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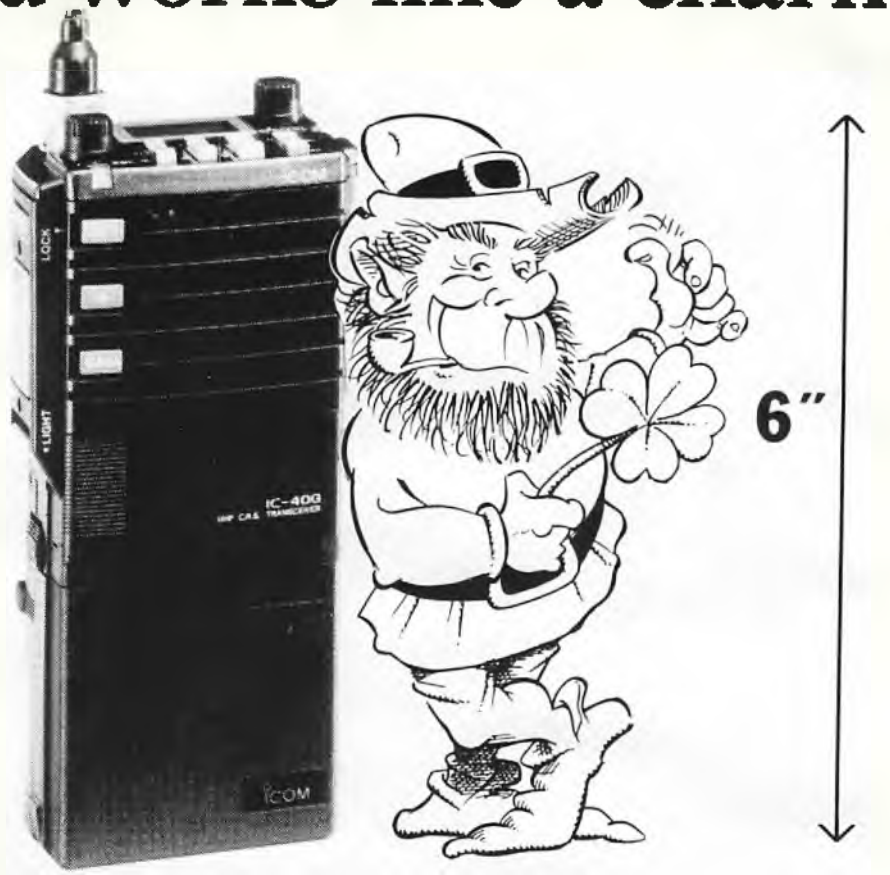

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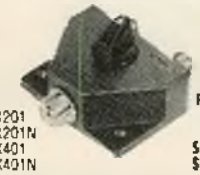

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ON CHANNEL

IT'S SURVEY TIME

Elsewhere in this issue you will find our annual 'questionnaire' which provides you, the reader, with the opportunity to tell us what you like and/or dislike in CB Action. We take the results of our surveys very seriously indeed and it is as a direct result of previous surveys that our scanning, shortwave listening, HF utilities and communication's oriented computer software have first been incorporated into the magazine and later, again as a direct response to your requests, enlarged due to their popularity.

While CB radio continues to be extremely important to us, it is obvious that many readers who first bought CBA to read about UHF and HF CB have now also turned their attention to other facets of radio communication. We have found that the first time buyer of CBA has almost always bought it to read about 27MHz, however, as he reads about the many other areas of radio communication available to him his interest expands to scanning or shortwave listening. He usually retains his enthusiasm for 27MHz, often also purchases a UHF rig, with a scanner becoming the third purchase.

In short, he learns that there is much more to radio communications than just 11-metre CB.

Our 1991 survey is more comprehensive than in the past. We are finding that we require solid input if we are to keep up with the changing interests of our readers and we ask you all to please take the necessary few minutes to answer the questions and make known your preferences to our staff.

As an inducement, we will again give away a free six-issue subscription to a reader in each state so be in it, get your survey answers back to us as early as possible and assist us in ensuring that you get what you want in CBA.

IN THIS ISSUE

Part two of Bob Lopaka's 'Military Action' is one of the main features of this issue and judging from some 'phone calls we've received there are a lot of readers out there listening to the action.

There will also be a lot of interest from 'old-time CBers' in the just released on the local market Midland 79-265 AM/SSB rig. Midland was a much sought after make during the mid-seventies boom-time, but, it slowly vanished from the scene with just a couple of AM-only rigs making occasional returns until now. Ken Reynolds has checked it out with a full review and, just to make your day, it is this issue's major Wordmaze prize. To go with it is a South Pacific Radio donated 27MHz Sniper base antenna and a length of coax, all the winner needs to do is buy a power supply and you're on air (providing of course that you also have a licence).

There's plenty to interest almost everyone in this issue. Reviews of the AR 2500 u-beaut scanner, also the AR477 UHF handheld and a good summary of just what those CB specifications mean by Lou Franklin plus a whole lot more.

Enjoy the read...

CB Action

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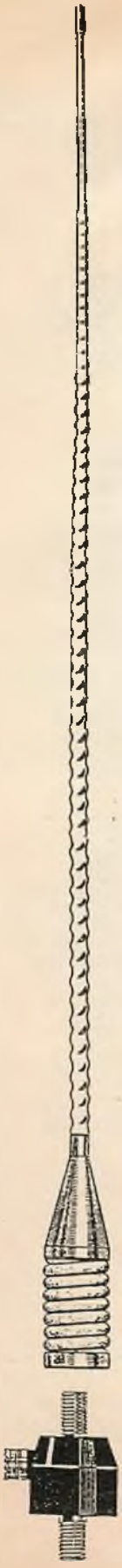

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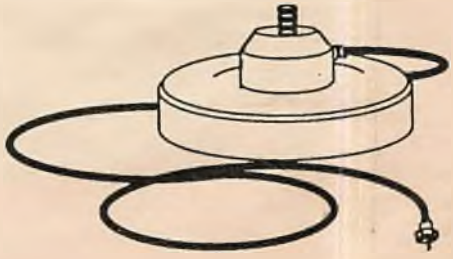

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Codes, callsigns and frequencies all spell out . . .

MILITARY ACTION

By BOB LOPAKA

This is part two of 'Military Action', a broad look at the communication systems, callsigns, codes and frequencies of the armed forces, particularly those of Australia and America...part one appeared in our Jan/Feb '91 issue and a limited number of this issue are still available from our 'back order' department, 'phone (03) 6014206. The author, Bob Lopaka, is a specialist in this area and he, with the assistance of air-band specialist Bob Bell, gives you the information to put yourself very much in the 'action' seat.

WHAT SORT OF EQUIPMENT WERE THEY USING IN HONDURAS 1983-84?

The main vehicular mounted VHF tactical radios found in jeeps, armored personnel carriers and tanks at that time seemed to be the AN/VRC-46 mobile sets, coupled to vertical monopole whips. These low band units were capable of tuning 10/preset frequencies in the 30 to 76 MHz range. We are talking about high tech radios here, capable of high security scrambled speech, but as happens, more often than not...according to those I mix with who listened in on VHF, the scramblers were not always activated when they should have been and the ute monitoring world got to hear an amazing amount of seemingly sensitive information.

Frequently the American "advisors" handed over sophisticated battlefield radios such as the AN/PRC-77 to the local soldiers, who got to play with them in Spanish. Some of our monitoring fraternity speak Spanish! Need I say more? And some of these local Honduran soldiers didn't have the discipline of their American counterparts. As such it was a monitoring field day!

Talking about the AN/PRC-77 field radio, it weighs in at 27 kg, and covers VHF low-mid bands 30-88 MHz, and boasts channel spacing every 25 KHz rather than the previous 50 KHz increments. The AN/PRC-77 unit tunes in a maximum 2320 frequencies as opposed to 920 channels on the unit it replaced. The radio (nicknamed by Aussie and Yank grunts alike the "PRICK-77") can cope with data sent at 16 kilobits by plugging in a modular outboard databurst keyboard, or standard rates of 75/4800 baud. Spanish-speaking military operators mouthing lengthy alpha-numeric substitution codes were frequently heard using AN/PRC-77s by SWL utility buffs in all parts of Australia and New Zealand. The equipment can also utilise "electronic countermeasures" or frequency hopping techniques, with a potential to "hop" up to 100 times per second. Three output power levels are available,low, medium and high,and when the unit is vehicle-mounted it connects to an accompanying power amplifier providing 50- kilometre simplex range in the local area (not to even think about the international skip!).

The unit also boasts a signal strength/SWR/power meter, and can be tuned plus or minus 5 to 10kHz to lock onto a station with slightly drifting frequency. Perhaps the thing that Aussie troopers and Yankie GIs loved most about the AN/PRC-77 radio set was its ability to be used in whisper mode. Battlefield infantrymen, patrols, or sentries could whisper into the mouthpiece still delivering loud clear audio at the destination receiver.

In single-channel mode, the AN/PRC-77 is compatible with AN/VRC-12 radios, which have a smaller RT unit. Why should I highlight the AN/PRC-77? It was, and apparently still is, the western world's most commonly used military tactical radio transceiver, similar to the way the Motorola MX-350 portable radio is used by most police agencies in the western world!

I'll discuss some other equipment, including you-beaut satellite gear just a trifle further on.

JUST WHO IS ON LOW BAND MILITARY FREQUENCIES?

Armies across the world, including the USSR, consisting of infantry, cavalry, engineers, command and control, administration and aviation personnel carry out practice manoeuvres, search and rescue duties, and fight actual battles or carry out policing operations in the world's trouble spots.

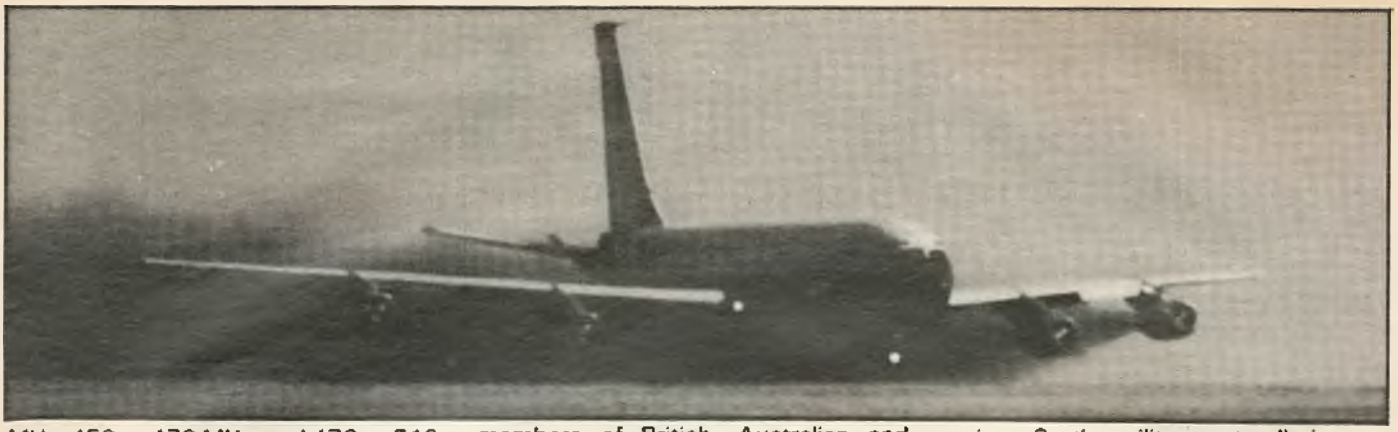
The bands are basically 30-30.5 MHz, 32-32.99, 34-34.399, 36-36.99, 38.2- 38.99, 40-41.99, 46.6-46.99, 49.6-49.99.

Here are just a few Australian Army frequencies (low/mid/high bands). The odd frequency is out of normal allocations: 37.5, 44.4, 44.55, 61.35, 70.46, 70.7, 78.94, 79.24, 79.42, 80.64, 80.76, 132.5, 132.9, 165.34.

OTHER BAND USAGE

Additionally, there is also use of VHF-FM high band 136-139.975 MHz and other scattered allocations in VHF-FM mid band from 68-88 MHz, some UHF frequencies between 400 and 450

This is part two of a two part article in which Bob Lopaka spells out where to listen for military communications and how to understand what they're saying when they use codewords.



MHz, 450 to 470 MHz, and 470 to 512 MHz. Not much use is believed to be made of bands between 512 MHz and 1 GHz, but above 1 GHz in the microwave bands, many channels are designated for military usage including those for satellite communication.

Military aviation occupies 225 MHz to 299.975 MHz in AM mode, and this is also the home of much satellite activity, including the US Navy Fleetsatcom operation within the 261 to 262 MHz band. Two "birds" are flying, the one with a footprint over Australia is heard every 25 MHz between 261.45 MHz and 261.95 MHz, in FM mode, not AM. **Fleetsatcom frequencies:** 261.45, 261.475, 261.5, 261.525, 261.55, 261.575, 261.6, 261.625, 261.65, 261.675, 261.7, 261.725, 261.75, 261.775, 261.8, 261.825, 261.85, 261.875, 261.9, 261.925, 261.95.

Narrow FM mode, satellite geo-stationary 172 degrees east.

SATELLITE EQUIPMENT (TRANSCEIVERS)

Satellite equipment available to friendly western allies of the US including Australia is state-of-the-art. The URC-101/110 single-channel tactical satellite transmitter (Tacsat) is a commonly found unit. It can be combined with Securefax or Tacfax using a unit designated as the AN/GXC-7 facsimile unit.

The portable AN/PSC-3 manpack and AN/VSC-7 vehicular satellite radio are two transceivers Australian monitoring enthusiasts hear being used by participants in the US Navy Fleetsatcom network. This portable unit is quite incredible to behold, and weighs in at only 14lbs or 6.36 kilos, and is carried by a soldier or sailor on his person! The unit is capable of high-speed transmissions using an attachable keypad for Databurst communications. Databurst is the name given to the process where large amounts of "intelligent" data is transmitted in bursts lasting only seconds. The message is "stored" until an appropriate moment, then "fired" off in a very short burst, making RF detection extremely difficult.

MILITARY BAND-SCANNERS

No...I'm not referring to us military monitors, I'm actually talking about members of British, Australian and United States army communications units actively detailed to bandscan and come up with clear frequencies right across the radio spectrum for possible future use. These armies are certainly not backward in coming forward when it comes to pinching spectrum space, even space they are not supposed to be using. I have spoken to several Aussie army personnel who were detailed regularly to do nothing else but search for clear channels! Now that's my kinda job!

SINCGARS

Single channel ground and airborne radio subsystem replaced the earlier AN/VRC-12 radios. The Sincgars AN/VRC-46 sets were developed in 1074, and are modular in design, small, lightweight and very portable, throwing army command and control into the 21st century with Securenet option, low maintenance, and relatively low cost.

TACTICAL CALLSIGNS

These are usually a combination of letters and numbers or words. Frequently callsigns are letter-digit-letter, as in "Juliett-4-Bravo", or "Whiskey-7-Xray."

Networked tactical callsigns are almost a hobby within a hobby...that is just trying to figure out who is who. Believe me, it's a no-win game. When the callsigns get to that condition, it's not always possible to go much further unless someone slips up and says more than he should. That does occasionally happen however.

MILITARY AFFILIATE RADIO SYSTEM (MARS)

Defense with emergency communications on a local, national and international basis. The headquarters are in Arizona, US, and the communications facilities at their disposal include equipment for voice, radio-teletype and data transmissions. Civilian amateur radio operators (HAMS) work together with soldiers on air in the MARS network. There are even services called Marsgrams, where radio messages to MARS stations can be written down then mailed to the serviceman's home.

FIBRE-OPTIC TECHNOLOGY

One fibre optics cable can carry as much information as up to 900 copper wires. So the military naturally is very interested in the technology, and has started using it. Specialist skills have had to be learnt to handle repair tasks, as rather than soldering irons and screwdrivers, surgical scissors, microscopes, and diamond-tipped cutters have to be utilized.

Fibre optics work by transmitting light pulses over minute glass fibres. The sources I have say at this stage they don't believe that the technology can be tapped. At this stage...

FURTHER FREQUENCY INFORMATION

US military aircraft are regularly copied on the 30 to 31 MHz portion of the band, sometimes using DVP, TDM scrambling, SSB, and occasionally guard tones.

Naval ships are frequently copied on the 33MHz band, with airforce and army operations to be heard on 34 MHz. 41.5 MHz is a frequently copied frequency used by US army aviation control towers.

TERMINOLOGY (JARGON)

Alpha Alpha-Assembly area.
Camo-Camouflage or scrambling.
Ci-Tech-Cipher Technician.
Cracker Box-Armored personnel carrier.
DZ-Drop zone.
Go Green-Activate scrambler.
Hot-Active area.
Go Red-Use clear voice when speaking on the radio.
Lima Charlie-Loud and clear.
Oscar Papa-Observation post.
Sitrep-Situation report

SOMETHING TO REMEMBER!

Don't forget to tune across stock-standard shortwave broadcast station frequencies for stations transmitting either in or near the countries being invaded or actually carrying out the invasion, or fighting a border war. These stations can sometimes be more interesting and provide more detailed information to you than listening to military communications nets. Just something to remember!

AUSTRALIAN ARMY CALLSIGNS

1...2...3-squadron or company. 4-heavy weapons. 5-quartermaster.

(Continued over . . .)

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MILITARY ACTION

PART TWO CONTINUED

6...7- surveillance and air defence. 8- light aid (RAEME). 9-commander.

CODEWORDS

Commander-sunray.
Second in command-sunray minor.
Operations adjutant-seagull.
Quartermaster-molar.
Armor-ironside.
Artillery-shelldrake.
Locating artillery-cracker.
Engineers-holdfast.
Signals-pronto.
Infantry-foound.
Aviation-hawkeye.
Transport-playtime.
Ordnance-rickshaw.
Medical-starlight.
Raeme-bluebell.
Provost-watchdog.
Intelligence-acorn.

NAVAL COMMUNICATIONS

A great deal of naval communications takes place within the military UHF block between 225 MHz and 399.975 MHz while the vessels are at sea. If in company with a flotilla of other naval shipping, a naval vessel will by virtue of the short-range nature of the communications, usually only a maximum of 15 nautical miles, communicate on UHF military or marine VHF frequencies such as 156.475/156.575, or use semaphore or lantern signalling if the ships are within a couple of miles of each other. All exotic modes are used, such as CW (morse), radio teletype transmissions using FEC, or forward error correction, facsimile and packet databursts.

Satellite communications using INMARSAT birds are also commonplace as is the use of thousands of HF frequencies by navies worldwide.

Royal Navy: 4221, 4244.2, 4246.2, 4247.8, 4280, 4300.1, 4305.8, 4307, 4310, 4321, 5014, 5400, 6362, 6407, 6413.7, 6414.1, 6433, 6434.7, 6435.5, 6490.7, 7771.5, 8492.6, 8494.8, 8499, 8534, 8600, 8652.2, 8646, 8673.3, 11193.5, 11994, 12740, 12741.8, 12807.7, 12844.5, 12921, 12987.2, 14690, 15760, 16345, 16937, 16938, 16987.2, 17030.5, 17030.8, 22335.2, 22384, 22454.2.

Royal New Zealand Navy: 4250, 4260.4, 6336.8, 6435.5, 8598.4, 8678, 12943.5, 14655, 16873.5, 16874.5, 17170.4, 19610, 22407.

Royal Australian Navy: 4304, 6738, 8160, 11176, 16918.8, 22485.

United States Navy: 4313, 5680, 5692, 5738.5, 5785, 6697, 6701, 6720, 6738, 6833.6, 7345, 7498.6, 7507, 7645, 7893.5, 8010, 8080, 8090, 8100, 8190, 8291, 8972, 8975, 8980, 8997, 9014, 9032, 9036, 9235, 9250, 9277, 9338, 10246, 10250, 10255, 10290, 10440.5, 10779, 10935, 10938, 11176, 11186, 11191, 11195, 11255, 11258, 11522.5, 12003.5, 12200, 12205, 12691, 12723, 12862.5, 12867, 12903, 12966, 12975, 13110.1, 13181, 13231, 13372.5, 13483.5, 13807.5, 13862.5, 13974, 14385, 14441.5, 14470, 14606, 14766, 14771, 14862, 15027, 15061, 16061, 16298.5, 16410, 17127.2, 17530, 17982, 17985, 18009, 18012, 18087.5, 18435, 20100, 20225, 20623, 20776, 20936.4, 20987.4, 23281, 2328.4, 23298, 25589.5.

USSR Navy: 7577, 8456, 8508, 8523, 8576, 9145, 10433.5, 10434, 10725, 11114, 11132, 11278, 11406, 11488, 11555, 12056, 12723, 12744, 12752, 12824, 12967, 12995, 13045, 13064, 14405, 14510, 14544.5, 14556, 14696.5, 15465, 16090, 16942, 16948, 17045, 17088.8, 17110, 17130, 17183.5, 17424, 17504, 18560, 18696, 18952, 19985, 19993, 20764.1, 20765, 22450, 22454.5, 22500, 22568, 25130, 25175.

I can't do much more for you now . . . you are out on your own in the field of military monitoring from this moment. Go to it and discover one of the most fascinating and rewarding aspects of the monitoring hobby . . .

Acknowledgement: My sincere thanks to Bob Bell, for allowing me to reproduce vital information from his new book, "The Australian Airband Guide," the ultimate book for aeronautical monitoring.

SCAN

by RUSSELL BRYANT

*******All frequencies are in FM and all times are local, unless stated otherwise*******

CONFESSIONS OF A SCANNER USER

A number of readers have written to me asking, amongst other things, how I became involved in scanning. This is a light hearted look at how one person can become so involved in a pastime.

It doesn't take long from the moment you are introduced to scanning until you are hooked...hopelessly and utterly under the influence of monitoring the VHF/UHF bands.

My initiation into the ranks of the monitoring insane was an accidental one. I owned a simple AM/FM transistor radio which, when in the FM mode and with the dial at the lowest end of the scale (around 88 MHz), I discovered it would receive all three of the 83 MHz VHF police channels used in Sydney at the time, (circa 1974).

When I say all three channels, I meant all three, at once, no such thing as selectivity or adjacent channels rejection here. Irrespective of that drawback, the pocket 'trannie' served the purpose well, that is, until it departed this world suffering an overdose of leaking battery acid.

Determined not to allow this set-back to hamper my monitoring activities, I ventured into my local Tandy dealer and swapped $69.95 for a Patrolman CB 60. I was in radio heaven, AM/FM bands, VHF AM aircraft band, high band and low band VHF, (30-50 MHz), and the best bit was the new (?) UHF frequencies from 420-520 MHz. All this in one radio, all this for under $70.00, and it even had squelch on VHF/UHF-fantastic! The Patrolman CB 60 was (or should I say is, as it still appears in Tandy's catalogue) a variable tuning radio. Frequency readout was a little hit and miss, nevertheless it was capable of receiving the police on 468 MHz. Only seventy dollars, hell I would have paid twice that amount.

In the meantime I had acquired a four channel crystal controlled handheld scanner. The Fanon Courier Cop-Scan came with a crystal certificate, enabling me to obtain one free crystal, frequency of my choice, from a supplier in the United States. I eagerly completed the necessary details and posted the card to the given address in California. I waited for the return mail, I waited and waited and waited.

Finally, nine months later, I received my crystal and without delay I plugged it into the scanner. My passport to the world of drift free reception had arrived. The Patrolman was not known for stability !

By now I was hooked, this was the pastime for me, I could hear the news before it was news, then there were those new mobile car phones on 500 MHz being installed. The potential was tremendous !

About this time (1979) a radio shop had opened in the Haymarket area of Sydney. Emtronics (yes, they've been around that long) sold gear I didn't even know existed. One such piece of equipment was the Bearcat BC 210 programmable scanner. Looking more like an oversized calculator with a speaker, the BC 210 provided direct access to thousands of frequencies at the touch of a button. I was no longer restricted to four channels, I had ten of them. If that wasn't enough I could search for active frequencies between two parameters, continuously !

Deviating slightly, in the early days frequencies were precious commodities, almost gold like, if you found an interesting one you guarded it jealously. Red herrings were common in an attempt to put everyone else off the scent of a desired frequency. One such attempt had me searching between 30-50 MHz in an effort to locate the NSW Fire Brigade radio. I later discovered them on 78 MHz.

Undaunted by the misinformation supplied, I decided I was missing too much being unable to receive frequencies in the Australian lowband. I had little trouble selling the Bearcat BC 210 to a member of the vehicle recovery industry (a towie). Its sale partially funded my purchase of another Bearcat, the 220FB.

Not only did it cover 68-88 MHz, but also the VHF aircraft band, something the BC210 lacked. I now considered I owned the ultimate in scanning receivers, so I concentrated my efforts on hearing more than just activity in my local area. A trip to my neighborhood car accessory shop proved successful, for around ten dollars I bought a fibre-glass AM car antenna. Not knowing and in consequence little caring about impedance or tuning, I erected the whip on the guttering of my parent's house with the cable running through a window...my bedroom soon became optimistically known as 'the shack'.

Connected to the 220FB, the result was very pleasing, I could hear police stations over a hundred kilometres away, such far flung regions as Gosford, Moss Vale and Lithgow. Terrific, I could hear the country !

Nobody could have as many frequencies as I do, I thought, so many I can't remember them all, police, fire, ambulance and aircraft, I had the lot. With so many things to listen to, why should I restrict myself to just one scanner ? Why not two, maybe three, maybe a room full ? In time, however, for the moment, two will have to suffice, let's not get greedy.

The newest member of my scanner collection (if two is a collection) was a Regency M100, designed primarily for mobile use, I decided to fit it to my motor vehicle. Finding the ten frequencies to fill the memory was easy. The NSW Police operated six UHF channels in Sydney, that meant I could have two ambulance and two fire channels. With a modified (cut) 27 MHz whip pointed sky-ward to trap the signals, I was mobile monitoring.

I continued to experiment with different sets and antennae, always looking to increase the range of my listening. Since those early days I have NEVER been without a scanner, I even took one on my honeymoon. That's dedication for you, or possibly stupidity ? (I'll settle for the latter..Editor).

These are just some of the scanners and events experienced pursuing the hobby of scanning the airwaves, to relate them all would take many more pages than these. Suffice to say I am a confirmed scanner user, having owned about forty of the beasts. Although I have ventured into other aspects of radio and communications my first love continues to be scanning.

I now must issue a warning to those contemplating indulging, be prepared to spend money, be prepared to fall head first into an almost full time hobby. In the beginning one scanner is enough, then you can't live unless you own two, maybe a third for the car, and of course one for the boat, and one for the....

How did I become involved with CB Action ? That's another story...

MAIL BAG

Our first letter is from Steven of Townsville QLD. Steven is an amateur radio operator, however, he has seen the light and become an avid scanner enthusiast as well. Enough stirring...on with his frequencies, the Fire Service in Townsville uses 466.875 MHz and tests its radio at 0700 daily. The North Queensland Emergency Response Group has taken over where the National Safety Council left off, it operates a Bell 412 helicopter VH-NSB and a Beech King Air VH-NSD. Apart from ex-NSCA aircraft they are also using the old NSCA frequency of 466.300 MHz. Military operations occur on 281.000 AM air to ground as well as 134.1 AM in the VHF band. The Navy is active on HF 8161 kHz. The local radio station 4RR has 959.000 MHz WFM as its link between the studio and TX site. Finally, the SES repeater frequency 468.600 is active along with HF 2575, 3732, 3743, 4576, 11435 and 14745 kHz. Steve, it is really okay that you are an amateur, after all some of my best friends are amateurs.

COAX AND CODES

Moving to the other side of the country, Phil in Medina WA has a few questions. The first is, what type of co-ax is best suited to a scanner, 50 ohm or 75 ohm ? The answer is that it doesn't matter which cable you use, the impedance of the antenna connectors on all scanners is wide enough to cope with either 50 or 75 ohms cable. In some cases you could use the proverbial piece of wet string. Phil would like to know the frequencies used by Cockburn Sound Security and the WA Environmental Protection Agency...can any reader help with those ? Can a scanner be used to monitor police radar guns...asks Phil. No is the simple answer, police radar (depending on the type used) operate on frequencies around 24 GHz, many times the range of even the best scanner. Phil also provided a list of codes used by the West Australian Ambulance Service, a reader in the last issue requested assistance with these, 1=Domestic Accident, 2=Vehicle Accident, 3=Sporting Accident, 4=Industrial Accident, 5=Assault, 6=Burns, 7=Collapse, 8=Hanging, 9=Murder/Suicide, 10=Rape, 11=Shooting, 12=Stabbing, 14=Acute Abdominal, 15=G.I.T Blood, 16=Gynecological, 17=Obstetric, 18=Baby Born, 19=Other Surgical, 21=Cardiac Arrest, 22=Chest Pain, 23=Electrocution, 24=Near Drowning. These will be continued in our next issue.

VIC AMBO RADIO

Randal in Melbourne VIC checks in with an up-date on the new UHF ambulance allocations. It appears a number of problems have become evident with the change over from the old 76 MHz frequencies. Portable radios are rendered useless in some areas with officers resorting to the car sets or relying almost totally on the VHF channels, if they are still fitted to the cars. Randal would like to know the frequency used by the Victorian Small Business and Franchise Office. Any helpers ?

THE MISSING LINK

Errol in Proserpine QLD wonders why he can hear the police in his area on 460.275 MHz. The UHF frequency is a link, used between the control room and a mountain top transmitter site. The return frequency is 9.5 MHz below. He would also like to know QLD police channels 52 and 54 VHF. They are repeater channels, 76.430/77.450 CH.52 and 76.355/77.375 CH.54.

RF AMPLIFIERS

In a past issue I reviewed a mast head amplifier kit adapted for scanner use. Terry in Appin NSW writes praising the virtues of such devices. He uses a MASPRO WB 28TGS Mast Head Amp with up to 30dB gain. He states perfect reception as far north as Newcastle on VHF and south to Narooma on UHF. "They are, ", says Terry, "the way to go".

HELP FOR PUCKAPUNYAL READER

If there are any readers in or near Puckapunyal VIC, Alan would like to hear from you. He would appreciate any assistance with frequencies for his area. If you would like to help drop me a line and I will pass Alan's address on to you.

PENRITH RUGBY LEAGUE FREQS

"Is Penrith Rugby League Club really on 466.850 MHz"?, asks Scott of Werrington NSW. He has tried monitoring this frequency with nothing more than a trucking company heard. Can any reader verify the presence or otherwise of the club on 466.850? While you are at it, he would like to know the frequency for Dunheved Security and Lube Mobile Mechanics. He would also appreciate some help in identifying the user of 466.4 MHz. It appears to be a security company using police terminology.

FREQUENCIES FROM KANDOS

Troy has recently moved to Kandos and has wasted no time in logging the following frequencies in the area. The police have 468.050 as the cross band link covering Kandos, Rylstone, Mudgee, Dubbo, Wellington and Nyngan. The Ambulance can be heard on 76.745 and 76.670 MHz, with the fire brigade using 78.160 MHz. The local VRA has 84.480 for its communications. He compliments Scanning Action for its Bathurst 1000 frequencies last November.

(continued over)

SCAN

by RUSSELL BRYANT

CONVERSION FOR 100 XLT?

Can a Bearcat 100 XLT be converted to receive 800 MHz ? Gary in Sebastopol VIC would like to know. Basically no, while the PC board may have provision for the module used in the 200 XLT, it can't be upgraded because the 100 XLT doesn't support the other electronic components necessary to receive the higher frequencies. Scanner manufacturers often use PC boards in a variety of similar radios, each wired up to suit the particular model and price tag. Gary also supplies a few frequencies for Ballarat, the police use 168.160 and 467.925, the ambulance 76.670 and 76.910 and finally the SES 468.625.

PARLIAMENT HOUSE AND GAS

In the Nov/Dec issue the frequency printed for Parliament House Security is wrong, instead of 467.550 it should read 467.850. The Secret Republican, who noticed the mistake, also supplies his latest loggings. The Natural Gas Company 173.700, 173.790, 173.910, 173.940 and 173.970. During what seems to be the never ending cricket season, the police use 468.100 MHz at the Sydney Cricket Ground. The Republican has also been hearing voices on 84.005 MHz, this frequency is very close to channel 17 of the police VHF, however, the user is not the police force. Can a reader help ID the user ? Finally, the band 956.000 to 959.000 MHz is used for radio station to transmitter site links. Transmissions are WFM, 50 kHz spacing and low power. How about dropping me a note with the link frequency used in your town or area?

CHAUFFEUR CAR FREQS?

I suppose everyone is scanning the particular group or service that they enjoy monitoring above all others. For Paul in Wentworthville NSW, Hire Cars and Chauffeur Services are his special interest. With this group in mind Paul requests help in finding a few car companies, the first is the North West Hire Cars which were on 464.250 but aren't now, he would like their new frequency. Also, Castle Hill Limos used 493.350, however, they merged with Accent Limos and vacated their old channel. Does anyone know the new one ? He would also like the frequencies for Western Hills Hire Cars, Prestige Limousines, Exclusive Chauffeur Drive and Parramatta & City Limousines.

QLD DMR CHANNELS

In my last column a reader asked for the frequencies used by the various Main Roads and Transport Authorities. Colin in Sadliers Crossing QLD supplies the following, DMR Queensland 158.530, 158.695, 158.845, 158.875, 158.905, 158.920, 158.935, 158.965 and 159.055.

MIXED BAG

John in Macksville NSW uses several scanners to monitor services around the North Coast of NSW. Here are some of the frequencies he has fogged, 464.025 Nambucca Shire Council, 76.670 & 76.760 Ambulance, 78.010 Fire, 74.360 Electricity Supply, 168.850 & 468.600 SES, 84.480 Volunteer Rescue, 167.620 RTA, 73.100 Forestry Commission, 127.700 & 118.200 Coffs Harbour Airport.

MORE MISSING LINKS

Link frequencies used by the NSW Bushfire Brigades and State Emergency Services around Wyong, Cessnock and Port Stephens as well as statewide are the request of Mark from Raymond Terrace NSW. If a reader has any of the above please forward them to me and I will pass them onto Mark.

CELLPHONES NO, NO, NO!

Bullsbrook WA is where Wayne tunes the police on 79.090 Enquiries, 79.210 Tasking, 79.300 Tasking. He also listens to the RAAF at Pearce on 118.3 Tower, 118.5 Tower, 135.9 Departures. Yes the Cellphones are illegal...!

HELP WITH NEWCASTLE SERVICES?

Can anyone help with the frequencies for Newcastle Taxis, Aero Pelican, Lake Macquarie City Council, UTA buses around Newcastle, Fisheries Inspectors and Newcastle Coast Guard, asks Roberta in Bungwahl NSW. The taxis in Newcastle operate between 70 & 72 MHz, Lake Macquarie is on 164.350, UTA buses 161.140, Fisheries Inspectors 467.275. Maybe a reader in the Newcastle area could supply the Coast Guard frequencies?

UPGRADE FOR TASMANIAN AMBOS

The Tasmanian Ambulance Service has completed the upgrading of its radio network, abandoning the 4.2 GHz bearer and employing frequencies able to be monitored by a scanner. The new allocations are, Mt Barrow to Weldborough Pass RX 155.100/TX 155.300 MHz, Mt Barrow to Dazzler Ranges RX 875.8375/TX 830.8375 MHz, Mt Barrow to Millers Bluff RX 875.0625/TX 830.0625 MHz and Mt Barrow to Launceston RX 1755.500/TX 1874.500 MHz. Operational frequencies are North East Tasmania (Launceston Control, Main 78.160, Secondary 79.810. North West and West Coast (Burnie Control), Main 78.130, Secondary 79.345. Southern Tasmania (Hobart Control), Main 78.385, Secondary 79.960.

RACING RADIOS

In the Jan '91 column a reader in Diggers Rest VIC wanted to know the frequencies used at the Calder Park Thunderdome. It appears that there is a company specializing in monitoring motor racing teams. Racing Radios are offering a new concept for the racing spectator 'FAN SCAN'. For an annual fee of $30, FAN SCAN provides frequency lists for the race teams as well as track services. Lists are regularly updated and mailed to members before each event. Racing Radios will also be at each Thunderdome meeting. For further information contact RACING RADIOS FAN SCAN, P.O Box 850, Croydon North, VIC 3136.

WHAT IS KDT?

What does KDT mean, with regard to the South Australia Police data communications, asks Andrew from Windsor Gardens SA. My South Australian informant tells me it stands for Keyboard Data Terminal. The KDT840 is a Motorola product introduced with CAD or Computer Aided Dispatch by the South Australian Police on the 1st July 1990. CAD has not replaced voice comms totally, the two modes are being used in conjunction with each other. The cost of the KDT terminal is around $5000 per unit.

CONTACTS

NAME : John VENESS
CONTACT : RMB 138, MACKSVILLE NSW 2447
INTEREST: HF, VHF, UHF plus air and marine bands for Northern NSW.

NAME : Michael EVANS
CONTACT : PO Box 624, HAWTHORN VIC 3122
INTEREST: Anything 10-1000 MHz in Victoria plus Australia wide police.

NAME : Wayne LARSEN
CONTACT : PO Box 157, BUSSELTON WA 6280
INTEREST: Defence forces, aircraft and government services.

Contacts is available to SCAN readers who wish to correspond with others of a similar interest or within the same geographical area.

PROPAGATION

America is seen as the radio enthusiast's 'Mecca'. The equipment, services and accessories make it, or so it seems, the place to be. It may surprise readers to know that America is currently in the grip of a scanner and communications receiver drought.

Icom have not yet released their IC R-1 and R-100 or their new comms receiver the R-72. The reason is an understandable reluctance to inflame the situation in which ACE Communications finds itself, being sued by radio giant Uniden for alleged breaches of patent rights. It appears a number of manufacturers have delayed releasing new equipment while some importers have postponed bringing scanners into the country because of the legal action.

American scanner enthusiasts were, until recently, denied access to the Fairmate HP 100 and AOR 1000 handhelds, AOR 2500, Standard AX 700 and Yupiteru MVT 5000 and 6000 receivers because of the writs. The place to be..? I'll stay right where I am, thanks very much.

It appears, by the number of letters I receive, that there is a hardcore group of railway enthusiasts who monitor train radio. I have put together a booklet on a number of railway systems and their radio frequencies.

It is not a lavish production, it doesn't have expensive covers or color photos. Called ***'A Monitors Guide to Railway Communications'***, its 70 pages include the history of some systems, radio information plus channels and usage from around Australia.

The guide is priced at $7.50 which covers costs and includes postage anywhere in Australia. If you would like a copy, please write to the address at the base of the column.

While on the subject of railways, AN (Australian National Railways), recently completed the TAR, (Trans Australian Railway), fibre optic based UHF communications system. Worked through Port Augusta SA, the network provides voice communications for train crews and maintenance gangs between Port Augusta and South Australia, a distance of 1,700 kms. The frequencies used are within the Railways of Australia allocations.

AN has also been conducting trials of cellular telephones in lieu of pole and wayside telephones. The experiment, which was carried out on the Angaston SA line, proved so successful that AN is now investigating their use in other locations. Because cellular telephone are immune from monitoring, this is one portion of railway communications not available to scanner-using rail enthusiasts.

During 1989 cellular telephone services almost doubled in number, an astonishing 185,000 phones are now connected to the system. That is an increase of 95% on the 1988 figures.

June 1991 sees the withdrawal of the 500 MHz telephones from service in Sydney and Melbourne, followed by Brisbane in June '92 with Perth and Adelaide in June '93. Much has been discussed with regards to the future of the segments now occupied by the phones. DoTaC has opted for an 'auction sale' of the frequencies, seeking 'entrepreneurs wanting to establish large communications systems throughout Australia'. An interesting time is ahead for scanner users with the removal of telephone services. Stay tuned for future developments in the 500 MHz segment.

Hopefully we will now see the end of the overloading and intermodulation problems caused to our scanners by the PAMTS service.

As another column draws to a close, you will have noted that the column has had a change of image, the title has been shortened simply to SCAN and the column banner cleaned up. I consider the column, like scanning, to be a dynamic one, always on the move, always changing. The new look reflects a resolution not to go stale or rest on our laurels. Let me know your opinion.

Until the next issue, if you wish to write the address is;

SCAN
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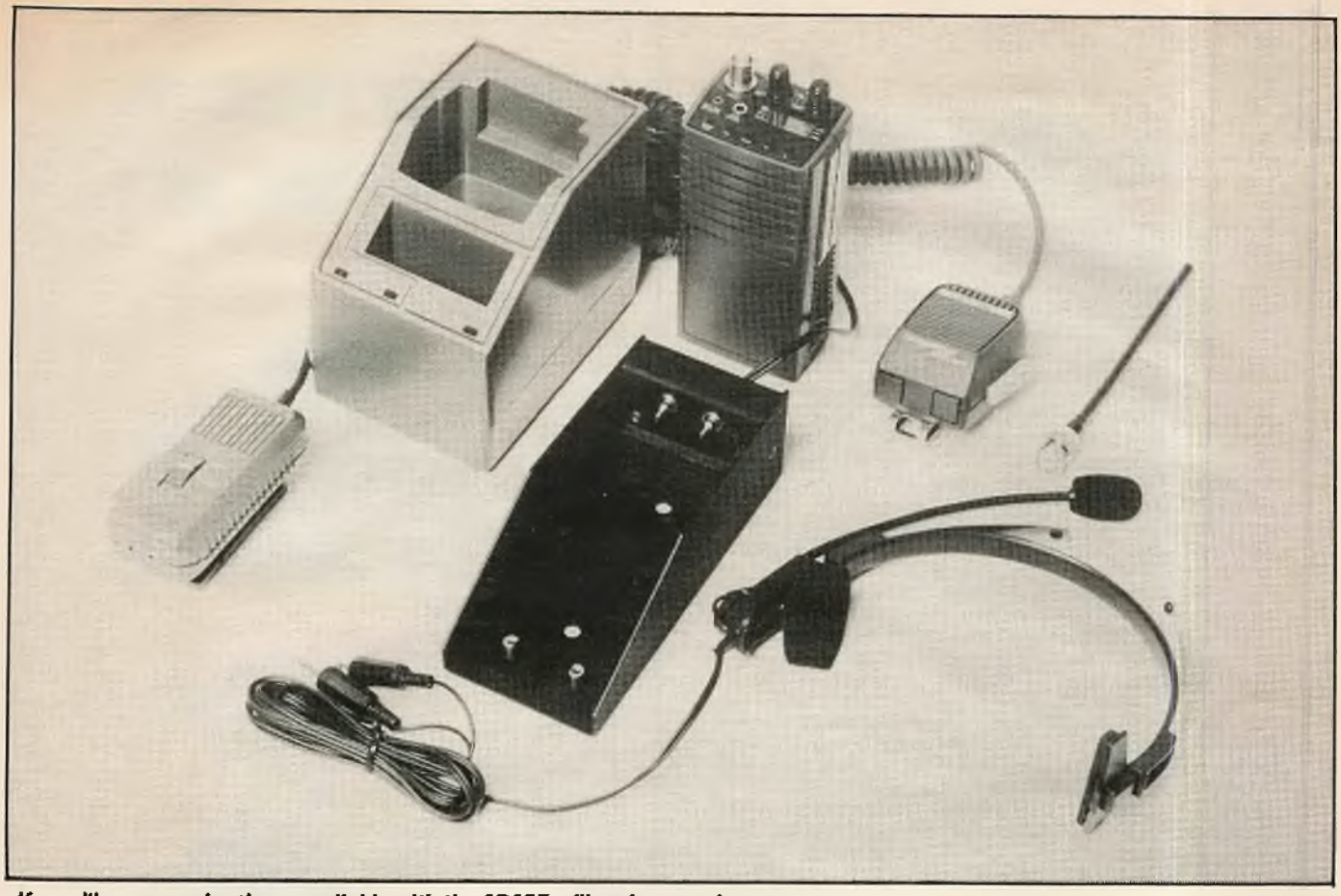


If you like accessories those available with the AR477 will make your day.

Greg Towells reviews the new

AR477 UHF HANDHELD

The Regency AR477 is one of the latest breed of UHF CB handheld transceivers. It is a dramatic reduction in size in comparison to the earlier types, an increase in output power, and a multitude of standard extra features only dreamed about some years ago.

The AR477 is one of these radios, and a hazard using it is the tendancy to put the radio down somewhere, then lose it, the unit being so small. Don't laugh, it happened to me more than once while playing with the Regency and its accessories.

Speaking of accessories, the AR477 has plenty, more than enough to ensure that it could easily become the sole radio of users on a limited budget. I will go into the accessories later, however, what is available has the potential to turn the AR477 into one of the most versatile packages I have seen for some time.

Now for the radio. The AR477 comes complete with a flimsy carry case, which I would replace fairly quickly with a more substantial transceiver case, antenna and metal belt clip ready to be screwed onto the radio. The operating instructions consist only of a fold-out sheet, but it appears to contain most of the information that a first-time user would require.

There are a few points that might have a user, not necessarily a first timer either, scratching his head in confusion after reading the operating instructions. One of these is the explanation of the controls and function buttons. While most are straightforward, there is no pictorial displaying the location of the controls and buttons mentioned, and this would lead to a reasonable amount of head scratching in order to find, for example, the TONE DEFEAT key. The instructions talk about it, but nothing on the radio is labelled as the tone defeat key. This key is used in conjunction with the powerlow key (thankfully labelled) to perform a lock function, to prevent the user accidentally pressing a key and initiating an unwanted function. Turns out that the tone defeat key is also the LCD lamp key (also unlabelled) situated

on the side of the radio. But it is a minor gripe.

One other gem in the instructions that might leave a beginner slightly bemused is the 'OPERATING PROCEDURE TO TRANSMIT' paragraph. A big highlighted caution warns the operator that a 'voltage standing wave ratio measurement must be performed prior to the use of the transmitter'. That would scare the hell out of some people I know. How many of you have performed VSWR checks on your handhelds before use? Another oversight?

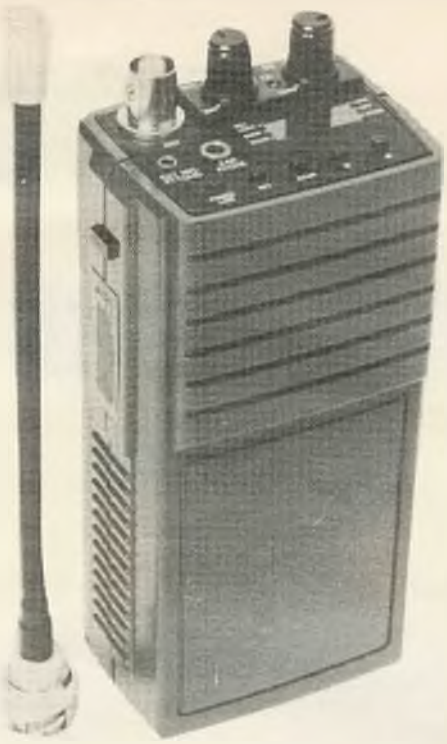
The radio itself is a compact 130mm x 63mm x 44mm and is the shade of grey common to most handhelds these days. The front of the unit looks pretty uninspiring, but on top is where the action is located. There are standard volume and squelch controls, with the squelch control doubling as the on/off switch for tone-coded squelch if fitted. The controls are a little cramped, particularly the volume/on/off switch, located right next to the antenna, making life difficult for those with big fingers, however it's a tiny radio with little space to spare so them's the breaks.

Right under the volume and squelch controls is the LCD channel display. It is a good size and has a backlight for easy navigation at night. The backlight extinguishes after approximately five seconds to further save power, a nice touch. The LCD display also has indicators to show the state of play of the scan operation, lockout, repeater offset on or off, low or high power, channel busy and keylock. All these are very easy to read at a glance, and this is the name of the game when the radio is in serious use.

Then there are five press button controls directly under the channel display. From left to right, they are power high/low, repeater offset, scan, and two buttons to advance the desired channel up or down. Each press of a button is greeted with an acknowledgement beep. The power level button selects high power of five watts or low power of one watt to conserve batteries. It is definitely a good idea to use low power whenever possible since high power operation flattens the battery in a few short hours, especially when you have a tendancy to waffle on a bit.

The full five-watt output is a definite bonus for this radio. I am used to handhelds with a high power of around 1.5 watt, and when I initially used the AR477, I was not aware that the full five was going out the stick (and frying the braincells, no, not really).

That power outperformed my old radio to such a degree that ol' faithful nearly ended up going in for a full grease and oil.



Repeaters that are usually not possible to crack were effortlessly used in most areas of my home. It is especially useful on high power in built-up areas such as inner Sydney, where a small UHF signal gets eaten up by everything around it. The AR477 handled it all with ease.

You must watch your amount of talk time with this radio because it does not have a battery low indicator or beep, the only indication of low battery power is the inability to transmit or receive anymore — just when you have something important to say! The solution is to carry a spare, and not to waffle on next time.

Having the full five watts available really blows away the main problem encountered in old handhelds — lack of range and therefore versatility. Many users, myself included, buy handheld UHF CBs to use when the mobile or base station is unavailable for whatever reason. The low power in many radios means a range of just down the road — fairly useless unless you happen to take your handheld into a high-rise office block or are situated real close to a repeater which pushes your signal a decent distance. It is rare that I use my handheld UHF for short point-to-point use intentionally, it is forced into that use because the range is dismal.

Enter the AR477 and five watts. Big increase in range, especially so if you use a 3db antenna on top. You will find that the radio will put a USEABLE signal into more repeaters, and linking handhelds up to repeaters is the strong point that most handheld UHF CB buyers and users will agree on.

The receiver of the AR477 is a match then for the high power of its transmitter. Many signals that my old radio missed were handled with ease by the AR477 (that service on ol' faithful is looking good!). Recovered audio is good and easy to listen to without too many bassy lows and scratchy highs. Audio output is 500 milliwatts — heaps for most uses. Sensitivity is quoted at 0.25uV at 12dB, well anyhow it sounded pretty good.

The Repeater Offset can be programmed for the desired channels between channels 1 to 8 individually. This is a great feature, because if in your area you only have repeaters on channels 2, 3, and 4, you only program the unit for repeater use on those channels and operation on every other channel is then simplex — no more moving from a repeater to another channel less than 9 and THEN have to fumble for the duplex switch to get rid of repeater operation, its already done!!

It is a shame that a few more MOBILE transceivers don't incorporate this type of idea. I prefer to forget the times that I have nearly driven the car up a telegraph pole while trying to change the '999 from duplex to simplex operation!

The SCAN function is a very good setup — in other words **IT'S SIMPLE.** Just press the scan button and it scans all 40 channels until a busy channel is heard. The scanning stops until the signal stops and there's a short delay, then it's back to scanning. If there are bucketmouths or terminal wafflers on any channel and you don't want the radio to keep stopping on that channel, it is just as simple to resolve. Just press the backlight key (the tone defeat key, remember, on the side of the radio) and the repeater key, and no more bucketmouths. It doesn't take long to lock out all the local repeaters at times! Each channel that is locked out has a little indicator next to it on the LCD display for future reference — if you forget to unlock it!

Now we get to the accessories. The AR477 has accessories coming out of its.....whatever sockets you care to name (yuk, that TV personality is getting to everyone!). First off, whatever handheld UHF CB you eventually decide to buy, I would recommend purchasing a 3dB antenna to replace the standard antenna — especially if you are looking at using the radio for anything except real short range communications. Only problem is in this case, the 3dB antenna is twice as long as the radio, but really

(Continued over)

worth using for the increase in range it produces. If you think that a radio as small as the AR477 would be unmanageable with a long 3dB antenna, think again. Some years ago I witnessed firsthand a group of unbalanced UHF CBers in a Sydney radio shop who attempted to use a 9dB BASE STATION ANTENNA atop of a UHF handheld. It performed great, but it waved around so much that it threatened to rip the antenna connection right out of the radio!

The battery pack is revealed by twisting a coin or a screwdriver in the slot on the bottom of the radio, which pops open the battery cover located at the back of the radio. The standard battery pack is a 10.8 volt 450 mAh capacity type, but an optional pack with a 500 mAh capacity can be obtained for a longer life, or more waffling at high power. When the battery pack is removed, all repeater settings, battery low and channel lockout settings are lost and must be reprogrammed. To eliminate this, a drop-in battery charger is available. Just drop the radio into the slot after use and the transceiver battery will be charged to within 85% of capacity after 3 hours. After this time, the charger will automatically change to the slower charging rate for the next three hours. After rapid charging finishes and when slow charging ends, their respective indicators extinguish to enable the user to determine when the radio is ready for use. There is also a slot for an additional battery pack to be charged, however it takes 14 hours to charge from flat in this slot. Both the radio and additional battery can be charged at the same time without any problems.

A speaker/microphone is also available for the AR477, which is very useful when using the radio in the mobile, or if you want to attach the radio to your belt and leave your hands free most of the time, except to work the mic. The plug on this type of speaker microphone is unusual in that

Controls are located on top of the unit and cover all the usual functions.

The drop-in battery charger will bring the batteries up to 85% efficiency after three hours.

an extra earphone socket is provided at the top of the plug, enabling an earphone to be used in conjunction with the microphone. I am a devotee of speaker/microphones and where the opportunity presents, I use them, so I was looking forward to checking out the AR's one. The audio from the speaker is very clear, even better than the internal speaker in the AR477 and very nice sounding. Unfortunately, the microphone side is not up to the standard of the speaker. Modulation comes across very low and muffled, requiring a very loud speaking voice, which seemed to muffle words more. I tried an old Santronic speaker/mic and there was a definite improvement in the audio going out. Maybe there was a problem with the speaker/mic that I received. I also tried out a Midland speaker/microphone that is available from Andrews Communications, and the improvement in clarity really eclipsed the original speaker/mic. The Midland unit is a really robust, good sounding piece of gear and sounds great on whatever it is used on, so I would suggest one for AR477 users.

Another useful accessory for the AR477 and one I really enjoyed using, is the Maxon Voice Operated/PTT headset assembly. This setup is ideally suited to the user requiring totally handfree operation, or limited handfree in a noisy environment. The heart of the system, the VOX Control Unit, is just slightly larger than a matchbox, and powered by a rechargeable 1.2 volt Nicad battery. Battery life is around seven to 14 days, again depending on your waffleability. Operation is simple, just plug the VOX control unit into the speaker/mic jacks on the AR477, plug the headset into the control unit, put the headset on your head, switch to VOX or PTT and away you go. Sensitivity adjustment controls are located on the back of the control unit behind the belt clip.

I found the factory presets acceptable for most conditions, but for noisy areas, just a slight adjustment with a screwdriver sorted things out for good operation. A wall charger is supplied to charge the necessary inbuilt Nicad battery, and an overnight charge was sufficient for weeks of operation.

One last and very useful addition to the AR477's list of extras is the Mobile Vehicle Adapter. Why it is called such is a mystery because it works when the vehicle is stationary as well. This device consists of a bracket which the AR477 simply slots into and you plug the cable into the cigarette lighter and away you go. Hook the radio up to an external antenna on the gutter or somewhere, add a speaker/microphone and you have a full power mobile station. Why bother buying another radio for the car? It would be just as simple to connect the mobile vehicle adapter to the power supply in the house, add a base station antenna and.....full featured base station. No need for an additional radio for the house. Maybe one day you might even get around to using the handheld as a **HANDHELD!** What a great idea.

Overall, I found the Regency AR477 a very nice radio, with a cluster of useful features. It is compact, yet offers high power to be sufficient in most operating conditions. It is definitely not complicated to operate, indeed I learned how to program repeater offsets, lockouts and scanning before I bothered to check out the handbook. Quite often handbooks have the ability to confuse rather than instruct! If the features of the radio are not convincing enough for a buyer, then the flock of accessories must sway that buyer. Certainly a nice package.

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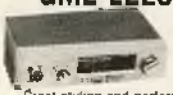

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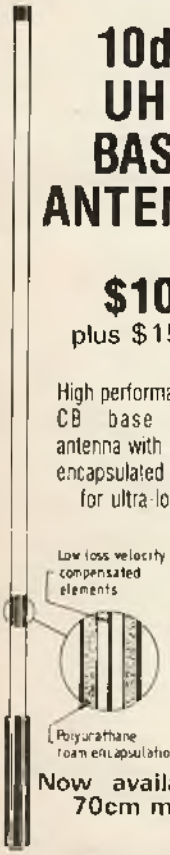

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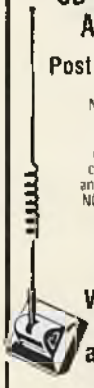

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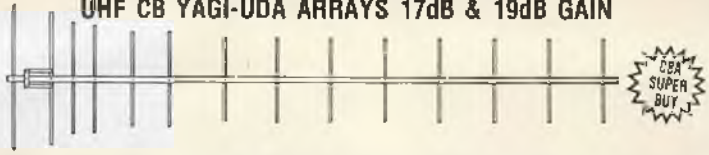

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Lou Franklin gives a summary of . . .

SPECIFICATIONS What do they mean?

Over the past five issues we have run an in-depth series on 'understanding specifications' by Ken Reynolds of Power Band Communications. The following article is a less technical piece which summarizes CB specifications in general and is published courtesy of Lou Franklin, author of 'Understanding & Repairing CB Radios' from which the article is taken.

Figure 1 is typical of the specifications found in CB radio service manuals. These particular specifications refer to the newly released in Australia Midland 79-265 which is reviewed elsewhere in this issue and is also the major prize for this month's Wordmaze.

First we'll list all the specifications, then we'll talk about what the most important ones mean. We'll skip the obvious specifications like size, weight, number of channels, etc.

FREQUENCY TOLERANCE

This specification refers to the guaranteed carrier frequency accuracy. It's usually expressed as a percentage, like '.005 percent', sometimes the actual tolerance in Hz is given. To figure the tolerances, multiply the carrier frequency by the tolerance percentage. As an example, assuming a frequency of 27.185MHz (Ch.19) and a tolerance of .005 percent, the actual value is:

27,185,000 x .00005 = +1359 Hz

Note the tolerance will change slightly from Ch.1 (1348 Hz) to Ch.40 (1370 Hz), since you're multiplying by different channel frequencies.

By the way, the value of .005 percent is the FCC (American equivalent to our Dept. of Transport and Communication) maximum, and practically all PLL CBs exceed this.

FREQUENCY STABILITY

This figure, expressed as a percentage of the center carrier frequency, indicates how much the frequency will drift after the unit warms up for 30 minutes. This is a measure of the transceiver's voltage regulation, operating temperature range, quality of crystals used, and general overall design. Again, with PLL control, frequency stability is excellent.

MICROPHONE

Nowadays these are always dynamic types with an impedance of 300-1K ohm. They may plug in or wire directly into the chassis as in some older 18 or 23- channel types. The dynamic element is the most desirable since it's very rugged, immune to temperature and humidity changes and, being low-impedance, is compatible with solid-state audio amps without needing transformers or other impedance matching circuits. Oldtimers may remember the Johnson CB line with its high-impedance ceramic mikes; being less common, they were harder to repair.

While we're at it, let's clear up all the confusion about 'low-impedance' and 'high-impedance' mikes. The only mikes that are truly high-Z are the crystal or ceramic types; the impedance is generally about 50K-1000K ohms or more. Being high-Z the output levels are somewhat higher than dynamic types, but modern high-gain mike amp circuits are cheap and easy to design so the output level is not longer important. All other mike types are low-Z, including power mikes. The output of a power mike amp is generally 1K-5Kohms which can be consider low-Z. Even if the mike element itself is high-Z (like the ceramic element of the popular D-104) its amplifier has already converted the high-Z input to a low-Z output at the mike cable, which is all the radio input sees anyway.

INPUT VOLTAGE

This describes the permissible range of DC input voltages for proper operation. The nominal value of 13.8VDC is generally the charging voltage across the battery terminals of a running auto engine, so this figure has become standardised for solid state mobile equipment. Since the modern CB has been designed for proper biasing from a main input source of 13.8VDC, even the base versions set their AC-to-DC converter at this level. Walkie-Talkies are the only real exceptions and actually do run on 12VDC from internal batteries.

It's extremely important to maintain the proper input voltage. Low voltage won't damage anything but will degrade receiver sensitivity and greatly reduce transmitter output power. However, excess input voltage can quickly burn out the transmitter RF amplifier stages, as well as ICs and other voltage- sensitive components.

All modern transceivers operate with positive or negative ground electrical systems, which means the main PC board isn't making a direct electrical connection to the radio frame but is 'floating' instead. This allows the radio to be bolted directly to the body of a positive-ground vehicle without causing a short circuit, and is a convenience feature since some large trucks and a few autos do use positive ground electrical systems. The PC board is grounded to the radio frame for RF via several disc decoupling capacitors, and that's why you'll see two different ground symbols on the schematic. One symbol actually means 'vehicle body' ground and one means 'chassis common tie point'. Mixing the two different grounds can cause ground loops and other problems which may drive you crazy trying to solve!

The Midland specs indicate that it will work within the operating range of 10 V to 16V, however, to be safe, try to maintain operation at 13.8VDC maximum.

CURRENT DRAIN

A CB transceiver will draw different amounts of power depending upon operating mode. This specification can help determine if an internal problem is causing excessive current draw, and also suggests an adequate power supply size for the type of radio being serviced. Typical values are:

Transmit AM/SSB @ full modulation = 2.2A*

Receive squelched = 300 ma to 650 ma

Receive @ full rated audio = 700 ma to 1.2A

*Higher power radios may draw over 3.0A on transmit; use a heavier power supply.

CARRIER POWER

This is the RF power output measured at the antenna jack when terminated in a non-inductive 50 ohm load. The power output depends upon the mode, and is the unmodulated value for AM and the peak-envelope-power (PEP) for SSB. For most CBs this is always four watts for AM and 12 watts PEP for SSB. Since these levels are the legal limits, the manufacturer is never going to say his equipment puts out less power.

MODULATION

This is almost always high and low level Class B for AM.

SSB CARRIER SUPPRESSION

The whole idea of SSB is that suppression of the unwanted carrier allows more useful power to apply to the sidebands. This specification indicates how well that's being done. If the carrier is not fully suppressed the listener will hear an annoying heterodyne along with the voice. The higher the dB suppression figure, the better. Modern CBs generally specify at least -45 to - 55 dB, which is good to excellent. Carrier suppression is affected by both the balanced modulator circuit used, and the crystal filter which eliminates the unwanted sideband.

UNWANTED SIDEBAND SUPPRESSION

This measures the ability of the SSB transmitter to eliminate the unused sideband. Like carrier suppression more is better, with -40 dB the FCC minimum but -55 dB being more typical of modern equipment. The specification is most affected by the quality of the crystal filter removing the unwanted sideband. This filter may also be used for SSB reception and therefore affects receiver IF selectivity. You'll find that the radios with the poorest adjacent-channel rejection also have the worst specifications in this category.

INTERMODULATION DISTORTION (IMD)

This measures signal purity in the mixer stages. If excessively strong RF signals are fed to the mixer, its output no longer changes linearly with the input. When not purely linear, distortion products form which can cause interference to nearby frequencies on Transmit or desensitization on Receive. The IMD products are similar to harmonics and are assigned numbers indicating their strengths relative to the carrier. The most important products are the 3rd, 5th, 7th and 9th 'order', which is why they're often specified individually. Once again, the more IMD suppression the better.

CROSS MODULATION

This is a form of receiver distortion closely related to IMD and most noticeable on AM. It's possible for a signal on a nearby frequency to modulate the signal on a desired frequency, even though the unwanted carrier is well outside the receiver's IF passband. A good figure for this is -60 dB, and is typical of better radios. It's basically a reflection of careful receiver design.

FREQUENCY RESPONSE

This indicates the range of audio frequencies transmitted and received. Since voice communications require a much narrower range than say, a hi-fi FM stereo, only a narrow band is allowed to pass through the audio circuits. There's little reason to even specify this, since virtually all two-way radio equipment operates in the audio range of about 300-2500 Hz anyway.

OUTPUT IMPEDANCE

Why this is even listed I'll never understand, since it's always 50 ohms by design. This is standard for virtually all two-way radio equipment. 'Unbalanced' means there's a single hot conductor, with the radio's frame providing the ground return. This allows the use of coaxial cable to connect the equipment to the antenna.

SPURIOUS RADIATION

When CB really got popular in the mid 1970s, TV viewers screamed

(Continued page 25)

Midland 79-265 Mobile CB Transceiver: Technical Specifications.

General Construction.

1. Three-pin polarized jack for DC power.
2. Four-pin screw connector for microphone.
3. No mechanical relays. All switching is solid state using diodes and transistors for high reliability.
4. Input power is suitably filtered and bypassed to deter alternator "whine" on transmit or receive.

Electrical Specifications.

General:

Voltage	13.8V. Positive/ Negative Ground Operating Range 10V to 16V
Frequency Stability	±005%
Temperature Range	-30° to +50°C (Per FCC Part 15)
Humidity	5-90%
Vibration	EIA Standard RS-424
Shock	EIA Standard RS-424

Receiver (AM):

Sensitivity
Less than 0.7 uv for 10 dB SN + N to N.

Automatic Gain Control Figure of Ment.
80 dB.

Audio Squelch Sensitivity
Threshold Less than 10 dB SN + N to N
Tight 1000 uv

Adjacent Channel Selectivity and Desensitization.
60 dB (Two-generator method).

Spurious Response Attenuation
60 dB (excluding image at 50 dB).

Audio Power Output.
3 W @ 10% distortion (load impedance 8 ohms resistive)

Audio Frequency Response (1 KHz, 0 dB reference).
300 Hz @ -6 dB.
1000 Hz @ 0 dB.
2000 Hz @ -6 dB.

Hum and Noise Squelched.
-45 dB

Noise Limiting.
Provided wth Switchable ANL.

S Meter Sensitivity at "S-9"
100 uv.

RF Gain Range.
40 dB

Antenna Input Impedance.
50 ohms. unbalanced.

Transmitter (AM):

Carrier Power. No Modulation.
4 W maximum. 3.6 minimum

Conducted Spurious Emissions
-65 dB.

Radiated Spurious Emissions.
(Complies with FCC Part 95)

Audio Frequency Harmonic Distortion.
10% maximum @ 80%

Audio Frequency Response (1 KHz, 0 dB reference)
450 Hz @ -4 dB.
1000 Hz @ 0 dB.
2500 Hz @ -4 dB.

Hum and Noise.
-40 dB.

Output Impedance.
50 ohms. unbalanced.

Output Protection.
Withstands for 5 minutes all VSWR around Smith Chart at 20:1 without damage or failure.

Output Stability.
Does not exceed FCC Limits For Spurious Emissions when operated into a mismatch load with 5.1 VSWR at any point on the Smith Chart.

Controls: Off/Volume control Squelch control HWY-City switch, NB-Off switch, ANL-Off switch.
S/RF/SWR/CAL Meter Red-color CH9-Off switch. PA-CB switch. Numerical LED Channel indicator Rotary Analog-Numeral Channel selector, HWY, LSB, USB, CH9, PA indicator. Mode Selector Clarifier.

Jacks and Connections: 4-pin/screw-type Microphone Connector, 50-ohm antenna 8-ohm external speaker. PA speaker.

Accessories Included: 500-ohm push-to-talk microphone with coil cord and screw-on, 4-pin connector. Microphone clip. Mounting bracket and hardware. Owners manual sub part D part 95,

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3 element V Quad	$189
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— Med/Heavy Duty	$399

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Uniden UH077	$399
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Uniden Grant	$299
Uniden PRO640E	$299

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Uniden 100XL	$249
Uniden 200XLT	$499
Uniden 760XLT	$499
Icom IC R-1	$699
Icom IC R-100	$999
AOR 1000	$549

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SPECIFICATIONS What do they mean?

bloody murder from all the interference they received. During the 23-18-40 channel conversion period the American FCC tightened certain technical specifications, including this one. This is a measure of all the unwanted junk (like harmonics) radiating from the radio cabinet. The FCC requirement is -60 dB. All American CB manufacturers must comply anyway, so any 40-channel FCC- approved model is going to specify this figure. (Unless of course the radio is even better.) This specification is determined by the amount of metal shielding and filtering used in the transmitter circuits. You oldtimers from the 23 and 18 channel era have probably noticed all the extra metal shielding in the 40-channel transceivers. Spurious radiation is measured with a Spectrum Analyzer, a very expensive instrument usually reserved for the R&D lab and the really well equipped CB technician's shop.

RECEIVER SENSITIVITY

This is one of the best indicators of quality and careful design and measures the ability to detect very weak signals against the normal background noise. The zero reference level is the noise itself, and a standard figure of 10 dB compares the signal to the noise. Hence the term, 'Signal + Noise to Noise Ratio,' or '(S+N)/N.' The signal strength in microvolts when it's 10 dB louder than the noise is the rated sensitivity. For this measurement less is better; the lower the microvolt reading the better the sensitivity. Anything under 1.0 microvolt is good, with many transceivers having even hotter specifications. An audio output level like '1/2 watt' is often included to give the specification a meaningful reference.

Note that different specifications are often quoted for the AM and SSB modes. Note also that SSB sensitivity is better than AM. The reason SSB is better is because the signal is being passed through a narrower IF filter which occupies only half the bandwidth of a comparable AM signal. Since the receiver bandwidth is narrower, less noise gets through, thus improving the S+N/N ratio.

UHF CB FM is unique. When the received signal is strong enough to start limiting action the set begins to 'quiet', meaning the background noise disappears. FM sensitivity is rated in terms of the amount of input signal required to produce a given amount of quieting, usually 20 dB. In other words, the amount of signal required to reduce the background noise by 20 dB is the rated sensitivity. With modern IC FM Detectors, sensitivities of less than 1.0 microvolts are easily attainable. Because of the inherent noise reduction of FM it can function with much higher background noise levels. This partly explains why the background hiss noise is so much louder on the UHF band than that on 27MHz AM.

SELECTIVITY/ADJACENT or CHANNEL REJECTION

These are the other major indicators of quality receiver design. Some manufacturers give both specifications and some use only the Selectivity figure, but both mean almost the same thing. The listener shouldn't be bothered by 'bleedover' interference from an adjacent channel during normal reception. Basically this says a signal of a given strength will be so many dB weaker one channel (10KHz) higher or lower than in the center of the desired channel. For the Adjacent-Channel specification, more is better; -30 dB is the absolute minimum and the better radios may specify up to -70 dB. The figure will be better for SSB, since a narrower IF filter is used.

Selectivity is defined in a slightly different way. It states the attenuation as a function of how far removed the signal is from the center frequency: at so many KHz from center, the signal will be reduced so many dB. Two points are chosen and a graph of attenuation vs. center frequency has the shape of a skirt; i.e., flat across the top and dropping off sharply on both sides. Hence the term 'skirt selectivity'. The IF bandwidth at the -6 dB and - 60 dB points is most often used, although CB manufacturers very widely in their choice of measuring points.

Receiver selectivity depends upon factors like the number of tuned circuits, single-vs. double-conversion, etc.

IMAGE REJECTION

Images appear whenever two signals mix together to form an Intermediate Frequency, or IF. If not attenuated they can be annoying and show up as 'birdies' at many places around the band. This specification indicates how well they're reduced. More is better. Some of the cheaper CBs have only about -40 dB image rejection even with dual-conversion, while the good ones measure more than -60 dB.

IF FREQUENCY

This isn't really a specification but a circuit definition. The industry standards are 455KHz and 10.695MHz, and these are used in most modern CBs. Some radios use 7.8MHz, 11.275MHz, 9.785MHz, 4.3MHz, and other off frequencies for the high IF. All this really tells you is whether the radio has a single or dual-conversion receiver...dual-conversion is better.

AUTOMATIC GAIN CONTROL (AGC)

This is a circuit that keeps the receiver volume level constant with widely fluctuating input levels. It's especially important for SSB, since with no carrier the signal strength changes only with speech. Without AGC you'd be blasted out of your chair whenever a stronger signal came on the channel, and that signal would probably be also very distorted.

This specification measures how wide a range of signal inputs can be handled by the receiver, called its 'dynamic range'. The American EIA (Electronic Industries Association) specifies that audio output should be maintained within 30 dB for input levels from 1-50,000 microvolts for AM receivers, and within 16 dB for SSB receivers. Most CBs specify an audio change of no more than 10 dB, which obviously exceeds the EIA requirements. The better the AGC circuit, the wider the dynamic range it can handle. AGC may be specified in terms of signal strength limits, or by a straight dB figure for dynamic range.

The Midland, has a figure of 80 dB. This is a very good AGC dynamic range figure and is typical of the better CBs; 100 dB would be outstanding.

SQUELCH RANGE or SQUELCH SENSITIVITY

Usually one or the other is specified. The sensitivity figure, which is the most common, indicates the weakest signal that will break squelch. This is usually close to the main sensitivity specification; i.e., about 0.5 microvolts. When stated as a range, this tells you the weakest and strongest input signals that can be squelched...a good squelch circuit can handle from 300-1,000 microvolts, right on down to the rated receiver sensitivity.

AUDIO OUTPUT POWER

This is specified at some percentage of total harmonic distortion (THD), usually 10 percent, and across some load impedance like 8 ohms, but occasionally 4 ohms or 16 ohms. There's nothing you can do to increase the audio power output so if you need the radio's PA function, you require one having a 4-watt output rating which is about the maximum available. Many older models only had about 2 watts output, barely adequate for a PA or inside the cab of a truck. All the better radios have 3-4 watts of output power.

AUDIO FREQUENCY RESPONSE

This range is about 300-2500 Hz for communications purposes and you'll never see anything much different. RC filtering in the receiver and transmitter audio circuits keeps the response within this range.

This sums up all the most common transceiver specifications you're likely to see. I've left out the obvious ones like Clarifier Range, RF Gain control range, metering, dimensions, number of semiconductors, etc.

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ONLINE

With PATRICK McDONALD

Howdy doody, dial twisters! Time once again to talk about those two glorious, addictive time-wasters, radio and computers, and how you can use them together to double your fun, so to speak!

Last time around I waffled on about a whole slew of varied topics, but in this issue I'd really like to focus on the nitty-gritty bread-and-butter topic of ONLINE, this being computer software programs you can use for various radio-related applications. Let's start with DX Tracker, a nifty little number for hams.

SOFTWARE FOR HAMS

DX Tracker is designed for amateur radio HF DX hounds. It provides useful information so the more serious, competitive and statistics-minded amateurs can count the countries and zones they have worked (around which most of the big on-air 'contests' are based), and tally those confirmed contacts. Using DX Tracker, a ham could instantly find out which countries have yet to be worked, any outstanding QSLs needed, sort all contacts in any number of ways and so forth. The program is extremely easy to use, with 'windows' and pull-down menus, online help and can even be driven using a mouse or other such rodent.

Sounds great, huh? Now, take note...the US author of this package points out that DX Tracker is NOT designed as a logging or contesting program. You don't enter any actual QSO data and will need dedicated log-keeping or contest-scorings to do this. DX Tracker concentrates only on maintaining your vital DX statistics.

Finally, be aware that DX TRACKER, like most other programs reviewed in this column, is an MS-DOS program. That means it will only run on an IBM-compatible PC. Sorry, Commodore and Mac devotees! Yours truly has no hardware on which to review other types of computer software, unless someone would care to donate the relevant equipment...!

DXCC COMPANION

Moving right along, here's a brief look at another program for amateur radio operators. It's the 'DXCC Companion', designed specifically for the popular DXCC contest, and it complements DX Tracker rather well due to its ability to record contest and log details. The DXCC Companion database records comprise 7 different fields of information: call prefix, place name, latitude and longitude, continent, ITU zone, and that vital CQ contest zone. If you are an active ham and into contests, imagine what DX Tracker and the DXCC Companion could do in your shack.

.....AND SCANNER FREAKS!

OK, enough goodies for ham radio buffs. What about something for the dyed-in-the-wool scanner enthusiast, those of you who (like myself) enjoy prowling the exciting VHF and UHF bands listening to police, fire, aircraft and other traffic? Well folks, the 'Scanner Frequency Finder' is just the program we have all been looking for! This shareware package enables you to maintain a complete database of VHF/UHF frequencies. The review copy I received even came with sample lists of data — frequencies, callsigns, locations — although as the SFF is a American product they were all US services. When you fire up this 'lectronic beastie, you are presented with a table of already-existing sample data and will notice an item marked 'Quick Jump'. This allows you to jump to a specific point in the data table immediately. However, you can also leisurely scroll through the SFF data file by using the cursor keys. When you find the item you are seeking, you may view, edit or delete it, as desired. And, of course, you can also add your own new items.

As all of these programs so far are 'shareware', a word of explanation may be in order for those new arrivals to ONLINE, who perhaps are beginning to wonder what I am running on about. Shareware is 'software', a program that runs on your PC and makes it do all sorts of marvellous things. But unlike commercial software which you buy from your local computer store, shareware is released to the general public on a kind of 'honour system'. Anyone can try out the program, share it with friends, and so forth, absolutely for free. However, if you decide the program is one you want to use regularly, you are requested to send the program's author a small fee for the package — normally quite a modest amount by the standard of today's commercial software, usually in the range of $10 to $50. Sounds pretty darn good, doesn't it? Well, it sure is, and I can guarantee from lots and lots of personal computer-bashing experience that a lot of the shareware is equal and in some cases superior to the commercial alternatives, which you can't even try before you buy! But, when you discover that great shareware program which you couldn't live without, be sure to do the right thing and register it. Don't forget that struggling author in your enthusiasm. Otherwise this wonderful source of new programs, including those written especially for radio nuts, may well dry up.

PC + RX = WOW!

Now let's move on to another hot topic. Over past months I have received a number of plaintive requests for information on computer-control of radio equipment such as scanners and shortwave radios. The following apparently commercial program comes as part of the 'Datametrics Communications Manager' system, and is designed for the fabulous Icom R7000 scanning receiver. Unfortunately, I don't possess one of these candy-coloured streamlined babies so I can't tell you if the software really does to the hardware what it claims. But if some Icom-equipped reader out there would like to try it out, I'd welcome your opinions. According to my overseas sources, the program intended to control the monitoring of frequencies from various databases, as specified, to automatically log active frequencies and graphically illustrate those frequencies being searched in a novel 'digital spectrum analysis' display. You can even manually toggle back and forth between this fancy display and the traditional frequency log while scanning. It's even said to contain a list of America's 'top 100' scanner frequencies, as compiled by the famous US mail-order radio retailer Grove Enterprises. Whew! Sure does sound good! But does it really work? Well, ONLINE is putting out a call to any of you who are using this program, or something similar, or who want to know about it. Drop us a line via 'snail mail' (via Australia Post) or preferably electronically...addresses at the end of this diatribe!

In the meantime, contacts in the US are putting together for me a list of computer control programs for Icom's R7000 and R71 receivers (the latter proudly owned by your writer) and I fervently hope to feature these more fully in the next issue of CBA. Your own first-hand reports will be included as well! However, if you just can't wait a day longer, you can write to the Chairman of the Association of North American Radio Clubs' Computer Research Department, enclosing a couple of 'green stamps' (US dollars) for return postage, and they'll send you a list of currently available MS-DOS software designed to make your radio life easier and more fun. The address is: David Snyder, ANARC, 127 Joseph Avenue Staten Island, NY 10314-5054, USA.

Be sure to check the next feature-packed edition of CBA for more on radios and computers. In the meantime, if you have a modem connected to that computer of yours, then dial into the SHORTWAVE POSSUMS BBS on (02) 651-3055, 24 hours daily, to share radio info, tips and programs with a worldwide group of fellow fanatics. You can also send written feedback to me at PO Box 357, Round Corner, NSW 2158. Now it's time for ONLINE to go OFFLINE — catch you next issue!

Russell Bryant checks out the latest from AOR . . .

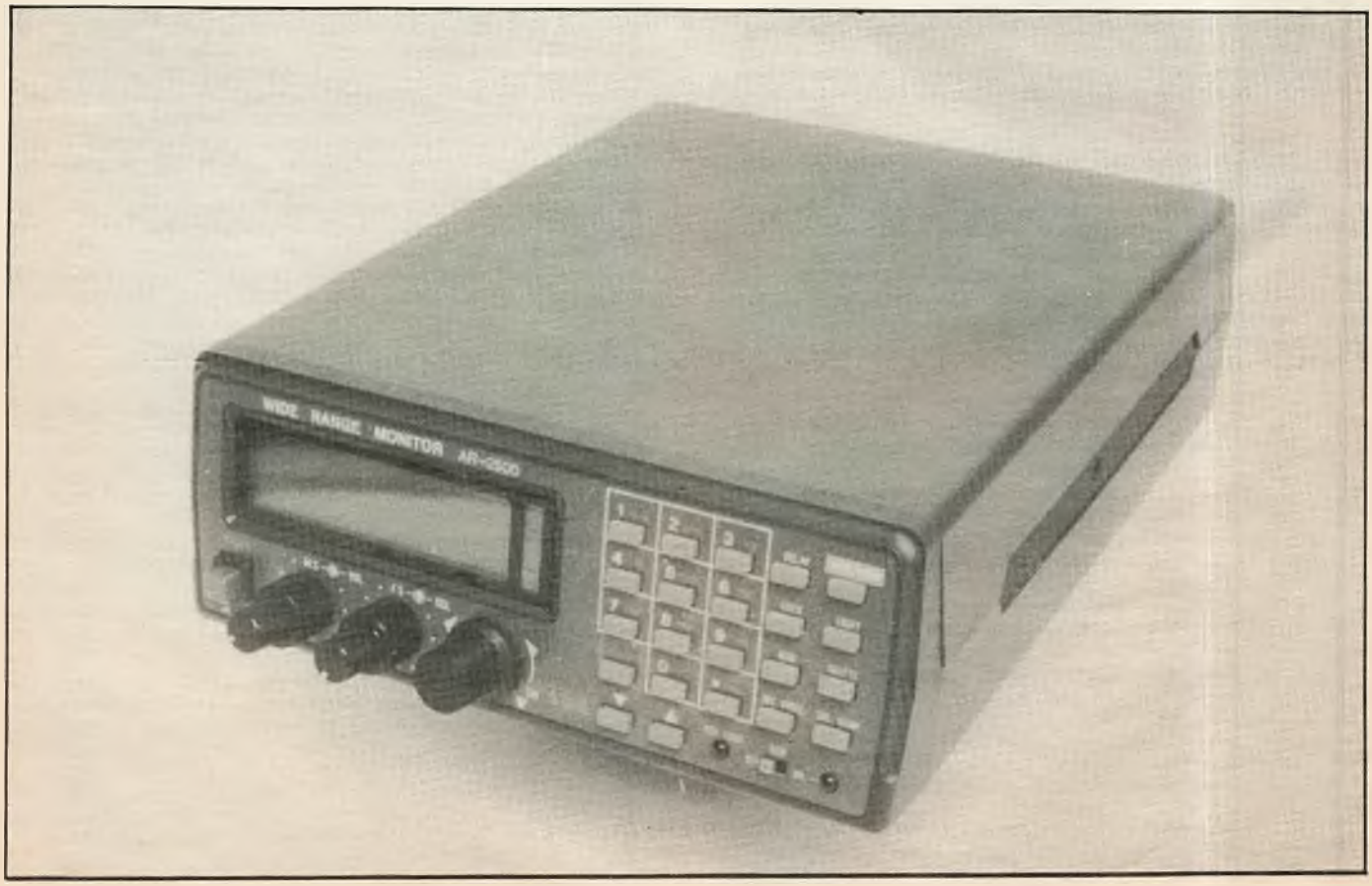
THE AR 2500 COMMUNICATION RECEIVER

It does not quite have the features and frequencies of the AOR 3000, then again it doesn't have the same price tag either. The just released AR 2500 offers a little more than the ordinary scanner....!

When the AR 3000 was first hinted at, enthusiasts were taken aback with its frequency coverage, memory capacity, variety of receive modes and user programmable features. A few hobbyists were also taken aback at the price being asked for the machine. Not much change from $1600!

With the release of the AR 2500, there is now a rig that offers something close to the frequency coverage of the 3000 with a lot more features tacked on in other areas. The AR 2500 is a compact, synthesized receiver offering access to frequencies between 500 kHz to 1500 MHz continuously. At first glance the AR 2500 appears familiar, AOR have utilized the same case as the AR 950 compact mobile. Measuring 5.5cm H X 14.5cm W X 16.25cm D (the AR 2500 is approximately DIN size, which is the motor vehicle industry standard for radios), and weighing around half a kilogram, the AR 2500 is obviously well suited to mobile as well as base applications.

Incorporated within the AR 2500, apart from the excellent frequency range, are selectable reception modes for AM, FM or WFM. The rig has one big advantage over others within the same price bracket, it also resolves SSB or Single Sideband transmissions via two clarifiers. The MS or Main Shift



dial is concentric with the Volume knob and it provides rough or coarse tuning of the SSB signal. Piggy-backed to the Squelch control is FS or Fine Shift which, as the name suggests, fine tunes the signal so providing optimum reproduction of the SSB transmission.

LARGEST MEMORY CAPACITY

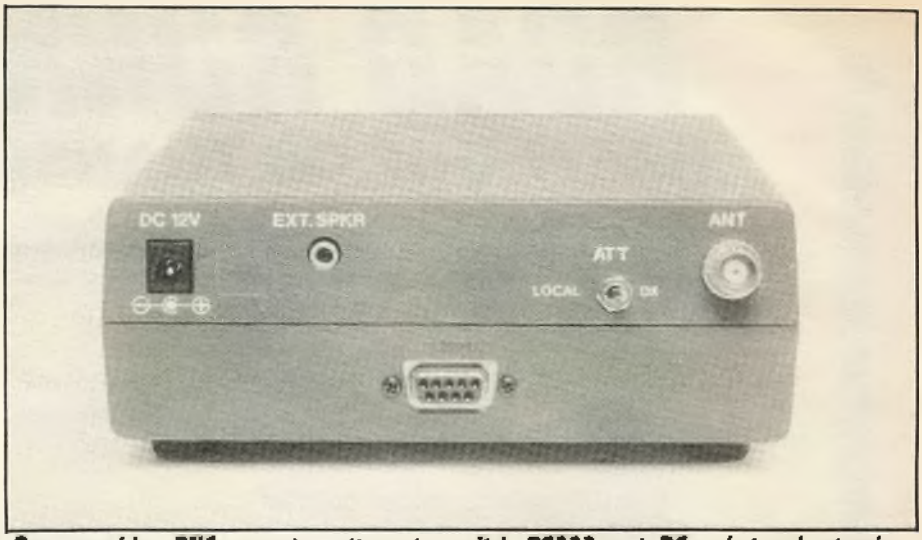
The 2500 has by far the largest memory capacity available in a stock standard scanner. There are an impressive 1984 positions comprising 62 banks of 32 positions each, all of which are user programmable. You may note that I have not called them channels, the AR 2500 does not have channels as we know them. Instead it retains frequencies, within a bank, in ascending numerical order, irrespective of the order in which they were entered.

Any combination of banks can be scanned, by simply LINKing or UNLINKing them. These functions enter or remove banks 1-63 from the scan list. When the bank number is flashing, the bank is not included in the list. A solid or non- flashing bank number indicates a LINKed bank.

A further 15, two-channel banks are provided for search functions. All data, including increments of 5, 12.5 or 25 kHz, is individually selected for each bank. Search and scan speed is a very fast 40 channels per second. To maintain that speed, AOR recommend that frequencies entered into banks be no more than 25 MHz apart. Given that most services have frequencies within 5 MHz at maximum, 25 MHz is adequately generous.

To cope with images and intermodulation, AOR have employed superior filtering (around 750 MHz first IF and 45.03 MHz second IF). Sensitivity across the entire frequency range is excellent. When monitoring some HF frequencies I found it necessary to toggle in the attenuator to prevent overloading of the receiver's front end. With the attenuator on, much of the noise associated with HF decreased, while the signal remained at a very acceptable level.....something akin to a noise limiter.

The rig has fitted as standard an 8K X 8 serial EPROM that provides storage for the frequency bank information. Access is available to the EPROM via an RS 232C port located on the rear panel. The AOR and a personal computer can communicate asynchronously via the RS232C interface at 300, 1200 or 9600 baud rates, with 8 data bits, no parity and 1 stop bit. I am informed by Access Communications, importers of the AR 2500, that software will be available for most of the popular PCs.



Rear panel has BNC connector, attenuator switch, RS232 port, DC socket and extension speaker jack.

SCANNER OR COMMUNICATIONS RECEIVER?

Before going any further, I must point out that I consider the AR 2500 to be in the same category as the AR 3000 and the Icom IC R-100. As much as Icom hates to admit it, these units are scanners first and foremost. The fact that their frequency range extends beyond the limits previously set in scanners is immaterial. In my opinion and my opinion only, these scanners DO NOT replace dedicated HF communications receivers. While they certainly come close, their frequency range and electronic construction (filters, etc.) are squarely within the VHF/UHF ranges.

Having said that, I must now say that given the usual fare that most enthusiasts monitor, it is difficult to tell if the aircraft being tracked on 8 MHz is booming in on a communications receiver or a scanner. When connected to a 50-metre long-wire antenna, the AOR acquitted itself well over the aeronautical and marine HF bands. I believe that this is the market the AOR is aimed at, those who primarily monitor VHF/UHF with an occasional wander into HF.

A single BNC connector is mounted on the rear panel, together with the attenuator switch (-20dB), extension speaker jack, the RS232 communication port and DC socket. The supplied telescoping whip is adequate only for VHF/UHF and very strong HF signals. A suitable long-wire or dipole antenna is a must when wishing to listen to transmissions on the lower end of the rig's frequency range although any commercial or home brew scanner whip will do for the VHF/UHF bands. There are several commercially manufactured aerials that will cover the entire frequency range of the AR 2500, it is all a matter of choice and budget.

As seems to be the trend these days, scanners are offering more and more as far as functions and features are concerned, however, the ease of use or operator friendliness is sometimes lost with the technological gains. This unit has not given up its ease of operation in the name of gadgetry. For example, if a bank has all 32 positions filled, the 2500 displays 'FULL' on the LCD screen. Pressing the DELETE button will remove a given frequency to allow a new one to be entered. This stops accidental removal or over-writing of wanted frequencies.

In lieu of a single channel priority, the AR allocates an entire bank to priority. When bank one is LINKed and the PRIority function activated, it is scanned after each successive bank. That is 1, 2, 1, 3, 1, 4, 1, 5 and so on. A very handy function given the action on the bands these days and having to decide which single frequency has priority.....you now effectively have 32 priority channels.

Overall, the AR 2500 is a dimensionally small receiver, offering the largest memory capacity, plus selectable receive modes including SSB. Its size and construction makes it ideal for mounting in a car, four wheel drive or boat while it will also make an ideal 'only allowed one' scanner with the added benefit of HF coverage. It is also ideal for those who like to control everything by computer.

It is priced at $995 and should you require the software for computer control it will cost you an additional $100. All the necessary mounting hardware and DC cords are included with the radio.

My thanks go to Access Communications for the loan of the test unit. Any enquiries should be directed to your nearest Access stockist.

ROAD-RUNNER

RR477 UHF CB TRANSCEIVER

The Roadrunner compact, full power handheld UHF CB transceiver offers high performance at an affordable price. Advanced microcircuit design, rugged construction and surface mount technology allow maximum legal output power with small size.

Functions not found on other transceivers include:

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- Channel scan – ensuring all channels are continuously monitored
- Lockout function to eliminate unwanted channels from scan schedule
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Units are fitted with plug connections for external speaker, speaker microphone, antenna, and battery charger.

Supplied with quarter wave antenna, Nicad battery, AC charger, carry case, and belt clip.

SPECIFICATIONS

TRANSMITTER
Output power: 5 watts
Spurious Emissions: –60dB
Current Drain: 1.6 amps (high power)
0.45 amps (low power)
Hum and noise: 40dB or better
Frequency tolerance: 1 KHz or better

RECEIVER
Sensitivity: 0.25uV for 12dB sinad
Audio output power: 0.5 watts
Hum and Noise: 45dB or better
Current drain: 20mA (power saver mode)

GENERAL
Power source: 10.8 V DC 450mAH Nicad battery
Operating temperature: –10 to +60 degrees C
Number of channels: 40
Frequency range: 476.425MHz – 477.400MHz
Microphone: Electret
Antenna Impedance: 50 OHMS
Size: 130(H) × 63(W) × 44(D) mm
Weight: 470 grams (incl battery pack)

CAT# C5047 RECOMMENDED RETAIL PRICE $599

ACCESSORIES:

C 5050 Speaker Microphone: A combination 8 ohm speaker and electret microphone allowing the transceiver to be belt mounted, with remote PTT and audio functions. Ideal for lapel mounting. Recommended retail $49.50

C 5052 Drop-in Desk Charger: Allows simultaneous charging of transceiver with flat battery and spare battery. Operates from Energy Dept approved AC adaptor. Recommended retail $129.

C 5054 Mobile Transceiver Adaptor: Allows the transceiver to be mounted in any vehicle (using hardware or velcro strips provided), and use the 12 volt vehicle power system. When used with C 5050 speaker microphone and our glass mount antenna, turns your handheld into a full power mobile transceiver. Recommended retail $69.

K 3095 Glass Mount Halfwave Antenna: Ideal for installations where mounting holes are undesirable. Also suit vehicles without "gutters". Antenna simply sticks on the outside of any window, coupling box sticks on the inside of the vehicle. RF energy is coupled through the glass with negligible loss. Recommended retail $79.

K 3090 Spare 10.8 volt 450mAH Nicad Battery: Ensure a charged battery is always on hand. Recommended retail $69.

C 5055 VOX Unit: Allows handsfree operation of the transceiver when using a headset. Ideal for hang glider pilots, rally drivers etc. Recommended retail $69.

K 5060 Communications Headset: Can be used either with or without above VOX Unit. (K 5070 single earpiece unit also available). Recommended retail price $55. ($49 for single earphone model).

C 5056 CTCSS Tone Squelch Board: Simply plugs into the transceiver. Any single sub audible tone from the 38 available tones can be used. Eliminates reception of non CTCSS transmissions. Recommended retail price $62.

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27MHz FREEBAND

The following strange communication turned up in our January mail. We decided to run it as an indication of the CB scene Stateside. One wonders what the American authorities feel about the so-called 'Freeband'.....we don't even have to wonder what our local DoTaC people think....!

Let us here and now assure any local 'out-of-band DXers' that the RIs have very little sense of humor and any attempt to become a 'Freebander' will cost you a lot of money if caught.

The Stateside bulletin follows.....(we have changed a few Americanisms and spelling to suit local terminology — Ed)

This 11-metre 'Freeband' report was compiled by Kenny Lloyd of the Eleven Metre News Service. This column covers all aspects of this part of 27MHz activity from DX Reports, Nets on the air, DXpedition news, features on different International Eleven Metre CW, FM, Packet, RTTY and SSB clubs around the world.

First let's take a look at International DX News heard on the 11-metre Freeband. These stations were all heard on 27.565 on the Alfa Romeo DX Network in December 1990. CHB 24-England, 9AR362-Newfoundland Canada, 262-Walter-South Africa, 24AR001-George-Panama, KW 565-Alex-Austria, 56AT132-Finland, 13AT112-Germany, 29WW727-Republic of Ireland-Walter.

These stations were all monitored on 1 Dec '90 through 19 Dec '90. From 26 Dec '90 to 31 Dec '90 these stations were all heard calling CQ DX around the world. The frequency was again 27.560, 38NE101-Greenland, 107AT104-Monaco Republic, Jackie-1178 or 120AR001, 5AT168 operator John-Venezuela, 108AT443-Duncan-Scotland, 1JR232-Jamaica West Indies-Stewart, 50RADIO-Moscow, 84AR001-operator Zoltan-Ivory Coast.

These are just a sampling of what can be heard on 11 metres SSB in the Freeband area. Remember we were just using one frequency out of many. Next issue we will break down all loggings by date, time, area, call, name and frequency. Now, just like Ham Radio, 11 metre operators in the Freeband take their hobby as seriously as their counterparts in Ham Radio.

Now let's take a look at DXpedition news. This includes all current data available at this time. A very popular DXpedition was the 142WRO Lesotho with many countries confirming this one which ran from Nov 8-12 on 27.600 USB. Expedition listings for 1991 are as follows: The Gambia-118ATO, March 1-24, operations can be heard on 27.570 USB; August 19-23, '91 listen for the 90ATO DX-expedition on the Isle of Crete on Nets on the Air and SSB International SSB call frequencies.

Let's look at where some of these groups can be found.

Starting in the 26MHz Freeband area at 26.145 USB is the Papa Delta XRAY International DX Group talk channel; listen on 26.150 for the India Delta XRAY Group; 26.285 is a great place to call into Europe as this is an international European call frequency on USB mode; 26.320 USB is the local call frequency for SSBers in the London, England area; 26.425 is very active now that East Europe is free as this is the Eastern Europe and USSR call frequency. If you want to contact any stations in these countries we suggest you try the above frequencies.

26.500 LSB/USB is the South Pacific International call frequency. Moving up to 27MHz, Freeband nets are as follows—again, listings will change each month as we update this area. 27.420 is the Satellite net from the USA. They operate 1400Z to 1500Z providing technical information for SSB operators. 27.465 LSB is the call frequency for the Bluesky operator's DX group. 27.485 LSB is used by many sideband DX groups. Jolly Roger International DX Group, Papa Whisky DX Group and Sandbaggers International DX Group all use this frequency. It is very crowded when conditions are open on 11 metres.

27.500 USB is a good place to look for stations in the Middle East area as this is the Middle East call frequency...also look for stations in all parts of Africa on this same frequency. 27.515 is used by the Kilo Papa International out of the Carribean Sea area. They are a big international SSB DX group. 27.525 USB and LSB is used by the Alfa Radio International DX Group on a daily basis. Also, if you're interested in UFOs, they run a UFO information net on every Sunday. There are two SSB groups, the Yankee America DX Group and the Kilo Kilo Kilo or KKK SSB group, operating daily on 27.535.

One of the largest 11-metre SSB DX groups is the Alfa Tango which operates on 27.555 USB along with the Club Connections International. Next time around we will look at more 11-Metre Radio Nets.

There are many 11-Metre Freeband DX groups looking for members from all over the world, here's a list of some you can join:

Alfa Tango, which is an international radio group, including (Hams, CBers, SWLers and Computer people). One of the functions of the group is to study propagation and to promote friendly relations among all people in the world. To be accepted for membership, it is important that you do the following things. They request all 11-Metre SSB operators to QSO (that's a strange thing to say...Ed) and QSL. They will only take countries included in the DXCC list. The membership is open to all operators who send applications, regardless of their nationality, race, religion, political beliefs, etc.

The Alfa Romeo International DX group is another international group which has as its motto 'Reaching the World through 11 metres'. They are growing very fast and have been on the airwaves for 10 years. They require all members to be either active Amateurs, or 11-Metre operators who are serious DXers. The Alfa Romeo group also requires all members to renew their free membership at the end of each year or they can have their AR numbers re-issued by their division.

The next group is the Jacobite Warriors International DX group. They warmly invite all good operators to join their club constituted on Culloden Moor (oh, come on now...Ed), the site of the last major land battle fought on Scottish soil.

United Kingdom International Radio group would like to promote the theme of peace and unity between people and countries by courteous DX contacts.

Next issue we will look at more international Freeband DX groups looking for members.

Finally it's our QSL card of the month received from afar...

If you or your group have any DX-expedition news, club news, 11-metre contest information, nets on the air, any and all 11-metre 26MHz to 27MHz CW, FM, PACKET, RTTY and SSB news it is always welcome.

All contributions to this column should be sent to Eleven Metre Radio News Service, On The Air Column, Attention: Kenny Lloyd, PO Box 617, Southbury, CT 06488 USA.

Take care and 73's from On The Air for now.

That's where that part of the 'newsletter' finished and providing that you only LISTEN, stress LISTEN on those frequencies you're not going to get into any trouble. If, however, you decide to 'pirate' on these frequencies, you are really tempting fate. DoTaC takes an extremely serious view of illegal operation and believe me, operating out-of-band is about as illegal as you can get in radio communications.

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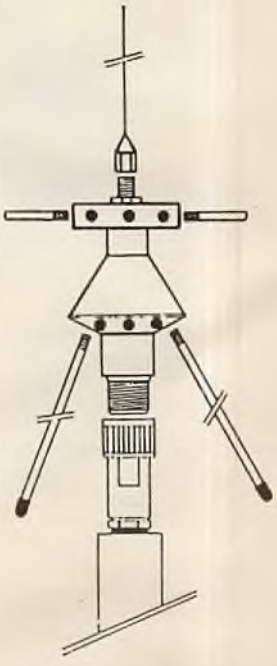
(Test Report in September 1987 CB Action)



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NATIONAL SPECTRUM ANARCHY

— FURIOUS FEWSTER TELLS IT AS IT IS —

REST IN PEACE, MATE

I'm sad to report the passing of Berry Driessen, the voice known to Brisbane CBers who called for assistance in the wee small hours of the morning as ACREM 14.

Years ago Berry was a big powerful man.....Green Beret material, in fact. A spinal injury put an end to all that, and his health progressively deteriorated until finally he was unable to leave his bed.

He and his wife Daphne, a trained nurse who literally devoted her life to taking care of him, used CB radio to keep in touch whenever Daphne had to leave the house.

Despite his hopeless condition and the constant pain which accompanied it Berry spent every spare moment monitoring the emergency channels. He wasn't one of your high-profile monitors.....just a voice on the radio to most people.....but I knew him as a guy with more feeling for his fellow man in his little finger than most men have in their whole bodies.

I know for sure the man upstairs kept a place reserved for Berry in heaven.....he'd already served his time in hell.

QUEENSLAND SURPRISE

In a surprise move the Queensland Government, prompted by the Traffic Branch, announced just before Christmas that radar detectors would be totally outlawed in Queensland as of 2 January, 1991. This brought howls of protest from the RACQ, importers and retailers of these devices, and the motoring public in general, but to date the Government has refused to back down, saying that anyone caught with one in their vehicle (even in the glovebox) will be fined heavily.

I've heard that some parties with vested interests are planning to mount a challenge to this prohibition on the basis that radar detectors are really only sophisticated 'radio receivers' and as such come under the jurisdiction of FEDERAL authorities (ie: our old friends the Department of Transport and Communications) and cannot be banned by State authorities.

Wish them luck.....they're gonna need it!!

As far as I can tell the Federal Government says you DON'T NEED A LICENCE to receive any frequency in the electromagnetic spectrum.....it DOESN'T say you have the RIGHT to receive same. There's a lot of difference.

POLICE TO POUNCE

Now for the REAL bad news.....

Most CB Action readers will be aware that there is already provision for the Queensland Police to charge anyone using a CB rig to warn other motorists about radar traps with obstruction.

The rumor is that they are going to start enforcing this in a big way.

Also.....they're about to make it an offence to use a hand-held microphone while driving!!

At present Queensland Police can charge a driver who uses a hand-held mike or a carphone with negligent driving but they don't do so very often. Making such an act a specific offence will remove the onus on the Police of PROVING that the driver was being negligent.....only a small loophole, but one the Police want closed before they start busting mobile bucketmouths on a large scale.

When you think about it, the only really safe way to transmit while driving is to use a 'hands-free' mike (voice-activated or perhaps operated by a foot- switch) like those found in some of the more modern taxis, but simply banning the use of hand-held mikes while driving could result in some downright dangerous alternatives being installed.

The sensible approach would be to introduce regulations governing the installation of VOX or remote-switched mikes at the same time as the prohibition against using hand-held mikes. It would be ridiculous to allow a boom mike to be installed in a position where it could poke out a driver's eye or smash his teeth in a minor collision.

WASHINGTON FINISHED?

My spies tell me that Uniden is about to drop the Washington base station transceiver from the range and introduce at least one new base rig (probably the compact PRO-810) and perhaps also the rumored 'super rig' (along the lines of the Cobra 2000) of which everyone at Uniden denies all knowledge. They're also about to dump the Grant and AX-144 mobiles and run with the PRO-640E and the PC-122.

To me this seems like a pointless move. Sure, the AX-144 is getting a bit long in the tooth and the Washington/Grant design is even older, but they're all bloody good rigs, tried and proven, technically still up there with Uniden's latest models and a damn sight better than a lot of the opposition's latest 'high-tech' offerings, and they're still the choice of CBers who prefer analog meters over the LED-bar meters fitted to practically every 'current model' CB on the market.

(If any Brisbane CBers want to have a peek at the Uniden PRO-810 base station rig there's one on display at South Pacific Radio.....it's not for sale though).

ADELAIDE ANTICS

Had a letter from Bob in Adelaide telling me that the AirBand, Police, Ambulance and commercial frequencies as well as 27 MHz and UHF-CB are being jammed on a regular basis.....sometimes for hours at a time.

People have been telling me about this clod (assuming it's the same guy) for years.

Are there any RIs in Adelaide?

SPIDER CRAWLS AWAY

The Brisbane CBer who's looking for the character who calls him 'Rock Spider' every time he opens his mouth might be interested to know that he's moved from Paddington and is now living in the Moorooka/Salisbury area.

IT WON'T BE OUTLAWED

The widely-believed rumor that the 27 MHz 'marine' band is to be outlawed in Queensland is NOT true!!

Safety authorities have made recommendations that boats be fitted with HF and/or VHF marine transceivers but they have NOT prohibited the use of 27 MHz 'marine' rigs.....in fact 27 MHz wasn't even mentioned at all in the recommendations.

THEY WERE FAKE RIs!

The young guy who had his illegally-modified Uniden HR-2510 confiscated in the carpark of a Southside 7-11 store recently will be pleased to hear that DoTaC won't be prosecuting him.....but not so pleased when he discovers that the 'RIs' who took his rig were FAKES!! The guys in DoTaC know nothing about the 'bust'.

RUSSIANS GET THE BUG

We can now add Russia to the list of countries with the CB bug, although the rigs the Russians seem to be using all seem to be the multi-channel 'European' variety.

I haven't heard any Russian stations operating inside the 'legal 40' channels yet, but no doubt they'll turn up sooner or later. Anyone with a decent receiver will probably be able to find a few Russians chattering to Europe (mainly in FM mode but sometimes on sideband) above Channel 40, and most of them seem to be able to speak English.

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Just about everything you'll ever need to know about . . .

ANTENNAS and SWR

An antenna tuner assists in tuning the antenna to an acceptable SWR figure, however, while it's used by many amateur operators to tune a variety of antennas, it should be unnecessary for a CBer who sets his 27MHz antenna up properly in the first place.

There is really nothing too mysterious about tuning and firing-up a new CB antenna — its operating theory might be hard to understand, but getting one to operate efficiently is usually quite simple — providing, of course, that you understand what you are doing.

Essentially, all transceiving antennas — including the CB variety — have many things in common. They all require tuning to the frequency to be used and also need to match the impedance of the transceiver to be used in a given application.

On the high frequency band — which includes 27MHz — most antenna systems require quite precise tuning because their individual band widths (frequency coverage) is rather narrow. The tuning of HF antennas can be considerably affected by the mounting position in relationship to nearby objects and even the size and shape of ground plane if one is needed.

For this reason, most manufacturers find it necessary to supply their antennas in a rough state of tune so that final tuning, to compensate for outside influences, can be made at the time of installation.

UHF CB antennas on the other hand have a relatively broad band width which allows final tuning to be accomplished at the factory, thus eliminating all but a few potential installation problems.

In sophisticated professional antenna systems, final tuning might be carried out with the aid of quite expensive equipment. One invaluable instrument in almost all cases is the SWR meter which is inserted into line for the sole reason of measuring the ratio between forward power (output from the transmitter) to reflected power. This is the quantity of power sent up the transmission line which the antenna is unable to absorb and then radiate. The unused power is finite when a poor impedance occurs and, since it has already been sent out by the transmitter, it must go somewhere.

A mismatch acts something like a mirror and most of the power that doesn't get absorbed and radiated through the antenna circuit is returned back down the transmission line to the transmitter from whence it came so it is easy to conclude that the transmission efficiency will be poor. A high SWR might return as much as 80 or 90 per cent of the transmitter output power back to the transmitter antenna terminals. Secondly and most important, the returned or reflected power is a finite quantity and has to be dissipated somewhere in the system. Because it sees a good impedance match at the transmitter antenna terminals, the power will be more than likely be consumed in the output stage of the transmitter. This can produce a high enough voltage at the output transistor to sometimes exceed its ability to cope — ZAP goes your RF power amplifier transistor.

Poorly matched antennas will usually cause a dramatic downturn in received signal strength as well. So, all things considered, it is well worth spending a little time and effort tuning an antenna properly — at least for the sake of performance and saving the cost of a fat repair bill.

According to transmission line theory, there is only one given condition when all the power from the transmitter will be absorbed by the antenna (load) and that is when both transmitter and antenna impedances are exactly the same — in the case of CB, both need to be 50 ohms non-reactive. Non-reactive is just a fancy way of saying the antenna will exhibit the same properties as a resistor.

Since all the power will be radiated only when this condition exists, it follows that reflected power will be at its lowest ebb also. So, the greater the mismatch, the greater will be the reflected power and therefore the Standing Wave Ratio (SWR).

At this point of explanation it is common for a little knowledge to be a misleading thing. Contrary to what other aspects of SWR you might hear on air, it is only related directly to impedance match and **an antenna which offers a very low SWR is not necessarily resonant,** but it will probably be quite close in most instances.

The purpose of our tuning exercise using a SWR meter will therefore be to match the transceiver's aerial terminal impedance as closely as possible with the antenna impedance. The rig's impedance is fixed and cannot be altered, so we adjust the antenna to bring it into line.

It is not always possible to obtain a perfect match with the antenna for various reasons and, in many cases, it will be necessary to settle for something a little less than perfect.

HOW TO USE A SWR METER

For starters, let's look at using a SWR meter. A short length of co-ax with a male connector at each end will be required, one end will plug into the antenna connector of the rig and the

other will fit into a similar receptacle on the SWR meter.

The connectors on the SWR meter should be labelled to show which one goes to the rig and the antenna. If you get it round the wrong way the forward/reflected switch will operate in reverse. Except for this small hitch most meters will work equally well either way round. Your antenna feeder PL 259 connects to the remaining socket.

The connecting lead should as a rule be less than a metre in length for 27MHz.

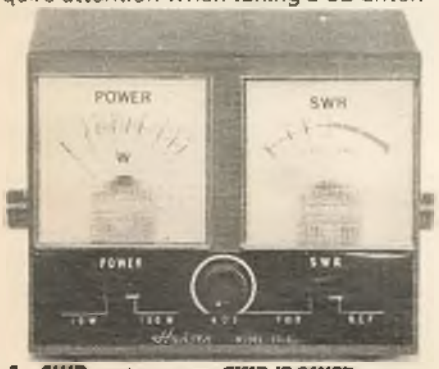
The meter dial will have a CAL or SET mark at the far end of the red scale from the needle at rest. With the meter switch set to 'forward' position and your transmitter on AM, press the PTT button briefly and adjust the meter needle to the reference (set) mark on the scale by turning the adjust knob. When this is done, flick the switch to reflected position to read the level of reflected power. If the needle drops back to almost zero and the rig seems to perform well, chances are that no antenna tuning is necessary.

The lowest point on the meter scale is '1' which indicates a close to perfect impedance match and therefore minimum reflected power, or lowest SWR of close to 1:1. In practical terms, there is really no way of achieving the magical 1:1 SWR — a perfectly matched system — as in reality, any reading under 1.5:1 must be considered good. The main requirement is therefore to get the needle to indicate the minimum possible SWR without getting too carried away with ridiculously low readings.

Care must be taken to ensure that the antenna is tuned to cover the required band — 40 channels on both the 27MHz and UHF CB bands.

This means that at least two measurements must be taken: one for the high end of the band and the other for the low end of the band. By comparing the two readings it can be determined whether the antenna is too long or too short.

Let's now consider what factors require attention when tuning a CB antenna. For mobile antenna installations, our main consideration will be the antenna's length. Most manufacturers supply their antennas cut a little too long so that it will be necessary to carefully trim the top section — on fibre glass whips. While it is true that changing the length of an antenna will affect its resonant frequency our prime objective in this area is still to adjust the length for correct impedance match and assume the resonant frequency will follow suit.



An SWR meter or an SWR/POWER meter should be an essential part of every CB shack. Easy to use and quite inexpensive, either unit provides an ongoing check that things are OK with your antenna system.

A short explanation on resonance would be in order at this time. Even though radio signals travel at the speed of light, the length of the radio wave varies with different frequencies. This is expressed as the 'wavelength'. At 1MHz (1000kHz — centre of the AM broadcast band), the wavelength is 300 metres (984.3 feet), at 27MHz this has reduced back to 11 metres (36.45 feet) and at 477 MHz (UHF CB), it is down to a tiny 0.63 metres (2.06 feet).

THE HIGHER THE FREQUENCY THE SHORTER THE WAVELENGTH

As you can see from the above, the higher the frequency the shorter the wavelength will be. The shortest resonant antenna for practical purposes is one electrical half-wavelength long and this can be readily calculated and then translated to a physical half-wavelength. An electrical half-wave is very rarely the same as physical half-wave due to the distortions produced as the electric current travels along a physical conductor (wire), so, some compensations must be made for the practical case. Now here is the rub...an antenna will only be purely resistive at its resonant frequency and what we need to achieve the lowest SWR is a pure resistance of 50 ohms...or at least very close to this value.

In a 27MHz mobile installation the antenna whip only represents one electrical quarter-wavelength and the vehicle on which it is mounted becomes an artificial ground (ground plane) which approximates the other electrical quarter-wavelength of the full half-wave antenna.

Because of the various mounting points for mobile whips and the different shapes and sizes of the vehicles required to carry antennas, the whole mobile antenna system is pretty much a hit-or-miss affair that might best be described as a compromise. The best compromise for this type of ground plane antenna system that requires no extra matching network is a vertical whip radiator (quarter-wave antenna) operating against an artificial ground plane of several quarter-wavelength long radials that are 'drooped' down at about 45 degrees beneath the whip as shown in the diagram. This arrangement when properly 'trimmed' will produce a feed point impedance of almost exactly 50 ohms resistance which is what we need to get the maximum power transfer from our transmitter to the radiating system.

Having the antenna mounted on a car will produce something less than perfection, however, in the majority of cases a remarkably good compromise can be reached with very little fuss.

If you look at a CB antenna mounted on the roof of a sedan car it is easy to imagine the shape of the car's body approximating the drooping radials of an artificial ground plane. In fact, this situation often emulates a proper ground plane so well that an almost perfect match (SWR) is achieved. The old 'hole-in-the-centre-of-the-roof trick' is the best position for the most even radiation pattern, however, a gutter grip often produces a lower SWR and saves a lot of drama if you don't wish to mutilate the family transport. The rain gutter mounting will give a slightly lop-sided radiation pattern but most operators will not find it too inconvenient.

All conditions considered there are many places on a vehicle where an antenna can be successfully mounted and a satisfactory SWR obtained, however, on some types of vehicle there are 'spots' where a low SWR is not possible without going to a good deal of trouble — you might even need to use a different type of antenna. For example, short loaded antennas often defy proper tuning while the problem can usually be solved by installing a longer

whip. Top loaded antennas about a metre long usually come up well in most situations.

IMPOSSIBLE MOUNTING SITUATIONS

Some impossible situations do exist. Mounting a mobile whip on a fibreglass body panel or roof is the obvious example. There is no ground plane provided in this situation and the minimum half-wavelength antenna requirement is not met. This situation must be avoided because the antenna feed impedance is so far away from our 50 ohms that most of the power is returned to the transmitter and this could result in serious damage to the RF output transistor in your rig. You could use an antenna tuner in this situation but you are best advised to find a metal panel that offers at least some ground plane effect.

GO GROUND INDEPENDENT

An alternative solution to this problem is the ground independent antenna system that simulates a complete half-wavelength radiator and therefore does not require a groundplane at all. On the UHF band this style of antenna has made great in-roads for obvious reasons — you can get quite high performance in a small package (less than 1 metre long) and the radiation pattern is also relatively independent of the antenna's surrounding environment. On 27MHz the proposition is more difficult. To achieve a good degree of efficiency a GI antenna needs to be about 1.846m (6 feet) long and even then the SWR bandwidth tends to be somewhat compressed, however, if you have no reasonable ground plane available the ground independent style antenna will provide a solution to your problem.

CABLE LOSSES

Cable losses are of little consequence at 27MHz but they become a major issue on the UHF citizens band.

Most readers probably don't understand the difference between various types of coaxial cable or how it can have an impedance of its own without any load (antenna) connected across the terminals. The most common types of coaxial cable are those with a 'characteristic impedance' of 50 ohms and 75 ohms — for CB we are generally only interested in the 50 ohm varieties the most common known as RG-58 and RG-213. RG-213 supersedes the older RG-8.

Without being too technical here, the 'characteristic impedance' of a coaxial cable relates to its physical and electrical properties and how they effect the passage of radio frequency energy along its length. There are three main losses to consider in coaxial cable, they are: (1) Resistance of the conductors, (2) Inductance of the conductors and (3) Capacitance between the inner and outer conductors. If we were to take an infinite length of RG-58 coaxial cable — 50 ohm cable — and connect it to our CB transmitter via an SWR meter we should find that the SWR is close to a perfect 1:1 impedance match. This is the characteristic impedance of the cable — the losses which are characteristic of this cable appear as though the transmitter was connected to a perfect 50 ohm load and in fact all the power transmitted down the line will be absorbed by the physical losses along the line. In practice you would not need an infinite length of cable to obtain a very good SWR. RG-312 is a much larger cable than RG-58 and has considerably lower losses, therefore you would require a greater length of this cable to produce the same result — about three times as much cable.

GOOD SWR READING — OR IS IT?

It doesn't take much imagination to see that with a long transmission we might be easily deceived into thinking the SWR of our antenna is better than it is while still reading a low SWR at the transmitter. There is a subtle difference between having a good SWR on the overall system compared with having a good SWR at the antenna. In either case the transmitter doesn't care so long as all the power forced into the transmission line is consumed. However, you can see that the SWR measured at the transmitter will be different from the SWR measured at the antenna by twice the amount of the cable loss. Twice the amount because the cable loss is incurred in both directions — once going from the transmitter to the antenna and once again for the reflected, unused power on its return trip to the transmitter.

If your line has a 3dB loss (reduces power by half) then the level reaching the antenna will be only half. If the antenna SWR is high, the reflected power will also be high as the reflected power encounters the same 3dB loss on the return journey.

Take the situation where all possible power is reflected back to the transmitter — infinitely high SWR. Five watts of power leaving the transmitter will be reduced to 2.5 watts at the other end of the line. We now have only 2.5 watts to be reflected back. On the way back another 3dB of level is lost resulting in only 1.25 watts being available for the SWR meter to read.

It is abundantly obvious that 1.25 watts cannot produce the same meter reading as 5 watts, therefore, an error has been inadvertently produced. This is one of several reasons why serious readings should be carried out right at the antenna, not always easy but certainly the best way to do it.

The object of tuning therefore will be to reduce the SWR reading to minimum. As the frequency increases line losses become a more important factor, however, at 27MHz the losses are minimal and require little attention.

While measuring SWR at the base of the antenna is desirable, there is one definite trap for young players apart form the inconvenience of needing binoculars for base antennas.

Although test instrument manufacturers go to great trouble for the sake of accuracy — depends a bit on the instrument's cost — measurements made in the very near field of a radiator can often be unreliable due to high level RF leakage getting into the instrument.

Attempts are made to avoid this effect but it can become a very real problem with cheap test equipment.

Due to the number of variables involved in mobile antennae (different size vehicles, varying locations, etc.) they must be tuned correctly to suit the particular circumstances.

The first part of tuning any mobile antenna is to ensure that the cable and the base are properly terminated and that there aren't any short circuits. Obtain a multi-meter with a high ohms (resistance) scale — over 10,000 times — and check the continuity between the sections as outlined below. It should be noted that neither the rig or the antenna should be connected — at this stage you are only checking the cable and antenna mount, with the mount fitted on the vehicle.

(a) Check continuity between the inner and outer sections of the PL259 plug — there should be no continuity.

(b) Check the continuity between both ends of the cable (plug to mount) on the earth braid and then on the centre core — full continuity.

(c) Check the continuity between the earth sheath on the PL259 and the negative power source — where you tap the power for the rig — full continuity.

If everything checks out, you can assume that your cable and plug are correctly terminated, as well as the cable to the base. If there is any doubt — especially for bonnet or boot mounted antennae — a separate earth strap can be run from the base to a good earth on the vehicle. It is essential to keep any earth straps as short as possible.

The antenna whip can now be fitted to the base, and the radio to the cable and power supply.

The SWR meter should be fitted into the feedline and the rig switched to channel 1.

Following the instructions with the SWR meter, check the SWR on channel 1 and then channel 40 noting the two readings.

If the SWR is higher on the high channels, the antenna is too long and needs reducing in length. If you are using a fibre glass whip antenna, this should be the situation as the antenna is usually designed to be too long.

There are many different types of antennae on the market though most seem to have one of three main types of tuning adjustment.

They are: **Base loaded whip with an adjustable steel rod.** A grub screw

is usually provided to adjust the length of the rod. If the rod is much too long and has to be shortened, deeply score around the rod with a file about half an inch from the bottom and then break off the bottom half inch by bending it back and forward with a pair of pliers. Do not try to cut the rod with side cutters. The rod metal is so hard it will probably damage the cutters.

Fibre glass whip with adjustable top section. Again these antennae have a steel rod which slides up and down to affect the lowest SWR. They are usually adjusted by loosening the special clamp near the top of the antenna with the spanner supplied (or a small shifting-spanner) and raising or lowering the rod until the lowest SWR is obtained. If the rod is too long, it can be shortened by using the method outlined above for the base loaded whip.

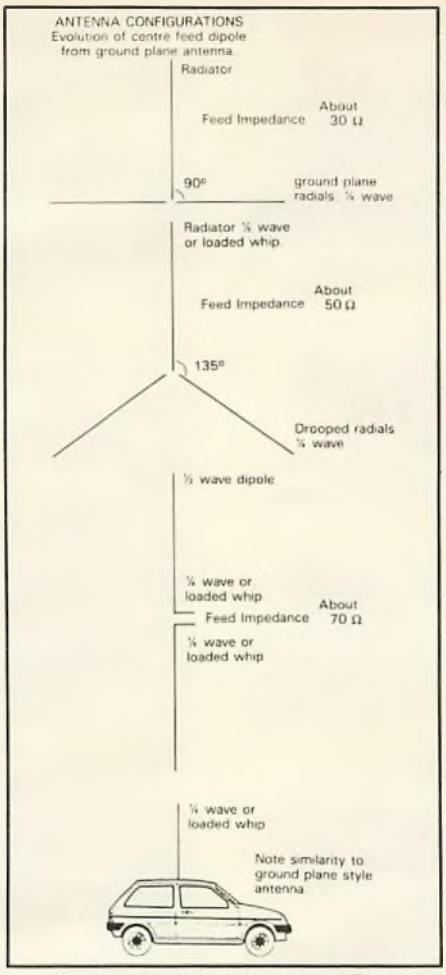
Fibre glass whip without adjustment rod. This is the most common antenna in use within Australia and, for 27MHz antennas, is usually manufactured too long so it can be cut back to effect a low SWR. Having established that it is indeed too long by checking with a SWR meter, it can be carefully cut back by removing one eight inch segments and checking with the meter after each cut. Do not use side cutters or cutting pliers to reduce the length of this antenna but rather use a hacksaw or other fine tooth saw. Side cutters and their like bruise the fibre glass rod and cause it to split along the length, reducing the potential life of the whip. It is very important to ensure that there are no strands of braid or other protrusions and the top of the whip is rounded. This will reduce static and other receiver noises as well as allowing higher power to be fed into the antenna. A small file can be used to complete the antenna tuning exercise by finishing off the top of the whip. If a small plastic waterproof cap was supplied with the antenna, this should be refitted. Shortened (loaded) antennas are so sensitive in their tuning that when the plastic tip has been replaced the tune will have changed slightly.

ANTENNA TIP IS IMPORTANT

On long mobile 27MHz whip antennas the effect on the SWR reading with and without the plastic 'tip' may go unnoticed. However, as the antenna length becomes shorter the importance of the tip to antenna tuning becomes more pronounced to the point where a considerable variation in SWR can be noticed when the tip is replaced after the whip is tuned without it. If you have just trimmed your antenna a fraction too short, before you panic, replace the plastic cap and you might find you did a great job after all.

There will always be situations where either the antenna was too short right from the start of too much was cut off in the adjustment.

With the steel section antennae, a small winding of wire near the top of the antenna will serve to electrically increase the length of the whip. This can be fixed with a fast setting epoxy resin (like 5-minute Araldite) and the antenna tuned while the resin is setting. Tuning is carried out by cutting back the wire coil around the whip until the lowest SWR is obtained.



When SWRing in mobile antennae, this simple trick could be of some value when trying to determine if the antenna is too long or too short and also show how RF reflections can electrically lengthen your antenna.

When keying the microphone with a SWR meter in-line, have someone walk near the antenna, putting his hand up near to the whip. While this is happening, the meter should indicate a change in SWR as the antenna gets electrically longer. If the needle dips down before rising, the antenna is too short, however, if the needle indicates a worsening SWR immediately, the antenna is too long.

Tuning disturbances can be caused by; a car door being left open while the SWR was being checked (close the door and the meter could indicate that the antenna was in fact too short); someone standing too near the vehicle; the antenna being located too near to metal surfaces (other cars, garages etc.); or close proximity of green foliage (trees, bushes etc.).

Undoubtedly, city CBers will find the best spot to tune their mobile antenna is the local public car park after normal business hours. To do this, make sure that all the doors are closed and your assistant is well back from the vehicle while you are actually checking the SWR and all should be well.

As a general rule, ensure that there is at least 15 feet (5 metres) clear around the vehicle and you shouldn't be too worried with extraneous influences.

BASE STATION ANTENNA

Base station antennae rarely have provision for SWR adjustment and should be pre-tuned at the factory.

If the average ground plane type base station antenna is correctly installed, the SWR over the legal channels should be below 1.5:1. If it is not, then the first suggestion would be that the coaxial cable is not properly terminated.

Of course a factory made antenna can be faulty. Anything mass produced is subject to manufacture problems but these are so rare that it should be assumed the problem lies elsewhere — until all other avenues have been explored.

If you do purchase a faulty antenna, do not try to repair the unit yourself. Return it to the retailer for replacement. If you are buying a new antenna from a shop, ensure that the seals on the box are unbroken. Some retailers like to check to contents of a box before it is sold but this can be done in your presence.

Some ground plane antennae have built-in matching transformers which have been factory pre-set. A check with the SWR meter after the antenna has been erected should suffice as rarely will there be any major problems with this type of antenna.

There is no substitute for doing a job properly and while there may be many apparent short cuts available to the installer, these always mean a loss or degradation of the final radiated signal. Cheap high-loss coaxial cable invariably mean a lower ERP (effective radiated power) which simply means that you're not getting out as well as you might.

Antenna matchers or tuners are absolutely last resort devices for CB operators. Amateur operators use them as they sometime have to tune many bands on the one antenna, but, as the CBer is operating on only one band — 27MHz or UHF — a matcher/tuner is not necessary if the antenna is set-up properly in the first place.

So there you have it. Maybe not the last word on SWR but certainly more that the average CBer will need to know to ensure that his antenna is correctly installed and tuned.

We've said many times before that you don't really need a linear or other fancy gear, all you need to do is ensure that your antenna and feedline are correctly installed. It's surprising just how much improvement can be made by spending an extra half hour working on the antenna.

DX LOGBOOK

WITH ROB WILLIAMS

Greetings and welcome to the first DX LOGBOOK for the new year. I trust you are finding the news and tips interesting. If you thought 1990 was a big year, well '91 is shaping up to be even bigger. So let's get going — and remember, all times are in UTC (same as GMT) and all frequencies are in kHz.

RELAYS FOR RN SCRAPPED

News from The Netherlands is that the Dutch Government has turned down Radio Netherlands' request to establish a relay station in Thailand. This relay was to be a joint Radio Netherlands/BBC facility but would have cost the Dutch some $US17 million to build and a further $US3.5 million per year to run. Since Radio Australia is also interested in setting up a Thai relay, this represents a good opportunity for RA provided they can get the funds.

ITU MOVES INTO THE 21st CENTURY

Since 1928 users of the HF spectrum have relied on the ITU to ensure that international frequency assignments don't clash with. Shortwave broadcasters know all about these problems and face constant pressure to find vacant frequencies, providing the ITU with suggested frequency assignments far in advance of each transmission period.

The ITU's enormous and ever-growing International Frequency List, also known as the White Book, has become the bible for administrations concerned with frequency planning. When first published the book ran to some 1700 frequencies over 24 pages; the most recent edition covers over a million frequencies in 6000 pages! In 1985 the ITU ceased producing the White Book on paper and moved to microfiche, and 1991 sees the first edition of the list on CD-ROM, the latest step in mass computer storage. And's it's cheap, too — less than $400 for two editions per year, with all the info any SWL could ask for. The cost of the CD-ROM player — well, that's around $1500!

WRTH EDITOR EMERITUS DOWN UNDER

Jens Frost, long-time editor and current 'editor emeritus' of the famed World Radio-TV Handbook, arrived in Australia towards the end of last year. I first met Jens at a major European DXers conference in Paris many years ago, although we had corresponded for years previously, and he has always expressed a keen desire to visit Australia. We met up again in Sydney in October and enjoyed many hours sharing tales on all manner of subjects.

Jens then visited a meeting of the DX Australia group, where he was awarded honorary membership in recognition of his long and outstanding service to the international hobby of shortwave radio. He also found time to fly to New Zealand and call upon another famous DXer, Arthur Cushen. Let's hope Jens has many fond memories of his visit here and will find time to return soon.

NHK EXPANDS AGAIN

1991 will see the commencement of NHK broadcasts from new transmitters in Sri Lanka. Regular programs were due to start on January 1, with a new Iranian language service aimed towards the middle east expected to start in April. English language transmissions are aired from 0100-0200 on 11840; 1400-1500 on 9535, and 1700-1800 on 15210. Keep an ear on NHK's regular DX program on Sunday nights, where they may announce the issue of a special QSL card to commemorate the occasion.

DW RELAYS UPGRADED

Popular German SW broadcaster Deutsche Welle have now completed their satellite linking of relay facilities, with the hook-up of the Sines, Portugal transmitter into the network. Meanwhile DW's Maltese relay licence has been renewed for a further five years. The site has been operating for 20 years, broadcasting on shortwave and mediumwave to Europe and the Arabic states. DW's current schedule for English to Australia is as follows: 0800-1000 on 6075, 6115, 9545, 9690, 9735, 11795, 11965, 11970, 13780, 15240, 17845, 21540, 21560, 21600;. 0700-0800 on 21640; and 0800-1000 on 6075, 6115, 9545, 9690, 9735, 11785, 11795, 11890, 13780, 15105, 15275, 17845, 21560 and 21640

RIP ANARC?

After much talk in world DX circles, it was reported on 'Sweden Calling DXers' that ANARC — the American National Association of Radio Clubs — is to be laid to rest. It's a pity to see this fine organisation fold, as it was always considered to set high standards for DX clubs around the world.

As personal computers moved into more and more shacks, it was ANARC which established one of the world's first online computer bulletin board service for SWLs and DXers. ANARC Meetings were held around the country, enabling enthusiasts to meet and exchange ideas and information about their hobby. The American Congress is considering placing restrictions on scanner enthusiasts, and many SWLs are afraid that this may spread to HF listening — at a time like this, ANARC is needed more than ever to be heard as the Voice of American DXers.

TROUBLED TIMES FOR RCI

What is happening at Radio Canada International? An announcement in late November stated that due to the mounting Canadian deficit and the high cost of maintaining a Canadian military presence in the Gulf, RCI — Canada's shortwave voice to the world — would be completely closed. RCI responded with a campaign asking that listeners and supporters write or fax their protest to Canada's Prime Minister.

In early December it was announced that RCI would continue to operate until the end of March, when a decision would be made as to its future. With a predicted budget shortfall of $US108 million, we may see not only the end of RCI but also of the extensive relay services operating between RCI and other shortwave broadcasters. Stay tuned to DX LOGBOOK, your favorite shortwave programs and the BBS International Shortwave Echo for the latest news.

THE FUTURE OF SHORTWAVE

You could write a book the size of 'War and Peace' on this subject and still not have all the answers, but the last six months has seen profound changes affecting the future of shortwave broadcasting, many to do with the all-round tightening of Government spending. Some DXers would argue that it is good that shortwave broadcasters are coming under increased pressure to justify their existence.

Broadcasts to various target zones have been cut back or dropped entirely, while other stations have severely modified their schedule, reduced their transmitting power or disappeared completely. The Japanese have been even been experimenting with Direct Broadcast by Satellite (DBS) as a cost-effective alternative to shortwave radio. Other stations are concentrating on broadcasts to Third World countries, because their traditional audience in the Western world has long been eaten away by other media sources. To make it more confusing, however, some of the largest manufacturers of shortwave receivers claim that their sales are increasing and they plan to expand their range of SW models! Some of this increase can be attributed to the situation in the Middle East.

TAKE THIS PLANE TO CUBA!

To mark 30 years of broadcasting, Radio Havana is offering a two-week, all-expenses paid trip to Cuba for five lucky listeners! To enter, just write an essay on the following topic — 'In Radio Havana Cuba's thirty years on the air, what do you think has been its main contribution to people around the world?' Easy, isn't it!

Radio Havana tempt the would-be winner with promises of exotic tours of 'farms, hospitals, factories, schools, tourist centres and places of historical interest' according to their press blurb (I'm thrilled at the thought! — Ed.). 20 runners-up will win a mystery prize. Entries must flood in by the end of April, to PO Box 7026, Havana, Cuba. Incidentally, I'm still waiting to receive the pocket-sized calendars that RH send me every year — each one decorated with a color photo of Fidel Castro!

ANOTHER SW SALE

American international broadcaster KUSW has been sold to the Trinity Broadcasting Network for $US2.1 million, and is now heard as KTBN. The station broadcasts a signal towards Ontario at a bearing of 70 degrees with a 100 kW transmitter; the current sked is 1600-0200 on 15590, and 0200-1600 on 7210. Local reception of KTBN has been noticed at 2100 but with only a poor to reasonable signal.

The QSL address is PO Box 18147 Kearns, Utah USA 84118. KTBN is currently re-broadcasting the audio feed from the Trinity satellite TV network, which explains why listeners are often referred to telephone numbers appearing 'on your screen'.

AND ANOTHER CONTEST!

1991 sees SWL favorite HCJB celebrate its 60th anniversary. Every 'happy birthday' letter it receives will be placed into a special draw with two one- week, all-expenses paid return trips to HCJB Ecuador. There is no limit to the number of entries per person, and the draw closes just before Christmas. Cuba or Ecuador? I know which one I'd choose!

HEAR IRAN ON SHORTWAVE

With all the media coverage centred on the conflict in the Middle East, it may be a good opportunity to try and catch some of the propaganda yourself. The Islamic Republic of Iran Broadcasting (IRIB) external service broadcasts English at the following times: 1130-1225 on 11790, 9705 and 9685 to East Asia and 9525 and 11745 to the Middle East; and at 1930-2030 on 9022 and 6030 to Europe. The latter is the best time to listen here in Eastern Australia on 9022. The Voice of Free Iraq can be heard from 0330-0800 and 1430-2000 on 17940, 15600 and 9570. The station is carrying Arabic music but when I checked it in January all frequencies were being jammed.

REVOLUTIONARY PLANS FOR RFI

Radio France International will receive a one billion Franc upgrade. 12 of RFI's oldest 100 kw transmitters are to be replaced by 16 new 500 kw senders, firing through rotatable curtain antennas. Their French Guiana relay will be given a fifth 500 kw transmitter, and two entirely new sites will be built in Thailand and Eastern Africa, both equipped with 3 x 500 kw units.

NEW QSL ISSUES

HCJB latest QSL series is entitled 'Hardware of HCJB', and feature various broadcasting gear used throughout the station. And from Radio Netherlands comes the card 'Faces Behind The Voices', featuring photos of announcers from RN's English section.

BITS AND PIECES

*Chasers of Latin-American broadcasters should keep an ear on HCJB's Saturday 'DX Partyline' program, which sometimes includes details of new and re-activated South American stations;

*Radio Botswana's 0530-1530 transmission has changed frequencies, from 5955 to 9600;

*Radio Moscow has replaced several of its target-zone English language programs with a 24 hour 'world service', and has also cut back on some Asian and European languages;

* 'All India Radio' has English-language services to Australia and NZ from 1000-1100 on 17387 and 15335, and then 2045-2230 on 9910, 15265 and 11715. Their 10-minute 'DXers Corner' program is heard in Australia at 1040 and 2130 on the 2nd and 4th Monday of each month.

Well that's all for now — good hunting, and I'll see you next issue. If you'd like to drop me a line, write to PO Box 108, Minto, NSW 2566 (enclosing an SASE for reply) or via the computer 'electronic mail' network on 3:713/605.

You don't need a super scanner to listen to 800MHz with a . . .

GRE SUPER CONVERTER II *and* SUPER AMPLIFIER

Two devices designed and built in America can add to your listening pleasure, by providing access to frequencies outside the range of your scanner. Scanning expert RUSSELL BRYANT checks out a couple of add-ons likely to prove popular.....

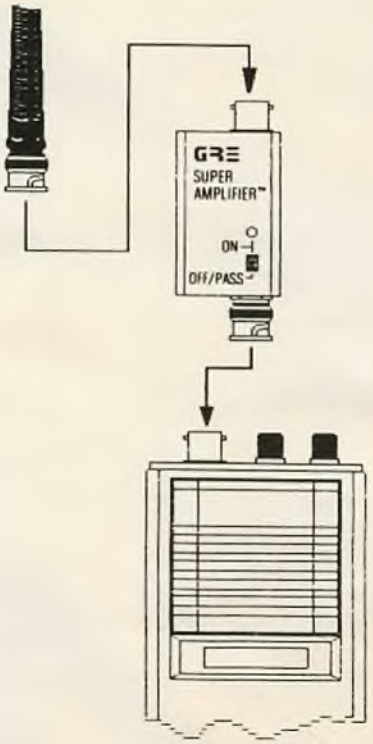
Not everyone can afford a super scanner, that is a receiver that covers the frequencies beyond the 512 MHz barrier. As the radio spectrum becomes congested on the lower frequencies, regulatory authorities look for higher numbers to allocate to radio users. Scanning receivers have kept pace with the higher allocations and the technology associated with frequencies having only a 30cm wavelength, but at a price.

Unfortunately not everyone can pay that price and are left behind, unable to break the 500 MHz limits imposed by scanner manufacturers. That is, until now. An American company, GRE America, has designed and built two pieces of equipment to overcome early frequency limitations. If there is any doubt as to the credentials of GRE, it is the manufacturer of most Tandy scanners.

The Super Converter II is a 400 MHz block converter, slightly larger than a couple of boxes of matches, that attaches to the BNC connector of a handheld scanner. It basically works by receiving frequencies between 810 MHz and 912 MHz and converting down to 410 MHz through to 512 MHz, well within the range of early and lower priced scanners.

While designed primarily for portable scanners, the Super Converter II will fit any scanning receiver that comes with BNC type connectors. A by-pass switch de-activates the converter for 'normal' operation. Powered by a 9 volt battery, the unit will operate continuously for 24 hours, however, for long term and base use a co-axial socket rated at 9 VDC 50-100 mA is provided.

Installation of the Super Converter II is as easy as removing the antenna, connecting the converter directly to the BNC socket, then reconnecting the scanner aerial to the converter. In operation, the GRE Super Converter works extremely well, using a Bearcat 50 XL and the tones associated with 800 MHz trunking, signals were comparable with a scanner (AR 1000) having the 800 MHz band built in. Naturally, when using frequencies in the UHF band, interference from users on the reference channels does break through, however, generally the Super Converter adequately handled their suppression.



Most scanners, handheld or otherwise, suffer from poor reception when using the aerial supplied with the set. This can be easily overcome by the utilization of an external antenna, however, not everyone has the ability to erect outside whips, thereby lessening their ability to hear weak signals.

The use of an RF amplifier or pre-amp is one method of boosting the receiver's capacity to detect low power or weak transmissions. The GRE Super Amplifier is a compact American designed and built pre-amp intended for use with portable scanners. It, like the Super Converter, can be used on other types of scanners provided they have BNC connectors or some method of connecting them to BNCs.

The Super Amplifier boosts or adds gain to any frequency between 100 MHz and 1000 MHz to a maximum 20dB. The design of the Super Amplifier allows adjustable amplification levels from 0 to 20dB via a variable control located on the rear of the unit. Powered by a nine volt battery for mobile use, an external power connector is provided for extended use and/or shack duties.

The Super Amplifier is installed co-axially between the scanner and aerial. A by-pass switch removes the effect of the pre-amp from the received signal while a glowing red LED indicates the Super Amplifier is on.

The performance of the GRE Super Amplifier is immediately noticeable when receiving weak signals with a rise in audio level, together with a reduction in noise, bearing testimony to its design. Adjusted properly, little overmodulation is evident making it ideal for simplex as well as repeater systems within its frequency range. While the unit is rated between 100 MHz and 1 GHz, I found it worked well on frequencies as low as 30 MHz, however, no guarantee can be given as to its performance outside stated specifications.

Both the Super Amplifier and the Super Converter II are neat, compact products that are well designed and constructed. If you are interested in either of these products, enquiries regarding prices and shipping should be directed to Marc Lopez, GRE America Inc., 425 Harbor Blvd, BELMONT, CA USA 94002 and please say that you heard about them in CB Action.

Thanks to GRE for providing the test units.

AN AM CB FOR LESS THAN $50!

AN AM CB FOR LESS THAN $50!

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In other words, there are no hidden extras—just a good deal on an AM rig.

If you've already got a CB radio, why would you want another? Well, how about one for the second car? Even if you never do more than listen to the highway channel or call for assistance on channel 9, it's peace of mind. Or why not install one in the caravan or boat? It's an inexpensive short-range two-way system ideal for holidays.

This special deal is direct from Access, the importer, to you the CBer, and is valid only until April 30, 1991. Access have arranged door-to-door overnight delivery for an additional $12 flat rate, anywhere in Australia. Or you can call Access Communications on (02) 417 7474 to order direct by phone or obtain the address of your nearest participating dealer.

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BAND SPREAD

FROM DC TO DAYLIGHT

WITH GREG TOWELLS

Welcome again to all readers of Bandspread. This column covers items of interest from any part of the radio hobby. If there is something you want to read about, or there are things happening in your area radio-wise, please drop me a letter to P.O. Box 514, Toukley, NSW 2263.

SIGHTSEERS A PROBLEM

It seems that this year we are actually suffering from a real summer, with high temperatures and little rain. All the conditions are there for a bad bushfire season, and indeed there have been hundreds of serious outbreaks so far in NSW alone. Naturally, all this activity means a lot of traffic on the various bushfire and emergency services frequencies. There are obviously a large number of CBers out there who are also scanner freaks, judging from the conversation around the bands. Many a time I have been able to zero in on a particular happening on the scanner from what was being said on the CB channels. Lots of people spend a great deal of time listening on the scanner and discussing the latest frequencies and what is going on at the time. So here is a hint for beginning scanner buffs, listen around the CB bands as well as the scanner, because people out there may be talking about the very frequencies you are after, or could tell you how to get the most out of your new hobby.

Now having said all that, there is a darker side to all this. On too many occasions I have monitored groups on the CB channels talking about the happenings on the scanner, and deciding to actually go and sight-see the action as it unfolds, and at this time of the year many of these are raging bushfires. Problems arise then, as these people get in the way of the emergency services who have their people stretched to the limit just trying to assist residents and control the blaze, without having to then rescue the sight-seeing newcomers. Many times I have heard two or three carloads of operators, co-ordinating their excursion on the CB and listening to the scanners, and accurately place themselves right in the middle of the most dangerous place to be, right in the path of the oncoming fire. Next thing they know is that they are the subject of the traffic on the scanner, as fire fighters do their best to assist people who shouldn't been there in the first place.

The moral of this lot is, stay right away from the action, particularly dangerous situations like fires and police operations. If not, you could become a part of the action on the scanner, a statistic!

PIRATE PACKET NETWORK

Monitoring the UHF CB band during the Christmas break revealed a large number of new stations, all eagerly trying out their latest Chrissie presents, most thoroughly confused on the subject of repeaters, simplex and duplex, and generally having an interesting time of it battling past the established residents of Sydney repeaters.

An even better catch presented itself on the simplex channels however. Mostly on channel 39, but sometimes on 27 was what sounded like some sort of digital mode. Being a packet radio buff, my next thought was that it sounded EXACTLY like packet. A few quick wire changes and my Packratt was listening for the mysterious signal on the UHF band.

Packet radio is a complex subject, but as simply as possible, it is a means by which to communicate between two computers using radio waves as the connecting medium, rather than wires. If you have used a computer in conjunction with the telephone system, you already have a good idea of what packet radio operation looks like on the screen. Nothing scary or strange about all that. You need for reception (or transmission if you are a licensed amateur, limited or full call) a computer, a communications program and the packet decoder (this is sometimes called a TNC, a Terminal Node Controller), and of course a suitable receiver. Hook this lot up together as per instructions, dial the radio to a known area where packet stations congregate (for example 144.800 MHz), and hopefully you will begin to receive packet stations.

Anyhow, that mysterious signal was indeed a packet transmission, complete with dummy VK callsign, and what's more running a full blown packet bulletin board system, not unlike the telephone types. There was a fair number of messages already on the system, and there must have been a reasonable number of people who know about it, since the variety of stations accessing it was amazing.

Of course, transmitting packet or any other mode of transmission on the CB bands other than the appropriate FM, AM or SSB voice, depending on what band you are using, is very, very illegal!!! Naturally enough then, I was content to restrict the connection of the Packet decoder to receive only, but there was no need for me to connect to find out what was happening, all the anonymous stations requested enough information from the bulletin board on CB radio to keep me satisfied.

I left the system receiving on this pirate packet network for something like a week, during which time some very interesting traffic went across. In fact some of the operators might as well have left full names and address on the board, such was the amount of use and type of messages going across. Some out there now reading this might be feeling a little guilty by now, however, I suppose they thought it would be pretty private on UHF CB. Still, that's how some mobile phone users feel, so no-one's perfect. After a week, the system shut down, as did all the users without any reason why and, up to now, I am still in the dark as to the instigators of this interesting little exercise. Anyone care to enlighten me?

ANYONE FOR AEROBICS?

So much for UHF activity. There has been a marked upsurge in the use of AM 27MHz CB, especially in the west of Sydney. Most are of a new breed of operator, interested in fellow operators, rather than trying to track each other down for a fight, more like using the CB as a social medium. It is a refreshing change to the antics on UHF of late. Lots of newcomers are asking questions about their radios and how to use them and already established people are taking the time to help them out.

Much of the more enjoyable aspect of CB use in the west happens after dark and into the early hours of the morning. It is around this time that an unknown, but immensely popular operator makes his presence felt in the western suburbs. He is the host of the latest leisure activity to hit the CB channels. Around midnight, beginning on the AM call channel, starts the regular session of CB aerobics! You may find it hard to believe, but CB aerobics have a huge following of western Sydney CBers, and the complaints run thick and fast when our friend does not appear on air for a few nights running. If you imagine dozens of CBers keeping fit in tune to the CBs, then that is exactly what is happening out west. I have listened on occasions, and it is too lively for me.

Who is the mystery fitness freak behind the microphone? Lots of people know him by a number of different callsigns, but few know the true identity of the host of aerobics on the air. A fan club has been formed for Mr. X and, during his sessions, he invites those enjoying a work-out to send any mail to P.O. Box 267, Blacktown, 2148. I think that CB aerobics is a quite unique, if rather unusual use of CB radio and I invite readers around Australia to write to me if you think a local happening or use of CB in your area is as different as this is!

ANOTHER GROUP OF IDIOTS

Further to my comments some issues ago about the group co-ordinating their flying raids on 27MHz conversations from illegal frequencies above 27MHz, I have been informed about another group that uses UHF CB for an almost identical kind of harassment.

The latest mob uses a simplex frequency on UHF and actually discuss and laugh about the chaos they cause on the selected 27MHz channel. Unfortunately for them, plenty of other 27MHz users also have UHF radios and I have noticed a few times when the slimes operate that an announcement has gone over one of the repeaters, giving their channel and inviting everyone up there. UHF is really easy to DF, as those dedicated to fox-hunting will attest to and it is rather simple to identify a voice on UHF as well, so the idiot few, give it away now.

WHAT RECESSION.....WHERE?

While on UHF, the regular complaint is the 'power station' syndrome running rampant on the Sydney repeaters, particularly 1 and 3. It is common knowledge that the strongest signal into the repeater completely takes over the channel and newcomers generally find that out the hard way.

I cannot see the sense in spending so much money on the transceiver, then hundreds on amplifiers (besides being illegal!) plus the huge power supplies and then beam arrays into the bargain, simply to point at a local repeater in order to be a 'power station'. Some of the locals have really gone overboard on the whole deal with more than one station possessing antenna arrays that would put to shame some amateur moon-bounce antenna farms that I know of. Come on everyone, do you really think that 10kw of ERP is necessary? So much for the recession and the lack of money in the community.

See you again next issue.

TELL US WHAT YOU THINK!

All information from this survey will remain confidential to the editorial staff of CB Action Magazine.

Name .....

Age .....

Address .....

.....

State .....**Postcode** .....

(1) I currently own (please mark the respective box(es).

- ☐ AM only transceiver
- ☒ AM/SSB transceiver
- ☐ UHF CB transceiver
- ☐ Scanner
- ☐ Shortwave receiver
- ☐ Personal computer

(2) In the near future I intend purchasing (please mark the respective box(es).

- ☐ AM only transceiver
- ☐ AM/SSB transceiver
- ☐ UHF CB transceiver
- ☐ Scanner
- ☐ Shortwave receiver
- ☐ Personal computer

(3) If you intend to purchase, will the purchased equipment be a replacement for existing equipment or additional to it?

- ☐ Additional
- ☐ Replacement

(4) If it is a replacement, how will you sell your present piece of equipment?

- ☐ Daily paper
- ☐ Trading Post type publication
- ☐ Local free paper
- ☐ Other, please describe .....

(5) Please number from one to 10 in order of popularity the following regular columns/features/services.

- 5 Bandspread
- 4 DX Logbook
- 3 Repeater List
- 10 Spectrum Anarchy
- 8 OnLine
- 6 Utility DX
- 2 DX Propagation Chart
- 7 Scan
- 1 DX International
- 9 Wordmaze

(6) Do you buy CB Action specifically to read one of the above columns, if so which one?

- ☐ Yes .....
- ☒ No .....

(7) Do the magazine's 'rig reviews' influence your decision when buying new equipment? Please mark just one box.

- ☐ Completely
- ☐ A lot
- ☐ Not much
- ☒ Not at all

(8) Do you read the advertisements?

- ☒ Always
- ☐ Often
- ☐ Rarely
- ☐ Not at all

(9) Do you usually purchase new communications equipment from CB Action Advertisers?

- ☐ Always
- ☐ Usually
- ☒ Sometimes
- ☐ Never

(10) Are you interested in relatively 'light' technical articles such as the SWR one in this issue?

- ☐ Very
- ☒ Not much
- ☐ No

(11) Are you interested in relatively 'heavy' technical articles such as an article on transistors, what they are and how they work?

- ☐ Very
- ☒ Not much
- ☐ No

(12) Would you like to see more 'do-it-yourself' articles?

- ☒ Yes
- ☐ No

(13) If yes to question 12, on any subject in particular?

Propogation / Antenna Specs / Design

(14) Do you buy every issue of CB Action?

- ☒ Yes
- ☐ No

(15) If yes to question 14, what is the main thing about the magazine that influences you to buy each issue?

Sometimes I think that there might be something of interest to me.

(16) If no to 14, how many of the six issues per year are you likely to buy and why would you only buy them and not each issue?

.....

.....

.....

.....

.....

(17) Does the cover of CB Action have any influence in your decision to buy that issue?

- ☐ Yes
- ☒ No

(18) Other than the regular columns, which article/review/report in this issue most interests you, please mark boxes one to five in order of interest with name of article/review/report.

- ☐ .....
- ☐ .....
- ☐ .....
- ☐ .....
- ☐ .....

(19) Do you have a general interest in radio communications or a specific interest in just one area such as scanning or HF CB?

☐ I am only interested in ..... and don't bother to read about anything else in the magazine.

☒ My main interest is 11metre DXing ..... but I enjoy reading about other communication matters and information.

☒ I am interested in radio communication in general.

(20) How did you first 'discover' CB Action?

☐ Heard about it from a friend.
☐ Heard about it on air.
☐ Saw an advertisement in the daily paper.
☒ Saw it in a newsagent.
☐ Saw an advertisement elsewhere, where?

(21) Do you have any interest in eventually obtaining an amateur (HAM) radio licence?

☒ Yes ☐ No

(22) Do you buy any of the following magazines? Please tick those you buy.

☒ Amateur Radio Action
☐ CAR Australia
☐ Wheels
☐ Silicon Chip
☒ Electronics Australia
☐ Overlander
☐ 4x4 Australia

(23) Do you have an amateur operating licence?

☐ Yes ☒ No

(23A) If yes to 23, what level?

☐ Novice ☐ Limited ☐ Full call

(24) Are you a member of the Wireless Institute of Australia?

☐ Yes ☒ No

(25) Are you a member of any CB club or CB association?

☐ Yes
☒ No

(26) If yes, which club/association? .....

.....

(27) If you operate HF (27MHz), do you operate base, mobile or both?

☐ Only base
☐ Only mobile
☒ Both base and mobile

(28) If operating base, what type (not make) of antenna do you use?

☐ Dipole
☒ Vertical
☐ Yagi (beam type)
☐ Quad
☒ Other, what is it? Moonraker 4 Element.

(29) If operating HF (27MHz) CB, what is your main interest?

☒ Working overseas DX
☐ Working interstate DX
☐ Just talking
☐ Other, what is it? .....

(30) Keeping in mind that CBA is a bi-monthly and some items might be already sold, even before the issue goes on sale, do you think a 'readers only' (no trade) classified section is a good idea?

☒ Yes
☐ No

Thanks for your assistance in this survey . . . we appreciate it.

MAIL TO: CB Action, P.O. Box 628E, GPO Melbourne 3001

Rob Williams explains how to

START LISTENING TO SW RADIO

As CBA's resident shortwave writer, I get many letters from people who want to set up a shortwave radio but don't quite know how to go about it. There is more to it than just buying a radio and turning it on...you need to put in a little work behind-the-scenes to get the right skills and knowledge so you can spend your DX time efficiently. There's nothing hard about it—just common sense, experience and a few 'tricks of the trade'. Learning more about shortwave is enjoyable, and will make great difference to your hobby.

As a DXer of many years experience, I've seen people enter the hobby full of confidence and enthusiasm, and quickly fall away again. Don't expect to log all those DX catches overnight. The hobby is far more complex than that, it takes time and plenty of listening to get a 'feel' for the bands. Propagation changes constantly, and the 11-year ionospheric or 'sunspot' cycle means that exotic low-frequency stations can be there one year and gone the next. You haven't really been a DXer until you've survived a few of these solar cycles!

DOWN TO BASICS

Let's start with the antenna system. If you live in a house and can run an outdoor antenna—do it! The effort is well worth it. By keeping the aerial up high and away from any electrical interference you should get good reception. If you are a beginner then a long straight wire is sufficient. As you get more experienced and confident you can venture out into more elaborate systems using tuned antennas which capture the various shortwave bands more efficiently. If you can't have an external antenna, try mounting a long wire inside the house, as high and long as possible. Easier but more expensive is to buy an 'active' antenna. If all else fails you can resort to the telescopic antenna fitted to most portable radios.

To connect or 'feed' the antenna to your radio, make a small patch box using banana plugs and a metal project box from your local electronics store. This allows you to patch in different antennas (assuming you have more than one), and makes them easier to disconnect from the radio during electrical storms. I have five shortwave antennas which can be switched in and out as required, for experimenting or whenever I'm reviewing a new SW radio for CBA.

Also handy for your DX shack is a tape recorder. A small inexpensive cassette recorder with a few blank tapes is all you'll need, even if it is a handheld unit. I suggest you make sure the recorder has an audio input socket to allow you to run a shielded patch cord directly between the radio and recorder to eliminate background noise. In my shack, the tape recorder is permanently connected to the main shortwave radio so at a moment's notice I can start recording. Have your tape recorder running if you are tuning across the bands, so when you hear something interesting you'll have it on tape. Most of the more expensive radios have a facility to automatically switch your tape on or off at preset times. I use this constantly with my R-1000 to tape regular DX programs from stations around the world. This increases your actual DXing time without having to sit in front of the radio!

Even if you don't have a timer, you can pick up a time-switch from most electrical stores—Kambrook have one with a digital display that lets you turn devices on and off several times each day.

CURING NOISE

Interference can be a real problem in any shack, and with even the best equipment. Make sure to only use shielded audio leads and cables, these are ones where the 'ground' connection is used. This will help minimise any induced electrical noise that might be present, especially if you have a computer. Try to keep your radio away from your PC. You can improve the audio quality of your radio by using an external speaker. Many shortwave radios with quite good receivers let themselves down with a cheap speaker.

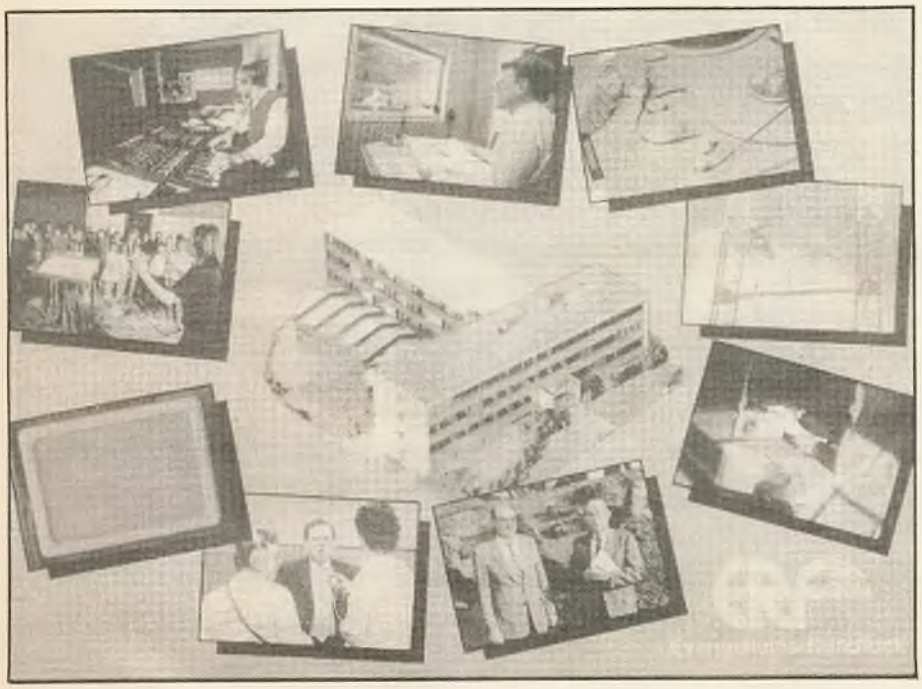
Tandy Electronics have a good range of speakers for the shack. A good set of headphones is also essential. Some stations are impossible to understand when the signal competes with any other background noise in your own shack, and of course you can DX to your heart's content without disturbing others in the house. Buy a 'notch filter', if you can afford one. These filters are designed to eliminate noise that surrounds the audio signal itself and may make the difference between hearing a station and losing it.

REFERENCE TOOLS

You should have at least one current DX book, such as the excellent World Radio TV Handbook or Passport To World Band Radio. And don't forget CB ACTION which provides a lot of up-to-the-minute information which you just won't find in regular reference boks. Those especially interested in utility listening will find it worthwhile to invest in either the Gilfer Confidential Frequency List or Jorge Klingenfuss' Guide to Utility Stations.

Broadcasters divide the year into periods based around the four climatic cycles. Using these periods as a base, they operate different combinations of times and frequencies to reach their audiences. However, there is a growing trend for stations to have only two major schedules per year, with minor changes in between. How do you find out about frequency changes which will affect your listening?

All stations regularly release free printed program schedules and even newsletters of sorts, but many are cutting back on this due to the enormous cost of printing and postage. So, the best way to keep in touch with these changes is through club newsletters, magazines such as CBA and on the computer bulletin board network's Australian and international shortwave forum, which often carries all the latest news.



WHAT ABOUT CLUB MAGAZINES ?

Magazines produced by clubs like DX Australia, the Southern Cross DX Club and the ARDXC are all full of tips and news and are at least one of the many good reasons for belonging to a shortwave club. Overseas clubs, such as those in the USA or Europe, can be expensive but worthwhile for the depth of information they can provide. If you intend to specialise in DXing one particular area of the world, find a DX club which specialises in that region.

International broadcasters announce times in UTC (GMT), so you will need to be able to convert UTC to local time and back again. If you aren't familiar with this, use a conversion chart—tables are printed in many DX books and phone books and you can easily make up one centred on your own local time zone. But remember to make allowances for daylight savings, otherwise you'll miss all your favorite programs.

Also have to hand a list of shortwave bands and frequencies so you can convert from metre bands to kilohertz or megahertz quickly and easily. It's also a good idea to make up a list of the stations you want to hear, in time- order together with the frequency or frequencies they will be on, and keeping it close to the radio. If you do this, all you have to do is look up your list to see if there are any stations you want to listen to at that particular time. If you are keen on snaring some rare DX, listen to stations WWV and WWVH for the latest solar forecast. WWV broadcasts on 2500, 5000, 10,000, 15,000 and 20,000 kHz at 18 minutes past each hour. WWVH is on all the same frequencies excepting 20,000, and is heard at 45 minutes past the hour.

BEACONS ARE A GOOD GUIDE

Another technique favored by experienced DXers is to use a few regular stations as 'beacons'. These are broadcasters scattered throughout the bands, with signals that come in loud and clear. You can quickly tune each station and, if you can't get a good signal, you have limited chances of hearing distant stations on that band. Beacons are a great guide to propagation.

Some of the best DXers always seem to be one step ahead of the rest of the crowd—with the latest schedule information, frequencies and station news. How do they do it? Well, it's no great secret, most of them listen to the top DX and SWL programs heard over stations like Radio Netherlands, RCI, KFBS and HCJB, which keep them up to date with all the happenings across the bands.

There are a lot of broadcasters jockeying for each frequency slot and some of them are constantly on the move—it's only through reports on DX programs and the BBS network that you'll know what happened to your favorite station when you can't find it at the usual time and place on the dial.

Once you've heard a new station, how do you identify it? Listen to the program. What are they talking about? Do they mention a town or city which you can use to identify the broadcaster? Is it a religious or propaganda program? Maybe you can recognise the language. Most international broadcasters identify on the half-hour or hour, so be patient. A good place to start looking for information is your DX club magazine or the WRTH as even though frequencies change throughout the year the languages to a particular target area generally remain the same.

KEEPING A LOG

When you start off in the hobby it's a good idea to keep a log book to record details of all the stations you hear. You can buy log books printed for ham radio use, however, I have found it better to design my own. All I use is a A4 sheet of paper with 13 columns running across the page—these are used for a reference (more on that in a minute), station name/callsign, time heard (in UTC), date heard (based on UTC), frequency, language, the date I sent a reception report, date the QSL card was (hopefully) received, total stations verified to date, total countries verified to date, total QSL cards received to date, whether I received a QSL card or letter and finally if I sent return postage or not.

If you are into utility DXing you'll want to make room for extra columns to record the mode of transmission, SINPO code and other comments. All this information is handy if you belong to a radio club, because you can send the club your monthly loggings. Once the master page is ruled up, you can photocopy it and stick the copies into a loose-leaf book. Simple, cheap, and fun—and you now have the start of an excellent logging system. If you would

(Continued over . . .)

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SWR/PWR meter (10/100W)..... **$39.50**
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THE SCREWDRIVER EXPERT'S GUIDE will enable the average non-technical CBer to locate and repair up to 95% of CB radio problems, as well as helping the advanced hobbyist to tune and modifify his equipment for improved performances. Price $15, $1.50 P&P.

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like a sample of one of my own sheets, just write to me enclosing an SASE.

You might want to go into even more detail with your loggings, so that you can determine whether you have verified a station or transmitter. A favorite of long-time DXers is to use index cards which can be bought complete with plastic case from your local newsagent. Create one card per station or country. On each card write the reference number which I mentioned earlier and the frequency you logged the station on. You can also do all this and more using a PC, but, the old tried'n'true system still works well.

RECEPTION REPORTS

If you don't already know, a reception report is a statement you send to the broadcaster outlining what you heard on their program together with some brief technical information on the quality of the signal. This is important for the station as it allows them to determine if their signal is getting through to the target area. You will need to include the frequency and time (in UTC) when you heard the transmission and a brief description of what you heard. This last requirement enables the station to confirm that you did indeed hear them—anyone can claim they did, but, only if you describe the program content, music played or anything else you heard can they be certain that you do deserve a QSL card. I find about 20-30 minutes worth of material is more than sufficient. Also, feel welcome to tell the station what you thought of the program...and include details on what type of radio and antenna you were using. Finally, use the international SINPO code to rate the quality of the received signal.

The SINPO code has five categories to describe the technical quality of the signal—strength, interference, noise, propagation disturbance and overall merit. Each factor is rated from 5 down to 1 (the higher the number, the better), giving you a string of 5 numbers in a row.

A perfect signal would have a SINPO rating of 55555, while an average one with slight interference and moderate propagation might be reported as SINPO 34433.

Keep a copy of all reception reports, just in case a station does not reply. If you are sure they do QSL, but are just a little lazy or may even have lost your

letter, you can send another copy of the letter with very little effort. But before you start chasing a particular station, get to know it. This is particularly important with Latin-American stations, some of which just refuse to QSL.

You could spend precious weeks trying to log a station, only to discover that it doesn't send reception verifications! Your time could be better spent trying to catch another station which QSLs. If you belong to a DX club, check to see if anyone else has recently received a QSL or letter from the station. Understanding the country itself is a real advantage to QSLing.

Some broadcasters vary their schedules during religious festivals, staying on air much longer than normal and improving your chance of you hearing the station. Also, during any war or conflict you will notice a massive increase in broadcast times and the number of transmitters in use. Newspapers and TV newscasts can give you a wealth of information on events in foreign countries, events which may affect your listening.

When sending a reception report to a station, be polite. Don't demand a QSL, because the station is under no obligation to reply, it is only a courtesy. When writing to a station, do ask for their latest program schedule and request that you be placed on their list for future mailings.

Some postal systems work in mysterious ways! You may find you need to send a station mint stamps (from the station's own country) to get a prompt reply, so you'll have to visit a stamp dealer to get the right stamps. Other stations don't favor International Reply Coupons (IRCs), which have to be cashed at the post office. If you want a QSL in a hurry, include enough return postage for airmail as seamail can take up to 12 weeks on top of any delay imposed by the station.

Many highly noted DXers don't even bother with QSL cards, preferring to record the station on audio tape. This is an instant way of proving to a friend that you really did hear that station, assuming of course that you can get a clear station ID. And shortwave DXers, like their CB and Ham counterparts, will go to all lengths to get that rare QSL card, from bribing a technician at the transmitter site to telephoning in person and getting on side with someone who will acknowledge their reception report.

There is no end to the pleasure you can get from listening to distant stations. With some practice and patience, you will enjoy the hobby as much as I have for the many years I've spent DXing...let me know how you go!

SINPO RATING SYSTEM				
S (Signal strength)	I (Interference)	N (Noise)	P (Propagation)	O (Overall merit)
5. Excellent	5. nil	5. nil	5. nil	5. excellent
4. good	4. slight	4. slight	4. slight	4. good
3. fair	3. moderate	3. moderate	3. moderate	3. fair
2. poor	2. severe	2. severe	2. severe	2. poor
1. barely audible	1. extreme	1. extreme	1. extreme	1. unusable

GET THE LATEST ON

HF UTILITIES

from BOB BELL

There's certainly been plenty to enjoy on the HF utility bands since I last sat down with you and enjoyed a chat over a cup of coffee. Of particular interest were the frequencies used by America's Cape Radio for point-to-point rebroadcasting of audio live from the Space Shuttles.

The best frequency monitored was 20185, after I received a timely telephone tip-off from a reader who uses the pen-name of 'Sunset' and is fast becoming an integral part of this fledgling column's monitoring team. There is also an amateur station in the US which rebroadcasts shuttle audio on all unclassified (ie non-Department of Defense) missions, transmitting on several frequencies including 3860, 7185, 14295 (the best signal to me), 21395 and 28650 kHz.

As for other official Cape Radio frequencies, most common channels apart from 20185 are 5680, 9002, 13218, 13480, 19640, 19990, 19995, 20395 and 22760. The best way to go about monitoring the shuttle is to tune to Cape Radio 20185 during the launch and shortly after the lift-off, then either stick with that frequency or change to the ham rebroadcast when the vehicle is in orbit. I monitored Discovery's most recent mission, and heard many juicy snippets including much conversation regarding the deployment of the Hubble space telescope. And you too can monitor the space shuttle! You don't need to have special microwave gear or dish antenna, just a decent HF comms receiver and antenna. So next time a shuttle launches, get into your shack and fly with the astronauts on this fascinating real-life adventure!

For those interested in the actual microwave or S-band channels used for shuttle space comms, the downlinks are 2287.5, 2250.0, 2217.5, 2214.0 and 2205.0 MHz, with uplinks to the relay communications satellite from Houston heard on 2106.4, 2041.9, 1831.8, and 1775.9 MHz.

ATS-803A — HOW GOOD?

On the subject of equipment, I have had a lot of correspondence concerning the Sangean ATS-803A receiver.....asking if it is suitable for ute and shortwave reception, and if indeed this portable HF unit is really as good as rumor says. My answer is "yes, yes, yes"!

The Sangean is an excellent performer with some very up-to-date features and after spending some time with an evaluation model, I took the drastic step of replacing my beloved Yaesu FRG-7700 with the ATS-803A. What's more, I can take the portable Sangean places where the 'Frog' could never go. For aviation freaks like myself, the Sangean ATS-803A is the answer to your HF prayers.

Tandy Electronics market this little beauty under their own banner, as the Realistic DX-440, however they sell it for considerably more — their current price is $349.95. The original ATS-803A retails for as low as $250 in some stores, so shop around and pick up this bargain while you can.

GULF FREQUENCIES

I've had many readers asking for frequencies used in the Gulf crisis, which as we go to press is escalating and barely days from the war deadline, and there are even monitors targeting the Middle East situation.

I know there are many experienced listeners who have been 'sitting' on allied military frequencies, but of late the mail on this subject has died down, and I'm at a loss to understand why! This is history in the making. I am personally continually looking for new channels being used in this standoff, logging EVERYTHING I hear.

11175 and 6738 are still active from the Gulf area, but I am now copying lotsa scrambling there. There's also plenty of activity being heard on 6763 and 8161. So if you're into military keep an ear out for any other frequencies, and report 'actives' to this column for the benefit of all HF Utilities enthusiasts! My thanks to Anthony Santos from Victoria, and Bob Lopaka from Mona Vale NSW for their assistance with these military notes.

RFDS RADIO

John Warren from Armidale NSW is interested in monitoring the HF channels used by the Royal Flying Doctor Service. Actually John, CBA spotlighted the RFDS network just a few issues ago, but for your information I will present the frequencies for the stations you specifically requested: namely Alice Springs, Broken Hill, Cairns, Charleville, Darwin, Derby, and Hobart. There are of course other stations located at Broome, Carnarvon, Kalgoorlie, Katherine, Meekatharra, Mt. Isa, Port Augusta, Port Hedland and Wyndham.

Alice Springs VJD on 2020, 4350, 5410, 6950; VZ8BZ on 5340, 5370, 8030 Broken Hill VJC on 2020, 4055, 6920 Cairns VJN on 2020, 2260, 5145, 5300, 7465 Charleville VJJ on 2020, 4980, 6845 Darwin VJY on 2360, 4010, 6840, 7975 Derby VJB on 2020, 2792, 5300, 6925 Hobart 5355.

AIRBAND NEWS

Info I leaked earlier about Qantas striving to be the first in the world with satellite antennas fitted to its B747-400s will soon be a reality. Delivered just prior to Christmas 1990 was a brand new Boeing 747-438 aircraft equipped with the exact same satellite antenna I predicted, a strange device which looks just a little like a surfboard on the upper fuselage and mounted just above Door 4.

The aerial is a Canadian Marconi high gain satellite antenna array, and allows for transmission of far more data than the usual satcom antennas. Another crystal-ball prediction I made, also about to come true, is Qantas' planned usage of the satellite antenna to transmit ACARS (Aeronautical Communications Addressing and Reporting System) information from airborne craft back to engineers at Qantas' Sydney jetbase. After initial ACARS trials, the antenna will be used in trials conducted with Air Traffic Control authorities in Australia, the United States, and Japan. These trials will be to develop an efficient system of position reporting using datalinks through the INMARSAT A bird. Aircraft positions will be automatically reported to the relevant ATC unit via commercial packet radio, using 9600 baud transmission rates. Also as tipped, oceanic aircraft HF voice reporting will become redundant between 1993 and 1995! In time, Qantas is planning to extend the use of the satcom system to provide passengers with inflight telephone and fax services.

Thanks again for that enjoyable chat, now let's catch up on the latest HF ute loggings from our ever-growing network of monitors. And if you wish to send me entries from your monitoring logbook, I'll need them in the following format: frequency (in kHz and ascending or lowest-to-highest order), station location and callsign (if known), time in UTC, details of traffic heard, and mode of transmission. Please indicate if you wish to be credited for your contribution, and include a stamped self-addressed envelope if you would like a personal reply. Send your loggings to me at PO Box 301, Chester Hill NSW 2162. So let's waste no time and get straight into the March/April utility logsheet.

UTILITY LOGSHEET

(all frequencies in kHz)

317 Sydney Airport NDB AERO 0510z CW with ATIS overlaid. CW ident/AM ATIS (Bromley)

2524 MYA MYA Maritime 2205z Safety Sked wkg yachts in Syd-Hob yacht race. Reporting numerous small items lost overboard from yachts, otherwise OK. USB (Bell)

4483 Ultimate Challenge and Witchdoctor (yachts) wkg Radio Relay vessel 'MYA MYA' 0639z with Posn. Report Sydney-Hobart Yacht race. USB (Bell)

4483 Penta CommStat Sydney 0535 Wkg numerous yachts in race to Coffs Hbr. Hear this same very dry OM every yr. on same freq as Syd-Hobart classic. USB (Bell)

5230 MIQ2 Israel Intelligence stn. 0130z Mossad broadcast to field agents, 'Mike India Quebec 2' repeated by YL continuously. AM (Purvey)

5643 Qantas 35 AERO 1002z wkg Sydney Radio at FL410 and passing Airep. USB (McFarlane)

5643 Singapore 801 AERO 1204z posn BAVOX passing Airep at FL 370 and wkg Sydney. USB (McFarlane)

5643 UTA 566 AERO 1246z posn LOTRA, FL 370, wkg Sydney USB (McFarlane)

5643 United Nations 953 AERO Wkg Nadi Radio with Airep at FL 330 posn LANIS. USB (McFarlane)

5643 Hong Kong 204 AERO 0849z Wkg Sydney at FL 350 at Posn ADKIP. USB (McFarlane)

5688 Tester 25 AERO 0650z Aircraft wkg Air Force Sydney with ETA information. USB (Palmer)

6499 WLO Mississippi MARITIME 1230z with traffic list and wx (weather) info. SITOR (Reakes)

6676 SINGAPORE VOLMET Aero 1950z terminal info for Kuala Lumpur, Denpasar, Penang. USB ('Sunset')

7660 VKG Tibooburra 0230z NSW Police Wkg Bourke, requesting warrant check as their Wang computer on 'Eaglenet' system off line. USB (Bromley)

8129 CLANDESTINE 1105-1126z Very slow dictation with rpt phonetic clarification.....No.2 Michel Vange, No.3 Patrick Gibiat, No.4 Michel Canal, No.5 Ernard Arcangelli, No.6 Rene Quinquins, No. 7 Noel Marcel, No.8 Hernandez, only 8 coming, total of eight' (intriguing!). USB ('Pete')

8161 WARSHIP FREMANTLE 0553z Wkg NOWRA CONTROL, suggested they contact Fleet Ops Controller for Port Kembla. USB (Henry)

8488 NAVAL COMMSTA CANBERRA 0345Z tx of stn ID for rx alignment, rpt'd over and over, then what sounded like young boy calling 'War Ship Sydney.....this is Navy CommSta Canberra, radio check, over'. Original tx interrupted for the 'boy'. USB (Harding)

8503 SEATRANS SYDNEY 0021z Wkg ship stn with reference to malfunct. hatch covers, suggested fix. CW ('Sunset')

8825 SHANWICK RADIO (Shannon Ireland) Wkg MAC 4464 (C-141 Starlifter jet) at posn 44N 15W, at FL 390. USB (Henry)

8867 AUSY 368 AERO 2124z Military a/c RAAF with in-flt drama, not declared emergency, but advising shutdown no. 2 engine & request immediate descent to FL 180. Stated 'not declared emergency and fuel dump not required.....request direct track Richmond'. USB (McFarlane)

8867 Boeing 623 (A20-623) 2348z Wkg Sydney Radio. 'Sydney Sydney, this is Boeing 623 on 8867. Request selcal check on GOLF LIMA-ALPHA KILO'. Boeing 707 a/c from RAAF fleet. USB (Bell)

8867 Argentina 881 AERO 1056z Wkg Sydney with Airep at FL 370. USB (McFarlane)

8867 NEW SOUTH 891 Aero 0054z Requesting selcal check on CHARLIE GOLF- ALPHA KILO bound for Norfolk Island a/c ex-East-West Airlines jet, VH-EWC, F.28. USB (Bell)

8975 ARMY TOWNSVILLE 2220z Wkg AIRFORCE TOWNSVILLE with radio and time check, Townsville counted down seconds after giving 2221z. USB (Henry)

9130 Unidentified spy numbers 0321z Possibly Israeli Mossad with five digit number groups. AM (Lopaka)

10051 NEW YORK RADIO Aero 1022 Volmet Broadcst for Niagara Falls, Milwaukee, Indianapolis, Detroit. All temperatures between 65 & 70 deg. fahrenheit. USB ('Sunset')

11306 OKINAWA KADENA Aero 0700 USAF Base wkg MAC a/c with terminal wx. USB (Henry)

11309 NEW YORK RADIO Aero 2007z Wkg MAC Alpha 3739 a/c at posn 42N 50W. Aircraft told squawk "1-5-6-7". USB (Henry)

11532 Unidentified Spy numbers 0805z Possibly Israeli Mossad five digit number grps. AM (Lopaka)

12747 MIW14 Israel Intell. stn 1947z Mossad broadcst for field agents. 'Mike India Whiskey 14' repeated over and over by young YL in heavy accented English. AM (Purvey)

25898 ZUA024 0010z Wx stn. idling, no traffic copied 425/50/H. (Elliot)

That's it for now. I'll see you next column, with even more on offer from the HF utility band, and in the meantime you can get all the aeradio news in my column 'On The Airbands' in Australian Aviation magazine.

Jack Haden looks at the

Anguilla Island

DXpedition

No doubt 1990 was the year of DXpeditions on the 11-metre band. Some incredibly rare countries appeared on the band, some for the very first time. This, in turn, created a frenzy of excitement as avid DXers sat by their radios for hours on end waiting for the band to open to these prized catches. Of course some actually made it and secured a contact while others unfortunately missed out. The dreaded unpredictability of Sunspot Cycle-22 was blamed by most as they struggled to decipher weak signals from the usual noise of 11 metres.

With events in Kuwait still fresh in everyone's mind, prominent Puerto Rican DXers Ozzie, the 11-AT-116; and Carlos, the 11-AT-121; decided to head to the British Dependent Territory of Anguilla, in the Caribbean Sea, on a DXpedition. This expedition was to be dedicated to fellow DXers in Kuwait, praying for their safety and that of their families and hoping for peace in our troubled world.

Anguilla is the most northerly of the Leeward Islands, lying some 70 miles to the north-west of Saint Christopher (St Kitts) and five miles to the north of St Maarten/St Martin. Also included in the territory are the islands of Sombrero, 30 miles north of Anguilla, and several other uninhabited islands.

The island is sub-tropical with the heat and humidity being tempered by the trade winds. Temperatures average 27 degrees Celcius and the main average rainfall is 36 inches. English is the official language.

Anguilla was a British Colony from 1650 until 1967. In February 1967 St Christopher (St Kitts) — Nevis-Anguilla became a State in Association with the United Kingdom. The Associated State status allowed internal independence while the British Government retained responsibility for external affairs and defence.

Due to a small uprising between political parties on St Kitts and Anguilla a short time later, British Security Forces were landed on Anguilla in March 1969 to install a British Commissioner. In December 1980 Anguilla formally separated from the State, while St Kitts-Nevis achieved independence. Anguilla became a British Dependent Territory, administered under the terms of the British Government's Anguilla Constitution Order of 1982.

Tourism is a major source of income to Anguilla. In 1987 a total of 69,123 tourists visited Anguilla and the number of hotel rooms increased to 580 in 1988. Education is free on Anguilla and attendance is compulsory between the ages of five and 14 years.

The total area of Anguilla is 91 kilometres and the statistics for the 1984 survey revealed a population of 7,019. Major export from Anguilla are livestock fish & lobsters, and salt which is extracted from a small mining operation. The currency on Anguilla is the EC (East Caribbean Dollar), roughly US $1 = EC $2.700 in 1988.

In 1986 there were an estimated 6,300 radio receivers in use on Anguilla. There is 90 kilometres of roads of which 46 kilometers is tarred.

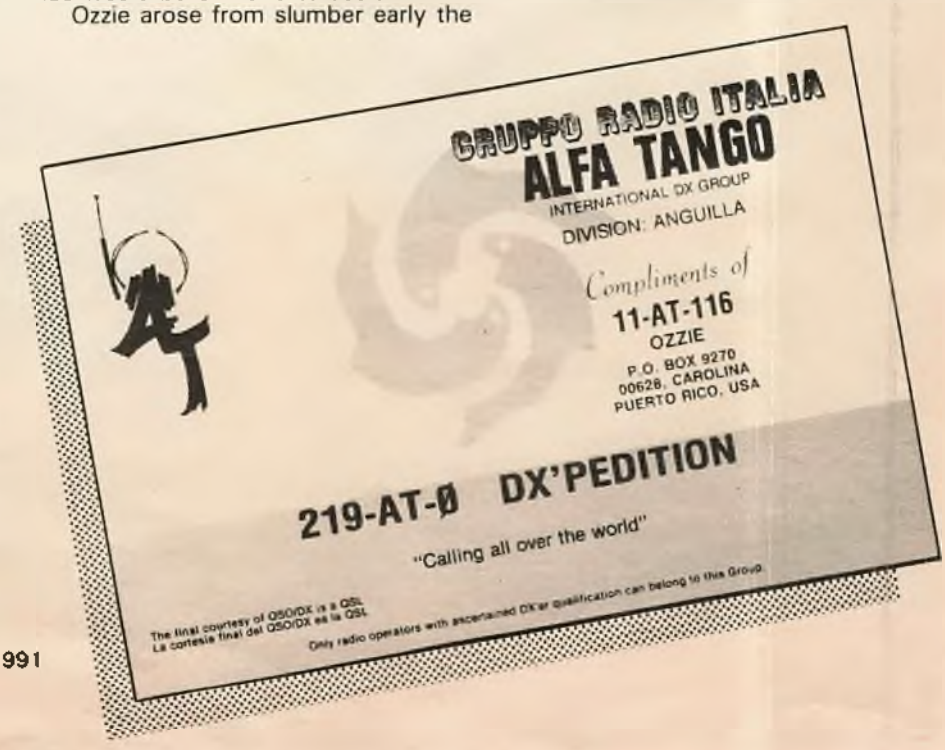
On 30 August, 1990, Ozzie was the first to arrive in Anguilla by way of aircraft from Puerto Rico with Carlos arriving the following day. On the night of 30 August, Ozzie was busy erecting the antenna at Crocus Hill, the highest point of Anguilla. This was in preparation for the final mounting and test to take place the following day when Carlos would be on hand to assist.

Ozzie arose from slumber early the following day and, after the radio and antennas were adjusted properly, the station broke on to air at 1145z to sign as 219-AT-0 VP2E. The first progressive number was issued to Larry, the 2-AT-325 in Michigan, U.S.A. During the day Ozzie chalked up a total of 245 stations in the log including another DXpedition station that was signing as 146-VC-0 in the north African country of Algeria.

That evening Carlos finally arrived from Puerto Rico and so the small two man DXpedition team was complete. After picking Carlos up, they returned to the station only to find that the propagation paths had quickly deteriorated and thus no further contacts were made. Carlos and Ozzie then decided to venture out and explore the nightlife of Anguilla and soon found a reggae & calypso music concert with free food.

Later that night they returned to the station to check on the band conditions and found an improvement with an opening to the South Pacific region and thus worked many Australian and New Zealand stations. During this time conditions also opened to neighbouring Caribbean countries and South America and a number of these were also put through.

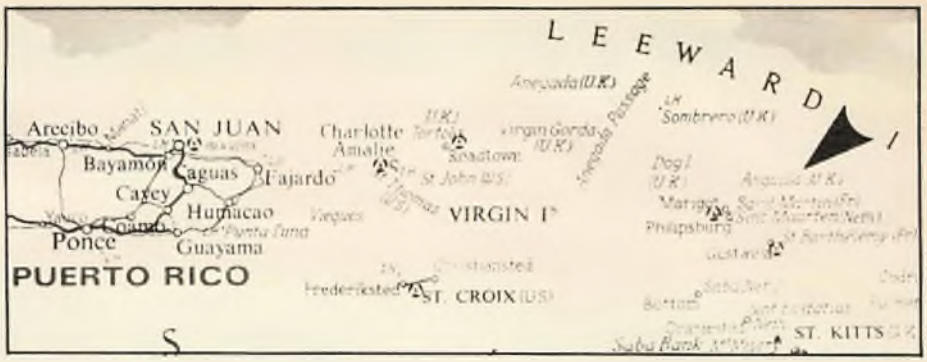
On Saturday 1 September, they ap-



peared back on air at 1000z which was 0600 hours in the morning Anguilla time and prepared to work quite a large pile up as the band was wide open at the time. Around midday they had to close down as the noise on the band was extremely high and making sound contacts proved difficult. It was decided that a break should be taken and return about 1900z and recheck the band.

The noise had died down considerably when the radio was switched back on at 1900z and 100-AT-102 from South Korea was worked, but later that evening the band conditions started to deteriorate once again and it was agreed that the reggae & calypso music establishments were the place to be. The band was totally quiet when Ozzie and Carlos returned sometime later and with 578 contacts in the log for the day it was decided to call it an early night.

On Sunday 2 September, Ozzie again started early at 1000z and by the time Carlos had arisen, Ozzie had worked in excess of 100 contacts. That day some good DX catches were made by way of contacts with 189-SA-01 operated by Annie in Mayotte, Indian Ocean and 176-RN-101 from the Central African Republic. Around midday local time Carlos and Ozzie realised, after checking the logs, that they were about to break the 1,000 contacts mark and at 2109z this goal was achieved by way of contact with



13-AT-249 operated by Ralph in (then) West Germany.

Again evening time propagation proved to be very poor that night and very few stations were contacted. Carlos and Ozzie again agreed that an early night would be in order so a fresh start could be made the following morning.

Monday, 3 September was to be the last day of operations and Ozzie was once again up and at it quite early, while Carlos packed his bags ready for the flight back to Puerto Rico later that morning. At 1000z the station was closed temporarily whilst Ozzie went with Carlos to the airport.

Ozzie returned sometime later and proceeded to operate until 1400z when the 1,200 contact mark was broken with an Italian station, 1-SK-124. After that contact was completed Ozzie officially closed the DXpedition station and prepared to dismantle the station ready for his flight home to Puerto Rico later that day.

A total of 69 countries were worked in all continents for a grand total of 1,200 contacts even, while signing as 219-AT-0 VP2E, Anguilla. Special thanks go to all those who called and for the general patience of operators in the pile ups. Ozzie and Carlos would also especially like to thank Roy, the 169-AT-108, and Phil the 169-AT-111 for the cold beers supplied.

For those who still need a card for the DXpedition and have a contact number, the QSL route is still via 11-AT-116 in Puerto Rico with the usual trimmings enclosed to ensure an AIR-MAIL reply. My thanks of course to Ozzie, the 11-AT-116 for supplying me with the full report on the operation. 73 Jack.

Ken Reynolds (Power Band Communications) reviews the

NEW MIDLAND AM/SSB RIG

MIDLAND used to be a name synonymous with CB radio although many CBA readers might have never heard of the company before. I owned a Midland 23 channel, crystal synthesized, AM CB rig way back in 1979 which was pretty hi- tech at the time when nearly all CB rigs used a pair of crystals for each channel.

For some reason, the MIDLAND name faded from the scene back in the early seventies and the only recent knowledge of it seems to be some importation of their commercial communications systems in recent years and an AM-only rig stocked by Dick Smith Electronics.

All nostalgia aside—MIDLAND is alive and being imported into OZ by Wagner Electrical Industries of Carramar, New South Wales and we're about to take a look at the 79-265 AM/SSB transceiver.

IT LOOKS FAMILIAR

At first glance the 79-265 seemed familiar—the front panel coloring and style being reminiscent of the old HUSTLER, now defunct for some years, while the control layout is dead similar to the UNIDEN GRANT.

The plastic control panel is, in the main, bright chrome plated with a large blackened window containing the channel selector, a row of press-buttons and the LED display information for signal strength, output power, SWR, channel number and mode selection, etc. The channel display is impressive with large bright orange numbers that are quite visible in medium bright light, however, the lack of a dimmer for night-time might well mean that the brilliance of the display could become annoying when driving.

The row of press buttons from left to right accounts for: HIGHWAY/CITY function which is a 40dB attenuator that takes the place of an adjustable RF gain control, ANL and NB buttons for impulse noise control, channel 9 priority switch and a PA/CB button that, as its name implies, toggles the operating mode between CB and public address modes.

The rotary controls from top left to right are: microphone gain, clarifier and SWR calibrate control. Lower left to right is combination ON/OFF volume control, squelch and AM/SSB mode switch.

WHO NEEDS A POWER MICROPHONE ?

The microphone gain control offers a very wide operating range from full attenuation of the microphone output to a level so high that it is nearly impossible to avoid bags of over modulation...just the thing for all you guys looking for power mikes these days. If our test rig is any indication you won't need a power mike with this baby. With the control set at about 50 per cent level (12 o'clock) the transmitted audio is good and a realistic level of modulation is maintained on AM. On SSB the same is true, however, increased gain tends to compress the

sideband signal into the upper power limits of the rig and really pushes maximum power even for fairly low microphone input levels. On AM, the modulation level of our test rig ran way over 100 percent with serious clipping of the signal.

The squelch control is a bit 'touchy' and difficult to set at an acceptable threshold level. The best we could muster on AM was about one micro volt sensitivity and that was with careful adjustment. Sideband is a shade better at 0.7 micro volts. Maximum squelch level (tight) required a 1,700 micro volts signal to open the gate.

The other rotary controls are pretty normal and require no further explanation.

The SWR indicator on this rig seems to be quite OK and gave a reasonable comparison with our test bench meter.

The noise limiting circuits are effective and their performance on AM is quite useful, but as with many other rigs, they leave a bit to be desired on sideband signals.

Receiver sensitivity is much the same as most modern rigs with the AM portion producing 0.35 micro volts for 12dB SINAD and the sideband receiver showing at 0.3 micro volts for both upper and lower sidebands. The received audio is pleasant and offers fairly 'flat' performance throughout the audio range from 400 hertz to 2.5 kilohertz with a quick fall-off below 300 hertz and above 3 kilohertz—quite good for a sideband rig.

The signal strength indicator gives a score out of five (5 LEDs) with the first segment illuminated by a 5.5 micro volt signal followed quickly by the second segment for 6 micro volts. Lights 3, 4 and 5 illuminate for levels of 15, 130 and 1,300 micro volts respectively. Even though the scale is a bit compressed at the lower extreme, the mid to upper end of the scale is quite a fair spread.

4.5 WATTS ON AM

Transmitter power on the test rig was 4.5 watts on AM and an easy 12 watts PEP on both sidebands with good, clean transmitted audio on both AM and SSB—provided of course that the microphone gain was kept under control. Into a 50 ohm load, only four of the five output power indicator LEDs were illuminated with the fifth flashing in brilliance in sympathy with the transmitted modulation. The 5 minute transmitter test on AM caused no decrease in output power, in fact the opposite effect was recorded with the power actually increasing by about one quarter of a watt. The test was carried out on a hot day and there was barely any increase in temperature of the case.

RARELY SEEN HEAT SINK

This is probably partly due to the incorporation of a small, finned heat sink bolted to the rear (see pic) of the case directly over the area where the RF driver and power amplifier transistors are bolted to the frame. This is rarely seen on HF CBs although common on many amateur type transceivers.

The microphone is identical to that supplied with a variety of other rigs, however, the four-pin plug has a die-cast metal shroud of the type that used to be supplied with sideband rigs away back when...haven't seen a new one in years.

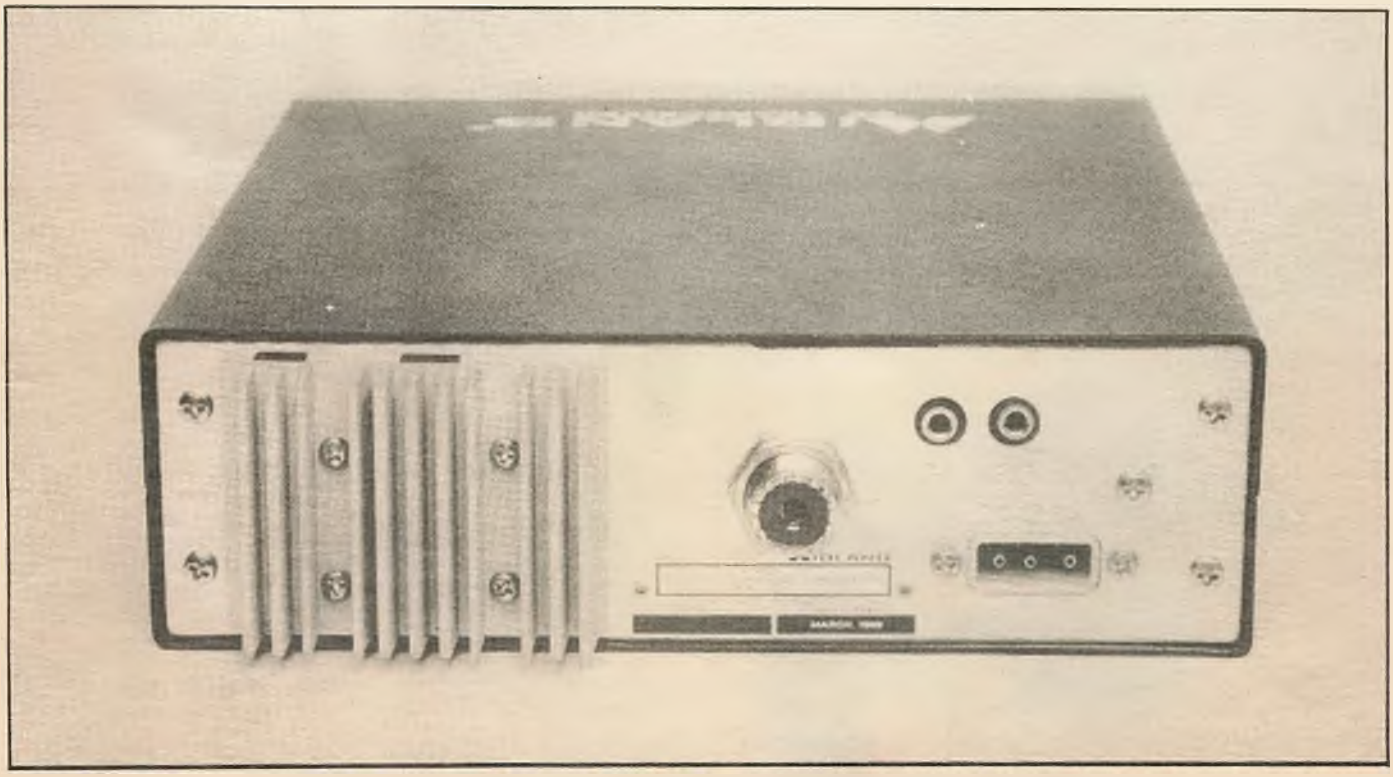
Case construction is assembled from individual panels of pressed steel and aluminium with the rear panel being aluminium onto which is attached the finned heat sink. The microphone socket is on the left hand side about 7 cm from the control panel—much the same as the older UNIDEN rigs.

Internally, the 79-265 also looks pretty familiar in format to some other popular designs with the parts layout remarkably similar to the UNIDEN AX-144 which seems to have been the evolutionary standard for several generations of other sideband CB transceivers.

The connections between front panel and the main printed circuit board are made with discrete 'hook-up' wires that have been hand soldered into place. In the past it is these hand soldered 'joints' that have been largely responsible for many intermittent faults in similarly constructed rigs due to the often fluctuating quality of the soldering.

SUMMARY

It is good to see the resurrection of an old familiar brand name and apart from a couple of minor 'glitches' the MIDLAND 79-265 represents good value. There is certainly more than enough microphone power to go around and if all 79-265s shape up like this one then power mikes might soon become extinct.



Fins on rear panel are for heat sink, not a feature seen often on 27MHz transceivers.

CB ACTION

Wagner Electrical Industries/ South Pacific Radio

WORDMAZE

1. What is the first name of the company importing the Midland 79-265 AM/SSB transceiver into Australia?
2. What is the surname of the person who reviewed the South Pacific Sniper antenna in the Jan/Feb issue of CBA...that's right, the issue before this one (aren't you sorry you didn't buy it!)
3. What is the name of the operator who signs as 'CHICO-RADIO' from Santiago, the capital of Chile?
4. What is the code-word for 'signals' in one of the articles in this issue?
5. What are the initials of the circuit that 'keeps the receiver volume level constant with widely fluctuating input levels? The answer is in this issue.
6. The (word?) Whisky DX Group gets a mention in this issue...what's the missing word?
7. Who was 'our man in Campbelltown?...surname only, yup, it's in this issue!
8. It's 'troubled times for Radio (country?) International'.
9. In this issue, DXer Jack Haden has a story on a DXpedition to (what island?)
10. The Midland rig has a "rarely seen (word?) sink".

Having caught up with Ken Reynold's review of the MIDLAND 79-265 AM/SSB rig on pages 58/59 of this issue, you now have the chance to win one courtesy of Wagner Electrical Industries. Also included is a 27MHz Sniper base antenna and 15 metres of RG213 coax from South Pacific Radio...now this is what you call a really great prize.

...and all you need are some correct answers to some easy questions and a bit of luck when we pick the envelope out of the mailbag.

We will hold all entries until 19 March and the rig and antenna will go to the first envelope opened on 20 March which contains all the right answers (and has all the answers circled in the wordmaze).

Don't forget, you need to answer the above questions and you must also circle them in the WORDMAZE.

A	O	A	C	G	O	N	T	A	P	R	L	H	L	A	O	R	L	P	G
R	A	G	O	E	L	E	W	A	A	L	L	C	R	T	A	I	N	R	T
L	A	T	C	A	U	A	A	N	N	D	R	U	N	A	U	U	G	O	U
G	G	O	C	I	G	A	A	T	G	T	R	E	G	N	L	D	P	T	N
A	A	A	U	N	C	P	G	A	S	S	R	E	A	A	A	A	G	H	T
T	E	R	E	N	R	D	R	M	G	E	A	U	P	P	O	N	O	E	T
N	A	R	A	O	A	I	A	A	U	A	I	P	O	E	A	L	C	A	A
A	E	O	N	O	L	I	C	L	A	A	P	P	G	G	D	A	A	T	L
A	N	T	R	C	L	C	A	G	N	A	G	M	H	D	A	N	S	A	D
C	O	C	N	L	D	O	A	R	A	A	C	O	P	A	N	O	I	M	N
P	P	A	I	N	U	L	C	N	A	C	A	M	R	O	A	G	A	I	E
L	A	W	T	C	P	A	R	A	A	E	A	N	A	G	C	N	E	R	N
A	O	G	T	U	M	M	W	E	L	A	C	A	L	T	U	I	O	G	O
P	G	T	A	N	U	T	G	A	N	S	O	A	A	E	A	C	T	A	N
A	M	I	P	N	R	A	L	N	P	A	A	R	L	A	G	N	N	T	U
G	C	C	N	O	R	N	O	S	A	T	U	A	L	P	G	E	G	A	M
O	O	W	S	U	R	I	P	O	M	A	D	I	E	U	U	O	A	A	T
N	A	E	P	R	T	A	G	H	A	L	L	I	U	G	N	A	A	A	A
E	U	O	G	G	C	A	P	P	T	I	L	A	P	A	P	O	C	I	O
M	C	A	D	G	U	A	A	A	C	T	U	A	T	T	R	C	G	G	R

1 .....

2 .....

3 .....

4 .....

5 .....

6 .....

7 .....

8 .....

9 .....

10 .....

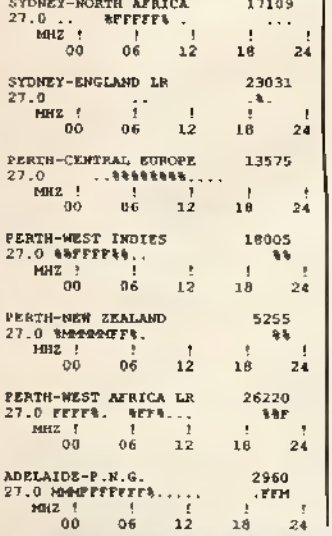
The answers to all of the above are to be found within either this or the previous issue.

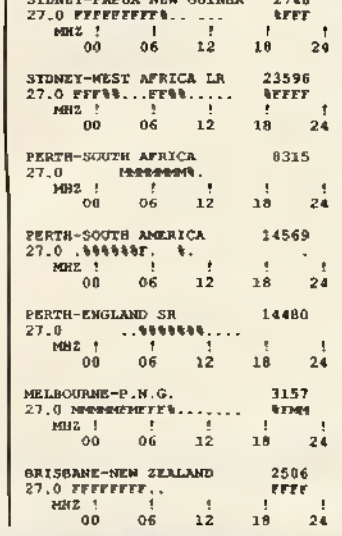
NOTE: The correct answers MUST be circled in the WORDMAZE — photostat copies are acceptable however only one per reader — if we find a reader sending in more than one photostat entry all that reader's entries will be excluded. You can of course send in as many entries as you like using the original page torn from the magazine...that way we get to sell more of 'em...!

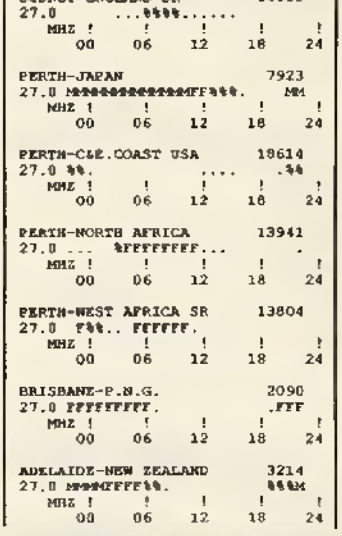
The closing date is 19 March and the winner will be the first entry opened after that date. The draw will be conducted in the offices of CB Action and the results, answers and winner will be published in the next issue.

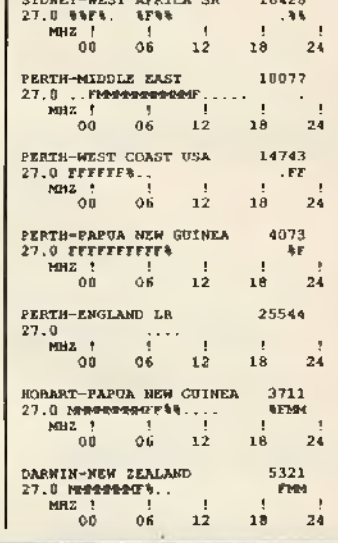
Entries should be addressed to: CB Action/Wagner Electrical Industries/South Pacific Radio Wordmaze, P.O. Box 628E, GPO Melbourne 3001.

NOTE: Skip conditions are virtually the same from Sydney as they are for all other East Coast areas — likewise Perth predictions can be taken as similar to those for other West Coast areas.









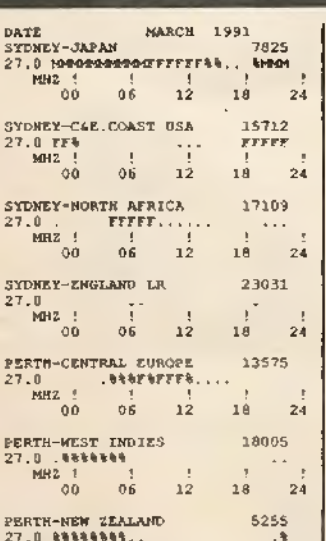
These GRAFEX style predictions present in pictorial form the expected HF propagation conditions between Australia and a number of important DX areas. For each circuit, the "East" terminal refers to the eastern half of Australia. The horizontal axis of each graph represents the hours of the day in Greenwich Mean Time from 0000 hours to 2300, reading left to right. The vertical axis represents increasing frequency.

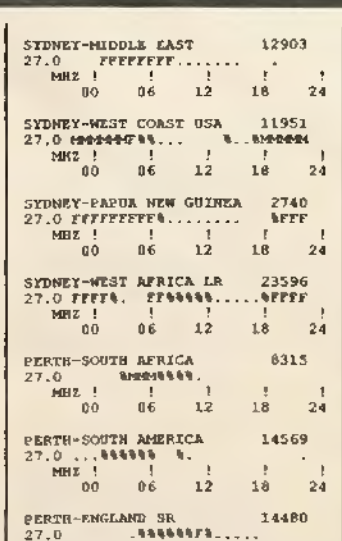
A GRAFEX symbol represents the predicted propagation conditions for a particular frequency at a particular time. The meaning of each symbol used is given in the key on the next page. The letter "F" designates the best conditions for HF communications.

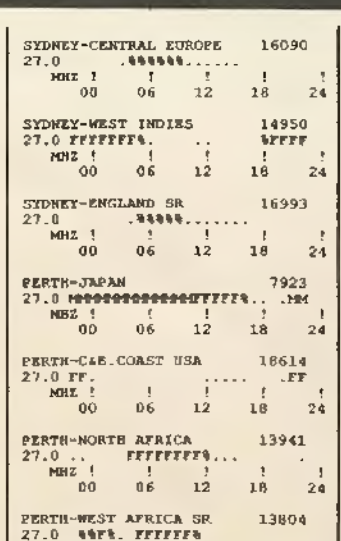
Grafex prediction charts supplied courtesy of the Ionospheric Prediction Service, 162-166 Goulburn Street, Darlinghurst, NSW. IPS offers pre-recorded telephone information. To access the service, please phone (02) 269 8614.

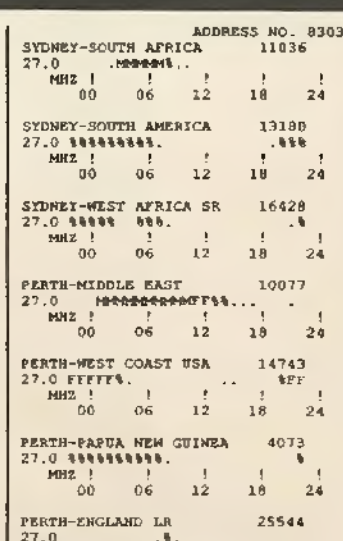
LEGEND TO GRAFEX SYMBOLS

- Propagation is possible but probably on less than 50% of the days of the month.
- % Propagation is possible on between 50% and 90% of the days of the month.
- 'F' Propagation is possible by the First F modes on at least 90% of the days of the month.
- 'E' Propagation is possible by the E modes on at least 90% of the days of the month.
- 'M' Propagation is possible by both the First and Second F modes on 90% of the days of the month.
- 'S' Propagation is possible by the Second F mode on 90% of the days of the month.
- 'A' High absorption — above the ALF but probably too close to it for good HF communication.
- 'X' Complex mixture of modes including the Second E mode.









JOIN NOW CBA Directory

Radio clubs, repeater sponsors — this is your chance to reach thousands of fellow hobbyists and potential members. CBers, shortwave listeners, monitors — here's how you can get more out of your hobby and meet a whole new circle of friends into the bargain.

It's the 1991 CBA Directory. The Directory is more than just a list of names and postal addresses — we give you the complete radio enthusiast's guide to the club scene, to help you choose which one is right for you.

The Directory is scheduled to run in our July/August 1991 issue, and to have your group listed all you need do is complete the official registration form (or a photocopy) and send it to us by April 30. That may seem like a fair time away, but don't risk missing out — do it now and make sure your group takes its place in letting the Australian radio hobbyists know who you are and what you can do for them.

Please note that all the necessary information must be completed for your group to be listed in the CBA Directory. We do require a contact name and phone number which will be printed with your club listing, for the purpose of membership and general enquiries. The only category exempt from this are repeater sponsors — after all, the last thing they need is some bozo calling at 3am demanding to know why he can't crack the repeater from 100 kms away on his handheld!

Here's a sample listing from a fictional club, so you can see how the CBA Directory will look:

So get to it, and make 1991 the year your club really took off!

Northern Hills Radio Club
PO Box 73
Northern Hills NSW 2999

Caters for all radio enthusiasts — CB, ham radio, scanning and shortwave — most members in 20s and 30s. Ham licence classes available. Monthly newsletter 'Radio Active'.

CB call prefix: 'Northern Radio'
Club amateur call: VK2PNR
UHF CB repeater: Northern Hills 8/38
ham repeaters: Northern Hills 6850 and 8575
net: Monday 2030, UHF ch 20
Tuesday 2030, 146.575
meetings: last Monday each month, 1930-2130 Community Centre, 28 Station St, Northern Hills
contact: Roger Duck, (02) 73 8873

1991 CBA DIRECTORY — REGISTRATION FORM

Directory details:

Club name.....

Postal address.....

City ..... Postcode .....

Fax (only kidding!) .....

Membership fees (optional) .....

.....

In around 25 words, tell us about your club — are you social or technical, family-oriented, how long have you been established, what are your aims? (Okay, 25 words is a bit short — let's make it 35!)

.....

.....

.....

.....

.....

Our club's main interest is (one only) ☐ CB
☐ amateur radio
☐ shortwave radio
☐ scanning/monitoring
☐ radio in general
☐ emergency monitoring

Now, complete the appropriate sections...

Meetings:
If you hold regular meetings, please complete the following:

how often (eg 1st Monday, 2nd and 4th Saturday etc).....

venue .....

address .....

start time .....

finish time .....

Contact name and telephone number (this number will be printed in CB Action, but is not compulsory for repeater sponsors).....

.....

Club magazine/newsletter:

What is it called and how often does it come out?.....

.....

CB clubs:

On-air callsign .....

Amateur Radio Clubs .....

Club callsign .....

Club repeaters (callsign and freq.) .....

.....

Club net (local time and freq.).....

Licence courses available? ☐ Yes ☐ No

Repeater Sponsors:
Tell us about that repeater you've established!

Callsign .....

Channel .....

Area.....

Easy, wasn't it? Now, all you've gotta do is send the completed registration form to:

CBA Directory
PO Box E160
St James NSW 2000

Remember, do it before April 30!

DX INTERNATIONAL

WHAT'S BEING HEARD ON THE DX CHANNELS — JACK-67-W-07

Propagation conditions on the 11-metre band have been far from outstanding recently, although there have been some odd good openings to keep DXers amused.

With sunspot cycle 22 on the decline, some DXers will find it more difficult to work the DX, especially if using basic vertical antennas or dipoles. No doubt those with sensitive beam or quad antennas will still be able to pick up something new from the weaker signals appearing sporadically on the band.

AFRICAN & INDIAN OCEAN REGIONS

Although signals have been poor from this part of the world, there have been some reasonable openings, at times subject to heavy fading.

A couple of stations from the Comoro Islands have been about for those who still need this one. At 0545z, I logged 185-NE-102 but the report was a poor four-by-two at the time. Later I heard the 185-AT-101 at 0720z with a very weak three-by-zero report.

Jerry, who signs as the 64-AT-101 from Senegal, has been active and has been busy dealing with pile-ups he has been attracting. At 0850z, Jerry was a poor three-by-one peaking at three at times.

The Maldive Islands have been about by way of 152-NE-101, who was logged on the band at 0610z with a fair five-by-three report.

As usual the regulars out of South Africa have been about, although their signals have been poor at times. At 0520z I noted Dick, who signs as the 44-E-57, on the band and Dick was a four-by-two. A little later the 44-AT-101, operated by Derek in the Transvaal, was heard with a four-by-two signal and subject to heavy fade.

A lady, simply calling as the 176, Central African Republic, was heard on the band at 2135z via the longpath. Her signal was so poor it was of little use to those in the Pacific region.

Djibouti was heard on the band at 0255z by way of Monique, who signs as the 186-RG-01. Monique was a poor four-by-one and soon faded out.

MIDDLE EAST & ARABIA

Activity from this region has been limited due to troubles in the Middle East, but some of the regulars have been about. At 0908z I logged Faisal, who signs as 112-LEB from Lebanon. Faisal was a good five-by-seven and the signal held quite well.

Bahrain has been about briefly by way of Jack, who signs as the 150-SB-01 from Al Muharraq on Bahrain Island. Jack was five-by-nine at 1040z but did not hang around.

Saudi Arabia was heard via the longpath at 2031z, by way of 48-GR-101 and was a good five-by-seven at the peak of the opening then quickly faded out with many South American stations in hot pursuit.

Some of the regulars from the United Arab Emirates have been about when conditions have been right. At 0901z I logged 94-DU-01 operated by Sam from Dubai. He was five-by-three at the time. Sam was operating from his car with only 12 watts output.

EUROPE

Eastern European stations are still generating much interest on the band and at 0918z I logged a station in Romania signing as the 233-ON-76 operated by Hans. Although conditions were poor, Hans managed to move the meter up to a three and had no shortage of callers from the Pacific region and Asia.

Bulgaria is still about for those who need it. At 0911z I heard Angelo who signs as 178-OP-101. Angelo was five by six at the time and had quite a pile up on his hands. I think this is the same gentleman who also signs as 178-NE-101, I may be wrong.

Uzebekistan in the USSR has been about by way of Varcia who operates as the 316-AT-101. Varcia was noted at 0831z and was a steady five by five at the time.

Azerbijan, also in the USSR, was logged at 0935z with a signal report of four by three. The station, signing as the 303-DX, was busy trying to maintain some order on a massive pile up of Italian stations that were running wild with excitement to work him.

Moldavia was noted briefly on the band at 1002z by way of Hakim. Despite heavy noise at the time from western Europe Hakim did manage one contact into the Pacific. Hakim signs as RR-001, and lives in the capital Kishinev.

Malta has been about the band at odd times by way of 93-AR-03 and at 0828z was a very poor four by one report and subject to heavy fade at the time.

At 1002z I logged a station signing as 306-SR-04 from somewhere in the USSR. As the Sperimental Radio Group have different numbers to the AT prefixes his exact country is unknown. He was five by five at the time but had faded out by 1015z.

A station calling as POLAND RADIO-001 was heard on the band at 0854z, although he was a good five by six here his English was very poor and was stuck on the calling frequency for the duration of his calls.

Quite a few stations from Hungary have been around. At 1032z I noted 109-HR-02 operated by Tibor from near Budapest. Tibor was five by four and uses 12 watts into a five element beam at a height of 25 feet.

Greece has been about in abundance when the conditions are right. At 1045z I logged 18-AT-154, name unknown, at a massive five by nine plus 10DB. Earlier that evening I noted Costas, who signs as the 18-AT-108, and at 0621z Costas was five by eight. Costas was busy looking for Pacific Islands from his home in Anthusa in Greece.

Luxembourg is still around. I logged 54-AT-107 operated by Norbett on the band at 0845z with a fair five by three signal. Some DXers have been complaining about Norbetts slow QSL procedures.

The Republic of San Marino was present on the band at 0801z by way of old time regular Guido who signs as 36-AT-102. As usual Guido was a good signal and was five by nine.

(continued over)

Those who were lucky enough to work the DXpedition to Sakhalin Island should have received their cards by now.

GME | ***Electrophone:::***

27MHz CITIZENS BAND TRANSCEIVERS

AUTO RECALL OF TRUCKIES ROAD ALERT CHANNEL 8

TX821 AM

■ Ch.8 Recall ■ Compact Size ■ Last Channel Memory ■ Modulation & Signal LED Indicators ■ Digital Channel Display ■ Electronic Channel Change ■ Separate Volume & Squelch Controls ■ Local/Distance Selection

TX830 AM SUPER DELUXE

■ Ch.8 Auto Recall on Mic. ■ Powerful Front Speaker ■ Interference Suppression Circuit (ISC) ■ Variable RF Gain ■ Signal Level Indicators ■ Power/Modulation Indicators ■ Dimmer Control

TX826 AM DELUXE

■ Ch.8 Recall ■ Compact Size ■ Last Channel Memory ■ Modulation & Signal LED Indicators ■ Digital Channel Display ■ Rotary Channel Selector ■ Combined Variable RF Gain/Squelch Control ■ Built in Noise Limiting

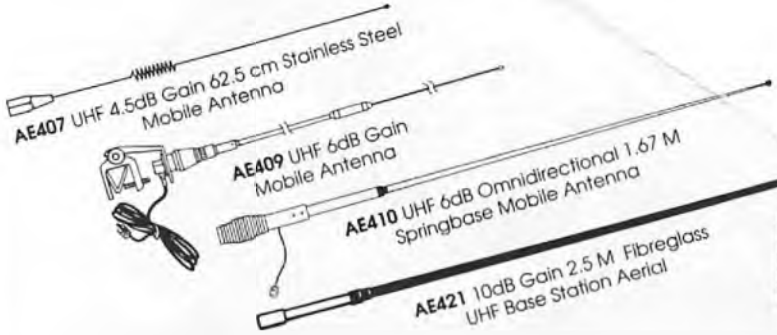
TX840 AM/SSB

■ Unique Auto Recall on Ch.8 ■ Separate Volume, Squelch & Clarifier Controls ■ Remote Speaker & PA Facility ■ LOC/DX & ANL Switching

TX472S 40 CHANNEL UHF/FM MOBILE TRANSCEIVER

AUSTRALIAN MADE

- Built-In Micro Computer
- Front Panel Field Programmable in 2 Modes
  —**Group Scanning**
  —**Open Channel Scanning**
- Memory Protection Circuit
- Hi Intensity L.E.D. Display with Dimmer Control
- Sel-Call Option



NOW WITH SEL-CALL OPTION

TX475S 40 CHANNEL UHF/FM HANDHELD TRANSCEIVER

- 450mA Quick Charge Ni-Cad Battery Pack
- 240V Electronic Wall Charger
- Inbuilt Electret Condenser Microphone
- Positive Thumbwheel Channel Selection

REGULATED POWER SUPPLIES

240V AC TO 13.8V DC
PSA123 3 AMP
PSA126 6 AMP
PSA1210 10 AMP
PSA1225 25 AMP

REGULATED VOLTAGE REDUCERS

24V DC to 13.8V DC

VR1-3 3 AMP	VR5-30 30 AMP
VR2-5 5 AMP	VR7-280 20 AMP
VR3-10 10 AMP	VR8-410 30 AMP
VR4-20 20 AMP	Single & Multi Circuit

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LOOK WHO'S BACK

MIDLAND 27MHz CB

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The world's smallest! 40-Channel Mobile CB big on high-tech features and performance. Full-time ANL to automatically suppress unwanted noise. ETR electronic frequency tuning for pinpoint accuracy.

MODEL 77-250

Professional class radio with highest level of modulation found in any CB. Highly sensitive tuned dual gate Mos Fet RF amplifier to improve signal-to-noise ratio. Three stage crystal and ceramic filters to eliminate adjacent channel interface. Switchable ANL to eliminate background noise.

MODEL 79-265

Designed like commercial two-way radio! Increased talk power comes from 120 channels and 12 watts of peak envelope power on SSB. City-Hwy RC Gain control that takes weak signals and enhances reception, while preventing overload from nearby stations.

NEED MORE REASONS?
THEN CHECK OUT MIDLAND'S NEW CB RANGE.
IT'LL GIVE YOU SOMETHING
TO CALL HOME ABOUT.

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