CB Action

AUSTRALIA'S ONLY CB MAGAZINE

NOVEMBER/DECEMBER 1988 $3.00

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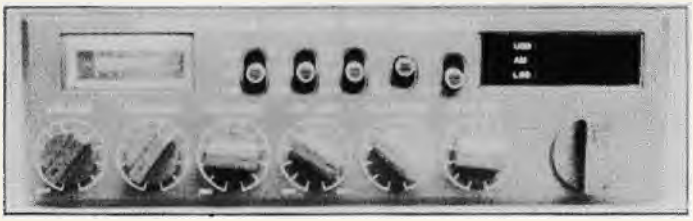

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ON CHANNEL

WE'RE IMPRESSED

Well, I've got to say that I'm impressed.

When you run a reader's survey you obviously expect to receive some replies, but, we surely didn't expect to receive the volume which poured into our office.

Two months after the final date for the survey we're still receiving forms from readers and, candidly, we have received almost as many forms since the closing date as we did before it.

What has also surprised us are the numbers received from overseas.

We've had 'em from America, England, New Zealand and Japan, which just goes to show that we really do cover the CB scene in a big way.

The breakdown of reader's interest shows that sixty four percent operate 27 MHz only, thirty percent operate 27 MHz and UHF and six percent operate UHF only.

Thirty two percent possess a short wave radio, thirty one percent possess a scanner and thirty percent possess a computer.

The main things requested were do-it-yourself projects and technical articles, more on 27 MHz, UHF and scanning with a lot of letters requesting regular short wave listening articles.

There was also a lot of interest in more information on DX and propagation — and everyone wanted more rig reviews.

Most of the responses were very complimentary and the few that weren't at least offered constructive criticism which we've taken notice of for future issues.

We hope you like the revamped CB Action and we intend to keep on improving with future issues.

THE EAGLE IS 'SORTOF' BACK . . .

Long time readers of CB Action will recall a column which appeared on a somewhat irregular basis called 'Eagle Droppings'.

If you remember the column then you will certainly also remember Fred — the definitive accident-prone CBer.

We happened to be browsing through some old issues a short time back and came across one of the better Eagle Droppings — despite the passing of time we still got a laugh out of it and think that you probably will also . . .

Incidentally, Fred is still around and about and, although somewhat more grey-haired than he used to be, he is still active (on and off that is depending on mishaps and accidents) on both 27 MHz and the amateur bands (yes, after years of trying he finally passed the examination).

If we get enough letters asking for a return of Eagle Droppings we'll have a word with Fred and see what we can do — so, if you want it let's hear from you.

Meantime, enjoy the read . . .

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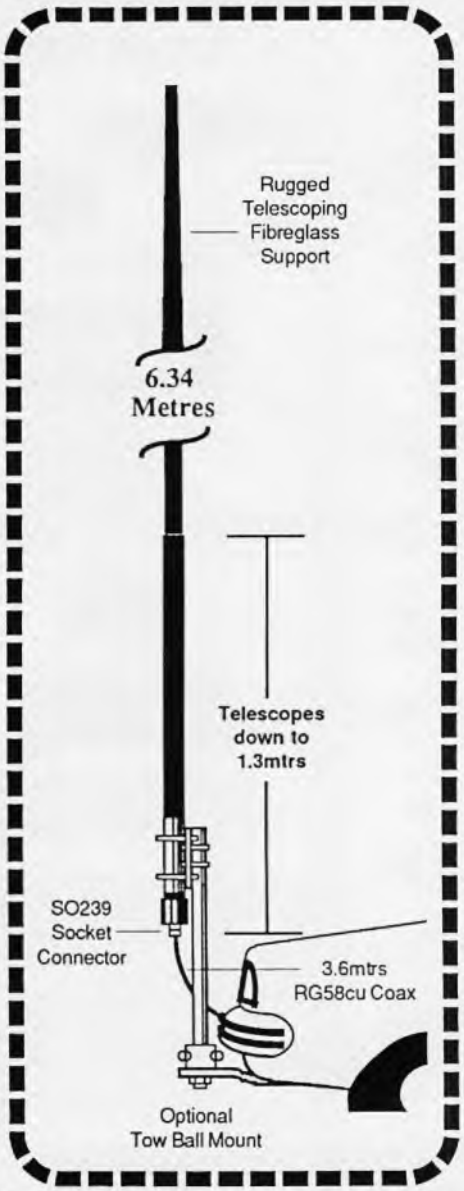

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FEATURES

TYPE	VERTICAL 5/8th WAVE
ORDERCODE	SC27
LENGTH	1.3 to 6.34 MTRS
WEIGHT	1.53 KILOS
TUNING	FACTORY PRETUNED
FREQUENCY	26.5 ~ 28 MHz
IMPEDANCE	50 OHMS
MAX.POWER	100 WATTS
TERMINATION	UHF SO239 SOCKET
PATTERN	OMNI DIRECTIONAL
APPLICATION	STATIONARY MOBILE
VSWR	≤ 1.5:1 OVER 1.3 MHZ

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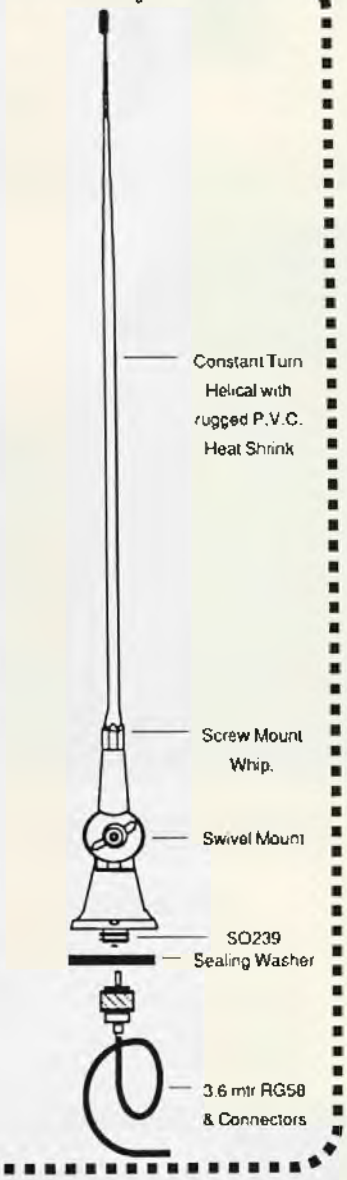
27.7 ~ 28 MHz

MA277

Drawing MA276



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ORDERCODE	MA277
LENGTH	70"
TUNING	Cut to Tune
FREQUENCY	27.7 ~ 28.00MHz
IMPEDANCE	50 Ohms Nominal
MAX.POWER	25 Watts
TERMINATION	SO239 UHF Connector
PATTERN	Omni Directional
APPLICATION	Marine Deck or Gunwale Mount
VSWR	≤ 1.5:1 over 300 KHz

Also Available

For use withVHF Sea Phone, Model MD156

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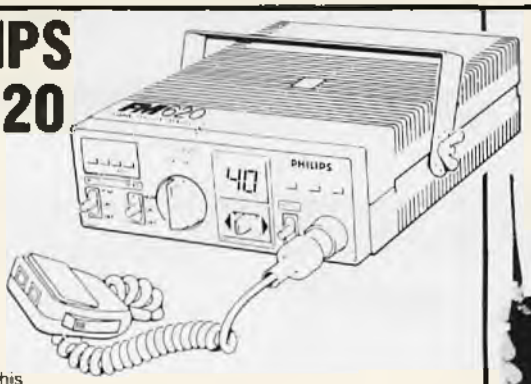

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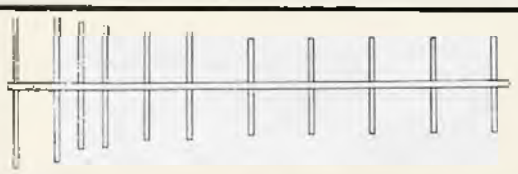

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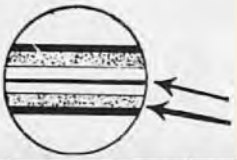

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EAGLE

DROPPINGS

If the editor wasn't so damn handy with his red pencil then you would have been fore-warned that this issue's column would again (yes still) deal largely with some further problems encountered by the ill-fated Fred in his pursuit of the ultimate happiness.

Ultimate happiness means different things to different people. To the editor it means getting the b....y magazine off to the printers and on time, hopefully with only a few mistakes — to the assistant editor it means not having the b....y editor on his back all the time so allowing him sufficient hours to devote to his sideline business of flogging auction purchased goods at a reasonable degree of profit.

But, to Fred, the ultimate happiness is to work all American States on his bog-standard (well almost) CB rig.

Now,, almost everyone else who I know (and who put in only half the time that Fred does) has already worked all American States and are now in the process of trying for such obscure countries as Botswana, Liberia and outer Mongolia.

Not so Fred — he still has about 10 States to go before he can call it quits there and start thinking of more ambitious projects.

One thing which has been bugging him for some considerable time has been the fact that the neighbours who live to the rear of his house have a whacking great gumtree on which Fred has managed to snare his antenna on more than a couple of occasions.

I won't go into details about Fred's antenna except to say that it sits atop a large triangular tower at a height of about 45 ft and has a number of alloy sections radiating from the main boom — obviously, I can't say too much as directive arrays are illegal and I wouldn't wish any more trouble on Fred than he manages to bring upon himself.

Anyhow, after much deliberation, Fred advised the neighbours (with whom he doesn't speak much due to some past bouts of TVI and things) that he was sick and tired of the "rotten gumtree" and intended to get someone in to lop off the top branches — which of course he could legally do as said branches were well and truly growing over Fred's rear garden.

Having received the quotes for this simple job, Fred had a few double whiskies, stated that all "b.....y tree fellers are b.....y rogues anyway" and decided to carry out the work himself.

So, the following weekend, armed with a bushmans saw, a small chainsaw (borrowed) and with a length of rope attached to his belt, Fred commenced the climb to the top of the much maligned 45 ft high gumtree.

Remarkably, the climb itself was accomplished without trouble and Fred fired up the chainsaw for his first incision and again, remarkably, the thing worked perfectly.

About 30 seconds later the first limb crashed to the ground — straight through Fred's wife's prized Pomegranate tree which took on a decidely lopsided look as most of the branches were stripped off as the gumtree branch crashed to earth.

Still, it was a fairly promising start . . .

Another quick "zip" and another branch was headed earthwards.

Sadly, it became tangled in other branches as it fell and performed a sort of a cartwheel thing and finally came to earth, heavy end first, about 20ft from where Fred had planned it to fall.

This 20ft became of tremendous importance as the branch actually fell onto the dividing fence between Fred and his next door neighbour, bounced off the fence, and speared through the neighbour's yacht which just happened to be sitting alongside the fence.

Long term readers will recall that something similar befell the said yacht quite some time ago when a crashing antenna did pretty much a similar sort of job — by now Fred was not exactly laughing.

Still, only one branch to go and he would have the b.....y tree trimmed back to an acceptable level.

Zip with the chainsaw, or rather more a zzzii i i i ppppp as regretfully the chain became jammed in the branch, almost pulled Fred out of the tree, then (still revving away) fell to ground where it disintegrated into a number of whirring, clicking type pieces of ex chainsaw — obviously totally beyond repair.

For obvious reasons, Fred's amusement was now at an all time low.

Still the job had to be finished and with a few deft cuts from the trusty bushman's saw he severed the branch and, as it parted from the tree, Fred felt himself being whisked quickly skyward because, as the branch went quickly down, Fred did much the same in the opposite direction, his safety rope having snagged on the downward descending branch with obvious results.

But, as the branch hit the ground, the rope snapped and Fred commenced a quick descent through, rather than around, a number of branches. Total time from about a height of 30ft to ground level was later established by his wife as approximately 3 seconds — this was estimated as the time she heard the first cry of 'b.....y hell", a snapping and crashing of branches, a dull thud and then a plaintive "oh s..t, what a b.....d."

Fred has been in hospital for about a week now but they expect his ankle should be ok in a few days and his wrist is already out of plaster — so, really it wasn't all that bad.

He's received a bill for the yacht repairs which total something in excess of $1,000 has yet to buy a new chainsaw to replace the broken one, and also understands that his backyard neighbour is suing him — claiming that Fred actually cut two of the branches on his (the neighbour's) side of the fence.

Further, his wife has not visited him in hospital stating that, "any b.....y halfwit who drops branches through my Pomegranate tree deserves all he gets."

In short, it's really just another typical day in the life of Fred and hardly worth even writing about . . .

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·LOG BOOK·LOG BOOK·LOG BOOK·

CBA READERS SURVEY

We asked 'em, and we got 'em — by the thousands! Our recent readers' survey proved beyond any doubt that you all have some very definite ideas about what you want — and don't want — in 'CB Action', Australia's only CB magazine.

We're in the final stages of processing and evaluating survey responses, and they've already yielded some interesting information which CBA has started to act upon (editor Len Shaw may have a bit more to say about this in 'On Channel').

And now — the winners of our three free CBA subscriptions per state/territory:

ACT: Stan Hillier, of Gilmore; W.D. Palfreyman, Civic Square; and Andrew McLeod from HMAS Creswell.

NSW: R.J. Speechley from San Remo; Malcolm Robar, St Marys and L.J. Hill of Mascot.

Victoria: Mark Adam, North Dandenong; Geoff Allen, Miram; and Max Collier from Keilor.

Queensland: Ron Brett, Brassall; Sandy Hutton, Mackay; and Allan Menham of Biggenden.

SA: Roger Verco from Bordertown; A.J. van Wageningen, Ceduna; Daniel Zaltron, Magill.

WA: Reginald James Rogers, Northampton; John Eve, North Lake; and David Dowley of Willagee.

Tasmania: Wayne Hasler, Risijon Vale: Mandy Billings, Gunnsplains; and Geoffrey Wickham from Penguin.

Only two readers from the Northern Territory responded to the survey — Paul Parker from Kintore and Ron Orr from Alice Springs. So both score an easy subscription, and if you're an NT reader (we know we've more than two!) then you missed out on the same for the price of a stamp.

We also had a dozen replies from overseas readers, which were really unexpected, so we decided to give one of them a year's free supply of CBA — drawn from the hat was Kelvin McLean from South Auckland, New Zealand.

Thanks to one and all for your great response to our survey!

SAIKO SC-8000 SCANNER

There will be a full review of thi sunit by Russell Bryant in the next issue.

Just released by Imark Pty Ltd is the Saiko SC-8000 mobile scanning AM/FM unit which is ideal for use both commercially and by scanning enthusiasts.

The Saiko SC-8000 features direct entry of any frequency within the assigned bands. The Saiko SC-8000 operates on HF (26-29.995MHz), VHF low band (68-88MHz), Air Band (110-138MHz), VHF high bands (113-176MHz and UHF (380-512MHz) bands. Any 50 frequencies within these frequency ranges can be entered into Memory. These frequencies can be reprogrammed at will and can be either AM or FM frequencies.

A microprocessor is used to control the PLL and the operational functions. These functions include manual channel change, scanning, memory scanning, search, delay, auto AM/FM selection and channel lockout. A backlit LCD is used to indicate the channel, scan, delay and channel lockout functions. Other features include adjustable squelch, tone, volume and on/off controls.

The unit uses all solid state devices and operates from a 13.8 volt electrical source. It utilizes the double conversion system, a monolythic crystal filter and a ceramic filters to provide selectivity and sensitivity. The audio amplifier provides 1.5 watts output.

The Saiko SC-8000 is supplied complete with telescopic antenna, mobile mounting brackets and an operators manual and dimensions are 152mm (W) x 58mm (H) x 220mm (D) and weight, approx 1.05 Kgs.

UNDERSTANDING AND REPAIRING CB RADIOS

If you are even slightly interested in the technical side of CB radio the new publication 'Understanding and Repairing CB Radios' will prove of great benefit.

Although primarily aimed at technicians, the book is written at an easily understood level and takes you through a conducted tour of basic electronic trouble-shooting techniques as they relate to CB radio.

There is a thorough analysis of virtually every type of circuit found in CB rigs from the classic 23-channel valve transceiver to the most modern, multimode solid-state models.

Unfortunately, some of the information is largely academic as, being an American publication, much of the 'where to buy it' type of data is of no use to Aussie operators.

However, this is a minor point when compared to the large amount of useful, easily read and understood data packed into the book's 370 pages.

Produced by CB City International, PO Box 31500, Phoenix, Arizona 85046, USA and available from that company for $29.95 plus $5 for sea mail or $15 air mail, it is also distributed throughout Australia and New Zealand by Dick Smith Electronics.

Legal or not...? POWER MICROPHONES

Steve Griffin, in his Sydney Scene column in our last issue, made reference to the 'legality' or otherwise of power microphones.

We followed up the question in a lengthy discussion with DoTaC in Canberra and we can now say we are just as confused as everyone else.

The simple fact of the matter is that power microphones fall into a "grey area" and whether they are legal or not becomes largely a matter of interpretation by local Radio Inspectors.

DOC15 states, "The (approved) equipment must not be modified or changed in any way. The operation of any modified transceiver is an offence under the Radiocommunications Act".

There are all shapes and sizes of microphones and if the mic. on your rig produces 100% modulation you're not going to gain much (if anything) by using a power mic.

But does a power microphone actually fall into the category of 'modified transceiver'?

DOC16 states, "The maximum transmitter power which you can use is fixed by the equipment specification and must not be increased by making any modification to the equipment and/or addition of amplifiers".

But again, does the power microphone qualify as an amplifier or as a 'modification to the equipment' or does it increase power?'

Put bluntly, it would probably require an actual court decision to find out once and for all whether or not power microphones are legal or illegal — and I doubt that anyone is going to take DoTaC to court to find out.

As we have said, it is an acknowledged 'grey area', however, it is probably safer to assume that any type of power microphone is likely to be found illegal by DoTaC and you therefore need to be very careful if you are using one.

For what it's worth — the question has been asked by CBers for ten or more years and it is still open to debate.

Even so, not every CBer operates strictly by DoTaC rules and regulations and there are thousands of power microphones being used throughout Australia at any given time.

Unfortunately, however, not all of these operators know the principle behind the workings of such a microphone with the result that many sound as though they've got their head in a bucket.

This article will, hopefully, cause these 'head in bucket' operators to clean up their act to the benefit of their own signal and the reception of other stations in close proximity.

Most CB rigs are designed for simple, non-power microphones using either dynamic or ceramic elements.

The rig designer anticipated that the microphones would be held within a couple of inches from the mouth and operator would speak quite loudly.

Not all rigs, however, are operated in this manner and this is particularly true with base stations.

The microphone which comes with the rig is an integral part of that rig's overall design and is perfectly adequate for the job, but, it is not necessarily the ***best*** *microphone that can be used.*

Because not everyone is totally legal all of the time there are many horribly distorted voices across the 27 MHz band as frantic operators try to outvoice other stations in the search for DX.

It is for them that this report is written because most of them do not know the principle behind a power microphone and all they are doing is making life more difficult for everyone else.

We do not recommend or condone using illegal equipment (and it appears

that no-one is even certain whether power mics. fall into this category anyway), but, if you're going to use one you might as well do it correctly.

All power microphones amplify the input signal to the transceiver and some also process the signal in an effort to increase the range of transmission.

WHAT IS THE OPTIMUM MICROPHONE?

The use of the optimum microphone can add greatly to both the clarity and range of radio communications.

A good power microphone will fully modulate the carrier under virtually all conditions.

Gain is not the most important specification.

All power microphones can overdrive a CB and too high a setting is likely to over-modulate the rig to the point that it radiates TVI and adjacent rig channel interference.

POWER AMPLIFICATION

Certain special types of microphones require power amplification to be useful.

Two such examples are the electret and noise cancelling designs.

An electret element provides crisper, clearer sound than does a dynamic or ceramic one and the end result is higher fidelity transmission.

Electret elements, however, generate very low power signals, often 10db or more below the required input for a CB while the design of a noise cancelling element causes an output reduction of up to 6db to achieve a 12 to 15db background noise lowering.

Both of these microphones require a power amplifier ***(and right about here DoTaC has a pretty likely argument as to why power mics can be considered illegal)*** *to be of practical use on a CB rig.*

The easiest, quickest and surest way to increase both clarity and range of transmission is to increase the output power of the rig — but it is, obviously, illegal.

For this reason, all transmitter operators, be they CB, amateur or commercial, run their power output up to the legal maximum.

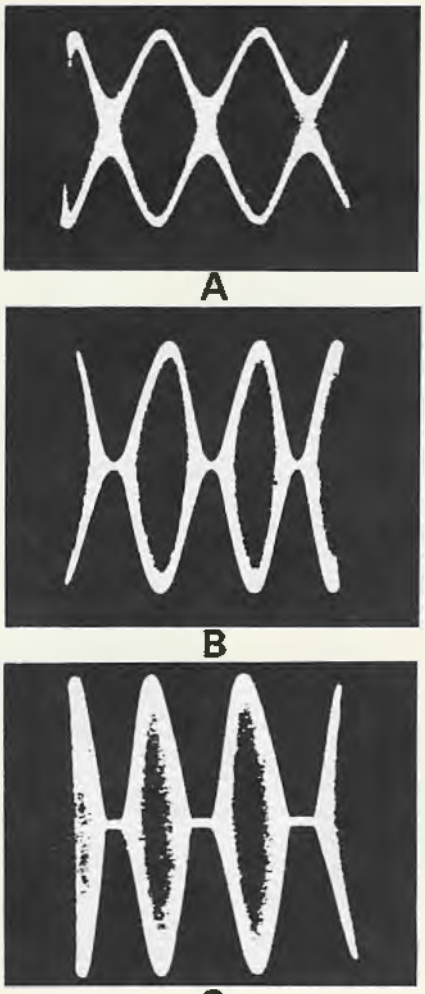
Another method of increasing AM transmissions is to allow 125% modulation. This capability must, however, be built into the transmitter and is used on the standard AM broadcast band of 540 to 1600 Khz.

It is not permitted on CB !

FORGETTING LINEARS

So, forgetting linears and the like as being effective but very illegal, many CBers believe that a power microphone, while probably still illegal, is not quite so illegal as a linear and they're willing to take a punt with DoTaC.

The reasoning is that while a linear actually increases output power to extreme levels, a power microphone only increases the average modulated power (and it can also be hidden a damn sight quicker if the R.I.s arrive on the doorstep).



Photograph A shows 50% modulation as seen on a 'scope and it is in cases such as this that a power microphone will bring the modulation up to the 100% level as in photo B. Photo C shows the effect of overmodulation caused by using too much microphone power — almost guaranteed to cause TVI and other problems.

There are several ways in which these increases can be accomplished.

Communications engineers have worked for a long time to increase the intelligible range of voice transmissions, whether by radio or telephone.

They have determined that the frequency range should be limited to 200 to 3000 Hz.

The loss in fidelity and voice character is quite noticeable but the range is greatly increased.

Further increase in intelligible range can be achieved by adding peak responses at 2000 Hz peak and a sharp drop off above 2000 Hz.

This 2000 Hz peak is called a 'presence peak'.

People hearing a transmission having a 'presence peak' often describe the voice quality as 'sharp' or 'penetrating' and this is precisely what the designer and operator are after.

It is no good simply putting out a loud signal if the other station can't understand what you're saying.

Having tailored the voice for maximum clarity and penetration, the engineer is still faced with peaks or 'power spikes'.

VOICE PATTERN SPIKES

These spikes exist in all voice patterns and so termed "better" voices, such as news broadcasters, generally have more spikes than nasal monotone voices.

If the input to the transmitter is reduced so that the peaks can be handled, the average power is very low.

It is for this reason that high fidelity enthusiasts have 50 or 100 watt amplifiers that they operate at an average level of two or three watts.

As against your 'ghetto blaster' mentality where noise is the only requirement, hi-fi fans use the power to generate quality sound.

Sadly, CBers do not enjoy this sort of legal power luxury and they need absolutely every bit of the allowable power available in the rig.

So the designing engineer must cope with these peaks in some other fashion and he does this in one of three ways.

First, he can just clip them off and discard them.

VOICE CLIPPERS

All CB rigs include these 'clippers' or 'limiters' to prevent peaks from overmodulating the carrier. The problem here is that these peaks are important to intelligible voice communication and a significantly clipped signal is hard and sometimes impossible to understand.

A second and better approach, is to compress the peaks while amplifying the lower power components. This technique is employed in a number of "compression" power microphones but it more usually built into the transceiver as in most amateur rigs.

While over-compression will cause distortion, a correct level will show a big improvement over clipping.

The third approach moves the peaks into valleys in the voice pattern and this technique saves the peaks, but, eliminates their height.

Repositioning of the peaks introduces a new form of distortion called 'phase distortion' and high fidelity engineers have long debated whether the human ear can in fact actually hear phase distortion.

For practical purposes we can state quite categorically that it is of no negative consequence in respect to CB operation.

Commercial broadcasters have used this peak redistribution technique for years and virtually all power microphones employ this technique.

(continued over)

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POWER MICROPHONES (continued)

They incorporate a tailored frequency response to provide the best possible clarity and penetration and ***providing they are not over-driven*** *the operator will receive maximum audio output without the undesirable side-effects of TVI or channel splatter.*

The reason that (correctly used) they do not cause side-effects is simply that they shift the peaks which cause spurious emissions.

Despite the uninformed comment often waffled onto the airwaves by the "look mate I'm telling you it works" brigade, no power microphone can compete with a linear.

A linear amplifier can increase the output of your CB to 50 or 100 watts — and it will also almost certainly gain you the notice of the DoTaC folk.

A top quality power microphone can increase the audio level of your CB and, if used sensibly, no-one is going to know.

If it is over-driven you simply finish up with the typical 'head in a bucket of suds' noise — loud, hopeless in quality and splattering from one end of the band to the other.

Think about it.

Five watts can become an effective 10 watts with a quality power mic.

The Mura PRX-100 was a particularly good handheld power microphone and you can still find the occasional second-hand one advertised in the classifieds.

Put that up into the sky through a 10db gain wide spaced Yagi and you have an Effective Radiated Power of 100 watts — now that's the way to work DX.

As we stated at the start of this article, although power microphones fall into a 'grey area', you are taking a risk by using one.

We believe that such a microphone should not be illegal, however, unless you are willing to go to court and debate the matter with DoTaC it is best that you consider them to be illegal and take the necessary care when using one.

What really gets to us is the fact that DoTaC takes such a great interest in so called 'pirates' who run illegal equipment such as 'tweaked CBs' and amateur rigs - even though many are sensible and courteous operators working only within the 27MHz band — but, often seems unwillingly or unable to take any sort of action against the brain-dead who harass and abuse other CBers.

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CB IS ALIVE AND WELL IN SPAIN

by GREG BAKER

My first contact with Spanish CB was in Madrid, Spain's capital. I was in the shop of Cristobal Laorden Martinez EA4DBA. The shop, at number 28 Carlos Aniches, is near the area of the Madrid Rastro, the huge and famous outdoors Sunday market. Billed as 'Equipos para radioaficionados' — equipment for radio amateurs — Cristobal's shop has CB gear too and is a meeting place for CB operators and amateurs alike.

Here Cristobal and assistant Miguel Angel de Mora showed me a range of gear, base stations, mobiles, handhelds and antennas too. Some gear is secondhand which helps people get into the hobby without parting with an arm or a leg in the process. (People at the lower end of the wage scale earn even less than in Australia.) Another CB operator, Laureano Silva Bey was there too on one of the days I was visiting. Between the three of them and in spite of my poor Spanish they gave me a good picture of CB in Spain.

We might be CBers or even good buddies but in Spain CB operators and enthusiasts call themselves 'cebeistas'. Just say it 'C-B-istas' and you get the idea. Officially CB is the 'banda ciudadana' but they still shorten it to CB and only rarely to BC.

FM NOT SSB

CB in Spain is restricted to the 27 MHz band with 40 channels corresponding exactly with those here in Australia. The current mode is FM. Gear on sale puts out as much as six watts though four or five watts is more usual.

Though Spanish authorities had planned to introduce AM and SSB to the 27 MHz band alongside FM, this is now not so clear. Spain is part of the European Economic Commmunity (EEC). This means that EEC guidelines and trends need to be taken into account by Spanish authorities. In addition, from 1992 borders will be abolished from the EEC area and all EEC countries will need to comply closely with EEC regulations. This means all EEC citizens will follow a single CB standard. This standard is promulgated by the European Conferencia Europea de Correos y Telecomunicacion (CEPT) and is called NET ('Norma Europea de Telecommunications'). In particular, recommendation TR-20 from CEPT allows only 40 FM channels at four watts for CB throughout Europe.

As a result, Spanish authorities have indefinitely suspended their plans for AM and SSB on 27 MHz. Parts of the CB fraternity are unhappy at this turnaround. They say that CEPT is independent of the elected European parliament and merely a 'club' for telecommunications officials. They feel that CEPT is being excessively restricted and intends to gradually phase out CB altogether.

Individuals and clubs are preparing a response. Nonetheless, it is interesting to note that fellow EEC members Greece, Italy and Portugal will make less restrictive regulations in spite of the CEPT recommendations. Portugal, for example, allows 40 27 MHz channels AM, SSB and FM with AM and FM at five watts, SSB at 15 watts.

Despite this, some CB sets are sold with AM and SSB modification possibilities even though these modes are looking more problematical all the time.

Gear in general, is similar to here, much of it of course imported from the USA.

RIGS MUST BE APPROVED

As in Australia, all gear must be type approved. In Spain this is carried out by the General Directorate of Telecommunications. The type approval is a certificate called the CAR (Certificado de Aceptacion Radioelectrica). Equipment to be approved is presented to the authorities by the shops and importers/distributors involved with gear sales. These are mainly in Madrid and in Barcelona, Spain's second biggest city after Madrid.

Some brand names are familiar. You can buy President and Uniden and Intek. But what about Dragon, Star, Mastec, Sun or Alpha? I hadn't hear of them before but I suppose there are some people more clever than me out there who'll tell me every corner shop here has them.

COSTS AND POWER

Prices? List prices for Presidents range from $A195 (President Harry) way up to $A735 (President Jackson). Other sample prices for new gear are: Base and mobile: Stalker H11, variable output power, 12 volt, 40 channels $A385; Intek FM5485 5W, 40 channels, 12 volt $A200; Super Star 2800, 12 volt $A310; Super Star 3900, 12 volt $A315. Hand-held units: 3 channels 2 watts $A100.

LICENCES

Obtaining licences is quite straightforward as it is here. Licences are called ERT-27. They are obtained by application to the headquarters of the General Directorate of Telecommunications in the province of residence. The application form requires personal data (name, address, etc), the transceiver certificate number plus the registration fee and annual payment.

Those wanting to use their CB transceiver in their car need to provide the car details, make, model, registration number, etc.

Annual fees are $A26 and temporary installations cost one-twelfth of that per month or part thereof.

Pensioners and those over 65 years of age pay one-tenth — about $A3 per year for their licences.

LONG WAITING LISTS

There are bottlenecks in the system to issue licences however. With rare exceptions (for example the Asturias which takes three to four days), most provinces have long waiting lists, sometimes exceeding one month.

Many cebeistas aren't happy about the situation because of a not unreasonable desire to get on air and do it legally. Clearly it is possible for them to go illegal, but in Spain, as in Australia, the frequency spectrum is continuously monitored by authorities. The principal base of frequency spectrum surveillance is Guadalajara, east of Madrid, but other centres have fixed listening posts and mobile units are used for checking frequencies above 30 MHz.

NO CB ACTION

Spain isn't blessed with a magazine like Australia's 'CB Action'. It does have, though 'CB Correo', a free monthly newspaper running around 16 to 20 tabloid pages. To get on the mailing list, cebeistas send their name, address, official call sign (ERT-27) and 'indicativo'. The 'indictativo' used in Spanish CB is equivalent to our 'bazza', 'the fox', etc. In Spain they naturally are a bit more hispanic like 'condor', 'el zorro' (the fox), etc.

CB Correo has news, equipment reviews, club lists, operating hints, readers' letters, regulations, information on how to obtain licences, international news, addresses of authorities plus articles on how the regulatory authorities operate. And, of course, advertisements. After all, someone has to pay for the newspaper. Print runs are about 20,000.

CB is ignored totally in the commercial amateur radio magazine 'CQ Amateur Radio' (an offshoot of the US magazine 'CQ' and also in the Union de Radioaficionados Espanoles (URE), Spain's Wireless Institute's official monthly magazine. Nonetheless, the current president of URE, Gonzalo Belay Pumares EA1RF, in a letter to CB Correo's editor, Aurora Prieto Guerra, has congratulated CB Correo for what it is doing.

The electronics component stall of Florentino Sanchez Argiles (EA4AHR) in the Rastro Madrid.

Spain has nearly 50 provinces grouped together into a dozen or so semi-autonomous regions. All regions have CB clubs with most interest of course in areas with large populations. This means Madrid, Catalunya (the area around Barcelona) and Valencia. Not only do they function as a meeting place for cebeistas, some offer a monthly newsletter and of course represent cebeistas with provincial authorities. Other activities include fox hunts ('caza del zorro'), one I saw advertising $A2500 in prizes for about $A6 entry fee.

Well, you're not ever going to hear cebeistas here, not on FM. But there are thousands out there on the band moving the electrons. If you ever make it to Spain, go west from Madrid's central square, the Plaza Mayor, on any day and check out Cristobal's shop at 28 Carlos Arniches.

Or on Sundays, during the Rastro, fight your way through the crowds to the street called Ronda de Toledo. There you'll find Florentino Sanchez Argiles EA4AHR and his son Jose Luis Sanchez Sanz EA4BWQ and a stall with a mountain of radio and electronic spares and components. Say hello and grab yourself a bargain. Take your phrase book but remember many of the words are the same. And if you need to spell anything use the international radio alphabet. Give it a go, you're bound to enjoy the experience.

Smart performance from the new
ELECTROPHONE TX830

In the last issue it was a new UHF CB transceiver. This month Standard Communications, the GME Electrophone brand-name users, introduce a new 40-channel AM rig which replaces the TX-820.

The TX-830 is a departure in size and styling from just about all CB rigs available in the past 10 years. The recent trend for AM-only CB transceivers has been for compactness with the aim to utilise any overlooked nook or cranny for installation in the modern family car.

The last AM model — the TX-820 — was also a party to the conventional slimline styling trend, however, the new offering is larger and in fact matches the UHF TX-472s in size with the now familiar front-mounted loudspeaker projecting the audio directly toward the operator.

The TX-830 in fact uses the same chassis and front panel moulding as the already tried and proven GME GX-287, 27MHz marine transceiver. The main external dimensions are 175mm x 172mm x 52mm which constitute a large volume of space inside the case. As can be seen from the photograph, there is a lot of unused space which is the sacrifice to be made for the new styling.

Front panel controls are the same as the marine version with the exception of an RF gain control which appears on the CB version. GME has also introduced a new upmarket term substituting for NB (Noise Blanker). It calls it ISC which is an abbreviation for Interference Suppression Circuit.

Another recent trend is the appearance of self-tapping screws holding together the main mechanicals of rigs — the TX-830 is no exception to the trend which seems to originate with Korean-made goods. The TX-830 chassis is quite robust and all the steel frame panels are well plated and straight with an extra sub-frame that accommodates the mounting points for the main circuit board while lending extra reinforcement to the chassis.

The fairly open design of the radio internally makes servicing the unit easier than the more cramped designs of the slimline rigs.

The fixed antenna socket style has given way to a 'flying lead' arrangement which allows the rig to be mounted almost flush up against a bulkhead thus offering an unexpected space saving. The fixed socket type usually requires about 3cm to 5cm space behind the radio to allow sufficient clearance for cable antenna and connector.

The display LED intensity can be varied with a 'DIM' press button which is useful for night driving or just for use in a darkened room. Signal strength indication employs three LEDs of different colors.

The highest intensity level on the channel display is about par for the course, however, in our opinion it could stand the addition of High Intensity LEDs which are available these days.

On this model, a channel 8 priority channel facility is provided through the addition of a press button on the microphone with an associated LED on the fascia indicating when it is operated. This feature allows the user to instantly access channel 8 (highway channel) by pressing the button while the rig reverts to the dialed channel when the button is reset.

A very handy feature — better than channel 9 for Australian use.

PERFORMANCE

As usual, our test voltage is 13.8Vdc which produced an output power of 4.5 watts with a frequency error of plus 200 Hertz. Modulation is pleasant and well rounded with only a few peaky frequencies.

Speaking loudly we were able to produce regular bouts of 140 per cent modulation, however, there was very little associated distortion. Using the audio signal generator produced different result and it was difficult to obtain any higher modulation percentage above 100 per cent.

After five minutes continuous transmission, the output power had only dropped by 0.2 watts and the frequency was 'spot-on'.

The chassis was hardly warm and we conclude that you could have long 'overs' repeatedly with virtually no ill effect on the transceiver.

The receiver was disappointing from the beginning being down on sensitivity and suffering from serious distortion as well. Our test rig was a prototype so we called the manufacturer to try and resolve the situation.

It seems we got the wrong prototype and there were several modifications to the receiver which had not been made to our rig.

After the mods, the receiver performance was dramatically improved. Sensitivity was 0.3 microvolts for the 12dB SINAD test. The distortion was caused by the noise limiter circuit which is permanently in operation in the TX-830 and a small change to the time constant restores the waveshape to more like the original product.

The LED strength meter showed us one light for 0.6uV (microvolts), two lights for 2.5uV and it required 20uV to illuminate the third LED.

While the front-mounted speaker is convenient and in many installations it negates the need for an extension speaker, it still tends to sound like a small speaker and is a bit chirpy.

The overload performance is fairly typical for a modern CB rig and distortion caused by nearby stations is generally improved by reducing the RF gain level. Adjacent channel interference again is typical and very strong signals on other channels within the band can virtually render the set useless for receiving other than strong signals.

The squelch action was positive and easily set to receive low level stations, while at its maximum setting we required a beefy 700 microvolts to open the receiver.

In summary, the TX-830 is a smooth new rig with all the necessary controls and operating features for good AM-only performance. The construction is very good quality with well-plated chassis segments and heavily painted covers.

The mounting bracket is heavier than necessary but more than adequate.

All the mechanicals fit together fairly well. The flying lead antenna socket is a good space-saving idea especially since the TX-830 is considerably larger than its slimline competitors.

We would like to see the RF/S meter display and the channel readout digits with a greater light output and more segments in the meter display.

At around $160 the TX-830 40 channel AM 27MHz CB transceiver looks like good value.

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The Opti Scan series of scanners used 'window sticker' squares for programming — the system failed to meet expectations.

AN INTRODUCTION TO SCANNING

'CB Action' scanning writer RUSSELL BRYANT tells you how to become involved in the engrossing hobby of scanning. It is a lesson on how to spend money and remain poor as you devote more and more funds chasing the ultimate scanner . . .

In 1968 the Electra Corporation of America introduced to radio hobbyists the scanning radio receiver. Very much different from the scanner we know today, the Bearcat model required crystals (plug-in modules) in order to receive a signal. The crystals, cut to a specific frequency, sold for between $3 and $8.

In comparison to its predecessors, the crystal locked 4-channel scanning receiver was state-of-the-art and developed a devoted following.

Monitoring the public service bands was a haphazard affair, with piggyback convertors connected to an AM broadcast receiver. You dialled up your favorite channel using manual tuning.

Regency in the late 40s marketed the tunable public service band (PSB) receiver. It was basically an AM broadcast receiver with the convertor built in. Although advanced for its time it was unstable and the tuning calibrations inaccurate. Only an approximate frequency readout was possible.

Being tunable the PSB receiver was prone to drift and professional users such as firemen and police demanded a better system. The fixed frequency receiver was the next link in the chain. You could monitor a single channel without having to adjust a tuning dial. It was not long before the idea of a multichannel receiver was being put forward. The multi-channel fixed-frequency receiver meant more than one channel could be monitored at the discretion of the operator.

Still not satisifed with their lot, public service monitors wanted more — a method by which the radio would switch between channels seeking an active one. This way you could keep tabs on several frequencies at once. Soon after the Bearcat scanner appeared, other radio manufacturers followed suit.

Limited to a single frequency and often only suitable to a particular radio, crystals became expensive. To maintain a bank of them for all your favorite services was to have considerable funds invested in 'rocks'. The race was on in the market for a crystal-less scanner.

Thousands of dollars were spent in the development of the programmable scanning receiver. A who's who of electronics manufacturers, Regency, Radio Shack, Electra Bearcat and Fanon Courier among others, all sought to be the first to patent the 'best programming system'. Many companies withdrew because of the complexity of manufacturing.

A binary code was the first method used to program the receiver. Using a code book, the operator set a series of switches in pattern. Reading the set pattern, the radio's microprocessor converted the binary numbers to RF frequencies and thus a channel was programmed. It was time-consuming, clumsy and failed to gain acceptance with scanner hobbyists.

Binary was the programming method in the Opti Scan series of scanners. This time instead of switches, plastic cards with 'window sticker' squares were used. To program the desired frequency you simply looked up the binary code for that frequency and removed the window stickers listed. When the card was inserted into the radio, an optical reader using photoelectric cells, read the missing squares and set the microprocessor by converting the binary to RF. It too failed to meet expectations.

BEARCAT WAS THE FIRST

Market leader Bearcat was the first to develop the user-programmable scanner. Frequencies were generated by a Phased Locked Loop or PLL chip. Programming was via a keyboard not unlike a calculator's buttons. Today we have scanners that cover almost all the usable radio spectrum.

As with all hobbies and pastimes, newcomers to scanning can be overwhelmed by some of the equipment and terminology. Forget about the fancy terms and specifications, words like 'sensitivity', 'SINAD' and 'image rejection' can cloud your judgement when purchasing your first scanner.

The first and foremost consideration is the price. The more sophisticated the unit the greater the cost. The inclusion

of the AM aircraft band or 800 MHZ cellular band can increase the price by $300. It would be a waste to have these bands and not use them.

With the dozen or so models available, it may be difficult to decide which will suit you — a portable, a mobile or a base scanner? Each type of scanner has its own advantages and disadvantages. A portable, for instance, is probably the most versatile because it can be employed in a variety of jobs. Connected to a power supply and external antenna, either at home or in the car, the portable becomes a base or mobile scanner. Certainly, if you plan to use your scanner where there is no power available such as sporting events and air shows, then a handheld is to be considered. Realistic, Cobra, Bearcat and Regency market handhelds to suit every need and budget.

However if your only interest is to keep an ear on traffic hazards, hold-ups and delays while motoring then a mobile unit is the choice.

A scanner that operates on 12 volts DC and 240 volts AC can be used mobile or base as desired. Remember, if you decide on a mobile scanner, there are a few points to think of such as the placement of the unit within the vehicle — as some scanners are bigger than many of today's cars. Try and avoid high vibration areas for you don't want the internals shaken loose and keep it out of sight of curious eyes yet still have it in a convenient place to operate the controls.

Before handing over the cash, make up a list of features you need. List the models that have those features and check them out. Price, service, ease of operation and resale value if you decide to update (and you probably will) should be considered when buying a scanner.

READ THIS MANUAL

You now have the scanner of your dreams. To stop it becoming a nightmare, read the instruction manual as soon as you open the box. The few minutes taken to learn what the radio is about can save many hours of frustration.

Nearly all scanners have a number of common controls — Manual, Scan, Lock-out, Delay, Priority, Program, Search Limited, Enter and the numerical keys are among them. However, because the manual button has a function on a Regency does not mean it performs the same function on a Realistic. The description of these keys is general and does not relate to a particular brand:

SCAN: Commands the radio to check the channels for activity.

MANUAL: Advances the scanner one channel at a time, disables the Scan mode.

LOCK-OUT: For bypassing unwanted channels, removes them from the Scan mode.

DELAY: Holds the scanner on a channel longer than normal, approximately two seconds.

PRIORITY: Gives your favorite channel preference over others.

PROGRAM: Opens your scanner's brain (microprocessor) to accept a new frequency.

ENTER: Places new frequency into the microprocessor.

NUMBERS: For displaying frequency on the LED or LCD readout.

LIMITS: Sets the upper and lower limits to be searched for unknown frequencies.

⌓ ⌔: Instructs the scanner to search in an up or down direction.

DIFFERENT TYPES OF ANTENNA

The next most important thing to consider purchasing is an outboard antenna. The standard telescoping whip that accompanies all scanners, except handhelds, is suitable for local monitoring. Handhelds normally use a 'rubber duckie' electronically tuned for optimum performance across their receiving range.

Among the external antennae available are discones. A discone has a disc — forming the receiving element — and a cone — that represents the ground plan. Normally discones have little or no gain. The SPR SCANTENNA-XLR, Icom AH 7000 and Diamond D-130 are good examples of discone antennae.

The second type of external aerial on the market is the active antenna. There are those who swear by them and those who swear at them. As the name suggests, an active antenna is more than a piece of metal pointing skyward. An RF amplifier powered by an external DC supply, boosts the incoming signal, some by 15 dB, making even the weakest signal seem like it is coming from next door. The active antenna has a built-in problem. Because of its 'activity' it can produce spurious signals or RF of its own and these signals lock-up many of today's super scanners.

Active antennae can be mounted indoors or out. Indoor locations include curtain rails, roof cavities and even the radio shack itself. Outdoors is, of course, the premium spot but the weather can affect the antenna physically, heat and water being the main offenders. The Dressler ARA 500 and MALDOL are active antennae available in Australia.

One of the most asked questions of the beginner is: How do I find out the frequencies?

One place is, of course, the magazine you are now reading. Others are the Department of Transport and Communications. I don't mean ring up and start asking for the local police, fire and ambulance channels. I am referring to the AMFAR/PARR microfiche. In 1984, under the Freedom of Information Act, DoTaC released a modified version of its frequency register, modified to the extent that sensitive users were sometimes deleted from the list. AMFAR or Australian Master Frequency Allocation Register has been replaced by PARR, Public Access Radio Frequency Register. PARR was reported to be a refined version of AMFAR and whether it is or not is open to debate.

By whatever name, the microfiche releases have produced a number of commercial off-spring. The ESG Frequency Register is a State-by-State correlation of frequencies from 30 MHZ to 520 MHZ listing Frequency, Callsign, Users and individual Transmiter sites. Around $26 each, they represent good value for money, because the removal of irrelevant information contained on the PARR has been done for you. The second type of directory lists only the principal and most interesting user of a channel. It is a quick reference priced around $19. Another advantage of the commercial lists is the lack of need for a microfiche reader.

SCANNERS ARE PERFECTLY LEGAL

Many of the emergency services object to the idea that people (taxpayers) can monitor their transmissions. Moves have been made in the past to restrict the public's access to scanners. Provided you don't listen to the mobile telephones (and who would?) the use of a scanner is perfectly legal. However, use a little commonsense and avoid having VKG, VKC, VKR etc blaring from your shack or mobile.

The American magazine 'Popular Communications' wrote: "There should be a warning label on the first scanner you buy, something like the one on a pack of cigarettes. It should warn you that continued use can be addictive, and can lead to varying, and unusual, expenditures." For those who know, it's too late, for those who don't BE WARNED!

In part two of this article I will fill you in on the pitfalls and problems of buying a preowned scanner. A ready reckoner of models, frequency range and cost will help in your selection.

Scanners

by uniden®

BC-175XL
An attractive, 16 channel scanner with luxurious wood grain appearance. It covers 9 bands including aircraft and lowband frequencies. Automatic search locates frequencies automatically and patented track running allows the unit to peak on each transmission. The priority feature checks channel one every two seconds for important messages. A memory backup retains frequencies entered for up to four hours without batteries in event of power failure.

BC-50XL
An attractive priced hand-held scanner featuring 10 channels covering 10 frequency bands, keyboard lock switch, audible low battery warning, channel lockout, two digit LC display and patented track tuning.

BC-100XL
A hand-held with more scanning power than many base or mobile units. Sixteen channels cover nine bands, including the aircraft band. Your priority frequency is checked automatically every two seconds. The keyboard can be locked to prevent accidental programming. The LCD display is lighted for better night viewing.

BC-800XLT NEW CELLULAR SCANNER
Scanning is easy and fun with the Uniden® Bearcat® 800XLT. Advanced microprocessor electronics provide some unique automatic and programmable features and dependable operation. The keyboard has been designed for maximum operating efficiency. It is divided into two sections: PROGRAM, which allows you to command any frequencies (VHF/UHF/800 MHz) on its 40 channels; and OPERATION, which controls scan, lockout, direct channel access and automatic search.

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Perth (09) 344 3937 Melbourne (03) 484 0373
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Beat the Heat!

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LEOPARD MK III UHF RIG REVIEW

A budget-priced bargain, reports David Flynn

I suppose if Pearce-Simpson didn't label new or updated radios as 'mark II', it would have run out of feline names long ago — such is its variety of rigs for 27 MHz, UHF CB and the HF/VHF marine bands.

The company's first UHF rig was the Tiger. Well, everyone is entitled to one mistake.

Since its debut in mid-1985, the successful Leopard series has more than made up for ol' Tiger. The original was very much Australia's first middle-of-the-range UHF mobile. The Mk II arrived some two years later, and went back to basics. It too found a nice welcome from buyers, who discovered that it had a very hot receiving section indeed.

Well, dear readers, the Leopard Mk III has just emerged from the jungle — and it's better than ever. The designers at Pearce-Simpson have clearly listened to the Australian UHFer, and delivered one of the best value-for-money UHF CBs on the market.

As you can see from our pics, the new Leopard is the epitomy of clean design. Apart from a few controls, the entire radio is finished in a smooth matte black. Combined with an uncluttered layout, the Leopard Mk III looks less like an flashy chrome-plated CB and more like a commercial two-way.

MANY IMPROVEMENTS

Improvements have been made in other areas, too. the rear panel now sports flying leads for both antennas and power connectors, which lets you use every inch of mounting space in a vehicle — perfect for modern Japanese boxes. Those clever Sawtron chaps started the trend, and now both Electrophone and Pearce-Simpson have shown their good sense (and respect for UHFers) by following suit.

Pearce-Simpson also has chosen the Leopard to continue its promotion of CTCSS as an alternative to selcall within the UHF CBs.

Selcall (selective calling) uses a once-only 'diddly-dit' burst of tones to open the mute on a rig. The continuous tone-encoded carrier squelch system (better known as CTCSS or subtone) sends one continuous tone under your signal, rather than a short activating burst at the start. The sub-tone must always be present before the mute opens.

CTCSS v SELCALL

The advantage of CTCSS over Selcall is that it does not need to be reset at the end of a conversation, in order to return radios to their quiet status. And every transmission you make carries the sub-tone. If there is no tone, you won't hear a thing. CTCSS is widely used on commercial VHF and UHF repeaters, where a number of user groups have a different tone and so can only hear their own network.

For UHF CB, CTCSS is probably superior to Selcall in the country or on a simplex channel where there is not too much traffic. Easier to use than selcall, too — once you switch in the sub-tone it's just like a normal radio, no 'send' buttons to push or switches to set and reset.

But sub-tone does have a difficulty over repeaters. Commercial repeaters are designed to handle the sub-tone, by regenerating it after it has been received, 477 MHz repeaters don't, and so whoever you're trying to contact won't hear you.

For this reason, it appears that the Leopard Mk III provides a choice between selcall and CTCSS, although this isn't made clear in the handbook.

Presentation of the Leopard is up to scratch. The handbook is straight-forward, and tells you all you'd need to know to get on air. After that, of course, you're on your own.

The Leopard carton bore a bright orange sticker, proclaiming that the rig was 'resealed after testing by Panther Viking Corporation — passed'. Hatadi Pearce-Simpson informs us that each rig, including the Cobra and Royce models, now undergoes a pre-delivery test at this facility, and those coming in under spec are aligned and re-tested. Some of the better retailers have been doing this in recent times, and it is good to see an importer putting the same commitment into its product.

The microphone is pretty standard fare — it will do the job, but doesn't look like anything you'd write home about. Ditto for the mounting bracket — but it's only a lightweight rig, and I wouldn't expect any real problems unless you forget to put screws in.

YOU CAN DRIVE IT IN YOUR SLEEP

In operation, the Leopard is the sort of rig you could drive in your sleep. All controls have a smooth and positive movement, with volume and squelch using long fluted knobs that are easy to grasp.

The LED displays are rather bright, so much so that a dimmer might be handy for night drivers. The meter uses five LEDs for output power/received signal — four greens and a red to top it off. Another green indicates duplex mode, with a dual-color LED showing green for receive and red for transmit.

Both transmitted and received audio was noticeably crisp, which is better suited to communications than a bassy tone in that it is more effective in penetrating noise. Of course for noise-free situations, such as base-to-base, you might sway towards something with

the more mellow and natural sound of the Sawtron, but it's all a matter of preference.

The receiver was a pleasant surprise. We figured that it would do the job adequately for a budget-priced rig, but didn't expect it to be so sensitive. There was a noticeable 'hiss' on quite a few signals in comparison to other radios, although this didn't affect legibility at all — perhaps it was just more noticeable due to the Leopard's sharp tonal response. Whatever the reason, the Leopard still insisted on pulling in clear signals almost every time.

If you add all of that up, you've got a pretty good UHF rig for $399 (rrp). And at $349 tax exempt, you can expect to see a lot of Leopards prowling around the sheep stations and grazing lands.

For the technical report, I'll let Argent Communications' ace tech John Meekings do the honors. But if you're looking for a low-priced no-hassle UHF for the second car, or as a first rig, or even a network for the business or farm — then it's hard to go past the Leopard Mk III.

This certainly looks better in black than the other 'plastic chrome' rigs, more like a business radio than low cost CB. The finish on the case looks good, and the fit is nice and tight.

The power connector is unusual, which unfortunately means that the dealer has to stock another power lead, instead of the most common two or three-pin configurations. It's nice and small, though, on the unit we tested the connector wasn't all that firm.

There is a small amount of surface-mount componentry around the transmit output stage, and overall the quality of work is excellent. Layout is no real problem, and it uses standard components which are easy to come by, so you're not waiting around for an expensive hard-to-get component.

The transmit power comes in at 4½ watts, with frequency accuracy on both simplex and duplex at 500Hz, which is almost nothing. Deviation sits around 3kHz at normal voice levels, and isn't willing to over-deviate.

Transmitted audio had a slight crispness compared to most other UHF radios, and is a bit sharp, which is better for communications.

The receiver appears to be very sensitive, around 0.35uV — compared to the handbook, which quotes 0.5uV. It's the same excellent receiver as the Leopard Mk II. The quality of recovered audio is also sharp, which makes the Leopard a communications radio right through, and very good for mobile use.

John Meekings
Argent Communications

ARGENT GRANTED REPEATER IN SYDNEY

The licence for the long-awaited western Sydney ch 2/32 repeater has been granted by DoTaC to Argent Communications of Blacktown.

The service is expected to commence on November 1st from a location in the Blue Mountains, following an extensive testing period.

"We will be looking at a repeater covering almost every part of Sydney, except for the low-lying northern beaches" a delighted Argent service manager John Meekings told CBA.

2/32 will allow mobiles across Sydney to remain on one channel rather than change channels as they travel from one area to another. It will also minimise traffic on the other Sydney repeaters, and act as a common "meeting ground" for UHFers.

Early tests have indicated that base stations as far as Gosford and the central coast, the south-west and the Blue Mountains will also be able to access 2/32, which will effectively act as their link with fellow UHFers in Sydney.

This is in keeping with the original intention of the 477MHz "metro" repeater service, to cover the greater Sydney region and beyond.

Coverage will also extend along the major road routes into and out of Sydney, including the freeway system, the Great Western Highway and the Putty Road.

The repeater system will be fully designed, installed and maintained by Argent Communications, with spare back-up modules so that service can be quickly resumed in the event of equipment failure.

Rural Communications Pty. Ltd.

7 Nevin Drive, Thomastown Vic. Ph: (03) 465 5866 Fax: (03) 465 4213

Country Branch: 22 David St, Horsham Ph: (053) 822 2271

AH: (053) 82 4326

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LAY-BY NOW FOR CHRISTMAS

VISA MASTERCARD BANKCARD

ODDS & SODS

NEW FROM LANKAR

LANKAR enters the fray with a new 40-channel AM/SSB 37MHz transceiver bearing the model number — DW-1200. The unit features just about everything you ever wanted in a sideband rig including its own VSWR meter. Instead of a rotary control for RF gain, the manufacturer has opted for a signal-step attenuator of 20dB — like the good ol' Local/DX switch.

The microphone connector is side-mounted on the left which tends to suit the left-hand drive car market better than we 'right-handers'.

In most respects this transceiver is electrically identical to our 27MHz feature review in the last issue and therefore our observations and test results apply equally on this occasion. The main differences encompass the front panel layout and the brand name identifying the transceiver.

The front panel components are all 'bright' chrome plated, while the knobs on the LANKAR transceiver are round in shape — again different from last issue.

Again we are offered an exceedingly familiar microphone bearing yet another manufacturer's mark.

All things considered, the DW-1200 is an acceptable performer on both modes - AM/SSB.

CONTRIBUTOR ADDRESSES

You will notice that Don Stewart's OUT WEST column failed to make this issue (my fault — crossed wires on deadline — Editor), also that Steve Griffin's SYDNEY SCENE is shorter than usual (I think this was my fault for the same reason — Editor) while Rod Fewster's QUEENSLAND SCENE is also shorter than normal due to Rod managing to set his kitchen on fire with the result that his computer, on which is typed his column, finished up smelling like bacon and being incapable of movement.

Hopefully, it'll all be back to normal with the next issue.

APOLOGIES . . .

We keep receiving 'phone calls asking where assorted contributors can be reached, but, we will not provide 'phone numbers for them.

However, they call all be reached by mail as below: Don Stewart — OUT WEST — P.O. Box 31, Bunbury, WA 6230. Steve Griffin — SYDNEY SCENE — P.O. Box 40, Gladesville, NSW 2111. Russell Bryant — SCANNING ACTION — P.O. Box R16, Roselands, NSW 2196. Greg Towells — UHF NEWS & REPEATER LIST — P.O. Box 358, Granville, NSW 2142. Graham Cotterell — CLUB NEWS/REGISTER — P.O. Box 184, Northbridge, NSW 2063. Rod Fewster — QUEENSLAND SCENE — P.O. Box 29, Kallangur, Q'land 4503. David Flynn — c/o P.O. Box 028, Milson's Point, NSW 2061.

SELCALL/ANI DECODER

Jensen Electronics has recently released a microprocessor controlled five or six tone SELCALL/ANI decoder to their range of signalling products. Called the SC4000 this compact decoder supports many features cincluding an inbuilt RS-232 interface.

It's low price and high performance make the SC4000 ideal for cost effective ANI systems, five tone SELCALL servicing and remote monitoring applications. For further information contact Jensen Electronics on (08) 269 4744.

PEARCE-SIMPSON

2 way communication

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For commercial, rural and other professional uses, UHF CB is affordable high-quality communications. Pearce-Simpson has the widest range and the best value In 477MHz rigs, with a full one year warranty.

SUPER LEOPARD MkIII

Latest Release

- 'Budget priced bargain' said CB ACTION
- All you need in a UHF rig — duplex, 40 channels, LED display and metering, optional selcall or CTCSS
- Australia's best priced UHF mobile, ideal for base too!

Also available are the famous Royce line of UHF CB radios:

- AUS-100 mobile, with ch. 11 reset and display dimmer
- AUS-200 handheld — a new model built to take the tough life
- TS-133 full-feature mobile, easily converts to portable or base with optional Royce 'Portabase'

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More on shortwave listening...

WHERE TO HEAR THEM and HOW TO IDENTIFY THEM

One of the results of our recent reader's survey was that we discovered that 32 percent of readers own short wave receivers and are interested in learning more about SW stations, programs, DXing and QSLs.

In our last issue, Bob Padula of the ARDXC, provided an introduction to what short wave listening is all about and in this issue John Rowe — a short wave listener of lengthy standing — follows that report up with information about how and where to find, firstly, the stations and secondly, how best to obtain a QSL card from them.

WHERE TO HEAR SW STATIONS

There was a short list of where to find SW stations published in Bob's article in the last issue so I guess most of you have already checked them out and at least found out what SWL (short wave listening) is all about.

As you were tuning around the frequencies, however, you doubtless heard a lot of stations — many of them broadcasting in languages other than English — which left you wondering who and where they were.

Identifying the English speaking stations is not very difficult and the best times to hear station identifications is on the hour and/or half hour.

The bigger and better stations such as Voice of America, BBC, Radio Australia and the like are easily found and easily heard — if not on one frequency then on another.

Where, however, do you start looking for specific SW and/or Medium Wave stations rather than simply tune around the bands to stumble onto unknown stations?

There are several answers to this question.

Firstly, and probably the best answer is to join a club such as Bob Padula's ARDXC or the Southern Cross DX Club.

Secondly, you can find a rough guide to stations in booklets such as the 'Wave Handbook' which is supplied with many receivers.

Thirdly, you can purchase a handbook such as the World Radio TV Handbook (WRTV) which is published annually, but, at $39.95 does not come cheap.

The advantage of the latter is that it contains an enormous amount of information including:

A comprehensive country by country listing of long, medium and short wave broadcasters by frequency, time and language.

It has the addresses of stations (which you will need if you intend to try to obtain QSLs from them), maps of principal transmitter sites, critical test reports on short wave receivers, propagation forecasts and many other articles and items of interest to any SWL.

Say, for argument sake you are listening to a station on 11.830 kHz and you have absolutely no idea what the station is or where it's located.

If you have a copy of the World Radio TV Handbook you can quickly check what stations are operating on this frequency — there are in fact ten listed — so, although you might still have no idea of the language being used, you have at least narrowed it down from thousands to a likely ten.

The handbook lists these ten stations with their callsigns and country and eventually you will almost certainly hear the callsign and be able to log the station.

You might need to listen for some time as, unlike 2UE and 3XY, short wave station do not just run music, talk-back and advertising, but, rather you will find them to be more like the contents of the ABC stations with interviews, music, news, etc. with station identification often at the start and end of each particular segment.

Having identified the station, you need to log the broadcast and take down specific information if you wish to try and obtain a QSL.

It is no good writing, "heard your station on Wednesday and liked the program".

It is just a little bit more involved than that.

Ideally, you should tape record the broadcast and then, if necessary, refer to it for the information you need.

For a start, you need to state the time in Universal Co-ordinated Time (UTC) which is the old Greenwich Mean Time. This is not difficult as the WRTV

Many SWLs forward reports to Ham stations stating when they were heard, who they were in contact with and a readability/signal report — this is a QSL card from Chinese station BY4AA for such a report.

handbook provides a listing of world times and you can easily establish the UTC time.

Next you obviously require the station's callsign and the frequency on which you are listening — again not terribly difficult, but, be as accurate as possible.

You need to state the date — and it is of little use writing it as 10.7.88 as, in America for instance, this would be read as October 7, 1988 rather than July 10, 1988.

Write it out in full and make it easily understood.

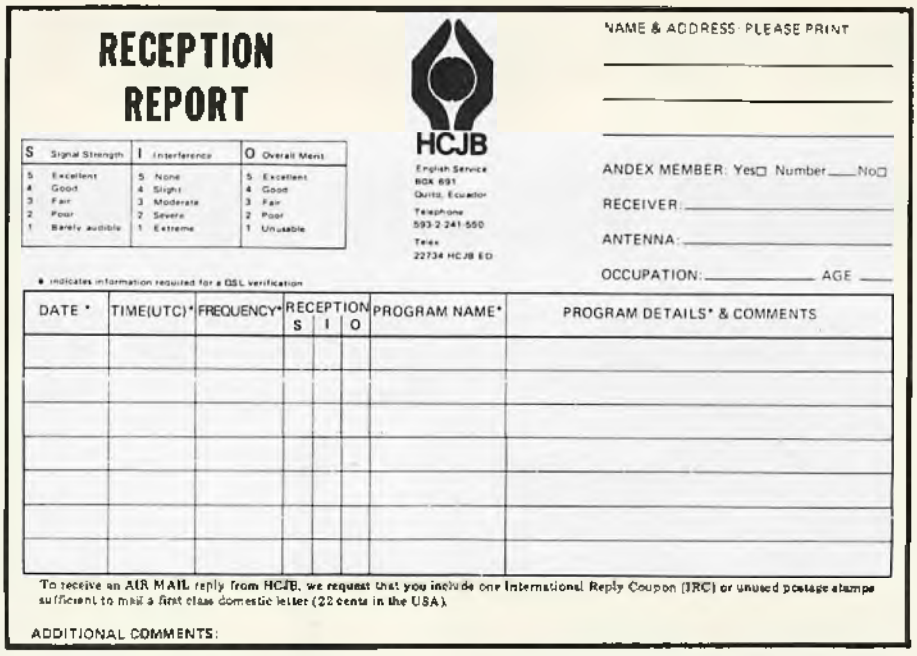
Keep in mind the fact that stations are **not obliged** to send you a QSL, however, they are interested in reports from readers and providing they are given useful information they will usually QSL.

So you now have the station callsign, details of the broadcast that you listened to, the frequency, UTC time and date — you're getting there, but, there is still a way to go.

It's of little use to the station to be told that, "I heard you", even if you include all the information above.

To be of any use to the station it needs to know how well you heard it, what were atmospheric conditions like at the time, was it being interfered with by another station, what sort of receiver you were using and any other data which will paint a picture of just how well the station is being received at any given time in your part of the world.

Now it might sound like a lot of trouble to go to, but, it really isn't and providing useful information to the station will be more appreciated (and more likely to return a QSL) than a rough old report which really tells them very little that they do not already know.



RECEPTION REPORT

HCJB

English Service
BOX 691
Quito, Ecuador
Telephone
593-2 241-550
Telex
22734 HCJB ED

S Signal Strength	I Interference	O Overall Merit
5 Excellent	5 None	5 Excellent
4 Good	4 Slight	4 Good
3 Fair	3 Moderate	3 Fair
2 Poor	2 Severe	2 Poor
1 Barely audible	1 Extreme	1 Unusable

NAME & ADDRESS: PLEASE PRINT

ANDEX MEMBER: Yes☐ Number____No☐

RECEIVER:

ANTENNA:

OCCUPATION:_____ AGE ____

* indicates information required for a QSL verification

DATE *	TIME(UTC)*	FREQUENCY*	RECEPTION S	I	O	PROGRAM NAME*	PROGRAM DETAILS* & COMMENTS

To receive an AIR MAIL reply from HCJB, we request that you include one International Reply Coupon (IRC) or unused postage stamps sufficient to mail a first class domestic letter (22 cents in the USA).

ADDITIONAL COMMENTS:

The above is a typical form for reporting to a SW station — in this case it is supplied by HCJB, The Voice of the Andes in Quito, Equador, South America.

HOW TO QSL

Remember, there might be hundreds, even thousands, of other SWLs around the world also providing information to the station and it is by compiling all this data that the station management knows just what is happening to its broadcast around the world.

So what constitutes a worthwhile report?

There are several schools of thought on this, but, the generally accepted method is by either the SINPO or SIO code.

These are relatively straightforward and roughly correspond to a Ham's Readability, Strength, Tone (if using cw) report or similar for a CBer's exchange of S9,Q5.

The simpler of the two is the SIO code.

The letters stand for Signal strength, Interference and Overall merit.

The ratings for Strength are 4 — good, 3 — fair and 2 — poor.

Interference is rated at 4 — nil or very slight, 3 — moderate, 2 — heavy while Overall merit is rated at 4 — good, 3 — fair and 2 — unusable.

So, if you rate a station at SIO 222 it means that the signal which you heard is quite useless while a report of 444 means that the reception is excellent.

The SINPO rating is somewhat more involved and rates from 1 to 5 in each category with Propagation disturbances and N — atmospheric noise — being additional to the categories of the SIO system.

As you can see from the illustration of station HCJB's reception report they also request that you advise the make and model of your receiver and antenna.

This is because the average listener is not likely to be using a $10,000 communications receiver, but, if they are the station would like to know so that it can take this into account when evaluating your report.

There is a chapter in the 1987/88 Guide to Broadcasting Stations published by Heinemann Newnes and available from most technical book stores at around $20 which will provide you with all the information you require in respect to obtaining QSL cards.

EASY TO HEAR SW STATIONS

Here is a short list of easy-to-hear shortwave stations, which should be audible on relatively simple equipment:

Radio Japan: 0900-1000 UTC on 11885 and 15235 kHz

Radio Austria: 0700-0800 UTC on 17870 kHz

Radio Prague: 0730-0800 UTC on 17840 and 21705 kHz

Radio Netherlands: 1030-1130 UTC on 9675 kHz

The Voice of Germany, Cologne: 2100-2200 UTC 9720 kHz, 11945 kHz and 17875 kHz

The Voice of the Andes (Ecuador): 0700-1030 UTC on 9745 kHz

The British Broadcasting Corporation: 0600-1030 UTC on 15360 kHz

The Voice of Greece: 0840-0850 UTC on 15630 kHz

Trans World Radio Pacific (Guam): 0930-1100 UTC 11805 kHz

Swiss Radio International: 0830-0900 UTC on 9560 kHz

Radio Sweden International: 0930-1000 UTC on 15390 kHz

All of the above transmissions are in English, and beamed specifically to Australia.

It's a well-worn line, but David Flynn asks Royce's UHF handheld: "Haven't we met before?"

ROYCE AUS-200 REVIEW

The AUS-200 is Royce's third entry into 477MHz. Following its feature-packed TS-133 and mid-range AUS-100, it certainly seems to have the market fairly well covered.

But while both other rigs were new to our shores, the AUS-200 gives you that feeling of deja vu — twice over. You see, it is identical to the TX474, Electrophone's first UHF handheld. Which makes it a blood brother to the Emtron ACE.

Now, this isn't necessarily a bad thing. As our bench tech John Meekings pointed out, there are enough of these models in circulation to ensure that most technicians are familiar with them and have ample spare parts on hand.

The AUS-200 shares something else with its siblings — being a no-frills handheld for UHF CB. No tricks, nothing fancy. Find the channel and talk. Adjust the volume and squelch, and listen.

This simplicity is mirrored in Royce's design. Check out the pics if you please — even without labelling the controls, you couldn't put a foot wrong. But it is worth commenting on the channel selector and duplex/power switches.

The AUS-200 uses common thumbwheel switches to change channels and these are marked with very large and legible numerals. No surprises here, except that channel 40 is dialled up as '00' — and as the 10s thumbwheel does not advance past '3', you've got to go back down to the bottom of the band.

FIRST READ THE MANUAL

Royce have seen fit to mention this in a whopping great note on the first page of the handbook . . . so if you unpack the AUS-200 and jump straight on air without reading the book, you'll be very confused. And it'll serve you right!

This arrangement does make it harder to do a 'manual scan' through the channels, as with the IC-40, but that's the only drawback.

But, as for those high/low power and simplex/duplex switches, don't you think it would make much more sense to put them on the top panel, or even the front panel, instead of at the rear?

Clip the AUS-200 onto your belt, and then try changing the power level or hopping on and off repeater channels. And you've got the same problem if you adapt it to a mobile mounting bracket.

That aside, we sent the Royce to work on air. It comes ready to fire up, complete with flexible whip antenna, battery pack and charger, fabric handstrap (not plastic, so that's welcome), belt clip and earphone.

ACCESSORIES

The standard battery is a rechargeable 8.4v 250mAH unit, providing 1.5 watts (low power is 150mW), and is interchangeable with packs from the Icom range. In the accessories line, Royce has available a speaker-mike, carry case, 3dB whip, desk-top and mobile chargers, and a trio of battery options — dry-cell, DC-DC mobile converter and 450mAH/10.8v fast-charge nicad packs.

Once fired up, the AUS-200 performs as you'd expect any handheld to. Received audio is clear, the speaker has plenty of volume and should do well even in high-noise environments.

The outward-bound signal showed signs of being best suited to the same situation. Given my usual voice level, there was precious little modulation to be heard — an identical problem to that of the TX474, it will be remembered. But put some pep into the vocal cords and presto — instant audio with not a hint of over-deviation.

We thought this particular unit may just have been out-of-tune, but the orange stickers plastered on the handheld (which were non-removeable, by the way, probably an incentive to buy a carry-case) assured us the unit was tested and passed through Hatadi Pearce-Simpson's QC system.

A bit of judicious fiddling on the test bench confirmed that this was in fact the nature of the beast.

NO NOISE OR DUST WORRIES

That the AUS-200 handhelds were extensively used in the Variety Club's 1988 Bourke to Blatherskite Bash (latest in the series of mad fund-raising outback rallies), proves that the rig is most at home with the extremes of noise, dust and temperature.

So if you need a 477MHz handheld for any noisy or rugged area, then the AUS-200 might just do the trick.

The handbook is up to the job, although many of the diagrams and text seem to be in the wrong place. Not too serious a problem, except for a glaring error in the list of 'duplex operating frequencies' — which adds 9/39 and 10/40 to the Australian repeater channels. No, DoTaC hasn't changed the rules while you weren't looking, this is just the same mistake which appeared in the instruction book for the TX474 three years ago.

At an rrp of $599 the AUS-200 may need some discounting to gain the attention of buyers. But they should quickly realise that Royce offers a handheld which will do the heavy-duty jobs without complaint, for less money than the top-end gear.

On the bench . . .

The AUS-200 is really for a different sort of UHFer than the guy who buys the IC-40 or TX475. It's not a rig for the CB enthusiast, more for the professional user who just wants a UHF handheld to talk on — say for a building site, a farm or a factory. It's like choosing between a Holden and a Mercedes — all cars go forward, and they'll get you where you want to go. But it's the way you get there — the speed, handling or comfort — which makes the difference.

Like most other handhelds, the Royce gets its frequency instructions direct from the BCD thumbwheel switch unit, which feeds into the PLL chip. The odd one out is the IC-40, which sends the switch coding via an EPROM. This of course allows for easy modification, so that the same coding can give different frequency instructions at the EPROM. This accounts for the humpback on the IC-40 (which holds the EPROM and the optional selcall board) and the thinner appearance of the AUS-200.

You really don't have to open up the AUS-200 to see it is from the same stable as the Emtron ACE. The internals are exactly the same, so at least service will not be a great problem — if you can fix an ACE you can fix an AUS-200. The same advantage carries through to the spare parts, which everyone has.

The Royce still has that muffled-sounding modulation, though. If you really drive it, at a high audio level, it comes through solid, but at normal voice level the deviation just isn't there. So it's fine in a noisy situation where you've got to yell into the rig, and it won't overdeviate like the others. But in a quieter environment, you'd be yelling so loud they could probably hear you without the radio.

The transmit power was 1.5 watts, wth 100mW on low setting — pretty much according to specification. Frequency was spot-on, and receive sensitivity also on par at 0.5uV.

— John Meekings
Argent Communications

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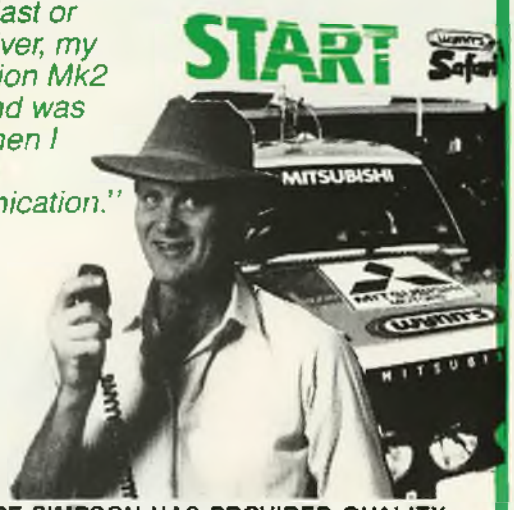

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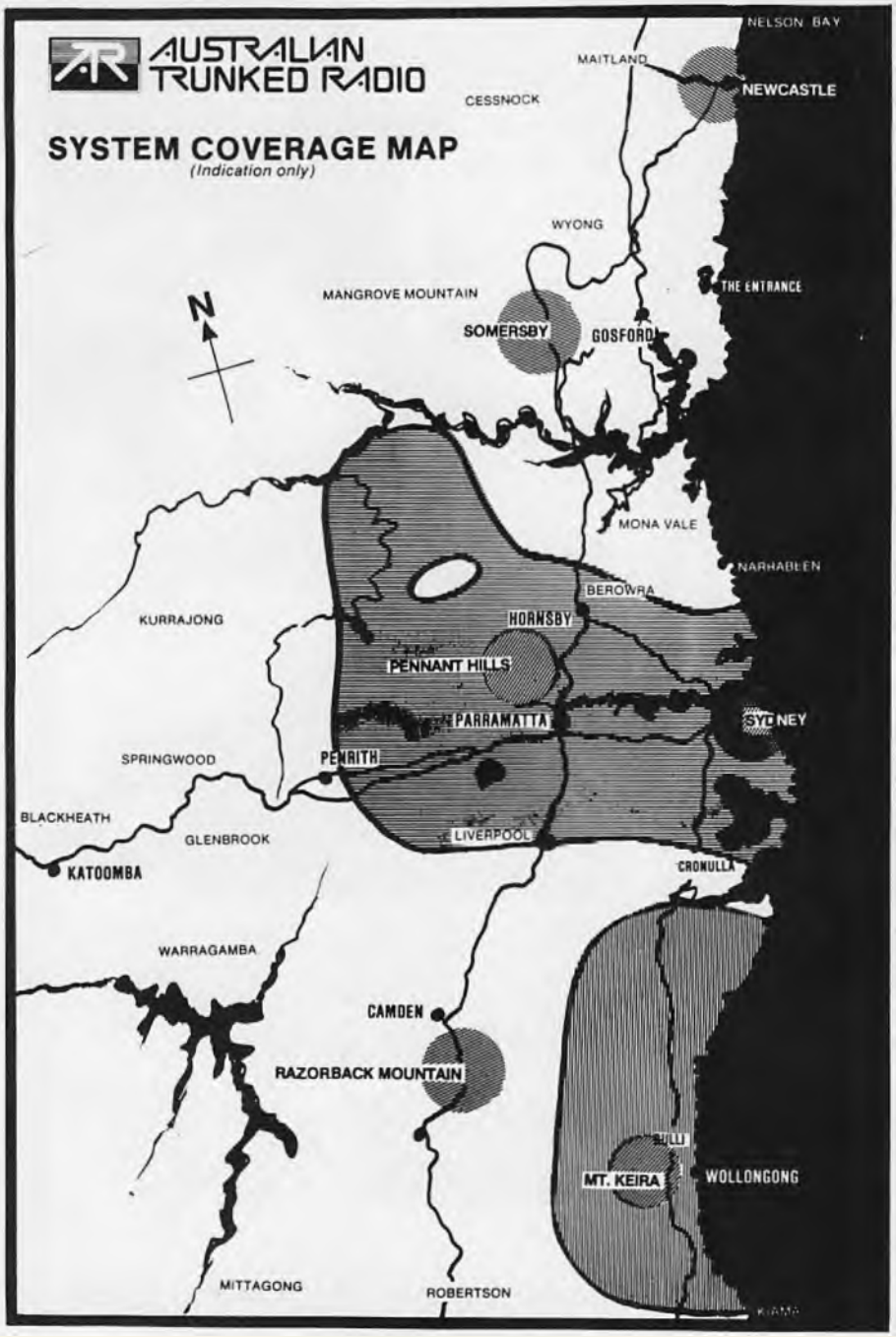

By RUSSELL BRYANT

When Marconi developed the radio he would not have foreseen the effect that this device would have on society. Today radio plays a part in everyone's life in one form or another. Broadcasters, television and even telephones are 'radio-controlled'.

With such a reliance on the spectrum and the limiting nature of the resource, it is becoming harder and harder to fit all the users of radio into such a small space.

Previously under-utilized portions of the band are now being opened up to accommodate the increasing demand by the Land Mobile Service. In an attempt to keep abreast of this, the Department of Transport and Communications has drafted a proposed frequency band plan to take Australia's communication needs into the 21st century.

The Department has advised 'CB Action' of the proposed plan and we have in turn made it available to you.

The four bands affected are: 1. the 40 MHZ band: 2. the 400 MHZ band; 3. The 900 MHZ band; 4. The Microwave Link Service.

As microwaves are beyond the receiving capabilities of most scanner users we will deal with the first three.

The frequencies between 29.7 MHz and 45 MHz have, prior to this year, largely been ignored in Australia. Mainly the home of a number of pager services, link frequencies and the military, 40 MHz will have users in the Land Mobile Service licensed on its channels.

A break-up of the DoTaC plan is:

29.70-31.00 MHZ miscellaneous fixed and mobile services.

31.00-32.00 MHZ two-frequency land mobile services group 1 base transmit.

32.00-33.00 MHZ Defence users only.

33.00-34.00 MHZ two-frequency land mobile sevices group 1 mobile transmit.

34.00-35.00 MHZ Defence users only.

35.00-36.00 MHZ two-frequency land mobile services group 2 base transmit.

36.00-37.00 MHZ miscellaneous fixed and mobile services.

37.00-38.00 MHZ two-frequency land and mobile services group 2 mobile transmit.

38.00-39.00 MHZ Defence users only and radio astronomy.

39.00-41.00 MHZ miscellaneous fixed and mobile services.

41.00-42.00 MHZ Defence users only.

42.00-43.00 MHZ two-frequency land mobile services group 3 base transmit.

43.00-44.00 MHZ Defence users only.

44.00-45.00 MHZ two-frequency land mobile services group 3 mobile transmit.

In the two-frequency Land Mobile service the base transmit frequency will be 2 MHZ lower than the base receive frequency. Low-powered users such as cordless telephones will still be permitted on 30.075, 30.125, 30.175, 30.225, 30.275, 39.775, 39.825, 39.875, 39.925, 39.975 40.025, 40.075, 40.125, 40.175 and 40.225.

The 40 MHZ frequencies will be known as the VHF Low Band. With sunspot activity on the increase it is going to make for some interesting scanner DXing in summer months.

The next band due for an overhaul is the UHF band. Frequencies between 403 MHZ and 520 MHZ have had a potpourri of users — links, pagers, remote control channels, two-way radio users and telephones are just some of the mixture. The new channel plan introduces trunking to Australia, with 200 paired channels between 406.1125 — 408.6250 and 415.5625 — 418.0750 at 12.5 KHZ spacing.

Trunking is a whole new ball game to scanner hobbyists. A trunked system uses a number of frequencies anywhere from five to 20 all linked together. As you tune the base transmit channels between 415.5625 and 418.0750, a computer-generated buzzing will lock-up your scanner. These noises are the data necessary to control channel allocation.

The data channel assigns the remaining channels to the system users so that different groups won't interfere with each other. Trunking is spectrum-efficient, having as many individual users on as few frequencies as possible.

The frequency channels allocated to the single frequency mobile service (or, in a word, simplex) are: 76 channels from 410.550-412.450; five channels from 415.425-415.525; 20 channels between 450.000-450.500 and 469.500-470.000. A further 40 channels are allocated from 471.200-472.200 with 16 from 474.800-475.200, 484.800-485.200 and 494.800-495.200. From 509.525 to 510.000 there are 19 channels and, from 519.525 to 520 there are 18. The band allows 25 KHZ spacing between channels.

With the UHF band becoming overcrowded, especially in the larger populated areas of Australia, the DoTaC decided to separate the frequencies from 452.000 to 453.500 and 462.000 to 463.000 by 12.5 KHZ, thereby halving the existing 25 KHZ spacing.. The frequencies between 504.000 to 507.000 and 514.000 to 517.000 will also be split by 12.5 KHZ spacing.

The frequencies that will retain the 25 KHZ split between channels are:

403.000-404.000;	405.000-405.975;
412.450-413.450;	414.450-415.425;
453.500-460.000;	463.000-469.500;
472.200-474.775;	475.200-476.400;
480.000-484.800;	485.200-490.000;
495.200-500.000;	500.000-504.000;
510.000-514.000;	517.000-519.525.

408.625-410.550;
418.075-420.000;
470.000-471.200;
477.400-479.975;
490.000-494.800;
507.000-509.525;

820.000-825.000 Trunked land mobile service — base receive and wide band fixed services outside major cities.
825.000-835.000 Cellular telephones base receive.
835.000-845.000 Cellular telephone base receive — Sydney and Melbourne. Wide band fixed services outside major cities.
845.000-849.000 Digital cellular telephones.
849.000-851.000 Aircraft telephone services.
850.000-902.000 Radiolocation services off-shore areas.
851.000-857.000 Digital cellular telephone service.
857.000-870.000 Wide band fixed services outside major cities.
865.000-870.000 Trunked land mobile service — base transmit.
870.000-880.000 Cellular telephones base transmit.
880-000-890.000 Cellular telephones base transmit — Sydney and Melbourne. Wide band fixed service outside major cities.
890.000-894.000 Digital cellular telephones.
894.000-896.000 Aircraft telephone service.
896.000-902.000 Digital cellular telephones.
902.000-928.000 ISM (industrial, scientific and medical services). Radiolocation service.
928.000-942.000 Radiolocation service off-shore areas. Wide band fixed service outside major cities.
942.000-943.000 Narrow band area service.
943.000-960.000 Wide band fixed services outside major cities.
947.000-950.000 Single frequency fixed services.
950.000-955.000 Two-frequency fixed services.
955.000-959.000 Studio to transmitter links.

That takes care of the primary users on 900 MHZ . The secondary services are:

902.000-928.000 Radio linked microphones, wide band fixed services outside major cities.
905.000-910.000 Two-frequency fixed services.

These miscellaneous services are located among the usual mobile users:

403.000-406.00 small capacity fixed links; 404.000-405.000 two-frequency fixed service; 406.000-406.100 mobile satellite service; 406.100-420.000 small capacity fixed links; 406.100-410.000 radio astronomy; 420.000-450.000 radiolocation and amateurs (secondary basis); 476.425-477.450 UHF Citizens Band Radio Service.

For those who live close to a major waterway that handles heavy maritime traffic, there are three paired channels in the maritime mobile service for the use of on-board stations in all Australina ports, harbors and territorial waters.

Those channels are: 457.525 with 467.525; 457.550 with 467.550 and 457.575 with 467.575.

We now come to the 900 MHZ band and the magical cellular services located therein. This band is the latest to appear in the new breed of super scanner. The PRO 2004, Yaesu 9600/965, Icom R7000, AOR 2002, Bearcat 800 XLT, Bearcat 200XLT and Kenwood RZ1 are all capable of receiving 800 MHZ and above. Because the 900 MHZ band is the new kid on the block it has been difficult to compile information on how the band is used and where.

This is the way the DoTaC will allocate frequencies under the new plan. The following are primary users, the secondary services will be given at the end of the list. The primary services are:

These band plans were open to public comment until March, 1988. Subject to representations and amendments, they are expected to come into operation shortly. So, with two new bands and an upgrading of an existing one, there is no better time to warm up your favorite black box and start logging a few frequencies.

PRODUCT UPDATE . . . to my review of the Cobra SR15 handheld scanner. Tim Shaw of Hatadi Electronics, importer of the rig, informed me that for a very modest fee Hatadi can remove the low band frequencies (29 to 54 MHZ) and insert the mid band (68 to 88 MHZ). If you own or are thinking of buying the SR15 and want the conversion, contact Hatadi in Sydney on (02) 997 7077.

FOOTNOTE . . . you may have noticed this colum is 'under new management'. As such, there will be a few changes made in the presentation of information and frequencies. I do not publish a frequency list or have any interest in another magazine. I am a scanner enthusiast and have been since 1974. I do not pretend to know it all when it comes to scanners. I am still learning even after 14 years. In the old days it was a case of for me to know and you to find out concerning frequency information and the like. These days with AMFAR and PARR it is no longer a secret, so if you have any info or want to know, how about asking 'CB Action'. Maybe we can help. If we can't, there might be a reader who can. It is up to you.

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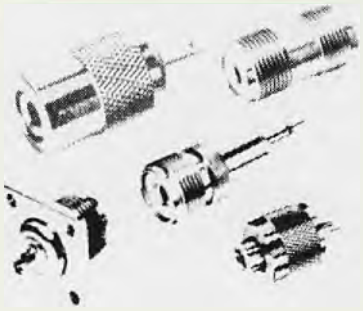

04 101	PL259 Plug takes Reducer	2 90
04 103	PL 259 Teflock RG58	5 50
04 104	PL259 Simple RG58/U	2 50
04 105	C32 9 PL259 Plug RG58 U	8 90
04 1050	C32-21 PL259 suit RG58	9 90
04 1051	C32 4 PL259 for RG213 U	10 50
04 106	PL259 to suit RG10FB Coax	22 00
04 107	C32 66 Right Angle PL259	19 50
04 108	PL259 Reducer RG58 U	00 50
04 1090	C32 36 UHF Inline Socket	10 50
04 1091	C32-42 PL259 to suit RG58	12 50
04 111	SO239 Socket Front Nut	2 00
04 112	SO239 Socket 4 pnt Flange	2 25
04 113	SO239 Socket 2 pnt Flange	2 40
04 114	SO239 Sh Socket back nut	2 50
04 115	PL258 Double Female Adaptor	2 90
04 116	UHF Double Male Connector	4 90
04 117	UHF Right Angle Connector	5 90
04 118	UHF T Connector 3 Female	6 40
04 119	UHF T Connector 2F 1M	6 75
04 120	SO239 to RCA Plug Adaptor	4 50
04 1201	PL259 to RCA Socket Adaptor	3 50
04 121	SO239 to 3 5mm Plug Adaptor	4 50
04 122	UHF Lightning Arrestor	2 50
04 123	CA35A Welz Surge Protector	49 50
04 127	Feed Thru D F 2" Connect	5 00

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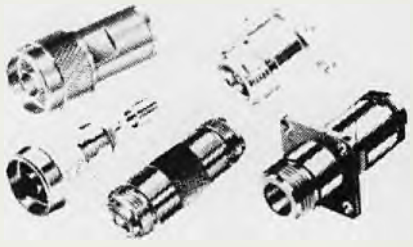
N-TYPE UHF COAXIAL



04 201	N-type Plug for RG58/U	8 90
04-2011	C390 15 N-type Plug RG58	9 90
04 204	N-type plug for RG213/U	9 90
04-2041	C39-22 N-type Plug RG213	12 75
04 206	N-type Plug for RG10FB	27 00
04-2071	N-type Plug suit LDF4/50	45 90
04 211	N-type socket inline RG58	8 50
04 212	C39 31 N-type Inline RG58	11 50
04-214	N-type socket inline RG213	9 50
04 215	N-type socket inline RG214	9 20
04 230	N-type 9 socket w back nut	5 75
04-232	N-Type socket Panel Mount 2	4 30
04-233	C39-37 N-Panel Socket to RSB	13 75
04-240	N type double female connector	6 90
04-241	N-type double male connector	7 00
04-243	N-type T Connector 2F 1M	10 00
04 244	N-type T Connector 3 Female	10 25
04 245	N-type Right Angle Connector	13 00
04 271	N-type Male BNC Female Adaptor	9 90
04 272	N-type Female BNC Male Adaptor	8 50
04 273	N type Female BNC Adaptor	7 50

BNC UHF COAXIAL

04 301	BNC Plug SCR Type for RG58	4 85
04 302	C53-01 BNC Plug Suit RG58	9 90
04 303	BNC Plug SCR Type for RG59	3 50
04 304	C53-09 BNC to suit RG213u	21 95
04 306	BNC Plug to suit RG10FB	38 50
04 311	BNC Crimp for RG58 UG	3 90
04 321	BNC Female PNL Socket	3 50
04 322	BNC Female Short Panel Socket	3 25
04 323	BNC Pane Mount UG1094 2N	3 50
04 324	BNC Female Panel socket 4P FL	5 00
04 331	BNC Female Inline socket	3 50
04 332	C53 14 Inline Crimp RG58	8 50
04 333	BNC Socket inline for RG59U	5 50
04 351	BNC Double Female Adaptor	5 50
04-3511	C53 41 BNC Double Female	8 50
04 352	BNC Double Male Adaptor	4 50
04 353	BNC T Connector 2F 1M	11 75
04-354	BNC T Connector 3F	11 00
04 355	BNC Right Angle Connector	10 00
04-371	BNC Male UHF Female Adaptor	7 50
04 372	BNC Female UHF Male Adaptor	7 50

2.5mm AUDIO

04-401	2 5mm Plug Plastic Red/Black	0 80
04-403	2 5mm Socket inline Plastic Black	0 50
04-405	2 5mm Socket Panel Mount	0 75
04-406	2 5mm Socket PMT change over	2 00

3.5mm AUDIO

04-411	3 5mm Plug Plastic Blk/Red	0 65
04-412	3 5mm Plug Metal	1 90
04-413	3 5mm Socket Inline Plastic	1 25
04-414	3 5mm Socket Inline Metal Body	1 75
04-415	3 5mm Socket Panel Mount	1 00
04-416	3 5mm Socket PCB Mount	1 50
04 417	3 5mm Change over Socket	1.00
04 419	3 5mm Plug to RCA Socket	3.50
04-421	3 5mm Stereo Plug Plastic B&R	2.00
04-422	3 5mm Stereo Plug Meta	2.00
04 423	3 5mm Stereo Socket Inline	1 80
04-424	3 5mm Stereo Socket Metal	2.00
04-425	3 5mm Stereo Socket Panel Mount	1.90

6.5mm AUDIO

04-431	6 5mm Plug Plastic Black Red	1 90
04-432	6 5mm Metal Mono Plug	2 75
04-433	6 5mm Cable Jack plastic Black	1 75
04-434	6 5mm Metal Inline Socket	2 50
04-435	Socket Panel Mount	1 00
04-436	6 5mm Socket Panel w Cutout	2 50
04-441	6 5mm Stereo Plug plastic Black	2 00
04-443	6 5mm Stereo Cable Jack PLS	2 00
04-445	6 5mm Stereo Socket Panel Mount	2 00
04-446	6 5mm Stereo Panel Socket w CO	3 50

RCA & DIN AUDIO

04-451	RCA Plug Black and Red	1.00
04-461	2 pin DIN Plug PD2	1 50
04-462	2 pin DIN socket SD2	1.50
04-467	DIN Plug 5 Pin Plastic	1.80
04-4671	PD5M 5 Pin DIN Plug Metal	5 75
04-468	DIN Socket 5 Pin Inline	1 50
04-469	DIN 5 Pin Panel Mount socket 45Deg	1 75
04-470	DIN Plug 5 Pin 180Deg	1 50
04-47006	PD6 6 Pin DID Plug	1 75
04-471	7 Pin DIN Plug	2 00
04-472	7 Pin DIN Socket	2 00

MICROPHONE LOCK RING/CB TYPE

04-501	2 Pin Mic Plug	4 90
04-502	2 Pin Mic Plug L-type	7 90
04-503	2 Pin Mic Plug Inline socket	7 50
04-504	2 Pin Mic Panel Socket	2 10
04-505	3 Pin Mic Plug	3 90
04-506	3 Pin Mic Plug L-type	7 50
04-507	3 Pin Mic Inline Socket	7 00
04-508	3 Pin Mic Panel Socket	2 75
04-509	4 Pin Mic Plug	4 90
04-510	4 Pin Mic Plug L-type	6 00
04-511	4 Pin In-line Socket	6 00
04-512	5 Pin Mic Panel Socket	2 90
04-513	5 Pin Mic Plug	4 90
04-514	5 Pin Mic Plug L-type	6 90
04-515	5 Pin Mic In-line Socket	8 90
04-516	5 Pin Mic Panel Socket	3 50
04-517	6 Pin Mic Plug	4 90
04-518	6 Pin Mic Plug L-type	7 00
04-519	6 Pin Inline Socket	6 60
04-520	6 Pin Mic Panel Socket	3 95
04-521	7 Pin Mic Plug	6 90
04-522	7 Pin Mic Plug L-type	10 95
04-523	7 Pin Mic Panel Socket	5 50
04-524	7 Pin Mic Inline Socket	8 00
04-525	8 Pin Mic Plug	7 50
04-526	8 Pin Mic Plug L-type	9 00
04-527	8 Pin In-line Socket	8 50
04-528	8 Pin Panel Socket	4 10

DIN AUDIO

04-540	DIN Mic Plug 5 Pin	4 50
04-543	DIN Mic Socket 5 Pin Panel Mount	3 25

CANNON TYPE DELUXE AUDIO

04-561	3 Pin MIC Plug Inline	6 50
04-562	3 Pin Mic Plug Panel Mount	6 00
04-5621	3P C type P-mount Black	19 00
04-563	3 Pin Mic Socket In-line	8 60
04-564	3 Pin Mic Socket Panel Mount	6 00

DC POWER

04-601	2 Pin Rectangular Power Plug	1 50
04-6010	PC2F Female Con & Housing	1 60
04-6011	PC2M male con & housing	1 60
04-602	Banana Plug Screw Type BK	0 75
04-611	Binding Post 4mm Red/Blk	1 50
04-612	Binding Post Large BLK	1 25
04-620	Alligator Clip	1 00
04-628	Auto Cigarette Lighter Plug	2 00
04-629	Auto Cigarette Lighter Plug Fuse	1 95
04-640	DC Power Plug 1mm P411	1 50
04-641	DC Power Plug 1 3mm P413	1 50
04-642	DC Power Plug 1 6mm DC16	1 95
04-643	DC Power Plug 2 1mm	1 50
04-644	DC Power Socket Panel 2 1mm	1 90
04-646	DC Power Plug 2 5mm	1 50
04-647	DC Power Socket Mount 2 5mm	1 50
04-648	DC Power Socket 2 5mm Plastic	1 00
04-649	DC Power Plug 3 1mm P431	1 75
04-680	Battery Snap I Type	0 90
04-681	Battery Snap T Type	1 50
04-682	Battery Pack 2 x AA	2 50
04-683	Battery Pack 4 x AA	1 00
04-684	Battery Pack 6 x AA	1 00
04-685	Battery Pack 8 x AA	2 00

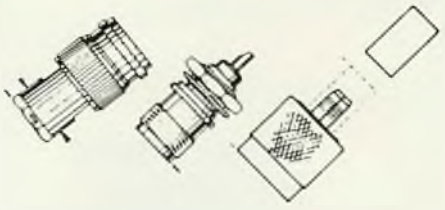
TV COAXIAL AND 300 OHMS

04-701	PAL Plug Plastic	1 00
04-702	TV PAL Plug for RG59 U	2 25
04-703	TV PAL In-line Socket plastic	1 00
04-704	TV PAL Inline Socket Metal	2 50
04-705	TV PAL Double Male Connector	2 00
43-706	TV PAL Double Female Connector	1 50
04-707	TV PAL Panel Socket 5 Face Mt	1 25
04-708	TV PAL Plug W 75 300 ohms TF	2 50
04-709	TV PAL 1M 2F 2 way splitter	4 50

AUTO ANTENNA TYPE

04-740	Auto Antenna Plug	2 50
04-744	Auto Antenna Panel Socket	1 50
04-747	Auto Socket Inline	2 50
04-748	Auto Socket W cable	2 50

TNC 800MHz COAXIAL



04-801	TNC Supa Crimp Plug	4 50
04-802	CS7-01 TNC for RG58 MILSP	8 00
04-803	CS7-14 TNC for RG58 MILSP	10 90
04-804	TNC-26 TNC Plug RG58 CRMP	5 90
04-806	TNC Panel Socket Single Hole	5 00
04-807	TNC Female In-line Socket	11 50
04-808	CS7-16 TNC In-line Socket	11 50
04-809	TNC Male/BNC Female Adaptor	9 50
04-810	TNC Male UHF Female Adaptor	10 50

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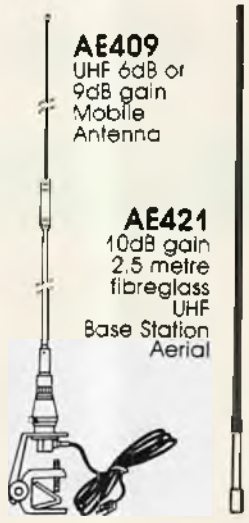


Greg Towells reports on. . .

UHF NEWS and HAPPENINGS

Welcome to the November/December edition of UHF News. Thanks to all who took the trouble to write and keep me and ultimately everyone, informed of what's happening UHF-wise. If you have any UHF article or news to report, please ensure it is at PO Box 358, Granville, NSW, 2142, no later than two weeks after the mag hits the news stands.

4/34 ON AND OFF

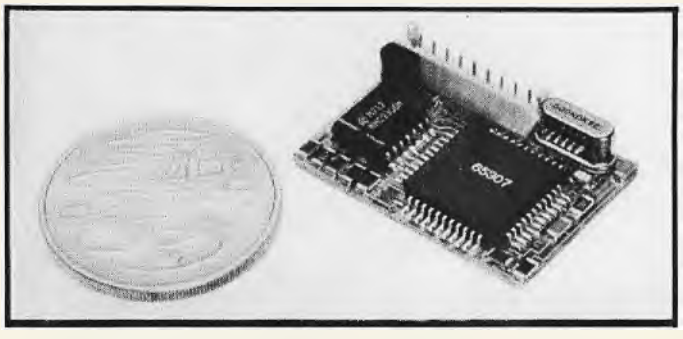
Last issue I commented on the on again/off again status of most of the Sydney region repeaters. I stand corrected as to the downtime reasons of the 4/34 repeater system. A friendly chat with John, the owner/operator of 4/34, revealed that 4/34 being on and off the air at that time had lots to do with TVI and harmonics, and little to do with the hordes of morons that seem to habitate on the system. It appears that a problem in the backend of the repeater (as opposed to a problem in the rear-end with the bucketmouths!) caused TVI to the owners of the site, as well as harmonics up and down the band. 4/34 was shut down for numerous tests (explaining the on/off nature over some weeks), and thanks to welcome and speedy advice from officers from DOTAC, enabled John to track down and correct the fault.

Since then, 4/34 has performed faultlessly, the only problem being a lack of a moron/bucketmouth/sound effects filter, and for the first few weeks of solid operation, poor old 4/34 sounded like a battleground for mudstations of varying degrees. Kind of makes you feel like throwing it in, John!! However since then things have quietened down and the system is going great.

But, since I have not received any response from the other repeater operators, I must assume the on/off on/off, or whatever else stuffs people around setups, must be built-in features of the respective repeaters. The reasons I omitted 1/31 last time is the mongrel short time-out and mile long tail makes it useless for anyone to use it properly. Again, anyone care to comment?

SELCALL FOR TX-475

The latest for owners of the mini-size Electrophone TX-475 handheld is the release of the micro-size 5 tone Sel Call module. Designated the SC475, the unit is compatible with all other 5 tone selcall systems and is a miracle in miniaturisation. The photo below compares the module to a 20 cent piece, but seeing is believing! Features include one button operation, beep acknowledgement and call alert tone which resets after 20 seconds. As the brochure says, "they said it couldn't be done, but the impossible has been achieved". Good one, GME-Electrophone!



Recent monitoring of the UHF Police band in Sydney has left me wondering many times whether it was the Police or UHF CB I was listening to. Tonight it was the latest Federal Budget relayed direct from 2MMM-FM, last night was farmyard sound effects night and last week sounded like a brawl was in progress on the actual police channel itself! Maybe we should be thankful we are on UHF CB, and not fighting to get a call across on the Police network.

KAMBALDA REPEATER

News from Kambalda, WA, of the local repeater, KAM-01 Operating on 1/31. The system has been in operation for 12 months, and is owned and maintained by the Goldfields UHF CB Repeater Group. The repeater consists of a Phillips FM 828, with two 4dB mobile antennas separated by 10 metres for isolation. Unfortunately, the writer has not mentioned the performance of the system, so I'm waiting for further reports on this. The Goldfields group has lodged an application for a similar system for Kalgoorlie, so best of luck for that.

Another new repeater, this time for the Inverell area of NSW. Indentifying with INV-02 and operating on 2/32, the repeater is situated at Inverell and is sponsored by Reg Stockman Communications. Reports of operations, which commenced in May 88, would be most welcome, both to me and to Reg Stockman Communications. Thanks for the info.

I received an interesting letter from a wandering UHFer, Allan, written 'on a beach' on the North West Cape of WA. Allan has spent a few months on the road picking my Repeater Listing to pieces and gleefully passed on the info. Thanks mate. By the way I'll excuse your writing style seeing it was scrawled without the benefit of a desk, with sun, surf and deserted beach around you. Anyhow, here are Allan's observations.

2/32 in the Ingham QLD does not seem to exist at all. However UHF CB is very strong in the area, with the local sugar mills making much use of the channels. Apparently, word around the area is that one of the sugar mills is considering sponsoring a repeater closer to where the mills are, on a location called Mt Facing, in the Habert Valley. I wonder whether that repeater will be closed to non-sugar mill traffic?

CHANGE AT ATHERTON

The Atherton repeater is operating on 8/38 and not 1/31 as previously reported. The owner of the system is said to be in the process of relocating the repeater to the ambulance tower adjacent to the township, and in the long term, to relocate again to the ranges west of Atherton for increased coverage. The 1/31 in the area appears to be allocated in the Innisfail area, south of Atherton. Allan reports a large coverage, but could not pinpoint the exact location. Can anyone help here?

UHF is very quiet in the NT, except for Darwin where the local repeater is definitely in operation and serves the community well.

An interesting system observed in Broome WA, on channels 22 and 24 and in Exmouth WA on 30 is the phone patch systems for the local taxis. The phone patch system appears to be legal and ring tones and the usual conversation can be heard. Similar to the systems operating on channel 12 in the western area somewhere in Sydney and accessible with a handheld DTMF unit. Could be rather expensive for the owners when all the locals here work out how to phone STD from the UHF in the car!

SUDDEN DEPARTURES

DOTAC seems to be on the move again here in Sydney and about high time too! I have heard many reports of the stations of many very vocal operators being visited, the absence of who, from the repeaters, generally pinpoints the reason for their sudden departure without further confirmation. The enforced departure of one pest generally ensures his (or her) close circle of annoying mudstations shuts up or go very quiet for a while. The result lately is clear, pest-free repeaters that are unusually quiet for long periods during the day.

What's needed now is a massive crackdown on these rabble who sit on a channel and claim it as their own. These types are the ones who sit silently on a channel for hours until you decide to take your conversation there and they blast you like a ton of wimps, with a ton of selcalls and other assorted calls to mobile 1001, until the unwanted stations vacate 'their' frequency. I've even heard of this type of operation on repeaters in some areas of Western Australia. It's absurd, illegal and it has to stop now. Go it it, DOTAC!! What do you think?

GETTING THE SWR RIGHT

Many and varied are the arguments about SWR readings and what they can do to your power output and/or rig finals.

This article is must reading for anyone who really doesn't understand SWR.

It's straightforward, only slightly technical and makes easy reading, but, it might save your rig an expensive trip down to the local technician after that tell-tale puff of smoke.

It's written by Lou Franklin who is the author of 'Understanding & Repairing CB Radios' and is published with his permission.

To absorb (and therefore radiate) the maximum RF energy, the antenna must present a load into which maximum RF current flows for a given transmitter power. The higher the antenna current, the further the radiation. Maximum current flows when the driving source impedance (the transmitter) equals the load impedance (the antenna). Under these conditions there are no standing waves on the transmission line.

The antenna is the only link in the signal chain that's not necessarily a 50 ohm impedance; the transmitter output and coax cable are designed to be 50 ohms. Hence the basic object of SWR matching: tuning out the reactance so the transmitter and coax cable 'see' the correct 50 ohm impedance at the antenna itself. If the antenna impedance varies from this, standing waves form on the coax and reduce power coupling efficiency.

SWR Defined

The 'Standing Wave Ratio' or 'SWR' is the degree to which standing waves exist on a transmission line. The smaller this ratio, the closer the impedances match and the more efficient the power transfer. A perfect match would be 1:1, while the worst match would be infinitely high. A transmission line with no standing waves (i.e. 1:1 SWR) is said to be 'flat'. SWR is measured by an SWR meter or Reflectometer, or by a directional RF wattmeter.

A lot of time, energy, and money is wasted chasing the 'perfect match', which isn't even necessary. Such a match is generally only important beyond VHF, because transmission line with losses increase the frequency.

SWR is defined more precisely as the maximum antenna voltage to the minimum voltage (VSWR), or maximum current to minimum current (ISWR). Since impedance is equal to E ÷ I, SWR can also be defined as the ratio of maximum impedance to minimum impedance. The larger value is always divided by the smaller so the ratio will be a number greater than 1. For example, a 75 ohm antenna connected to a 50 ohm coax line and transmitter has an SWR of 75 ÷ 50 = 1.5:1.

In practice VSWR is used, since it's easy to measure by simple diode rectification of RF driving a DC voltmeter. When two diodes of opposite polarities are bridged across a transmission line, both the forward and the reflected RF voltages can be measured and compared to indicate SWR directly on the meter.

Since high SWR results in high reflected RF voltages around the Final amp circuit, the S/RF meter will also read abnormally high or low, either pegging hard at full scale or barely moving from the low end. The specific needle direction depends on the relative phases of the forward and reflected voltages when they combine at the S/RF metering circuit. If in phase, the reflected voltage adds to the normal RF voltages to make the meter read higher than normal. If out of phase, the voltages will subtract and the meter reads lower. Most S/RF meters read higher with high SWR, and this is often the first symptom of an antenna problem.

Power Loss Percentage

The heart of the SWR argument concerns the power loss in a mismatch. Most operators wrongly believe that anything worse than 1:1 is something to worry about, when nothing could be further from the truth. Let's prove it!

The ratio of voltage (or current) reaching the antenna to that reflected back down the coax is called the 'coefficient of reflection' or 'k.' This is calculated by,

$$k = \frac{SWR - 1}{SWR + 1}$$

Using the earlier example of a 75 ohm antenna with a 50 ohm transmitter, the k factor is (1.5 - 1) ÷ (1.5 + 1) = 0.2. Since power is proportional to I^2 or V^2, this means the reflected power is k^2, in this case 0.2 x 0.2 = 0.04. So only 4% of the power is reflected, which means 96% is delivered to the antenna! An SWR of 1.5:1 is therefore not even significant. Most SWR meters display the reflected power percentages, and that's why an SWR of 1.5:1 corresponds to 4% reflected power, 2:1 to 11%, 3:1 to 25%, 4:1 to 36%, and so on. Furthermore SWR meters are notoriously inaccurate, especially at the ends. (All DC voltmeters are most accurate in the center of the scale.) So low SWR readings aren't necessarily correct anyway.

SWR Effects On Transmitter Output

The biggest concern with high SWR is the potential destruction of the RF power transistors. This usually results from an antenna that's shorted or open. In either case SWR is theoretically infinite. The RF Driver sometimes blows along with the Final, since part of the impedance mismatch is reflected back to it. In valve rigs SWR mismatches are better tolerated, since valves are more rugged.

FIGURE 1
SWR ALONG A 1/2-WAVE TRANSMISSION LINE

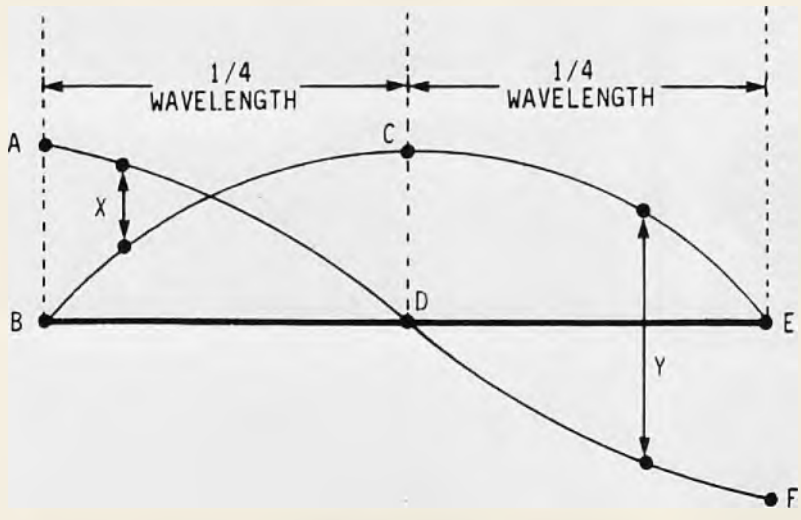
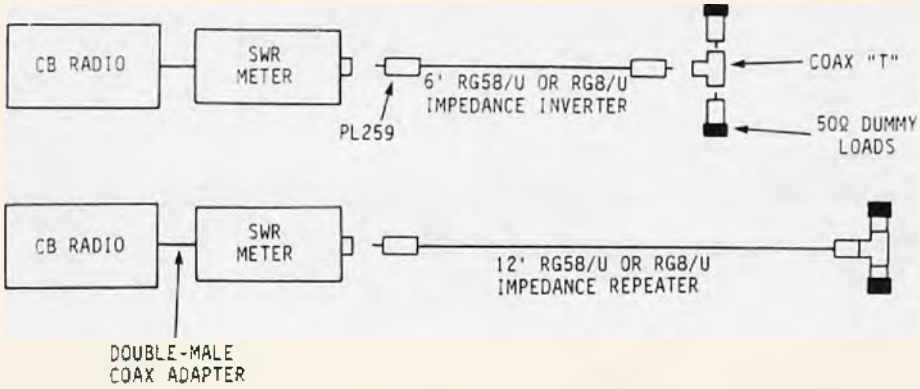


FIGURE 2
TESTING COAX LENGTH VS. SWR MEASUREMENT IN A REACTIVE LOAD



With a short, the full RF current flows through the Final transistor, since there's no load to absorb the power. With opens, the reflected RF voltage may be high enough when combined with the DC supply to exceed the maximum safe Vceo breakdown rating, typically about 18-25 VDC for most common Japanese and Motorola RF power transistors. Remember, high antenna impedance develops high RF voltage, while low impedance develops a high RF current. The high reflected voltage can also cause an RF feedback squeal, especially when combined with a linear amp!

To emphasize the effects of high RF voltage, I remember when I worked at KPOL in Los Angeles, which was 50,000 watts, AM directional. The towers had base impedances of about 600 ohms. Touching a tower ball insulator with the wood handle of a shovel would shoot a flaming arc about 2 feet! The RF voltage was tremendous. In that particular case, it didn't mean the SWR was high.

The towers happened to be fed at voltage loops with suitable matching networks, since that was the station's FCC-approved antenna system. And AM broadcast transmitters run on tubes, which are high-impedance devices. With CBs using transistors, the antenna must present, a low-impedance load to minimise RF voltages. This implies current feed instead.

Most Finals blow due to the SWR extremes caused by an outright open or short, and rarely from conditions in between. For example, the MRF477 Final in the Uniden Jackson is rated at a 30:1 maximum SWR tolerance! When you replace a bad Final, **always** suspect the antenna; check it or the new transistor may burn out too.

Coax Length vs. SWR

Undoubtedly the biggest CB argument!

The ONLY way to correct high SWR is to change the coax impedance to match the antenna impedance, or change the antenna impedance to match the coax impedance. **Changing the length of the coax has absolutely no effect on SWR!** Changing the coax impedance isn't practical, since that would no longer match the 50 ohm output of the transmitter. Therefore **only the antena impedance** can be changed to affect the SWR in CB installations.

This can be easily proven. Figure One represents a 1/2-wavelegth of mismatched coax.

Standing waves of voltage and current now appear on the cable. At the two ends current is minimum and voltage maximum, so both ends (A-B and E-F) have the same impedance. Since the pattern repeats itself regularly every 1/2-wavelength, this coax length is an 'impedance repeater'; the SWR measured at one end will be the same at the other end.

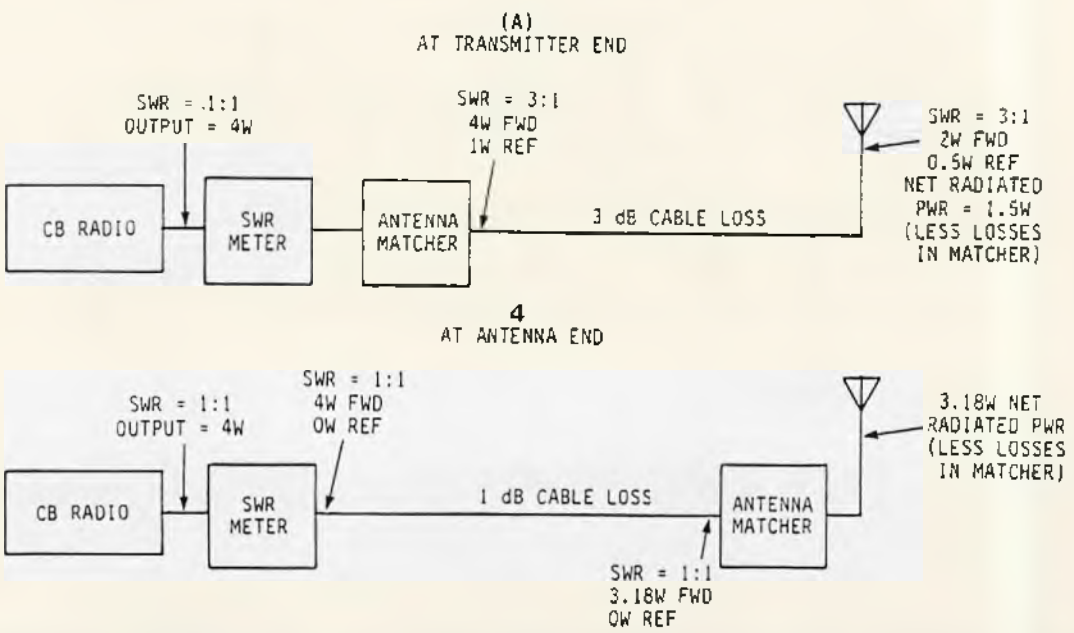
At the centre (C-D), current is maximum and voltage minimum, making the impedance different than at the ends. Compare the centre to the ends, which are a 1/4-wavelength away. The voltage/current relationships are inverted; if voltage is decreasing towards the centre it's increasing towards either end, and vice-versa for the current. A 1/4-wavelength is therefore an 'impedance inverter'; at this spacing centre and end impedances oppose each other instead of being the same.

(continued over)

COAX TYPE & DIELECTRIC*	IMPEDANCE	VEL.%	ATTENUATION PER 100 FT. AT 27 MHz	POWER RATING AT 27 MHz (SWR = 1.0)
RG58/U PE	53.5 ohms	66	2.5 dB	550 watts
RG58/U CPE	50 ohms	79	2.2 dB	550 watts
RG59/U PE	73 ohms	66	2.1 dB	720 watts
RG59/U CPE	75 ohms	79	1.6 dB	720 watts
RG8A/U PE	52 ohms	66	1.2 dB	1720 watts
RG8/U CPE	50 ohms	80	0.9 dB	1720 watts
RG213/U PE	50 ohms	66	1.2 dB	1720 watts
RG8/X CPE	52 ohms	78	1.2 dB	- - - - -

*PE = Polyethylene, CPE = Cellular Polyethylene ("FOAM")

FIGURE 3
EFFECT OF ANTENNA "MATCHER" & COAX LOSS ON RADIATED POWER



GETTING THE SWR RIGHT (continued)

An SWR meter at the centre and either end would measure totally different values because of these different impedances. In fact measuring at many places along the coax (like points 'X' and 'Y') would give many unique readings. If standing waves weren't there in the first place (which they wouldn't be if the antenna had an impedance of 50 ohms), all measurements would be the same. That's where they got the term 'flat' line. Coax length changes the **apparent** SWR when standing waves are present, but not the fact that the antenna is what's causing them!

The cure for suspicious SWR readings is to measure at the antenna itself where practical. Base antennas use standard coax sockets but mobiles don't, so this isn't always possible. Use a 1/2-wavelength of coax or its multiple (2/2, 3/2, 4/2, 5/2, etc.) instead. Such a length repeats whatever impedance actually exists at the antenna, while a 1/4-wavelength feedline inverts it.

COAX CHARACTERISTICS

The coax length important for SWR measurements is the electrical length, not the physical length. The electrical length will always be shorter than the free space length, since electricity slows down in any material having resistance. This 'Velocity Factor' shortens the physical coax length and must be considered.

The Velocity Factory is the degree to which the signal slows down when compared to air, and is determined by the type and thickness of the conductors and the dielectric material. These same characteristics also affect signal loss and the coax impedance itself. The chart lists the most important characteristics of CB coax. (Incidentally, the "RG" cable prefix is an old military term meaning "Radio Grade.")

The chart shows the Velocity Factor as a percentage of the free space wavelength. Note it's slower in standard polyethylene dielectric (PE) cables than foam dielectric cables. This seems reasonable, because foam cable also has less initial signal loss due to its lower resistance; RF can travel further through foam cable in the same time period. Also note the heavier the cable, the more power it can handle due to larger physical conductors. Power ratings and attenuation depend on frequency, always getting worse with increasing frequency.

Assuming a Velocity Factor of 0.66 for standard cables, this means the electrical length of the cable must be 66% of the computed free space wavelength. So the 1/2-wavelength formula for standard coax is,

1/2-wavelength (in feet) = 468 x 0.66
freq. (MHz)

Therefore a 1/2-wavelength of coax at 27 MHz is about 11.44'. A 1/4-wavelength is about 5.72'. In practice 12' and 6' are close enough. For accurate SWR readings in a base antenna, use a multiple of 12'. (Assuming standard coax; for foam types, calculate using the higher Velocity Factor.) Prepackaged mobile antennas often come with 17' of RG58/U coax to reach from the boot to the dashboard. This amount is almost 3/4-wavelength, which means it's a potential impedance inverter and may give false readings if the SWR is already high. (An odd multiple of a 1/4-wavelength is the same electrically as one 1/4-wavelength.)

To prove this fact to yourself make the test cable set-up shown in Figure two. By paralleling two 50 ohm dummy loads with a 'T' connector, you've made a 25 ohm non-reactive impedance. The SWR meter when placed as shown should read 50 ÷ 25 = 2.1 SWR. You'll find that it does read this with 12' (1/2-wavelength) of coax, but reads something quite different with the 6' (1/4-wavelength) cable!

This should end the argument . . .

Effect of Antenna Tuners & Other Accessories

Antenna Tuners are in-line devices which help reduce SWR by cancelling antenna reactance.

It's important to understand how these work, how to use them, and what to realistically expect from them. In Figure three, such a tuner is shown installed at the radio end of a 3:1 SWR (ie., 25% loss) mismatched antenna. When adjusted to 50 ohms, the tuner allows the full 4 watts of RF power to be coupled to the **coax.**

The problem is that the antenna is not resonant and therefore the 3:1 SWR still exists at the antenna end of the coax! All you've done is fooled the transmitter into thinking it sees the correct load. The losses are stil there. And as shown, only 1.5 watts is actually available to be radiated.

Maximum power can't be coupled from the far end of the cable into a

(continued over)

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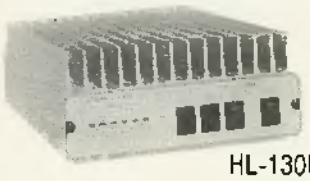

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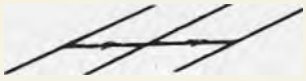

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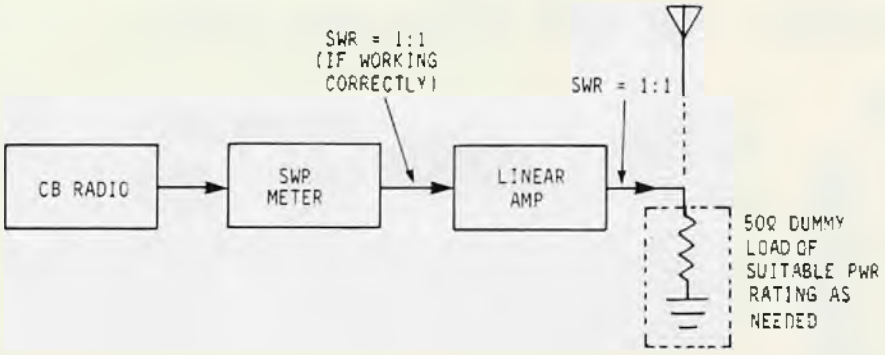
FIGURE 5
TESTING INPUT/OUTPUT IMPEDANCES OF LINEAR AMPLIFIER



GETTING THE SWR RIGHT (continued)

mismatched antenna. **Nothing you can do at the transmitter end of the coax has the slightest effect on antenna SWR.** The correct tuner location would be as shown in Figure four, at the antenna itself.

The tuner then becomes part of the antenna and reflects the correct impedance all the way back to the transmitter. Except for the coax loss and a tiny insertion loss from the matcher, most of the original 4 watts is radiated.

This brings up another important point: the correct placement of an SWR meter is always **before** any other in-line accessories like a tuner, low-pass filter, coax switch, frequency counter, or linear amp. It then shows the combined effect on impedance from such accessories being added in series. (Assuming the antenna itself was correctly matched.)

Many RF Finals blow by using linear amps with high input SWR. The input SWR can be affected by a mismatched antenna **or** the wrong amount of RF drive power from the radio. Figure five shows how to check this. Connect the linear's output to a suitable dummy load, and the SWR meter between its input and the transmitter output. Make sure the CB output is exactly 4 watts. If the amp is good, the SWR should be close to 1:1. If not, the amplified reflected power will eventually fry the Final transistor and/or the linear transistors. When the dummy load is replaced by a properly matched antenna there should be no change in the reading, which means the amp hasn't added any significant mismatch. Ditto for any other in-line accessories.

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NEW ZEALAND FREQUENCY LIST

As announced in our last issue, New Zealand has finally joined the rest of the world with a full 40 channel, AM/SSB CB service.

Unfortunately for NZ CBers the service continues on 26MHz rather than on 27MHz which means that life will continue to be somewhat difficult.

The new 40 channels utilise identical spacing to those used in Australia.

The prime reason for NZ continuing with 26MHz is that its TV channel 2 sits on 54MHz which, being twice the frequency of our 27MHz, means that a 27MHz NZ service would incur nation wide TVI — what a horrible thought!

Below is the full channel allocation of the new service.

NEW ZEALAND CB CHANNELS (as of 1/7/88)

Ch	Frequency (MHz)	Use
1	26.330	AM only
2	26.340	AM only
3	26.350	AM only
4	26.370	AM only
5	26.380	AM only
6	26.390	AM only
7	26.400	AM only
8	26.420	AM only
9	26.430	AM only
10	26.440	AM only
11 (ex ch.2)	26.450	AM only
12	26.470	AM only
13	26.480	AM only
14	26.490	AM only
15 (ex ch.4)	26.500	Call/emergency (AM only)
16	26.520	Call/emergency (AM only)
17	26.530	Call/emergency (AM only)
18	26.540	Call/emergency (AM only)
19 (ex ch.6)	26.550	Call/emergency (AM only)
20	26.570	Call/emergency (AM only)
21	26.580	Call/emergency (AM only)
22	26.590	Call/emergency (AM only)
23	26.620	Call/emergency (AM only)
24 (ex ch.8)	26.600	Call/emergency (AM only)
25	26.610	SSB only
26	26.630	SSB only
27	26.640	SSB only
28 (ex ch.10)	26.650	SSB only
29	26.660	SSB only
30	26.670	SSB only
31	26.680	SSB only
32	26.690	SSB only
33 (ex ch.12)	26.700	SSB only
34	26.710	SSB only
35	26.720	SSB only
36	26.730	SSB only
37	26.740	SSB only
38 (ex ch.14)	26.750	SSB only
39	26.760	SSB only
40	26.770	SSB only

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Rod Fewster with the

QUEENSLAND SCENE

BAD LUCK COMES IN THREES

This is the shortest Queensland Scene ever, due to circumstances beyond my control.

They say "Bad luck comes in threes", or something similar.

Well, I've had my "three" for this year.

First I came down with diabetes.

Next, my house got flooded.

Last, but not least, I set fire to the bloody place. My wife and kids were out, and I decided to surprise them by cooking lunch. Instead I surprised them by trying to burn the house down while they were away.

With only a couple of days left until deadline I discovered that my computers had all died from smoke inhalation, so this column is being scribbled on the back of an old cigarette packet.

EL-CHEAPO RIGS

Following my bit on el-cheapo rigs and the interference to the spectrum caused by same, I received an unofficial call from one of DoTaC's technical bigwigs who told me that if he has anything to do with it the importers of this crap may be in for a rude shock once the "Ministerial Standard under the Radiocommunications Act 1983 for 27 MHz Citizens Band Radio Service Equipment, Number 312" comes into effect.

Under sub-section 15(2) of the Radiocommunications Act 1983, it is an offence to submit an unrepresentative device in support of an application for a compliance statement certificate. In other words, a CB transceiver submitted for type-approval must be IDENTICAL with the transceivers which are later imported and sold to the public.

This RI told me he felt that some CB rigs submitted for type-approval may have been specially-selected examples . . . decidely unrepresentative of subsequent production models . . . as some of the rigs which originally passed compliance requirements with flying colors are now the worst offenders in the out-of-specification stakes.

He said he intends to start random testing of CB transceivers already on the market to establish whether or not there has been any shonking of compliance requirements. (Hope his Queensland counterparts start doing this. There's a ton of junk in use around Brisbane). He added that, judging by some of the rigs he'd exmained in the course of investigating interference complaints, it would probably be more a case of "how much" shonking than "if any".

At time of writing, Ministerial Standard 312 is still sitting on the back burner due to a clerical oversight, but by the time you read this column it should be in full effect.

Ministerial Standard 312 gives DoTaC the power to bite importers of cheap-and-nasty rigs, especially any who can be shown to have deliberately submitted a specially-prepared super-clean one-off special for type-approval, a bloody sight harder than ever before.

Let's hope this new set of dentures doesn't go to waste!!

REPEATERS ARE BREEDING LIKE RABBITS

UHF-CB repeaters are breeding like rabbits in the near-Brisbane area.

Latest on the scene is 4/34, sited about 400 metres above sea-level near Rosewood, giving pretty good coverage of Toowoomba, Esk, the western parts of Brisbane, and the whole Ipswich area. It's run by the Ipswich Repeater Organization . . . a group formed specifically to set up and maintain this repeater. If you want to have a chat with the organizers, join the users' net at 7.30pm Sunday evenings.

A couple more relative newcomers have leaped into life on 8/38 . . . one on Mount Brisbane and the other near Dayboro at Ocean View. (Ocean View was the home of a million or so DX contacts back in the old pirate days. Portable beams used to spring up like mushrooms in secret clearings every weekend.)

Many UHF-CB repeaters are run on shoestring budgets by groups of users (like the Ipswich Repeater Organization) who have banded together to try to get better communications in a particular area, and small donations towards their upkeep are usually gratefully received. If you're using a repeater regularly and would like to help out, just ask around on-air. No doubt someone will tell you how to go about it.

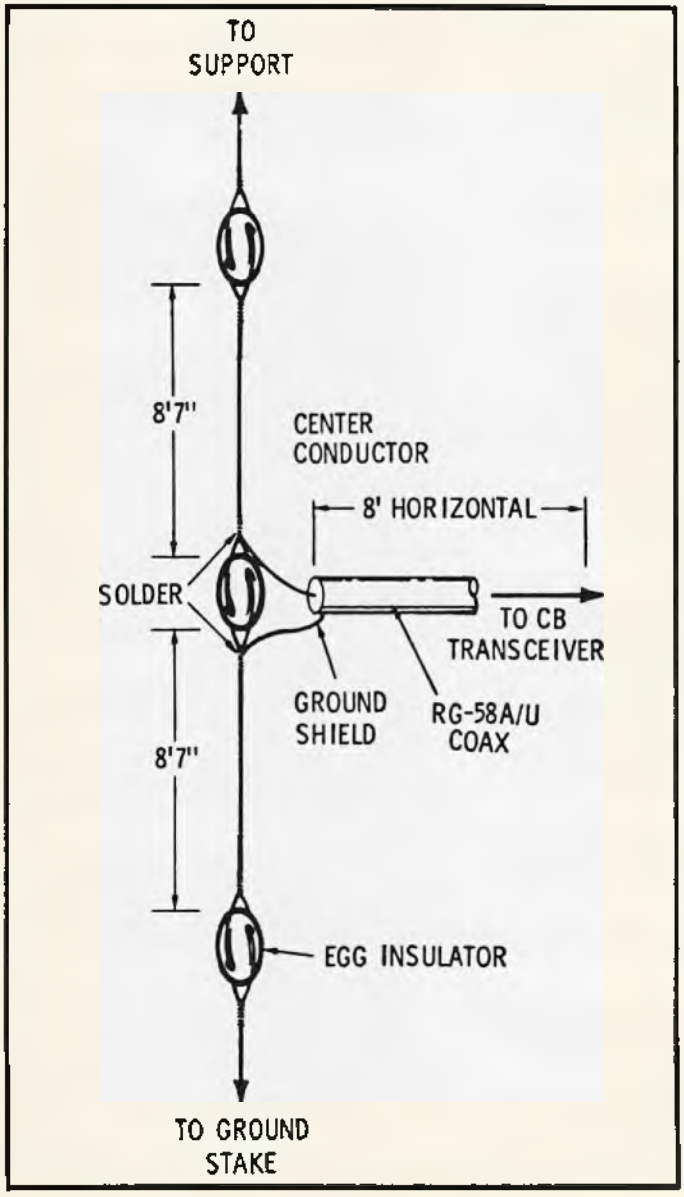
A quick D-I-Y Project

MAKE YOUR OWN VERTICAL ANTENNA

In the July/August issue we really managed to confuse just about everyone with a 'tech tips' temporary 27MHz antenna in which we managed to get most of it wrong.
(Not my fault — it was the previous Editor — current Editor).

As a consolation prize try this one — it's a bit different as, although it's a standard dipole antenna, it is also a vertically polarised one-element beam.

Because there are no reflectors or directors, RF radiation is omnidirectional and owing to the dipole's better radiation angle you should notice a definite improvement over the performance of a ground plane antenna.



The ground plane radiates most of its energy into the sky at an angle determined by the configuration of the radials whereas the dipole's radiation angle is very close to horizontal — yes, we do mean horizontal radiation angle even though the energy is vertically polarised.

All you need for construction are two eight feet seven inch lengths of No.10 or 12 solid copper wire, three egg type insulators and some RG-58/U coaxial cable.

You simply tie the top section to a tree or whatever other support is available and anchor the bottom section to a ground stake. Solder the top copper wire section to the centre wire of the coax and the lower section to the shield section of the coax — but, most important, you must run the first eight to nine feet of the coax at right angles (horizontal) to the antenna as the coax is actually part of the antenna.

Also keep the connections between coax and antenna sections as short as possible and seal them with Silicone or similar to keep them waterproof.

You should also attempt to make the coax sections a multiple of a quarter wavelength — i.e. 9 ft, 18ft, 27 ft, etc. — for best results.

Worth noting is the fact that dipole antennas have a characteristic feed impedence of 73 ohms whereas your CB rig will be looking for a 50 ohm impedence so you might need to use an antenna tuner to obtain the best results with RG-58/U coax.

Naturally enough, you can also use the dipole horizontally to obtain horizontal polarisation, but, you should try it vertically first time out and compare the reports with those obtained off a vertical ground plane.

You can try this dipole using multi-strand, covered wire too and a little experimentation with the section lengths will enable you to make it resonant on a specific frequency with only a slight fall-off to either side of that specific channel.

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'BACK TO YOU...'

Letters from readers are welcomed. They should be type-written and present an interesting viewpoint.

OVERSEAS DX?

Dear Sir,

Congratulations on your last issue — and particularly on the introduction of the propagation charts and the DX reports.

I'm a long time 'legal' DXer — that is, I use completely legal equipment and operate only on the legal channels, however, I would like to know the real situation in respect of working overseas' DX.

My mates tell me that if I work an overseas station, even New Zealand, it is possible that DoTaC might seize all my equipment and prosecute me for operating illegally.

I find this pretty difficult to believe so can you please advise me of the situation?

J. Nelson
Parramatta

Well, we hate to say it but your mates are quite correct — you are not allowed to speak to stations outside Australia.

The regulation contained in DOC14, Part 2, Para 7 states, "CB stations are only authorised to communicate with one another within Australia using voice communications".

That's pretty straightforward and does not allow any room for misunderstanding.

So the legal situation is obvious — if you are caught by DoTaC working an overseas station it is possible that they will take action against you.

Let's, however, look at a more realistic scenario.

DoTaC has plenty of things to keep them busy — from foul-mouths to brain-dead and from linears to TVI — candidly, we believe that they are totally disinterested in an operator, working within the legal channels and using legal equipment who happens to work an overseas' station.

Having said that, however, the fact of the matter is that ***it is illegal and the risk is always there that you can be prosecuted.***

Editor

MORE TVI PROBLEMS

Dear Sir,

I have had complaints from neighbours that I am causing TVI.

My rig is totally standard and I don't use a power microphone or a linear or in fact anything else that might cause this sort of problem.

The problem has only occurred recently although I've been on air for five months without any complaints.

The people who moaned about it said that they haven't had any TVI before so something must have gone wrong with the rig, but, I don't know what.

They have also said that they would report me if I cause any more TVI so I'm not game to go back on air until I've found out what the problem is.

Can you make any suggestions?

Dick Weston
Carlton
Victoria

As you have been on air for some time without causing any problems it seems that the most likely cause of your trouble has something to do with the antenna — but you don't say what type you are using.

You also do not say whether you are using an in-line SWR meter so the best we can do is to have an educated guess.

If you do not use an in-line SWR meter we suggest that you get one and check whether the reading is high.

If it is then the fault is either with your antenna or the coax cable.

If you can easily get to the attachment point of your antenna, take an SWR reading and if it is still high then the problem is with the antenna.

If, however, the reading shows an acceptable SWR reading at this point then the problem is with the coax cable.

If the SWR reading is acceptable anyway, then the problem is most likely in the rig, but, this is the less likely area as you would almost certainly have received comments that your audio was bad if this was the case.

If everything still appears OK, you should maybe fit an in-line filter to your rig and maybe also one to the TV set of your neighbours.

If none of the above works, you would be wise to take your rig down to the local CB shop and have them check it out.

It might cost a few dollars but at least you won't have any further hassles.

Editor

SHORT WAVE RADIO

Dear Sir,

I read in your last issue an article about short wave listening and found it very interesting, however, I do not have large amounts of cash to splash out on purchasing a communications receiver.

Do you at some future time intend to publish an article on what is available and what level of cost is necessary to enable me to hear the majority of short wave stations?

Possibly you could do something on older receivers which are now available secondhand — again, what their price is and how good they are.

As an alternative, is there anything now on the market at less than $500 which can be used for short wave listening?

Also, can you tell me what a QSL means.

I know what a QSO is but I am not a CBer and haven't got the vaguest idea of what QSL is or does.

R. Trenton
Glenelg
South Australia

Yes, we hope to run an article on what's available for SWL in the near future, however, it does take a degree of research and is probably at least a couple of issues away.

Elsewhere in this issue is a review of the Sony SW1 which, while a bit above your $500, is an excellent unit for its price of around $800. Mind you, you can certainly pick up an older receiver for far less than that and it will prove adequate to your requirements.

Another good starter's rig is the Sangean ATS-803 which we reviewed in the July/August issue of this year and no, sorry we sold out and only have a couple of file copies, but, at a price of something between $350 — $400 it does a good job.

To answer your query about QSL.

A QSL is part of the amateur radio operators' Q Code.

The Q Code was originally devised as a shorthand method of sending specific messages when using cw (morse code).

It means "can you acknowledge receipt" and "I acknowledge receipt" but today it takes on the broader meaning of being a QSL card — a card which is exchanged by stations to verify contact between them.

If a station asks, "will you QSL?" he is requesting the station that he is talking to to send him a QSL card which will contain the information about the contact — and he will also send his own QSL card to the other station.

Editor

SYDNEY SCENE

by Steve Griffin

Just to get the ball rolling it seems quite a few people are upset with what I said about UHF handhelds in the last issue. A few letters expressed views like 'How ridiculous', 'How do you get the nerve to say . . .' and 'You're wrong, there is no way!' Mind you, the last comments came from a doctor. All I will say at this point is BE WARNED.

The second thing is a little mention to all the Johnson Viking owners out there, in particular John from Manly. If you want your radios fixed, drop me a line. I happen to know somebody who is NOT afraid of fixing them. For that matter, all types of CB radios can be repaired, so why are there so many dealers that are scared of a radio more than seven years old? Okay, admittedly replacement panels and knobs are hard to get, but the internals are not really a problem.

The subject of UHF repeaters came up recently when I decided to sneak up on a few CBers at Mt Canobolas (south-west of Orange). It seems somebody has been operating a pirate repeater, in the 2/32 slot, with a great response from the users. Apparently the repeater 'gets around' and has had strong readings from Canterbury, Revesby, Chatswood and the Blue Mountains.

Although I'm not sure who owns and operates the repeater, I'll bet it's up and about more than the original 2/32. Also the question of a mobile repeater in Sydney was raised and good and bad points discussed.

Everyone agreed that it would be a great promo at Sydney's field days and other similar events that are hosted by the various clubs.

30 WATT MODULES

Other hot little items are the 30-watt modules that are now availale for a few mobile UHF sets. Radios like the Electrophone TX 470s, Sawtron 880 and 990, even the Philips 300 series, accept these new modules and the price — around a cool $100 — sounds good. I'm pretty sure that there would be a circuit design somewhere for an external amplifier too. Not for CB use of course!

Isn't it funny how UHF H/H battery packs are similar. One of the better known retailers recently was requested to find a battery to suit an imported unit and, after a little phoning around, was told to contact Icom. The reason . . . 'they are all the same aren't they'.

Rumor has it that Lithium battery packs are taking on the US market at the moment. These hot little packs are a third the size of a standard pack but can last up to four or five times longer and provide a more consistent power than your average battery. These little items will probably retail at four or five times the price too . . . so start saving.

FM, FM, FM . . . it's coming and it's good. The 27MHz issue is growing quickly and arousing interest in many parts of the country. It is rumored that even NZ may be interested . . . in a few years. The main manufacturers are gearing for the Australian market with great features in mind and word has it they will be ready to go at the drop of a hat. Surface mount components are going to be in and the quality and reliability will be of great importance.

The DOC is as confused as ever and is unable to comment about the suspected AM/FM/SSB configuration. Many people in the know suspect that while an AM radio still exists there will still be an AM mode allowed. The overall opinion appears to be that no more AM radios will be sold in Australia after 1990 and that only FM/SSB models will be.

Well, anything is possible, but my opinion is that there will be an AM/FM/SSB service with radios to suit. A perfect example is the Uniden series that was available in the UK a few years ago, radios like a Grant, Washington, etc. They were really the President series with names like McKinley, Adams and the like, and had multi-modes. The only real difference was the frequencies and maybe an extra LED or two. So I guess anything could happen. It's really hard to tell the way our trusty DOC thinks.

I must apologise for the poor coverage in the August-September issue on The Sydney Radio Field Day. Firstly, it wasn't really all my fault . . . see I did put it in writing you guys . . . the editor cut my last issue's effort to shreds due to space restrictions.

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Brisbane television station TV0 has installed a multi-million-dollar newsroom (the most up-to-date in Australia) inside the Queensland Pavilion on the Expo site.

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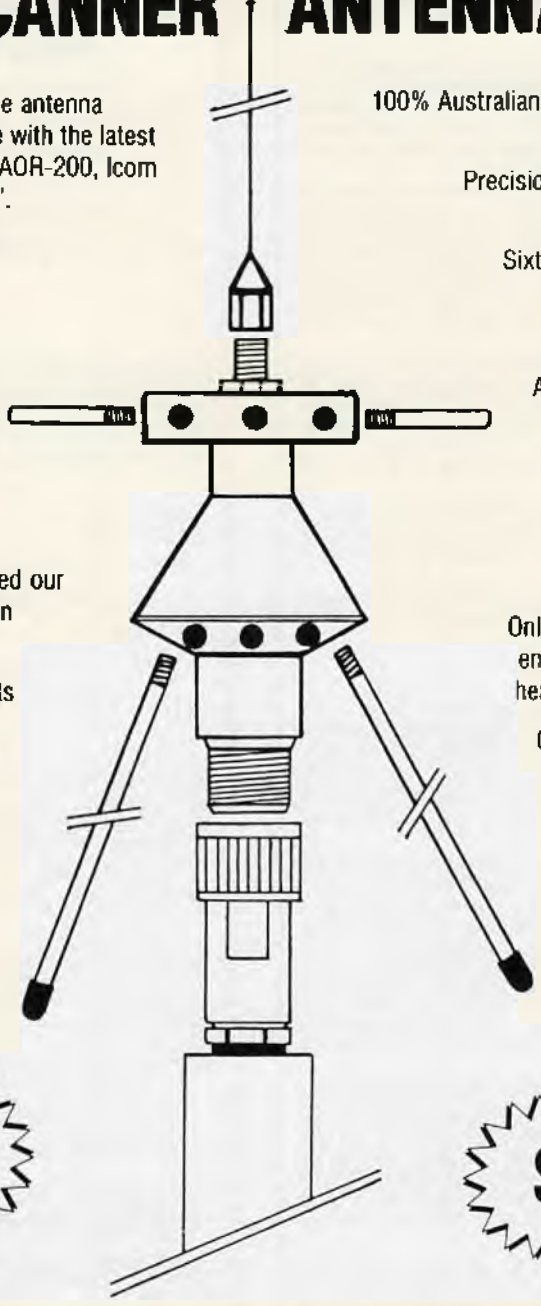

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TEST REPORT IN SEPTEMBER 1987 CB ACTION

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HERE'S HOW DX WORKS

Compiled by Jack, 67-W-07

The art of long distance radio communication represents many goals and challenges to radio enthusiasts around the world. One of the main challenges for the most serious radio DXer would be experimentation, whether it be experimenting with the numerous types of antennas available, or building your own, the end results help you to understand numerous antennas and their characteristics.

The results with antennas don't mean experimentation ends there. Some radio enthusiasts move onto feedlines, looking for coax with minimum power loss, making every watt count from transmitter to antenna; others experiment with various microphones even to the extent of modifying existing microphones for maximum performance.

All this experimentation leads to better results when the DX bands are open, and as the old saying goes: "If you cannot hear them, you cannot work them".

QSL CARD IS PROOF OF CONTACT

Without radio propagation many a radio shack would be void of QSL cards, those colorful bits of wall paper from interstate or from around the world that are shown off with pride when a visitor calls in for a chat and a cold one. After all, the QSL card is the main source of proof to establish that in fact the contact had been made. One of the main goals of any serious radio DXer is the pursuit of countries, working them and confirming them by way of QSL cards, and the best way of keeping track of this is by way of the DXCC countries' list, an important part of any radio shack.

This is where challenges and goals amalgamate to form the addictive habit called "DXing", many hours are spent at the radio searching for new countries, much to the family's discontent as they usually by now have written you off as a hermit or even as an eccentric as you sit listening and calling on the radio for hours on end.

Without radio propagation all of the above would not be possible, except for experimenting. This would still take place but not in the magnitude that it now does with the existence of radio propagation, but what is radio propagtion and how does it work?

Radio amateurs and other affiliated groups associated with radio have experimented and monitored the characteristics of radio propagation for many, many years now, even to the extent of predicting schedules for optimum results, but of course have not always been 100% successful in this field. Despite the rapid changes we have seen in the electronics world in the past decade, radio propagation still remains relatively unpredictable.

MOST IMPORTANT FACTOR IS THE SUN

The most important factor associated with radio propagation is the sun. Without the sun there would be no DX and also no life on this planet. The sun influences all radio communication beyond ground wave or line-of-sight communications. Most of us have no doubt heard of numerous "old wives' tales" that have been linked to DX openings on the band, a popular one of these is the association of clouds with DX.

It helps if you know what's happening. . . .

I have often heard people mention on the radio that the more cloud there is the better the DX and vice-versa, another is that the DX always comes in better after it rains. In actual reality these statements hold no water, none whatsoever, so are totally invalid as any radio enthusiast with basic knowledge of radio propagation will tell you.

THE IONOSPHERE AND THE LAYERS

As most of us are no doubt aware the earth is surrounded by a layer of protective gases. Without these gases our planet would be very vulnerable to excessive radiation from the sun, such as ultra-violet light. Also without these gases, meteors and other space junk would enter our atmosphere totally uninhibited and cause massive destruction upon impact.

Several layers of these gases which surround our earth, are useful in radio propagation and work in conjunction with the sun — these gases are called the ionosphere.

It is the ionosphere, which lies between 30 and 260 miles above the earth's surface, that reflects and refracts radio signals back to earth. Without it, the signals would simply pass into space, thus no DX. The gases that compose the ionosphere are largely made up of free ions and electrons and when charged by ultra-violet radiation from the sun affect the path of radio signals. This is called "ionization".

Each of the several layers of gases that make up the ionosphere are affected in various ways when ionization occurs as each layer has a central region of maximum density. This in turn dictates the distance that radio signals travel.

HF RADIO PROPAGATION

On HF radio, which encompasses the 3 to 30MHz bands, there are five important layers of the ionosphere which affect radio signals, these being named the following: "D Layer", "E Layer", "Es Layer", "F1 Layer" and "F2 Layer".

Of these layers the "D Layer" absorbs a certain percentage of radio signals that pass through it. The "D Layer" is the first layer that radio signals come into contact with and it acts like an RF Sponge absorbing parts of the radio signal. Actually it is the remaining four ionospheric layers that determine how far your radio signal will go.

History of the D Layer is still not well documented but we do know that it absorbs a certain amount and sometimes all of a radio signal, this depends on the position of the sun in relation to height above the earth at that time.

The D Layer is 45 to 55 miles above the earth's surface and is most active during the hours of daylight and mainly affects signals in the Low Wave and Medium Wave bands.

The next layer to describe is the "E Layer", which is 65 to 75 miles above the earth's surface. During a solar decline, when the bands above 15m (21MHz) have little or no DX conditions, the E Layer proves useful for returning signals back to earth.

The atmosphere at this level is still dense enough so that the ions and electrons set free by solar radiation have little distance to travel before they meet and amalgamate to form neutral

particles. The E Layer thus maintains its ability to refract (bend) radio signals back to earth but only in the hours of daylight. Ionization of the E Layer is at its best around midday and holds through to sundown when it then disappears.

The nomadic cousin of the E Layer is the SPORADIC E Layer, labelled as Es. The sporadic E layer is responsible for a great deal of the propagation of radio signals on 11m (27MHz) when solar activity is at a low. Sporadic E Layer contacts may last for hours or just a few minutes and the range of these contacts can be anything from 400 miles to 1300 miles or greater.

During the Southern Hemisphere winter the sporadic E Layer plays a confusing and erratic role in providing the bands above 15m (21MHz) with some interesting DX openings with some single hop communications. Single hop communications occur when the signal leaves the radio station and is refracted only once to return at a point up to some 1300 miles distant.

Sporadic E Layer also provides us with some excellent multi-hop communications thus expanding the distance that the signal travels. Multi-hop as the name suggests, provides a greater range as the signal bounces betwen the earth and the ionosphere a number of times. Capable of anything up to several hops, it dramatically increases the signal range up to and often in excess of 2600 miles. Sporadic E Layer propagation is very common on 11m (27MHz) and happens totally independant of the conditions associated with the F Layers.

Now we come to the final two layers of the ionosphere associated with radio propagation, the "F1 Layer" and "F2 Layer". These layers are in the range of 90 to 200 miles above the earth's surface and ionization occurs quite quickly after the sun rises and reaches a peak in electron density quite early in the afternoon.

The ionospheric layers F1 and F2 are in existence during the hours of daylight, after sunset F1 layer ceases to exist and amalgamates with F2 at night, leaving a broadened F2 layer. In actual fact the F1 layer is not an important medium for propagation, its refracting (bending) heights are between 90 and 120 miles and it is subject to peaks and declines in relation to the passage of the sun.

The F2 layer is an important medium supporting HF communications over the entire HF spectrum. The layer of F2 is relatively thin during the day, around 50 miles in fact, but broadens at night to around 95 miles, centered of course at its height of 200 miles above the earth's surface. The maximum range of a single hop radio contact from the F2 layer is around 2500 miles or greater.

PROPAGATION METHODS

Two of the most well known terms used in radio communication HF communications would have to be Sky Wave (also known as ionospheric waves) and ground waves (also known as tropospheric waves).

The majority of communications in the amateur bands below 30MHz is by way of sky wave, and judging by its technical name ie: ionospheric wave, we arrive at the conclusion that the radio waves emitted from the antenna travels from the earth's surface at an angle that would send it out into space if it was not indeed refracted by coming into contact with the ionosphere, thus returning the signal to earth at a point far from the original transmitter site.

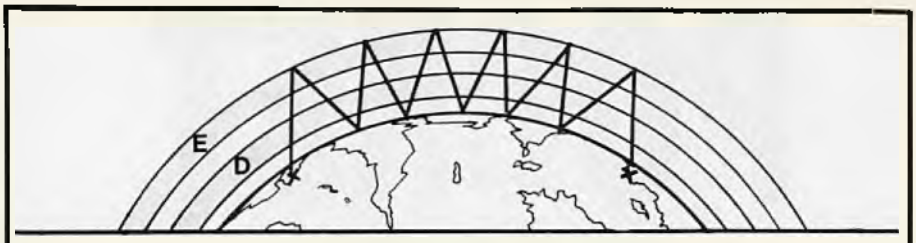
Ground waves are the portion of the radiation kept close to the earth's surface as a result of refraction in the lower atmosphere. This is more evident and noticeable on the higher section of the HF band such as 11m (27MHz). Basically the ground wave is the portion of the radiation directly affected by the surface of the earth. An interesting fact is that a ground wave is vertically polarized and its absorption increases with frequency.

CONCLUSION

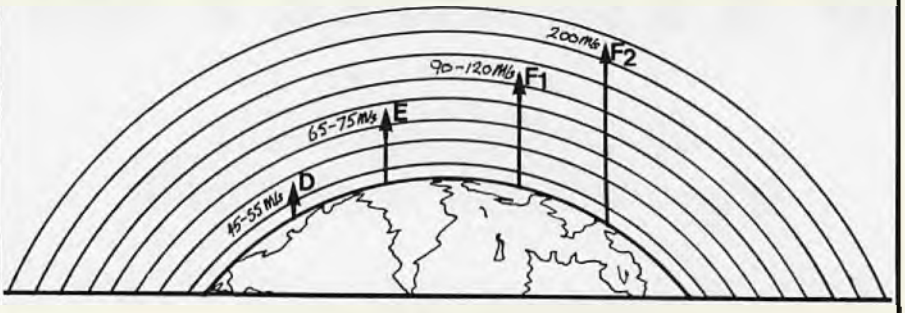
I hope that I have covered the subject sufficiently to give most readers a basic idea of what radio propagation is all about as it is an interesting and fascinating subject for those who have a passion and interest in DXing on the radio.

There are various publications that have detailed sections dealing with propagation, one such publication is the 'American Radio Relay League Handbook'. This book offers some interesting reading, not only on propagation but other technical aspects associated with amateur radio. On equal footing with the 'ARRL Handbook' is the 'Radio Society of Great Britain Handbook' — this too has a wealth of information on all aspects of radio, propagation and other technically-related subjects. Both are well worth the time to sit down and refer to and offer hours of informative reading. Just the thing when the bands are dead.

In a future edition of this publication I hope to deal with the subject of understanding Ionospheric Predictions, such as those offered by the Ionospheric Prediction Service (pre-recorded telephone service) and the daily Ionospheric Report and Prediction Update heard daily on Radio Australia with Mike Bird. To a lot of us the information given by these services means nothing but a jumble of figures, but with a basic knowledge of what the figures mean and what the terms associated with them imply, you too can achieve an understanding of current propagation conditions and set a pattern to understand the propagation events and happenings on the radio bands and what to expect as far as operating conditions are concerned. Good DXing and 73's from Jack.



The results of a 6 stage multi-hop via "E-Layer" shows how a signal traverses from one side of the globe to the other. Even though the "D-Layer" has depleted much of the signal at the receiving end signals are audible enough for a two-way contact to be made.



The ionospheric layers above the earth's surface: D-Layer/45-55 miles, E-Layer/65-75 miles, F1-Layer 90-120 miles, F2-Layer 200 miles.

POCKET DYNAMITE!

By Chris Edmondson, Editor, Amateur Radio Action

Sony has been catering to the shortwave listener market for years — almost since its inception. It sells a variety of quite competent receivers which perform well enough for the average SWL's tastes. Of course, as they're made by Sony, they usually come with all the bells and whistles. Things like automatic tuning, multi-zone clocks, liquid crystal display (lcd) readouts, and all sorts of other natty features as well, abound in the Sony lineup.

When **CB Action** first heard about Sony's latest shortwave creation, the little **ICF-SW1S**, we didn't know whether to take it seriously or not. The receiver's specifications looked as though they belonged to something a good deal bigger. Let's face it, we've grown up in a world which still fervently believes that bigger is better.

Despite its ridiculously small size, the 'baby' Sony offers AM tuning in 5 kHz steps from 150 kHz to 29.995 MHz, (which takes in the European long wave band — used here mainly for aeronautical and navigational beacons, the medium wave broadcast band, all shortwave bands, and the 11 metre CB band) as well as extended stereo FM coverage from 76 to 108 MHz (which should allow you to hear the normal broadcast FM stations, as well as quite a number of low-band VHF communications services, including taxis, police and ambulance in some areas, although in FM only (most commercial services there use AM).

Okay, apart from the extra FM coverage, there's nothing particularly unusual there. But a glance at the photos tells the real story. It's tiny — almost unbelievably small, tipping the scales at a puny 230 grams, or about half a pound — and that's **with** the batteries installed...

This little receiver performs easily as well as its big brothers, but does it from a package hardly bigger than the average 25 pack of cigarettes. It measures less than 12 by 7 by 2 cm. It would still be small if those measurements were in inches...

Incidentally, the receiver itself is called the ICF-SW1. But it comes in a solid carry case with a whole heap of accessories. Put the lot together, and it's called the ICF-SW1S — ICF-SW1 System. Just thought you'd like to know...

It's all done by wires...

Sony chose the ICF-SW1S to introduce surface-mount technology to the booming SWL marketplace. Surface-mount, quite simply, allows a manufacturer to put a good deal more into a circuit than early manufacturing processes allowed. Its main disadvantage, though, is that the home tinkerers haven't a chance to fix it when something goes wrong. Come to think of it, that may not be such a disadvantage after all!

The main point is that Sony has still managed to put all the features the budding SWL needs inside the tiny case.

All, that is, except a BFO for SSB, and minutely variable tuning, which is a great pity, because many of today's CBers use SSB almost exclusively. But listening in on AM shows it is a remarkably sensitive little device, and more than up to tuning everything from Radio Australia to Radio Zimbabwe.

Tuning through the international broadcast bands is deceptively simple, with strong, clear reception the order of the day. Those AM tuning steps of 5 kHz are pre-programmed into the chips which run the receiver. Near as we can make out, it's as close to **exactly** 5 kHz that it doesn't really matter. To cope with different systems in different parts of the world, the tuning steps in the medium wave broadcast band are user-selectable at either 9 or 10 kHz.

There is no provision for 'tweaking' in a shortwave signal, but in its intended market, the ICF-SW1S doesn't really need it. You're also spared the muddle of antenna tuning, as the antenna is automatically coupled for an optimum match to the receiver.

Tuning stations is achieved by direct keyboard entry, selecting a favorite memory, or by scanning across a chosen band until a strong signal momentarily stops the scan.

There is a total of 10 memories for your most commonly-used frequencies, and these are simply accessed by hitting one of the numbered keys. To directly go to a particular frequency you first hit either the AM or FM key, then the desired frequency, followed by the AM or FM key again.

And once you've got your station, a push of one more button will lock the keys to prevent accidental changes. From there it's into the crushed velour case, grab the stereo headphones, and go for a walk...

What can I hear?

Although the receiver offers manual continuous coverage from 150 kHz to 29.995 MHz, the scan mode does not cover the entire HF spectrum in one hit. Instead, scanning is broken into several pre-programmed 'broadcast' bands.

Scan bands start at 150 kHz, 530 or 531 kHz (depending on the MW broadcast 9/10 kHz step selector setting), then 2.25, 3.15, 3.85, 4.7, 5.9, 7.0, 9.4, 11.5, 13.5, 15.0, 17.45, 21.4 and 25.6 MHz. These frequencies represent the most widely accepted broadcast bands, and make SWLing an absolute game, with station after station stopping the scanning. The last 'band' covers the entire FM portion in one sitting, and starts at 76.0 MHz. You don't even have to change from the AM setting to the FM setting, as the ICF-SW1 does it for you.

The mode setting also automatically changes from AM to FM when moving up to the 76 to 108 MHz band. When a signal is detected in either mode scanning stops momentarily before resuming within two seconds from the same frequency. When the end of each band is reached the internal processor 'wraps around', taking you back to the starting point for a repeat performance.

While the scan speed is not user-adjustable, it's quick enough to cover any of the bands in seconds if nothing is received, and the speaker remains muted until scanning stops (or is manually halted by the user).

The up/down frequency key also doubles as the band up/down key when the dual-function band/alarm

button is also held down.

Sony has somehow managed to cram a clock in with the receiver. It even has alarm and sleep functions, and can be set to switch the receiver on to your favorite station at preselected times each day.

It's a surprisingly sensitive little unit, and employs the familiar double conversion superheterodyne system to produce quite startling results. On test, it acquitted itself very well against some pretty stiff receiver competition, and actually won out in a number of areas from a couple of other portable receivers we lined up against it.

Audio quality, though, was understandably 'tinny' when compared to its big-speaker opposition, but that was quickly solved by hooking it into a HiFi system using the 'line out' jack — and that's one feature none of the opposition could offer...

Long distance travellers will really love this receiver. A great way to listen to Radio Australia when you're otherwise out of touch — without breaking the bank over the excess baggage rates.

There's the usual ferrite rod antenna somehow squeezed inside which is used for the medium wave band, and a cute little nine section telescopic whip around 50 cm long which pulls out of the left-hand end of the case.

But when that's not enough, Sony supplies the ICF-SW1 system with yet another antenna for those real DX efforts. Inside the very sturdy carry case is a wide frequency range 'active' antenna, with a whip about 115 cm long. The active antenna is an amplified unit which presents a far stronger signal to a receiver's input stage. The main benefit, of course, is that you can have the benefit of a major outdoor installation — without the tangle of wires.

Almost 375 cm of a very fine coaxial cable reels neatly into the antenna base (which also holds a four AA battery power supply for the amplifier). This antenna works surprisingly well, and provides a marked improvement over the internal whip.

In fact, when using the active antenna the receiver can tend to get a bit swamped by really strong signals close to one another, so there's also a switchable 20 dB attenuator, a device which actually cuts the incoming signal back to something a bit more manageable. This is built into the neat control unit for the external amplifier, which connects neatly to the left hand end of the receiver. Another switch is used to select between low and medium wave bands, and the shortwave band, while the third switch applies the amplifier's power.

There's no question the active antenna makes an amazing difference to the receiver. Switch across to the internal whip and many of the weaker signals are prone to vanish without a trace. But that's only to be expected from such a short whip. After all, when

it's all said and done, any antenna needs a reasonable 'catchment area' to work efficiently. Otherwise, it's like trying to fill a major water reservoir with a bucket! The internal ferrite aerial works well simply because it has a long piece of fine wire wrapped around it to form a tuned coil.

To cap the antenna side of things off, Sony also offers a couple of optional external antennas. The first, using a conventional longwire arrangement, is designated the AN-60, and — looking hard at the brochures — seems to be more an antenna system made up from a number of tuned lengths of wire. Amateurs and SWLs the world across will tell you this tried and proven method of very effectively covering a number of bands for a minimal outlay.

The AN-60 is supplied complete with insulators and feed line to bring the signals crashing inside. The only things you need to supply are a couple of poles or conveniently placed trees to keep the wire well away from the mud.

The other optional antenna, called the AN-1, is a more substantial outdoor wideband active antenna, and is once again supplied with all the bits and pieces down to the last nut and bolt. The supplied active antenna is definitely aimed at indoor use only, so the AN-1 would be a very good choice if you're a flat-dweller, or otherwise limited in space. Doubtless, it's also a good deal easier to install than the AN-60...

(continued over)

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POCKET DYNAMITE (continued)

The ICF-SW1S also offers quite good performance on the FM band, with clear stereo signals available at the miniature headphone jack. I found myself listening to a number of commercial two-way services located below the FM broadcast band, although the wideband FM system meant that I could sometimes hear more than one two-way channel at a time!

There's a limited range of audio tone control, which is limited to a two-position toggle switch offering either 'low' or 'high'. Personally, I thought it sounded a bit better if I always left it in the high position, but individual preferences can vary . . .

Apart from the mini stereo outlet, which is affected by the tone control, there's a line-level auxiliary output jack, which Sony added for the convenience of being able to record live 'off-air'. This outlet is taken from the circuit before the tone control. Sadly, though, it is a monaural-only outlet, so hooking into your stereo amplifier for better quality will result in the loss of stereo.

Another of the 'goodies' inside the system case is a set of supplied stereo headphones of the compact 'in ear' type. These things you will either love or hate. (I bought a set of medium-cost Kenwood 'in ear' phones a few years ago, and they absolutely trounce my very large — and equally expensive — Sennheisers where performance is concerned! There are plenty of cheap and nasty 'in ear' phones around, but most are well worth giving a miss. Do yourself a favor and pay the few extra bucks for a really good set.)

Sony calls its in ear headphones 'Twin Turbos', for some entirely unaccountable reason. But here, too, it put the thinking cap on and came up with a really clever way of protecting them from loss or damage. The phones are supplied in their own hard plastic wind up carry case, which should protect them from just about anything short of a hammer or a kid with scissors!

As always, Sony's packaging is absolutely superb. The company seems to have thought of almost everything. The receiver itself comes in a soft, crushed velour pouch with a real leather strap and velcro fastener. This, in turn, is loaded into a functional, and quite handsome, moulded plastic case — not unlike a pint-sized briefcase — which has room for the receiver itself, the external whip and amplifier, the multi-lingual instruction manual and Sony's 'Wave Handbook' (we'll deal with that in a moment), the pair of stereo headphones, and an AC power supply.

Because Sony has aimed this receiver directly at jet-setting international travellers, the power supply is designed to automatically select the operating voltage. All one has to do is use the right plug adaptor to fit it to the power socket in use. But don't get too excited yet.

Unfortunately, the model destined for Australia has a gaping hole where the power supply should be, so operation appears limited to two AA penlite cells for most local purchasers. With its auto-ranging characteristics, the supply should have been quite adequate for our 50 Hertz 240 V, so its omission probably has something to do with the complicated procedures one must endure to get compliance approval from Australian electricity supply authorities.

The books supplied with the unit seem to cover almost any eventuality. The first is the inevitable instruction manual, which is printed in umpteen languages and seems to explain the radio's inner workings quite well.

The second is Sony's 'Wave Handbook', a nifty 120 page book listing the frequencies and on-air times for major broadcast outlets around the world. It covers medium wave through shortwave broadcasters, and even lists selected FM stations in almost every city you can name. Rather than list everything in frequency order, Sony has put the information together country by country, so if you can identify the language you'll probably be able to identify the station.

I was rather perplexed to discover a small suction cup with a length of shoelace threaded through a hole in the cup sitting in the case when I unpacked the receiver. At first, I though somebody had cocked up when packing the evaluation unit, but there it was on the parts list.

There is no mention of it in the handbook — beyond the parts list, that is — and the best thought I can come up with is that you're supposed to hook the sling formed by the lace over the top of the active antenna to stop it from falling off your window sill. All very technical. But it shows Sony has though of literally everything...

While AM stereo is not offered in the tiny shortwave receiver, an internal speaker is. It's a commendably thin, oblong affair measuring about 4 by 6 cm, and produces a really surprising amount of audio from just a quarter of one watt drive.

It's just as well the Sony ICF-SW1S performs well. When I put it in front of a few people and asked them to guess its retail cost they were usually out by a factor of four. The recommended Australian retail price of this receiver system is **$799**, which puts it out of contention for many hobby SWLers.

And that's a pity, because while it **looks** like a toy its performance proves it most certainly is not. If you're planning a trip, and would like to stay in touch with happenings at home, you could do a lot worse than take a long, hard look at the Sony ICF-SW1S.

ARGENT FOR UHF

All models sold and serviced, here at the UHF headquarters of Sydney's west.

STOP PRESS: Come and see us for the amazing Icom IC-U16 UHF super handheld! 400-500MHz, 5 watt output, scanning, DTMF and subtone, scanning . . . put one on your Christmas list!

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IC 40 — still our most popular handheld, with the full range of Icom accessories (and yes, we are an official Icom agent).

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Sawtron 999 — the unchallenged leader among mobile UHF CB radios. Commercial quality, engineered for total performance.

PEARCE SIMPSON

Leopard Mk III — just released, real value for your UHF dollar — see the review in this issue.
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Specifications: Frequency Range: 500kHz-905mHz Mode: A3(A3E) (AM), F3(F3E) (FM) Circuitry: AM, FM(N) = Triple conversion system FM(W) = Double conversion system Sensitivity: AM (S+N/N = 10dB) = Less than 5uV (BC band 10uV), FM(N) = 12dB SINAD less than 6uV (500kHz)-60mHz) less than 3uV (60-905mHz). Operating Temperature: -10°-+60° Audio Output Power: 2W (at 8 ohms load 10% distortion). Current Drain: Less than 1A (audio power utput 1W). Antenna Impedance: 50-300 ohms. Power Requirement: 13.8VDC +- 15% Dimensions: 180(W) x 50(H) x 158(D) mm. Weight: 1.5kg.

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CB ACTION

AUSTRALIA'S ONLY CB MAGAZINE

CB ACTION/HATADI ELECTRONICS CORPORATION PTY. LTD.

WORDMAZE COMPETITION

WIN A BRILLIANT NEW LEOPARD MARK 3 UHF RIG

This month's competition has as its prize the new Leopard MK3 UHF rig as reviewed in this issue.

Hatadi Electronics Corporation Pty. Ltd. has made available the latest in Pearce-Simpson UHF CB technology — the Leopard Mark 3 — for the winner.

It's not hard to win — we've hidden 10 words in the maze, the answers to which can be found in this issue of CB Action.

The answers can run in any direction — horizontally, vertically, diagonally — and also back to front.

Find the ten words hidden in the maze and post your entry to:

CB ACTION/HATADI ELECTRONICS CORPORATION PTY. LTD. WORDMAZE COMPETITION GPO BOX 628E MELBOURNE, VIC. 3001

The closing date is November 11 and the winner will be selected from all the correct entries received by that date. The draw will be conducted in the offices of CB Action and the results and solution will be published in the next issue of CBA.

The winner will be notified by mail.

1. *Who is the contributor who wrote Scanning Action — surname?*
2. *(First name?) Communications has been given approval for the 2/32 channel repeater in Sydney.*
3. *Who is the definitive disastrous CBer featured in one of the columns in this issue?*
4. *Who (first name?) supplies the UHF news to us?*
5. *One of our rig reviews in this issue is the (name?) TX830.*
6. *What is the surname of the contributor who wrote "CB is alive and well in Spain"?*
7. *What is the first name of the 67-W-07?*
8. *In what suburb would you find the manufacturer of the PB-11E UHF beam.*
9. *What company builds the ICF-SW1 receiver?*
10. *This contributor was late with his copy for this issue because of a fire in the kitchen — what's his first name?*

U	A	I	B	X	D	P	G	T	E	E	A	E	S	B	J
H	A	T	A	D	I	D	N	E	L	R	A	I	Q	A	E
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LAST WORDMAZE WINNER

Congratulations to the winner of the last competition: Mr C Ormond of North Rockhampton.

In contrast to the previous Wordmaze competition in which we opened some 50 entries before we found a winner this one came out on the third try.

The answers were 1 — Padula, 2 — propagation, 3 — Stewart, 4 — Steve, 5 — Barrett, 6 — Lion, 7 — independent, 8 — low, 9 — skipchaser, 10 — Just.

By the time this issue goes to press Mr (Mrs ?) Ormond should have received his/her Electrophone TX-472S courtesy of Standard Communications whom we sincerely thank for this great prize.

I would like to enter the CB ACTION/HATADI ELECTRONICS CORPORATION PTY. LTD. WORDMAZE Competition.

WORDMAZE Competition. I agree to abide by the judge's decision.

NAME.....

ADDRESS.....

.....

TELEPHONE NUMBER.....

SIGNATURE.....

Club NEWS

Hi! Here we are again — time sure flies. Very poor response to the renewal for club registration. The address is: Club Register, PO Box 184, Northbridge, 2063. C'mon! If there is no response the section will be deleted from 'CB Action'.

Thanks to those clubs that responded with information for the column — club history, club events, unusual or interesting happenings etc. etc.

The next deadline is October 30.

BROLGA ONE'S AUSTRALIA ALL-OVER TOUR

Reg Richards' Cancer Fund tour ended on a sad note when Reg returned to his home town, Townsville, after suffering a heart attack. However, after talking with Reg by phone, we can report he sounded like his old self. Good news.

Although a final tally is not at hand, on promises received the tour raised around $20,000. It would seem that most of the money came from Victoria, Tasmania and South Australia. Obviously, Western Australia and Northern Territory could not have helped as Reg had not reached there. Shame on New South Wales and Queensland. Reg spent several days in Sydney and received $57 in cash! All I can say is: "Reg Richards from Townsville has a heart of gold! How about it Australia?"

EAST COAST RADIO CLUB

WOT! Another club.

The newly reformed East Coast Radio Club is on the move. No, it has not been reborn from the ashes of an earlier club (East Coast) but seems to have been revived from the cinders of the Blackwood Radio Club — at least in Sydney.

Well, it may seem strange that another club is up and running. The enthusiasm with which the club has been accepted is exceptional — 70 members at the time of writing. Who knows, with the right administration progress may continue.

The inaugural meeting was held on Sunday, 14 August at the Arncliffe (Sydney) RSL. More than 50 members attended, which was very pleasing according to a club spokesman who went on to say: "Many East Coast members lived either interstate or in country areas."

The newly elected committee consists of president Frank 229, secretary/treasurer Rod 287, vice-president Steve 02, social secretary Eileen 03 and Tony 256, the public relations officer.

All enquiries to the club secretary at: PO Box 414, Bexley, NSW 2207.

The club policy, according to the spokesman, is one of fostering a friendly group with the emphasis on creating good clean radio operators and to vary social activities to interest all club members.

The club QSO is held each Monday night at 1930 hours and finishes at 2100 hours.

We did not wish to infer (earlier in the article) that the Blackwood Club is no longer. In fact it is as strong as ever — it simply has closed its books to further membership. The East Coast Radio Club has written to all Blackwood members in the immediate area (Sydney) to see if they wish to join. Rod, I did not know that Wonthaggi was in the immediate area — seems like a little touting going on — not raiding the other clubs membership lists are we?

SYDNEY RADIO GROUP

The Group enjoyed another splendid occasion at its annual outing to St Albans in the Wiseman's Ferry region of NSW.

The old hotel there, located beside the MacDonald River, was built in 1836. Other clubs who visited on the day were the East Coast Radio Club ably represented by president Frank Parks (229) and a group of Metro West members including Lorraine (66) and Ian (81).

The raffle for an airpot was won by Suzie Thoreau (SR79) who, by the way, should be married to yours truly as you read this. Why not put out a call for us. We should be marine mobile.

The raffle for the Super Bengal MKII was won by Mark Williams of Roseville, NSW (02SR17) and was drawn by that lovely lady Mrs Greg Ackman wife of Mr Mobile One himself.

The group says that the club magazine, now professionally printed, is proving to be popular with articles on projects, amateur radio and travel.

One of the more recent additions to the club is Lito — call-sign Charlie Charlie Eagle 22 from the Phillipines — whose group call is 11.SR.101.

The recent Steak Night Out, held at the Black Stump in Sydney, proved to be as successful as the Chinese Night Out held earlier in the year.

The question and answer segment on Radio Theory is proving to be extremely popular on the weekly QSO — Wednesday nights 1930 hours eastern standard time, QSV from Ch.35

RESCUE DRAMA

Two members of the club were involved in a dramatic rescue in the Norseman region of Western Australia. Brian Harris of Bailey's Radiators and Tony van de Kolk, both of Sydney, were having a QSO when they monitored an emergency call from two people bogged in three feet of mud — they were located 40 kilometres west of Cave Hill (nearest town Widgiemooltha to the east).

The Sydney stations contacted the stranded men's workplace. They phoned the Norseman police station which in turn phoned Sydney to confirm that the call was genuine.

Later they received a further call from constable George Lewis to say that a search party had been sent out.

Both Tony and Brian thought that would be the end of it, however the following day they again heard Eric, one of the stranded men, putting out calls. Eric informed them that they had not heard from the search party.

Brian again phoned the police in Norseman, spoke to Constable Lewis who required more information.

After more communication with Eric and the police an exact location was established.

By this time, Tony and Brian had been using two radios and two telephones. Unfortunately the skip had changed and the latest request from the police was for Eric and his mate to change to 14AM.

Luckily Albatross Radio 500, Val, located on the Gove Peninsula in the township of Nhulunbuy, just happened to be 'sandbagging' on the frequency.

The police phoned back later that day to say that both people had been rescued.

QUEENSLAND BLUE HEELER CLUB

Club President QBH696 Terri from Geelong in Victoria tells us that everybody down there in recent months has been suffering from the flu.

A club newsletter is now being produced in Victoria, NSW and Queensland. If you want one, send a stamped, self-addressed envelope to your State address. These newsletters are on a trial basis and your support is needed.

Blue Heeler spoons are still available from headquarters in Victoria — $5 if local or $6 including postage. Terri says that the rubber stamps are still up in the air at this stage. She goes on to say: They may be made overseas, so keep the money coming in for them and they will be less expensive." The cost at this stage is $10 including postage and handling. The more orders the club gets the saving will be re-

funded or, if not enough orders, the entire $10 will be returned.

To cut down on office work, the paper work for new members will be processed at the end of each month.

Incidentally Terri, I did not turn the skip off. Must be something wrong with your gear. I will order some 'DXelien' for you. Do not forget to apply it to the correct side of the antenna.

PATHFINDER CB SOCIAL CLUB

Now, here is a club that is active in various fields — charity being just one. We understand that from 11-13 November it will be set up on Mount Ainslie, ACT (so named because of a bet made by an army officer who foolishly rode a horse straight down the mountain to his death) in aid of Cancer Research.

Several groups will be sponsors at so much per contact. This time it is being organised by the Queanbeyan/Canberra Division.

Stan, Pathfinder 163, says: "We have 92 members in the Division and since its inception in 1983 we have conducted a weekly QSO and held our 250th on 24 August."

It would seem that the talkbacks have been a great success with members from other groups joining in. Of course, skip, when it is running, adds to the occasion. All members are invited to chair the meetings at any time with the opportunity of choosing their own topics and therefore bringing variety to the talkback.

Do not forget the cancer fund — dig deep!

Great to hear from you again, Ken. Sorry about the mixup with the PO Box No. You shouldn't worry, I have been trying to get the editor in Melbourne to correct the spelling of my name ever since I started writing for 'CB Action'.

Ken goes on to say that the last club news he sent must have missed the deadline. Ken, it never arrived!

The spirited members of the club went to the local bus stop three days in a row — and no Brolga — the information provided to 'CB Action' was correct with regard to his itinerary. However, the schedule was changed after Reg left Townsville.

The group passes on all the very best to Reg Richards the Brolga One. Okay Ken, so you Sandgropers are only two hours behind — but really, a Brolga on a bus! Have you ever seen a Brolga? It has trouble sitting on a fence.

INTERNATIONAL AMATEUR RADIO NETWORK

Here's another new club and what a great cause. WANTED — volunteer radio operators for overseas areas.

Would you like to do a tour of duty overseas, using your radio skills to help provide radio communications in disaster-affected countries?

In recent times some notable disaster areas where international aid has been called include Sudan, 10 years of rainfall in one night; Rwanda, because of the arrival of 35,000 refugees and Nepal, because its telephone network was wrecked by an earthquake.

Sam Voron AX2BVS/NDG427, well-known radio hobbyist (remembered for providing communications into Mexico after the major earthquake) and Glen Baster, K1MAN, Interanational Amateur Radio Network world director, have made the offer to each of these countries to supply volunteer Australaian radio operators with their equipment at no charge. This would be supplemented by volunteer American operators if required.

If you are a radio operator or would like to be trained to become a radio operator and if you would be prepared to volunteer at least one month overseas service setting up and operating radio equipment to assist countries in distress, then you should join the International Amateur Radio Club.

The club has set up its own station, VK2DTN, as a disaster traffic network. The aim of the club is to help train radio operators for international disaster radio communications.

CB operators Australia-wide are welcome to join IARN. There is no age limit and no membership fee. Members Australia-wide are welcome to visit Sydney and arrange to use the club equipment under licenced supervision while undertaking radio operator training.

All enquiries to Sam Voron: Telephone (02) 407 1066.

BUNBURY RADIO CLUB

Did we say Western Australia is a little behind, two hours at least? This one is a real worry. How would you feel if you got a letter that started off in a strange fashion? Such as this:

'Gidday, Mick Dundee here'. This was from the club secretary, Dave Lindsay. He seems to think that I am Rambo (I will have to think about that, Dave).

Dave goes on to say that he went into CB in March 1984 when one of his sons got a set and the missus (is that something like a wife?) and Dave joined the Bunbury Radio Club.

Dave went on to become vice-president for a year, president for two years and now is club secretary. He is also the founder and editor of 'Quarterwave', the club's newsletter.

The Bunbury Radio Club has been, since October '87, sharing premises with the Rathmines Sea Scouts, an arrangement which is working quite well. It has been allocated a sizeable room within the building which it intends to set up as a Radio Communications & Committee Room. The scouts have a proficiency badge and they are assisting in achieving this.

They (the scouts) also conduct a 'Jamboree of the Air' on an annual basis with which the club can assist.

Dave also mentions that an associate member of the club, Jack Schultz from Wodonga, Victoria, has recently spent some time with the club in the West, along with his wife and a couple of friends, renewing old acquaintances and making new ones.

Help Us Fight

Muscular Dystrophy

With 16,000 sufferers Australia wide, Muscular Dystrophy picks a fresh bunch of almost two hundred little Australians every year.

It then proceeds to destroy vital muscles. First in the legs. Then those in the arms. And finally, the whole body.

It takes about ten years.

The mind remains fully alert and aware to the inevitable end.

From the onset of the disease, ever increasing care and support is needed. Both physical, and moral.

The distress suffered by these children and those close to them is awesome.

Please, now is the time to give. For more information please phone the Muscular Dystrophy Association of Victoria on telephone 370 0889, or write to M.D.A.V., 208 Union Rd., Ascot Vale, 3032.

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DX UPDATE FROM NEW SOUTH WALES

Compiled by Jack, 67-W-07

The past few weeks have produced some really surprising DX openings on the 11 metre band, with propagation slowly on the improve as we move towards summer. We should all take this as a good sign of things to come.

Previously, stations unheard from the rarer and hard-to-get countries are now coming through and thus providing the serious DXer and country chaser with a new challenge on the band. I think the time has now come to blow the dust off the DXCC list and to also place the Atlas close at hand as some interesting DX is definitely on the way.

AFRICA & INDIAN OCEAN REGIONS

As mentioned in the introduction, there have been some surprises and one of them has been the island of Mayotte, which is to the north-west side of Madagascar.

The 189-AT-108 was moving the needle up to a good six to seven and proved that there is some activity from Mayotte Island after all. Usually, if you can hear the island of Reunion, you can hear Mayotte at the same time, around 3pm EST through to 7pm EST and at times, later.

The regulars out of South Africa are still coming at the times mentioned above and at times, if you are lucky, the odd station out of Botswana may also be heard with reasonable signals, 105-AT-102 to name one good signal from that region. Recently Wayne, 43-WT-09 in New South Wales, informed me that he had heard some good signals out of the Somali Republic around 5.15pm EST.

Although I have heard the west coast of Australia calling the Maldive and Seychelle Islands, no audible signal has been logged here as yet, but with the conditions on the increase these areas will become available soon.

MIDDLE EAST

Even though signals from the Middle East have been poor and band opening times to this region erratic, there are some reasonably clear signals to be heard.

The past few weeks have seen an upsurge of propagation especially to Lebanon and Kuwait with the occasional signals from Saudi Arabia and the United Arab Emirates to be heard also.

The best time for this region is between 3pm EST to 7.30pm EST and at times even later than that, depending on prevailing conditions.

I was very surprised to hear a station calling from Babylon in Iran at 5.45pm EST with an audible signal. I personally think we will gradually hear more signals from Iran and also Iraq as the United Nations peace-keeping force makes its presence felt during the current intermission in war activities in this troubled area.

Signals from Lebanon have been heard with the regular station out of Beruit, Hani the 112-AT-107, leading the way. He has been closely followed by 1-PW-003 also out of Lebanon, both with reasonable reports. Another interesting one to hear is the '664' Maritime Mobile in the Persian Gulf, off Bahrain, as well as numerous stations from Qatar. In the next few weeks conditions in this area will pick up offering some choice DX to this region.

EUROPE

The band openings to Europe at times have been fairly erratic, depending of course which particular area you are after. The regulars, Italy, France, Belgium and the Scandinavian countries have been coming in any time from 3.30pm EST through to 9pm EST, and at times earlier and later, depending on band conditions.

I have observed Europe, especially Sicily, coming in as early as 2.30pm lingering to at least 9pm EST.

An interesting station to listen for is John, JT-177, who is near Nicosia on the island of Cyprus. John is retired and loves DXing and will send a QSL card first, as he has local problems that prevent him from giving his QSL information on-air.

Anthony, the 18-AT-107 in Ilioupol, Greece puts a magnificent signal out and I could not believe my 'S' meter as he was five and seven and the rest of Europe was barely moving the needle here. It was a virtual pile-up with stations from Australia and Indonesia wishing to work him. Also from Greece, Rhodes has been noted along with the Italian island of Sardinia putting in excellent signals between 4pm EST and 6.30pm EST.

QSL card from Faliraki operator on Rhodes Island, Greece.

Zivko, the 1-KL-001 from Domzale in Yugoslavia, has been very active while conditions have been in. Despite rumours, Zivko does in fact QSL but takes some time before he eventually issues a card. I waited nearly three months for mine. Better late than never as the saying goes. The United Kingdom has been conspicuous by its absence on the band although I did hear 137-AT-101, Roy from the Isle of Man, just recently. Even though the signal was low here on the east coast, the fellows on the west apparently had him better and were in there to the hilt calling. It is only a matter of a few weeks before the UK and districts start to come in better here on the east.

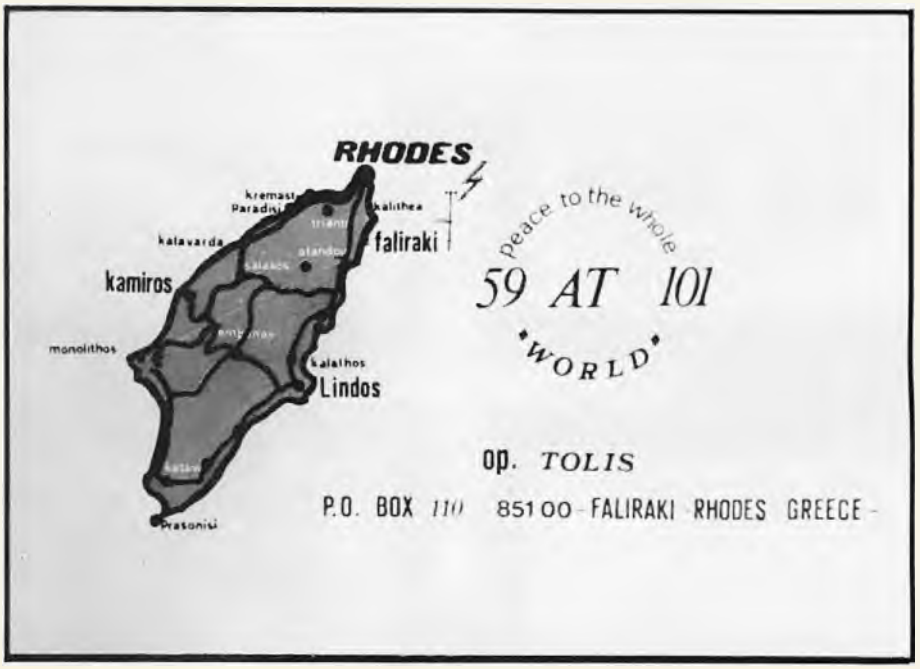
A country seldom heard lately is Switzerland, but do not despair as it is out there. 43-AT-163, Ned in NSW has a card on the way. Good work Ned. I am very pleased you were around at the right time for that one.

CENTRAL/SOUTH AMERICA AND THE CARIBBEAN SEA

Some of the rare countries are now starting to emerge on the band now that the conditions are picking up. This is a good sign for the country-hungry DX chaser. You may remember in the last issue I mentioned the scarcity of some South American countries on 11 metres, well in the past few weeks this has changed dramatically. Stations from Argentina, Bolivia, Paraguay and Peru are starting to make their presence noticed on the band, although most are Spanish-speaking there are a small number of English-speaking stations around for the offering although you have to listen hard to hear them.

Despite their appearance over the past couple of weeks they still prove to be most difficult to secure. At times it appears to be one-way conditions but only time will tell. I found the best time to look for them is any time from daylight onwards to around noon, but a keen ear is needed as signals from the regulars such as Costa Rica and Mexico seem to dominate the band.

(continued over)



Pictured is the Radio Guatemala Internationale 1344, Victor, who operates out of Guatemala City using — wait for it, a Realistic TRC-458 (without after-burner) — through an Akai UM Separation microphone into a three element Yagi.

DX UPDATE (continued)

Cuba also has been heard on the band at various times, but not in English. One of the more distant areas of the Caribbean also has been heard — the island of Bermuda — but, again, the signal was hard to decipher from the hurly-burly of other Hispanic stations on the band. Barbados has been scarce of late although most of the other island chains in that district have been coming through from time to time. A point to note is that if you can hear Florida in the US, then you should be able to hear the Caribbean countries directly south, such as the Bahamas.

Panama, along with numerous other little countries which make up Central America, can be heard any time from daylight onwards here on the east coast. Signals are good and usually hold for some time, often late into the morning and at times into the early afternoon. Virgilio, the 24-AT-105, doesn't seem to have his QSL portfolio in order judging by recent gossip on the band. It really is a shame as he is one of the best English-speaking stations from Panama.

Some districts I would like to hear on the band are Belize, the IJS, the Virgin Islands, French Guyana, Guyana and Uruguay. Activity from these areas now seems to be scarce, although I have heard of people noting French Guyana, and Uruguay.

ASIA AND THE PACIFIC REGION

Depsite the usually strong signals from Japan, the Philippines and Indonesia, there has been some good DX to be sought in this region. During the last upsurge in the propagation conditions on the band signals have been heard from West Malaysia, namely the 113-AT-101, Dean, who was having some transmitter problems at the time and also the 1212 from North Korea has been active on the band. I haven't heard North Korea for some time so the appearance of the 1212 is welcomed

Vladivostok, the USSR Pacific seaport, also has been noted on the band when Asia has been coming in, actually not long after the 1212 in North Korea was heard. This is a good sign for overall DX conditions as many a DXer will be after this one as signals from the USSR are not all that common on the 11 metre band. A lot of DXers dismiss Asian DX when it is at its peak so I am sure that the incentive of perhaps capturing a signal from Vladivostok let alone securing a card should keep some operators alert when Asian DX is in.

Bhutan also has been heard in the mid and early evenings although no accurate call-sign has been logged, also the odd weak signal from Andorra is still being logged although I know of no-one as yet who has secured a card from there. Ray, the 60-AT-101 (ex-VS 6057) out of Hong Kong, has been coming in quite well along with Han, 100-AT-101 in South Korea. Both can be heard quite early in the morning (around 8am EST) through to the early and sometimes late evenings. I have yet to receive a card from Mike, the MJS-514 who was operating out of Camp Coiner, a US military camp in South Korea not far from the capital of Seoul. Maybe it's a case of better late than never.

Guam has been putting some very strong signals into Australia. Ken, 68-W-100, was putting the meter up to the 40/DB over nine mark for quite some time as was Danny, 68-W-78. Ben, the 68-W-46, is always on the prowl looking for new countries. Eddie, the 68-W-08, is off-air due to do-it-yourself open heart surgery on his new radio. Just goes to show that you shouldn't touch something that you know nothing about.

Papua New Guinea is still about the frequencies. TA-31, Mike near Madang, is coming in with quite good signals. Patrick, the 101-AT-101 at Wabag, is still going strong and has taken advantage of the excellent conditions of late and pushed the needle well into red, giving me the impression that he is a local and not in PNG. Seems the quad is doing well, eh Patrick?

LONGPATH NOTES

Even though conditions have declined regarding longpath DX, the conditions are still hanging in there. Depending on propagation conditions, Europe has been coming in quite well; Italy, France and Belgium from time to time have been quite strong in the mid and late mornings here on the east coast and occasionally Portugal, Spain and the Canary Islands have been there along with the odd station from the 49-AT region of the Balearic Islands providing a much-needed new country for some.

Conditions for these longpath openings have been erratic and sometimes start as early as 8.30am EST through to noon and sometimes the early afternoon. One thing I have observed is that if we receive excellent longpath to Europe in the mornings, the evening openings on the shortpath are very poor, if any at all.

As we near summer the longpath conditions will drop off in favor of shortpath openings, but sometimes the occasionally sporadic burst of longpath will pull through but will not last as long as wintertime longpath openings did. It is a matter of being on the band at the right time to reap the benefits but again it must be noted longpath conditions are on the decline.

Before closing, I would like to thank many people from around Australia who have passed favorable comments along to me regarding this column. I take this opportunity to say, thank you again and good DX. Jack.

INTERSTATE SKIP REPORT FROM ALBURY/WODONGA

Greetings again from the national growth centre of Albury/Wodonga. I must say I am delighted to have the opportunity to be back for another edition and am becoming increasingly confident about being a regular part of the scene and thank all concerned for their support.

What a great couple of months it has been for DX! I have enjoyed some great QSOs with some really nice people, all further reinforcing my opinion that the majority of CBers are genuine and decent folk.

Unfortunately, some individuals still persist in demonstrating that their mouths are equally as vile as their minds.

LOCAL SKIP

Again the Sandgropers have just about ruled the roost. One exceptional day I heard both Sydney and Melbourne. On Monday, 25 July, at 1.17pm I tried desperately to put in a breaker on Metrowest 52 (Denise out of Leithbridge Park) and RC05 (Bob out of Dandenong) who were involved in a QSO on 28USB. I was beaten to the mark by 113 Nigel in Sydney, but never mind it was a big buzz to hear both capitals simultaneously and to hear Bob again with whom I have QSO'd previously at his past QTH of Caboolture, Qld.

Most envious of MI309 (Ian portable north of Darwin) with whom I QSO'd on 26 July around lunchtime. While I was rugged up enduring a midday maximum of 8°C, he explained at great length how he was perched on the beach in bathers enjoying a cold tinnie and soaking up Sol's rays in 30° luxury.

Other good contacts of late have included: 9 July - WG579 Brian, Perth, hello again mate; 18 July - 701 Joyce (a lovely lady who with her XYM runs a nursery at Eumundi), Qld; 20 July - APA257 Gary, Brisbane; 23 July - 308 Kath, Bundaberg; Hawker 2 Bob, Whyalla (with whom I was beginning to enjoy a good QSO when we got lost in the chook pen); 24 July - ARA137 Archie, Brisbane (cheers to Sue); 25 July - NGP852 Bill, Broken Hill (who helps quench thirsts up there, keep up the good work Bill); 31 July - WCK225 Jane & Peter, Broomehill WA; 9 August - Scarecrow 564 Alex, Tieri Qld; 18 August - WB04 Beryl; WB59 - Carol; WB60 Vince, not exactly DX copies I admit as all were mobile on their way home to Latrobe Valley after a wild week in Sydney.

Having stopped for some discount diesel, Carol and Co. put a call out for their old mate ARA345 - Jack who is holidaying in WA — so had to settle for me being the only one on-air locally; 21 August - Wild Geese 622 Bernie, Armadale WA (and during the same QSO, ARA317 George, Sydney via relay thanks to Bernie).

Thanks to all of the above for the QSOs and QSLs where applicable.

Other stations romping in with strong signals of late for the interest of the operators concerned have been:

10 July - 421 Perth; 11 July - 356 Karnarvon; 13 July - 508 & 980 Qld; 17 July - SW39 WA; 18 July -723 Gold Coast (mobile); 20 July - 138 Brisbane; 21 July - 513 Nth Territory; 22 July - 049 Brisbane; 677 Bundaberg; 571 Maroochydore; 23 July - 308 Bundaberg; AW204 Bundaberg; 591 Snowy Mountains; 24 July - WCC330 Tom Price (cheers Bertie and regards from brother-in-law ARA578 John with whom you QSOd out of my QTH while he and sister Phyl were visiting); 25 July - Eureka Base 112 Adelaide; 26 July - 135 Geraldton WA; 27 July - JDW196 SA; 28 July - 725 Weipa Qld; 29 July - 132 Timber Creek NT (mobile); 30 July - True Blue 355 WA; 31 July - 193 Albany WA; 1 August - WCB579 Albany WA; 3 August - 925 Geraldton WA; 5 August - WCE342 Mt Pleasant WA; 6 August - ARA345 WA (mobile); 7 August - BD308 Bundaberg Qld; 9 August - 602 Rockingham WA; 11 August - ARA500 NT; 14 August - WC1247 Jarrahdale WA; 15 August - 557 Darwin NT (mobile); 18 August - 293 Perth WA; 24 August - 820 Fitzroy Crossing WA; 25 August - 412 Nth Qld; 26 August - ARA88 Fremantle WA.

As you can see, a bit of a mixed bag with WA still very strong with not so much as a peep out of Tasmania, which is unusual.

While I would dearly love to get back to every station that puts out DX calls, I do have a daytime job to hold down, so please forgive me if I do not respond to all calls.

Now, before those in the know start ratting on me, I will admit that I have had the last 4 weeks off, but the ongoing quest to maintain domestic harmony triumphed and the kitchen renovations are now complete.

In contrast to some decidely and deservedly negative comments about a certain station in the last edition, I would like to mention two of the finest ambassadors for our hobby that I have had the pleasure to talk to in recent times.

On 12 July at 9.34pm I had an excellent QSO with MSF180 Corey and RR190 Kim out of Mt Compass, SA, on 20USB. I hasten to add that these two operators are only 17 years old, well mannered, not a word out of place, a credit to their parents and again a pleasure to talk to. Both work at the local butter and cheese factory and Corey mentioned that if any Gouda bits of Cheddar are around at the end of the day they Edam up. Pardon the pun guys, keep up the gouda work and cheese for now.

A bit quiet with ARA345 Uncle Jack and Aunty Jane on holidays.

Did, however, poke my nose over a fence one recent Saturday afternoon and discovered 599 Reg preparing foundations for a very elaborate tower he has painstakingly built. Hope the mike gain in his old Super Cheetah still works.

That's it from me for now.

Cheers and 73s.

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- ☐ 50 channels
- ☐ Built-in mobile noise reduction circuitry

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DX PROPAGATION

We reintroduced the propagation charts in our last issue and on the opposite page are the predicted skip conditions for the months of October and November.

You're all aware (well, aren't you?) that you are only allowed to work interstate skip and DoTaC doesn't approve of you talking to international DX stations.

We are, however, allowed to listen to them — providing of course that we are all operating within the 40 channel structure — and an indication of our recent reader survey was that a whole heap of operators would like to know when propagation conditions are best to hear 'em.

They might well be very confusing, but, stay with us.

Say for example you're based in Sydney and want to listen to a Japanese CBer — first thing to do is locate the box on the opposite page headed Sydney-Japan.

Now it's full of squiggly things such as dots and % marks, so, now refer to the "Legend to Grafex Symbols" and you will see the dots represent propagation is possible but probably on less than 50% of the days of the month while the % marks indicate that propagation is possible on between 50% and 90% of the days of the month.

The figures across the bottom of the box — ie 00,06,12,18,24 — is the time by a 24 hour clock in UTC (Universal Co-ordinated Time) so, 18 represnts 6pm UTC.

UTC is the old Greenwich Mean Time and you have to figure this out against your own local time as 1800 UTC means a different local time in Perth than it does on the East Coast.

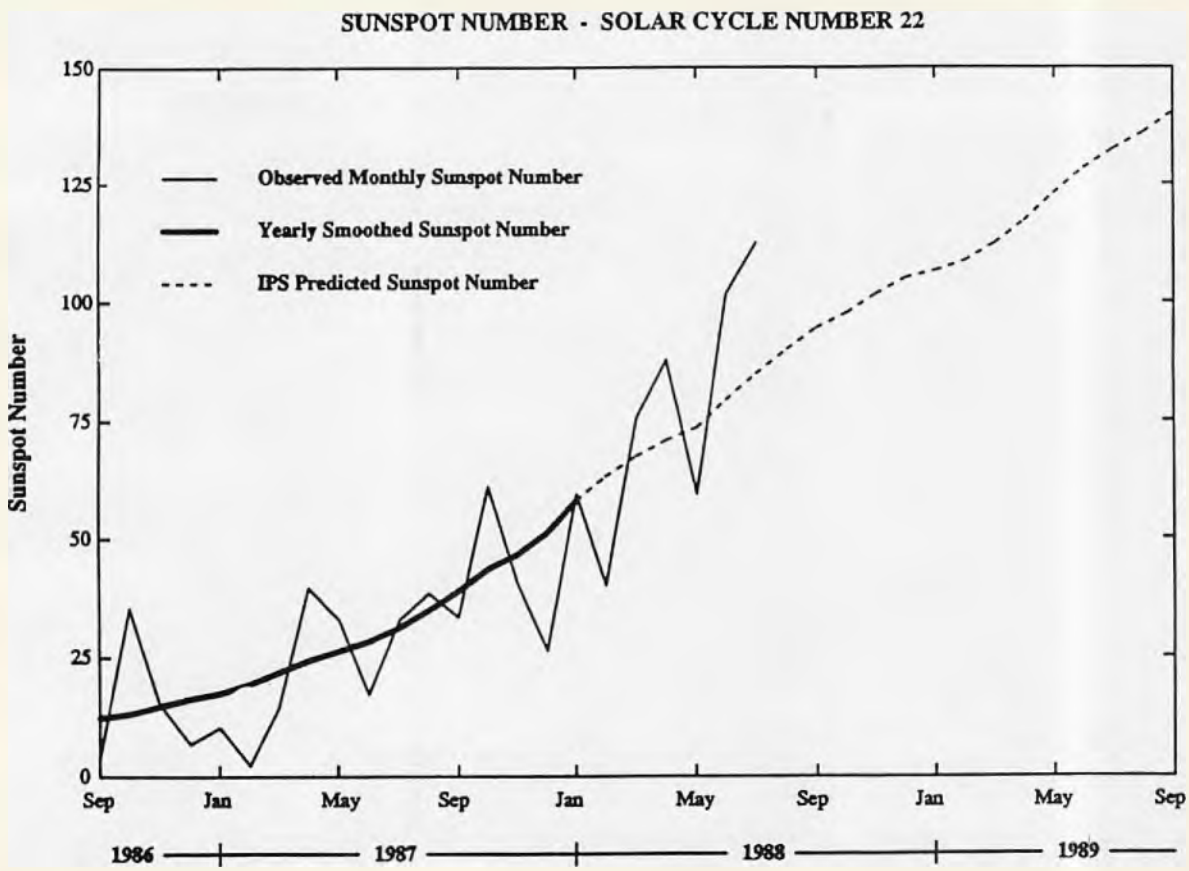
East Coast of Australia time is 10 hours ahead of UTC, therefore 1800 hours UTC becomes 4am local time.

In direct relationship to the Sydney-Japan chart, this means that if you live on the East Coast your best chance of "hearing" Japanese CBers is between 0100-0600 UTC, or, 11am and 4pm local time.

Grafex prediction charts are supplied courtesy of the Ionospheric Prediction Service, 162-166 Goulburn Street, Darlinghurst, NSW.

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 mode 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.



DATE OCTOBER 1988

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SYDNEY-JAPAN                    7825
27.0 MMMMMMXXXXXXX. .  XMM SM
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-C&E.COAST USA           15712
27.0                .XXXX.
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-NORTH AFRICA            17109
27.0      XXXX...
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-ENGLAND LR              23031
27.0        ..
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-CENTRAL EUROPE           13575
27.0     .XXXXXXX.....
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST INDIES              18005
27.0 .....                      .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-NEW ZEALAND               5255
27.0 ...   .                    .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST AFRICA LR           26220
27.0 XXX.  XX...          .X..X
 MHZ |    !    !    !    !    !
    00   06   12   18   24

ADELAIDE-P.N.G.                 2960
27.0 FXXXXXX.......     .XX .F
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-MIDDLE EAST             12903
27.0 .XXXXXX....                .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST COAST USA          11951
27.0 SX.X...          .XXMM  S
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-PAPUA NEW GUINEA         2740
27.0 XXXXXX.......      .XXX .X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST AFRICA LR          23596
27.0 XX.   X.......     .XXXX..X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-SOUTH AFRICA              8315
27.0  ..XX.....
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-SOUTH AMERICA            14569
27.0 ..... ..
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-ENGLAND SR               14480
27.0     .XXXXXX......
 MHZ !    !    !    !    !    !
    00   06   12   18   24

MELBOURNE-P.N.G.                3157
27.0 FXXXXXX.......     ..XX  F
 MHZ !    !    !    !    !    !
    00   06   12   18   24

BRISBANE-NEW ZEALAND            2506
27.0 .......              ..  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-CENTRAL EUROPE          16090
27.0    .XXXX.......
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST INDIES             14950
27.0 X....              .XXX..X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-ENGLAND SR              16993
27.0     .XXX.......
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-JAPAN                     7923
27.0 MMMMMMMMMXXXXX      .M  M
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-C&E.COAST USA            18614
27.0          ...     .X.
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-NORTH AFRICA             13941
27.0     XXXXXX..
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST AFRICA SR           13804
27.0 ... .XXXXX..               .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

BRISBANE-P.N.G.                 2090
27.0 X.....           ...  .X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

ADELAIDE-NEW ZEALAND            3214
27.0 ........             .  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-SOUTH AFRICA            11036
27.0   XX.......
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-SOUTH AMERICA           15160
27.0 .......                 ..  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST AFRICA SR          16428
27.0 ...  ...                   .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-MIDDLE EAST              10077
27.0 .MMMMMMXMXX.....           .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST COAST USA           14743
27.0 XX.                  .X..X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-PAPUA NEW GUINEA          4073
27.0 .....                      .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-ENGLAND LR               25544
27.0        ..
 MHZ !    !    !    !    !    !
    00   06   12   18   24

HOBART-PAPUA NEW GUINEA         3711
27.0 XXXXXX.......      .XXX .X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

DARWIN-NEW ZEALAND              5321
27.0 .......              ...  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24
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DATE NOVEMBER 1988

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SYDNEY-JAPAN                    7825
27.0 MMMMMMXXXXXXX.     .XX  M
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-C&E.COAST USA           15712
27.0              ... ...XXX
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-NORTH AFRICA            17109
27.0      X.....
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-ENGLAND LR              23031
27.0        .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-CENTRAL EUROPE           13575
27.0      XXXXX....
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST INDIES              18005
27.0
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-NEW ZEALAND               5255
27.0
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST AFRICA LR           26220
27.0 .XX    ....              .  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

ADELAIDE-P.N.G.                 2960
27.0 XXXXXX.........    ...  .X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-MIDDLE EAST             12903
27.0  XXXXX... ...
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST COAST USA          11951
27.0 X.....           . ..XMMM  X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-PAPUA NEW GUINEA         2740
27.0 XXXXX.........     .... .X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST AFRICA LR          23596
27.0 XX.   XX..........XXXX..X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-SOUTH AFRICA              8315
27.0     .........
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-SOUTH AMERICA            14569
27.0
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-ENGLAND SR               14480
27.0      XXXXX.....
 MHZ !    !    !    !    !    !
    00   06   12   18   24

MELBOURNE-P.N.G.                3157
27.0 XXXXXX.........    .... X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

BRISBANE-NEW ZEALAND            2506
27.0 .....                .  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-CENTRAL EUROPE          16090
27.0     XXXX.......
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST INDIES             14950
27.0 ....          .    ....X...
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-ENGLAND SR              16993
27.0      .XX.......
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-JAPAN                     7923
27.0 XMMMMMMMMXXXXX      ..  X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-C&E.COAST USA            18614
27.0          ....      ..
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-NORTH AFRICA             13941
27.0     XXXXXX..
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST AFRICA SR           13804
27.0 .. ........
 MHZ !    !    !    !    !    !
    00   06   12   18   24

BRISBANE-P.N.G.                 2090
27.0 .XX.....                 .  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

ADELAIDE-NEW ZEALAND            3214
27.0 .....                    .  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-SOUTH AFRICA            11036
27.0  .......
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-SOUTH AMERICA           15160
27.0 ........                ..  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24

SYDNEY-WEST AFRICA SR          16428
27.0
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-MIDDLE EAST              10077
27.0  XXXFXXXXXX.....
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-WEST COAST USA           14743
27.0 XX.                  ..  X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-PAPUA NEW GUINEA          4073
27.0  ..
 MHZ !    !    !    !    !    !
    00   06   12   18   24

PERTH-ENGLAND LR               25544
27.0
 MHZ !    !    !    !    !    !
    00   06   12   18   24

HOBART-PAPUA NEW GUINEA         3711
27.0 XXXXXX.........    ...X .X
 MHZ !    !    !    !    !    !
    00   06   12   18   24

DARWIN-NEW ZEALAND              5321
27.0 .......              ...  .
 MHZ !    !    !    !    !    !
    00   06   12   18   24
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AUSTRALIAN UHF REPEATER LIST

AREA	CHANNEL	LOCATION	SPONSOR
New South Wales			
Newcastle	1/31	Charleston	—
Ebor	1/31	Near Armidale	—
Wingham	1/31	Wingham	
Jindabyne	1/31	Cornya Alpine Centre	Mansi Brothers
Sydney	1/31	Hurstville	Practronics
Corowa	1/31	Corowa	Corowa Electronics
Tamworth	1/31	Windworth	Landlink Communications
Harden	1/31	Mt Bobbara	—
Wilcannia	1/31	Murtee Station	—
Inverell	2/32	Inverell	—
Canberra	2/32	Isaacs Ridge	Philips Communications
Parkes	2/32	Parkes	Bionics Australia
Narrabri	2/32	Castletop Mountain	Lance Hannaford Elect
Walbundrie	2/32	Walbundrie	Corowa Electronics
Lismore	2/32	Baus	—
Murrundi	3/33	Liverpool Range	—
Sydney	3/33	Prospect	Philips Communications
Tenterfield	3/33	Mt McKenzie	Nathan Ross Electronics
Taree	3/33	Taree	—
Deniliquin	3/33	Deniliquin	Deniliquin Machinery
Tumbarumba	3/33	Mt Ikes	—
Armidale	4/34	Armidale	New England Mobile Comm's
Goulburn	4/34	Mt Gray	Double Diamond
Albury	4/34	Lavington	Albury Communications
Muswellbrook	4/34	Mt Arthur	General Communications
Bega	6/36	Murrabulla Mountain	Athol McCoy Two-Way Radio
Casino	6/36	Mallanganee Range	Nathan Ross Electronics
Newcastle	6/36	New Lambton	General Communications
Coffs Harbour	6/36	Coffs Harbour	Country-wide Communications
Moree	6/36	Terry Hi-hi	Des Groth Radio-Electronics
Cowra	7/37	Bellview Hill	Harvey Electronic Service
Sydney	7/37	Chatswood	Philips Communications
Bulahdelah	7/37	Cabbage Tree Mt	Great Lakes UHF Rpt Group
Wagga	7/37	Wagga	Riverina Communications
Glen Innes	7/37	Mt Rumbee	Glen Innes Amateur Radio Club
Bathurst	8/38	Mt Panorama	Serv-U Appliance Centre
Stanthorpe	8/38	Amiens	—
Sydney outer-west	8/38	Kurmond	Riverlands Rpt Group
Wollongong	8/38	Robertson	Phil Day
Walcha	8/38	Walcha	WALGRAZ—
Portable NSW	Various	Statewide	NDP-826, GT Electrics
ACT			
Canberra	2/32	Isaacs Ridge	Philips-TMC
Canberra	8/38	Isaacs Ridge	Philips-TMC
West Australia			
Denmark	1/31	Denmark	—
Kellerberrin	1/31	Kellerberrin	Central Wheatbelt Rpt Group
Kambalda	1/31	Kambalda	Goldfields Rpt Assoc
Meekatharra	1/31	Hill View Station	—
Perth	1/31	Wanneroo	Philips Communications
Wickham	1/31	Wickham	Wickham Radio Club
Bencubbin	2/32	Bencubbin	—
Bunbury	2/32	Shenton Ridge	Greyhound TV Sales
Albany	3/33	Mt Melville	—
Perth	3/33	Roleystone	Philips Communications
Boyup Brook	4/34	Donnybup	Boyup Brook Farm Comm's Group
Esperance	4/34	Esperance	—
Kulin	4/34	Kulin	—
Lancelin	4/34	Lake Karakin	Gingin Shire Council
Perth	5/35	Maddington	CREST (WA)
Margaret River	6/36	Ellen Brook	UHF Association of WA
Mt Marypeaks	6/36	Mt Marypeaks	—
Wyalkatchem	6/36	Wyalkatchem	D & G Pearce
Mt Barker	7/37	Mt Barker	Plantagenet Rpt Group
York	7/37	Mt Bakerwel	York Rpt Group
Coolgardie	7/37	Mt Burgess	—
Manjimup	8/38	—	—
Ravensthorpe	8/38	—	—
Portable WA	8/38	WA-wide	Gary, WAX-723
Tasmania			
Devonport	1/31	Roland	Rick Rickard, TAJ-652
Hobart	1/31	Grass Tree Hill	Southern Tas. Rpt Assoc.
Launceston	2/32	Mt Arthur	Launceston Rpt Assoc.
Devenport	3/33	Railton	Rick Rickard, TAJ-652
North-East Coast	3/33	Tower Hill	North-East Rpt Assoc.
Tasmanian Midlands	4/34	Millers Bluff	Midlands Rpt Group
Hobart	5/35	Mt Faulkner	CREST (Tas.)
East Coast	6/36	Mt Toombs	East Coast Rpt Assoc
West Coast	6/36	St Valentines Peak	North-West Coast Rpt Assoc.
Central Highlands	7/37	Barren Tier	Central Highlands Assoc
Burnie	8/38	Round Hill	North-West Coast Rpt Assoc
Hobart	8/38	Mt Nelson	Harris Pty Ltd
Portable Tas	Various	Tasmania-wide	Rick Rickard, TAJ-652

AREA	CHANNEL	LOCATION	SPONSOR
Victoria			
Penshurst	1/31	Mt Rouse	Hamilton UHF Users Grp
Barnsdale	1/31	Mt Nugong	Barnsdale Communications
Melbourne	1/31	Broadmeadows	Philips Communications
Alexandra	1/31	Mt Eildon	Weeks Radio
Mansfield	2/32	The Paps	—
Moe	2/32	Moe	Gippsland Rpt Assoc.
Ballarat	2/32	Mt Bunnyong	Central Highlands Rpt Assoc
Lorne	3/33	Weeaproinah	—
Melbourne	3/33	Lysterfield	Philips Communications
Yelta	3/33	Yelta	Nor-Co Sales & Service
Strathbogie Rngs	3/33	Mt Wombat	Goulburn-Murray Rpt Group
Bendigo	4/34	Specimen Hill	Central Vic. Rpt Assoc
Carrajung	4/34	Carrajung	Carrajung UHF CB Rpt Assoc.
Hawkesdale	4/34	Hawkesdale	—
Hamilton	5/35	Mt Bainbridge	Hamilton Electronics
Melbourne	5/35	Olinda	Paravic Sports Assoc.
Foster	6/36	Mt Fatigue	Gippsland Rpt Assoc
Ararat	6/36	Mt William	Mt William UHF Rpt Committee
Wangaratta	6/36	Warby Ranges	Corowa Electronics
Gippsland	7/37	Mt Taylor	Gippsland Rpt Assoc.
Shepparton	7/37	Shepparton	Angus Communications
Ballarat	7/37	Mt Bolton	—
Melbourne	7/37	Frankston	Powerband Communications
Myrtleford	8/38	Mt Porepunkah	—
Cavendish	8/38	Mt Dundas	Hamilton UHF Users Grp
Bendigo	8/38	Mt Alexander	—
Portable Vic	Various	State-wide	Omega Radio Club
Queensland			
Bundaberg	1/31	Mt Perry	Bundaberg Hi-Fi Stereo
Mt Isa	1/31	Lake Julius	Qld Education Dept
Brisbane	1/31	Mt Cotton	Philips Communications
Rockhampton	1/31	Mt Archer	Capricornia UHF Rpt Assoc.
Atherton-Mareeba	1/31	Rocky Creek	Marteens Electronics
Mt Stewart	1/31	Mt Stewart	Olbis Industries
Roma	1/31	Mt Bassett	Roma Teleradio
Middlemount	1/31	Middlemount	—
Leichhardt	1/31	Mt Hope	Driscoll Pastoral
Clermont	1/31	Clermont	—
Gunalda	2/32	Mt Kanigan	Ralph Hill Electrical
Taroom	2/32	Mt Kinnoul	Taroom Rpt Assoc.
Toowoomba	2/32	Picnic Point	Custom Scientific Electronic
Marlborough	2/32	Broadsound Range	Marlborough UHF Rpt Assoc.
Quilpie	2/32	Trinidad Station	D E A. Pegler & Co.
Ingham	2/32	Mt Cudmore	R E. Pugh
Mackay	3/33	Farleigh	Mackay Citizens' Rpt Group
Monto	3/33	Pine Mountain	Monto UHF Rpt Committee
Tin Can Bay	3/33	Double Island Point	Tin Can Bay Lions Club
Springsure	3/33	Rodda Lookout	Bauhina S.E.S
Cairns	3/33	Mt Yarrabah	GCG Communications
Bajool	4/34	Mt Hopeful	Mt Hopeful UHF Rpt Assoc.
Dalby	4/34	Mt Mowbullan	G.T. Communications
Bundaberg	4/34	The Sloping Hummock	Bundaberg Hi-Fi Stereo
Goondiwindi	4/34	Goondiwindi	Border TV & Radio
Gold Coast	4/34	Coolangatta	Philips Communications
Brisbane	5/35	Mt Glorious	ACRM (Qld)
Caloundra	6/36	Bald Knob	Ralph Hill Electrical
Gladstone	6/36	Mt Larcom	Nixon Controls
Palm Island	6/36	Palm Island	Palm Island Council
Blackdown	6/36	Blackdown Tableland	Blackdown UHF Rpt Assoc
Burnett Ranges	6/36	Mundubbera	Custom Scientific Electrical
Yaraka	7/37	Mt Slowcombe	Yaraka Rpt Assoc.
Brisbane	7/37	Toohey Mountain	Olbis Industries
Murgon	7/37	Mt England	Murgon Rpt Assoc.
Mt Alexandra	8/38	Mt Alexandra	Bill Jones Comms
Biloela	7/37	Mt Bertha	Biloela Rpt Assoc.
Stanthorpe	8/38	Amiens	Mt Peanga Rpt Assoc.
Chinchilla	3/33	Mt Peanga	Mt Peanga Rpt Assoc
Emerald	8/38	Emerald	Emerald District Rpt Assc
Pialba	8/38	Ghost Hill	Maryborough Sugar Factory
Milaa Milaa	8/38	Milaa Milaa	Bill Jones Comms
South Australia/ Northern Territory			
Adelaide	1/31	Summerton	Philips Communications
Carnarton	1/31	Price Hill	—
Darwin	1/31	Darwin	Seascan Communications
Black Rock Peak	2/32	Black Rock Peak	Toops Electrical
Cleve	2/32	Mt Nield	Cleve Rpt Assoc.
Myponga	2/32	Myponga Hill	Volunteer Coast Guard
Adelaide	3/33	Trott Park	Philips Communications
Blinman	3/33	Patawarta Hill	—
Barossa Valley	4/34	Angaston	—
Kangaroo Island	4/34	Parndana	Kangaroo Island Rpt Assoc.
Snowtown	4/34	Snowtown	—
Naracoorte	4/34	Lucindale	Naracoorte UHF Rpt Assoc
Adelaide	5/35	Hawthendorne	ACRM (SA)
Renmark	6/36	Renmark	—
Whyalla	6/36	The Bluff	Mt Remarkable Council
Clare	7/37	Quarry Hill	Mid-North Rpt Assoc.
Mt Gambier	7/37	The Bluff	South-east UHF Rpt Assoc.
Mt Bryan	8/38	Mt Bryan	Mt Bryan Rpt Assoc.
Port Lincoln	8/38	Tumby Bay	Sth Eyre Peninsula Rpt Assoc.
Portable SA	Various	State-wide	ACRM (SA)

Can you find the radar in this picture? Cobra can.

By the time you see the radar source, chances are it's too late. But if you had a Cobra Trapshooter radar detector, it would sniff it out in an instant.

Cobra Trapshooter's not only find radar wherever it lurks, but also filter out false signals that other detectors simply can't.

Both the miniaturised yet incredibly sensitive Cobra Trapshooter Ultra, and the Cobra Trapshooter employ the latest technology in electronic circuitry to warn you of radar, even over hills and around the bend.

The Cobra Trapshooter, for visor or dash mount, literally fits into the palm of your hand.

The Trapshooter Ultra is even smaller, with its unique, sporty design, and 3 different alarm settings: voice warning, melody and beep.

Oh, the radar? Take a good look. It's just beyond the bend, behind the row of trees on the right.

Still can't see it? Better get a Cobra.

Cobra Trapshooter Ultra RD 3170

Cobra Trapshooter RD 3160

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It's new! It's expen$ive! It works!

But what else would you expect.

Whistler, the leading name in radar detectors, finally announce the release of their new range of heavy duty high performance radar detectors for use by professional drivers.

All leading motoring magazines have tested and found Whistler to be No. 1 for performance.

Now in 1988, Whistler drives ahead yet again with the new Whistler Q4000 - the very latest in radar detector technology.

The Whistler Q4000 is half the size of the now trusted and proven Whistler Q3000.

The unique feature of the Whistler Q4000 is that it is available in no less than 4 different versions: *Long Range Q4000 for professional drivers; *Tri-band Q4000 for drivers who frequent South Australia and Queensland, and require a detector capable of picking up all three frequencies of radar in those States;

*And the revolutionary Whistler Q4000K, the radar detector in which over 90% of interference from burglar alarms and motion detector sensors has been eliminated.

The Q4000 is guaranteed to give you advance warning of 'X' and 'K' band pulse radars, including all the latest mobile and slant radars.

The Whistler Q4000LR is unconditionally guaranteed to out-perform any other brand of radar detector on the market.

Whistler, the performance leader, leads once again in 1988.

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