SPRING IS HERE!
The BayGen Freeplay
clockwork radio

Plus
Whatever Happened to the
RF Gain Control?
Solar Radio Astronomy
GPS Explained
A new world class communications receiver for the discerning listener.

Now with:-
- Improved ergonomics
- Expanded computer control
- Alpha numeric display
- Event timers and clock

More memory
Tone control
Improved AGC
Improved FM

SPECIFICATIONS
- Frequency range: 100 - 30,000 kHz
- Modes: AM, LSB, USB, CW, RTTY & FM
- Filters: 12 kHz, 500 Hz, 6 kHz, 4 kHz, 2.3 kHz & 1.8 kHz all fitted as standard.

PRICE £1295

YUPITERU MVT 7200
New limited edition model now with:-
- Built-in Ferrite rod short wave antenna
- Improved SSB filters
- Selectable Narrow/Wide AM modes
- Flexible high gain VHF/UHF antenna

SPECIFICATIONS
- 530 kHz - 1650 MHz
- All mode coverage: Wide AM, Narrow AM, FM, Wide FM, LSB, USB & CW
- 1000 memories
- Search & Priority scan
- Battery Saver circuit
- Supplied complete with NiCads and AC charger

PRICE £449

Available from Nevada dealers throughout the UK.

Use your credit card for same day despatch:

Retail & Mail Order Enquires (01705) 662145
Trade & Export Enquires (01705) 698113
Fax (01705) 690626
TRIDENT TR980
Powerful compact wide band receiver
A compact, pocket sized handheld offering continuous frequency coverage that's simple to programme and has a triple conversion sensitive receiver.

SPECIFICATIONS
• 5 - 1300 MHz
• Receives AM, FM & WFM
• 125 memories
• Priority channel monitoring
• Direct keypad entry
• Five independent search steps 5, 10, 12.5, 25, 30 kHz
• Delay/Hold function
• For Optional Nicads and AC charger add £20

New low price
Price £199

TRIDENT TR2400
Top of the range model with:-
Ultra wide frequency coverage & all mode reception including SSB. Easy to use direct keyboard control.

SPECIFICATIONS
• 100 kHz - 2060 MHz
• All mode reception SSB, CW, AM, NFM & WFM
• 1000 memories including 10 search banks
• Priority channel monitoring
• Rotary or keypad frequency control
• User programmable step sizes 1 kHz - 999 kHz
• Fast scan speed 20 channel per second
• Supplied complete with NiCads and AC charger

New low price
Price £299

NEVADA COMMUNICATIONS
189 London Road, North End, Portsmouth, PO2 9AE
The SCOUT™ Has Taken Tuning Your Receiver To a New Dimension

Featuring Automatic Tuning of your AR8000 and AR2700 with the Optoelectronics Exclusive, Reaction Tune (Pat. Pend). Any frequency captured by the Scout will instantly tune the receiver. Imagine the possibilities! End the frustration of seeing two-way communications without being able to pick up the frequency on your portable scanner. Attach the Scout and AR8000/2700 to your belt and capture up to 400 frequencies and 255 hits per frequency. Or mount the Scout and AR8000/2700 in your car and cruise your way into the future of scanning. A simple interface cable will connect you to a whole new dimension of scanning.

The Scout’s unique Memory Tune (Pat. Pend.) feature allows you to capture frequencies, log into memory and tune your AR8000/2700 at a later time. A distinctive double beep will inform you when the Scout has captured a new frequency, while a single beep indicates a frequency that has already been recorded. For discreet monitoring, a pager style vibrator will inform you of any hits the Scout captures.

The Scout will also Reaction Tune and Memory Tune ICOM CI-V receivers: (R7000, R7100, and R9000) and Pro 2005-6 equipped with OS535 (which gives them the needed CI-V port to interface the Scout). Download the Scout frequencies to a PC with the Scout Utility Disk and CX-12AR (optional) for reference and building your frequency database.

Act Now!! Let the Scout Reaction Tune you into The World of Scanning

Features
- Automatically tunes these receivers with Reaction Tune (Pat. Pend.), CI-V receivers (ICOM's R7000, R7100, and R9000), (Pro 2005/2006 equipped with OS535, Pro 2035 equipped with OS535) or AOR models (AR2700 and AR8000).
- Records and saves 400 unique frequencies
- Records 255 hits on each frequency in memory
- Digital Filter and AutoCapture (Pat. Pend.)
- 10MHz-1.4GHz single frequency range
- View frequencies in RECALL mode
- 10 digit LCD with EL Backlight
- 16 Segment RF signal strength bargraph
- CX-12AR Computer Interface for Scout & AOR (optional)
- PC Utility Disk for downloading memory to PC included
- Rapid charge NiCads with 10 hour discharge time
- 32 VHF/UHF mini-antenna shown with Scout (optional)
- Distinctive Beeper/Vibrator indicate frequency hits

At right: Scout shown with CLIPMATE™. A handy windshield mount for Scout, for quick access and visibility.
Cover Subject
The BayGen Freeplay Clockwork Radio is intended for the African continent. Perhaps it has a lesson for us all in energy conservation!

DISCLAIMER. Short Wave Magazine wishes in no way to either condone, or encourage, listeners to monitor frequencies and services which are prohibited by law. We respectfully refer you all to both the Wireless Telegraphy Act 1949, and the Interception of Communications Act 1985. 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 will 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.

BayGen Freeplay Clockwork Radio
Dick Ganderton G8VFH

A Day in the Life of a Radio Inspector
J. Edward Brown

Unfulfilled Ambition
J. Worthington GW3COI

Momentum Synop Decoder
Mike Richards G4WNc

Whatever Happened to the RF Gain Control?
John Wilson

Solar Radio Astronomy
Ron Ham

Radio Astronomy for the Amateur
Arthur Gee G2UK

Forecasting The Next Sunspot
D A Whitaker BRS25429

The Man Who Picked Up the Galaxy
Robert Newman

Unfortunately we have had to hold over the article on GPS mentioned on the cover of this issue.

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**SWM SERVICES**

**Subscriptions**
Subscriptions are available at £25 per annum in UK addresses, £30 in Europe and £30 overseas. Subscription copies are dispatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both Short Wave Magazine and Practical Wireless are available at £420 (UK) / €47 (Europe) and £61 (rest of world).

**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, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 0121 - 384 2473.

**Photocopies and Back Issues**
We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review, or whatever that you missed first time around, we can help. If we don’t have the whole issue we can always supply a photocopy of the article. Back issues are £2.60 each, photocopies are also £2.60 per article, plus £1.00 for subsequent parts of serial articles.

Binders, each taking one volume are available for £9.50 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, Arowsthorne Court, Station Approach, Broadstone, Dorset BH18 8PW, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London clearing bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Broadstone (01202) 659950. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (01202) 659950.

**Technical Help**
We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. If you require help with problems relating to topics covered by SWM, please write to the Editorial Office, we will do our best to help and reply by mail.

---

**EDITORIAL**

The secret is now out! A new column makes its first appearance in this issue. Jerry Glenwright will be writing a regular quarterly column titled 'Help Needed'.

The recent arguments conducted in the Letters column of this magazine have indicated to me that there is a need for a quarterly page devoted to problems related to short wave listening.

So you think that you haven’t got a computer in your shack? What about that scanner? What about the RTTY decoder? They all use dedicated computer technology to enable them to work. A computer was more than likely used to help design your radio, which was then probably assembled by a computer driven ‘robot’. Even your favourite magazine is put together using computers.

However, don’t worry that computing will be taking over the magazine. The new column is only one page every third issue and I have no plans to increase that allocation. Short Wave Magazine will remain the magazine for the listening - or watching - enthusiast for as long as I am Editor.

Dick Ganderton G8VFH

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**LETTERS**

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

---

**Secret Lists**

Dear Sir

Re: The use of scanners and the frequencies one may or may not listen to. Various sources are offering lists of ‘secret’, ‘classified’ or ‘prohibited’ frequencies. They cannot be ‘secret’, etc. any longer if they are available for a payment!

If they are supposed to be ‘prohibited’, etc. they obviously, by definition, are not. Why aren’t the purveyors of such lists prosecuted?

Anyway, I think I could claim to legally listen to all and sundry transmissions. I was a Merchant Navy Radio Officer and after I passed the exam but before I was issued with my ‘ticket’, I had to sign a form to the effect that I would ‘preserve the secrecy of correspondence’.

---

**Help Needed**

Dear Sir

I’m a subscriber of Short Wave Magazine and radio collector. I would like to have your help to find a copy (or photocopy) of the Owner’s Service Manual for the National Panasonic RF-8000. My set does not work and I would like to repair it.

I will pay the cost of replies.

Sabino Fina

Avellino

Italy

---

Dear Sir

Some months ago I wrote a letter to you, which was published (thank you!) in the May ’95 edition. Unfortunately, I had to move almost at the same time, so I had no feedback, (different phone no. as well). I am now living near Tokyo (not in Tokyo) and my phone number has changed. I can be contacted on Tel/FAX: +81-429-39-9942.

I’m French and am a keen short wave listener. Unfortunately, there are only a few non-Japanese s.w.l.s in Japan. I would like any other English, French or German speaking s.w.l.s in Japan to contact me on my new telephone/FAX number.

F. Collin

Japan

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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.
Sony Receiver Coverage
Dear Sir
For any of your readers who own a Sony ICF-2001D and who would like to scan the entire receiver coverage or to scan from a particular frequency or from a memorised h.f. frequency, may I suggest that they try the following:
Enter h.f. frequency in A1 (say 150.0kHz)
Enter Air frequency in A2 (say 110MHz)
Hold down shift key and press define key (150.0kHz appears in display)
Press scan (scan starts from 150.0kHz)
Press scan to stop and enter a frequency say 110.0kHz and press execute
Press scan (scan starts from 110.0kHz)
Press scan to stop and press any memory button containing h.f. frequency
Press scan (scanning from the memorised frequency)

If f.m. and airband scan are not required, then press scan to stop and return to h.f. scan, hold down the shift and press define (150.0kHz appears in display). Similarly, if broadcast band has been used, hold down the shift and press define to return to h.f. scan.
F.S. The above procedure is not mentioned in the Receiver Handbook. It is the result of my trying to find a way to scan the entire Receiver coverage.

Len Woolley
Bude
Cornwall

Trawling LM&S
Dear Sir
I have just bought my January 1996 issue of SWM and had to put digits to keyboard to respond to Mr. Preston's letter. I am one of those dull souls who 'trawl' through LM&S, in fact this was the main reason I first bought SWM a few years ago, after a twenty year break from the hobby. I wanted to see what was going on...
I am mainly a broadcast band s.w.e. and sometimes a DXer and normally go straight for LM&S when I pick up SWM, but I also read some, or all of the many other areas covered by the magazine. Maybe one day I will become involved with RTTY or FAX, or something. I hope that Mr. Preston might understand that it is not beyond most people to consider developing their interest from an initial attraction to one area of electronic communications, into the many exciting other possibilities. If they do wish to do this, then I think that SWM is a good 'way in'.
On another matter, has any readers had any problems with the Sony SW100? I have just paid a repair bill for £80 - the radio only cost £189 - for new key pads that I was interested to understand why they wish to examine/repair if necessary, my three radios, all of which are working satisfactorily. One is a Philips D2999, another an Indesit R15 plus a Pye 1R720.
Surely it's the batteries leaking, not the radios! If any SWM readers know the answer......
G. Fry
Freshwater
Isle of Wight

Remote Meter Reading
Dear Sir
I know we all take very seriously the problem of our radios injecting an r.f. signal onto domestic mains electricity. I've seen in numerous SWM and PWs hints for reducing this by wrapping mains cables around ferrite rods or looping the cable around ferrite rings. Those lucky enough to own delicate hi-fi systems even claim that dirty mains affects their listening enjoyment. I'm concerned about possible effects entering our equipment the other way.
As the Electricity Industry approaches its major restructuring in 1999, companies are racing to find innovative ways to read electricity meters, without using staff to read them. Since I could, in theory, be buying my electricity from Marwell when I lived in Romford, Marwell will need to have my meter reading in order to bill me correctly. I cannot conceive of a chap jumping into a van in Runcombe to visit me! Some form of remote reading therefore seems likely.
There have been proposals to use low power radio devices and even to send a signal down the mains, modulated onto the 50Hz to an intelligent, individually addressable meter. I realise that the 'interrogating signal must be at a much lower frequency than 50Hz, but I don't know enough electronics to work out whether I should be worried or not. Can anyone shed some light on this topic for me please?
Dave Taskis
Romford

Internet
Dear Sir
I read with interest the letter from Ben Ramsden (Letters, SWM November) who disagrees with me regarding the inclusion of computer articles in SWM. He then goes on to suggest that an article on the Internet would be appropriate.
No doubt your readers will correct me if I am wrong, but I always thought that the Internet is nothing more than a computer connected to a telephone line, and if this is so, then what on earth has this to do with short wave listening and more to the point, isn't even radio.
If Mr Ramsden wants to know more about the Internet, may I suggest that he buys a magazine which explains this, and not make suggestions that have no relevance to Short Wave Magazine's remit.
Harold McIntyre G3FLJ
Southampton
Hampshire

Leaking Batteries
Dear Sir
Having returned leaking batteries on three occasions to a well-known manufacturer, I would be more interested to understand why they wish to examine/repair if necessary, my three radios, all of which are working satisfactorily. One is a Philips D2999, another an Indesit R15 plus a Pye TR720.
Surely it's the batteries leaking, not the radios! If any SWM readers know the answer......
G. Fry
Freshwater
Isle of Wight

Reviews
Dear Sir
What a refreshing article by John Wilson. It's nice to see that an author can still see the good as well as the bad in a product and make a comparison between different manufacturers.
The main reason I started buying SWM was to get some impartial advice on what equipment to buy - unfortunately all of your recent reviews simply stated what a joy each unit was to use and how the author didn't want to give it back, followed by the specification from the handbook. Personally I would prefer to see a head-to-head comparison between different radios - pointing out the good and bad points of each. Then a final personal choice from the reviewer.
What is wrong with stating that the latest 'XYZ' is not really worth the money, or that the manufacturer has got it wrong. Motorcycle magazines do it all the time! I often get the impression that radio magazines are afraid of losing valuable advertising revenue if they give a bad review?
Individuals do not have the resources to do comparative tests, that is what I hoped to get from an impartial magazine.
David Cripps G7IDB
South London

I am sorry that you think that our reviews are not informative enough for you. If the reviewer thought that the set under review was the best thing since sliced bread and that he really would like one himself, what do I do - wield the blue pencil and cut it out?
Testing a radio is, I would say, more difficult than testing a car or motorcycle. What do you do if the conditions are so bad that nothing is there to be heard? What if you happen to be in the only radio 'black hole' around that day? If a car or motorcycle is bad then you find out pretty quickly - if you live to write the review! Head-to-head reviews are not easy to do unless you have an unlimited Editorial Budget. Many suppliers in the radio business have a very limited number of sets to loan to the likes of SWM for solo reviews, let alone comparative ones.
However, I do take notice of what my readers tell me and will bear your comments in mind for future reviews. Ed.

Reading
I see that I will have to drop a line to the
Remote Meter Reading
Is there something you want to get off
your chest? Do you have a problem
fellow readers can solve? If so then
drop a line to the
Editor.
Club Secretaries: Send all details of your club's up-and-coming events to: Lorna Mower, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Please tell us your County and keep the details as brief as possible.

Rallies


February 19: The Rainham Radio Rally is to be held at the Rainham School for Girls, Deman Road, Rainham, Gillingham, Kent. Talk-in on 522 G0WHR. Doors open at 10.30am to 4pm each day. Trade enquiries from Katy GWOSFO, QTHR on (01545) 580675.

February 27: The Barry Amateur Radio Society are holding their annual Radio and Computer Rally at the Barry Leisure Centre, Barry. Doors open at 10.30am (11:00 for disabled visitors). More details can be obtained from Brian Brown GWUPF on (01222) 23223.

March 2: The 3rd West Wiltshire Amatuer Radio and Computer Rally is being held at a new venue - the Pericarpia School, Abingdon, Oxfordshire. Amateurs, computer and radio hobbyists, radios, books and videos, trade stalls, special interest groups, Bring & Buy, Repopper Groups. Details from Ian White. (01235) 742742.

March 9/10: The London Amateur Radio & Computer Show. The Lakeside Dome, Queen Elizabeth Olympic Park, West Ham. Doors open 10am to 5pm each day. There will be a large number of clubs, special interest groups, Construct a radio, Morse tests (two photos needed), talk-in on 2m and 70cm, Home-made refreshments available with an area to sit and eat and watch television. Entry is £3. There will be trade stalls, Construct a radio, Morse tests (two passport photos required), home-made refreshments, new friends, old friends.

March 16: Wythall Radio Club will be holding their annual radio rally at the Wythall Golf Club, Wythall Park, Silver Street, Wythall (near Birmingham 6.5 miles). The rally is to be held at a new venue - the Penparcau School, Aberystwyth, Ceredigion. Admission is only £1.50 for adults, first 400 + free. For more information call 01970 622127.

March 24: Bournemouth Radio Society's 9th Annual Sale will be held at Kinson Community Centre, Millhams Road, Kinson, Bournemouth. Doors open at 10.30am until 4.30pm. Talk-in from GN02 on 2m & 6m. Admission is £3. There will be a large number of clubs, special interest groups, Bring & Buy, Repeater Groups, DX supply construction, 21st - Aircraft magazine evening. Bany Taylor. (01527) 542266.

March 25: 24th Portmore & District Amateur Radio Society Annual Rally. The Grove House Club, Grove Street, off Banbury Road, Oxford. GN02 on (01979) 213282.

April 8: Southend Radio Club annual 'Spring 85' rally at the Haden Hill, Canvey Island. Doors open at 10.30am. Details from Dave GOFIX on 0113-2383622.

April 15: Southend Radio Club annual 'Spring 85' rally at the Haden Hill, Canvey Island. Doors open at 10.30am. Details from Dave GOFIX on 0113-2383622.
Junior Listener
You will often have been seen me making the joint wave, listening clubs that exist and writing about
the various short wave listening groups that have been formed and their contact details. ISWL
members can get discounts with firms of even better value. ISWL whilst reading through noticed
issues of Monitor, the magazine of the RSGB. I have received the November and December
mentioning the various short wave

You will have often seen me
Junior Listener

Partyline that from January 1 the
change from the time I write about
Mason pointing out that due to the
League.

1PF. Evelyn May, who has done a
Drive, Chellaston, Derby DE73
and address have changed. You
League elections, the contact name
Kenwood, London Road, Louth,
member. All QSLs for this station
activated each month by a different
callsign GB50SWL that will be
this year. Keep a listen out for the
are hoping to increase membership

and heard it announced on DX
Lawrence has been listening to HCJB
them and the time you read them.

meet the RSGB
Many listeners don't believe that the
RSGB is worth joining as it's 'only for
licensed amateurs'. That's not strictly
true, the RSGB have got a lot to offer
many listeners and they too have a couple of mailbag programmes. Musical Mailbag
goes out every Saturday and is a very informal chat and music show that deals
with readers letters. The second offering, Saludos Amigos hosted by Ken

Mailbag Radio!

Whilst browsing the internet, the other day I came across an interesting article in
the North American Short Wave Association's regular on-line journal. The article
focused on the appeal of getting involved with what have been known as mailbag programmes. These are programmes that deal mainly with
listeners letters. Some deal with music requests, while others answer readers
queries on a wide range of topics. The thrill of hearing your letter read out on a
distant radio station is nearly as good as seeing your name in SWM! In amongst
the host of mailbag programmes a few are worth of special note. Probably the
one with the most one time air is Monitor Radio International's Letterbox. This programme is on air at 0049UTC for half an hour from Tuesday through to
Friday. A little closer to home is the new Radio Netherlands programme,
Sincerely Yours. The programme is hosted by Pete Myers and answers listener's
queries on a wide range of diverse topics. HCJB has been a popular choice for many
listeners and they too have a couple of mailbag programmes. Musical Mailbag
goes out every Saturday and is a very informal chat and music show that deals
with readers letters. The second offering, Saludos Amigos hosted by Ken

McHarg runs every Sunday and offers a more detailed response to listeners' letters. If you've had any of your letters read out on air or have a favourite
mailbag programme please drop me a note with the details. In the meantime
here's a few regular international mailbag programmes.

<table>
<thead>
<tr>
<th>Day</th>
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<th>Station</th>
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<tr>
<td>Thur</td>
<td>0010</td>
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<td>0040</td>
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<td>Radio Canada</td>
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<td>Radio France</td>
<td>Club 9516</td>
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<td>Mon</td>
<td>0145</td>
<td>BBC</td>
<td>Write On</td>
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Meet the RSGB

At 21.149MHz 28.060-28.190MHz 28.225-28.500MHz 50.0-52.0MHz 43-44MHz 1240-1325MHz 10000-10500MHz
This gives a Novice access to some popular bands and so

Now, they are open every week-day from 9.15am and 5.15pm, but that
doesn't necessarily help if you are at
work or school. Last year, the RSGB
started opening the headquarters on
the 3rd Saturday of each month
between 10am and 4pm. The
bookshop, museum, library and
G3BRS stands will be available to
visitors and I believe you can take
Morse tests between 11am and
12.30pm. This is a really good way of
seeing how the Society works and
give anyone thinking of taking their amateur licence, whatever the
Novice one or not, a chance to chat
about what's involved. Whilst talking
about the Novice licence I could tell
you that three new Senior Novice Licence Instructors have been
appointed for Cheshire, Somerset and
Wiltshire. A Senior Novice Licence
Instructor holds details of all the
Novice courses in their locality and
coordinate the work of the instructors.
So if you are thinking about heading
into amateur radio, these senior
instructors are the place to start. A full
list of these Senior Novice Instructors is available from the RSGB HQ
(something you could pick up should
you decide to visit). The three new
names are: Gordon Adams G3LEQ,
2 Ash Grove, Knutsford, Cheshire
WA16 8BB. Tel: 01625 634040.
George Davis G3IJO, Broadview,
East Lanesc, Mudford, Yeovil,
Somerset BA21 5SP. Tel: 01935
25699. Noel Woolrich G4TXI, 20
Meadow Drive, Devizes, Wiltshire
SN10 3BJ. Tel: 01380 724333.

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<tr>
<td>Tue-Fri</td>
<td>0049</td>
<td>Monitor Radio</td>
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<tr>
<td>Mon</td>
<td>0109</td>
<td>HCJB</td>
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<td>Mon</td>
<td>0110</td>
<td>Deutsche Welle</td>
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<td>Mon</td>
<td>0130</td>
<td>Radio Canada</td>
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<tr>
<td>Sun</td>
<td>1245</td>
<td>Radio France</td>
<td>Club 9516</td>
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<tr>
<td>Mon</td>
<td>0145</td>
<td>BBC</td>
<td>Write On</td>
</tr>
</tbody>
</table>

Meet the RSGB

Many listeners don't believe that the
RSGB is worth joining as it's 'only for
licensed amateurs'. That's not strictly
true, the RSGB have got a lot to offer
the listener and one way to find out is
to go and meet them.

Now, they are open every week-day from 9.15am and 5.15pm, but that
doesn't necessarily help if you are at
work or school. Last year, the RSGB
started opening the headquarters on
the 3rd Saturday of each month
between 10am and 4pm. The
bookshop, museum, library and
G3BRS stands will be available to
visitors and I believe you can take
Morse tests between 11am and
12.30pm. This is a really good way of
seeing how the Society works and
give anyone thinking of taking their amateur licence, whatever the
Novice one or not, a chance to chat
about what's involved. Whilst talking
about the Novice licence I could tell
you that three new Senior Novice Licence Instructors have been
appointed for Cheshire, Somerset and
Wiltshire. A Senior Novice Licence
Instructor holds details of all the
As we are all aware in these days of continuing recession and slow growth in many countries around the World, both s.w.i.s and international broadcasters have to be careful with money they have to spend. Even major stations like VOA and the BBC are being forced to cut-back due to shrinking budgets.

In an effort to provide both broadcasters and listeners alike with the opportunity for more for their limited financial resources a project was initiated last year by Marbian Productions International. The Canadian based organisation is offering, for the price of sending a postcard request to them, a free selection of current short wave station programme schedules from around the world. Send your request to:

Marbian Productions International, PO Box 1051, Pointe Claire, Quebec, Canada H9S 4H9. Fax: +1 514 697 2615.

This year marks the 50th anniversary of the formation of the International Short Wave League. The ISWL will, as part of their Golden Jubilee Celebration, be operating the special event station with the callsign GB5ISWL. The station will be operated throughout the year of 1996. Anyone either hearing or working the station will be entitled to receive a special GB5ISWL QSL card.

The station can QSLed via the Bureau or direct to:

David Beale GODRX, Kenwood, London Road, Louth, Lincolnshire LN11 8QH.

Short Range Site Comms
The Radiocommunications Agency's - SRBR (Short Range Business Radio Service) is due to be launched early this year.

GB5ISWL. The station will be

slightly different, and at present, it can only be speculated about what form the radio communications might take. Telkom Maritime Services, the company which is operating Cape Town Radio, is also sending along a vessel named 'Telkom Maritime'. This vessel will have three radio operators on board, and they will handle the (official) telecomms for the race. Most definitely communication between the yachts and 'Telkom Maritime' will be u.s.b. It is not known whether the latter vessel will also be in u.s.b. contact with Cape Town Radio simultaneously - we'll just have to see. Still expect that at least some yachts will still contact Cape Town Radio directly...

Aimed at small business and first time business radio users, for construction sites, hotels, retail complexes, warehouses, etc. the system allows speech and paging services with a range of about 8 km.

The scheme will allow the user to utilise their own equipment with out restrictions on portability or location, throughout Britain.

The easier availability of simple, entry-level communications equipment was welcomed as an aid to small business efficiency by Science and Technology Minister Ian Taylor. A single licence is required for the use of either speech or paging or both on SRBR radio channels (around 49 and 461MHz). The licence fee is £50 for a three year period, this allows use anywhere in England, Scotland and Wales.

Details will be published early this year, enquiries to:

Christine Morgan, Radiocommunications Agency, South Quay Three, 189 Marsh Wall, London E14 9XK. Tel: 0171-211 0280.
There has been no specific maximum output into the antenna. at 12kHz running up to 25W will be - the documentation at least one p.m.r. bands. Once the ink is dry on specs have to be agreed for these proposed bands. Currently have already designed equipment Diplomat Communications Ltd who shown two duplex p.m.r. bands with channels. used on a housing estate can blanket certain of the former having been baby alarms, walkie talkies etc., with the growth of low power in use by the new services. The 47-55.75MHz reception almost impossible in interference if not render DX European channels to local TVDXers though will fare less well TVDXing in Band 1 is a TV broadcast band, extensively used throughout Europe though UK Band 1 TV transmissions ceased with the end of 405-line transmissions in the mid 1980s. The present and proposed allocations for Band 1 will have considerable impact for receiving enthusiasts. Scanner users will have a vast new spectrum to search. TVDXers though will fare less well and could well lose several popular European channels to local interference if not render DX reception almost impossible in populated regions. The 47.5-55.75MHz band has already been allocated and is in use by the new services. Interference to TVDXing in Band 1 in recent years has been plagued with the growth of low power devices within the 49MHz band, baby alarms, walkie talkies etc., certain of the former having been identified with ranges of at least 1km! Boots/Mothercare usually have several models on show which when used on a housing estate can blanket off both chs. E2/R1, two prime DX channels.

On the allocation plan there are shown two duplex p.m.r. bands with a 7MHz spacing. I have spoken with Diplomat Communications Ltd who have already designed equipment for these proposed bands. Currently the CBS Working Group document specs have to be agreed for these p.m.r. bands. Once the ink is dry on the documentation at least one duplex band will come into operation. Diplomat advise that this will be - Mobile TX 55.755 - 56.425MHz and Base TX 62.7625 - 63.425MHz.

There will be 54 channels spaced at 12kHz running up to 25W maximum output into the antenna. There has been no specific commencement date given for the new band (s) though learned comment suggests within the next 12 months - subject to approval of the specifications. I spoke with Diplomat early December '95.

Unfortunately the above bands relate with chs. E3 and E4 which may well present a challenge to TVDXing, given that low band communications will prove popular both by potential range and signal ingress into areas where other higher frequency signals have problem coverage. Notch filtering, slant antennas, phasing tricks etc. may be required to maintain effective TVDXing operation. Other Band 1 users such as outside broadcasts, radio mics. etc. will be more of an itinerant use rather than a fixed base installation and shouldn't be too much of a problem - here one day and gone the next - we hope!
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You have never heard an AR8000 like the AR8000DX.

Exclusive performance and feature modifications
- Switchable narrow AM filter for DX performance
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- Free Windows Control software worth £50.00!!
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All this for just £409.00 plus £10.00 carriage

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Wideband multimode monitor
- Advanced memory features
- Multifunction display
- Optional computer control
- 1000 memory channels
- 20 search bands
SPECIAL PRICE
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Civil and Military
- Full VHF & UHF airband ranges
- Keypad entry
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Wideband scanner
- 40 memories
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SCANNER ANTENNAS
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- Watson Super Gainer £19.95
- LoweScan resonant airband mobile antenna with mag mount base £29.95
- LSA700 Discone 70-700MHz £39.95
- LSA1300 Discone 25-1300MHz £59.95
- LSA1500 Vertical, 25-1500MHz £39.95

SCANNER BOOKS
- UK Scanning Directory £17.50
- Scanning Secrets £16.95
- Scanners 3 £10.95
- Airwaves 95 £7.95
- Understanding ACARS £9.95
- World Aeronautical Communications Directory £19.95

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Excellent entry level broadcast receiver
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- Built-in telescopic antenna
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- Unrivalled audio quality
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TEL: 01629 580800 FAX: 01629 580020

...and on the World Wide Web
URL http://www.lowe.co.uk/
New TV Broadcasting Bill

A new bill, published mid December 1995, sets out a regulatory framework which gives industry its best chance to make a success of the new digital terrestrial TV services. The adoption of digital technology is central to the Government's long term radio frequency spectrum strategy. It is claimed that "Digital TV will offer viewers wider programme choice and improved picture quality."

The Government has started the process by putting in place a new regulatory framework.

The contribution required of the broadcasting industry is to simulcast both analogue and digital systems, their programmes and to invest in new digital services that are highly attractive to viewers.

Planned is a Government review after five years from the commencement of the new digital services - sooner if penetration of digital sets reaches 50% of households - to establish a timetable for the withdrawal of the channels used by analogue TV services.

At the start of this timetable, there is a requirement that manufacturers label all new TV sets manufactured that are not capable of directly receiving digital terrestrial services.

Powers are provided in the Bill to require the 'multiplex providers' - providers of the digital infrastructure - at their licence renewal, to invest in additional measures designed to bring forward the withdrawal of current analogue allocations.

The withdrawal is likely to be a phased affair, with the high penetration areas of the digital system, taking into account the relevant contribution of digital cable and satellite services for the reception of public service broadcasts.

The Science and Technology Minister said, "The Government wishes to encourage the eventual transition of all broadcasting and telecommunication services to digital means of transmission. When all signals are digital then the full power of computer technology can be applied at all stages of the path from the TV studio to TV display, realising the full value to society of the information superhighways and interactive services. The future of broadcasting in the UK is enormously exciting."

This will of course be a very large chunk of spectrum available when the analogue TV infrastructure starts to be dismantled.

Realistic PRO-27

The latest hand-held scanner from Realistic is the PRO-27. Like most of the Realistic range of scanners the PRO-27 has a discontinuous frequency coverage. The seven ranges cover the following parts of the r.f. spectrum 66-88, 137-174 and 406-512MHz, so tough if you wanted to use it for civil air monitoring. The new model has 20 memory locations, plus a search facility which can be activated on any of the ranges.

Power supply is either via internal alkaline cells or by external 12v d.c. - useful for in-car use.

Sensitivity is claimed to be 0.5µV. Scanning rate is a pedestrian ten channels per second.

Aimed at the entry and second receiver market, this new Realistic scanner can be obtained via the usual outlets. For more details contact: Mike Bowthorpe, Link Electronics, 216 Lincoln Road, Peterborough PEI 2NE. Tel: (01733) 345731, Fax: (01733) 346770.

Realistic PRO-27

European ACARS.

The unit is simple to operate, requiring an external 12v d.c. power supply and a suitable antenna (discone or dedicated air-band). The receiver allows direct connection to the Universal M-400 ACARS decoder for instant dedicated receiving system. Those ACARS enthusiasts with a PC can utilise the Lowe Airmaster software as an alternative.

The MyDEL Optima ACARS receiver retails at £139.95 and it the ACARS decoding facilities mentioned are available from Martin Lynch, The Amateur Radio Exchange Centre, 140-142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120, Fax: 0181-566 1207.

Benfleet RAE Course

The South East Essex Sixth Form and Community College will be running courses and exams for the RAE from this January onwards. Courses run from January to April and September to December each year.

The session commencing January covers the syllabus for Paper 1 and that commencing September - Paper 2. Examinations for both papers will be held each May and December as usual.

Meetings will be held on Saturday mornings from 1000-1230. Candidates will be allowed to use the College station GX7PRU as part of the course. The Facilities of the Electronics Department will also be available making the approach a very practical one. For further details contact: Adult Education Secretary, Carole Cork, SEEVIC College, Runnymede Chase, Benfleet, Essex SS7 1TW. Tel: (01268) 756111, Fax: (01268) 565515.

ISDN Test Set

Consultronics, the innovative manufacturer of telecommunications test equipment announces the release of their brand new ISDN test set the Consultronics ISDN Test Set. It was launched at the recent Telecom '95 Geneva, Switzerland.

The unit can monitor and decode layers 1, 2 and 3 of the ISDN D channel according to ITU Q.921, Q.931, Q.932 and national ISDN standards. It can also emulate NT, TE or U and can perform call set-ups. B channel BERT testing and analogue measurements and interfaces for BRI S/T, BRI U, and PRI S/T are also available. Consultronics is a registered ISO9001 company. For further details contact: Robert Fitts, Consultronics, 160 Drummill Circle, Concord, Ontario, Canada L4K 3E5. Tel: +1 905 738 3741, Fax: +1 905 738 3712 or E-mail: rfitts@consultronics.on.ca
on all PCs with a 386DX40 or better cable connector adapter box and it is fully screened 9-way to 25-way serial whole interface to fit into a standard, power supply as its power is derived this new and exciting product from technology for the hardware has technology from Code-30 latest Decoder product. Using the very Netherlands HQ has resulted in this development work over at our got to be the hottest decoder to hit excellent stable of decoding products. very exciting new product from their provisional details of what looks like a Hoka Electronics announce the P0. Box 30, 1-50141 Firenze Succ conference are 26-29 April. Details are the 1996 event. The dates of the Florence, Italy, will be the venue for Annual Conference. The location of The Council continues to hold an AutoClassification, oscilloscope and interface acts as the `dongle'.

EDXC Election

The Secretary General of the European DX Council has announced that he will not be seeking re-election for 1996. In a statement Secretary General, Michael Murray stated that after a term of some 16 years it was time for some new blood in the post, hopefully this would bring some fresh ideas to the position. Nominations have been invited from the clubs. elections will take place shortly. The results of which will be featured on these pages when announced. The Council continues to hold an Annual Conference. The location of Florence, Italy, will be the venue for the 1996 event. The dates of the conference are 26-29 April. Details are available from the organisers: A.L.R., PO. Box 30, 1-50141 Firenze Succ 30, Italy.

Code-3 Gold Decoder

Hoka Electronics announce the provisional details of what looks like a very exciting new product from their excellent stable of decoding products. They state that, 'Code-3 Gold has got to be the hottest decoder to hit the streets. Over a year of hard development work over at our Netherlands HQ has resulted in this latest Decoder product. Using the very best of software d.s.p. filtering technology from Code-30. The use of surface mount technology for the hardware has resulted in the imminent release of this new and exciting product from Hoka Electronics.'

The main features are:

- Low price - provisional price is less than £350.
- The Code-3 Gold requires no power supply as its power is derived from the host PC.
- Both 9-way and 25-way serial connectors are supported. The use of miniature construction allows the whole interface to fit into a standard, fully screened 9-way to 25-way serial cable connector adapter box and it is claimed that it produces no r.f.i. or e.m.i.

The Code-3 Gold software will run on all PCs with a 386DX40 or better processor, but the use of a 486 is highly recommended. This latest offering from the Dutch decoder specialists now only supports a minimum of VGA, although SVGA with Tseng ET4000 chip set is possible.

Like all modern programs, performance is enhanced by the addition of more memory and processor power.

Like its predecessors Code-3 Gold does run in a Window 3.1 DosBox - but only if your PC is a 486/100 or Pentium. It will definitely not work under Win95 yet! Code-3 Gold features no copy protection and it can be installed on as many computers as you like. The interface acts as the 'dongle'. There are no ACF Analysis tools except shift and speed measurement, AutoClassification, oscilloscope and ASCII Save to Disc. No 'Bit Buffer' storage/replay capability are provided. For experts who want to start analysing signals in very close detail - the Code-30 is recommended.

Basic Code-3 Gold is for use with all systems and the more common h.f. systems only - ACARS/SITA, POCASG, d.m.r.f., Packet (300+1200), Baudot, ASCII, Stor ARQ/FEC, Pactor, Fax (f.m. and a.m. Meteosat) and SSTV (Martin 1 only).

For those in need of more capabilities, the only addition available will be a short wave option. This will include the lesser used modes - Annex10 (A/v/sca/s), Hell, Morse, ARQ-5, ARQ-6, ARQ-7, Packet (300+1200), Baudot, ASCII, Stor ARQ/FEC, Pactor, Fax (f.m. and a.m. Meteosat) and SSTV (Martin 1 only).

For more details contact NTech Communications, 8 The Crescent, Willingdon, Sussex BN20 9RN. Tel/Fax: (01323) 483966.
NEW OPTO SCOUT 3.1-Mk2
NO INTEREST, YOUR JOKING!
Latest Mini Frequency Finder From Optoelectronics. It will capture and memorise up to 400 frequencies that can be recalled directly into the AR8000. Supplied with ANT, Nicads and Charger. RRP £399

NO INTEREST! YOUR JOKING!

NEW OPTO CUB
The Cub is ideal for communication, surveillance and recreational monitoring applications. From 10MHz-2.80kHz. The Cub has maximised sensitivity for detecting RF in the near field and displaying the frequency detected. The cub features a digital filter that reduces false counts and random noise, digital auto capture that acts like an intelligent hold button allowing any frequency captured to remain displayed as long as needed. RRP £139

NEW DB-32
A Miniature Wideband Antenna. Receives 30 - 1200 Mhz. Transmits 2m/70cm, BNC fitting only 1.5" long its superb. RRP £29.95

SCANNING RECEIVERS
PRO-2036
Wideband Desktop Scanner with rotary tuning and tone encoder £49.95

BSS-1300
Wideband desktop antenna covers 25-1300MHz. £44.95 P&P £7

AIR-33
Professional quality airband base antenna, Civil & Military. Just over 1m long, including Mounting brackets. £44.95 £4 P&P

STAR BUY REALISTIC PRO-43
Listen to aircraft, ham, marine, mobile phones and much more with this superb handheld scanner. Covers 66-88/108-174/380-512Mhz. £149.95

OUR PRICE £169.95

REALISTIC PRO 25
Soft case for 8000/2700
OUR PRICE £159.95

REALISTIC PRO 26
Soft case for 8000
OUR PRICE £269.95

PRO 44/43 CASE
OUR PRICE £159.95 £1 P&P

NETSET PRO-44
WANT TO GET INTO SCANNING? THEN THIS IS IDEAL FOR YOU
Listen to Aircraft, Ham, Marine and much more with this superb scanner. Covers 66-88/108-174/380-512Mhz. £149.95

OUR PRICE £199.95

AR-8000
The ultimate handheld receiver. RRP £449

AR-2700 RRP £299 .......OUR PRICE £239.95

Soft case for 8000/2700 .....OUR PRICE £17.95

CU-823 comp I/face ..........£39.95

SW-8000 S/ware for 8000 ........£49.95

ABF-125 airband filter ..........£29.50

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BUY THE AR-8000 + OPTO SCOUT TOGETHER INCLUDING MODIFICATION & CONNECTING CABLE.
RRP £848. SPECIAL OFFER £719

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Deluxe over the ear earpiece. £9.95 + £1 P&P

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Mobile holder for H/helds £9.99 P&P £2

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Superb quality ext speaker with volume control £14.99 P&P £1

CLIP ON MINI SPEAKER
Ideal for portable scanners. Swivel clip attaches to collar or lapel for easy listening while you carry your portable on a belt clip. (3.5mm plug) £9.99

CLIP-On MINI SPEAKERS

SCANMASTER SP-55
Boost reception of your scanner with this pre-amp. 25-1500Mhz, variable gain, band pass filters. RRP £69.95 P&P £3.50

YUPITERU MVT-7100
Handheld scanner cover 100kHz-1650Mhz. All mode. RRP £249.00

MVT-7200 RRP £449.00

OUR PRICE £369.95

MVT-7000 RRP £449.00

OUR PRICE £289.95

OUR PRICE £289.95

YUPITERU MVT-7100
Handheld scanner cover 100kHz-1650Mhz. All mode. RRP £420.00

MVT-7200 RRP £449.00

OUR PRICE £369.95

MVT-7000 RRP £449.00

OUR PRICE £289.95

DSS-1300
Wideband desktop antenna covers 25-1300Mhz. £44.95 P&P £3

BSS-1300
Loft or outside antenna receives 25-1300 MHz COMP. with coax and plugs £69.95 P&P £7

SCANMASTER SP-55
Boost reception of your scanner with this pre-amp. 25-1500Mhz, variable gain, band pass filters. RRP £69.95 P&P £3.50

AIR-33
Professional quality airband base antenna, Civil & Military. Just over 1m long, including Mounting brackets. £44.95 £4 P&P

DB-770H
Telescopic antenna with wideband receive 25 – 1300Mhz RRP £24.95 P & P £1

TSC-2602
Flexible Wideband Antenna 25 – 1300Mhz 14” Long £22.95 P&P £1

DELIVERY (UK MAINLAND) 24HR £10

NB: ALL PRICES INCLUDE VAT

* Outside office hours 0589 318777* Mail Order: Same Day Despatch *

SALES PHONE - 0181-951 5781/2

132 High Street, Edgware, Middlesex HA8 7EL
Close to Edgware underground station (Northern Line). Close to M1, M25, A406.

Fax: 0181-951 5782

IT’S EASY WHEN YOU KNOW HOW!
**HOW DO WE DO IT?**
Constantly criticised by our competitors for our low pricing – yet we are growing from strength to strength, with our constant strivings to keep our prices low, we keep our overheads to the minimum. We negotiate the best deals from manufacturers with our massive buying power and you get the keenest uk price with quality assured service. We're even expanding to a 2nd shop – see this space next month.

### COMMUNICATION RECEIVERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>YAESU FRG-100</td>
<td>£449.00</td>
</tr>
<tr>
<td>KENWOOD R-5000</td>
<td>£899.95</td>
</tr>
<tr>
<td>AOR AR-7030</td>
<td>£349.95</td>
</tr>
</tbody>
</table>

### PORTABLE SW RECEIVERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony SW-77</td>
<td>£189.95</td>
</tr>
<tr>
<td>SONY SW-1000</td>
<td>£225.95</td>
</tr>
</tbody>
</table>

### DIGITAL AUDIO FILTERS

**TIMEWAVE DSP-59+**
As recently reviewed, this is far the best "DSP Audio Filter" available. We've sold hundreds and have had nothing but good reports. Isn't it about time you cleaned up your shack?

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRP £299</td>
<td></td>
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<tr>
<td>OUR PRICE</td>
<td>£275</td>
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<tr>
<td>RRP £239.50</td>
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<tr>
<td>OUR PRICE</td>
<td>£225.50</td>
</tr>
<tr>
<td>Datong FL-3</td>
<td></td>
</tr>
<tr>
<td>OUR PRICE</td>
<td>£149.95</td>
</tr>
</tbody>
</table>

### VECTRONICS AT-100 COMPACT SW ANTENNAS

This is a superb self contained antenna system for inside the house/fiat, for better results you can even connect a longwire antenna to the rear. Don't miss out any longer! Add one of these to your receiver (built in preselector)

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRP £79.95</td>
<td></td>
</tr>
<tr>
<td>P&amp;P £4</td>
<td></td>
</tr>
</tbody>
</table>

### ACCESSORIES

**HOWES CT-U8**
Ready built, ready to go antenna tuning unit.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT-2000 ATU</td>
<td>£49.95</td>
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<tr>
<td>P&amp;P £5</td>
<td></td>
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</tbody>
</table>

**SWA-30**
Passive (non-powered) desk or wall mount shortwave antenna. RRP £44.95 with a built in magnetic balun. OUR PRICE £44.95 P&P £4

**NEW SP-1 SPYWIRE**
Ideal for any receiver. Receives all short wave bands. All mode, no ATU required. Built in balun. S0239 connection.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUR PRICE</td>
<td>£24.95</td>
</tr>
<tr>
<td>P&amp;P £3</td>
<td></td>
</tr>
</tbody>
</table>

**SONY AN-71**
Pull out and clip on compact short wave antenna. Boost the performance of your portable with one of these RRP £9.99 P&P £1

**SW LONG WIRE KIT**
DX and feed long wire kit, up to 150ft of copper wire. The Complete Package. £24.95 P&P £3

**HF ACCESSORIES** (P&P £1.50)
MLB Watson Wire Balun...£19.95
HD CV 50m hard draw copper wire...£10.99
IS nylon dog gone insulators...99p ea
PL-259/5 1m Patch lead (259-259) £4.95
PL-259/5 5m Patch lead (259-259) £7.99

### SECONDHAND & EX DEMO BOARD

**KENWOOD R-5000**
...

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-5000</td>
<td>£79.95</td>
</tr>
<tr>
<td>VGC</td>
<td></td>
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</table>

**AR-3000A**
Immaculate condition £799.95

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>AR-3000</td>
<td>£649.95</td>
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<tr>
<td>VGC</td>
<td></td>
</tr>
<tr>
<td>As new</td>
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<tr>
<td>PRO-2032</td>
<td>£129.95</td>
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<tr>
<td>Signal R532 airband receiver</td>
<td>£149.95</td>
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<tr>
<td>PRO-2025 6-12MHz with gaps</td>
<td>£399.95</td>
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<tr>
<td>Shiwma scanner wideband mobile</td>
<td>£249.95</td>
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<td>AOR-990</td>
<td>£179.95</td>
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<tr>
<td>Sony SW-55</td>
<td>£229.95</td>
</tr>
<tr>
<td>Ex demo</td>
<td>£259.95</td>
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<tr>
<td>Sony SW-77</td>
<td>£199.95</td>
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<td>As new</td>
<td>£259.95</td>
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<td>New</td>
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<td>RFB-65</td>
<td>£149.95</td>
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<td>R-808</td>
<td>£89.95</td>
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<tr>
<td>YB-500</td>
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<td>Mint condition</td>
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<td>YB-400</td>
<td>£299.95</td>
</tr>
<tr>
<td>ICF-7600DS</td>
<td>£39.95</td>
</tr>
<tr>
<td>VGC</td>
<td></td>
</tr>
</tbody>
</table>

**MTV-7100**
Immaculate condition £269.95

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTV-700</td>
<td>£229.95</td>
</tr>
<tr>
<td>As new</td>
<td></td>
</tr>
<tr>
<td>PRO-43</td>
<td>£139.95</td>
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</tbody>
</table>

**SHORT WAVE MAGAZINE, FEBRUARY 1996**

Short Wave Magazine, February 1996
A portable radio that doesn't require batteries or mains power offers the Third World countries the means to get radio to the poorest people. British inventor Trevor Baylis thought of using clockwork power to solve the problem - the end result being the BayGen 'Freeplay' wind-up radio made near Capetown, South Africa. The story of how Trevor Baylis came to invent the clockwork radio and how it developed from an idea to a production item was told in a television documentary programme last August. I must admit to being fascinated by the programme while at the same time being left very disappointed. It concentrated on the human aspects while glossing over the technical points.

In trying to review this intriguing piece of equipment I have kept in mind what it was originally conceived for. It is not intended to be a set for the serious DXer. Indeed it has been designed with impoverished Third World citizens in mind. In terms of sound quality it is certainly not hi-fi. However, it is acceptable as long as the volume is kept at a reasonable level. Turn it up too high and the distortion becomes unbearable.

**Three Wavebands**

The 'Freeplay' comes as standard with three wavebands, selected by a slider switch on the same end as the tuning knob, volume control and on-off switch. The v.h.f. f.m. band covers the standard broadcast band of 88 to 108MHz in mono only. Medium wave coverage runs from 520 to 1800kHz while short wave is catered for from 3 to 12MHz - covering the Tropical Bands.

Two built-in antennas are provided. The v.h.f. f.m. and short wave sections share a telescopic whip antenna while medium wave uses an internal ferrite rod antenna.

**Spring**

The radio is powered solely by the BayGen clockwork generator. The instructions warn against opening the case and we received an urgent telephone call from Martin Lynch warning us against trying to look inside. A pity as I would love to see just what sort of spring was being used. The TV documentary glossed over such technicalities.

To operate the radio it needs winding up. This is accomplished by the winding handle on the right hand end of the set. The winding operation needs the set to be placed on a firm flat surface, the handle held with the left hand and the spring wound with the right hand. It does require a fairly strong arm to complete the 60 turns needed for a full wind, particularly if it is to be accomplished in the stated 20 seconds!

The on/off switch performed in a most interesting way. In the 'on' position the winding handle rotated at about two revolutions per second and audio came out of the speaker. Slide the switch to the 'off' position and the audio was muted as expected. However, the winding handle didn't stop, continuing to rotate, but at the much reduced rate of one revolution every three minutes. I can only assume that the switch puts a short across the generator to achieve this. This slow 'discharging' of the spring reduces the number of turns needed for a full wind after the set has not been used - unless some three hours has passed.

Winding the spring during playing obviously stops the set working. The publicity material states that for a full wind, which should take 20 seconds, a playing time of 40 minutes is available. The set supplied for review would only achieve 30 minutes. At the end of this period the set was mechanically turned off with a distinct 'clunk'.

The spring generator was not completely silent, some gear noise being audible with the audio turned down. However, in use this was not noticeable and didn't detract from the usefulness of the set. At random intervals during playing the spring seemed to make some 'grunting' noises, but again this was not too distracting.

The radio is substantially built and looked as if it would be capable of taking some fairly severe punishment - short of stopping a charging rhino.
How about never having to buy batteries for your radio? Dick Ganderton has been trying out the clockwork radio from South Africa.

Tuning

Tuning was accomplished by a simple knob set into the left hand end of the set. A thumbwheel was also available in a recess on the front of the set if preferred. The dial pointer was driven by a cord and pulley system and seemed to suffer from a lot of backlash, making fine tuning difficult. The dial itself is a simple one with the three wavebands in vertical columns. Only very minimal frequency information was on the dial - rather like a clock with only 3, 6, 9 and 12o'clock marked. A simple, three-position, slide switch positioned alongside the volume control selects the band.

I found tuning local transmitters to be no problem but on the short wave band it was more difficult. However, BayGen Europe aim to drive sales of a limited number of the clockwork radio to generate funds to enable them to donate 'Freeplay' radios to the War Child charity organisation for their first proposed African project in Angola.

In fact, 'Freeplay' is charity driven. The factory near Cape Town where 'Freeplay' is made is owned by Disability Employment Concern (Pty) Ltd. and at least 60% of the staff are disabled or disadvantaged. The new plant has the capability of producing 20000 'Freeplays' each month with an eventual production capability of one million radios each year. The clockwork 'Freeplay' radio is priced at £79.95 in the UK and is available from Martin Lynch & Son, 140 - 142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120 who kindly provided the set for review.

SPECIFICATION

Frequency range: FM 88 - 108MHz
MW 520 - 1600kHz
SW 3 - 12MHz

Audio output: 4W into 8Ω
Speaker: 89mm dia.

Power source: B-Motor carbon steel spring driving a generator

Length of run: Specified 40min
Tested 31min
Wind-up: 60 turns
Rate of turn: On 30s
Off 3min

BayGen UK have informed us that the radio we reviewed was a pre-production model. Production models have had some changes to the 'engine' which should result in it being quieter and running for the full 40min on one wind.

Charity

The 'Freeplay' clockwork radio is certainly an interesting project and will be the talking point of owners for some time to come. In developed countries, like the UK, it is only likely to appeal to those who can already afford batteries. However, BayGen Europe aim to drive sales of a limited number of the clockwork radio to generate funds to enable them to donate 'Freeplay' radios to the War Child charity organisation for their first proposed African project in Angola.

In fact, 'Freeplay' is charity driven. The factory near Cape Town where 'Freeplay' is made is owned by Disability Employment Concern (Pty) Ltd. and at least 60% of the staff are disabled or disadvantaged. The new plant has the capability of producing 20000 'Freeplays' each month with an eventual production capability of one million radios each year. The clockwork 'Freeplay' radio is priced at £79.95 in the UK and is available from Martin Lynch & Son, 140 - 142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120 who kindly provided the set for review.

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After 25 yrs in Business... we promise -

**Lowest UK prices**

### AR8000 + Opto Scout

Let the Scout tune your AR 8000 to the captured frequency instantly. The Scout will capture & memorise up to 400 frequencies.

**Special Offer**

AR8000 + Modification + Scout

RRP £299

Our Price £795

### AR 8000

- 500 kHz - 1900 MHz
- Computer control
- Data store
- 1000 memories
- c/w Nicads & charger

**Price**

£39.95

### MVT 7200

Limited Edition

See our colour advert on the inside front cover for details.

**Price**

£39.95

### UBC 220 XLT

Unidens best model handheld

- 66 - 956 MHz with gaps
- 200 memories
- Easy to use
- c/w Nicads & charger

**Price**

£199

### MVT 7100

**This is still the Number 1 handheld scanning receiver.**

- 530 kHz - 1560 MHz
- AM/FM/WFM/WIDB/CW
- 1000 memories
- c/w Nicads & charger

**Price**

£399. Call

### UBC 65 XLT

- 66 - 512 MHz with gaps
- Covers Marine, PMR, Police, etc.
- 10 memories
- Variable gain
- Band pass filters

**Price**

£69.95

### Scanmaster SP55

Boost reception of your Base/Handheld scanner with this state of the art preamplifier.

- 25 - 1500 MHz
- Adjustable gain
- Band pass filters

**Price**

£39.95

### AR 3000A

- 100 kHz - 2036 MHz
- Features include computer control

**Special offer**

£799

### Accessories

**Global AT12000**

3W AM/FM with 8 Selector to prevent interference. (1000 kHz - 30 MHz)

**Price**

£95

**Vectorics AT100**

Active antenna and pre-selector. (300 kHz - 30 MHz)

**Price**

£79.95

### Wire Antennas

**EFW - Shortwave Antenna**

The EFW is a complete 20mtr long short wave receive and fed wire antenna. Balun fed, uses high quality "Flex Weave" copper wire 1 - 30 MHz.

**Price**

£59.95

**DLB Longwire Balun**

Matches fed long wires to 50 ohm coaxial cable, helps on receive to reduce noise and interference & transmits up to 100 Watts. Fully moulded for full weather protection.

**Price**

£39.95

**Scanners Antennas**

- **MVT 1000**
  - 500 kHz - 1560 MHz
  - AM/FM/WFM/WIDB/CW
  - 1000 memories
  - c/w Nicads & charger
  - £399. Call

**Price**

£39.95

**Scanmaster Antennas**

- **Scanmaster Base**
  - 25 - 1500 MHz
  - Fibreglass 1.1 mtrs long
  - £399

- **Scanmaster Diverse**
  - 25 - 1300 MHz
  - Stainless steel high quality
  - £49.95

- **Scanmaster Mobile**
  - 100 - 1200 MHz
  - Complete magnetic mount with BNC
  - £29.95

- **Scanmaster on Glass**
  - 108 - 136 MHz
  - 25 - 1300 MHz
  - £29.95

- **Scanmaster Airband Base** 108 - 136 MHz
  - £29.95

- **Scanmaster Airband Mobile**
  - 108 - 136 MHz
  - £29.95

- **Sky Scan Desk Top**
  - 25 - 1300 MHz
  - £99.95

**Base Antennas**

- **CLP 5130-2**
  - 105 - 1300 MHz
  - £99.95

- **Diamond D707**
  - 500 KHz - 1500 MHz
  - £29.95

- **Scanmaster Diverse Antenna**
  - 25 - 1300 MHz
  - £29.95

**Digital Audio Filters**

From Timewave USA

- **DSP-9 Plus**
  - All modes
  - £259

- **DSP-9 Plus**
  - £299

**Send SAE for full details of these filters.**

**Order Hotlines:**

TEL: (01705) 662145
FAX: (01705) 690626
**Same Day Despatch**

<table>
<thead>
<tr>
<th><strong>Opto Scout v3.1</strong></th>
<th><strong>Lowe HF 250</strong></th>
<th><strong>Kenwood R5000</strong></th>
<th><strong>Drake SW8</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- 10 kHz - 1.4 GHz</td>
<td>- Lowe's latest model</td>
<td>- 100 kHz - 30 MHz + optional VHF</td>
<td>- 500kHz-30MHz &amp; 87-108, 118-137 MHz</td>
</tr>
<tr>
<td>- 400 memories</td>
<td>- New super receiver now in stock</td>
<td>- All modes with optional filters</td>
<td>- AM/FM/SSB</td>
</tr>
<tr>
<td>- Software for PC incl.</td>
<td>- 30 kHz - 30 MHz</td>
<td>- AM/TW/SSB</td>
<td>- 240V AC adaptor included</td>
</tr>
<tr>
<td>- Supplied c/w antenna, Nicads &amp; charger</td>
<td>- Supplied c/w Mains adaptor</td>
<td>- Price</td>
<td>- Price</td>
</tr>
</tbody>
</table>

**Price** £399.95

<table>
<thead>
<tr>
<th><strong>Opto 3300</strong></th>
<th><strong>Sangean ATS 818</strong></th>
<th><strong>Yetu FRG 100</strong></th>
<th><strong>Drake R8A</strong></th>
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</thead>
<tbody>
<tr>
<td>- 1 MHz - 2.8 GHz</td>
<td>- Excellent shortwave receiver</td>
<td>- Probably the best value for money shortwave radio on the market this month offered at the very special price of £449. A saving of £150 on the RRP.</td>
<td>- New world class receiver</td>
</tr>
<tr>
<td>- 10 digit LCD disp.</td>
<td>- 150 kHz - 30 MHz plus VHF</td>
<td>- Pay by 3 post dated cheques or part exchange your old radio!</td>
<td>- £100 kHz - 30 MHz wide coverage</td>
</tr>
<tr>
<td>- Supplied c/w Nicads &amp; charger</td>
<td>- Supplied c/w Mains adaptor</td>
<td>- £129.95</td>
<td>- AM, CB, USB, CW, RTTY &amp; FM</td>
</tr>
</tbody>
</table>

**Price** £109.95

<table>
<thead>
<tr>
<th><strong>Opto Cub</strong></th>
<th><strong>Sangean ATS 803A</strong></th>
<th><strong>ERA Microreader</strong></th>
<th><strong>AOR AR 7030</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- 10 MHz - 2.8 GHz</td>
<td>- Our most popular shortwave portable with SSB reception</td>
<td>- Decodes RTTY/AMTOR/CV/SSB/FEC</td>
<td>- New receiver from AOR</td>
</tr>
<tr>
<td>- 9 digit LCD disp.</td>
<td>- 150 kHz - 30 MHz plus SW/MW</td>
<td>- Complete stand alone unit</td>
<td>- Pay by 3 post dated cheques or part exchange your old radio!</td>
</tr>
<tr>
<td>- Supplied c/w Nicads &amp; charger</td>
<td>- Complete unit for use anywhere</td>
<td>- Price</td>
<td>- Nevada are main AOR stockists.</td>
</tr>
</tbody>
</table>

**Price** £139

### Receivers

<table>
<thead>
<tr>
<th><strong>HF 250</strong></th>
<th><strong>HF 225</strong></th>
<th><strong>D-225</strong></th>
<th><strong>HF-150</strong></th>
<th><strong>PRI 150</strong></th>
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<tbody>
<tr>
<td>Receiver</td>
<td>New model</td>
<td>£799</td>
<td>£499</td>
<td>£269</td>
</tr>
<tr>
<td><strong>SW 7600G</strong></td>
<td><strong>SW 555</strong></td>
<td><strong>SW 777</strong></td>
<td><strong>AN3</strong></td>
<td></td>
</tr>
<tr>
<td>Save £20</td>
<td>Save £30</td>
<td>Save £30</td>
<td>General Purpose Ant.</td>
<td></td>
</tr>
<tr>
<td>£139.99</td>
<td>£249.00</td>
<td>£249.00</td>
<td>£59.95</td>
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<tr>
<td><strong>Sony</strong></td>
<td><strong>Opto Scout v3.1</strong></td>
<td><strong>Lowe HF 250</strong></td>
<td><strong>Kenwood R5000</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SW100E</strong></td>
<td><strong>D-225 Synchronous DET</strong></td>
<td><strong>HF-150</strong></td>
<td><strong>PRI 150</strong></td>
<td></td>
</tr>
<tr>
<td>New SSS receiver with 32mhz. + cassette</td>
<td>£249.99</td>
<td>£269.00</td>
<td>£225.00</td>
<td></td>
</tr>
<tr>
<td>£249.99</td>
<td>£249.00</td>
<td>£249.00</td>
<td>£225.00</td>
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</tr>
</tbody>
</table>

### Computer Control

**Synop Weather Plotting**

Receive and decode RTTY signals on shortwave to produce live on screen weather pictures.

**Skyview WX Chart**

Same as Synop but uses your external computer.

**Skyview Fax III**

Receive the very latest news & weather Fax's on your shortwave radio.

**Skycall Callbook**

Complete UK amateur call book on disk for handheld & base scanners.

**Noise Reduction Unit**

JPS ANC 4

Connects between your transceiver or shortwave radio to control out all local noise including computers and TV time base hash.

**OPTIO Interceptors**

These clever units instantly lock on to any close strong signal, allowing instant protection. Ideal for use anywhere two way communications are in use!

**R20 - AM**

- Interceptor/Bug detector
- 500 kHz - 3000 MHz
- AM monitoring w/earphone
- FM detection
- Field strength indicator
- 9V battery operation

**DC440 Decoder**

A new decoder that displays DTMF, CTCSS, DCS and QRA. Runs within Windows.

**Books - Post Free!**

- UK Scanning Directory
- Scanner Busters
- Short wave Maritime Comms
- Eavesdropping on British Military
- Flight logging (1995)
- Air Traffic radio
- Scanning secrets
- Short wave conf. frequency listings

**Quality Used Equipment**

**Scanning Receivers**

- Alinco DJ1
- ACR AR1500
- ACR AR3000
- Bearcat SBX100
- Bearcat 142XLT
- Cometel 204
- Netset Pro 46
- Realistic Pro-32
- Trident TR-2400
- Win 108
- Yupiteru MVT2100
- Yupiteru MVT6000
- Yupiteru MVT7100
- Yupiteru MVT8000

**Shortwave Receivers**

- Drake RBE
- Grundig Satellit 700
- Kenwood R2000
- Sangean ATS 803
- Sony IC100E
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A Day In The Life Of A Radio Inspector

Probing The Galena

Young Golly and Kilocycle Ken try to track down the music and voices coming from a bed!

Kilocycle Ken lay on the candlewick bed cover of the matrimonial double bed, his ear to the mattress. The woman of the house hovered anxiously on the rag mat in her wrap-around apron. The Holland blinds were pulled down because she didn't want the neighbours to see in.

"Anything?" Young Golly the radio inspector trainee asked.

"No," Kilocycle Ken said.

"Can I listen?" the woman complainant asked.

Kilocycle Ken clambered off. She pressed her curled hair against the sagging lumpy kapok mattress, closed her eyes.

Young Golly sighed.

Kilocycle Ken sniffed roast mutton from the kitchen oven inside this suburban galvanised iron-roofed bay-windowed wooden bungalow in the shadow of the radio broadcasting mast on the top of the hill.

She shook her head disappointedly. "I can't hear anything."

She had complained that she could hear music and voices coming from the bed, and there was no radio in the room. Was she going mad?

"It seems to have disappeared," Kilocycle Ken observed.

Young Golly whispered, "Ask her if movement on the bed makes it come and go."

"You should have been here last night," she said loudly.

"I believe you," Kilocycle Ken said.

"Thousands wouldn't," she said doubtfully.

Kilocycle Ken assured her that she wasn't hearing things, at least not unearthly sounds, there were probably radio signals being rectified by the wire-wove mattress, just as a transistor could rectify, perhaps in this case caused by rust, or two different types of metal touching. "The mattress could be said to be acting like a crystal set of yesteryear."

"How can it be fixed?" she asked.

Almost Impossible

There wasn't a simple solution. Finding the exact place where rectification was occurring in the wire wove was almost impossible.

"Buying a new bed is a way out." She didn't like that.

"You do have the satisfaction of knowing that you aren't hearing things, or you are hearing things, to put it another way, but it's not supernatural."

Young Golly said, "You do have the advantage of being able to listen to a radio station without paying for the electricity to run a radio."

Kilocycle Ken said, "Unwanted rectification of radio signals by devices akin to crystals has always been relatively common, especially close to transmitters. Signals have been heard coming from gas stoves, from false teeth, spectacles, anywhere where two dissimilar metals touch and where there is a strong electromagnetic field. Sometimes the effect is produced by touching pipes. Telephones once suffered from the same problem, caused by rectification in the then usual carbon microphones."

"A .002 across the microphone fixed it," Young Golly said wisely.

"We'll leave it to you," Kilocycle Ken said.

Outside, Young Golly said, "Another satisfied customer."

Kilocycle Ken said, "I had a crystal set years ago."

"I thought you would."

Desirable

"A crystal set was a very desirable piece of apparatus in a boy's world, crystals were magic, and nothing could beat the thrill of hearing music and voices on such a powerless device. It was a large coil of fabric-covered copper wire on a two inch varnished cardboard tube, a galena crystal in a metal holder and a cat's whisker, a tuning capacitor, two clips for the prods of the headphones, all connected together and mounted on a square of wood.

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"I had Cannonball headphones of aluminium, Bakelite caps and there was a brown leather band which became greasy with Brylcreem.

"A large aerial was necessary so I used the wire wove of my mattress, a large mass of coiled wire on which the conventional kapok mattress was spread, like the complainant's.

"I've got a water bed," Young Golly said. "No chance of hearing music on that."

"A crystal set enabled a private world, one was not restricted to the living room and the valve wireless, there was privacy, long before the transistor and the Walkman was invented."

"But not mobility," Young Golly said.

"I could listen to 1ZB and 1ZM and 1YA in Auckland, often all mixed up together, as is the way of crystal sets because they have little capacity of selecting and separating different broadcasting stations. They did work very well in areas with only one medium frequency station."

"They wouldn't work now, we've got more broadcasting stations than New York."

Kilocycle Ken said, "At night I probed the grey glistening knob of the galena, the size of a small pea, and with breath held, searched for the most sensitive spot. The signals were loud at some places where the spring cat's whisker touched, in other places they were faint, and sometimes there was nothing to be heard.

"Many different types of crystal were used for such sets, galena was common, and there was zincite, fused silicon, copper pyrite, graphite, iron sulphide, bornite, carbonundum, molybdenite.

"And with deliberation, a radio receiver which will act similar to a crystal set can be put together using two needles and a pencil, a knife blade and a piece of a incandescent lamp filament, a section of dry-cell battery carbon and an iron wire, a razor blade with a pin for the cat's whisker. Such crude reception devices were made by World War II prisoners of war to listen to forbidden radio broadcasts. Used to be that guys in prison could make razor blade radios, don't have to do anymore, they've got multi-channel piped radio.

"And in the early days of wireless at sea, crystal sets were used for reception of telegrams. After the Titanic disaster of 1912, ships were required by law to carry a crystal set for emergency reception.

"Guglielmo Marconi was never an advocate of crystal receivers, he favoured the magnetic detector and the coherer. On the Titanic the magnetic receiver was standard, with the coherer - a glass tube filled with metal fillings - for standby use, but one or other of the two operators would have had a piece of crystal.

**Unreliable**

"Crystals at sea were considered by some to be unreliable, they needed constant adjusting for sensitive spots, and often went dead in the middle of a message. The vibration of the ship could throw them out of adjustment, or a crash of static could paralyse them, but nearly all marine wireless operators had their own crystals, tenderly wrapped in cotton batting when not in use, sacred pieces by whose alleged virtues and marvellous receptive powers they swore by. And maybe there was more to those old crystal sets than met the eye?"

"What do you mean?" Young Golly asked.

"The crystal ball symbol of the occult is of hidden wisdom and fortune telling, gazed into, it is possible to see into the past, tune into the future. There are legends of the ancient continent of Atlantis where crystals generated power for entire cities."

"Different type of crystal," Young Golly said.

"But nevertheless a mineral, and one version of the story is that the abuse of those crystal energies resulted in the eventual destruction of the Atlantis civilisation."

"A fairy story," Young Golly said. "I used to know a guy who ground his own crystals for amateur and m.h.f. communications gear. He had a stack of World War II rocks."

"No call for them now."

**Meditation**

"Big simple crystals, holders as big as a box of matches. You wanted to QSY then, change the crystal. But now quartz crystals have become popular in other ways. It is believed, by some, that crystal forces set the electromagnetic field of the Earth so that human souls can incarnate. Some believe that such crystals are sources of light and energy and can be used in meditation, to develop intuition and learn from the higher senses, balancing and heading. When one tunes into such a crystal it becomes a mirror that will reflect the light within back into the consciousness."

Young Golly said, "I never knew you were one of those New Age people."

"When crystals are used for healing purposes, they become very receptive to the vibration of the individuals and can pick up and retain energies."

"If you believe," Young Golly muttered. "You're as nutty as some of our complainants."

"But then before the invention of wireless the ancients would have dismissed the fact that galena, or those other similar minerals, could receive voices through the air."

Young Golly laughed. "I doubt if any gypsy crystal ball fortune teller could have seen you in that house lying on the complainant's bed. What a sight!"
Most young boys wanted to be an engine driver when they grew up. John Worthington was different - he wanted to be a Government Interference Inspector!

In the days of my extreme youth, not many kids used to answer the question 'And what does sonny want to be when he grows up?' with the words, 'A Government Interference Investigator'. But I only mention those to underline my early hopes. In those days, a Government Inspector of any kind, gas, water, Police, medical, etc., carried with him an aura of massive power and it was this factor that a strong attraction to a little squirt like me.

When eventually I obtained my Ham ticket and had been 'done' by the local gauleiter twice, the possibilities of the work became manifest and as I went about my duties in civilian life, there was hardly any day when I didn't spare a thought for those lucky enough to have collared a post in the Department.

I would picture myself leaping out of bed each morning, winter and summer, with the eagerness of a honeymooner, ready for my daily task of sorting out some poor devil's interference, walking away leaving him revelling in a smooth, noise free band. And I would have an underling to accompany me to carry my AVO and sandwiches! And to be paid a handsome salary with a pension in due course when I should retire to a cottage on a hilltop overlooking long path to VK!

However, my reveries on a daily and nightly basis were to be shattered for good when I became a close acquaintance of Lupe Ferrite (A pseudonym - publication of his real name would surely tempt revengists and silent carrier swoopers). Lupe had been with the Department since graduating from a red brick university with a Third in Trombone Studies.

He had obtained a lowly post due to the Personnel blokes fancy for his (Lupe's) stepmother, and was soon carrying an AVO plus all the trimmings. His actual knowledge of radio and electronics, if made of leather, could not have assisted in the manufacture of a watch strap for a gnat, but he could make a nice cup of tea.

Hierarchy

He rose quickly through the hierarchy of the Interference Department and when we met, he was already wearing the two medal ribbons of the Overmodulation Club and the Compressor Society. He showed me his Solar Storm Belt which was kept polished by the up and down motion of his waistcoat.

He was a heavily built chap due mainly to the steady diet of junk food the job entailed. Hours were spent wandering around the streets of the city and the temptation to drop into the many available 'caff's', for a bacon sarny was never resisted.

Alarming Tales

But he told me many alarming tales of his encounters with enraged 'clients' and I can tell you it put me off the work for good. Finally, he invited me round to his shack - I should have mentioned that he manages to pass his RAE by judicious use of guesswork, going on to pass his Morse by the same method.

His equipment was the usual mix of old and new, and you know how it is - you can't take it all in without spending some time. He showed me what he called a 'nose clipper', a cigar like object, apparently battery driven. 'Solid State?' I enquired, and he told me rather cryptically that it was indeed, especially after a heavy cold.

Horrible Noise

Anyway, I'm sure you can't spare the time for me to describe his rather mundane gear, so I'll get to the nub. He flicked through a few switches and the shack was filled with the most horrible noise I have ever heard. It was a jagged, rasping glass cutting shrasr which had every loose object shuddering in its influence. 'Where's that from?' I bawled with cupped hands into his left ear. He made a dive and switched everything off - he was pale and shaking. 'I'm sorry about that - it must have been the XYL in the bathroom shaving her legs'.

Well, that's it..... I just thought you ought to know that even Government Inspectors have their problems.
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We are happy to announce the arrival of the new WINDOWS management software package for remote control of the AR8000 & AR2700 using an IBM compatible computer running Windows 3.xx or Windows/95. Facilities include memory / search bank upload, download, editing, sorting, automode bandplan data change, spectrum display and sound recording to disk (also requires CU8232 interface or equivalent plus serial lead). £49 + £3 P&P

**FREE!!! SEARCHLIGHT FOR WINDOWS SOFTWARE**

for customers purchasing an AR3000A (or AR3000A PLUS) receiver which has been distributed by AOR (UK) LTD between 1st January 1996 and 31st March 1996.

To claim:
1. Check that your receiver has been distributed by AOR (UK) LTD, there will be a label on the carton stating this fact, if in doubt serial numbers can be verified by our computer at AOR.
2. Forward your original receipt (photo copies not accepted) to AOR UK ensuring the receipt is dated between 1st January & 31st March 1996 inclusive and shows the serial number.
3. Enclose a note claiming the free software and provide your name & address.

Conditions: Offer applies to NEW AR3000A receivers purchased between 1st January 1996 - 31st March 1996 which have been distributed by AOR UK LTD and verified by the AOR serial number computer records. Offer limited to one software package per receiver purchased and must be claimed by the final retail customer only. All claims must be received by 30th April 1996. Claims must be made "directly" to AOR UK, they cannot be claimed through dealers. This is not a competition, statutory rights are not affected.

HAWK-5000 for WINDOWS

New WINDOWS software package for the SDU5000

HAWK-5000 is a brand new PC control package for the SDU5000 spectrum display unit. HAWK-5000 will work in conjunction with the AR3000A plus ICOM ICR7100 receivers. Video frames may be stored to disk for replay at a later date and SONOGRAM makes identification of signal changes very easy. Spectrum data can processed by HAWK-5000 to produce channel occupancy for export into formats suitable for other AOR packages so providing automatic loading of memory channels. The computer must be a minimum of 486DX66 IBM compatible with fast graphics and running Windows 3.xx or Windows/95 (also requires a serial lead). A necessity for the professional listener.

HAWK-5000 for WINDOWS £99 + £3 P&P

The SDU5000 is a spectrum display unit designed with the AR3000A, ICOM R7000, R7100 & R9000 in mind. It will also be ported for the new AR5000. Locating brief transmissions has never been so easy, by using the MAX facility any transmission within ± 5 MHz may be identified and signal strength measured in dBm. A small modification is required to the standard AR3000A to provide compatibility but the AR3000A PLUS is ready to go. SDU5000 £799

The AR3000A has established itself as a high performance base mobile receiver offering an extremely wide frequency coverage of 100 kHz - 2036 MHz and all mode receive. See offer (left) AR3000A £949, AR3000A PLUS (customised version) £995
AOR AR5000 - "The new horizon"
New wide band all mode base receiver

The AR5000 is housed in a newly designed solid metal cabinet and provides a very wide receive frequency coverage from 10kHz to 2600MHz, all mode reception FM, AM, USB, LSB & CW and MANY microprocessor facilities aimed toward professional monitoring and the dedicated listener. Price includes mains power supply.

£1749 inc VAT

AOR AR7030 - "Superior by design"
New high dynamic range short wave receiver

A new standard of performance is provided by the new UK designed & built AR7030 receiver. Strong signal handling is stunning, greater than +30dB (typically +35dBm, reduced by about 10dB with preamp On), dynamic range 105dB in SSB modes with a 2.3 kHz filter. All this and GREAT SENSITIVITY better than 0.5uV for 10dB S/N in AM mode and better than 0.3uV for 10dB S/N in SSB. The AR7030 is British designed by the highly acclaimed John Thorpe and is built by AOR MANUFACTURING LTD of Belper, Derbyshire. Price includes mains power supply, infra-red remote control, all modes reception including synchronous AM and FM.

£799 inc VAT

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TIP OF THE MONTH
Modifying the AR3000A/AR3000 receiver
If you are interested or curious and would like to receive details of how to carry out the “PLUS” modifications to the AR3000A and AR3000 receivers, please forward 6 x 25p stamps or a £1.50 postal order / cheque made payable to AOR UK LTD. It must be stressed that these modifications should only be tackled by an experienced (and brave!) person as the work is very detailed and some self-initiative reference will be required to the circuit diagrams and PCB layouts. While we are happy to assist by telephone, time is precious and we cannot accept liability for anyone destroying their £1000 pride and joy while carrying out DIY modifications. Of course any of the modifications may be carried out in our workshop on a chargeable (and no risk to you) basis.

01773 880788

Short Wave Magazine, February 1996
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## Antennas

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## Books Available

- **4th Scan Directory** £17.00
- **Scanning Secrets** £16.50
- **Airwaves 95** £7.50
- **Flight Routings 1995** £6.25
- **Airband Jargon Book** £6.95
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- **World Radio & TV Handbook** £15.50

## Contact Information

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Short Wave Magazine, February 1996
Momentum have achieved great success over the past few years with their MCL1100 decoding system which provides fully automatic decoding of RTTY, C.W., ARQ, and FEC. The great attraction of the MCL1100 is its ease of use combined with low interference levels, thanks to the well-screened electronics. Mike Richards takes a fresh look at the latest MCL1100, paying particular attention to the new Meteo upgrade board.

For the review, Momentum supplied a complete MCL1100 EasyReader package that comprised the following: MCL1100 decoder, plug-top power supply unit, MM901ME video monitor, plus all the necessary connection leads. In addition to the hardware, there was an EasyReader user manual, technical manual and a separate manual for the Meteo Upgrade.

Setting-up has been made extremely easy and requires just three connections to the main MCL1100 unit. The power output from the plug-top power supply connects to the main unit using a standard coaxial power lead. Next comes the receiver audio feed that connects to a standard 3.5mm mono jack socket on the rear panel. The input sensitivity here is around 200mV so it should be suitable for use with most receivers' line-out jacks. This has the advantage of running the decoder from the fixed output so you can adjust the receiver volume without effecting the decoder levels. The final connection is the coaxial lead carrying the composite video to the monochrome monitor. Although these are all the essential connections, there is an extra connection on the rear panel for a standard PC printer. With this connected you can obtain printouts of the decoded data. You can also add an optional RS232 interface so that captured data could be fed to a computer or other serial device for further processing.

Once all is connected and powered-up, you are presented with the start-up menu page which shows all the receive modes and options. Selection of the required mode is achieved using the numeric keypad on the main panel. This keypad proved very reliable in use and featured a good compromise between lightness of touch and positive feel to reduce input errors. It may not be the most elegant of keypads, but it works! When selecting the required receive mode you have to use the STOP button to complete the selection in much the same way as the ENTER key on a computer.

SmartLock

One of the most important features of the EasyReader is the inclusion of what Momentum call SmartLock. In essence, the incoming audio signal is passed through a limiting filter to remove unwanted components such as mains hum and other spurious signals. Once through this basic filtering the signal is applied to the Z8 processor for decoding. As all the decoding is performed in software, tuning becomes less critical as the decoding algorithm will automatically track the signal over a relatively large range.

Closely associated with SmartLock is the on-screen tuning indicator. This comprised an up-arrow at the top left of the screen that moved from left to right as the input signal moved across the Smartlock tuning range. For reliable decoding all you had to do was ensure the up-arrow was in the centre third of its movement. An additional feature of the tuning indicator was the way in which it reacted whilst receiving ARQ signals. To indicate that lock has been achieved the up-arrow changes to an X, changing to a * when data is being received.

One of the potential disadvantages of an automatic decoding system is a tendency to keep resynchronising to the signal during poor conditions. The EasyReader copes with this problem through the addition of lock facility that will hold the current operating conditions regardless of the state of the incoming signal. In addition to being able to simplify the tuning process the Smartlock system includes routines to
automatically determine both the baud rate and polarity of the received signal. The combination of automatic decoding and simplified tuning make this system particularly attractive to the newcomer. If the letters I receive are a fair reflection of the problems experienced by new listeners, the EasyReader's Smartlock should prove extremely popular.

**Status Display**

Right next to the main tuning display is a status line that provides information on all the current parameters. The exact format of the status line is dependant on whether the display is set for 40 or 80 line resolution. As you would expect the 40 line display shows a much reduced level of information with mainly single letters and opposed to an abbreviation. The information displayed includes, mode, speed, Smartlock alignment, and printer. There is also an indication of the letter/figure shift setting when receiving RTTY signals.

**Decoding**

Now that you've an idea of some of the fine points of the EasyReader, let's see how it performs on-air. The supplied monitor (green screen) proved to be very good with a clear display and relatively low r.f. emissions - far better than most colour monitors. Starting with c.w., the EasyReader's automation was very effective and all but the weakest of signals achieved lock within a second or two. There was a tendency for the logic to attempt to resynchronise when dealing with very weak signals, but this could be overcome by switching to manual mode. In addition to the main tuning display, the c.w. mode included a simple data indicator that flashed in synchronisation with the incoming signal. This provides a useful check that you are receiving the correct signal! Moving on to RTTY reception, the EasyReader proved just as easy to use with the SmartLock system providing synchronisation within about 2-3 seconds. However, it is important to note that there are many signals around that sound for all the world like RTTY, but are, in fact, obscure complex modes - so don't expect to be able to decode them all. Although the SmartLock provides excellent decoding for the majority of signals, the EasyReader provides the operator with manual control of baud rates and data polarity. When receiving ARQ/FEC operation is slightly more complex due to the more sophisticated nature of the transmission system. The first point to note is that the EasyReader will only synchronise to an Information Sending Station (ISS) as opposed to a receiving station (IRS). I found that it was occasionally necessary to put the SmartLock into locked mode to speed-up synchronisation. Whilst monitoring ARQ signals you have the option to decode in literal or CCIR476-3 modes. The difference is that the literal mode displays all the characters including control signals whereas the CCIR mode only displays the message text. Whilst the RTTY and c.w. decoding routines were very good, the ARQ mode required a cleaner signal for reliable decoding.

**Meteo Upgrade**

A good reason for taking a second look at the EasyReader is the introduction of the new Meteo upgrade board. This factory fitted, expansion board provides all the necessary logic to translate a whole range of coded Meteo RTTY signals into plain English. For UK listeners one of the most popular sources of this information has been Bracknell Met on 4.489MHz. Sadly this station has reduced power in recent months, so you may get better service from one of the other continental stations such as Hamburg on 7.646MHz.

One of the main attractions of the data sent by these stations is the fact that you can pick out the precise weather conditions from a wide range of monitoring stations around the world. The service is...
particularly popular with amateur meteorologists as they can build-up detailed reports for specific local areas and so build their own forecasts. So much for the background, let’s take a look at the EasyReader’s implementation. The first thing to note is the wide range of Synoptic modes covered that include TEMP range, SHIP/SYNOP and the PILOT range. Selecting the synoptic mode can either be done from the RTTY mode by pressing [5] or by pressing [41] from the main menu.

I would recommend starting from RTTY as you ought to make sure you have a clean signal before you start trying to interpret the results. A useful facility here is to invoke the EasyReader’s TRACE option. This causes the decoder to display the received character together with the literal translation on the same line. Not only does this help check the quality of the signal, but it also gives you a preview of what you are about to receive. The real gem with this implementation of the synoptic decoding is the inclusion of a decode buffer. If you’ve tried some of the other synoptic systems, such as HAMCOMM, you will have noted that with an incoming data rate of 75 baud, the translated text is displayed too fast to read. In order to use the information you have to save it to disk or printer. Momentum have largely solved this problem with their built-in buffer. This automatically stores the literal translations and displays them at a speed selected by the operator.

The speed of display could be adjusted by the operator using the STOP and SPACE keys on the main keypad. You may have twigged that, if the data is being displayed more slowly than it’s being received, there’s bound to come a point when the buffer memory will fill. The EasyReader handles this by informing the operator and that decoding has been paused until the buffers have cleared. In practice this didn’t turn out to be a significant problem as there were sufficient gaps in most normal transmissions to let the buffers clear without intervention. Should you suffer errors during a transmission the EasyReader just displays a message and attempts to resynchronise to the signal.

Summary

The EasyReader is certainly a well thought out systems that’s particularly suitable for those new to decoding. The RTTY and c.w. decoding algorithms supporting SmartLock were very robust and provided good results for all except very weak or noisy signals. The real gem was the buffered synoptic decoding that worked extremely well and opens up a new source of fascinating data for many listeners. The complete package as reviewed with main unit, monitor and Meteo upgrade costs £449.95 plus £15.00 next day delivery. Individual parts are available at £375 for the main decoder plus for £69.95 video monitor. The Meteo upgrade costs an additional £129 inclusive of factory fitting. Momentum can be contacted at 6 & 7 Clarkson Place, Dudley Road, Lye Stourbridge, West Midlands DY9 8EL. Tel: (01384) 896879. My thanks to Momentum for the loan of the review model.

Demodulator: Baudot 45/50/75 baud a.f.s.k. shift 150-850Hz
ASCII 110/200 baud a.f.s.k. shift 150-850Hz
c.w. 2 - 99 w.p.m. manual
2 - 99 w.p.m. auto word search
6 - 99 w.p.m. c.w. auto mode

Audio In: 3.5mm mono jack
200mV to 10V p-p in 5kΩ

Video Out: Phone socket
Composite video 1V 50Ω 80/40 chrs per line & 25 lines

Power In: 9-13V d.c. at 600mA

Modes: RTTY, SITOR/AMTOR Mode A & B, c.w., ASCII

Dimensions: 292mm wide x 148mm deep x 50mm high

Weight: 1.1kg

Environment: 10-40C, Humidity 5% to 95%

Meteo Modes: TEMP, TEMP DROP, TEMP MOBIL, TEMP SHIP
SHIP, SYNOP
AIREP (ARP/ARS)
PILOT, PILOT MOBIL, PILOT SHIP
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31
Let Me Put You on a Pedestal

Or

Whatever Happened to the RF Gain Control?

Time was when any communications receiver worthy of the name had a knob labelled 'RF Gain', and any operator who used it knew what it was for. John Wilson discusses the demise of this valuable control.

How times have changed, and there are now receivers around which have dispensed with the ubiquitous r.f. gain control, and there are users (I won't say operators) who in any case wouldn't know what to do with one if they had it. Let me put my case more strongly: In my view, any receiver intended for use by a short wave listener, particularly for s.s.b. reception, will at some point prove unsatisfactory if it does not have an r.f. or i.f. gain control. Indeed, I would go so far as to say that such a radio does not qualify as a 'proper' h.f. receiver except for a.m. broadcast listening. Those of you who know how to use an r.f. gain control when listening to s.s.b. or c.w. will appreciate what I mean, but for those uninitiated in the ways of good receivers, let me try to teach you something you may not know (as the Mandarin said to the Minister).

Average Receiver

The average receiver has to have enough gain to amplify signals of less than a microvolt at the antenna socket to a level which you can detect and hear in a loudspeaker or headphones. Just how much gain is needed depends to some extent on the frequencies where the receiver is used, and although there is little point in having high sensitivity on the tropical bands (2 to 4MHz), at higher frequencies it is useful to have a receiver sensitivity of better than half a microvolt to give a readable output to the loudspeaker. The reasons for these changing sensitivity requirements can be covered in a later article, but for the moment let me stay with the 'RF Gain' control.

If you have a receiver with sufficient sensitivity to give a readable output from half a microvolt of signal, what happens when you tune around and come across a signal which generates 100µV into the antenna socket? You blow your head off with noise, and although some of our younger generation seem to enjoy premature deafness from listening to pop music, perhaps the short wave listener would like to retain a modicum of hearing into at least middle life. Of course, most superhet receivers employ an automatic gain control (a.g.c.) system to control the gain, and those of you in the FOUL (Few Of Us Left) Club who appreciate these matters will know that a reasonable a.g.c. system will hold the audio output from a receiver constant within about 3dB for antenna input signals changing between 1µV and 1mV, so where is the problem? Let the a.g.c. system cope with it. Well, that's fine for a.m. signals where the a.g.c. generally works on the constant (apart from fading) carrier, but what happens in the case of signals where there is no carrier on which to hang the a.g.c. system? I'm talking about single sideband (s.s.b.) communications channels which is what you will find if you want to listen to utilities such as aircraft h.f. links or ship to shore traffic. With an s.s.b. signal, when the fat lady stops singing there is no signal at all. Therefore, your receiver a.g.c. system thinks to itself "If there is no signal, then my job is to increase the receiver gain", and it does this quite
rapidly, increasing the background noise from the antenna until the receiver is back at full gain. If in the meantime the fat lady has started singing again, the a.g.c. winds down the gain to restore the audio output to normal. If the a.g.c. system has a fast attack and decay characteristic, the receiver audio output will pump up and down between syllables as the a.g.c. tries to keep the levels constant, and you then get the effect which you can sometimes hear on news reports from far off places where the correspondent’s voice tries to punch holes in the prevailing background noise. The ‘pumping’ effect also occurs where the receiver has audio derived a.g.c., which is a method of obtaining the automatic gain control from the audio of the demodulated s.s.b. or c.w. signal rather than the i.f. signal, because when speech stops there is no demodulated audio and the receiver gain increases. “Ere Mabel, I thought ‘e was telling us about r.f. gain, and ‘ere ‘e is waffling on about a.g.c.”

In a typical receiver, the a.g.c. for the s.s.b. mode, whether i.f. or audio derived, would have a rapid attack and slow release characteristic which would help to stop the receiver restoring to full gain between syllables, but however carefully the designer chooses the a.g.c. decay time and the slope of the release curve, sooner or later the fat lady stops for breath and the receiver roars back up to full gain. And so to the point: If instead of the receiver galloping to full gain we had a front panel control to reduce the overall gain to the point where it is adequate to listen to the wanted signal comfortably, but not so much as to amplify the background noise, our ears would have an easier time. In other words a variable r.f. or i.f. gain control allows the user to reduce the range over which the a.g.c. system operates and thus reduce the background noise between speech syllables.

That, dear reader, is what an r.f. gain control can do for you, and despite all the cleverness of the a.g.c. designers, having a variable gain control under your hairy fingers makes a big difference to the comfort of listening to s.s.b. or c.w. signals. In the case of c.w., the really experienced operator usually prefers to switch off the a.g.c. altogether and rely on the r.f. gain control to keep the incoming signal riding above the noise.

From the mists of time it came...

However, not all knobs labelled ‘RF Gain’ do the same thing, and don’t let anyone tell you that an r.f. attenuator is the same animal as a classic r.f. gain control because it isn’t. Back in the mists of time when receivers got warm to the touch, and I mean the warmth from valves rather than the heat from some modern receiver power transformers......, the valves used for r.f. and i.f. amplifier stages had what was known as a ‘variable-mu’ characteristic. This meant that controlling the bias applied to the control grid changed the actual amplification factor of the valve (its gain), and since in standard designs the valve obtained its bias from a resistor in its cathode, making that resistor variable provided an easy method of controlling the stage gain. If the valve was being used as an r.f. amplifier, this gave variable r.f. gain, and if used as an intermediate frequency amplifier you had variable i.f. gain. Sometimes you would have separate front panel controls for r.f. and i.f. gain but many receivers used the simple technique of connecting two or more gain controlled stage cathodes together and using a single variable resistor to simultaneously control r.f. and i.f. gain. With the advent of solid state devices, the same technique was often
used by making the source resistor of an f.e.t. variable, but the results were sometimes as variable as the resistor and often highlighted the fact that the thermionic valve had become a very advanced device in its years of development since Dr. Lee de Forest first put a control grid in an electron stream in 1907. In any case, by the time the semiconductor appeared, r.f. gain control systems had changed significantly.

Remember that the receivers I am describing had automatic gain control as well as manual r.f. or i.f. gain adjustment, and the a.g.c. also operated by applying variable bias voltages to control elements in the valve or semiconductor. In effect the a.g.c. and the r.f. gain control bias were additive, a standing bias being produced by the front panel gain control and a changing bias coming from the a.g.c. system. I don’t know which designer realised that having designed an a.g.c. system to control the overall r.f. and i.f. gain of a receiver it would be relatively simple to feed a variable bias into the a.g.c. to give it a try.

Hammarlund followed the cathode control of r.f. Gain, and even Collins used it in the 75A-1. However, by the time the 75A-4 came out, Collins had changed to using the a.g.c. line as the method of applying r.f. gain control, as had Drake, right from their first receiver the 1-A. This was the system used in receivers such as the Collins 51S-1, 75S-3, Drake R-4, Hammarlund SP-600 and others of the same period - an era which I and many other people regard as the golden age of h.f. receiver design: but I digress.

“The Bells, the Bells, Esmerelda”

For those of you who are by now a bit lost in the tangle of words I’ve thrown at you, let me try an analogy. Imagine that you want to listen to the sound of church bells coming from a spire a hundred feet above the ground, whilst at ground level there is the constant noise of traffic which drowns out the sound of the bells. Fortunately you have a friend operating a tower crane close by and you can stand in a bucket and be lifted out of the traffic noise to a height where you can hear the bells more clearly. Unfortunately every time the peal ends, the crane drops you right down into the traffic noise, and then hoists you rapidly up at the start of the next peal. That’s effectively what the a.g.c. system of a receiver is doing when it tries to restore full gain between speech syllables. Now imagine that as you stand in the crane bucket you have full manual control over the crane and can adjust the height of the bucket so that you are out of the ground level noise and sitting in the clear air, level with the bells and listening in peace. That’s more or less what a manual r.f. gain control does - it lifts the listening point of the receiver, reduces the background noise, and leaves the signal you want in the clear. Because the control function is carried out by applying a steady bias to the a.g.c. system, it places the wanted signal on a fixed “pedestal”, and this is the term most often used for the particular method of gain control I have described. A major feature of the ‘pedestal’ approach is that if the wanted signal increases above the pedestal, the a.g.c. system still operates and holds the receiver gain constant at or slightly above the pedestal level. The effect is remarkable, and if you haven't enjoyed listening to s.s.b. signals in this way, find a receiver which has a proper r.f. gain control and give it a try.

When is an RF Gain Control not an RF Gain Control?

Answer: When it doesn’t control gain, and if that seems silly let me refer you to the ‘Century 21’ receiver, also variously labelled as the SRX-30 and other allures.

The ‘RF Gain’ knob on these receivers (and others I could name) is actually a potentiometer connected across the antenna input socket and therefore doesn’t control gain, merely the amount of signal reaching the r.f. stage of the receiver. It’s not one of nature’s grandest designs: put up a nice long antenna to get big signals into the radio, then stick a resistor in the way to cut them down again! But isn’t that what we do when using an r.f. attenuator?

There are some receivers, admittedly designed more for the a.m. broadcast listener, which do not have any form of manual receiver gain adjustment and rely on the a.g.c. system alone to keep the audio output constant. However, for reasons already explained this does not work well for s.s.b., and when such a receiver is being hit by big signals the only control available to the user is an r.f. attenuator. Sometimes the attenuation is a single fixed step of, say, 20dB and sometimes several steps are provided. The snag to this approach is that the r.f. attenuator reduces the unwanted noise and the wanted signal by the same amount, and the end result is that whilst initially the perceived signal to noise ratio of the signal remains the same, as more attenuation is used the signal begins to disappear into the internal noise of the receiver which is now operating at full gain, the a.g.c. system having cranked it up, and the signal to noise ratio gets worse and worse, quite unlike the effect of an r.f. gain control. However, that’s not the whole story:- it seldom is.

There are many top class receivers around which have front panel switched r.f. attenuators, for example the Kenwood R-5000 or the JRC NRD series, or attenuators selected by front panel function buttons such as the Drake R-8A. There are some receivers, admittedly designed more for the a.m. broadcast listener, which do not have any form of manual receiver gain adjustment and rely on the a.g.c. system alone to keep the audio output constant. However, for reasons already explained this does not work well for s.s.b., and when such a receiver is being hit by big signals the only control available to the user is an r.f. attenuator. Sometimes the attenuation is a single fixed step of, say, 20dB and sometimes several steps are provided. The snag to this approach is that the r.f. attenuator reduces the unwanted noise and the wanted signal by the same amount, and the end result is that whilst initially the perceived signal to noise ratio of the signal remains the same, as more attenuation is used the signal begins to disappear into the internal noise of the receiver which is now operating at full gain, the a.g.c. system having cranked it up, and the signal to noise ratio gets worse and worse, quite unlike the effect of an r.f. gain control. However, that’s not the whole story:- it seldom is.

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...only two people in the universe...

within the receiver (but that's another subject). The r.f. gain control is still the knob reached for by the experienced operator when listening to s.s.b. transmissions, and when physically combined with the a.f. gain control by making them dual concentric, the ease with which the user can control the listening quality is quite noticeable. Some Eddystone owners who are fortunate enough to have separate r.f. and i.f. gain controls can become somewhat confused at this point, so why not give your surplus gain control to some poor fellow who hasn't got one?

I've got one; what do I do with it?

If you have a receiver with a 'proper' r.f. gain control on it and you haven't bothered to move it away from its fully clockwise position, why not tune to one of the regular s.s.b. nets on the 80 metre amateur band (tune around 3.740 to 3.780MHz) and back off the r.f. gain until the signal to which you are listening is in the clear with the band background noise reduced to a low level. If your receiver has a signal strength meter driven from the a.g.c. system as most of them are, rotation of the r.f. gain control will probably cause the meter reading to increase from zero. This shows the effect of the 'pedestal' being applied to the a.g.c. network, and the aim is to get the meter reading to be just less than the peak signals you want to hear so that they are sitting on or close to the pedestal. I do recall receiver owners complaining to me about the meter reading increasing with r.f. gain control adjustment, but in fact it's a positive feature and far from being a drawback. You see, if it all works properly, the incoming signal will still be correctly measured on the meter if it appears just above the pedestal.

There's Always One Who Wants to be Different....

Some receivers will not conform to my simplified explanations of an r.f. gain control, and we have historic examples such as the HQ-170A which employs two mechanically coupled potentiometers of different value controlling r.f. and i.f. stages; or the 1940s BC-348 which in some versions (there were many), ganged together r.f. and audio gain controls; or the NRD-505 from JRC which had without doubt the most complex set of interlocking pre-set gain controls I ever encountered, and which only two people in the universe apart from the designer ever understood. There are no doubt countless more, and out there my fellow members of the FOUL Club will be sharpening their pencils to tell me about them. The fact still remains that even today, in our technologically advanced equipment (or is it?), the provision of some means of manually controlling the r.f. or i.f. gain of a receiver is an absolute 'must' if the user wants to get the best out of s.s.b. listening.

One last request, apart from a hearty breakfast and a visit from the Chaplain; I am trying to put together a library of equipment handbooks and circuit information so that I can extend my researches into equipment design and help other people with their queries. If you have any old handbooks for receivers of any period, even modern(ish) units, I would be very glad to hear from you. Just drop me a note c/o Short Wave Magazine or call me on (01271) 858430 and I will be pleased to hear from you.

John Wilson
Ron Ham describes the radio astronomy experiments that he conducted from his ‘radio observatory’ on the north face of the South Downs.

The ideal world for a radio astronomer would be one without interference from television timebase whistles, ignition systems, thermostats and the multitude of terrestrial radio signals that travel through the earth's atmosphere every hour of the day. Such a situation could be recreated if it were possible to take one of today’s sensitive communications receivers, with a suitable antenna, back 200 years and use it. At switch-on, before connecting the antenna, the gentle ‘twitter’ of receiver background noise would come through the loud-speaker.

Couple the antenna and ‘noise’ from thunder storms and celestial sources, like Cassiopeia and Cygnus or, nearer home, our sun and the planet Jupiter would be heard. Lightning would produce frequent sharp ‘cracks’ depending upon the distance of the storm and, because there is no man-made noise, the radio-waves from more distant stella objects could be studied over a wide range of frequencies.

Sunspots

Today, most radio operators are aware of the relationship between solar activity and disturbances to terrestrial communications. Experience tells us that when sunspots are present the sun can eject streams of charged particles toward the earth and, at the same time, emit powerful radio-waves, Fig. 1a. The particles may take up to 40 hours before reaching the earth's orbital path whereas the radio waves, which move at the speed of light, can be detected on earth just 8.3 minutes after leaving their source of origin on the sun. The detection of solar radio-waves is an early warning that an event, possibly a flare, has occurred and, if the timing is right, the particles may create an aurora, Fig. 1c, in the earth's polar atmosphere and/or damage the ionosphere, Fig. 1b, to such an extent that terrestrial radio signals rapidly fade or are lost altogether. Aurora and ionospheric disturbances can last for several hours.

Archives

Evidence exists that all this was known some 60 years ago when scientifically minded short wave enthusiasts logged any unusual happenings and sent their reports to the specialist writers in magazines like Practical Wireless, RadCommunication, Short Wave Magazine and Wireless World. For instance, in the mid-1930s, the late Miss Nell Corry, became author of a monthly column in the RSGB's journal. Her writings were based on the daily information that she received from wireless-operators around the world. These reports were kept in a set of five diaries ranging from January 1936 to May 1940. Before her death she kindly gave me these diaries which, after analysis, I deposited in the Vintage Wireless library at the Chalk Pits Museum. These diaries revealed that the late Mr. Dennis Heightman (Clacton-on-Sea) and a number of other short-wave enthusiasts were among the first to hear and recognise radio-waves coming from the active sun. Both Miss Corry and Mr. Heightman told me that it sounded like 'hissing' above the background noise of their receivers. They noted that the 'hissing' always occurred during daylight hours and prior to reports of aurora and ionospheric disturbances. One of the astronomical contributors to Miss Corry's column was a Mr. Newbiggin who also observed sunspots at his observatory in Worthing.

Fig. 1. CONTINUED ON PAGE 39

Short Wave Magazine, February 1996
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ALL WITH 12 MONTH WARRANTY. LIMITED STOCKS OF SOME MODELS

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### SONY: SHORT WAVE RECEIVERS

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**Short Wave Magazine, February 1996**

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Short Wave Magazine, February 1996
CONTINUED FROM PAGE 36

Solar Radio Waves

As an ‘armchair’ astronomer, the solar system was among my special interests and, as a radio-engineer, the thought of detecting radio waves from a celestial body, 93 million miles away, appealed me. So, from 1968 to 1984, I observed the sun for three hours each day (approximately 1130 to 1430) with a simple radio-telescope, Fig. 2.

Before building such a tool I had to find an observational frequency that was clear of terrestrial and satellite signals plus a south-facing site on which to install the antenna. After prolonged tests with a converter and dipole I found that 135.95MHz met the first requirement and by watching the sun’s path I decided that the southern end of my garden was suitable for the second. Fig. 3 shows the 136MHz antenna in its winter position when the sun was low in the sky and Fig. 4 shows it at a steeper angle later in the year. The antenna on its left feeds another solar telescope working on a lower frequency.

Equipment

The simple radio telescope that I built in 1968 had a dedicated antenna, Figs. 2(A), 3 & 4, a 136MHz to 26MHz converter mounted behind the antenna, Fig. 2(B) and upper left Fig. 6, a communications receiver, tuned to 26MHz, as the intermediate frequency amplifier. Fig. 2(D), a d.c. amplifier; Fig. 2(E), a pen recorder, Fig. 2(F) and a good supply of chart recording paper. Briefly, the 26MHz signal was carried underground between the converter and receiver via a good quality coaxial cable, Fig. 2(C). The altitude of the antenna was adjusted about five times per year to keep the sun within its vertical beamwidth and its azimuth was carried through the path of the sun by using the daily rotation of the earth on its axis.

When working, the gentle ‘twitter’ of the receiver’s background noise increased rapidly when the radio waves arrived from the sun. I found it best to ‘zero’ the pen-trace with a control on the d.c. amplifier. The input of this amplifier is connected to the receiver’s detector and its output to the pen-coil on the recorder.

First Hand Experience

After hearing solar noise through the telescope’s loudspeaker I can confirm that the Corry/Heightman description of ‘hissing’ and text-book statements such as, “it sounds like the sea rolling across the shore (‘seashore effect’)” and ‘whoOoshing’ over a wide range of frequencies is absolutely correct.

I commenced daily solar observations, at 136MHz, in May 1968 and by the end of 1969, I had recorded a number of individual bursts of solar-noise, as drawn in Fig. 5 (Nov. 11) and a few continuous noise storms similar to the trace in Fig. 5 (Nov. 14). During that period I learnt that solar bursts had a life ranging from seconds to about 10 minutes whereas a storm could rage from a few hours to several days.

Sometimes when an ‘active’ sunspot appeared on the East limb of the sun there would be a few random bursts which would become more frequent over the next couple of days. Then a storm would develop, reach its peak as it crossed the sun’s central meridian and gradually decrease and return to isolated bursts before disappearing off the Western edge. Should a sunspot or group live long enough, its return, due to solar rotation, could be expected some 13 days later. There may also be new active areas, unseen from earth, Fig. 1(A), which will eventually come into view.

Some Spectacular events.

A major storm began on March 1st, 1970, with a general increase in the noise level intermixed with large single bursts and ended on the 8th with a spell of even larger bursts. The noise remained slight on the 2nd and the 5th but was intense on the 4th. One effect from this solar activity was the aurora-borialis which manifested between 1600 and 2200 on the 6th. Apart from its colourful beauty an aurora is an area of temporary ionisation which will deflect and reflect v.h.f. radio signals over abnormally long distances. This can be observed by pointing a yagi type antenna toward the North and periodically tuning through the v.h.f. bands when the sun is active. Auroral reflected Morse code takes on a low pitched rasp, s.s.b. signals sound like ghostly voices and distant broadcast stations just ‘burble’. On one occasion, from my home in Sussex, I received auroral reflected signals from a number of East-European broadcast stations in Band I (45 to 80MHz) plus distorted television pictures from the IBA’s Band III transmitters in London and on the Isle of Wight. This shows that aurora can be detected without being seen. Before the advent of radio untold numbers of auroral events must have gone by unrecorded because they manifested when the skies were overcast, the moon too bright or during the daylight hours.

The Noisy 16th

In 1970, my instrument recorded some form of solar activity each day from October
9 to November 5 including an intense noise storm from October 27 to 30 inclusive. The sun was then relatively 'quiet' until November 11, Fig. 5, when a few tiny bursts appeared on the recording chart. Next day the solar noise level gradually rose and fell as the sun travelled, by earth-drift, through my telescope's antenna beamwidth. When the instrument switched on automatically on the 13th a noise storm was already raging and the recording pen was well above the 'quiet' base line. The storm increased in strength on the 14th and 15th, peaked, with the recording pen hard against the upper stops, on the 16th, 17th and 18th, decreased to about 60% on the 19th and 20th and ended with a few tiny bursts on the 21st. During this period there were several short-wave fade-outs and blackouts.

However, after sunset on the 16th the background noise level on these bands was unusually high as though the ionosphere was re-radiating after its excessive battering with solar particles.

A colleague suggested that it could be the moon deflecting the solar noise towards the earth, why not?, after all the sun was still pumping the particles out.

We will never know the actual cause of this amazing natural event, although something like this must have happened many times before in the earth's history.

I have indicated where I think the active sunspot group was on each of the solar diagrams at the right of Fig. 5.

Exciting Years

Several major solar storms were recorded during 1972, resulting in memorable aurorae on June 18 and August 4 and 5 and a short wave blackout on November 1. At midday on April 1, 1973, a fellow engineer heard solar radio noise on his short-wave receiver while my telescope recorded a couple of individual bursts. The next indication that something had begun was the two-phase aurora which manifested between 1600 and 1800 and 2000 to after midnight. During each period, with a Yagi facing North-East, I detected 'burbling' signals from those East-European broadcast stations being reflected from the aurora. On the 2nd, 3rd and 4th, I recorded a mixture of solar noise and bursts before the main storm began on the 5th.

World Wide Effect

While a solar storm was in progress on October 30, the BBC's World Service warned their listeners that ionospheric disturbances were causing poor reception. They issued similar warnings on September 14, 15 and 16, 1974, during a period of intense sunspot activity. On July 2 that year, I recorded severe solar noise which was still very strong early on the 3rd. Fortunately I was checking the effect of this storm with other equipment when a massive and scientifically rewarding burst, lasting about 8 minutes, 'jumped' out from the prevailing storm. But let the entry in my log explain.

"0832, burst of radio noise 136MHz, gradually getting stronger and it spread down past 70, 50 and 30MHz to 8MHz. It remained strong on all these frequencies until 0836 whilst this burst was in progress, the solar noise drowned out all signals between 8 and 20MHz."

This was a case of being in the right place at the right time with the right equipment ready to use. While this storm was in progress solar noise was heard at 28MHz on the 2nd, 3rd and 6th and at 50 and 70MHz on the 3rd and 6th, aurora manifested on the 4th and 6th, a short-wave blackout was noted on the 4th and World Service reported ionospheric disturbances on the 5th, 9th and 10th.

Because the word 'severe' is written against the solar storm entries in my log for September 14, 15 and 16, there was little surprise when an
aurora, lasting several hours, manifested during the afternoon of the 15th. At midday on October 13, after several days of solar activity, signals from an OSCAR satellite took on an auroral tone as it crossed the North pole. This aurora ended around 1715 and during that event I again heard reflected signals from the East-European broadcasters. However, the reflection area for most of them seemed to be due North but toward the end of the aurora they were peaking in the North-East. This is a good example of how the movement of auroral ionisation can be plotted by radio.

The Familiar ‘Hiss’

The following observation will emphasise the importance of monitoring the sound while a radio telescope is running. Around 0830 on August 22, 1976, I heard a very strong burst of solar noise on 28MHz which I duly noted in the log. I spent the rest of that day on exercise with the Air Training Corps and, as a signals instructor, I had a v.h.f. radio-telephone fitted in my car. In general, communications between all units operating on the South-Downs and back to our HQ were fine, but, at 1158, I was unable to hear the reply to my call because the incoming signal was obliterated by a sudden outburst of very strong noise. It was a good 10 minutes before our channel cleared and although I only had a rod antenna on my car roof, that familiar sound told me that the noise came from the sun. I checked my telescope’s recording chart when I got home and found a spectacular trace of this particular solar burst which had lasted for 16 minutes on 136MHz. Later, a colleague told me that he heard it for about 30 minutes on 28MHz which again proves that solar radio noise can spread over a wide area of the spectrum.

Radio Astronomy For The Amateur

At first sight, it might seem that anything to do with astronomy has little to do with amateur radio. However, like most sciences these days, there is a big overlap between the sciences, one to another, and this is certainly true with radio astronomy. Arthur Gee G2UK suggests that schools and clubs would find some interesting projects related to this subject.

You will find that many Radio Clubs have a Radio Astronomy item on their winter lecture program these days, which suggests that radio astronomy is steadily making its way into amateur radio. Readers of Short Wave Magazine will of course be aware of the connection through the regular articles by Ron Ham on Propagation. The most obvious astronomical phenomena is, of course, the effect that the sun has on radio propagation. Sun spots, flares, coronal holes and the eleven year sunspot cycle. Quite a number of short wave enthusiasts and radio amateurs and educational establishments do keep regular solar observations using quite elaborate equipment, but one does not have to have very hi-tech equipment to participate in these observations.

A practical system can be set up by the amateur with the usual amateur radio equipment to receive the actual radio signals emitted from the sun. All one needs is a fairly simple radio antenna, a receiver to cover the frequencies around 136MHz and some recording equipment, such as a pen recorder.

The antenna can be of the Yagi type, easily home-built or obtainable from radio stores. Suitable u.h.f. converters for the 136MHz band are also readily available. For signals from the sun, a dish antenna is not necessary, though if one is available it would be very acceptable. A minimum dish size of about 2m diameter is advisable.

Such a set-up can also be used to receive radio signals from Jupiter, as these are very strong signals. There are, of course, very many other sources of radio signals in the Universe, but these are very weak indeed, compared with those from the sun and from Jupiter. Much more elaborate equipment is needed for these. Large antenna systems, pre-amplifiers, very sensitive radio receivers and elaborate recording systems are absolute necessities for receiving these signals.

Science Project

The sun’s radiation provides a good constructional and science project for schools and radio clubs and also makes an interesting radio/astronomical demonstration for pupils and ‘open days’ for the public. They help to show that amateur radio has a useful educational side as well as being just a means of communication. For those interested in constructional and experimental projects, radio astronomy provides a wide field of interest.

What can one hear? An intense rushing sound, way above the background noise of the receiver, is an indication that you have ‘hit target’. Feed into a pen recorder, a trace will be recorded with peaks and troughs indicating the fluctuations of the sun’s emissions. Nothing terribly exciting you think, but it is interesting and exciting for those who want to try something new in their hobby.

The most difficult item of equipment needed is the pen recorder. You may be able to find one at a rally or other source of surplus equipment. A new one is very expensive! However, there was an excellent series of articles in this magazine on the construction of a very useful pen recorder. (May to September 1993.

A convenient kit of all the mechanical parts is available from the author of this series of articles. This would provide a very useful topic for school science projects, with construction of the antenna, radio equipment and pen recorder, from which useful and interesting recordings could be had.
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Graeme or "Mr Scanner Man" as he's known to his colleagues is a confirmed scanner nut. It is rumoured that there are monitoring facilities in almost every room of his home, including a scanner in the loo! Graeme is a licensed amateur and like most of the Lynch Mob has been involved with the hobby since his childhood. His forte is scanning products and their associated accessories. Give him a call today.

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As most avid listeners will know, Spring 1994 showed a marked drop in propagation conditions on the h.f. bands. This is by no means unusual at this time of the solar cycle. But having had six years of pretty good band conditions, this sudden drop seemed to hit everyone rather hard! So, let's see what has happened.

I have been a fairly active h.f. operator for over 30 years. But I have to admit I have found current falling conditions more dramatic than in previous solar declines. I therefore thought I would check for myself just how far the present sunspot cycle has reached. I have then attempted to pinpoint a month when the cycle will reach its minimum.

For past solar information I have taken actual solar flux numbers as recorded in various radio magazines and news sheets. By taking this data I have been able to establish the time when the flux reached its minimum.

Solar Flux

At this point, I had better explain what the term 'solar flux' means. This definition has again been taken from earlier radio magazines, to which I am grateful.

Solar Flux is a measurement of the noise the sun emits on 2.8GHz - a kind of 'S' meter reading. We have always figured that this frequency was selected largely because of the availability of surplus 10cm radar receivers and antennas when these measurements began in 1946.

The solar flux figure ranges from a value of over 300 at the peak to below 70 at the bottom of the sunspot cycle. The flux varies almost as directly as the sunspot number.

A solar flux of 300 equates to a sunspot number of 365 and a flux of 67 is close to a sunspot number of zero. So, having given everyone some idea of what I am writing about, I shall continue.

As I write this article, in mid September 1994 the present solar flux has begun to level out around 80. So, one may assume we could be seeing the bottom of the current sunspot cycle (number 22) shortly.

As I stated earlier, I calculated the previous sunspot as taking place in June 1986. This would make another eighteen months from where we are now until we reached the end of the sunspot cycle 22. Does anyone follow my logic?

For past solar information I have extracted the solar data measured daily numbers on a weekly basis and then on a monthly basis. Of course, there are days when the daily numbers were reached from June 24 to 30, July 2 and 3, August 13, all with 66.

The solar flux figure ranges from a value of over 300 at the peak to below 70 at the bottom of the sunspot cycle. The flux varies almost as directly as the sunspot number.

A solar flux of 300 equates to a sunspot number of 365 and a flux of 67 is close to a sunspot number of zero. So, having given everyone an idea of what I am writing about, I shall continue.

As I write this article, in mid September 1994 the present solar flux has begun to level out around 80. So, one may assume we could be seeing the bottom of the current sunspot cycle (number 22) shortly. Sorry folks, you are wrong! A sunspot cycle usually averages 11 years, but occasionally there have been cycles of 10 years (or, very rarely, even less).

In this cycle we saw it commencing its climb in the autumn of 1986. But prior to the peak of the previous cycle reaching its minimum, there had been almost two years of solar flux numbers averaging 75. This can be a long time when you have been used to hearing lots of DX on the h.f. bands.

Decline

To arrive at my assumption of the next sunspot minimum, I have extracted solar flux numbers for the years 1984, 1985, 1986 and 1987. These four years were the ones when the cycle 21 was in decline. I then extracted the solar data for 1993 until the present time.

The first half of 1984 saw the solar flux varying from 100 to 140. Then the decline started, which is very similar to what happened in the spring of this year. The last four months of 1984 had a solar flux count averaging 76. That was some drop!

1985 saw the flux averaging 75. I estimated that the previous sunspot cycle reached its bottom (or minimum) in June 1986. At that time, the flux was averaging just over 67. (Official statistics, however, claim that the minimum was two months later).

The following six months showed only a small rise in solar activity. In 1987, the new sunspot cycle started its upward climb, the average for the year being 85.

We now go forward to 1993 with the flux giving reach its minimum. A pattern had developed between the latter half of 1984 and the beginning of 1994.

As I stated earlier, I calculated the previous sunspot as taking place in June 1986. This would make another eighteen months from where we are now until we reached the end of the sunspot cycle 22. Does anyone follow my logic?

My Forecast

So, here is my forecast - the minimum should be in March or April 1996. After April 1996, we should see a steady rise in solar flux numbers until the latter half of 1997. Then we will be off again to the very top, which could be around the turn of the millennium, ie. year 2000.

In conclusion, it seems the current sunspot cycle will travel approximately just under 10 years, which could be one of the shortest cycles we have ever had. For anyone who likes to follow the solar pattern and wishes to know for themselves when the current sunspot reaches its minimum, look for flux numbers in the 60s. August 1986 had 24 days in the 60s and September 1986 had 25 days. The lowest solar flux numbers were reached from June 24 to 30, July 2 and August 13, all with 66.

As you will have seen, most of the solar flux data has been calculated in the first place by averaging the daily numbers on a weekly basis and then on a monthly basis. Of course, there are days when the solar flux is higher than the average. But a graph taken of the years 1985 and 1986 show very few occasions when there had been any significant rises over the average.

I should add that the last complete sunspot cycle, number 21, was regarded as a typical cycle in relation to its predecessors. Had that not been so, comparisons with the present cycle 22 would have been invalid.
The Man Who Picked Up The Galaxy

Robert Newman tells the story of Karl Jansky and how he 'accidentally' discovered radio emission from space.

In 1928, a radio engineer named Karl Jansky was assigned to investigate static on radio telephone lines. In doing so, he accidentally discovered radio emission from space, and gave astronomers a tool with which to uncover a new picture of the universe.

Karl Jansky was born in Oklahoma, USA, in 1905. His father, Cyril, a professor of electrical engineering, was teaching there at the time. Later, the family moved when Cyril Janksy took a job at Wisconsin University.

Karl Jansky's early career closely paralleled that of his older brother. Karl excelled academically and took a degree in physics at Wisconsin.

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Karl Jansky's early career closely paralleled that of his older brother. Karl excelled academically and took a degree in physics at Wisconsin. In 1928, after a year of postgraduate study, he applied for a job as a radio engineer with AT & T, at the Bell Telephone Labs in New York City.

The company medical, however, revealed that Karl was suffering from a kidney ailment, Bright's disease. Nevertheless, after taking into consideration Jansky's academic record and listening to persuasive words from his brother, Bell Labs decided to take him on.

Pinpointing The Source

Since the previous year, AT & T had run a short wave transatlantic radiotelephone service. Initially, it operated at a frequency of 60kHz, but the system was plagued by electrical interference. Customers complained about the constant hissing and crackling of static on the line - understandably at $75 for a three minute call!

Getting To Grips

Jansky spent some time getting to grips with the technology of the job, never having taken engineering as a specialist subject. While learning the business, Jansky observed longwire static with a continuously rotating antenna, and helped adapt the idea to short wave.

The designing and building of the short wave receiver was a slow process. It was late in 1929 that the construction of the antenna began in earnest, to a design of E. Bruce, a member of the Cliffwood group. It was officially known as a Bruce array, but unofficially as the 'Merry-go-round'.

The antenna was designed to be two wavelengths long, though the exact dimensions were not finalised until Jansky had found a quiet band to listen to. He earned $35 a week.
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Short Wave Magazine, February 1996
**Short Wave Magazine, February 1996**
quarter wavelength. The reflector, or passive element, was about 600mm taller than its counterpart. The whole thing was mounted on four Ford Model T wheels and running around a circular track, and rotated continuously at three revolutions per hour, powered by a quarter-horse-power motor. The receiver shack was situated 90 yards away, connected to the antenna by copper pipe.

The design allowed the direction of the static source to be determined, as the array would pick-up only emission arriving roughly perpendicular to its length.

In early 1930, word came that the field station was to move a few miles south to a spacious new site at Holmdel, New Jersey. The Bruce array was dismantled, transported to the new location and reassembled in an ex-potato field. By August 1930 the antenna had been tested and debugged, and the static investigation could begin.

Mysterious Hiss

Studies began on the 14.6m wavelength, over a bandwidth of 26kHz. Initially however, only a small amount of static was picked-up. This state of affairs continued for some time, so Jansky stopped work on the problem when winter arrived and concentrated on other things, taking it for granted that "...there is practically no static in winter".

When Jansky returned to the static in the following year, there was no shortage of the stuff, so he began to work out where it was coming from. By studying weather reports and noting in which direction the static was strongest, Jansky determined that part of the problem was caused by thunderstorms.

There were two distinct components, one the result of nearby storms, the other the result of distant ones, radio emission from which was bouncing off the underside of the ionosphere. In the background though, was a mysterious hiss.

In his August 1931 work report, Jansky described it as 'a very steady hiss-type static, the origin of which is not yet known'. A look at the records collected by the receiver revealed that the hiss seemed to be coming from a definite part of the sky, which appeared to move as the earth rotated.

In his January 1932 work report Jansky wrote that the interference '...changes direction continuously throughout the day, going completely around the compass in 24 hours'. He was intrigued, and finding the source of the hiss became his pet problem.

Jansky immediately suspected that the radio emission was coming from the sun, and referred to it as 'sun static'. Even when study of his results revealed that the source was initially at its strongest at night, Jansky still believed that the sun had something to do with it. He could think of nothing else that would case static that varied in a 24-hour cycle.

Complications arose when Jansky discovered that the peak did not recur every 24 hours exactly, but reappeared around four minutes earlier each day. The source was completing a circuit of the sky in 23 hours, 56 minutes.

To an astronomer, this would have been a dead giveaway, as the earth takes about 23 hours, 56 minutes to rotate once with respect to the stars. A radio source lying outside the solar system would therefore reappear in the same part of the sky approximately four minutes earlier than the previous day. Jansky however, was no astronomer, and did not yet appreciate the significance of his results.

In June 1932, Jansky and his colleagues suffered a pay cut and reduction to a four day week as a result of the Depression, but the Holmdel field station and the short wave antenna survived and Jansky continued his work. By this time, perhaps due to his training in physics rather than engineering, Jansky was the only member of the group with a significant interest in the background hiss.

On 31 August, there was a convenient eclipse of the sun visible from Holmdel. Jansky was very interested to see if this interruption in the sun's radiation would affect the intensity of the static, but he observed no detectable change.

After a while, Jansky's
supervisor, Harald Friis told him to write up his findings in a paper, which appeared in the December 1932 edition of the Proceedings of the Institute of Radio Engineers. In this paper, Jansky mentioned that 'hiss-type static', but noted its cause as unknown. The big breakthrough was about to be made, however.

The Discovery
At about the time his first paper was published, Jansky was asked to plot an entire year’s worth of data by George C. Southworth, an AT & T employee who was studying ‘diurnal changes in earth’s currents’. When Jansky did so, he was struck by the fact that his mysterious radio source had shifted a total of exactly 360° with respect to the sun over a period of precisely twelve months.

He noted that, at the start of the twelve month period, the source would be coincidental with the sun, would steadily get four minutes further ahead of it every day, until at the end of the twelve months it would again be coincidental. Jansky might have suspected the truth at this point, but confirmation may well have come from A. Melvin Skellett, a friend of Jansky’s who was also a radio engineer with Bell Labs and a graduate astronomy student.

Skellett may have pointed out that, bearing in mind that the earth takes one year to orbit the sun, during which time the stars remain effectively fixed, an extraterrestrial radio source outside the solar system would behave exactly as Jansky’s was doing.

Jansky was euphoric. He was now absolutely convinced that he had made an earth shattering discovery. Radio emission from space was something previously unknown. He immediately began to work out where in space the mission was coming from.

Analysing his results gave Jansky a rough idea of where the source was in space, but things were complicated by the large area from which the radio waves were coming, plus the fact that the main antenna could not measure the height above the horizon of the sources. Jansky tried using other antennas at the site for this, but without success.

He did manage to work out that the emission was coming either from the constellation of Hercules - the direction in which the solar system is moving - or from Sagittarius, the direction in which the centre of the Galaxy lies.

Jansky also had the problem of explaining how the hiss could be picked-up, even when the source was below the horizon. He came up with the idea that diffraction was responsible.

Media Celebrity
Jansky wrote up his results in a paper dryly entitled Electrical Disturbances of Extraterrestrial Origin. Harald Friis had vetoed a more eye catching title and forced Jansky to use qualifications like ‘apparently’ and ‘seem to’. He was wary of Jansky making claims which might turn out to be wrong.

The paper was presented at a meeting of the International Scientific Radio Union in Washington DC in April 1933. It attracted only a small, unenthusiastic audience of old radio engineering professors and Bureau of Standards engineers.

Jansky was surprised and disappointed at the lack of interest from astronomers. Things were no different when the paper was presented again in Chicago, two months later.

Karl Jansky was unlucky in this respect. His discovery came at a time when most astronomers were unable or unwilling to follow up his work.

They were just beginning to undertake extensive photographic studies with big telescopes. It was exciting and time consuming work and few astronomers had time for a fledgling field of unproven usefulness like radio.

Besides, not many of them knew much about it or how to make sense of Jansky’s data. Worse still, it was the time of the Great Depression and university astronomy departments simply weren’t willing to spend money employing radio engineers without being certain it was worth doing.

Strangely enough, much greater interest came from the mass media. When Bell Labs issued a press release outlining Jansky’s discoveries in May 1933, a front page story appeared in the New York Times. Next day, the hiss from outer space was heard live on an NBC radio broadcast via a link to Jansky’s antenna.

There were also more newspaper reports in other parts of the world. The young radio engineer had become something of a media celebrity.

Drive & Determination
It wasn’t enough for him, however. Jansky tried to get through to the astronomical community by writing an article for Popular Astronomy, a well read magazine of the time. This did have some effect when it was seen by astronomers Fred Whipple and Jesse Greenstein, who came up with a theory which attempted to explain how radio emission came about.

Unfortunately, when they discovered their calculations to be incorrect, what little enthusiasm there was from the scientific community subsided. Despite this, Jansky’s drive and determination remained high, and he continued his investigations.

During the rest of 1933, he attempted to study the nature of emission at different frequencies. The main antenna was capable only of working within 10% of its optimum 20.5MHz, and no change in signal strength over that range was found. Other antennas at the site were used to study assorted frequencies, but Jansky found that he couldn’t usefully compare results from different instruments.

In his August 1933 work report, Jansky suggested that the radio emission in fact came from the whole of the Galaxy, not just part of it. By October, he had worked out the details of the theory.
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The Man Who Picked Up The Galaxy

He knew that the Galaxy was disc-shaped and that the solar system lay inside this disc, about halfway out from the bulging nucleus. Radio emission should therefore come from a distinct band around the sky (visible as the Milky Way) and be strongest from the direction in which the centre of the Galaxy lay, as there were more stars in that direction than anywhere else. (In reality, the emission came from clouds of gas surrounding the stars, but the effect was the same).

This accounted for Jansky's findings neatly. There was now no need to explain how emission could be picked-up when the source was below the horizon - there wasn't a single source at all.

It was from here on that Karl Jansky's work on extraterrestrial radio fizzled out. Due to the lack of interest from astronomers, Friis not surprisingly considered the 'star static' to be of little importance, and not worth spending company time on.

He told Jansky to stop work on it and to investigate other aspects of short wave static. Jansky reluctantly complied. He was not one to cause trouble, but he found the new work less interesting and less likely to attract publicity.

Serious Study

Things looked up in the autumn of 1934 when the Director of Research at Bell Labs used some of Jansky's findings in a lecture, and described them as 'the most interesting discovery in recent years'. This prompted Friis to ask Jansky to write another paper, which he did.

In it, Jansky described his theory on how the shape of the Galaxy was responsible for the variation in strength of the signal. But again, there was a dispiriting apathy in the astronomical community. Perhaps more astronomers would have been interested if Jansky had drawn up a contour map of the intensity of the emission, but it never seemed to occur to him.

Jansky was permitted to do some more serious study of the phenomenon in 1936, when extraterrestrial static was found to be the limiting factor of useable signal strength. He wrote another paper, but thereafter never returned to the subject. During the war, Jansky worked on a system which could track and identify German U-boats by intercepting their short wave radio transmissions.

Slow Development

There were a few other people interested in radio astronomy, however. Most notable among them was Grote Reber, a radio engineer who, in 1937, built a dish antenna of the type suggested by Jansky in his backyard. It was the first purpose-built radio telescope and for almost ten years, Reber was the only radio astronomer in the world, even he only an amateur.

Despite his remarkable spare time efforts, which included making a radio map of the sky, Reber's work remained unappreciated for some time. But then, as in many other fields of science and technology, the Second World War changed everything.

During the war, engineers on both sides worked flat out to improve radar and radio communications. When peacetime returned, radio technology had taken a big leap forward from pre-war days.

On top of this, universities in America could now afford to hire radio experts, many of whom had nothing to do after the scaling down of military projects. Radio astronomy, after many years of neglect, finally began to take off.

Jansky lived just long enough to see his original work begin to bear fruit. He died of a stroke in 1950, aged 44.

Usefulness of Radio

The usefulness of radio to astronomers stems from the fact that the radio picture of the sky doesn't look much like the optical one. Some objects which are bright optically are faint in radio wavelengths, while some objects which are powerful radio sources have no detectable visual output.

This allows astronomers to better understand the nature of the objects concerned. Radio has a wide range of applications in astronomy. It can be used to study the centre of our galaxy, as radio waves easily pass through the clouds of dust which obscure our optical view of the galactic nucleus. It can also enable astronomers to roughly determine the structure of the Galaxy by picking up 1.3GHz emission from enormous clouds of hydrogen gas.

But, perhaps most important of all, radio telescopes can pick-up weak emission from all over the universe - the echo of the big bang - giving astronomers a look at how the universe evolved in its early stages.

Jansky's Contribution

Luck certainly played a part in Jansky's discovery. The antenna built for the static investigation happened to be just the kind of thing needed for the detection and study of extraterrestrial emission. It was sensitive, had fairly good directivity and by good fortune operated at around the frequency at which the galactic radiation is strongest.

In addition, the investigation itself involved a methodical gathering and study of results. This enabled Jansky to notice the phenomenon and pin down the source.

On top of that, the sun was on Jansky's side. During the early thirties it was going through the minimum of its 11 year cycle of activity and wasn't doing much on the frequency Jansky was studying. (This was why Jansky didn't detect the sun with the antenna). Had the cycle been at its maximum at the time, strong radio bursts from the sun and disruptive ionospheric effects would have made the results far more difficult to understand.

On this foundation of luck must be added Karl Jansky's great resolve to find the course of the interference. When other members of his group lost interest in the hiss, Jansky's curiosity drove him on.

This effort went largely unrewarded. Karl Jansky never received any scientific award, even when the significance of his work was becoming apparent. He did, however, have a scientific unit named after him. The amount of power received in a radio telescope from an extraterrestrial source is measured in Jansky's!
Suspend the Nomad antenna from any convenient point. Flexible ribbon cable may be folded up to fit into a small bag or even a pocket.

- **Receiving section:** 1.2m long
- **Matching unit:** 180mm
- **Supply/splitter box:** 120 x 32 x 66mm
- **Total weight:** 335gm (with coaxial cable)
- **Power supply:** Internal 9V battery (PP3)

**ACTIVE NOMAD**

Garex wideband pre-amplifier (25MHz - 1GHz) to maximise reception, together with a built-in filter to reduce troublesome medium and short wave signals.

Just unroll the Active Nomad, hang it from a suitable point - Garex suggest your hotel curtain rail, an attic rafter or a handy tree branch - plug it to your scanner and away you go.

Already fitted with 4m of high-quality coaxial cable and a BNC plug, the Active Nomad also has a supply/splitter box with on/off switch, battery compartment and 2.1mm coaxial power socket for use with an external d.c. supply.

Your chance to buy the recently introduced active version of this popular scanner antenna at a saving of £4.00 off the normal retail price of £29.95 inc. P&P.

The Active Nomad is the ideal accessory for the scanner user who likes to travel a lot. Lightweight, compact, easy to use, it incorporates a Garex wideband pre-amplifier (25MHz - 1GHz) to maximise reception, together with a built-in filter to reduce troublesome medium and short wave signals.

Just unroll the Active Nomad, hang it from a suitable point - Garex suggest your hotel curtain rail, an attic rafter or a handy tree branch - plug it to your scanner and away you go.

Already fitted with 4m of high-quality coaxial cable and a BNC plug, the Active Nomad also has a supply/splitter box with on/off switch, battery compartment and 2.1mm coaxial power socket for use with an external d.c. supply.

**Short Wave Magazine** Special Offer Price is £24.95 plus £1.00 P&P.

Overseas readers please enquire as to price and availability.

Please use the Order Form on page 83.

Short Wave Magazine, February 1996
Sporadic-E reception was possible on November 5 and 6. The reception on the 5th was very unusual consisting of Canal Plus audio only on channel L2 (49.25MHz) for several minutes! An opening to Spain occurred around noon on the 6th with various stations coming through on channels E2, E3 and E4. An opening to central Europe occurred on the 27th with signals from DRS (Switzerland) on Channels E2 and E3, ORF-1 (Austria) E4, ARD/ZDF (Germany) on Channel E2 and RAI UNO (Italy) on IA and IB. The 28th produced signals from Spain on Channels E2 and E3 around noon. Other Band I activity throughout the month was confined mainly to Meteor Scatter activity on channels E2, R2 and E4.

Tropospheric reception occurred in early November with several Benelux stations being received. During the afternoon of November 6, strong French Canal Plus signals were evident on all channels throughout Band III.

Reports

Tim Bucknall (Cheshire) saw RTE-1 and Network-2 from the Kippure (Dublin) transmitter on November 2nd. The Channel E transmission was by far the strongest (in colour) but the Channel H signal was much weaker.

Stephen Michie (Bristol) received several German stations during November 6 including ARD-1 on Channels E6 and E32, plus the FuBK test pattern from Nederland-2 on Channel E27 with the identification 'Zender Lopik'. Many French stations were evident too, including "M6" on Channel L5.

Moving further across Europe, Stephen comments that the present opening sequence of TV Slovenia (Fig. 1 and Fig. 2) is identical to the former 'TV Ljubljana' one. Riccardo Mariotti (Italy) has no free channels available at u.h.f. because of the numerous private stations and relays operating throughout the country. Band I and III is not so much a problem and Croatian TV can be received most of the time with watchable quality in Band III on channel E8 and it is usually present when there is no other signal. There is no identification and the signal comes in from the north-west, so presumably it originates in Pakistan. Recently, the state's third network 'Doordarshan-3' was re-launched via a 1kW transmitter in Delhi. The station lacks popularity and companies are not interested in advertising.

Strretched Test Cards

Most DXers will by now have seen test patterns in the 16:9 format. The Netherlands are using a stretched version of the Philips PM5544 for some Ned-2 transmissions. Incidentally, in Belgium the 16:9 version has replaced the PM5544 on a permanent basis. BRTN-1 transmissions now take place throughout the night with text pages being shown.

Regional Testcards

The unusual electronic test pattern with 'Nordland' identification (Fig. 6) was seen on Channels E2, E3 and E4. The Nordland area lies mid-way up the coast and includes the three main Band I transmitters.

Short Wave Magazine, February 1996
Steigen (E2), Hemnes (E3) and Hadsel (E4). Whether it was simply a one-off broadcast we don't know but NRK obviously have the facilities for regular test transmissions.

Winter-Time DXing

Anyone who commenced TV DXing last summer will realise that propagational conditions during the winter months can be bleak to say the least. Usually, sustained Sporadic-E openings can be relied upon until late August or the first week in September, then a noticeable lack of reception occurs. This is more noticeable to the enthusiast using basic antennas such as an indoor dipole because it excludes all but the stronger openings which may occur.

We know from experience that many new enthusiasts don't become involved in the hobby until later summer and the lack of signals can be most off-putting.

What do DXers do all winter?

Sporadic-E reception is possible all year round but it occurs predominantly throughout the summer months, i.e. May through to September. Reduced activity occurs during most years in the autumn with occasional openings matching those experienced during the summer. Often there are strong openings in late December/early January where reception can last for hours. Meteor-shower activity can occur at any time but signals last only briefly, so you have to be quick off the mark to identify the pictures. The most productive showers for TV DX during the winter are the Quadrantids (Jan 3-4th) and the Geminids (Dec 13-14th). During those showers, propagation is possible on frequencies throughout Band III.

Sporadic-E reception can be as enjoyable as Sporadic-E and openings can occur at any time of the year. Signals are stable so there is the added bonus that whole programmes can be watched unlike Sporadic-E reception where you don't know whether the Russian ballet dancer will suddenly be replaced by a raging bull from Spain?

Sporadic-E reception is associated with anticyclonic weather conditions and sometimes these can last for several days at a time. Reception tends to diminish during the day but evening and early morning periods can provide local-level signals for most enthusiasts. Round-the-clock transmissions in Europe mean that rare channels can be DXed throughout the night while the 'BBC' and 'Channel 4' transmitters are off the air.

During a typical opening, DXers in central England can receive French, Belgian and Dutch signals. An improved opening provides additional signals from Germany, Denmark and sometimes Sweden and Norway. 'Super' openings can include Poland, the Czech Republic, Switzerland and Austria. Tropospheric reception from stations along the north coast of Spain are possible mainly in southern England; there have even been reports of Basque transmissions on channel E35 being received as far north as Lancashire. DXers along the Scottish west coast can expect plenty of Norwegian, Swedish and Danish reception thanks to the sea path and lack of other transmitters en route.

With tropospheric reception, more attention needs to be paid to antenna efficiency and although many enthusiasts do remarkably well using loft antennas for Bands III and IV, an outdoor system is recommended.

Please send DX TV reception reports, equipment news, off-screen photographs and general information as soon as possible to the column head address.
World Propagation Forecasts

How to use the Propagation Charts.

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim. The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time. Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50% probability of success for the path and time.

To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

Short Wave Magazine, February 1996
Dick Ganderton, c/o SWM Editorial Offices, Broadstone

Propagation Extra

I believe that it is still essential that those readers who have an ongoing interest in propagation still have access to the various pieces of information collated by Ron Ham. I have asked Ron to continue to provide his monthly barometric pressure charts in the same format as before. In the meantime I am trying to arrange for a regular supply of sunspot charts and other similar information. If there are any readers who would be prepared to provide such information on a regular basis, please get in touch with me at the Editorial Offices, Broadstone.

Ron has provided two barometric pressure charts for this issue, Fig. 1 covers the month of November 1995, Fig. 2 covers December 1995. In future each chart will cover one calendar month.

LAKE ELECTRONICS

CT400 ANTENNA COUPLING TRANSFORMER

The CT400 is a broadband transformer, providing inductive - i.e. magnetic - coupling between a long-wave antenna and a low impedance feeder. It works on all the HF bands with wire antennas of virtually any length and is suitable for reception of all modes. Entirely weather-proof, the CT400 can be easily fitted into any convenient enclosure of your choice. Full instructions and suggested mounting arrangements are, of course, included. Price? A mere £8.75 for one or £13.00 for two. Please add £1.00 P&P.

TU3 ANTENNA TUNING UNIT

Designed expressly for the keen SWL, using a long wire antenna, the TU3 features a "mode switching" arrangement which makes it one of the most versatile ATU's on the market. Professional in appearance and performance, available ready to use in kit form, the TU3 must be one of your first choices in tuners! £4.00 complete or £4.00 for a full kit containing all components AND hardware. P&P £4.00.

"CARLTON" 3 BAND RECEIVER

A Direct conversion Receiver covering the three most popular HF Amateur Bands - 80m, 40m and 20m, the "carlton" receives USB, LSB and CW. Sensitive and selective, this easy-to-build little receiver will give you many fascinating hours of listening to stations from all over the world. It comes to you as a complete kit with no hidden extras to buy. ALL components, ALL the hardware, FULL instructions - all supplied! All you need to provide will be a small soldering iron, a few basic hand tools, a pair of headphones (or a small 'speaker), a battery and, of course, a few enjoyable hours of your time. £39.50 plus £4.00 postage.

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7 MIDDLETON CLOSE, NUTHALL, NOTTINGHAM NG 16 1BX
TEL: 0115 933 2509 (CALLS IN APPOINTMENTS ONLY)

Fig. 2: Barometric pressure chart for December 1995 taken by Ron Ham at Storrington, E. Sussex.

Fig. 1: Barometric pressure chart for November 1995 taken by Ron Ham at Storrington, E. Sussex.

DISCONE III. This is designed for external mounting, and has proved ideal for the first scanner antenna on the market and is now recognised. The design has stayed the same for the past 20 years, it is an excellent all rounder. £29.95

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DISCONE III.

The NEW BREED OF MOBILE SCANNER ANTENNA. All the antennas, below are designed for discrete listening unlike the old style which you now recognise. £19.95

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Mid December and snow falls across the UK, early by normal British Winter standards. The snow has also fallen rather more thickly in the Balkans as the United States peace keeping troops arrive en-mass in an attempt to maintain a wintery calm between the Serbs and Croats. President Clinton too, has been on hand with a mid December visit to Europe including Northern Ireland, Eire and Germany - co-inciding with the signing of a Yugoslavian peace treaty in Paris. As expected, the satellite air waves have been very busy with all manner of outgoing news packages, live 1 and 2-ways, etc. Both NBC and CBS news featured live inserts and links from the snow clad front-line (links are live transmission between a programme item finishing and a new (next) item starting) using several satellites such as Orion @ 37° West; Intelsat K @ 21° West and Eutelsat II F3 @ 18° East (Tusla).

One such interesting satellite 2-way was between President Clinton (Paris) and the CBS news reporter in Yugoslavia (this satellite link unknown), feeding back to Washington (one bird for inclusion into the main programme make-up, in turn linked back into Europe via Intelsat K and a further uplink from the London Teleport onto Astra for Europe-wide distribution, a total of four satellites to bring the programme as an Astra Sky News offering unencumbered from any ‘Immarsat' phone line terminal for general comms, from the ground-Stateside in Yugoslavia!

More domestic perhaps but important within the sporting arena was the UEFA football draw, December 17th at Birmingham’s International Convention Centre and carried via Telecom 1C on the 12.055GHz vertical transponder, with various interviews and foreign reports into the European networks late afternoon. England drew to battle with her old enemy Scotland in the 1966 European Championships June 15th next.

Julian Redwood (Chichester, Dorset) comments on several good news feeds, November 20th with Shuttle Landing operations - the final Bosnian Peace meeting had ‘feeds were all over the place' including an unusual sighting of the 45° West PAS-1 bird carrying Bosnian talks in NTSC (525-line) at 11.67GHz and in PAL (625-line) at 11.64GHz. Several transponders on Orion-1 also carried Bosnian activity in analogue, but more recently

Julian comments on fewer Orion feeds visible, most likely having opted into the digital domain. Unless you're fortunate enough to own a digital receiver, can tune exactly to the specific frequency and also select the correct bit rate - all you'll see is a screen full of snow! The advent of digital transmission presents a serious challenge to the satellite enthusiast and only when we can gain access to reasonably priced equipment can we assess how easy - or otherwise - digital DXing will be...

Several readers have commented on a very week 525-line NTSC signal on the 21° West Intelsat K which if you've a big enough dish, say upwards of 1m, can be identified as Dubai at 12.78GHz between - the 2m dish LNB had died through rain ingress, a 23K replacement has been fitted. He is also receiving excellent C-Band PAS-4 signals including the new Hw TV offering in Hong Kong. Odd to report that CNN via Palapa B3P encrypted back in the Summer but Alan reports it’s now back in the clear. I read that BT have now opened a UK uplink facility at Martlesham, Norfolk to access the PAS 4 bird, a very low catch in the SE sky. BT have both a 13 and 16M dish in use with 2-way traffic into S.E. Asia and India. The installation cost over £3 million!

A pleasure to hear from an established and mature SWM reader - Owen Jones (Milton, Stoke on Trent) - who having moved to his present address found that a TVDXing aerial was out and he's been checking out the satellite scene using only a 60cm dish hand tracked from the window. To date Owen has logged nearly 70 different signals both programme and news feeds such as the Ukraine, Athens, New York, Tokyo Bangkok and oddly the "RAC Chester"! This clearly shows even the most simple of equipment can be used for quite substantial reception catches. It looks like good news for sat-martzers with mid Summer reception, the new ArabSat 2A should fly into orbit at 26° East late July '96 and offer 22 C-Band and receiving important to us some 12 Ku-Band transponders, being followed up into the Clarke Belt 10 months later by ArabSat 2B at 30° East with a similar transponder loading. Already Bahrain TV and the Lebanese 'Future Vision' have signed up for high power Ku-Band capacity so hopefully more exotic signal potential!
T he Caribbean Beacon, a medium wave religious station on the island of Anguilla, is quite widely heard in North America running 200kW on its 1610kHz frequency. Now the Caribbean Beacon is adding a short wave outlet. This will give DXers and Short wave Listeners worldwide a chance to log a short wave broadcast station from Anguilla, the first such opportunity we've had in many years. Although the short wave facility is expected to be on the air soon—perhaps even by the time this reaches you, the station has not announced any schedule or frequency usage yet. Apparently there are still some matters to be settled with the Anguilla government. The first broadcasts, when they begin, will be in the form of tests.

United States religious broadcaster, the World Voice of Historic Adventism (WVHA), is operating at only half of its 500kW potential. The power reduction is part of an effort to save money. In another economy move the number of hours on the air have also been cut, down to just four. Prophecy Countdown, which operates the station, is running behind with its payments on the loan it took out to build the station from the Christian Science Monitor. Reports from various sources indicate that the station may have to be sold.

Down Mexico Way

The little Mexican short wave station, Radio Huayacocota, which had been closed down by the authorities, ostensibly for several minor infractions of Mexico's broadcasting rules, has been allowed to return to the air. When conditions are particularly good it's being heard on 2390 around 0000. Beware of the Guatemalan station, La Voz de Atitlan, also on 2290, though recently reported just a fraction lower than the Mexican. The Guatemalan station tends to play a good deal of marimba music.

The government station Radio Mexico International is active just slightly below 5.985, as well as on 9.705. The schedule has two segments: 1300-1700 and 2000 to 0445. Some announcements are in English.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Language</th>
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<tr>
<td>5.767</td>
<td>Estacion Soritor</td>
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<tr>
<td>5.957</td>
<td>Radio Altura</td>
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<tr>
<td>6.090</td>
<td>Radio San Miguel</td>
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<tr>
<td>6.188</td>
<td>Radio Oriente</td>
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<td>6.204</td>
<td>Radio Cusco</td>
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<td>Radio Superior de Naranjos</td>
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<td>6.281</td>
<td>Radio Huacosamba</td>
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<td>6.420</td>
<td>Radio Imperial</td>
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<td>Radio Huacosamba</td>
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<td>6.670</td>
<td>Radio Santa Monica</td>
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<td>Radio San Ignacio</td>
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<td>6.755</td>
<td>Radio Los Beseros</td>
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<td>6.985</td>
<td>Radio La Voz de Santa Cruz</td>
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<tr>
<td>9.625</td>
<td>Radio Fides</td>
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Peru

This nation continues to be the most 'radio-active' country in the Americas as far as shortwave broadcasting is concerned. There are dozens of short wave stations on the air from Peru. New ones come on the air almost every month, while others relocate to different towns, or disappear altogether. Here's a listing of recent Peruvian heard in North America. Reception in Europe demands some late/early morning tuning. Most stations stay on the air until at least 0100, some as late as 0500 or even 0800. All frequencies listed in Table 1 are slightly variable.

Argentina

A couple of Argentine broadcasters who don't use short wave directly can sometimes be heard via a point-to-point utility station, probably intended for Argentines in Antarctica and/or Argentine UN troops serving overseas. Weekends offer the best opportunity to hear these special relays. 20.276 i.s.b. sometimes carries the programming of Radio Rivadavia in Buenos Aires and occasionally that of Radio America, also. Rivadavia airs mostly sports programming while America's format is news. These broadcasts have been reported around 2000, as well as 1300, but they seem to be rather irregular.

Bolivia

Recent loggings from this country include the following (frequencies slightly variable):

<table>
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<tr>
<th>Frequency</th>
<th>Language</th>
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<tbody>
<tr>
<td>4.549</td>
<td>Radio Tropico</td>
</tr>
<tr>
<td>4.649</td>
<td>Radio Santa Ana</td>
</tr>
<tr>
<td>4.882</td>
<td>Radio Patití</td>
</tr>
<tr>
<td>4.702</td>
<td>Radio Eco San Borja</td>
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<tr>
<td>4.750</td>
<td>Radio La Cruz del Sur</td>
</tr>
</tbody>
</table>

Operations Suspended

Radio Copan International, from Honduras, has suspended its operations temporarily. The station is upgrading from 1 to 3.5kW, and a new antenna system is also being installed. Perhaps these technical improvements will make the station move easily and widely heard. When it returns it will likely use a frequency in the 31 or 43 metre bands, rather than its former 15.675. In the interim programmes formerly relayed on the Honduran station will be carried by its sister station, WRMI in Miami, Florida.

RAE, the government station of Argentina, has shifted 10kHz down from its former 15.345, for its European beam.

The Guyana Broadcasting Corporation has been off short wave for some time but says it is planning to reactivate both of its high frequency outlets and, indeed, may have done so by now. The 49 metre band outlet, 5.985, is a very congested spot so it may require some careful listening during periods of good conditions, not to mention a reception 'window' when any co-channel stations are off the air. Better luck may be had with the 3.290 frequency in the early morning hours, UTC.

Latin American Miscellany

Colombian station Radio Mira has resumed activity on 6.015. Rarely reported Radio Esperanza, from Chile, is being noted at 0900 on 6.085. Another rare one is Radio Patagonia Chilena on 6.080, being heard around 0000.

Radio Misfit in Nicaragua, 5.770, is heard to sign off around 2345. This station has a new address: Evaristo Mercado Peres, Director, Puerto Cabeses R., A.A.N., Nicaragua.

Radio Nacional/RAE, Argentina, has dropped from 15.345 to 15.335, apparently to avoid interference. RAE has English to Europe at 1900 on this frequency.

HCBJ decided to continue its upper sideband broadcasts on a 24 hour a day basis, on 21.455 (using just 1.5kW), but has dropped the other u.s.b. transmission which was on 15.540.

Suriname's only short wave station, Radio Apinete, is again being heard on 4.991 or a hair under, with light US pops to close down at 0400. This is probably a relay of their local f.m. station's programming.

Another frequency for Radio Havana Cuba's single sideband transmissions is 11.960 between 2200-2300, in English. Another seldom-heard higher band South American is Radio Encarnacion in Paraguay, which has been noted with poor signals by some DXers around 0100 and later.

And finally, this from the medium wave scene: station WJDN in Elizabeth, New Jersey is to be the first station to make use of the new, expanded a.m. band in the United States. WJDN will operate with 10kW during the daytime and 1kW at night on 1660kHz.

That covers things for this time. We will have more in the May issue. Until then, good listening!
Amateur Bands Round-Up

Listening to the Amateurs
Let’s have all your news and comments, sent as usual for the start of the month.

C

ertainly - well, almost! - we are within a year of the end of the Sunspot Cycle, and the 28MHz band is dead.

Or is it?

During the CQ WW SSB Contest recently the solar flux was considerably down, at 74, but against that the K figures were low at 1 or 0 decisively down, at 74, but against all countries during the contest weekend on 28MHz. Outside the contest period, I heard nothing other than the beacons. In other words, 28MHz is often unreliable even when it sounds ‘dead’: if only that the K figures were low at 1 or 0 to the contrary! SLP yielded 77. Not bad for the same token, if stations A and B are not on the same band, and neither is on the band, to accept all the floppy-disk logs computers with enough memory for the darned meter really is when the detail misses. DXNS is put together mainly on Wednesdays to reach readers by Thursday morning, so it catches a lot that alas our longer lead-time misses. Anyway, looking first at 14MHz, Ian notes 9Y4RM, NZ2N, N2TQZ, FHSOT, VE1CZ, KB2HQ, IT9DSC in Sicily, KB2BF, KNOZ, VO1SE, PJ9T, SU2MT, VP5T, VE7GASVP9, V31DX, 6Y5DA and 8P9Z.

Many of you transcribe a ‘fair log’ to send in to the column. Please do be careful to check the fair copy; a couple of what might have been very interesting calls had to be left off this DM because of possible but, for me, uncheckable errors!

I might
This month I'm going to cover a number of loose ends and small 'bits' of information that I've accumulated over the past year. As I type these words, Christmas is still a few weeks away, so I've no idea how last month's offer of 'Mystic Star' frequencies will turn out.

**Traffic Log**

<table>
<thead>
<tr>
<th>Frequency (all frequencies in MHz, u.a., all times in UTC)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.622 (13/11, 22.30) 'BFC' working Sofia, in Bulgarian. This is Bulgarian Airlines LDCD and 'BFC' should be airliner 'L-86C'.</td>
<td></td>
</tr>
<tr>
<td>6.683 (29/10, 23.17) SAM 200 (USA C-20B a/c) working Andrews VIP ('Andy'). 'Andy' asked SAM 200 to QSY to F275 (upper and unknown freq.)</td>
<td></td>
</tr>
<tr>
<td>6.754 (11/11, 22.44) JAP (probably 'Magic Ops' in Germany) working 'Magic 59'.</td>
<td></td>
</tr>
<tr>
<td>6.891 (25/11, 12.19) Aeroflot 324 working Bodo Aero, passing their report afterwards. 'BJO' is the NDB beacon at Bjornoya, which is better known as Bear Island.</td>
<td></td>
</tr>
<tr>
<td>6.975 (29/10, 22.05) Buchan ADRU working YOB, who was some sort of RAF tanker aircraft (VC-10 or Tristar).</td>
<td></td>
</tr>
<tr>
<td>6.710 (26/10, 12.06) Buchan ADRU working YOB, who was some sort of RAF tanker aircraft (VC-10 or Tristar).</td>
<td></td>
</tr>
<tr>
<td>8.891 (11/11, 13.20) PACAF 31 working YOB VIP (a/c) working MacDill GHFS, passing their report afterwards. 'BJO' is the NDB beacon at Bjornoya, which is better known as Bear Island.</td>
<td></td>
</tr>
<tr>
<td>11.175 (9/11, 07.57) Yokohata GHFS with a 'Skyking' broadcast: 'For FAIRLY, OX2, time 57, authenticate AF' which was repeated twice.</td>
<td></td>
</tr>
<tr>
<td>11.181 (11/11, 13.20) PACAF 31 working YOB VIP (a/c) working MacDill GHFS, having just departed from Andrews AFAB is Washington DC. They also tried calling Offutt GHFS and McClellan GHFS.</td>
<td></td>
</tr>
<tr>
<td>13.242 (29/10, 18.12) Sharks working Albrook GHFS with a phone-patch to a ground station who '89 referred to as 'C 0 1'. Their e.t.a. was 01.30z, and they both made good contact on F877. 'Andy' said to QSY to F877 upper</td>
<td></td>
</tr>
<tr>
<td>16.363 (4/12, 10.00) Portishead Radio (KGB2) working yacht Georgiano on marine channel 1603, with a phone-patch to a wine-merchant on Gran Canaria, asking for some wine to be delivered.</td>
<td></td>
</tr>
</tbody>
</table>

**Pirates**

Rex O., from Cornwall writes with a long list of frequencies where he has heard Scottish fishing vessels. They seem to crop-up all over the bands between 2 and about 8MHz. They are very distinctive, as they have very heavy Scottish accents, and usually the sound of engines or generators running in the background. Some of the language used leaves a lot to be desired; one wag decided it was really the 'Scottish fisherman's swearing championships!' On one occasion Shamrock ATC responded to a fishing vessel thinking it was an aircraft.

**Antennas**

A few months back I mentioned a request from Bob Taylor who was looking for a way to run two receivers from a single antenna. Soon after the request appeared in print, Bob found a suitable piece of equipment from a firm in Yorkshire, but I’d like to thank all those who wrote in with suggestions and ideas. Perhaps I didn’t make it quite clear in the original text, but Bob wants to run two receivers at the same time. I’ve had quite a few letters showing designs for simple switch-boxes - but this means that you can only listen to one receiver at a time. From Bob’s letter, it sounds like he found what he was looking for, maybe he can be persuaded to write in and give us a brief review of his new piece of equipment.

**Bodo**

A few months back I mentioned a request from ‘down under’ for any loggings of Bodo Aeradio. Steve Rooney writes in with a logging of Bodo during November (see the ‘Traffic Log’ below for more details). Bodo tends to be used by aircraft which are taking the polar routes from Europe to the Pacific, and according to my ‘boys own’ atlas, it is at 67°16'14.22'N - not a place I’d like to be at this time of year. Steve’s logging just goes to show that even rare stations can still be heard with a little patience and luck. For the record, Bodo Aeradio operates on the following frequencies as part of the North Atlantic Track (NAT-D) system: 2.971, 4.675, 8.891 & 11.279MHz. They also have a few airground frequencies: 2.983, 4.686, 6.544 & 8.840MHz. Steve wishes Evan good luck in logging Bodo.

**Mug Shots**

Having been involved in this column for a few years now, I was quite surprised to receive a request from a reader for a photograph of me to appear one month. I filed this away, thinking that the other columnists don't put their photo's into their columns, so why should I be different. At the Martin Lynch open-day in West London during November, several photographs were taken of the SWM stand, including a few including yours truly. I was very surprised to see one of the photo's used in the January 1996 issue of SWM. Take a look at the bottom right corner of page 9; 'yours truly' is seen talking with Paul Way of the UK Scanning Report; the person half-hidden on the very left is one of my regular readers, 'Tex'. The stand was supposed to be looked after by Kathy from the SWM office, but she was chatting-up Martin Lynch's salesmen at the time.
Airband

It's interesting to follow the technical development of new aircraft types, but sometimes they end up being mentioned in accident or incident reports. In November (page 69) a flap problem on the B.747-400 was described. This prompted Alan Burnett-Provan (Wotton under Wain, surely where the South Stratford Canal runs in an aquatic?) to ask about certification. In general, requirements for a C of A in the public transport category are exacting and rigorous. There really isn't the prospect of consistently dangerous aircraft being allowed to fly.

Some problems only appear after experience (and operating hours) have been gained with the aircraft. Occasionally, fatigue shows up many years later. That's why such stringent and regular checks are made throughout an aircraft's service life. When a problem does occur, the regulatory authority has to decide on the safety implications and experience counts when making a sensible decision. How dangerous is the problem and how likely is it to occur on other aircraft in the fleet? Depending on the circumstances, a decision is made to modify the affected part in so many flying hours or after a particular lapse of time; at the next scheduled maintenance; or immediately. Standard operating procedures might be varied in the meantime.

So I don't think they'd allow the aircraft to continue flying if it presented a real danger. Incidents usually appear in the Air Accidents Investigation Branch (AAIB) Bulletin but no information on this case has been published to date - I've just received the 12/95 issue. The AAIB are separate from the CAA so as to ensure that accident investigation is not biased by the economic constraints that the CAA work under.

Information Source
First, send off for the Airband Factsheet (see below, under Frequency and Operational News). Then, if you're a beginner like E. Payne (Bishops Stortford, conveniently near Stansted?) have a look at what the SWM Book Store can offer (see back pages of this Magazine). May I suggest Air Band Radio Handbook and Airwaves '95 for starters?

On choosing a receiver, there can be nothing better than the one that seems to suit you best - so try some and see! One point, though, is that it's convenient to be able to select a frequency automatically by typing it on the keypad. Not all the Realistic PRO series scanners that I've seen can do this - some require the frequency to be entered into memory first. Do check before buying.

You Write
E.D. Hoye (MacClesfield) has broken the ice by writing to a magazine for the first time ever. I'm honoured that my column was the one chosen to write to! Despite claiming to be in an uninteresting area, things can't be that bad up north as EDH reports F15Es from Lakenheath and U2 'spy' planes flying over. I'm not sure where the U2s are based now as Alconbury has closed.

Try as I might, I can't please everyone and Mark Zee (Waterford) has decided that 'Airband' doesn't cover what he wants. Sorry. Anyway, this would be a good opportunity to remind ourselves of what I'm trying to achieve. This column enables you, the reader, to ask questions that help to improve your understanding and enjoyment of all aspects of aviation. To understand airband radio procedures, you need to know what the pilot's up to at the time. Otherwise, it all just sounds like a string of meaningless technical jargon and numbers. The radio aspect, as Mark calls it, is simple: the aircraft is on a given frequency, if anyone were to tune in then there it would be. I can't write an interesting monthly column based on that one simple fact - it's the background information, that brings the subject to life, that you readers want to see.

Navigation aids, a.d.f. and s.s.r. are all radio aspects. Most of the other contents is covered by reader request: for example, Red Arrows flight dates appear by popular demand. I covered the above discussion on flap problems because readers wrote in about it. Much of my material is aimed at the 'armchair pilot,' which I'm sure we all are to some extent. Why should I mention slot times? Mark asks how many listeners have waited for a slot. Well, hands up - how many of you have flown as passengers on commercial routes? There's your answer!

There now seems to be some overlap between this column and 'Scanning' and 'SSB Utility'. Generally, v.h.f. and navigation comes here, 'Scanning' overlaps the u.h.f. military side and 'SSB Utility' often mentions h.f. It seems to work.

In answer to Mark's questions about the North Atlantic, I did, in fact, cover this area and explained that there is no immediate plan to replace f.h. by satellite. I could have mentioned the reduced vertical separation trials (1000ft instead of 2000ft between flights above FL290), which Mark asks about, but I can't win because he also says he's not interested in operational matters! As far as reviews go, this Magazine often carries full articles on receivers. I can't review the Internet, not having sufficient funds to buy the equipment needed.

For the future, I intend to carry on answering your questions and printing your news snippets as you send them. Most readers seem happy with that, so why change?

Follow-Ups and Foul-Ups
More caption trouble! Page 66, December: note spellings of Parnetav and Yakovlev. Page 3, October: that impressive silhouette of a Lockheed Hercules was by Christine Mylnek. Must send the Art Editor on an aircraft recognition course!

Mac Line 01 (November page 68) isn't a Twin Squirrel after all. To prove it, Robin Karp (Enfield) sent an article that appeared in Flight International (September 20-26, 1995, page 53). The London Fire Brigade's machine, G-LFBA, is in fact a Eurocopter BK.117C1, a higher-powered variant of the B1 helicopter. It's a twin, of course (both engines being coupled to the single rotor via a combiner gearbox). This type of machine is so new that McAlpine have needed to help with obtaining a C of A. As well as carrying fire brigade personnel and an underslung water-bucket, the rear hold can take pre-packed pallets of specialised equipment suited to the expected task.

The helicopter enables a faster response by beating the London traffic jams.

Back to December, and Chris Brenton (Plymouth) adds to the list of v.h.f. London Mil frequencies (all MHz). North is 128.7 according to Aerad and Retro (Surrey). South has 135.275 according to Retro and Aerad, specified as east of airway A4 by RAF Supplement; also, 135.15 according to Chris, specified as west of airway A1 by RAF, finally, 133.3 reported by Chris.

The delivery of North Atlantic oceanic clearances is available via ACARS, the v.h.f. air/ground digital data system. Being digital it's more
accurate than humans having to copy and read-back the co-
ordinates, says Chris. But, being v.h.f., it doesn’t work over the
Atlantic. Flights still need to report their full long/long co-ordinates on h.f.

Frequency and
Operational News
Two new reporting points have been established. Unless you know
where they are, you won’t know the location of aircraft when pilots
report their positions. So, on B4 there’s NELSA at N51°37'.47 W002°20'.03; on G1 they’ve created
WOTAN at N51°37'.47 W002°20'.03.

Plotting these points on your existing radio-navigation chart is
easy as you just follow the airway existing radio-navigation chart is
WOTAN at N51°37'.47 W002°20'.03. On G1 they’ve created
there’s NELSA at N53°51'.80

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WOTAN at N51°37'.47 W002°20'.03. Plotting these points on your
existing radio-navigation chart is easy as you just follow the airway
until it intersects one of the latitude or longitude lines. AIC 100/1995
(from the CAA) describes the new points, Aerad chart EUR/1 depicts
both airways. How do you contact Aerad to buy the chart? First send a
stamped/addressed envelope to the Editorial Office at Broadstone (not
an u.t.c.)

Abbreviations
AIC Aeronautical Information
Controller automatic direction finder
Boeing
C of A Certificate of Airworthiness
CAA Civil Aviation Authority
d.m.e. distance measuring equipment
FL flight level
GASIL General Aviation Safety
Information Leaflet
GHz gigahertz
h.f. high frequency
i.t.a. instrument landing system
LATCC London Area & Terminal
Control Centre
MHz megahertz
s.s.b. single sideband
s.s.t. secondary surveillance radar
u.h.f. ultra high frequency
u.t.c. universal time coordinated
VFR Visual Flight Rules
v.h.f. very high frequency

Could You Help?
To complete a project, Jim Beacon G1JBG (11
Dunraven Path, Chesham, Buckinghamshire, HP5
2UH) wants to obtain the radio-magnetic
indicator and the antennas for a Marconi
ADF/30. Contact Jim direct if you can help.

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Editorial Office
Pretty full mail bag this month - lots to talk about, as usual!

First, something that was brought to my attention by 'Yorkshireman' and concerned with a BBC Radio 4 programme called You and Yours broadcast sometime in November of 1995. I apologise for the delay but this is the first opportunity I've had to place the piece. Apparently, interception of a doctor's conversation was made via a local GP service - where a doctor was paid to use his radio for patient details. The follow-up is that a woman patient was then bothered by malicious telephone calls. The programme included an interview with Greater Manchester Police and a member of The Federation of Communication Services - a Mr. David Savage - who declared that the DTI should now make sale or possession of scanners illegal. Manchester Police suggested a scanner had been used to intercept the radio link.

Mr. Savage's interview brought certain aspects of this out of concern to each of us. He stated that scanners were used by nosy parkers and air band enthusiasts and that these same people could intercept and interrupt transmissions. Noting this, I would state clearly here that there is NO scanner on the market able to interrupt a transmission. However, Mr. Savage clearly states that whilst movements in telecommunications are currently shifting towards digitised transmission - and therefore more secure nets - it will take time to come to the fore. He goes on to say scanners are widely available and that his organisation thinks it should now be a criminal offence to own and use one. They are, he said, actively lobbying the DTI to this end. This disturbs me. A recent letter by a Mr. GA some time ago said that his organisation thinks it must be considered potential ram raiders? 'Yorkshireman' also goes on to state that many daily papers also carry scare mongering stories concerning scanners. He quotes a story that suggests owners of scanners can clone mobile 'phone numbers, using them to defraud service users. Again, not, our type of scanner! It would seem the press love the sensationalism involved here but forget that a scanner can be the name for many things - not just a radio! It looks, to me, that we are in for a rough ride ahead and it is here I urge all of you to do something when the time comes. What? We'll see - but do adopt the motto of the Boy Scouts and 'Be Prepared'.

Rumours abound from various sources that the Black Cat Aviation Group is suffering some sort of crisis and has, apparently, gone bust. Having read the last issue of the club magazine I note, sadly, that hardly anyone is writing in. It could therefore be the reason for the crash. I also think that BCAG should have written to everyone involved and mentioned their position. I'm sure we'll find out in due course. It is very sad when something that should be of interest to us all loses support.

Frank from Kensington upon Hull asks for the address of The Scanning Report edited and produced by Paul Wey and Carl Ashby. Once again, I cannot fault this piece of work and would suggest that writing to the addresses below will help! Paul Wey also sent me a list with other frequencies on but these are freely available and therefore of limited use. However, should they be available in your area then I will file them for use, thanks Mike.

Mike also sent me a price list of $4995.00 and a map of $795 of a radar. Mike is personal. Mr. Savage is, believe, scare mongering and is not qualified to do that. Yes, scanners can be used for criminal activities but so can cars. Does this then mean that car owners must be considered potential ram raiders?

Savage clearly states that whilst there is NO scanner on the market able to do anything then I will file them for use, thanks Mike.

Bargain Antenna

Tracey Gardner G5SVU has information requested by Dave Howarth on building a low powered, AF antenna. He suggests that you try ARRL Antenna Handbook and also HF Antennas for all locations by Les Moxon. Mike has subsequently found out that it was manufactured for the measurement of e.m.c., and has a gain of 10dB at 2GHz, and will handle a p.e.p. of 800W! In conversation with EMCO, Tracey discovered the antenna has a price list of $4995.00 - and discloses that EMCO were extremely surprised to hear he'd bought one for just $75! Proving - once again - that there are bargains to be had out there!

P of Yorkshire writes with something to interest Fire Brigade listeners. He suggests that frequencies published by many with regard to mid v.h.f. band are link frequencies. That is, only those directly under the link will hear anything as it is a point to point system. Far better, it is suggested, to listen to frequencies within the 70MHz allocation, which is a basic relay. P also identifies the frequency of 251.625 as coming from the Trimmingham and Bawtry frequency published by London Mill East. Also, that LICAO changes may well take a little while to come through so you are reminded - if military is your thing - to listen to both new and old frequencies for the time being. P also throws light on some frequencies in the December issue, namely:

313.000 London Mill Dis. Variettes 43.750 Luechars Radar.
122.750 Danger Area Activity (DAAS) - at Crowden, Doncaster. 233.800 Lon Mill Claxton Sector new allocation. Replacement for 224.475 Weather bank. 275.400 Middle Wallop Radar.
122.750 Danger Area Activity (DAAS) - at Crowden, Doncaster. 233.800 Lon Mill Claxton Sector new allocation. Replacement for 224.475 Weather bank.
370.075 Luechars Radar.
262.975 Lon Mill.

The USAF in Europe, by the way, use whatever frequency they can get
However, the new Police and u.h.f. tends to use 25kHz spacing. The lower end of the v.h.f. band, 12.5kHz steps, particularly down to Home Office frequencies are in 5kHz steps to search. Almost all Police call signs - including those of the Met, London, and West York's in f.m. - are in 5kHz steps, as are many Home Office frequencies. Be aware, however, that the change to 25kHz spacing is not universal, and some older Police sets may still use 12.5kHz steps.

71.135 should read 71.1375 - Bucks, Humberside Ch. 1.
71.000 should read 71.1000 - Oxfordshire (NOT Thames Valley) and Hertfordshire, also Lancs Ch. 2 in f.m.
70.760 should read 70.7625 - East Sussex and South Yorkshire.
70.635 should read 70.6375 - East and Dyfed.
70.610 should read 70.6125 - Surrey.
70.585 should read 70.5875 - Essex, Kent, and Cumbria.
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December’s column request for readers to check their own frequencies and call signs. If you have any corrections or additions to the list of frequencies and call signs, please let me know.

That brings me neatly to the end of the piece for this month. Please remember to use the new address at the column masthead for mail. If you write to the old one, no worries. It’ll be forwarded on.

My thanks again to all of the contributors - regular and otherwise. In the meantime, 73s and catch you down the log sometime soon.
Radio Books

The UK Scanning Directory
Lists over 20,000 Spot Frequencies
Here is the book everybody is asking for! Britain's largest and best scanning directory lists over 20,000 Spot Frequencies in 300 plus pages. It covers everything from the Police to your local scrap yard. Its comprehensive coverage and detail continues to amaze readers with its huge listings of Civil and Military Aviation, Maritime, Army, Navy, Stoopers, Police Helicopters, Battleships, Motor Racing, Ambulances, Prison, BR, Taxi Services, Courier Services and a vast amount more. There is no other book like it!
Price £17.50 + £1.00 UK postage. Europe add £2.50.

Shortwave Maritime Communications
It will show you how easy it is to monitor ships receiving instructions from their agent, air sea rescue, how to get out of some difficulty, what supplies are needed, or even a major shipping disaster!
The book is laid out with both the beginner and the well-seasoned maritime radio enthusiast in mind, providing the most accurate and detailed information in an easy-to-use format. The first few chapters show in detail with bandwidths the various communication modes used by ships today, from Morse right through to Inmarsat.
Two mammoth frequency lists give every coastal station worldwide with the shore and corresponding ship's frequency, plus the station's name, mode and callsign (200 pages A4).
Price £16.90 + £1 UK p&p. Overseas Europe post (£4) and sea £1.50 airmail.

Eavesdropping on the British Military
For the very first time a book has been published showing you how to monitor the British military communications. Networks such as the Royal Navy's UKMACCS can be heard as ships report in and receive new orders. Tune into the RAF air defence exercises which involve some of the advanced weaponry, listen into the British Army on their many battlefield and exercise frequencies, or to NATO exercises and heaps more which are in the clear. Giant detailed frequency lists cover the VLF submarine bands through to LF, MF, HF, VHF, UHF and on to Skynet, and includes the largest British military callsign list ever published.
There is no other book like this one!
Price £17.50 + £1.25 UK post. Overseas add £1.50 Europe/sea or £1.50 airmail.

Weather Reports from Radio Sources
Step by step guide to monitoring weather reports from around the world. Written in non technical terms, explains how to understand transmissions and the system with the help of charts and tables. International frequency list includes VOMET and its workings, and time, mode and location. Tune into hurricane reports from Miami to African weather bulletins from Brazzaville.
Price £6 incl. UK post. Add £1 for Europe, or £1.50 elsewhere.

Scanner Busters
How to tune into more frequencies and beat new technology
The Police are scrambling their frequencies, trunked radio systems are making it harder to eavesdrop on conversations, and there are more and more strange noises heard on the bands. To overcome this new technology Scanner Busters guides you through the maze, showing you how to deal with the systems, and to tune into what you really want to hear. In simple terms it explains the workings of PMR, digital telephones, spread spectrum, frequency hopping, encryption systems and the Emergency Services. It will be of great help to new and old scanner owners who want to get more from their equipment.
Price £4.95 incl. UK post. Overseas post add £1 Europe/sea or £1.50.

Audio Guide to the sounds of Shortwave
Over 30 of the most commonly heard transmissions sounds on SW including RTTY, CW, SITOR, FAX, encryption systems, etc. which will help to identify and decode many more transmissions.
Price £4.95 incl. UK post. Overseas airmail + £1.

The UK Scanning Directory
Interception Numbers Stations...£9.95
International Callsign Handbook...£18.50
Monitoring Yugoslav Conflict...£4.95
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...Global Positioning Systems...
On a damp, mid-December morning, while watching NOAA-12 deliver a miserable image scenario of cold estuaries on my computer, I received a call from Gordon Griffin from New South Wales in Australia, telling me that his air conditioning unit was helping him to keep pleasantly cool in the heat-wave! Gordon told me that there are many interested followers of WXSAT operations in Australia, and looking at recent bulletins from NASA, I know that the country has an active commitment to space activities. Even amateur groups are active in the field of rocket launches, as readers may recall reading in this column some months ago. Gordon’s associates are developing software and he has promised to send me a copy for checking out.

Current WXSATs

The GIO WXSAT METEOR 3-5 has continued normal operations, transmitting visible-light only, on 137.6MHz. During December it made south-bound passes over Britain during the day, so we heard the sudden start of transmissions triggered by sunlight. Those readers who may have only recently started monitoring the WXSATs can hear this happen quite dramatically by watching the satellite’s footprint on a computer, using a suitable satellite predictions program. Within seconds of the METEORs entering sunlight, the a.p.t. comes on and the scanner springs to life.

The two NOAA WXSATs (12 and 14) show just how low the level of daylight illumination is during northern winter. Even without a WXSAT receiver, using a conventional radio scanner tuned to 137.62MHz for NOAA-14 around mid-day, one can hear the satellite transmitting the a.p.t. (picture as it travels northbound over Britain. As it approaches more northerly latitudes (near Scotland) its sound changes dramatically when the under-illuminated visible-light sensor information is replaced by an infra-red image.

The content of the latter gives a higher frequency component to the a.p.t. sub-carrier and this is easily heard, even by an untrained ear! Those who have never tuned to the WXSATs might care to try this any day of the week.

METEOSAT - 1691 and 1694.5MHz

There are now two METEOSAT spacecraft in operation: METEOSAT-5 (the currently operational WXSAT) and METEOSAT-6 (the backup or standby satellite). From time to time the latter is operated to test additional software necessary to correct for an on-board image anomaly. These test transmissions are those that can cause some interference to transmissions from METEOSAT-5 to those WEFAX users using small dishes.

Two previous satellites in the series, METEOSATS-3 and 4 were removed from geostationary orbit in November, having come to the end of their operational lives. Removal is done using thrusters to raise the height to what is called a ‘graveyard’ orbit, where old, former geostationary satellites can be ‘parked’ so that they do not physically obstruct active satellites.

Other Geostationary

Changes

The American GOES (Geostationary Operational Environmental Satellite) WXSATs are also involved in the changing WXSAT scene. The GOES-9 spacecraft has been drifting toward its next operational position at 136°W (GOES-W), moving a little under one degree per day, and scheduled to arrive on station on January 22. GOES-7 is expected to be switched off around 11 January, as GOES-9 approaches. Routine GOES-9 WEFAX operations are not expected to begin until mid-January. Here in Britain we cannot receive direct images from GOES-9. My thanks to Jamison Hawkins, GOES Product Manager at NOAA/NESDIS, for this information.

EUMETSAT

A new era started in early December when EUMETSAT took responsibility for the operation of the METEOSATs from ESA’s European Operations Control Centre. Hand-over was marked by a ceremony held in the new headquarters of EUMETSAT in Darmstadt, when the Director General of ESA, the chairman of EUMETSAT Council, its Director and ESA’s Director of Operations, introduced one of the most advanced meteorological satellite ground systems in the world. This new system enables EUMETSAT to concentrate on meteorological satellite operations, while ESA continues the operation of ESA’s scientific and development programme satellites.

The EUMETSAT Council decided in 1990 that a new ground segment should be developed for METEOSAT. The new team was given intensive in-house training on the system throughout the summer in readiness for the hand-over. Some of the staff and contractors were previously employed operating the METEOSAT ground segment at ESOC where many techniques of meteorological satellite control and data processing were pioneered. ESOC is the satellite control centre of ESA, and has controlled over 30 ESA satellites and operated 14 satellites for national agencies. Thanks to advanced modern technology, it can control over 15 satellites simultaneously. The EUMETSAT ground segment is based on a central facility in Darmstadt with other major components, such as the primary ground station based in Fucino, Italy, and its back-up in Weilheim in Southern Germany.

My thanks to Gordon Bridge, the METEOSAT Programme Manager, for this information.

Readers’ Letters and Pictures

Correspondent, Des Thompson G8SBU of Exmouth, told me about his role at RAE (Farnborough) in the Space Department, where he supervises the destruction of ‘break-up units’ and explosive bolts for the Black Knight (a British rocket developed during the 1960s, then abandoned) and other projects. All re-entry heads were recovered at Woomera (Australia) for return to RAE for tests and evaluation. Des told me that Woomera was unique, having a 1700 mile range, the retrieving of re-entry rocket items being possible, rather than these items being lost at sea - as was usual at other ranges.

Lester Jones of West Kirby monitored hurricane Felix during summer last year and sent several images on disk, collected from METEOSAT-5’s re-transmissions of GOES-E images, Fig. 1 shows the hurricane when off the east coast of the USA. Kurt Feller sent me a disk containing a dramatic image - see Fig. 2 - showing a NOAA picture of Europe with sun-glint catching a series of rivers and lakes. The original image was rather dark because of the conditions, so I have enhanced it for the sake of clarity in this publication. Sun-glint is a feature of spring and autumn WXSAT images, where the sun is reflected off water surfaces into the satellite sensors.

Dr Martin van Duinen sent several excellent pictures from Holland where he monitors both a.p.t. and h.r.p.t. from the NOAAs. He uses a Hansen h.r.p.t. system, about which I am afraid I have no information. Martin kindly sent a selection of image printouts from which I just had to include Fig. 3, a NOAA-10 (note that!) high resolution picture of Scotland taken on July 25. Also included were several OKEAN and SICHER images, prompting Martin to ask how one might differentiate...
between images from the two C1S oceanographic satellites. I would suggest that the first method involves correlating the times of passes using a good satellite predictions program; these are regularly mentioned in this column (my favourite being PCTrack). Using current Kepler elements, identification in real-time is then obvious. Identification of recorded data requires more planning! If the image includes a 'time' indicator (the numbers sometimes included in the telemetry) then these can be decoded - I shall cover that on another occasion.

A further method requires identification of the scene and a comparison of the tracks covered by the two satellites. Both appear to be able to provide similar picture content, whether visible, radar or microwave, or some combination, so the time of data acquisition is important for satellite confirmation. Another picture from Martin will be included in a future edition.

Another European reader, Peter Schoen of Germany, has sent high resolution pictures taken with his h.r.p.t. system. How excellent they are! His antenna is located in the back yard, surrounded with houses, so that data reception starts at about 10° elevation, though Peter comments that this also acts as a windbreak, enabling him to track during strong winds. He tracks the dish manually. Like Martin, Peter's results are superb - see Fig. 4 that shows my neck of the woods - so I shall include further pictures in a future edition. He also has an a.p.t. system, fed by a crystal-type receiver, and decoded and enhanced using the JVFAX software.

Pictures for Beginners
Several correspondents, including B. Parylo of West Yorkshire, have enquired about the possibility of obtaining some images on disk in order to see what is currently obtainable from the different WXSATs. I am putting together a selection of images on to a standard HD 3.5in disk. If any reader would like a copy, please send an HD (1.44MB) disk, together with an s.a.e. and 50p coin (or equivalent), and I shall send it by return. If you also need a display program, I can provide one - for the PC only I'm afraid.

WARC 1995 - WXSAT Frequencies
A previous edition of 'Info' mentioned the meeting known as WRC-95 (World Radio Conference -1995), concerning the allocation of radio frequencies to satellite operations, that could have all but destroyed the meteorological facilities used by the 137 and 1690MHz bands.

Three major WX SAT issues were dealt with at the WRC:
- A Brazilian proposal to expand use of the 137-138MHz a.p.t. band by eliminating the protection WX SATs have in part of the band;
- A US proposal to introduce other utilities into the 401-404MHz band, used by data collection platforms (DCPs) transmitting to ARGOS, GOES and other WX SATs;
- Brazilian and Canadian proposals to eliminate the interim protection given to WX SATs in the 1675-1710MHz band until compatibility studies are complete. This last band is used by both h.r.p.t. and WEFAX.

The result: all three proposals failed. The 137MHz proposal was withdrawn after being widely criticised by other delegations. For the 1675-1710MHz proposals, the ITU (International Telecommunications Union) was asked to study the matter with a view to action being taken at WRC-97 (the next meeting). My thanks to Rick Emerson for providing access to this information.

NOAA-K Launch Date
I monitor the published launch dates for future satellites using a number of sources on the Internet. Occasionally these dates are inconsistent, as recently happened with dates given for the launch of NOAA-K. Enquiries brought further information from Jonathan Smith of the Satellite Sounding Group at the Meteorological Office, in Bracknell. A recent NESDIS Polar Orbiting Environmental Satellite weekly report gave the launch date as 1 August 1996, or rather, that this is 'the revised overall launch readiness date for NOAA-K'. Other sources, such as the Space Calendar, give 29 December 1995 - hence my enquiry. Much depends on the status of NOAAs 12 and 14. NOAA-K could be launched as early as 1 April, but expect the launch to be later than that.

Future Launches
For readers who are interested in having advance information on launches, those currently scheduled include the following:
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A letter from G. Bickerton of Northumberland responds to a previous request in this column for information about space-related software for the Amiga computer. He refers to the Amiga Amateur Radio User Group; write to: Bob Francis, GOLB13, 120 Cranes Park Road, Sheldon, Birmingham B26 3ST.

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Many readers have enquired about Shuttle monitoring; Peter Wade and Richard Keen are two of several who have successfully achieved this. Not all Shuttle passes come over Britain, but when they do, Richard suggests that for direct reception you try 145.6MHz during a pass, particularly when there are amateur radio operators on board.

Kepler Elements - MIR & Shuttle
Different options are available:
1: For a print-out (A5 size) of the latest WX SAT elements, the Shuttle and MIR, send an s.a.e. and 25p coin or separate, extra stamp. Transmission frequencies are given when operating. This data originates from NASA and is totally up-to-date.
2: I send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (plus four self-addressed, stamped envelopes) for four editions.
3: You can have a computer disk file containing current elements for the WX SATs, and a large ASCII file containing current elements for the Shuttle and MIR, send in an s.a.e. and 25p coin or separate, extra stamp. Transmission frequencies are given when operating. This data originates from NASA and is totally up-to-date.

Mike Gibson wrote from Satish to tell me of his success monitoring transmissions of the Shuttle Columbia, relayed from WA3NAN. He found the frequency 14.298MHz (20m band) to be useful, and also monitored Atlantis during its link with MIR, using the same frequency. Leif Lindeskov also reports hearing the Shuttle on this frequency 'a few times every day' from home in Denmark. Following many requests from readers, an extra page has been added to the Shuttle pack collection. It now includes a total of eight sides of A4 giving the entire Shuttle manifest - up to the last currently scheduled launch on 4 December 2003, and includes a summary of the abbreviations used in the official manifest. A list of all known Shuttle re-transmission frequencies used by amateur stations throughout the world is given, as well as the actual frequencies used by the Shuttle itself, and many of those used for NASA and USAF projects. FAQ (frequently asked questions) on monitoring the Shuttle is included, and finally, by popular request, notes on how to obtain NASA Causeway passes to watch a Shuttle launch.

Two years ago C. Wileman of Bideford enquired of the Kennedy Space Centre and obtained the launch pass to watch a Shuttle launch. He describes it as an experience he will never forget. This launch pass was provided by Australian folk to whom credit is given in the pack. Two colour graphics are included and one or two may be added. Please enclose at least 50p as well as an s.a.e. when requesting this pack.

WXSATs have in part of the band; although Peter comments that this also acts as a wind break, enabling him to track during strong winds. He tracks the dish manually. Like Martin, Peter’s results are superb - see Fig. 4 that shows my neck of the woods - so I shall include further pictures in a future edition. He also has an a.p.t. system, fed by a crystal-type receiver, and decoded and enhanced using the JVFAX software.

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The real problem comes when you try to feed the recovered signal into two 3.5mm sockets. One of these sockets comprises a 3.5mm jack that splits systems provide slant correction. This image has been received.

In a few cases you may find that the output level from the tape or line output of your receiver may be too low for your decoder. You will then have to use the external speaker or headphone connection. This has two disadvantages:

a) It usually cuts off the internal speaker and
b) You need to carefully set the volume control level.

The first problem can at least be partly overcome by using what’s known as a “Y” connector. This comprises a 3.5mm jack that splits into two 3.5mm sockets. One of these can be used to connect your decoder whilst the other can be used to feed an external speaker. If you still want to be able to separately control the speaker volume you could either use a speaker with a built-in volume control or fit a simple volume control yourself.

Andrew Cooke of Grimsby also has a few problems getting started. He is concerned about interference and wonders if it would be possible to record RTTY signals as a WAV file for later playback into HAMCOMM or similar decoding packages. Whilst it is feasible to record audio on hard disk you would have to pick a sampling rate that provides a compromise between record quality and available disk space. The real problem comes when you try to feed the recovered signal into HAMCOMM as you won’t be able to run your playback software and HAMCOMM at the same time! The only solution would be two.

If you’re also thinking of using the ScanMate from transmission you will also need a VLab video digitiser.

The current prices for the ScanMate are DEM448 for a single transceiver version, DEM568 for three transceivers or DEM688 for the three transceiver version plus an a.m. option for satellite reception.

For more details contact MSoft via Michael Strecke, Brabanter STR.5, D-50674 Cologne, Germany.

Korean News

Brian Webb in Thousand Oaks California has sent in a good press photo that he received from KCNA Pyongyang in North Korea on December 1st at around midnight. The station callsign was HMF52 and the operating frequency was 11.4781 MHz with an IQC of 288 and 60 r.p.m. drum speed. Can anyone explain the photo - it looks very old, but was probably taken recently.

Balanced Interface

One of the many interference cues to pass through this column is the use of a microphone transformer to isolate the receiver from the computer. An alternative system that will help reduce what’s known as common mode interference is to employ a balanced feed between the receiver and computer. This system may well be particularly beneficial for those who are using portable receivers for monitoring.

Gordon West

of Olney has written this month with just such a suggestion. His design, see Fig. 1, uses the balanced input of a 741 Op-Amp to create a new interface. As you can see the circuit is very simple and Gordon has built the prototype on a small piece of Veroboard that is mounted inside the 25-way D-type connector. You may be able to further improve the design with a faster op-amp such as the popular LF-351. If you have any neat interface designs please drop me a line with the details.

Demon ROMPS

Yes I’m afraid there’s yet another buzz word for Internet users. Demon Internet are one of the major UK suppliers of Internet services to the general public and have built-up a substantial network. However, they have in the past been criticised for network overload and not providing local call access throughout the UK. Demon have now tackled both these problems through a new link-up with Mercury Communications.

Whilst their earlier network was supplied through Energis it soon became clear that Energis would not be able to expand their network fast enough to meet demands from Demon customers. It was this that triggered Demon to supplement their network with links into the Mercury network. At the same time they have chosen to move away from the term vPoPs (virtual Points of Presence) to ROMPS (Regionally Organised Modern Pool).

At the time of writing there were three active ROMPS serving various regions of the country. However, the important point about ROMPS is that they provide access to the Demon network at local call rates rather than from the UK. This provides a significant cost saving for users, especially if you time your calls to take advantage of BT’s 1p per minute Weekend Rate. For more information of local access numbers, contact Demon at URL http://www.demon.co.uk/dispat ches Alternatively you can phone Demon on 0181-371 1000.

Shareware CD-ROM

Although I don’t usually mention general computer software in this column, a recently received CD-ROM warrants mention. In the past couple of years I’ve looked at lots...
of shareware CD-ROMs packed with potentially useful programs and data. However, I usually find that there is very little information supplied regarding what the various programs are supposed to do. The only option being to waste lots of time installing them to check them out. Not so with the Best of British CD-ROM supplied by The Thompson Partnership.

This CD contains a host of useful programs, including the GeoClock grey-line predictor. What sets this apart from the rest is the excellent browser that lets you scan through the available programs, view screen shots and read comments on the programs function and system requirements. Where the program could be run from the CD there was a software button provided to do this. If you decided you liked the program another button click started an automatic installation process. Overall an excellent collection of software very well presented. Just to complete the picture the CD-ROM costs just £5.00 plus VAT and is available from The Thompson Partnership, Lion Buildings, Market Place, Uttoxeter ST14 1HZ. My thanks to Steve Townsley for supplying the review copy.

Klingenfuss News

This month sees two new releases from Klingenfuss Publications - The 1996 Guide To Utility Stations and the 1996 Super Frequency List CD-ROM. Although the unfavourable exchange rates have hit the UK prices quite badly the Guide to Utility Stations remains the definitive and most up-to-date guide available. The latest version follows a very similar format to its predecessors, but with a few very worthwhile improvements.

The most noticeable change is the use of a much denser printing ink that makes the text very much easier to read. The review copy also appeared to have an improved binding that will go a long way to improve the life of these much used reference books. As far as the content goes, all the regular sections remained, including the popular FAQ and press schedules.

1996 Super Frequency List.

The 1996 Super Frequency List on CD-ROM is much improved over last year's version. Gone is the restrictive frequency viewing and you can now browse a whole screen full at a time. You also have a wide range of search facilities so you can seek countries, frequencies, stations, languages, callsigns, times and modulation systems. For a CD-based system with no files downloaded to your hard disk the search and retrieval time were very good. Of course this can be improved still further if you have a high speed CD-ROM drive.

In addition to containing some 14500 frequencies from the Guide to Utility Stations the disk features 3000 entries for international short wave broadcasting services, 1000 abbreviations and 12820 formerly active utility frequencies. Although I would still like to see the software enhanced to facilitate the downloading of frequencies into the receiver, the current offering is very useful. The disk is only available for PCs running Windows 3.1 or later. For more information on these publications contact the SWM Book Store.

NAVTEX Listings

This listing is a compilation of all the stations known to be assigned to alphabetic identifiers. Many of the stations that are used in the UK stations may well be receivable in the UK. My thanks to Day Watson for compiling the data.

Readers Special Offers

Here's the latest list of reader's special offers. Whilst I do my best to return orders promptly, please allow up to two weeks for delivery.

IBM PC Software (1.44MB disks):

Disk 1 (Order Code DK1) - JV FAX 7.0, HAMCOMM 3.0 and WE FAX 3.1
Disk 2 (Order Code DK2) - DSP Starter plus Texas device selection software.
Disk 3 (Order Code DK3) - Ultrakap 4.0 and NuMorse
Disk 4 (Order Code DK4) - MScom 1.3 and 2.0

Printed Literature:

Beginners Utility Frequency List (Order Code BL)
Complex Signals Utility Frequency List (Order Code AL)
Decode Utility Frequency List (Order Code DL)

FactPack 1 Solving Computer Interference Problems (Order Code FP1)
FactPack 2 Decoding Accessories (Order Code FP2)
FactPack 3 Starting Utility Decoding (Order Code FP3)
FactPack 4 JV FAX and HAMCOMM Primer (Order Code FP4)
FactPack 5 On the Air with JV FAX and HAMCOMM (Order Code FP5)
FactPack 6 Internet Starter (Order Code FP6)

For the printed literature just send a self-addressed sticky label plus 50p per item (£1.00 for four, £2.50 for 7 and £3.00 for 9). For software send £1.00 per disk (£1.75 for 2, £2.50 for 3 or £3.00 for all 4) and a self-addressed sticky label (don't forget I provide the disk!).

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FAX received by Brian Webb.

Varna, Bulg.
Kerkya, Gr.
Boston, Mass. USA
Rogaland, Nor.
Limnos, Gr.
Cyprus
Casablanca, Mor.
Ismaila, Egypt
Portsmouth, USA
Portpatrick, Scot. UK
Malta
St. John's, NS. Can.
Netherlands CG, Neth.
Haifa, Isrl. [Planned]
Split, Croatia.
Sydney, NS. Can.
Reykjavik, Ice.
Monsanto, Port.
Varna, Bulg.
Yarmouth, NS. Can.
Staysnais, Swed.
Cagliari, Sardina.
Oostende, Belg.
Kirkby, Gr.
Monsanto, Port.
Cyprus
Boston, Mass. USA

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<td>A</td>
<td>CROSS Corns(Brest), Fr.</td>
<td>A</td>
<td>Miami, Fl. USA</td>
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<tr>
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<td>B</td>
<td>Bermuda</td>
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<td>Murmansk, Russ.</td>
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<td>F</td>
<td>Herta, Azores</td>
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</tr>
<tr>
<td>G</td>
<td>Antalya, Turk.</td>
<td>G</td>
<td>[Not approved by IMO]</td>
<td></td>
</tr>
<tr>
<td>H</td>
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<td>H</td>
<td>Bjurbrockub, Swed.</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Iraklion, Crete.</td>
<td>I</td>
<td>Izmir, Turk.</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Palma, Canaries</td>
<td>J</td>
<td>Las Palmas, Canaries</td>
<td></td>
</tr>
</tbody>
</table>

JVFAX and HAMCOMM Primer (Order Code FP4)
FactPack 5 On the Air with JVFAX and HAMCOMM (Order Code FP5)
FactPack 6 Internet Starter (Order Code FP6)

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FAX received by Brian Webb.

Varna, Bulg.
Kerkya, Gr.
Boston, Mass. USA
Rogaland, Nor.
Limnos, Gr.
Cyprus
Casablanca, Mor.
Ismaila, Egypt
Portsmouth, USA
Portpatrick, Scot. UK
Malta
St. John's, NS. Can.
Netherlands CG, Neth.
Haifa, Isrl. [Planned]
Split, Croatia.
Sydney, NS. Can.
Reykjavik, Ice.
Monsanto, Port.
Varna, Bulg.
Yarmouth, NS. Can.
Staysnais, Swed.
Cagliari, Sardina.
Oostende, Belg.
Kirkby, Gr.
Monsanto, Port.
Cyprus
Boston, Mass. USA

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<th>ID</th>
<th>Station</th>
<th>Callsign</th>
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<th>City</th>
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<td>CROSS Corns(Brest), Fr.</td>
<td>A</td>
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FAX received by Brian Webb.
Hello and welcome to the first Short Wave Magazine quarterly radio and computing column. Let me begin by apologising to all those who decry the inclusion of computers in their favourite magazine. To them I'd like to say that this column isn't devoted to the waxing and waning of the computer industry -- the high street newssheets are full to bursting with magazines offering just that, and I heartily sympathise and agree with your objections.

What the column is about, are the issues which arise from the ever-deepening relationship between radio and computers and, specifically, about how a machine in the shack can help you to get the most from your hobby. In coming instalments I hope to review useful software and hardware, detail home-brew add-ons, explain how to access bulletin boards, the Internet and much more.

But let's start by setting the scene with a run down of what makes up my computer collection: an O40 Apple Mac, a 386 PC, an Atari ST, Archimedes A3000, and an Atari 8-bit, a Spectrum and Amstrad CPC (as well as other more obscure 8-bits such as the Oric 1, Atmos, and Dragon), several laptops including the Tandy 102 and Palmtops including the Palcom Series 3 and Atari Portfolio. Is there anything among that lot you feel special affection for? Write and tell me about it.

My station consists of a Lowe HF-225, Sangean ATS-803A, an ancient Heathkit SW717, Vega VHF-208 (plus other Russians), AOR AR1500, and a kit-built WXSAT receiver. A number of random wire antennas in a variety of locations around the garden give good service and they're routed through a home-brew a.t.u. that gives minimal selectivity but helps enormously with all the electrical noise from the computers! I'm afraid I'm a bit of a Jack-of-all-trades when it comes to listening, and monitor everything from the broadcast bands to w.h.f.u.h.f. scanning, with data modes decoding, weather satellite monitoring and maritime beacons included in between. DCF77 is my all-time favourite utility station, and the commonplace but comforting Kremlin chimes my favourite sound on the broadcast bands.

Alternative Approach?

For many, the IBM PC and compatible is the computer of choice for the shack (and wisely so, given its level support), but there are lots of other machines -- many available for just a few pounds at boot sales and the like, which can be used to good effect. I hope that this column will become a forum for those who -- like me -- derive a lot of fun from keeping 'obsolete' alternative micros in the front line, or who want to acquire a computer for basic tasks around the shack without spending a lot of money. I have a special affection for the excellent Atari 8-bit machines, and impossible -- especially if they own a Mac, Atari ST, Archimedes or the like. That's why I'd like to start a 'software exchange' scheme that will make available items of hard to find public domain and shareware software.

There'll be no charge for this service short of basic disk (or cassette!), postage and packaging costs. Alternatively, a blank formatted disk and an s.a.e., and the service will be entirely free.

What is required however, is software. That is, if you've tracked down a particularly rare shareware artifact you can offer exchange for the Commodore 64 and BBC B were also well supported, and there are others such as the CF/M-capable Amstrad CPC and PCW range which everything from OGL databases to Yagi calculators can be found.

Ironically, the ultimate in alternative computing is probably an early example of what's popular today. My own 386 PC for example, is powerful enough for all kinds of useful work. It's a PS/2 machine complete with poorly-supported MCA expansion slots, but it cost just £35! The machine has 2Mb of RAM, VGA graphics, mouse port and so on. It runs JVFAX and Hamcom (including the latter's 'scope and tuning functions) like a dream.

If your wad stretches to a Pentium-based machine, fine, but a no-frills shack workhorse will cost tens rather than thousands of pounds and reward you with competent performance. So while news and reviews of the very latest in radio-related hard and software for the Mac and IBM PC are very important, there'll be space here for the old 'uns.

Software exchange

Tracking down radio-oriented software is difficult enough for even devoted computer enthusiasts with IBM PCs -- for those to whom computing is a secondary pursuit the task is often

And Finally...

While I own around 30 computers from almost as many manufacturers, I can't claim to be expert with all of them. If you feel able to offer help, or have a selection of radio-oriented hints and tips, particularly for the more obscure machines, why not share them with the rest of us? Drop me a line, your input will be greatly appreciated.

Until next time, good listening.
Long Wave Reports

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

Broadcasters are reluctant to respond confirmation (QSL) by card or letter. In return they received
opinion of their programme(s) as well as an honest SINPO rating.

From the TRT 2000kW outlet at Polatli, Simon Hockenhull (E.Bristol) used
The transmitter at Saarlouis, Germany
s.w. in MHz; lime in UTC (=GMT).

He heard a faint foreign language
transmission, which may have come from the TRT 2000kW outlet at Polatli, Turkey.

While checking the band at 2200UTC on November 10 Fred Pallant (Storrington) picked up a broadcast in Italian from
Radiotelevisione Italiana (RAI) via its 10kW outlet at Catanzaro, Italy on 189. He rated the transmission
SINPO 23342. The sky waves from that station were also received after dark by Paul Bowyer in Burnham-on-Crouch.

Unusual conditions were sometimes present during daylight and reception was then exceptionally good. George Millmore (Wotton, loW) was surprised by the strength of some signals he received at 1015 on November 23. His report of Cash Radio on 270 was a potent SINPO 55555, Raszyn, Poland 1018 was SINPO 4444 and Minsk, Belarus 279 was SINPO 3333. An unidentified transmission under R.Monte Carlo via Roumoules on 216 was heard during daylight by Simon Hockenhull.

Medium Wave Reports

During November a dramatic improvement in the propagation at night of m.w. transmissions over
transatlantic paths was evident. Favable periods reception from
wireless listeners have sent
reports on reception to
'A wireless' listeners have sent
reports on reception to
Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

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L.S.S.

S
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'wireless' listeners have sent
reports on reception to
Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

L.M.S.W.

Long, Medium and Short Waves

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

Long Wave Chart

<table>
<thead>
<tr>
<th>Freq (kHz)</th>
<th>Station</th>
<th>Country</th>
<th>Power (kW)</th>
<th>Listener</th>
</tr>
</thead>
<tbody>
<tr>
<td>117</td>
<td>Berlin</td>
<td>Germany</td>
<td>200</td>
<td>A</td>
</tr>
<tr>
<td>124</td>
<td>Berlin</td>
<td>Germany</td>
<td>150</td>
<td>B</td>
</tr>
<tr>
<td>171</td>
<td>R.C.C.</td>
<td>Mexico</td>
<td>200</td>
<td>C</td>
</tr>
<tr>
<td>177</td>
<td>Leipzig</td>
<td>Germany</td>
<td>200</td>
<td>D</td>
</tr>
<tr>
<td>211</td>
<td>Munich</td>
<td>Germany</td>
<td>150</td>
<td>E</td>
</tr>
<tr>
<td>252</td>
<td>Cork</td>
<td>Ireland</td>
<td>50</td>
<td>F</td>
</tr>
<tr>
<td>315</td>
<td>Manila</td>
<td>Philippines</td>
<td>200</td>
<td>G</td>
</tr>
<tr>
<td>351</td>
<td>Tokyo</td>
<td>Japan</td>
<td>150</td>
<td>H</td>
</tr>
<tr>
<td>740</td>
<td>London</td>
<td>UK</td>
<td>150</td>
<td>I</td>
</tr>
</tbody>
</table>

Note: Entries marked "w" were logged during darkness. All other entries were logged during daylight or as dawn/dusk.

Long-Wave Listeners:
(1) Ted Greaves, Bochum, Germany
(2) Ted Harris, Manchester
(3) Simon Hockenhull, Bristol

Short-Wave Listeners:
(1) Sheila Hughes, Maidenhead
(2) Iain McKinnon, Wotton
(3) Tony Smith, 8th Avenue
(4) Andrew Stokes, Lanchester

George Millmore, Wootton, loW.

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

Short Wave Magazine, February 1996
<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Station</th>
<th>Country</th>
<th>Power (kW)</th>
<th>Listener</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Radio Bremen (BR)</td>
<td>Germany</td>
<td>0.3</td>
<td>K*</td>
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<tr>
<td>873</td>
<td>COPE via?</td>
<td>Spain</td>
<td>3</td>
<td></td>
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<tr>
<td>855</td>
<td>Rome</td>
<td>Italy</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>846</td>
<td>Batra</td>
<td>Egypt</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>837</td>
<td>Cairo</td>
<td>Egypt</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>828</td>
<td>Naples</td>
<td>Italy</td>
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<td></td>
</tr>
<tr>
<td>783</td>
<td>Burg</td>
<td>France</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>774</td>
<td>Tullamore (RTE1)</td>
<td>Ireland (N)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>756</td>
<td>Paris</td>
<td>France</td>
<td>3</td>
<td></td>
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<tr>
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<td>Batavia</td>
<td>Netherlands</td>
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<tr>
<td>699</td>
<td>Kaduna (NIG)</td>
<td>Nigeria</td>
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<td>675</td>
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<td>Ireland (N)</td>
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<td>Radio RNE1</td>
<td>Spain</td>
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<td>637</td>
<td>Radio RNE1 via?</td>
<td>Spain</td>
<td>3</td>
<td></td>
</tr>
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<td>621</td>
<td>Napoli Italy</td>
<td>Italy</td>
<td>3</td>
<td></td>
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<tr>
<td>603</td>
<td>Bosnia and Herzegovina via?</td>
<td>Yugoslavia</td>
<td>3</td>
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<td>576</td>
<td>Radio RNE1</td>
<td>Spain</td>
<td>3</td>
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<td>566</td>
<td>Tullamore (RTE1)</td>
<td>Ireland (N)</td>
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<td>Nice</td>
<td>France</td>
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<td>551</td>
<td>Tarragona</td>
<td>Spain</td>
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<td>531</td>
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<td>Spain</td>
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<td>Radio RNE1 via?</td>
<td>Spain</td>
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<td></td>
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<td>496</td>
<td>Nice</td>
<td>France</td>
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<td></td>
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<td>Spain</td>
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<td>475</td>
<td>Falun</td>
<td>Sweden</td>
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<td>472</td>
<td>Radio RNE1</td>
<td>Spain</td>
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<td>408</td>
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<td>Spain</td>
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</tr>
</tbody>
</table>

Note: Entries marked * were logged during daylight hours. Entries marked ** were logged during daylight or at dusk/vawn.
### Local Radio Chart

#### Frequency, Station, Location, and Listener Information

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Station</th>
<th>Listener</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>764</td>
<td>Radio London</td>
<td></td>
<td></td>
</tr>
<tr>
<td>850</td>
<td>Radio London</td>
<td></td>
<td></td>
</tr>
<tr>
<td>950</td>
<td>Radio London</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1050</td>
<td>Radio London</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1150</td>
<td>Radio London</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Transatlantic DX Chart

#### Transatlantic DX Chart

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Station (Station Call)</th>
<th>Location</th>
<th>Power (kW)</th>
<th>Time (UTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>660</td>
<td>WFKX</td>
<td>New York</td>
<td>0.031</td>
<td>1432</td>
</tr>
<tr>
<td>770</td>
<td>WABC</td>
<td>New York</td>
<td>0.300</td>
<td>1432</td>
</tr>
<tr>
<td>860</td>
<td>WRCA</td>
<td>New York</td>
<td>0.300</td>
<td>1432</td>
</tr>
<tr>
<td>950</td>
<td>WNBC</td>
<td>New York</td>
<td>0.300</td>
<td>1432</td>
</tr>
<tr>
<td>1050</td>
<td>WBAL</td>
<td>New York</td>
<td>0.300</td>
<td>1432</td>
</tr>
<tr>
<td>1150</td>
<td>WJZ</td>
<td>New York</td>
<td>0.300</td>
<td>1432</td>
</tr>
</tbody>
</table>

### Note

Listeners: (A) Paul Rowley, Burundi; (B) Robert Connolly, Kilkeel; (C) Tony Harvey, LGBT+ Rights; (D) Francis Hearne, while in W.W.London.; (E) Simon Harvey, Belfast; (F) Sheila Hughes, Morocco; (G) Rhodri Morgan, Caernarfon; (H) Ross Leeley, Shetland; (I) George McAnally, Southend, bef. (J) Roy Fanklyn, Derby; (K) Tom Smith, Caernarfon. (L) Andrew Stokes, Liskeard.

During the afternoon, WYFR via VOFIC Taipei, Taiwan 11.560 Eng to India 1300-1500 W4444 at 1330 in Rugby; Polish R, Warsaw 11.815 (Eng to Europe 1300-1500) 54444 at 1330 in Rison-Ray; Voice of Vietnam, Hanoi 12.020 Eng to F.East 1300-1400 52233 at 1330 in Newry; Voice of the Mediterranean via Cyprus, Malta 11.925 (Eng. to Air N.Africa 1400-1600) 54544 at 1425 in Herstmonceux; R.Australia via Carmenov 11.660 (Eng to S.Africa 1430-1600) 53444 at 1430 in Edinburgh; Freshwater Bay; R.Jordan via Al Karanah 11.970 (Eng 1500-1700) 54444 at 1530 in Gaeta; Greece 11.640 (Eng to Air 1600-1800) 44444 at 1600 in Morden; RCI via Suffolk, UK 11.935 (Eng. to Air, Europe 1400-1600) 34232 at 1620 in Bridgwater; R.Pakistan, Ismailabad 11.570 (Eng. to Air 1600-1800) 44444 at 1620 in Norwich. Later, the BBC via Kanji.

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Station (Station Call)</th>
<th>Listener</th>
<th>Location</th>
<th>Power (kW)</th>
<th>Time (UTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>660</td>
<td>WFKX</td>
<td>New York</td>
<td>0.031</td>
<td>1432</td>
<td></td>
</tr>
<tr>
<td>770</td>
<td>WABC</td>
<td>New York</td>
<td>0.300</td>
<td>1432</td>
<td></td>
</tr>
<tr>
<td>860</td>
<td>WRCA</td>
<td>New York</td>
<td>0.300</td>
<td>1432</td>
<td></td>
</tr>
<tr>
<td>950</td>
<td>WNBC</td>
<td>New York</td>
<td>0.300</td>
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<td>New York</td>
<td>0.300</td>
<td>1432</td>
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### Note

Listeners: (A) Paul Rowley, Burundi; (B) Robert Connolly, Kilkeel; (C) Tony Harvey, LGBT+ Rights; (D) Francis Hearne, while in W.W.London.; (E) Simon Harvey, Belfast; (F) Sheila Hughes, Morocco; (G) Rhodri Morgan, Caernarfon; (H) Ross Leeley, Shetland; (I) George McAnally, Southend, bef. (J) Roy Fanklyn, Derby; (K) Tom Smith, Caernarfon. (L) Andrew Stokes, Liskeard.

During the afternoon, WYFR via VOFIC Taipei, Taiwan 11.560 Eng to India 1300-1500 W4444 at 1330 in Rugby; Polish R, Warsaw 11.815 (Eng to Europe 1300-1500) 54444 at 1330 in Rison-Ray; Voice of Vietnam, Hanoi 12.020 Eng to F.East 1300-1400 52233 at 1330 in Newry; Voice of the Mediterranean via Cyprus, Malta 11.925 (Eng. to Air N.Africa 1400-1600) 54544 at 1425 in Herstmonceux; R.Australia via Carmenov 11.660 (Eng to S.Africa 1430-1600) 53444 at 1430 in Edinburgh; Freshwater Bay; R.Jordan via Al Karanah 11.970 (Eng 1500-1700) 54444 at 1530 in Gaeta; Greece 11.640 (Eng to Air 1600-1800) 44444 at 1600 in Morden; RCI via Suffolk, UK 11.935 (Eng. to Air, Europe 1400-1600) 34232 at 1620 in Bridgwater; R.Pakistan, Ismailabad 11.570 (Eng. to Air 1600-1800) 44444 at 1620 in Norwich. Later, the BBC via Kanji.

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Station (Station Call)</th>
<th>Listener</th>
<th>Location</th>
<th>Power (kW)</th>
<th>Time (UTC)</th>
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<td>Country</td>
<td>UTC</td>
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<td>E.G.H.</td>
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**Tropical Bands Chart**

- **3.930**
- **3.375**
- **3.335**
- **3.315**
- **3.270**
- **3.260**
- **4.835**
- **4.815**
- **4.770**
- **4.750**
- **4.747**
- **4.035**
- **3.985**
- **3.345**

**China R via SRI**

- **AIR Gorakhpur**
- **AIR Delhi**

**India**

- **SABC Meyerton**
- **S.Africa**

**North Korea**

- **R.Pyongyang**
- **KCBS Wonsan**

**Japan**

- **R.diff TV Burkina**
- **R.Tarma**

**France**

- **FRCN Kaduna**
- **frHuanta 2000**

**Central America**

- **R. DifTropico**
- **Ulan Batar 1**

**South Africa**

- **S.W.Africa**
- **China**
- **Peru**
- **Venezuela**
- **China**
- **Zimbabwe**
- **Brazil**
- **India**
- **Peru**
- **Mali**
- **Indonesia**
- **Swaziland**
- **China**
- **Peru**
- **Bolivia**

**Europe**

- **11700**
- **2005**
- **1718**
- **1950**
- **(K)**

**Asia**

- **1523**
- **1645**
- **1921**
- **1821**
- **(G)**

**Legends:**

- **F,H,K**
- **AD,L,M,P,Q,R,U**
- **C,H,R**
- **A,C,K,M,L,M,RU,W**
- **EG,H,K.R.0**
- **A,E,F**
- **C,F,H**
- **F.H**
- **A.C.1-1,L,M,R**
- **E,R**
- **E,F**
- **C,F,H,U**

For full details and times, please refer to the document.
**Short Wave Magazine, February 1996**
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