shortwave magazine
BRITAIN'S BEST RADIO MAGAZINE
OCTOBER 1997 £2.75

Icom IC-PCR1000

THE JW REVIEW

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JOE CARR ON CLASSIC ANTENNAS

CW FILTER PROJECT - CONCLUDED

UNDERSTANDING WXFAX

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it's arrived !

ALINCO DJ-X10E SCANNER

JUST LOOK AT THESE FEATURES!

- **RECEIVES**
  100kHz - 2000MHz
- **MULTI MODE RECEPTION**
  AM - WFM - NFM - SSB - CW
- **1200 MEMORY CHANNELS**
- **CHANNEL SCOPE SPECTRUM ANALYSER**
  that allows monitoring of 40 channels at a glance
- **CHANNEL SCOPE PEAK SEARCH**
  During searches you can tune in the strongest signal displayed on the channel scope
- **ADVANCED SCANNING FEATURES**
  that allow selection of these types of scanning:

Programmed Scan (up to 10 groups)	*VFO search*
Programmed Memory Scan	*Dual VFO search*
Any Memory Scan	*Band encursion scan*
Mode Scan	*Priority scan*
(not found on many scanners!)	*Any channel ship scan*

- **USER FRIENDLY FEATURES**
  Help messages - Personalised Channel names - Memory cloning - Auto memory write scan - Beginner/Expert Mode - Memory Tune Mode
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  with switchable backlight for easier use at night
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  With auto ON/OFF facility
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  For extended use
- **SQUELCH CONTROL**
  Fully adjustable and switchable squelch control
- **STYLISH CABINET WITH LARGE SPEAKER**
  For clear sound quality
- **A SUPER SENSITIVE RECEIVER**
- **DUAL VFOs**
- **FACILITIES FOR CLONING ANOTHER SET**
- **BUILT IN 24 HOUR CLOCK**
- **DISPLAY - CONTRAST - CONTROL**
- **LOW BATTERY ALARM**
- **SWITCHABLE ATTENUATOR**
- **SELECTABLE CONTROL BEEP TONE**
- **KEYPAD LOCK CONTROL**

DJ X10E includes FREE

- **MAINS DROP IN CHARGER**
  For easy and convenient use
- **NICAD BATTERY PACK**
  4.8V DC 700mAH NiCad battery pack
- **BELT CLIP**
- **CARRYING STRAP**
- **FLEXIBLE LOW PROFILE ANTENNA**

SPECIFICATIONS

Frequency.....100kHz - 2000MHz
Memories.....1200
Scan Speed....25 ch/sec
Scan Steps.....Selectable (50Hz - 500kHz) in 20 fixed steps
Receiver.....Triple Superheterodyne
Dimensions...57(H) x 150(W) x 25.5(D)
Weight.....320g (with EBP-37N Battery pack)

OPTIONAL EXTRAS

EBP-33N....Small size 650mAH NiCad...£39.95
EBP-34N....Long life 1200mAH NiCad...£49.95
ESC-29.....Standard Soft Case.....£7.95
EBC-6.....Mobile Mounting Bracket.....£12.95
EME-6.....Earphone.....£10.95

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£449.95

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SCANNING RECEIVER WITH PANORAMIC DISPLAY

A beautifully engineered radio perfect for home or mobile use. See up to 1MHz of Bandwidth at a glance on the large panoramic display plus full information on the channel being monitored.

- 50 - 904.995MHz
- 100 memories
- 12V or 240V operation with power supply supplied
- Sensitive receiver
- 2W audio output
- 10/12.5/20/25kHz scanning steps
- Price includes power supply

£449.00

YAESU FRG-100

This receiver provides solid coverage from 50kHz to 30MHz with all mode reception of AM, SSB and CW. 50 fully tunable memory channels store frequency, mode and filter selections. The FRG-100 has twin 12 hour and 24 hour programmable clocks with on timer and sleep timer. The set requires 12V DC.

New low price £489 £449
FM option available - add £39

DRAKE SW2

A new low cost receiver from this famous American manufacturer with exceptional sensitivity, selectivity and dynamic range. A ruggedly built radio that is easily transported with optional carrying handle or vehicle mounted for mobile use.

- 100kHz - 30MHz
- AM/SSB
- 100 memories
- Easy tuning
- Selectable Sideband Synchronous detection
- Dual antenna inputs
- Long wire short wave antenna
- 12V DC operation

JRC NRD 345G

A cracking new receiver aimed at the Broadcast and Shortwave listener. JRC build some of the World's finest receivers and this is no exception. Designed to give clarity and interference free reception.

- AM synchronous detector
- Low noise PLL chip
- Wide dynamic range
- Sensitive receiver
- Noise blanker
- RS232 computer I/F
- 100 memories
- Clock/Timer functions
- Supplied complete with AC mains adaptor

YUPITERU MVT 9000 EU

With a range exceeding 2000MHz, a real time bandscope, twin VFO receiver, and a host of other features, this will be Yupiteru's flagship model in 1997!

Note the EU version is especially designated by Yupiteru for the UK and Europe to meet full EMC specifications and is supplied with Yupiteru's own original English handbook.

£395.00

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- All mode - FM, WFM, SSB, CW, AM Receiver
- Newly designed 'BUSY CATCH SCAN'
- Wide band coverage with all mode receive capability (0.5MHz - 1300MHz)
- 1000 memory channels with memory name function
- VSC (Voice Scan Control)
- Full computer access capability
- Auto mode and tuning step for simplified operation
- 4 AA NiCads or 4.5-16V external power supply

YUPITERU MVT 7100 EU

Yupiteru's own EMC version of this popular radio.

- 530kHz-1650MHz
- AM/FM/WFM/SSB/CW
- 1000 Memories
- C/w NiCads & charger

AOR AR8000

Still the **No.1** *seller*

- All mode FM, WFM, SSB, CW, AM
- 500kHz-1900MHz
- Computer control
- Data clone
- 1000 Memories
- C/w NiCads & charger

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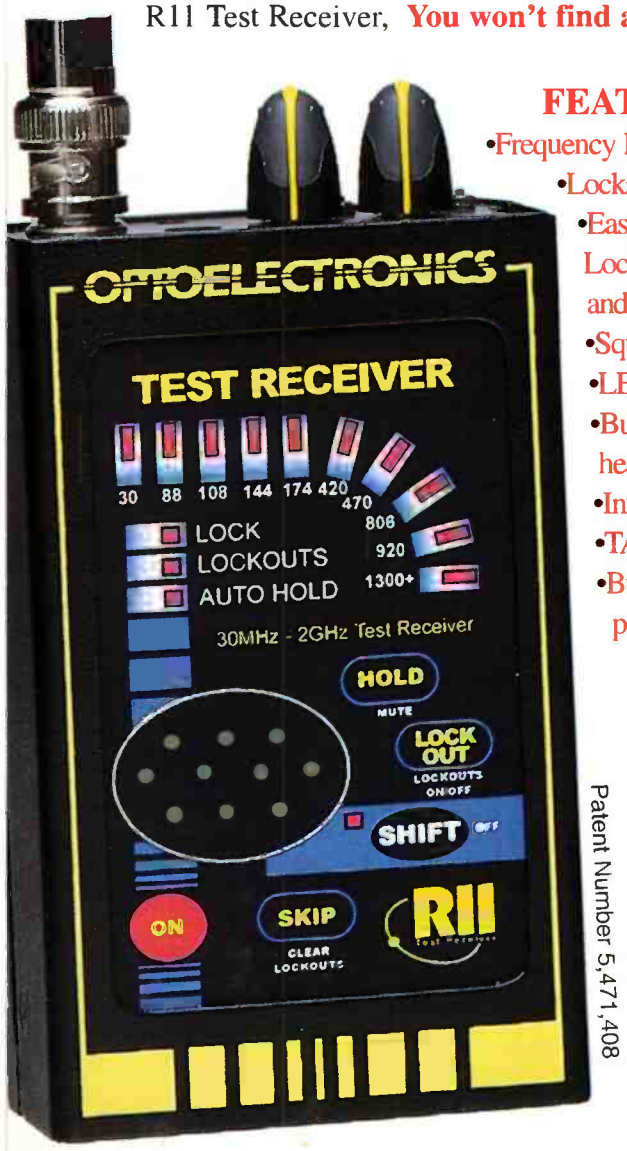
NEVADA

Built for Speed

The new R11 Test Receiver...

...If there's RF, you'll catch it!

The **NEW** R11 is a Nearfield FM Test Receiver capable of sweeping **30MHz - 2GHz** in less than one second. The R11 can lock onto a **5 watt UHF signal** as far away as **500 feet** and demodulate the signal through its built-in speaker. A unique feature of the R11 is its ability to determine what band the frequency is transmitting in and display it on its LED indicator. When speed is an issue, reach for the R11 Test Receiver, **You won't find a faster nearfield FM test receiver anywhere.**



Patent Number 5,471,408

FEATURES

- Frequency Range: Analog FM, 30MHz - 2GHz (Cellular frequencies blocked)
- Locks onto 5 watt UHF signals as far away as 500 feet
- Easy to use keypad functions: Frequency Hold, Frequency Skip, Frequency Lockout, and the Shift key feature for Audio Mute, Enable/Disable Lockouts, and Lockout Clear
- Squelch and Volume control knobs
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- Interface with the Scout for Reaction Tune
- TA100S Telescoping whip antenna included
- Built-in NiCad batteries (4 hour discharge) and power supply included

Reaction Tune with Scout using optional CB-RT

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Cover Subject
John Wilson reviews what promises to be the definitive computer controlled radio.
Photo courtesy of Icom UK Ltd.

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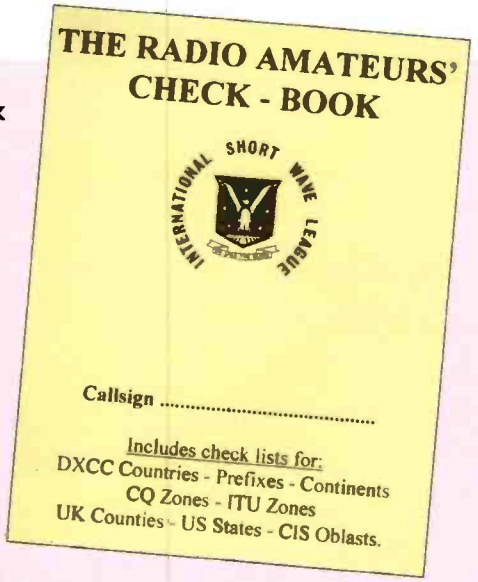
Check Out The Check Book



Recently landed on the *SWM* Newsdesk is the latest International Short Wave League publication, *The Radio Amateurs' Check-Book*, which is now available. The publication is a useful addition to any shack and allows the user to keep track of all major worked/heard records in one convenient book. Each check list has been designed, where necessary, to enable cross referencing between items worked or heard and related bands.

The Radio Amateurs' Check-Book is printed on good quality A4-sized paper with colour coded pages for quick reference. It is spiral bound so that it can be folded back on itself to fit easily on the shack desk. The book has stiff card front and back covers and contains 42 pages of detailed, pre-printed check lists for DXCC countries, prefixes, continents, CQ zones, ITU zones, UK countries, US states and much more.

Available exclusively from the ISWL, it costs £4 Sterling, including P&P in the UK and Europe or £4.50 Sterling outside Europe, (postage stamps to the appropriate value of ten IRCs are also acceptable).

The *Check-Book* will be available from the ISWL Rally Stands, but if you can't wait that long to the next rally you'll be attending, order yours now from: **ISWL HQ, 3 Bromyard Drive, Chellaston, Derby DE73 1PF.**

RAE Classes

Gordon L. Adams G3LEQ, Senior Lecturer & Course Organiser, has written with details of Novice and Full Radio Amateurs' Examination Classes for Winter 1997/98. Here goes:

The **North Cheshire Radio Club** will be holding RAE and NRAE classes starting at the end of September and thereafter weekly at their HQ in the **Morley Club, Morley Green, Wilmslow, Cheshire**. Candidates may join any Sunday evening from then until the end of November. Details can be obtained from Gordon Adams G3LEQ on **(01565) 652652** or FAX on **(01562) 634560**.

The **Warrington Collegiate Institute** will also be running an RAE course starting at the end of September and thereafter weekly at the **North Campus, Winwick Road, Warrington, Cheshire**. Details available from Gordon Adams G3LEQ (see above). The prospectus is also available by telephoning **(01925) 494494**. Candidates may join on any Thursday evening until the end of November.

Leicester's Last!

As most of you will probably be aware, the Leicester Rally held this year on 17-18 October is the **last one** to be held at Granby Halls. **Waters & Stanton Electronics** have news of various products which they will be showing.

First seen at Dayton in the Spring of 1997 was the Kachina 505 DSP computer controlled h.f. transceiver, which caused a lot of interest both there and later at Friedrichshafen and will be shown for the first time at Leicester. The provisional price is £19.95 and a full range of optional accessories will be available.

Next, from another progressive American company, comes the new SG 2020 QRP h.f. transceiver based on the very successful Index Laboratories rig. With a provisional price in the region of £700, it is hoped that the first sample will be on display. Also from the USA, Cushcraft Antenna Corporation will supply W&S with first production models of two new super strong multi-band h.f beams, model X6 and X8, offering excellent performance and rugged design.

From Optoelectronics, three new products including the shirt pocket-sized miniature frequency counter priced at £99.95, which will cover frequencies between 10MHz and 1.2GHz. Second is the compact micro d.t.m.f. decoder priced at £89.95 and finally, the all new R11 test receiver, covering frequencies between 30MHz and 2GHz and able to interface with the Scout frequency recorder. Price will be in the region of £369.

In addition to all this, Waters & Stanton will also be displaying new products from ADI, AKD, Ameritron, AOR, Diamond, MFJ, Microset and Watson. So, readers, you can see why it is worth visiting what is claimed to be the largest stand in the main selling hall at Leicester.

Racal Avionics Ltd

In Godfrey's 'Airband' column back in August was a mention that Aerad had come to the end of an era as they had been taken over by Racal Avionics. However, **Leith Whittington**, General Manager of **Racal Avionics Limited**, would like to point out that Racal Avionics have undertaken a programme of investment in the Aerad product that will bring it to the development that British Airways would never have brought - they have a different agenda to Racal and differing financial objectives.

Racal's purchase of Aerad was part of a long term development strategy which is to provide integrated services and service packages to the various segments of the aviation community. A navigation data service has been provided for many years, supporting military and civil flight and navigation management systems. This operation has many synergies with the Aerad operation and has similar development and market needs. So, the acquisition of Aerad, therefore, was a natural development.

Racal will be adding more service business either through acquisition or through the development of strategic alliances and have created the Aeronautical Services Group to act as the focal point for these operations.

New Look Kits & Modules

Maplin's new packaging for its range of electronic project kits and modules.

Maplin has introduced new packaging for its range of electronic project kits and modules. The new packaging has been designed to reflect the quality and diversity of the projects and 'ready to integrate' modules in the Maplin range. It has been developed to make the products more eye-catching and easier to find in the 40 Maplin and three Mondo stores throughout the country.

Current best sellers in the Maplin projects range include those associated with home automation, computing and communications. 'Ready to integrate' modules, which provide innovative solutions for specialist applications, are enormously popular with trade users. Maplin stock modules exclusive to the company, special function modules not readily available elsewhere and industry standard parts such as radio telemetry and display modules.

Simply Digital!

Everyone has difficulty at some time or another in remembering a telephone number.

Haydon Communications feel that way too, in that customers often have difficulty in remembering their number, so now they have introduced a new number that readers won't be able to forget!

Any reader with a telephone that has alpha numerics on it (letters under the numbers 2-9), can now make use of a new, easy-to-remember number. **Simply dial 07000 then type in HAYDON** (this number is **429366**) on your telephone keypad and you will get straight through to Haydon themselves. It couldn't be easier!

Buyers Beware!

We have been informed of the following by the Eddystone User Group.
Around 1983, Eddystone Radio introduced their first microprocessor-controlled l.f.-h.f. communications receiver, the Model 1650. It was built to the highest professional standards and sold in many different versions, including the 1650/6, a special classified version for the British Government. The series went out of production a couple of years ago.

A considerable quantity of 1650/6s has recently found its way onto the surplus market and they are being offered for a fraction of their original cost. This would appear to be an attractive proposition until one discovers that this model is so specialised as to be useless to the amateur. Most of the facilities, i.e. mode selection, bandwidth selection, scanning facility, variable tuning, etc., are missing.

The Eddystone company has been receiving requests for information on converting the set into a standard model. For many reasons, they are unable to do so!

Purchasers of the Model 1650/6 must appreciate that they are buying a collectors' item rather than a general purpose receiver. Conversion is not a possibility for anyone other than a microprocessor expert, and even then it would not be an economic proposition, too many parts are missing!

The asking price for the set is around £300, which is a lot of money for someone to pay for what they think is a bargain and turns out not to be. The 1650 Series costs from around £3500 upwards, plus VAT, only two years ago, and this version is the only 'non-starter'. So, take note, this warning could save people a lot of disappointment.

The Eddystone User Group can be contacted at Eddystone User Group, c/o Graeme Wormald G3GGL, 15 Sabrina Drive, Bewdley, Worcs DY12 2RJ. Tel: (01299) 403372. They provide an excellent forum for owners of all Eddystone products.

New Scanner From Yupiteru

Yupiteru have just announced a new hand-held scanning receiver due for delivery in the UK during November of this year.

The scanner, designated MVT-3300 EU, covers 108 - 170, 300 - 470 and 806 -1000MHz with selectable a.m./f.m. modes, 200 memory channels and selectable scan steps of 6.25, 10, 12.5 and 25kHz.

Inside reports leaked from Yupiteru claim that the receiver has "breathtakingly" good performance. Tentative price for the CE approved EU version is around £189.

Nevada, 189 London Road, North End, Portsmouth, Hants PO2 9AE.
Tel: (01705) 662145.

Send your news to Zoë Crabb at the Editorial Offices

Communiqué

WorldDAB Multiplex

Anyone with a DAB digital radio receiver in London, Birmingham and Berlin can now tune to one of the foremost news and information radio network in the world. WRN1 has been broadcast as part of the UK's Independent Radio DAB Multiplex run by a consortium led by the UK's GWR Group and Classic FM since 1996. It has proved popular in focus groups run in the UK to discover the likely consumer take-up of DAB Digital Radio.

During the recent Internationale Funkausstellung (IFA '97) in Berlin, WRN1 brought together 21 of he world's leading international radio stations in a 24-hour-a-day English language radio network carried on satellite across Europe. Broadcasters as diverse as America's National Public Radio, ABC Radio Australia, Channel Africa, Polish Radio Warsaw and BBC World Service were all to heard on the unique radio network.

"We are delighted to be part of the WorldDAB Multiplex here in Berlin," commented Simon Spanswick, Director of Corporate Affairs at WRN. "With the public launch of DAB Digital Radio here at this important and exciting exhibition, World Radio Network is making sure that international radio broadcasting has a strong foothold in the new digital marketplace. Here, for the first time, international radio stations from every corner of the world are available in CD quality on a range of first generation consumer digital receivers. As the first genuinely new service on UK independent digital radio, we are really giving consumers something out of the ordinary, both here and back in Berlin."

World Radio Network, PO Box 1212, London SW8 2TG. Tel: 0171-896 9007.

Variable Response Console

For those of you who have a communications receiver and want to improve the audio, Alpha Delta have introduced their VRC - Variable Response Console.

This is a heavy diecast metal unit measuring 209 x 207 x 155mm and weighing in at 3.6kg. The unit contains a low distortion push-pull amplifier, a ducted port bass reflex enclosure for the 10mm wide-range Pioneer speaker. Other built-in features include an adjustable 12dB bass boost/cut circuit, sampled data switched capacitor audio filter, peak/notch filters and an l.e.d. bargraph reading in dB.

The VRC has been designed to get the best out of communications receivers, whether on a.m., f.m., s.s.b., c.w. or data. The retail price is £229.95 and should be available through your local dealer.

Waters & Stanton Electronics,
Spa House, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835.

Progression Award

An agreement has been signed by **The Electronics Examination Board** (EEB) and **The City & Guilds of London Institute** to establish an Awarding Body partnership for the award of National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs) in Electrical and Electronics Servicing.

The formal signing of the agreement by the EEB Chairman, **Michael Buck** and the Director General of City & Guilds, **Dr. Nicholas Carey**, took place at a special ceremony held at the London office of City & Guilds back in July.

The two organisations have been associated in the assessment and certification of engineers in the field of electrical and electronics servicing since the early 1950s and currently jointly operate the popular Course 2240, Electronics Servicing. Building on this successful relationship, EEB and City & Guilds are collaborating on the development and implementation of a Progression Award in electrical and electronics servicing.

This award will cover the underpinning knowledge and skill requirements of the new NVQs and SCQs and is designed to update and supersede Course 2240. It is planned to have the Progression Award ready for a September 1998 start date in colleges and training centres.

Silent Key - Frank Elliott G4PDZ

The sad news that 'Mr Leicester Show' **Frank Elliott G4PDZ** had died came to me during my holiday in Wales in the first week of September. It came as quite a shock because I'd been talking to him the day before I started my holiday about the final (final final!) Granby Halls event .

Frank G4PDZ was 68 when he suffered an immediately fatal heart attack on September 3rd. He had known much family tragedy in recent years with the loss of his wife, followed by the death of a daughter. Despite this, he kept a smile and a quiet warmth for everyone he came into contact with. He was also 'unflappable' and scrupulously fair. I often joked that he was so cool, calm and collected that he'd inherited some of 'ice' from the middle of Le**ICE**ster!

Many people in the East Midlands will remember Frank from his shop 'Elliott Electronics' and this is how I first met him many years ago. And of course he became famous amongst radio enthusiasts as one of the 'Gentleman In Maroon', wearing the trademark of the Leicester Show organiser's distinctive maroon jackets.

The radio hobby has lost a good friend, but at least Frank knew that the Leicester show will take place at Granby Halls in 1997 and continue at the new venue at Donnington in 1998. My condolences go to Frank's family and especially to his partner and friend Sylvia Grassby for the loss of 'Mr Leicester'.

Rob Mannion G3XFD

Weekend On The Air

The **Bury St. Edmunds Amateur Radio Society** are once again indebted to The National Trust at Ickworth House, just outside Bury St. Edmunds, for providing the Society with an excellent venue for their annual Special Event Station, held over the weekend of 9/10th August 1997.

Back in 1995, the Society helped celebrate the National Trust Centenary with GB100NT. In 1996, they operated as GX2TO (the club callsign). This year, **Derek Spender G4DHU**, applied for the callsign GB2NTI and acted as Station Manager.

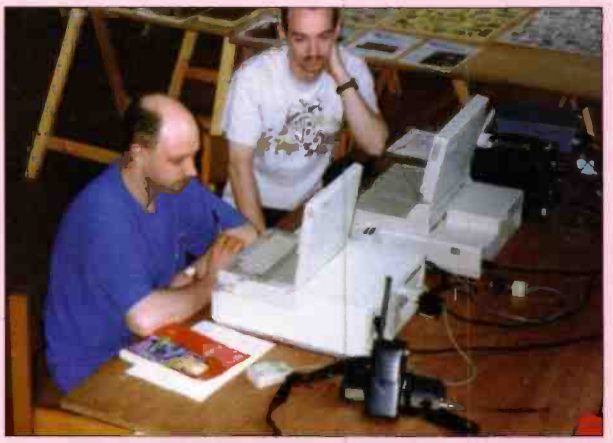
Chris Brown G0JRM kindly agreed to exhibit some of his collection of vintage wireless receivers and other radio nostalgia in the display cabinets, which lined one side of the Lecture Theatre, which was put at the Society's disposal. Liaison with the National Trust was in the hands of **David Riches G0XEG**, who happens to be a Volunteer Room Warden at Ickworth House.

Peter Brindley G0HEV, Secretary of Bury St. Edmunds ARS, handled all the publicity, and the National Trust kindly agreed to provide the Society with picture postcards of Ickworth House, which were able to have overprinted with the callsign on the front and the usual details on the reverse.

Finally, the Chairman **Kevin Waterson G1VGI** and G0XEG did an interview for a magazine programme on BBC Radio Suffolk, so with all that under control, the society just needed fine weather and some help in getting the antennas up!

On the Friday evening, a working party of members assembled to start putting Chris Brown's exhibits in place, unpack the club transceivers, put a rope from the top floor of the Rotunda and another over a large oak tree for the G5RV antenna, which they intended to use. All tasks were completed by the time it was getting dark, having started before 5.30pm!

Saturday dawned bright and sunny (fortunately!) with temperatures in the eighties, but the Lecture Theatre was cool, and members were soon calling CQ on the FT-100 through the club-built a.t.u.,



but did not reach anywhere near the 100W that the FT-100 can produce. First thought was that they had too much feeder and really needed to move the antenna nearer the transmitter, but they would have to wait until the end of the day when there were no visitors.

The Society also have an FT-102 with matching a.t.u. and other accessories, but the a.t.u. will only cope with unbalanced antennas, so they decided that it might be worth trying to use the G5RV as a centre-fed dipole with one side tuned against the earth as they were using 300Ω twin right through. This in fact loaded well and members were able to work on 80, 40 and 20m, but, regrettably, only around Europe.

In the end, after investigating the home-brew a.t.u., the main cause of trouble was found - a faulty contact strip on the moving vanes of the first variable capacitor! As it was not the sort of thing that could be replaced quickly, (they had to find one first!), it was not used again over the weekend. The antenna was moved on the Saturday evening, which gave more success on the Sunday. In spite of these setbacks, over 100 stations were worked in the end!

Darren G7SDC and **Martin 2E1FZH** helped the number of contacts by running a packet station on v.h.f. from a couple of laptop computers and a most impressive home-brew TNC and p.s.u. They even managed to enlist the help of the GB7TDG Sysop - **John G4VEL** - in getting an 'ad' into the system telling people of the special event! They worked quite a few stations direct, as well as through the BBS. This evoked quite a bit of interest from the visitors, in spite of l.c.d. screens being difficult to read.

With hindsight, the Bury Society felt that the visitors were more interested in the exhibition of old radios and packet than trying to understand the audio from s.s.b. signals, so when the Society put on another station, they may now consider putting on some SSTV or even FSTV for the public benefit, whilst maintaining the Amateur Radio interest on air with a special event callsign and QSL card.

All in all, it was a good weekend, in spite of a smaller number of contacts. Everyone went home happy, even if hot and tired! The Bury Society would like to say thanks to Property Manager **Kate Carver**, the House Manager **Maria Moffatt**, the House Steward **Eilidh Taylor** and **Paul Dickson**, the Regional Public Affairs Manager from the National Trust, without whose help and co-operation, the event could not have taken place again this year.

Lastly, thanks to the members who helped plan and set up, pack up and operate. Most members who attended have already asked about next year - but that's another story!

Further information from **David Riches G0XEG, 92 Barons Road, Bury St. Edmunds, Suffolk IP33 2LY, Tel: (01284) 701034.**

Send your news to Zoë Crabb at the Editorial Offices

Editorial

The one-day amateur radio rally is one of the highlights in a lot of clubs' annual calendar. It offers them a fixed point at which to aim and at the same time, hopefully, produce some much needed income for their coffers. *Both Short Wave Magazine* and *Practical Wireless* attend many rallies up and down the country in an attempt to meet as many of our readers as possible and help promote the hobby generally. Obviously, it is impossible to have a stand at all the rallies that take place each week. The ones that we do attend are carefully selected so as to give us a presence in as many geographical areas of the UK as possible, but still be practical as far as the logistics are concerned.

Over the fifteen or so years that we have been attending rallies, we have made many friends, not just among the 'punters', but the select few who organise the events. This tends to be the same small team, even just one person, in each club, year in, year out. Some of them are remembered by their little eccentricities - roller skating around the site, for instance. Others, perhaps, for the military precision of their operation. Sadly, none of them are getting any younger and many have passed on or had to give up because of severe illness. If you belong to a club that organises a one-day rally, why not **offer** your services to help with the organisation of the event rather than waiting to be asked. Perhaps one day you will get to be the one who roller skates around the halls!

As I write this piece I am just about to leave to attend the funeral of the man whose name is synonymous with the Leicester Amateur Radio Show. Frank Elliott G4PDZ was in the final run-up to the last Leicester Show to be held at the Granby Halls when he died. Frank devoted a lot of time and effort to the organisation of what is probably the premier amateur radio show in the UK. He had negotiated for a new venue for the 1998 show - at Donnington Park - and was very enthusiastic about it and its possibilities. Nobody is indispensable and, of course, the show must and will go on. But it will not be the same without Frank!

Dick Ganderton
G8VFH

Letters

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.

IF YOUR LETTER IS PUBLISHED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE.

Dear Sir
I am a fifteen year old student, currently studying at Corfe Hills School and enjoy reading your magazine very much.

I constructed my receiver which was built from a Maplin Electronics p.c.b. (now unavailable), in conjunction with a Howes AA2 active antenna, for the express purpose of listening to coastal shipping on s.s.b. between 1.8-2.24MHz. I found the article on this subject, published in June 1997, very interesting and helpful.

The big problem still remains that I am not receiving any shipping at all, not even at the busy period at three minutes past the hour. All I seem to be able to receive is a very annoying Morse beacon and German national radio! Even the occasional amateur I receive sounds so distorted I can't make out what is being said.

I would be extremely grateful if anyone could help me as I have spent lots of money on it. Even if this letter does not find way to the pages of your editorial, I would be indebted to you if you or one of your team could help me. Thank you very much for your time and I look forward to hearing from you soon.
A. J. Marshall
Wimborne, Dorset

Dear Sir
Following the success of our 1997 airband newsletter, it has been decided, due to the tremendous interest in the military field, that a new quarterly, military only, airband magazine will be produced in 1998.

To add to our existing network of UK sources, input from enthusiasts and aviation professionals alike is sought to compile additional data on any aspect of h.f./v.h.f./u.h.f. military airband monitoring, in the air or on the ground.

We are especially keen to extend this coverage to include world-wide airarms, particularly in the form of h.f. news, aircraft/base callsigns, exercises and u.h.f. squadron air-to-air operations/AUX/channel pre-set tie-ups. Military aircraft units and serials relating to airband are also of interest to the publisher.

If you would like further information, please write enclosing a stamped addressed envelope to: **Mark G. Thirkettle, Editor, Military Air Scan Network News, MGT Publishing, PO Box 564, Norwich, Norfolk NR7 8DD.**

Dear Sir
SWM August - Reflection on the AOR AR7030
As previously outlined I have recently re-appeared on the wireless scene. My impression of the change in 40 years is the number of knobs now provided on the front of the radio chassis. It seems that the end price is directly proportional to their number.

Mr Wilson and many more of us can remember a much simpler looking wireless, not always with less performance than today. I wonder if the designer of the AR7030 had that in mind when he designed the 'thinkers' wireless.

To my mind, AOR tend to keep you on your mental toes with all their designs.
Ronald Howe
Sittingbourne, Kent

Dear Sir
With reference to the request for letters on computers used in the shack, my machine is a 486DX2 66MHz. I see no reason for upgrading to an ultra fast Pentium accompanied by Windows 95.

Almost all the best radio related software is written to work from DOS. The best and fastest way to access such programmes is to use a DOS menu. Using such a menu, all your programmes appear on screen on boot up and can be run from a single keystroke.

Writing such a menu is fairly simple after some practice. Basically, the method is to create a subdirectory c:\menu and write a batch file for each programme into it. A file called menu.scrn must also be written to this subdirectory. This is to enable the DOS menu to appear on screen for editing and adding further programmes.

This work can be done from the DOS editor or more easily from a file handling programme such as *Xtree Gold*. Windows 3.1 can be run from the DOS menu for use with Windows only programmes.

Regarding the fast Pentium computers, an experiment reported in a past edition of *Passport To World Band Radio* found that they created more interference on internal radio cards. Users of decoding software, etc., will know that the less interference, the better!
William Tait MM1BJU
Loanhead, Midlothian

Dear Sir
First to thank you very much for a particularly interesting September issue of *Short Wave Magazine*, and especially the 'Romanian Summers' article. I am a member of R. Romania International's Listener's Club and I remember Michael Osborn when he was a Section Editor in the British DX Club's monthly journal *Communication*.

I have some comments to make regarding your letters section. Regarding the letter from John Joint, I was pleased to see that there were some appropriate Editor's comments on the somewhat sarcastic remarks made by this reader. Personally, I think LM&S has an extremely useful and helpful format, especially in relation in MW, Local Radio & Longwave.

In my experience, it is a useful guideline to what one might be able to hear to know the name and the location of these listeners listed in the various charts. This information used in conjunction with the quarterly list of equipment used is an ideal reference.

I agree with the remarks in the letter from Barry Henshall about the printing aspect of the charts. I like his tip about the use of a ruler, and would add to this by recommending the use of a stamp collector's magnifying glass.
Sheila Hughes
Morden, Surrey

*To help those of you who haven't got a ruler to hand, we've kindly added one on the page in the form of a thin line under each frequency entry. - **KN.***

Dear Sir
Receiver Reviews - Letters Page September 1997 and previous letters.
Why has no one mentioned the AOR AR3030? It beats the FRG-100 and HF-150 all the way to the post. I have just bought one, having traded

r.f. gain control (which should delight John Wilson and his pedestal!), provision for a whip antenna with internal amplifier, a superb a.m. filter - 8.2kHz at -60dB, a superb s.s.b. filter 2.5/3.5kHz, an EEPROM microprocessor, half octave front-end selectivity and a.m. distortion mostly excellent. I could go on, but read the *Passport* evaluation white paper. At the current price of £499 I vote it the best value on the current market.

Adverse points are that its 3rd order intercept point, at 5kHz, is only 'fair' as is its dynamic range at 5kHz spacing. It has no clock (does it matter?) and the cassette operation is via the squelch control. It has no 'stop' after the kilohertz, which is sometimes a little confusing. I can highly recommend it.

Ted Kimber
Taunton
Somerset

PS. It is far more straightforward to operate than the AR7030 and it has a forward facing speaker.

We reviewed the AOR AR3030 receiver when it first appeared back in January 1994 We will shortly be starting to take a look at some of the older receivers that are still in production. ***Ed.***

Dear Sir

Although I spent many years as a telegraphist in the Royal Navy, I am not a 'technical' person and most d.i.y. projects are well over my head. However, by following the guidance given in two fairly recent articles in *SWM* and using a balun unit supplied by Wellbrook Communications, I succeeded, with no great problems, in erecting a T2FD antenna.

The improvement in reception over my previous 'longwire' is quite marked and I have to thank all of you who put me on the 'right road'.

Because my home is in an exposed corner, I found that the whole assembly swayed quite a bit in strong winds and I feared chaffing, so I added a support half way along the length. For a modest outlay, this project was well worthwhile and I have no hesitation in recommending the design.

Finally, my thanks to you for putting together an informative magazine and please do not allow John Wilson to stop writing reviews! He has the rare ability to make the complex simple so that even dim wits like me can understand!

R. Walker
Renfrewshire

I am pleased that you took the plunge and made your T2FD antenna. There is no doubt in my mind that building something for your station, be it an antenna, a filter or even a complete receiver, provides hours of enjoyment, coupled with a great feeling of achievement when the project is finally completed and working. ***Ed.***

Dear Dick

Another good read plonked through the door today! With regard to Roger Waldron's query about the supposed Russian transmissions in the Seventies.

Roger is presumably referring to the bane of every amateur's life, that wretched noise known as The Woodpecker. Much to my surprise, I learnt in recent years that it did not emanate from Russia at all - although they may have experimented with their own version - but came from our own fair shores, from a site at Orfordness in Suffolk.

The site is now occupied by the BBC World Service and used for more peaceful purposes. I have visited the site and seen photographs of this colossal installation, which was an experimental over-the-horizon (OTH) radar system using spread spectrum techniques between 6-40MHz. It was operated by the Americans and was a failure, hence its withdrawal from this country.

73 de Bob G8JNZ

Hi,

I have been an avid reader of *SWM* and a listener now for a number of years, and I enjoy very much receiving the various data modes.

I bought a *Hamcomm* type interface from Pervisell a couple of years ago and I have great satisfaction from it, which has further developed my interest in packet.

I have recently started to build a 'Baycom' type packet modem as my old 286 Laptop running DOS has finally given up the ghost, and *PktMon* won't run under Windows 95 on my new Pentium but I have a major problem trying to locate a chip for the modem. I am looking for a TCM3105 IC, which Texas Instruments discontinued in 1996, I was wondering if any readers may have one lying about in their spares box that I may be able to purchase or maybe point me in the direction of a supplier who might still have this part in stock.

Hoping that somone can help and thanks for a great magazine.

Matty Cunningham

If any reader can help, please contct the Editorial Offices and your message will be forwarded on to Matty. ***Ed.***

Dear Sir

Could I please ask you to make a determined effort to get rid of the awful background on most pages of your otherwise excellent journal. In company with many recent correspondents, I find that the needless-muddy backgrounds and the hideous colour combinations which you use completely spoil my interest in most articles. They also make many features well nigh impossible to read!

After 60 years spent striving for perfection in the Audio, Radio and Video equipment which I use, I find it most unpleasant to put up with a publication whose signal-to-noise ratio approaches unity on the worse pages! Would you put up with that on your radio, I wonder?

W. R. Potter
Lancs

We do our level-best to make articles appealing, both technically and visually, given the pretty boring subject material of black-boxed radios. We are in a market place which competes with glossy, often wierd, computer and asscociated technical magazines so we 'throw colour' at some articles to make them look interesting. Sometimes we go a little too far, which I appologise for, but we ***always*** *listen to complaints and try to keep most people happy. Thank you for taking the trouble to write, us 'Art Bods' need keeping in check you know! If the Editor had told me about your letter sooner, or marked up the page proofs for this issue, I would have slightly changed a couple of the articles this month. Unfortunately the films (quite a long process) have now been made, but I assure you I will be a little less ambitious in the future.*

Art Ed

Europe Bandscan

Peter Shore
c/o SWM Editorial Offices
Broadstone
Dorset BH18 8PW

Few international radio broadcasters rely solely on transmitters in their own country to ensure that listeners have a good signal wherever they are world-wide. Relay agreements allow stations to provide stronger signals than their own transmitters can without making a huge investment in transmitting equipment overseas.

For example, listeners to Swiss Radio International (SRI) outside Europe have for some years benefited from short wave relay agreements with China Radio International and Radio France Internationale. Until now, the Bern-based broadcaster has used its own transmitters in Switzerland to send programmes on short wave to its European audience.

However, SRI is currently reassessing its distribution strategy on a world-wide basis, and has been discussing transmission terms with Deutsche Telekom this summer for short wave facilities at the Julich transmitting station near Cologne.

The Swiss station will use Julich for European transmissions to improve reception, which is currently less than satisfactory from its sites at Schwarzenburg and Lenk in the Swiss countryside. SRI has wanted to construct a new, high-power short wave station in Switzerland for many years, but has fallen foul of environmentalists who will not permit such a broadcasting facility to be built. Look out for the new arrangements in the schedule which comes into effect at the end of this month.

Swiss Radio International's strategy work means that it has been unable to take a decision on whether or not to join the major broadcasters in Europe which are taking part in WRN3, the new German-language service from World Radio Network. This new radio service brings together programmes from 11 international stations, including BBC World Service, Radio Sweden, Radio Budapest and others, in a 24 hour-a-day service using the same concept as the English-language service, WRN1, which has been running successfully since 1993.

WRN3, which came on the air at 1100 on 31 August, is available on Astra in conventional analogue form on the Sky Movies transponder, and via Astra Digital Radio on the ZDF transponder. Listeners outside the Astra satellite footprint can listen live via the Internet, and I understand that there has already been a good response from German-speaking surfers of the world wide web from Japan to the United States. Check out the World Radio Network web site at: **www.wrn.org**

Station News

Radio Vlaanderen Internationaal from Brussels faces severe reductions in its output at the end of the month. Arabic- and Spanish-language programmes will cease and both French-and German-language services will be drastically reduced from daily broadcasts to weekends only. English is also affected.

The current six daily broadcasts of Brussels Calling will be cut to five, to be heard at 0830, 1300, 1730, 1830 and 2100UTC. At the same time, the North American English-language transmissions which have been relayed via Radio Netherlands' relay station on Bonaire will cease.

At the end of August, Radio Netherlands dropped one of the two satellite subcarriers it has used on the Astra satellite for European direct-to-home listeners. The service, on the audio subcarrier at 7.38MHz on transponder 58 of the Astra system (which carries Granada television and the Computer Channel), ended, although English-language programmes continue to be heard on the subcarrier at 7.56MHz at 1830 to 2025UTC and again at 2330 to 0125UTC daily. In addition, Radio Netherlands is heard via WRN1 on transponder 22 at 0930, 1830 and 2330UTC.

The Voice of Greece is now relayed from Voice of America transmitting stations in the United States. The Greek authorities decided earlier this year to take advantage of a reciprocal arrangement in the agreement governing the provision of two Voice of America relay stations in Greece.

The agreement allows the Greek state radio service to transmit its external service from the United States for as long as the VoA relay stations operate in Greece. The schedule for the US relays is: 0600-0800UTC to the Pacific from Delano on 9.775MHz; 0900-0950UTC to Australia from Delano on 9.775MHz; 1200-1350UTC to Canada via Greenville on 9.59MHz; 1830-2200UTC to Canada via Delano on 11.73MHz and to Latin America via Greenville on 17.745MHz.

The Voice of the Mediterranean broadcasts from Malta via transmitters in at Deutsche Telekom's Julich station in Germany every day at 1900 for an hour on 9.765 and 12.06MHz. The station also broadcasts to the Far East and Australia in English on Sunday at 0200 for 90 minutes on 15.55 and 17.57MHz, followed by a 90 minute programme in Maltese on the same frequencies.

A Japanese-language programme, aimed at potential tourists to Malta, is beamed towards Japan on Sunday at 0500 on 17.57MHz only.

Relays of China Radio International from the African state of Mali ended early in the summer. China has used the Mali transmitting station - which it equipped as part of an aid agreement - for many years. References to the Mali frequencies have been dropped from China Radio International's announcements.

Rallies

September 27: The Crawley Computer Fair, this time in Crawley Leisure Centre, Haslett Avenue, Crawley, West Sussex. There will be a large range of new and used computer equipment on offer at bargain prices. Doors open 1000 to 1600. Admission is £2 for adults, £1 for OAPs and under 16s. **Steve Bealch** on **(01342) 842966**.

September 28: The Eastbourne Computer Fair is to be held at the Cavendish School Sports Centre, Eldon Road. Doors open 1000 to 1400. Admission is £2 for adults, £1 for OAPs and under 16s. **Steve Bealch** on **(01342) 842966**.

September 28: The Harlow and District Amateur Radio Club Rally is to be held at the Sports Centre, Harlow, in Essex. Doors open at 1030 (1000 for disabled visitors). Talk-in by G6UT on S22 and SU22. The large ground floor main hall will feature a selection of traders, both old and new with products ranging from complete radio/computer systems through software, electronic components and second-hand equipment. There will also be a special interest area and a large club room, Bring & Buy stall. Morse tests on demand will be available (two passport photos required). Refreshments will also be available. All car parking is free, plus there is disabled parking near the entrance. **Len G7UFF** on **(01279) 832700** or the Rally Manager **Mike G7BNF** on **(01279) 865092**.

October 5: The Blackwood & District Amateur Radio, Computer & Electronics Rally is to be held at the Community College, Oakdale, near Blackwood, Gwent, South Wales. Doors open at 1000. There will be traders, a Bring & Buy sale and a talk-in on S22. **Norman GW0MAW** on **(01495) 227550**.

***October 5:** The 21st Annual Lumley Rally will be held at the Community Centre, Great Lumley, Co. Durham. Doors open at 1100, (1030 for disabled visitors). There will be a good mix of traders inc. *PW* & *SWM*, Bring & Buy and refreshments available. Talk in on S22, SU22. **Paul Moss** on **0191-5121360** or E-mail: **paul.moss1@virgin.net** or check the website at **http://freespace.virgin.net/paul.moss1/**

October 12: Computercations 97 Computer/Radio Rally is to be held at Hillhear Camping, Kingswear Road, Hillhead, Brixham, Devon. There is overnight camping, trade stands, car boot sale, Bring & Buy, refreshments, unlimited free parking, talk-in on S22 by G7FDC, Special Events Station GB2CPU. **Bill G6ZRM** on **(01803) 522216**, E-mail: **106445.2574@compuserve.com**

***October 17/18:** The Leicester ARS is being held at Granby Halls, Leicester. Doors open at 10am each day (9.30am for disabled visitors). All major companies will be in attendance plus a large Bring & Buy stand run by the Leicester Radio Society. Morse tests will be available on demand, but two photographs plus proof of identity will be required. There are ample car parking facilities. Talk-in on S22 and SU22 callsign GB2GH. **G4AFJ on (01455) 823344.**

October 25: The G-QRP Club Mini Convention is being held at St Aidans Hall, Sudden, Rochdale, Lancashire. Admission is £1 and doors open at 1000. Talk-in on S22. There is a large social area, lectures on QRP subjects, Bring & Buy, surplus, junk, components, kit traders, food and drink all day. **Rev. George Dobbs G3RJV** on Tel/FAX: **(01706) 31812**.

BBC's Anniversary

This year the BBC celebrates its 75th anniversary and to mark the occasion it will open a splendid visitors centre at Broadcasting House in central London at the end of the month. The new centre, open daily from 0930 to 1730, allows visitors a look at the history of the Corporation from the earliest days of wireless services, through the vital role it played during the Second World War, and right up to date with the digitisation of broadcasting.

Visitors will be able to take part in the recording of a short radio drama, or be a news reader, or record a segment of Desert Island Discs. There will also be an extensive section on television, including behind-the-scenes looks at popular drama like Eastenders.

More than 300 000 people are expected to visit the new centre every year for guided tours which will last about an hour and a quarter. Admission charges are £5.75 for adults, and £4.00 for children, with under-5s free.

To book tickets for the BBC Experience, call **(0870) 6030304** in the UK. If you want to book from outside Britain, call **+44 1222 577771**. The official opening by Her Majesty the Queen will be on 29 October, and the show opens to the public the following day.

Relay Station Strike

A strike hit the BBC East Mediterranean Relay Station on Cyprus at the end of August. Twelve staff at the station (now run by Merlin Communications, the privatised former World Service Programme Delivery Services department on behalf of the BBC), were issued with redundancy notices in contravention, the staff claimed, of an agreement between the British Foreign Office who employed the staff up to the end of April.

It appears that the Foreign Office rather than Merlin Communications employs the local relay station staff. The BBC said that despite the strike, no transmissions from the Cyprus station were lost.

IBC, the London-based Tamil-language radio station which is heard across Europe via the Astra satellite, has been noted testing short wave transmissions to South Asia. The 50-minute broadcasts are relayed from the former Soviet republic of Georgia, and have been heard at 1300 UTC on 12.120 and 15.075MHz.

And Finally

Finally this month it is worth remembering that if your favourite radio station disappears from the airwaves without warning, it may be as a result of something completely outside the broadcaster's control. In June, Aden Radio's external service went off the air for about 24 hours after the cables feeding the transmitting station were stolen by thieves who wanted the copper in the wires.

Luckily this sort of thing doesn't happen too often, but it is a regular problem in countries in Africa where telecommunications infrastructure is often stolen much to the chagrin of 'phone companies and broadcasters. Good listening until the next Bandscan for Europe and Africa in the January 1998 edition of *Short Wave Magazine*.

Next Month
Bandscan America

Grassroots

AVON

Bristol International RC: Tuesdays, 2000. The Little Thatch Country Club, 684 Wells Road, Whitchurch, Bristol. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. September 30: Bristol past and present by Brian Haines, a fascinating look back through the archives by a well known local expert. Robin Thompson G3TKF on (01225) 420442.

South Bristol ARC: Wednesdays, 1930. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. October 1 - CW practice with teachers, 8th - Bristol video night, 15th - VHF workshop for newcomers, 22nd - History of WD and HO Wills. For more information ring (01275) 834282 on a Wednesday evening.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 2000. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). October 15 - Grand sale. Gerry Somers G7VFV on (01296) 432234.

CHESHIRE

Mid-Cheshire ARS: Meetings held every Wednesday, 2000, at Cotebrook Village Hall, North of Tarporley, Cheshire. October 1 - HF on air club station G3ZTT plus construction class, 6th - Committee meeting, 8th - Surplus equipment sale, bring something to sell, 15th - HF on air G3ZTT club station plus construction class, 22nd - Informal night. Ted Bannister G0RBA on (01606) 592207.

DEVON

Appledore & DARC: 3rd Mondays, 1930. Appledore Football Clubroom. October 20 - Bring & Buy. Den Williams G0UMT on (01237) 471802 for more information.

Exmouth ARC: Alternate Wednesdays at the Scout Hut, Marlpool Hill, Exmouth. October 8 - Whose shack is this?, 22nd - Construction competition. D. Fox G0NRR on (01395) 271880.

EAST SUSSEX

Hastings Electronics & RC: 3rd Wednesdays, 1930. West Hill Community Centre, Croft Road, Hastings. The club runs courses for the RAE and Novices and is approved as an examination centre for City & Guilds exams. Doug Mepham G4ERA, 8 The Close, Fairlight, E. Sussex TN35 4AQ or 'phone on (01424) 812350.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 1930. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. October 8 - President's address - Station Efficiency, 22nd - Junk sale at St. Fillans Church Hall. Tommy Main GM4DCL, QTHR on 0131-663 8501 day and evening.

GREATER LONDON

Southgate RC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane, Winchmore Hill, London N21 3ER. September 25 - Radio on the air, October 9 - 2nd Junk Sale, 23rd - Radio on the air. Dave Michael G0ASA on 0181-482 6795, FAX: 0181-807 5366.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 1930. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. October 7 - Natter night. S. Swain (01705) 472846.

Southampton ARC: Mondays, 1900. This club is now up-and-running after some years of inactivity. New members welcome. Harold McIntyre on (01703) 737715.

HEREFORD & WORCESTER

Malvern Hills RAC: 2nd Tuesdays. Red Lion, St. Annes Rd. October 14 - The shining light of radio, The Eddystone Story by Graeme G3GGL. Dave Hobro G4IDF on (01905) 351568 evenings and weekends.

HERTFORDSHIRE

Hoddesdon RC: Alternate Thursdays, 2000. Conservative Club, Rye Road, Hoddesdon. September 25 - Slide show - IOTA by Neville Cheadle G3NUG, October 16 - Visit to Stanstead Airport (ATC). Don G3JNJ on 0181-292 3678.

KENT

Bromley & DARS: 3rd Tuesdays, 1930. The Victory Social Club, Kechill Gardens, Hayes. October 21 - Surplus equipment sale. A. Messenger G0TLK. 0181-777 0420

Medway AR & TS: Fridays, 1930. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. September 26 - Robin G4DVJ, Maplin Electronics, October 10 - Junk sale. G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

NORFOLK

Norfolk ARC: Wednesdays, 1930. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. October 1 - Night on the air, construction QRP and Morse practice, 8th - Vibroplex - The Keys and the Company, an evening of practical demonstrations, hands-on trials and the fascinating history of the world's most famous telegraph keys, 15th - Night on the air, construction QRP and Morse practice, 17th - Leicester Radio Rally, 22nd - Surplus equipment sale. Mike G4EOL. (01603) 789792.

West Norfolk Airband Monitoring Group: Regular informal meetings on Thursdays, 1930. Dave on (01485) 578183 for details.

NORTH YORKSHIRE

Hambleton ARS: All meetings held at Allertonshire School, Northallerton, 1930 to 2130. October 2 - 2m aerial construction, 16th - Aerial analysis. More details from John G0VXH on (01845) 537547.

WARWICKSHIRE

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 2000. St Johns HQ, Warwick Div., 61 Emscote Road, Warwick. October 14 - Baluns and lines by David Yates G3PGQ. G8XDL on (01926) 498115.

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. October 13 - Visit from Castle Electronics. The Society are again organising a course of instruction for the Radio Amateur Examination of the City & Guilds of London Institute and further details can be obtained by writing to the Chairman of the Society, Mr J. Harris G8HJS, enclosing a stamped addressed envelope. The address to write to is: 57 Evesham Road, Stratford upon Avon, Warks CV31 2PB.

WEST MIDLANDS

South Birmingham RS: West Heath Community Association, Hamstead House, Fairfax Road, West Heath, Birmingham. October 1 - Lecture by David Inman on Amateur Television Repeaters, 8pm. Don Keeling on 0121-458 1603.

WEST SUSSEX

Worthing & DARC: Wednesdays, 1930 for 2000. The Parish Hall, South Street, Lancing. Roy G4GPX. (01903) 753893.

WILTSHIRE

Salisbury ARC: 2nd and 4th Tuesdays, 2000 The Scout Hut, St Marks Avenue, Salisbury, Wiltshire. Prospective members and visitors are welcome. A club Net held daily at 1830 local time and additionally 2030 Fridays S.16 (V32) 145.000. RAE tuition available. September 28 - G3KFKF/P and M1BNF/P at Winterbourne/P Club Stations, October 14 - QSL evening - bring a pen or two! Jamie G7WAA on (01772) 334935 (business hours).

Trowbridge & DARC: 1st & 3rd Wednesdays, 2000. The Southwick Village Hall, Southwick, Trowbridge. October 1 - Natter night, 15th - Development of the Morse key by G3LLZ. Ian G0GRI on (01225) 864698.

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 os brief as possible.

Lowe Elec

JRC NRD345G

JRC's latest receiver is setting of the mid-price receiver war again! It offers a very high specification and ease of operation. We know lots of people who have really wanted to benefit from the engineering and ergonomics that are the trade mark of JRC but simply couldn't afford it before. Well, wait no longer. Now you can afford it, especially at the new low price. The NRD345G is now just £749.00 is superb value for money.

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How To Beat The Weatherman!

Ian McCaskill presenting the familiar weather forecast on BBC1.

Philip C. Mitchell takes time from his weather forecasting schedule to help you use your radio for forecasting.

Since the appearance of 'The Interpretation of Facsimile Weather Maps' in *Short Wave Magazine*, February 1993, Offenbach, operated by the German Weather Service, terminated its long wave transmissions in May 1996 in favour of a satellite link and most weather FAX transmission schedules from other sources have been revised.

For example, a revised schedule from Hamburg/Pinneburg became operational on 15th January 1997 replacing one that had been in place for several years, so we may expect much weather data to be available from this source for some time to come, most of which, incidentally, originates from Offenbach EDZW!

Accurate Forecasts

It is this data originating from this and other sources that provide similar information, which form the basis of highly accurate forecasts and current status of the weather. The equipment needed and operating technique for the reception of FAX weather maps either via dedicated hardware or computer software has been fully described in past numbers of *Short Wave Magazine*, particularly so in Mike Richards' 'Decode' column.

For those who have access to a PC, a variety of software and interfaces are available at reasonable cost for FAX decoding. It is assumed therefore, the reader has some form of basic rig for FAX reception and display of FAX maps and charts, or maybe after reading on, will be encouraged to splash out on some additional equipment for the already overcrowded shack!

Whatever station is selected for the reception of weather FAX maps, it is always desirable to aim for a clear, interference-free result by spending some time on fine tuning of your equipment and to take careful note of all settings that give optimum reception. A sharp, detailed map is essential to enable a meaningful interpretation to be made.

Hamburg/Pinneburg Meteo

The facsimile weather maps that can be received from Hamburg have been mentioned in the opening paragraph, since they are easily received in the UK and Europe on the three operational frequencies, 3.855 (0.8kW), 7.880 (20.0kW) and 13.8825MHz (20.0kW). The weather maps transmitted from this station have always been received with minimum distortion - in the south of UK at least - contain enough information to form the basis of this article and enable the recipient to acquire a basic understanding of the weather.

It is hoped, therefore, that some FAX map enthusiasts and the new recruits to their ranks, will be transformed into more enlightened weathermen, at the same time being one jump ahead both in time and accuracy of the professional TV weather presentations. The secret in the interpretation of FAX maps is to initially devise a routine that will provide the recipient with meaningful facts about the weather both as it should be in some future time (surface pressure forecast) and as it is at present time (surface weather analysis).

Both these weather states are very clearly presented in the Hamburg transmissions, but first of all recommend that you concentrate on those maps that will give us all that is needed for a basic understanding of current and forecast weather. Of course, it is fascinating to scan through the many FAX schedules and discover, for example, how much ice exists in the Barents sea, but this does seem to act as a diversion to our main task, in this case, of weather watching and forecasting.

As you advance in your understanding of the weather, the more complex maps and charts can then be tackled. So, to simplify our routine, I recommend concentrating initially on the type of map in **Fig. 1**, the surface pressure forecast (ref: PPOK89), i.e. the one transmitted at 0821UTC for a forward period of 72 hours from 0000UTC (midnight), showing weather to come.

Figure 2 shows the surface weather analysis (ref: QPOA89) transmitted at 1050UTC that shows actual weather existing at 0600UTC on the day of reception. These maps are repeated at 1900UTC (forecast 72 hours from 1200UTC) and 1600UTC (weather at 1200UTC) respectively. From experience, I believe that

the 72 hour forecast is reasonably accurate, after that, accuracy does seem to diminish as the forward period is extended.

Back To Basics

But first let's attempt to understand our two types of maps, as illustrated in **Fig. 1** and **2**, received from Hamburg Meteo. For many of us, understandably, these might leave us completely baffled at first sight, so a few basic facts will help in interpretation.

These facts will hold good even though the maps will alter in appearance every day and if interpreted correctly should enable us to accurately assess the weather at a particular time, both now and in the future, not only where we live but over a wide geographical area. Note that the two maps illustrated refer to two different reception dates.

Initial inspection of either map shows a great many lines superimposed on an geographical area of western USA and Canada, Atlantic, UK, western Europe and North Africa. Closer inspection shows that these lines are unbroken and in many cases form closed areas.

They indicate barometric pressure (i.e. what is shown on your barometer), which remains the same along the length of any particular line. The lines are called 'isobars' (iso means equal) as shown in **Fig. 4**, the pressure is measured in millibars (mB) as indicated and the isobar lines on these maps are 5mB apart.

Depressions

Figure 3 shows a simplified representation of a low pressure area or better known as a depression (the UK has a fair share of these throughout the year). The centre is marked 'T' (German: Tief means Low).

The winds in the Northern hemisphere always blow in an anticlockwise direction slightly towards the centre of a depression. The isobars around a depression are close together, closest near the centre, farthest apart on the outside.

The closer the lines are, the stronger the wind, so the strongest winds are blowing near the depression centre, strangely enough though, right in the middle of a depression there is no wind at all! (This is due to there being no pressure difference and hence no air flow!). The lowest central pressure in millibars can be read off as indicated.

The track of the whole depression is, on average, from the south west to the north east. The speed of movement of the whole can be considerable but both speed and continuing direction can be quite unpredicable on occasions.

In general, the weather associated with depressions follows a set pattern as shown in **Fig. 6**, commencing with the passage of a 'warm front' with rain and freshening winds from south west. There follows a brief clearing and easing off of rain until the arrival of a 'cold front'. In spring and summer, thunderstorms along the latter front can bring heavy rain and hail showers but in winter the front brings heavy squally snow showers.

As this front passes, there is a quite noticeable drop in temperature and then a clearing of skies to more settled conditions. In its early stages, a depression will have a well defined warm and cold front but as it develops, the cold front tends to overtake and drive upwards the warm air in the warm front sector.

This part of the depression towards the centre then becomes 'occluded' and the new front an 'occlusion'. Most depressions reaching the UK from the west are occluded and one can expect steady rain in this part of the system.

Depressions have a definite 'life cycle', most starting life way out in the western Atlantic. They deepen as they approach the UK, dump their rain then 'fizzle out' on their way to northern Europe.

This is a generalisation however and sometimes they appear to follow a more erratic course. Watch your maps and track them, this makes weather watching the more interesting!

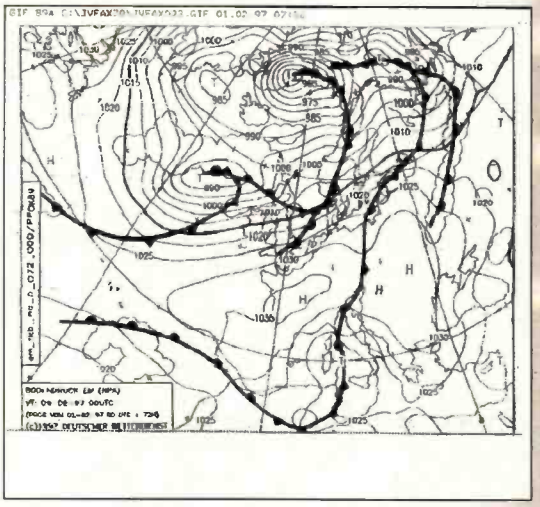
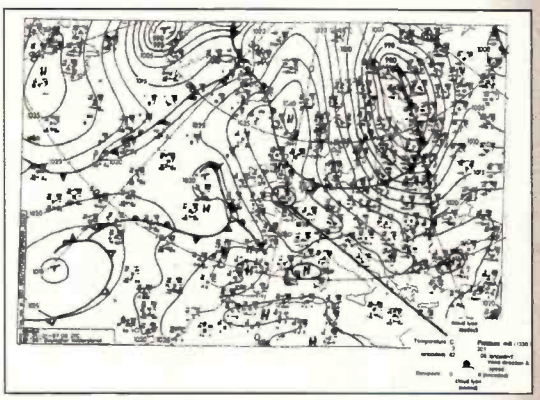


Fig. 2.



Anticyclones

An area of high pressure or anticyclone is shown in **Fig. 3**, the centre of which is marked H on the map (German: Hoch means High). This type of weather system generally brings weather that is the opposite to that associated with a depression.

Firstly, the isobar lines are closer together on the outside of an anticyclone than they are towards the middle and they are farther apart on average than in a depression. Hence lighter winds can be expected down to dead calm in the central areas.

Unlike a depression, an anticyclone is a far less active creature. It develops slowly (intensifying), moves slowly but sometimes not at all for days on end and gradually fades away (declining). Quiet, settled weather is its hallmark, in spring and summer mainly clear skies with warm days, but in winter months cold, sometimes cloudy days clearing at sundown to give a hard frost overnight and early fog, hanging on throughout the day.

Oddly enough, although weather across an anticyclone will be rain free, drizzle is not uncommon in the winter months through condensation of fog particles in cold air. If temperatures are low enough, the dreaded freezing fog is much in evidence in the latter conditions.

The propagation of radio waves, especially so on the v.h.f. and u.h.f. bands, can be much affected by the development of an anticyclone. ('...please do not adjust your sets!), particularly so on the decline, when the troposphere will undergo structural changes.

I have noted, in the case of FAX map reception, that some form of interference may be expected in these conditions. The arrival of a depression does seem to improve things.

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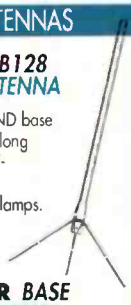

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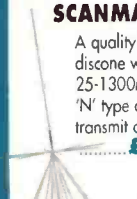

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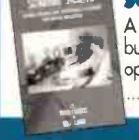

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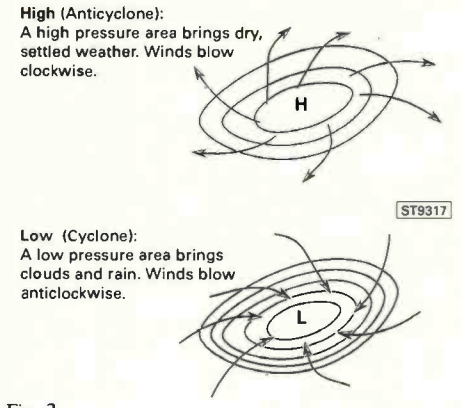


Fig. 3.

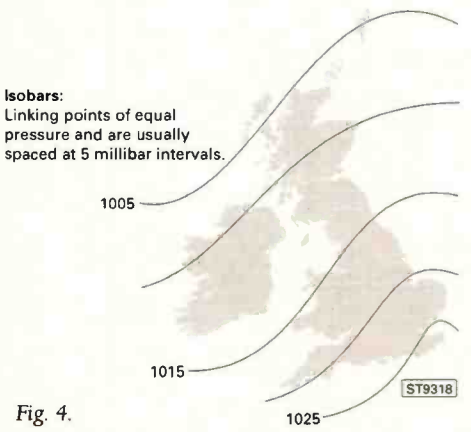


Fig. 4.

The Maps

Both the surface forecast maps and surface analysis type maps will show all the features mentioned in the previous paragraphs. In addition, it will be noted that on the forecast map, **Fig. 1**, areas of significant cloud are indicated and it will be seen that these are usually generated in the regions of the low pressure areas along the lines of their 'fronts'.

The surface pressure forecast map as illustrated in **Fig. 1** indicates weather status expected at a forward period of 72 hours from the time of compilation of map at 0600UTC. The actual Hamburg transmission time is 1050UTC daily.

Therefore if this map is received daily, a succession of forecast maps can be saved with your PC. On a day-to-day comparison, the movements of weather systems will be apparent.

The *JVFAX* application has excellent facilities for the saving of maps and the playback of up to a sequence of 50 images within the movie option, at varying speeds. This can be most instructive regarding the actual development and movement of weather systems.

On the surface analysis map, **Fig. 2**, in addition to the isobars, depressions, fronts, etc., a great many small plots can be seen and the enlargement of a single plot will enable the precise weather conditions to be ascertained in a particular area. For those who perform decoding via *JVFAX*, a zoom option is available to enlarge and subsequently interpret such plots and also other parts of the map to clarify any required detail.

The enlarged plot shows the temperature, dewpoint, barometric pressure, wind strength and direction. The remaining symbols can be interpreted by referring to the appropriate tables published by the Metrological Office. The tables are too big be accommodated here.

Here then is a good way to verify the type of weather that can be associated with the 'highs' and the 'lows' and by comparing the surface pressure forecast map in **Fig. 1** with the appropriate surface analysis map, **Fig. 2**, the accuracy of the forecast map can be checked. You should now at least be able to have a good idea of what to expect of the weather for the next day or so.

In General

A closer inspection of your map should reveal the direction of the wind as mentioned under the two main weather systems, depressions and anticylones. It can be assumed that air originating from the north is colder than that from the south. It is fairly safe to do so most of the time, but you should study your FAX map closer and try to ascertain where the winds originate from.

On the leading edge of a depression whistling in from the Atlantic, the south westerly winds will be mild and moist most of the year, since the sea keeps a fairly stable temperature i.e. because of its mass takes a long time to warm up and cool down. However, an anticyclone stuck over Iceland in January can bring bitterly cold easterly winds to the UK from Scandinavia, where land masses have cooled considerably in a shorter period than that of the surrounding sea areas.

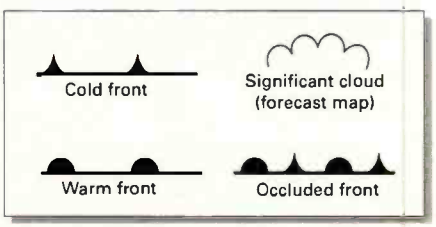
A similar anticyclone over the low countries in summer can bring positively tropical weather to the UK, since its western side will be drawing in warm air from southern France and Spain. These general observations should enable a reasonable assessment of temperature to be expected which you can confirm by reference to the individual plots on the pressure analysis map.

Good weather watching and I hope that with perseverance, the information I've presented here will produce a few more weathermen amongst fellow s.w.l.s.

Further Reading

Fax and RTTY Weather Reports from SWM Book Store.
In depth weather information can be found in *Atmosphere, Weather & Climate*, published by Methuan, Barry & Chorley.
The Met. Observers's Handbook published by HMSO.
The UK Met. Office web site can be accessed at
http// www.meto.govt.uk/home.html

Fig. 5: Frontal symbols.



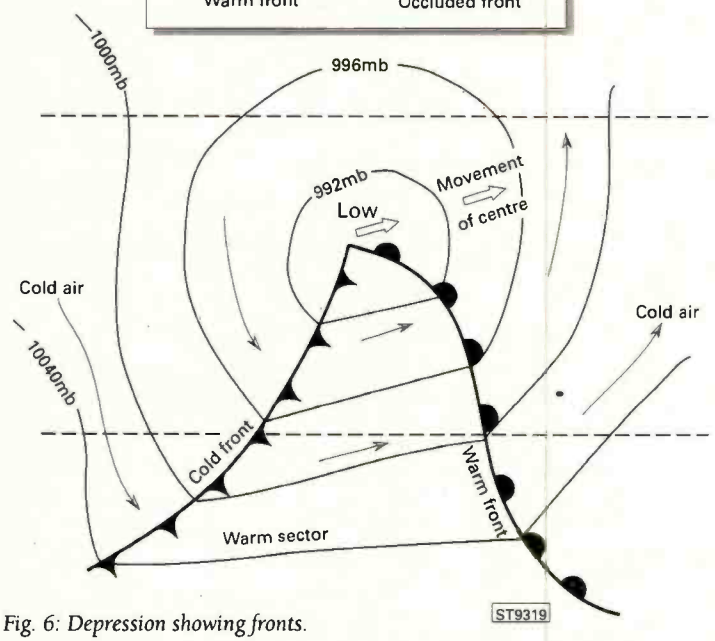


Fig. 6: Depression showing fronts.

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Coming Soon Micro RF Detector

Oldies, But Goodies

This month Joe Carr K4IVP, brings us some antennas from yesteryear that still work for s.w.l.s today

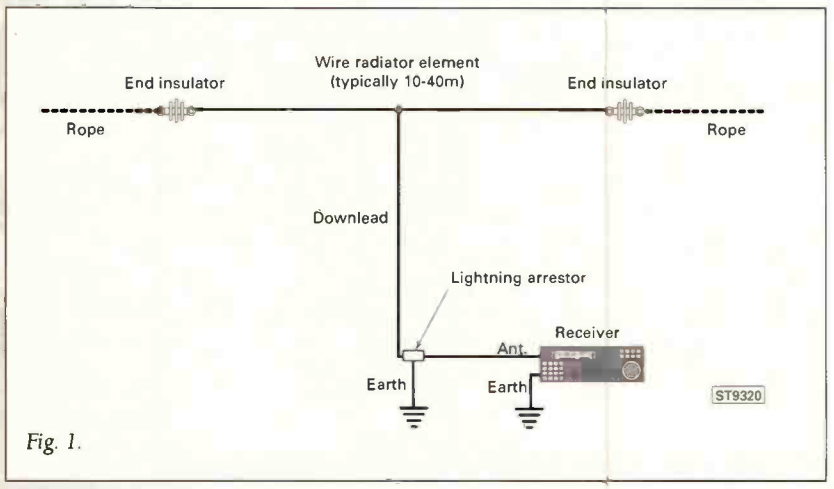


Fig. 1.

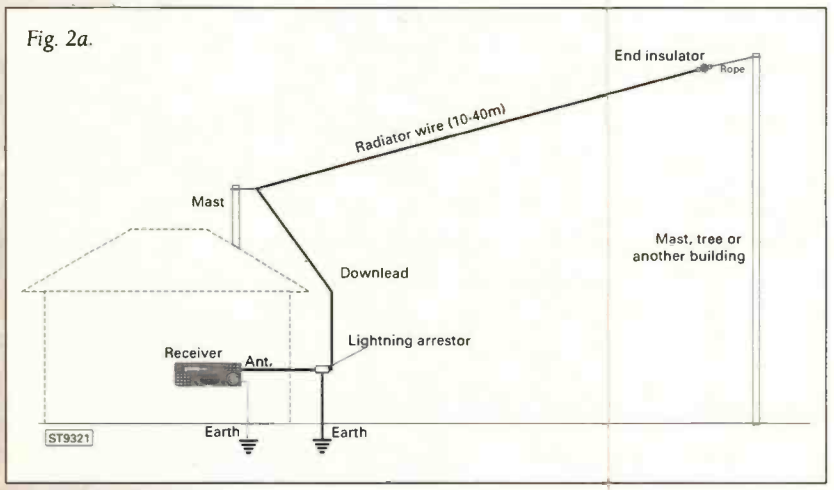


Fig. 2a.

Fig. 1: 'T' antenna.

Fig. 2: a) Random length wire antenna; b) L-section coupler.

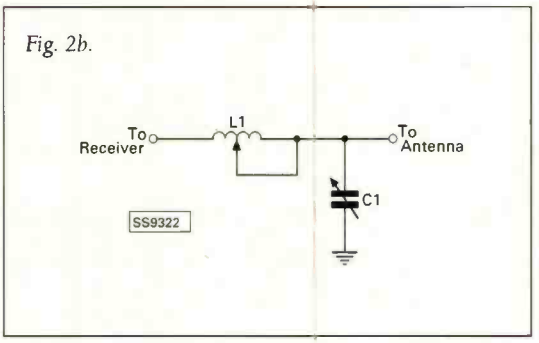


Fig. 2b.

Over the past thirty years I've researched most of the available professional and amateur literature on radio antennas, and am still a sucker for anything new that appears on the market. And although progress goes on, there are still some fundamentals that don't change. For the typical short wave listener (s.w.l.), some antennas are better than others, but even some very simple antennas work quite well. Although much of my antenna writing involves some sophisticated designs, I am occasionally reminded that "...better is the enemy of good enough." Sometimes, in trying to find the optimum antenna, or the antenna with the highest performance numbers, we overlook perfectly decent antennas that will do the job. In this article, we will take a look at some of the tried and proven antennas that your grandmother might have used on her valve receiver, but will still perform wonders for your synthesised, synchronised, digitised, IC-ised Super Bandbuster Mark Future receiver.

T Antennas

The 'T' antenna - **Fig. 1** - is especially suited to short wave listeners, although amateur operators have used them. The 'T' antenna is a length of wire 10 to 45m (or so) long that is fed at the centre with another wire, called the downlead. The antenna element can be bare (not insulated), but the downlead should be insulated 14, 16 or 18s.w.g. wire (where no stress is on the lead, smaller diameters may be used). The antenna element should be made of 16s.w.g. or heavier, hard-drawn, stranded copper wire, or Copperweld wire. The latter is made with a steel core and is coated with copper. Because of the skin effect, r.f. only flows on the surface so the steel core does not add losses to the circuit. If Copperweld is not available, then use hard drawn, stranded copper wire. If regular soft drawn hook-up wire is used, then it will soon fatigue and the antenna will fall down.

The downlead is brought to the receiver by way of a small hole cut into the wall of the house, or through the window. At the antenna end, it is wrapped five to seven times around the antenna element wire, and then soldered. The purpose of the solder is not strength, but rather to prevent corrosion of the joint in weather. Strength is provided by the wire wrap.

Random Length 'Longwire' Antennas

The term longwire is used for a wide variety of different antennas. The only rigorously correct usage of the term is for antennas that are more than two wavelengths long. However, it is common to use the description 'longwire' also for antennas that are actually random length wire antennas (**Fig. 2a**). If the antenna element is, say, 30m long, then it is a 'longwire' at frequencies of 20MHz and up, and a random length antenna for lower frequencies.

The random length wire antenna of **Fig. 2a** is a 10 to 50m long run of 16s.w.g. or thicker wire (again, Copperweld is preferred). In the case shown, the end closest to the house is supported by a mast installed on the roof while the far end has a special support

structure. However, both ends could be attached to buildings, trees, or special structures. The downlead of the random length antenna must be insulated, but need not be Copperweld wire. Ordinary 16s.w.g. stranded wire will suffice.

If the random length antenna is used for transmitting, then a good ground absolutely must be provided. In fact, a 'good ground' is also quite useful for receive only installations ...but for amateur stations it is a must. A 'good ground' means a very short (relative to quarter wavelength) run of heavy wire to one or more 2.5m ground rods. Alternatively, if only a few bands are used, then a system of resonant quarter wave radials can be provided. These can be left on the surface, but only if there is no chance of injury to people crossing the space (In the USA, even prowlers, burglars and other trespassers can sue a homeowner!). Otherwise, bury the radials 20-30mm under the surface using the edge of a spade to make the cut in the ground.

Also required for the random length antenna used for transmitting, and useful for s.w.l.s as well, is an antenna tuner. A standard L-section coupler (**Fig. 2b**), or some other low to high impedance transformation coupler is required.

A variation on the theme is shown in **Fig. 3**. In this case, the wire antenna and downlead are the same as in the previous antenna. However, at the feed end you have the selection of several options in addition to direct connection to the receiver (see inset to **Fig. 3**): i) an inductor for antennas that are too short, ii) a capacitor for antennas that are too long for the operating frequency, and a pair of L-section couplers depending on whether the antenna impedance is higher than (iii) or lower than (iv) the transmission line or receiver antenna input impedance. For both the inductor and the capacitor two maximum values are listed in **Fig. 3**. Use the lower for antennas that are predominantly in the high end of the h.f. spectrum, and the larger for lower frequencies.

Doublet Antennas

A doublet antenna is one that is fed in the centre. Unlike the 'T' antenna, the doublet is broken in the middle and each half is fed by one side of a two conductor transmission line. The most familiar example of the doublet form of antenna is the half wavelength dipole, but there are also several other forms. If the doublet is half wavelength long, then each half is quarter wavelength. The overall length of such an antenna is found from:

$$L = 143/F$$

Where: L is the length in metres, and F is the frequency in MHz. Each quarter wavelength element is one-half this length.

Keep in mind that, although equations for antenna length look absolute, they are only approximations. An unfortunate trait amongst we antenna buffs is a fondness for using very precise mathematics for things with so much inherent variability that the maths is at best an educated guess...but a guess none the less. The actual length required is determined by the immediate locale, and what's in it to alter the antenna characteristics (houses, trees, etc.). For proper operation, the antenna will have to be tuned (of which, more later).

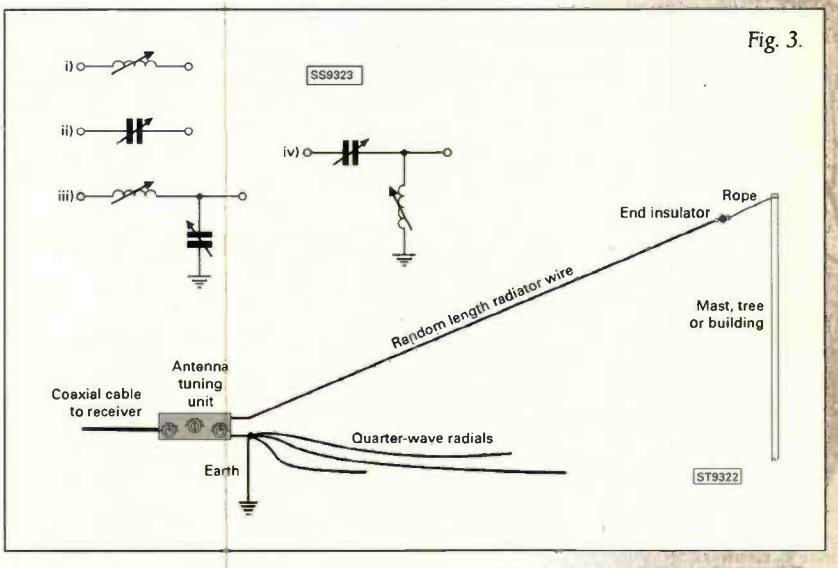
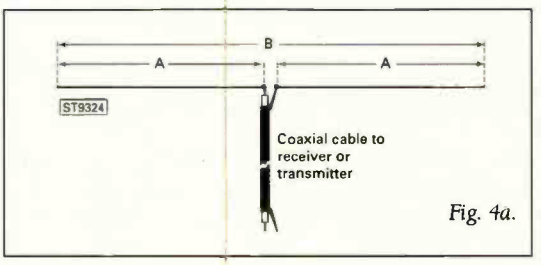


Fig. 3: Random length wire antenna with several different options for the tuning unit (see inset).



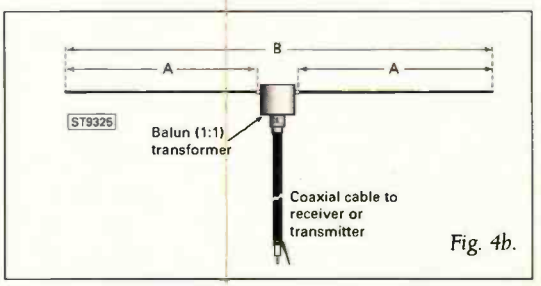
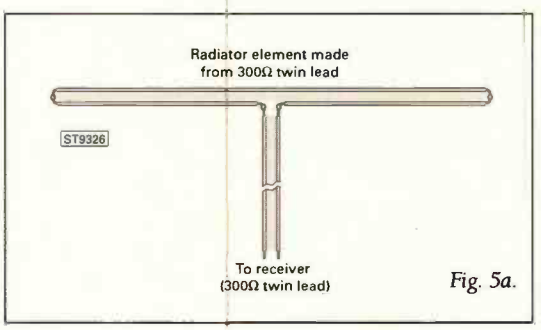


Fig. 4: Half wavelength dipole: a) direct feed; b) with 1:1 BALUN transformer feed.



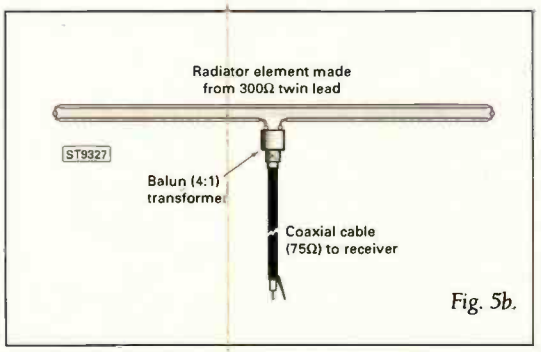


Fig. 5: a) Standard folded dipole made of 300Ω twin-lead, and using 300Ω twin-lead for the downlead; b) Using a 4:1 BALUN transformer to match the feed point impedance to 75Ω coaxial cable.

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True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts. The AR5000 is not like this! Drawing from its earlier success, AOR has designed the AR5000 to be a true base station receiver - from the drawing board, this is very apparent when plugging in an external aerial, the result is unsurpassed performance instead of a clutter of music and pager breakthrough over many of the desired frequency bands.

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Alan Gardner, Short Wave Magazine, June 1996 *"I found the r.f. performance of the receiver to be very good, making it suitable for professional as well as top of the rage hobbyist use... unlike most other wide band receivers it uses separate Vericap tuned r.f. stages to provide important front end pre-selection for a large proportion of its range. This is particularly important in conjunction with a good dynamic range and a low noise synthesised local oscillator in order to minimise unwanted intermodulation products... Receive sensitivity was very good and tended to remain fairly constant throughout the range of the receiver..."*

Chris Lorek, Ham Radio Today Vol.15 No.6 *"...Not once did I find any problems on VHF or UHF due to strong signal overload from other bands - I was extremely impressed! ...Throughout the wide frequency range, the receiver was adequately sensitive, especially so at the upper end, with good overall strong signal handling characteristics... I must admit that I'm a fan of AOR's receivers, and having tested the AR5000, even more so."*

Add to this the most comprehensive set of scanning facilities in this sector of the market, wide unbroken all mode coverage of 10 kHz - 2600 MHz in 1 Hz steps, high stability NCO (Numerically Controlled Oscillator) for drift free listening and **the AR5000 proves to be quite a receiver.**

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AR7030

AR7030 - High dynamic range short wave receiver £799

High dynamic range, what is it all about ??

The AR7030 has been designed to provide excellent strong signal handling, this provides the operator with the very best chance of hearing weak distant DX even when very much stronger more local transmissions occupy the same frequency band and are positioned close to the wanted signal. Good strong signal handling simply is the ability to hear weak signals in the presence of strong transmissions... in technical terminology, the greater the dynamic range (and higher the IP^3 = third order intercept point), the better the results on crowded bands. For short wave listening, an IP^3 figure around 0dBm is fair but many receivers struggle to better this even to +10dBm, while the AR7030 surges passed with IP^3 greater than +30dBm. While it is nice to quote good figures in advertising, it is more beneficial if they are qualified:

Peter Hart, RadCom July 1996 *"...The strong signal performance is extremely good. The intermodulation measurements are at the limit of my measurement capability and close-in result by far the best I have measured on any general coverage receiver. ...The excellent RF performance of the AR7030 is certainly most apparent in on-air tests."* The measured performance in a RadCom table provided IP^3 results better than +30dBm and dynamic range well over 100dB.

Lawrance Magne, Passport to World Band Radio *"The '7030 was obviously designed with exceptional strong-signal handling in mind... Dynamic range is excellent at both 5 and 20 kHz separation points, and third order intercept measurements at 5 and 20 kHz separation points are superb. The '7030's dynamic range is at a level normally associated only with the finest professional receivers... Best dynamic range of any consumer-grade radio we've ever tested. What these measurements showed is that the '7030's dynamic range and third-order intercept points are at levels normally associated only with the finest in professional hardware. Yet the '7030 does this at a fraction of the price."* An in-depth report in 1997 Passport quoted IP^3 at +30dBm.

Strong signal handling is often more important than pure sensitivity, this being the case in most European locations. Of course the AR7030 also provides good sensitivity and excellent selectivity, this *balance* coupled to innovative features is what has earned the AR7030 so many awards and accolades over the last year or so.

Chris Lorek, Ham Radio Today May 1996 *"...Regarding the RF performance of the set, my measured results say it all. If you're not technically minded just read these as superb..."*

The designer's (JT) enthusiasm for top range Hi-Fi design has also shone through. The AR7030 provides truly excellent audio and low distortion, separate tone controls enable incremental 2dB change in treble and 1dB change in bass.

Lawrance Magne, Passport to World Band Radio *"Superior audio quality, so it's well suited to listening to programs hour after hour... over-all distortion is good-to-excellent in the AM mode, and excellent-to-superb when the synchronous detector is in use."*

Chris Lorek, Ham Radio Today May 1996 *"...Besides the RF measurements I've tabulated, for 'audio buffs' I also quickly measured the audio distortion, which came out at 1.3% on AM with 50% volume setting and 1kHz tone, measured 'flat'. Placing a 300Hz high-pass audio filter in line brought the distortion down to an almost unmeasurable level, thus with a typical 'communications speaker' any distortion you'd probably hear would be only that on the transmitted signal..."*

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The flexibility of the AR7030 is immense, many types of optional filter may be added to customise for data, CW use etc, the multi-option notch / noise blanker / features CPU adds another array of controls.

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UPNB7030	Upgrade noise blanker & notch filter when the features CPU is already fitted (such as the *AR7030 PLUS*)	**£163.00** (£5)
BP123	(BA7030) Internally mounted battery	**£99.99** (£6)
TW7030	Optional telescopic whip for the AR7030	**£12.95** (£2)
DATA MASTER	PC control software & data base	**£129.00** (£3)
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MF500	500 Hz Collins mechanical CW filter	**£69.95** (£2)
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MF6	6.0 kHz Collins mechanical AM filter	**£69.95** (£2)

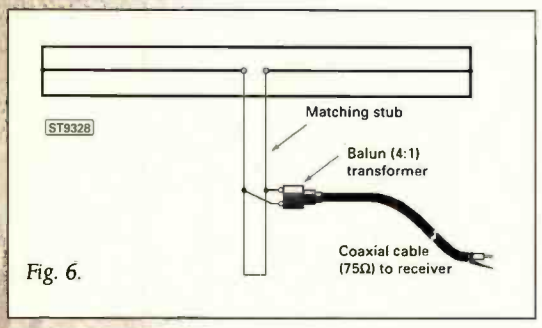

Fig. 6.

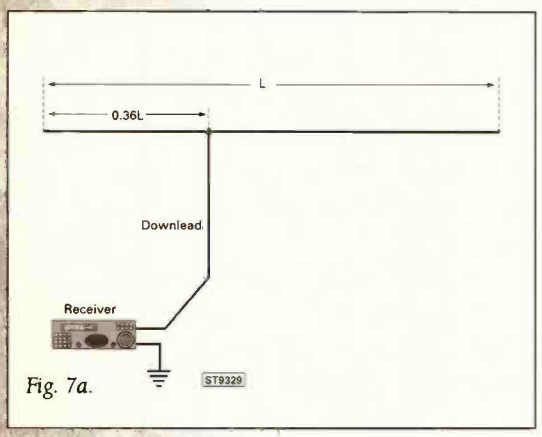

Fig. 7a.

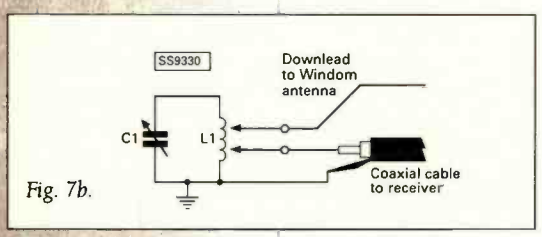

Fig. 7b.

Fig. 6: Three-wire dipole.

Fig. 7: a) Windom antenna; b) tuning unit for Windoms.

The basic form of the halfwave doublet is shown in Fig. 4a: the half wavelength dipole. The overall length (B) is calculated from **Formula 1**, and each element (A) is B/2. This type of dipole is most often fed with 75Ω coaxial cable. But in older designs of this antenna coaxial cable was not always used. At least two forms of transmission line were often used that are not coaxial. One form of alternate transmission line is called twisted pair. Two insulated conductors are twisted over on each other. You can either buy twisted pair wire, or make it using a hand drill and two lengths of regular stranded wire. Use about 24 twists per metre. The other form of two-wire transmission line is ordinary lamp flex.

It is good practice to couple the feed point of the dipole to the transmission line through a 1:1 BALUN transformer. This type of transformer provides no impedance transformation, but does convert the unbalanced transmission line for use with a balanced load/source such as the dipole antenna. **Figure 5a** shows the folded dipole form of doublet antenna. Again, the overall length of the antenna is half wavelength. The folded dipole consists of two half wavelength radiators that are closely coupled to each other. The two radiators are insulated from each other at all points except the very ends, where they are shorted together. The feed point is at the middle of one of the radiators. This form of antenna has a feed point impedance around 280Ω, so is a good match for 300Ω twin feeder.

The radiator element of the folded dipole can be made using 300Ω twinlead if only used for receiving, or low power transmitting, but if higher powers are contemplated then use 16s.w.g. stranded wire spaced 100 to 200mm apart. The spacers are ideally the ceramic types once found in abundance in radio stores, but Lucite, pvc or even treated (waterproofed) wooden dowels. The inset detail shows how to connect the spreaders to the antenna wires, and use safety wires to keep them in place.

Another means of feeding the folded dipole is to replace the centre insulator with a 4:1 ratio BALUN transformer (**Fig. 5b**). These low-cost devices will transform the 300Ω balanced impedance of the folded dipole down to 75Ω unbalanced so that ordinary coaxial cable can be used for the run to the receiver. If you've every worked with twin-lead, you'll probably recall that it can sometimes be a mess.

Still another form of doublet antenna is the three-wire folded dipole of **Fig. 6**. This form of antenna is similar to the standard two-wire folded dipole, but uses three parallel conductors instead of two. The conductors are kept insulated from each other except at the far ends, where they are connected together. The impedance of the three-wire folded dipole is controllable by varying the ratio of the conductor diameters and their relative spacing. For our purposes, however, a simplified arrangement is used in which all three conductors have the same diameter, and they are all spaced from each other by 100 to 120mm. This arrangement will yield a feed point impedance of about 600Ω, so is a good match to 600Ω parallel line.

The Windom Antenna

The Windom antenna is a half wavelength wire antenna that is fed off-centre (**Fig. 7a**). Because the mid-point of the half wavelength antenna is the low point (about 70Ω), the off-centre feed point is at a higher impedance. **Figure 7** shows the classic Windom antenna used in the 1930s. The single conductor downlead is fed at a point that is 0.36L, where L is the length of the antenna (143/F(MHz)). The Windom antenna is usually fed through an antenna coupler so that its impedance can be matched to the lower impedance of the transmitter or receiver.

The impedance of the feedline from the Windom is quite high, so connecting it directly to the receiver results in a high v.s.w.r.. And although this mismatch is not the profound problem on receivers as it is for transmitters, it none the less represents a loss. **Figure 7b** shows the usual antenna tuning unit for the Windom antenna. A parallel resonant L-C circuit (C1/L1) is tuned to the desired operating frequency. Two taps are provided on the inductor (L1). The high impedance tap goes to the Windom downlead, while the low-impedance tap goes to a length of 52Ω coaxial cable to the receiver.

Figure 8 shows a modified Windom design in which the single wire downlead is replaced with either 300Ω twin-lead transmission line, or a 4:1 BALUN transformer that is in turn fed with 75Ω coaxial cable. This antenna does not provide an ideal impedance match, and one can expect (as with both Windoms) some 'r.f. in the shack' when more than moderate power levels are used. However, the v.s.w.r. is not terribly high and can be overcome using a standard coaxial-to-coaxial 'line flattener' form of antenna tuner.

Figure 9 shows two variants of the Swallow Tail Multi-band Vertical antenna. The radiator elements in both **Fig. 9a** and **9b** are cut to specific frequency bands, and are quarter wavelength (L(m) = 75/F(MHz)). As many as needed to cover the bands of interest may be used, provided that they don't bear a 3:1 frequency ratio. The reason for the constraint is that for all antennas but the resonant one the impedances are so high that connecting them in parallel with each other does not affect the overall feed point impedance.

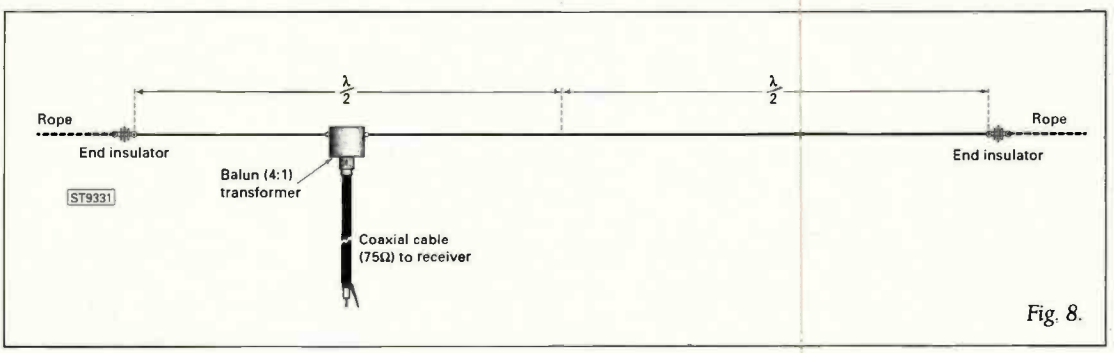

Fig. 8.

Fig. 8: Modified Windom with 4:1 BALUN to transform impedance and coaxial cable feedline.

Fig. 9: a) Swallow Tail antenna with rope support; b) Swallow Tail antenna with yard arm support.

Fig. 10: Shortened dipole.

However, at the third harmonic, the impedance again drops low and will load down the impedance seen by the transmission line. This is another situation where the results are more profound for amateur radio transmitters than for s.w.l. receivers, but it's a good idea to avoid it, if possible. Besides, the antenna is actually resonant on its third harmonic, so you lose nothing.

The version in **Fig. 9a** uses a pair of insulated masts, or support structures (roof of a house, tree, etc.) with a rope stretched between them. The quarter wavelength resonant wires are spread out along the length of the rope, evenly spaced.

The version shown in **Fig. 9b** uses a large wooden cross-like structure. The antenna wires are connected to the cross-piece at the top end, and to the coaxial cable at the bottom end. This antenna apparently worked well for a fellow who wrote to me recently. He lives in a townhouse community that has a 'homeowners association' of nit-picking little dictators who like to tell people what they may do with their houses. One of the rules is "no outdoor antennas" of any sort. He erected a mast in his rear garden shaped like a ship's mast and yardarm, and then convinced the busy-bodies snooping for 'the committee' (dread!) that it was somehow nautical, not radio!

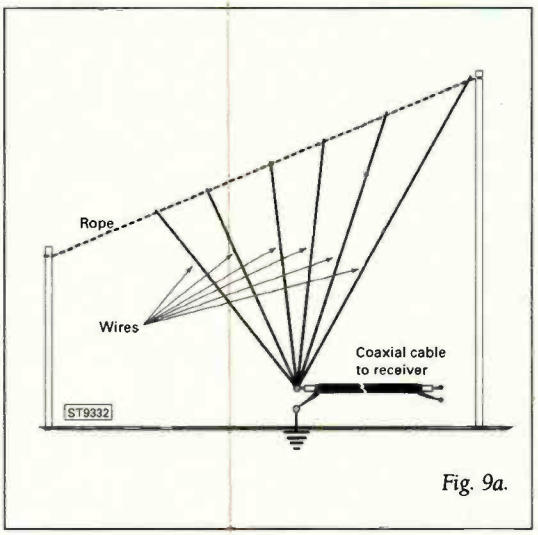

Fig. 9a.

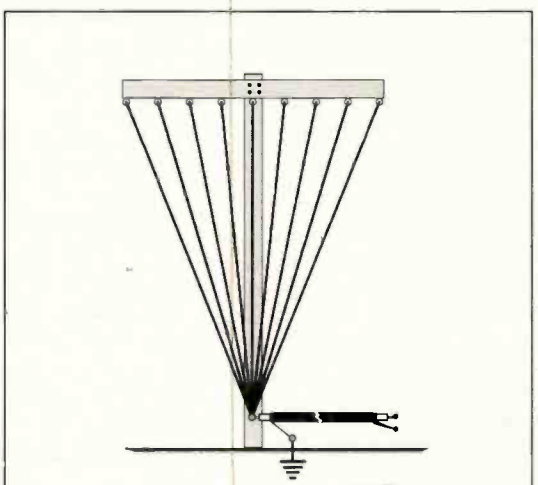

Fig. 9b.

Shortened Dipole

Some short wave enthusiasts cannot easily erect a half wavelength antenna because of space limitations. Those people can use a shortened dipole such as **Fig. 10**. These antennas are very similar to the regular dipole, except that the overall length is less than a half wavelength. The difference is made up by inserting an inductor in each element. Although the placement and value of the inductor is determined through a complex process, some companies offer preset coils that will suffice for most readers. Follow the instructions that come packed with the coils for proper installation. For those who wish to make their own inductors, when the coils are in the middle of each leg (as shown), and the antenna is made from 16s.w.g., wind the coils to have an inductive reactance of about 650Ω in the middle of the desired band.

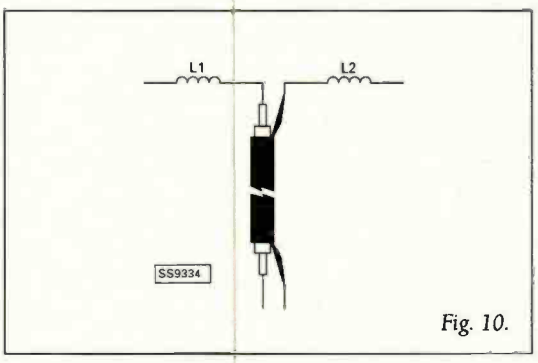

Fig. 10.

Conclusion

Before considering spending a huge sum of money, and loads of effort, erecting a high performance antenna, you should consider whether or not one of the simple antennas presented in this article are sufficient for your needs. After all, it's still true that "...better is the enemy of good enough."

30 Years Of BBC Colour Television

Keith Hamer and Garry Smith continue the story of the first colour television service in Europe.

Part 2

Transmitting The Colour Signals

The programmes were radiated by the Crystal Palace transmitter to which the programme was fed from Alexandra Palace by land-line. The Crystal Palace outlet consisted of twin transmitters having a common carrier drive and separate modulators and modulated carrier amplifiers which were in parallel to provide the required power into a common antenna.

The BBC arranged for colour receivers to be installed in the homes of research staff. All the sets were fitted with the RCA 21in tri-colour kinescope chassis, type 21/AXP/22A. The majority of the receivers were manufactured by Murphy Radio Limited and were in the nature of 'commercial' prototypes in that the components and circuit techniques employed were similar in quality and cost to those used in domestic monochrome television receivers, although of course, much more complex. At any one time there were about eighteen of these receivers in use in various homes. There were also a number of experimental receivers, mainly using the RCA tube, available to members of BREMA. By 1960, the General Electric Company had developed a commercial receiver which gave a much improved performance particularly from the point of view of brightness, sharpness and registration.

What About The Programmes?

There were altogether seven different programmes transmitted from October 1957 on a regular basis from Studio A at Alexandra Palace during 1957-1958. The programme was changed every month and was broadcast on six occasions in the first week of each month. Three were radiated in the evening following the close down of normal programmes from about 11.15pm until midnight. The remaining three transmissions took place during the Trade Test Transmission period in the afternoons at about 3.30pm.

The colour test transmissions were only radiated from Crystal Palace; all other transmitters continued radiating the BBC Test Card 'C' with lively accompanying music. A film was usually transmitted from Crystal Palace as a separate part of the same colour programme and additional film transmissions took place in the third week of each month on four occasions with two in the evening and two in the afternoon. Of the seven programmes, three were plays evenly divided between modern and historical settings, two revues, a programme in which the emphasis was on dancing including ballet, and a variety programme of songs, turns and dances. The film transmissions were all from 35mm footage.

In order to make the assessment of picture quality, viewers were asked to complete a questionnaire which covered twelve aspects of the colour programme including noise, mis-registration, fidelity of colour reproduction, picture sharpness and overall assessment. The results from the non-technical viewers indicated that mis-registration was the worst aspect of the colour transmissions. This effect tended to be reduced when using the English Electric image orthicon tubes which, unlike the RCA types, featured a field mesh.

Colour Test Charts

A black 'grille' pattern on a white background was originally used to check registration. However, beam-pulling occurred in the RCA 6474 camera tubes which resulted in poor registration. To counteract this, a grille of white lines on a black background was used to adjust studio cameras (**Fig. 1**). Since registration in the centre of the picture is more important, a finer grille was incorporated into that area of the chart.

The only other test chart which was used regularly in the studio was a standard RETMA logarithmic grey scale (**Fig. 2**). This consisted of a 20 x 16in opaque chart having ten neutral steps graduated in equal levels of brightness. It had two horizontal rows of grey scales with the white of one scale vertically above the black of the other so that allowance could be made for the effect of shading across the picture. The greyscale test chart had to be evenly illuminated at the same lighting level as the studio set, and with light of the same colour temperature. The illumination was provided by using two 'scoops' which provided light from both sides of the chart at an angle of incidence of 45°. A similar grey scale test chart is still used today to align colour cameras although the method of lighting has been modified.

Once the cameras were lined up, they were panned on to a 'live' model, sitting inside the studio set, correctly illuminated and correctly made up to make possible an assessment of the accuracy of camera line-up that had been achieved. A 'live' model was used because the successful reproduction of facial tones is the most critical task of any colour system. It was, and still is, essential to check the system by a test no less critical than the one by which viewers would judge it. Of course this was a fairly expensive part of the lining up procedure because the models required payment.

Colour photographs were tried as an alternative, but

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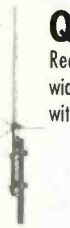

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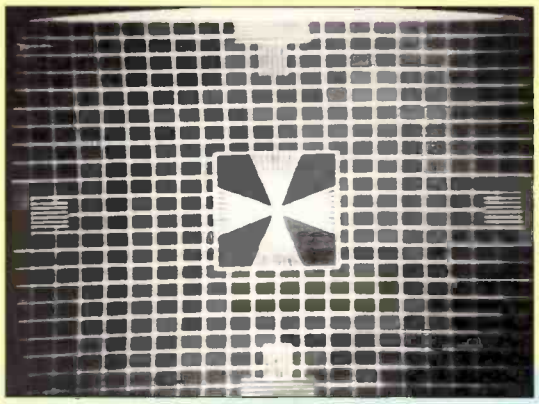


Fig. 2.1: This monochrome Test Chart was used by the BBC in the fifties to check colour camera registration.

were not very successful. Photographic techniques were not sufficiently developed for this purpose until the introduction of the BBC Colour Test Card 'F' on 1 July 1967 where it was possible to feature a large area of flesh-tone in the centre circle. BBC Test Card No. 61 (Flesh Tone Reference, produced by the BBC and Royle Ltd) did provide some form of alternative photograph for aligning studio cameras.

A special Colour Tuning Signal was devised to advise viewers in the late fifties that an experimental transmission was about to take place (**Fig. 3**). The central photograph, featuring Sylvia Peters, was radiated to show as much flesh-tone as possible so that viewers could adjust their colour sets as required despite the inherent limitations of the photograph.

Mobile Colour Television

When the series of experimental colour transmissions ended in April 1958, a great deal of knowledge had been gained. However, most of the programmes had originated in the studio and experience with outside broadcasts was minimal. It was decided, therefore, that before the colour cameras were finally packed away it would be a good idea to try colour OBs. The two colour cameras and associated equipment were transferred to a huge pantechnicon which before the War had housed one of the mobile Band I OB transmitters.

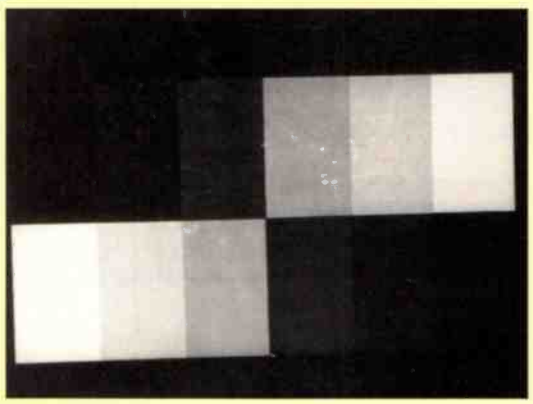


Fig. 2.2: A Test Chart featuring a set of twin grey scales was used in the fifties for colour camera alignment.

The first use of the mobile control room was at the Festival Hall on June 25th, 1958 when a small interviewing studio was set up in the foyer on the occasion of the Soirée of the Institution of Electrical Engineers. Guests were invited to appear in front of the colour cameras and were interviewed by Sylvia Peters who at that time was a BBC television announcer. Although this interview style of production was relatively easy to do, an attempt to get pictures of dancers on the floor was a complete disaster with the total lack of camera sensitivity being all too obvious!

Between 11 and 13 of August 1958, the Military Tattoo at the White City in London provided a subject which had many features which would probe the performance of the colour cameras. The Tattoo provided plenty of colour, movement and, at times, a mass of fine detail. One of the cameras was fitted with a zoom lens with a focal length of 50 to 200mm. The signal was relayed to Broadcasting House in Portland Place by cable where a large audience (mainly BBC engineers) viewed the Tattoo.

Over the three-day period the English climate threw everything it could at the OB which resulted in many problems regarding lighting. Because of these tests in 1958 it was thought that scenes shot outside in colour would not be acceptable to viewers for some considerable time due to the widely varying levels of natural light. However, a lot of invaluable experience was gained.

Later Developments

From October 1958 until the early Sixties, a regular series of experimental colour transmissions was radiated from the Crystal Palace transmitter. The main purpose of these transmissions was to provide a high-quality signal for the benefit of the television industry engaged in research and development of colour television. The nature of transmissions was agreed with BREMA who were consulted at the very beginning of test transmissions back in 1955.

On 27 March 1960, the first transmission of colour television took place between Paris and London and was demonstrated at the Institution of Electrical Engineers.

Up until the autumn of 1960, test transmissions in colour took place both in the morning and the afternoon. However, the morning transmissions had to be discontinued from September 19 due to the introduction of extended hours for Schools programmes. On the mornings of Mondays to Fridays inclusive, colour slides and Test Card 'C' were radiated during alternate 15-minute periods. The afternoon colour transmissions, which continued after 19 September 1960, took place on Tuesdays, Wednesdays and Thursdays and consisted of a 30-minute programme showing pictures from 35mm film. The transmissions began at approximately 4.00pm, subject to programme commitments.

At this stage, it seemed that the NTSC colour system would be adopted in the UK; the PAL system was still to be developed. By 1960, the NTSC system had been in use in the USA for some seven years, but it didn't appear to be making much progress. One of the main problems encountered in the USA was that colour television required highly skilled technicians to repair customers' sets and these appeared to be in short supply.

The research work carried out by the BBC from 1955 indicated that the NTSC system was a sound standard, although there were many problems to overcome. It could provide a sturdy signal with excellent picture quality, but the main problems were associated with the colour camera.

Between 22 August and 2 September 1961, colour television was demonstrated for the first time to the general public by the BBC at the Earls Court Radio Show using the 405-line system. At the same venue the following year, the BBC demonstrated, for the first time, colour television on 625 lines.

The first colour television transmission via the American *Telstar* satellite took place on 16 July 1962. In the same year, on September 3, the BBC began monochrome field trials on 625-lines in the u.h.f. bands from Crystal Palace as part of the long-term plans for the commencement of BBC-2.

Between 8 an 16 July 1963, the BBC demonstrated three alternative systems of colour television to members of the European Broadcasting Union and representatives of the Eastern-bloc OIRT Organisation. The three

systems were NTSC, SECAM and PAL.

On April 20th 1964, BBC-2 began broadcasting on 625 lines in the u.h.f. bands. Due to a power cut at Battersea Power Station just minutes before the official opening ceremony planned for 7.20pm, the celebrations had to be postponed until the following evening. The first programme on BBC-2 was screened on the morning of April 21st without any ceremony. It was *Play School*, for the under fives. Just over a year later, on 24 May 1965, the experimental NTSC colour test transmissions were replaced using the PAL system.

On March 3rd 1966, the Post Master General authorised the introduction of regular colour television transmissions on BBC-2. The transmissions were planned to commence towards the end of 1967, using the PAL system. In 1966, the BBC provided facilities for colour television coverage of the British General Election results programme for the North American networks. The transatlantic colour signals were transmitted via the *Early Bird* communications satellite. At the BBC's Television Centre in London, Studios 6 and 8 were quickly transformed from mere carcasses to being fully equipped for colour working. The BBC-2 Presentation Studio and the Network Control Room were also equipped for colour. At Alexandra Palace, arrangements were made for the News Operations departments (both studio and film) to be switched to colour.

Preparations were made in 1966 for all existing BBC-2 transmitters to carry programmes in colour. By the end of 1967, the BBC planned to have 18 main transmitters in service plus a number of relay stations so that approximately 70% of the UK population would be able to receive colour transmissions. A further ten high-power transmitters were planned for 1968. Two large colour Outside Broadcast units were ordered by the BBC for delivery in 1967 for 'live' colour coverage of various sports events, in particular, Wimbledon. The installation of colour telecines and colour video tape machines at Television Centre and Alexandra Palace enabled the BBC to produce two hours of colour programmes each night from the commencement of the BBC Colour Television Service on 1 July 1967. The first transatlantic colour programme using the BBC's field-store standards converter was shown on 31August 1967.

BBC Colour Test Card 'F'

The little girl in the red dress, sitting in front of a blackboard, used to be the 'star' hardly anyone knew. She used to appear for hours every day (except Sundays) on BBC-tv. In March 1969 it was announced that she was due to be seen on ITV every day, too, by the end of the year. The 'little girl' was Carole Hersee and she appeared without fail on the BBC Colour Test Card 'F' (Fig. 5). Nowadays you have to tune-in during the dead of night to catch a glimpse of Carole!

The story of her break into television began in 1966 when the BBC was designing a new Test Card to help the Television Trade tune in sets ready for the launching of the Colour Service on BBC-2. They decided to include a child, and chose Carole, daughter of a BBC engineer closely involved with the production of BBC Test Cards. She was photographed beside a blackboard with her favourite toy - a blue and white-striped clown. But for the picture he was given a green outfit with yellow buttons.

Since July 1967, Carole's picture and the highly technical area around it were a daily feature of BBC-2 Trade Test Transmissions. In March 1969, Thames TV decided to use the same girl. Carole was photographed at the company's London studios on 18 March 1969 for a new test card to be used when ITV transferred to colour in November of that year. Nothing much seems to have come of that photo session!

Fig. 2.3: The BBC Colour Television Tuning Signal used in the fifties featuring announcer, Sylvia Peters.

Carole has clocked-up more air-time on television than anyone else, and not only in the UK! Test Card 'F' has been used around the world including countries such as Norway, New Zealand, Australia and Bahrain. In 1971, she was given an award at the Royal Television Society's Ball for services to the television industry. Although as a child she dreamed of becoming a model she abandoned the idea when she left school, going instead to work as a costume-maker for Shepperton Studios. Her work included making clothes for Alfred Hitchcock's version of the thriller *The Lady Vanishes*.

Fig. 2.4: The original version of the BBC Colour Test Card 'F' transmitted from 1 July 1967.

Carole has worked as a costume-maker ever since making many of the clothes for *The Phantom of the Opera* when it toured the world. She also worked on period outfits for the film *Dangerous Liaisons*.

The BBC Colour Test Card 'F' has been radiated for 30 years without any major modifications being necessary, although a digitally-generated version was introduced in 1984.

Calling All Collectors!

Readers interested in archive television, graphics and test cards (including the accompanying music) may like to know that the authors have produced various books and video cassettes on the subject. Further details are available by sending a stamped-addressed envelope to: **Keith Hamer, 7 Epping Close, Mackworth Estate, Derby DE22 4HR, Tel: (01332) 513399.**

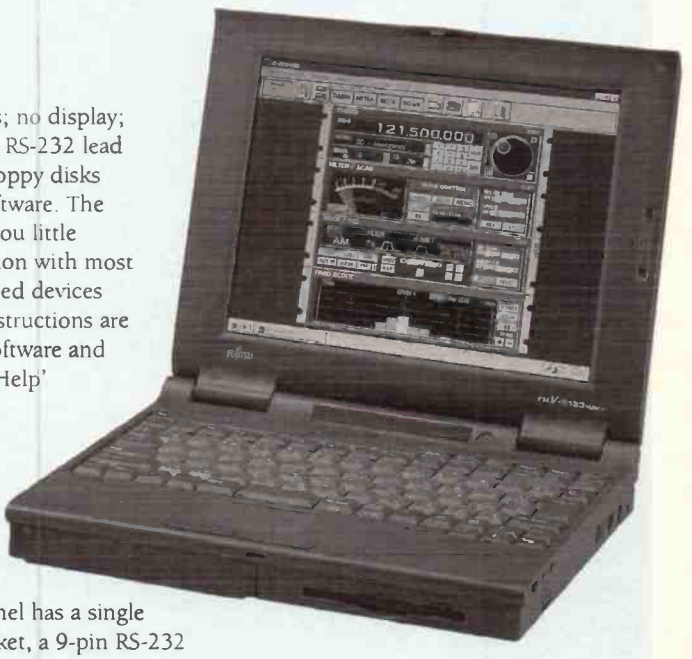
How I Came To Love The Computer

John Wilson connects the newly launched Icom IC-PCR1000 wide band receiver to his computer and is suprised at what he discovers. Read on - and discover more!

When *Short Wave Magazine* published my thoughts on the marriage of computer to receiver, it led to my taking a look at the WinRadio, an experience which confirmed my belief that the last place you want to put a receiver is inside a PC. However, as I have mentioned since, I do use computer-controlled receivers almost every day in my EMC work, and although the receivers cost around £30 000 each they do at least work without being affected by the PC from which they are controlled via a GPIB (IEEE) data bus - so it is possible to marry the computer and receiver satisfactorily if the manufacturer is Rohde & Schwarz. Then out of the blue I was asked to cast my beady eye over a computer-controlled receiver from Icom - who know a thing or two about receivers. How could I resist, bearing in mind I was still mightily unimpressed by my last encounter with a computer-controlled radio, so here is how I got on with the latest black box, the IC-PCR1000.

The Mystery of the Black Brick

Black box it certainly is, because what you get for your money is a matt black brick about the size and weight of a thick paperback. But inside this paperback is a receiver covering 10kHz to 1300MHz (specification guaranteed 500kHz to 1300MHz), which provides all mode reception of u.s.b., l.s.b., c.w., a.m., f.m. (narrow), and f.m. (wide). No front panel; no controls; no display; but you do get an RS-232 lead and a couple of floppy disks containing the software. The 'handbook' tells you little because, in common with most computer-controlled devices these days, the instructions are held within the software and accessed via the 'Help' menu from the computer screen. There is one control on the front of the receiver - an on/off switch, whilst the rear panel has a single BNC antenna socket, a 9-pin RS-232 connector, an external speaker socket, a data output socket for connection to a packet terminal, an earth bolt and a power input socket.



So connect the RS-232 lead to the computer and load the 'set-up' files from the first disk. Having loaded the second disk, up came a very pretty display comprising four units stacked one upon the other. At the top was a unit containing digital frequency read-out, a keypad, a tuning knob and other minor controls including up/down buttons for the TS (tuning step) function. Would you believe that you can select tuning increments from a huge spectrum - galloping 10MHz per step down to a micro fine 1Hz step - and at any frequency?

Beneath this unit is a meter panel which shows a large traditionally calibrated 'S meter' and the various scan controls, and below again is the 'Mode/Vol' panel which carries the mode selection buttons, i.f. filter bandwidth, i.f. shift control, buttons for a.f.c. (automatic frequency control), a.g.c., NB (Noise Blanker) and ATT (r.f. attenuator), and the volume and squelch sliders.

Left: This is what you get (p.s.u. not shown).

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Finally, below the mode panel is a 'Band Scope' panel which shows a panoramic display of signals around the frequency to which the receiver is tuned. The maximum span of the display is 400kHz, but this changes itself automatically in use to suit different tuning step and sweep settings. More detail on the various 'panels' is given later on.

So I thought "This is wonderful" - until I noticed that at the top of the display was a cryptic legend saying "COM Port Trouble?". There certainly was, because I couldn't get the damned computer to talk to the receiver and there is no information in 'The Handbook' because it's all contained in the 'Help' files, which I couldn't access via the program unless I could get the computer to talk to the receiver. Have you ever had one of those days? *(Note that you can always access the help files directly via Windows Program and File Manager* - **KN**). I rang Icom UK to ask what the COM Port settings were supposed to be, but in the end I had to try another computer to get the system to work. Having succeeded (but how many of you have several different computers to try out?), I found that the IC-PCR1000 was quite amazing.

Not knowing quite where to begin I connected the telescopic whip antenna supplied with the receiver and tried a few favourite frequencies. As I expected, the h.f. bands contained a fair few squawks and whistles generated by my own computer, but at least there were many genuine signals to be heard (unlike that other PC controlled 'receiver'), so it was clear that Icom had done a good job at h.f. Going on to v.h.f. and checking airband, amateur bands, the marine band and numerous radio and TV channels made it equally plain that the IC-PCR1000 was a real receiver. So what did I complain about with previous receivers? 'Chuffing' noises when using the tuning knob - not a sign of it on this radio; sudden leaps in background noise when tuning across certain v.h.f. frequencies - not a sign of that either; huge background levels of 'crud' when using a wire antenna - better than expected; I thought it was time to do some real performance checking.

Table 1.

Frequency	Sensitivity	
	a.m.	f.m.
(MHz)	(dBm)	(dBm)
0.150	-102	
1	-110	
10	-117	
30	-112	-115
50	-116	-119
100	-116	-119
250	-116	-119
500	-118	-120
1000	-115	-118

Figures are given for 12dB SINAD in a.m. using the 6kHz filter and 60% modulation at 1kHz. In f.m. I used the 15kHz filter with 3kHz deviation at 1kHz. I began checking the f.m. sensitivity at 30MHz

One problem with wide range, all mode receivers is internally generated signals (sproggies), so I did a sneaky thing with the IC-PCR1000 by putting it inside an r.f. anechoic test chamber and controlling it from outside the room via a long RS-232 cable. I fed the audio from the receiver back out so that I could listen to it and also fed in a signal generator so that I could tell whether or not the receiver was still working. I then programmed a scan to tune from 100kHz to 1300MHz in 10kHz steps, set the squelch control to just close off the background noise, set the mode to a.m. and let it run, and run, and run. To my surprise and delight it ran right through the entire frequency range with only a very few signals on which it stopped, and when I realised that these were all multiples of a basic 16MHz signal, I really didn't know whether they were coming from the IC-PCR1000 or my computer - so the receiver is clean as a whistle, and as I checked the receive performance during the scan by putting in test signals from my Rohde & Schwarz generator, it was also apparent that the receiver sensitivity and background noise were completely consistent across the whole of its tuning range. Remarkable, and having satisifed myself that the receiver was 'clean' I checked that apparent level sensitivity more carefully. The results are shown in **Table 1**.

Now that is a flat sensitivity response if ever I saw one, and just for the record I checked the sensitivity for 12dB SINAD in s.s.b. mode and it came out at -122dBm which is actually rather too sensitive for h.f. work but fine for v.h.f.

Just to see if the 'S meter' readings were as consistent as the overall receiver, I checked the calibration at three frequencies using the a.m. mode with the 6kHz filter with the results as per **Table 2**.

Take any of the frequencies and look at any of the 'S meter' readings and you can see the remarkable flatness of the results. To polish off these measurements I checked the S9 sensitivity on s.s.b. at 150kHz, 1.4, 10, 50, 150, 450, 750, 1000 and 1025MHz and it was consistently -64dBm at every frequency. Even down at 50kHz the S9 reading came out at -62dBm. This is a receiver which could almost be used for professional measurements, and I'm seriously considering buying one for the EMC Centre with which I am associated. Not having any circuit information through which to browse, I can only guess at the reasons for the regularity of performance, but one hint in the sales brochure mentions the use of r.f. tracking filters above 50MHz to improve image rejection, and let's face it, Icom have been designing receivers for some 30 years and their experience shows in everything they produce.

Now those of you who have read previous reviews of mine will realise that I usually describe the operating features of a receiver before going on to the technical aspects, but in the case of the IC-PCR1000 I was so relieved that someone had produced a 'proper' computer-controlled receiver that I couldn't contain my enthusiasm. However, perhaps I should tell you more about the operating features and how easy I found the IC-PCR1000 to use.

Logical Layout

I liked the arrangement of four stacked units which appeared when the software was fired up, and the layout was logical and easy to use. The main tuning knob operated by using the left and right mouse buttons for 'up' and 'down', and there was the customary speed up of tuning rate when you held down the button. You can enter a frequency directly from the PC keyboard, but have to remember that the entry is in megahertz only which means that for frequencies below 1MHz you must enter a zero followed by a decimal point before the kilohertz digits i.e. 198kHz is entered as 0.198, and 60kHz as 0.060. There is also a keypad on the virtual front panel

which can be accessed by the computer mouse, but I found it easier to use the PC keyboard. Around the main tuning knob are up/down buttons for selecting the tuning steps, and the memory 'Write' and memory 'Clear' buttons. Two smaller displays show the memory channel number and name (which is entered from the PC keyboard and very easy to use), and the memory bank and name. Finally, another display shows the tuning step in use, with another pair of typically 'Windows' up/down buttons for changing the step. This is in addition to the buttons by the main tuning knob. As I mentioned earlier, the choice of tuning steps is very comprehensive, ranging from 1Hz (what a synthesiser!) to 10MHz when you really need to get a move on. In between you have all the increments you could possibly wish for, including 6.25kHz for p.m.r. channels, 9 and 10kHz for European and non-European medium wave scanning. As far as I could see there wasn't a single receiving requirement which could not be covered by the tuning steps provided, and in use the synthesiser was free from plops and clicks during frequency changing.

Traditional 'S'-meter

Below the 'Tuning' module is the 'Meter/Scan' module which shows a large analogue representation of a traditional 'S-meter' alongside all the necessary controls for the scanning functions. One feature I liked was the programmed scan in which you can set up a tuning range, say from 118 to 137MHz for airband; select an appropriate tuning step, mode and bandwidth; give the scan set a name, and then call it up whenever you want to use it. By thinking about what you are likely to need, you can have a different program bank ready set up for each of your fields of interest. During programmed scan you can also set up an 'auto memory' function so that whenever the receiver stops on a signal the frequency is entered into a memory bank so that you can leave the receiver to look after itself and review the contents of the store later. A 'SET' button opens up a programming window so that you can set up the start and end scan frequencies and give the scan bank a name. All this is done from the computer keyboard and is just so easy to do it's a pleasure. You can vary the speed of scanning and the length of time the receiver pauses on a signal before resuming the scan by two slider controls, and the familiar Icom 'VSC' facility is provided so that the receiver will ignore signals which do not have any modulation on them.

The memory banks are sensibly arranged to hold 50 channels, and make use of the fact that you have a PC connected by arranging the memory contents to be easily stored and displayed. However, the most powerful thing about having the PC is that you have virtually unlimited memory capacity because the banks are stored in your computer and the only limit is the amount of space you have available on your disk drives. Each memory channel contains frequency, receive mode, memory name, tuning step, attenuator setting, i.f. filter bandwidth, and so on. Is this the perfect marriage of the computer and the receiver? I have to say that I'm impressed.

The 'MODE/VOL' panel contains everything needed for controlling mode selection, filter bandwidth, a.f. gain and squelch setting. What comes as a surprise is the comprehensive nature of these provisions, for you have i.f. bandwidths of 230kHz, 50kHz, 15kHz, 6kHz and 2.8kHz (this shows on the display as 3kHz). The selection of bandwidths is related to the chosen mode, and obviously a choice of 15kHz, 6kHz and 3kHz for a.m. is sensible, as is the 230kHz, 50kHz and 15kHz for the f.m. modes. If you wonder why anyone would want 50kHz then you haven't tried to receive weather satellite data, for which a 50kHz bandwidth is ideal. Both s.s.b. and c.w. are catered for, but what a pleasure to have i.f. shift included, with a clear display of the effect of the shift and an instant 'centre' button for cancelling the shift. The bandwidth legend is accompanied by a little picture to give a visual display of the bandwidth, and all of this is large enough to be easily taken in at a glance. Controls for a.f. gain and squelch occupy the right hand side of the panel together with 'MUTE' and 'MONITOR' buttons, whilst the final four buttons control r.f. attenuator, a.g.c. on/off, Noise blanker and a.f.c. (for use in f.m. modes).

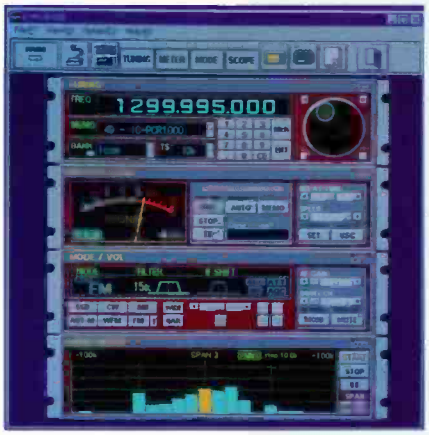
Band Scope

The final panel contains a 'Band Scope' which is a fancy name for what used to be known as a 'Panadaptor', and consists of a frequency spectrum display centered on the frequency to which the receiver is tuned, and covering (in this case) a span of 200kHz each side of centre. The span displayed is automatically adjusted according to the tuning step chosen, but two buttons provide span increase and decrease functions, and sweep 'start', 'stop' and 'pause' buttons are also displayed. The band scope is a nice addition to the overall facilities and does allow you to see what's going on in the band around the frequency, but there was one small problem I found in that if you have the band scope running whilst in s.s.b. or c.w. mode, you don't get any audio output. The only way I could use the receiver in s.s.b./c.w. was to switch off the band scope function - which brings me to the 'tool bar' at the top of the computer screen. Four buttons on this allow you to select or de-select the four panels displayed on the screen, and using the normal Windows drag and drop function means that you can arrange the layout of the units selected to suit yourself. A truly 'virtual' receiver.

Table 2.

'S'-meter	Frequency (MHz) 10 (dBm)	100 (dBm)	750 (dBm)
1	-100	-105	-93
3	-97	-100	-90
5	-89	-94	-85
7	-78	-81	-77
9	-68	-69	-67
9+20	-60	-55	-55

But that's not all; Icom have provided two other virtual front panels for you, in the shape of a communications receiver which looks very much like the larger Icom receivers, and a desk top scanner which reminded me of the front panel of an AOR AR3000A. Something to suit everyone, and entirely flexible.



The three alternative 'virtual' receiver configurations.

The Broader Picture

With the introduction of the IC-PCR1000, Icom have produced the first satisfactory example of a computer-controlled wide range receiver, and since I already have AOR 'Virtual receiver' software to review, with Fairhaven about to produce a virtual screen for their RD500 receiver, it seems clear that the 'virtual receiver' will be an addition to the existing market which has tended to be dominated by the stand alone 'hands on' receiver. My own reviews in the past have concentrated on the high performance h.f. receiver sector, and have been concerned with the all out r.f. performance aspects of such receivers. However, as one recent letter to *Short Wave Magazine* reminded me, there are many listeners for whom the r.f. performance is secondary to the ease of use and operating facilities of the equipment, and in reviewing the IC-PCR1000 I can see that point demonstrated very clearly. After all, as I said when I began writing for the magazine, it is astonishing how good listening results can be achieved by the simplest of receivers having levels of r.f. performance almost certainly vastly inferior to the top-end £800 plus h.f. receivers. It all comes down to 'horses for courses'. and whilst many enthusiasts will want the high performance thoroughbreds, there are possibly more fans needing the abilities of the wide ranging hunter or three-day event champion (if you see the analogies).

The IC-PCR1000 does not have the thoroughbred h.f. performance of a receiver like the AR7030, but it's considerably better than other contenders in the field, and I think that ICOM, by keeping the receiver as a separate unit from the computer have adopted the right approach. By putting a receiver inside the PC you are placing it in an essentially hostile environment, and connecting directly to the main computer data bus system which carries high levels of fast transients is just asking for trouble. Using a relatively slow speed data system such as GPIB or RS-232 between the computer and the receiver gets rid of a lot of these problems and also allows physical separation betwen the receiver and it's main source of interference. The other overwhelming advantage of the separate black brick receiver is the fact that you can use it with any computer, including a lap-top, which makes it a hugely more attractive proposition for the user.

Conclusions

My main conclusion is that I'm a very fortunate chap to be allowed to look at so many interesting pieces of receiving equipment, each of them in their own way making me think longer and harder about the way manufacturers see the market. In the IC-PCR1000, Icom have used their experience and judgement to produce a general purpose receiver which will satisfy large numbers of enthusiasts. The wide frequency range from 10kHz to 1300MHz is impressive, as is the provision of all mode reception, whilst a synthesiser which will tune down to 1Hz increments at any frequency in that tuning range is a dream come true. The r.f. performance at h.f. is better than many other wide coverage receivers in a similar price range although not up to dedicated h.f. receiver standards, but the gain and measurement flatness are outstandingly good, and the construction and general finish are outstanding. It does need a fast (ish) computer to drive it properly, and it's no good trying to run it with a little 386 machine - I did, and it was completely hopeless. I did my testing using a 75MHz Pentium with 16Mb of RAM, and many readers will be using better machines than this, so there should be no problems. Priced at the incredible figure of **£349**, the IC-PCR1000 should be a winner.

My sincere thanks to **Icom (UK) Ltd. Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741 FAX: (01227) 741741** for letting me review the receiver despite their trepidation at my reputation for disliking the marriage of computers and receivers (I can't think where that came from). When a manufacturer does the job properly and their representatives don't make claims that can't be upheld, what can there be to worry about?

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73 from Dave G4KQH, Technical Manager.

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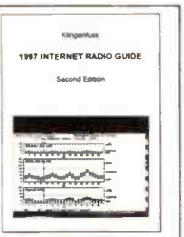

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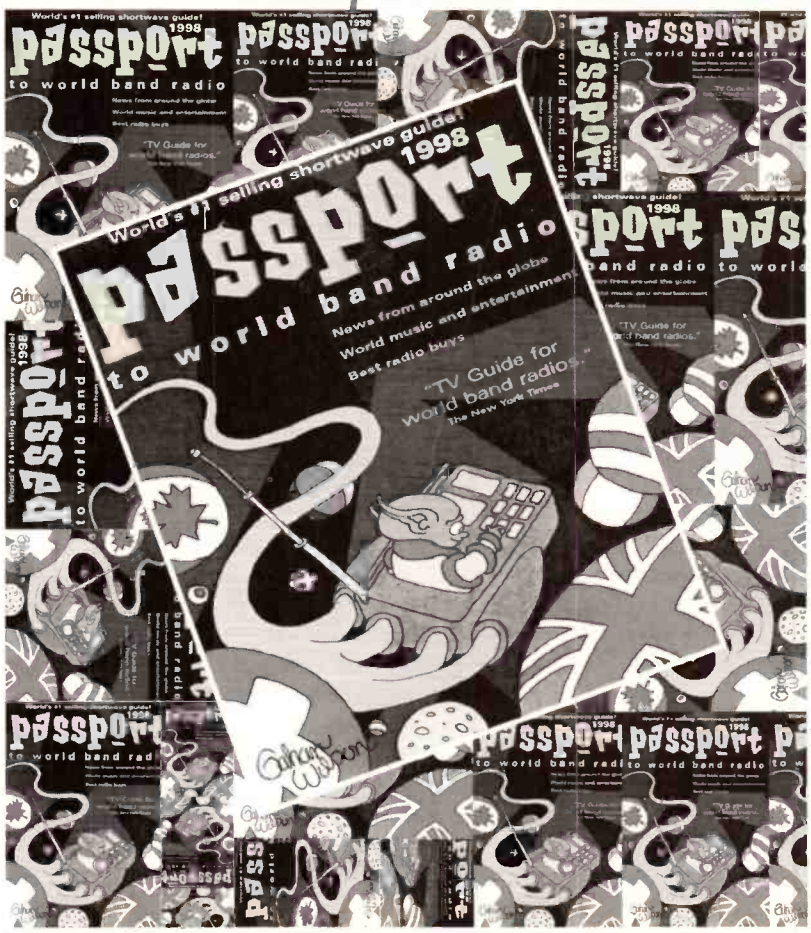

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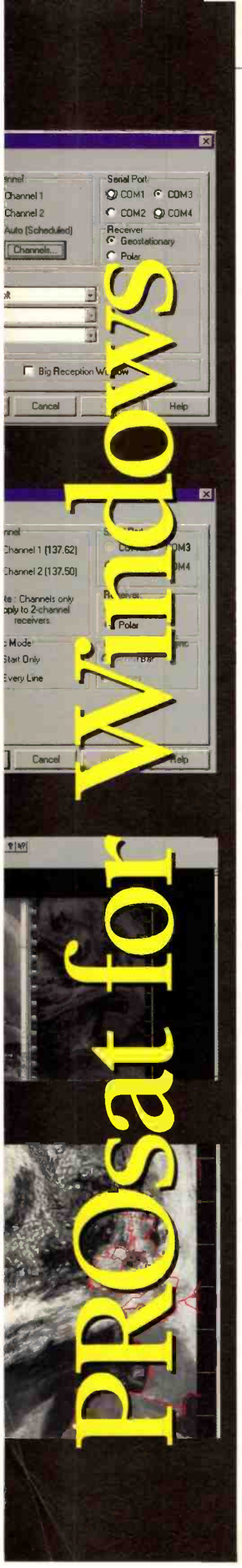

Lawrence Harris reviews the latest weather satellite decoding package from Timestep Weather Satellite Systems.

I have used the DOS version, PROsatII for some years, and increasingly this has carried the penalty of preventing the computer being used simultaneously for other work. I want to be able to write and occasionally watch! Timestep Weather Satellite System's new PROsat for Windows is a classic example of the Windows version of what was a DOS original - and now significantly upgraded. Timestep's programmer Peter Arnold has done an excellent job re-writing PROsatII for Windows95, and has used the opportunity to improve many of the original facilities, and create new ones.

I had the pleasure of receiving one of the earliest versions of this new version and have had time to put it through its paces. Better than that, I sent my initial queries via E-mail to Peter who responded to each one, and in several instances modified the software to incorporate my suggestions! Consequently, one or two early irritations were removed!

Basic System - What You Get

The package comprises an expansion card which fits into a spare 8 or 16-bit ISA Bus slot, a dongle (copy-protection hardware) which plugs into the printer port, software, and a manual. An external serial interface version is also available for laptops, etc. The software comprises the PROsat WXSAT a.p.t./WEFAX decoding program, and TrackII, the satellite tracking program - described further on.

The manual covers all the options available and it is well worth studying this carefully before jumping in at the deep end. There are some facilities which you didn't even know you wanted! It is very tempting to try using the software - selecting options without even opening the manual - and yes, I did some exploring!

WXSAT Reception Hardware

Do not misunderstand the nature of this system. As with other decoding systems, the hardware and software will decode WXSAT signals. They cannot receive the signals. To use this system, you must already have - or must get - the associated WXSAT receivers and antenna(s). For METEOSAT (or GOES or GMS - depending on where you live), you require a suitable 1691MHz antenna; common types in use are a 1.0m dish or a Yagi. I have both; I use the dish for METEOSAT, and need the Yagi for GOES reception (which is at about 3° elevation above my western horizon, somewhere amongst the bushes). The average METEOSAT antenna used by most amateurs will not have enough gain to feed the receiver, so a high quality, low-noise pre-amp must be connected directly to the microwave feed. The output is then fed through a short (matched) cable into the METEOSAT receiver. I use a direct 1691MHz receiver with switchable channels to allow the use of METEOSAT's 1694.5MHz channel. There is no equivalent second channel (that I know about anyway!) on any similar satellite.

Reception of polar orbiting a.p.t. signals requires a suitable (that is, right-circularly polarised) crossed-dipole, mounted high enough to provide line-of-sight to the satellite while above the local horizon. A balanced, low-loss, high quality cable running down to the receiver should mitigate the need for a 137MHz band pre-amp (and therefore minimise interference from paging systems using nearby frequencies). Each of the above systems should provide a signal (WEFAX or a.p.t.) which can then be processed by this system.

Computing Requirements

PROsat is specifically designed to take advantage of the facilities offered by the Windows95 platform and includes much 32-bit programming code and multi-tasking capability. The computer must therefore have a minimum specification of 486DX2-66, at least 8Mb of RAM, a spare 8 or 16-bit ISA slot, 20Mb of available hard disk space, and an SVGA display (minimum 800x600 in at least 256 colours). Having more RAM allows the simultaneous opening of more image windows; a faster processor produces faster gridding, better multi-tasking and better performance. Video cards offering16-bit high colour or 24-bit 'true colour' modes give better image production. For the whole of this review I used a Pentium 120MHz computer and substantially better specification (32Mb RAM) than those listed as the minimum. To challenge the system I also used the computer for other jobs - including writing this review and having other programs running.

Installation

Although this process is straightforward, it took me longer than I expected because I had to configure an unused port and interrupt combination, as described in the manual. There are easy-to-read instructions and the process is explained without unnecessary complexity. It is important to examine the card before installation. You need to identify the two switch banks used to set the COM port and the interrupt setting - identified by seeing which ports and interrupts Windows tells you are available. After physically installing the card, I installed the software which came on three disks. Later versions come on four disks and include sample images. Windows-95 has the capability to detect new hardware and this it did precisely.

The software can process geostationary WXSAT WEFAX and polar orbiter a.p.t. (OK, and GPS signals - but I don't have a receiver for those!). The connector on the card is compatible with the previous PROsat DOS system; the first cable output from the card is connected to the METEOSAT receiver - the second cable is connected to the a.p.t. (polar orbiter) receiver. With the continuous transmissions available from METEOSAT-6 I set the system to receive these.

Input Levels Set-Up

Having fitted the card and configured the software, two more entries are required before routine operations can start. The COM port number has to be set on the tab entries under Receive, options, geostationary/polar. It is possible to fit two cards - one for polar and one for geostationary - and receive and process signals simultaneously. Note that this can already be done to a certain extent - as I will explain.

The last setting-up task is to receive live signals and adjust the individual input signal settings for both geostationary and polar satellites. As with the earlier DOS version there are two tiny potentiometers fitted inside the recessed panel, requiring careful adjustment with a suitably tiny screwdriver. With a signal coming from the METEOSAT receiver, adjustment is made to bring the red band to the recommended average setting - near 250 (on the scale 0 to 255). A visible-light image is preferred for this adjustment because they contain a wider dynamic range of grey scale. After this adjustment, perfect synchronisation should occur each time.

This process is repeated using live a.p.t. from either a NOAA or METEOR WXSAT. In practice, I have found METEOR a.p.t. to reach slightly higher levels than NOAA a.p.t. Following this adjustment live a.p.t. should synchronise properly - assuming that the correct satellite has been selected.

Routine Reception of WXSAT Signals

Having set the receiving system up (dish/dipole, pre-amp, receivers and software) the main program is started by double-clicking on the icon. In its basic form, the main menu offers File, Receive, Update, View and Help. There are several icons which start specific processes, or you can use the multiple choice selections from the main menu.

To receive either polar a.p.t. or WEFAX, ensure that the 'front-end' is providing the signal (connect a speaker to the socket on the panel). From Receive - the choices are geostationary, polar, schedule, auto-save, and options. The use of the first four menus require that the various options have already been set to allow for the immediate reception of either geostationary or polar WXSATs. The first action therefore needs to be the setting up of the various options. It is here that we enter future preferences; for geostationary reception we select satellite (METEOSAT), channel (three options of which auto is the most interesting), COM port (as referred during configuration), masks for colour reception and window size (for which I used dual reception). The manual explains the meaning of each option. As the hours pass, you can try the other options.

After setting up 'geostationary', you should set the defaults for 'polar'. Again the options are easy to identify; satellite (NOAA, METEOR, OKEAN), direction (ascending or descending), delay (to allow the WXSAT to rise higher before attempting to synchronise), sync mode, and of course COM port (which should have been set during configuration). So before any satellite is received you simply check the relevant options - taking just a few seconds.

'Geostationary' Facilities

When 'geostationary' is selected the menu offers 'satellite', 'channel', 'colour reception', 'serial port', and those mentioned during setting up procedures. The software has several options for processing and displaying geostationary images. In Britain, 'geostationary' means METEOSAT (although in certain parts of western Britain GOES-E can be received), but the setting can be changed to GMS or GOES - so the program can be used anywhere that these other satellites can be received. At all times you can receive individual frames and also run animation sequences.

There is a choice of preferred display (the options at the bottom of Fig. 1) - see 'image display size'. Full resolution images can be seen in real-time, though this is slightly tedious because the image is too large to fit in the window, unless you can use a 1280x1024 display, you may need to scroll. Better to use the single or dual window facility and get the 'whole' picture.

For METEOSAT operations there is a channel-changing option. The setting can be switched to 1 or 2, or to 'auto-scheduled'. Auto-scheduling uses a pre-set schedule which is fully editable and comes already set to switch channels between 1 and 2 to select the most interesting WEFAX images from each channel. Left in 'auto' mode you can watch selected images come in from both channels. You do need the Timestep (or compatible) METEOSAT receiver for this process to work.

Another option is '3-D' display in which white areas are assumed to be clouds and are suitably profiled. There is a temperature readout available, though where accuracy is essential manual calibration using 'ground truth' data is required; you could probably get this from teletext - but then you could also get the temperature you wanted from teletext! The median filter option does as much as it can to remove METEOSAT's country outlines, but this is a challenging process!

'Polar Satellite' Facilities

Before actual reception of a polar WXSAT is started, the required settings must be specified under 'Receive, options' - see Figure 2. The choices are NOAA, METEOR and OKEAN (SICH). Settings for direction, sync mode and type of sync (where required) should be set.

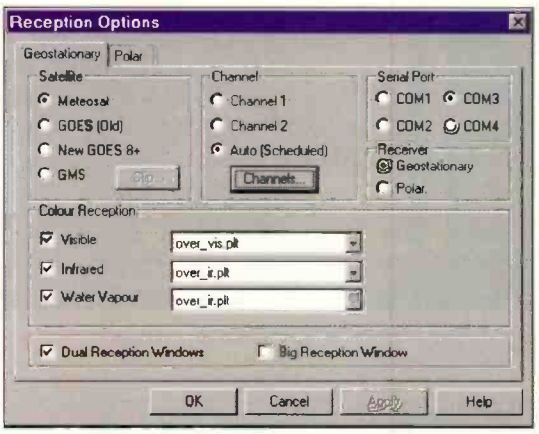

Fig. 1: Screen display - geostationary options.

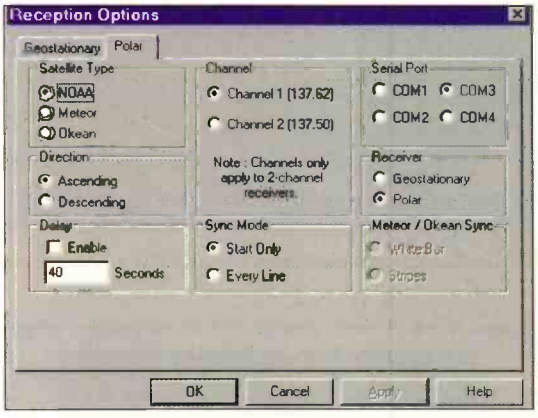

Fig. 2: Screen display - polar options.

Fig. 3: Raw NOAA-14 pass as it was being received on 1 August.

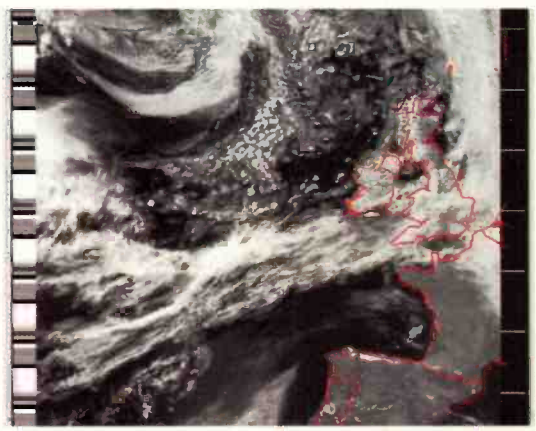

Fig. 4: Above NOAA-14 image with country outlines added.

Fig. 5: METEOR 3-5 image 4 August.

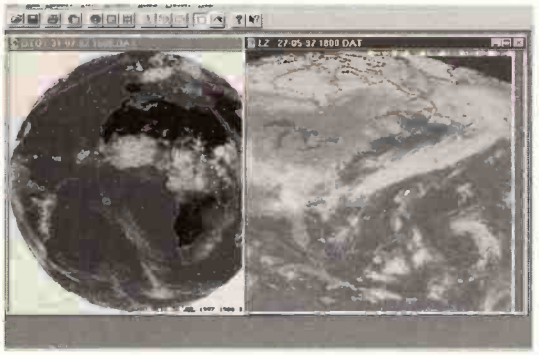

Fig. 6: Geostationary - two-window display.

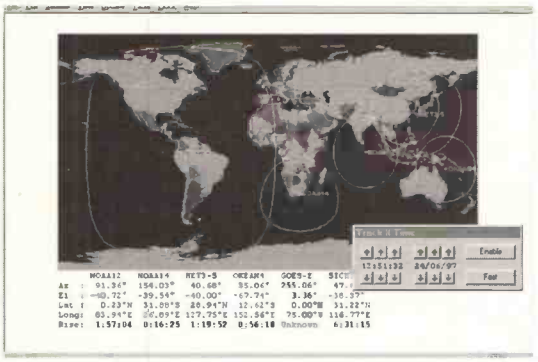

Fig. 7: TrackII screen display.

Fig. 8: Channel changing schedule for METEOSAT receiver.

Reception is then started by clicking either Receive, polar or the specific icon. During reception the image builds up and an a.o.s. (acquisition of signal) time is displayed. The entire pass is viewable in the window - see **Fig. 3**, showing a NOAA-14 pass. After the pass you can zoom using F9 and F10 (as with the DOS version). Switching between NOAA sections (visible and infra-red) is performed using the 'View, section' option - again, as with the DOS version. The whole pass is stored at full resolution and can be saved if required - occupying up to 4.8Mb.

The 'gridding' (lines of longitude and latitude) option for both NOAA and METEOR WXSATs is useful, but I preferred the country outlines option. For accuracy in either process, Kepler elements (see later in this review) for the period in question are essential. If the outlines/grid does not exactly coincide with reality, adjustments can be made on a 'click-and-drag' basis. You can store the elements with the file. This 'outlines' option worked very well - see **Fig. 4** - when I applied it to the NOAA-14 image **Fig. 3**.

Image Display Size

The size of the image presented on the screen depends on selections made within the software. For METEOSAT WEFAX, there is a choice of reception window modes: 'dual reception', and 'big reception window'. Using the 'dual' mode, the program displays each new image in the 'new' window, then switches it to the 'old' window before the start of the next image. If the 'dual window' option is unchecked then each new image overwrites the previous one. The size of the individual windows is either maximum (if 'big reception window' is selected) or nominal if not. Each window is sizeable but can be left to show the whole picture, which occupies about one third of the screen - see **Fig. 6**. The 'big' window uses a much larger display so only part of the image can be seen without scrolling. There is no preliminary setting for window size for polar images - they display as shown in **Fig. 5**.

Colour

Images can be displayed in 'colour'. For beginners to WXSAT decoding, it is important to understand that none of the WXSATs transmit colour images. The on-board sensors record three wavebands: visible, infra-red and water vapour (which is a section of the large infra-red band). Secondly, images from geostationary WXSATs contain specific formats (that is, fixed areas of the whole globe), so using a mask technique it is possible for a programmer to attribute blue, white and green shades to sea, clouds and land areas respectively. By careful programming, every image format can be coloured effectively. Someone not knowing the technicalities of WXSAT reception could be forgiven for believing that weather pictures were received in colour!

Some palette (colour and contrast enhancement) files are included and can be used to instantly improve image clarity. Under 'colour', the 'load palette' option provides the choice. Alternatively you can create and save your own palette specifically for the image in question. The 'autoset' option does a fair job 'guesstimating' what colours are needed, and you can make modifications as required. Changing the boundary levels of colours is rather easier than the method used in the DOS version, and a number of overlays are provided which help minimise colour bleed (where the wrong colours are displayed on features). I need hardly say that by the time the user has experimented with colour palettes, he or she can appreciate the extra-ordinary number of facilities included within the package.

Figure 6 shows the 'two windows' option when receiving METEOSAT images.

Autosave

For both METEOSAT and polar satellites, the PROsat can be set to automatically save pre-selected satellite passes and/or individual METEOSAT images. Under the 'receive' option (Main menu), 'schedule' lets you set up a list of either formats/times for METEOSAT transmissions or satellites and times for the polar WXSATs. If you are not using a PROsat receiver then you cannot (automatically) switch channel frequencies (137.50, 137.62 or 137.85MHz) but you can still leave the system to receive and save passes from one polar WXSAT. The 'polar autosave' option enables this. During METEOSAT reception the program will switch to receive a scheduled polar WXSAT - so you can monitor both, in sequence.

Animation

Geostationary WXSATs transmit images containing scans of specific areas which are made at regular intervals. The 'D2' area from METEOSAT contains an infra-red image which includes the western part of Europe, and the whole of Britain. This is transmitted approximately every thirty minutes. By saving each D2 image and replaying them sequentially, an extremely effective 'movie' can be made, revealing cloud movements. There is an option to display this in colour or black-and-white, and you can leave this running while still collecting and displaying other formats.

Animations are opened as configuration files from the 'File' menu. Using this option you can prepare a number of

sequences, such as D2, C02, CTOT etc. You can 'open' an already prepared sequence, or you can define a 'New sequence'. The 'open' option also opens a number of other types of files: images, tracking windows, animations, and NOAA image sections. It is possible to run multiple animations.

Configuration Files & Tracking Windows

These are files which you didn't know you needed! On most occasions you will want to receive images from NOAA-12 or 14's next pass, without being sure exactly when this occur. From the File menu you can open a pre-set configuration file which immediately displays a tracking window showing pre-selected satellites, the time of the next pass, and also sets up the reception data for you! You set your own preferences and save these as a new configuration file. This saves repeatedly checking that METEOR or NOAA selections and directions are set correctly. When you have mastered this facility, you will realise it is a real time-saver.

Also located in the File menu there is an option for 'new tracking window'; this is a version of the TrackII display which you can set up with your preferred satellite combinations and save. This is loaded up within the program and provides quick information on passes. There are more advanced facilities available for PROsat receiver owners.

TrackII - Satellite Tracking Program

As already mentioned, PROsat itself now has the facility to save sets of configuration files, each containing up to six satellites in TrackII format, and these can be loaded in seconds by pressing a function key. At first sight, TrackII itself appears to be a fairly basic satellite tracking program which can monitor up to six satellites simultaneously, showing the footprints of each - hardly an earth-shattering innovation. However, that is an 'iceberg' view. TrackII actually has much more inside.

The Main Menu options are File, Edit, Satellite, View, Update, Table, Clock, and Help.

With the TrackII display you can have on screen a selection of up to six satellites (or five with the Sun). Using Satellite, you can add, remove or swap satellites to get your preferred group of six. I chose NOAAs 12 and 14, METEOR 3-5, OKEAN-4, SICH-1 and GOES-E. Once six are selected, 'add' is removed from the options list. 'Swap' will always swap the last satellite for a new one.

After completing the collection, you can save this group as block-1. Four blocks are available so you can save combinations of NOAAs, METEORs, and any other satellite combination that you want to monitor regularly. MIR is worth tracking if, like me, you regularly listen out for the conversations transmitted on 143.625MHz. I set block 4 to store the geostationary WXSATs MET-6, GOES-E and -W, GOMS, GMS-5 and FENGYUN-2. This gives a good perspective on the world's weather coverage. Each block can be called by the press of a function key - F9 to F12 inclusive.

Having selected your preferred satellite block you can use 'View' to choose the display features. Options include ground track (which leaves a trail showing the satellite's previous path), name (the label, such as NOAA-14), footprint (the ground circle in which the satellite's signal can be received), rise-set sounds (the computer beeps when any displayed satellite is rising or setting), alternate map (this switches to the US centred projection), and status bar (an area at the bottom of the display screen). I set all options on.

From time to time you may wish to enter a new satellite into the program's database, or to remove one no longer of interest. This is done under Update, add/delete satellite. An entry box is opened enabling you to enter basic information such as name and catalogue number. This is sufficient when you are going to use the update by file method to enter the complete element set. The database can handle a total of 64 satellites, plus the Sun.

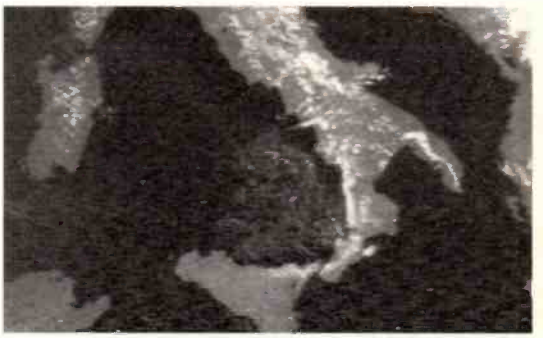

Fig. 9: Close-up of the METEOSAT C03 format showing Sicily.

The remaining options under 'Update' are less likely to be used frequently. User position lets you set your longitude and latitude automatically if, by luck, you live in one of the cities included in the database. All major cities are there - including Plymouth! Alternatively, you can enter the data yourself. The final option allows the export (as a file) of the current Kepler elements in the database (possibly for use in a competitor's program?).

Schedules

A method of producing a printed schedule of one or more satellites is almost essential if you are wanting to fit in a live pass or two during an otherwise busy day. Options quick, full and multi-schedule provide a single-satellite listing, a full minute-by-minute listing, and a quick-form summary of each displayed satellite, respectively. In each case the list can be printed.

Future events can also be simulated using the Clock option from the Main Menu. This offers the options fast (to fast-forward the displayed satellites), slip (which freezes the time) and the selection of displayed time (UTC or local). The floating time display (the box shown in the screen picture) similarly allows the time to be changed by clicking the fast or enable options. The latter allows the time setting to be changed to any selected time in the future or past (accuracy subject to the validity of the Kepler elements).

A channel changing schedule - see **Fig. 8** - is available for METEOSAT reception to facilitate swopping between channels 1 and 2.

The Help option contains a short summary of the commands available from the menu, and their operation. The manual seems to form a better guide.

Summary

The PROset package is comprehensive and should work efficiently with any WXSAT receiver, though naturally it is optimised for use with Timestep's own product. By the time I had finished testing the software, Peter Arnold, the programmer, had incorporated virtually every suggestion that I had made - so how can I criticise the result?

Although at **£299 plus VAT**, the price may seem high, the product includes software for every WXSAT monitoring requirement - real-time colour display, programmable pass scheduling and image enhancement and analysis. What more do you need? PROsatII is available from **Timestep, PO Box 2001, Newmarket, CB8 8QA. Tel: (01440) 820040, FAX: (01440) 820281.**

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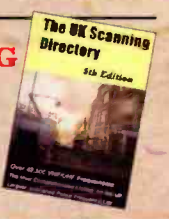

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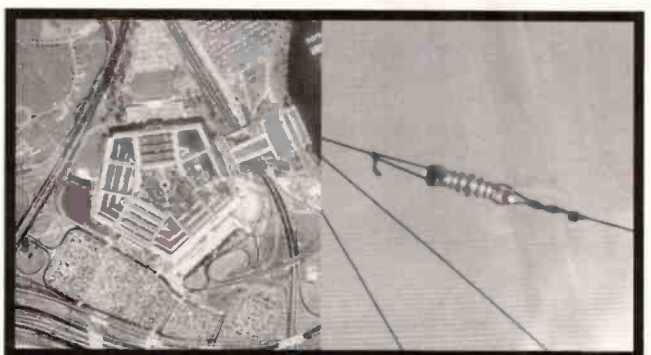

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Circuit Operation

The main circuit diagram for the c.w. processor appears in **Fig. 1.5**. The circuit diagram for the audio oscillator is shown separately in **Fig. 1.6**. Taking **Fig. 1.5** first, IC1 operates as the input amplifier and provides the circuit with an input impedance of about 50kΩ.

The elliptic highpass filter uses C3 to C7 plus L1 and L2 in the standard five stage arrangement. R3 and R4 ensure that the filter has suitable source and load impedances (470Ω in both cases).

IC2 is used as a non-inverting amplifier which boosts the signal by a factor of 11. The output from IC2 is fed to a conventional fourth order highpass filter based on IC3. The combined response of the two filter blocks gives a cut-off frequency at just under 650Hz, and there is nearly 60dB of attenuation at 300Hz.

The elliptic lowpass filter used C14 to C18 plus L3 and L4 in what is again a conventional five stage arrangement. R14 and R15 provide the circuit with suitable source and load impedances and once again these are both 470Ω. IC4 operates as a non-inverting amplifier which has a closed loop voltage gain of 23.

The signal is then fed to the two third order lowpass filters. These are based on IC5 and IC6 and together with the elliptic lowpass filter they provide a cut-off frequency at just over 900Hz and about 60dB of attenuation at 1.5kHz.

A -3dB bandwidth of just over 250Hz is therefore produced by the highpass and lowpass filters. R26 is the volume control for the direct signal and its output is coupled to the power amplifier.

This is based on IC7 (an LM386N) which has more than sufficient output to drive any normal headphones and with some types the drive level may be excessive. It would then be advantageous to add a resistor of about 100Ω in value in series with C29.

The phase locked loop tone decoder is based on an LM567N (IC8) which is specifically designed for this task. A 12V supply is far too high for the LM567N and R29 is therefore used to provide a voltage drop that produces a supply potential of about 6V for IC8.

C33, R30 and R31 are the timing components for the v.c.o. and R31 enables the free-running v.c.o. frequency to be set at the centre of the filter's passband. C34 and C35 are the capacitors in the tone decoder's lowpass filters.

D1 is the l.e.d. indicator and it is driven from the open collector output of IC8 via current limiting resistor R32. The l.e.d. current is about 5mA, which should hive good brightness from any l.e.d. of reasonable quality.

Turning now to **Fig. 1.6**, the audio oscillator uses IC9 in the standard triangular/square wave oscillator configuration. IC9b operates as the trigger circuit and a square wave signal is produced at its output. IC9a is used as the integrator and a triangular waveform is generated at its output.

In this case it is only the triangular signal that is needed and it is fed to a conventional third order lowpass filter which has IC11 as the buffer amplifier. The oscillator's output frequency is about 800Hz and the filter's off frequency is a little higher than this. Consequently, the fundamental frequency is passed straight through to the output, but the harmonics are severely attenuated.

This rounds the triangular waveform to produce a reasonably pure sine wave signal that is coupled to the power amplifier via volume R42. R27, R28 and R41 form a simple passive mixer at the input of the power amplifier.

On the face of it, there is no difficulty in using the output of IC8 to switch the audio oscillator on and off. In reality, things are complicated by the need to avoid loud switching 'clicks' each time the oscillator is switched on or off. Various methods of gating the oscillator were tried, but only one gave a really 'clean' output signal.

This method was adopted in the final design, and it uses a CMOS analogue switch (IC10) in parallel with C37, which is the timing capacitor in the oscillator. When the switch is in the 'on' state, it blocks oscillation by virtually short circuiting C37.

This stops the circuit from oscillating but it does not produce any large or sudden changes in the output voltage that would generate switching 'clicks'. R36 and C38 slightly slow down the switching of IC10, which further helps in the quest for noise-free gating.

Note that if the reconstructed audio facility is not required, the entire circuit of **Fig. 1.6** can be omitted, but everything in the circuit of **Fig. 1.5** will still be required. If the tuning indicator is not required either, also omit IC8, C30 to C35, R29 to R32, D1 and R31.

Power Supply

The c.w. processor has a current consumption of xx mA under quiescent conditions, but the consumption increases significantly at high volume levels and when D1 is switched on. The circuit was originally designed for use with a 12V battery supply, but it operates quite well with a mains power supply provided it has a very low output noise level.

Good results are obtained with the circuit of **Fig. 1.7** which uses a full wave bridge rectification and a small monolithic voltage regulator (IC12) to smooth and stabilise the output. Slight 'hum' is evident on the output of the

Fig. 2.8: The component overlay for the printed circuit board.

Fig. 2.9: Details of the p.c.b. track pattern (actual size, copper side view).

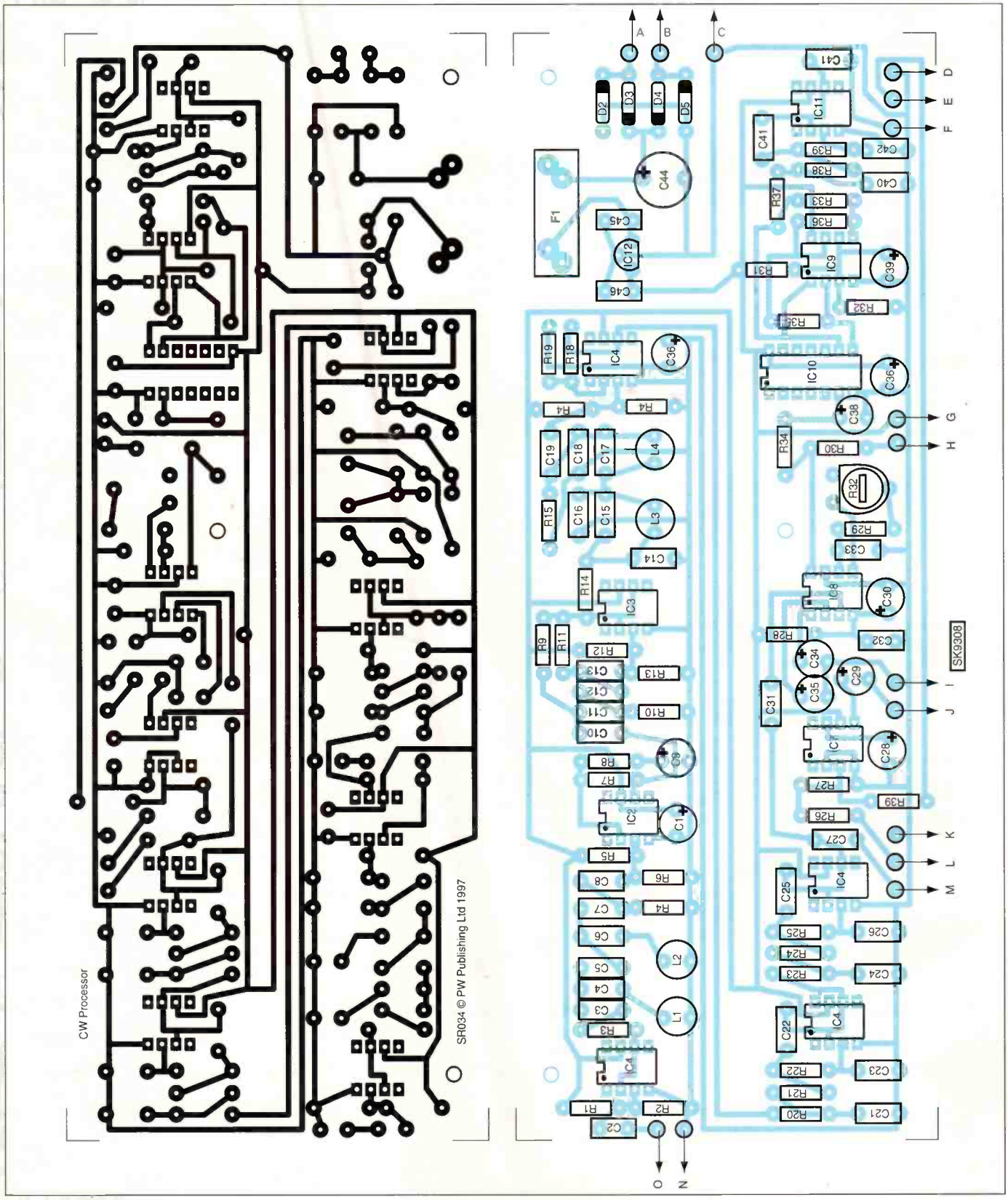
prototype c.w. processor with R26 at maximum volume, but the 'hum' is not noticeable in normal use.

Perfectionists can reduce the 'hum' to a totally insignificant level by increasing the value of C44 to 2200μF.

Construction

Details of the printed circuit board are provided in **Figs. 2.8** and **2.9**, which respectively show the component and the underside views of the board. Building the board is reasonably straightforward, but as there are so many components to deal with, it is obviously necessary to proceed very carefully in order to avoid the odd error here and there.

It is important that the filter capacitors are all miniature types as there is not a great deal of space available on the board for most of them. They all have a lead spacing on 7.5mm, but cased capacitors having 5mm lead spacing will fit into the layout reasonably well.



It is not a good idea to use uncased capacitors having the wrong lead spacing, as one of the leads can easily become detached when manoeuvring them into place. The filter capacitors should have the tolerance of 10% better.

The four inductors must be types that are suitable for use at audio frequencies and not radio frequency chokes. The circuit has only been testing using the inductors specified in the components list and it cannot be guaranteed to operate properly with other types.

Also, other indicators might not fit into this component layout correctly. Therefore, the use of substitute inductors is not recommended. Only one of the integrated circuits is a MOS type and that is IC10.

The normal anti-static precautions are therefore required when dealing with this device, but it is a good idea to use holders for all the d.i.l. integrated circuits. The 4066BE is pin-for-pin compatible with the 4016BE, but is not recommended for use in audio circuits. Accordingly, it is probably best to only use a 4016BE for IC10 in this circuit.

The fuse is mounted in a pair of fuse-clips which are soldered direct to the printed circuit board. The fuse-clips must be the type which has two printed circuit tags, such as the Maplin 'type 1' clips. Be very careful to fit the four rectifiers with the correct polarity as mistakes here could cause costly damage.

Once all the components have been added, complete the board by fitting single sided solder pins at the points where connections to off-board components will eventually be made.

A metal instrument case at least 250mm wide is needed to accommodate this project. For safety reasons the case must be a type which has a screw fitting lid or outer cover and not one that has a clip-on lid that would provide easy access to the mains wiring. Also, the case must be of all metal construction, and reliably earthed to the mains earth lead.

The printed circuit board is mounted on the left hand section of the base panel, leaving sufficient space for the mains transformer to its right. Solder tags are fitted on both of the mains transformers mounting bolts to provide chassis connection points.

Mount S1 well towards the right hand end of the front panel so that it is close to the mains transformer. The input and output sockets are mounted on the front panel of the prototype, but they can obviously be relegated to the rear panel if preferred. Standard jack sockets are probably the best choice, but it is obviously all right to substitute a different type if it is a better match for your other equipment.

Details of the hard wiring are provided in **Fig. 2.10**, which should be used in conjunction with **Fig. 2.8**. The wiring is generally straightforward and should provide no major difficulties. However, as some of the wiring carries the main supply, it is important that it is free from errors and that the competed wiring is checked very thoroughly just in case a mistake has been made.

As this project involves connections to the mains supply, and is fairly complex anyway, it is not really suitable for those of limited experience. It is not essential to use screened cable for any of the signal wiring provided it is kept reasonably short and well clear of the mains transformer and the mains wiring.

A mains transformer having a secondary current rating of 100mA is satisfactory if the unit is only used with headphones. However, a secondary current rating of 200mA or more is needed if the unit will be used to drive a loudspeaker. It should not be used with a loudspeaker that has an impedance of less than 8Ω.

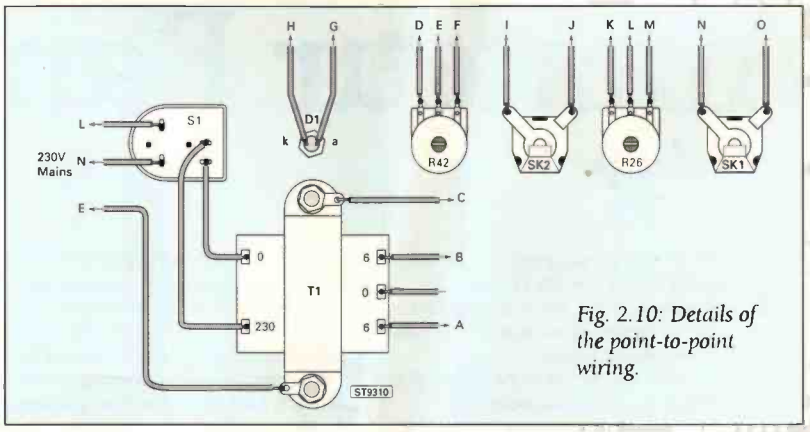


Fig. 2.10: Details of the point-to-point wiring.

In Use

Start with R31 at a roughly central setting. The input of the processor is connected to either the headphone socket or the tape output of the receiver using a screened lead.

Using the headphone output has the advantage that the input level to the processor can be adjusted via the receiver's volume control, but satisfactory results were obtained when using the tape output of a Yaesu FRG-8800 receiver.

If the signal level from a tape output seems to be slightly excessive, with the background noise tending to hold D1 switched on, reducing the value of R7 to about 10kΩ will reduce the gain of the processor to a more suitable level. If you connect the processor to the headphone socket, experiment a little to find the optimum volume control setting on the receiver.

This will be the highest setting which does not result in background noises almost continually activating D1. The receiver's volume control is then left at this setting and the volume is controlled using R26 and R43 in the processor.

Resistor R31 must be given the correct setting before the unit can be used in earnest. If suitable test equipment is available, use an audio sine wave generator and some form of audio level generator (such as an audio millivolt meter or an oscilloscope) to set the audio generator's frequency a the centre of the filter's passband. This should be at about 750Hz.

Diode D1 will then switch on with R31 adjusted within a small range of settings. Simply adjust R31 to the middle of this range of settings. In the absence of suitable test equipment, set the receiver to the c.w. model and tune to an a.m. transmission so that a heterodyne beat note is produced by the receiver.

The frequency of the note can be altered by adjusting the receiver's tuning control, effectively converting it to a crude audio generator. Adjust the tuning control 'by ear' to the centre of the filter's passband. Due to the sharpness of the filter's response, it should not be too difficult to do this quite accurately. D1 should then switch on with R31 at a small range of settings and, as before, R31 is set at the middle of this range.

Initial tests with the prototype were made using the unit on the 40m band and results were very encouraging. In many cases, there was a plethora of c.w. signals when listening to the direct audio output of the receiver. But only one audible on the output from the processor.

The audio reconstruction facility works well and can track quite fast c.w. rates. However, it might be defeated by really high speed Morse, or by the occasional operator who produces virtually non-existent 'dots'. When reception conditions are very poor, especially when there is severe fading, it is probably best to full back-off R42 and not use the reconstituted audio signal.

Amateur Bands

Round-up

PAUL ESSERY GW3KFE
PO BOX 4
NEWTOWN
POWYS SY16 1ZZ

We are *well* past the sunspot minimum, but as yet there is little sign of a serious improvement. Either this is going to be a low-peak cycle, or we can expect an explosively-fast improvement. No bets on which!

At the time of writing we are in the middle of a hot spell, so the static crashes are worse than normal, especially on the lower bands, with thunder and lightning in the distance.

Antenna Tuners

We are sometimes asked "What's the profit in buying an a.t.u.?". Personally, I wouldn't consider buying one, having enough tools and knowledge to home-brew. However, let's rephrase the question: "What's the profit in using an a.t.u. at **your** station?"

If you have a dipole for the centre of each band, each fed with coaxial cable by way of a balun at the feedpoint, then you need only think of an a.t.u. for 1.8 and 3.5MHz - so your a.t.u. is a simple affair covering just these two bands, and then only if you insist on covering the entire band. Forget 80 and Top Band and you don't need a tuner at all. A bit more complex is the 1.8MHz end-fed Zepp used on all bands, where the a.t.u. must cope with large excursions of both resistance and reactance On the other hand, there are some favoured feeder lengths in the older textbooks which are useful, even though the usual explanation of this antenna's operation is balderdash! If, like so many of us, you must make do with an end-fed wire to fit your space, fed against the best earth arrangement you can manage, then an a.t.u. can make a mighty difference to your reception. The snag for the listener is this: I can put my transceiver on the 50Ω dummy load, then back on my a.t.u, poke some r.f. power up it, and tuner-twiddle until I see unity s.w.r. between tuner and rig. Without the transceiver, I can fall back on my MFJ-959, or home-brew test gear. As a last resort I do what the listener usually does - twiddle the a.t.u. knobs until a peak is heard on each band. For a listen-only session I use the rig to tune-up as usual, but I do 'tweak' the a.t.u. for an audio peak - the two seldom go together.

I also find that in my own case, the a.t.u. settings have a tendency to vary with the seasons and between dry and wet weather. Always, though, my a.t.u. gives me some profit, even if it is only the odd decibel! While one decibel isn't very much, remember that it may be just enough to give you copy. In fact, decibels are a bit like peeling an onion - every layer of improvement reveals a previously unsuspected layer of DX beneath.

Letters

Our tame night-owl, **John Collins** of Birmingham starts by noting that on 7MHz he heard ZA1MH call CQ, followed by a massive pile-up; one would have thought that by now ZAs would be fairly bread-and-butter, so why the pile-up? YZ1PC was asking for cards via YU1ABH and A41JZ has been noted around the 0230 mark. John says it'll soon be the 350th anniversary of the city of Moscow, so look out for 'specials'. Still on 7MHz, Mongolia and Kadjikistan have been heard around 0300, but of course, under thus usual attendant horde of Europeans. On the QSL front, John mentions 3W6LI via XU2A; T77WI to PO Box 3, San Marino City, 47031 San Marino - don't leave out the word 'City'! CQ4FMX to CT1FMX; HB0/DL9YB to the home call; TU/HB9CVB, again to the home call; V44NEF, QSL direct. Next a question, around 2200UTC on 7MHz John heard 3L2GD asking for QSLs via SP2FOV; John couldn't be sure whether the call was 3L2GD or 3L2CD - can anyone out there help please? Finally, John notes that there are still problems with Box 88 Moscow, and that most Russian and CIS stations now give their Box Number or address over the air for QSLs direct.

Ted Trowell, the c.w. addict from Minster, Sheppey tried 7MHz at 0500z for ZL4LO, KP4BY, CY9AA, CO8LY, FG/F2HE, TK/F5LGF, HJ6PPN, HJ1RRL, ZL2AGY, VK4EXA, CO2VQ, ZL4AU, VK3BG; by 0600 FM5HA was audible, and at 1800 CX0I and OY1G. At 0800 Ted shifted to 14MHz and found CT3FT, but by 1500 things were better with YB5QZ, JA7BO, VU2PAI, JR7VHI, JA7SSB, JA1IDY, OY6A, 3V8BB, and a try at 1900z turned up LU9FD, ZP6VT, and PY2NZR.

1500z on 18MHz was the right time for JA8BGO, SV8/DK2OC (Hydra Is), T77C, and TK/F5LGF. Finally, 21MHz where D2JKJ was worked.

Last month we had an input in a familiar hand, but no name - and it's happened again! **Anon** offers G0WSB and G4AAH on 3.5MHz, and on 7MHz BV5BG, CN8SN, EA8AK, IN3VVK, SM5VDW, UR6MF, YB2PBX. 14MHz shows a long list including AP2EH, A61AQ, A71AD, A92GE, CX6FP, EA8EMU, EA8SH, IT9ICS, K4EE, LU1ECX, LU4EOM, LU8VCC, OJ0/P/N4EN, OD5PN, PR7FB, PT7VB, PY2ETR, PY5FLA, PY6MZ, PW8TR, P43ARC, RN6BY, VA3NAA, VE2PTL, YV1EFG, ZD7WW, ZD7HI, 4X1MO, 4Z5FB, 5X1T, 5Z4RL, 9G1BJ, 9H1DL, and 9H3JB. 18MHz 'gave' with K2QBV, ZD7MY, 9H1HB, and on 21MHz CE3BPE, - plus of course the usual covey of Europeans. Will the owner of the list step forward, please!

Sideband on 7MHz is a favourite with **Colin Dean** in Barnsley; Colin noted A61AS, BV5BG, CE9EIO, CX2CB, C37URA, DS5RNM, EX8MLE, HL3ERJ, HZ1AB, HZ1CCA, OD5PH, TA1AR, TA2IJ, T77W, UM7TX, VU2SWS, YB2PBX, YC6HDF, YC8TZR, YC0FEO, YK1AO, ZA1MA, ZL1PB, ZL2AXQ, 3V8BB, 4L4MM and 9K2AI. Up to 14MHz and here the sideband logged signals included such as AP50AMR, AP50CM, AP50WAP, A22EW, A47RS, A61AN, A61AQ, A71EF, BA1DU, BD4IE, BO0ORT, BV7GA, CY9SS, ET3AA, HS2CRU, JA4HL, JX6RHA, SU0ERA, VQ9IE, VR2JE, VU2NGS/50, DU7BDS/MM in the Indian Ocean, ZD7DP, ZD7HI, ZD7WRG, 5Z4RL, 7Z1AB, 9M2TO, 9M8ZZ, and 9N1UD.

Convention

This is as good a place as anywhere to mention the RSGB HF and IOTA Convention, at the Beaumont Conference Centre, Old Windsor, Berks., 26, 27, 28 September. Programme includes a full lecture programme, DX Dinner, Partner's Programme, RA Forum, RSGB HF Contest Committee, demonstration station, workshops, Morse Tests on demand - two passport photos and the money - RSGB book stand, etc. Weekend package deals available, details from Fay Huxley or Marcia Brimson at RSGB HQ, on (01707) 659015. If you want to rub shoulders with top DX-ers and listen to how they achieve it all, this is the event for you.

All sorts of questions in the letter from **Paul Hetherington** in Cambridge who is ex-G7TLB. First, this learning Morse business. Cue-cards don't really help much at first. Learn the alphabet first, like an actor learns his lines. Once you've got the alphabet learned, get your cue-cards back, and use them to speed up you recognition. Then go and listen to the stuff! Always - repeat always - try to copy stuff that's a mite too fast, as when you get 100% copy you haven't gained any speed from that session! Also, don't forget procedural signals such as AR and VA. These are normally written with a bar over them to signify they are sent as a single symbol - VA then is di-di-di-dah-di-dah rather than two separate letters. Another thing; do try and listen to Morse on the air, in particular the 'Martian Morse' exponents simply because they are harder to copy! Too much of the perfect computer-generated stuff doesn't help, as no-one - not even old GW3KFE - ever sends perfect Morse on a straight hand key.

Next he asks about noise. Try a receiver on batteries, and see if switching the mains off gets rid of the noise. If so, you can choke the mains input to the house, maybe at the house side of the meter. A choke on the telephone lead where it comes out of the wall will reduce pick-up there. Now another choke at the receiver mains lead - all of the 'clamp-on' variety for obvious reasons. On the earthy side, it might be worth cutting some quarter-wave radials of thin wire and 'losing' them under the carpet.

As to connectors, a genuine Belling-Lee was designed to match its cable, so is a BNC. Either are better than a PL-259-series, particularly of the 'el cheapo' breed. As for the loss in a BNC/PL-259 adaptor or in going from 50 to 75Ω, if after allowing for measurement tolerances, you can measure it accurately, you're a better man than I am, Gunga Din!

Still with Paul and the noise problem, it is always the ideal to suppress the noise **at source** . Clearly, you can't always do this, so then you fall back on what are, at best, palliatives. An electric drill, for example, radiates from its mains lead; the mains plug may be suppressed, but the noise is picked up on, say, the telephone wires, or radiated from the flex back into into the mains wiring and of course also to the receive antenna. The easiest check is to make up a short lead with a resistor across the end and a connector to match the receiver input. **If** the noise is antenna-borne, it'll be inaudible when you go to dummy load; and in my personal circumstances that's the case 95% of the time. I have a PL-259 with a small 51Ω resistor wired inside the connector as a vital piece of test gear.

Finally, to Paul's lists. Weeding out the European stuff, we see OJ0/DL1AN for Market Reef on Top Band, and on 3.5MHz a 7X, SV9CVJ; 7MHz offered EA8AK, ZA1MH, HJ8RPV, ZA1MH again, CM7RU, VP2MGG, TI2OHL, CU5AM, CU8L, TI4CF, CU7AA, ZP7FRA, LU2BD, VE1NCB, TI2LL, CE8EIO, CU7BA, ZB2CF, XE1NVA, ZL2CD, 9H3YP, ZL3NL, CY9AA, and ZP9KIA. Up now to 14MHz to find W8ERN, ZF2WI, with FG5HR noted on 18MHz and Europeans on 21, 24 and 28MHz. It all suggests a serious look at that noise problem!

Newtown SY16 1ZZ, as always.

Scanning

JOHN GRIFFITHS
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OXFORD
OX4 3BG
TEL: (01865) 241065

A while ago I asked, on two separate occasions, for any comments on the possibility of radio equipment interfering with breathalysers. The questions were posed by **Graham Rankin** and received no response from 'Scanning' readers.

Undeterred, Graham wrote to the 'Ask Bob' column in the *Monitoring Times* . The answer was duly given in that the newest type of breathalyser is sensitive to RFI (Radio Frequency Interference) when on 'alert', and therefore it is possible to be misread. I'm glad to see that Graham got his answer.

'Scanning' is a forum for all manner of questions concerned with this aspect of the hobby and is not just a frequency exchange. I'd like to labour that point as, on occasion, I get mail from readers which has slight reference to scanning but is still radio oriented.

As an aside, *Monitoring Times* is an excellent publication to have with the scanner and you can order it from the publishers of this magazine, via E-mail, FAX or mail, see the ad on page 70 - you will not be disappointed!

Letters

A letter from **James McGahan** is a good case regarding what the column does apart from give scanning frequencies. James has written before, on the subject of Fire Brigade callsigns, and wants me to thank the following for their time in writing to him with advice. **Tony Williams** and **Tom** from Surrey, take a bow!

The column proved, in that instance, to be a good forum for linking up people with interests in a particular area. It only involved me as I featured James' address and request.

So, if you have any queries about scanning, be that for info, like-minded individual contact, exchange of info, then write in and I'll flash you up on the page. Who knows? It's not just about frequencies, you know!

CCTV transmissions on the air could be a likely cause of interference to the scanning activity of a reader in Chertsey. He has noted transmissions, sounding like packet radio, on the following frequencies: 441.487, 441.512, 441.537, 441.562 and 441.637. He also noted that 439.250 was affected. He wonders what could be causing the interference and is it the council installed CCTV system?

The frequency 441MHz plus is allocated to the p.m.r. sector, with MOD having an allocation further up at 443, but mostly, 441 is allocated to people like MediCall, Aircall, Rank Xerox and so forth. 439.250 is actually in the Amateur Fast Scan TV portion of the band. I'd be interested to discover, from those who are in the know out there, what the CCTV frequencies are and if this section is being used.

It would appear, therefore, that interference is being caused to the scanning activity by the CCTV cameras and I also wonder if that same RFI is being scattered about and annoying other users. I myself have a problem with breakthrough of Fox FM in a good portion of the civvy airband here in Oxford. Time for a notch filter, I think.

Silverstone Frequencies

SH in Warwick sends me in Silverstone frequencies as heard over the 11-13 July weekend. These may be worth hanging on to for other events. On the airband side, 118.325 was the ATIS, 121.075 was the tower, and is listed as such in most publications, 128.525 ground and 130.675 air-to-air safety.

Some other interesting frequencies heard were as follows: 467.7375 OB co-ordination, 453.9750 and 460.4750 were general circuit channels and marshals. These frequencies could well be in use at other events so it's always worth keeping them somewhere close to hand if motorsport is your bag.

I managed to catch Fairford arrivals and departures here on both my scanners over that weekend as they routed cross country and even fired up the archaic frequency converter on my Sony PRO-80 to make sure that I had three sets dedicated to the band for the weekend. It sounded a bit like a comms jam at times!

Ultimate Station

A letter from **J. Cockburn** of Wheatley asks what, in my opinion, would the ultimate scanning station look like? He asks me to bear in mind cost and the like and not to go too overboard with my equipment choice!

I did this as an exercise and decided to try to keep the cost down as well as target the station towards someone with a general, rather than specialist, interest in the hobby. Here's my line up then, Jim, and bearing in mind you allocated me £1000 only....!

Firstly, I'll presume the budget of £1000 is the absolute limit. This then allows me to buy second user and, looking through the magazine last month, I see two choices of set which would be ideal to run with. Firstly, the 'main set' would be a Yupiteru MVT-7000 (S/H at £170.0) followed by a Yupiteru VT-225 for dual airband and some utility services (S/H at £175.00).

That's a total spent, so far, of £345. I'd then purchase an h.f. RX such as a Yaesu FRG-7700 at £199 - again S/H. That's £544.00 spent.

Next, two filters, one for the FRG-7700 for short wave work, and this has to be a Howes ASL5 and HA50R kit at £29.80 followed by a Scanmaster SNF 170 notch filter for both scanners, a pair of which, at £27.95 each, brings the total to £629.70.

ATUs next, and again, Howes to the fore. Howes make an excellent one at £29.90 as a kit, the CTU 8, which would suit the FRG very nicely. On the scanner front, I'd not use their short wave sections as fitted, preferring to leave that to the h.f. set.

A set of speakers for all of them would run to less than £40, leaving me with £300.50 left. Good! It's time for antennas now. Given the cost of antenna nowadays, I'd look for simplicity.

For the MVT-7100, I'd be looking at using its own whip but having maximum effective listening whilst at home. A Scanmaster Base at £40 would do nicely here, with a back-up being a Nomad portable antenna for the VT-225 at £18.00.

For short wave, I'd go for an external antenna, and the Q-TEK HF-30 grabs my attention quite well. That's £79.95 and brings our total to £837.55. Plenty of change left to improve things, like getting good quality coaxial cable, good quality connectors and mounting hardware plus p.s.u.'s to drive the lot and power leads.

I'd also buy an antenna splitter so that I could run both scanners from a single antenna and that should round things off nicely to our £1000. It should also give us a good quality, basic station that is still ripe for development. For instance, a PC and some decoding softwarefor use with the FRG, an ACARS decode system for the VT-225, at a later date. So, Jim....how's that for a start?

By the way, I chose the FRG-7700 because I used to have one and also because it can be added to things like an active antenna, a.t.u. and v.h.f. converter. The set is also a solid and reliable performer and I found it to be very good indeed.

Given £2000, from a lottery win perhaps, I'd be able to go in for higher spec equipment second-hand and build up the sort of station you'd die for. Then again, dreams eh?

CB Activity

Lastly, some info required by a reader in Bushey, Herts, asks whether anyone has heard activity on the old 934MHz CB band? This reader, **DGH**, informs me he has heard two-way traffic on a fairly infrequent basis and in particular on channel 15 - 934.71MHz.

The band ran from 934.01 to 934.96, in 50kHz steps and was 20 channels. It did not prove to be too successful, due to the cost of the equipment, but it did operate. However, it seemed to have died a death as very little was heard about it.

Now it may be that someone has a set and has linked up with another user for some probably interference free chatting. Anyone any idea whether this band is still alive? (*This band has been withdrawn by the RA - the spectrum is now allocated to digital cellphones.* **KN**).

I've tried it in Oxford over a period of a few days but had zilch on it. Anyone else had any luck? It would be interesting to hear whether it actually exists any longer.

And Finally

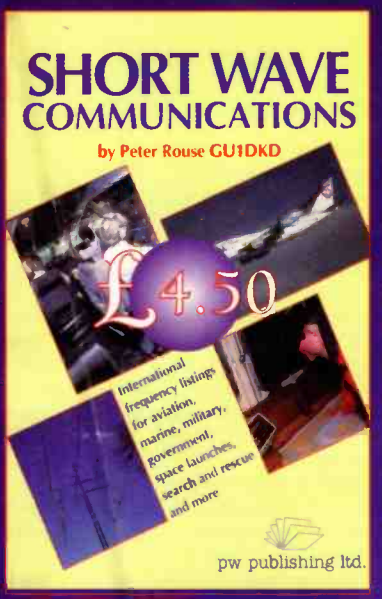
That said, it's time to shut it down again for another month. Keep the news coming in for any item concerned with scanning, and also with any unusual transmissions you may hear.

Note the new address and telephone number but please, urgent calls only after 6pm and before 9pm only. If you want a reply, an s.a.e. guarantees you a personal one! So, that's the lot for now! Catch you next month - until then, 73s.

To order any of the titles mentioned on these two pages please use the Or

SHORT WAVE

This month's Book Profiles highlights six books written for the short wave listener. Whether you're just a beginner or whether you're a more advanced listener, these books contain something for everyone. You can't afford to miss out, so read through and order the one that suits you best.



Short Wave Communications

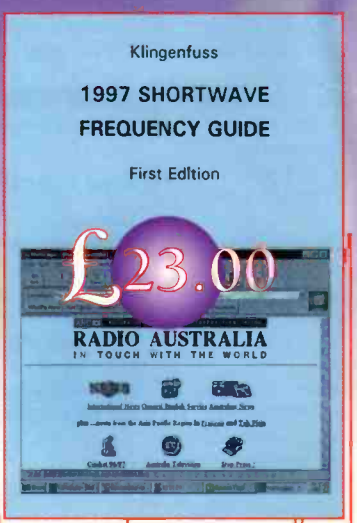
An introduction to radio communications, operating your radio, antennas, international band plans, marine bands, civil aviation, military operations, amateur and citizens band radio, international callsigns, receivers past and present, accessories, suppliers of equipment and lots more are all included in this little book.

A great buy and definitely one for your bookshelf, only £4.50.

Short Wave Listener's Guide

Written by Ian Poole one of the leading writers on radio, this book is the complete practical guide to short wave listening. It explains exactly what short wave listening is, how radio waves travel, what equipment is needed to receive a signal, how to set-up and run a short wave listening stations and how to obtain an amateur radio licence.

Each topic is clearly explained and illustrated and the practicalities of short wave listening are discussed, from buying a new or second-hand radio to making and erecting an aerial. A definite must for your bookshelf. £13.95.



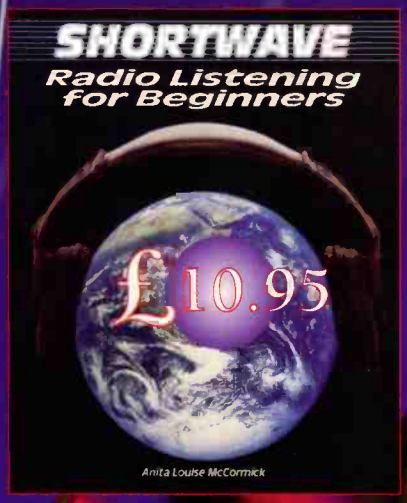
1997 Shortwave Frequency Guide

This book is a very comprehensive, reliable and up-to-date manual. Within its pages is everything you need to know about clandestine, domestic and international services, to user-friendly listings in convenient frequency order and 13800 entries covering all utility stations world-wide. It's a real solid introduction to real short wave radio monitoring. Order your copy now for £23.00

To order any of the titles mentioned on these two pages please use the Or

der Form in this issue or telephone Michael or Shelagh on (01202) 659930.

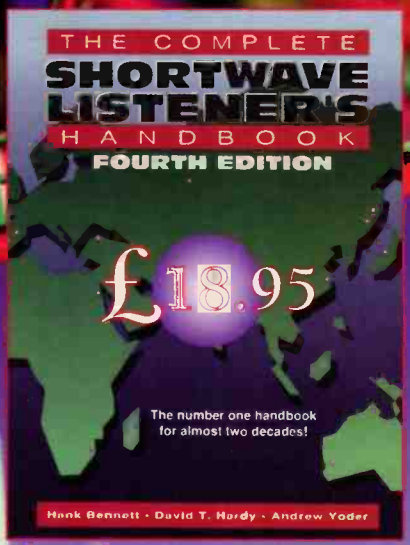
LISTENING !



Shortwave Radio Listening for Beginners

This well-researched book can help open the door to the manual unusual and wonderful things available on the short wave band. *Shortwave Radio Listening for Beginners* provides all the hands-on information you need to get off to a quick start with this fascinating hobby and listen in on today's most unique radio broadcasts from across the country and around the world.

An excellent introductory guide, this book describes, in easy to understand terms, everything from how short wave radio works to how to become a licensed amateur radio operator, and much more. £10.95.



The Complete Shortwave Listener's Handbook

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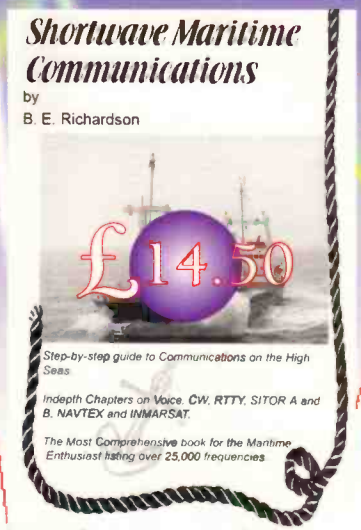

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SAR

There has been a great deal of interest in 'Search and Rescue' (SAR) frequencies in recent weeks, mainly due to the interference being suffered by SAR services. The interference on 5.680MHz first appeared at the start of August, and seems to be most active during the late afternoon and evenings UK time.

The interference is being caused by an a.m. broadcast station, which comes on air and quickly gets jumped on by a 'bubble jammer'. After a while the a.m. station stops broadcasting and the jammer also stops, but then seconds later the broadcast restarts again the jammer also returns. This leaves absolutely no doubt that the a.m. broadcaster and the 'bubble jammer' are connected in some way, or rather, are opposing each other. In either case, this is a real problem for SAR stations trying to conduct rescue missions!

Recently, there has even been a second bubble jammer, which just makes matters worse. Other readers have reported hearing scrambled transmissions also, but this may be on 5.680MHz l.s.b. On another occasion, an unidentified station was sending five letter and five number groups in Morse on the frequency. This was sent quite slowly, and with my limited c.w. skills, I even managed to decode a few groups. This appeared to be hand sent rather than automatic, since there were a number of requests for groups to be repeated, which tends to indicate that there were at least two stations communicating with each other.

A number of people have commented on the a.m. broadcast station, and the most likely suspect is thought to be from the 'Voice of the Mojahed' broadcasting from an unknown site in Iraq to listeners in Iran.

As this interference is causing a lot of problems for SAR stations all over Europe, I am sure that various diplomatic channels are being used to make complaints. If the source of the broadcast does turn out to be Iraq it may be difficult to do anything about it.

Other sources of QRM that have been heard during the past month include what sounds like Spanish fishermen, Russian speaking stations, even on a number of occasions around 0057UTC people report hearing the Spanish Navy with their "CQ CQ CQ de EBA EBA EBA Navarea Three Navarea Tres" broadcasts in c.w. As for the legitimate users - Kinloss and Plymouth Rescue usually do a "1-2-3-4-5-4-3-2-1 Test" message at full power whenever unidentified stations appear, or "VVV de GFF" messages in c.w. if that mode QRM is present. Recently they have been instructing rescue aircraft to QSY to various other RAF frequencies when interference becomes too bad, so if you can't hear anything on 5.680MHz try checking any or all of the following frequencies: 4.718, 4.721, 4,724, 4,745, 5.178, 5.270, 5.705, 6.691 (all MHz u.s.b.). A few months ago the UK SAR services were asking stations to use 4.745MHz when propagation on 5.680MHz was bad; they referred to this frequency as 'The UK Daytime Back-up Frequency'.

Another interesting signal heard in recent weeks is the call-sign "ETLL" who has called up several times requesting a radio-check. On one occasion, he called up Kinloss Rescue and announced that he was over northern Spain and maintaining a listening watch. This voice is reported to have an Irish accent (not confirmed by me, though), so this might be TransAer Airbus A.300 EI-TLL. However, I cannot understand why they would ask Kinloss for a radio-check, nor why they would maintain a 'listening watch'. By announcing that they were 'over northern Spain', they must have been an aircraft, but the callsign does not fall into the standard patterns for aircraft callsigns; if it was the above aircraft, it should use either its full registration or 'ELL'. If anyone has any other ideas on this matter, I would like to hear them.

Letters

David H. writes (via E-mail) from north of the border with concerns about listeners being identified in print, and possible reactions by the authorities. He says that he has been a keen s.w.l. for many years, and has recently gained his 'Class A' Amateur licence.

David says that he is concerned how often he sees people quite openly quoting their amateur radio callsign when they send their logs, news and reports to various radio magazines and on the Internet. He is worried that this would make listeners too easy to identify, and does not want to risk losing his licence, and wonders if he is being over cautious.

Well, I have always had a policy of not being to specific in identifying those who write to me. When I mention somebody in this column, I always avoid being too specific with a name or location. In David's case, his E-mail gave me his location and amateur callsign, but I choose not to use them to maintain his anonymity. Just to put David at ease, I used to be G6SUQ, but I let that lapse about 10 years ago. Up until two years ago I was still listed in the *RSGB Callbook*, and it was just earlier this year that I was removed from the US published *The Radio Amateur Callbook - International*. In over fifteen years of listening to all sorts of h.f. frequencies, and over four years compiling this column, I have never had any problems with the authorities.

Going back to last month's letters and questions, **Hans-Peter Tillman** asks for an address of 'Kinloss Rescue'. It has taken me some time to find the proper address; I have it in my 'filing system', but in the wrong place! Kinloss Rescue took-over from Edinburgh Rescue at the end of January 1996, and since then the 'most quoted' address is as follows: **Air Rescue Co-ordination Centre Kinloss, RAF Kinloss, Forres, Morayshire, IV36 0UH, Scotland.**

Hans-Peter also asks how he can QSL the individual RAF and RN helicopters that he hears on h.f. Well, from letters and comments that I have seen, it is certainly possible to write to them direct rather than relying on some sort of central bureau. The big problem is finding the correct address for each airfield where the helicopters are based. I have the information about where they are all based, but I do not have accurate addresses for any of them. If anyone has successfully QSLed a SAR helicopter, please can they write-in with details so that I can forward the address.

Leicester

Once again, I will be attending the Leicester Amateur Radio Show during October. This year's show is being held on Friday 17th October and Saturday 18th October, and the venue is the same as last year, the Granby Halls in the centre of Leicester (*For the lat time! Next year's show is at Donnington Park - **Ed***).

After last year's show, most of us were under the impression that the show would be held somewhere different this year as the site was due for re-development. It seems that the move has been postponed for another year.

I will be 'working' - if you can call it that - on the PWP stand, so I hope that readers will find time to come over and say 'hello'. I draw the line at signing autographs, but I will have some frequency listings to hand out.

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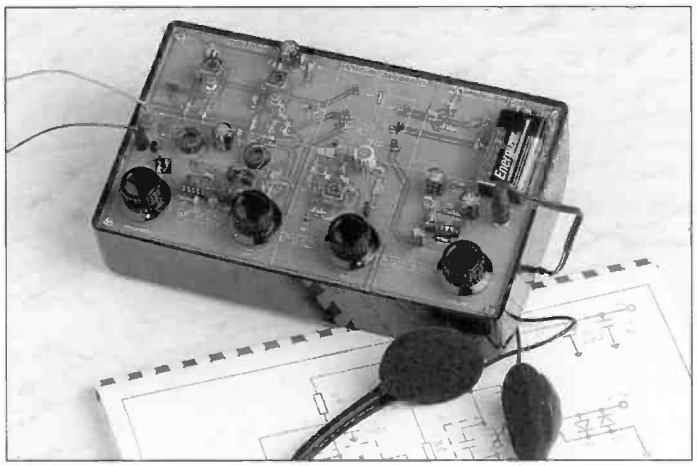

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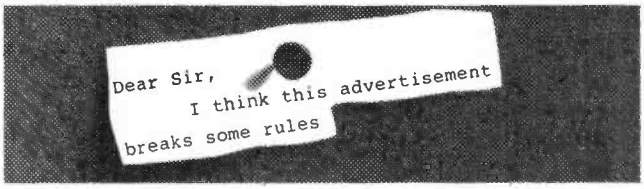

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There was no shortage of exotic Sporadic-E reception during July. There were also a few mysteries thrown in for good measure. Conditions were wide open to the Middle East on several dates, most notably the 17th and 24th.

Arabic Reception

Peter Chalkley (Luton) identified Iran on July 10th when at 0900UTC, clear pictures and sound were received. The 'IRIB' logo was clearly visible and his scanner read 48.240MHz. A second encounter occurred at 1015 on the 15th when an Arabic sound channel was heard on E2, with video at 48.240MHz. On the 13th on E2, at 1600 and again at 1700UTC, **Keith Greenwell** (Luton) noticed text pages with an eagle logo which was similar to Dubai's satellite transmission.

On the 17th, signals from the Syrian second network on E2 were discovered while checking Band I at 0715UTC. By 0910 a second Arabic signal was present at 48.240MHz and Peter is sure this was Iran again. At 0915 a completely different Arabic signal was present on E3, which could not be identified. No European signals were present during this opening.

Conditions on the 24th went one better when Syria E2 was present for over four hours! At times, the same programme was resolved on channels E3 and E4. This is a mystery because the only official Band I outlet for the second network is E2. Perhaps there are new outlets for the 2nd network?

High MUFs

On July 10th, **Stephen Michie** (Bristol) managed to resolve Belarus on Channel R5 while the f.m. band was active. During the same period, **Barry Bowman** (Manchester) noticed a strong Ukranian (YT-1) signal corresponding to Channel R6 in Band III. This is the first report of Band III Sporadic-E activity for several years.

Mystery Signals

This is the third consecutive season that a video signal has been resolved at 57.75MHz, a frequency used in China but not in Europe. The signal seems to originate in the south-west of Ukraine or northern Rumania and the sound channel is similar to Russian. The programmes are different to those being received at the same time on the channels R2 and R1, thus ruling out spurious mixing effects within the tuner or distribution amplifier.

Colour bars with a tone from the direction of the Middle East have been noticed twice this season in Derby. **Andrew Jackson** (Birkenhead) also logged the mystery signal on the 14th at 0840UTC.

Some of the on-screen logos are still causing confusion. One resembles 'I+I' (the Is are fat, squared and white). This logo is thought to originate in Belarus, although they usually show a 'bT' logo.

Portuguese 2nd Network

An interesting catch has been the 35W Channel E2 RTP-2 relay at Valenca Do Duora in the north of the country. It's RTP-1 counterpart transmits on E4, also with 35W. The FuBK test card, with 'RTP LISB2' identification, is broadcast well into the afternoon, so it is an easy one to spot from the south-west.

July Log

We have been deluged with reception reports from readers, so the July log is presented as a collection of various logs. The service name appears in brackets where appropriate. To save space, only the most productive days are shown.

1 Italy (RAI, UNO, TVA and VIDEO), Serbia (RTS), Hungary (MTV), Croatia (HRT) and Spain (TVE-1).
3 Italy, Spain, Portugal (RTP-1), Sweden (SVT), Russia (ORT), Ukraine (YT-1), Croatia (HRT) and Moldova (TRM).
9 Itlay, Slovenia (SLO-1), Portugal (RTP-1 and RTP-2), Spain, Ukraine (YT-1 and YT-2), Serbia, Rumania (TVR-1) and Norway (NRK-1).
10 Syria E2, Iran (IRIB) E2, Slovenia, Belarus (BT), Moldova, Lithuania, Ukraine, Hungary, Russia (RTV), Denmark (DR-TV0, Sweden, Norway and Iceland (RUV).
12 Finland (YLE), Corsica (Canal Plus), Italy, Czech Republic (TV NOVA), Ukraine (YT-2), Lithuania (LTV), Sweden, Norway and Germany (ARD-1).
13 Dubai E2, Portugal, Spain, Slovenia, Croatia, Lithuania, Germany and Italy.
14 Croatia, Slovenia, Serbia, Czech Republic, Ukraine, Lithuania, Belarus, Russia, Hungary, Switzerland (DRS), Italy, Spain, Portugal, Norway, Sweden and Albania (RTSH on channel IC).
15 Iran E2, Hungary, Rumania, Slovenia, Czech Republic, Serbia, Portugal (RTP-1 and RTP-2), Spain and Italy.
16 Italy, Corsica, Spain, Portugal, Rumania, Belarus, Ukraine, Estonia (ETV), Norway, Denmark, unidentified Russian video at 57.75MHz.
17 Syria E2, Dubai E2, unidentified Arabic signal E4, Rumania, Italy, Spain, Portugal, Hungary, Norway, Finland and Sweden.
24 Syria E2, E3 and E4, Ukraine, Rumania (TVR-2), Czech Republic, Italy, Sweden and Norway.
28 Serbia, Slovenia, Italy, Spain and Portugal.

Reception Reports

John Woodcock (Basingstoke) reports lots of activity from all over Europe using his h.f. long-wire antenna on Band I approximately 3λ long. **Simon Hockenhull** (Bristol) is also using indoor antennas, either a telescopic rod or wire type. Despite this, Sporadic-E reception from many European countries has been noted including Lithuania on July 14th. The signal was identified by the weather map at 1900UTC.

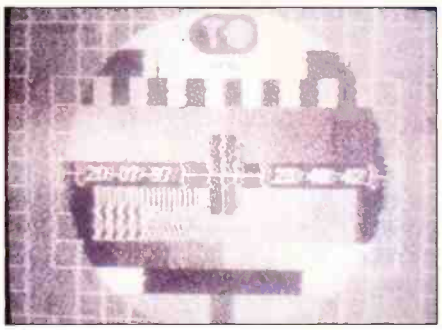


Fig. 1: NRK-2 PM5534 test pattern with 'TO' 'nrk' identification at the top.

Fig. 2: Norwegian TV-2 weather forecast. We gather the forecaster doesn't always look as if she is asleep! Note that TV-2 and NRK-2 are two completely independent TV services operating in Norway.

Fig. 3: Swedish 'SVT' identification graphics. This stylised logo is also present on programme schedules. During programmes for schools a 'VR' logo is displayed.

Fig. 4: A modified PM5534 test card used by Saudi Arabia. This was photographed from satellite TV but terrestrial transmissions also use this modified test card with its extensive black areas.

Vincent Richardson (Clwyd) queries an 'LT7' logo followed by a programme schedule on July 10th. This is Lithuania and the correct logo is 'LTV' in stylised lettering which makes the 'V' look like a '7'! **Peter Barber** (Coventry) has cleared up a mystery surrounding a logo shaped like a tie on July 12th and 14th. Apparently the ETA killing of a Spanish politician prompted TVE-1 to replace its usual logo with a black tie until the day of the funeral. The symbol even appeared between the letters 'L' and 'R' to the left of the clock! Ukraine, Rumania, Italy (TVA and VIDEO private stations) and Serbia are examples of the more commonly received countries by Peter this season. On one occasion a heading 'PTC-2' logo was seen as a co-channel sign to Serbia (PTC-1) on Channel E3. The Ukraine and the Italian private station 'VIDEO' were logged many times by **Tom Crane** (Essex). So far this season, **Lt. Col. Rana Roy** (India) has logged many Arabic stations in Band I, including Dubai and Iran. On the 'R' channels, various Russian stations have been identified. On one occasion a Chinese test card was seen on channel R1.

Tropospheric Reception

Colour signals from the Norwegian TV-2 and the new NRK-2 networks have been identified by **George Garden** (Edinburgh) during recent openings. Two examples of reception are shown in **Figs. 1** and **2**. In addition to these networks, **Ian Milton** (Tyne & Wear) has also logged the TV Norge and NRK-1 networks, the latter being noted in Band III. Further south, **Shuan Taylor** (Howden) identified Belgian broadcasts from Wavre on channels E8 RTBF-1) and E10 (BRTN-1) and also Canal Plus pictures from France. **R. Frost** (Felixstowe) is in a favourable reception spot. Using a set-up top antenna, he can regularly watch Belgian and Dutch TV. There are plans to install a wideband grid, similar to the one featured in this column recently, to improve reception.

FM Band Reception

Mike Gaskin (Cornwall) has queries an unlisted Arabic station on 87.6MHz, usually received without an RDS code. Recently, an RDS code has been present which reads '-INTER-'. It has now been identified as a new Tunisian outlet at Zarzis and it has also been logged by **Tony Healless** (Blackburn). On the 10th, **Nicola Hutchings** (Somerset) identified Croatia on 105.1MHz and 105.9MHz. On 106.2MHz, a station with the RDS code "NOVA' was heard. Could this be the Czech Republic? Other countries include Finland on 87.9, 91.2 and 94.0MHz, identified from the RDS codes with 'YLE' prefixes and Sweden on 89.5MHz with the code '-SR P1-'. **Andrew Jackson** (Birkenhead) has added dozens of f.m. stations to his log this season, including 'FUNRADIO' on 87.7MHz from the new 50kW Kosice transmitter in Slovakia. 'PRO TON' on 90.0MHz has now been identified as coming from the Plzen transmitter in the Czech Republic.

Keep On Writing!

Please send off-screen photographs, reception reports and general information by the 3rd of the month to: **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.**

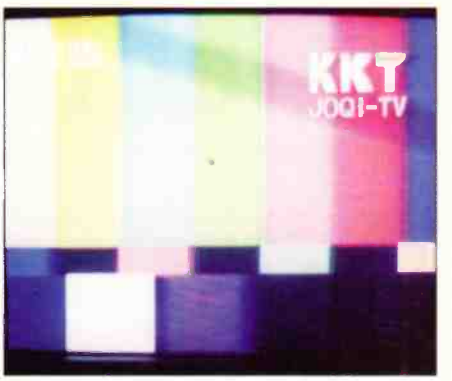


Fig. 5: A colour test pattern radiated by KKT JOQI-TV in Japan.

Fig. 6: This month's dip into the archives. The BBC-2 Clock caption with superimposed sunset shown at Closedown in March 1975.

Satellite TV News

ROGER BUNNEY
35 GRAYLING MEAD
FISHLAKE
ROMSEY, HANTS
SO51 7RU

Unless otherwise credited, pictures are courtesy John Locker, Wirral.

Summer '97 and there's been lots of satellite activity to keep enthusiasts and DXers active - despite the ever present hype of digital TV, good old analogue is still providing reception across the whole Clarke Belt!

August 18th and a teatime check on Intelsat K 21.5°W (Reuters lease @ 11.540GHz vert.) showed interesting activity underneath New York's Brooklyn Bridge, shots of the harbour, camera pics from a helicopter idling over Manhattan. And then, zoom in to a mid-50s Caddy cruising the freeway with escorting motor bike cops - no - not President Clinton arriving but the Rolling Stones for a press meeting to launch their US/Canadian tour in launching their new CD *Riches to Babylon*. Mick Jagger and co were on form, though the press call lasted, perhaps, only 10 minutes. Another New York live event the previous week (12th) at the new Virgin MegaStore involved the 'Backstreet Boys' and a massive crowd for the free entertainment, carried in clear analogue via Orion-1 Atlantic at 37.5°W.

The now traditional summertime hook-up for *GMTV* via the Reuters mobile uplink was fully active late July through August with the production crew travelling the hot spots of the Spanish seaside holiday resorts offering a song/dance and general entertainment happening inserting live into the UK's breakfast *GMTV* programme. The 'Reuter TV Uplink 2, UKI 76' unit travelled with the OB crew and the daily morning offerings appeared around 0745 UK time on Intelsat K. I noticed *The Weekend Show* was uplinking at 1800 on Intelsat K July 25th featuring Emma Forbes and Andy Peters from a Thames-side location.

Another favoured customer on Orion is the BBC's Plymouth SNG truck 'UKI 231' often seen at various holiday venues during the Summer. August 14th and Jersey's Battle of Flowers, up popped 'UKI 231' with a circuit back into the Plymouth newsroom at 12.586GHz via Orion-1 37.5°W for the evening magazine programme - general flower procession coverage, interviews, etc. (the afternoon procession is 'pay to view' - around St. Helier with a free to view evening smaller version).

Readers may recall my dish planning problems, the local enforcement officer's visit resulting in my recently sending in my planning applications + four copies, local maps, photographs and a £90 cheque requesting 'Retention of satellite dish on post in rear garden', (the post incidentally is 1.5m high). The borough council circulated the neighbourhood seeking comments and objections prior to a full planning committee meeting late August. Meanwhile the local ward (town planning) councillor hammered on the door one evening seeking a personal viewing of the disputed dish - he received in addition a Clarke Belt tuning check-up and having seen various international news feeds and distant programme channels went away both impressed and indicating his recommended approval of the installation (to the borough council). The saga continues...

It was good to hear from **Dave Phillpotts** (West Looe) recently, he uses a 1m offset tracking dish feeding into either an Echostar SR8700 or a Nokia 1700 - whereas the threshold extension on the '8700 pulls in weak signals Dave finds that the Nokia overall gives better picture quality on stronger signals. Next is the jump into deep water and digital reception - Dave's considering the current flavour of the month, the Nokia 9500-S. There are rumours that Mascom, a German company (that have produced a much modified and versatile Nokia 9500), are about to launch in Europe their 9600 which incorporates even better upgrades than before.

If you thought that jamming was restricted to the short wave bands, think again! July 1 and Eutelsat II F2 @ 10°E (10.970GHz vert.) as usual was down linking the MED-TV Kurdish language programme channel (MED-TV is produced in and uplinked from the UK). Two of our readers notice that the TV signal is

Brightstar has re-appeared on Intelsat K in both analogue and digital.

suffering heavy interference from around 1700 - though one viewer thought that MED-TV were having problems aligning their uplink feed onto the 10°E bird. A press report said that MED-TV claimed their transponder was being jammed from the Turkish mainland, if so then Eutelsat may take action to prevent Turkey from using Eutelsat facilities. The other MED TV downlink on Intelsat 705 @ 18°W (11.075GHz vert.) has to date been left unharmed. After the early July event the Eutelsat 10 °E MED-TV has been left with clear pictures.

Dean Rogers (Abbeywood SE2) uses an Amstrad SRD550 fed from an 800mm Lenson Heath dish and Cambridge LNB attached to an IRTE 'Multisat' motorised upgrade arm. Using this combination plus slight manual adjustment Dean can track across the skies from Kopernikus DFS-2 @ 28.5°E to 1°W and has logged many programme feeds + conventional programme channels. Being keen on football, Dean watches Telecom 2C, which often carries the Canal Plus OB circuit of the matches back to the Canal Plus HQ. The Kopernikus 23.5°and 28.5°E birds have been extremely busy the past few weeks carrying live news feeds from the extensive flooding regions in Eastern Germany/Poland. Certain sporting feeds carry German commentary plus effects on the 6.60MHz sub carrier, a clean feed of effects only can be found on 7.20MHz. Clean effects are often provided for foreign broadcasters to add their own commentary.

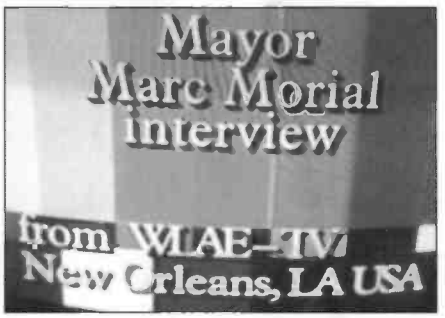
And from Sandown, IoW, **Roy Carman** has sent in a massive analogue reception log! Roy has been enjoying the extensive and very thorough coverage of the *Tour de France* cycle race that has been carried extensively for French TV as OB feeds on Telecom 2C. Camera work is impressive and the live links from the TV motorcycle camera up to the helicopter - which also carries an onboard camera - are impressive and beautiful particularly when the race is passing through the mountains. Back to reality and the evening of August 19th with a live OB feed for Central TV into their evening news programme, the Staffordshire Fire Brigade advising viewers to take care in the tinder dry countryside - ironically the interview was carried out in the pouring rain! An interesting one as SISLink 26 were providing the uplink onto the inclined orbital Eutelsat 1 F5 @ 25.5°E - 11.183GHz horizontal. This is an ageing craft and not always easy to catch unless your dish has an inclination arm - or you're lucky! Though a cheap satellite on which to lease transponder time, the inclined orbital track of the bird means that the up and downlink dishes will have to track the unstable satellite constantly during signal access time.

Orbital News

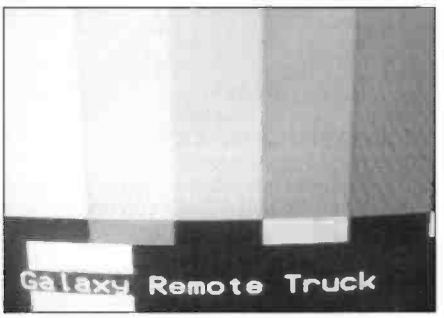
Adult XXX movies have hit Australia courtesy of a digital downlink from Intelsat's 702 bird. The programming from Taiwan's Space TV Systems arrives within an MPEG digital TV package - initially 'in the clear', but now all action is encrypted! The Taiwan programme company link their output into the North American Brewster, Washington state earth station via the 180°E Intelsat 511 (soon being replaced with the modern 701 bird), the adult action was **sourced** from a local video playout facility, added to the Space TV package and uplinked back to the 177°E 702 bird whence it dual illuminated SE Asia and South East Australia requiring dishes from 1m upwards.

Problems continue across India with the government delaying any satellite programming start-

Dean Rogers (Abbeywood) sent in this shot of golf via DFS-2 @ 28.5°E.

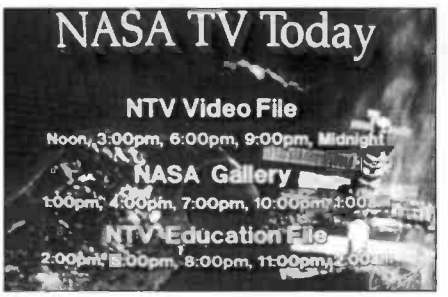


Eastbound programme feed ex US into the UK's GMTV via Intelsat K.

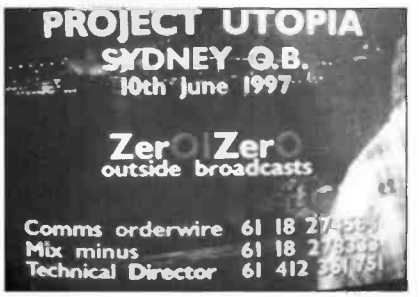


Another 21°W US satellite truck in analogue.

TARA-TV, the Irish cable TV service, digital via Intelsat 603 @ 34°W.



More Intelsat K digital during the Mars-Pathfinder project.



British Airways corporate world-wide hook-up to present their new aircraft colours. At least six satellites were used across Europe alone.

up to the continent until the new broadcasting bill is passed, expected Spring '98. The transmission ban applies to all signals above C-Band and attempts to prevent any broadcasting monopoly being established within the DTH (direct to home) broadcast market. ISkyB (Indian Sky Broadcasting) from Rupert Murdoch's News Corporation is included within this ban. ISkyB ex Star TV from Hong Kong intended to hit the digital air waves with 45 channels via PAS-4 at 68°East using their own unique encryption. The new bill when passed will limit foreign ownership for Indian continent broadcasters to 49%, the majority therefore will be held by Indian companies.

Meanwhile, Sony are serenading Rupert Murdoch as it seeks a joint venture with the News Corporation's Japanese Sky Broadcasting (JSkyB). Sony hope to include their own music channel based around their large music library within the JSkyB package and if revenue is forthcoming this may encourage Sony to opt for their own satellite music channel across Japan. JSkyB intends launching Spring 1998. Two analogue satellite broadcasters in Japan are reckoning to switch into digital Autumn 1998 - Skyport with their nine channels and CS-Ban running five channels. To encourage digital take-up, subsidised and free equipment will be on offer.

The American FCC have issued licences to 13 companies allowing fixed services in the upcoming 28GHz Ka band. Usage will include data, telephony and TV transmission using over 70 satellites either currently operational or planned. With Norway's Telenor THOR-2 satellite now orbital and working at 1°W, Hughes have received a contract to construct and launch THOR-3, again at 1°W being delivered in orbit August 1998. Coverage will be primarily Scandinavia and Eastern Europe. THOR-3 will carry 14 x 47W Ku band transponders and have a planned life of at least 11.5years.

The Government of Gibraltar have finalised plans to allow GE Capital Satellites establish a satellite teleport base on the 'Rock' giving access into Atlantic, European, African and Far Eastern satellite regions. In another Mediterranean move the Republic of Cyprus will establish pan-European and local island coverage via the soon to orbit Sirius-2 bird at 5°E.

News from the UK includes the NTL offering a 24 hour service for occasional TV users out of their Crawley Court, Winchester Teleport, having just commissioned an updated control room for their dish farm. And news operation AP-TV have recently networked multimedia and internet data around the world via satellite using UK hi-tech NDS technology. One test transmission via an international video feed sent an electronic copy of *The Sunday Times* to American, European and Australian subscribers. Currently testing at 6Mbit/s NDS reckon their system will run up to 30Mbit/s per sec.

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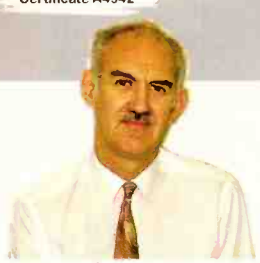

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* *6 Bands*
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* *Size 84 x 55 x 60mm*

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* *500kHz - 30MHz*
* *6 Band Positions*
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W&S £169

Price Match

* *153kHz to 30MHz*
* *FM Broadcast*
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* *Alphanumeric storage*
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* *Pre-set BC stations*
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* *0 - 32MHz*
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* *AM Synchronous*
* *100 Memories*
* *4 filters fitted*
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* *Passband tuning*
* *Enhanced AGC*
* *Noise spike compression*
* *Six level attenuator*
* *Bar S-meter*
* *AC adaptor included*

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With 5 Year Warranty Contract £1649

W&S £1549

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* *Alphanumeric*
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AOR AR-5000

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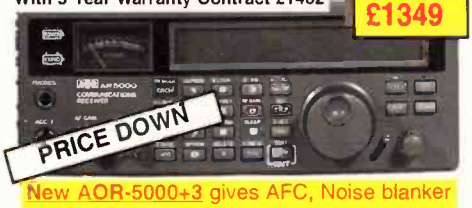
W&S £1349



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AS-5000	Auto 4-way ant. switch	£82.95
CT-5000	CTCSS decoder for AR-5000	£72.95
DS-8000	Speech inverter (also for AR-8000)	£64.95

KENWOOD R-5000

With 5 Year Warranty Contract £983

W&S £885

* *100kHz - 30MHz*
* *SSB CW AM FM*
* *100 Memories*
* *10Hz steps*
* *3 IF Filters*
* *Analogue S-meter*
* *Dual AGC*
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* *Wide dynamic range*
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* *1kHz readout*
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* *1000 Alphanumeric Memories*
* *Duplex monitoring & tracking*
* *USB LSB CW AM FM*
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* *Blistering scanning speed*
* *Good performer on the SW bands*
* *Totally programmable*
* *Multiple tuning steps*
* *Extremely sensitive front-end*
* *Good strong signal performance*
* *Includes AC charger and Ni-cads*

We can supply any ham radio item - phone for deal 62

W&S

Welz WS-2000 Scanner

NEW

£269.95

* World's smallest scanner
* FM, WFM, & AM
* 500kHz - 1300MHz
* Fast scanning speed
* Clear LCD readout
* 2000 Memories
* Even better sensitivity
* Good strong signal handling
* Runs from just 2 x AA cells
* Battery saving mode

Ham Radio Today Review of WS-1000 says *"Lovely little set - very sensitive receiver."*

Very Limited Stocks!

Accessories:

CNB-401	Ni-cad pack	£11.95
CSA-401	AC charger	£36.95
WSC-1000	Soft case	£14.95

AOR AR-8000 Scanner

Special W&S £299

Price Match

* 500kHz - 1900MHz
* WFM, NFM, SSB, AM
* 1000 Memory Channels
* 20 Search Banks
* 30 ch. per second search
* Band Scope Display
* Password Protect
* Computer control outlet
* Signal Strength meter
* Illuminated Display
* Programmable Steps
* Ni-cads and AC charger.

Yupiteru MVT-7000 Scanner

Special W&S £249

Price Match

* 100kHz - 1300MHz
* WFM, NFM, AM
* 200 Memories in 10 banks
* 20 channels per second speed
* Programmable Steps
* Illuminated Display
* Audio and Carrier Search
* Signal Strength meter
* RF atenuator switch
* Ni-cads and AC charger

Yupiteru MVT-7100 Scanner

Great Value W&S £269

Price Match

* 100kHz - 1650MHz
* NFM, WFM, SSB, AM
* 1000 Memories
* Signal Strength Meter
* Illuminated keypad - display
* 500 Ch. pass memories
* 30 Ch. per second speed
* Unique mode scan
* Ni-cads & AC Charger

Yupiteru MVT-7200

Special W&S £359

Price Match

* 100kHz - 1650MHz
* WFM, NFM, SSB, AM
* 1000 Memories
* Illuminated kepad - display
* Signal Strength Meter
* Built-in ferrite AM aerial
* Narrow band SSB filters
* Improved SW reception
* Improved selectivity & batt drain
* 30 ch. steps per second
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For the very best in ATUs the AT-200 has to be the choice. Hundreds in use around the UK - it's the best.

MFJ-784B DSP filter

W&S £239

* Works with any receiver or transceiver
* This filter is fully programmable with memories
* 16 factory pre-set positions for easy use
* Plugs directly into the headphone socket
* Drives speaker or headset to good volume
* Requires 12v DC at approx. 500mA.

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Free Freq. Guide

* 10MHz - 1.4GHz
* 400 Memories
* 255 hits record
* Auto store/ recall
* Interfaces with AR-8000
* Ni-cads and charger

W&S £348

The sure way to get frequencies

OptoElectronics Xplorer

PRICE DOWN

25-1300MHz Nearfield Monitor

W&S £798

* Complete FM Receiver
* Spectrum scan in 1 second!
* Reads out exact frequency
* Records "hits" and multiples
* Shows tones and deviation
* Computer interface option
* Ni-cads & AC charger

FC-128 Counter

W&S £79.95

1MHz - 2.8GHz

This new model has a wide frequency range and is powered by internal ni-cads. External BNC socket with aerial makes it very sensitive. Supplied with AC charger, it is very well built. Don't be fooled by the price!

Micro Counter

NEW

New from Optoelectronics is the Techtoyz counter that is "pager" size and can clip on to your belt. Claimed to be the smallest in the world, it covers 10MHz to 1.2GHz. Runs for 10 hours from 1 x AA cell.

£99.95

Micro Counter

NEW

A nearfield receiver that covers 30Mhz - 2GHz in less than a second and locks onto any FM signal providing good speaker output and instant deviation reading. Includes ni-cads and charger. £369.95

QS-400

NEW W&S £9.95

* Mounts handy or GPS on dash grill
* The safe way to go mobile
* Quick release feature.
* Doesn't use nasty adhesive!

BNC Scanning Whips

Watson Super Scan Whips

No other models offer the same features and performance. Beware of copies that only "look the same!" You can rely on Watson to give you the kind of performance and quality that is synonomous with the name. The most popular scanning antennas in the UK. - Fact!

* 25MHz to 1900MHz
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* Out-perform all others

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Mini -Magnetic Scanner Mobile Antennas

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Airband Civil & Military model WSM-225

* 25MHz to 1.9GHz Car Antenna
* 29cm super magnet that really sticks!
* Low profile 400mm long black whip
* 2.75m of coax fitted BNC plug
* Out-performs all others
* Scanning whilst on the move

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* Transmit and receive
* Needs PC 286 or better
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* No external power required
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* 1.6GHz GPS ant.
* Low profile for car
* Magnetic mount design
* 6dB gain design
* Guarantees improved range
* BNC terminated coax.
* OK for Garmin etc.

WEP-400 Earpiece

* Improved
* Soft pad
* Left/right fit
* 8 Ohm driver
* Extremely comfortable
* Fitted with 3.5mm plug

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WSC-2 Belt Case

NEW

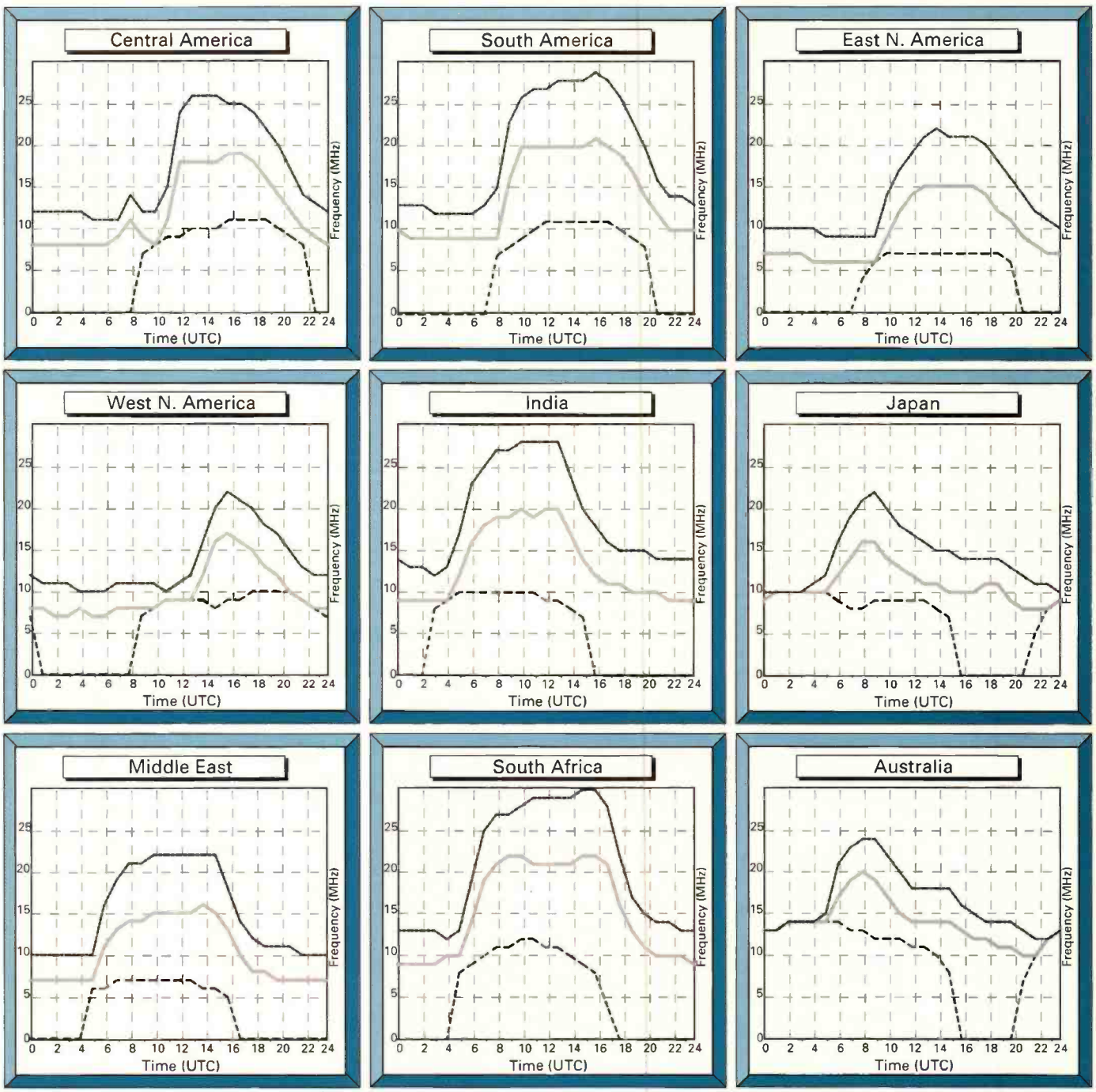
W&S £14.95

Combined quick release spring clip and belt loop. Self adjusting, fits all handys.

World Propagation Forecasts

JACQUES D'AVIGNON
VE3VIA

October 1997.
Circuits to London



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.

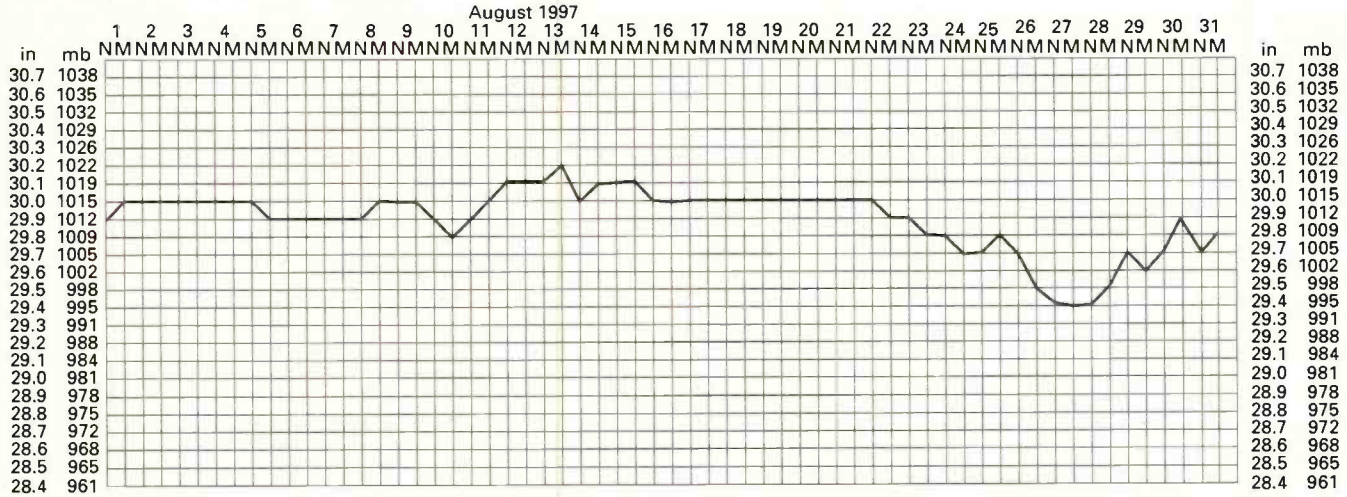
To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots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

Good luck and happy listening.

Propagation Extra

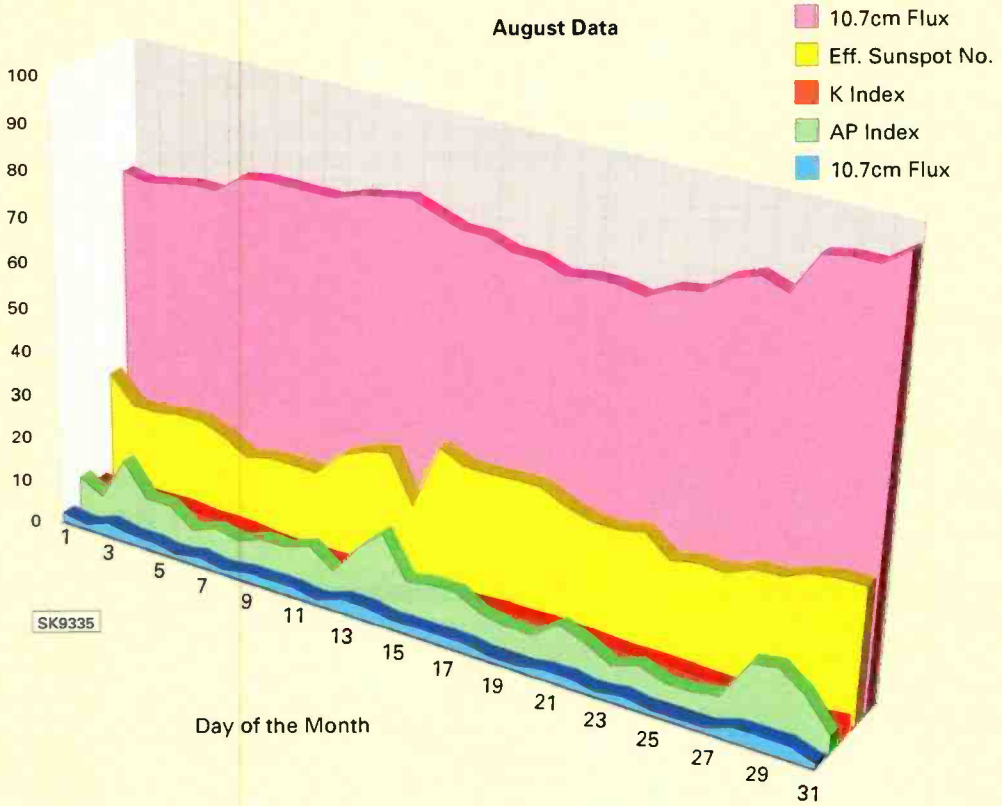
KEVIN NICE
G7TZC
SWM
EDITORIAL OFFICES
BROADSTONE

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, August 1997.



Guide to the Chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.
The K and AP indices are measures of geomagnetic activity.
The K index ranges from zero (very quiet) to nine (severely disturbed).
K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.
The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.



Airband

GODFREY MANNING G-AGLM
c/o THE GODFREY MANNING AIRCRAFT MUSEUM
63 THE DRIVE, EDGWARE
MIDDLESEX HA8 8PS

Siai-Marchetti S205/20R. Christine Mlynek.

Unidentified Flying Objects are always good for debate. Readers will by now know my opinion: they might be unidentifiable, but we don't need to invoke extra-terrestrial life-forms in order to explain them. It's highly likely that intelligent life exists elsewhere in the Universe and almost impossible that we will meet up with it.

Knowing the way the United States authorities work, it came as no surprise to read the revelations in the national press that previous sightings were really U2 spy aircraft. The US Government didn't want their Cold War adversaries to know about these flights and so made up a frightening story about aliens!

Even though all has been revealed, some American enthusiasts are so disappointed at the non-existence of visiting aliens that they persist in believing what they want rather than what actually happened!

Flying Activities

So far, **Andy Mattacks** (Surrey, Tel: (01883) 652109) hasn't had any takers for his Trident simulator. This is probably the only chance most of us will get to fly an airliner and at a price less than a typical lesson in a light aircraft! See July 'Airband' for a more detailed description and photo.

If you can help provide time and effort or else spare parts for restoration of a Victor cockpit, then the Victor Association would like to hear from you. Contact **Garry O'Keefe, 34 Francis Close, Compass Point, Saunders Ness Road, Cubitt Town, London E14 3DE**, although I stress that you won't find part of an aeroplane in Garry's house!

Not a Victor part but an a.d.f. indicator has been acquired by **Andrew Stephenson RS174635** (London). The yellow/black dial marking colours are unusual and the single pointer is more suggestive of a light aircraft. It might have been specified for more than one aircraft type, of course.

It's 'Indicator Electrical 9550' with what looks like an RAF AP1086 stores vocabulary reference 10Q/16356. This is the RAF catalogue of all spare parts they hold in stock.

The 'MOD Record' plate refers to MODifications and if none of the boxes 1 to 12 on this plate have been crossed through then no MODifications have been done.

It might have been fitted to WF382 on October 28, 1968. This serial is not listed in *Military Aircraft Markings* (available from the *SWM* Book Store) but would have been within a block allocated to Vickers *Varsity* aircraft.

Wire locking prevents the case being opened by unauthorised people and also stops the screws working loose by accident. You can open it, of course, as long as you promise never to put it back in a working aircraft.

If opened, the seal will be broken; it was put there by someone with an inspector's stamp coded 'MOS' (not the Ministry of Supply which ceased to exist before 1968, I believe).

Why not send me a photo, Andrew? Or, failing that, a good impression can be obtained by simply putting the unit on a photocopier, cover with a cloth or newspaper to make the surroundings dark, and literally copy it!

Also do a 'brass rubbing' of the electrical connection. Can anyone shed more light?

Radar

Secondary Surveillance Radar (SSR) relies on aircraft carrying a transponder. This equipment receives radar pulses that the ground stations send out. Then it transmits a high-powered reply back to the ground.

An advantage is that information can be encoded and included in the reply. There are various modes but Mode **3** is the civil one and all military traffic also operates Mode 3 as a minimum requirement.

There are features within Mode 3 and Mode A (should we say 3/A?) is one of them, sending a four-digit number back to the ground. The pilot selects the required number (squawk code) as instructed by the controller. The controller issues a unique number to each flight and so can tell them apart on the radar screen.

When in contact with London Flight Information Service (FIS), aircraft might be instructed to set the new squawk code 0027. Of course, FIS is not radar-equipped. But, the aircraft might also be in range of another controller's radar. This other controller can thus be reassured that the aircraft is indeed in contact with FIS. See *AIC* 97/1997 from the CAA.

A trial of squawk 7004 is applied to display/aerobatic aircraft by *AIC* 91/1997. I have a list of all squawks if you want to ask me about a specific one (I can't print the whole lot!). **Stephen Hill** (Warwick) will find the complete list in *UK AIP* section RAC 7-4-1 which ought to be on display at any local flying club such as at Coventry or Wellesbourne.

Transmit Mode C as well as Mode A and the controller now sees the aircraft's flight level on the radar screen in addition to the squawk code.

Yet another mode is possible: Mode S (see *AIC* 100/1997). There are only 4096 squawk codes in Mode A.

Although no one controller will be working this many aircraft at once, it does place restrictions when trying to allocate logical blocks of codes to flights in different but adjacent areas.

Mode S takes advantage of modern advances in electronics. In principle it works in the same way as Mode A but is expanded to provide 16 million codes. Practically one per aircraft!

Data can also be exchanged in both directions, the aircraft reporting its heading, airspeed, vertical speed and much more when the ground station requests. As this is far too much information for a human controller to take in, will computers be programmed to control aircraft from the ground?

I want a pilot up there if I'm a passenger!

Flight Ops Dept

Taking advantage of my offer in July to look up frequencies for local airways is **C.R. Holme** (Bournemouth) who should find (all MHz) UG1: 129.375, 133.6, 134.75 & 136.4; UR1: 127.425, 129.425, 132.45, 132.6, 135.05, 135.425 & 136.6; UR8: 126.075, 127.425, 129.425, 132.95, 135.05, 135.425 & 136.6. Note the overlap when different airways cross the same sector.

Now, C.R.H., could you confirm which part of UP6 and UR4 you want? They don't seem to run near to you.

ACARS enables aircraft to tell their owners' operations departments their positions and other technical data. Stephen Hill is correct that 131.525MHz is an extra ACARS frequency, the Secondary (Europe) allocation to be precise.

Thanks for the good wishes from **Brian Oddy G3FEX** (our 'LM&S' columnist); we've both completed 10 years of writing for *SWM*! He agrees that a successful format should remain unaltered.

Brian remembers a Decca Navigator station at Bolberry Down on the south-west coast. I think it's the master of Chain 1 (South-West British). See also the August issue under the 'Navigation' sub-heading.

Frequency & Operational News

I read in *GASIL* 4 of 1997 from the CAA that Beccles is closed but perhaps only temporarily. At Jersey, a new departure a.t.i.s. is on 129.725MHz

Continued on page 71

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GPS MAP 230	£Call
GPS MAP 220	£Call
GPS 12	£149
GPS 40 (recon)	£99

Aviation - Marine - Land

MAGALLAN

GPS 2000	£129
GPS 2000XL	£149
GPS 3000XL	£159
GPS 4000XL	£219
GPS MeridianXL	£239
NAV DLX10	£459
Sky Blazer	£Call

Aviation - Marine - Land

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PC kits	£Call
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Mounting bracket	£Call
Power data cables	£Call
Unit to unit cable	£Call

Call for latest accessories

PSION

Psion 5 series	£Call
Psion 3 series	£Call
Psion Siena	£Call

PSI on full range

SCANNERS

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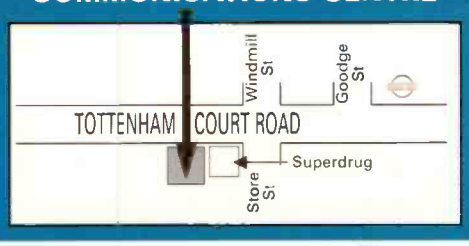

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As I have included quite a bit of frequency information during the past three months, I thought I would take a small departure from the norm this month to address the subject of US Military Aviation Black Projects. I have received quite a number of letters regarding this subject and as a consequence, I thought I would devote some space this month to collate the contents of these letters and to add my own thoughts on the subject.

The endless rumours regarding the return to the UK of the SR-71A Blackbird, fuelled by films and TV programmes such as *Independence Day*, the *X Files* and *Dark Skies* seems to have fired the imaginations of the UK's aircraft enthusiasts. The now much published existence of the Groom Lake Research Facility, (Area 51/Dreamland), has literally caused an explosion of interest in the so-called Black Projects over the past couple of years. The subject of the base they call Dreamland and what aircraft may operate from there has quite definitely aroused the public's curiosity. (And no, I am not going to discuss Back-Engineering, Roswell or Flying saucers).

There is irrefutable proof that Groom Lake has hosted, (allegedly), a wide variety of unusual aircraft types over the past four decades. During the cold war many Russian built types, (obtained by fair means or foul), were evaluated at this facility. If reports in the US press are to be believed, at one point in time there was at least 22 Eastern Block aircraft, which were under test here. The test programmes for the U-2, SR-71 and the F-117A Stealth were largely conducted from this facility. The presence of all three types was kept well under wraps until those in power deemed it was time for the public to be made aware of their existence. This is what makes the B-2A Spirit unusual. Instead of the project being conducted under the usual veil of secrecy, the B-2A was launched into the public view in a plethora of marching bands, fanfares and all the Razzmatazz that the Americans could muster. The question that needs to be asked is **why** go public so early in its career?

There are a number of people, including myself, who hold the view that the B-2A project is possibly an elaborate front, both political and financial for the real stealth or black project that is as yet still hidden deep in the Nevada desert. (Refer to my comments regarding the B-2A in last month's column). For the past decade, people have speculated as to the existence of a further stealth project, some have even given them aircraft designators such as the F-19A and the TR-3. They may or may not be on the right track but given the Americans past history of disinformation I think it is very likely that one or more as yet undisclosed projects are under test and possibly even available operationally. This is further fuelled by reports of strange sonic booms triggering seismic equipment at regular intervals plus odd vapour trails have been spotted giving rise to speculation that a new form of propulsion system may be under development.

This then leads us to whether such a project may have visited the UK and to whether such an aircraft has been heard on the airwaves. I have had several letters from people who believe they have heard the Blackbird over the UK during 1997, but despite firm evidence that plans were made for its return to the UK by the US military, there is no evidence to suggest that such a visit has been made. After the presence of the Blackbird at the Nellis USAF 50th airshow there was a slight chance that it would visit one of the UK 50th events, but this was not to be. Consequently, I personally think that such a visit is now highly unlikely. There have been reports in the past that covert aircraft have been based in the UK making night missions from such locations as Machrihanish, but once again there is no proof that this is the case.

Perhaps the one significant event that may give a clue to the existence of a further Black aircraft was during the Gulf War. At the time when the F-117A stealths had been precision bombing tactical targets, one news reporter asked a senior USAF officer what type of aircraft were used to provide the guidance to target in what was considered to be a high risk area. The officer stated that he was not at liberty to divulge the aircraft type used for that mission. Despite being pressed by the reporter, (who suggested it was an E-3 AWACS), the officer refused to answer and stopped the interview immediately. Whilst this proves nothing, as most of the Gulf War was seen almost minute by minute on live TV, including the presence of stealths, why did he refuse to answer the question when everything else was very public?

It is quite possible that the next couple of years may see the announcement of the existence of a new type of aircraft possibly with advanced technology, we shall have to wait and see. I must say if I had invented a new type of propulsion unit I would inclined to keep it well under wraps - as the saying goes. The truth is out there - it just depends on when someone decides to divulge it to us!

Airband

Continued from page 67

and I will take a guess that this is because the higher-powered arrival a.t.i.s., relayed on the v.o.r. frequency, can't be received very well when on the ground at the airport (as I found out myself when I flew there).

Sheffield's runway is 10/28 asphalt, says Stephen Hill; also, a.t.i.s. 121.7, see September 'Airband,' is confirmed by **Andrew Green** (Barnsley) and air traffic 128.52MHz, see August, by **John Bar**. Stornoway now has Aerodrome Flight Information Service 130.35MHz.

The Lower Airspace Radar Service is enhanced by Honington 135.2MHz.

Scottish Frequencies

Back to the May issue where I listed all the Scottish sectors and frequencies. If you want a chart of these sectors, *AIC* 99/1997 will help and you can get a copy from the address on the *Airband Factsheet*. The two page A4 *Factsheet* is free from the Broadstone Editorial Office (but **not** from me!), if you send an addressed, reply-paid envelope. When your copy arrives, send another addressed envelope to the appropriate authority (contents will weigh about 22g) as instructed on the *Factsheet*.

I do hope all readers in the Scottish area will take advantage of this. In summary, Flight Information Service is available on 119.875MHz in an area roughly overlapping the Forth Low and Antrim sectors. If this frequency is not operational, or when flying in other areas, the normal sector frequencies for Antrim, Forth Low, Hebrides, Moray and West Coast also provide this service.

Scottish radio relays are at Craigowl Hill, Fitful Head, High Buston, Lowther Hill, Mangersta, Prestwick, Rhustafnish, Snaefell, Stornoway, Tiree and Windy Head. Primary radar heads are at Aberdeen, Great Dunfell, Lowther Hill, Stornoway, Sumburgh and Tiree.

London Airways have 134.125MHz and Stephen Hill and **Chris Jordon** (Poole) will find that Biggin Hill, London (City) and Southend inbounds are controlled here.

Navigation now, with information from **Martin Sutton** (CAA). Thanks also for the frequency list, Martin. New d.m.e. beacons (response frequencies in MHz) are at Machrihanish (MAC, 11941); Stornoway (STN, 1185, old beacon but new frequency) and Wick (WIK 1170). Is the old WIC still there on channel 18?

And a new reporting point: DORKI is between the Ockham and Biggin v.o.r. beacons presumably on UR12 near Dorking.

Next Deadlines

The publication schedule has been altered, so the revised next three deadlines (for topical information) are October 6, November 10 and December 8. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

Abbreviations

ACARS	Aircraft Communications Addressing & reporting System
a.d.f.	automatic direction finder
AIC	*Aeronautical Information Circular*
AIP	*Aeronautical Information Publication*
a.t.i.s.	automatic terminal information service
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
g	grams
GASIL	*General Aviation Safety Information Leaflet*
MHz	megahertz
v.o.r.	very high frequency omni-directional radio range

Decode

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This month I have a whole suite of programs from regular contributor **Jan Nieuwenhuis** (The Netherlands). Jan has been providing information for 'Decode' readers for many years now and has been gradually building-up a selection of useful database programs. The suite of four programs described here covers a wide range of listening interests - much of which will, I'm sure, appeal to 'Decode' readers.

Probably the best known of these programs is *WXFAX*. The latest version of this handy utility (v3.4) provides an up-to-date listing of all known h.f. FAX stations. Not only does the program provide a simple frequency listing, but there are full address and transmission details provided where available. To make the package accessible to as wide an audience as possible, Jan has written the program to run under DOS. As a result, it will run on just about any PC from a 286 upwards, providing it has 640Kb of memory, VGA display and running DOS 3.3 or later. Although this lowly requirement means the graphics are a bit thin, it does ensure quick operation. Installation of the software is simply a matter of copying the files on the supplied floppy disk to a directory of your choice on the hard drive. You can also run *WXFAX* from the floppy, but access becomes a little slower. Operation of the program is pretty much self explanatory as all the features can be accessed via the main and sub menu systems. With the main listing you have the option to sort the information by frequency, station, callsign or location.

Once the appropriate option has been selected you can scroll through the complete list viewing thirteen lines of information at a time. The information stored for each station is name, country, callsign, frequency, transmission time, transmitter power and the FAX mode e.g. 120 rpm/IOC 576. This is just about all you really need to know, but if you did need more there was on-line help available by pressing the F1 key. This provided rapid access not only to basic information on how to navigate the program, but also a full ITU country list and an index of all the station abbreviations used in *WXFAX*. To supplement the viewing options, *WXFAX* included a comprehensive set of printing options. Within this menu you could print a full sorted listing, ITU country list, station address list, transmission information, weather map identification codes or you own selection. This was really very comprehensive. If you use a computer control program for your receiver you will be pleased to hear that *WXFAX* includes an option to export all the frequency information to a tab delimited file for import into your control software. You will need a little computing knowledge to make full use of this but it is a welcome extra.

An alternative method of viewing FAX station data is to use the Station Data menu. This uses a neat set of windows to display the full information on any selected station and is particularly useful when your tuning around looking for a station to monitor. All this is supplemented by some very handy general FAX information covering operating and decoding systems. Overall this is a simple, but very well thought-out, program that's packed with useful information. If you've got a PC and are interested in FAX you really ought to have a copy of *WXFAX*.

Next in the list of goodies from Jan is a Windows (3.1) based ships' callsign database, *SHIP-CS*. This provides a very informative listing showing the ship's name, callsign and country of registration and is likely to be of particular interest to all listeners who enjoy maritime monitoring. In addition to the basic listing, there is a full listing of the world-wide callsign assignments plus some detailed information on the operation of Scheveningen and Oostend radio stations. At present the ships callsign list is restricted to ships that have been registered in Belgium, Netherlands and Luxembourg, but it nevertheless makes a very useful reference. The next two programs are both Windows based but of less interest to 'Decode' readers. The non-directional beacon database program *NDB* provides full information on the international medium wave beacons that can be heard between 194kHz and 524kHz. The database listing includes the full Lat./Long position, Morse ID and the station name. To help with the identification the program can sound the station's Morse ID using the PC's speaker. This is another excellent and easy-to-use program.

Finally, we have the *Euro-TX* program that provides comprehensive information on broadcast stations that have programs directed towards Europe. The database features the same type of flexibility as *WXFAX* and will no doubt prove of great benefit to those with an interest in broadcast listening. Having tempted you all with these programs, here's how to get hold of a copy. The fully inclusive price for *WXFAX 3.4* and *EURO-TX 2.1* is just £8.00 (25 Guilders, 23 German Marks, $13 US) or $14 US outside Europe. *NDB 1.0* and *SHIP-CS 1.0* are available for £4.00 (10 Guilders, 10 German Marks, $6 US Dollars) or $7 US dollars outside Europe. With prices as low as this it is important that you use the correct payment method or most of it will be lost in bank charges. Could you therefore send either cash, Euro-Cheque or International money orders. The address to send to is: **Jan Nieuwenhuis, Vloedlyn 12, NL-1791 HH Den Burg (Texel), The Netherlands**. My thanks to Jan for supplying the review samples.

DSP Blaster Update

This program has caused quite a stir since I first mentioned it a couple of months ago and I know many readers without Internet access are struggling to get hold of a copy. Thanks to an E-mail from **Mike Le Ves Conte** this is now possible. Mike has been authorised by the author, **Brian Beezley**, to distribute copies of the demo version and has supplied details of how to get a fully registered version for the US. If this is your first encounter with the program, I suggest you take a look at the last couple of 'Decode' columns to see just how good it is.

Basically, if you have a PC and a SoundBlaster card you really ought to give it a try. You will get a fully configurable DSP filter that can run in the background whilst you use the PC for other Decoding tasks. The program is really very good. To get a demo version just send a formatted 1.44Mb 3.5in disk with a pre-paid reply envelope to: **Mike Le Ves Conts, 28 Woodlands, Paddock Wood, Kent TN12 6AR**. Registering for a full version can be done through the author Brian Beezley and costs $125 or equivalent. Brian supplies the program on disk and he accepts payment via MasterCard, Visa, Discover, International Money orders, cheques drawn on US banks or cash in a registered letter.

You should post your orders to **Brian Beezley, 3532 Linda Vista Drive, San Marcos, CA 92069 USA**. If you'd rather pay via 'phone Brian can be contacted during the hours of 1400-0100UTC on 001-760 599 4962. My thanks to Mike for supplying this information.

FAX Synchronisation

Colin Tunnah has written to me asking for help with a FAX reception problem. Colin currently uses *JVFAX* for his reception but this particular problem effects many FAX enthusiasts when they're just getting to grips with the hobby. I've shown a sample picture from Colin in **Fig. 1**. As you can see the image detail is not at all bad, but the image is very badly skewed and can even be seen coming back on itself.

To understand the problem I need to refresh your knowledge of how the h.f. FAX system operates. At the transmitting end of the link the paper image is wrapped around a drum such that the ends of the rolled-up sheet nearly touch. This drum is then set spinning at a pre-set rate - usually 60, 90 or 120r.p.m. An optical sensor then slowly scans along the length of the image converting the black and white chart image into electrical impulses that are used to modulate the transmitter. At the receive end the process has to be reversed to enable the image to be reproduced. In the original electromechanical systems the receiver would be the same as the transmitter except the optical sensor is replaced with a marking device that responds to the electrical impulses from the radio receiver.

I'm sure you can see that if we are to receive a good likeness (or facsimile) of the original, both the speed of the drum and the movement of the sensor along the chart need to be exactly matched. In addition, It's also important to ensure the starting edges of the paper are aligned or the chart may print over the edge. To help ensure that images can be received accurately between different systems there are a set of agreed international standards that are used by all the stations. The drum speed is the simplest and is measured in r.p.m. with the common standards being 60, 90, 120 and 240r.p.m. The movement of the sensor is a little more complicated as the exact rate will depend on the size of the paper at

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TUNING IN

ISSUE NO.1

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Rather than bombard you, dear readers, with meaningless lists of products this month we thought it might be helpful to let you know what's 'Hot' and what's not.

We've recently refurbished our Southampton Showroom and fitted out two dedicated 'Radio Shacks' (one for Data, one for General Radio) where customers are very welcome to try products on-air rather than just having to having to rely on a glossy brochure and a bit of Sales patter.

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Short wave Under £100?

Sangean ATS-818 Worldband Radio

Yes that's right, our buying power has enabled us to offer the fabulous Sangean ATS-818 receiver at just £99.00 rather than its usual list price of £119.00. The 818 is a high quality feature packed portable Short wave receiver tuning 1.7MHz to 29.999MHz plus MW, LW and FM S-T-E-R-E-O! All this plus 45 preset channels, built-in sleep function and AC supply, we must be crazy!

The Super Snooper Sniffer...

Have you ever wondered how books like the UK Scanning Directory are compiled? How do they find out who uses what frequency? One possible explanation could be the Opto Scout, an ingenious little device that slips in your top pocket whilst sampling two-way radio users nearby logging their frequencies into its memory. Up to 400 frequencies may be stored for later retrieval from the Scout's built-in LCD screen or by dumping the information out to a PC (using an optional RS-232 interface such as the Siskin Multicat) for in depth analysis with programs such as Microsoft Access etc.

Optoelectronics Scout

Supplied by SMC complete with built-in Nicad, fast charger, wide band telescopic whip and companion PC software diskette at just **£249**.

Receiver C.A.T. control

What is all this C.A.T. stuff everybody is on about these days? Well, many modern receivers (most Icom, Yaesu FRG100, Kenwood R5000, AOR AR8000 etc.) have an extra computer control socket allowing a PC to control mode, frequency and memory functions. Whilst you could buy an RS-232

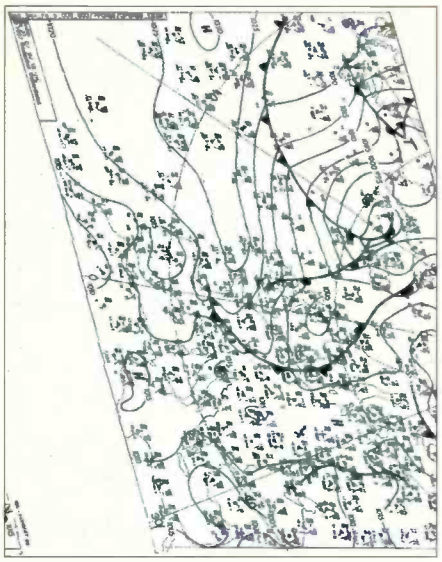

Fig. 1: Misaligned FAX Chart.

the receiving end. This is an important point about the FAX system as it can easily be used to enlarge or reduce on the original size.

Rather than specify the sensor speed in mm/second its the relationship between the drum speed and the size of the received image that's used. I won't go into the exact relationship here, but the term used to describe it is Index Of Co-operation or, more commonly, IOC. Providing the drum speed and IOC are correctly set you should receive an image which is a very good facsimile, but not necessarily the same size, as the original. This is particularly important with computer based decoding systems as they use a completely different method to electronically simulate a FAX machine to enable FAX images to be either displayed on the screen or printed-out via a standard printer.

So what happens if either the drum speed or IOC are not exactly aligned with the transmitter. Of the two the IOC is the less critical. If you try receiving a 576 weather FAX chart with the IOC set to 288 you will find that the chart is still readable but is very squashed. However, the drum speed is extremely critical. To illustrate the point, I'll run through an example. If you imagine we're receiving a 60rpm 576 IOC image that is due to be 200mm wide on the printer. Some simple maths shows that this is equivalent to the paper passing under the sensor at a rate of 200mm per second (60r.p.m./60 x 200mm). So let's look at what would happen if the drum speed was running slow at just 59.9r.p.m. This would give a new paper speed of 199.666mm per second. Whilst this may seem pretty close, it would mean that on every turn of the drum the image would shift out of alignment by 0.334. Okay, this is still small beer but what would happen over a typical FAX transmission time of 10 minutes?

Again, some simple maths shows that the image would shift by an amazing 200mm! In practice this would cause the image to be skewed to an angle of around 45°. So you can see that even very small errors in the drum speed can cause dramatic distortion of the received image. Returning the original question from Colin, you can see that he needs to adjust the drum speed to get his images properly aligned. Fortunately, this problem is well recognised by the suppliers of FAX decoding systems and they all either feature very accurate internal reference sources or include controls to adjust the drum speed in fine increments. In the case of *JVFAX* you just have to press the '/' key whilst receiving until the image is properly aligned. If you want to get a little more scientific with the adjustment you could try setting your FAX decoder to align with the MSF Rugby frequency standard on 60kHz. All you have to do is start your decoder in the normal way but set the drum speed to 60r.p.m. Next start receiving and tune around 60kHz ±1.5kHz. If you listen to the receiver at the same time you should hear the regular tick of the time signal. Now you just have to fine tune you receiver so the FAX decoder starts to produce a black or white stripe that aligns with the time signal. Just monitor this for a while and if all is well, the stripe should stay parallel with the edge of the screen or paper if your using a print-out. If it drifts away from being exactly parallel then you need to adjust your decoder's drum speed to pull it back into line.

In order to get this absolutely spot-on you will need to monitor for at least ten to fifteen minutes. Although it's a bit tedious, you will probably only have to do this once or twice a year depending on the stability of your decoder/PC's reference oscillator. Another important aspect of FAX reception is the initial synchronisation at the start of the transmission. If you think back to the image wrapped around the drum if the edge of the image at the receiver does not exactly line-up with the start of the transmitted image you may end-up with a nice square image that prints right across the edge of the paper. In order to cater for this the starting edge of the receiving FAX has to somehow be aligned with the same point on the transmitter. The solution to this and the appropriate selection of drum speed and IOC is to be found in the automatic picture transmission systems used by all the major FAX stations. This system adds three extra elements to each transmission, a Start tone, synchronisation pulses and a stop tone.

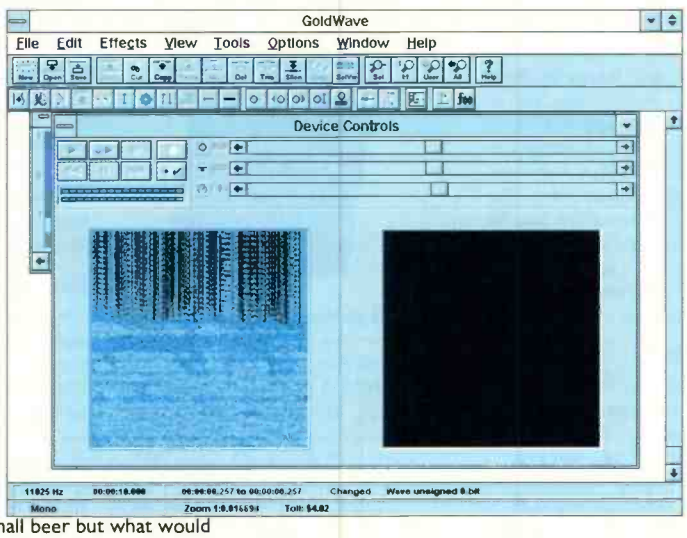

Fig. 2: Goldwave display of MCVFT Signal.

The start tone not only tells the receiver that a transmission is about to begin, but the frequency of the start tone is used to indicate the IOC of the image with 300Hz for 576 and 675Hz for 288. The synchronisation sequence consists of 30 seconds of pulses that flick from black to white. The pulses align exactly with the start edge of the image and occur at the proposed drum speed. In this way the decoder knows where the image starts and can work out the appropriate drum speed to use. To complete the process a 450Hz tone is used to indicate the end of the image. This simple, but highly effective, system means that FAX links can be left to operate completely unattended which is not only a boon to FAX enthusiasts but essential for ships at sea.

GoldWave

For those of you that want a real-time tuning but don't currently have Windows '95 installed you will be interested to hear that I've found another program that may fit the bill. If you're in any way interested in electronic music you will probably have come across the program *GoldWave*. This is a top quality digital editor for WAV sound files and includes a host of wonderful features including lots of interesting special effects. But what appeals from a 'Decode' point of view is the inclusion of a neat signal monitor device that can be set to display an incoming signal as an oscilloscope display, bar chart, or more interestingly, a spectrogram.

The device is actually part of the recording system and the trick is to set it to monitor the incoming signal but not to actually start recording. The resultant display is very similar to that provided by the program Spectrogram except it lacks the calibration markers. Nevertheless it is extremely useful as a tuning aid and for basic analysis of data signals.

To give you an idea of its usefulness I've included a screen dump of the program - **Fig. 2** - whilst tuned to a multi-channel telegraph transmission. Here you can clearly see the horizontal lines that represent the data for each of the channels. As well as using GoldWave for real-time analysis you can also make digital recordings of signals and then use *GoldWave*'s zoom feature to take a more detailed look at the signal. You can also speed-up or slow-down the signal to help reveal more about how the signal was constructed. This latter function could be very useful for resolving high speed Morse.

The program is widely available on the Internet and through the many shareware vendors. By the time you read this there may well be a link on my Web site! If you find any other interesting analysis packages or have a novel use for any software please write and let me know.

Info in Orbit

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This month's 'Info' is a little different from usual. Once a year or so, I believe it is a good idea to take a step back and view our hobby in perspective so that those unfamiliar with satellites in general and weather satellites in particular, can see what we are doing - if not why we are doing it! It has been prompted by many letters, particularly one from **Beryl Byrne** of Redditch. She recently bought her husband a computer and a copy of *SWM*. The July issue of 'Info' prompted her to investigate WXSATs, and her letter asked for basic information. I have received several other letters wanting to know how to start.

Correspondence and Images

Many people have entered the 'soundcard' decoding (of WXSAT images) route following previous references in 'Info'. Briefly, this innovative method of decoding uses a soundcard fitted in a reasonably well specified computer. Software written independently by **Christian Bock** and **Steven Bonnett** does the signal processing.

Brian Powell of Hereford uses the soundcard program to produce a detailed image from NOAA-14 captured on 19 July - see **Fig. 3**. He uses the Timestep PROscan receiver with *WXSAT* (English version 2.3). Brian built his own computer, which is currently a Pentium 133 with plenty of RAM and an Audio-Excell 16-bit soundcard, as well as the Timestep DOS card (PROsat II). Brian also heard OKEAN-4 (on 137.40MHz) around 1816UTC during a rare transmission.

A number of readers have sent in images, together with information about their own set-ups. **Lee Keywood** of New Milton has spent some time assembling a system which currently uses a Maplin crossed-dipole to receive the a.p.t. signals, the Maplin v.h.f. WXSAT receiver (Mk1), and decoder kit. I am interested to hear more about the performance of this system. Using a 486DX40 computer he has apparently written his own software (in C++). Lee tells me that he almost discarded the project in total frustration, but did persevere, finally getting his first visible-light image of Britain on 9 July at 1350UTC from NOAA-14 - see **Fig. 4**.

Fig. 1: Dish for METEOSAT WEFAX reception.

Kurt Feller of Lachan sent me a print - see **Fig. 5** - of "an exceptional METEOR pass from central Africa to Novaya Zemlya". My own experiences of METEOR passes during recent months has been variable. Several have been rather poor with much interference, but I have also had a few of very good quality.

Internet Site Update

Following many E-mail enquiries concerning the a.p.t./WEFAX sound-card decoding software issued by Christian Bock and Steve Bonnett, Internet users will now find both these programs available directly from my own web site. Other programs referred to in 'Info' will be linked as well. The URL is **http://www.ndirect.co.uk/~lawrenceh/index.htm**

Forthcoming Launches

Ms. Sally Wannop of EUMETSAT's User Service advises me that the launch date for METEOSAT-7 is 2 September 1997. This is the latest in the series of EUMETSAT satellites which provide data and images to Europe's weather forecasting centres.

Shuttle STS-86 *Atlantis* is scheduled for launch on 22 September for the next MIR mission.

Shuttle STS-87 *Columbia* is scheduled for launch on 19 November into a 28.45° inclination orbit.

Wayne Winston, NOAA/NESDIS Meteorologist advises that NOAA-K (15) is currently scheduled for a February 1998 launch into a morning (0730 - local time) orbit. The a.p.t. frequency will probably be 137.50MHz.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me as the *Shuttle Pack*. Please include a secure £1 and stamped s.a.e. for the A4 booklet.

Fig. 2: Yagi for METEOSAT WEFAX reception.

Fig. 3: N-14 on 19 July from Brian Powell.

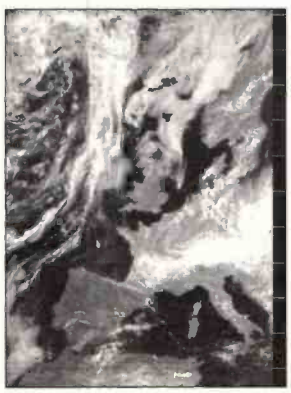

Fig. 4: NOAA-14 from Lee Keywood.

More Non-WXSAT Frequencies

Argentina's MICROSAT-1 transmits telemetry on 137.95 MHz n.b.f.m. There are short bursts of c.w. every 90 seconds. The signal is strong and easy to receive.

ORBCOMM-FM1 uses 137.71 MHz f.m.
ORBCOMM-FM2 uses 137.68 MHz f.m.

The Orbital Communications Corporation is developing and operating the world's first satellite-based, two-way data communications system - ORBCOMM. The system makes use of small, low earth orbiting satellites. My thanks to **John Corby** (Canada) for this information.

Kepler elements - MIR and Shuttle

1 For a print-out of the latest WXSAT elements, MIR, and the Shuttle (when available), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. During Shuttle operations I send Kepler elements by return-of-post.

2 I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.

Fig. 5: METEOR 3-5 17 July from Kurt Feller.

3 You can have the data as a computer disk file containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest), ideal for automatic updating of your tracking software. Please enclose 50p with your PC-formatted disk and s.a.s.e.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 uses 137.85MHz
OKEAN-4 and SICH-1 use 137.40MHz for occasional transmissions.
METEOSAT-6 (geostationary) uses 1691 and 1694.5MHz for WEFAX
GOES-8 (western horizon) uses 1691MHz for WEFAX
MIR uses 145.80 and 143.625MHz.

Satellites - The Background

Many people have a scanner (the general purpose type of receiver capable of tuning to different frequencies - often in the 30 to 1300MHz band - in an automatic manner), and at least one antenna. Some may even be thinking about investigating satellite monitoring and want to know how much it can cost to get started. Some background information on satellites and frequencies should help to clarify the situation.

Several nations have put satellites into orbit, and these are generally classified into categories such as defence, navigation, amateur, national and personal communications, weather (referred to as WXSATs), earth observation, television direct broadcast, and scientific research. If any nation or organisation selected a transmission frequency without regard to other users, the result could be chaos, with services suffering severe interference whenever a local frequency conflict arose. Consequently, a world body - the International Telecommunications Union - was established to control and approve frequency usage for specific applications. Continued development of new electronic systems means that there is rarely a period of time when any frequency band can be considered 'safe' or 'permanent' for its current users.

Magazines such as *SWM* and *PW* in the UK provide specialist columns devoted to various types of satellites including amateur, weather, and television direct broadcast. This column concentrates on WXSATs, but takes an occasional peek at the general scene.

WXSATs on HF?

You do not have to buy any satellite receiving equipment at all in order to get WXSAT pictures. An h.f. receiver operating in the 30kHz to 30MHz band, fed by a good random length antenna or other suitable antenna and a.t.u. (antenna tuning unit) can receive terrestrial broadcasting stations, and there are several which transmit a variety of weather satellite pictures. I have a Lowe HF-225 receiver which can keep me occupied - out of Marion's way (my SO, or XYL if you prefer!) - for hours at a time. 'Info' is about reception from the satellites themselves.

Monitor or Decode?

Before committing yourself to serious expenditure, you have to decide whether you want to 'use' (decode) the signal or simply 'listen' (monitor). If your interest is in monitoring satellites rather than taking the data and analysing it, then you are saved the not inconsiderable cost of signal analysis - decoding - as it is termed. With a scanner and one or more antenna(s) you can tune into a large number of satellites, and not worry about whether you are getting the last dB of signal from the ether!

If you read through this feature (and the second part next month) and choose to simply monitor the satellites (which many people do) then you may be interested to know the frequencies used. I occasionally include lists of those satellites operating near the 137MHz band, most of which I have personally monitored, and one or two which I have not heard but which others have reliably reported. More frequencies are given in this column - see 'non-WXSAT frequencies'.

WXSAT Bands

There are two types of WXSAT - the polar orbiting spacecraft and the geostationary constellations. The former include the American NOAAs, the Russian (or Commonwealth of Independent States - CIS) METEORs, and the CIS oceanographic imaging satellites. The geostationary WXSATs include METEOSAT (European), GOES (American), GOMS (CIS), FENGYUN (Chinese), and GMS (Japanese). The Indian government's communications satellite INSAT also provides some weather imagery.

There are essentially two bands used by WXSATs and both are under threat! The frequencies between 137.00 and 137.95MHz are used by polar orbiting WXSATs for the broadcasting of 'automatic picture telemetry' (known as a.p.t.). These are the images which are often printed and talked about in this column. An average of 5W power is transmitted by the satellites as they orbit, and this is normally sufficient to enable reception of a good quality signal, providing one has a suitably designed antenna. PDUS (Primary Data User System) and h.r.p.t. (high resolution picture transmission) images in the 1700MHz band, require the use of relatively expensive equipment so are less commonly monitored by hobbyists.

The currently active polar orbiters are NOAA-12, NOAA-14 and METEOR 3-5; all provide easily decodable a.p.t. on the v.h.f. frequencies listed at the end of this column. The oceanographic satellites SICH-1 and OKEAN-4 (also known as 1-7) transmit a.p.t. infrequently; you might occasionally be lucky enough to hear a transmission.

The NOAA WXSATs also transmit a higher resolution image (h.r.p.t.) on 1698.00 or 1707.00MHz, from which the lower resolution a.p.t. is derived. Systems to receive and decode these (h.r.p.t.) images are far more costly because the components - such as the receiver - are more expensive, and the receive antenna must be tracked to follow the satellite.

Geostationary WXSATs use 1691.00MHz for transmitting WEFAX images. METEOSAT-6 also transmits WEFAX on 1694.5MHz, as well as Primary Data. Because of their economical cost and the continuous stream of images which they provide, WEFAX decoding is popular and is sometimes combined with an a.p.t. system - see next month; for most people the cost is not too prohibitive.

Entry Level Summary

Suitable systems for decoding a.p.t. and/or WEFAX require a computer, an antenna for each band, receiver(s), decoding hardware and software.

PDUS and h.r.p.t. telemetry is relatively expensive to decode. A tracking antenna is required for h.r.p.t. together with a receiver and software; PDUS requires a large dish, special receiver and additional software.

For beginners, I believe that the most sensible approach is to set up either a WEFAX or a.p.t. system (or a combination if you have the funds) to gain experience. A move to h.r.p.t. or PDUS could follow later after invaluable experience has been gained with the basic system.

Antennas - Monitoring with a Discone

For monitoring purposes, the discone can suffice. This type of antenna can receive signals covering a wide band of frequencies - the entire v.h.f. and u.h.f. bands - between 25 and approximately 1300MHz. I have heard most of the amateur radio satellites, all of the polar orbiting WXSATs, the 150MHz band Russian navigation satellites, and a large number of other satellites transmitting in the 136 to 150MHz part of the radio spectrum - all while using a discone and wide-band pre-amplifier.

Prices and quality vary; a discone carrying more elements and made of solid rod rather than thin alloy is more likely to stand up to inclement weather. A glance at *SWM* advertisers Nevada Communications and Haydon Communications pages shows prices around £50-80.

Using such an antenna, you should hear the WXSATs in the 137MHz band. The resulting signal, however, will vary significantly and in a manner that may not be obvious unless you are already experienced in receiving WXSAT pictures direct from the satellites.

137MHz Band Antennas

A whip antenna, often used with a portable scanner, is an example of a narrow band antenna - one which receives signals within a relatively narrow frequency range, or multiples/sub-multiples of that range. This type of antenna is usually 'cut' (designed) for the frequency band of interest, so for the WXSATs, one could cut the length for 137MHz. In practice, the antenna should still receive signals between about 80 to 200MHz. Being tuned, such an antenna has a higher gain than that of a discone.

A dipole (centre fed) antenna is usually cut such that each of the two rods has a length of about one-quarter of the required wavelength. For the 137MHz band, the total length across both rods should be about 1.15m, to account for the changed velocity of the signal within the material of the dipole. Dipole antennas are easy to make and cheap to buy.

WXSAT 137MHz Antennas

The type commonly used for 137MHz WXSAT reception is a variation called a 'crossed-dipole' and consists of a pair of dipoles stacked together at 90°, and carefully connected (phased) so that optimum reception is for right-hand-circular polarised signals - the type transmitted by polar orbiting WXSATs. Another increasingly popular antenna is the QFH - quadrifilar helix. I plan to feature this antenna in a future issue.

METEOSAT Antennas

WEFAX signals on 1691.0/1694.5MHz can be received from METEOSAT-6 containing the four-minute image slots. Two types of antenna - a dish or loop Yagi - are used for collecting these transmissions. The dish should be about 1m diameter with a 'coffee tin' type of feed. Alternatively a Yagi fitted with around 47 elements should also provide a good signal. Yagis are very convenient to use. A suitable mount can be made and Yagis offer little wind resistance.

Dishes must be mounted and, as with the Yagi, must be aligned on METEOSAT-6, currently at 0° longitude. The signal available from either antenna is insufficient to provide noise-free data so a low-noise pre-amp must be attached directly to the antenna feed. These antennas are not good enough for PDUS reception - but that is another story.

WXSAT Equipment Suppliers

I shall be including system prices in the next edition, by which time the variations in system options will have been covered. A glance through the magazines shows that the main UK suppliers of WXSAT products are: Timestep: Tel: (01440) 820040, Martelec: Tel: (01420) 82752, TH2 Imaging: Tel: (0843) 223831, Remote Imaging Group: (members receive a quarterly magazine which regularly includes some special offers on equipment purchase); for membership enquiries write to **RIG-SUB, PO Box 142, Rickmansworth, Hertfordshire WD3 4RQ**.

The commercial suppliers may have a current price list; this can vary from time to time depending on the availability of special offers.

LM&S

BRIAN ODDY G3FEX
THREE CORNERS
MERRYFIELD WAY
STORRINGTON
WEST SUSSEX RH20 4NS

When referring to the data herein, which is based upon reports of actual reception, do bear in mind that some international broadcasters may alter their short wave transmission schedules on October 25 to allow for seasonal changes in propagation.

Such changes often result in listeners being temporarily unable to locate their favourite broadcasters. Details of any changes which you notice while searching the bands will be welcome here for 'LM&S'.

Long Wave Reports

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

In past years **Alan Roberts** (Quebec, Canada) has noticed that long wave propagation is enhanced during the mid-summer nights and this year was no exception! At 0310UTC on July 25 he picked up Saarlouis, Germany, on **183kHz** with a French report on the latest sheep cloning experiment in Scotland. The 2MW transmission rated SIO 333. He then tuned up the band and at 0320 heard a song *Don't look back in anger* on **252kHz**. It was followed by the station DJ with the ident 'Long Wave Radio, Atlantic 252'. The signal from Clarkstown, Ireland, was SIO 333.

In contrast, there were no reports of the sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanisseta, Italy on 189kHz reaching the UK during the evenings of July.

Medium Wave Reports

As expected, there were few reports of m.w transatlantic reception at night during July. WTOP in Washington, DC on **1500kHz** was logged on the 2nd by **Tony Stickells** (Thornton Heath) as SINPO 34112 at 0151UTC. CJYQ St.John's, NF on 930 and WNRB Boston, MA on 1510 were heard on the 18th at 0240 and again on the 22nd at 0355 by **John Slater** in Scalloway, Shetland. Typical ratings were SIO222.

The sky waves from the All India Radio (AIR) 1MW outlet at Nagpur on **1566** were picked up at 2345 on July 3 by Tony Stickells. They were peaking 33233. Some of the m.w. stations in the Middle East and N.Africa were also heard after dark - see chart. Whilst touring parts of Scotland from Strathyre **Brian Keyte** (Bookham) noticed that the Faroe Is station at Akraberg on **531** could be received over most of North & West Scotland by day - he was still hearing it with an unaided car radio South of Carlisle.

Short Wave Reports

The **25MHz (11m)** band is likely to remain unused for broadcasting until the propagation conditions improve.

The conditions in the **21MHz (13m)** band varied daily but the broadcasts from several countries often reached the UK. Those from RAI Rome **21.520** (It to Africa 0600-1300) were rated 44434 at 0815 by **Bernard Curtis** in Stalbridge; DW via Julich? 21.680 (Eng to SE.Asia 0900-0950) 44444 at 0930 by **Thomas Williams** in Truro; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200) 24332 at 0956 by **Rhoderick Illman** in Oxted; R.Portugal Int via Sines? **21.720** (Port to Africa? 0900-1100) 34333 at 1015 by Ernie Wiles in Bedford; UAER, Dubai **21.605** (Eng to Eur 1030-1055) 44343 at 1030 by **Norman Thompson** in Oadby; RFI via Issoudun 21.620 (Fr to E.Africa 0800-1500) 45444 at 1132 by **Eddie McKeown** in Newry; R.Portugal Int via Sines **21.655** (Port to Brazil 0700-2000 Sat/Sun) 22222 at 1220 by **Robert Connolly** in Kilkeel; UAER, Dubai **21.605** (Eng to Eur 1330-1355) 45434 at 1331 by **Tony Hall** in Freshwater Bay, IoW; BBC via Ascension Is **21.660** (Eng to W/E/S.Africa 1100-1700) 35334 at 1440 by Simon Hockenhull in E.Bristol; RFI via Issoudun? **21.580** (Fr to Africa 0900-1600) 55544 at 1500 by **Tim Allison** in Middlesbrough; BBC via Cyprus **21.470** (Eng to E.Africa 1400-1700) 34433 at 1545 by **John Eaton** in Woking; WYFR via Okeechobee, USA **21.745** (Eng to Eur, Africa 1600-?) 23232 at 1635 by **Darren Beasley** in Bridgwater; WYFR via Okeechobee? **21.725** (Fr to Africa ?-2045) SIO433 at 2000 in Quebec; WYFR via Okeechobee **21.525** (Eng to Eur, Africa 1600?-2200?) 34433 at 2055 by **Fred Pallant** in Storrington.

Propagation in the **17MHz (16m)** band has also varied daily but broadcasts from several continents could usually be received here. During the morning the BBC via Mayhe, Seychelles **17.885** (Eng to E.Africa 0500-1400) was rated 34333 at 0650 by **Stan Evans** in Herstmonceux; R.Australia via Shepparton? **17.750** (Eng to Asia 0600?-0800?) 24532 at 0700 by David Edwardson in Wallsend; R.Slovakia Int **17.570** (Eng to Australia 0830-0857) 44333 at 0845 in Scalloway; SRI via Schwarzenburg? **17.515** (It, Eng, Fr, Ger, Port to Australia 0830-1100) 45333 at 0907 in Newry; DW via Rwanda? **17.800** (Eng to Asia, Australia 0900-0950) 23432 at 0928 in Oxted; REE via Noblejas? **17.890** (Sp to ? 0900-?) 43333 at 0900 in Stalbridge; R.Pakistan, Islamabad **17.865** (Eng to Eur 1100-1120) SIO333 at 1100 by Tom Smyth in Co.Fermanagh; Israel R, Jerusalem **17.545** (Heb [Home Sce rly] to W.Eur, N.America 0700-1730?) 44444 at 1200 in Bedford; Voice of Russia 17.610 (Eng [WS]) 33233 at 1200 by **Clare Pinder** in Appleby.

Later, R.Cairo via Abis **17.595** (Eng to S.Asia 1215-1330) was 24432 at 1245 in Kilkeel; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-2100) 33223 at 1400 by **Gerald Guest** in Dudley; VOA via Tangier, Morocco **17.895** (Eng to Africa 1600-1900) 44444 at 1625 in Freshwater Bay; REE via Noblejas? **17.755** (Sp to Africa, S.America 0900-1900) 44534 at 1740 by **Vic Prier** in Colyton; WYFR via Okeechobee, USA **17.555** (Eng to Eur 1600-2145) 44333 at 1915 by **Sheila Hughes** in Morden; R.Nederlands via Bonaire, Ned Antilles 17.605 (Eng to S/E/W.Africa 1830-2025) 44444 at 1943 in Woking; RFI via Fr.Guiana? **17.630** (Fr to S.America? 1600-2200) 45444 at 2034 in Storrington; RCI via Sackville, Canada **17.820** (Fr, Eng to Eur, Africa 1900-2200) 35333 at 2120 in E.Bristol; VOFC Taiwan via WYFR **17.750** (Eng to Eur 2200-2300) 25322 at 2204 in Bridgwater.

LONG WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	F*
153	Donebach DLF	Germany	500	A,B,C*,D*,E,F*,G*,I,J,K*
153	Bod	Romania	1200	C*,J*
162	Allouis	France	2000	A,C*,D*,E,F,G,I,J,K*
171	Nador Medi-1	Morocco	2000	A,B*,F*,J*
171	B'shakovo etc	Russia	1200	C*,D*,E*,J
177	Oranienburg	Germany	750	A,B*,C*,D*,E,F,G,
180	Polati	Turkey	1200	J*
183	Saarlouis	Germany	2000	A,C,D*,E,F,G,I,J,K*
198	Droitwich BBC	UK	500	C*,D*,E,I,J,K*
207	Munich DLF	Germany	500	B,D*,E,F,J,K*
207	Azilal	Morocco	800	B*,F*
216	Roumoules RMC	S.France	1400	A,B,C*,D*,E,F,G,I,J,K*
225	Raszyn Resv	Poland	7	A,B*,C*,D*,E,F*,I,J
234	Beidweiler	Luxembourg	2000	A,C,D*,E,F,G,J,K*
243	Kalundborg	Denmark	300	A,B,C,E,F,G,J
252	Tipaza	Algeria	1500	C,E*,F*,J*
252	Atlantic 252	S.Ireland	500	A,C,D*,E,F,G,H,I,J,K*
261	Burg(R.Ropa)	Germany	200	E,F*,J
270	Topolna	Czech Rep	1500	C*,D*,E,F*,G*
279	Sasnovy	Belarus	500	C*,D*,J*,K*

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

Listeners:-
(A) John Eaton, Woking.
(B) Simon Hockenhull, E.Bristol.
(C) Sheila Hughes, Morden.
(D) Eddie McKeown, Newry.
(E) George Millmore, Wootton, IoW.
(F) Fred Pallant, Storrington.
(G) Vic Prier, Colyton.
(H) Alan Roberts, Quebec, Canada.
(I) Tom Smyth, Co.Fermanagh.
(J) Tony Stickells, Thornton Heath.
(K) Norman Thompson, Oadby.

The conditions in the **15MHz (19m)** band have been more reliable and good reception from some areas was noted. In the morning the BBC via Kranji, Singapore **15.360** (Eng to Asia 0500-1030) was 25532 at 0630 in Wallsend; R.Japan via Moyabi, Gabon **15.230** (Eng 0700-0800) 33233 at 0700 in Appleby; Voice of Russia **15.470** (Eng [WS]) SIO444 at 0808 by **Francis Hearne** in N.Bristol; Voice of Armenia, Yerevan **15.270** (Fr, Eng to Eur 0800-0900 Sun) 43443 at 0835 in Herstmonceux; Monitor R.Int via KHBI Agingan Pt, N.Mariana Is **15.665** (Eng to E.Eur? 0800-0900) 33333 at 0900 in Stalbridge; Voice of Russia, Moscow **15.510** (Eng [WS]) 34433 at 1126 in Freshwater Bay.

During the afternoon the BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 0300-0915, 1000-1400) was 34343 at 1224 in Woking; R.Tashkent, Uzbekistan **15.295** (Eng to Asia 1330-1400) 44433 at 1330 in Morden; RCI via Sines, Portugal **15.325** (Eng, Fr to Eur, M.East, Africa 1330-1500) 44444 at 1330 in Truro; Voice of Vietnam, Hanoi **15.010** (Eng to Asia

1330-1400) 25333 at 1353 in Storrington; Israel R, Jerusalem **15.650** (Eng to Eur? 1400-1430) 44444 at 1419 by Vera Brindley in Woodhall Spa; VOA via Woofferton, UK **15.205** (Eng to Eur, M.East 1500-1700) 43334 at 1500 in Dudley; UAER, Dubai **15.395** (Eng to Eur 1600-1640) 44322 at 1600 in Middlesbrough; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 34443 at 1615 in Kilkeel.

Later, VOA via Morocco **15.410** (Eng to Africa 1600-2200) was SIO222 at 1700 in Co.Fermanagh; RNB Brazil **15.265** (Port, Eng, Ger to Eur 1630-2020) SIO322 at 1720 by **Philip Rambaut** in Macclesfield; WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-1900) 25232 at 1721 in Bridgwater; AIR via ? **15.075** (Eng to E.Africa 1745-1945) 22332 at 1910 in Colyton; R.Cairo via Abis, Egypt **15.225** (Eng to C/S.Africa 1630-1830) 34233 at 1815 in Bedford; R.Nederlands via Bonaire **15.315** (Eng to S/E/W.Africa 1830-2025) 43333 at 1947 by **Tom Winzor** in Plymouth; R.Algiers Int, via Bouchaoui **15.160** (Eng to Eur, M.East, Africa 2000-2100) 33433 at 2030 by **Ross Lockley** in Galashiels; RCI via Sackville **15.150** (Eng to Eur, Africa 2000-2130) 34333 at 2109 in Oxted; RCI via Sackville **15.325** (Eng to Eur, Africa 2000-2129) 45434 at 2115 in E.Bristol; VOFC Taiwan via WYFR? **15.600** (Eng to Eur 2200-2300) 35233 at 2200 in Newry.

The conditions in the **13MHz (22m)** band have also been fairly reliable. Before noon Vatican R, Italy **13.765** (Eng to Africa 0630-0700) was 34333 at 0655 in Freshwater Bay; R.Austria Int via Moosbrunn **13.730** (Ger, Eng, Fr, Sp to Eur 0400-1800) SIO333 at 0754 in N.Bristol; R.Korea via Kimjae **13.670** (Eng to Eur 0800-0900) 32222 at 0800 in Appleby; R.Finland via Pori **13.645** (Eng to Australia 0800-0827) 33333 at 0805 in Truro; Croatian R, Zargreb 13.830 (Cr, Eng to Pacific 0600-1000) 34332 at 0837 in Oxted; R.Kuwait via Kabd **13.620** (Ar to Eur, N.America 0930-1605) 54444 at 1109 in Plymouth.

During the afternoon WHRI South Bend, USA **13.760** (Eng to E.USA, Eur 1500-2057) was 32323 at 1555 in Woodhall Spa; DW via Julich? **13.690** (Eng to S.Asia? 1600?-1650?) 55555 at 1610 in Bedford; SRI via Sottens? **13.635** (Fr, Ger, Eng to S.Asia 1500-1630) 45454 at 1611 in Bridgwater; Croatian R, Zargreb 13.830 (Cr, Eng to N.America 1230-2100) 44444 at 1630 in Kilkeel.

Later, UAER, Dubai **13.675** (Ar to Eur 1640-2100) 45534 at 1745 in Colyton; Voice of Turkey 13.695 (Eng to Eur 1830-1925) 34443 at 1830 in Dudley; Vlaanderen Int, Belgium **13.645** (Eng, Fr to Africa? 1800-1900?) 23332 at 1845 in Middlesbrough; RCI via Sackville **13.650** (Fr, Eng to Eur, Africa 1900-2200) 54444 at 2025 in Scalloway; RCI via Sackville **13.670** (Fr, Eng to Eur, Africa 1900-2200) 45544 at 2045 in E.Bristol; R.Havana Cuba **13.715** (Eng to Eur 2030?-2130 [also on **13.725** u.sb. Fr 2200-?]) 24432 at 2100 in Galashiels; Monitor R.Int via WSHB Cyprus Creek, USA **13.770** (Eng to Eur 2000-2157) 34343 at 2104 in Woking; R.Damascus, Syria **13.610** (Eng to Eur 2005-2105; to N.America 2105-2205) 44444 at 2106 in Newry; R.Ukraine Int, Kiev **13.590** (Eng to Eur 2100-2158) SIO444 at 2130 in Co.Fermanagh.

Good reception from some areas has been noted in the 11MHz (25m) band. Qatar BC via Al Khaisah **11.820** (Ar) was 44333 at 0732 in Oxted; Slovak R.Int, via Velke Kostolany **11.990** (Eng, Slov to Australia 0830-0927) 22222 at 0900 in Truro; RCI via Sackville **11.855** (Eng to USA, Caribbean 1200-1359) SIO222 at 1300 in Co.Fermanagh; Voice of Israel, Jerusalem **12.080** (Eng to Eur? 1400-1430) 33333 at 1400 in Appleby; BBC via Skelton & Woofferton **12.095** (Eng to Eur, N/W.Africa 0400-2230) 25322 at 1450 in E.Bristol; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1000-1630) 44434 at 1552 in Woodhall Spa.

Later WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2300) was 34433 at 1800 in Bedford; AIR via Bangalore **11.620** (Eng, Hi to Eur 1745-2230) 45534 at 1805 in Colyton; DW via Rwanda **11.810** (Eng to Africa 1900-1950) 43344 at 1900 in Dudley; R.Romania Int, Bucharest **11.940** (Eng to Eur 1900-1955) 43343 at 1910 in Newry; R.Bulgaria, Sofia **11.720** (Eng to W.Eur 1900-2000) 54554 at 1920 in Herstmonceux; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 54444 at 1949 in Middlesbrough; R.Algiers Int via Bouchaoui **11.715** (Eng to M.East, Eur 2000-2100) 44333 at 2005 in Morden; R.Damascus via Adra **12.085** (Eng to Eur 2005-2105) 44444 at 2008 in Plymouth; R.Nac da Amazonia, Brazil **11.780** (Port 0900-0200) 35553 at 2048 in Wallsend; RCI via Sackville **11.690** (Eng to Europe, Africa 2000-2130) 44434 at 2125 in Freshwater Bay; R.Australia via Shepparton **11.695** (Eng to Pacific areas 2100?-0000?) 34333 at 2135 in Bridgwater; R.Globo, Rio de Janeiro, Brazil **11.805** (Port 0900-0330) 24322 at 2145 in Galashiels; R.Brasil Central, Goiania **11.815** (Port 0700-0300) 33333 at 2145 in Scalloway; BBC via Ascension Is **11.750** (Eng to S.America 2000-0200) 32433 at 2155 in Woking; China R.Int via Mali **11.715** (Eng to N.America 0000-0057) 34433 at 0035 in Kilkeel.

In the **9MHz (31m)** band WYFR via Okeechobee, USA **9.985** (Eng to Eur, Africa 0500-0750) was 54544 at 0645 in

LOCAL RADIO CHART

Freq (kHz)	Station BBC	ILR (kW)	e.m.r.p	Listener
558	Spectrum, London	I	0.80	B*,D,G,J
585	R.Solway	B	2.00	A,E,F
603	Cheltenham R.	I	0.10	A,B,G,J
603	InvictaSG,Litt'brne	I	0.10	G,J
630	R.Bedfordshire(3CR)	B	0.20	D,G,J
630	R.Cornwall	B	2.00	A,E,G
657	R.Clwyd	B	2.00	A,G
666	Gemini AM, Exeter	I	0.34	B,C,G,J
666	R.York	B	0.80	A,C,E,F
729	BBC Essex	B	0.20	G,J
738	Hereford/Worcester	B	0.037	A,B,J
756	R.Cumbria	B	1.00	A,E,F
756	R.Maldwyn, Powys	I	0.63	B,G,J
765	BBC Essex	B	0.50	C,G,J
774	R.Kent	B	0.70	G,J
774	R.Leeds	B	0.50	A,F
774	3 Counties SG, Glos	I	0.14	A,G
792	Classic Gold 792	I	0.27	D,G,J
792	R.Foyle	B	1.00	A,E,I
801	R.Devon & Dorset	B	2.00	A,B,G,J
828	Classic Gold 828	I	0.20	J
828	2CR CG, Bournemouth	I	0.27	G
828	Townland R, Ulster		0.80	A,H
837	R.Cumbria/Furness	B	1.50	A,E,F
837	Asian Netwk Leics	B	0.45	G,J
855	R.Devon & Dorset	B	1.00	G
855	R.Lancashire	B	1.50	A,E,F,I
855	R.Norfolk, Postwick	B	1.50	C,J
855	Sunshine 855,Ludlow	I	0.15	B,C,J
873	R.Norfolk, W.Lynn	B	0.30	C,D,G,J
936	Brunel CG, W.Wilts	I	0.18	G,J
936	Yorkshire Dales R	I	?	A,E,F
945	S.Coast R, Bexhill		0.75	G,J
945	Derby (Gem AM)	I	0.20	A,F
954	Gemini AM, Torquay	I	0.32	G,J
954	Wyvern AM, Hereford	I	0.16	B,G,J
963	Asian Sd,Manchester		0.80	A,E,F
963	963 Liberty (Viva)	I	1.00	F,G,J
990	R.Aberdeen	B	1.00	E
990	R.Devon & Dorset	B	1.00	A,G,J
999	Gem AM, Nottingham	I	0.25	J
999	Red Rose 9-99 P'stn	I	0.80	A,F* H
999	R.Solent	B	1.00	D,G,J
1017	WABC, Shrewsbury	I	0.70	F,H
1026	Downtown, Belfast	I	1.70	A,E,H,I
1026	R.Jersey	B	1.00	G
1035	RTL Country 1035	I	1.00	G,J
1035	N.Sound, Aberdeen	I	0.78	A,F,H
1035	W.Sound, Ayr	I	0.32	E
1107	Moray Fth,Inverness	I	1.50	E,F,I
1116	R.Derby	B	1.20	A,F,J
1116	R.Guernsey	B	0.50	G,J
1116	Valleys R.Ebbw Vale	I	0.50	B,F
1152	Amber, Norwich	I	0.83	F*
1152	Clyde 2, Glasgow		3.06	E,F,H
1152	LBC 1152	I	23.50	G,I*,J
1152	Pic'ly 1152,Manch'r	I	1.50	A
1161	R.Bedfordshire(3CR)	B	0.10	J
1161	Brunel CG, Swindon	I	0.16	A,G,J
1161	Southern Counties R	B	1.00	G,J
1161	Tay AM, Dundee	I	1.40	E,F,H
1170	Amber SGR, Ipswich	I	0.28	F*
1170	GNR, Stockton	I	0.32	A,F
1170	SCR, Portsmouth	I	0.50	D,G,J
1170	Swansea Snd,Swansea	I	0.58	A,H
1170	1170AM,High Wycombe	I	0.25	C,J
1242	InvictaSG,Maidstone	I	0.32	J
1242	IoW Radio, Wootton	I	0.50	B,G,J
1251	Amber SGR,Bury StEd	I	0.76	A,F*,J
1260	Brunel CG, Bristol	I	1.60	G
1260	Marcher G, Wrexham	I	0.64	F
1260	R.York	B	0.50	A,F
1278	1278 W.Yorks Cl.G	I	0.43	F*
1296	Radio XL,Birmingham	I	5.00	A,F,G,H* I,J
1305	Big Easy Magic AM	I	0.15	A,E,F
1305	Premier via ?	I	0.50	E,F*,G,J
1305	Touch AM, Newport	I	0.20	G
1323	S.Coast R,Southwick	I	0.50	F*,G,J
1323	SomersetSnd,Bristol	B	0.63	A,F
1332	Premier, Battersea	I	1.00	A,E,G,J
1332	CG 1332, Peterbor'	I	0.60	E,F
1332	Wiltshire Sound	B	0.30	G
1359	BreezeAM,Chelmsford	I	0.28	J
1359	R.Solent	B	0.85	G
1368	Southern Counties R	B	0.50	C*,G,J
1368	Wiltshire Sound	B	0.10	G
1413	Premier via ?	I	0.50	E,F*,G,J
1413	Yorkshire Dales R	I	?	A,F
1431	Breeze AM, Southend	I	0.35	D,F*,G,J
1431	Cl.Gld via Reading	I	0.14	F,G,J
1449	R.Peterboro/Cambs	B	0.15	A,G,J
1458	R.Cumbria	B	0.50	A,F
1458	R.Devon & Dorset	B	2.00	A,G
1458	1458 Lite AM Manch'	I	5.00	E,F*,H,I
1458	R.Newcastle	B	2.00	E
1458	Sunrise, London	I	50.00	F,G,J
1458	Asian Netwk Langley	B	5.00	B
1476	CountySnd,Guildford	I	0.50	A,B,F,G,H,J
1485	Cl.Gld via Newbury	I	1.00	B
1485	R.Merseyside	B	1.20	A,C*,G,I
1485	Southern Counties R	B	1.00	G,J
1503	R.Stoke-on-Trent	B	1.00	A,C*,E,F,G
1521	R.1521 Craigavon,NI	I	0.50	A,E,F,H,J
1521	Fame 1521, Reigate	I	0.64	F,G,J
1530	R.Essex	B	0.15	G,J
1530	1530 AM W.Yorks CG	I	0.74	A,E,F
1530	Wyvern, Worcester	I	0.52	G,J
1548	R.Bristol	B	5.00	G,H
1548	Capital G, London	I	97.50	G,J
1548	Magic 1548 Liverp'l	I	4.40	A,H
1548	Forth AM, Edinburgh	I	2.20	E,F
1557	R.Lancashire	B	0.25	A,C*,E,F
1557	Mellow, Clacton	I	0.125	D,J
1557	CG 1557, N'hampton	I	0.76	F,H
1557	S.Coast R, So'ton	I	0.50	C*,G,H
1584	London Turkish R	I	0.20	G,J
1584	R.Nottingham	B	1.00	A,C*,F
1584	R.Shropshire	B	0.50	G*
1584	Tay, Perth	I	0.21	E,F
1602	R.Kent	B	0.25	E,F,G,J

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

Listeners:-
(A) Robert Connolly, Kilkeel.
(B) Simon Hockenhull, E.Bristol.
(C) Sheila Hughes, Morden.
(D) Rhoderick Illman, Oxted.
(E) Brian Keyte, while in Strathyre.
(F) Ross Lockley, Galashiels.
(G) George Millmore, Wootton, IoW.
(H) Chris Ridley, Co.Sligo, Eire.
(I) Tom Smyth, Co.Fermanagh.
(J) Tony Stickells, Thornton Heath.

MEDIUM WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Wurzburg (BR)	Germany	0.2	G*,L*
526	Vatican R.	Italy	5	L*
531	Ain Beida	Algeria	600/300	H*,L*
531	Torshavn	Faeroe Is.	100	F
531	Leipzig	Germany	100	G*,H
531	RNE5 via ?	Spain	?	G*,H,L*
531	Beromunster	Switzerland	500	H,L
540	Wavre	Belgium	150/50	B,E,G*,H,L,M*
540	Sidi Bennour	Morocco	600	H*,L*
549	Les Trembles	Algeria	600	D*,H*,L*
549	Thurnau (DLF)	Germany	200	D*,G*,H,L
558	Espoo	Finland	100	G*,M*
558	Tirgu Jiu	Romania	200	H*
558	RNE5 via ?	Spain	?	H*
567	Tullamore(RTE1)	Ireland (S)	500	C,E,F,H,J,K,L,M*
576	Muhlacker(SDR)	Germany	500	G*,H,L*
576	Riga	Latvia	500	H*
576	Barcelona(RNE5)	Spain	50	H*,L*
585	Paris(FIP)	France	8	E,H,L
585	Riyadh	Saudi Arabia	1200	B*
585	Madrid(RNE1)	Spain	200	D*,G*,H*,L*
585	Gafsa	Tunisia	350	L*
585	Dumfries(BBCScot)	UK	2	F,G*,K,L*
594	Frankfurt(HR)	Germany	1000/400	B*,G*,H,L
594	Oujda-1	Morocco	100	H*,L*
594	Muge	Portugal	100	G*,H*,L*
603	Sevilla(RNE5)	Spain	50	G*,H*,L*
603	Newcastle(BBC)	UK	2	F,G*,K
612	Athlone(RTE2)	Ireland (S)	100	C,F,H,J,K,L
612	Sebaa Aioun	Morocco	300	H*,L*
612	RNE1 via ?	Spain	10	H*,L*
621	Wavre	Belgium	80	E,G*,H,L
621	Orava	Slovakia	14	L*
621	RNE1 via ?	Spain	10	G*,L*
630	Vigra	Norway	100	G*,H*
630	Tunis-Djedeida	Tunisia	600	G*,H*,L*
639	Praha(Liblice)	Czech	1500	G*,H*,M*
639	RNE1 via ?	Spain	?	G*,H,L*
648	RNE1 via ?	Spain	10	G*
648	Orfordness(BBC)	UK	500	F,H,L
657	Neubrandenburg(NDR)	Germany	250	G*
657	Napoli	Italy	120	H*,L*
657	Madrid(RNE5)	Spain	20	L*
657	Wrexham(BBCWales)	UK	2	C,D,F,G*,K,L
666	MesskirchRohrd(SWF)	Germany	150	G*,L*
666	Lisboa	Portugal	135	G*,H*
666	Barcelona(SER)	Spain	50	L*
675	Lopic(R10 Gold)	Holland	120	C,E,G*,H,K,L,M*
684	Sevilla(RNE1)	Spain	500	G*,H*,L*
684	Avala(Beograd-1)	Yugoslavia	2000	L*
693	Tortosa(RNE1)	Spain	2	G*,L*
693	Droitwich(BBC5)	UK	150	H,J,L,M*
693	Enniskillen(BBC5)	UK	1	K
702	Flensburg(NDR)	Germany	5	G*,L*
702	Monte Carlo	Monaco	40	L
702	Slovensko 1 via ?	Slovakia	?	L*
711	Rennes 1	France	300	B,C,E,H,L
711	Heidelberg	Germany	5	L*
711	Laayoune	Morocco	600	H*,L*
720	Tayevad	Iran	400	H*
720	Lisnagarvey(BBC4)	Ireland (N)	10	F,H*
720	Norte	Portugal	100	G*,L*
720	Lots Rd Ldn(BBC4)	UK	0.5	H,K,L
729	Cork(RTE1)	Ireland (S)	10	G*,H*,L*
729	RNE1 via ?	Spain	?	G*,H*,L*
738	Paris	France	4	H,L*
738	Poznan	Poland	300	L*
738	Barcelona(RNE1)	Spain	500	G*,H*,L*
747	Flevo(Hilv2)	Holland	400	E,G*,H,L
756	Braunschweig(DLF)	Germany	800/200	G*,H*,L,M*
756	Bilbao(El)	Spain	5	G*,H*,L*
756	Redruth(BBC)	UK	2	H
765	Sottens	Switzerland	500	G*,H*,K*,L*,M*
774	Hrvatski R.	Croatia	50/10	L*
774	Abis	Egypt	500	M*
774	Enniskillen(BBC)	Ireland (N)	1	F,G*
774	RNE1 via ?	Spain	?	G*,H*,L*
774	Plymouth(BBC)	UK	1	O
783	Leipzig(MDR)	Germany	100	G*,H*,L*
783	Miramar(R.Porto)	Portugal	100	H*,L*
783	Dammam	Saudi Arabia	100	L*
792	Limoges	France	300	G*,H,L,M*
792	Lingen(NDR)	Germany	5	G*,L*
792	Sevilla(SER)	Spain	20	H*,L*
801	Munchen-Ismaning	Germany	300	G*,H*,L*
801	Ajlun	Jordan	2000	H*
801	RNE1 via ?	Spain	?	G*,L*
810	Volgograd	Russia	150	H*
810	Madrid(SER)	Spain	20	G*,H*,L*
810	Westerglen(BBCScot)	UK	100	C,F,H*,K,L*,M*
819	Batra	Egypt	450	H*
819	Trieste	Italy	25	L*
819	Warsaw	Poland	300	G*,L*
819	S.Sebastian(El)	Spain	5	L*
828	Hannover(NDR)	Germany	100/5	G*,L*
828	Rotterdam	Holland	20	G*,L
837	Nancy	France	200	H*,L
837	COPE via ?	Spain	?	G*,H*,L*
846	Rome	Italy	540	H*,L*
855	Berlin	Germany	100	G*,L*
855	RNE1 via ?	Spain	?	G*,H*,L*
864	Santah	Egypt	500	L*
864	Paris	France	300	F,H,L
864	Socuellamos(RNE1)	Spain	2	G*,H*,L*
873	Frankfurt(AFN)	Germany	150	A*,C*,D*,G*,H*,L*,M*
873	Zaragoza(SER)	Spain	20	G*,H*,L*
873	Enniskillen(R.UI)	UK	1	F
882	COPE via ?	Spain	?	G*,H*,L*
882	Washford(BBCWales)	UK	100	D,F,H,L,M*
891	Algiers	Algeria	600/300	D*,G*,H*,L*
891	Huisberg	Netherlands	20	G*,H*,L
900	Brno(CRo2)	Czech Rep	25	G*
900	Milan	Italy	600	G*,H*,L*
900	COPE via ?	Spain	?	L*
909	B'mans Pk(BBC5)	UK	140	H,J,K,L,M*
918	Plesivec(Sloven'nR)	Slovenia	600/100	G*,H*,L*
918	Madrid(R.Int)	Spain	20	L*
927	Wolvertem	Belgium	300	E,G*,H,L
927	Zakynthos	Greece	50	L*
936	Bremen	Germany	100	G*,L*
936	Venezia	Italy	20	H*,L*
936	RNE5 via ?	Spain	?	G*,H*,L*
945	Toulouse	France	300	G*
954	Brno (CRo2)	Czech Rep	200	G*,H*
954	Madrid(C1)	Spain	20	G*,L*
963	Pori	Finland	600	G*
972	Hamburg(NDR)	Germany	300	G*,H*,L*
972	RNE1 via ?	Spain	?	L*
981	Alger	Algeria	600/300	D*,H*,L*
990	Berlin	Germany	300	G*,L*
990	R.Bilbao(SER)	Spain	10	G*,H*,L*
990	Redmoss(BBC)	UK	1	G*
990	Tywyn(BBC)	UK	1	F
999	Schwerin (RIAS)	Germany	20	G*
999	Torino	Italy	20	L*
999	Madrid(COPE)	Spain	50	G*,L*
1008	SER via ?	Canaries/Spain	?	G*,L*
1008	Flevo(Hilv-5)	Holland	400	G*,H,L
1017	Rheinsender(SWF)	Germany	600	G*,H*,K,L*
1026	SER via ?	Spain	?	G*,L*
1035	Lisbon(Frog3)	Portugal	120	G*
1044	Oresden(MDR)	Germany	250	G*
1044	SER via ?	Spain	?	H*,L*
1053	Zarogoza(COPE)	Spain	10	G*,L*
1053	Talk R.UK via ?	UK	?	H,J,K,L*,M*
1062	Kalundborg	Denmark	250	G*,H*
1062	R.Uno via ?	Italy	?	H*,L*
1071	Brest	France	20	H*
1071	Riga	Latvia	50	G*
1071	Bilbao(El)	Spain	5	H*,L*
1071	Talk Radio UK via ?	UK	?	K,L
1080	Katowice	Poland	1500	G*,H*,L*
1080	SER via ?	Spain	?	H*,L*
1089	Talk Radio UK via ?	UK	?	H,J,K,L
1098	Nitra(Jarok)	Slovakia	1500	G*,H*,L*
1098	RNE5 via ?	Spain	?	L*
1107	AFN via ?	Germany	10	G*,L*
1107	RNE5 via ?	Spain	?	L*
1107	Talk R.UK via ?	UK	?	H,J,K,L
1116	Bari	Italy	150	L*
1116	Pontevedra(SER)	Spain	5	L*
1125	La Louviere	Belgium	20	G*,H*,L
1125	Deanovec	Croatia	100	L*
1125	RNE5 via ?	Spain	?	H*,L*
1134	COPE via ?	Spain	2	D*,G*,H*,L*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	D*,G*,H*,L*
1143	AFN via ?	Germany	1	G*,L*
1143	R.Due via ?	Italy	?	G*
1143	COPE via ?	Spain	2	H*,L*
1152	RNE5 via ?	Spain	10	H*,L*
1161	S.Sebastian(El)	Spain	50	L*
1179	SER via ?	Spain	?	L*
1179	Solvesborg	Sweden	600	A*,E*,G*,H*,J*,K,L*
1188	Kuurne	Belgium	5	G*,H*,L
1188	Reichenbach(MDR)	Germany	5	L*
1188	Szolnok	Hungary	135	G*,H*,L*
1197	Munich(VOA)	Germany	300	G*,L*
1197	Virgin via ?	UK	?	C,H,J,K,L
1206	Wroclaw	Poland	200	G*,L*
1215	COPE via ?	Spain	?	L*
1215	Virgin via ?	UK	?	H,J,K,L
1224	Lelystad	Holland	50	G*,L
1224	COPE via ?	Spain	?	L*
1233	Liege	Belgium	5	G*,K*,L*
1233	Virgin via ?	UK	?	C,L
1242	Marseille	France	150	G*,L*
1242	Virgin via ?	UK	?	L*
1251	Marcali	Hungary	500	G*,L*
1251	Huisberg	Netherlands	10	G*,L*
1260	SER via ?	Spain	?	G*,L*
1260	Guildford (V)	UK	0.5	H,J,K,L
1269	Neumunster(DLF)	Germany	600	G*,H*,K,L*
1269	COPE via ?	Spain	?	L*
1278	Dublin/Cork(RTE2)	Ireland (S)	10	F,G*,H*,J,K,L
1287	RFE via ?	Czech Rep	400	G*,H*,L*
1287	Lerida(SER)	Spain	10	G*,L*
1296	Torento	Italy	5	L*
1296	Valencia(COPE)	Spain	10	G*,L*
1296	Orfordness(BBC)	UK	500	K,L
1305	Rzeszow	Poland	100	G*,H*
1305	RNE5 via ?	Spain	?	G*
1314	Kvitsoy	Norway	1200	E*,G*,H*,L
1314	RNE5 via ?	Spain	?	L*
1323	Zyyi(BBC)	Cyprus	200	L*
1323	W'brunn (V.Russia)	Germany	1000/150	G*,L*
1332	Rome	Italy	300	G*,H*
1341	Lakihegy	Hungary	300	G*
1341	Lisnagarvey(BBC)	Ireland (N)	100	C*,D*,E*,F,H*,J,K,L*
1341	Tarrasa(SER)	Spain	2	H*,L*
1350	Cesvaine/Kuldiga	Latvia	50	G*,H*
1359	Arganda (RNE-FS)	Spain	600	E*,L*
1368	Foxdale(Manx R)	I.O.M.	20	D*,F,H*,I,J,K,N*
1377	Lille	France	300	E,H,L
1386	Athens	Greece	50	L*
1386	Bolshakovo	Russia	2500	D*,E*,G*,H*
1395	Fllake	Albania	1000	H*
1395	TWR via Fllake	Albania	500	G*
1395	Lopic	Netherlands	120/40	D*,E,G*,H,L
1404	Brest	France	20	H,L*
1413	RNE5 via ?	Spain	?	G*,H*,L*
1422	Heusweiler(DLF)	Germany	1200/600	E*,G*,H*,L
1440	Marnach(RTL)	Luxembourg	1200	B*,D,E*,G*,H,I*, J,K,L*,N*
1440	Damman	Saudi Arabia	1600	D*,G*
1449	Squinzano (RAI)	Italy	50	H*,L*
1449	Redmoss(BBC)	UK	2	F,L*
1467	Monte Carlo(TWR)	Monaco	1000/400	G*,H*,L*
1467	Volvograd	Russia	25	G*
1476	Wien-Bisamberg	Austria	600	E*,G*,L*,L*
1485	SER via ?	Spain	?	L*
1485	Carlisle(BBC)	UK	1	F
1494	Clermont-Ferrand	France	20	L*
1494	St.Petersburg	Russia	1000	G*,H*,L*
1512	Wolvertem	Belgium	600	A*,D*,E*,G*,H*,J, K*,L*,N*
1512	Jeddah	Saudi Arabia	1000	L*
1521	Duba	Saudi Arabia	2000	H*
1530	Vatican R	Italy	150/450	D*,G*,H*,L*
1539	Mainflingen(ERF)	Germany	350(700)	G*,H*,K*,L*
1539	SER via ?	Spain	?	L*
1557	Nice	France	300	K*,L*
1566	Nagpur	India	1000	L*
1566	Samen	Switzerland	300	C*,L*
1566	Sfax	Tunisia	1200	L*
1575	Genova	Italy	50	L*
1575	SER via ?	Spain	5	H*,L*
1584	SER via ?	Spain	2	L*
1593	Holzkirchen(VOA)	Germany	150	G*,H*,L*
1602	SER via ?	Spain	?	H*,L*
1602	Vitoria(El)	Spain	10	H*,L*
1611	Vatican R	Italy	15	L

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

Listeners:-
(A) Tim Allison, Middlesbrough.
(B) John Eaton, Woking.
(C) Simon Hockenhull, E.Bristol.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Brian Keyte, while in Strathyre.
(G) Eddie McKeown, Newry.
(H) George Millmore, Wootton IoW.
(I) Clare Pinder, while in Appleby.
(J) Chris Ridley, Co.Sligo, Eire.
(K) Tom Smyth, Co.Fermanagh
(L) Tony Stickells, Thornton Heath.
(M) Norman Thompson, Oadby.
(N) Thomas Williams, Truro.
(O) Tom Winzor, Plymouth.

Herstmonceux; HCJB Quito, Ecuador **9.765** (Eng to Eur 0730-0930) 33333 at 0800 in Truro; R.Nederlands via Bonaire, Ned.Antilles **9.720** (Eng to Pacific 0730-0925) 34232 at 0900 in Oxted; R.Mediterranee Int via Nador, Morocco 9.575 (Fr, Ar to N.Africa, S.Eur 0500-0100) 54444 at 0930 in Scalloway; SRI via Sarnen **9.535** (Eng, Ger, Fr, It to SW.Eur 1000-1300) 55555 at 1000 in Bedford; BBC via Skelton, UK **9.410** (Eng to Eur, N/C.Africa 0200-2230) 45444 at 1015 in E.Bristol; BBC via Kranji, Singapore **9.740** (Eng to S.E.Asia 0500-2200) 35533 at 1510 in Wallsend; R.Pakistan, Islamabad **9.485** (Eng to M.East, E.Africa 1600-1630) 23442 at 1628 in Bridgwater.

During the evening VOA via Gloria, Portugal **9.760** (Eng to M.East 1700-2200) was 42433 at 1800 in Woodhall Spa; Israel R, Jerusalem 9.435 (Eng to Eur, N.America 1900-1925) 43334 at 1900 in Dudley; RAI Rome **9.670** (Eng to Eur 1835-1955) 43333 at 1935 in Appleby; R.Romania Int, Bucharest **9.690** (Eng to Eur 1900-1955) 42232 at 1945 in Colyton; TWR via Meyerton, S.Africa **9.510** (Hau to W.Africa 2000-2030) 35444 at 2001 in Storrington; Voice of Greece, Athens **9.380** (Eng [News] to Eur 2000-2010) 44434 at 2002

in Freshwater Bay; R.Finland via Pori 9.855 (Eng to Eur 2000-2030) 54444 at 2021 in Middlesbrough; Voice of Vietnam, Hanoi **9.840** (Eng to Eur 2030-2100) 23432 at 2030 in Galashiels; R.Thailand via Udon Thani **9.680** (Eng to Eur 2030-2045) 44344 at 2040 in Newry; Voice of Indonesia, Jakarta **9.525** (Eng to Eur 2000-2100) 33333 at 2044 in Plymouth.

Later, AIR via Delhi? **9.910** (Eng to Australasia 2045-2230) was 43333 at 2115 in Stalbridge; R.Cairo via Abis **9.900** (Eng to Eur 2115-2245) 55454 at 2200 in Oadby; China R.Int via Russia **9.880** (Eng to Eur 2200-2300) 44444 at 2200 in Morden; SRI via Montsinery, Fr.Guiana **9.905** (Ger, Eng, Sp, Fr, It to C/N.America 0030-0315) 33333 at 0045 in Kilkeel; HCJB Quito, Ecuador **9.745** (Eng to N.America 0030-0500) 45544 at 0229 in Woking; R.Austria Int via Moosbrunn **9.655** (Eng to N.America 0230-0300) SIO444 at 0237 in N.Bristol.

Noted during the early morning in the **7MHz (41m)** band were Vatican R, Italy **7.250** (Eng to Africa? 0500-0530), rated 54444 at 0517 in Plymouth; R.Japan via Woofferton, UK **7.230** (Jap, Eng to E.Eur 0400-0800) 33333 at 0630 in Stalbridge; Monitor R.Int via WSHB **7.535** (Eng [Various Sat/Sun] 0400-0958) 45444 at 0635 in Herstmonceux; RFPI Costa Rica **7.385** (Eng 24hrs) 24222 at 0738 in Newry; Croatian R, via Deanovec **7.165** (Cr, Eng 0600-2300) 43332 at 0837 in Oxted; R.Vlaanderen Int, Belgium **7.190** (Eng to Eur 0900-0925) 45444 at 0900 in Scalloway.

In the evening R.Slovakia Int **7.345** (Eng to Eur 1830-1900) was 32232 at 1830 in Colyton; R.Budapest, Hungary **7.155** (Eng to Eur 1900-1930) 43344 at 1900 in Dudley; R.Thailand via Udon Thani **7.210** (Eng to Eur 1900-1958) 54444 at 1900 in Appleby; Voice of Nigeria, Ikorodu 7.255 (Eng to W.Africa 1900-2100) 22432 at 1900 in Galashiels; Israel R, Jerusalem **7.465** (Eng to Eur, USA 1900-1925) 33333 at 1910 in Truro; Polish R, Warsaw **7.285** (Eng to Eur 1930-1955?) 43333 at 1934 in Middlesbrough; VOIRI Teha Int **6.055** (Eng 1830-1900) 45433 at 1831 in Middlesbrough; R.Estonia, Tallinn **5.925** (Eng 1900-1930, Mon/Thurs only) SIO322 at 1900 in Co.Fermanagh; REE via Noblejas **6.125** (Eng 2000-2100) 43333 at 2000 in Appleby; China R.Int **6.950** (Eng 2000-2157) 34334 at 2000 in Dudley; R.Prague via Litomysl **5.930** (Eng 2000-2027) 54444 at 2005 in Freshwater Bay; RCI via Skelton, UK **5.995** (Fr, Eng 1900-2200, also to M.East, N.Africa) 33333 at 2036 in Plymouth; R.Ukraine Int **6.010** (Eng 2100-2200) 45453 at 2105 in Bridgwater; R.Korea via Kimjae **6.480** (Eng 2100-2200) 21311 at 2105 in Galashiels; REE via Noblejas **6.125** (Eng 2200-2300), noted as 'good' at 2210 in Oadby.

Noted to other areas were the BBC via Kranji, Singapore **6.195** (Eng to Asia 2100-0200), rated 32223 at 2320 in Stalbridge; Caribbean Beacon, Anguilla **6.090** (Eng to N.America?) 23232 at 2330 in Scalloway; R.Nederlands via Ned.Antilles **6.165** (Eng to N.America 2330-0125) 33333 at 2333 in Newry; R.Nederlands via Flevo **6.020** (Eng to N.America 2330-0125) SIO444 at 2336 in N.Bristol; BBC via Antigua, W.Indies **5.975** (Eng to S/C.America 2100-0700) 34433 at 2340 in E.Bristol; SRI via Schwarzenburg? **6.135** (Ger, Eng, Sp, Fr, It to N/C.America 0030-0315) 44444 at 0115 in Kilkeel; R.Satelite, Santa Cruz, Peru **6.725** (Sp 2300-0300) 34343 at 0250 in Woking; VOA via ? **5.970** (Eng to Africa 0500-0630) 33333 at 0545 in Bedford.

TROPICAL BANDS CHART

Freq (MHz)	Station	Country	UTC	DXer
2.325	ABC Tennant Creek	Australia	2002	H
2.485	ABC Katherine	Australia	2036	H
3.240	TWR Shona	Swaziland	0315	G,K
3.255	BBC via Meyerton	S.Africa	2041	G,H,K
3.270	SWABC 1, Namibia	S.W.Africa	2040	B,G,H,K
3.290	Namibian BC,Windhoek	S.W.Africa	2040	B,C,H,K
3.300	R.Cultural	Guatemala	0333	G,K
3.306	ZBC Prog 2	Zimbabwe	2035	G,H,K
3.315	AIR Bhopal	India	0032	B,K
3.316	SLBS Goderich	Sierra Leone	2022	H,K
3.320	SABC (RSG) Meyerton	S.Africa	2017	B,C,H,K
3.325	FRCN Lagos	Nigeria	2040	H
3.330	Christian Voice	Zambia	1930	C,H,K
3.345	AIR Jaipur	India	0030	B
3.365	GBC R-2	Ghana	2142	C,F,G,H,K
3.375	R.Nacional S.Gabriel	Brazil	0150	K
3.380	NBC Blantyre	Malawi	2033	D,H,K
3.395	ZBC Gweru	Zimbabwe	2033	H,K
3.915	BBC via Kranji	Singapore	2135	C,E,G,J,N
3.955	BBC via Skelton	England	0400	G,M
3.955	Nexus, Milan	Italy	2110	G
3.970	R.Korea via Skelton	England	2100	I,N
3.975	R.Budapest	Hungary	1910	A,F,G,J
3.985	Nexus, Milan	Italy	2130	J
3.985	China R via SRI	Switzerland	2100	F,G,I,L,N
3.985	SRI Beromunster	Switzerland	1945	F
3.995	DW via Julich	Germany	2005	B,C,F,G,J,N
4.035	Xizang PBS, Lhasa	Tibet	2305	K
4.500	Xinjiang BS, Urumqi	China	2302	K
4.735	Xinjiang, Urumqi	China	2300	K
4.755	R.Educ CP Grande	Brazil	0354	B,K
4.760	TWR Manzini	Swaziland	0315	G,K
4.770	FRCN Kaduna	Nigeria	2024	F,G,H,J,K,N
4.775	AIR Imphal	India	0035	B
4.777	R.Gabon, Libreville	Gabon	1951	C,F,H,J,K
4.783	RTM Bamako	Mali	2010	C,H,K
4.790	Azad Kashmir R	Pakistan	0040	B
4.790	R.Atlantida	Peru	0412	K
4.800	AIR Hyderabad	India	0035	B
4.800	LNBS Maseru	Lesotho	2024	C,G,H,K
4.805	R Nac Amazonas	Brazil	0045	B,C,K
4.815	R.Difusora, Londrina	Brazil	0035	B
4.815	R.diff TV Burkina	Ouagadougou	2019	C,H,K
4.820	R.Botswana, Gaberone	Botswana	0411	G,K
4.820	La Voz Evangelica	Honduras	0335	K
4.820	Xizang, Lhasa	Tibet	2315	K
4.825	R.Cancao Nova	Brazil	0328	K
4.828	ZBC R-4	Zimbabwe	2210	K
4.830	R.Bangkok	Thailand	2210	K
4.830	R.Tachira	Venezuela	0215	B,G,K
4.835	R.Tezulutlan, Coban	Guatemala	0055	B,K
4.835	RTM Bamako	Mali	1950	C,E,F,G,H,K
4.840	AIR Bombay	India	0035	B,K
4.845	ORTM Nouakchott	Mauritania	2021	B,H,K
4.850	R.Yaounde	Cameroon	2145	C,G,K
4.860	AIR Delhi	India	0045	B,K
4.865	PBS Lanzhou	China	2205	F,K
4.865	L.V. del Cinaruco	Colombia	0045	B
4.870	R.Cotonou	Benin	2140	F,G,H,K
4.875	R.Roraima, Boa Vista	Brazil	2300	K
4.885	R Clube do Para	Brazil	2225	C,K
4.885	R.Difusora Acreana	Brazil	0055	B
4.885	KBC East Sce Nairobi	Kenya	1839	H,K
4.890	RFI Paris	via Gabon	0357	G,K
4.895	Voz del Rio Arauca	Colombia	0050	B,K
4.905	R.Nat.N'djamena	Chad	1948	G,H,K
4.910	R.Zambia, Lusaka	Zambia	1834	G,H,K
4.914	R.Cora del Peru,Lima	Peru	0415	K
4.915	R.Anhanguera	Brazil	0045	B,G,K
4.915	GBC-1, Accra	Ghana	2038	B,C,E,G,H,K
4.915	KBC Cent Sce Nairobi	Kenya	2051	H
4.920	R.Quito, Quito	Ecuador	0337	G,K
4.920	AIR Madras	India	0030	K
4.927	RRI Jambi	Indonesia	2202	D,K
4.935	R.Capixaba, Vitoria	Brazil	0335	K
4.935	KBC Gen Sce Nairobi	Kenya	2037	G,H,K
4.940	AIR Guwahati	India	0050	B
4.945	R.Progresso	Brazil	0050	B
4.950	VOA via Sao Tome	Sao Tome	2030	D,G,H,I,K
4.955	R.Nac. de Colombia	Colombia	0405	B,K
4.960	VOA via Sao Tome	Sao Tome	0316	G,K
4.975	Fujian 1, Fuzhou	China	0055	B
4.975	R.Uganda, Kampala	Uganda	2048	G,H,K
4.980	Ecos del Torbes	Venezuela	0220	B,G,K
4.985	R.Brazil Central	Brazil	0005	B,K
4.990	R.Ancash, Huaraz	Peru	0340	K
5.005	R.Nacional, Bata	Eq.Guinea	2007	K
5.009	R.TV Malagasy	Madagascar	1835	G,K
5.010	R.Garoua	Cameroon	0325	K
5.010	AIR Thiru'puram	India	0025	B,K
5.020	PBS-Jiangxi Nanchang	China	0050	B
5.020	Xizang-Tb, Lhasa	China	2307	K
5.020	La V du Sahel,Niamey	Niger	1953	C,G,H,K
5.025	R.Rebelde, Habana	Cuba	0441	B,G,K
5.025	R.Uganda, Kampala	Uganda	2037	K
5.030	AWR Latin America	Costa Rica	0352	B,K
5.035	R.Educacao Rural	Brazil	0350	K
5.045	R.Cultura do Para	Brazil	2233	C,K
5.047	R Togo, Lome	Togo	2045	C,F,G,H,K
5.050	R.Tanzania	Tanzania	1955	G,H,K
5.055	RFO Cayenne(Matoury)	French Guiana	0100	B,K
5.060	PBS Xinjiang, Urumqi	China	0105	B,K
5.075	Caracol Bogata	Colombia	0225	B,K
5.100	R.Liberia, Totota	Liberia	2315	C,K

DXers:-
(A) Tim Allison, Middlesbrough.
(B) Robert Connolly, Kilkeel.
(C) John Eaton, Woking.
(D) David Edwardson, Wallsend.
(E) Simon Hockenhull, E.Bristol.
(F) Sheila Hughes, Morden.
(G) Eddie McKeown, Newry.
(H) Fred Pallant, Storrington.
(I) Clare Pinder, while in Appleby.
(J) Vic Prier, Colyton.
(K) John Slater, Scalloway.
(L) Tom Smyth, Co.Fermanagh.
(M) Ernest Wiles, Bedford.
(N) Thomas Williams, Truro.

QUARTERLY LIST OF EQUIPMENT USED

$ August, #September, *October'97

$* Tim Allison, Middlesborough: Lowe HF-225 + r.w.
$#* Darren Beasley, Bridgwater: Yaesu FRG-100 + a.t.u. + 15m wire.
$#* Vera Brindley, Woodhall Spa: Sangean ATS-803A + r.w.
$#* Robert Connolly, Kilkeel: JRC NRD-525 + Datong AD-370.
$ Martin Cowin, Kirkby Stephen: Hitachi TRK-5854E + built-in whip.
$ Bernard Curtis, Stalbridge: Fairmate Scanner, Bush Trans-world portable.
#* Bernard Curtis, Stalbridge: Grundig Satellit-2100 or Tatung TMR7602 + r.w.
Ron Damp, Worthing: JRC NRD-525 + Mag Balun + 14m wire.
$# John Eaton, Woking: Lowe HF-225 + Datong AD270 or a.t.u. + r.w
* John Eaton, Woking: JRC NRD-345 + Datong AD270 or a.t.u. + r.w.
$#* David Edwardson, Wallsend: Trio R600 + Pi-Balun + invert V trap dipole or 2.5m x 2.5m loop.
$#* Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
Robert Frost, Felixstowe: Aiwa Multiband WR-A70.
Michael Griffin, Ross-on-Wye: Lowe HF-225 + a.t.u. + 45m wire.
$# Bill Griffith, W.London: JRC NRD-535 + 25m wire.
#* Gerald Guest, Dudley: Roberts RC818 + r.w. (location 300m a.s.l.)
$#* Tony Hall, Freshwater Bay, IoW: Yaesu FRG-7 + r.w.
$#* Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
* Simon Hockenhull, E.Bristol: Roberts R817, ITT Colt or Bush TR130.
$#* Sheila Hughes, Morden: Sony ICF-7600DS or Panasonic DR48 + 15m invt L.
Nicola Hutchings, Wellington: Sony Walkman.
$#* Rhoderick Illman, Oxted: Kenwood R-5000 + r.w.
$# Brian Keyte, Bookham: CA117 radio in car + loop above sunroof.
* Brian Keyte, while in Strathyre: CA117 radio in car + loop above sunroof.
$#* Ross Lockley, Galashiels: Realistic DX-300 + a.t.u. + 40m wire or Sangean ATS803A.
Ross Lockley, while in Dent: Car radio + whip antenna on car.
#* Eddie McKeown, Newry: Tatung TMR 7602.
$#* George Millmore, Wootton, I.O.W: Sangean ATS-803A + loop or Racal RA17L + v.l.f. converter + loop.
$#* Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
$#* Clair Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w.
$# Peter Pollard, Rugby: Sony ICF-2001D + r.w.
$#* Vic Prier, Colyton: Racal RA17L or Redifon R551N + active vertical on roof.
$#* Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
Harry Richards, Barton-on-Humber: Grundig Satellit 700 + AD270 or r.w.
$* Chris Ridley, Co.Sligo, Eire; Morphy Richards R-124 + loop or Philips R242 car radio.
* Alan Roberts, Quebec, Canada: Lowe HF-225 + 11m vertical dipole.
# Chris Shorten, Norwich: Matsui MR4099 + 10m wire.
$#* John Slater, Scalloway, Shetland: Lowe HF-150 + a.t.u. + 20m wire.
$#* Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191.
$#* Tony Stickells, Thornton Heath: AOR AR7030 + 20m wire or loop.
$ Andrew Tett, Hove: Lowe HF-150 + 12m wire.
$#* Norman Thompson, Oadby: Matsui MR4099 + 20m wire in loft.
Phil Townsend, London: Lowe HF-225 + preselector + r.w. or loop.
#* Ernest Wiles, Bedford: AKD Target HF3 or Lowe HF-125 + 5m long windom.
$#* Thomas Williams, Truro: Sharp 5454 or Gundig Yacht Boy 206.
$#* Tom Winzor, Plymouth: Kenwood R-1000 or Eddystone 840C + Miller ant.

Off the Record

ANDY CADIER
28 ROMNEY AVENUE
FOLKSTONE
KENT CT20 3QI

The East Anglia Productions recreation of Radio London started on schedule on 18 August from off the Essex coast near Frinton. Last minute difficulties over the use of the intended lightship, mentioned last quarter, led to another vessel, the *Yeoman Rose*, being used.

I do recall a similar station run by the Caroline Movement who attempted to recreate offshore radio five years ago with only very limited success. I listened very attentively to the new Big L, on 1134kHz, wondering if it would live up to my expectations and that of its advance publicity.

Without any hesitation, I can report that it certainly worked for me, all the memories it brought back were quite startling, the disconcerting thing I suppose was that it all happened a wopping 30 years ago! The secret of this success is clearly the ability of the organisers to get so many of the original Radio London voices back on the air.

I suppose a contributing factor is that Radio London was closed down under the *Marine Offences Act* in August 1967, rather than simply being legalised. Now 30 years later, this Big L reincarnation still possesses its own charm, style, and atmosphere that seem to elude most of the newer sound-alike f.m. pop music stations.

355 Tribute

The offshore station Radio 355 closed down on 5 August 1967, owing to the impending legislation that was to take effect on 15 August. The contract for the ships crew and supply tenders was about to expire and it was considered not worth renegotiating for just another ten days.

Paul Graham presented the *Radio 355 Tribute* programme aboard the Radio London vessel *Yeoman Rose* and demonstrated, amongst other things, his remarkable knowledge of offshore radio and the people involved in it. From 6pm to 9pm on the 30th anniversary of 355's closure, most of the original presenters were back, working together aboard a radio ship.

I somehow found myself typing the script for veteran newscaster **John Ross-Barnard**, while **Mark Sloane** took charge of the weather. We each in turn sat behind the microphone to recall our personal experiences of that radio station and in the curious ways we each managed to get into broadcasting.

Dave Gilbee (Dave McKaye) now works for Melody Radio in London, **Tony Monson** is in the music/record business and **John Aston** does special effects for the film industry. It was a programme of mixed emotions, the pleasure of meeting former colleagues after 30 years, and a considerable amount of nostalgia with all of us in the same boat again.

For me it seemed most strange introducing myself as Martin Kayne, a name I assumed for my pirate radio activities during the 60s, in order to hopefully conceal my true identity from the authorities. The slight tinge of sadness was the absence of our programme director **Tony Windsor** who passed away some years ago.

Tony's taped close down message was indeed very moving, even when played so many years after the event. The tribute ended with a recording of 355's Managing Director, **Ted Allbeury**, who's words were clearly as relevant today as they were back in 1967.

I must thank **Ray Anderson** and Paul Graham of East Anglia Productions for making the whole thing possible. Also special thanks to **Chris Elliot, Peter MacFarlane** and all DJs and crew aboard the MV *Yeoman Rose* and the supply boat *Lady Gwen* for their help and hospitality.

Souvenirs of this event, and the original Big L, are available from **Radio London Merchandising, 21-23 Walton Road, Frinton, Essex CO13 0AA**.

MV Yeoman Rose, the temporary home of Radio London.

Radio Argus

London based m.w. station is just about to celebrate its 12th birthday, they claim to be the third oldest pirate in the capital. **Bob Marsh** of Bexleyheath in Kent has reported hearing this station at substantial signal strengths. It is likely that their 819kHz frequency will be dropped in favour of a rock service on 1494kHz and a heavy metal outlet on 783kHz. however, these are only proposals at this stage.

The relay facility offered to Radio Free London on 1134kHz was only used for one broadcast, RFL withdrew suggesting a lack of audience response, they are now back on short wave. Radio Argus regard short wave as a supplementary service only but are attempting to raise funds to establish h.f. facilities for use in the future.

Pirate Frequencies

I get many letters asking for station broadcast times and frequencies. I did at one time keep a database of them, however the job of constantly updating this information proved too time consuming. **Les Borthwick** of Harwick, Scotland, is seeking a QSL address for Reflections Europe and **Mike Newell** is after a comprehensive list of pirate broadcasts.

If you are equipped to use the Internet, there are a few web sites you can visit. SRS News provide a daily log of short wave pirates heard in Europe together with lots of background information, they are at **http://www-pp.hogia.net/jonny/index.html**

Another source of pirate frequencies is the British DX Club magazine. Their free radio correspondent **Alan Pennington** edits *Alternative Airwaves*, which is updated each month and is packed with frequencies and information.

The mailing address of BDX is **10 Hemdean Hill, Caversham, Reading RG4 7SB**. Membership is £10 per year for UK residents and £14 elsewhere in Europe. I have to confess to being a member myself!

Mike Raven

Both *Offshore Echo's* and *Horizon* Magazines have sadly reported the death of disc jockey **Mike Raven**, back in April. He was originally with Radio Atlanta, but was best known for his activities on Red Sands towers in the Thames estuary.

He was one of the key people behind Radio Invicta, King Radio and eventually Radio 390, all of which had their offices here in Folkestone. After the pirates, Mike joined the BBC, but left for a career in, believe it or not, horror films! *Lust For A Vampire* and *Discipline Of Death* were just some of the titles in which he was featured.

Later he took over a sheep farm in Cornwall. One of his radio catch-phrases was "Mike Raven the oldest living teenager in captivity" and that's how I am sure he will be remembered. He was 72.

Getting Started

Jimmy Conroy of Longbenton, Tyne & Wear, says he was a teenager when the pirates of the 60s came along, prior to which he recalls listening to Radio Luxembourg in the evenings. He says the pirates brought a breath of fresh air into radio broadcasting.

He started in hobby radio by constructing crystal sets and plugged them into his valved tape recorder to amplify the signal. Another of Jimmy's memories was the opening of BBC Radio 1, on 247m, in September 1967, he still remembers the opening music. Actually, *Theme One* by George Martin is still available on the CD *Sound Gallery volume 2*, among a whole collection of theme tunes.

Big L's very compact studio.

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Fairmate HP-2000 scanner, excellent condition, also *UK Scanning Directory*, *Air Band Handbook* and *Confidential Frequency Handbook* (Short wave), the lot for, £140 o.n.o. Ian, Huddersfield. Tel: (01484) 646242.

FRG-7700 h.f. receiver, v.g.c., memory unit, manual, a.m., l.s.b., u.s.b., c.w., £190. Ex-military receiver, 1-20MHz a.m., s.s.b. (b.f.o.), converted to 240V mains, £60. Tel: (01695) 722573 after 6.30pm or mobile on (0378) 418862 anytime.

Icom IC-R10 scanner, latest model, mint condition, boxed, all accessories plus case, cost £350, will sell for, £250. John, London. Tel: 0171-622 2820.

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Kenwood TS-850S transceiver, £750. Yaesu FP-800 p.s.u., £120. Timewave DSP 599ZX, £250. ERA Microreader, £100. Sandpiper V9 vertical, £35. Longwire antenna with Wellbrook balun and feeder isolator, £40. Garry, Maidstone. Tel: (01622) 851309.

Lowe HF-150 + keypad, p.s.u., Lowe PR-150, both used as second set, very low running time, £420. AR7030| mint condition, £500. Yupiteru MVT-8000 multi-band receiver, £220. Tel: (01924) 267509 after 1800.

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Short Wave Magazines, April 1987 up to current issue, plus various other 1960s, 1970s, etc. Offers or swap, w.h.y.? Buyer collects, 180+ mags in total. Tel: Chester (01244) 310271 evenings only.

Short wave receivers for sale: Sony ICF-SW100 with s.s.b., very slightly used, £125. Sony ICF-SW40, brand new, boxed, £90. Grundig YB217, brand new, boxed, £35. E. Razavi, E. Sussex. Tel: (01273) 588291.

Signal R535, boxed, as new, all accessories, seldom used, excellent condition, £250 inc. P&P/ins. Racal RA17, cased, service manual, excellent condition, buyer collects, £125. Tel: (01733) 709811.

Timewave DSP 599ZX digital signal processor, three months old, genuine reason for sale, £290 inc. carriage. Stuart, W. Yorkshire. Tel: (01535) 635898 after 6pm.

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Yaesu FRG-9600 scanning type v.h.f./u.h.f. receiver + h.f. module, £250. May consider swap/p.ex for 70cm base transceiver if you write with details. Other items for sale, send s.a.e. for lists. Keith Burrows, 10 Basil Street, Stockport SK4 1QL, messages via OAP (with luck!) on 0161-477 5303.

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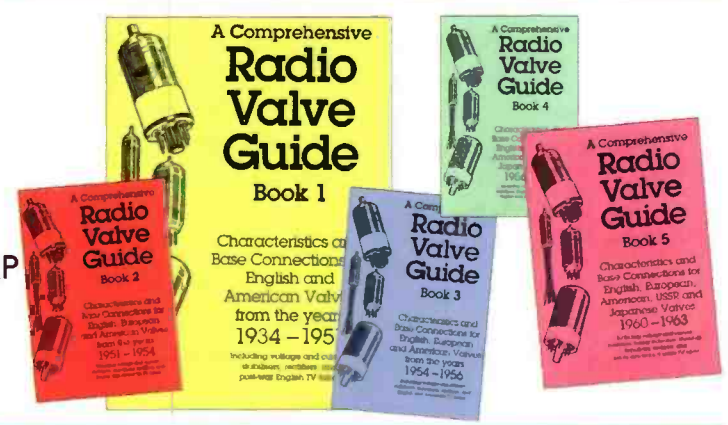

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