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without spending too much money

on test
Yaesu VX-246 PMR 446

on test
Grundig Porsche P2000

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radio ACTIVE
the world of radio communications

special edition August 2001

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Welcome

Welcome to this special free edition of *Radio Active*. It contains a selection of articles from some of our recent issues to show you that we are a magazine for everyone who has an interest in radio.

We cover everything to do with radio including military airband, covert operations, scanning, broadcast and general listening, CB and much more.

We hope you enjoy reading this sample and if you do, you can read many more articles like these in the regular full-sized issues of *Radio Active* that are on sale every month at most good newsagents, or take a look at the trial subscription offer on page 15.

Elaine Richards, Editor

monitoring the military

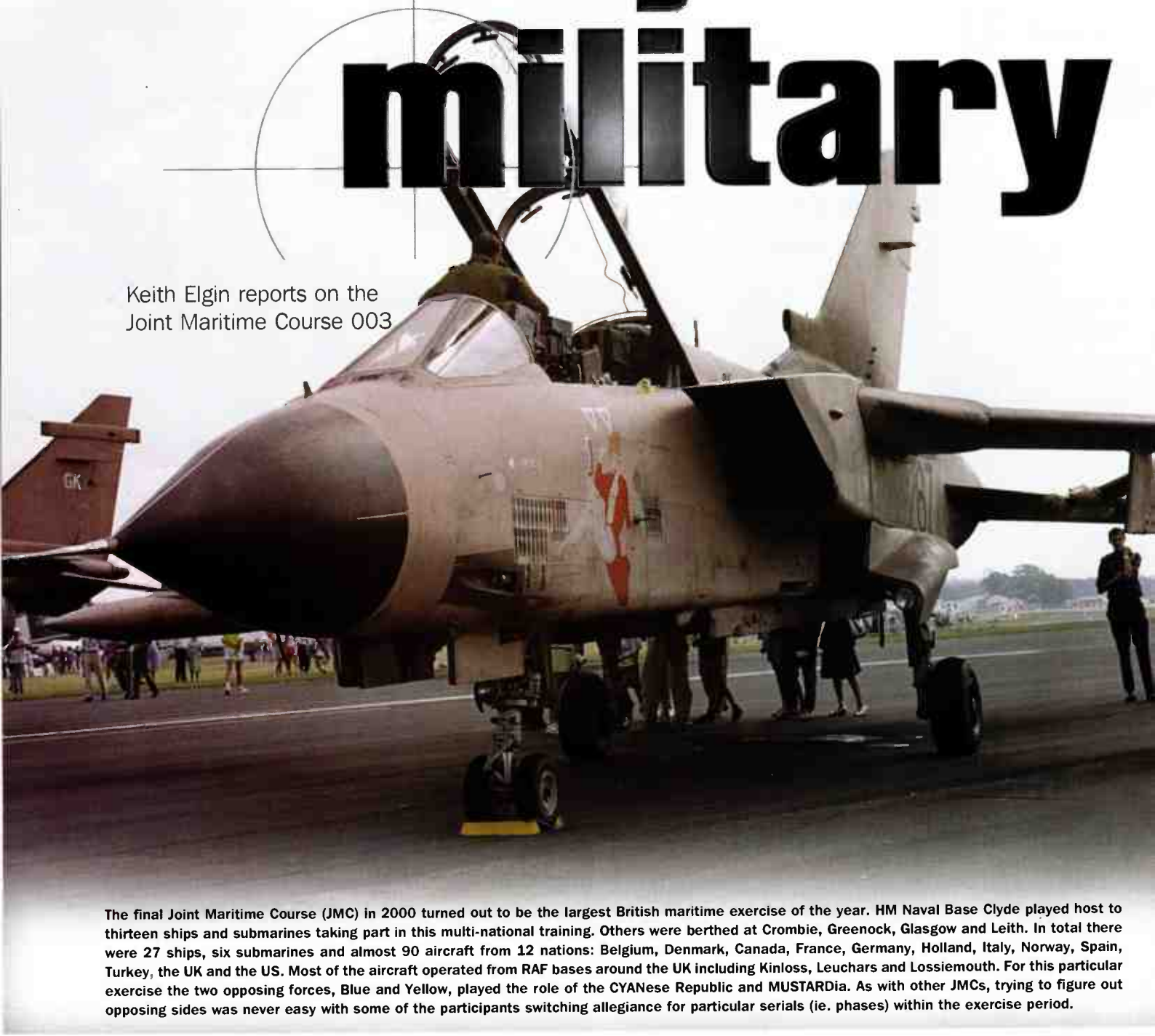
Keith Elgin reports on the Joint Maritime Course 003

Judging by the e-mails received it appears that quite a few monitors managed to hear some HF activity during JMC003. Line designators for the Joint Anti Air Warfare Shore Co-ordination (JAAWSC), Command and Control (C^2) and Chick Co-ordination circuits were once again relayed as additional information following the STCICS (Strike Command Integrated Communications System) hourly and half-hourly broadcasts.

One of the additional information broadcasts on the morning of Saturday 28th October 2000 caused some initial confusion and a couple of e-mails arrived here within 10 minutes! The message was relayed as follows "*2 RPT2 Tac TG Tac PH Tac PO*". Studying the layout of the message it became apparent that the controller had misinterpreted the shorthand for repeat and had spelled it out phonetically. The correct message should have been "*2 repeat 2 - TG - PH - PO*".

The first few days of the exercise saw **4.484MHz** used for the JAAWSC circuit. It was then shifted to **6.724MHz** for a couple of days causing a few problems as this was the primary HF SURPIC (Surface Picture) frequency. Following that it moved to **4.724MHz** where it remained for the rest of the exercise. The Vector Logic Reference Points (VLRP) heard on the JAAWSC circuit were based on the solar system. Those noted in use were *Earth*, *Jupiter*, *Mars*, *Moon*, *Neptune*, *Saturn* and *Uranus*.

The Link Co-ordination (LC) circuits were once again the most



The final Joint Maritime Course (JMC) in 2000 turned out to be the largest British maritime exercise of the year. HM Naval Base Clyde played host to thirteen ships and submarines taking part in this multi-national training. Others were berthed at Crombie, Greenock, Glasgow and Leith. In total there were 27 ships, six submarines and almost 90 aircraft from 12 nations: Belgium, Denmark, Canada, France, Germany, Holland, Italy, Norway, Spain, Turkey, the UK and the US. Most of the aircraft operated from RAF bases around the UK including Kinloss, Leuchars and Lossiemouth. For this particular exercise the two opposing forces, Blue and Yellow, played the role of the CYANese Republic and MUSTARDia. As with other JMCs, trying to figure out opposing sides was never easy with some of the participants switching allegiance for particular serials (ie. phases) within the exercise period.

active frequencies to monitor and could be heard 24 hours a day. There was an East and West Coast LC operating throughout the two-week period but on the odd occasion UHF was used severely limiting the range for monitors. Noted active were **4.8785**, **5.0915**, **5.310**, **6.940**, **7.795**, **7.934**, **240.300** and **258.950MHz**.

As with other JMCs, the weather was quite atrocious at times with the fleet having to remain close to the coastline for shelter. Operating in the vicinity of land appears to cause additional problems with the Link-11 data circuit and numerous frequency changes were made to try to maintain a good picture. Both HF and UHF data circuits were used and these included **4.7785**, **5.2765**, **5.460**, **5.733**, **5.910**, **6.779**, **6.882**, **9.394**, **338.200** and **383.150MHz**.

RAF *Leuchars* had an interesting mix of foreign participants based there during the exercise. This included six Tornado IDS of MFG-2 from Eggebek, Germany. The aircraft flew using the callsign '*Viking*' and were noted on **399.850MHz** for air-to-air communications. This was preset as Channel 26 but was mainly switched to as '**F1**'. They were also heard on **243.600MHz** when flying in company with Tornado IDS of 156 Gruppo. These Italian Air Force aircraft are normally based at Gioia Del Colle, Italy and during their stay in the UK used the callsign '*Lynx*'. **243.600MHz** can be used by both these units as it is programmed into their emergency radios. The German Air Force and Navy refer to it as '**E4**' and the Italian Air Force refer to it as '**2E**'.

There were also a number of F-16s based at Leuchars for this particular exercise. This included two F-16 A/B of 31 Sm from Kleine-Brogel, Belgium, which arrived for the second week of the exercise. During their stay they used the callsign '*Hammer 61-62*' and were noted using their operations frequency **142.675MHz** for air-to-air communication, this was programmed as **Victor 19**.

The other F-16s were four 31st FW aircraft from Aviano AB, Italy. They also arrived during the second week of the exercise, replacing six 48th FW F-15Es from RAF Lakenheath. The F-16s used a couple of callsigns during the exercise period, '*Buzzard*' and '*Nickel*'. **138.550MHz Victor 12** and **141.425MHz Victor 13** were the air-to-air frequencies in use.

Refuelling operations

Air-to-air refuelling operations were conducted on ARA-1 and ARA-14. RAF *Brize Norton* based VC-10s operated in ARA-1 although for

Logbook

Date	Time(Z)	Freq(kHz)	Notes
08/11/00	1430	20943	Shark 82 wkg u/i station
14/11/00	2001	6694	Rescue 323 wkg Halifax Military with p/p to Rescue Ops
14/11/00	2233	3506	NATO LC Net - 3MH (French), T4W (Dutch) very loud
14/11/00	1257	4484	Crosstell Net - Buchan, Crowbar, 6JO requesting 'Vector Logic point'
15/11/00	2340	5707.5	NATO LC Net - T7V, 3NU, 3SF (all RN)
16/11/00	0820	5707.5	Same net as above - Q5X, R3H etc.
16/11/00	0950	5685	MKH5 - CWL 88
16/11/00	1103	5690	0A - C253 IAC Casa voice/data with CW id
16/11/00	1112	6690	Magic 73 (AWACS) - LBV3 Voice and RATT traffic
16/11/00	0855	6697	MKL - D1T (Nimrod) RATT failed, relay to J0Q on task time 1000
23/11/00	1952	5127	NATO tracking net with E2B, 1MU and 1ZB
26/11/00	1001	9013	Q6H (Submarine) wkg Navy Prestwick and F3U (Sea King) for pax transfer
28/11/00	1835	4733	Croughton, Magic 92, MEF and MPD in ALE, RATT and Voice. Also on 5684 and 6724
29/11/00	0052	2544.5	British Army net with Zero wkg U30, W10 and W11 in voice and data
29/11/00	1708	5685	British Army net with 34 wkg 11C, 11D, 12C, 12D and 41C
29/11/00	1711	5687	GAF 449 wkg DHM91 with arrivals message
30/11/00	0011	5725.5	NATO LC Net during NAVSOUHT exercise with C3E, E0W and 6YY
30/11/00	1045	8965.5	S5L wkg NAWS and 5OS

monitoring the military

Photo: Neil Howard

much of the exercise period they flew from RAF *Leuchars*. The callsigns used were '*Cotton 01/02*'.

Refuelling operations were usually under the control of RAF *Buchan* and the primary AR (Air Refuelling) frequency was **252.400MHz (TAD 077)**. For the first time in years, the 100th ARW, RAF *Mildenhall*, were also involved in JMC refuelling operations. One KC-135 would be available in ARA-14 for the morning raids and two for the afternoon raids. For these particular sorties the tankers used their regularly heard '*Quid*' callsign. The numerical part was in the forties with the morning callsign higher than the following two. For example, during Wednesday 1st November 2000, '*Quid 43*' was the early morning tanker followed by '*Quid 41/42*' in the afternoon.

During AR the track's primary frequency **340.700MHz** was used. Refuelling operations for the USAF tankers also came under the control of RAF *Buchan* on **340.900MHz TAD 022**. When two tankers were on the track together they used **379.075MHz**, known as **Bullpen**, for air-to-air communications.

High drama

There were some quite dramatic communications to be heard on the 27th October 2000. This involved the ditching of an EH 101 Merlin HM Mk 1 anti-submarine warfare helicopter which had been operating on the BUTEC (British Underwater Test and Evaluation Centre) Range 'D710' off the western coast of Scotland. At the time I had been monitoring the HSAAF (High Seas Anti Aircraft Firing) circuit on **5.431MHz** when one of the ships taking part in the firing mentioned the possibility of a helicopter going down.

A quick scan of the rescue frequencies found '*Rescue MU*' working '*Kinloss Rescue*' on **5.680MHz** inbound the scene. On the UHF Scene of Search frequency **282.800MHz** E-3 AEW '*Magic 89*', which was on station in orbit area UK11 at the time, was working with warship callsign '*4PD*' and Super Puma helicopter '*Broadway 09*' in relation to the incident. By the time '*MU*' had arrived on scene, the five-man crew had been rescued by a couple of fishermen in a creel boat which had come to their aid. Four of the crew were taken to the Mackinnon Memorial Hospital at Broadford, Skye, for tests. The fifth was airlifted to the Western Isles Hospital in Stornoway with back injuries.

Dramatic end games

As well as the tactical UHF frequencies, a lot of the communications for the final serial of the exercise were conducted on VHF marine Channel 73 **156.675MHz**. In previous days it had been used for diplomatic traffic between the opposing fleets but it was now about to carry one of the most dramatic end-games to a JMC since the 'Battle of Faraid Head' which was played out on the 1st November 1998.

Following the early morning raids by Cyanese aircraft (Jaguars and FRADU Hawks), two of the Mustardian MCMVs (HMS *Cattistock* and HMS *Atherstone*) were on escort duty with 'Merchantman' (played by HMS *Bulldog*). They were attempting to run a blockade of HMS *Gloucester*, TCG *Kemalreis* and HDMS *Peter Tordenskjold* who were situated about five miles offshore.

Completely outgunned by the Cyanese destroyer and her escorts and remaining suspicious of their offer of protection, the Mustardians did the only thing possible; bluffed their way out and then ran for shallow water where the frigates couldn't follow. The Cyanese Air Force then went rogue and allied themselves with a third party known as the 'Independent Scottish Territories' becoming a serious threat to both the Cyanese Navy and Mustardians!

JMC003 - Participating Vessels

Vessel	Pennant	Type	Force
FGS *Lubeck*	F214	Frigate	German Navy
FGS *Spessart*	A1442	Auxillary	German Navy
FGS *U23*	S172	Submarine	German Navy
FS *Jean de Vienne*	D643	Frigate	French Navy
HDMS *Niels Juel*	F354	Corvette	Royal Danish Navy
HDMS *Peter Tordenskjold*	F356	Corvette	Royal Danish Navy
HMCS *Halifax*	FFH330	Frigate	Royal Canadian Navy
HMS *Atherstone*	M38	Minesweeper/Hunter	Royal Navy
HMS *Bulldog*	H317	Survey/Manned Auxiliaries	Royal Navy
HMS *Cattistock*	M31	Minesweeper/Hunter	Royal Navy
HMS *Chatham*	F87	Type 22 Frigate	Royal Navy
HMS *Cottesmore*	M32	Minesweeper/Hunter	Royal Navy
HMS *Glasgow*	D88	Type 42 Destroyer	Royal Navy
HMS *Gloucester*	D96	Type 42 Destroyer	Royal Navy
HMS *Grafton*	F80	Type 23 Frigate	Royal Navy
HMS *Inverness*	M102	Minesweeper/Hunter	Royal Navy
HMS *Lancaster*	F229	Type 23 Frigate	Royal Navy
HMS *Monmouth*	F235	Type 23 Frigate	Royal Navy
HMS *Quorn*	M41	Minesweeper/Hunter	Royal Navy
HMS *Richmond*	F239	Type 23 Frigate	Royal Navy
HMS *Southampton*	D90	Type 42 Destroyer	Royal Navy
HNLMS *Willem van der Zaan*	F829	Frigate	Royal Netherlands Navy
HNLMS *Zuiderkruis*	A832	Supply Ship	Royal Netherlands Navy
HNOMS *Trondheim*	F302	Frigate	Royal Norwegian Navy
HSMS *Uppland*	J17	Submarine	Royal Swedish Navy
RMAS *Salmaster*	A186	Mooring & Salvage Vessel	Royal Navy
SPS *Asturias*	F74	Frigate	Spanish Navy
SPS *Patino*	A14	Tanker	Spanish Navy
TCG *Kemalreis*	F247	Frigate	Turkish Navy
USS *Thomas S Gates*	CG51	Guided Missile Cruiser	United States Navy

Check it out!

With an earlier than usual deadline due to the Christmas holidays I have not seen any JMC listings for the 2001 calendar. The first JMC of the year is often held during late February running into early March so it may be worth checking for activity around that time.

That's it for another month. Thanks to **Nick Owen** (Ripley, Derbyshire) for his help with the column, **Oldtimer** (Portrush), **Ronald Rensen** (the Netherlands) and **Terry Ford** (Sheffield) for their HF loggings. Logs or questions to: 806 Farranseer Park, Macosquin, Coleraine, Northern Ireland BT51 4NB. Or via e-mail to **keith@coleraine.demon.co.uk** ■

tried & tested

Yaesu VX-246
PMR 446 hand-held

On 31st December 2003 the short range business radio (SRBR) service will finally close and those using the band will move over to use PMR 446. This licence-free service can be used by anyone, business and consumer alike, and so there are a variety of radios appearing on the market for these different users.

If you want a tough, rugged radio that will stand up to dubious treatment on a building site, out in the field or factory complex then choosing a consumer unit that's built to a price for occasional, well-handled use won't work. Very soon the radio will fail, probably in more than one piece! You need to choose the right radio for the right job. Likewise, someone wishing to have a couple of radios for occasional use whilst out with the family has no need to invest in expensive, business quality radios.

Yaesu have built the VX-246 radio for the professional or business user. The radio looks and feels strong, business-like and ready for the task. Here's how we got on using them.

The first thing you notice about the Yaesu hand-helds is the weight and rugged feel to the radios. They don't have any 'bells and whistles' on them to attract consumers, they don't have colourful panels or bright colours. That's not to say they're boring or bad. They have been built to a high standard for business use and those buyers aren't looking for multi-functions or bright colours. They want a radio that will work for many hours each day, several days a week and for years on end.

Controls

The controls on the Yaesu radios are both basic and complicated as there's two levels of programming available to the user. Basic Operation involves using the Channel control (there are 16 positions as each of the 8 channels are repeated) and adjusting the volume control. Both controls are rotary and the channel change control is taller than the volume control and has 16 definite steps. You can tell which channel you are operating on by looking at the longest tab on the control and reading the numbers at the base of the switch.

Once you've chosen the channel of operation you're going to use it is just a case of pressing the **PTT** (press-to-talk) switch and away you go. When you're transmitting the LED on the top panel glows red continuously, when the radio is receiving a signal it blinks green. You can check whether there is a weak signal on the channel by pressing the **MONITOR** button on the side of the radio (just under the **PTT** switch). This disables the squelch and you can check for other signals on the channel, a quick press of the button again enables the squelch again.

The received audio is crisp and clear, which you would expect from a professional radio. It made listening to signals under difficult or noisy conditions much easier, although there are optional headsets and microphones that can be used with these radios. In fact you can have speaker mics, VOX headsets or earpiece microphones. Other optional extras are a larger NiCad battery pack (1100mAh), the DTMF pager unit and a rapid desktop charger.

The radios use a NiCad battery pack (7.2V 700mAh) and come with a drop-in overnight charger. It takes approximately 15 hours to recharge a completely discharged battery pack. You can buy optional extras like the FBA-25 battery case that allows 6 AA alkaline batteries to be used if you are likely to be in a situation where you won't be able to recharge the radios. Of course, this is the radio in its most basic mode. If you have a large number of untrained people who will need to use the radios then this mode could be very useful. If you're dealing with trained staff, then the Advanced Operation mode will give them a much more versatile piece of equipment.

The range of these radios is greater than the average consumer model, not because they're using more power but because they use a more efficient antenna. The one on these hand-helds doesn't fold away for carrying around in your pocket, nor is it a short little antenna. But when you want to be heard across a large sprawling building site or between several floors of a office construction site, then the extra range is vital.

Advanced mode

If you've already got one or two PMR-446 radios around then the first thing you may want to do is make sure they are all using the same DCS or CTCSS tone for each of the 8 channels. If your existing radios are preset you don't need to worry, because you can alter the DCS/CTCSS to channel assignments in the Yaesu radios. This was simple to do and just required a button press plus entering the two digit code for the CTCSS/DCS set you want.

When you're operating in unfamiliar circumstances there's always the worry that you will end-up moving out of range and losing contact. There's no excuse for this with the Yaesu radios thanks to their ARTS transponder system. Before you start, you just put both radios into program mode and enable the ARTS feature and from then on the radios will send test signals every 60 seconds or so to make sure they are still within range. If they drift out-of-range each radio emits a series of rapids beeps to alert the operator that contact has been lost. This is a real timesaver that I've found useful on so many occasions.

One of the truly advanced facilities available for the Yaesu is the use of a DTMF tone signalling facility. DTMF is an acronym for Dual Tone Multi Frequency and is the system used on all modern telephones to signal the dialled digits. You may well have heard the tone when using your Cellphone or if you inadvertently press a dial button whilst on the phone. You're probably wondering why anyone would want to send these tones on a PMR-446 radio! By fitting the optional FVP-25 encryption/pager unit you add a DTMF signalling facility and a voice encryption system.

With the DTMF signalling system you can assign each of the radios its own 3 digit DTMF code. Once set, the radio will only respond to a signal containing this code sequence. This is almost like having your own private on-air phone system. To call a particular person you just hit the PTT and use the keypad to type in the three digit code for the a station you want. The next stage is to store your favourite sets of DTMF tones into the ten available memories.

If you're using the radios for commercial operation you may find the

Yaesu VX-246 • Price – £175 • Available – Now • Stockists – All Yaesu dealerships

voice encryption system particularly handy. This facility is included with the FVP-25 module and, when activated makes the speech totally undecipherable unless you have the FVP-25 decoder. This was really effective and makes the Yaesu's particularly powerful contenders in the commercial market place.

Who's likely to use them?

If a day spent at my local sports centre is anything to go by, then it's places like that who need radios like this! Watching staff move from one place to another trying to find other personnel, having to go to the main reception to have a tannoy message relayed or just the general movement of staff made it obvious how the use of business radios can transform the working day. If you don't need to wander around a complex looking for staff or customers, if staff can be moved efficiently around the building so you don't end up with a surplus near the swimming pool and a deficit on the all weather turf outside then it makes sense for staff to carry radios.

Premises like factories, sports complexes, security sites, schools and office blocks all rely on communication to get jobs done. But they also need a radio that's reliable for long periods, powerful enough to reach all around the complex and not fail after a few hundred yards and rugged enough to cope with the occasional bit of clumsy handling! Extra facilities like the CTCSS tones, DTMF paging and voice encryption all goes to help keep your signals heard by your staff and helps prevent picking up of messages not intended for your staff.

The debate on whether business users and consumers will be able to operate side by side still hasn't been answered, there are many business still using their SRBR equipment (and they will continue to do so until the deadline). But those investing in new equipment or upgrading existing equipment will all move onto the PMR 466 band. Hopefully, even in busy areas, there won't be too much interference although users may not always be able to transmit exactly when they want due to someone else using the channel nearby. The next few years will see more and more users moving onto PMR 446 and so high quality radios like the Yaesu VX-246 will be in demand.

Around the world

Another important consideration is that these radios can now be used in several other countries around the world. If you are sending teams of workers abroad frequently then being able to take PMR 446 radios with you ensures communication between employees wherever the job may be.

At the present time PMR 446 radios can be used in the following countries:

Austria	France	Ireland	Portugal
Belgium	Germany	Liechtenstein	Spain
Denmark	Greece	Luxembourg	Sweden
Finland	Iceland	Netherlands	Czech Republic

Many thanks to **Yaesu UK Ltd., Unit 12, Sun Valley Business Park, Winnall Close, Winchester, Hants SO23 0LB. Tel: 01962 866667 www.yaesu.co.uk** for the loan of these radios, they were a pleasure to use. ■

A radio designed to a high standard for the professional or business user, excellent facilites.

radio active news

from the world of communications

Leicester Show

The 30th National Amateur Radio, Electronics and Computer Exhibition at Donington Park will be held on Friday 21st and Saturday 22nd September. There will approximately 120 traders in attendance with something like 6000 visitors expected over the two days.
www.lars.org.uk

New Kenwood Portable Transceiver/ Scanner

Kenwood UK is very pleased to confirm the initial information issued at the recent Dayton show, where visitors saw the first Kenwood amateur VHF/UHF portable transceiver to feature a built-in full range Scanner.

The sample shown at Dayton was a prototype of the American-market triple band radio, which includes the 220MHz band not available in Europe. The UK/European version doesn't cover this band for TX purposes and therefore will have a different model designation - it will be called the TH-F7E.

Basic details are:

* Dual band TX 144/430MHz.
* Receives 2 frequencies simultaneously, even on the same band.
* 0.1 ~ 1300MHz RX (on "B" band).
* FM, FM-W, FM-N, AM plus SSB/CW receive.
* Internal VOX.
* Internal bar antenna for AM broadcast RX.
* 1200/9600 packet ready (with external TNC).
* 434 memory channels
* 16-key pad plus multi-scroll key
* Lithium-Ion battery as standard (7.4V/1550mAh) giving 5W output.
* Special charging circuit for simultaneous charging/operating.
* MIL-STD 810 C/D/E for vibration, shock, humidity and light rain.
* Automatic Simplex Checker.
* Windows Memory Management software (free download from Kenwood Website).

The price is not yet fixed, but is expected to be under £300. Deliveries commence in the autumn.

Kenwood Electronics UK Ltd., Kenwood House, Dwight Road, Watford, Hertfordshire WD1 8EB. Tel: 01923 655284

YOU MAY BE AN ENGINEER...

If the thought that a CD could refer to finance or music never enters your mind!

Back on the air

GB3WX, the 6m repeater north-east of Wincanton, is back on the air. It was switched on again at 11.25am on Saturday 7th April. After much modification to the logic controller, the DTMF and data bit stream circuits having been disabled and isolated.

www.twxrg.org.uk

Broadcasts in English

The summer 2001 edition of broadcasts in English is now available from the British DX Club. It was compiled by BDXC-UK editor Tony Rogers and lists international broadcasts in English on short wave and medium wave for the Summer 2001 schedule period. It is in time order throughout and covers all target areas. Transmitter sites are included where know. A comprehensive guide to DX and media programmes is also included along with WorldSpace and WRN Euromax schedules.

Copies of this 40 page booklet are available for £2 (payable to BDXC) or $3 US for Europe.

British DX Club, 126 Bargery Road, Catford, London SE6 2LR.

Test & Measurement

Wavetek has introduced a line of more than 60 versatile, easy-to-use test and measurement products designed for shop, too bench, boat, home or pocket. The Meterman line includes everything from rugged digital multimeters to basic and speciality testers for lighting, electrical and electronics testing. Clamp-on ammeters offer precise electrical readings, while component testers and speciality test tools are the right match for electronics troubleshooting.

www.metermantesttools.com

Skywaves

The British FM & TV Circle has just launched its new streaming audio service via the Internet, called Skywaves Radio. This new service which broadcasts programmes made for broadcast band DXers, by DXers.

The club is aimed at enthusiasts, who have an interest in FM, TV, DAB or satellite DXing.

For readers who do not have access to the Internet, a subscription for the printed version of Skywaves can be taken out. Sample copies available for £1 plus and SAE

Skywaves, 27 Barton Road, Tilehurst, Reading RG31 5NJ.
www.skywaves.co.uk

Marconi museum

Patricia Hewitt, the e-Minister, visited Grey Coat Hospital secondary school to launch the interactive online Marconi Museum on May 3rd. The website launch coincides with the 100 year anniversary of the world's first transatlantic wireless transmission by Marconi and captures the extraordinary achievements and the innovative tradition of Marconi, the pioneer of wireless communications.

www.marconicalling.com is a comprehensive site featuring 10,000web pages containing an historic collection of 500 pieces of ephemera, 426 photographs, 33 sound clips and 10 film clips. It caters for the interest of all ages including students, historians, researchers and wireless enthusiasts.

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Ringwood • Hants BH24 1UU.
e-mail: elaine@pwpublishing.ltd.uk

Radio Specialists are 'Dreaming' of Success

For the second year running, employees of radio manufacturers Icom UK, are taking part in the Formula One 'Dream Team' Contest, organised by *The Sun* newspaper. They are also joined by David Wilkins from Kenwood UK, Mark Francis from Waters & Stanton PLC, Chris Taylor of Martin Lynch & Son, Ailsa Turbett from Yaesu UK, and several other interested parties. Event organiser Mark Jarvis, Amateur Radio Product Specialist at Icom says, "*We ran the contest for the first time last year, purely for a bit of fun, and also because we have a number of motor sport fans within the company. It proved so popular that we've decided to go it again this year*".

The contest runs over the course of this year's F1 World Championship, with the final race coming from Japan on 14th October.

The current positions are:

1st: Paul Position - Icom
4th: Medical Fly Boys - Icom Marine Sales
17th: Gibbering Wrecks - Ailsa at yaesu
20th: The Watford Speedsters - David Wilkins at Kenwood
21st: The Taylors - Chris Taylor from ML&S
23rd: Marks' Mighty Machine - Mark Jarvis at Icom
25th: Memories of Mansell - Mark from W&S

We'll keep you posted to see how the various team do and see if some can improve as the season progresses!

Coming Soon!

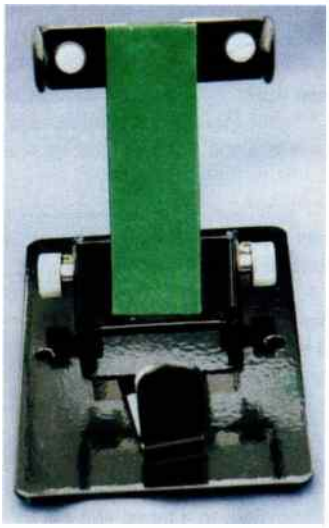
Coming soon from Alinco is the DJ-X3, a wideband communications receiver. It will have the 8.33kHz steps for airband as well as 700 memory channels and an audio descrambler. Covering 100kHz to 1300MHz with modes AM, FM and WFM, it measures just 56 x 102 x 23mm. It's expected to retail for £129.95 and full details are available from:

Nevada,
Unit 1 Fitzherbert Spur,
Farlington,
Portsmouth PO6 1TT.
Tel: 023 9231 3090.
www.nevada.co.uk

Radio Rally

The Huntingdonshire Amateur Radio Rally will be on August Bank Holiday Monday (27th August) at Emulf Community School, St Neots, Cambridgeshire. Doors open 10am to 2pm and admission is £1.50. It features a hall and car boot hard standing areas and there will be hot and cold refreshments available.

Peter 01480 457347 between 6 and 10pm please.



Tester stand

New from SSE, who are well-known for their range of hand-held radio stands, is the adjustable multimeter tester stand. It has adjustable stainless steel side arms and front stop as well as an adjustable back support so you can get the best viewing angle. For safety it has an earth static point. It comes in two different sizes and is suitable for holding most makes of hand-held meters.

Solid State Electronics (UK), 6 The Orchard, Bassett Green Village, Southampton So16 3NA. Tel: 023 8076 9598. www.ssejim.co.uk

Short wave in Cuba

Radio Havana Cuba is the short wave radio station of Cuba. It broadcasts in nine languages to latin America, the Carribbean, North America and Europe transmitting 30 hours of programming a day.

You can expect to hear news, on the hour and half hour, Cuba Today - interviews, stories and reports about Cuban events, Time Out - their sports programme, DXers Unlimited that is heard on Tuesdays and Saturdays and Cuban music.

They broadcast in English to Europe from 2030-2130 on 13.660 and 13.750MHz and from 0500-0700 on 9.830MHz.

Radio Havana Cuba, PO Box 6240, Havana, Cuba.

Internet Linking

Internet repeater linking represents an important element in the future of amateur radio. With a hand-held transceiver it will be possible to connect to any repeater in the world by punching in a 4 digit number.

Ian Able will take listeners through the process, give ideas and references to websites, where necessary software can be downloaded, followed by an interactive Q&A session.

Intecnet2001 is presented monthly by the South African Radio League and can be heard on 3.215MHz in the 90m band. This transmission is sponsored by Sentech.

www.qsl.net/g3zhi

Lighthouses

The International Lighthouse/Lightship weekend will take place from 0001UTC on Saturday 18th August until 2359UTC on Sunday 19th August.

This event is not a contest, each station decides how they will operate their station with regards to modes and bands.

YOU MAY BE AN ENGINEER...

You have a habit of destroying things in order to see how they work!

North Kent RS

The North Kent Radio Society meets on the 1st and 3rd Tuesday at the Bexleyheath Pop In Parlour, Graham Road (opposite Adsa) at 8pm. For the latest details, contact:

Dave G4YIB on 01322 330830 or e-mail dave@quartslab.com

Horndean club

The Horndean and District ARC meet on the 1st and 4th Tuesdays at Lovedean Village Hall, 160 Lovedean Lane, Lovedean. Meetings start at 7.30pm.

www.hdarc.cwc.net

Red Arrow Dates

August

1st	Broadstairs & Taunton
4th	Windermere & Dumfries
5th	Kielder Forest
15th	Cromer & Weymouth
16th	Dawlish & Eastbourne
17th	Bournemouth & Eastbourne
18th	RAF Valley & Eastbourne
19th	Eastbourne & Whitby

www.raf.mod.uk/reds/dates.html

Streetwise!

I am not a morning person. So why on earth I ended up doing a job that often necessitated early starts, or even worse late nights, I just don't know. Sometimes very early starts are inevitable. If you have to creep underneath a target's car and attach a tracking device, well you can't be doing it in broad daylight can you?

What is a tracking device?

A tracking device is a gadget that will send an indication as to the location of the vehicle to which it's attached and whether that vehicle or vessel is stationary or mobile.

There are a number of different types of these units. The fancy ones are gadgets that have to be fitted by a technical unit and involve a fair bit of work on the vehicle. These units incorporate a GPS receiver hooked up to a cellphone transmitter all of which then run from the vehicle's own power supply. the car's normal radio antenna is utilised.

As you can imagine they do take time to fit, usually a couple of hours or so. It's not the done thing to breeze up to a target and ask to look into his vehicle, so more underhand methods have to be utilised. Should the man have his car booked in for a service, then perhaps the garage can be coerced into letting the vehicle go for an hour or two. Often more direct action is required and the vehicle will be 'stolen' only to be found abandoned a few miles away later that day. The owner is pleased and amidst the universal rejoicing, the team are now able to look at the location of the motor on the fancy computer display.

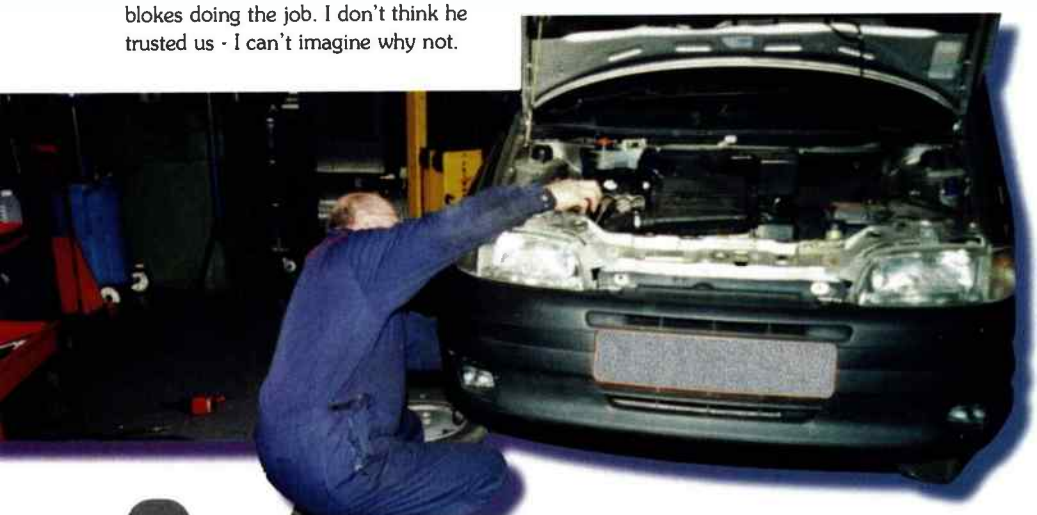
These gadgets have the advantage of being manpower efficient. The disadvantages, however, cannot be ignored. On one occasion that I remember, the boss wanted to have a unit fitted to a target's car but for some reason or other the local police force were involved. Normally, our own technicians would have fitted the unit to the vehicle but on this occasion the local chief constable insisted on his own blokes doing the job. I don't think he trusted us - I can't imagine why not.

Now, this particular bunch had a bit of history in the lash up department. On one occasion they had placed a TV transmitter and camera in a van to watch a suspect's house, but they had got the transmitter running on a normal UHF TV channel. When matey got home and turned on his set.... there was his front door and his neighbour walking the dog! More interesting than *Coronation Street*, but less dialogue. Another time they placed a similar rig watching an office, but this time they had learned their lesson so they put the transmitter right in the 70cm amateur band. Result: local amateur repeater wiped out together with a mould repeater and the local council's own radio system suffered terrible interference. Eventually they were tracked down and the unit was taken off air.

So we awaited their foray into tracking unit installation with bated breath. We were not to be disappointed. The target's car was 'acquired' and taken to a garage where the deed was to be done. They took a bit longer than normal so I'm told. When the target was reunited with his motor, the results can only be described as.... spectacular. The bad man turned on the engine, it started fine but so did the windscreen wipers. When he tried to turn them off the brake lights came on.... and stayed on. When he turned on the indicators the heater fan went on and off .. on and off.

Now this guy wasn't daft. He knew straight away that his car had been got at and drove straight to the police headquarters building to complain. The 'technicians' knew that their number was up so they put in a phone call and Mr. Target was kept waiting an inordinately long time to make his complaint enabling our heroes to take the car to a lock up in the police compound and remove the unit, then replace the car in the car park before he returned. A close one for them. If you are reading this, YOU KNOW WHO YOU ARE !! I heard that the target reckoned that the car was never the same again.

The other difficulty is that these gadgets have to be removed carefully using the same procedure as before. You may recall that Mr. Gerry Adams the Sinn Fein fellow made a big fuss about his boys finding one in his car. That is why the 'lump' or 'tango' is still a popular choice.



Early morning start

Which is why, at 4am on a drizzly morning, I was underneath a parked vehicle in a side street wielding the unit. With a tiny torch in my mouth illuminating the underside of the vehicle I was trying to find a suitable place to clamp it to using its powerful magnets. It can't be placed where it will get too hot and we want it in a location where the signal will get out. Job done, I scramble out rather damply and head off on foot to a vehicle parked up about five hundred yards away in another street.

I fired up a hand-held AOR800 scanner (very old) and found the unit on **81.4876MHz**

SSB. The scanner, however, could resolve the signal enough for me and then I radioed the technical car that I could hear it.... so could they. Hooked up to their receiver was a Datong DF unit. Instead of the usual four antennas mounted on the roof, which would have been a trifle indiscreet, this old type Ford Granada had a roof rack which in fact was the antenna system. The Datong unit gives a visual display of the direction of the received signal relative to the vehicle.

It's not as precise as the GPS based unit but it is easier to deploy and recover. The transmitter makes a kind of grumbling sound which is hard to describe, but once you have heard it you will always remember the noise. From the type of noise being made you can tell whether the unit is moving or stationary. All useful stuff. Then once the target vehicle is 'lumped up' then it's game on for a rally drive through the roads and byways with the technical car and the surveillance team all in touch by car to car radio following off the vehicle.

Bad driving or blocking tactics?

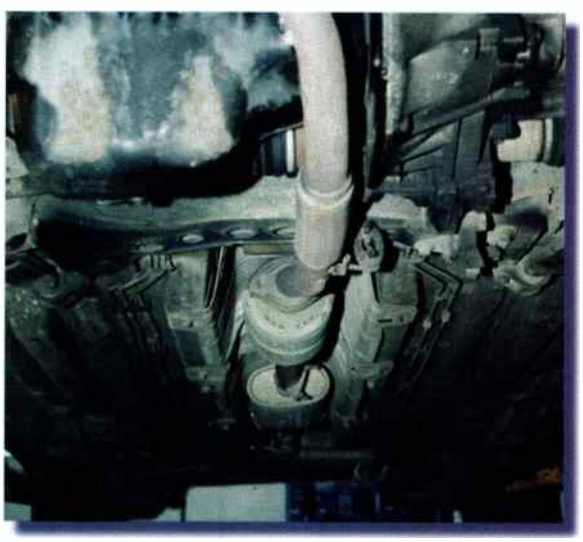
You may see such teams tearing up the roads on occasions. If you are ever waiting to enter a roundabout and a car drives almost all the way round the roundabout and then stops, effectively blocking the roundabout just before one of the exits this could be part of a team.

You'll know if it is because as all the other motorists are getting irate at being held up and sounding their horns etc., the driver will calmly sit there as if he has not heard a thing. Then you will see about another three or more vehicles tear on to the roundabout and scream off at another exit. The blocking car will drive off following them at the end of the queue, the 'tail end charlie' position. Don't try to keep up with them. Their boss will be shouting at them to 'make ground' as they are likely to be in a big hurry to get somewhere else quickly.

High speed chases

The 'lumps' are, of course, occasionally discovered and that's when targets with a sense of humour can get their own back. Lumps have been thrown onto dustcarts which results in a whole team ending up at the council tip. They have been bunged under police cars and once a unit was clamped to a high speed Intercity train which, if Norris McWhirter had been around, could have got the whole team some sort of Guinness World record for high speed multi vehicle driving. It was quite spectacular so I heard.

In the undercover world of covert ops you expect to collect some lumps and bumps, but they're not always what they seem! Jerry Wright explains.....



One more thing about the GPS/GSM tracking units that I would be keen to know is how they stop the diddly dum noise coming over the normal car broadcast radio and stereo because I haven't got a clue how they stop that.

Radio comms

Simplex radio is, of course, essential. Whether person to person or car to car or any combination thereof, the job would be totally impossible without it. Sometimes it can cause embarrassment. I was in a vehicle when we were at a slack time on a job, in the pre radio encryption days. It was about 10am. The boss, who had acquired himself the best car, a nice new 5 series BMW, called that he wanted a meeting with us at a layby about ten miles from where we were.

We had just pulled into the parking space in front of a large hotel as I needed to use the lav. The boss called up and Tom replied, "*OK boss we'll be about half an hour. We're just at the Castle Hotel in Windsor. Old Jerry wants to use the bog.*" I wandered into reception where two ladies were cleaning the foyer. The piped music was playing Radio 2. One of the gels shouted, "*Hi Jerry seeing as you're not booking in here the gents is down there, first on the right*". The bloody transmission had come up on the hotels piped radio system. After using the facility, I slunk out of the place like a bad payer. It was all rather embarrassing and not very covert, but these things happen and the boss was waiting, so we hurried off to see what our next awkward and inconvenient task might be. We were seldom disappointed. ■

Thanks to Al Clutches (Poole) 01202 625625 for their help with photographs.

Setting up your first CB station

Malcolm Hoskins

This article is based on my own experience of CB over the last 10 years. One thing I have discovered during this time is that good advice, especially to begin with, is not easy to come by. True, there is an abundance of advice about, as you will soon discover, but in the CB world, to be honest, there is a lot of bad practice used.

One example you will soon hear about is that to get out and be heard you need a 'burner' or amplifier. Apart from being highly illegal and a downright nuisance to others it is a misconception. You can make contacts all over the world using half a watt of power if the conditions are right and, most importantly, if you set your station up using good equipment and have used the correct practices to put it together.

So, if you are just about to start out in CB radio, this is written to give food for thought on setting up a good radio station and to get the best out of it before you spend too much money.

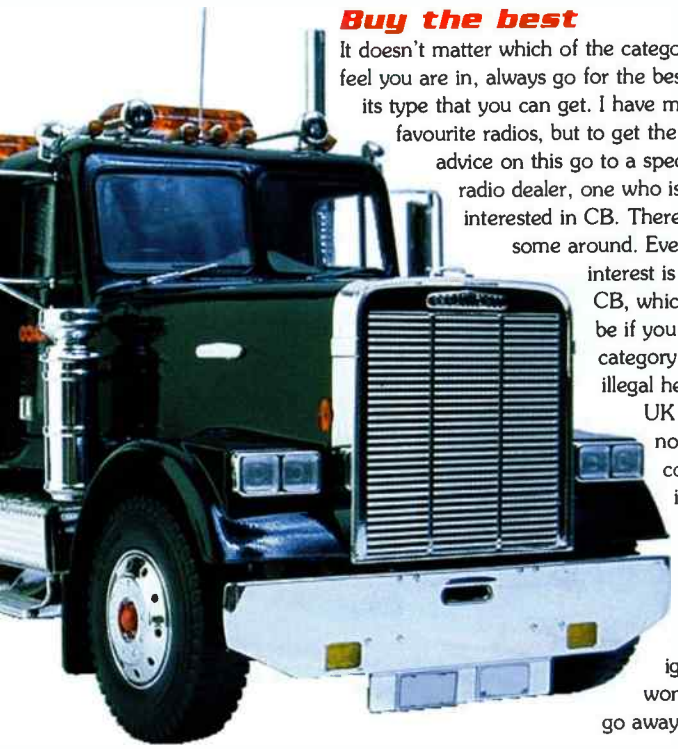
To begin with there are different reasons why people decide to use CB as a form of communication. I have put these into three main categories.

1: Business use, eg taxi firms.

2: People who just want to talk to their friends, perhaps between car to car or car to home.

3: Those who have a fascination with radio and the way it works, along with a little DXing.

Which of these categories you come into could be a deciding factor in what sort of radio you will buy, but not in how you set up the station. For example, if you come under category number 1, a pretty basic, low-priced set will probably be quite adequate. If you come into category 2, a bit more up-market radio with a few more features may be what you need. and if you fit into the last category, you will need the best set that you can possibly afford.



Buy the best

It doesn't matter which of the categories you feel you are in, always go for the best radio of its type that you can get. I have my own favourite radios, but to get the best advice on this go to a specialist CB radio dealer, one who is really interested in CB. There are still some around. Even if your interest is in SSB CB, which it may be if you fit into category 3 (this is illegal here in the UK and I am not condoning its use, but it is where a lot of the interest lies and ignoring it won't make it go away) go for the best you can buy. Be very careful purchasing second-hand sets privately, there are a lot of radio around that are very dodgy to say the least and you could be throwing your money away.

Of course, before buying any radio you have to decide where it is going to be used, ie at home, which means either having a 'homebase' set with an in-built power supply or using a mobile set and buying a purpose made transformer that is compatible to the radio.

If it is to be used in the car you will need a mobile set that usually comes supplied with fitting brackets. If you are fitting the rig to a lorry, which generally uses 24V systems, you will need to fit a voltage reducer to supply power to the radio.

Often forgotten items

There are two other items needed to set up your station, which are of equal importance to your radio and a lot of people ignore, or don't realise, just how vital these are to the success of a good station. They are the antenna and the much ignored coaxial cable. It's surprising how many newcomers, and not so newcomers, to CB don't appreciate the importance of positioning the antenna and the condition of the coaxial cable.

What can happen is that the new CBer goes off to the shop to buy themselves a nice new radio, and when they get home, out comes an old car antenna that they somehow connect to a bit of TV coax, they then hang the antenna out of the window and switch on - just to see if it works OK and that they can hear what's going on. Result? Disappointment, and worse if they try to transmit using this kind of lash up.

So, as with your radio, you need and where you will station you will need a need to get it as high as you away from buildings and chimney of you house is a to obtain planning for this, so check with want an antenna to be small ones. This may be permission and can't biggest and best legally buy. A tallest. again, favourites, so get makes by asking your think about what type of antenna be able to fix it. If it's a homebase homebase antenna and you will possibly can, preferably on a mast other obstacles, but obviously the good second best. You may need permission from the Council them first. Some CBers don't too conspicuous, so they buy alright if you need planning get it, but always try to get the antenna that you can five eighths wave is the operators have their advice on different dealer or reading articles in CB books or in magazines. Remember, the taller your antenna and the higher it is the better. This will make a huge difference between being a poor station and a good one.

The mobile option

Choosing a mobile antenna for your car, in principle, is the same as for a homebase. but in practice it's quite different. First, you have to get a mobile antenna and there are a lot of choose from. Again, get the largest you can put up with stuck on top of your car for best results. But you have to be practical. Ideally the best place to mount

the antenna is the roof of the car, bang in the middle with a hole drilled through to take a stud mount. but you may not want to spoil the roof of your nice, shiny vehicle, so a magmount will do.

Next, and of equal significance, comes the coaxial cable and its connections. Go for the best you can afford, again. Personally I use RG213. You can tell good coax by looking at the braiding, it should

be of high density. Ask your dealer for advice. If you don't ask, they usually sell you the cheap stuff, and it does make a difference. You then need to buy quality coaxial plugs and if you can't do the soldering yourself, then ask your dealer to solder them on for you. The good, knowledgeable dealer will not only sell CBs, but repairs them and will help you with soldering plugs. RG213 is OK for homebase use but absolutely useless in your car as you will soon realise when you see it. So something like RG58 is more suitable. Usually you can buy ready-made up lengths with plugs already fitted for the car.

Putting it together

All of this advice is to enable you to get the best results from your radio station. However, circumstances vary in more ways than one and satisfactory results can be obtained from using smaller antennas and different, although still suitable, coax. The important thing is to make sure everything is put together properly.

OK, off to find the nearest good dealer or send for a catalogue from a mail order company, addresses can be found in this magazine and away you go.

Not it all has to be fitted. You have to find a suitable place to put the radio at home (the shack) or somewhere in the car, the antenna has to be mounted, the SWR has to be checked and the coax has to be correctly secured and tidied. ■

scanners

Bill Robertson brings you a review of Icom's latest hot little baby, the IC-R3

It's been demonstrated at shows, advertised in the press, and it's now finally available in the UK. It's the IC-R3, a hand-held scanner 'with a difference'; it's got a built-in colour liquid crystal display for off-air TV monitoring and display. Not just broadcast TV either - with a coverage up to 2450MHz it can tune into ham radio TV transmissions on 1249MHz, cordless video 'baby alarm' transmitters on 2400MHz, 'eye in the sky' helicopter-mounted cameras, wireless video surveillance systems....by now you're probably getting the idea! It's rather more than a scanner with a simple portable TV built in. Icom UK call it their 'hand-held audio-visual receiver'. But don't think the video monitor facility is the only thing you'd use the scanner for - it's a powerful wide-band receiver in its own right as well.

Coverage and TV modes

The hand-held receiver, which at 61 (W) x 120 (H) x 33mm (D) is actually smaller than the already small hand-held Casio TV-600 colour LCD TV I also use, covers the wide frequency range of 495kHz to 2450.095MHz in AM, FM and WFM modes. It'll also tune into AM broadcast TV transmissions above 30MHz in the UK, these using the 'PAL' (Phase Alternate Line) standard. This is the analogue TV standard which we've been receiving all these years from our local TV transmitter, and more recently from the RF lead to our TV from a video recorder or digital TV receiver. The sound is transmitted on an FM sub-carrier (the sub-carrier offset varies between different European countries) and it'll receive this as well alongside the broadcast picture you're viewing.

Just to make life a little more complicated, satellite TV, radio amateurs on 23cm (1240-1315MHz), wireless video transmitters around 2400MHz and so on use FM TV, not AM. Which means you can't receive the video, at least not very well, using a standard AM TV receiver like the one you have in your living room, without some extra clever circuitry. That is why we have an extra 'set-top' box to receive these. But the IC-R3 has FM TV receive built in, which you can activate between 900-1300MHz and 2250-2450MHz. The US and Japanese home-market models of the IC-R3 have a different TV receive standard, NTSC, fitted, this is incompatible with UK PAL. So be careful where you buy your IC-R3 from.

Displays

The large colour LCD is a 50mm active TFT screen, the type you'd find on 'top spec' portable PCs and hand-held TVs, which doesn't need a backlight - it actually transmits light from it for easy viewing. Just below the colour LCD is a small monochrome LCD, it's a smaller version of the type you'd normally see on a scanner.

The small monochrome LCD gives you most of the usual things you'd again find on a scanner display, like the tuned frequency, memory channel, bank and mode indications and a bargraph S-meter to give you an idea of the relative signal strength of the transmission you're listening to. But if that's not enough, you can also bring the larger colour LCD into use to give you a larger and more colourful text display of the frequency, mode, and so on.

In fact you can choose any one of eight different background colours for the text display. It's graphic facilities aren't wasted, because it can also display a few more things, as well as giving a more comprehensive display to set up your tuning step sizes and so on which the smaller LCD can't display. Here are a few examples:

Each memory channel can be assigned a short 6 character alphanumeric 'tag' to remind you of what you've programmed into that channel, which can be displayed on the colour LCD.

The LCD can also used to display a bandscope, with a span of up to 1MHz, the strength of received signals being indicated by the height of the appropriate bar. Whilst the set stays totally silent while it's in bandscope 'search' mode, you can move a small pointer along to select a wanted signal indication along the displayed bargraph and press a button to immediately listen to that frequency.

A 'direction finding' display mode is also available, where the display again gives a bargraph of received signal strength but with a horizontal axis of time rather than frequency, although I'd suggest a simple 'real-time' S-meter reading is just as useful for direction finding.

Rocker pad

To make the receiver its compact size, Icom have replaced the usual keypad you'd use on a scanner for frequency entry and the like with just three push buttons and a four-position rocker pad. Together with

the click-step rotary knob on the top panel and a side mounted 'function' bar, these controls let you do all the usual things like select a frequency, program memory channels, adjust the channel step rate and so on. A further recessed green push button is used as the power switch, holding this down for a second or so acts as an on/off toggle switch.

Power

As for the power supply itself, Icom supply a 'right bang up to date' high capacity 1600mAh Lithium Ion 6V battery pack, which Icom say will give you up to 27 hours operation time. Note the words 'up to', more of this later! In case you get caught short with a flat battery pack, you can very usefully also pop in a set of 3 alkaline AA cells. My review sample came supplied with both the Lithium Ion pack and a set of AA NiCads, plus a wall AC charger which plugs into the side of the IC-R3 - it takes around 15 hours for a full recharge.

Bands and memories

The receiver's wide frequency coverage is divided up into 11 frequency bands, which the set cycles through using the left and right rocker pad buttons. These bands are arranged as:

AM Broadcast: 0.495-1.620MHz
HF: 1.625-29.995MHz
50MHz: 30.0-75.995MHz
FM Broadcast: 76.0-107.995MHz
VHF Aircraft: 108.0-135.995MHz
144MHz: 136.0-255.095MHz
300MHz: 255.1-382.095MHz
400MHz: 382.1-769.795MHz
800MHz: 769.8-960.095MHz
1200MHz: 960.1-1399.995MHz
2400MHz/TV: 1400.0-245.095MHz/UHF TV channels.

To tune to the frequency you're after, you use the rocker pad to get somewhere near where you want to tune to, then use the top rotary control to 'fine tune'. Pressing the side-mounted function button speeds the tuning rate up to 1MHz steps to help you get there somewhat quicker.

A useful extra touch is that you can pre-set the receiver to automatically detect when the tuning knob is being rotated quickly, this automatically increasing the step rate for you. You can also pre-set different tuning steps for each band (with the exception of the AM broadcast band which is fixed at 9kHz steps) to either 5, 6.25, 10, 12.5, 15, 20, 25, 30, 50 and 100kHz. No 8.33kHz steps for civil airband though.

To search for new frequencies to listen to, the IC-R3 has no less than 25 programmed band search ranges available, each of which you can program with a pair of lower/upper frequencies for the set to search between, halting when the squelch raises. 400 memory channels arranged into eight banks of 50 channels each are available to store your favourite frequencies in, these can be tagged to be included or skipped in subsequent memory scans. There are also up to 400 'pass' channels available (these using the 400 available memory channels) which can store frequencies to be automatically skipped in VFO 'search' mode.

In use

The manual told me (good job I read it first!) that the up/down positions of the rocker bar are used to adjust the receive volume. Also pressing the 'Sql' button while I rotated the top tuning knob varied the squelch level, to one of nine pre-set steps or an 'Auto' level adjustment where the set itself decides when to open the squelch. Not automatically obvious, though no doubt I'd have found out sooner or later.

On first switching on. I found the Lithium Ion battery already had a good level of charge in it, which let me to have an initial 'play' on my trip home by train from the 'Ally Pally Rally' where I'd picked the set up. It certainly gave me a more interesting journey back! That evening I gave it an overnight charge, ready for a full day's listening starting the following morning.

I found it a little hard at first to get used to the fairly tedious method of getting to the frequency I wanted to listen to - I'd have preferred a direct frequency entry keypad. Likewise trying to 'alpha tag' the memories involved cycling through the various letters and positions using the rocker switch. However, Icom do have an optional remote PC interface available where you can remotely upload and download frequencies to and from the receiver, this I believe could be a very useful add-on for the serious IC-R3 user.

The IC-R3 is supplied with an extendable telescopic whip antenna, which is rather more efficient than a ubiquitous 'rubber duck' in that you can either just extend it fully, or to the length needed to make it approximately resonant as a quarter wave on the frequency range you're interested in. A belt clip and a soft pouch are supplied as carrying aids, although in practice I didn't use these, preferring to slip the set into my jacket inner pocket instead, often with an earphone plugged in for private listening.

I found the receive sensitivity typically on a par with several other hand-held scanners, although not quite up to that of the 'top of the range' sets from AOR and Yupiteru, although the efficient antenna helped here. As with may other scanners, connecting a rooftop antenna brought in a few problems from strong signal overload, but Icom have thoughtfully provided a four-step attenuator to help here. This I found especially useful on HF for short wave broadcast band reception. What a pity it didn't have SSB receive to listen into utility stations.

The telescopic whip had a double hinge at the base, which at first I thought this was a little strange. But this arrangement let me 'double back' the retracted antenna so it was alongside the case, rather than sticking upwards and prodding me in the chin or neck while I carried it this way - very handy for 'close in' covert listening! It also let the receiver be placed flat on a table top for monitoring, the whip angled so that it was vertical. Unfortunately the audio amplifier gave a 'thump' every time the squelch opened and closed - very noticeable with a hi-fi style earphone (eg with good bass response) plugged in.

I mainly used the IC-R3 in memory bank scan mode - it could either scan any one bank or all eight banks, but I did also have a go at TV reception. Broadcast TV was fine, although I found the Lithium Ion battery pack only lasted about an hour and a half in this mode, likewise when I used the main TFT colour LCD in normal listening or scanning mode. Using three fully charged NiCads gave me less than 30 minutes worth of viewing before they went flat. Whenever the colour LCD in switched into use, the smaller LCD shows the battery voltage to the nearest half volt together with a small battery bargraph indicator - handy to warn you of impeding demise of battery charge! TV sound reception was fine using the 'AM TV' channels, but switching the colour LCD in to view the picture on weak signals brought up some 'mush' on the sound until I moved the antenna to get a stronger signal.

Cordless 2.4GHz domestic video transmitters commonly use one of four frequencies, 2400MHz, 2427MHz, 2454MHz and 2481MHz, so the IC-R3 can tune to two of these. In practice, I found the monitoring range very restricted, moving just a few metres away from a transmitter with its built-in antenna caused the signal to fade out on the R3, whereas the matching domestic video receiver again with its built-in antenna could receive the same transmitter several tens of metres away.

I had no luck at all on the amateur 23cm band with TV repeaters, as virtually all of these in the UK transmit in the 1308 - 1316MHz range, the IC-R3 stops at 1300MHz. However, a test using the R3 connected to a loop Yagi and aimed at one of my friendly local ATV buffs (who pointed his Yagi at me) gave me a watchable signal on the repeater input frequency of 1249MHz. Switching an in-line 23cm pre-amp in and out made a vast difference in the readability, or viewability, confirming the R3 to be somewhat 'deaf' on FM TV.

Most serious enthusiasts tuning into the 1300MHz or 2400MHz range would, in any case, undoubtedly have a mast-head pre-amp system for home-based monitoring,- and the R3 has a video output which you can connect to a larger video monitor. But all this does defeat the object of having a small portable receiver!

More usefully though, the TV video can be 'inverted' positive/negative - not all transmissions use the same and this saves viewing what appears to be a 'scrambled' transmission. Also, the sound offset can be varied slightly to suit different offsets - potentially useful for DX TV reception on VHF and UHF when used with a suitable antenna and possibly a VHF/UHF preamp.

Conclusions

Icom have broken new ground with the IC-R3, the incorporation of a built-in AM and FM TV facility being a 'world first' in a wide-range hand-held receiver at a consumer price. I found it was a reasonable 'all-rounder' for listening and broadcast TV reception, although somewhat insensitive above 1GHz for the 'interesting' TV things that you could find up there.

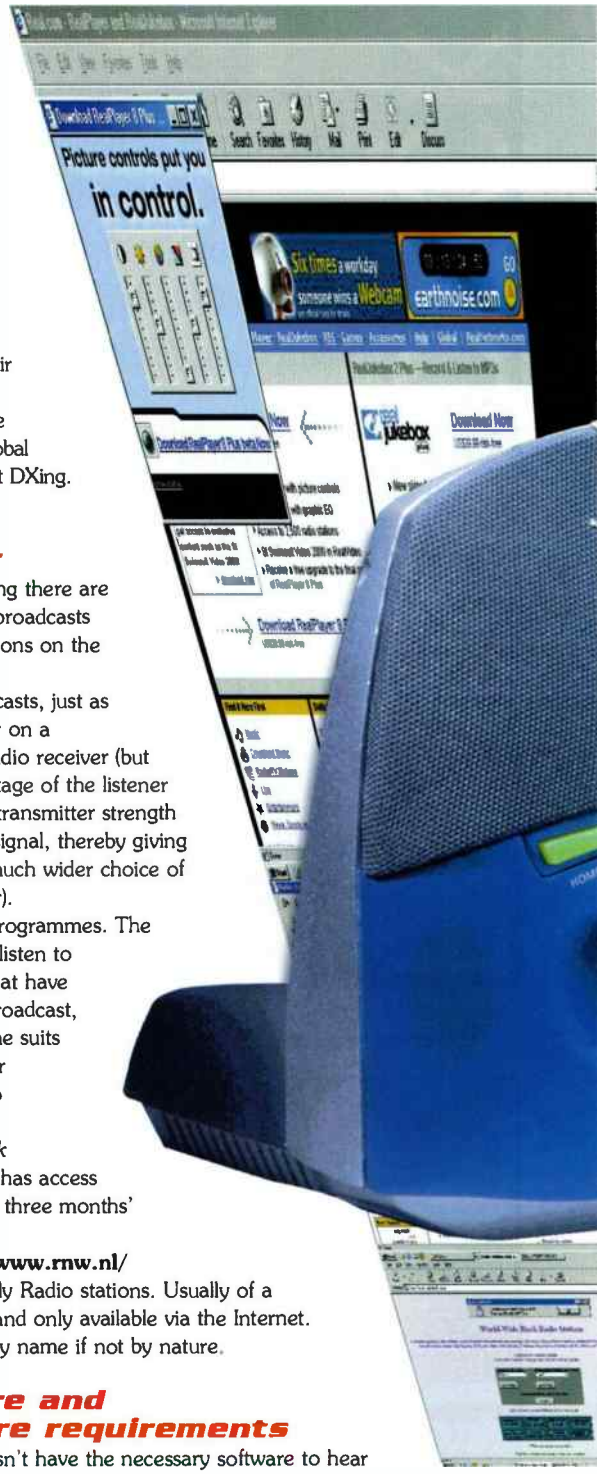
Our thanks go to Icom UK (Tel. 01227 741741) for the loan of the review receiver. The IC-R3 is available from all authorised Icom dealers in the UK at a current price of around £449.

Half a dozen things you could be tempted to use the IC-R3 for

- Wide-band scanning
- Listening in to virtually anything
- Watching Broadcast TV
- Watching Formula 1 car camera links while at the racetrack
- Tuning into your wireless video 'baby watcher' system
- Watching 'Eye in the Sky' video transmissions

Publisher's note; Please be aware that unless you're receiving authorised broadcast transmission or certain hobby radio transmissions, depending on your country's laws you must normally have prior permission to be able to tune in to other stations. The RA's free RA169 '*Receive Only Scanners Etc.*' information sheet has more information on what you can and can't listen to in the UK. ■

DXing



It's late at night as you sit in the shack, the rest of the house have long since gone to bed, leaving you with the elements trying to eke out a distant signal from Alice Springs, by the dim light of the desk lamp and LCD panels. However, this isn't the scene of a late night scan of the Tropical Bands, in fact there isn't a radio receiver being used, but a computer enabling you to hear remote domestic stations broadcasting live on the Internet.

This is the first of three articles that will show you how to pull in those low powered domestic stations and the bigger boys on the band, without crackle, fade or co-channel interference, without an antenna or even a radio receiver.

Why not turn the tables on the overseas audience that listens on Internet and contribute via e-mail to the *Up All Night* programme on **BBC Radio 5 Live** and late night shows on **Talk Sport Radio**? Listeners in mid-west America, small Pacific Ocean islands and the Far East can often be heard expressing their opinion alongside phone callers from the UK.

Just missed it!

How many times have you sat by your set all ready to listen to that eagerly anticipated programme? **VoA's** *Communication World* perhaps or *Musical Mailbox* from **HCJB**. You're tuned to the right frequency with a nice strong signal coming in, then the telephone rings, or there's a knock at the door.

We're not all so organised to always have a cassette tape ready to record the programme off air. By the time you have returned, the programme is all but finished, forever lost in the airwaves. Or is it? Not when the station's website archives it's programmes and you can access it at your convenience over the Internet.

To start with, I'll highlight the software needed and some of the major websites and portals that give lists and links to the radio stations on air. Then, over the next two months, I'll take a closer look at some of the radio stations themselves, both the low powered and some of the international powerhouses.

So why not unplug your receiver for the evening, take down the antenna that annoys family and neighbours so much, and drag a comfortable chair over to your computer, as we embark on a global guide of Internet DXing.

What's to hear

Broadly speaking there are three types of broadcasts from radio stations on the Internet.

* Live broadcasts, just as you would hear on a conventional radio receiver (but with the advantage of the listener not relying on transmitter strength to receive the signal, thereby giving the listener a much wider choice of stations to hear).

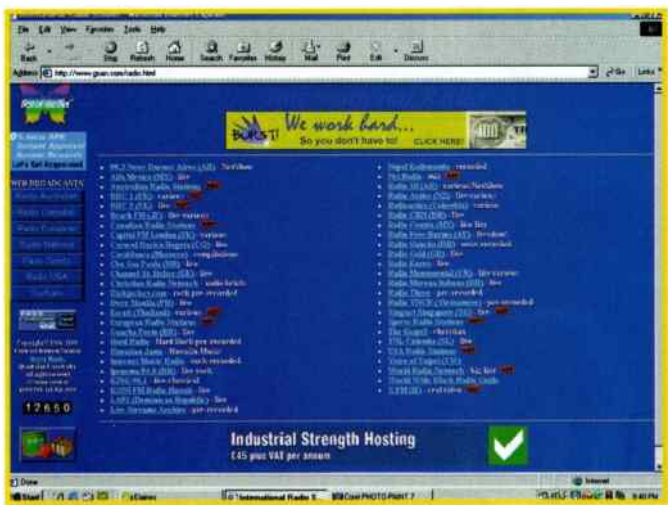
* Archived programmes. The opportunity to listen to programmes that have already been broadcast, at whatever time suits the listener. For instance **Radio Netherlands'** *Media Network* website always has access to the previous three months' editions.

http://www.rnw.nl/

* Internet-only Radio stations. Usually of a music format, and only available via the Internet. Called 'radio' by name if not by nature.

Software and hardware requirements

If your PC doesn't have the necessary software to hear



webcasts, audio streaming, Internet radio, or whatever other terms used for what is basically 'listening on the Internet', you'll need to download them from the appropriate website. It's an easy process and the software is free. The most common software used is Real Audio/Real Player, and Windows Media.

The Real Entertainment centre combines Real Jukebox, Real Player and Real Download, and is available from:

http://www.realplayer.com/

http://www.realaudio.com/ (the same website)

Windows Media Technologies consists of *'a variety of components for creating, serving, and playing digital media'*.

http://microsoft.com/windows/windowsmedia/en/download/

There is a good overview and links to all the software you'll need at:

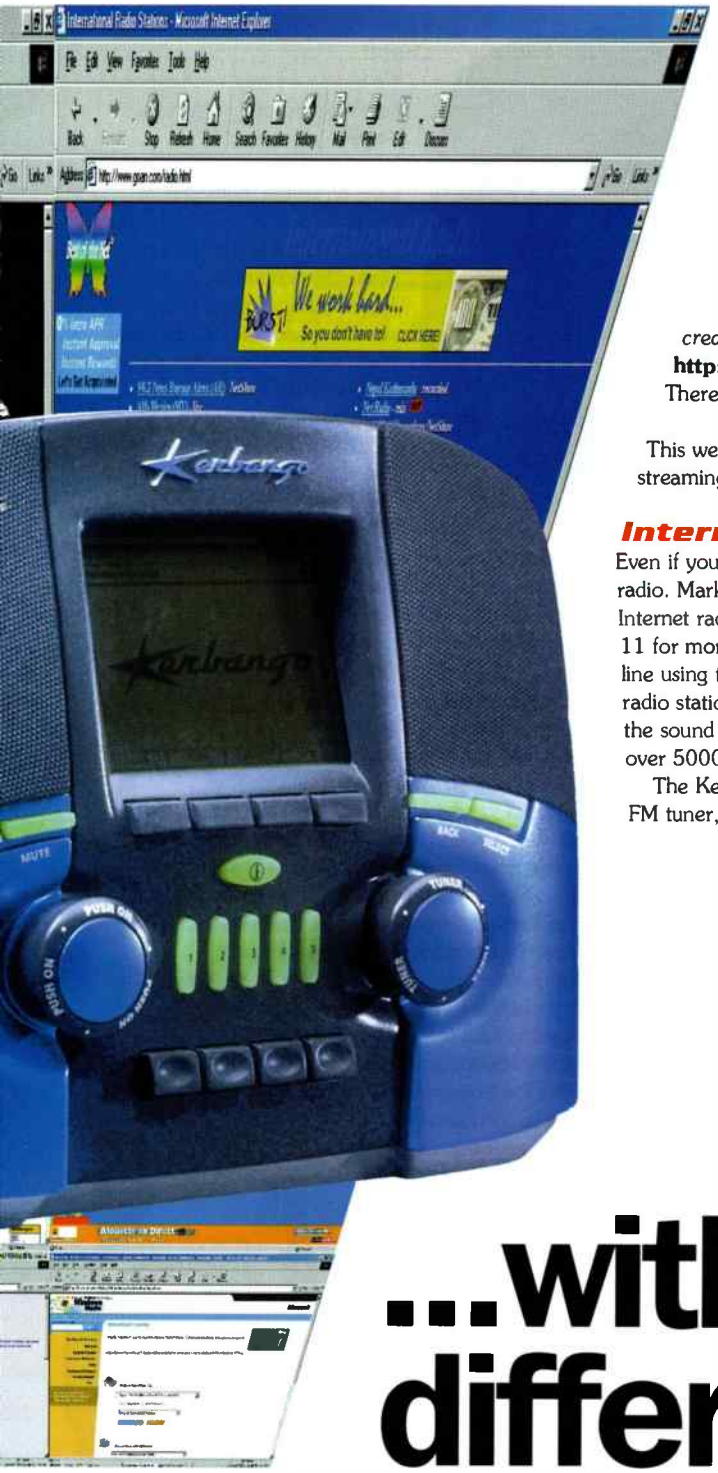
http://www.live-radio.net/info.shtml

This website also has a short and easy to understand technical definition of how streaming audio works.

Internet Radio without a computer

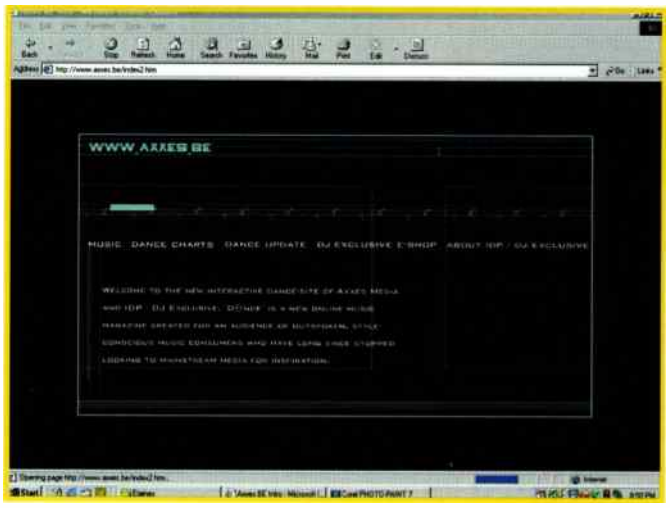
Even if you don't have access to a PC there is now another way of listening to Internet radio. Mark Savage of the British DX Club informs me of the world's first stand-alone Internet radio. This is available from a company called Kerbango (see the news on page 11 for more details). It looks like an old-fashioned radio and connects to the telephone line using the Kerbango Tuning service to provide a constantly updated list of all the radio stations that broadcast on the Internet. The service is free to access and also rates the sound quality of the stations. You can access over 5000 Internet stations from it.

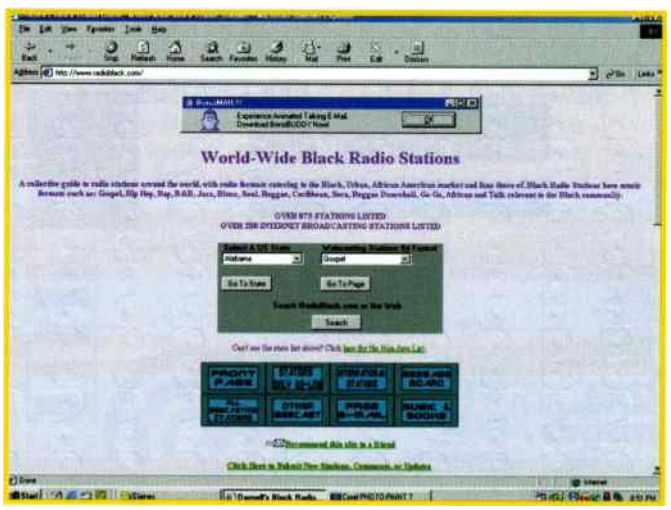
The Kerbango also features an ordinary AM-FM tuner, and has outputs to link to a home hi-fi



...with a difference

Chris Brand





system. It can also be connected to PCs and play MP3 files through the 'radio'. Ingeniously, there's even a 'buy' button so that you can purchase a copy of the music on the station you've just listened to. The expected retail price at the time of writing is $300, although you are likely to have to wait a while as they're not due over here until at least the end of the year.

http://www.kerbango.com

Tune in and download

There are numerous websites which host links to radio stations. Many perform a similar function, but to different degrees and in different ways. I'll run through some that I have used and found to be the most accurate, informative and user-friendly. They all offer more than just a list of links. Some are specialist music radio websites, others try to give all and sundry. The best thing is to dip in and see which ones suit your tastes. This is often down to the website layout and design.

The best of the bunch

This section looks at some of the best websites to access Internet Radio from. Most of these connect to stations all over the globe, only a small percentage of which you can hear on a conventional receiver. As there are thousands of new and exciting stations to log, these portal sites are an ideal way to browse the options on offer.

Just as when you tune the dial on a regular receiver, there is variety in abundance when performing a similar function on the Internet. The main difference between 'regular' DXing and the Internet variety of DXing is that on The Net you first identify the station you want to hear, then click on its website to hear programme material and to read other information on it.

'*Live Radio on the Internet*' has been online since August 1997 and for me is one of the best websites of its kind. It's nicely laid out with a deep blue background and packed with all you could need to know, although the font size could be larger. It is categorised by continent, with easy to see graphics denoting a live feed or an archive programme.

Featuring little extras like a station of the month, links to new sites, wallpaper downloads, and a fun 'boss is coming' button, which transforms the webpage from radio into a page with a fake error message, if you're browsing at work and radio websites have nothing to do with your job!

http://www.live-radio.net/

It's well worth persevering with the small font (try changing the size via your control panel), especially when quotes like this come up:

"I am amazed at radio DJ's today. I am firmly convinced that AM on my radio stands for Absolute Moron. I will not begin to tell you what FM stands for." - Jasper Carrott

"It's not true I had nothing on, I had the radio on." - Marilyn Monroe

Well, to prove Jasper wrong, head off to the thousands of stations on offer and have a listen. As well as being the UK's most visited live radio site, it claims to be different from most as it monitors and updates the links daily, removing any that no longer work. That is a difficult task to keep up, and the bane of any surfer's time online must be the number of links that are full of promise but lead nowhere. The site is used by radio stations themselves, including the **BBC World Service**.

Another good starting point to discover what's being broadcast over the web is in France at *ComFM*

http://www.comfm.com/

You can link to over 6000 radio websites, 900 television and nearly 1500 media-related webcams, some of which show you behind the scenes in radio studios, some of which are live on the air, such as **Kalaallit Nunaata Radioa**, a radio station in Nuuk, Greenland. The web has heralded a new age of visual radio.

Although this site and the weekly e-mail list you can subscribe to are in French, it is easy to follow, with graphics and several key words which mean the same in several languages, such as radio, television and stereo.

The links are continually updated and the e-mail list keeps you informed of any new additions.

A handful of the many diverse live radio stations you can hear via the *Com FM* website are:

Radio Fragola, Trieste, Italy
Radio Simba, Kampala, Uganda
Voltage FM, Paris
FFH, Frankfurt, Germany
Univalle Stereo, Melendez, Colombia
RCI Martinique, Guadeloupe
RCI Guyane, Guyana

The '*Top Radio*' website in the USA states that it receives 1200 visitors a week. A nice feature to this site is that you can e-mail your own radio recommendations and your link is added. You simply e-mail '*Top Radio*' with the web address, station name, frequency, location, programme format (News, Talk, Sports, Business, Music), type of music programming (Oldies, Country, 70's Rock, Jazz, Classical, Big Band, etc.)

You can hear all manner of radio stations from here, with the

option of searching for them by city, country, format or Internet-only.

http://www.topradio.com/

The *International Radio* website can be found by typing

http://www.goan.com/radio.html

It offers a cosmopolitan mix of live radio, to stations such as **Alfa Mexico**, **Beach FM** (Japan), **Cbn Sao Paulo** (Brazil), **Channel St. Helier** (Channel Islands), **Dwrr** Manila (Philippines) **KONI FM Radio** Hawaii and **LA91** (Dominican Republic).

A well-known and all encompassing website that lists most of what can be heard on the web is '*The MIT List of Radio Stations on the Internet*'. It bills itself as '*Your Electronic Guide to Radio Stations around the world*' and includes links to 10007 radio station websites and 2119 streaming radio stations.

http://wmbr.mit.edu/stations/

A good site called '*Radio Tower*' gives access to over 1100 live feeds across the planet. Running since 1996, which is quite a while in 'Internet Mean Time', the site provides a guide to find '*web radio of your choice: music, news, sports, business...*' It has a choice from 80 countries and 20 different genres. The website editors '*pick of the moment*' is a good place to begin, but if you still can't decide what to listen to, hit the Random Transmission button, which makes a selection from the extensive database for you.

http://www.radiotower.com/

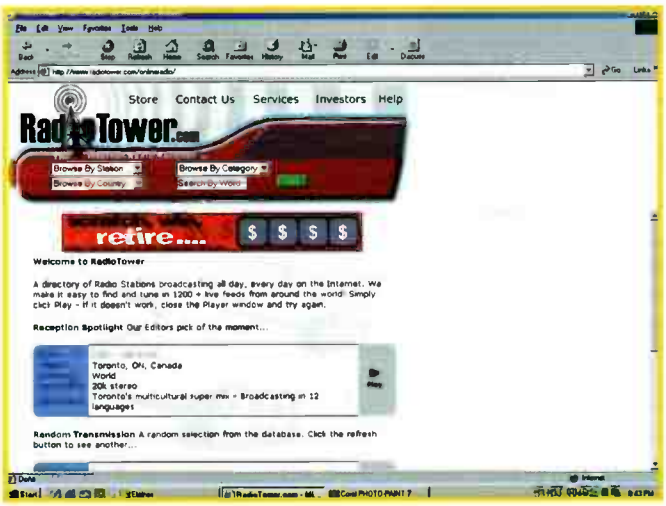
'*Radio-Stations.Net*' lists the stations by continent as well as country and station format, and also provides a weekly e-mail list of changes to programmes available via the Internet. Tune in to stations as diverse as **Guam's KGUM** in Agana (News/Talk), **Sud FM** in Dakar, Senegal to **Anet station** in sub-Antarctica.

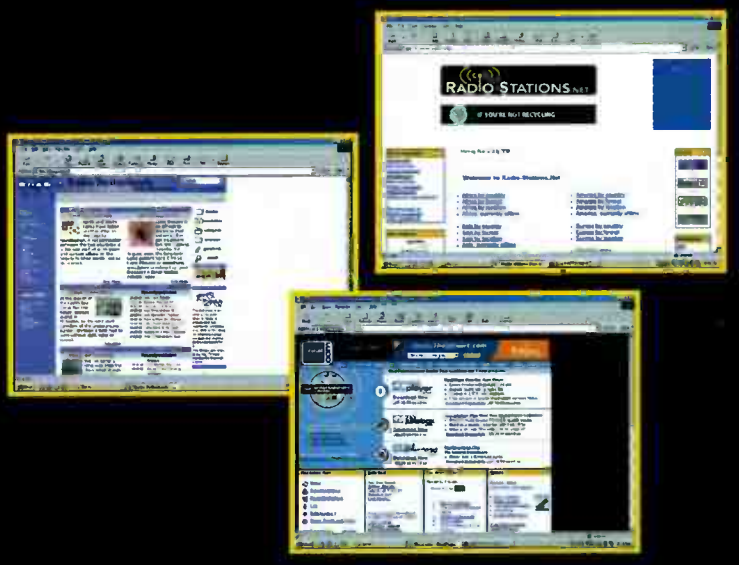
http://www.radio-stations.net/

If you have downloaded your software from the Real Player website, you might want to click on their radio tuner guide, comprising a selection of random stations that change regularly, and also an option to listen to stations playing a wide range of music; hip-hop, Christian rock, jazz, techno, pop, classical, world music, Latin/Salsa. Most styles of music appear to be on offer but nearly all of the stations featured are from the USA.

http://www.realaudio.com/

Click on a category and you are given a number of radio stations to choose from, each with a symbol denoting if it is a talk or music station. When I last visited the site, if you chose 'Techno' there were links to the following four stations, all of which appear to be Internet-only stations: **NetRadio.com** (Techno), **globalmedia.com** (Test Pattern), **globalmedia.com** (Club House), **GrooveRadio.com** (Electronic Dance). Choosing the 'Spiritual' button led to six links from: **Today's Christian Radio**, **Christian Pirate Radio**, **WAVA in Washington DC**, **KWRD 94.9 FM**, the **Black Gospel Network** and **Acaza.com**.





Specialist stations

The '*Radio Site*' has a traditional radio dial graphic, a calming pale yellow background, and an uncluttered interface, where you click from five buttons marked, 'Live, USA, Belgium, Europe, Other.'

With a straightforward array of links, it is a good place to start in many ways, as some of the larger websites can be overwhelming with their choice of everything under the sun. This site, based in Flemish Belgium, specialises in the Belgian radio scene. The 'Live' section has a useful list that includes links to Talk Radio stations and the *Real Radio Magazine* site, described as '*The ultimate list for live radio on the Internet*'.

http://www.ping.be/~ping0837/stationsb.htm

From the USA comes the award winning '*world-wide Black Radio Stations*' website, with over a dozen awards including Mr Media website of the week, Open Directory Cool Site Award, and Radio Contacts Hotsite.

http://www.radioblack.com/

This is a guide to over 875 radio stations around the world, with radio formats '*catering to the Black, Urban, African American market and fans there of. Black Radio Stations have music formats such as: Gospel, Hip Hop, Rap, R&B, Jazz, Blues, Soul, Reggae, Caribbean, Soca, Reggae Dancehall, Go-Go, African and Talk relevant to the Black community*'.

More than 200 of the stations have webcasts including

Vienna ORF 1476 MW (Reggae , Soca) Bahamas, Nassau, Freeport, 100.3 FM, 100 JAMZ; R&B , Hip Hop , Reggae , Reggae Dancehall, Soca, Gospel; Junkanoo and Calypso; Gospel on Sundays.

Haiti, Port-au-Prince, 99.3 FM, Vision 2000; Soca , Hip-Hop, Reggae, Jazz and Calypso.

If you want to listen in on the Canadian radio scene, then go to

http://www.canehdian.com/radio3.html

where you can access stations by musical genre, enter competitions and plenty more. '*featuring most Canadian radio stations, indexed by call signal (e.g.: CIGO)...Browse through comprehensive listings of radio stations for Canada's largest cities. Internet Radio Stations The newest force in Canadian radio. University Stations - The place where our future disk jockeys (sic) fine-tune their radio skills*'.

Although the use of the web is a technological leap forward for the world of radio, both in broadcasting and in disseminating information about the medium, don't forget that the Internet remains radio's servant, not it's master.

More next month when we continue our journey and listen to some of the bigger national and international stations broadcasting on the Internet.

tried & tested

Grundig Pors

Radio Active tests a portable short wave radio designed by F A Porsche

I first saw the Grundig Porsche P2000 in one of the dealers adverts in *Radio Active* back last year. Even in the adverts it scored 11 out of 10 for looks, but I wasn't sure whether its performance would match! Grundig kindly agreed to loan us a radio so we could find out. This is the first 'designer' short wave radio for many years. Grundig have commissioned F A Porsche to make special versions of other Grundig products, but this is the first short wave portable radio to get the treatment.

When the P2000 arrived it certainly lived up to the advert! It's a compact radio, small but not so small that it is fiddly to operate. All the rectangular buttons sit in a circular cut out making operation quick and easy. Its design is certainly stylish and different, which made it a very pleasant addition to the household.

Protected by a heavy-duty leather wrap-around case, the silver finish and design is different. Let's be honest, even a well-worn and slightly battered leather case will look much better than a scratched silver radio! With the case covering the radio only the speaker and power button are accessible, but fold back the cover and it becomes an effective stand for the radio. OK, so it looks good and is well laid out, but what was it like to use?

Operation

Let's look at the non-radio bits first. The Grundig P2000 has an alarm function that is very effective. Ideal if you plan to take a radio like this on your travels as it doubles as a clock and alarm. You can either have a noisy buzzer or a radio station of your choice wake you up. Other functions are the clock and 'sleep' function, which was the usual radio playing for a set time (adjustable between 10 and 90 minutes) before switching off automatically. Finally, for the non-radio side of the P2000, the backlight. The button in the top right hand corner switched on an effective backlight that I found provided enough light to see the display easily both in low light and darkness.

The **LOCK** button is useful when the radio is being carried around as it prevents any settings being changed accidentally. The power switch can be locked too if the button is slid into place when the radio is switched off, this prevents the radio being switched on accidentally and running the batteries flat.

The audio tone was pleasant, enough bass to make music comfortable and quite a bit of treble, which helped with both speech and weak signals. I always prefer using headphones or earpieces and the ones supplied were very comfortable stereo earpieces. Whilst listening to Radio Solent I tried taking the earpieces out and comparing the sound between the two. The internal speaker certainly sounded different, not unpleasant, but not as 'full' a sound. It probably has a lot to do with having the sound right inside your ear when using the earpieces.

I worked my way through all the controls before settling down for some serious listening. You can step up and down through any of the bands using the ∧ and ∨ keys, with the step size changing depending on the band you're using. There is no main tuning control and no fine tuning either. Alternatively, you can just go for direct frequency entry if you know where you want to find a station.

To move around the various short wave bands, and there are 13

Grundig Porsche P2000 • Price – £89.95 • Available – Now • Stockists – Check out Grundig dealers

che P2000

of them, it's best to use the **METER** button. The sequence was: 2.3 > 3.15 > 3.85 > 4.7 > 5.75 > 7.05MHz on SW1 and 9.4 > 11.50 > 13.5 > 14.95 > 17.4 > 21.3 > 25.6MHz on SW2. The **METER** button doesn't have any effect on the MW and FM bands.

Results

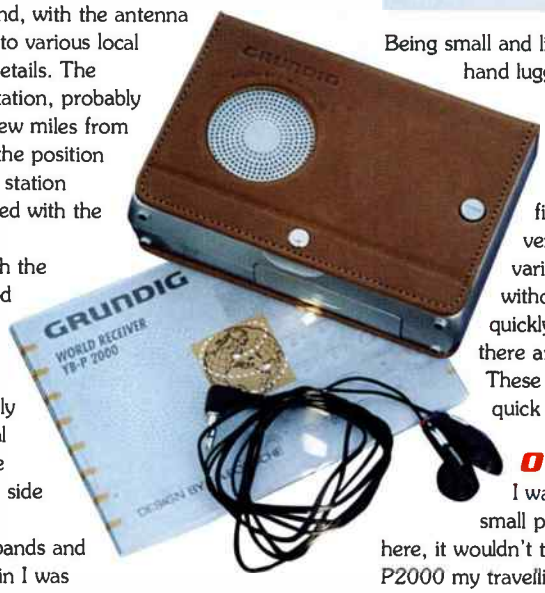
The first chance I had to use the radio was under some of the most difficult circumstances. I had cause to be in a local sports centre - as a spectator - and so had a couple of hours to spare. With no windows to put the radio near and being inside a steel structure I didn't expect any real results whatsoever. How wrong I was!

Starting on the medium wave band, with the antenna fully extended, I was soon listening to various local radio stations, see Table 1 for full details. The stations logged included a French station, probably from Rennes. I know I was only a few miles from the coast, but by the time you add the position of the radio and the distance of the station heard, you can see why I was pleased with the results.

Next followed a quick trip through the VHF FM band. Results were as good here, but when I tried again at home - a much better radio location - the stations were there to be heard. Obviously stations can only be heard in mono using the external speaker, but good stereo is available from the headphones socket on the side panel.

Finally, I thought I'd try the SW bands and see if anything could be heard. Again I was pleased with the results, see Table 1.

A small portable like this is the type of radio you would tend to take away on holiday, trips away for work and other portable operation.



Specification

Range:	
FM:	87.5-108MHz
MW:	522-1620kHz
SW1:	2.3-7.4MHz
SW2:	9.4-26.1MHz
Audio:	500mW peak power
Speaker:	2in wide range
Tuning Steps:	5, 9 & 50kHz
Antennas:	MW - ferrite rod
	FM/SW - telescopic antenna
Power:	4.5V plug-in (not supplied)
	3 x AA cells
Connections:	3.5mm stereo for headphones
	5.5mm for DC connector
Dimensions:	142 x 92 x 35mm
Weight:	3309 (without batteries)

Being small and light-weight it wouldn't take up much room in your hand luggage but gives good results.

Getting back home gave me a chance to read the manual and try the P2000 under more favourable conditions. The instruction book is in 10 languages, but the pages are edge marked to make it easy to find your preferred language. It was well-written and very easy to understand, with diagrams to illustrate various points. It dealt with all the functions of the radio without confusion enabling the user to get the best results quickly. It was after reading the manual that I discovered there are five programmable memories on each band. These would be ideal for storing your favourite stations for quick reference.

Overall

I was really pleased with the sensitivity and sound of the small portable. If I didn't already have too many radios here, it wouldn't take much persuasion to make the Grundig Porsche P2000 my travelling portable! Sadly it has now returned to Grundig - many thanks to them for the loan. I'm sure it will stand up to the knocks and bumps that a travel portable gets during its lifetime and still look good at the end of the day. The heavy leather case will protect the radio and the fact it also makes a stand puts the radio at a suitable angle for extended use.

The P2000 was very easy to use, stylish to look at (it occasioned much comment from those who saw the radio in use) and it gave great results. You can get an optional AC adaptor to save on batteries, although I didn't manage to flatten one set of batteries despite extensive use during the review. I was pleasantly surprised with audio tone, it was crisp enough to make listening to weak stations possible yet still pleasant for music listening. A fine tune control would have been useful, although there were only a few occasions when I would have like to have been able to off tune a station in the hope of picking up a weaker one.

I hope a few more radios get the designer touch, it certainly makes a pleasing change. Top marks Grundig!

■

Band	Frequency	Notes
MW	693kHz	5 Live. Discussions on the new England coach
	828kHz	Classic Gold Dorset & Hampshire playing Eric Clapton's *Leyla*
	909kHz	5 Live. Discussion on climbing Everest to 23,000ft
	1053kHz	Talk Sport
	1197kHz	Virgin Radio. Adverts
	1359kHz	BBC Radio Solent. Phone-in on young offenders.
MW	711kHz	French station ? Rennes ?
VHF	100.3MHz	Classic FM from Rowridge. Stereo classical music.
	107.6MHz	The NRG playing Madonna (this station is now called The Fire)
SW	5.955MHz	Radio Netherlands? UK records, Dutch(?) presenter.
	6.045MHz	Deutsche Welle
	11.755MHz	Voice of Russia
	13.800MHz	Radio Tashkent?. Female vocalist, ethnic music.

Table 1: Excellent results despite using the Grundig Porsche P2000 under extreme conditions

A stylish portable radio that gives good performance and value for money.

Them, watching u

Bill Robertson reveals what's behind those silent blu

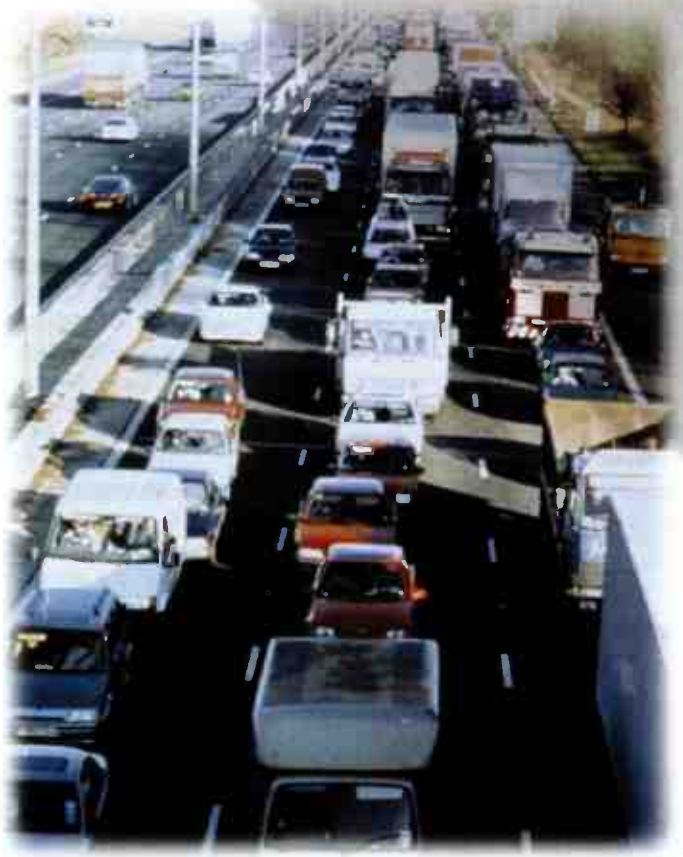
THERE MUST BE FEW MOTORISTS IN THE UK WHO HAVEN'T SEEN THE APPARENT 'SPEED CAMERAS' mounted on blue-painted posts around the UK. Much of the A-Road system in the UK has them dotted about every few miles, and there are similar sensors, although not as apparent, at virtually every motorway junction as well as on several motorway bridges.

What are they?

Are they police speed cameras, ready to catch the unsuspecting motorist who's doing a few miles per hour over the speed limit? Is a fixed penalty fine plus three points the result of passing these somewhat faster than you should do?

Many of us have witnessed the grey-painted rectangular boxes which really are traffic enforcement cameras, with their 'double flash' taking two consecutive pictures of speeding motorists, or those who jump traffic signals on red. These certainly are the ones to keep us 'in check'. But the blue ones are, reputedly, something rather different. They, if you believe what 'they' say, keep us informed of what speed the traffic's going at. Or rather, they're there to help us - the motorist - find out where the traffic isn't going at the speed that it should be. In other words, where there's traffic congestion. The TrafficMaster system does just this, using infra-red based cameras mounted on the blue poles, operating around the clock. In fact, on one section of the road network in Somerset these 'blue poles' had signs on them saying that they definitely weren't government speed enforcement cameras, to hopefully stop them being attacked by disgruntled motorists!

With this system using a small dashboard-mounted unit in your car, you can receive 'live' information of hold-ups in your area. Both the AA and RAC have units available at discount to members, one was even offering a free unit as an incentive for signing up as a new member. Other organisations and motoring retailers have similar units, with either free-to-use visual LED-based displays, or subscription-based units offering all manner of services such as voice alerts, up-to-date news, weather and sport information as well as traffic hold-ups.



How does it work?

The first TrafficMaster system relied on sensors mounted on motorway bridges to measure the local traffic speed, co-ordinated via their central headquarters, and transmitting data-based information at **433.92MHz** to receivers from the same installation 'boxes' which housed the local equipment. Take a look around a motorway junction, usually at the side of the road bridge on the elevated verge, and you'll typically see a grey-painted metal enclosure with similar grey poles containing the antennas.

The organisation later received permission to install a much more sophisticated system, the one that's now used with the infamous cobalt-blue poles, and there are already over 4000 of these around the UK. The system is based on car number plate tracking, and stores details of traffic movement based on number plate identification. It does this by measuring the time taken for a vehicle to travel between two successive 'blue pole' roadside sensors, usually spaced four miles apart, and converting this into a measure of traffic flow.

The patented system is called Passive Target Flow Measurement (PTFM for short) and came into 'live' operation in the UK in mid-1998. Each roadside unit converts this into a 'tag' along with the actual time that vehicle passed the sensor. Every four minutes, a data

...s, watching them

...ue guardians of the roads - the Trafficmaster system

transmission sends the tag and time information to TrafficMaster's central processing system which is currently in Milton Keynes, a new headquarters is also planned for Cranfield in Bedfordshire. This matches the tags and respective times, and thus calculates the average journey times between each of the four mile 'links' across the UK. This data is then re-transmitted throughout the network to us, the motorists.

Big Brother?

TrafficMaster claim they only read and store the central four characters of vehicle number plates. But then, most plates have 7 characters (so there are no 'middle four'!) as well as a wide variety of number plate lengths for personalised numbers, in my opinion the system must have the facility at least to read the whole number plate to be able to extract these four characters.

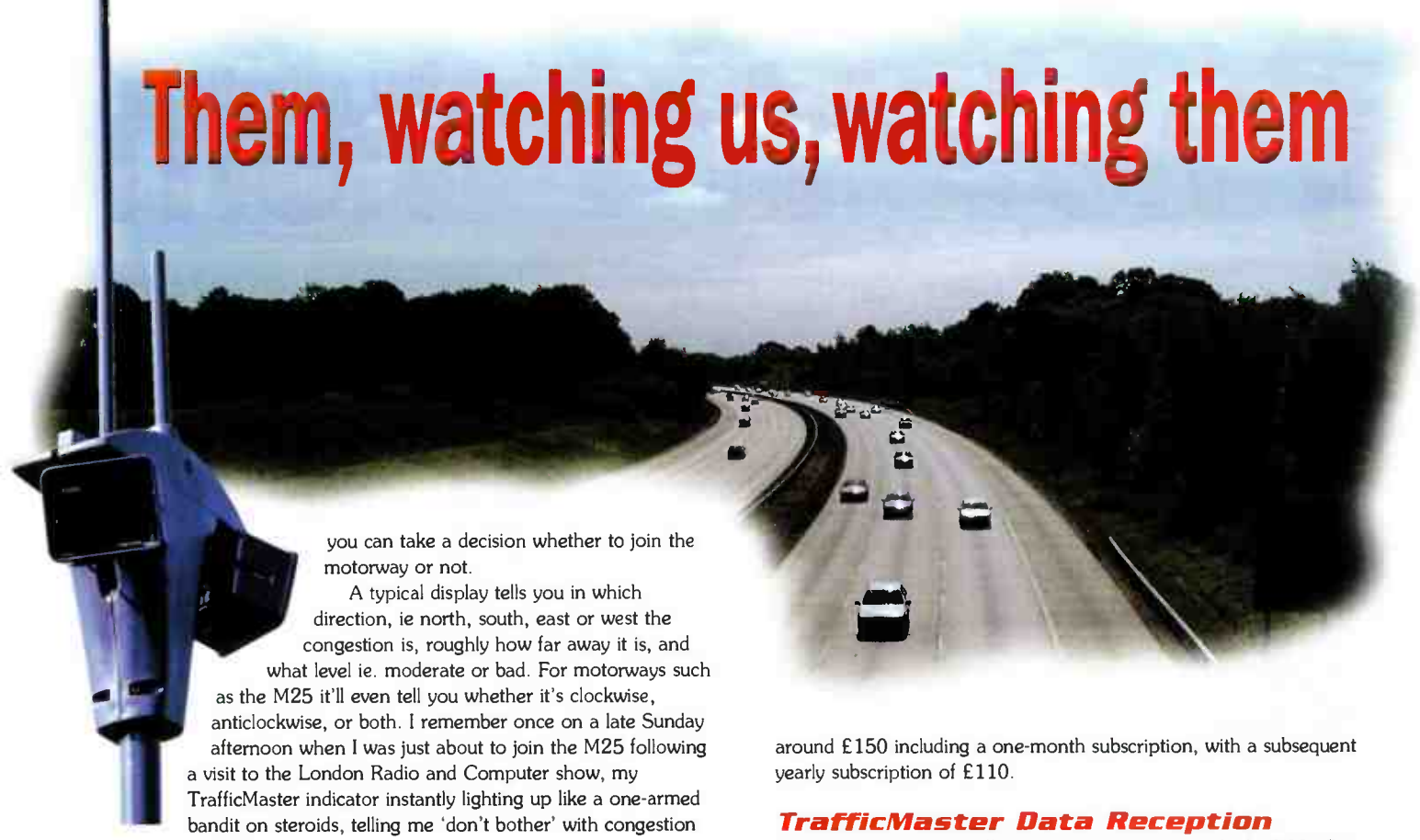
TrafficMaster however also say that only a sample of vehicles are used, so it's not definite that it's the details of every single car that's being stored and analysed. But all this does make the typical UK motorist think about the possibilities. Tracking of individual vehicles across the UK could certainly be possible, as well as an individual driver's journey time along a motorway or road to reveal an 'average speed' every few miles.

Information

The simplest receiver uses LEDs to give a local information display of any traffic congestion, up to several miles ahead. It receives its data signal from a sensor location you're physically near to, with a typical range of a few hundred metres from the antenna pole. This means that you can, if you wish, decide to leave the motorway or A-road you're travelling on to find a different route if you get an indication of problems ahead. It's also useful if, say, you're just about to join a motorway junction as the system can warn you of unseen congestion just along the motorway, so

Photos courtesy of TrafficMaster and Bill Robertson

Them, watching us, watching them



you can take a decision whether to join the motorway or not.

A typical display tells you in which direction, ie north, south, east or west the congestion is, roughly how far away it is, and what level ie. moderate or bad. For motorways such as the M25 it'll even tell you whether it's clockwise, anticlockwise, or both. I remember once on a late Sunday afternoon when I was just about to join the M25 following a visit to the London Radio and Computer show, my TrafficMaster indicator instantly lighting up like a one-armed bandit on steroids, telling me 'don't bother' with congestion in all directions!

Other subscription-based systems are also available, including the TrafficMaster YQ unit which can also act as a personal pager. Traffic information is displayed on the unit in an LCD 'map' format, which can be zoomed in or out as you wish - even the whole UK can be shown. When you 'zoom in' to a given area, slow traffic speed is shown as either 0, 5, 10, 15, 20 or 25 miles per hour.

As well as this, further 'pages' can be viewed which display news updates, sports and weather information. This is a 'wide area' system and, as it isn't just tied to in-car use, a number of transport companies such as airport couriers and haulage firms use these to good advantage in their offices. Wheras the 'local' in-car LED-based service is free to the user with a low purchase price, the 'YQ' unit costs around £150 including a one-month subscription, with a subsequent yearly subscription of £110.

The details of the system used by TrafficMaster are;

Receive Frequency:	**153.2750MHz** (FSK)
Data Format:	POCSAG
Data Speed:	512 bits per sec
Data RIC:	0901977

Publishers Note: Please be aware that although the information given in this feature is correct to the best of our knowledge, nothing in this feature should be construed to incite the reader to break the law, all details are provided for technical interest and educational information only.

TrafficMaster Data Reception

Inside the 'wide area' TrafficMaster unit there's a standard POCSAG (Post Office Standards Advisory Group) pager receiver. For the technically-minded, this uses the VodaPage network and each receiver has two 'capcodes', one for the personal pager and the other for the TrafficMaster information.

As regular readers of the *Radio Active* Scanners! and Software Spot columns will know, POCSAG signals can be received using a normal VHF/UHF scanner receiver, preferably with the audio output taken from the internal discriminator point, although the external earphone/speaker jack will often work as well. This audio from the receiver is then taken to a PC's sound card, with software such as POC32 or Semasoft used to decode the received data into on-screen text. The PD203 decoder program is also a popular choice, this needing just a simple data slicer circuit in-line between the receiver and your PC. I personally use POC32 which seems to work very well for POCSAG decoding.

For the benefit of readers, this month's *Radio Active* Software Spot CD carries the latest versions of all the above data decoder programs, plus several extra information files on data format decoding of the traffic, news, sport and weather transmission formats. ■

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satellite monitoring

2001 - our Space Odyssey unfolds says Lawrence Harris

As of 1st January 2001, we entered the new Millennium, and ahead - for this year and for the next several years - we will be able to literally watch and hear the progress of the construction of the International Space Station (ISS). If you are old enough (and I plead guilty), you may remember seeing Arthur C Clarke's seminal film, back in 1969, about a trip to the planet Jupiter. It was based on an earth-orbiting space station - as was then envisioned. In reality, the ISS has been designed within the constraints with which we are familiar - rather than those anticipated back in the 1960s.

The most impressive feature of the building of the ISS - at least in my view - is the ease with which the hobbyist and space enthusiast can monitor many of these events. The ISS is likely to become the brightest satellite visible from earth, possibly even brighter than planet Venus (which is shining in the western sky after sunset). I have already watched both the Shuttle and the ISS cross Plymouth skies during one clear, early evening. A tracking program and the latest Kepler elements ensured a positive identification.

What do you require to tune in and listen? The same equipment that you would use for monitoring any satellite: a suitable antenna, and a receiver that can tune to the desired frequencies. ISS frequencies? There are many, but the ones of greatest interest to us are in the VHF band - and may already be familiar!

Monitoring frequencies

The old MIR frequency of **143.625MHz** is being used for voice transmissions direct from satellite-to-ground. I have been monitoring these for some weeks.

Voice on **259.7MHz** from the Shuttle during launch has been reported during the early part of the flight while over Europe.

259.7MHz EVA 1 to shuttle & EVA 2
279.0MHz EVA 2 to shuttle & EVA 1
296.8MHz Shuttle to EVA 1 & 2
414.2MHz and 417.2MHz

Amateur Radio frequencies for ISS

STS-106 carried the first set of amateur radio hardware to the International Space Station. If you are interested in this international amateur collaboration, more information is available from:

http://ariss.gsfc.nasa.gov/

John D Corby reported on Monday 13th November 2000 that the crew of ISS has commenced operation of their ham radio equipment. The frequency to monitor is **145.800MHz** during crew rest periods.

Amateur radio satellite operators followed the launch of the *Soyuz TM-31* rocket that took place from the same site from which first human in space - Yuri Gagarin - blasted off in 1961. Aboard the *Soyuz* rocket was the *Expedition-1* crew bound for the International Space Station. The crew included commander/US astronaut Bill Shepherd KD5GSL, *Soyuz* vehicle commander/Russian cosmonaut Yuri Gidzenko and flight engineer/cosmonaut Sergei Krikalev U5MIR. The crew successfully docked with the ISS's *Zvezda* module as the spacecraft flew high above south-eastern Russia. The crew began, what many of us hope will be, a permanent human presence in space.

The Station has a radio callsign, following US astronaut Shepherd's request for a go-ahead to christen the outpost '*Alpha*' just hours after arriving at the complex. The *Expedition-1* crew's activities are scheduled such that their working day starts around 0800UTC and ends near 1900UTC - with a lunch break near 1200UTC. When the ISS passes over a given location, passes that are near the beginning, lunch, and end of the crew day could be favourable times to find a crewmember relaxing with ham activities. The crew should also have most weekends off - from about mid-Saturday until the end of Sunday. It is hoped that the power budget on *Alpha* will allow the astronauts to leave the packet rig powered during times when the crew cannot perform voice contacts.

The ARISS (Amateur Radio on the International Space Station) working group has requested that the packet rig be left on as much as possible. The crew has been trained in the use of the beaconing capabilities of the TNC. My thanks to NASA, AMSAT and ARISS for providing this information.

ISS Amateur radio workspace

Shuttle/Progress delivery schedule

The December Shuttle *STS-97* mission included the installation and checkout of the solar arrays, and an internal EVA (extra-vehicular activity) to move the *Zvezda* Docking Probe.

January's schedule includes continued checkout of the solar arrays, further experiments, a Progress unloading, the third *Progress* undocking, *STS-98* launch and docking, *Destiny* Laboratory installation and activation, *STS-98* undocking, *Soyuz* repositioning from *Zvezda* aft docking port to *Zarya* nadir port, and *Destiny* Laboratory checkouts.

February's schedule includes the fourth *Progress* re-supply Ship launch and docking, *Progress* unloading, US Laboratory *Destiny* checkouts, *Expedition One* crew packs for return to Earth, *STS-102* launch and docking, *Expedition One/Expedition Two* crew handover, *STS-102* undocking, *Expedition One* Crew returns to Earth with *STS-102* crew.

All of these operations will accompany voice communications, many of which may be monitored.

At this very moment as I write, Shuttle *STS-97* astronauts are installing the solar array wing onto the ISS. This is part of the P6 truss element, consisting of the array, an Integrated Electronics Assembly (IEA) section with a thermal radiator for the solar wing, and the Long Spacer (LS) truss segment with two thermal radiators for the *Destiny* module, which follows on a later flight). P6 will be installed on one end of the Z1 truss, though later, during further assembly, it will be moved to the other end of the port truss.

In fully deployed mode, the solar arrays are over 73m from tip to tip, and 11.58m wide.

(ISS01-E-5011 taken November 2000) - A mass of storm clouds was captured on film from the International Space Station (ISS) by the Expedition 1 crew members. The picture, made with an Electrical Still Camera (ESC), was the first Earth observation still image downlinked by the three-man crew

Mystery signal identified

On November 5th. **Robert Christy** heard an unexpected satellite transmission on a frequency of **400.326MHz**. Robert is a member of the Kettering Group that monitors satellites, and has previously made some astonishing discoveries - such as identifying an unknown Russian launch site during the Cold War period of the 1960s and 1970s. After monitoring the signals for about two weeks, he came to the conclusion that the signals emanated from *Resurs 01-N4* - a weather satellite (WXSAT) that transmits APT (picture) imagery on **137.85MHz**. *Resurs* is routinely monitored by WXSAT hobbyists all over the world.

Following discussions with others, he was able to confirm that the unidentified transmissions were probably emanating from a piggy-back package called Little Leo - a European Space Agency data store-dump system which downloads once per orbit through a ground station near Spitsbergen, Norway. They believe that the signal being picked up is probably the trigger to activate uplinks from user stations as the satellite passes. This transmitter has been tracked by Robert. **Sven Grahn** and **Chris Wood** - all in Europe - and reception should be possible world-wide.

Signal characteristics are five distinct channels of signal at 4kHz intervals centred on **400.326MHz**. Each channel carries a series of rapid pulses at a rate of 1.3kHz. Although weak, they show up well on a receiver in CW mode. The transmitter appears to be on continuously - or at least transmissions are not confined to the European land mass. I am grateful to Robert for this information. It demonstrates once more, the potential discoveries that can be made by scanner frequency sweeps. In this particular instance, Robert had left the scanner frequency set for reception of a different satellite!

MIR to be de-orbited

Russia finally announced that the Mir complex will be de-orbited around 28th February 2001. This massive undertaking will be achieved by docking two *Progress* supply vessels with the MIR station, and then the *Progress* engines will be used to perform a re-entry manoeuvre. Yuri Koptev is the head of the Russian Space Agency, and he has stated that Mir will re-enter between 1500 and 2000km to the east of Australia.

Readers' monitoring logs

If you have been successfully monitoring any of the satellites mentioned in this bi-monthly column, or other satellites not recently covered, drop me a line or e-mail containing a description of your receiving equipment and a summary of your logged data. I can then pass the information on to enable other readers to appreciate that they are not the only hobbyists trying something 'out of the ordinary'! ■

Fig. 2: STS-106 docked to ISS

The four corners of the earth.

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