WIN
A Dressler ARA 2000 50MHz - 2GHz Active Antenna in Our Reader Survey Competition

MARINE ISSUE

- UK Coast Radio Stations in the 1990s
- Marine Navigation Aids
- Global Maritime Distress & Safety System

Reviewed
- Yupiteru MVT-3100 Multi-band Receiver
- Timestep PDUS

Plus
- Modifying the Sangean ATS-803A
- Restoring an RI-155

Plus Regular Features Covering
YUPITERU
MVT-7100
A Handheld Sensation!

- Continuous Coverage 100KHz - 1650MHz
- 1000 Memory Channels
- All Mode Reception (including SSB & CW)
- High Scan Speed

The MVT-7100 is a new handheld sensation with the widest ever frequency coverage! It's sensitive receiver provides effortless reception of SSB and CW using true carrier injection with 50Hz resolution. It can even be hooked up for fax and data reception (with accessories).

The MVT-7100 is a complete communications package in the palm of your hand.

Accessories supplied:
Telescopic Antenna, NiCad Batteries, Car Connector, UK Charger, Carrying Strap, Earphone, English Manual

Available from your local dealer or direct from U.K. Distributors

NEVADA COMMUNICATIONS
189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (0705) 662145 Fax: (0705) 690626
Cover:
This month's cover photo, kindly supplied by the RNLI, shows the St Peter Port (Guernsey) lifeboat Sir William Arnold attending the wrecked Point Law on the coast of Alderney. A French helicopter also assists in the evacuation of the crew.

Photo: A M Perry

DISCLAIMER. Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. Short Wave Magazine advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The Publishers of Short Wave Magazine wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.
When the AR3030 was first placed onto the drawing board about 15 months ago, the R&D team at AOR had the dream of producing a high quality DDS (Direct Digital Synthesizer) receiver with excellent filtering characteristics offered by the legendary *Collins mechanical filters. This dream has now come true, a feat rarely achieved by any manufacturer whether large or small. As a shortwave listener you too can enjoy the experience of this very special marriage of high technology and classical styling.

Most receivers employ ceramic filters, such filters offer good performance and reasonable cost. However the "best" kind of filter is the mechanical resonator filter, pioneered and still manufactured by the *Collins Division of Rockwell International. In contrast to ceramic filters, *Collins mechanical I.F. filters are more expensive and rarely used in any but the very top of the range and professional equipment.

Our aim here at AOR has been to produce a general coverage receiver using the *Collins 6kHz AM mechanical filter fitted as standard yet at an affordable price for most shortwave listeners around the World. We believe that only the very best receiver design deserves the *Collins mechanical filter, and feel our R&D team have succeeded with this goal. It is very easy to appreciate the true effectiveness of the *Collins AM mechanical filter on today's crowded medium and shortwave bands especially in Europe after dark.

We also believe DDS is the best method available today to produce the cleanest signals, absolutely essential for high performance receive capability especially on crowded bands containing many strong signals. There are two other filters fitted as standard, these being 2.4kHz for SSB/FAX/CW and narrow AM/S.AM & 15kHz for NFM. Additional filter options include a *Collins 7 resonator mechanical 500Hz filter for narrow CW operation and a *Collins 8 resonator mechanical 2.5kHz filter for even better selectivity on SSB.

Our "Collins inside" logo and use of name has been fully approved by Collins Rockwell and we are proud of that fact. Our pride will be lifted even higher should other manufacturers be brave enough to follow our example in the near future.

The AR3030 boasts a wide frequency coverage from 30kHz to 30MHz and all mode reception 'as standard': AM, S.AM (synchronous), NFM, USB, CW & FAX with a minimum tuning step of 5Hz. Frequency stability and alignment is excellent featuring a temperature compensated crystal oscillator (TCXO) fitted as standard.

The AR3030 has a number of unique facilities to offer. In particular the BFO (Beat Frequency Oscillator) is switchable on USB/LSB/CW and FAX modes. During 'normal' operation the AR3030 uses true carrier re-insertion techniques for SSB reception, this ensures ease of use and good audio quality. However should adjacent interference be encountered, the BFO may be switched on so that the main rotary tuning control can be used to tune away from interference and the BFO used to recover readable audio thus provide a simple but effective manual form of passband tuning.

Operation is from a nominal 13.8V DC input or from internally fitted VHF converters for short duration use to provide greatest flexibility while operating from a fixed or portable location. Two optional internally fitted VHF converters are also planned.

AR3030 all mode receiver with *Collins AM mechanical filter and TCXO, includes mains power supply

£699.00 inc V.A.T.
editorial

You can help me in my task of providing you with the magazine you want to read. How? By taking a few minutes to fill in the Reader Survey Form included in the centre of this issue. By way of an incentive you will get a free entry into our Prize Draw for a Dressler active antenna. If you haven't already filled it in, do it now - before you forget.

Volume Numbers

Something went wrong with the issue numbering system towards the end of last year and the volume number mysteriously increased by one with the October issue. To correct this and avoid a missing volume this issue is correctly identified as Vol. 52 Issue 2. Volume 53 will start with the January 95 issue. If you use the Volume Number for reference purposes please correct the October, November and December 93 and January 94 issues. The annual Index, published in the December issue, is not affected as the issues are referred to by Issue Month.

Dear Sir

In the USA we have a licence-free experimenters' band at 160 to 190kHz. One watt and 15 metre antenna is maximum. Receiving techniques must parallel those of low-frequency broadcast bands except that very narrow bandwidth is useful to receive Morse. I suspect high perfection has been achieved in your s.w.l. community. I want to correspond on 'Ham' with those interested.

David Jones AD4NR
1600 Hilton Avenue, Columbus, OH 31906

Has anyone outside the USA heard these signals? - Ed

Dear Sir

41m/7.105MHz. I think the station was Radio Neaster using R. Moscow's transmitters. The station finished at 0400UTC (as it was 0300 to 0400). The address, as I said, was pronounced quickly, but I caught the town name, I think, being Transnist (appropriate name, I thought).

In the CIS they said that it is scheduled for 7.105MHz on 2100UTC, and then 0300-0400UTC, but I've yet to log it, have any of your readers logged it yet?

Lee Williams
Birmingham

Dear Sir

Why is it getting harder and harder to receive QSLs from ILR stations these days? As an avid QSL collector, I am becoming perplexed by the number of non-replies to reception reports from these stations. I have tried sending friendly letters with my reports, stamped addressed envelopes and even prepared postcards, but with very little result, my success rate being about 50%.

The most notable non-verifiers are Capital Gold - London (5 reports), Brunel Gold - Swindon and Bristol (6 reports each) and Radio 210 - Reading, who finally verified after 7 reports over two and a half years.

Have your readers any tips on how to receive these elusive QSLs. Thank you for your help and I look forward to reading the next issue of your magazine.

Mr T. Vaughan
Southampton

We have received other letters on the difficulties of obtaining QSLs from both UK and foreign stations and would be pleased to hear from any readers who feel they have a higher than average success rate. Do we have any readers working in ILR? - Ed.

Dear Sir

The Editor reserves the right to shorten any letters for publication but letters published in this magazine are not necessarily those of Short Wave Magazine.

If you have any points of view that you want to air please write to the Editor. If your letter is published you will receive a £5 voucher to spend on any SWM service.

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

Back Numbers and Binders

Limited stocks of most issues of SWM for the past five years are available at £2.00 each including P&P to addresses in the USA and overseas (by surface mail).

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

Orders for back numbers, binders and items from our Book Service should be sent to: PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW, with details of non-replies to reception of QSLs. Joint subscriptions to both SWM projects are available from the SWM PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326.

Components for SWM Projects

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

The printed circuit boards for SWM projects are available from the SWM PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326.
Dear Sir

A short while ago I purchased an MVT-7100 scanner along with a base station antenna, more commonly known as a discone. While the discone was not extremely expensive, it does justice to the scanner and I am quite pleased with it's performance.

However, there is the cause that has prompted me to write in. To the best of your knowledge, have you ever heard of a musical discone? If not, perhaps I could sell you on it.

The problem began about a week after I had installed it on the chimney stack. It was in the early hours of Sunday morning that it happened! HOWLING, GONSA and WHINING, WHISTLING, DRONING, the notes changing in pitch to the force of the wind.

Needless to say, it's no longer up there! The discone is completely manufactured of solid aluminium rods, eight in total with eight short elements at the top, (a typical discone).

On inspection on the antenna, the fitter found the noise to be transmitted down the pole and into the chimney lining, thus acting as a wind tunnel. Can you imagine the noise? It was torture to say the least! I am now in the process of buying a Scannmaster from Nevada.

Surely I am not the first to be cursed with this wretched noise.

A. Webb
Gwent

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Dear Sir

I read with horror the report from Mr T Brown GONSA on lightning in the September issue. Being a TV/Video engineer, I come across quite a few lightning strikes.

If you disconnect your PL259 or BNC plug and leave it dangling on either work station or carpet and you get a direct hit, the lightning will find it's way to the nearest earth, e.g., radiator or mains socket. Lightning can travel any distance from the end of your cable to earth from 50mm to well over 6 metres. Be prepared to call out the Fire Brigade or ambulance if you're in the way.

Even without a direct hit, electrostatic charges damage front ends and micros and even with the radio disconnected it can still destroy memory or micros.

There are only a few ways of nearly full protection:

1. As stated, electrostatic surge protectors (these will protect against indirect strikes).
2. Make sure your neighbour's aerials are a lot higher and better earthed than yours. (Your neighbour may not be very impressed with this!)
3. Have your aerials on a crank arm (so you can reduce the height), this may be inconvenient.
4. The best way is to fit a socket to a metal plate, take an earthing strap (say as thick as the mains earth from the electricity meter to your fuse box) and feed it outside to an earthing stake, making sure the aerial mast is earthed as well. In time of storms disconnect your equipment and fit a plug with a shorting connection, then just wait for the almighty bang!

M. Robinson
Essex

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Dear Sir

I was very interested to read that letter from Mr D A Grant of Worcestershire in your January issue and his experience with the Sony AN1 antenna.

I purchased one about two years ago, after noting the success of the various people who subscribe to your Band Report pages, and have had great success with it.

Living on a city housing estate and being unable to use an outside antenna, I mounted this in the loft and used it in conjunction with my Sony 2001 and Kenwood TR600 receivers.

It has been a great success and I can easily listen to amateurs chatting to each other from most parts of the world including Japan, India, the Americas and all the Russian continent, plus aircraft over the Atlantic coast of Spain, as well as the different RAF bases over the Channel. In addition, I can pick up the HKCB, Radio Providence and many others.

Several times I have tuned in to a station that I knew by name, and when the RAE had ceased all activity, I found that the station was being heard on the AN1, which wouldn't have been possible on a discone. While the discone is commonly known as a discone, the Sony AN1 in this case acts as a discone.

I am now in the process of buying a Scannmaster from Nevada.

Surely I am not the first to be cursed with this wretched noise.

A. Webb
Gwent

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Dear Sir

I appreciate that you have only recently published one of my letters, but having read the letter from K Brown (G7EXO) in the January 1994 issue, I felt I just had to reply.

Why is it that the only letter I read campaigning for the abolition of the Morse Test always seem to be written by those people who, for one reason or another, haven't passed it? These letters moan on with various reasons from outdated modes to unfair testing. Reading between the lines, would it not be true to say that for the majority of people, the Morse Test equates to another examination for which people are not prepared to dedicate some more time and effort to?

Having read many such letters on the subject, I have yet to see any mention of the fact that in NO way has anyone 'moved the goal post after the game begun'. We are all aware, when setting about studying for the RAE, that the Morse Test must be passed if we wish to operate on the h.f. bands. Nobody hides this fact from us or slips the information to us just after sitting the RAE but you wouldn't know this from the content of these letters.

Learning the Morse Code can be likened, in a lot of respects, to a diet. In order to obtain the final result you have to stick with it. In a diet, it's very easy to have the odd snack, but this is usually accompanied by a slip back in weight. The Morse is similar in the respect that it's easy to miss the odd night of practice, but this is usually accompanied by the gaining of the odd pound in weight. The Morse is similar in the respect that it's easy to miss the odd night of practice, but this is usually accompanied by a slip back in speed or the odd letter not learnt. Eventually, with the diet, no weight is lost. With the Morse, the test is failed. I passed the RAE in 1982 but finally passed the Morse Test in 1988. During the five years between, I tried to settle down and learn the Morse of numerous occasions without success. It finally took three months of 30 minutes practice per night before I cracked it. No one told me it was easy and it wasn't.

Is this fact that a particular test or examination is difficult to obtain really a sufficiently good reason to abolish it? If it is, then I hope they never apply the same logic and reasoning to the Driving Test........or the RAE for that matter!

Chris Carrington G0IVZ/G-20365
Derby

This topic has been using up space in the Amateur Radio press for many years. Rather than continue this debate could we hear from those who have tackled the Morse Test with their tips on how to succeed, and their pit-falls to avoid. - Ed

Short Wave Magazine February 1994
**Jargon Buster!**

The most common problem for new listeners entering the hobby is getting to grips with all the jargon that’s used. Although the Editor tries to keep this to a minimum, there’s still an awful lot about. I thought it might be useful if I offered a jargon busting service through this column. All you need to do is write to me with the offending item and I will do my best to explain what it really means. To get the column started, I’ve picked one that appeared in a recent reader’s letter.

**DXTV:** This refers to the reception of television signals from a great distance and is a specialist aspect of listening. Those involved use sensitive receivers and larger than normal antenna systems to attempt to receive these, often very weak, signals. *Short Wave Magazine* has a regular specialist feature written by Ron Ham called ‘DXTV Round-Up’.

From this I hope you can see that the letters DX are used to indicate long distance. In fact, this is an abbreviation well worth remembering as it gets used in most aspects of both listening and amateur radio. The term originated from the days when Morse code was still the main method of radio communication. As this was a rather slow way of communicating, a wide range of abbreviations were devised to help shorten the messages. As you’ve probably already guessed, DX was just such an abbreviation.

**Air Band Companion**

A recent batch of product information from AOR Ltd contained a little gem that will be of interest to many new scanner owners. If you’re operating with very limited funds (like most of us!) you may well start out by buying one of the many budget range scanners that are on the market. One of the common problems with these is a poor image and overload performance. This means that signals other than the one you’re tuned to can break through and cause interference. This is often particularly frustrating for those with an interest in the civil air band as it’s often 145MHz amateur radio signals that interfere with the reception.

You can also suffer all sorts of unwanted noise and a reduction in sensitivity from strong short wave signals. The problem is caused by the design of the first stages of the scanner being prone to overload from these strong signals. You’ll be delighted to know that the problem can be cured for just £24.50! The solution is to fit a tuned filter between the antenna and the receiver. This filter is specially made to pass all signals in the air band with minimum loss, but to severely reduce all other signals.

The ABF-125 filter from AOR is just such a device and reduces signals outside the air band by more than 300 times (25dB), whilst only reducing the wanted air band signal by around 2.5 times (4dB). The ABF-125 is very compact being just 73.5mm long with a BNC socket at one end and a plug at the other. This type of construction means that it can be used just as well with a portable whip antenna as with a base station unit. As the ABF-125 is a passive device, there are no power problems to worry about either. For more information contact AOR Ltd., Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbys DE4 4BG. Tel: (0629) 825926.

If you’re feeling really adventurous, you could always try building your own filter. A look through a book such as the *ARRL Handbook* or *RSGB Manual* should provide all the information you need providing you have a few constructional skills and can drive a calculator. These books are sometimes available in your local library, or you could find a second-hand copy at a rally.

**Winter Schedules**

Chris Carrington of the International Short Wave League has just written to let me know that the winter schedules of their *Guide to English Language Short Wave Broadcasts to Europe* are now available. The guide is attractive to new and experienced listeners alike as it contains all the very latest transmission schedules. For the newcomer there’s an informative introduction giving details of some of the latest modes as well as covering the general organisation of the guide. Rather than giving just conventional frequency listings, the guide lists all the stations in chronological order starting from midnight. Within this

**Hubble Trouble!**

If you’ve been as fascinated as me with the repair of the Hubble telescope in space last December, you’re bound to enjoy the latest special exhibition at the Science Museum in London. This exhibition is set to run through until March and includes all sorts of interesting features. Among these are examples of the photon detector units, solar wings and a range of space images plus videos of the repair mission.

Just in case you weren’t aware, the faint object camera at the heart of the Hubble telescope was invented by Professor Boksenburg of the Royal Greenwich Observatory and the detector units were built by British Aerospace and Thorn EMI. For more information on this exhibition contact the Science Museum on their Information Desk number which is 071-938 0808.

*Short Wave Magazine, February 1994*
rallies

February 13: 3rd Northern Cross Rally is being held at the Radisson School on the A61 between Leeds and Wakefield (near Wakefield railway station) Doors open at 11am, 10.30am for disabled visitors and Bring & Buy, usual deals, ample parking, bar & refreshments. Morse tests. Talk-in on 522. Dave Gray on (0532) 287933.

*February 20: The Great Northern Rally. D-MEX, City Centre, Manchester. All the usual attractions, including free tea and coffee until 10am, entertainment to the exhibition floor, ample car parking for exhibitors and visitors, comprehensive catering and leisure facilities. Jack G1G0ZD. 091-265 1718.

February 26: Tyneside Amateur Radio Society are holding their eighth annual rally at the Temple Park Society. Admissions £1.50, doors open at 10.30am, cafeteria for hot and cold refreshments, licensed bar, Bring & Buy, Talk-in on 144MHz via GB1GMX. Further information on 061-7835952.

February 26: The 9th Rainham Radio Rally is being held at the Rodillian School in Tiverton, Devon. G4TSW, Mid Devon Rally, PO Box 3, Wincanton, Somerset BA9 9BX. Tel: 051-630 5790.

February 8: ‘March 12/13: The London Amateur £1, children under 16 Free, Talk-in on the 17th annual rally at the Temple Park Society are holding their eighth annual rally at the Temple Park Society. Admissions £1.50, doors open at 10.30am, cafeteria for hot and cold refreshments, licensed bar, Bring & Buy, Talk-in on 144MHz via GB1GMX. Further information on 061-7835952.

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Contest News

The International Listeners Association has opened its contests to non-members. They have told us of two contests in February:

On 6 February the 1st Prefix Contest 1994 and on 13 February the 1st Set Listening Period 1994. Both contests cover the period 0000 to 2400UTC, but you must select six hours total logging time.

For the Prefix Contest monitor the 1.8 and 3.5MHz amateur bands and log as many amateur prefixes as possible on each band. Multiply the totals from each band together to get the total points.

For the Set Listening Period monitor the 60 and 75metre broadcast bands and log as many stations as possible in the time allowed.

For both contests send a copy of your log and an entry fee of £1.00 to K Burnell, Contest Manager, 91 Mabins Lane, Coppenhall, Crewe, Cheshire CW1 3RG who, I'm sure, would be willing to send you details of other contests on receipt of an s.a.s.e.

All amateurs are invited to participate in the EA RTTY Contest, from 1600UTC Saturday 12 February to 1600UTC Sunday 13 February, organised by the Union de Radioaficionados Españoles (URE).

This type of contest is a wonderful opportunity to hear those rare "contest only" stations and prefixes on the 10, 15, 20, 40 and 80-metre bands.

Copies of the full contest details are available from the SWM offices in Broadstone on receipt of an s.a.s.e.

Contest organisers please note: we are always please to publish details of listeners' contests or contests with a listeners' section and brief details of other contest if you get them to the SWM office well in advance of the date.

Thanks from RAIBC

The Northern Ireland Area group of the Radio Amateur Invalid and Blind Club have asked us to convey their thanks to all who donated petrol tokens to them.

The RAIBC are still collecting Air Miles and petrol tokens and vouchers of all types. Send them to Radio Amateur Invalid and Blind Club (NI Area), FREEPOST BE1769, Belfast BT15 3BR. Further information can be obtained from David Caldwell GIOHOW, 59 Connsbrook Avenue, Belfast BT15 3BR. Further information can be obtained from David Caldwell GIOHOW, 59 Connsbrook Avenue, Belfast BT15 3BR. Further information can be obtained from David Caldwell GIOHOW, 59 Connsbrook Avenue, Belfast BT15 3BR.

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Deutsche Welle Changes

The English language programmes from Deutsche Welle have left the long-established medium wave channel of 1269kHz and are now to be heard on 5.960 and 7.285MHz (short wave) at the new time of 2000 to 2050UTC.

The satellite service on Astra has also moved, it is now carried on an audio subcarrier of RTL Plus television (transponder 2) at 7.740MHz.

Drake SW8 Receiver

Nevada Communications have told us of the new Drake SW8 receiver that they expect to be released by the time the edition of SWM is published. This microprocessor-controlled, synthesised, world band receiver features continuous coverage from 500kHz to 30MHz with a.m., u.s.b. and l.s.b. modes, 116-136MHz (airband) a.m., 87-108MHz (Band 2) f.m. with stereo available on headphones.

The receiver follows the modern trend of using a multi-function back-lit liquid-crystal display featuring a seven-digit frequency display. The 70 memories, which do not require a battery backup, store all the parameters associated with a particular communication channel including the frequency, mode, bandwidth, fast or slow a.g.c., r.f. attenuator and synchronous detector.

The receiver is powered from either six "D" cells or an external adapter and is expected to sell in the £500-£600 price range.

Further details from Nevada Communications, 189 London Road, North End, Portsmouth, Hants. PO2 9AE. Tel:(0705) 662145 or Fax:(0705) 690626.

News

The Early History of Radio: from Faraday to Marconi by Gerald Garratt

Most books on the history of Radio start with Marconi and ignore the men and the work that went before. This new book deals with the "pre-history" of Radio and ends with Marconi.

The book outlines the sequence of development from Faraday's first prediction and concept of the electromagnetic field, the mathematical definition of the conditions for propagation of waves by Maxwell, the demonstration of their physical existence by Hertz, identification of the need for resonance between transmitter and receiver by Lodge and finally Marconi's successful practical application and "invention".

The late Gerald Garratt was formerly of the Science Museum, London.

This book is part of the Institution of Electrical Engineers "History of Technology" Series and is published at £19 including p&p within the UK. Add 10% for Europe or 15% for accelerated surface post elsewhere. Further details from The Marketing Officer, IEE, Michael Faraday House, Six Hills Way, Stevenage, Herts. SG1 2AY. Tel: (0438) 313311 or Fax: (0438) 313465

Weather Plotting with Isobars

Weather information from shore, ship, oil rig and aircraft based observing stations is gathered and broadcast by radio immediately on receipt. This information is collected, processed and rebroadcast by national meteorological agencies in Europe every three hours. This information is, however, at least three hours old and the "raw" data could only be decoded as a meaningless jumble of letters and figures.

ICS Electronics Ltd produce ICS-SYNOP which will gather the "raw" data from a suitable h.f. receiver and present it in a fully zoomable map of Europe on the screen of any IBM-PC compatible computer to show wind, barometric pressure, temperature, cloud cover, etc. The latest version ICS-SYNOP III now includes isobars (or isotherms).

The package includes both the computer software and the radio interface. For further details contact ICS Electronics Ltd. at Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD. Tel: (0903) 731101 or Fax: (0903) 731105.

(We will be reviewing ICS-SYNOP III in a future issue of SWM)

Short Wave Magazine, February 1994
The NTR1 is a sophisticated audio processing unit that uses Digital Signal Processing to provide superior operating characteristics to those attainable using analogue techniques. The unit takes the audio from the receiver and converts it into a digital bit stream, processes it and turns it back into an analogue signal.

Four pushbutton switches provide Power On/Off, Noise Reduction On/Off, Notch On/Off and Bandwidth Wide/Narrow. All functions are independent and can be used separately or together. Whenever a function is engaged, a companion LED is illuminated.

The NOTCH mode removes tones, whistles or heterodynes. This is useful when adjacent channel carriers are present or when CW or RTTY tones interfere with desired speech reception. When receiving CW or RTTY signals, the notch must be disengaged or nothing but key clicks will be heard!

The NOISE REDUCTION mode is known as "Dynamic Peaking", and works by forming dynamic bandpass filters around any coherent frequencies appearing within the audio passband such as the fundamental and harmonic frequencies of speech, CW tones, RTTY MARK and SPACE tones etc. These dynamic filters reject the non-coherent frequencies of white noise and other similar noise types. Therefore it can actually be used to accentuate or peak CW or RTTY signals, as well as eliminate white noise from them.

Here at last is a device that provides noise and tone elimination from wide band audio signals, yet leaves the desired speech with good fidelity......and you can buy it from Lowe for just £199.00.

The NTR1 needs a REGULATED 12V DC power supply, at 800mA current. A suitable unit is available from us at £29.95.

Other JPS digital filters are also available - full details on request.

Wide band noise and tone remover. Works with any receiver or scanner.
Provides wide band operation for AM or FM signals (approx. 6.8kHz).

Narrow band operation for SSB, CW or Data reception (approx. 3.4kHz).
Reduces atmospheric noise through Dynamic Peaking
Rapidly removes multiple tones from voice signals
Operates on receiver audio output - no modification required.
Built-in audio power amplifier

PLEASE NOTE:
OUR FACTORY AT "CROMFORD" IS PURELY A PRODUCTION UNIT WITH NO CUSTOMER FACILITIES.
PLEASE DIRECT ALL ENQUIRIES TO OUR RETAIL OPERATION AT "MATLOCK" OR TO OUR BRANCHES.
OUR APOLOGIES FOR ANY CONFUSION CAUSED!
THE WORLD'S BEST RADIOS...

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tr>
<td>HF150</td>
<td>Short-wave receiver: AM; AMS, SSB 30kHz to 30MHz</td>
<td>£389.00</td>
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<td>PR150</td>
<td>Active pre-selector</td>
<td>£235.00</td>
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<tr>
<td>HF225</td>
<td>Short-wave receiver: AM; SSB; CW; 30kHz - 30MHz</td>
<td>£479.00</td>
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<tr>
<td>HF225</td>
<td>Limited edition HF225: Narrower AM filters etc</td>
<td>£699.00</td>
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<tr>
<td>SXR50</td>
<td>Portable SW RX, inc. LW; MW; &amp; VHF/FM in stereo</td>
<td>£39.95</td>
</tr>
<tr>
<td>NRD535</td>
<td>Top class general coverage receiver</td>
<td>£1,695.00</td>
</tr>
<tr>
<td>ICR72E</td>
<td>General Coverage Receiver, inc Stand By Battery</td>
<td>£59.95</td>
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<tr>
<td>FRG100</td>
<td>Receiver 50kHz-30MHz</td>
<td>£59.95</td>
</tr>
<tr>
<td>ICFSW7600</td>
<td>Portable SRX with VHF/FM</td>
<td>£169.00</td>
</tr>
<tr>
<td>ICFSW755</td>
<td>Portable SW RX</td>
<td>£269.00</td>
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<tr>
<td>ICFSW777</td>
<td>Portable SW RX</td>
<td>£369.00</td>
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<tr>
<td>VT125UK</td>
<td>VHF Airband scanner</td>
<td>£189.00</td>
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<tr>
<td>VT225</td>
<td>VHF/UHF Airband, 100 memories</td>
<td>£289.00</td>
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<tr>
<td>MVT7000</td>
<td>500kHz - 1300MHz 200 memories, 10 search bands</td>
<td>£319.00</td>
</tr>
<tr>
<td>MVT7100</td>
<td>500kHz - 1650MHz, 100 memories, 10 search bands, AM/FM/WFM/USB/LSB</td>
<td>£39.00</td>
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<tr>
<td>MVT8000</td>
<td>Base/mode version of MVT7000</td>
<td>£39.00</td>
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<tr>
<td>R537S</td>
<td>Tuneable airband receiver</td>
<td>£79.95</td>
</tr>
<tr>
<td>R535</td>
<td>VHF/UHF Airband scanner, civil and military</td>
<td>£79.95</td>
</tr>
<tr>
<td>WIN108</td>
<td>VHF Airband scanner 20 mem,</td>
<td>£139.00</td>
</tr>
<tr>
<td>AR3000A</td>
<td>Base/mode wide band receiver, all-mode, 400 memories, 150kHz - 2036MHz</td>
<td>£939.00</td>
</tr>
</tbody>
</table>

...DESERVE THE BEST ACCESSORIES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>AN1</td>
<td>Active antenna</td>
<td>£52.95</td>
</tr>
<tr>
<td>MLB</td>
<td>Magnetic Longwire Balun</td>
<td>£39.95</td>
</tr>
<tr>
<td>MLBAMK1</td>
<td>MLB Antenna kit, 12.5m</td>
<td>£69.95</td>
</tr>
<tr>
<td>MLBAMK2</td>
<td>MLB Antenna kit, 20m</td>
<td>£79.95</td>
</tr>
<tr>
<td>MTA</td>
<td>Magnetic Transfer Antenna</td>
<td>£179.00</td>
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<tr>
<td>DXONE</td>
<td>High quality active antenna</td>
<td>£289.00</td>
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<tr>
<td>AD370</td>
<td>Deltong active antenna</td>
<td>£79.95</td>
</tr>
<tr>
<td>AT1000</td>
<td>SWL Antenna tuning unit</td>
<td>£89.95</td>
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<tr>
<td>FL3</td>
<td>Deltong multimode audio filter with automatic notch</td>
<td>£149.95</td>
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<tr>
<td>ABF125</td>
<td>VHF airband filter</td>
<td>£249.00</td>
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<tr>
<td>D130N</td>
<td>25 - 1300 MHz discone c/w 15m COAX</td>
<td>£99.95</td>
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<tr>
<td>LAB</td>
<td>Airband ground plane antenna</td>
<td>£21.95</td>
</tr>
<tr>
<td>SCANMAS</td>
<td>Wide band receiving antenna 500kHz - 1300MHz</td>
<td>£39.95</td>
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<tr>
<td>JIM75</td>
<td>(JIM M75) Scanner pre-amp</td>
<td>£84.95</td>
</tr>
<tr>
<td>HB400</td>
<td>Mobile mount for scanners</td>
<td>£15.00</td>
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<tr>
<td>PSU101</td>
<td>Scanner PSU and stand</td>
<td>£29.95</td>
</tr>
<tr>
<td>MG125B</td>
<td>Airband mobile antenna with mag mount &amp; cable with BNC plug</td>
<td>£29.95</td>
</tr>
<tr>
<td>LNA3000</td>
<td>Masthead pre-amp, 50 - 3000MHz</td>
<td>£159.00</td>
</tr>
<tr>
<td>AFG</td>
<td>Airband Frequency Guide (covering Civil &amp; Military)</td>
<td>£5.95</td>
</tr>
<tr>
<td>ATR</td>
<td>Air Traffic Radio</td>
<td>£2.25</td>
</tr>
<tr>
<td>UKSD</td>
<td>UK Scanning Directory</td>
<td>£14.95</td>
</tr>
<tr>
<td>VUFG</td>
<td>The VHF/UHF Scanning Frequency Guide</td>
<td>£9.95</td>
</tr>
<tr>
<td>SCANNERS</td>
<td>Scanners 3rd edition</td>
<td>£8.95</td>
</tr>
<tr>
<td>SCNR2</td>
<td>Scanners 2, International</td>
<td>£10.95</td>
</tr>
</tbody>
</table>

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WALES & WEST
79/81 Gloucester Road Patchway, Bristol, Tel 0272 315263

SOUTH EAST
Communications House Chatham Road Sandling, Maidstone, Tel 0622 692773

NORTH EAST
Mitford House Newcastle Int'l Airport Newcastle upon Tyne Tel 0661 860418

SOUTH WEST
The Basement, Royal Fleet Club Devonport, Plymouth, Tel 0752 607284

SOUTH COAST
27, Gillam Road, Northbourne, Bournemouth, Tel 0202 577760

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CARRIAGE CHARGES - A = £1.00, B = £3.00, C = £5.00, (POST) D = £10.00 (PARCELFORCE - NEXT WORKING DAY SERVICE)
China Steps Up Jamming of BBC Broadcasts

The BBC announced that there has been a sharp increase in Chinese jamming of all frequencies carrying BBC Chinese language programmes in Mandarin. Originally the jamming, which began in 1989 at the time of the pro-democracy demonstrations, was confined to transmissions from the BBC relay station in Hong Kong. Now it has spread, according to BBC engineers, to all frequencies beaming BBC Mandarin broadcasts into China, including those from transmitters in the former Soviet Union.

Jamming is not being directed at BBC output in Cantonese and English for China, but Voice of America's Mandarin service is also being harder hit than previously.

No other countries are currently jamming the BBC. Iraqi interference to the BBC Arabic Service which started during the Iran-Iraq war and continued during hostilities in the Gulf has recently ceased.

48th WRTH

Just out is the 48th Edition of the radio listener's bible - the *World Radio TV Handbook* - affectionately known by the tongue-twisting acronym WRTH. This encyclopaedic guide has been recognised as the most authoritative and up-to-date publication of the world's long, medium and shortwave radio and television stations for many years. Designed for easy access, the book allows the user, with the right radio equipment, to tune into any of the world's radio and TV stations.

WRTH '94 was produced with computerised editing, ensuring that new information is inserted right up to the time the final pages were sent for printing.

Available now from the SWM Book Service for £15.95 plus £1.00 UK p&p or £1.75 overseas surface.

Problems in Malta with the officially allocated two u.h.f. channels of E21 and E29 being 'taken' by private stations operating on nearby Sicily. Overtures are being made to remove the invaders from the Maltese allocations.

Meanwhile 'Super One Television' on Malta has now opened test transmissions on the non-allocated Ch. E43!

Radio TVDX News

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Zambia will have her first taste of private broadcasting early 1994 with at least 12 bidders receiving licences for radio and TV stations. The radio stations will operate at v.h.f. f.m. Band 2. There are no plans to privatise the state-owned ZNBC in the short term. Nearby Kenya has received grant aid cash from Japan to modernise her radio and TV network system with three new TV transmitters at Kisii, Nakuru and Webuye, a new studio complex at Ngong which should bring population coverage up to 60%.

RTL has been allowed to continue broadcasting into the Saxony (German) region using local Deutsche Telekom facilities. This is despite moves by the local licensing authority, the ruling was announced in Dresden recently.

Further to the news of 5 Doordarshan satellite channels (see "Satellite TV News"), the broadcaster is to terrestrial broadcast the same channels on low power transmitters in the main centres of Calcutta, Bombay, Delhi and Madras using a mix of Band 3 Chs. E5,7 and u.h.f. Chs. E23, 26 and E29.

The Polish 2nd TV chain will be transmitting in PAL from January 1994 and dropping SECAM. It is intended that the 1st chain will also adopt the PAL standard from early 1995.

The Warsaw transmitter at the Palace of Culture has apparently been unwell and local viewers have suffered 2 months of interruptions during repairs to the aged transmitting system. The press report suggests the installation is 38 years old! Polsat, the satellite channel is being granted a licence/franchise for ten years to create a nationwide terrestrial network.

'Steletsa na Gaile' is a Gaelic language channel to open across Eire during 1994 initially running three hours daily with a mix of locally produced material (30%), RTE produced (30%) and imported dubbed/subtitiled. Running costs are about £1.5 million Irish with a similar figure for annual operating costs. The Franco-German arts channel 'ARTE' has been struck a blow by Belgian's RTBF pulling out of funding due to severe money problems. Though the programme will cease to be aired in Belgium, it will continue to appear on the numerous Belgian cable systems.

Finally if you are a 405 line vintage TV enthusiast and crave for the good old Test Card C then weep no more! HS Publications are making available a limited number of digital pattern generators displaying the real BBC Test C. This unique item is a limited edition generator made under licence from the BBC. For more information write - with s.a.e.- to HS Publications, 7 Epping Close, Derby DE3 4HR or ring (0332) 513399.
Broadcast Schedules

Every post seems to bring another batch of short wave broadcast schedules into the SWM office. Obviously we cannot publish everything or there would be no room for anything else in SWM, but we will attempt to squeeze in as many of the English language listings as we can using a condensed "frequency(MHz) / time(UTC) / target region" format. We will also try to list the dates for which these schedules are valid.

Channel Africa (until 26 March)

<table>
<thead>
<tr>
<th>Frequency(MHz)</th>
<th>Time(UTC)</th>
<th>Target Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.585</td>
<td>0300-0500</td>
<td>Kenya, Uganda, Ethiopia</td>
</tr>
<tr>
<td>5.955</td>
<td>0300-0500</td>
<td>Zambia, Zimbabwe, Malawi</td>
</tr>
<tr>
<td>2.725</td>
<td>0900-1000</td>
<td>Zambia, Zimbabwe, Malawi</td>
</tr>
<tr>
<td>11.900</td>
<td>0500-0600</td>
<td>Nigeria</td>
</tr>
<tr>
<td>11.710</td>
<td>0600-0700</td>
<td>Nigeria</td>
</tr>
<tr>
<td>17.810</td>
<td>1000-1100</td>
<td>Kenya, Uganda, Tanzania, Ethiopia, Somalia</td>
</tr>
<tr>
<td>7.270</td>
<td>1100-1200</td>
<td>Zambia, Zimbabwe, Malawi, Namibia, Botswana</td>
</tr>
<tr>
<td>15.240</td>
<td>1500-1600</td>
<td>Ghana, Sierra Leone, Gambia, Liberia, Nigeria, Cameroon</td>
</tr>
</tbody>
</table>

Adventist World Radio (until 26 March)

<table>
<thead>
<tr>
<th>Frequency(MHz)</th>
<th>Time(UTC)</th>
<th>Target Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.995</td>
<td>7.270, 9.525</td>
<td>3:00-5:00, 7:27-9:52, 11:815</td>
</tr>
<tr>
<td>6.135</td>
<td>7.285, 9.525</td>
<td>8:00-16:55</td>
</tr>
<tr>
<td>7.210</td>
<td>16:00-17:00</td>
<td>S Asia</td>
</tr>
<tr>
<td>7.230</td>
<td>1600-1100</td>
<td>Europe</td>
</tr>
<tr>
<td>7.930</td>
<td>1000-1300</td>
<td>C &amp; S America</td>
</tr>
<tr>
<td>9.725</td>
<td>1000-1300</td>
<td>S Asia</td>
</tr>
<tr>
<td>13.750</td>
<td>1200-1300</td>
<td>C &amp; S America,</td>
</tr>
<tr>
<td>19.725</td>
<td>1200-1300</td>
<td>C &amp; S America</td>
</tr>
<tr>
<td>13.720</td>
<td>1700-1800</td>
<td>S Africa &amp; Africa</td>
</tr>
<tr>
<td>13.720</td>
<td>1800-1900</td>
<td>Africa</td>
</tr>
<tr>
<td>5.980</td>
<td>1900-2300</td>
<td>C &amp; S America</td>
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<tr>
<td>5.970</td>
<td>2100-0000</td>
<td>Europe</td>
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<td>9.835</td>
<td>2300-0000</td>
<td>N &amp; E Asia</td>
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<tr>
<td>11.870</td>
<td>2300-0000</td>
<td>C &amp; S America</td>
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<tr>
<td>16.510</td>
<td>2300-0000</td>
<td>SE Asia</td>
</tr>
</tbody>
</table>

Not daily

A new transmitter at Rimavska Sobota, Slovakia will begin test transmissions on 6 January. A full service will be provided in the next period.

Provisional test schedule:

<table>
<thead>
<tr>
<th>Frequency(MHz)</th>
<th>Time(UTC)</th>
<th>Target Region</th>
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<tbody>
<tr>
<td>7.270</td>
<td>0100-0300</td>
<td>Indist</td>
</tr>
<tr>
<td>9.465</td>
<td>0300-0500</td>
<td>W Asia</td>
</tr>
<tr>
<td>9.455</td>
<td>0400-0500</td>
<td>E Africa</td>
</tr>
<tr>
<td>13.715</td>
<td>0600-0700</td>
<td>W Africa</td>
</tr>
<tr>
<td>7.180</td>
<td>0700-0800</td>
<td>N Europe</td>
</tr>
<tr>
<td>13.790</td>
<td>1400-1500</td>
<td>India</td>
</tr>
<tr>
<td>9.465</td>
<td>1600-1800</td>
<td>Indist</td>
</tr>
<tr>
<td>11.610</td>
<td>1600-1800</td>
<td>E Africa</td>
</tr>
<tr>
<td>† May include other languages</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Radio for Peace International (until 26 March)

<table>
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<th>Time(UTC)</th>
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<tbody>
<tr>
<td>21.465</td>
<td>0000-0400</td>
<td>u.s.b.</td>
</tr>
<tr>
<td>15.030</td>
<td>0100-0600</td>
<td>a.m.</td>
</tr>
<tr>
<td>7.375</td>
<td>0100-0800</td>
<td>a.m.</td>
</tr>
<tr>
<td>7.385</td>
<td>0100-0800</td>
<td>u.s.b.</td>
</tr>
<tr>
<td>15.030</td>
<td>0900-1600</td>
<td>a.m.</td>
</tr>
<tr>
<td>7.375</td>
<td>0900-1200</td>
<td>a.m.</td>
</tr>
<tr>
<td>7.385</td>
<td>0900-1400</td>
<td>u.s.b.</td>
</tr>
<tr>
<td>21.465</td>
<td>1200-1800</td>
<td>u.s.b.</td>
</tr>
<tr>
<td>15.030</td>
<td>1700-0000</td>
<td>a.m.</td>
</tr>
<tr>
<td>21.465</td>
<td>1700-0000</td>
<td>u.s.b.</td>
</tr>
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</table>

Polskie Radio Warsawa (until 26 March)

<table>
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<th>Frequency(MHz)</th>
<th>Time(UTC)</th>
<th>Target Region</th>
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<tbody>
<tr>
<td>6.135, 7.145, 7.270, 9.525</td>
<td>1300-1355</td>
<td>Europe</td>
</tr>
<tr>
<td>7.285, 9.525</td>
<td>1600-1655</td>
<td>Europe</td>
</tr>
<tr>
<td>5.995, 7.270, 7.285</td>
<td>1800-1855</td>
<td>Europe</td>
</tr>
<tr>
<td>1.503, 5.995, 6.135, 7.285</td>
<td>2030-2125</td>
<td>Europe</td>
</tr>
</tbody>
</table>

Radio New Zealand International (until 19 March)

<table>
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<th>Frequency(MHz)</th>
<th>Time(UTC)</th>
<th>Target Region</th>
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</thead>
<tbody>
<tr>
<td>9.700</td>
<td>0559-1200</td>
<td>Pacific S 6.096</td>
</tr>
<tr>
<td>9.655</td>
<td>1200-1649</td>
<td>Pacific (occasionally)</td>
</tr>
<tr>
<td>1600-1649</td>
<td>Pacific (Mon-Fri)</td>
<td></td>
</tr>
<tr>
<td>11.735</td>
<td>1850-2137</td>
<td>Pacific</td>
</tr>
<tr>
<td>15.115</td>
<td>2139-0658</td>
<td>Pacific</td>
</tr>
</tbody>
</table>

430MHz Repeater Stolen

The complete GB3GF 70cm repeater was 'very professionally' stripped and stolen from its site at Guildford, Surrey, in the early hours of Thursday 30 December 1993. This was obviously a pre-planned operation as the equipment was neatly and skilfully dismantled with tools during its time of least usage, and a 15m high tower was scaled on a wet night to remove the antenna.

The main repeater items consist of a Pye F9U wall-mounted base station, much modified, an 8W power amplifier in an unpainted die-cast box with GB3GF engraved on the lid, a homemade 12V power supply in a black plastics box and a number of cavity filters approximately 200mm long by 100mm diameter.

Antennas stolen were a J-Beam 'white stick' collinear with a glass-fibre outer tube, approx. 3.5m long, an X-50 dual-band collinear with a white glass fibre outer and three small radials near the base approximately 20cm long and a 2m high 4-stack professional folded dipole array.

As the theft was so professional it is possible that the equipment will be re-assembled and used for illegal purposes. This repeater is crystalised for 433.300MHz receive and 433.900MHz transmit, so any unexpected activity on these frequencies, outside the usual repeaters, particularly if the GB3GF Morse ident is used, should be reported to PC1284 Clarke at Guildford Police on (0483) 31111, ext 3128 or to the Guildford Repeater Group's Secretary, Alex Morris G6ZPR, on (0483) 892348, or Fax: (0483) 899927

Kenwood Appoints Dealer for Channel Islands

Kenwood's dealer network has been further strengthened by the appointment of Geoff Brown as an official Kenwood Amateur Radio Dealer.

Based in St Helier on the island of Jersey, Geoff has been involved in Amateur Radio for some 30 years and supplied Kenwood locally under its previous Trio brand name as long ago as 1975. Geoff is internationally famous for his operations, as GJ4ICD, on the v.h.f. and u.h.f. bands and has been Chairman of the UK Six Metre Group (UKSMG) for many years. For further information contact Trio Kenwood UK Ltd., Kenwood House, Dwight Road, Watford, Hertfordshire WD1 8EB, Tel:(0923) 816444 or Geoff Brown, The TV Shop, Belmont Road, St Helier, Jersey, Channel Islands.

Vintage Valves Still Available

We are pleased to learn that Valve & Tube Supplies, run by Rod Burman, has acquired the valve stock of the former Vintage Wireless Co. of Bristol.

Once the stock has been thoroughly sorted (probably by the time this issue appears) a two- to three-day order turn round is promised. Both tested and untested valves are available, at different prices.

For further information contact Valve & Tube Supplies, Unit 2A, Rink Road Industrial Estate, Ryde, Isle of Wight PO33 2LT. Telephone: (0983) 811386 or Fax: (0983) 564708.

New UK Agent for Mosley Antennas

From 1 January 1994 Eastern Communication have been appointed as the sole UK Agents for the world-famous beam antennas manufactured in the USA by Mosley Electronics Inc. of St Louis, Missouri.

Mosley manufacture a full range of beams for the Radio Amateur from 5-element h.f. monobanders, to 9-element multibanders, h.f. verticals and v.h.f. u.h.f. Yagis.

A full catalogue is available on request from Eastern Communications, Cavendish House, Haprisburgh, Norfolk NR12 ORU. Telephone: (0692) 650077
We aim to give the best prices on all major brands and we will endeavour to match any competitors genuine offer on Icom, Kenwood, AOR & Yaesu receivers.

**Massive Savings on Yaesu, Kenwood, ICOM, AOR & Yupiteru**

**FRG-100 HF Receiver 50kHz – 30MHz. SSB, CW, AM, FM**

**SMC PRICE only**

£499

*FREE AC PSU*

**FREE CASH BACK offer. Ask for details**

*FM unit optional*

**AOR**

**HF Receiver AR-3030**

- AM, S.AM, FM, USB, LSB, CW, FAX
- Collins mechanical filters
- Optional VHF converters
- Adjustable B.F.O.
- Mains power unit included

**SMC PRICE**

£699

Optional filters SSB & CW £89 each

**NEW**

**NEW AND USED HF RECEIVERS AND SCANNERS ALWAYS IN STOCK**

**FRG-8800 HF Communications Receiver**

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Short Wave Magazine, February 1994
Historical Radio

Restoring An R1155
Part 3

In this last part, Chas Miller tests the receiver's s.s.b. performance and attends to its physical and mechanical faults.

The final test of the R1155 was of its single-sideband capability using the b.f.o. This, by the way, operates at 280kHz (half the i.f.) and the harmonic used to beat with the i.f. signal. It must be borne in mind that the sole application of the b.f.o. in the R1155, as in most communications sets of its period, was to render c.w. signals audible; to this end the b.f.o. was tuned to around 1kHz off the i.f. The half-frequency method was employed to prevent the b.f.o. from becoming locked to the i.f. signals and thus failing to produce an audible note in the operator's earphones. My standard test for s.s.b. uses the RAF Volmet station on approximately 4.8MHz, which provides a reliable signal at constant signal strength throughout the day. Excellent speech quality could be resolved and since the b.f.o. was injected into the secondary of the i.f.t., after the a.g.c. diode has been fed from the primary, there is no need to change from the a.v.c. to manual control modes. This was tried as a matter of course, but found to be not only unnecessary but undesirable as it introduced some unpleasant background noise. Once the preset adjustment had been made to the b.f.o. it required no further attention.

Mechanical Considerations

The semicircular surround which carries the Celluloid dial cover was removed to enable a new cover, cut from thin optical quality plastic, to be fitted. This necessitated unscrewing a number of rusty 8BA bolts, which required a dose of penetrating oil well in advance of being tackled with a screwdriver. It is absolutely essential, by the way, that the blade of the latter should fit the screw slot accurately, especially on such small bolts as these: a major cause of failure to remove tight screws is ill-fitting driver blades which simply chew up the screw heads.

Operation of the epicyclic drive to the tuning gang had become tight and jerky; this was cured by some grease on its moving parts. The bearings on the moving vanes of the gang were given a little light oil, which in addition to making them move freely, quiteens them electrically.

The dial itself had become severely discoloured and in parts had faded badly, no doubt due to damp. The paint used to print the legends on R1155 dials was on a par with that used on many domestic receivers in the '30s and '40s - in other words, deplorably impermanent! It is hopeless to try to remove dirt by using a cloth having even the slightest amount of dampness, for it will assuredly remove the markings from the dial as though they had never existed. The most that may be tried is a very gentle rubbing with a dry cloth - and even that is chancy. As it happened, thanks to a reader, a spare dial was available, but instead of using it direct experiments were made as to the feasibility of making a photo-copy to be pasted over the old one. The original coloured sections were lost in the process, but this is not a very serious objection since later models of the R1155 were in fact fitted with black-and-white dials.

The various small brass plates giving the functions of the controls responded to light cleaning with a slightly dampened cloth. The same treatment makes the front panel reasonably acceptable, but in due course it will probably be repainted.

The holes left in the front panel by the removal of the d.f.-related controls are a problem with any R1155 which requires careful consideration. Blanking plates, unless very carefully fitted, may not look much better than holes! Filling the latter and then painting them over is tedious but effective, provided that the redundant indicator plates also are removed and their screw holes filled as well. If any reader has suggestions to make in this respect they would be much appreciated.

The bank of Jones plugs used for interconnecting the receiver to the power supplies, indicators, units, antenna, headphones and associated T1154 transmitter had all been removed and a small panel carrying a fuseholder and jack socket fitted in their place. This job had been done rather well, tending to confirm my suspicion that the previous owner had much better at mechanical than electrical work. The fuseholder was retained to protect the h.t. input, whilst the jack was earmarked for the output to the loudspeaker.

A Final Job

The performance of the set from the rubbish dump was as good as any R1155 I have tested, and better than some. Sensitivity was well maintained over the full extent of each band, and between midday and two o'clock on a July afternoon it was particularly noticeable on the 600 to 1500kHz range that dozens of UK 'local' low-power stations could be heard with almost uniform volume, despite the wide variation in signal strengths. On the i.f. the sensitivity was maintained right up to the 18.5MHz limit. Selectivity was excellent with no evidence of sideband 'splash'.

The fact that the set worked so well served to highlight a problem that is common with these receivers. The presence of R26 in series with h.t. - and the lower end of the volume control prevents the latter from reducing the signal to the triode grid to zero when turned to its minimum position. When the set has been modified for loudspeaker use even moderately powerful signals may produce a minimum-volume output that is embarrassingly loud, especially in the quiet of night. In addition the frequency response of the output stage varies noticeably as the control is moved through the first third of its travel, being initially 'bassy' and then rather shrill. To overcome these effects R26 should be replaced by a link to h.t., and C105 replaced by a small 50μF/25VW electrolytic (this may be fitted into the same clip). Some extra negative feedback is introduced by changing R2A to 180Ω and fitting an additional 1ΜΩ, R3A, taken from V8 anode to the anode of the output valve. The volume control will then be found to operate normally and without affecting the tone. In fact, the output from the set via a good loud speaker will almost certainly surprise the listener by its quality.

Abbreviations

A \hspace{1cm} \text{ampere}

a.g.c. \hspace{1cm} \text{automatic gain control}

a.v.c. \hspace{1cm} \text{automatic volume control}

b.f.o. \hspace{1cm} \text{beat frequency oscillator}

BA \hspace{1cm} \text{British Association}

(c) \hspace{1cm} \text{screw-thread standard}

(Morse) \hspace{1cm} \text{screw-thread standard}

B.A. \hspace{1cm} \text{British Association}

h.t. \hspace{1cm} \text{high tension negative}

i.f. \hspace{1cm} \text{intermediate frequency}

i.f.t. \hspace{1cm} \text{intermediate frequency transformer}

kΩ \hspace{1cm} \text{kiloohm}

kHz \hspace{1cm} \text{kilocycle}

kΩ \hspace{1cm} \text{kilocycle}

MHz \hspace{1cm} \text{megahertz}

μF \hspace{1cm} \text{microfarad}

μV \hspace{1cm} \text{microvolt}

Meteorological report

WV \hspace{1cm} \text{volts working}

VW \hspace{1cm} \text{volts working}

MET \hspace{1cm} \text{METeorological report}

Volmet \hspace{1cm} \text{VOLume}

VOLume \hspace{1cm} \text{METeorological report}

VW \hspace{1cm} \text{volts working}

μF \hspace{1cm} \text{microfarad}
With technology advancing so rapidly we can easily be forgiven for thinking that designs more than five years old are out of date, so any receiver that remains in production and sells well for a similar period must embody competent circuitry. The longest running model of a large international family of digital world band portable radios that are manufactured in Taiwan, is the Sangean ATS-803A, and it, like the Sony ICF-2001D, is becoming a classic in its own lifetime.

Since 1986 there have been many versions of this receiver, they all look the same but carry different importers badges and type numbers. One of the first, the Sangean ATS-803, did not have switchable a.m. i.f. passbands; this was closely followed by others - Ambassador EEB2020, Edvis RX33, Eska 33, Matsui MR4099, Realistic DX440, Tatung TMR7602 and many more. All use the same p.i.p. digital synthesis and mixing techniques, although there may be minor circuit and performance differences; e.g. the MR4099 has a single stage crystal roofing filter where the ATS-803A has two.

Though already good for broadcast listening, these portables can be further improved, especially with regard to tropical band sensitivity and chuff tuning. Their digital system cannot be accessed to enhance poor ergonomics or the basic 1kHz frequency resolution, but we can overcome the chuffing annoyance and add to ownership satisfaction by:

1. Making the b.f.o. knob into a 52kHz fine tuning control that smoothly interpolates the digital steps on a.m., l.w., m.w. and s.w. This is ideal for minimising s.w. whistles or rocking the narrow filter over a quieter sideband to avoid splatter.

2. Render inoperative the audio mute to enable 'listen whilst scanning', and use the mute switching line to smooth a.g.c. levels so that weak and average signals may be slowly digitally tuned without disturbance. Strong signals still chuff, so no improvement here.

3. Slightly boost l.w.-m.w. ferrite antenna sensitivity.

4. Slightly boost a.m. i.f. gain with an LC circuit that improves weak signal demodulation. This might not improve MR4099 types; the extra gain could be unnecessary and just increase front end noise.

5. For external a.t.u. use between 1.62 and 6MHz increase sensitivity by disabling the internal 50Ω load that shunts the external antenna RCA phono socket. This modification is not suitable if you live in a high signal strength area or your external antenna is active or long; receiver generated l.w.-m.w.-Tropical harmonics might cause problems in m.w.-Tropical-s.w. bands respectively.

6. Fit an internal antenna amplifier to improve amateur and tropical bands sensitivity with the set's own whip antenna. This enhances portable performance and is automatically powered at frequencies above 1.62MHz via an internal processor controlled line.

I'll not go into circuit detail, nor expound oft-written text on how to get the best out of a portable, merely limit text to relevant points. These modifications are 'back off' and 'soldering iron in' jobs, and best left to a practical hand. There is always the risk of damage, so try only modification 1 if you lack confidence or have limited experience. You'll need a magnifying glass or +4 dioptré specs to work comfortably inside this receiver.

Removing the receiver back

a. List your 25 memory frequencies on a sheet of paper; the nine manually stored and the 16 band button executed.

b. Remove the battery cover and bottom three large batteries.

c. Lay the radio face down on a soft surface.

d. Remove six back screws - all the same.

e. Gently click off the back and open like a book, setting it flat down on the left. Look out for the fragile white wire between the back mounted telescopic antenna and the internal p.c.b. - for convenience unscrew the antenna tag.

To re-assemble work in reverse.

The Modifications

1. Locate the rear of the b.f.o. switch towards the bottom left beside the flat p.c.b. interconnection. (Fig. 1.) Cut one p.c.b. track with a sharp craft knife and solder in a sub-miniature 47kΩ resistor. If
necessary trim T111, above the a.m. filters, with a sharpened
matchstick to centre the zero beat of an indicated
station frequency.

2. Find R49 near the top
middle a.g.c. pre-set.
(Fig. 2.) Solder a 22pF
capacitor between it and
pin 2 of the inter-p.c.b. 8-
way ribbon cable on the
right hand audio board.
Link the two tracks shown.

3. Locate and snip one leg
of R72, in the top left back
corner, to reduce r.f. stage
damping without affecting
stability. Those who are
more adventurous might
wish to change C61 at the
same time from 220pF to
100pF.

4. Solder a series connected
33µH inductor and 4.7nF
capacitor between R112/4
and R115/6 beside Q121,
below the a.g.c. pre-set.
(Fig. 3.)

5. Locate R7 above the
external antenna switch
and carefully solder a
40mm wire link between it
and the screening can.
(Fig. 4.) Watch out for
overload problems - fit a
switch if necessary.

6. Try the circuit shown in
Fig. 5, as the basis for a
whip antenna amplifier.
Noise and stability
problems can occur when
this type of buffer is
mounted with the receiver
cabinet, so it could be
tried externally.

And finally - once you’ve
tuned in a weak l.w. beacon or
m.w. signal, remember to use
the lock button. Below 850kHz,
and at some other
frequencies, this set can
annoy by picking up its own
internal strobe noise.
Switching the lock to ‘on’
effectively mutes this noise,
and the new tuning, volume
and tone controls may be
adjusted for comfortable
listening.

Other improvements are
possible in the form of narrow
a.m. and f.m. i.f. filters -
455kHz types are OK for a.m. if
T111 is re-trimmed to pull the
second crystal oscillator.
However, I enjoy my 803A for
broadcast listening and don’t
expect to be modifying it
again.

Fig. 1
Fig. 2
Fig. 3
Fig. 4
Fig. 5
The Yupiteru MVT-3100 is a slim hand-held multiband receiver covering the 143 - 162.025, 347.7125 - 452.0 and 830.0 - 960.0MHz bands, operating in f.m. mode. It is supplied with a flexible antenna, hand strap, belt clip, earphone, car connector and a 58-page owners manual. As well as four 4.8V NiCd batteries and a 12V UK charger.

The first thing that struck me after unpacking the MVT-3100 was its user-friendly look, in fact you could almost call it trendy! The main controls are housed on a 16 - button key pad which is mounted on the front of the receiver. The POWER/VOLUME switch and SQUELCH controls and external speaker jack are situated on the top panel, with the all important SEARCH and SCAN controls are next to the display panel.

It's worth pointing out that although the MVT-3100 has a black plastics casing the button controls are very colourful making it easy to determine which controls perform which functions. For example the pink FUNCTION key is used to execute the extended functions of the keys also labelled in pink.

Search Bands

The MVT-3100 has ten pre-programmed search bands catering for Marine, Amateur and p.m.r broadcasts to name a few. Even though these search bands are preset it is possible to change the range of the search band. Changing the range is very easily done by first selecting the manual mode, then pressing the FUNCTION key followed by the BAND WRITE key. After this you enter the lower limit of the band frequency before pressing ENTER and then the upper limit followed by ENTER. Once this has been done press the appropriate search band key, e.g. 3 MARINE, followed again by ENTER. When using the receiver in search mode it is possible to 'pass over' frequencies where there is noise or unreadable signals from weak stations. This can be easily achieved by using the search pass memory function. This function is particularly useful as a time-saving device because it enables the search mode to be more efficient by allowing unnecessary or noisy frequencies to be passed over. It is also possible to verify the frequencies that have been stored in the search pass memory.

Another very useful search function is the continuous search facility. This allows the user to enter an approximate frequency manually and then leave the receiver to automatically search for stations based on the frequency entered. I thought this was a simple but effective idea especially for someone who's not entirely sure of the desired frequency. However, you have to bear in mind that only stations that are within the receiving frequency range of the receiver can be searched for.

When operating the MVT-3100 in search mode it automatically stops searching when it reaches a signal. It will stay on the received signal until you press either the directional arrows to shift the signal or until the signal is broken for longer than two seconds. When the signal does become broken the receiver will start to search for another signal.

Memories and Scanning

The MVT-3100 has 100 memory channels which are arranged in ten banks giving the user the freedom to enter and store useful and favourite frequencies into the memory. It is very easy to store frequencies into the memory channels and the method involved is explained very well in the manual.

It is also possible to scan through either all of the 100 memory channels or if you prefer just through specific banks. This again is a useful feature especially if you only want to scan for specific frequencies.

Another interesting feature is the priority function. This allows you to store chosen frequencies as priority channels. For example, if you are listening to a particularly active frequency but also want to search or scan for others you can program the active frequency into the receiver as a priority channel. If you do this and then activate the PRIORITY function, the priority channel will be displayed every five seconds enabling you to keep tabs on what's happening on your active frequency, at the same time as searching for others.

Additional Features

As well as the features I've already mentioned the MVT-3100 also has two buttons and one switch on the left hand side of the plastics casing. These are labelled LAMP, MONI and ON KEY LOCK.

The function of the LAMP button is self explanatory and when pressed operates a back lit function on the display. MONI is a monitor switch that is designed to be used when the reception of a signal is broken or becomes weak. The KEY LOCK switch when used locks the keypad completely.

I thought the idea of the KEY LOCK was very useful especially when I was monitoring an interesting frequency and did not want to loose it by inadvertently touching the keypad.

There is also the option to hear a beep tone every time a key is pressed. I was glad that this was an optional feature as after a while the continuous beeping heard when I pressed a key became irritating. Needless to say I soon switched this function off.

Display and Manual

I found the display on the MVT-3100 to be very well laid out and mainly self explanatory. It was easy to see at any one time exactly what was happening. For example when using the receiver to search through the search bands the frequency and appropriate search band number was displayed, together with the signal strength and frequency step.

The well designed uncluttered display is definitely a plus point. I don't think there is anything worse than a display that is so busy that you are constantly referring back to the manual to see what all the various symbols mean.

I would like to congratulate the writers of the 58-page manual that accompanies the MVT-3100. The manual is very well set out and takes you through all of the various features,
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Short Wave Magazine, February 1994
functions and display symbols in step by step stages. The terms used on the keypad buttons are also explained with a brief description of when and how they are used. Each function description is also accompanied by an illustrated example.

I think the user-friendly approach of the manual is very good especially for someone who is fairly new to using receivers or for those of us who get lost in the jungle of jargon that is often used in manufacturers' manuals.

Ease Of Operation

I found the MVT-3100 very easy to operate and soon felt comfortable using the various functions. I liked the way the receiver felt in my hand and the fact the it was relatively light to hold. The buttons gave a very positive sounding click when pressed, so there is no question of whether you’ve pressed them hard enough or not. Charging the batteries is also straightforward as all that is needed is the 12V charger which plugs directly into the receiver without the need to remove the batteries first.

The only real criticism I have of this compact receiver is of the lamp function. I would like to have been able to have the lamp on for a desired length of time upon the operation of a switch. Instead I had to keep my finger on the lamp button. I suppose this could be a battery saving design but as I found the i.c.d. to be somewhat on the dark side and therefore difficult to see even in daylight a switch to allow the lamp to be on or off as required would have been nice.

Summing Up

My overall impressions of the Yupiteru MVT-3100 were good. I enjoyed using it, got good results and found it lived up to the claim made on the box about it being user friendly. I managed to pick up quite a few amateurs operating mobile, as well as some interesting signals when using the marine band on a visit to Poole Quay.

I feel it would be a particularly good receiver to start out with as it is uncomplicated, good looking and at £199 relatively inexpensive. However, the more experienced scanner enthusiast may find that it doesn’t offer enough in the way of memories and receiving modes and may not like the fact the frequency steps cannot be adjusted.

Yupiteru have many scanners in their ranges and while this is probably one of the more basic ones, its low cost and high standard of operation make it a very tempting option. I know I would like to own one.

My thanks go to Nevada Communications, 189 London Road, Portsmouth PO2 9AE. Tel: (0705) 662145 for the loan of the Yupiteru MVT-3100, which they can supply for £199.

Specifications

| Frequency Range:         | 143.0 - 162.025MHz |
|                         | 347.7125 - 452.0MHz |
|                         | 830.0 - 960.0MHz    |
| Tuning Steps:            | 10/12kHz            |
| Modes:                   | n.f.m.              |
| Memories:                | 100 arranged in 10 banks of 10 |
| Scan/Search Speed:       | Priority 1          |
|                          | Search pass 100     |
|                          | 30 channels/40 steps per second |
| Antenna:                 | 50Ω BNC             |
| Audio Output:            | 100mW into 8Ω THD 10% |
| Power Supply:            | NiCad battery (4.8V) |
|                          | External power 12V d.c. |
| Current Consumption:     | 140mA max. audio    |
|                          | 65mA standby        |
| Operating Temperature Range: | 0°C - 50°C         |
| Dimensions:              | 59 (w) x 147 (h) x 38mm (d) |
| Weight:                  | 280g (excluding antenna) |
**UK Coast Radio Stations in the 1990s**

The Maritime Radio service around our coast has to change with the times. David Bailey describes recent changes to see the service through the next few years.

Only a few years ago, if you walked into a coast radio station, you would have found just about what your mind's eye would probably have foreseen; operating consoles, each with a couple of professional communication receivers and a mass of knobs and switches to control transmitters, antennas and landing circuits. It would have been noisy, phones would have been ringing, people would be talking, telex machines buzzing and a babble of voices and Morse signals would have been tumbling out of loud speakers from receivers guarding 2182 and 500kHz, the international distress and calling frequencies. And, of course, no matter what day you arrived, and not matter what time, someone would always be there, a fact not lost upon the local police station, whose officers knew where they could always find a welcoming cuppa in the dead of a cold and miserable night.

Like the castles of the robber-barons dotted along the banks of the Rhine, controlling their stretch of river, the coast stations were independent communication centres spread out around the UK coast; liaison by telephone and telex of course, but essentially individual units, staffed by a pretty individualistic bunch of people, looking after and dealing with those afloat on their patch of sea.

### Integration

But, things are different now. Four of these coast stations have disappeared; Oban on the west coast of Scotland was the first, followed by Anglesey and Ilfracombe and, most recently, by North Foreland Radio. At least the names of the last three live on, as v.h.f. slave sites to the remaining stations; Anglesey under the control of Portpatrick; Ilfracombe and North Foreland controlled by Niton.

All the remaining coast stations offer their services around the clock, but nowadays you might walk into one and find it deserted, with not a voice or a Morse signal to be heard. You might just hear a printer operating, and if you went over to read the emerging text, you could be surprised to find details of radio traffic that was handled by the station that very minute. Indeed, the station's own transmitters would have been in operation, and its own telephone lines would have been used to connect the ship's call to the subscriber ashore, but the coast station radio officer who dealt with the traffic would have been hundreds of miles away, sitting at his console at another radio station, and a very different kind of console it would be, gone are the general coverage receivers directly in front of the operator, and gone are the transmitter control panels. Console now means a modern office desk, upon which sits a.v.d.u. and keyboard, and an almost-silent ink-jet printer. There's a lightweight head set and just one old familiar item, a Morse key. And that's it. The system that makes all of this possible is called Distributed Operations Control (DOC) and, of course, at the heart of it all the inevitable computer, referred to in the DOC as the Processor.

Each station has two identical processors, one 'online' and the other on standby. If a processor failure is detected, the standby processor will automatically come on-line and the faulty unit will be shut down. But now, onto the organisation of the DOC system.

### North-South Split

Two independent DOC networks exist, one in the north of the country, and one in the south. The northern ring consists of Cullercoats Radio, Stonehaven Radio, Wick Radio and Portpatrick Radio.

The southern ring members are Humber Radio, Niton Radio and Land's End Radio. Of these seven remaining stations, two, Stonehaven and Humber, no longer have W/T facilities, but of course, the staff at these two stations can take full control of the W/T equipment at the other stations in their region.

Although all are essentially the same, the coast stations fall into one of two categories, Commercial Coast Stations (CCS), or Distress Watch and Broadcast Stations (DWBS). Each region has one DWBS; Stonehaven in the north and Land's End in the south.

As the name implies, a DWBS is responsible for keeping the distress watch in its region on 2182kHz and 500kHz (channel 16 v.h.f.) is now the responsibility of the
Coastguard service) though its own receivers, and also through those at the other stations. All broadcasts in a region are done by the DWBS. For example, gale warnings concerning the waters off Humber or Niton Radios would be effected by the staff at Land's End controlling the transmitters at the local stations. The broadcast control station, incidentally, is independent of the DOC system, so if the DOC system circuits were to fail (not unknown), broadcast action would continue. Of course, the broadcast system could fail too (also not unknown), in this eventuality the responsibility for broadcast action would be assumed by the stations concerned, and the messages to be broadcast would be sent by telex from the DWBS to the broadcast station. A DWBS is staffed throughout the 24 hours.

A CCS is not continuously staffed, although during the day, on weekdays, at least one radio officer will usually be on the station. A Commercial Coast Station is normally just that, handling paid-for traffic between ships and individuals or organisations ashore. The bulk of the traffic will be radiotelephone calls, but the stations still equipped for W/T remain quite active with telegram traffic. Radiotelex traffic is also passed via coast radio stations, but this is through a fully automatic system controlled from Portishead Radio, actually situated at Highbridge, Burnham-on-Sea. A DWBS, of course, fully participates in commercial traffic handling via the DOC system.

If a distress incident occurs in a CCS's area, the CCS will normally take no part in the proceedings, the DWBS will handle the entire situation. However, under exceptional circumstances, a CCS might have to handle a distress, and it is fully equipped to do so, all editions have fully capabilities on a 'stand alone' basis. But, back to a CCS's usual activities. A Ship with, say, v.h.f. traffic will call on one of the CCS's v.h.f. working channels, after first listening for a moment to ascertain that the channel is clear. The voice of the ship's operator will not be heard, but the coast station receiver will detect the signal, and the presence of the signal will cause the DOC processor to switch on the associated transmitter, which will radiate a series of pips to indicate to the ship that its call has been registered. At the same time, the processor will look for a free coast station operator. If there is an operator free at the station, through which the call is being made, the traffic will always be offered there, if not, it will be offered via the network to a free operating position at another station. When a free operating position is found, the processor signals to the radio officer there, that traffic is available, the word 'traffic' appears on the v.d.u., and there is a short audio 'beep'. At this point there is no indication of what the traffic is, nor through which station the ship is calling.

The radio officer will key his acceptance of the traffic, and when this is done, some basic details will appear on the v.d.u. The coast station being called by the ship is identified on the screen by its callsign. The main stations have their own long established callsigns, GLD, GNI etc., and the v.h.f. slaves have '2' prefix callsigns, e.g., 2CE is Celtic Radio. The frequency on which the ship is calling is shown, on v.h.f., this will be given as the international channel number. The radio officer's headphones are now connected to the receiver and his microphone to the transmitter. He will ask the ship to identify itself, and enter its name and callsign on the screen via the keyboard.

**Computer**

The ship's name and callsign are passed instantly by the station processor to a computer at Portishead Radio, and checked against database records. If any to-ship traffic is on hand for the ship, the Portishead computer signals this fact back to the coast station, and information about the traffic appears on the operating position v.d.u. This all takes about a couple of seconds.

Various screen displays are now available to the radio office, and he chooses the one relevant to the traffic to be handled, to-ship, from-ship, telephone call or telegram. Assuming that the ship wishes to make a telephone call, the corresponding screen is selected, and the phone number required is typed in. A single key stroke will then cause the processor to select an exchange line, and the number is automatically called. When the subscriber answers, another touch of the keyboard connects the radio circuits to the line, and the call can commence. When the radio officer is satisfied that all is well, he then passes the call to 'system control', his headset is disconnected form the audio circuits, and the v.d.u. screen clears. He has nothing more to do with the call, and is free to accept new traffic.

The telephone call is now monitored solely by the on-line processor. When the processor detects that the call is ended (by sensing the condition of the exchange line), it once again searches for a free operation position, in exactly the same way as at the beginning of the call, and so it follows that the radio office who deals with the conclusion of the call need not be the one who started it, and it is quite likely to be at another coast station. The radio officer responds to the 'traffic' promptly, and all the details entered at the start of the call will be displayed, plus the
## Marine Radio Frequencies

<table>
<thead>
<tr>
<th>Coast Station</th>
<th>Channel</th>
<th>Service</th>
<th>Ship Transmit (kHz)</th>
<th>Ship Receive (kHz)</th>
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### Medium Frequency

That was an outline on how a typical v.h.f. radiotelephone call is handled, Medium Frequency R/T and W/T call are dealt with along the same lines, but there are differences of course. For m.f. R/T, which incidentally is always on s.s.b. using upper sideband, coast stations have receiving frequencies paired with the transmitting frequencies, and these are given an m.f. channel identification letter. Channel 'R', for instance is the TX/RX pair 2684/2002kHz at Humber Radio.

The receive paths on these m.f. working channels are fitted with speech detectors that are supposed to differentiate between human speech and the squeaks and pops and other strange noises that appear on m.f. The idea of the speech detectors is to make possible direct calling on working frequencies. If a ship does call direct, exactly the same things will happen as though the call was on v.h.f., except that instead of the v.h.f. channel number appearing on the radio officer's v.d.u., the m.f. pair will be displayed.

However, the speech detectors are in fact susceptible to false alarms, especially at night, and they may have to be disabled by the coast stations staff on duty. The ship will then have to call on 2182kHz, or it may prefer to do so anyway, especially if it is a foreign vessel and not familiar with UK coast stations. As already mentioned, the DWBS maintains a 24 hour watch on 2182 and 500kHz, both through its own receivers and those at CCS sites. If the watch keeping radio officer at a DWBS hears a ship calling a CCS on 2182kHz, he will use the CCS's 2182kHz transmitter to answer, and advise the ship of the working frequencies to be used. Through a facility known as the Search Point Screen, he is able to feed the ship's details and the frequencies to the CCS processor, which will then respond as if it had just detected a direct call on the m.f. working channel, and progress as previously described. The Search Point Screen is available from all operating positions, and when staff are on duty at a CCS, 2182 and 500kHz are monitored, so that a CCS could also deal with ships calling on those frequencies of the DWBS was unable to respond immediately.

The same procedure is followed if a ship is heard calling in Morse on 500kHz (and there are no direct calling arrangements for W/T working frequencies). The radio officer at an operating point responding to the traffic prompt, would see from the frequencies displayed that the ship was on W/T, if the ship had a telegram to send, the relevant screen would be brought up, and the message entered onto the screen via the keyboard. The station processor would count the words in the completed telegram, and pass it directly to the Message Handling System at Portishead Radio for automatic forwarding to its destination. If there was a telegram on hand for the ship, it would be fetched from the
Message Handling System to be displayed on the screen and the radio officer would transmit it using his Morse key.

When an m.f. ship is being worked, full control of the transmitter and receiver is available from the keyboard; function keys are provided for such things as power levels, gain and bandwidth control, tuning and frequency changing.

That then, is a basic description of how this very complex system operates. It has its 'teething troubles' of course, and in the very early days some of these verged on the catastrophic. However, the system is now very reliable, and of course continues to be refined. Needless to say, there are some very comprehensive and sophisticated monitoring and control facilities available to the staff from their operating positions, that it is not possible to describe in this outline of the DOC system.

If the trend of the last decade continues, traffic through coast stations will further decline and, at a guess, the northern and southern regions could combine into a single UK network. Whatever the outcome, a few of the famous names (and call signs) of maritime radio history will at least be heard for a few more years to come.

**Network Map**

The map shows how the stations are linked by landline for the various purposes within the DOC system; these landlines are the private wire circuits as leased by the BT regions to various users. The lines used for the broadcast and distress watch network are not shown, this network is independent of DOC, although DOC is interfaced to it, because they share the radio hardware.

The arrangements for the north are similar, an anomaly being that Portishead Radio is used as the switching site for the audio signals between the stations of the southern region, Portishead is the UK's maritime h.f. station, and does not participate in the m.f. and v.h.f. coast station service. The switching site was formerly Land's End Radio, but the lack of alternative trunk line routes into the West Country meant that line failures (farmers with JCBs!) could not easily be circumvented.

When North Foreland Radio ceased to be a manned m.f. station, the processors from these were installed at Portishead to enable it to become the region's audio switch. There are no DOC operating positions at Portishead. The switching site for the northern region is Stonehaven Radio. The north has a link to Portishead Radio, because Portishead is used by both regions for traffic storage and forwarding, as well as holding database information.

The data links in the system are arranged as a loop, and the data between stations is sent both clockwise and anti-clockwise, if one leg of the loop becomes interrupted, the system can still function.

The link between the v.h.f. slaves and their parent stations were in place before DOC was implemented, and remain unchanged.

**Coast Station Block Diagram**

All data to and from the processor is in serial form. The matrix switch is a complex electronic device controlled directly by the processor, and all audio paths within the station, as well as those entering and leaving the site, are routed through it. A malfunction of this gadget can give rise to truly wonderful effects.

There are many more transmitters and receivers than shown on the diagram, of course. The m.f. W/T and R/T receivers are multi-channel spot frequency types. In addition each station has a fully tuneable Eddystone 1650 receiver whose audio output feeds into the system via the matrix switch, but is manually controlled. Keying of the W/T transmitters is effected by it following an audio interrupted by the Morse key.

---

**Listen With Grandad** by Leon Balen and David Leverett

**Sorry m'boy – haven't quite got the hang of these new fangled remote control thingummyjigs!**
LED’s are Out!
Opto-3300 Mini Counter

1MHz-2.8GHz Frequency Counter
* 6 gate times
* Hold switch
* Pocket size
* 10MHz standard
* 50 Ohm BNC
* Highly sensitive
* Ni-cads and charger
* Aerial etc.

The problem with LED counters is that you can’t see them in daylight and they consume massive amounts of current. The new M-3300 counter has LCD readout and is super sensitive. You get frequency hold, input filtering, ni-cads, AC charger and aerial.

ALINCO’s - - - New Duo For 1994

DJ-G1E
The Spectrum Display
* 2m Tx/Rx
* 70cms Rx
* Rx 108-174MHz
* Rx 400-510MHz
* Rx 800-950MHz
* AM/FM select
* DTMF
* CTCSS Encode
* 5W on 12V
* 80 Memories
* £349

The most exciting rig to hit the market with the unique spectrum display. See the activity on adjacent channels, on adjacent memories, or check 2m and 70cms repeaters at the same time! You get channel activity and signal strength. You also get nearly 400MHz of receiver coverage! You look at the features: AM/FM - switchable over the whole receiver range; Channel steps - programmable and self correcting; Memory Erase - clears individual channels; Programmable Scan - you set the upper and lower limits; Memory Skip - select memories to be ignored; Channel Scope - gives you a spectrum display of 7 memories or channels; CTCSS Encoder - gives you selective repeater access; Reverse Repeater - lets you listen on the input; Crossband Transmit - lets you transmit on 2m and listen on 70cms. Illuminated dial - either 3 seconds or continuous; Auto Power Off - no more flat batteries; Low Battery Indicating - you know when to charge it; Battery Save - for extended operation; Full DTMF - for selective calling; Bep Tone Off - for peace and quiet!

DJ-480E
* 70cms Tx/Rx
* 400-510MHz Rx
* 10 Memories
* 200 Memory option
* Full scanning
* Auto Power Off
* Programmable Steps
* Rotary Dial
* £249

A wolf in sheeps clothing might be apt! For its budget price it holds a high performance rig from the market leaders of hand-helds. Amazingly low-cost for a rugged and well tested radio that has dominated the Japanese market for some time. And no wonder when you look at the value you get. Slip it into your pocket or brief case and you can keep in touch through the many UK repeaters. If you hold a Novice licence, you will find this fits the bill perfectly. You get ALINCO reliability, tough construction and is super sensitive. You get frequency hold, input filtering, ni-cads, AC charger and aerial.

WATERS & STANTON
UK's LARGEST SELECTION
OF HAM RADIO PRODUCTS

Ten-Tec Scout £499

**NEW LOW PRICE**

SSB/CW 1.8MHz - 30MHz Capability!
- 5 - 50 Watts Output SSB/CW
- Easy-in Band Modules (40m included)
- Variable Xtal Filter 500Hz - 2.4kHz
- VSWR, Power & S-meter
- Full Break-in * Built-in Speaker
- 100Hz resolution 12 Volt operation

Just arrived from the USA. It's the elegant HF rig with the famous Ten-Tec Pedigree. Just pay for the bands you want. Just like Rubber Duck. But better!

ESCO Dealer

**Price Crusher!**

- 20 Memories
- 2 Watts Output
- Wide-band Rs
- Key-pad entry
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ADI - 2m & 70cms
Hand-holds

£199 (2m Version)

We've cut the price to the bone on these rigs. You get great value, guaranteed reliability and superb performance. Fully featured, these rigs are well recommended for the beginner or experienced user. You get two dry packs, one taking 4 AA cells, the other 6 x AA cells. The 70cms model is ideal for the NOVICE operator. By direct selling these we have been able to offer you the very best value. Includes aerial and belt clip. Ni-cads and chargers extra.

ADI only available direct through Maplin

AD-450
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**EAR TALKER £29.95**

Factory Direct Price

Combined ear-piece and microphone

Comes with PTT control box and clip. Models for most modern hand-holds. Quote model when ordering.

Mobile?

We used one with a handheld and the quality was superb with low-car noise. The performance will amaze you.

KENWOOD VERSION NOW IN STOCK

**Warehouse Clearance**

Alinco Mobiles
DR-112E 45W £329

**DIAMOND VSWR Meters**

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SX-100 1.6-60MHz 3kW
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LED display Power

0.3-5 Watts

BNC connector

20MHz - 1300MHz

Just like Rubber Duck

Amazing device. Just plug into any handheld, CB or cellular phone to read the power. Levels are 0.3/0.5/1/2/3/5W. Available from most suppliers when it goes wrong and make all kinds of excuses another 5% off the price, send your rig back to the backed up by our own service department. We could shave competitive, yet allows us to give you an honest warranty.

**MASPRO**

The only ones you can mount vertically without loss!

Super Japanese quality.

- 444-WHS, 5 el, 2m
- 444-WHR, 6 el, 2m
- 435-WHR, 8 el, 70cms
- 435-WH15, 15 el, 70cms

KSB-50, Vertical mounting kit

£9.95

**W9GR DSP Audio Filter £299**

Cuts our almost all noise including power lines, static, ignition, heterodyne etc. Pass bands down to 30Hz and bands to Transmatch. Amazing device. Just plug into any handheld, CB or cellular phone to read the power. Levels are 0.3/0.5/1/2/3/5W. Available from most suppliers.

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**MFJ-1278 Data Controller**

10 Modes World Leader

£339

For Fax & SSTV you need the 1289 software pack for £69.95. For IBM PC, receiver or transceiver, and software. Most modes can be operated using shareware or MFJ-1284 pack at £79.95. For Fax 6. SSTV you need the 128W software pack for £69.95. Come and see our demo unit in action. There's lots of activity (14.065-14.080) and data comes through at speeds faster than you can type. Even when signals are weak. All in a narrow bandwidth that even 250Hz filters can pass!

1kW 50 Ohm Load

£39.95!

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Just fill with transformer or vegetable oil, and you have a really robust load. 1MHz - 400MHz with SO-239. Will withstand 1kW for ten minutes!

**Special Yupiteru Purchase**

MVT-5000 Scanner

£229.95

25MHz - 550MHz
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We've managed to purchase the last production run of this receiver at a special price. Full coverage of all the popular channels including the full aircraft marine and ham bands etc. Compare the cost of its competitors. This is an extremely sensitive scanner. Includes ni-cads AC charger 12v Cigar lead

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Retail only: 12 North Street, Hornchurch, Essex. Tel: (0708) 444765
Finding your way around the high seas has never been easier. Brian Oddy G3FEX describes the techniques used and the sort of equipment that those of us on dry land need in order to listen to the beacons.

Yachtsmen, fishermen and the owners of small boats who wish to make coastal and short sea passages rely upon aids to find their position at sea. The basic aids are a compass and a chart (marine map) covering the area. Only the more important lighthouses and aids to navigation are marked on the 'small scale charts' which mariners use to plan their route and plot their position whilst at sea. Much more detailed 'large scale charts' are used when approaching land. They show the nature of the coastline, land marks visible from the sea, the depth of water to the shore, dangers which must be avoided and the position of buoys and lightvessels.

When in sight of land, a mariner can ascertain the boat's position by using a hand bearing compass to obtain the bearing of two charted landmarks, such as a lighthouse and the point of a headland. On a chart of the area a pencil line is then drawn towards each of the chosen landmarks in the same direction as the bearings. The point at which the two lines intersect represents the position of the boat and is called a 'fix'. If the angle between the lines is less than 30° the fix cannot be relied upon.

**Additional Aids**

After dark it may well be dangerous to approach the shore and impossible to enter harbour without the help of visual aids, such as lights mounted on buoys or installed on shore. The colour and nature of a light is chosen to convey information and to avoid one light being mistaken for another - it may be fixed, flashing or alternating in colour. In mist or fog it may not be possible to see any lights, so reliance must then be placed on audible warnings.

Some buoys are fitted with whistles, which are operated by compressed air, or bells which are activated by passing waves. On shore, explosive charges may be fired at regular intervals. A number of different fog horns are employed, the most well known being the diaphone type installed at lighthouses, which emit a powerful low-tone note ending in a sharp descending note, which sounds like a grunt!

**Radio Beacons**

As an additional aid the maritime authorities have installed low power long wave radio beacons at prominent charted positions around coastlines worldwide, also on certain light vessels. The radiation from the transmitting antenna (often a Marconi 'T') is vertically polarised and non-directional. When within range, it can be detected with a fairly simple receiver.

Prior to 1 April 1992 they operated either within a group (maximum of 6) or as a single beacon. Their transmissions were either sequential or continuous. The carrier of each beacon was amplitude modulated (a.m.) with a tone, thereby producing a double sideband (d.s.b.) signal. It was keyed in Morse code (modulated carrier wave - m.c.w.) so that the beacon could be identified by its two or three letter callsign. The duration of each beacon signal was one minute. It consisted of the callsign keyed three to six times (22s), a long dash (25s), the callsign keyed once or twice (8s) and a silent period (5s).

After that date the use of modulated Morse code largely ceased and only the carrier of each beacon is radiated. The beacons now operate individually and continuously. Each carrier is keyed in Morse code (c.w.) so that it can be identified by its callsign. The single or two letter callsign is sent at least twice (13s), followed by a long dash (47s). Those situated on the coasts of Europe and the UK transmit on frequencies between 283.5 and 315.0kHz. The use of c.w. has enabled them to be spaced 0.5kHz apart, but due to the large number of beacons involved it has been necessary to allocate shared frequencies to some beacons which are geographically well apart. A few beacons, notably around Iceland and along the Baltic coast still operate in groups and employ m.c.w.

**Use Of Beacons**

Provided two or more beacons are within range, their signals can be used at sea to obtain a fix. The key factor in this process is the use of a receiver which has either a vertical loop or a horizontal ferrite rod antenna mounted on top, so that it can be freely rotated above a fixed circular scale, which is calibrated 0° - 360°. The directivity pattern of the antenna resembles a figure of 8. The two points of minimum response to incoming signals are indicated on the antenna by a line, which acts as a pointer for the calibrated scale. The set is positioned so that the 0° - 180° line on the scale is parallel to the boat's fore and aft line and as far away as possible from the mast and rigging.

After tuning the receiver to the frequency of one of the beacons the antenna is rotated for maximum signal so that
the keyed callsign can be clearly heard. During the 'long dash' which follows, the antenna is slowly rotated until it reaches a position where the signal can no longer be heard. It is then swung slightly to either side of this point to find the exact point of zero received signal, called the 'null'. As soon as this is achieved the exact compass heading of the boat is noted. The 'relative bearing' of the beacon is then read off the circular scale beneath the antenna. This process is then repeated with the second beacon.

(There are two such nulls 180° apart. Some sets have a 'sense' circuit to establish the correct null, otherwise it must be ascertained from a local chart, taking into account the estimated position of the boat).

The relative bearings of the beacons are then added to the noted magnetic headings of the boat to obtain the magnetic bearings of the beacons, if necessary subtracting 360°. They are then plotted on a chart to obtain the fix. If the bearings of three beacons are taken and then plotted on a chart the pencil lines will be unlikely to meet at a point. Usually they form a triangle, known as a 'cocked hat'. If the cocked hat is small the indicated position can usually be relied upon.

**Radiobeacon DXing**

Many 'landlubbers' enjoy searching for radiobeacon signals. After logging the local ones, the hunt for others may prove to be quite a challenge! Several factors need to be borne in mind when starting out on this interesting aspect of our hobby. Perhaps the first point to mention is that unfamiliarity with the Morse code need not deter anyone from taking part. The callsigns are sent so slowly that it is possible to jot down the dots and dashes as they are received and then decode them later by referring to a copy of the SWM Book Service - see page 76.)

### Choice Of Receiver

The capabilities of the receiving equipment will play an important part in achieving good results. Many of the older portables which cover the long and medium wave broadcast bands will also tune to the beacon band, but they cannot detect c.w. signals without modification. This involves injecting the output from an oscillator operating close to the receiver intermediate frequency (i.f.) into, or just ahead of, the detector stage. When an incoming c.w. signal (at i.f.) mixes with the output of this 'beat frequency oscillator' (b.f.o.) an audible beat note occurs, which is reproduced by the loudspeaker. It may be quite a simple matter to add a b.f.o. to an existing a.m. portable. A b.f.o. kit is available from H. Corrigan, 7 York St, Ayr KA8 8AR - see advert on page 66, December '93 Practical Wireless.

Relatively expensive modern portables often cover a wide range of frequencies and cater for several transmission modes, including c.w. The digital frequency display will prove to be an especially useful feature. Some have a memory bank in which can be stored the frequency of known beacons for subsequent recall at the touch of a button. Quite good results can often be obtained when using this type of set with just the built-in ferrite rod antenna, but most have provision for connecting an external antenna, which may be advantageous. Some listeners prefer to use a large loop when DXing. Simply placing the set near to the loop may give sufficient coupling and better results than a direct connection.

Some communications receivers can produce outstanding results when coupled to a large loop or a properly matched external antenna. However, not all such receivers are sensitive in this part of the spectrum and some do not cover the band at all! Such problems can be overcome by using an up-converter to shift the beacon signals to a band more suited to the set. A crystal controlled i.f. converter, which shifts all signals in the range 10-500kHz to 26.010-28.500MHz in the 10m amateur band, is manufactured by Datong Electronics - see advert on page 67, December '93 SWM.

Because a c.w. signal has no sidebands it is possible to increase the selectivity of the receiver. This will enable the signals to be separated more easily, but an added advantage is that a marked improvement in signal to noise ratio will occur. An optional quartz crystal c.w. filter (B/W 250Hz) can be fitted to the i.f. chain of some modern communication receivers, but a cheaper alternative, which can be used with most receivers, is to install an audio filter between the headphone jack and the headphones. In practice it has been found that some beacons can only be resolved by using a very narrow audio filter (B/W 30Hz) and a good loop to null-out an unwanted co-channel beacon signal.

### Propagation

DXers should bear in mind the differences in propagation during daylight and after dark when searching the band. During daylight, only the waves which leave the beacon antenna at low angles can reach a point of reception. They are known as 'ground waves' because they follow the natural contours of the earth. Any radiation which leaves at high angles will be absorbed by the lowest (D) layer of the ionosphere, which is highly ionised by the radiation from the Sun.

Soon after sunset the D layer disappears to expose the E layer, which acts like a giant mirror in the sky. It may reflect the waves back towards earth. The reflected 'sky waves' may arrive within or well outside the area covered by the ground waves. The sky waves from distant beacons may be logged after dark, but just how well they are reflected depends upon the state of the ionosphere, which is continually changing. Some DXers use the signal from a distant beacon as a pointer to conditions.

### Interference

Reception at night is sometimes impaired by static and thunderstorms, but man-made electrical interference is a more common problem. A marked reduction in the level of interference from nearby TV sets may be achieved by suspending a random length of wire between two supports erected as far away from the house as possible. A magnetic balun installed at one end of the wire will enable the signals to be conveyed to the receiver via a screened (coaxial) cable.

**Aeronautical Beacons**

Many aeronautical radiobeacons also operate in this part of the spectrum and they tend to confuse DXers. Most radiate a plain carrier which is keyed once with a two or three letter callsign in Morse code. There are no breaks in transmission.

### Guide Books

One of the most popular guides is Reed's Nautical Almanac. A new edition is published each year by Thomas Reed, 178-185 High Street West, Sunderland Tyne and Wear. Some major bookshops stock the Admiralty List of Radio Signals.

The quarterly radiobeacon chart in SWM can be used as a guide, but there are many more waiting to be logged!

As I am putting this edition of the magazine together the distinction between the sea and dry land is a little vague in Southern England! - Ed
Global Maritime Distress and Safety System

John Griffiths explains the intricacies of the new Marine Radio requirements and explains how the equipment would assist in a search and rescue operation.

The International Maritime Organisation (IMO) has been working for the past ten years on the development of a new safety and distress system that will enhance the current system used at sea. In the autumn of 1988 the IMO convened a conference with a view to revising sections of the 1974 Safety Of Life At Sea (SOLAS) requirements regarding communications at sea with emphasis on safety and distress.

Currently and in its most basic form, radio at sea provides watchkeeping monitors on two specific frequencies in the DUS portions of the spectrum. Ships NOT carrying a Radio Officer and there aren't many at sea today that do - would maintain a listening watch on 2.1825MHz and v.h.f. Channel 16 (156.8MHz), while ships with a Radio Officer aboard and over a set tonnage, would, in addition to the above, monitor 500kHz.

However, with effect from 1 January 1992, the new system, known as GMDSS, for Global Maritime Distress and Safety System, came into force which is in line with the revised Chapter IV of the SOLAS Convention. It uses the latest in communications technology to provide immediate distress alerts, rapid transmission of DUS and an efficient communications network during any Search and Rescue (SAR) operations. Now, every ship without exception from 1 January 1992, must fit the equipment to comply with DUS alerts, rapid transmission of distress alerts and, despite natural duplication in the case of safety alerts, message availability, is vital for its own safety and the safety of other vessels in its area.

With the coming of satellites and the tie-in with radio, advances in radio communications allow for greater coverage and availability, message duplication in the case of safety alerts and, despite natural limitations, like global 'footprints' associated with satellites, mandatory reception of safety messages and associated SAR transmissions. GMDDSS allows any ship in danger to automatically link-in and alert land stations, including rescue co-ordination centres, and pass on the distress to other vessels in the area. Separate systems aboard the ship will allow her to communicate with other vessels as well, in effect doubling the transmission spread.

To ensure the system is up and running as soon as possible, legislation maintains that all vessels constructed after 1 October 1995 must meet GMDSS requirements, whilst vessels built before that date must fit before 1 February 1999, or satisfy ALL requirements of the older Chapter IV SOLAS Convention. Alternatively, for ships built before 1 February 1995, that they must meet all the requirements in GMDSS after 1 February 1999. GMDSS equipment may be installed on both new and existing tonnage on a voluntary basis from 1 February 1992. Many ship owners are already fitting their new tonnage to comply.

Basic Principles

Ships will fit equipment based on their areas of trading, irrespective of their size. Four areas have been defined:

A1 Within range of a v.h.f. Coastal Radio Station (CRS) with Digital Selective Calling (DSC)
A2 Within range of an m.f. CRS with DSC
A3 Within cover of International Marine Satellite (INMARSAT) system
A4 All areas outside A1, A2 and A3 (The Polar regions, North of 70°N and South of 70°S).

For example, a ship trading world-wide and within the INMARSAT area must have the full functions of A1, A2 and A3 while a coastal trader working around the UK coast would only be required to satisfy criteria for A1.

Equipment

The equipment required is comprehensive, being duplicated in a lot of cases, and covers on an 'All Rights' basis. It can be seen that coverage is a very important by-product of the new system which ensures safety is given the highest priority at all times.

For example, a bridge, that is the navigation control centre, must be required to have the following items:

DSC watch receiver/printer for continuous monitoring of v.h.f. channel 70.
A DSC watch receiver/printer for continuous monitoring on 2.1875MHz.
An R/T distress frequency watch receiver for 2.1825MHz but only until 1 February 1999.
A NAVTEX receiver - in all areas with NAVTEX coverage.
An INMARSAT EGC receiver - Enhanced Group Call, on ships engaged in trade in non-NAVTEX areas.

Distress and Safety Frequencies

Monitoring will be automatic under GMDSS, or near-auto of these frequencies:

- 500kHz
- 2.1825MHz
- 2.1875MHz
- 2.180MHz

In addition to this, all ships must carry a 9GHz radar transponder for use in all survival craft, but, if under 500 tons gross, only one need be carried. They must be kept in an accessible place for transportation to survival craft.

News services

Ship owners
Rescue co-ordination centres
Meteorological services
Coastal Radio Station (CRS)
INMARSAT

Calling (DSC)
with Digital Selective
Coastal Radio Station (CRS)
INMARSAT

With the coming of GMDSS, or near-auto of these frequencies:

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- 2.1875MHz
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- 2.1825MHz
- 2.1875MHz
- 2.180MHz

In addition to this, all ships must carry a 9GHz radar transponder for use in all survival craft, but, if under 500 tons gross, only one need be carried. They must be kept in an accessible place for transportation to survival craft.
RC11 Remote Control
EX257 FM Unit
CR64 High-stability Crystal Unit
EX310 Voice Synthesizer
FL44 SSB Filter
FL32 or FL613 CW/RTTY Narrow Filter

Don’t forget HAMSTORES stock AEA, AKD, Alinco, AOR, Barenco, Comet, Cushcraft, Davis, Dee Comm, Diamond, JRC, Kenwood, Lowe, Microset, MFJ, RSGB Books, Toyko, Yaesu and Yupiteru, so whatever you want HAMSTORES will have it! Low deposit, interest-free credit is available on most radio purchases.

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1992 Edition of “POOLEY’S FLIGHT GUIDE”
This “Aviator’s Bible” contains details of all UK airfields, all ground, tower, approach and radar frequencies, all lower airspace and radar information, all UK aviation addresses and phone numbers, airways frequencies, private airstrip and helipad locations and much, much more. This is last year’s edition but almost all data is still correct. Normal price: £17.50.
OFFER PRICE ONLY £4.00
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He’ll face 30ft. waves, blizzards & force 9 gales.

All we ask of you is £9.
We rely entirely upon voluntary contributions to run the Lifeboat service. Please help us today.

To: The Director, RNLI, West Quay Road, Poole, Dorset BH15 1HZ.
I wish to join the RNLI. My first annual donation is:
£____ for Shoreline membership (min £9 p.a.).
£____ for Joint Shoreline membership (Husband & Wife – min £15 p.a.).
£____ for Governorship (min £30 p.a.).
£____ for Life Governorship (once only payment – min £500).
£____ for Storm Force membership (under 16’s – min £3 p.a.).
Please attach name, date of birth and sex of child.

I do not wish to become an RNLI member but I enclose a gift of Mr/Mrs/Miss/Ms
Address
Postcode

Royal National Lifeboat
Institution

Short Wave Magazine, February 1994
On special offer this month, this fantastic receiver is a must for those taking the hobby seriously. Only £499.00. Deposit from only £99.00

AOR 3030
The latest receiver from Japan, the only set on sale today with 'Collins Filters' inside.

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Scanmaster Base (500kHz-1500MHz)
New high quality wide band scanning antenna.

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Scanmaster Mobile (25 - 1000MHz)
High quality wideband mag-mount mobile.

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Complete with stainless steel 'N' type connector, mounting pole, clamps, 8-16 element vertical whip.

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Scanmaster Double Discone
100 - 1300MHz giving outstanding performance. Nearly 2.5dB gain over standard discone

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PR-150
The latest from John Wilson's stable, "Lowe Production" the new Preselector will work with any good Shortwave receiver. Once again it's on demo in the London showroom. Call today for your free info sheet.

£235.00
With the collection of Audio & Digital Filters that seem to be swamping the market, there is always one that stands out during demonstration in our showroom - the proven Datong FL3. Like the antennas, the FL3 was originally manufactured for commercial use. Fortunately, the price embarrasses its competitors and the performance is truly untouchable. Whether your Shortwave receiver is blessed with notch and width controls or not, try the FL3 from Datong. You'll wonder why you didn't buy one earlier!

MyDEL TPA Tunable PreAmp Antenna
Housed in one neat unit, the MyDEL TPA is the latest innovation from the USA. Ever wished you could increase the input signal just a little bit when the going gets tough? MyDEL thought so, and for the first time, the TPA offers an effective ATU for short random wires together with a pre-amp, and as an alternative a telescopic whip for the occasional indoor short wave listening. Powered by one 9V PP3 type battery, it could be the answer to your tuner problems! Ideal for listeners who only have limited space for antenna systems.

£69.95 incl. VAT. (9V battery not supplied)

MyDEL ATU-1
A more conventional approach to resonating that length of wire or centre-fed dipole for an antenna system is the NEW MyDEL ATU-1. Built in the UK to our own specification, the ATU-1 is housed in a strong metal case and employs two good quality tuning capacitors with a tapped coil in the standard ‘F’ configuration. Almost identical to a similar Japanese model costing nearly 40% more, isn’t it time you bought British?

£59.95 incl.VAT and patch lead to your radio.

Attention all Yupiteru MVT7100 & 7000 owners!
The new MyDEL SCAN-2513 Wide band scanner antenna
Ideal as a direct replacement to the telescopic antenna offered with the Yupiteru models, the NEW MyDEL SCAN-2513 has antenna covers 25 - 1300MHz. It’s a far more convenient than the standard unit and a lot safer! Will suit any hand-held scanner.

£19.95 incl. VAT, plus £2.00 p&p.

NEW!!!NEW!!!NEW!!!NEW!!!NEW!!!NEW!!!NEW!!!

Lowe Production “WireMatch” aerial now available!

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People print lists. Little lists. If you want to see 1650 sq ft of space crammed full of good clean gear, then call in. If you’re overseas or can’t make the journey then send for your FREE LIST. It goes on & on & on... Yes it is all guaranteed, yes we can offer INTEREST FREE ON MOST OF IT, (Many part time companies cannot), and we will willingly take other goods as trade in. We are still collecting clean used gear FREE OF CHARGE IN THE U.K., (if you’ve got the original packing), so get dialling for a quote and our courier will be around the same day.

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By Tube, still the same Piccadilly line and get off at Northfields, but turn RIGHT, instead of left for the old shop!, walk less than five hundred yards and the showroom is on your left hand side. For those of you who know RUPERT’S Vintage Wireless shop, we're opposite! By car, much the same as before, i.e the same road, still between the M4 & the M40 motorways. Phone for precise details.

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Telephone 081 566 1120
FAX: 081 566 1207
Digital Selective Calling on Marine v.h.f. channel 70 (156.525MHz)
Monitoring on v.h.f. channel 16 (156.800MHz)
Medium Frequency 518kHz NAVTEX
Medium Frequency 2.1875MHz Digital Selective Calling
Medium Frequency 2.182MHz Two-tone on DUS frequency
High Frequency 8.1415, 4.2075, 6.312, 12.577, 16.8045MHz
MSI Frequencies as are as follows:
High Frequency (h.f.) 4.2095, 6.314, 8.4166, 12.5795, 16.8065, 19.6805, 22.376, 26.1005MHz.

Radio Equipment Functions

For those with no knowledge of tags such as 'DSC' and so on, in its basic form it is an automatic call system which is beamed based. It allows an individual ship to be called - ship to shore, shore to ship, ship to ship - and can be originated from a terminal and sent 'direct' to an addressee. It can also be grouped, e.g. to a company fleet using a code to 'All Ships' in a particular area. It has been in use in aircraft communications for many years - and some amateur equipment has it!

Under GMDSS, equipment will include a processor and a v.d.u. A printer may be attached. A dedicated scanning receiver will be included in equipment fits, scanning on both m.f./h.f. as well as v.h.f. On m.f. (1.6-4MHz), DSC will be used for automatic DUS communications. A radio-telex will be connected to the equipment for text. As in all cases, emergency back-up power cable of maintaining the facility will be a requirements in event of a main power source failure.

On h.f. (4.0-27.5MHz) DSC will be sited along with the usual s.s.b. and RTTY/SITOR links. There is a clause requiring upgrading for Duplex R/T should it be deemed feasible. In power output, back up batteries must be able to provide 400 watts of s.s.b. operation, so battery banks will need to be fairly big although with advances in battery development this need not be as big as imagined!

On h.v.f. DSC must provide two-way simplex telephony as well as having DSC TX/RX facilities with the addition of full semiduplex and full duplex operation recommended under the GMDSS umbrella. Important information will automatically be printed out or displayed on a v.d.u. or alphanumeric display.

Portable v.h.f. sets must be capable of two-way communications on v.h.f. 16 and at least one other channel. It should be able to operate and have an output of at least 0.25 Watts. Power source must last eight hours in normal use. Oh, and should any of the 'purists' be wondering - no, there is no longer a provision for c.w. (Morse) operation. In fact, the General Operators Certificate (GOC) has no provision for Morse to a communications medium.

Further communications items are the Enhanced Group Call (EGC) Receiver. This is part of INMARSAT's EGC Safety Net and enables users to receive marine safety information on a national or regional basis. See Fig. 1. In fact, the International Telecommunications Union (ITU) and the IMO have approved 490kHz for MSI broadcasts in national languages! Some DXers on the East Coast may like to see what they can pick up on that one!

This equipment also gives access to 'FleetNET', where commercial information via public data bases can be distributed on a fleet, regional or national basis. Some INMARSAT-B, C and M fits will have an in-built EGC receiver. Some will not. Radiotelex in A3 area must have ARQ (automatic telex fault correcting) as standard, as do vessels in A3 likewise. The system must also provide automatic reception of MSI messages.

So, in terms of communications aboard ship, things appear to be well and truly covered. It should prove to be an exciting time in marine communications as developments 'shrink' the globe making it possible to send a note from your office desk in, say London to a ship's master across the world in Australia - and in under an hour! Usage of satellites is proving this to be the case but, prior to GMDSS, DUS was a 'hit and miss' affair, as a lot of owners, especially in poorer third world countries, made use on board ship of sometimes obsolete equipment.

However, to ratify this, the IMO which is the international 'Watchdog' have come up with GMDSS in the hope that safety at sea is now more of an accurate affair than previously. By 1999 all vessels should be GMDSS equipped, the exception being vessels under the lower tonnage limit of 500 tonnes.

Location Devices

Various methods exist at sea for location of survival craft in the event of a sinking, or other emergencies. Most of these will be Emergency Position Indicating Radio Beacons (EPIRBs) and Search and Rescue Transponders (SARTs). However, in this category also falls the airborne Automatically Deployable Emergency Locator Transmitter (ADELT), which is carried by helicopters overflying water. It will be seen that auto-location devices are not just 'smart' but extremely versatile.

Marine type satellites fall into basic groups. The INMARSAT groups are A (Ship - Earth station), B, M and C are followed by the COSPAS/SARSAT 'birds'. SARTS stands for Search And Rescue Satellite Aided Tracking and COSPAS is an acronym of the same words, but in Russian! In the event of an emergency, beacons can 'call up' the 'bird' and initiation of a rescue mission can be got underway quite literally in minutes.

Quite simply, INMARSAT is one of the main communications systems approved in GMDSS work. It offers automatic handling of distress traffic by 'phone and telex. Some systems have an in-built function which will report the ship's position automatically in response to a password. INMARSAT B and M use digital signalling, coming with GMDSS functions as standard and includes the EGC facility. Users know which satellite is which as INMARSAT M is a simplified version of B, denotable by the slight reduction in voice quality due to an antenna so that it can compensate for sea movement.

INMARSAT C is based on an automatic telex transmissions between two electronic mailboxes. It is limited to 600baud and is standardised for use with PCs, carried nowadays by most ships. 'C' has auto reception of EGC messages as standard.

COSPAS/SARSAT is a low altitude, polar orbiting satellite which monitors all parts of the earth. It uses space segment packages as the 'birds' are not exclusively used for sole SAR work. In the event of any DUS traffic being received, it would automatically pass on the information to an LUT, Local User Terminal. COSPAS monitors signals on 121.5MHz and 406MHz and SARSAT monitors both of these plus 243MHz.

In actual use the system would run as follows (see Fig.2.): In the event of EPIRB or SAR or ADEL triggering the satellite, the signal would be temporarily stored until a ground receiving station comes into view. It would then rebroadcast the information it has stored, which would be acted upon by staff at the ground station. Typical time in European waters is 45 minutes or less. 406MHz beacons are stored with the ship's name and callsign, while 121.5MHz EPIRBs
are monitored also by aircraft. The 1.6GHz L-band EPIRB transmits its signal via geostationary satellites. Within range of the space segment, outside the Polar areas, it can send position and identify in near real time. At least one of the CRS in the coverage area will have L-band processors for auto-alerting of SAR services. Location comes from the beacon transmitting its position and this is done by the use of an on-board Global Positioning System (GPS) receiver which constantly updates its position. Later developments are planned to include a keyboard, making additional information for the SAR services available. Accuracy is, it is claimed, down to 200 metres.

SARTs respond automatically with a transmission of a special 9GHz or 3cm sweep signal when interrogated by a radar in the 9GHz band. This signal appears as a line of 20 dots on a radar screen, which provides a line for a bearing. The signal can also be picked up by a suitably equipped aircraft and at a much greater range. On interrogation, an audible alarm and visible indicator will sound and flash on the SART, indicating that the beacon has been 'seen'.

A DELT is ejected from an aircraft at 8m per second in order to clear props, fuselage and rotors. On deployment, activation is automatic and it begins to transmit on 121.5MHz and 243MHz plus bringing in an X band radar transponder. All of these frequencies are air and sea compatible. Like the SART above, the reflected interrogated signal is unmistakable and obvious.

**System On-Pass Operation**

Should an LUT be informed of a DUS message via satellite it will come to them via an MCC, and will decipher the data needed for things like callsign, name and position. Data links from satellites to LUTs are carried out on 1544.5MHz. A Doppler component exists in this link due to the motion of the low orbiting satellite. The Doppler component is used to fix the location of the emergency transmission, this results in last and long fix which is then on-passed to the Mission Control Centre (MCC). The UK LUT is at Lasham in Hampshire.

**Doppler Principle**

By looking at Fig. 3 we see that in the left-hand side the satellite (travelling left-to-right) approaches the transmitter. Here the frequency of the transmitter received by the satellite is higher than the transmitted frequency. When the satellite is heard on the transmission, the receiver's frequency is the same as the transmitted one. As the satellite moves away, the frequency received is lower than the transmitted one. The curve, called a Doppler Curve, is monitored by the LUT and results in them working out the Time of Closest Approach (TCA) of the satellite. Using the slope of the curve it can be determined how far the emergency transmitter is from the satellite. By knowing the exact position of the LUT and the satellite, fixing the transmitter's location is a matter of knowing the other two and computing the TCA.

**Mission Control Centres**

The UK MCC is at Plymouth in Devon. It is a national point of contact for date exchange, and this involves the transfer of system control data which is needed at the LUT and from other MCCs. Once data is received at the MCC from its associated LUT, SAR responsibility is determined and the alert sent out to the Regional Control Centre (RCC). Military RCCs in the UK are located at Edinburgh (Edinburgh Rescue) and Plymouth (Plymouth Rescue). In civilian locations, centres would be those manned by HM Coastguard and are located at Falmouth, Dover, Great Yarmouth, Aberdeen, Clyde and at Swansea. Certain CRSs also have an alert responsibility.

So, by combining GMDSS with established SAR procedure, and making it a mandatory system by 1999, the IMO will hopefully be able to achieve a world-wide safety net from which mariners the world over, and aviators too, can safely assume the nature of their distress can not only be ascertained, but pin-pointed and, let's face it, down to 200m (700 feet or so) is pretty accurate! Then, using traditional methods of marking such as orange dye and smoke flares, pyrotechnics and the still used 'mirror to catch the sun' device, location can be more or less dead on.

With alerts taking minutes, thanks to the advances in technology safety at sea has never been in better stead. Who's have thought though that the old Morse code, used so dramatically through the years, would finally have been usurped -- and in the very environment it proved so good in?

I trust that, if you're into marine monitoring on whatever bands, this look at GMDSS, which is even now taking a hold aboard ships, was simple enough to follow. Don't worry if it isn't - even hardened and experienced seafarers are having nightmares about it! Then again, I expect they said the same about Morse, too.

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**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADEL</td>
<td>Automatically Deployable Emergency Locator Transmitter</td>
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<tr>
<td>ARG</td>
<td>Automatic Repeat reQuest</td>
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<tr>
<td>COSPAS</td>
<td>Search and Rescue Satellite Aided Tracking (in Russian)</td>
</tr>
<tr>
<td>CRS</td>
<td>Coastal Radio Station</td>
</tr>
<tr>
<td>DSC</td>
<td>Digital Selective Calling</td>
</tr>
<tr>
<td>EGC</td>
<td>Enhanced Group Call</td>
</tr>
<tr>
<td>EPIRB</td>
<td>Emergency Position Indicating Radio Beacon</td>
</tr>
<tr>
<td>INMARSAT</td>
<td>International Maritime Satellite</td>
</tr>
<tr>
<td>ITU</td>
<td>International Telecommunications Union</td>
</tr>
<tr>
<td>GOC</td>
<td>General Operators Certificate</td>
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<tr>
<td>GMSS</td>
<td>Global Maritime Distress and Safety System</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<tr>
<td>IMO</td>
<td>International Maritime Organisation</td>
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<tr>
<td>LUT</td>
<td>Local User Terminal</td>
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<tr>
<td>MCC</td>
<td>Mission Control Centre</td>
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<tr>
<td>MSI</td>
<td>Maritime Safety Information</td>
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<tr>
<td>SOLAS</td>
<td>Safety Of Life At Sea</td>
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</table>

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Short Wave Magazine, February 1994
The HF-235; it's a little known fact that the HF-235 dominates its own sector of the market, but where you have a true professional need, there you will find the HF-235. Broadcasting companies use them for remote monitoring; airline companies with international HF networks use them for keeping in touch with their fleet; Government monitoring services use them (but who knows for what?); but what has this to do with the short wave listener??

I simply use the HF-235 to show that the team at Lowe Production Ltd. not only design and make short wave receivers for the enthusiast, but are equally at ease in professional markets. Mind you, it is true that there are many individual owners of the HF-235 who appreciate its quiet, relaxed approach to the HF bands and who prefer the professional style of a rack mounted unit. If you want to know more about the HF-235, just ask for a brochure or write to me at the address on this page.

Why the “Europa”? Many people have asked me why we made the “Europa” version of the HF-225, and how it differs in performance. The “Europa” is a very carefully reworked HF-225 aimed at the real short wave DX enthusiast, and the performance we obtain from the “Europa” comes from a host of detail changes, each one contributing to the end result. For example, those of you who follow “leading edge” technical discussions will know that several well respected authorities such as Ulrich Rohde (as in Rohde & Schwarz) have pointed out that intermodulation can be caused by the switching diodes used for filter selection (RF or IF), and that by correct selection and biasing of these diodes a great improvement in intermodulation performance can be gained. The snag is of course that a typical switching diode might cost 2p whereas the diodes we are talking about could be £2 or more — but we fit just such diodes to the “Europa” because the results are worth it to the user who can tell the difference. This is just one small example of the “Europa” approach, but when we have fitted all the detailed improvements, including a new filter bank, and new control software, and specially selected magnetically shielded filter inductors, and so on and so on, you have one hell of a receiver.

That’s why we can’t make enough to meet the demand. Come to think of it we can’t seem to keep up with demand for any of our products which is why the announcement on the facing page is so important. By the way; the Europa spec. includes the famous Keypad Controller, and the synchronous AM detector unit already fitted. Ask your favourite short wave dealer for a trial run against other receivers, and just listen to what the “Europa” can do.

Send 4 first class stamps to cover postage and we will send your FREE copy of “The Listener’s Guide”, our ever-popular aid to LF, MF and HF listening. Ask for my leaflets (No1) “ATU or Preselector”, (No2) “What makes a Lowe receiver so good”, and the new (No3) “WireMatch Aerial” leaflet and we will include them in the pack.
When I first suggested some eight years ago that we had the knowledge and ability to design and manufacture a British short wave receiver, some people told me I was dreaming. But perhaps due to my foresight and certainly due to another man’s talent (the genius of John Thorpe) I am delighted to announce that we have reached the point where the design and manufacturing team can stand alone as a separate company to be known as "Lowe Production Limited". During that eight year period we have produced a series of receivers with a particularly "Lowe" flavour which comes from having a clear vision of what the short wave listener needs from his radio, and an equally clear determination from John Thorpe and myself to design our products to give the results in performance, features, and reliability which we see as correct.

Not that we stop at receivers; in addition to a growing number of short wave accessories such as the WireMatch aerial system and the PR-150 preselector, we have also designed and produced pulsed laser equipment for the treatment of veterinary injuries, and we are involved in design consultancy for very high quality compact disc transports and signal processing, so there is more going on here than many folk realise.

I did say “The Team”, and I consider myself fortunate to have an enthusiastic and capable group around me. In the photograph you will see John Thorpe in the centre, surrounded by Jean Jones my production controller; Kevin Whitehead, my general manager; Beryl Goulding in charge of sales order processing and everything else; and then there’s me at the back with the specs. We look happy because we are; it’s not every day you get a chance to go forward to an exciting future, particularly in these dark days, but we are all short wave enthusiasts at heart and what better work than your hobby?

There is another “Team” of course, and that is made up of Carl and his merry men; Dave, Steve, Mark, John and Henry. If I could only stop them working and gather them together in front of a camera I could present them to you – perhaps next month, but they are the chaps who have put together your receiver with such care and skill, and my thanks go to them for their dedication.

Finally, we all thank you dear reader for supporting our little company by buying, and I hope enjoying, the receivers which we make. Without you we would not exist, and I hope that we can count on your support in the future. If you have any comments on what we do, we are here at our new location for you to ring or write to us. It’s by listening to you that we can all listen to the world with such ease.

Happy Listening

John Wilson
Managing Director

With every product we make; Expertise; Knowledge; Experience; and that most important ingredient of all; the personal touch in everything we do

Lowe Production Limited
Unit 23, Cromford Mill, Cromford,
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New DRESSLER Active Antennas

**ARA 100 HDX**
40kHz – 200MHz
Gain: 9dB to 100 MHz
8dB to 150 MHz
7dB to 200 MHz
3rd Order IP +48 -50dBm typical
N-type between antenna and interface BNC plug to receiver.
Length 1250mm. Complete with 15 metres cable, power supply, interface and mounting brackets.

**ARA 2000**
50MHz – 2000MHz
Gain: 19dB to 1000 MHz
18dB to 1400 MHz
16dB to 2000 MHz
Noise: 1.5 – 2dB to 1000MHz
1.8 – 2.5dB to 1500MHz
2.5 – 4dB to 2000MHz
3rd Order IP +40 – 42dBm typical. Complete with 15 metres cable, power supply, interface and mounting brackets.

£299

**NEW RANGE OF MASTHEAD PRE-AMPLIFIERS**

<table>
<thead>
<tr>
<th>EVV 2000 HDX</th>
<th>EVV 700 HDX</th>
<th>EVVPA 5200</th>
<th>EVV-INTERFACE</th>
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<tbody>
<tr>
<td>2m N-Type</td>
<td>70cm N-type</td>
<td>wide band scanner use</td>
<td>permits hard switching of Dressler</td>
</tr>
<tr>
<td>250w FM max (500w with EVV INT)</td>
<td>120w FM max (350w with EVV-INT)</td>
<td>50-2000 MHz</td>
<td>Masthead pre-amps</td>
</tr>
<tr>
<td>20dB gain max</td>
<td>20dB gain max</td>
<td>receive only</td>
<td>RSM 2000 – coax DC block</td>
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<tr>
<td>VOX activated</td>
<td>VOX activated</td>
<td>15dB gain max</td>
<td>which allows 10w of R.F.</td>
</tr>
<tr>
<td>50Ω, 12.5-15v DC</td>
<td>50Ω, 12.5-15v DC</td>
<td>N-type connections</td>
<td>SOP 2002 – 2-way antenna splitter, 5-2000 MHz</td>
</tr>
</tbody>
</table>

£169

**SOLE UK IMPORTERS**

**DRESSLER ACTIVE ANTENNAS**

<table>
<thead>
<tr>
<th>ARA60 Active Antenna</th>
<th>ARA1500 50MHz-1500MHz</th>
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<tr>
<td>50kHz-60MHz with limited performance up to 100MHz</td>
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<tr>
<td>£169</td>
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</tbody>
</table>

**WIDE-BAND MAST-HEAD PREAMPLIFIERS ALSO AVAILABLE**

50MHz – 950MHz from £89.

**NOTICE**

We are in the process of appointing Dealers for our entire DRESSLER RANGE of products commencing from January '94.

Will any bone-fide traders or companies who are interested please telephone or write to us now for further details.

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Buy the s.w.l.’s bible - the 1993 World Radio TV Handbook

Comprehensive country-by-country listing of long, medium and short wave broadcast and TV stations by frequency and time.

Special features include world satellite broadcasts, receiver test reports, English language broadcasts, broadcasters’ addresses and personnel, maps of principal transmitter sites.

Special offer price £9.00 (p&p £1 UK, £1.75 overseas surface)

Please see page 79 for details of payment and an order form.

Don’t Miss Out
On The Holiday Of The Year

Come Fly With Us to the 1994 Dayton HamVention - and see What’s on Offer at the Biggest Amateur Radio Show in the World.

It’s not too late to book your seat - it’s waiting for you, although time is running short. Hurry now...we don’t want to leave you behind!

Join the Practical Wireless party, led by PW Editor Rob Mannion G3XFD, when we fly out on a scheduled Delta Airlines flight from Gatwick on Monday April 25 1994. We’ll fly direct to Cincinnati, then our private coach will take us to the Holiday Inn in Dayton for our seven night stay.

There’ll be several day trips in our private coach and we’ll spend a day at the world famous United States Air Force Museum. There’s plenty of shopping and other attractions for the family too!

Book your seat on the PW 1994 HamVention Holiday for only £630 per person, sharing a twin bedroom. Single rooms are available for an extra £205. The price includes the return flight and meals on the aircraft, coach transfers, accommodation for seven nights, two day excursions by coach and an admission ticket to the HamVention. We return home on Monday May 2, arriving at Gatwick on Tuesday morning.

Although Rob Mannion G3XFD is leading the PW party, the entire holiday is being organised by the Bristol based professional tour group operator RCT International. Sheila Bayliss at RCT is waiting for your enquiry and she’ll be delighted to send you a full itinerary and booking form. Don’t delay, telephone Sheila now or send away today and you’ll fly with PW to the greatest amateur radio adventure of 1994!

Seats to Dayton HamVention 1994 are strictly limited, don’t miss your chance...book now. We don’t want you to miss the flight!

To Sheila Bayliss
Practical Wireless 1994 HamVention Holiday
RCT International
44 College Green
Bristol BS1 5SH
Tel: (0272) 230933, FAX: (0272) 226912

I am interested in joining the Practical Wireless 1994 Dayton HamVention Holiday, please send me further details.

Name: _____________________________
Address: ___________________________
How many seats required: ___________
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Your scanner is only as good as your antenna

SKY SCAN
Magmount MKII £24.95

Free P&P this month on SkyScan

SKY SCAN Desk Top Antenna
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SKY SCAN Top Performer in Independent Test!
SKY SCAN V1300 Antenna £49.95

NEW THIRD EDITION
UK SCANNING DIRECTORY
Essential for all Scanning Enthusiasts
Price £16.95 p&p £2.75

AOR 3000A
G5RV Antenna
Full size
£19.95 + £2 p&p

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Longwire Kit
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NEW! NOW IN STOCK
Grundig 500
Yachtboy Receiver
£189.99
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NEW! NOW IN STOCK
Multimode Scanner 100KHz-
2036MHz USB, LSB, C.W, AM, FM, WFM

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PRO-43
200 Channel Scanner
10 Monitor Channels

FREE PWR SUPPLY WITH ALL PRO RADIOS

PRO-44
50 Channel Scanner
66-88, 108-136.975(AM)
137-174, 380-512MHz

PRO-46
100 Channel Scanner
66-88, 108-136.975(AM)

Specifications
• NFM / WFM / AM / LSB / USB • 530 KHz – 1650 MHz
• 1000 memory channels • 500 search pass frequencies
• 10 search bands • 30 channels per sec. scan speed
• 12v d.c. or 4 x AA power supply • Back-lit l.c.d. & buttons

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Nr. Stourbridge, Wers. Tel: (0562) 730672. Fax: (0562) 731002
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Sangean ATS 803A
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£129.95
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Use your Credit Card for same day despatch

Short Wave Magazine, February 1994
Win a Dressler ARA 2000
50MHz - 2GHz
Active Antenna - worth £299!

Help us plan the Short Wave Magazine you want to read. Fill in the questionnaire and you could win the star prize Dressler ARA Active Antenna kindly donated by South Essex Communications.

The winner of our free competition will win the very latest active receiving antenna from Dressler, the well-known German manufacturer. It’s compact, unobtrusive (110mm x 480mm), can be used indoors or clamped to an outdoor mast and gives in excess of 16dB gain over the entire frequency range.

The two runners up will receive one year subscriptions to Short Wave Magazine.

To enter the free competition all completed questionnaires must be sent to the address on page Q4. Entries must be received at the SWM offices by Friday 30 April 1994. The first questionnaire drawn out by the Editor will win the sender the ARA antenna. The two runners up will win the one year subscriptions. The Editor’s decision is final and no correspondence will be entered into.

How many issues of SWM do you usually buy a year?
1 [ ] 3 [ ] 6 [ ] 9 [ ] 12 [ ]

How do you obtain your copy of SWM?
From a newsagent:
- on firm order [ ]
- home delivery [ ]
- casual purchase [ ]
From an amateur radio dealer [ ]
By subscription [ ]
From a friend [ ]

Do you have difficulty finding a copy of SWM?
Yes [ ] No [ ]

How many other people usually read your copy of SWM?
None [ ] 2 [ ] 4 [ ] 6 [ ] 7 or more [ ] 1 [ ] 3 [ ] 5 [ ]

How many of these magazines do you also read or buy per year?
Radio Communications [ ] None [ ] 1-3 [ ] 3-6 [ ] 6-9 [ ] 9-12 [ ]
Ham Radio Today [ ]
Practical Wireless [ ]
Electronics + Wireless World [ ]
Monitoring Times (USA) [ ]
Popular Communications (USA) [ ]
CQ Magazine (USA) [ ]
Maplin Magazine [ ]
Elektor [ ]
Everyday with Practical Electronics [ ]

Which of these newspapers do you regularly read?
Daily Mail [ ] Daily Express [ ] Daily Mirror [ ]
Daily Telegraph [ ] The Times [ ] The Star [ ]
The Guardian [ ] Today [ ] The Sun [ ]
The Independent [ ] Regional [ ] Local [ ]

Do you own a home computer?
Yes [ ] No [ ]

If “Yes”, which type (e.g. BBC, IBM PC Compatible, Macintosh, etc).
Do you hold an amateur radio transmitting licence?
- No
- Yes (Class A)
- Yes (Class B)
- Yes (Novice A)
- Yes (Novice B)

How much do you spend on the radio hobby in an average year (including QSL expenses, books, equipment, shows, etc)?
- Under £50
- £51-£100
- £101-£250
- £251-£500
- £501-£1,000
- Over £1,000

Have you ever bought anything from an advertisement in SWM?
- Yes - Major equipment
- Yes - Antennas
- Yes - Accessories
- Yes - Components
- Yes - Books

If "Yes", how would you rate the service you received from the advertiser?
- Poor
- Acceptable
- Good
- Very Good

How many radio rallies/exhibitions do you visit annually?
- None
- 1
- 2
- 3
- 4
- 5 or more

How would you describe your expertise in electronics?
- Beginner
- Average
- Advanced

Which of these clubs/societies/groups do you belong to?
- AMSAT
- BARTG
- BATC
- EDXC
- ISWL
- RAYNET
- RSGB
- RIG
- ILA
- WACRAL
- Local
- Other
- Radio Station DX Club
- None

Do you have any other major hobbies? If so, what are they?:

How interested are you in the following regular features in SWM?

- Reviews - Receivers
- Reviews - Scanners
- Reviews - Accessories
- Historical Features
- Constructional
- Modifying Equipment
- Letters
- Junior Listener
- Advertisements
- Grassroots
- News
- Airband
- Amateur Bands Round-up
- Bandscan America
- Bandscan Australia
- Bandscan Europe
- Decode
- DXTV Round-up
- Info in Orbit
- Long Medium & Short
- Maritime Beacons
- Off the Record
- Propagation
- Satellite TV
- Scanning
- SSB Utility Listening
- Watching Brief
- Trading Post
- Rallies
- Competitions
- Book Service
- Special Offers

Very interested
Fairly interested
Slightly interested
Not interested
On a scale of 1-10, how would you rate the content of SWM?

We regularly devote issues to a theme and sometimes we add extra pages in the form of free pull-out supplements. How do you rate them?

Themes
Very interested Fairly interested Slightly interested Not interested
Simple Receiver Projects
Airband
Marine
Propagation
Antennas
Historical
Projects to Build
Computers
Radio Stations
Going on Holiday

Free Supplements
What Scanner
Guide to SWL

How interested are you in reading about the following aspects of radio?
Very interested Fairly interested Slightly interested Not interested
Help for Beginners
New Products
News Items
Computing
Modifying Equipment
Test Equipment
CB
Airband
Historical Items
Show Reports
Scanning
Short Wave Listening
Constructional Projects
Satellites
Other (Specify)

How do you rate the overall design and layout of SWM?
Poor Fair Good Excellent

How do you rate the look of SWM's covers?
Poor Fair Good Excellent

How easy is it to spot SWM on the newsagent's shelf?
Very Easy Fairly Easy Fairly Difficult Very Difficult

How often do you construct projects published in SWM?
Never Seldom Often Always

How closely do you read the advertisements in SWM?
I read all or nearly all of the advertisement
I read some of the advertisements
I read the occasional advertisement
I never read the advertisements

Which of these do you listen to regularly?
Broadcast Stations Utilities
DXTV Fax
Airband SSTV
Weather Satellites Amateurs
Beacons Amateur Satellites
Other

Q3
Which of these bands do you listen to most often?

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<th>Band</th>
<th>Usually</th>
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<th>Sometimes</th>
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<td>Long wave</td>
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<td>Amateur</td>
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Can you say, briefly, how you would like us to improve SWM?

__________________________________________________________________________

__________________________________________________________________________

PERSONAL DATA

Personal details are required for statistical purposes and will be treated in the strictest confidence. Please ignore any of the following questions that you do not wish to answer. You must, however, supply your name and address if you want to be included in the prize draw. The information in the questionnaire will be stored on a database but it will not be stored and/or associated with your name and address.

How old are you?

Under 15 □ 15-25 □ 26-35 □ Over 65 □

Are you employed in an electronics related field?

Yes □ No □

What is your annual income?

Under £6,500 □ £6,500 - £10,000 □ £10,001 - £15,000 □ Over £30,000 □

£6,500 - £10,000 □ £10,001 - £15,000 □ £20,000 - £25,000 □ £25,001 - £30,000 □

Please tick this box if you do not want to receive further information from PW Publishing Ltd and/or associated companies □

Thank you for taking the time to fill out our questionnaire. If you write your name and address in the space below and send the completed form to the address below, you will be entered into our free prize draw. We will be happy to pay the postage*.

PW Publishing Ltd. (Survey),
FREEPOST,
Arrowsmith Court,
Station Approach,
BROADSTONE,
Dorset BH18 8PW.
(NO STAMP IS REQUIRED)

NAME ____________________________
ADDRESS ____________________________________________
______________________________________________________
BROADSTONE, Dorset BH18 8PW.

POSTCODE ____________________

*Unfortunately, the FREEPOST facility is only available for readers within the United Kingdom, Northern Ireland, Channel Islands and the Isle of Man. Despite this, although readers abroad will have to pay the postage to return their questionnaires, they will still have free entry to the competition, and with the closing date of 30 April 1994, we have allowed plenty of time for entries to arrive from around the world. – Ed.
The new MVT7100...  
...the ultimate scanner!

MORE MODES:  
AM/FM/WFM/USB/LSB

MORE FREQUENCIES:  
100kHz to 1650MHz (no gaps!)

MORE MEMORIES:  
1000 Channels

Plus:
Delay and skip functions  
High speed search  
10 search bands  
Three-way tuning  
Fast scan speed  
Ultra-fine tuning  
Priority scan  
User friendly  
Attenuator

NOW £389

Complete with:  
- Belt clip  
- Earphone  
- Wrist strap  
- Car cigar lead  
- Mains charger  
- Nicad batteries  
- Telescopic antenna and Lowe’s famous service and back-up!

Receives: Utilities  
- TV sound  
- Marine band  
- Civil airband  
- Military airband  
- Broadcast radio  
- Emergency services and many more local and international services

SPECIAL OFFER
1992 Edition of “POOLEY’S FLIGHT GUIDE”  
This “Aviator’s Bible contains details of all UK airfields, all ground, tower, approach and radar frequencies, all lower airspace and radar information, airways frequencies, private airstrip locations and much, much more. This is last year’s edition but almost all data is still correct.

Normal Price £16.50  
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plus £2.00 Post & Packing (It’s heavy with information!)

LOWE ELECTRONICS LTD  
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Tel. 0629 580800  Fax. 0629 580020  
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Frequencies: 30kHz-30MHz.
Tuning: 8Hz steps.
Memories: 30 channels.
Filters: IF filters for all modes fitted.

The AR3000A is a follow on from the highly acclaimed AR3000. Many major improvements have been implemented at the request of enthusiasts. The tuning control is now ‘free running’ to provide a smooth feel for SSB/AM, 50 buttons have been added to make step size faster and more convenient. All information is contained on the LCD instead of a separate status LED indication. The RS232 facility has been added.

Frequency coverage: 30kHz-300MHz.
Modes: USB/LSB/AM/FSK/AM/FM/AM (selectable 5 band).
IF Bandwidths: 2.5kHz & 7kHz.

The AR2000 is a logical alternative to the Japanese ‘push button portables’. Designed as a logical alternative to the Japanese ‘push button portables’, the HF-150 places a ‘real radio’ within your price reach. Whilst reflecting the Lowe approach to simplicity of operation, the HF-150 nevertheless has all the features and facilities you need. This truly is ‘Real Radio’.

Frequency coverage: 50kHz-1300MHz.
Modes: USB/LSB/AM/Sync. AM (selectable S’band).

Frequency coverage: 30kHz-30MHz.
Modes: USB/LSB/AM/FSK.

HF-150 Compact Communications Receiver
£359 inc VAT
Designed as a logical alternative to the Japanese ‘push button portables’, the HF-150 places a ‘real radio’ within your price reach. Whilst reflecting the Lowe approach to simplicity of operation, the HF-150 nevertheless has all the features and facilities you need. This truly is ‘Real Radio’.

Enterprise Radio Applications Ltd
26 Clarendon Court (Dept SW)
Warrington WA2 6QG

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Radio Days

Many of us have to put up with less than ideal radio shacks.
Bob Ellis describes a wireless set that almost required mountaineering skills to adjust.

I'm sure Woody Allen won't mind if I borrow one of his film titles for this little piece. Like Allen reflecting on his native New York, radio for me has always been a thing of wonder, mystery and magic. Something special, your closest friend and yet somehow out of reach.

Growing up in a Midlands town, the first radio I can remember was out of reach. It was screwed to the ceiling!

To live in Derby in the early sixties meant that Dad was a Rolls Royce man, so could turn his hand to anything. We lived close enough to the engine test beds at Sinfin to have their constant roar as a backdrop to everything we did. Just as you were getting complacent, one of them would playfully fire a loose bolt through next-door's greenhouse. It kept you on your toes.

The radio had probably been a bargain. A marked cabinet, perhaps. For a few hours, the test beds became a poor second to the sound of manic carpentry from the prefab garage. The new cabinet had a front, but no sides. It was nothing more than a large baffle board the width of the back door, a system of chains holding it a jaunty angle between the top of the door frame and the ceiling.

To this day I can't work out where it got its power from. All I can recall is that when Mum stood on a chair to switch it on, the reassuring glow of the station glass was followed by the strains of The West End Celebrity Orchestra with the theme to the Housewife's Choice on the Light Programme of the BBC - fifteen hundred metres on the long wave from Droitwich. Station names like Daventry, Warsaw and the other country that was West Region hold memories for all my generation, more so when to read them meant dragging the kitchen table, a vision in yellow Formica, over to the back door then, from a chair placed on top of it, listening could begin.

Minor adjustments could be made by leaning out from the work surface, a route only attempted after scaling the north face of the Aga. What wonders were held frozen in the station glass. Reading across you find the results of early European Cup matches; Hilversum 1, Sottens 2, a sad day for Hilversum fading in extra time. I could find Prague in the school atlas, but where was Athlone?

Tuning to Saar-Louis only got me the news in Welsh – writing to the External Service of the BBC only got me a terse note from the Board of Trade telling a six-year-old that grant-in-aid funded broadcasts in the Empire Service are not for domestic consumption. Tell a boy he should not be listening and you have a listener for life!

As the family settled down with Perry Mason, the scaffolding would be erected in the kitchen for the evening session. News from Moscow had to wait until I knew the winner of Have A Go and the eight o'clock repeat of The Goon Show. Moscow and AFN played cat and mouse across the dial agreeing only when Cuba became the perfect holiday home for nuclear missiles. We stood at the brink of war, but as long as Sunday lunch brought me Round the Horn, The Navy Lark and in the grey afternoons of winter, The Clitheroe Kid and The Billy Cotton Band Show, that was a problem for the grown-ups.

My only problem then was Sam Costa. As the days went by he was getting fainter and fainter. Dad said one of his valves was going and we could sort it out at the weekend. This would mean missing Saturday Club, but it would be worth it. The radio was taken down from the altar above the back door and dusted. Each valve was removed with a true sense of ceremony, wrapped in newspaper, its position noted on the back of a fag packet.

You had to queue in a radio shop in those days. An earnest young man in a white coat took our newspaper parcel into the back door. Whatever he did in there, he had to do it alone. A man's relationship with his valve tester is a personal thing.

The worst part is the waiting. After what seemed an age our hero returned and told me to be strong.

"It's the rectifier. Gone low emission. I'm very sorry".

Not as sorry as Dad. A new 7Y4 would set him back fourteen shillings. On the journey back, he moaned about paying for new technology. “These all-glass valves are bound to fail because you can't seal glass against the metal pins. They never had this problem with International Octal...”

The new valve was fitted in an atmosphere of relief and resentment, depending on which one of us owned the wallet, normal service being resumed just in time for Two Way Family Favourites.

After Dad had had a chance to mourn the passing of fourteen bob, he decided to turn his loss to my educational gain by breaking the glass of the old valve to explain to me how it worked.

It was obvious to me that it could never have worked. I'd been making circuits with batteries, bulbs and switches and had learned that if you wanted it to work, there must be a circuit across positive and negative. The bits inside the valve aren't connected to each other. No wonder it didn't work! I knew better now, of course. As I finish this while listening to Classic FM on a fully synthesised wireless, I realise just how far we have come.

But where is the magic?
There can be few people who have not seen the weather pictures routinely shown on most weather forecasts. These are pictures taken by the geostationary METEOSAT satellites, orbiting the earth at some 35800km.

**METEOSAT data**

METEOSAT transmits different types of telemetry, apart from digital and analogue picture data. Forecast charts and other basic information are broadcast as part of the Meteorological Data Dissemination (MDD) to small receiving stations, often called SDUS (Secondary Data User Stations), as WEFAX images. Major national weather centres and research establishments often require images of the highest possible quality, and this is where Primary Digital data comes in.

This product from Timestep Weather Systems is not designed to receive WEFAX. It goes all the way and decodes the original, high resolution (Primary Data) digital images transmitted on 1694.5MHz (channel 2), from which WEFAX pictures originate.

**Primary Data**

The main mission for METEOSAT is the generation of 48 cloud images per day using three spectral bands - visible light, thermal infra-red and infra-red (water). This data is used for short term forecasting, although the same information produces a range of products for use in both meteorology and longer term climate studies.

Different types of image are broadcast, some being full earth (called A-format), and others which include Europe and a section of North Africa (called B format).

Each PD transmission usually contains images from more than one band, the data being interspersed. The AV format is a whole disc, visible light image having maximum resolution - 2.5km, but AVH contains both infra-red and visible images, each at 5 or 10km resolution; AW contains the water vapour image. Test images and re-transmissions from other satellites - METEOSAT 3 and the Japanese GMS are also broadcast.

**Hardware requirements**

To receive and decode Primary Data from METEOSAT you need several items of hardware, and a suitable computer. The first item, and the only item, apart from the computer, not supplied by Timestep, is a large dish!

Although 1m, or even slightly less, can get you a good, apparently noise-free WEFAX image, to obtain reliable Primary Data, using current technology, we are looking at an absolute minimum of 1.6m diameter, with a strong preference for 1.8m. The 1.6m dish size can give good images if everything else is, and remains, perfect. For everyday operation you need a system with some flexibility, so that slight degradation of system performance in one or more of the associated components does not mean that the images are immediately degraded.

A 1.8m dish is large and must be accommodated properly. For correct use it should be supported at least half a metre above the ground, and preferably have provision for controlled movement in both elevation and azimuth. Such dishes are becoming more easily obtainable. It may also be prudent to enquire about planning consent from the local council.

**Feed and pre-amp**

The dish must be fitted with the supplied horn feed, mounted on three long, threaded rods, fitted near the rim of the dish.

A high quality pre-amp, provided as part of the equipment, is designed to be totally compatible with the rest of the hardware.

Cable of some 20m length was included, balanced to the pre-amp and receiver, so there was no need to cut it shorter. At first I was surprised to see F connectors fitted, but these have proved very efficient in combination with the CT100 cable.

The dish and pre-amp deliver the 1694.5MHz signal along the CT100 cable and into the receiver. This was upgraded during the review period, now having three switches and two rotary controls. Fortunately there is an absolute minimum of day to day adjustment required.

The receiver is connected to a card, slotted into a 16-bit expansion bus inside an AT computer - a standard procedure. Before installation I examined it carefully, noting the gold-plated connectors and neat, construction.

**Primary Data Receiver**

This is a small unit, about 200mm wide by 80mm high and 140mm deep, with three switches, two rotary pots, and a carrier meter. It can take time to settle - no doubt enhanced thermal stabilisation will become a future upgrade.

To align the dish precisely for PD reception, I attached a micro-ammeter to a long cable and plugged it into the receiver output provided for this purpose, on the rear of the receiver. It indicates the carrier level to help with remote positioning. Alternatively, grab your spouse or other friendly person, and they can call out signal readings!

One switch selects 1691.0 or 1694.5MHz (to allow for possible transmission changes), and another switches between the carrier signal strength and data tuning. The manual briefly describes the necessary adjustments, though without providing any significant information about the nature of what you are asked to do. Fortunately the equipment worked despite the manual's shortcomings.

The receiver switches were set, the process completed within about fifteen minutes! It is a mark of the effectiveness of the hardware design that this took so little time. Other facilities on the back of the receiver include an i.f. monitor and other outputs, none of which I needed to use.

I found that for the first ten to fifteen minutes, the receiver was stabilising, so early decoding required some adjustment of the tuning control to obtain good lock. Sometimes the lock light would come on yet no data appeared on the screen.

**Computer requirements**

Although framestores are often used for WEFAX imagery, a computer is virtually essential for Primary Data. For this system, you need an absolute minimum of a fast 286 machine; my own operations mostly use a 386DX running at 33MHz. A 1Mb RAM video card with SVGA graphics is also required. A hard drive is essential and it should be a reasonably good quality one - maximum 28ms access time.

Timestep recommend the ET4000 video card. Using a different card means that the animation program gives only marginally usable results. The problem appears to be that the ET4000 card is one of only a few which permit bank switching - the ability to hold multiple images so that different ones can be switched into the display. I suspect that there might be software options potentially available to overcome this feature.

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Timestep PDUS

Lawrence Harris reviews one of the first METEOSAT Primary Data systems to become available at amateur prices.

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Short Wave Magazine, February 1994
Setting it all up

Having manoeuvred the dish into the approximate position - pointing towards METEOSAT 4, I configured the equipment for WEFAX reception so that the signal could be located using the audio tone. Aligning the dish for the best initial signal proved the system was working, so I changed the input connection from the WEFAX receiver to the PD receiver.

Test Image

Several separate programs are provided, and installed virtually automatically using the supplied software. The first is called MTEST, used in initial setting up - which puts every line of decoded data (normally infra-red) directly on the screen without saving. The resultant image is only for quality checking. It is necessarily distorted but allows you to see whether the lines are good. If any are corrupt you may need to troubleshoot. Any problems with the data stream will be obvious - missing data shows as lines or black bands; noisy data may show partially reversed sections.

If you have carefully positioned the dish and confirmed the signal strength then you should get a good quality picture. I ran this test for some time to ensure that the receiver was operating consistently. When the quality is good, and it almost certainly will be, then you have got yourself a working system - read on!

After monitoring image reception quality (using MTEST), I ran the main PDUS program. The manual lists image types transmitted by METEOSAT, including resolutions (at the sub-satellite point) and the duration and frequency of transmissions. EUMETSAT publish the official dissemination schedule.

Software scales the image so that the whole of the format is shown during collection. Realtime data is stored with the filename TEMPDATA.MPD, and subsequent images replace previous ones with the same name.

After collection, you can zoom in to any selected region. Higher resolution formats give more detailed images - from 2.5km at the sub-satellite point, down to the lower resolution figures seen at higher latitudes.

Every line contains position information, so, unlike WEFAX data, you can start image decoding at any time during the transmission, and the program plots the image in the correct position. This can be useful if you don't have enough disk space for a complete image.

Data is written directly onto the hard drive. This is necessary because images contain up to 30Mb of data, and is the reason for having a reasonably fast disk drive. You may also need to perform file and space consolidation from time to time.

The software

The PDUS program is styled on the PROsat II format and has a similar menu choice - FILE, SECTION, RECEIVE, DISPLAY, COLOUR, OPTIONS, and QUIT.

FILE allows the loading of previously saved PDUS images which can take several seconds to load! SAVING the image is a quick as it is merely necessary to rename the temporary file. Image deletion and directory switching are also included.

The SECTION option allows marking for subsequent saving of a selected portion of the complete image. This facility lets you select the important part of an image instead of saving the whole image. RECEIVE offers several choices. You can start image collection immediately, or, using the SET READ TIMES option, do it under program control during your absence. Select AUTOSAVE and the software waits until the next programmed time slot.

The DISPLAY option allows channel selection when image collection or loading is complete, and indicators show what is available, though these do not always seem to be accurate, sometimes indicating an absent channel as being present. You can select an area for zooming and the function keys are suitably programmed.

Enjoy the View

When you collect either the European or whole disk images, you have, in one image, greater detail than seen in the sum total of all the WEFAX images that METEOSAT transmits during a whole hour.

I find several areas to be of great interest. The island of Sicily has the active volcano called Mount Etna. When it erupted several months ago I was able to see the smoke emissions over several days. Images of the ever-changing snow covered peaks of the Alps, and the ice forming and melting around Norway are transmitted every half-hour. Yes, I even used it to see our weather! I also find that these images are of considerable help when I am planning on setting up my telescope for a night's observing. Individual clouds around Dartmoor and Plymouth Sound can be seen.

Special mention must be made of morning and evening visible-light whole disc images. They cannot have significant applications near these extremities but they look incredible - just like the crescent moon. Add some gentle false colouring and they are a must.

Re-transmitted pictures

There are so many different areas available from these Primary Data images that selecting a few for detailed comment is a problem! METEOSAT 3 is currently near longitude 72°W, and some of its images are re-transmitted by METEOSAT 4 in the LXI slots.

The Amazonian rivers and jungles have proved consistently fascinating to me,
and can be scientifically monitored on a regular basis. Whole disc thermal images of America from METEOSAT 3 are re-transmitted from METEOSAT 4 every hour.

Further north, between Canada and Greenland we have the area which the higher orbiting METEOR WXSATs occasionally reveal to people monitoring from Britain. METEOSAT Primary Data images routinely show these areas, though from a different perspective. The enormous ice sheets and icebergs are visible in different spectrum images.

**Temperature**

A complete infra-red image includes calibration data. This can be used by the software to allow both temperature profiles, and the direct reading of temperature to be accomplished. It works a treat! Images are calibrated to high accuracy, so you see displays such as -30.3° indicated. The accuracy of the read-out compares well with the calibrations on NOAA polar WXSATs. I tried this and found them to be similar, but the thickness of the atmosphere might cause some distortion at higher latitudes for METEOSAT readings.

**Bugs??**

Yes I did find a couple of bugs, even if minor. Using the mouse to move the pointer for menu selection is fine. When you switch to SECTION for zooming, it sometimes jumps to an unpredictable position. I can live with this one!

A second, slightly more puzzling problem may occur during the use of AUTO-INVERT under the OPTIONS menu. This facility is used to reverse the display of infra-red images, and is very useful for METEOSAT 3 visible images which are sent in reverse grey scale. This initially operated correctly, but suddenly reversed its logic! My version now shows the proper grey scale when the option choice indicates that it is reversed. Timestep suggest that this might have been caused by data corruption from a METEOSAT 3 image.

Another ‘bug’ I found was the unclean result occurring if your disk becomes full during data collection. On my computer the image simply started to display regular missing lines; this then became the indication of a full disk. At least the system didn’t crash!

In my view these problems are not very significant.

**Picture conversion**

The software allows conversion from PD images (.MPD) to PROsat II (.DAT) files, and to both SCF and PCX file formats. This means that further conversion to common formats is possible. I tried all conversions using a variety of images and the results were excellent. It allows the selection of a section of the UK for saving and conversion, which can be read by DTP programs and even into my word processor for use as a letter logo! I also found it cheaper on disk space to convert files to PCX format, then compress using PKZIP or similar program.

**Animation software**

There are two animation programs supplied - PDAFANIM, which animates the whole earth (A-format) infra-red images, and PDUSANIM which animates Europe. It is essential to recognise that the software only works effectively with the ET4000 video card and one or two others, and needs lots of RAM! The manual specifies a minimum of 4Mb. This program for A-format images is very versatile, and contains other options, helping to make this a quite exceptional piece of software, provided your hardware can cope!

The second animation program is called PDUSANIM, and animates images of Europe. Like its sister program, it needs plenty of RAM (16Mb is specified!) because each file occupies over 1Mb. A description of sorts was included in the PDUS manual. Unfortunately this was not comprehensive, several software options not being mentioned. Additionally, the built-in HELP screen excluded reference to them as well! By experimentation, I managed to work out what was on offer.

**Encryption**

Primary Data from METEOSAT will be encrypted in due course, starting with tests in early 1994, and continuing until routine encryption after 1995. Manufacturers of PDUS equipment were informed of this change during 1992 so that the necessary decryption key units could be built. Pricing policy for UK users will be decided by the Meteorological Office. ‘Info in Orbit’ will provide full details as information becomes available.

**Prices**

Timestep can supply all or any of the parts for a complete PDUS system. If you already have a METEOSAT system you will not need all of it. Their catalogue, available on request, lists all the options. Typical prices are:

- Dish feed: £49
- Preamp: £255
- Receiver: £699
- Card & Software: £499

**Final notes**

My aim with this review has been to provide a comprehensive description of a Primary Data system, explaining what is available from both the satellite and the hardware. If you are actually proposing to spend money on purchasing a PD system, I would suggest that it could be worthwhile identifying your personal reasons for doing so. If you only want to see the weather, this is not for you - just watch the news!

In this part of the market I don’t think that Timestep have much competition - I have come across few other PDUS systems around the world, and their prices need to be seen to be believed - they are so out of the reach of the amateur market.

This system provides some superb images, and needs minimum re-adjustment. My only significant criticism of the whole set-up is the manual, or rather the brief notes that were included. Timestep need to look urgently at this aspect of its output, a view repeatedly expressed by correspondents to ‘Info in Orbit’.

My thanks to Dave Cawley and Peter Arnold of Timestep Weather Systems for providing this exceptional piece of equipment.

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**Fig 4. METEOSAT-4 total solar eclipse 30 June 1992; circular shadow over south Atlantic.**
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73 from Dave G4KOH, Technical Manager.
By Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Propagation

Broadly speaking, short wave enthusiasts are particularly interested in receiving radio signals from abroad, for example via signals from abnormal long-distances. This is commonly called DXing, however, before any of this can happen one must get 'wrong' somewhere in the earth’s complex atmosphere and upset the normal paths of such signals. The idea of this column is to publish readers’ reports and observations so that others can compare these results with their own work or logs over a similar period.

School Project

With this in mind, I must now congratulate, 13 year old, Connor Walsh (C. Wexford) who decided to use the subject of propagation for a school project last June. Briefly, he checked the prevailing atmospheric pressure against a range of signals that he received in Band II (87-107MHz) and writes, “I feel I learned something from it”. Of course you did Connor, you recorded for future comparison results from your own work or logs over a similar period.

Solar

From sites in Edinburgh and Glasgow, Ron Livesey, the auroral co-ordinator for the British Astronomical Association, using the spray method, reported several auroras of varying intensity, the most intense of which was observed on October 16th & 22nd. These latter were also observed by Patrick Moore (Selsey) who kindly sent a drawing of three of these auroras, Fig. 1, as he saw them on his projection screen at 1100 on the 22nd.

Auroral

Ron Livesey received reports of auroral ‘glow or patch’ for the overnight period on October 9/10, 11/12, 17/18 & 20/21; ‘arc or band’ on 10/11, 11/12, 12/13, 18/19, 22/23 & 24/25; ‘active forms or pulsations’ on 9/10 & 21/22 and ‘will disappear’ on 8/9, where visible, from observers in Canada and the United States, The Met. Office at Wicks and the Ocean Weather Ship Camulus. May I remind you that Ron would be happy to receive your reports at Flat 1/2, East Parkside, Edinburgh EH16 5KJ.

Magnetic

The variety of magnetometers used by John Fletcher (Tuffley), Tony Hopwood (Upton-on-Severn), Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle) and Tom Rackham (Gooserey), between them, recorded strong disturbances to the earth’s magnetic field on October 9, 10, 11, 25 & 27-29. Lesser activity was noted on days 1, 4, 5, 16 & 18.

Propagation Beacons

As usual, my thanks are due to Gordon Foote (Didcot), Cmdr Henry Hatfield (Sevenoaks), Ian McDermid (Comrie), Ted Owen (Malton), Em Worwick (Plymouth) and Ford White (Portland), for their 28MHz beacon logs from which I compiled the chart in Fig. 2. Henry’s reports of EA3JA were very loud on November 6.

Among the other South African beacon activity, Gordon copied a lune signal from ZSSVHF on November 7. Gordon also reported that reception was up and down during the period and he found the best day was November 14 when he logged 12 beacons and, significantly, a few Americans among them. Ern and Gordon told me that Z5BPW is now up on 28.100MHz (previously 28.150MHz).

Band II

During the tropospheric opening on November 18, Connor Walsh, using a Sony ICF-SW800 with its own rod antenna, heard a French transmission around 55.4MHz. While Leo Farr (Sunderland) was tuning through the band on his Philips car radio he found the local stations Radio Broadland and Lincs FM and an unidentified station from Holland. On October 29/30, Leo heard BBC Radio 4 from Ashkirk, Forfar and Sandisle, Classic FM, BBC Radio Scotland and 1FM from Blackhill, 1FM from Darvel, BBC R Scotland from Skraig, Isle Of Skye, BBC Radio Solway and Viking FM. He identified these by their programme content.

Details of the atmospheric pressure, recorded by me from October 26 to November 25, can be seen in my television column elsewhere in this issue.
The wind of change has blown through Eastern Europe these past couple of years, the most dramatic perhaps Orientel '93 with the Russian Revolution - 2. World changing events like this are well covered in the media and for satellite 'zapppers' the world's dramas are played out in their living rooms as the various satellite TV news feeds are monitored.

I personally would have thought a year ago that Russia would be carrying soft porn but I am again proved wrong! Cable Plus is a Prague based company producing an evening menu of films and series (such as the US version of Candid Camera) that are then downlinked across Czechoslovakia for cable systems in the major towns. Friday/Saturday nights from about 2300 is the cue for the soft porn segment in an evening of programmes running 1800-0100. This teletext downlink can be monitored currently on the Russian satellite - Gorizont 11 at 11°W - on its single Ku band 11.525GHz r.h. circular transponder with a relatively strong signal. A tri-band dish tracking.

Gorizont craft have no provision for station keeping (orbital stability) and gradually they move into an increasing inclined orbital movement which demands a special receive dish tracking. That's why the 14°W Gorizont is so weak for much of the day as the bird moves in an inclined orbit above/beneath the Clarke Belt though centred at 11°W. The relatively stability of the 11°W bird suggests that its relatively new into service and has yet to move into an inclined orbiting pattern.

In the past few weeks we have seen several new satellite channels become established, there's never a dull moment out in the Clarke Belt! One SWM reader queried the new pop music channel, similar to MTV but in German on Eutelsat II F3 @ 16°E will start receiving service at very high signal strengths. If you're into live pop music you can check out their station as a 24 hours service from EDTV Dubai (Filmnet pad) is found another 24 hours service from Intelsat K @ 13°E.

Another hot spot for satellite operations is the Middle East with several large groups planning to open satellite TV services. Orbit Communications is opening a TV production facility near Rome, Italy that will offer digitally compressed and encrypted TV channels across the whole Middle East during 1994 aiming for over 20 available channels by 1997. MPEG compression will be used with encryption for the service of films, sports, general entertainment and children's programmes.

Another Rome based service - Arabic Radio and TV - (ART) is planning a 4-channel TV service via Arabsat 1D 'soon' though using D2-MAC with K4-Crypt scrambling. Further action is seen with established Middle East Broadcasting (MBD) out of London with their compressed + DigiCipher service though intended for over 150 terrestrial receive sites and related MMDS (microwave terrestrial retransmission) transmitters. The new services will include general entertainment, family entertainment and education, movies and a news channel. The other new satellite service is an Arabic station - 'Al-Mustaqbal TV' - broadcasting from Beirout across the Middle East via Arabsat 1D (20") in C Band for some 20 hours daily.

Finally, if you write in with information or queries can you please include an s.a.e. General reception reports and news of welcome, include details of your own receiving setup and any unique home construction or adaptions to the system. Due to time limitations I'd prefer not to receive long video tapes! I'm not too happy to receive 'phone calls at 0900 Monday mornings or 2200 Sunday evenings - which has happened!

**Orbital News**

We've news of a really hot satellite DX receiver with a claimed threshold of under 2.5 uV - the SRX 2000E - made by NKM Elektronik GmbH. This rather dramatic development in low signal working results from a new integrated circuit via Eutelsat II F3 @ 13°E and rethink around the video demodulator stages and combines a very low threshold video demodulator with digital signal p.i.l. processing. The incoming signal (either PAL, NTSC, SECAM) is split into its 3 basic components (r, b, y) each is digitally processed and recombined to produce a new cleaned up PAL signal, new syncs and colour burst. Though menu driven it is claimed to be 'user friendly'. Price tag is DM 5500 FOB Germany, for more details contact the manufacturers at PO Box 1705, 79507 Lorrach, West Germany (FAX: 07621 18840).

Another interesting development is in the Middle East with several large groups planning to open satellite TV services. Orbit Communications is opening a TV production facility near Rome, Italy that will offer digitally compressed and encrypted TV channels across the whole Middle East during 1994 aiming for over 20 available channels by 1997. MPEG compression will be used with encryption for the service of films, sports, general entertainment and children's programmes.

For Arabic students on the same channel there are a series of channels being provided from the Russian satellite - Gorizont 11 at 11°W - on its single Ku band 11.525GHz r.h. circular transponder with a relatively strong signal. A tri-band dish tracking. That's why the 14°W Gorizont is so weak for much of the day as the bird moves in an inclined orbit above/beneath the Clarke Belt though centred at 11°W. The relatively stability of the 11°W bird suggests that its relatively new into service and has yet to move into an inclined orbiting pattern.

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Another Rome based service - Arabic Radio and TV - (ART) is planning a 4-channel TV service via Arabsat 1D 'soon' though using D2-MAC with K4-Crypt scrambling. Further action is seen with established Middle East Broadcasting (MBD) out of London with their compressed + DigiCipher service though intended for over 150 terrestrial receive sites and related MMDS (microwave terrestrial retransmission) transmitters. The new services will include general entertainment, family entertainment and education, movies and a news channel. The other new satellite service is an Arabic station - 'Al-Mustaqbal TV' - broadcasting from Beirout across the Middle East via Arabsat 1D (20") in C Band for some 20 hours daily.

Finally, if you write in with information or queries can you please include an s.a.e. General reception reports and news of welcome, include details of your own receiving setup and any unique home construction or adaptions to the system. Due to time limitations I'd prefer not to receive long video tapes! I'm not too happy to receive 'phone calls at 0900 Monday mornings or 2200 Sunday evenings - which has happened!

**Orbital News**

We've news of a really hot satellite DX receiver with a claimed threshold of under 2.5 uV - the SRX 2000E - made by NKM Elektronik GmbH. This rather dramatic development in low signal working results from a new integrated circuit via Eutelsat II F3 @ 13°E and rethink around the video demodulator stages and combines a very low threshold video demodulator with digital signal p.i.l. processing. The incoming signal (either PAL, NTSC, SECAM) is split into its 3 basic components (r, b, y) each is digitally processed and recombined to produce a new cleaned up PAL signal, new syncs and colour burst. Though menu driven it is claimed to be 'user friendly'. Price tag is DM 5500 FOB Germany, for more details contact the manufacturers at PO Box 1705, 79507 Lorrach, West Germany (FAX: 07621 18840).

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For Arabic students on the same channel there are a series of channels being provided from the Russian satellite - Gorizont 11 at 11°W - on its single Ku band 11.525GHz r.h. circular transponder with a relatively strong signal. A tri-band dish tracking. That's why the 14°W Gorizont is so weak for much of the day as the bird moves in an inclined orbit above/beneath the Clarke Belt though centred at 11°W. The relatively stability of the 11°W bird suggests that its relatively new into service and has yet to move into an inclined orbiting pattern.

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When I am asked, "do you ever get the time for material for your columns?", in theory, the answer should be "yes, at the end of the Sporadic-E season", but this is not the case, because, there is always something going on in the restless atmosphere to write about. Also, there is more behind the reception of long-distance (DX) television signals than the subject immediately suggests. For example, each time pictures from afar appear on your screen you have learnt that a natural disturbance is taking place in the ionosphere or the troposphere. Broadly speaking, a good Sporadic-E is required to see DX in Band I (45-68MHz), while Bands I (175-230MHz), IV (471-608MHz) and V (615-856MHz) need what's called a tropospheric opening.

The former is a sudden upset in the 'E' region of the ionosphere and the prevailing weather has a lot to do with the latter. DXTV can sometimes be seen in Bands I and III, rather grottily, via auroral reflection and for a momentary 'flash' by meteor trail reflection. So, to sum-up, a small portable television receiver that covers all three bands is a super propagation indicator to have available. Don't forget readers, if pictures are being received on Chs. E2 & R1 then you are almost certain to find DX in the 50MHz amateur band because of the similarity in frequencies. This association also goes for Band III and the 144MHz band and Bands IV and V and the 430 and 1296MHz bands. It all fits together nicely and this is where one interest in the world of radio can alert another.

General Rules

For the benefit of our new readers, Bands I and III are in the v.h.f. part of the spectrum and Bands IV and V are in the u.h.f. region. Although Sporadic-E events do occur, on a limited scale, during the winter months, the main 'season', when the big openings are expected, is between mid-April and mid-September with peaks in June and July.

Each 'band' represents a part of the radio frequency spectrum that has been internationally allocated to terrestrial television. Because of the limited frequency space available, the bands have to be shared and to do this they are divided into channels, a few megahertz wide and given a number that is recognised throughout the world. For instance, Band I has the West European 'E' channels and the East European 'U' channels that are allocated to many countries such as Norway on Chs. E2 (48.25MHz), E3 (55.25MHz) & E4 (62.25MHz), Denmark on Ch. E2 & E4 and Poland & Russia on Chs. R1 (49.75MHz) & R2 (52.25MHz). More precise information can be found in the latest edition of the World Radio TV Handbook, published by Billboard and, if wanted, can be purchased from the SWM Book Service at the Editorial Offices in Broadstone.

Over the years, TVDXers have proved that when Band I is open, television pictures from stations in Albania, Austria, Belgium, Czechoslovakia, Finland, France, Germany, Holland, Hungary, Iceland, Ireland, Italy, parts of the Middle East, Portugal, Romania, Russia, Scandinavia, Spain, Sweden, Switzerland and Yugoslavia can be received in the UK and the latter in the UK because of their low power.

Satellite TV

Having seen a picture from a Polish satellite station (Polsat) in my November column, Tomastow Grytny, kindly explains the origin. "It's a commercial Polish station, with films and news transmitted from Holland by Eutelsat" and added that this is the reason why you can sometimes read the word 'NETHERLANDS' at the bottom of the picture.

Rana Roy reports that as from August, India has 5 satellite channels that are telecast via INSAT 2A and are visible in July by Peter de Jong (Leiden, Holland) from ASTRA 1 C include an opening announcement, Fig. 6, a channel schedule, Fig. 7 and a German (WDR) programme, Fig. 8. In New Radnor, Simon Hamner has been watching "all those German channels, via Astra satellite, the same as we aim for during tropospheric openings". He continued, "that includes 5 regions from the third network, BR-3, MDR-3, NDR-3, WEST-3 and SWF-3. I can even listen to Jonathan Mark's excellent MDR-3 Radio Nederland in f.m. quality in the evenings". Simon pointed out that this is good because short wave reception can be rotten at that time during the winter.

Weather

"We have been having pleasant weather now. Temperatures are 27°C during the day and 11°C at night," wrote Rana Roy on November 18. A little snow, icy winds, high pressure, fog, hard frosts and short periods of heavy rain is the best way that I can sum up November's weather here in West Sussex. I recorded 77.5mm of rain during the month compared with 171.7mm in November 1992. Most of this years rain fell on the 10th (17.8mm), 13th (22.9mm), 14th (16.5mm) and 30th (16.5mm). By midnight on the 14th the pressure reached 1029mb (30.3in) (see Fig. 13), the rain had gone and a cold spell set in that did not abate until the 24th. Some overnight temperatures, measured in my garden, were down to 21°F and there was light snow on the 20th and 21st.

The daily variations in atmospheric pressure for the period October 25 to November 25, Fig. 13, were taken at noon and midnight from my own barograph.
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**Tropospheric**

Tropospheric disturbances often occur during periods of very high atmospheric pressure and make the higher v.h.f. and the u.h.f. bands DX prone when the "high" begins to move and the pressure starts to fall. This happened during the evening and overnight on November 16/17. The usual co-channel interference, in the form of the modal pattern, developed on the u.h.f. screens and some of the networks apologised to viewers about the poor quality of their pictures and explained that it was due to the atmosphere and beyond their control.

Such events can last anything from a few hours to several days. It all seems to depend upon the extent of the prevailing high pressure system, the strength of the incoming "low" that is pushing it and changes in temperature.

Reports from radio observers over the years have helped everyone to better understand what happens and it's not uncommon to learn that after seeing patterns on their domestic TV, v.h.f./u.h.f. enthusiasts make haste to their stations to see what DX is about on the nearest amateur band.

Connor Walsh (Co. Wexford) tells me that, "In this part of Ireland everybody watches HTV (Wales), BBC1 and 2 (Wales) and 4MC with a u.h.f. antenna on the roof and sometimes a booster". However, Connor has been keeping an eye on the changing pressure and on November 1st, with his family's domestic set and antenna, he received a noisy picture from the French Canal+ and a strong colour picture from Germany's ZDF.

Lower down, in Band III, on October 29, 31, November 1 and 2, Bob Brooks logged a test-card from Belgium (VRT) and Denmark (DR) and programmes from Denmark, France (Canal+), Germany (ARD1 & WDR1) and Ireland (RTE). Bob also received signals in this band from Belgium, France and Ireland again on the 17th and 18th.

On November 1, Simon Hamer, trawled Band III and logged pictures from Denmark (DR) on Chs. E5 and 8, Norway (NRK) on Chs. E9 and 11 and their TV2 on E12 and Sweden (SVT1) on Chs. E6 and 9. He also found Denmark's TV2 and Sweden's SVT2 in the u.h.f. band. As expected, Simon had a good haul on the 18th with programmes from Denmark, Finland (YLE1) on Ch. E6, Norway, Poland (TVP) on Ch. R8 and Sweden in Band III as well as Belgium, Denmark, France, Germany (ARD1, HR3, MDR3, N3, NDR3, SWF3 & ZDF), Holland, Ireland and Sweden's SVT1, SVT2 and TV4 in the u.h.f. bands.

**SSTV**

In November, John Scott (Glasgow) received slow scan television captions, in the 14MHz band around 14.230MHz, from stations in the Commonwealth of Independent States (CIS) Fig. 9, Germany Fig. 10, Spain Fig. 11 and Sweden Fig. 12. John has received QSL cards, acknowledging his reports, from stations in Ireland (Craigavon and Lisburn) in the north and Tipperary in the south and others from Kent and London. He tells me that the SM5EEP, Fig. 12, has a regular net, on 14.233MHz, around 1330 on Saturdays, when other SSTVers come up to work him. Thanks for this info John, it will greatly help newcomers to have a known signal to look for. To avoid disappointment, those of you who are new to slow-scan reception may like to try, listen around 14.230MHz for a strong 'twittering' then, while watching the monitor, slowly tune through the 'twittering' until the picture starts to 'run' and slowly build up. It's best to try this several times before you tackle a weak signal.

![Fig. 8: WDR programme.](image)

![Fig. 9: SSTV from CIS.](image)

![Fig. 10: SSTV from Germany.](image)

![Fig. 12: SSTV from Sweden.](image)
The Christian Science Monitor (Herald Broadcasting) has signed an agreement to sell WCSN, its short wave station in Maine, to Prophecy Countdown, a religious organisation headed by Seventh Day Adventist Pastor John Wesley Osborne, Jr. The actual transfer of ownership is not to occur until September, but WCSN is already airing as many as 30 hours of Prophecy Countdown programming per week.

Prophecy Countdown, based in Mt. Dora, Florida, will pay $5 million for WCSN. Herald Broadcasting expects to have planned major improvements in place at the WSHB station in South Carolina by the September take-over date. These improvements involve the addition of another 500kW transmitter and associated antennas and will enable WSHB to fill in the gaps in Herald Broadcasting's world coverage left by the loss of WCSN.

Radio Miami International Arrives

After years of effort, Radio Miami International has finally begun broadcasting. Initial test broadcasts were aired over a standby transmitter, using only about 400W watts. The regular 50 kW unit should be in operation by now. WRMJ is using 9.950Mhz. The first broadcasts consisted of periodic test tones and station announcements. Once the normal schedule is in place you should be able to find WRMJ active on 60 metre bands as well. Much of the programming will be in Spanish. Reception reports will be confirmed with an attractive card. The address is Radio Miami International, PO Box 526852, Miami, Florida 33152, USA. You can contact the station via e-mail at CompuServe - 71163, 1735. The Fax number is (305) 267-9253.

High Frequencies on The High Seas?

Word is still floating around about the coming operation of a "radio ship". The M/V Veterans is said to be the vessel. In the process of being outfitted in Boston harbour and then is to be positioned somewhere in the Caribbean next year. The ship is supposed to have four short wave transmitters which were once used by the VOA, two of them said to be 40 kW and two of 10kW. Air time on will be sold to various groups. Brother Stair, a preacher based in South Carolina, is reported to have bought all the available time on one of the transmitters so it will be devoted exclusively to his own preachings. Apparently a number of Caribbean island governments have turned down applications for a license for this station.

Silent Canadians

CFX, the short wave relay of CJCQ, Montreal went off the air last August and at the time, a spokesman made it sound as if it would be a very long time before the station returned to short wave. However, US DXers are now hearing it again, for its usual 6.005 frequency and with better signals than before. Other DXers on a recent 'DXpedition' to Washington state, say it appears that two other Canadian short wave stations are currently off the air. No signals were heard from CKFX on 6.060 or CKZU on 6.160. Had they been active they should have been heard easily in Washington state.

Notes from Central America and the Caribbean

Ondas Musical, Santo Domingo, is active from the Dominican Republic on 4.780 or slightly below, running to 0300 sign off. This is a return to short wave for this station, which was active on the 60 metre band years ago. Another reactivated station is Radio Barahona on 4.530, which now seems to have added 'International' to its name. The religious station Radio Amamecaer International on 6.025 will increase its power to 5kW. The station is broadcasting programming to Cuba, in addition to a two hour English program directed to the Caribbean each evening. The station is considering the addition of French language broadcasts as well. A month or two before the first signals from WRMJ were heard, its sister station, Radio Copan International, went on the air from Tegucigalpa, Honduras. It is operating with Spanish programming Mondays through Saturdays from 1400-1500 and 2100 to 2300 and on Sundays 2100-2200 on 15675. A 60 second spot announcement on Radio Copan International costs $5. Reports can be sent in care of Radio Miami International.

Radio Litoral, another new station from Honduras, is said to be active now on 4.830 although we've seen no listings on this one. Supposedly it is located at La Ceiba and identifies as 'Radio Litoral, la voz internacional de la Ceiba'. Anyone who spends as much time tuning the 60 metre bands knows what a poor frequency choice this is. 4.830 is normally occupied by a strong signal from Radio Tachira in Venezuela. Radio Reloj in Costa Rica is often active on 4.832.

Adventist World Radio's installation at Calcutta is reportedly to have been having some problems with its transmitters and are in the process of having the trouble fixed by the manufacturer. That will explain any absence you may note on one or more of AWR Cost Rica's frequencies.

In Mexico, Radio Education on 6.185 has added more English language programming and also plans to add programmes in French and German.

South America

Ecos del Oriente, Lago Agrio on 3.270 has been relocated and signs on at 1510 UTC. Radio Oriential is using 4.780, slightly variable, which will make logging and identifying this one, or the Mexican mentioned earlier, quite a bit confusing! The station operates from Tena, in Napo province and signs on just before 1000 UTC.

Still another reactivation is Radio Bahai on 4.950 which signs on just prior to 0900.

And yet another returning station is Radio Luz y Vida, 4.850, which signs on around 1030. This station has been around for many years and has disappeared and then returned several times over that period.

Radio Occidente has reappeared from Venezuela after being silent on shortwave for a multi-year period. It's been heard on 9.750 for much of the daylight hours in the Western Hemisphere. The identification is said to also mention 3.225, where the station used to operate, but that channel seems not to be in use.

Surinam is one of the less easily heard stations. It has been heard as you read this. KWHR is affiliated with AWR and German, South American countries. The station operates from Tena, in Napo province and signs on just before 1000 UTC.

Back on the Mainland

US short wave station WINB at Red Lion, Pennsylvania has cut its broadcast time to 7/4 hours per day while it makes changes to its antenna system. Pastor Peter Peters has purchased a 15% interest in WINB. WINB went on the air in 1982, so it predates by two decades the flood of private US short wave broadcasters which began in the early 1980s.

WEVN in Alabama, which has been on the air for a year or so now, has decided to continue use of one of its four high power transmitters. The station will keep the fourth unit as a standby.

The Voice of America station at Dixon, California has now been completely closed down.

Other Notes

KNLS, Anchor Point, Alaska now airs programming in English and Japanese between 1300 and 1400 on 7.395. It is also being relayed by a transmitter at Novosibirsk, Russia (ex Cluj, Romania) in Chinese between 1300 and 1500 on 6560. Unfortunately, this DXer friendly station says it cannot QSL reports for its Russian relay.

That's all for this time. We'll have more news from the Americas and the Pacific in three month's time. Good listening!
SSB Utility Listening

Graham Tanner,
42 David Close, Harlington, Middlesex UB3 5EA

I thought that I would take this opportunity to state the
objectives of this section of SWM, for the benefit of new
readers, and as a reminder to existing readers. This part of
the magazine is devoted to the numerous segments
allocated to radio amateurs, there are still vast areas available to all
sorts of 'utility' signals. Many of these utility signals use complex
equipment (e.g. FAX, AMTOR, RTTY, etc.) to code and decode
transmissions, so you, the reader, will also need equipment to decode
them, the benefit of s.s.b. voice transmissions is that you already
have the best and most sensitive
ear units, and don't want a visit! Sometimes, I
had quite a few letters on this subject, including a long letter from Mrs B in the Isle of Man. She explains that the Britannia set-up is
so that they can monitor their
flights and crews when they want,
without having to rely on
telephone-patches via the BT
Portishead Radio. It also allows for
longer conversations to discuss
problems and flight changes.

More Britannia

A few months back, I mentioned the h.f. station operated by
Britannia Airways at Luton. I have
Mrs B says that Britannia Airways has just taken delivery of
six brand-new Boeing 767ERS (ER - Extended Range), which will be
replacing some of their Boeing 737s; she doesn't know their
Selcalls yet, so if anyone hears of
these being passed 'on air', I'll be pleased to pass them on via this
column.

Exercise

Geoff Crowley writes with another
interesting letter from Iceland. I
dread to think what the
propagation must be like up there.
He mentions an exercise taking
place in early November in which a
station was talking with 'Architect'.

Mrs B says that he wasn't aware that the RAF assigned code-
letters to their h.f. frequencies. Well, Geoff, there
appears to be two group; one set
comprises just single letters (such as 'Lima' above), and another
series has two letters such as 'Hotel Mike'.

Logs received over the past few
months sometimes list an
occasional tie-up, but I'm not too
sure about printing them in this
column for two reasons - maybe
the frequency/letter(s) tie-ups change, and I value my freedom
and don't want a visit! Sometimes,
the end of the 'Architect' hourly
weather broadcast, they read a
series of letters - maybe there is a
connection between the two?

Geoff's log of the exercise
traffic was mainly anonymous 'tri-
gram' callsigns (combinations of
letters and numbers) talking to a
station 'Buckam'; this is actually
'Buchan', which is one of the RAF's
circuits. Many of these circuits
are still vast areas available to all
operators. There are a number of paired
'calling frequencies', where the
shore station transmits a two-tone
bleep every 5 seconds to indicate
that the particular circuit is active
and it is available for use (the
tones disappear when a contact is
being set-up). One tip (from Ron
Galliers) is to listen to the 'ship
frequencies, so that you don't have
to put up with the annoying tones.
Clive says that he has heard both
7.025MHz and 4.420MHz active
recently, but when I checked
there during last summer I was told
that everything had been moved
away. I have since heard that it
now operates from a site
somewhere to the south-west of
Oxford.

More Coastal Control

Clive M writes from Cornwall, and
mentions 'Coastal Control', and
asks why haven't I mentioned it any
more since July 1992. Well, Clive,
partly through lack of information,
and partly because I would like to
be sure about what I print.

What is known is that the
"Coastal Control" set-up is used by the
Royal Navy and Merchant Navy. There are a number of paired
'calling frequencies', where the
shore station transmits a two-tone
bleep every 5 seconds to indicate
that the particular circuit is active
and it is available for use (the
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Oxford.
If you look at the countries checklist on page 50 of the 1994 RSGB Call Book, or if you have a recent copy of Geoff Watts’ Prefix-Country-Zone List you will see against a given country not only the amateur bands but also the ITU allocation. Consider the USA, for instance, we see AAA-ALZ, WAA-WZZ, NAA-NZZ, KAA-KAZ as the ITU allocation. We may say then, that ‘special’ starting with one or two letters in these groups is US in origin. APA-ASZ, by contrast, is from Pakistan, so if you picked up a call sign of the form AS22Z, for example, you could assume that (if he is genuine) he is in Pakistan. When thus a new call is heard, if he can’t be pulled out of the ‘normal’ country reference then a reference to the ITU listings will usually resolve the question.

Properly, there are no exceptions to this rule, however unfortunately, with the calling number having number 1 have been used; 1S Spraty was one such, 1A the Sovereign Military Order of Malta, 1B Blenheim Reed, 1G Greyfax Reed, 1M Bourns, and 1Z the Karen State. This position only arises in a place having no licence authority, so in fact it edges up to the outer edge of piracy, though maybe with the best of intent.

Tonged with the whole question of call signs and I say to Harry, and anyone else in the same boat, do get hold of Geoff Watts, Lists (62 Baltimore Road, Norwich) and keep it by you.

Mark Malone in Great Harwood turns to slightly different, sticking to 14 & 21MHz. Stripping out the Europeans and the nearer CIS stuff, we find on 14MHz EA1TQ, W3NA, VUI2DK, OD5GJ, W2JYM, 3M8R, RVW9X, W2WV, JGU4U, N1DUG, W1NIK, W5DJ, 6W8KB/3AYP & 9H4M. For 21MHz we see VD1DGP, AK1L, AASC3, VU2DX, NSKTE, AU2EZ, 9SKJC, N1DCM, N4MM & W2BXA.

Next we turn to Mark Borthwick who lives in Hawick on the Scots Border and runs a Sangean ATS-803A into some 9m of wire, in an end-fed arrangement. On 7MHz we see a crop of GB stations & EA8UK, on 14MHz s.s.b. there are lists of W1-2-3-6-7-9 & 0, along with H5W5DA, 4X2DK, 4X6DK & TL8NG. 28MHz yielded a W, probably via the RS1 ‘bird’ but otherwise Europeans. The very long 35TCJ list shows the 41K7X0 group to have been the most productive, with N Africa, Europe of course, Asia, Africa & Australasia all well represented. 14MHz was also fun, available from hubs as K2CKD, K2JED, CQ7NS, K2Y5V, K2B2H, and no RFI was received from CUI1AC, E6A8D & CUE3EM.

When Mark gave 16MHz a whirl, he logged W1-2-3-4-5-6-7, AJ9BE, AI1AD, SJ15C, F1JBD, Y0G6, 7X2B, VE1KEP, CH1X in Nova Scotia, JL1WPO, JA2HDF, JA2GZC, JAT6R & ZB2AZ. Turning to 21MHz, again lots of W1-2-3-4-5-6-7-8 and 0, FM5KWE, FM5LSE, CS9HG, KG24P, VPSN, VK5/K2TD, T05M (Mortique Is), YJ5IN, HZ1AF, 9K2CT, 7XLS, 7X2WEK, 7X2HM, C51AJ, VUI2B, YVS1N, V8DHN, 9S1D, 9S1UP, 9S1DKS, 9S1EL, PY1R, OD5GJ, VE3KVT, 4J2AT & 4Z5D. On a different tack, Mark wonders whether it is worth recording in this column the times when particular stations are heard. I see no objection, but I suspect the Editor won’t allow that sort of extra space! Mark himself seems to listen mainly during the day, rather than early morning or night-owling.

Harry Richards was a mite 

*(The full text continues from page 56 of the original document.)*

**OSL Etiquette**

Now we come to a different question: paying to receive OSL cards. A few questions arise for the simple and old-fashioned. I will send cards to and receive them from the Bureau. If someone sends me an IRC or a dollar bill, it goes back with the card. Anybody who demands payment for his OSL card, and, worse, anyone who refuses to answer Bureau cards, is acting against the interests of amateur radio.

Odd, I have a copy of *Practical Wireless* for January 1937 in front of me, containing a reader’s letter complaining of the money-for-my QSL cards practice! Fifty-five years ago, the then BSVL was ‘prepared to black-list the tin god amateurs’ - it’s not a new problem then, is it?

Putting it bluntly, new entrants to the hobby are needed at all the time. Charging for cards, and refusing to use the Bureau system, puts off the newcomer, licensee or listener; and, perhaps worse, it debars poorer amateurs and pensioners from full participation in their hobby of maybe a lifetime.

The answer is simple; get every Bureau to stamp up cards going through them. Then let the DXCC Desk at Newington, add a new condition for recognition: that when the cards come in for verification, at least a specified proportion must bear one or another Bureau stamp. If this test is failed, the operation be declared invalid for DXCC credit.

To go on a DXpedition it only be one of two things for the operators: either a test of oneself, or an ego trip. Either way it is only right the cost should fall on the expeditor.

**Final**

That’s the lot for now! As usual, the deadline is for arrival by the beginning of the month and the address Box 4, Newtown SY16 1ZZ. Now go to outside into a $9-plus gale to check my antenna farm!
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Short Wave Magazine, February 1994
Once February arrives, at last there will be noticeably longer daylight in the evenings. Before long, better flying weather will be with us and many pilots start to practise their routines in preparation for the forthcoming display season. There's no prize, but I'll report here the first sighting of a calendar and information on abbreviations and context.

Aeronautical Experiences

Thanks to an anonymous reader from Shropshire who sent various examples of aviation art (probably from a calendar) and information on pleasure flights operated by Air Atlantique DC-3 to view the tall ships taking part in the Cutty Sark display season. There's no prize, but I'll report here the first sighting of a calendar and information on abbreviations and context.

Aeronautical Experiences

John is aware of night-time overflights. Yes, major airports do accept flights at night and there is always a team on watch. Freighter flights are allowed subject to noise restrictions and there is always the odd emergency or irregularity (e.g. landing en-route for fuel). The upper airways intersecting over London (and outer areas of London) preferentially use southbound, UG4 (bidirectionally east/west), UG27 (preferentially from south-west to north-east) and UG48 (bidirectionally south-west/north-east). If you're interested, these are shown on the usual charts. A list of chart suppliers appears on Airband magazine.

Frequency and Operational News

Once again, I summarise the latest changes to the GASP [11163] from the CAA. Deenethorpe has a change of frequency, 127.575 replacing 120.275MHz even though the latter has only recently been established. Castle Donington is well enough known since wartime. The old callsign finally disappears, but its replacement, 'East Midlands', is more in keeping with the modern context in which the airport operates. At Southend, radar services on 125.05 and 129.55MHz have ceased.

Aeronautical Experiences

Some n.d.b.s have also been withdrawn and they are Clacton (CLN, 429kHz), Ottringham (OTR, 398.5kHz) and Strumble (STU, 400kHz). Other beacons at these locations continue in service. Now for the Stornoway story. North of the airfield, on the 18 approach, was a locator (SWY, 669.5kHz). This has been withdrawn and a new beacon established on the airfield (SAT) with the same frequency. Don't get confused - check the Morse identification carefully before commencing an approach. National Air Traffic Services (joint CAA and military air traffic control) are constantly striving to increase capacity on busy routes. At peak times, the London Upper Sector provides separate control for south-east England overflights. This sector has been split and is worked on 134.75 (west) and 127.425MHz (east). A new upper airway has been established, UG71 from Honley to Biggin. For full details see AIC 164/1993.

Meanwhile in Scotland, improved traffic flow will be possible by repositioning some of the Edinburgh, Glasgow and Prestwick holds. Some SIDs are changed so that fast jets and slower propeller aircraft take separate routes and Prestwick's PTH and GOW SIDs have been withdrawn. Northbound arrivals and overflights approach Scotland along airways to the east side of the country and southbound flights will remain to the west, an anti-clockwise traffic pattern is thus established. For full details see AIC 165/1993.

Follow-Ups and Foul-Ups

No prizes even if you spotted that the photo captions had been switched round in December. Ernest Marrows (Grimsby) was quickest off the mark in reporting this error, for which apologies. In December, I entered the debate about allowing twin-engined airliners to fly long over-water sectors: extended-range twin-engine operations (ETOPS). The regulatory authorities don't share my personal concern that the reduced margin for error isn't worth the risk. Another question: what's to be gained? The lower purchase and ownership costs of two (rather than more) engines must be balanced against the extra fuel consumed in following routes that are not too far from a landing, the modifications (and extra weight) that must be added to a twin to bring it up to ETOPS standard, the need for special maintenance procedures with a stricter Minimum Equipment List (allowable faults on despatch), specialised crew training, and the requirement to demonstrate all of this to the airworthiness authority.

It surprised regular traveller Andy Cadier (Folkestone) to be confronted with Britannia B.767-204ER G-BYAB [25139] when departing for San Juan (I assume this to be TJJSJ on Puerto Rico). Andy asks how the maximum permitted passenger load is derived. What about evacuation in an emergency? Various factors operate here. The load must not be so great that the runway's take-off distance available is insufficient. Then there is a maximum weight beyond which the lift and thrust of the aircraft are inadequate to allow control in the air. The regulated take-off weight calculation sees to this at the flight planning stage. Another physical restraint on the number of passengers is that the seats must not be too close together. Seat pitch is adjustable in 1in increments as the seats themselves clip onto slotted tracks in the floor. Evacuation must be demonstrated by filling the aircraft with people and then throwing them all out down the escape slides within a stipulated time. For this test, certain emergency exit doors are deemed to be inaccessible and hence remain closed. The flight crew complete the emergency drills and then usually vacate the cockpit's direct vision windows, lowering themselves down an escape rope. It worries me that many of these trials are done with fat, healthy, young volunteers wearing sensible shoes and in the absence of simulated smoke.

There is something you can do as a passenger. Note the positions of the exits (not just the nearest one) and how to operate them.

CONTINUED ON PAGE 61
With the start of a New Year, I thought that it would be a good idea to take a look at what radio related developments may take place over the next decade.

During the last year, the government has been engaged in a major review of the way a large part of the radio spectrum is currently being utilised, with the aim of determining the best way to manage its use during the next decade, for how to harmonise allocations throughout Europe. Previous reviews have already examined the microwave spectrum but this time the emphasis has been on the frequency range 28-470MHz, which is of particular interest to scanner owners. The final report of the spectrum review seminar that was held at Lords cricket ground during the summer.

Military Users

The largest users of the spectrum under review are Government services, particularly the MOD. With the end of the Cold War it could be argued that the next decade for access to large portions of the radio spectrum have diminished, but this would not seem to be the case.

The MOD currently performs most of its battlefield training exercises in Europe, but with the withdrawal of many forces back to the UK it is likely that there will actually be a requirement for large scale exercises within existing training areas. This will bring with it the need for a large number of single frequency radio nets operating mainly in the 30-47MHz band.

In order to reduce the amount of spectrum required for such nets, NATO is considering the use of 12.5kHz channel spacing, although it would be a considerable time before this could be implemented.

However the main chunk of spectrum as far as the military are concerned is the huge block at 225-400MHz. This is currently administered by NATO and is used for a large range of single channel air-to-air, air-to-ground, ship-to-ship, ship-to-coast and shore-to-shore communications as well as links via the Skynet and NATO 4 series of military communication satellites and Ptarmigan Tactical radio relay networks. The current thinking is that the top and bottom ends of this large band will be released to civil users sometime during the next decade.

Other MOD uses of the spectrum 400-450MHz include the new PavePaws Ballistic Missile Early Warning system at Fylingdales in North Yorkshire. This can be heard 'chattering' in the background of most u.h.f. p.m.r. transmissions throughout the North-east of England, though it is not likely to be operating at its full capability during peacetime. Intriguingly the MOD also claim to be operating large p.m.r.-like systems and a wide-area mobile telephone network but little detailed information is available on the subject.

Two other defence networks are mentioned: one is 'MOULD', a national defence communications system, which is now reaching the end of its design lifespan. Quite what will replace it is at this stage unknown, but it could have other implications for part of the system shares spectrum in the 430MHz amateur band. The other system is the Government Emergency Communications Network, this comprises of a microwave backbone network with local access via links at v.h.f. and u.h.f. An existing low band v.h.f. network that was intended for 'last ditch' communications has now been discontinued and the equipment passed on for use by local government.

Emergency Services

The emergency services were also discussed at some length, the main topics being the integration of all the different communications systems into one nationwide network and the interference problems that many police forces experience during the summer months due to enhanced propagation conditions. This is made worse by current frequency planning that has all the main UK base station transmit and receive frequency bands reversed with respect to the rest of Europe.

This would be very difficult to change overnight, so the current thinking is to try and move existing users such as police personal radio systems to a new allocation in the frequency range 380-400MHz. It is intended to eventually make this allocation a new Europe-wide digital trunked p.m.r. allocation for a system called 'TETRA' that would be primarily used by the all the emergency services. But don't get too excited as all of these networks are just proposals at this stage, however they do give an insight into where or what these are used for?

Private Mobile Radio

PMR services are mentioned as having an increased allocation in the v.h.f. lowband with mobiles transmitting in the range 68-70MHz paired with base transmitters operating between 81.5-83.5MHz. In the long term most p.m.r. services are expected to operate as trunked networks with the eventual transition to digital systems such as the proposed European 'TETRA' standard.

DBS

Other topics worth mentioning include the possible allocation in 1995 of the band 216-225MHz as a temporary 'parking' band for Terrestrial Digital Audio Broadcasting - experimental transmissions are already being conducted in this band from the BBC site at Crystal Palace in London.

Band III

Looking at further uses for the old TV Band allocation, a small band between 198.7-198.8MHz has been set aside for radio and TV talkback channels, 199.5-200.5MHz is to be used for cordless PABX (telephone) systems and 183.5-184.5MHz has been designated for low power devices that may include short-range remote gas, electricity and water meter reading equipment that are currently under development.

If you would like to read more about the subjects I have mentioned you can obtain the Radio Spectrum Review Committee Stage 3: 28-470MHz Report of seminar proceedings 8th July 1993 by ringing the DTI Radio Communications Division Library on 071-215 2072 and asking for a copy.

Antenna Design

Antennas seem to regularly feature in the letters I receive. Charles Vasili has noticed that most v.h.f. and u.h.f. antennas are constructed from aluminium, and he wonders if there would be any advantage in using a better conductor such as copper in order to improve the gain. Well, the answer is yes - but it only makes a few tenths of a dB in difference, which is such a small value as to be practically immeasurable.

The main reason for using aluminium is to reduce the cost and weight, electricity boards use it for overhead power lines for exactly the same reason. In actual fact, the resistance of a material used for antenna construction varies throughout the radio frequency spectrum. This is because of an effect known as skin resistance. At very low frequencies, the resistance of a conductor is directly proportional to its conductivity, cross sectional area and length. As the frequency is increased a progressively larger proportion of the current flows only in the surface layer of the material. The thickness of this layer is...
proportional to the square root of the material resistivity. So in actual fact the thickness of the layer will be greater in materials of higher resistivity which tends to counteract to a certain extent any improvement that could be gained from using a more conductive material. One way of achieving the best use of materials is to coat or plate a relatively poor conductor with a thin layer of much higher conductivity metal such as gold or silver. This is particularly useful when physical constraints such as size or weight have to be taken into consideration, or when metal to metal joints have to be made, as is the case with connectors. Pure gold or silver connectors are too soft to be of practical use, as they would wear rapidly. By using a harder material such as brass or copper for the main part of the connector, and plated the actual contact surfaces, a much more durable design can be produced.

One of the other factors to be considered when constructing antennas is the need to avoid the use of dissimilar types of metals in conjunction with each other. A good example of this would be the use of brass nuts and bolts to connect to aluminium elements. This can cause electrolytic corrosion to take place, especially if the metals are likely to be used in wet conditions or if there is a large amount of atmospheric pollution present. The two metals act rather like the plates of a wet cell battery, with the conductors slowly corroding away whilst producing a small direct current. The resultant joint can act as a non-linear junction causing all sorts of additional side effects including the production of harmonics and intermodulation products which may in turn interfere with other radio services, especially if they are likely to be conducted by transistors. In fact a slightly modified and more sensitive version of the electronic security barrier equipment is sold for use as a bug detector, as it can locate any electronic circuit even if it is switched off and concealed within another object such as a wall or desk.

**Security Tags**

The production of spurious signals can also have practical uses. Have you ever wondered how the electronic security tags used in high street stores work?

Well one method is to make use of the non-linear junction effect. The security tag usually consists of two overlapping short metal strips of foil with a layer of a different material sandwiched between the strips, which are cut to form a half wave dipole at the frequency of operation. When the tag is passed through a security barrier it is subjected to a strong r.f. field consisting of two signals transmitted at similar frequencies to each other. This causes the non-linear junction formed by the different metals to produce intermodulation products which are re-radiated by the simple foil dipole antenna. These signals can then be detected by a suitable receiver built into the security barrier. This can sometimes be foiled by other electronic equipment which also contain non-linear circuit elements such as diodes or transistors. In fact a slightly modified and more sensitive version of the electronic security barrier equipment is sold for use as a bug detector, as it can locate any electronic circuit even if it is switched off and concealed within another object such as a wall or desk.

**AOR 2001/2 Mods**

Finally just a quick mention on this subject, for some reason several readers have been simultaneously written to ask if I know of any modifications for the AOR 2001/2 series of receivers. The only ones I can recollect were published some years ago in the March 1985 and May 1987 issues of *Practical Wireless* and subsequently reproduced in Peter Rouse’s book *Scanners 2* along with some additional information. The July 1991 *SWM* 'Scanning' column also contained a scan resume circuit that I find to be most useful.

In response to the most frequently asked questions, no, I don’t believe it is possible to increase the number of memory channels beyond the original 20 as they are retained in memory that is an integral part of the microprocessor controller chip.

The memory back-up capacitor in the AR2002 will only retain information for a few hours, rather than days as stated in the handbook. Rechargeable NiCad batteries would seem to be the best option if you can fit some in. It is not possible to significantly increase the search and scan speeds by changing capacitors on the control board as the squelch and p.i.l. circuits cannot respond fast enough to operate correctly. Although the scanner appears to run much faster it will not stop when a signal is detected. The best you can hope for is double the speed providing you don’t make large frequency changes during memory scans.

It just remains for me to thank you for your letters, calls and faxes during the past year and wish you all the best for 1994. Until next month - Good Listening.

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**Abbreviations**

AIC Aeronautical Information Circular
B B reconnaissance
BEA British European Airways
CAA Civil Aviation Authority
DC Douglas Commercial
FL Flight level
GASIL General Aviation Safety Information Leaflet
Hz kilohertz
MHz Megahertz
MoD Ministry of Defence
n.d.b. non-directional beacon
SID Standard Instrument Departure person

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The next three deadlines (for topical information) are February 11, March 11 and April 15. Replies always appear in this column and it is regretted that no direct correspondence is possible. All letters to ‘Airband,’ c/o The Godfrey Manning Aircraft Museum, Edgware, Middlesex HA8 9SG (please don’t send duplicate information/engquiries: 081-958 5113 before 2130 local please).
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A new year, perhaps with new opportunities. This month's column includes details of a free offer of PC software of interest to WXSAT enthusiasts.

January METEOR launch

Just before press date for last month's Info I received news of the impending launch (on November 26) of METEOR 3-6 so was able to include it. On November 29 I heard METEOR transmissions on 137.30MHz that did not correspond to the times expected for METEOR 3-3 (that has also been using that frequency) so I presumed it was 3-6. I then noticed that the image corresponded to the path of METEOR 3-5, that we have not heard from since November 1992. Checking following passes showed that it was METEOR 3-5 and not a new satellite.

Meanwhile, the TASS news agency announced a delay in the launch of the new METEOR. Their correspondent, Semen Ivanov, reported that the satellite was due to be launched from Plesetsk in northern Russia, carrying scientific equipment provided by German and northern Russian institutes, carrying scientific equipment to be launched from Plesetsk on November 29.

A later FANAS bulletin confirmed the operation of METEOR 3-5.

NOAA Orbital Changes

Those who listen to WXSAT transmissions, but do not decode the pictures can still identify which satellites are operating. The effect of subtle orbital changes, however, might not be noticed. Those monitoring images may have noticed the improvement in lighting conditions that is affecting NOAA-9 morning passes. Conversely, NOAA-10 and NOAA-11 are slowly descending. The changes are caused by the slow regression of the nodes of the orbits of each satellite.

Satellite A9 passes southbound each day at about 0834 local time (0834UTC in Britain) during morning daylight. Because of the slow rotation of its orbital plane, this WXSAT is not a truly sun-synchronous. Measurements of its orbit - our old friend Kepler elements - reveal this change to be a little over 1° per day. This translates to over three hours later per month, so NOAA-9 is passing over when the sun is a little higher than previously - hence the improvement in lighting for the morning passes.

NOAA-10 passes southbound at about 0620 local time (0620UTC in Britain) and its orbital change - a nodal regression rate of nearly 1° per day - makes it earlier. NOAA-10 is therefore moving towards darker mornings, and will eventually descend in darkness. Conversely its afternoon passes will improve as they encounter the sun at higher elevations.

NOAA-11 was originally a mid-afternoon WXSAT, providing well-illuminated images. Its orbit has drifted such that it is now crossing northbound (daylight ascending) at 1620 local time (1620UTC in Britain). It will continue to drift by about four and a half minutes later per month, corresponding to a nodal regression rate of over 1° per day.

The orbit of NOAA-12 is relatively stable, crossing southbound at 0728 local time (0728UTC in Britain). Its orbit is slowly moving such that it crosses just 44 seconds earlier each month. Were NOAA-13 to be operational we would see it crossing northbound at about 1345UTC in Britain, and moving slowly forwards by almost a minute per month.

Learning about Orbits - Free Software

The newcomer to satellite monitoring faces a bewildering collection of new technology and terminology. The most common query that I receive involves requests for explanations of Kepler elements, so some months ago I ran a series on this subject that seems to have been helpful to those new to WXSAT monitoring.

During the last few months I have been collecting software of both the shareware and public domain type, on topics relating to satellite orbits and utility programs. One was written by Major Tom Riggso of the US Air Force's Academy's Astronautics Department, and illustrates Kepler elements by simulating the resulting orbit. It is excellent.

The program comes in compressed (Zipped) format, in two parts. One teaches the fundamentals, with illustrations to demonstrate the meaning of individual Kepler parameters. It allows you to fill in your own figures and then see the resultant orbit. I tried it on the CIS METEOR WXSATs and the simulation showed how the orbits precess over a period of weeks. Using low inclinations one could see how satellites having a low inclination do not normally rise above UK latitudes, unless they have a large orbital radius (and correspondingly long orbital period) such as the geostationary satellites. Increasing orbital period towards the geostationary value (about 24 hours) demonstrates pictorially how these satellites appear to remain stationary in the sky.

When the simulation program is run, the screen provides three displays. The first shows the globe of the earth within the orbit of the satellite, and the relative position of the satellite in that orbit. A text field is adjacent, showing the selected Kepler parameters, together with some derived figures showing the satellite's current position. The lower half of the screen displays a map of the earth, with the sub-satellite point superimposed, leaving a null. For dead zone purposes time is speeded up, so within a few minutes you can see the manner in which successive satellite passes cross at different longitudes.

This program includes everything about orbits that one needs to know, and I will be happy to provide a copy on receipt of a self-addressed, stamped envelope containing a standard PC formatted disk, of either size. Please include two extra First Class stamps towards copying, etc.

METEOSAT-6 operations

The successful launch of METEOSAT-6 was announced in a press release from Paris. An Ariane V61 boosted it into orbit at 0117UTC on 20 November 1993. The spacecraft was placed in a planned geostationary transfer orbit (GTO), and ESA's European Space Operations Centre (ESOC) established radio contact with the satellite soon after injection into GTO.

The initial configuration and checkout operations were successful, and control of the satellite was taken over by ESOC's Operations Centre, ESOC, in Darmstadt, Germany, immediately after its separation from the launcher, 28 minutes after launch. A global network of four ground stations operated from ESOC's main Mission Control Centre, had been set up. During the first hours in orbit, ESOC performed configuration and check-out of the main electrical systems, while METEOSAT-6 was still in the elliptical, geostationary transfer orbit. Some 37 hours after launch, the apogee boost motor was used to circularise the orbit.

The spacecraft's longitude was then about 18° west and the satellite was taken over by ESA's operation centres, with ESOC performing configuration and check-out of the main electrical systems, while METEOSAT-6 was still in the elliptical, geostationary transfer orbit. Some 37 hours after launch, the apogee boost motor was used to circularise the orbit.
ownership of the satellite can be transferred to EUMETSAT as from early February 1994.

First Image

An important event in the commissioning phase is the transmission of the first image from METEOSAT-6, which was scheduled for the end of November. The infrared detectors on board have to be cooled down first. The first infrared images are transmitted two days later, but many more images are generated and their quality assessed before the satellite is declared operational.

EUMETSAT plans to make METEOSAT-6 the operational satellite, replacing METEOSAT-4, that will become the in-orbit, back-up satellite. METEOSAT-5, that has served as back-up so far, will then be moved westward over the Americas. There it will take over from METEOSAT-3, that has been on loan to the US Weather Service, NOAA, since 1991, until NASA's next-generation geostationary satellites are launched and become operational. After five years of service, METEOSAT-3 has little propellant left for orbital manoeuvres, and needs to be replaced within a couple of months.

During the next season, METEOSAT-5 is expected to play an important role in the detection and real-time tracking of these dangerous events.

METEOSAT-6 and METEOSAT-7, (scheduled to be launched at the end of 1995), will ensure continuity of vital weather data until the turn of the century. As from the end of 1995, EUMETSAT will take over operations of all METEOSAT satellites from ESA.

My thanks to Gordon Bridge of EUMETSAT, together with other ESA sources, for providing details for inclusion here.

Letters

Regular readers of Info will recall Ray Howgego of Caterham, who has written to update me on his projects. Ray designed his own Lindenblad antenna, which received considerable interest from readers - I passed on several enquiries to him. He comments that some commercial crossed-dipoles appear to be scaled-down versions of 14MHz antennas and, he suspects, may have their phasing harnesses wrongly fitted. Hobbyists often discover the WXSATs while monitoring amateur radio satellites such as UoSAT-2 (and several others). These require the use of a left-circularly polarised antenna for reception. The result of using such an antenna for the WXSATs (that use right-circular polarisation) would be to experience deep signal fades; it is worth remembering this possibility - particularly if weak signals are received from high elevation NOAA passes.

He also built an i.f. strip for his IC-R7000 receiver, and an eight-pole crystal filter to minimise pager interference. He uses a loop-Yagi for METEOSAT reception, and a Dartcom down-converter to change the 1831MHz carrier to the more conventional 137.50MHz signal. Ray comments that this is probably the cheapest way into METEOSAT reception.

Brian Dudman sent me a picture of his 1.6m dish, camouflaged in his picturesque Harrow garden - see Fig. 1. He also included a realistically coloured Primary Data visible light image of north and south America - see Fig. 2 - imaged by METEOSAT-3 and re-transmitted by METEOSAT-4.

Bev Marks of Battle (East Sussex) obtained a NOAA-9 image showing sun-glint near Italy during summer. In order to obtain a good quality print he contacted Chris Kaley who is on the committee of the Remote Imaging Group. The IR-PHOTOSTAT format image was enhanced with Photostylar software (running under Windows 3.1) and converted to PCX format for printing out on a Laserjet printer - see Fig. 3.

Quentin Hordle provided Fig. 4, dated August 10, a large format picture showing Greenland, and down across the Atlantic to Spain - see Fig. 4. He also built an if. strip for his WXSAT receiver and interfaces to a PC. The cost of the circuit is minimal, though test equipment is required for setting up purposes. Tom sent me a disk containing some sample pictures that were impressive, particularly considering the cost of the decoder. There may be a separate description of Tom's project.

Screen Photography

One or two correspondents have asked for advice on taking photographs of screen images. A few pointers to successful photography can be given from experience! The camera must not operate the flashgun - though unfortunately some automatics cannot be disabled. Any flash, or other light shining into the screen will cause unwanted reflections.

In order to avoid image distortion, set the camera along an axis perpendicular to the screen. For best results, do screen photography during the evening when you can darken the surrounding area to obtain the best contrast.

Focusing is straightforward with the "single-lens reflex" type of camera, but should be checked carefully when the image is suitably positioned. I use a 135mm telephoto lens, focused while set to f/1.8. Closing down the aperture to about f/4 for actual picture taking ensures that the image will be sharp.

Exposure time should be something over one second of a second to minimise the effect of screen refresh, though if you have the luxury of a non-interlaced monitor, such problems will not occur. I use colour film rated at 100 or 200ASA. Taking a few experimental pictures and noting the different settings should quickly provide optimum results.

Please!

Please note that I can only respond to brief requests accompanied by a stamped s.a.e. During the last few weeks I have received a few letters asking for either tape recordings of the WXSATs, or for volumes of information, sometimes without even the courtesy of a stamp.

Abbreviations

a.p.t. automatic picture transmission
AVHRR Advanced Very High Resolution Radiometer
BBS Bulletin Board Service
DOS Disc Operating System
EMS Expanded (or extended) memory System
ESA European Space Agency
EUMETSAT European Organisation for the Exploitation of Meteorological Satellites
GOES Geostationary Operational Environmental Satellite
GOMS Geostationary Operational Meteorological Satellite
h.r.p.t. high resolution picture transmission
NASA National Aeronautics and Space Administration
PDUS Primary Data User Station
SVGA Super VGA

Fortunately this is a small minority. I remain unemployed...

Kepler Elements

I will send a print-out of the latest letters on requests for a stamped s.a.e. and extra First Class stamp. All known weather satellites plus MR can be included, together with their transmission frequencies if operating. This data originates from NASA.

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAA 10, 12 on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEOR 3-4 or 3-5 on 137.33MHz.

Fig. 4: NOAA image of the Atlantic: Quentin Hordle

Fig. 3: NOAA-9 image showing summer sun-glint: Bev Marks.

Short Wave Magazine, February 1994
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Short Wave Magazine, February 1994
Maghreb Arabe Press (MAP) Schedule

Dave Woods has this month sent me the latest schedule for this well established h.f. press station. As many readers have shown an interest in foreign language transmissions, I’ve included the full schedule of all transmissions.

**Arabic**

- **Directed to Africa and the Middle East**
  - 0800-1030 & 1530-1700UTC on 18.491MHz (CNM86/X11)
- **French**
  - **To Africa**
    - 1000-1130UTC on 18.265MHz (CNM78/8) & 18.2209MHz (CNM76/X9)
    - 1530-1700UTC on 18.2209MHz (CNM76/X9), 18.265MHz (CNM78) & 15.6545MHz (CNM95/1X)
  - **To Europe**
    - 1000-1130UTC on 15.6545MHz (CNM65/1X), 7.8424MHz (CNM20/1X), 14.76MHz (CNM16) & 19.1711MHz (CNM86/X11)
    - 1530-1700UTC on 7.9424MHz (CNM20/1X), 10.6341MHz (CNM37/9X) & 19.1711MHz (CNM85/X11)
- **English**
  - **To Middle East and Africa**
    - 1200-1400UTC on 18.491MHz, 18.265MHz (CNM78) & 18.2209MHz (CNM76/X9)
  - **To Europe**
    - 1200-1400UTC on 15.6545MHz (CNM65/1X), 7.8424MHz (CNM20/1X), 14.76MHz (CNM16) & 19.1711MHz (CNM85/X11)
- **Spanish**
  - **To Brazil**
    - 1800-2100UTC on 13.873.9MHz (CNM58/X9)
  - **To Puerto Rico**
    - 1900-2100UTC on 13.383MHz (CNM47/X9)
  - **To Bogota**
    - 1900-2100UTC on 13.4575MHz (CNM49)

All these transmissions use 50 baud RTTY with a 400Hz shift, so should be easily receivable subject to the prevailing propagation. If you want to QSL with this station, the latest address according to the Klingenfuss Guide to Utility Stations is: Maghreb Arabe Presse, Le Chef d’Exploitation, Rue Ibn Aicha, BP1049, RABAT Morocco.

**Korean Central News Agency (KCNA) Schedule**

This station transmits a wide range of press information to most parts of the globe. Jan Nieuwenhuis has sent me a copy of the winter schedule as transmitted in November ’93. One interesting feature for FAX enthusiasts is that they have also sent photos at the following times and frequencies:

- 0303-0100UTC & 2330-0000UTC on 13.58MHz (HMF38) & 11.475MHz (HMF52)
- For 50 baud, 400Hz shift RTTY transmissions, the following schedule applies:
  - **English**
    - 0400-0600UTC on 14.568MHz (HMF32) & 14.58MHz (HMF46)
    - 1000-1100UTC on 10.58MHz (HMF46) & 15.152MHz (HMF86)
    - 1500-1730UTC on 10.58MHz (HMF46) & 8.02MHz (HMF86)
  - **To Europe**
    - 0400-0630UTC on 15.633MHz (HMF26) & 11.475MHz (HMF55)
    - 1000-1200UTC on 15.633MHz (HMF26) & 11.43MHz (HMF55)
    - 1500-1730UTC on 13.78MHz (HMF35) & 9.395MHz (HMF84)
  - **To America**
    - 0800-1030UTC on 14.452MHz (HMF55) & 11.536MHz (HMF49)
    - 1800-2100UTC on 11.475MHz (HMF52) & 8.02MHz (HMF85)
  - **French**
    - **To Asia**
      - 1145-1430UTC on 10.524MHz (HMF45) & 8.152MHz (HMF86)
    - **To Europe**
      - 2130-0000UTC on 11.43MHz (HMF45) & 9.395MHz (HMF84)
    - **To Africa**
      - 1145-1430UTC on 14.452MHz (HMF57) & 11.536MHz (HMF49)
      - 1800-2100UTC on 11.536MHz (HMF49) & 8.02MHz (HMF85)
  - **Russian**
    - **To Europe**
      - 0600-0830UTC on 15.633MHz (HMF26) & 11.78MHz (HMF59)
      - 1200-1430UTC on 15.633MHz (HMF26) & 11.43MHz (HMF55)
    - The latest QSL address for this station is: KCNA Pyongyang, Ministry of Communications, Department of International Relations, Korean Central Wireless Station, Oesong-Dong, Central District, PYONGYANG, N. KOREA.

Dr J. Sine from Falkirk is just starting out in utility decoding having developed an interest through reading Short Wave Magazine. He currently uses a Lowe HF-225 receiver and has access to a 80486 based computer. Having looked at the wide range of decoding systems, he’s inclined to go for the Lowe Modemaster and wonders if this will do the job. A look at the review in the November issue should confirm that the package is well and truly fit for the purpose. I have also had the opportunity to use the package over an extended period and still find the FAX reception extremely good. In my case, the link between the program and the HF-150 receiver is particularly useful.

Just to prove the wide distribution of Short Wave Magazine I’ve just received a letter from Steve Rawdon of the Wellington Airport Met Service. He saw the chart I printed in the November issue and has sent me a copy of a companion chart. He was interested and the column, he also sent me a complete transmission schedule but that will have to wait another month as there’s more than enough material for this column.

**NAVTEX Round-up**

As a number of readers have asked for more information about this mode, I think it’s about time I gave it another airing. NAVTEX is an acronym for NAVigational TEXt and provides a wide range of navigational information for those at sea. The system forms part of the Global Maritime Distress and Safety System and receivers are mandatory on all passenger ships and cargo ships over 300 tons. In practice, you will find that many smaller boats take advantage of the information as well.

One of the important aspects of NAVTEX is that it operates on just one frequency, 518kHz, but involves local ship-to-shore stations all over the world. The avoidance of radio ‘collisions’ is achieved in two ways:

- the limited range of 518kHz transmissions and
- each station is allocated specific timeslots in which to send their information.
Press RTTY

This month Day Watson has sent me a comprehensive press RTTY listing that he put together during November. As I know many of you have a particular interest in press transmissions, I have taken the opportunity to replace the normal frequency list with a press special. Because all the stations listed have been recently heard in the UK you are almost guaranteed success providing you listen at around the specified times.

The single letter in the Identifier column is used to indicate that the area covered by that station and can be used at the receiving end to select which stations you want to receive, but more of this later. To show you how the collision avoidance system works, let’s look at Harnosand Radio that transmits on the hour every four hours. A look through the international timing charts shows that the only other stations using those time slots are: Miami, Antofagasta (Chile), San Francisco and Vladivostock. You can see from this that there is little likelihood of interference between these stations.

The transmission mode used for NAVTEX is standard Forward Error Correction (FEC) that goes under the name of OMEGA. This system carries the information required to transmit urgent warnings and collision avoidance information directly relevant to its area.

NAVTEX is standard Forward Error Correction (FEC) that goes under the name of OMEGA. This system carries the information required to transmit urgent warnings and collision avoidance information directly relevant to its area.

Now let’s take a closer look at how a typical message is transmitted. The example shown here is a direct copy of a real message.

The first line of this message carries the information required to clearly identify the source. ZZCC is a standard code to indicate the start of a message. Of the next characters, ‘S’ identifies the station as Niten Radio, ‘A’ shows that the message is a navigational warning and the number 35 is just a message serial number.

In addition to these standard message formats the transmission follows a standard prefix that includes a minimum ten second period of idles at the start of the transmission with a further five seconds between messages. These periods of idles are required as many FEC decoders can only synchronize while the station is sending idles. More information about this mode can be found in the Klengfuss Radioteletype Code Manual available from the SWM Book service. Full details of the station identities and timeslots is in the Admiralty List of Radio Signals Vol 2 or the Klengfuss Guide to Utility Stations.

Regular Offers

I am currently offering a number of services to readers to help with your listening as follows. For a copy of Day Watson’s Beginners Frequency list or my own Decode list just send three first or second class stamps and an address label to the address at the head of the column.

For those of you with access to an IBM compatible computer, I can also offer the latest version (6.01 of the popular JV-FAX program. All you need to do is send me a blank, formatted 3.5in disk, three first class stamps and an address label.

The following table shows how these timeslots are shared out for stations covering the North Sea area.

<table>
<thead>
<tr>
<th>Station</th>
<th>Identifier</th>
<th>Transmission Times (UTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttercoats Radio</td>
<td>G</td>
<td>0048, 0448, 0848, 1248, 1648 &amp; 2048</td>
</tr>
<tr>
<td>Harnosand Radio</td>
<td>H</td>
<td>0000, 0400, 0800, 1200, 1600 &amp; 2000</td>
</tr>
<tr>
<td>Coast Guard Texel</td>
<td>P</td>
<td>0348, 0748, 1148, 1548, 1948 &amp; 2348</td>
</tr>
<tr>
<td>Oostende Radio</td>
<td>T</td>
<td>0248, 0648, 1048, 1448, 1848 &amp; 2248</td>
</tr>
<tr>
<td>Rogaland Radio</td>
<td>L</td>
<td>0148, 0548, 0948, 1348 &amp; 1748</td>
</tr>
<tr>
<td>Stockholm Radio</td>
<td>J</td>
<td>0300, 0730, 1130, 1530, 1930 &amp; 2330</td>
</tr>
<tr>
<td>Tallinn Radio</td>
<td>U</td>
<td>0200, 0600, 1000, 1400, 1800 &amp; 2200</td>
</tr>
<tr>
<td>Vardoe Radio</td>
<td>V</td>
<td>0300, 0700, 1100, 1500, 1900 &amp; 2300</td>
</tr>
<tr>
<td>Wellington FAX Chart from Steve Rawdon.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The great benefit of having these well defined areas and message formats is that the receiver can be set to receive only those messages that are important for the craft concerned. There is also the facility for urgent warnings to be transmitted outside the normal schedule. Let’s now take a look at how a typical message is transmitted. The example shown here is a direct copy of a real message.

ZZCC SAA5
WZ 1708
IRELAND, WEST COAST.
APPROACHES TO GALWAY BAY.
FINNIS ROCK BUDY
52-03N 09-25W UTLN.

The single letter in the Identifier column is used to indicate that the area covered by that station and can be used at the receiving end to select which stations you want to receive, but more of this later. To show you how the collision avoidance system works, let’s look at Harnosand Radio that transmits on the hour every four hours. A look through the international timing charts shows that the only other stations using those time slots are: Miami, Antofagasta (Chile), San Francisco and Vladivostock. You can see from this that there is little likelihood of interference between these stations.

The transmission mode used for NAVTEX is standard Forward Error Correction (FEC) that goes under the name of OMEGA. This system carries the information required to transmit urgent warnings and collision avoidance information directly relevant to its area. This area being that indicated by the single letter identifier. I mentioned earlier. In addition to grouping the information into geographic areas there are a range of different message types available. These are currently divided into ten different types using letters of the alphabet as follows:

A = Navigational warning
B = Meteorological warning
C = Ice report
D = Search and rescue
E = Meteorological forecast
F = Pilot message
G = DECFA message
H = LORAN-C message
I = OMEGA message
J = Differential OMEGA message

The following table shows the states that are shared for stations covering the North Sea area.

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### Medium Wave Chart

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<td>526</td>
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<td>Radio Ver Sacre</td>
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**Note:** Numbers marked with an asterisk (*) were logged during darkness. All other entries were logged during daylight or under 200 lumen. Only BBE articles of 20 kHz or less are included.
New contributors to this column are always welcome. Please be sure to state your name, address and post code on all correspondence. Your full address will always be treated here as confidential only an approaching item can be quoted in the text.

When compiling a report please state the frequency first, then station name followed by time of receipt in UTC (+GMT). If possible, indicate present language used, target area and duration of the broadcast. Group the entries so that all M.W. local radio is together, all 1.7MHz etc. together, etc.

Long Wave Reports

While listening at midnight on November 14th, Roy Merrill (Dunstable) heard Kazakh Radio sign on with their National Anthem at 0001UTC on 243kHz. Their 500kW signal from Alma Ata was under a broadcast in Danish. To be sure of listeners in Africa. How well their signals are received there is a whisper sometimes in the evenings, but that is all.

Some of R. Australia’s 17MHz (16m) signals have also reached the UK early in the morning. Their transmission to S Asia via Carnarvon 17.750 (Eng 0700-0900) 23532 at 0815 by Brian Dailey in Bushby Health.

In the afternoon, R. Moscow Int. 21.450 (Eng WS 0700-1300) was 55444 at 1208 by Ronald Kilgore in Co. Londonderry; RAI Rome 21.030 (Eng 2200-0300) 44433 at 1306 by Peter Pollard in Rugby, R. Portugal via Sines 21.515 (Eng to M-East) 1530-1600 44443 at 1542 by Rhoderick Illman in Oxed; HCBJ Dusto 21.455 (u.s.b. + p.c.) 35033 at 1530 by Harry Richards in Barton-on-Humber; WYPR via Dikechobe, 21.515 (Eng to Africa 1600-1700) 25332 at 1645 by Darren Beasley in Bridgewater; also R. Berlin (Eng) Ger 1800-1900 1700-1800 45555 at 1705 by John O’Toole in Stratford; R. Nederland via Bonaire 21.590 (Eng to W Africa 1730-2030) 45222 at 1745 in Hafnarfjordur.

Long Wave Reports

The conditions for M.W. transatlantic DXing proved to be good on several nights in November. Whilst checking the band at 0730 on November 3rd, John Parry (Northwich) was amazed to find WBBR in New York on 1130 still coming in during daylight! Exceptional conditions were observed on November 27th by Paul Logan in Lisnaskea, Co. Fermanagh. That night the strongest signal came from Lisbon. See chart. By far the strongest signal came from CTBC in St John on 530, it rated 44444 at 0356.

The sky waves from some stations in N Africa and the Middle East were also heard after dark by listeners in the UK, see chart. Those in the 21MHz (16m) band were Algeria (300/kW) on 540 and Oulja, Morocco (100/kW) on 594 reached Iceland, some 450km (280miles) away! They were rated 42442 at 2101 and 2332 by Peter Pollard in Rugby, respectively by Geoff Cowley in Hafnarfjordur.

A new LR station in High Wycombe on 1170 was logged by John Wells in E Grinstead. It is called ’1170 AM’, Tel: 0494 44611 for more details. Following the closure of the M.W. outlet of BBC Greater London Radio (GLR), 145kHZ has been taken over by Sunrise Radio for a 24hr Asian service. Reception reports on their 50kW transmission should be sent to Sunrise Radio, Sunrise House, Sunrise Road, Southall, Middlesex. Tel: 081-574 6666.

Short Wave Reports

A change in h.f. propagation occurred towards the end of November, which resulted in the 13m, 16m and 19m bands coming close quite early in the even. Even the 25m band became inescapable as listeners at numerous other stations revised their published schedules and moved to frequencies in the 31m band, which then became congested. Nevertheless, the higher frequency bands were open during daylight and good reception from some areas was evident.

Although we are now well down the slope of the sunspot cycle, the 21MHz (15m) band is still being used by some to reach listeners in Africa. How well their signals are received there is unknown to me, but several listeners in the UK logged them via backscatter and other modes. They come from Norway Int. 25.730 (Norw 1300-1328) 25312 at 1307 by Eddie McKeown in Newry; R. Denmark via RNI 26.120 (Eng 1300-1330) 13333 at 1330 by Robert Connolly in Kilgore; R. Nederland via Flevo 25.970 (Du 1300-1125, Sum only) 310242 at 1100 by Kenneth Buck in Edinburg.

In the 21MHz (13m) band have the enabled signals from a number of different areas to reach our shores. Those from R. Australia were heard on 21.525 from Darwin (Eng to S Asia 0900-1000) 22222 at 0816 by Gerry Haynes in Bushby Health; 21.505 from Carnarvon (Eng to S Asia 0100-0900) 32344 at 0832 by Martin Price in Shrewsbury; 21.725 from Darwin (Eng to S Asia 0900-1100) 45544 at 0910 by Ross Lockley in Stirling.

Among those from other areas in the morning were R. Japan via Moyabi, 21.575 (Eng to M East 0700-0900) 34533 at 0702 by Chris Shorten in Astley; R. Iran via Iran 21.320 (Eng 0800-0845) SI0444 at 0828 by Bill Clark in Rotherham & (Eng to U 1100-1120) 44444 at 1100 in Morden; UAE, Abu Dhabi 21.630 (Ar to Far East) (7/800-1100) SI0191 by Philip Rambaut in Macclesfield; SRI via Lottong: 21.820 (II, Eng, Fr to Aust, S Pacific 0830-1030) 24342 at 0930 by Michael Griffin in Ross-on-wye; BBC Asia R. Pakistan 21.710 (Eng to Asia 0900-1000) 23332 at 0930 in Kilkee, UAE R. Dubai 21.605 (Eng to U 1030-1050) SI0455 at 1030 in Edinburgh; HCBJ, Ecuador 21.455 (u.s.b. + p.c.) 35033 at 1145 by Vera Bridley in Woodhall Spa.
Note: Entities marked * were logged during darkness. All other entries were logged during daylight or at dusk.

Eng to Africa 1000-1025) 43333 at 1000 in Morden; Monitor R. Int via KBH 17.595 (Eng to Asia 0900-1030) S10333 at 1007 in Rotherham; R. Pakistan, Islamabad 17.600 (Eng to Euro, 1100-1120) 44444 at 1110 by George Tebbitts in Penmaenmawr; H.C. B. Quito 17.890 (Eng to U.S. or p.c. 1030-1230) 54444 at 1125 in Kilkeel.

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US "G" Chain 17.890 (Eng to USA 1130-1600) was SI0322 at 1214 in Middlesfield & 17.790 (Eng to 1900-2000) 43344 at 1905 by John Eaton in Woking; Voice of America 17.525 (Eng to C Africa 1300-1305) 44444 at 1318 by Martin Dale in Stockport; Africa No.1, Geben 17.630 (Fr, Eng to W Africa 0700-0740) 43433 at 1324 by Ron Damp in E Worthing; RTM Tanger, Morocco 17.595 (Fr to M East, Africa 1400-1700) 44333 at 1700 in Woodhall Spa; WEVWN Birmingham, 17.510 (Eng to 1600-1700) 22222 at 1630 in Rugby; VoA via Morocco 17.790 (Eng to Africa 1630-1730) 54444 at 1630 in Barton-on-Humber; R. Nederland via Bonden 17.805 (Eng to W Africa 1930-2025) 55555 at 2013 in Hafnarjofudir and 34322 at 2017.

Over night reception of R. Australia's 15MHz (19m) broadcasts has been reported by listeners in the UK. J. 55555 to S Asia (Eng to 1100-1300) was 55533 at 1100 in Bushey Heath; 15.170 to N Asia via Carnarvon (Eng, Cint, Cant 0900-1000) 43444 at 1100 in Sunderland. Many other signals have reached the UK in the morning including R. Yugoslavia, Kent 0900-1000) 43444 at 0940 in Newcastle.

While beaming to other areas, signals from the "G" chain were 44444 at 1700 in Penmaenmawr; WYFQ Okechobee 15.956 (Eng to Euro 2000-2200) 34322 at 2029 in Oxet, BBC via Ascension Is 15.400 (Eng to 1900-2305) 35333 at 2030 in Barton-on-Humber. Potent signals from R. Australia have been reaching the UK in the 13MHz (22m) band. Their signals on 13.605 from Darwin (Eng, Cint to Asia 0900-1040) peaked 54444 at 1005 in Woodhall Spa; Shrewsbury; R. China 13.560 via Mail 13.550 to E Africa 1000-1630) 34322 at 1630 in Barton-on-Humber; R. Nederland via Bonden 17.805 (Eng to W Africa 1930-2025) 55555 at 2013 in Hafnarjofudir and 34322 at 2017.

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South Bend 15.780 (Eng 1700-2000) 44444 at 1700 in New York; R. Kuwait via Kaab 13.620 (Eng 1800-2100) heard by David Nettleton in Bradford; R. Prague, Czech Rep 13.550 (Eng to USA 2000-2300) 44333 at 2045 in Hafnarjofudir. Some of the 11MHz (25m) signals to Europe come from H.C. Buito 17.895 (Eng 0800-0830), heard at 0700 in Bradford; BBC via Ramapesh 11.680 (Eng 0930-0933) 44344 at 0928 in Sunderland; R. Romania, Bucharest 11.940 (Eng 1300-1400) 55555 at 1315 in E Worthing; Polish R, Warsaw 11.815 (Eng 1300-1335), noted as far as 1340 in Woking; ERT Thessaloniki, Greece 11.595 (Gr 1000-2245) SI0454 at 1525 in Edinburgh; Israel R, Jerusalem 11.545 (Eng to 2000-2300) 34333 at 2045 in Woodhall Spa; R. Japan via Miyabi, 11.325 (Eng 2100-2155) 34444 at 2100 in Penmaenmawr; A. China via Radio 11.390 (Eng, H. 1745-2230) 22222 at 2110 in Rugby; RCI via Sackville 11.945 (Eng 2130- 7) 24222 at 2149 in Oxet, VOF via Okechobee 13.710 (Eng to 2000-2200) 54433 at 2222 at 2200 in Morden. While beaming to other areas H.C. Buito 11.925 (Eng to N Pacific areas 1300-1730) SI0433 at 1105 in Rotherham & (Eng to USA 1300-1600) 44333 at 1148 in Goedbrood; FBE, Philippines 11.590 (Gr 0900-1100) 33333 at 0953 in York; Voice of the Mediterranean, Malta 11.525 (Eng, Ar to N Africa 1400-
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For a comprehensive list, including DXvar and DXvar comments, please refer to the main text.
With some notable exceptions, personal computers have not made major inroads into ATV operation. Sure, some people use Amigas for generating on-screen graphics and captions and in North America, where the NTSC standard reigns, the addition of a Video Toaster board turns an Amiga into a highly effective video special effects generator.

That’s North America though and there are no plans for a PAL version of the Toaster. There is an add-on for IBM PCs and their clones that does the same for these computers but it’s a lot more expensive than the Video Toaster and has not caught on in amateur circles, which is a shame.

Computers in SSTV

Where the PC does have a role to play is in slow scan television (SSTV) and a new product called Pasokon TV deserves careful attention. The name sounds Japanese (a lot of products there are called Passo-something, it’s the way it’s pronounced), but the origins of the name are not so obvious. What is clear is the specifications, so here is a description of Pasokon, but first a word of explanation.

For many years operating SSTV meant either building a dedicated receive converter, transmit converter and, for colour, multiple memory units, or buying a ready-built commercial unit. Neither of these methods has been particularly cheap, in fact, commercial units have generally been of the order of between somewhat dear and very expensive.

Another problem with these hardware-based SSTV systems is that they are mode orientated. That is, hardware-based SSTV converters will operate in only one mode at a time, and to change mode - and this is only possible on a few systems - then the firmware has to be exchanged. Not a satisfactory method of operating slow-scan, especially in these days of multiple modes and operating systems. Invariably, ownership of one of these hardware based converter systems means that you are limited to the reception and transmission of only one, or at best, a limited number, of modes.

Many protagonists (and detractors!) of SSTV have argued that the mode suffers badly from this variety of ‘standards’ and the time has come for a rationalisation of the multifarious modes, transmission times, etc. Failing that, what operators want is a system that allows them to receive and transmit in a variety of modes and at the flick of a switch, and at an affordable price. Also, this slow scan system must be updated easily, so new modes should be added to the repertoire, thus giving the operator the ability to keep pace with the ‘art’.

The Pasokon TV

Well, this Utopian dream of a multi-mode SSTV transmit and receive converter has been realised. With the advent of the affordable PC (as low as £25 at the last Cranfield Rally!), the simple addition of a card converter system means that you can select any of multiple modes and operating speeds and the variety of a whole range of SSTV modes, even those who purchased the initial version were not so lucky and explains all you need to know in layman’s terms. That is, you should buy a fair computer, probably with an electronics whizz-kid to get the system installed and operational.

Pasokon is able to send and receive all popular modes: Roberts, Martin, Scottie, AVT and Wraase, producing full colour images during reception. It features automatic receive mode selection and automatic fine-tuning for signals up to 100Hz off frequency. The program reads and writes popular image file formats and offers simple image manipulation and easy operation overall. It works with any 286 or later CPU and at least 640K RAM and VGA display. Operating SSTV with Pasokon is simplicity itself. On receive, with the program loaded, you just tune the receiver into a slow-scan signal, switch over to Pasokon, hit the ENTER key and it does the rest. Select the correct mode and speed and the incoming image is displayed in full colour real-time during reception. Transmitting a picture is just as easy. The only compliant with the system at all is that, unlike conventional hardware based converters, you cannot feed a camera or video signal direct into Pasokon to snatch an image for transmission. Instead a separate image capture system is needed, although a software link is provided in Pasokon for direct access to the VIP 640C Frame Grabber that John Langner recommends.

To sum up, Pasokon TV provides a relatively inexpensive means of becoming fully operational on SSTV on all modes, even if it means purchasing a PC as well. If you already have a PC in the shack then the system is highly cost-effective when compared to conventional slow scan converters. It is simple to use and the quality of the received pictures is said to be as good as any other system used. The only failing of the system is the inability to snatch live pictures direct.

Otherwise the quality of the pictures resolved and the colour content is of very high quality by all accounts. Pasokon TV costs £189 plus £6 P&P (£12.00 Overseas). A receive-only version, called Snooper, consisting of a very small interface card will plug directly into a spare serial port on the PC, program disk and user manual, costs £85 plus £2.50 P&P. Pasokon and Snooper are available exclusively from Wartime Publications, 5 Ware Orchard, Barby, Rugby (CV23 8UF). Tel: (0788) 890365; FAX: (0788) 891883.

Finally, a note to other suppliers: I will be happy to feature your ATV products as well, just send them along!
When a signal is received and off when there is no signal present - result no signal present - result

Connects to and works with any receiver which has an 'ear' socket and squelch control. Simply plug the AUTO-VOX into the 'ear' socket of the receiver, then plug the output leads from the AUTO-VOX into the microphone and remote sockets of a tape recorder. The AUTO-VOX will then automatically switch the tape recorder on when a signal is received and off when there is no signal present - result: a tape full of all the action!

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