CB Action

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- Packet on 11 metres — legally!
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CB Action

Editor:
Len Shaw (VK3ALS)

Advertising Manager:
Ian Dale
Telephone:(03) 601 4209
Fax: (03) 670 9096

Advertising Enquiries
New South Wales (02) 299 267
Fax: (02) 299 7269
South Australia (08) 373 1142
Western Australia (09) 328 2677
Queensland (07) 202 6444

Editorial Office:
603-611 Little Lonsdale Street
Melbourne 3000.
Postal: GPO Box 628E
Melbourne 3001.
Telephone: (03) 601 4222
Fax: (03) 670 9096

Marketing:
Guy Allan

CONTRIBUTORS

Richard Jary
PO Box E160
St James NSW 2000

Russell Bryant
PO Box 344
Springwood NSW 2777

David Flynn
PO Box 24
Glenbrook NSW 2773

Greg Towells
P.O. Box 577
St Marys NSW 2760

Rob Williams
PO Box 108
Minto NSW 2566

Jack Haden
PO Box 630
Elsternwick Vic 3185

Ken Reynolds
1289 Nepean Highway
Cheltenham Vic 3192

Patrick McDonald
PO Box 357
Round Corner NSW 2158

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ON CHANNEL

PACKET ON CB BANDS

Well, it's taken a long time but we finally received an answer (more or less) from the SMA in respect to using packet radio on CB bands.

The official answer is NO, it's not legal.

This hardly came as a surprise, however, there is - for want of a better way to describe it - a loophole which allows for packet to be used on certain frequencies without the need of a licence.

The person who finally ran this information down was Peter Berrett, VK3KAT, who showed a great deal of tenacity and finally received an answer from the SMA - which was better than we had managed to do.

Peter chased through a maze of bureaucracy and the end result of his endeavours appears on pages 32 and 33.

Briefly, the regulations allow for low power transmitters (and we mean low) which are restricted to several frequencies among which are several in the 11 metre (CB) band.

...and we repeat, no licence is needed, nor a type approved transmitter.

For the many CBers who are interested in communications in general, and not simply HF DXing, packet radio has a helluva lot to offer in terms of experimentation. Packet is by far the quickest growing area of interest to amateurs and there is no reason why it shouldn't prove equally interesting to CBers. Many amateurs operate QRP (low power) stations simply for the challenge of getting through to other stations running minimum power, often less than that of an HF CB rig - and they achieve some amazing results. The regulations which Peter ferreted out are exciting for CBers in that not only do they allow packet radio, they also allow various modes - of transmission - AM, FM, SSB and even Morse.

The small power allowed means that many stations can operate on the same frequency without interference to others using the same frequency, exactly the same as the amateur packet stations operating on the two metre band.

While HF DX is far from dead, the fact is that conditions are going to continue downwards for several years yet and serious CBers will start looking elsewhere for their daily "fix"...packet radio is one of the answers.

For the full picture, read the article - and then let us know your thoughts.

WHAT HAPPENED TO THE NO-CODE LICENCE?

Shortly before going to press we received a fax from the SMA which said in part,"it was anticipated that these changes (variations to the Radiocommunications Act) would have been implemented on July 1, 1993. Unfortunately, the changes necessary for the introduction of the proposed Amateur arrangements were not able to be included in the subordinate regulations and instruments involved in the introduction of the Act. The next opportunity to make the legislative changes will occur in the autumn sittings of Parliament next year."

This sort of thing is pretty much par for the course these days and there is little that anyone can do other than wait.

We assume the proposed "no-code" licence is still on the agenda and will be introduced "sometime next year".

In the meantime, however, we suggest that instead of waiting, start your morse practice now and go for the existing Novice licence - really, it's not all that difficult.

CB Action

ADVERTISING:

Victoria:
Ian Dale
(03) 601 4209

New South Wales:
Tiffany Palmer, Syme Magazines,
Melbourne Age Office, 7th floor,
50 Margaret Street, Sydney 2000.
Phone (02) 299 2671 Fax (02) 299 6474

South Australia:
Tony Giuliani, Cumberland Media
12 Eaton Street, Cumberland Park,
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Frank Hall Media
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Geoff Horne Agencies
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The S475 whip section is a sturdy 3.2mm diameter stainless steel antenna that will remain vertical at high speeds and is ideal for applications that have little or no ground plane area or applications that require a rugged durable antenna, ie: Industrial, Mining, Heavy Transport etc.

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Specifications

TYPE	Ground Independent Colinear
ORDERCODE	RF470
LENGTH	83cm
WEIGHT	300 Grams
TUNING	Pretuned
FREQUENCY	465 ~ 485MHz
IMPEDANCE	50 OHMS
MAX POWER	200 Watts
TERMINATION	PL259 Supplied
PATTERN	Omni Directional
APPLICATION	Mobile or Base
VSWR	<1.5 to 1 Over 18MHz
GAIN	5db

Available from Dick Smith Electronics Cat # D4028

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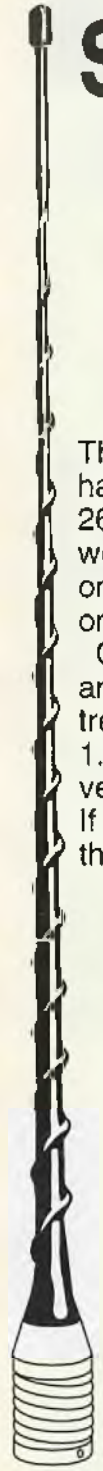

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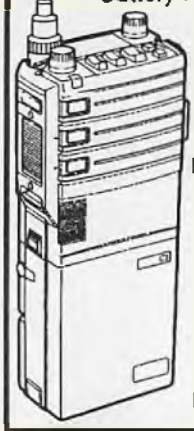

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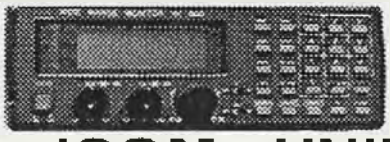
and a Safe and Prosperous New Year in 1994.



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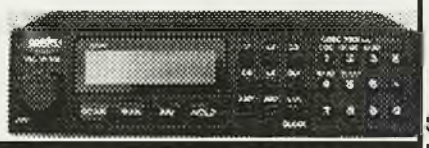

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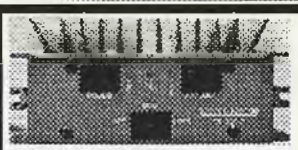

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Tandy Pro-34		$39
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MURPHY'S LAW

The principle that whatever can possibly go wrong will
(Funk and Wagnalls, Standard College Dictionary)

MURPHY'S LAW

If anything can go wrong, it will.
Corollaries:
1.Nothing is as easy as it looks.
2.Everything takes longer than you think.
3.If there is a possibility of several things going wrong, the one that will cost the most damage will be the one to go wrong.
4.If you perceive that there are four possible ways in which a procedure can go wrong, and circumvent these, then a fifth way will promptly develop.
5.Left to themselves, things tend to go from bad to worse.
6.Whenever you set out to do something, something else must be done first.
7.Every solution breeds new problems.
8.It is impossible to make anything foolproof because fools are so ingenious.
9.Nature always sides with the hidden flaw.
10.Mother Nature is a bitch.

THE MURPHY PHILOSOPHY

Smile...tomorrow will be worse.

MURPHY'S CONSTANT

Matter will be damaged in direct proportion to its value.

QUANTIZATION REVISION OF MURPHY'S LAW

Everything goes wrong all at once.

HILL'S COMMENTARIES ON MURPHY'S LAW

1. If we lose to much by having things go wrong, take all possible care.
2. If we have nothing to lose by change, relax.
3. If we have everything to gain by change, relax.
4. If it doesn't matter, it doesn,t matter.

O'TOOLE'S COMMENTARY ON MURPHY'S LAW

Murphy was an optimist.

ZYMURGY'S SEVENTH EXCEPTION TO MURPHY'S LAW

When it rains, it pours.

BOILINGS POSTULATE

If you're feeling good, don't worry.
You'll get over it.

ILES' LAW

There are always an easier way to do it.
Corollaries :
1. When looking directly at the easier way, especially for long periods, you will not see it.
2. Neither will Iles.

CHISHOLM'S SECOND LAW

When things are going well, something will go wrong.
Corollaries :
1. When things just can't get any worse, they will.
2. Anytime things appear to be going better, you have overlooked something.

CHISHOLM'S THIRD LAW

Proposals, as understood by the proposer, will be judged otherwise by others.
Corollaries :
1. If you explain so clearly that nobody can misunderstand, somebody will.
2. If you do something which you are sure will meet with everybody's approval, somebody won't like it.
3. Procedures devised to implement the purpose won't quite work.

SCOTT'S FIRST LAW

No matter what goes wrong, it will probably look right.

SCOTT'S SECOND LAW

When an error has been detected and corrected, it will be found to have been correct in the first place.
Corollary :
After the correction has been found in error, it will be impossible to fit the original quantity back into the equation.

FINAGLE'S FIRST LAW

If an experiment works, something has gone wrong.

FINAGLE'S SECOND LAW

No matter what the anticipated result, there will always be someone eager to
(a) misinterpret it,
(b) fake it, or
(c) believe it happened to his own pet theory.

FINAGLE'S THIRD LAW

In any collection of data, the figure most obviously correct, beyond all need of checking, is the mistake.
Corollaries :
1. No one whom you ask for help will see it.
2. Everyone who stops by with unsought advice will see it immediately.

FINAGLE'S FOURTH LAW

Once a job is fouled up, anything done to improve it only makes it worse.

FINAGLE'S RULES

1. To study a subject best, understand it thoroughly before you start.
2. Always keep a record of data, it indicates you've been working.
3. Always draw your curves, then plot your reading.
4. In case of doubt, make it sound convincing.
5. Experiments should be reproducible, they all should fail in the same way.
6. Do not believe in miracles, rely on them.

WINGO'S AXIOM

All Finagle's laws may be bypassed by learning the simple art of doing without thinking.

GINSBERG'S THEOREM

1. You can't win.
2. You can't break even.
3. You can't even quit the game.

FREEMAN'S COMMENTARY ON THE GINSBERG'S THEOREM

Every major philosophy that attempts to make life seem meaningful is based one the negation of one part of Ginsberg's Theorem.
1. Capitalism is based on the assumption that you can win.
2. Socialism is based on the assumption that you can break even.
3. Mysticism is based on the assumption that you can quit the game.

WE'RE SURE EVERY CBer CAN RELATE TO THE ABOVE GEMS OF WISDOM

Could this really be the "second coming"?

UNIDEN GRANT XL

AN OLD FAVOURITE IS UPDATED

It's just before 8:00am on a sunny Tuesday morning, and I've been listening to a deathly-quiet 27 MHz band for about two hours now. Slowly emerging from the gloom is the familiar background drone of distant stations rising and fading as the Sun prepares the upper atmosphere for the day's proceedings.

A quick check down on 26 MHz reveals the Kiwis are already 'screaming in' from across the Tasman — AM and all.

It's now 8:35am, and back on 27 MHz a few Queensland stations mixed with VK2s are beginning to inch their way over the whine and static as the new **Uniden Grant** threads its way through the increasing jumble of distant stations... Yep, looks like a good day for DX if you don't gotta go somewhere.

Over the past few years your chance to clap hands on a Uniden Grant has been pretty much an ON again, OFF again affair with limited stocks arriving on the shores of Oz in an unpredictable, apparently random fashion. And the market price (when you could *find* one, that is) seemed just as random, ranging from a shade over $200 to about $350.

For such a box full of tricks and its associated performance, a price tag of around $270, given the present economic climate, would be around the expected mark.

Well, after years of complaining in these pages about useless Channel 9 priority switches and 'old hat' fascias, Uniden has finally put all the good features together in an all matt black, restyled package and called it the Grant (Aus).

Take a look at the Grant's portrait above to see a feature-packed front panel where Uniden has still resorted to using two dual concentric controls and leaving the five-pin microphone socket relegated to the left hand side of the case.

Was this just to fit all those knobs and switches on the front? Yep — a look behind the fascia confirms that all the available space has been used.

This new-look Grant appears smaller than its predecessor — probably because of its color — but the measuring tape reveals identical dimensions of 220mm wide by 230mm deep excluding the antenna connector and controls, and 60mm high.

Overall depth is 270mm including

knobs and antenna connector but for installation purposes you will require an extra 30mm to accommodate the mating antenna and power connectors in the back panel. Pretty hefty space requirements by today's standards.

Apart from the complete rearrangement of the control panel and the brushed matt black background, the Grant has been given a scattering of new features — well, new to this model at least.

In the past you were stuck with one level of illumination of the LED display and 'S' meter. A two-position switch now permits BRT (bright) or DIM lighting of the displays according to taste or ambient lighting conditions.

If you are the kind of operator who keeps a bedside vigil on the channels — and probably suffers from CB insomnia — having your rig lighting up the whole room and driving you to distraction could be a part of the complaint! A nice new Grant might just fix that little problem and you can dedicate more effort to listening...???

Borrowed from the Uniden PRO-series CB transceivers (PRO-510/520/640E etc) is the bright yellow/green LED channel display. However, it a bit disappointing to find the attractive and functional back illumination of the controls has been omitted in the flagship of the range.

Our test rig was a pre-production model so perhaps this handy feature will be included in the final design... huh Hmmm... *please*.

An audio pitch tone control has been added in the form of another two-position switch. If you feel a tone control is required on a CB rig, you might prefer a continuously-variable type, but the two selected pitches represent a good choice, and in the LOW mode, sometimes the desired received signal can be enhanced considerably by removing much of the high frequency component of the background crackle and hiss. This control would probably be called a HI-CUT filter in the PRO-640e. Since we did not get an instruction manual with the test rig and the front panel designates the control only as HI and LOW we can only guess at its nominated name.

Somewhere else in the world one of these two-position slide switches is probably labelled CH-9... thank Christ it's not here!

The most significant addition to the Grant is an in-built SWR meter whose function is accessed through a three-position rotary switch located smack in the middle of the main rotary control bank.

The switch converts the metering operation from reading signal strength and RF output to reading forward power, which is calibrated via one of the dual concentric potentiometers and finally, to reading SWR or reflected power.

Or, as my pedantic, Tasmanian critic might say:

"Mr Reynolds is misleading CBA readers by not informing them of the true facts about the type of metering circuit used in CB radios. The meter in itself cannot read signal strength nor power, but is simply sensing voltage across a resistive load ±J (inductive or capacitive reactance), which causes a representative current to flow in the rotor coil of the meter.

This in turn produces movement (described by Len's Law) due to the mutual interaction between the produced electromagnetic field around the fine wire 'moving' coil and the permanent magnet in the meter's magnetic circuit.

And further more... Blah blah blah and, and do be quiet" (The rest of the 2,000 words explanation has been cut due to lack of space. Ed.)

I bet you all feel better informed now.

The Uniden Grant (Aus) is not a brand new rig or anything too radical like that. New designs usually have 'bugs' and take a bit of sorting out. The Grant is built upon a foundation of successful design and construction established over about two decades of CB radio manufacture, and underneath the new clothing is still essentially the old reliable Grant we've come to know and love.

In the same vein that an oil company tells us that 'oils ain't oils', much the same can be said about CB radios. The Grant exhibits subtle differences (which in many cases are sensed rather than clearly defined) from most of its colleagues and rivals. These qualities are difficult to quantify even in technical terms because the usual evaluation routines don't include such tests as squelch 'attack' time constants and filter shape factors and the like which all contribute to an overall 'feel' for a particular item of equipment.

At this point a reviewer's evaluation becomes more subjective than objective, however, comparing opinions and notes from various sources over a long period it is general consensus that the Uniden Grant is one of the 'nicest'-sounding CB rigs on both transmitted and received signals.

INDIVIDUAL FEATURES

The far left-hand control is the microphone gain which allows full control over the transmitted audio and ultimately the sideband RF power output level. If you ever needed a 'power-mike' which was legal yet still transmitted a clean, easily readable signal *this* would be the way to go. Turned fully counter-clockwise the control completely shuts off modulation to the transmitter.

Continued over page...

Could this really be the "second coming"?

UNIDEN GRANT XL

AN OLD FAVORITE IS UPDATED

(Continued from previous page)

A couple of degrees off the stop the rig is teased into about 0.5 watts PEP sideband output which quickly increases with clockwise rotation of the knob. At about mid-position the control assures good strong 95 per cent AM and peak sideband RF output. Further increasing the microphone gain level tends to compress the audio bringing even relatively weak sounds up to full transmitter power output without introducing any real harshness or unintelligibility to the transmitted signal.

The volume (AF gain) produces more low distortion loudspeaker audio than you can comfortably stay in the room with, and in association with sensible use of the noise blanker/limiter and audio high frequency cut (tone) switch most received signals can be accommodated satisfactorily. You can't fix the already dirty, scruffy stuff heard around the band... only an RI can do that.

Indicated Signal Strength	Input Signal in dBm	Input Signal in µV
1	-104	1.5
2	-96	3.8
3	-90	7.5
5	-84	14
7	-76	35
9	-66	105
9+30	-44	1,500

The squelch circuit 'snaps' open quietly and has just the right amount of delay (hysteresis) before closing gently as the received signal strength slides away. The comfortable opening threshold is about 1.3 microvolts — a bit high — and in the maximum or 'tight' condition a huge 1,000 microvolts received signal is needed to open the gate.

The RF gain control range of 52dB is more than adequate for almost any condition the band can dish up. An increase or decrease of 50dB (decibels) is a multiplication factor of 100,000 times an increase or decrease in signal power level.

This much attenuation of incoming signals allows the operator to 'knock out' all but the very worst cases of receiver overload, however the Grant's large signal handling capabilities are so good that you rarely need to use the control for that purpose.

On the same shaft as the RF gain is the SWR meter calibrate control which, in conjunction with the adjacent S/RF - CAL - SWR switch permits you to perform an approximate test on the tuned state of your antenna or other antenna load. While you should not consider this function to be the ultimate in instrumentation it serves as a good indicator antenna condition.

Using our 10 GHz 50 ohm dummy load as a reference the Grant's SWR meter indicated an SWR of about 1.3 to 1.

At 27 MHz the SWR of the Hewlett Packard 50 ohm termination should be almost unreadable with conventional meters.

On a couple of known impedance antennas the test result on the Grant's meter was different from a good external sensor, but near enough for CB applications.

Skipping the AM/USB/LSB mode switch, the clarifier has a quite wide but asymmetrical (lop-sided) range of plus 1,050 Hertz and minus 2,500 Hertz from centre frequency. A bit better centering of the range would be handy.

The main channel selector switch, located directly below the green LED channel display window, is large enough but large fingers might accidentally bump the clarifier off tune (the two dual concentric shaft controls share a similar fate.)

The channel display is set back within the fascia that from some angles of view it can be difficult to read the selected channel number.

The edge-reading meter suffers similarly on one scale but S-meter readings are unaffected from most angles.

The S-meter readings were checked in dBm and micro volts (µV) - see panel below. For those who care, the noise floor of the Grant's receiver is -133dBm and the receiver sensitivity was measured at 0.5 µV on AM and 0.22 µV on SSB. Its resistance to adjacent channel interference is not bad, but hardly compares to the quad-conversion receivers in some of the amateur rigs these days.

Contrary to a recent discussion in these pages recently I would prefer to listen to CB on the Grant than my Gee Whiz $3,000-plus amateur rig.

Except for occasional bleed-over from a few local 'dirty', over-driven signals, I find the Grant more intelligible and much, *much* easier to use.

The Grant's noise limiter and noise blanker work better too, but they are better on AM than sideband where their use is somewhat limited

SUMMARY

Uniden's new-generation Grant (AUS) is similar in performance to its predecessor, but has been redecorated in black with the addition of some new, useful features.

It is a bit large to make the ideal mobile rig — unless you've got plenty of available space — but used as a base station on a mains power supply it will give an excellent account of itself.

An extension speaker makes a nice touch if you want to enjoy the full potential of this solid performer.

NEW MOBILE ANTENNA LOOKS PROMISING

Just prior to going to press and just a touch too late for a review, John Dahl of the Queensland based Commex Communications Corporation sent down what appears to be the most innovative new mobile antenna that we've seen in a long time.

It is model named the SRA 139, is designed and built by Ranger Communications and is arguably the best new item of this type we've sighted for several years.

It is different to other antennas in that it is a "multi-configuration" antenna which means that it is designed to run 500 watts PEP on any frequency from 14MHz to 170MHz, depending on the turns wound onto the coil former.

The actual construction quality is outstanding with a stainless steel whip which can be pulled into a tight circle which, when released, springs back to perfectly straight. All fittings are either brass or heavily chromed plated brass and the antenna definitely looks the part.

The antenna came with some notes from Commex which indicated that in its base loaded configuration they had run 100 watts up the stick for a non-interupted 10 minutes and there was no sign of coil heating or other untoward problems. They also wound one coil up for 35 - 37 MHz (part of the commercial repeater band) and reported that the unit showed a VWSR reading of 1.05:1.

The company also "road tested" the antenna at 100 km/h and reported no wind noise, with the antenna remaining where it should, vertical, without the usual bending caused by wind pressure.

The unit comes complete with SO239 base, boot mount fitting (no holes), three metres of RG58CU cable and a PL259 plug.

The recommended retail price is $86 which, while not inexpensive, would seem to be quite reasonable given the claims made for the antenna.

We'll be testing the unit over the next few weeks with a full report to appear in the next issue of CBA.

REVIEW OF THE

SCALAR OZU-1 OZ-GLASS ANTENNA

By Andrew Ridge

Like anyone who has anything to do with scanning or two-way radio, my last two cars were a fine example of the veritable `mobile porcupine' - antennas everywhere. With my current car, I decided that this was not to be the case - if anything I wanted my activities to be as covert as possible, while still retaining some sort of functionality.

When it came time to get a UHF CB up and running I began looking at alternatives to the normal, common hard-wired antenna.

Wanting it to be inconspicuous, a through-glass antenna started to look (pun intended) rather attractive.

Also, I've come to the conclusion of late that the designers of modern cars aren't radio operators, be it CB or commercial radio.

The absence of gutters have made it almost impossible to mount an antenna short of attacking the paintwork with a drill.

This fact, plus the new-found desire of many for things inconspicuous has created a market for antennas that use a material abundantly available medium in modern cars - glass!

One Australian company that has recognised this market is Scalar, with its OZU-1 OZ-Glass antenna.

A quick bit of history - did you know that the original through-glass antenna was patented for 27MHz CB in the USA?

If you're like me, you would have been surprised to find that it was originally designed for HF frequencies, not the more common 800MHz cellular phone service.

All this took place in Addison, Illinois in March 1978. The patent covering antennas for cellular phones in Australia was lodged in August 1983.

The use of through-glass antennas for 477MHz UHF CB and scanning is one that seems not well supported; a few of the installation companies I spoke to seemed wary to specify them for this use - one even called it a "90 per cent antenna".

True, they may be a compromise in terms of gain and signal strength, but they are a very good one when no other alternative is available.

I know people who are using them though and they are quite happy with the performance; as an example, David Flynn is still using the Larsen through-glass antenna he reviewed many issues ago, with no noticeable degradation in the performance of the CB from when it was first installed.

How a through-glass antenna works is quite fascinating. Without being too technical, it relies on capacitive coupling to send your signal through the glass - with the 'foot' on the antenna being one plate of the capacitor, the glass being the dielectric (insulating material) and the other plate being formed by the coupling box. To make that look good to your transmitter, a trimmer is provided on the coupling box to enable you to achieve that elusive 1:1 VSWR - and you can, as I found when installing the Scalar antenna.

FIRST IMPRESSIONS

When I first looked at the OZU-1, I must say I was impressed with what I saw.

The radiator section is made of black anodized spring steel with a bottom loading coil along the same lines as a Cell-phone antenna.

The coupling box, used inside the car, is a sleek black box not much bigger than two match boxes put end to end. Extending from this box are the ground

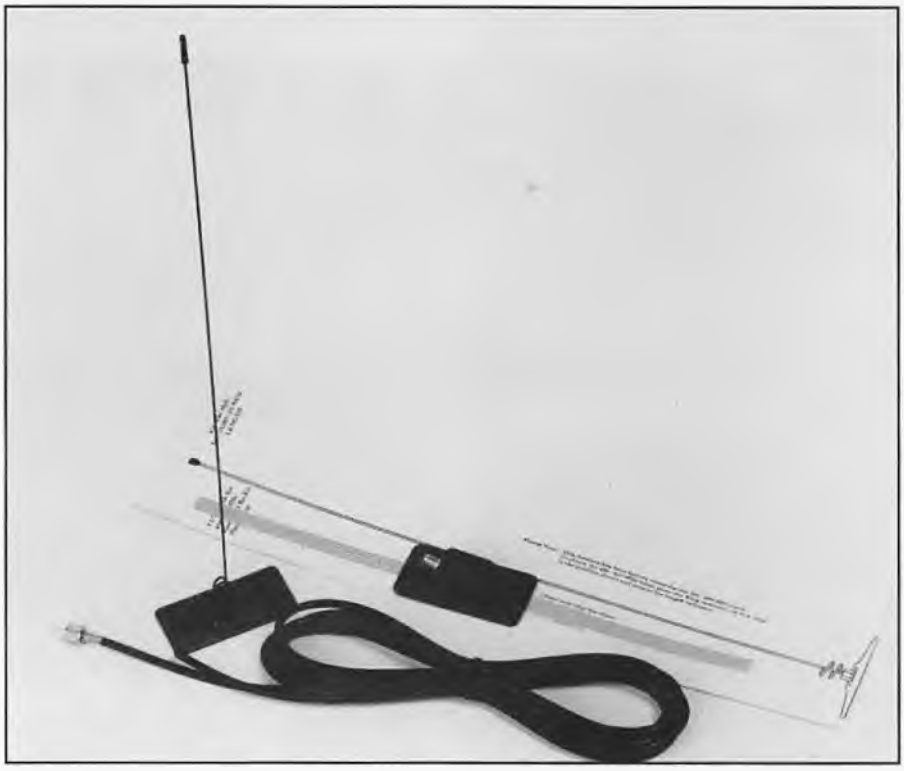
plane radials made of foil strips attached to a mylar-like material which sticks to the window. After reading the specifications, I was even more impressed - the OZU-1 has a frequency range of a staggering 390 to 520 MHz, with a usable VSWR of less than 1.5:1 over a 20MHz bandwidth in this range, which allows me to use it for 477MHz UHF CB, VKG receive, or, when the need arises, on the commercial UHF repeater that I have access to.

Yes, it is the same one that David mentioned recently. Continuing with its specifications, Scalar have given the OZU-1 a maximum transmitter power rating of 100 watts - I doubt that it would be fazed by a 5-watt UHF CB, let alone a 25-watt commercial radio.

To connect the antenna to your transceiver or scanner, Scalar provide 4.5 metres of milspec RG58C/U terminated in a mini UHF connector pre-crimped to suit the connector on the coupling unit.

The other end is left unterminated, enabling you to cut the cable to length and terminate it with a connector to suit your application, be it BNC or PL259.

One thing that had me intrigued, though, was the difference in appearance of the OZU-1 to others I have seen. A quick phone call to the helpful people at Scalar soon had this sorted out - the minor design change to the OZU-1 has given it a slight performance increase, plus enabling the whip to be removed easily before having it minced by your local car wash.



GETTING IT GOING

A word of warning: before installing any through-glass antenna, read the instructions and rehearse what you are about to do; you only get one chance to get it right!

They use what must be the stickiest double-sided tape I have ever used, so one chance is all you are going to get!

Having said that, installation of the OZU-1 took me all of about an hour and I know that in the event of ever being able to afford a new car, Scalar can supply a re-termination kit to allow me to use the antenna again - although after sticking it down (in the light of my previous warning) it will be fun getting it to un-stick, but at least I know it won't decide to leave the rear window as I drive down the local freeway. I decided to check the VSWR of the system after cutting the whip to length, and was pleased to find that it was around 1.5:1.

Obviously, better results can (and are) achieved by using a VSWR meter to tune the trimmer located in the coupling box, and I strongly recommend this if you are going to use the antenna with a transceiver. For scanning use, cutting it to length will be fine.

In use, the OZU-1 performs admirably - only in fringe signal areas would a `hard-wired' quarter wave whip produce better results, both transmitting and receiving. In Sydney, where signals to listen to on a scanner are plentiful, I was hard-pressed to tell which antenna I was using, when comparing the OZU-1 to a quarter wave whip.

Transmitting with it, my range decreased to about 90% of what it was using the hard-wired antenna.

This estimation is based on off-air reports from Russell Bryant, between my home location and his in the Blue Mountains, west of Sydney - a good test of any antenna.

A GREAT ALTERNATIVE

Scalar has itself a winner with the OZU-1 OZ-Glass antenna for those who want an alternative to drilling a hole in the car. The only addition to the kit that I could suggest would be some way (like self-adhesive clips) to attach the cable from the coupling box to the window when it is not possible to route the cable any other way, like under a trim.

Otherwise, sending your RF through your car window is very much a viable alternative with an excellent product like this. My thanks go to Scalar for supplying the review antenna and having the patience to answer my questions.

The OZU-1 antenna is available from Scalar agents like Dick Smith Electronics (Cat No. D4019, $69.95) and is well-worth considering for your next installation.

Bandspread

By Greg Towells

The UF-2020E UHF CB has been available for quite some time now as just the 2020, however some type-approved mods have been carried out to the model to improve performance and features, hence the addition of 'E' to the model number.

Among the improvements made are the ironing out of bugs in the transmit side, receiver selectivity and sensitivity improvements and transmit power increased to close to the legal limit. The main addition to the unit however, is the incorporation of Police receive only! This alone makes the unit very attractive indeed, giving the user the ability to maintain communications as well as be informed as to the status of local and city-wide police operations.

Readers looking to install a UHF CB in their vehicle would do well to give the UF-2020E consideration given the severe lack of space in today's modern cars. This radio has the ability to be remote-mounted, and comes complete with all the necessary brackets and cabling, all ready to install and go.

The remote head of the transceiver simply unscrews from the rest of the transceiver, so all you have to do is find a place to put it and run the cables. This remote-mounting package comes as standard with the UF-2020E, so there's no more money to shell out.

I would suggest that users take the trouble to install an external speaker, though, since the inbuilt speaker is rather on the tinny side and hard to hear over the noise of an operational vehicle. Mind you, most radios which end up doing service in cars would probably benefit from the addition of an external speaker anyway.

Thin audio aside, this radio is full of special functions and features. Some of the features would rarely be used, so you set them up the way you want them initially then forget them. This makes it a better radio for mobile usage.

In my opinion, this is an ideal radio for the confirmed button-pusher (no, *not* the PTT button!), since there are so many parameters that can be changed if required, such as timeout timer, squelch mode (the speed at which the squelch reacts), manual squelch and setting the CTCSS and Selcal codes.

All the radio's features are set or changed by five multi-purpose panel buttons and the use of the channel selector control. Has that confused anyone? It certainly struck me as a different way of doing things. Let's look at an example.

Since this radio does not have a variable squelch control, you have to set it to a preset level of your choice. Basically, you select channel 8 on the display and hit function and the select button together to set the appropriate squelch level.

By altering the channel selector from 00 (which gives you open squelch) to 40 (flat out, full squelch) you choose which level of squelch you want. Then you hit the call button to save the setting.

You use the same procedure for setting the 'instant channel access' channel. Just select channel 5 on the display then hit the function and select keys together then move the channel selector to the channel you want to memorise for this feature. It's all quite simple after a bit of use.

If things get too confusing, or if you lose the plot completely, you can return the radio to factory default settings or clear all the memory channels.

The only thing is remembering the channel number for each feature, or indeed using many of the other features including activating the scan functions. Fortunately, at the back of the instruction book is a quick reference guide which is very handy.

ACCESSING ANOTHER FEATURE

Embedded within the frequency selection circuitry of your UF-2020 transceiver is additional information which, when accessed through the keypad functions, can provide a range of extra *receive only* channels beginning at 467.850MHz and incrementing in 25kHz steps per channel. The additional channels are displayed 41 through to 99.

To access these channels - with the transceiver operating;

Select channel 3
Press **FUNC**
Press **CALL**
Turn off the transceiver.
Wait about four seconds for registers to clear.
Turn radio on.

The channels should now read from 00 to 99.

To cancel this function, repeat the above process but press **CALL** twice and standard functions should be restored.

Other aids to the correct programming and operation of this radio come in the form of LED indicators and tones. There are LEDs for TX and Selcal (if fitted), memory/instant channel change, duplex and repeater reverse, scan and priority operation and another to indicate when the function mode is activated during the programming sequence.

Andrews Communications' UF2020E is basically a well sorted (enhanced) standard UF2020 with a claimed performance improvement. The "police receive" facility is available on standard rigs (read article).

Continued on page 19

The beeps which issue forth from the radio are interesting though! A high beep means that a command has been enabled and accepted, meaning you did it right. A low beep means a command has been accepted and the function disabled (turned back off again). Three high beeps indicates a user error, a low-high-low beep sequence indicates return to normal VFO mode and two high beeps indicates the radio is in memory mode.

The scan and priority channel functions are very useful in this radio, particularly in view of the police receive capability. Channels can be stored in memory and scanned, or *all* the channels can be scanned in the one operation with bucket-mouths locked out with the push of a button.

The priority channel function is one of the most flexible I have ever come across on a scanner type radio yet. There are four selectable modes available for priority channel operation. Basically, two of the modes will check the priority channel if there is no signal on the current channel. If there is a signal on the priority channel, one mode will lock onto to that channel, while the other will beep three times and return to what the radio was doing previously.

The other two modes operate exactly the same, except they will check the priority channel even if the current channel is receiving a signal. That may sound confusing but it is great in practice.

Other good features for mobile users are one-touch instant channel recall, reverse repeater function and activation of scanning. All the variable parameters that you have spent ages setting are saved by turning the radio off by the vol/off control. The radio emits a hiss and the call LED flashes to reassure you that everything has been saved. Of course, I fell for the trap of turning it off at the power supply and everything went back to default setting...

Overall, I enjoyed this radio — particularly its flexibility and its ability to change so many radio settings.

The UF-2020E is available from **Andrews Communications** for **$399.**

PHONE PATCH INFO...

For all the readers who asked for further information regarding the phone patch unit I reviewed some issues ago, here it is:

The **SDP-600** Phone patch is available from J-COM, PO Box 194C, Ben Lomond, California 95005-0194, USA. At the time of writing the advertised price for the unit was US$249-95, but remember, you'll need to pay both import duty and stamp duty if you plan to import one of these units. *(Here's a tip: you can very simply import items worth*

THE MAN FROM GIANTSPARK

I spotted this little treat circulating on the packet radio network, and it fits UHF CB just as well as amateur radio:

It was the man from Giantspark
That struck the repeater clown
He scanned the channels in every park
He scanned them up and down
He listened here, he listened there
'Til he was like to drop
Until at last in great despair
He sought a Radio Shop
"Ere sell me one of them little beams
Or p'raps a DF loop
I'll find this bally repeater fool
Even if I have to snoop"
The repeater clown was small and flash
As most fools usually are
He wore a strike yer fancy sash
He smoked a huge cigar
He was a humorist of note
And keen on ree part tee
He laid the odds and kept a tote
Whatever that may be
And when he heard our friend arrive
He whispered here's a lark
I'll blow his hand-held completely up
This man from Giantspark!
There were some sandbaggers
That sat on the repeater side
Their eyes were dull, their heads were flat
They had no brains to hide!
To them the loonie passed the word
His voice amongst the noise
"I'll make this yokel's voice all slurred
Just watch me all you boys"
He raised his power, his brow grew black
He made an awful tone
Then jammed his index finger
Upon the microphone!!
Upon the frequency
It made a dreadful row
Just like a dreaded yowie
That'd just been kicked by a cow!
No doubt it fairly took him in
This man from Giantspark
He'd never heard such an awful din
As he staggered in the carpark!
He fetched a wild up country yell
'Twould wake the dead to hear
And quickly grabbed his headphones off
That were stuck from ear to ear
He struggled gamely to his feet
And swung the loop about
And zeroed in on the domicile
That hid the repeater lout
He lifted up one hairy paw
And with one tremendous clout
He landed on the loonie's jaw
And knocked the loonie out!
He set to work with tooth and nail
He made the place a wreck
He kicked the loonie's linear
And smashed it on the deck
An RI that heard the din
Came in to see the show
He tried to run the bushman in
But he refused to go
And when at last the loonie spoke
And said "'Twas all in fun
'Twas just a harmless little joke
A trifle overdone"
"A joke!", he cried
"One night I'll catch
This mongrel shark
At home in Giantspark"
And now while round the clubhouse floor
The listening hams all gape
He tells his story 'or and 'or
And brags of his escape
"Them repeater clowns what
keeps the tote
By George I've had enough
One tried to send an awful note
But lucky my ears are tough!!"
And whether he's believed or not
There's one thing to remark
That repeater loons are scarce about
Way up at Giantspark!!

Poem destruction by interstate truckie Ian, VK2XB, with apologies to 'Banjo' Patterson.

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Bandspread

Continued from page 17...

less than A$400 if they're posted here — but only posted. Check with the Post Office for details. Ed.)

Any reader looking for the schematic diagram for the unit, or whether it will work in their situation or with their particular radio setup should direct their queries to the address quoted for J-COM. Since reviewing the phone patch many months ago, I have received a lot of inquiries about this device and, unfortunately, since I do not have the unit now or any of the paperwork associated with it, I cannot answer any further questions about it. For those interested, the company J-COM advertises products ranging from the previously-reviewed phone patch, to automatic notch audio filters, to disguised decal antennas, and 'ventriloquist devices' to record frequently repeated on-air statements such as CQ DX type calls so you don't have to use up your voice quite so quickly!

The disguised decal antenna looks to be an interesting product. Basically the product is an antenna for a specified VHF or UHF band which looks exactly like any type of sticker and it attaches to the inside of your windscreen, safe from vandals, thieves, car washes and low garage doors. The 'antenna' is around 10cm square and a few millimetres thick and is of a multi-polarised design and is claimed to reduce signal fades and flutters under mobile conditions. The decal is manufactured from etched polyamide with an anti-corrosive graphite-colored coating, and optionally can have the familiar *Warning — this vehicle is fitted with an alarm system* alarm sticker advice to further the disguise.

Amazingly, this antenna is rated up to 100 watts, depending on model and band. At present the disguised decal antenna is only available for the VHF/UHF amateur bands, however this may be very suitable for mobile scanning work, or possibly UHF CB. Again, inquiries to J-COM at the above address.

CALLBOOKS ON DISK

Seems that the computer is invading just about every corner of society, for good or bad. The latest is the release of the Australian Amateur Radio Callbook *on disk*.

A company called Alert Radio Systems has put together a listing consisting of three files, one a general listing of all calls, one of beacons and another for all repeaters. The beacon listing shows power, antenna polarity and location and the repeater listing contains details of power, location and licencee. These databases come in dBase IV V2.0 format, but on request can be supplied in text, PFS, or many other formats and are shipped on 3.5" or 5.25" disks.

Cost is $25 including postage for the dBase format and other formats are $27.50.

Alert Radio Systems also offers customised frequency and user lists covering the spectrum from HF to SHF which can include anything from police, land mobile or satellites.

Data can even be supplied on a suburb-by-suburb basis for any service, which would be quite useful for scanner users or simply anyone wondering who all these broadcasters in the FM band are! Listings containing just about any frequency or user allocation including licensee or location can be supplied.

Alert Radio Systems can be contacted at PO Box 491, Ryde, NSW 2112.

CELLULAR PHONE MONITORING

I assume by now that most scanner users are aware that monitoring of cellular, or *any* other telephone network traffic is illegal and you are naughty if you do it. Surely, by now most cellular phone users are aware that their conversations are far from private as well.

If any cellular users still think that theirs is a private medium, or that the frequency changing which occurs often during cellphone use assists with privacy, then this little bit of info might just change their minds for good:

A device is available in the USA that will enable the scanner user to 'target' a specific cellular phone user. Note that in the States it is illegal to even sell a scanner that is capable of reception in the 820 to 900 MHz range, so this is quite a step! The device is manufactured by a company called **Custom Computer Services** in Milwaukee. The device is called a 'digital data interpreter' and it allows the scanner user to decode the cellular phone data channels. These data channels are the frequencies with the unusual annoying tones that you might have heard in the middle of the cellphone band if your scanner accidentally slipped and scanned through the high 800 MHz area.

The unit takes the audio from your scanner, decodes it and displays the information on your computer. The digital data interpreter will reveal details such as phone numbers (known as MIN), power output of the cellphone, and what channel the phone will change to as it moves into a new cell. The unit will interface to superscanners such as the AOR-3000A and the Icom IC-R7000 to automatically follow a cellphone call from cell to cell *uninterrupted*.

The unit retails for around US$330. Cellphone users who want further info on how easy it is to violate their privacy can write to CCS, PO Box 11191, Milwaukee, Wisconsin 53211, USA.

PRO-2021 MOD

This is a modification to speed up the scan rate on the Realistic PRO-2021 scanner. The scan speed will be increased to around 11 channels a second which is a good improvement over the old speed. The mod does not have any effect on the delay time. Right, on with the mod:

- **Unplug the radio and remove the 9 volt battery.**
- **Remove the upper case by removing the four screws on both side of the outer case, as well as the one screw on the rear of the radio which fastens the upper case to the body of the unit, then lift the top case section and unplug the white plastic dual conductor speaker plug, and remove the upper case.**
- **With the scanner sitting upright and facing you, locate resistor R147, which is a 39k resistor to the left front of the main board. It is very close to the rear of the LCD display.**
- **Snip the leads at the resistor body with a pair of wire cutters so as to leave as much of the existing leads as possible.**
- **Finally solder a 15k resistor across those cut leads.**
- **Reassemble the scanner, remembering to plug in the speaker leads again, and enjoy!**

A BOOK REVIEW WITH A DIFFERENCE

RECEIVING ANTENNA HANDBOOK

By Joe Carr

Normal style "book reviews" are limited in the information they provide to the reviewer's personal opinion so, as a change, we have reprinted a chapter from Joe Carr's "Receiving Antenna Handbook" so that you can see exactly what sort of information it contains. We think it's a very worthwhile addition to any radio enthusiast's library.

DIRECTIONAL ANTENNAS

Directional antennas are those in which the reception pattern can be directed or steered to a specific region of the universe.

The reason that we want to be able to direct the pattern is two-fold. In the main beam (or "lobe") of the antenna pattern, signals will be louder. This is because there is a gain associated with the antenna. The other reason is that a null—a point of minimum pick-up—exists in the pattern and it can be positioned towards an interfering station. In this chapter we'll take a look at several popular directional antennas.

ROTATABLE DIPOLES

The half-wavelength dipole is probably the most popular single type of directional antenna in the shortwave bands. It has a "figure-8" directional pattern (azimuthal) consisting of two maxima at right angles to the wire, and two minima (nulls) off the ends of the wire. If the dipole can be rotated, then the nulls and the maxima can be positioned for best signal reception.

Figure 10-1 shows a rotatable half-wavelength dipole that can be built at frequencies as low as about 13 MHz, although it is probably easier to construct the antenna at the 18 MHz band and up. (At lower frequencies, the elements get too long for simple construction practices.)

The antenna elements are made from 3/4-inch to 1 1/4-inch aluminum tubing. Each element is a quarter-wavelength long. The aluminum tubing is mounted on a piece of 1x2 pressure treated lumber. A pipe floor or ceiling flange makes a decent center mount for smaller antennas (such as for the 13-meter band) while the matching pipe serves as a mast.

Rotation of the antenna can be by either of two methods.

The "Armstrong" rotor consists of a good gripping wrench or pliers and some elbow grease. Don't laugh—I've known both hams and SWLs who would open an upstairs window and use a vise grip wrench to turn the antenna mast to point the antenna in the right direction. The other method is to buy a regular antenna rotator.

For lightweight antennas (above 20 MHz), an ordinary television antenna rotator will suffice, but for larger antennas a heavy duty ham radio rotator is required.

PARASITIC BEAM ANTENNAS

If an array of two or more antenna elements is arranged so that only one element, such as a dipole, is connected to the receiver or transmitter, then it is called a parasitic beam antenna. In these antennas, the element connected to the receiver is called the driven element, while other— parasitic— elements are called either reflectors or directors depending on their placement. These elements are said to be parasitic to the driven element because they are not directly connected to the receiver or transmitter, but instead are electromagnetically coupled to the driven element.

The reflector elements are tuned to a slightly lower frequency than the driven element and tend to be about 4% longer than the driven element.

Similarly, the director elements are tuned to a slightly higher frequency and are about 4% shorter than the driven element. There can be any number of reflectors and directors making up a parasitic beam antenna.

The radiation characteristics of the parasitic beam antenna are approximately unidirectional.

The pattern is a function of the relationship between the phases and amplitudes of the currents flowing in the various elements. The pattern is altered by the tuning and position of each parasitic element. In general, the parasitic elements are located between 0.1λ and 0.26λ, with 0.15λ being very popular. There are two basic forms of parasitic antenna which we will consider: *Yagi-Uda* ("Yagi") beams and *quads*.

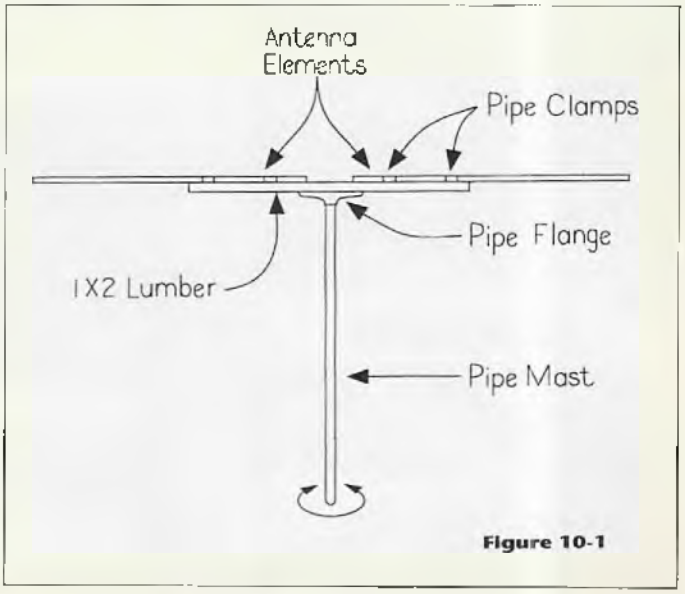


Figure 10-1

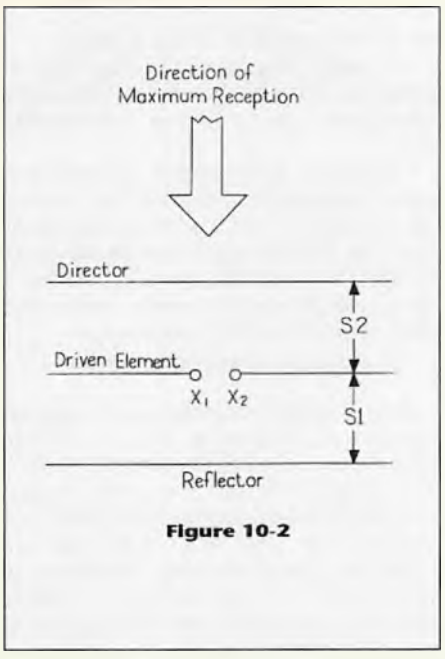


Figure 10-2

The Yagi antenna shown in **Figure 10-2** consists of two or more half-wavelength dipoles arranged parallel to each other. The driven element is fed at the center at points X1 and X2. These antennas can be constructed of either wire or aluminum tubing, although rotatable Yagis are usually made of tubing. This type of antenna should be operated at a height of λ/2 or more above ground at the lowest frequency of operation.

The lengths of the elements are found empirically, but the starting points are approximated by:

Driven Element:

$$L_{feet} = \frac{475}{F_{MHz}}$$

Director Element:

$$L_{feet} = \frac{456}{F_{MHz}}$$

Reflector Element:

$$L_{feet} = \frac{500}{F_{MHz}}$$

Additional directors are sized to be 4% shorter than the director one space closer to the driven element, while additional reflectors are 4% longer than the next reflector.

The direction of the maximum receive sensitivity, and maximum radiation on transmit, is in the direction away from the reflector and towards the director. The elements are spaced approximately 0.15λ apart. In this case, the gain of the Yagi will be optimized at 5.8 dB for a two element model and 7 dB for a three element model. Additional elements add gain, as does "stacking" two or more beams (about 3 dB per stack if done correctly). Yagi beam antennas can be either horizontally or vertically polarized, although the horizontal version is the most popular (except on the 11-meter citizens band).

Yagi beams can be operated on multiple bands using tuned traps, similarly to the trap dipoles discussed earlier. Amateur radio operators often use multiband, multi-element Yagi beam antennas for their operations. Yagi beam antennas can also be shortened by inserting inductors in the elements. Similarly, the inductance can be provided by helically winding the wire along the length of an insulating element. By using this method, low frequencies can be accommodated, although at the cost of lost bandwidth.

The impedance at the feedpoint of the Yagi beam antenna is lower than the 75 Ω one normally expects of dipole antennas. Values of feedpoint impedance of 12 to 60 Ω are found, depending on the number of elements and their relative spacing. This impedance can be measured, and an impedance transformer or

Continued over page...

Driven Element:

$$L_{feet} = \frac{1005}{F_{MHz}}$$

Director Element:

$$L_{feet} = \frac{975}{F_{MHz}}$$

Reflector Element:

$$L_{feet} = \frac{1030}{F_{MHz}}$$

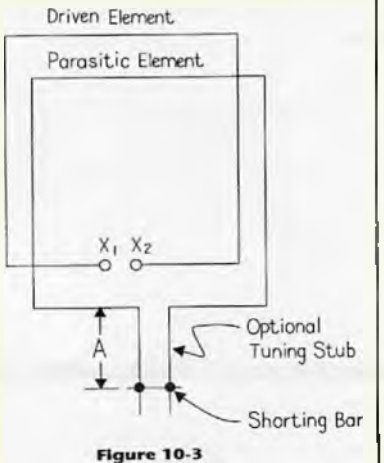


Figure 10-3

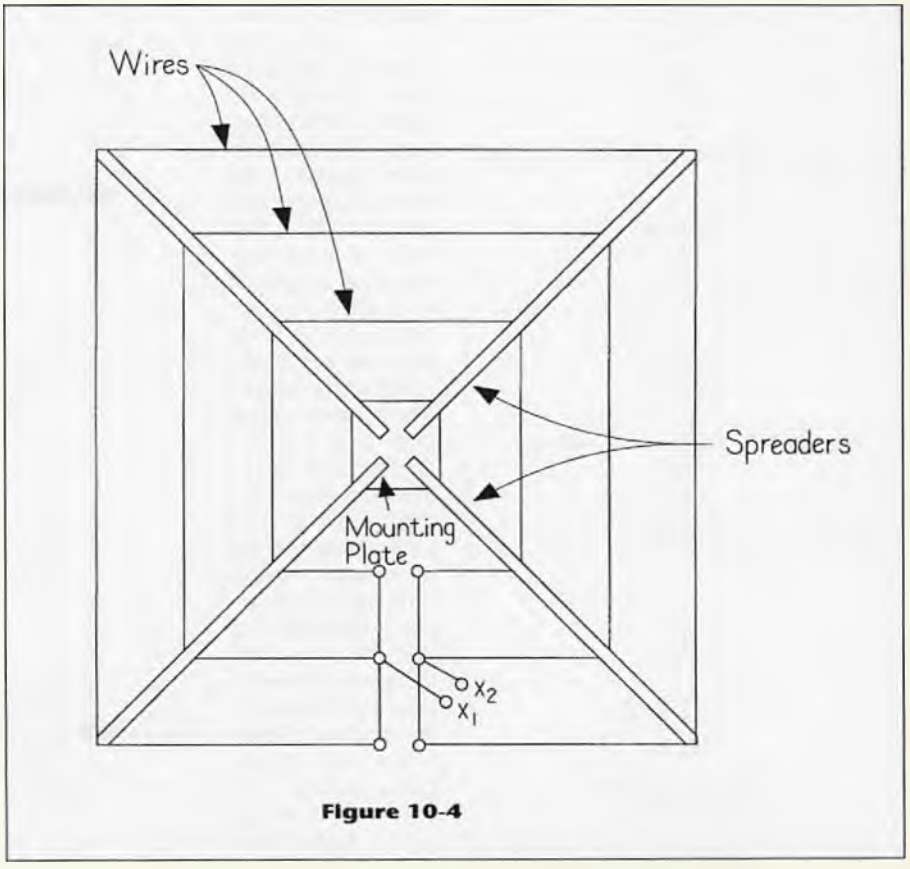


Figure 10-4

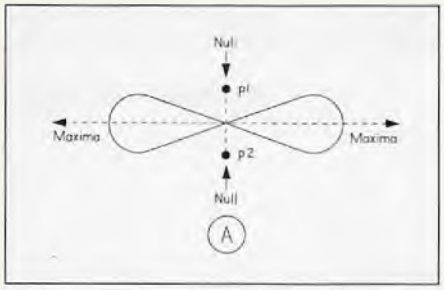
A BOOK REVIEW WITH A DIFFERENCE

RECEIVING ANTENNA HANDBOOK

Continued from previous page...

balun provided to match it to 50 Ω coaxial cable. There are other matching methods—such as the gamma match, omega match, and hairpin stub—but these tend to get a bit dicey to build.

Quad beam antennas are full wave loops (**Figure 10-3**) rather than half-wavelength dipoles. The quad antenna was invented in the late 1940s by engineers for the missionary shortwave radio broadcasting station HCJB in Quito, Ecuador. HCJB was troubled by RF corona arcing of the Yagi beam antenna elements at their ends in the rarified high altitude atmosphere of Quito. By making a current mode loop antenna, the high voltages at the tips were avoided (there are no tips in a loop).



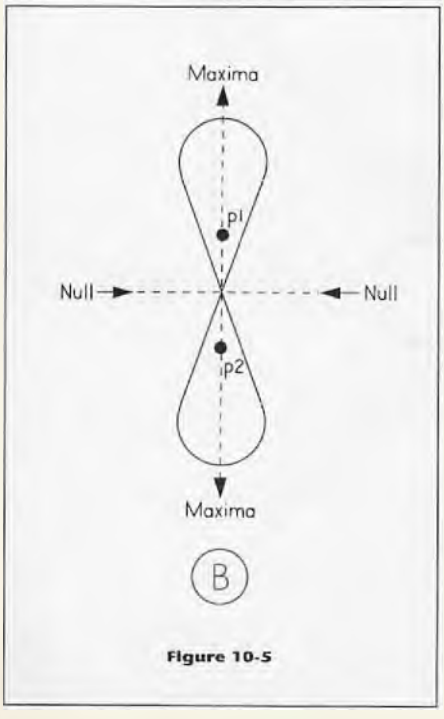


Figure 10-5

The loop lengths (i.e., entire perimeter) can be found by the formula in **Figure 10-3.**

These lengths are the entire loop length, rather than each side. The length of the individual sides are one-fourth of the lengths calculated by the equations above. The antenna can be tuned by adding a quarter-wavelength tunable stub ("A") to one side of the reflector element, although this stub is considered optional by some experts.

The feedpoint impedance of the quad antenna will vary from about 40 Ω to around 90 Ω, depending on the spacing of the elements. These antennas are therefore reasonable matches to either 52 Ω or 75 Ω coaxial cable. In some cases, however, an impedance transformer or matching stub is used to improve the situation. A popular impedance matching method is to use a quarter-wavelength piece of 75 Ω coaxial cable at the feedpoint, and then 52 Ω coaxial cable from the open end of the 75 Ω section to the receiver. The length of the 75 Ω portion is reduced by the

$$L_{feet} = \frac{246V}{F_{MHz}}$$

velocity factor of the coaxial cable:

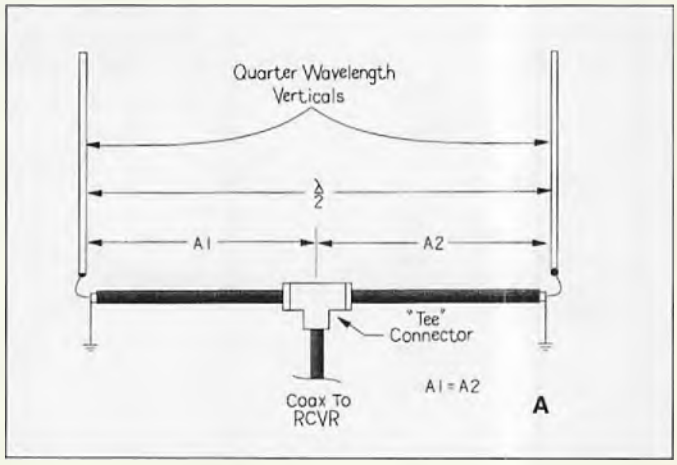
Multiband quad antennas can be built from a common mounting scheme (**Figure 10-4**). The wires of each band's antenna can be connected in parallel to the transmission line (points "X1" and "X2"). The spreaders are made of fiberglass, although at one time bamboo poles (used in the carpet trade) were quite popular. Unfortunately, bamboo poles are a bit hard to find these days and the cardboard rolls now used by carpet makers are not suitable. The mounting plate can be a thick piece of plywood or a fiberglass or metal plate. Check the amateur radio or SWL magazines for current suppliers of these items.

Hardware to make either Yagi or quad antennas can be obtained by salvaging parts from used amateur radio antennas.

I've seen a large amount of such hardware at hamfests and other "flea market" get togethers, and the stuff is generally low cost. The elements can be either cut to SWL frequencies, or the basic hardware used to support newly constructed elements cut to SWL frequencies.

PHASED VERTICAL ARRAYS

Can a vertical antenna owner get the benefit of directivity without a huge investment in a tower mounted with a Yagi beam or quad? The usual solution is to use phased verticals. AM broadcast stations with more than one tower are using this type of system. The idea is to place two or more antennas in close proximity and feed them with currents at specific phase angles to produce a desired radiation pattern. A lot of material is available in the literature on phased vertical antenna systems, and it is far too much to be covered here. There are "standard patterns" dating from before World War II that are created with differ-



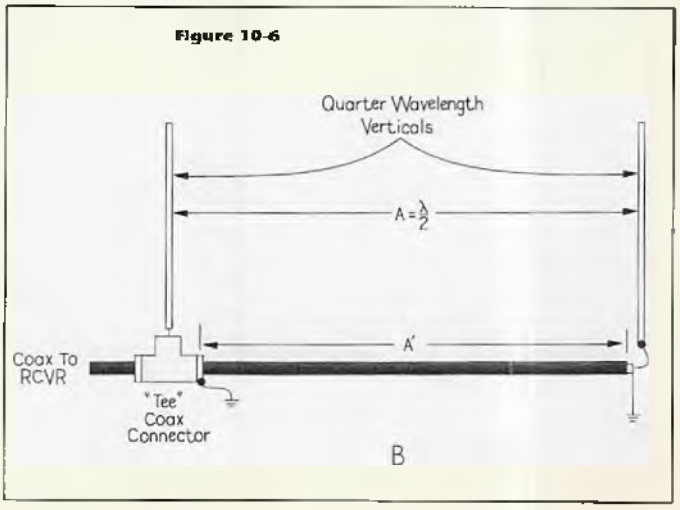


Figure 10-6

ent spacings and different phase angles of feed current. In this chapter, we will consider only one system.

Figure 10-5 shows the patterns for a pair of quarter-wavelength vertical antennas spaced a half-wavelength (180°) apart. Without getting into complex phase shifting networks, there are basically two phasings that are easily obtained: 0° (antennas in-phase) and 180° (antennas out of phase with each other). When the two antennas (P1 and P2) are fed in-phase with equal currents, the radiation pattern (shown somewhat idealized in **Figure IO-5A**) is a bi-directional "figure-8" that is directional perpendicular to the line of centers between the two antennas. A sharp null exists along the line of centers (P1 -P2) . When the antennas are fed out of phase with each other by 180°, the pattern rotates 90° (quarter way around the compass) and now exhibits directivity along the line of centers (P1-P2). The interference canceling null is now perpendicular to line P1-P2.

It should be apparent that we can select our directivity by selecting the phase angle of the feed currents in the two antennas. **Figure 10-6** shows the two feeding systems usually cited in books for in-phase **(Figure 10-6A)** and out-ofphase **(Figure 10-6B)** systems. In **Figure 10-6A**, we have the coax from the transmitter coming to a coax Tee-connector. From the connector to the antenna feedpoints are two lengths of coax (A1 and A2) that are equal to each other and identical. Given the variation between coaxial cables, I suspect that it would work better if the two cables were not merely the same length (A1 = A2) but also came from the same roll!

The second variation, shown in **Figure 10-6B**, supposedly produces a 180° phase shift between antenna P1 and antenna P2, when the length is an electrical half-wavelength. According to much-publicized theory, the system of **Figure 10-6B** ought to produce the pattern of Figure 10-6B—yet experience shows "t'ain't always so." It seems that there are a couple of problems with the system in **Figure 10-6B**. First, remember that coax has a velocity factor (VF) which is the fraction of the speed of light at which signals in the cable propagate. The VF is a decimal fraction on the order of 0.66 to 0.82, depending upon the type of coax used. Unfortunately, the physical spacing between P1 and P2 is a real halfwavelength (A = 492/F), while the cable length is shorter by the velocity factor (A' = ((VF) x 492)/F) . Consider an example. A 13-meter band (21.65 MHz) phased vertical antenna system will have two 11.4 foot radiators spaced 22.8 feet apart (approximately, depending upon exact frequency) .

If we use foam coax, with VF = 0.80, the cable length is (0.8) x (22.8 feet), or 18.25 feet.

In other words, despite lots of publicity, the darn cable won't fit between the towers.

Second, the patterns shown in **Figure 10-5** are dependent upon one principal condition: the antenna currents are equal. If both of them are the same impedance, and are fed from the same transmitter, then it is reasonable to assume that the currents are equal—right? Wrong! What about coax loss? Because of normal coax loss, which is worse at higher frequencies, the power available to antenna P2 in **Figure 10-6B** is less than the power available to antenna P1. Thus, the pattern will be distorted because the current produced in P2 is less than the current in P1, where they should be equal.

The first problem is sometimes fixed by using unequal lengths for cables A1 and A2 **(Figure 10-7)**, and using it for the out of phase case.

For example, if we make A1 a quarter-wavelength, and A2 a 3/4-wavelength, antenna P1 is fed with a 90° phase lag (relative to the Tee connector signal), while antenna P2 is fed with a 270° phase shift.

The result is still a 180° phase difference. Unfortunately, we have not only not solved the current level problem, we have actually made it worse by adding still more lossy cable to the system.

There is still another problem that is generic to the whole class of phased verticals. Once installed, the pattern is fixed. This problem doesn't bother most point-to-point commercial radio stations or broadcasters because they tend to transmit in only one direction. But we are most likely to need a rotatable antenna pattern. Neither **Figure 10-5A** nor **Figure 10-5B** is rotable without a lot of effort—like changing coax feeds around (or physically digging up the verticals and repositioning them?).

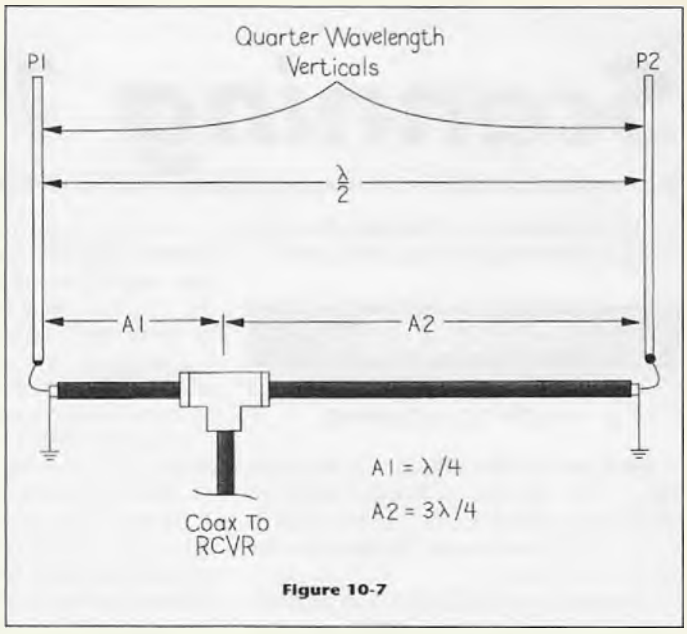


Figure 10-7

The pattern of a pair of phased vertical can be steered considerably (20 to 70°) by inserting a phase shift network in series with either antenna's coaxial cable before it inputs to the phase control box. Various RLC networks can be used for phase shifting, but the coaxial cable version of **Figure 10-8** is quite simple. Cut up a halfwavelength piece of coax and fit the ends with coaxial connectors. Connect the coax junctions, via Tee connectors, to a coaxial switch (S1).

Adjustable phase control is obtained by selecting how many segments are switched into the circuit at any one time.

Joe Carr's Receiving Antenna Book is DSE catalogue # B-2045 and it sells for $39.95.

As you can see, it is easy to read, easy to understand and well illustrated - it deserves a place in your shack.

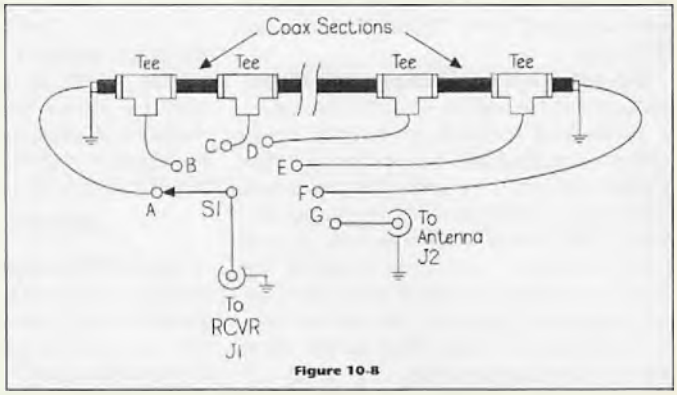


Figure 10-8

Scanning 1994

By Russell Bryant

All frequencies are FM and all times are local unless stated otherwise.

MAILBAG

SILVER CITY SCANNING

First out of the bag is a letter from Tony, who resides in the far-western NSW town of Broken Hill. He has sent in a list of the most-used frequencies for the mining center.

The police use 83.760 for local taskings, 169.450 for cross-border with the SA Police. Fire Brigade 78.040 and 471.350 hand-held, Ambulance 76.670, SES 171.330, Broken Hill City Council 83.580, City Electricity 82.800 and 149.150 link, Broken Hill Water Board 73.220, RTA 460.950 link, Telecom 158.680 and 472.0625, Royal Flying Doctor Service 159.730 Air to ground and 485.200, Broken Hill Hospital 474.800, Corrective Services 78.850, School of the Air 78.665, Airport 122.600 FIS, 132.800 Adelaide Control. A number of security groups operate in the city; they are Armaguard 161.4375, Silver City 476.325 and finally Pasminco 469.475.

SIGNAL DRIVER

AE, of Adelaide SA has a question about changes to the STA Bus radio. It appears the transit organisation is now transmitting the time every hour on the hour, as well as a form of Selcall. Any information about the new procedures would be welcomed.

DISCONE DILEMMA

BP, of Kipparing QLD has a question about a comment I made in a past issue regarding the removal of the top whip element from Diamond and Icom discones.

He asks the advantages and disadvantages in taking the whip off the top.

First and foremost, a discone is based on a tried-and-true formula: it has a **disc**, which is a vertically-polarised wide-band (within reason) receiving element. The **cone** becomes the ground element, which essentially turns the whole unit into a dipole. Altering the pattern alters the characteristics of the aerial. Once the top whip goes on the thing it's is no longer a discone.

A discone is/was not designed to operate over the huge frequency range that today's scanner can receive. The fact that they *do* is something of a bonus for those who use discones. The operating range of the average discone is roughly 100 to 500 MHz, plus or minus a bit, depending on element size.

The top element is an attempt to extend the receiving range of the antenna down below the 100 MHz limit.

Several enthusiasts, including yours truly have recorded degradation in UHF frequencies when the top whip is in situ. Removal showed a marked increase in the quality of UHF transmissions.

No other alterations were made to the aerial. Removal of the whip is purely subjective and dependant on your listening habits, location in relation to weak or low power signals and the need to hear these signals effectively. Disagree Mudguts?

(Mudguts might not disagree, but there's a school of thought that says the Icom AH-2 discone has a whip on top so that it tunes correctly on two metres! It's designed to transmit on the 10, 6 and 2 metre bands and on 23 and 70cm amateur bands. Without the whip it simply wouldn't work on two metres or down. According to Icom, that's the reason it's there... Editor)

FOREIGN CORRESPONDENT

Now for something completely different: BD, from Jakarta, Indonesia writes listing some of the services which can be monitored in the Indonesian capital. The term 'police' can refer to several law enforcement groups, including military, civil and traffic authorities.

Police 163.650, 163.700, 163.850, 457.300, Radio Sonora 100.9 FM, Sonora's in-house radio 442.775, Taxis 452.150, air-to-ground 119.300 AM and 120.500 AM. Cellular telephones are the same as Australia (870-890 with 30 kHz steps). A mobile telephone service can also be found around 154 MHz. The majority of radio activity in Jakarta can be found in the 150-170 MHz band and the 400-480 MHz band. More later.

PHONES AND MORE...

CC, of Bendigo Vic was searching between 450 and 460 MHz when he located what sounded like cellular telephone conversations, and he wonders if it is legal to listen.

Firstly, cellphones only operate in the designated band 870-890 MHz. What our reader could have been listening to are RF links used in the **Rural Telephone Service.**

The cost of running land-based telephone lines to many properties located in the bush is prohibitive. RF links are cheaper and easier to install, maintain and control. These links are located throughout the VHF and UHF bands.

And yes, it *is* illegal to listen. By the way, Bendigo Ambulance operates on 76.910 for primary response and 412.475 for hand-helds.

PRO PROBLEMS...

SA, from Robina QLD is interested in hearing from anyone who has a **Realistic PRO-2004** which is not working. He is interested in purchasing these radios for parts.

He is also chasing a service manual for the 2004. If anyone has either item write to me here at SCAN and I will forward the letter on. Please enclose a stamped blank envelope so I can re-address your mail.

CHARGE IT...

RB, of Bicton WA has a Tandy PRO-38 and a Bearcat 100 XL. He would like to know the correct voltage to use to charge the internal NiCd batteries, as well as the polarity of the tip or center pin of the charger lead.

The PRO-38 is in reality a Uniden scanner (the 50XL) dressed in Realistic clothes. It, like the 100 XL, uses a nominal 12 volts to charge to batteries. The tip polarity for all Uniden hand-helds is positive.

MONITORING ACARS

MB, from Bondi NSW is interested in monitoring **ACARS**, or Aeronautical Communications Addressing and Reporting System.

ACARS is basically high-speed data between aircraft and their ground stations. Information contained in the data stream includes wind aloft observations, weather data, positional reports as well as aircraft disposition data.

More detailed information about ACARS can be gleamed from Bob Bell's book *Listening In to Aircraft Radio*, available by writing to Airband Communications, PO Box 16, Georges Hall, NSW 2198.

REPEATER SCANNING

PL, of Brisbane QLD wonders if he can monitor repeaters on his scanners.

There is nothing special involved in listening on repeaters.

A repeater is simply a tool used to extend the range of a radio signal.

Here's how they work: Under normal circumstances a signal on frequency 1 (the input) is transmitted to the repeater from a car or portable.

The repeater re-transmits that same signal at high power on frequency 2 (the output) to other cars or portables within the network.

Because the repeater is located on top of a tall hill or building its signal can be heard much further away than the originating station.

The best examples of good repeater usage are the various police systems around the country.

To hear what is going on with repeaters you program frequency 2, the output frequency, into your scanner.

The frequencies published in SCAN which are not simplex, are always the repeater outputs.

As far as the 'numbers' beside the town names in the CB repeater list in the back of this magazine are concerned, 1, 2, 3 etc are the outputs of the UHF CB allocations, 31, 32, 33 etc being the input.

Frequencies are published in many documents, including the DoTC/SMA handbook relating to CB Radio that you receive when you licence your CB radio.

LS, of Bundaberg QLD can monitor both sides of the police radio, however he can only hear the base transmissions of the ambulance and fire services in his town.

The police are using a repeater (see definition above) while the ambos and firies are on simplex — in other words, they're using the same frequency for transmit and receive.

Unless the car is close to you, you generally will not hear it. It would not be possible to tune into radio traffic from Brisbane, for example, unless it was delivered to the Bundaberg area by some means such as satellite, bearer, link or whatever.

MSS uses 157.870, Brambles 162.235, 162.490, 162.835, Wormalds 166.240 and Armaguard 493.550.

PROPAGATION

The Newcastle Scanner Group decided to find out, once and for all, if scanners are or will be the subject of legislation banning their use.

Please read carefully the following from a letter signed by the Minister for Transport and Communications dated 16 July 1993: I quote "The Radiocommunications Act 1992 does not prohibit the use of radiocommunication scanning receivers and there is presently no intention to introduce legislation to prohibit their use."

ALL correspondence regarding the legality of scanners is *closed*, and no further will be entertained. The group can be contacted by writing to PO Box 728, Charlestown, NSW 2290.

THE HANDBOOK OF AUSTRALIAN RAILWAY FREQUENCIES 2

The first version of HARF proved extremely popular with scanner and train enthusiasts alike. The second edition is now available with new listings, expanded data sections, rosters and more. The new Handbook of Australian Railway Frequencies 2 is available from me at $19.95 postage paid anywhere in Australia.

ESG FOR '94

ESG has just released its frequency guide line-up for 1994. Registers for all states which list VHF/UHF are available from all ESG dealers. Disks can be purchased from ESG direct by writing to ESG, PO Box 1200, Adelaide 5001. Also available in book form are the complete guides and HF guide. All inquires to ESG.

I have recently had a change in duties at work, and cannot devote the time that I would otherwise like to the things that I enjoy.

Personal replies are the first to suffer from this lack of time. Therefore, those readers who require personal answers to their questions, I regret, may have to wait a little longer than normal for a reply, or they may even have them answered in the column. Please bear with me...

If you wish to write to SCAN, the address is PO Box 344, Springwood, NSW 2777

DX Logbook

By Rob Williams

Here's a bumper edition to end the year off. There's DX news from all corners of the globe, the latest receiver news and even some hard-to-hear stations to catch. So let's get going. As always, all times are in UTC (same as GMT, expressed as 'z' for zulu) and all frequencies are in kHz unless stated otherwise. All broadcasts are in AM unless I tell you otherwise.

RA SUFFERS A BLACKOUT

Full details are starting to come through about what actually happened to **Radio Australia**'s transmitter site at Cox Peninsula. A cable-laying ship was digging a trench to lay a new optical fibre cable when it nicked the outer covering of the power cable which feeds the site across the harbor from Darwin.

The jacket around the cable carries oil which is used to cool and insulate the high voltage in the cable. The oil leaked out putting it out of action. The cable was laid back in 1974 after Cyclone Tracy to replace an older one in use. Power was applied to the old one hoping that it could carry the load, but it blew up, forcing Telecom to run the site on the standby diesel generator.

This forced the station to reduce transmitter power output. Telecom brought in an additional 650 kW generator plant to assist, but running the diesel is an expensive exercise and an argument broke out between Telecom and the NTA over who should pay the costs of the diesel and repairs, which were estimated at in excess of $600,000, which included the installation of a new power cable.

Luckily the break in the cable occurred near the low water mark.

The tides in Darwin harbor normally vary by seven metres, making it possible to repair the damaged cable.

While all this was going on antenna activities at Shepparton ceased so Shepparton couldn't cover RA's output, plus extensive flooding around the area hindered the movement of trucks and accessories needed at the site.

The blow to Darwin couldn't have come at a worse time as the new transmitters were just about to be installed. Nevertheless, RA was kept on air and as you read this the two new Thompson transmitters have been put through their testing stages and are expected to go into regular service very soon if not by now.

NEW BBS FOR DXERS...

The hot news this edition is a new BBS designed for the serious DXer. The **OZ DX BBS** is accessible between the hours of 9:00 PM and 9:00 AM (Melbourne time) and caters for all forms of radio listening as well as Amateur Radio. OZ DX specialises in the harder-to-hear broadcasts, so you can expect to find plenty of the latest catches from the tropical bands. Another special area will be devoted to pirate and clandestine broadcasts, which are a real challenge. The phone number is (03) 416 8715, so give it a try.

RED CROSS SUMMER BROADCASTS

The Red Cross carries English to Europe on 7210 at 1100-1130 on the following days. 26/12, 30/1 and 27/2. Another transmission using the same frequency goes out on 27/12, 31/1 and 28/02.

WWCR ON-AIR WITH THREE TRANSMITTERS

According to *Tom Sudstrum*, here is the current sked for **WWCR**. Transmitter no 1: **1100-0100** on 15,685 and **0100-1100** on 7435. Transmitter no 2 **1300-0300** on 13,845 and **0300-1300** on 5935. Transmitter no 3 **1100-0100** on 15,610 and **0100-1100** on 5810.

RECEIVER SHOPPING LIST AVAILABLE

Radio Nederland has released edition 13 of its receiver shopping list — a must for those looking for a shortwave radio. It's free and available from the usual Radio Nederland address of PO Box 222, Hilversum, The Netherlands.

TRY YOUR LUCK FOR ICELAND

Don't be put off trying for this one. This station has been heard and verified here in Australia, so have a go. Its current sked is **1215-1300** on 13,835 and 15,770, **1855-1930** on 11,550 and 13,855 towards Scandinavia, Great Britain and Europe. **1410-1440, 1935-2010** on 13,855 and 15,770 and **2030-2335** on 11,402 and 13,855 towards Canada and the US.

FROZEN DX AVAILABLE

KNLS from the frozen US state of Alaska has issued a new sked effective until March 26, 1994. English is aired as follows: **0800-0900** on 7345 to eastern Russia and China, and again on 7355 at **1300-1400** to the Asian Pacific coast.

US STATIONS MAKE FREQUENCY CHANGES

October 31 saw the US move off daylight saving time. This also meant the annual frequency changes for many of its stations: **WRNO** will be using the following sked: **1600-2300** on 15,420, **2300-0400** on 7355 and **0400-0700** on 7395.

WYFR INTRODUCES WINTER SKED

English from **WYFR** until March 27 next is as follows:

To India between **1302-1502** on 11,550.

To Europe and Africa **0400-0500** on 11,825. **0500-0600** on 9850 and 11,850, **1600-1700** on 15,355, 21,525 and 21,615, **1700-1900** on 21,500, **1900-2200** on 7355, 15,566, 17,750 and 21,525, and **2200-2300** on 17,750 and 21,525.

PRAGUE'S NEW ENGLISH SKED AVAILABLE

Thanks to *Alexander Ageenkov* from Russia who has provided the latest sked from **Radio Prague** over Internet. The English broadcasts go out as follows, with transmitter power in brackets:

0000 on 5915 (100kW) to North America; 5930 (250kW), 7345 (200kW), 9405 (100kW), 9810 (100kW).

0100 on 5915 (100kW) to North America; 7345 (200kW) and 9405 (100kW).

0300 on 5915 (100kW) to North America; 5930 (250kW), 7345 (200kW), 9405 (100kW), 9810 (100kW).

0400 on 5915 (100kW) to North America; 5930 (250kW), 7345 (100kW), 9405 (100kW), 9810 (100kW) and 13,715 (100kW) to the Middle East and East Africa.

0700 to Europe on 6055 (200kW), also on 7345 (250kW), 9505 (100 kW) and 11,990 (100kW).

0730 on 11,990 (100kW) to the Pacific; 13,590 (100kW) to Asia and the Pacific. Also on 15,605 (100 kW), 17,535 (100kW), 21,705 (250kW).

1130 on 6055 (100kW) to Europe, plus 7345 (100kW), 9505 (100kW), 11,990 (100kW), 15,355 (100kW).

1600 on 6055 (100kW) to Europe; 7345 (100kW), 11,990 (250kW) to Africa; 13,580 (100kW) to the Middle East; and 15,505 (100kW) to north-west Africa.

1800 on 6055 (100kW) to Europe; 7345 (100 kW), 9490 (100kW), 11,990 (250kW) and 13,580 (100kW) to Africa.

2100 on 6055 (100kW), 7265 (250kW), 7345 (100kW), and 9490 (100kW) to Europe.

HCJB — COMPLETE ENGLISH SKED AND GOES ON-LINE

I thought I'd bring you the complete English sked for HCJB. DXers here in Australia know of this station's broadcasts to Australia between 0715 to 1125 on 9745 and 11,925 — two old faithful channels which have been in use for many years — but what about *other* broadcasts?

Here they are:

0700-0830 to Europe on 6205 and 11,835.

1630-1700 (Mon-Fri) to the Middle East on 15,270 and 17,790.

1700-1800 on 15,270 and 17,790.

1900-2000 to Europe on 15,270 and 17,790.

2130-2200 on 11,835 and 15,270.

0030-0430 to North America on 9745 and 15,155.

0500-0700 on 11,925.

1130-1430 to North and South America on 15,115.

1130-1600 on 11,925 and 17,890.

HCJB's SSB transmissions are:

0030-2200 and **2300-0000** on 21,455.

0030-0430, 0700-0930, 1000-1030, 1200-1600, 1900-2000 and **2130-2200** on 17,490.

Continued on page 29...

HCJB has also entered the computer age and is now contactable via Internet. This is a great chance for DXers from around the world to have almost instant access to the HCJB staff. You can send all your questions, requests and, I suppose, reception reports and have a reply back quickly. I only wish more stations were accessible via electronic mail! HCJB's electronic address is **English@MHS.HCJB.COM.EC**.

EXTERNAL SERVICE AVAILABLE FROM FINLAND

Helsinki has its external service on air with English at the following times:

0745-0755 to Europe on 6120, 9560, 11,755.

2230-2300 to Europe on 9615.

0530-0550 to the Middle East on 9635, 11,755.

0900-0930 To Australia on 15,330, 17,800. (Then **2230-2300** on 9615.)

2230-2300 to South America on 9615.

1230-1255 to North America on **11**,735, 15,400 (Mondays to Fridays only).

1330-1400 to North America on 15,400, 17,740 (Mondays to Fridays only).

1430-1500 to North America on 15,400 and 17,740.

This sked is current until March 26 next. Thanks to **Reid Kelly** who posted this sked in the international shortwave echo in Fidonet.

ALBANIA'S REDUCED ENGLISH OUTPUT

English from Albania these days is restricted to a few broadcasts as follows: to America at **0130-0200** and again at **0230-0245** on 9580 and 11,840. To Europe at **1530-1600** on 7155 and 9760 then again at **2300-2315** on 9760 and 11,825.

A SUPER-POWER'S VIEWPOINT

NHK's current sked to March 31 next in English is as follows:

To South East Asia (General Service) at **0100-0200, 0300-0400, 0500-0600** and **0700-0800** on 17,810; 11,815 between **0900-1000**; 11,915 between **1400-1600, 1700-1800, 1900-2000, 2100-2200** and **2300-0000**. 11860 to Indo-China between **0100-0200** via BBC transmitter at Singapore. 21,610 between **0600-0800. 0500-0600** to Indo-China, **0700-0800** on 11,740 and again at **0900-1000. 2100-2200** and **2300-0000** on 9660 and 15,430. 6035 to Indo-China between **2100-2200**. 15,445 between **0900-1000** and **1100-1200**.

To the Asian Continent: 17,775 at **0100-0200, 0300-0400** on 15,210, **0500-0600** and **0700-0800** on 15,410, 9750 at **0900-1000, 1400-1600, 1700-1800**, 6185 **1900-2000** and **2100-2200**. 15,195 at **0100-0200**. 11,860 at **0600-0700**. 9610 at **0900-1000** and **1100-1200**. 7140 between **2300-0000**.

To South East Asia on 17,845 and 11,840 at **0100-0200**. **1400-1500** on 9535.

To Oceania on 17,860 between **0700-0800** (General service) and again at **0900-1000** (Regional service). 9640 **1900-2000** and **2100-2200**. Also 11,875 between **1900-2000**.

There are several other English broadcasts to the rest of the world but space constraints prevent me from printing them all.

TURKISH DELIGHT ON SW

The **Voice Of Turkey** from Ankara will be using English until March next year at **0400-0500** to Nth America on 9445. **1330-1400** to South-West Asia on 9675. **2100-2200** to Europe on 9445 **2300-0000** to Europe on 11,895 and the Middle East on 7185.

LAST MINUTE CHANGE TO RNZ'S SKED

Radio New Zealand International has made a late change to its October to March 1994 schedule. Due to varying reception conditions in the Pacific it has reinstated 11,735 kHz. So, effective **1900z** from 10 Oct, 1993, the schedule was like this: **1650-1849** on 9550 Mon-Fri. **1850-2137** on 11,735 daily. **2138-0658** on 15,120 Daily. **0659-1205** on 9700 daily. **1206-1649** on 9510 Rugby (Sports Channel). Thanks to *Bruce MacGibbon* who saw this report in **DX Australia**'s magazine.

BULGARIAN ENGLISH BROADCASTS

Radio Bulgaria has English broadcasts scheduled on the following frequencies until March 26, 1994. **0100-0200** on 7455 and 9700. **0500-0630** on 9700 and 11,720. **1130-1300** on 11,645 and 13,645. **1330-1500** on 11,630. **1515-1645** on 13,670. **1830-2000** on 7455 and 9700. **2100-2200** on 6085 and 9700. **2245-0015** on 7455 and 9700. Thanks to *Andreas Volk* reporting on **Usenet**.

HEAR BUDAPEST ON SHORTWAVE

Radio Budapest from Hungary has English broadcasts as follows: **0200-0300** to North America on 9835 and 11,190. **2100-2200** to Europe on 6110, 7220, 9835 and 11,910.

AUSTRIAN BROADCASTS IN ENGLISH

Radio Austria International has English broadcasts valid to March 27 to Asia between **1230-1300** on 15,450, **1330-1400** on 15,450, **1530-1600** on 11,780 and **1630-1700** on 11,780. To Australia and New Zealand between **0830-0900** on 15,450 and 17,870 and again **1030-1100** on 15,450 and 17,870 (Mon-Fri).

WINTER SKED FOR CUBA RELEASED

Radio Havana is broadcasting in English at the following times: **0000-0200** to America on 6010 and 9815 (USB); **0200-0500** to America on 6010, 6180 (**0400-0500** only) and 13,660; **0500-0700** to America on 9510; **2100-2200** to Europe and the Middle East on 17,760 and finally **2200-2300** on 6180 to Europe and America.

NORTH KOREA

Radio Pyongyang has the current English broadcast sked for DXers:

To Europe: **1500-1600** on 9325, 13,785; **1700-1800** on 9325, 13,785; **2000-2100** on 6576, 9345 and **1300-1400** on 9345, 11,740.

To North America: **2300-0000** on 11,700, 13,650; **0000-0100** on 11,335, 13,760, 15,130; **1100-1200** on 6576, 9977, 11,335; **1300-1400** on 13,760, 15,230.

To South East Asia: **0400-0500** on 15,180, 15,230, 17,765; **0600-0700** on 15,180, 15,230; **0700-0800** 15,340, 17,765; **0800-0900** on 15,180, 15,230; **1300-1400** on 9640, 13,760, 15,230.

To Africa and the Middle East: **1500-1600** on 9640, 9977; **1700-1800** on 9640, 9977 and, finally, **2000-2100** on 9640, 9977.

HEAR FRENCH NEWS, VIEWS AND POLITICS

Radio France International broadcasts in English with the following sked in place until March 27, 1994:

1230-1300 on 9805 and 15,195 to northern Europe and the CIS, 11,670 to the Middle East, the CIS and northern Europe, 15,155 to the Middle East, 15,365 to the USA and Canada and 21,645 to Latin America.

1400 to 1500 to South-East Asia on 11,910, 12,035. Also to the Middle East on 17,650. **1600-1700** to central Europe on 6175, 12,015 to North Africa via Gabon, 11,975 to the Middle East, 11,705 to West Africa via Gabon and, on the same channel, direct from France, 17,620 to West and north-east Africa, 17,850 to South Africa and, finally, 17,795 to south-east Africa.

ANOTHER CHANCE FOR RADIO ST HELENA

Did you miss **Radio St Helena** this year? Well, I tried, but the signal at my QTH was so weak that it was impossible to hear the broadcast. But don't worry! October 14, 1994, has been declared the next annual Radio St Helena day, so we'll all have another chance to catch this elusive station.

DX TIDBITS...

• *Dave Onley* reports on the new service in English and Hindi on 15,190 from 0830 to 0845 from **AIR** from Bangalore.

• There are only a few days left to QSL **VLQ** on 9660. As reported on *Media Network* this 10 kW transmitter is to be switched off at the end of December.

• *Jorma Mantyla* reports that the **Bhutan Broadcasting Service** has changed frequency to 5030 from 5025.

• **VOA** has introduced a new fax line for listeners to contact the station. The number to dial from Australia is 0015 1 202 619 0211.

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DX Logbook

Continued from page 27...

• The **Voice Of Vietnam** from Hanoi has English to Europe at 1800, 1900 and 2030 and French at 1830, 1930 and 2100 on 9840 and 12,020. It seems to have dropped 15,010. (Via *Cees Van Oudheusden* from Holland on the Fidonet SW Echo).

MORE TURMOIL FOR RADIO FREE EUROPE

Radio Free Europe announced in October that it will be reducing its staff from 1540 to 705 by September, 1995 and will be leaving its HQ in Munich. A decision is expected soon on whether the HQ will be moved to Prague or be brought back to Washington.

Its current annual budget of US$210 million will be reduced to US$75 million by the 1996 financial year, forcing deep cuts to its operations.

The first cutbacks saw the Hungarian service ended on November 1, while **Radio Free Afghanistan**, which started in 1985, finished on October 20.

Polish and Czech services will be cutting their transmission times by the end of the year and will move to Warsaw and Prague. At this stage **Radio Liberty**, which broadcast to CIS countries in Russian and 11 other languages, isn't affected due to the continued instability in this region.

The organisation's production facilities in New York will be closed too. Plans are still going ahead for a new Serbo-Croatian service to the former Yugoslavia to begin in November, and maybe a new Albanian service will be started too. It seems that this news story made the local US press as well as all the regular SW news outlets.

VOICE OF FREE CHINA, AN EASY SW CATCH

Thanks to *Ray Chow*, we have a copy of the English sked from the **VOFC** valid until March 27 next. **0200-0300** to Australia and New Zealand on 9765, with 11,860 to Malaysia, Vietnam and West Indonesia and 15,345 to Japan and Korea. **0300-0400** on 9765 goes to Australia and New Zealand, 11,745 to East Indonesia and the Philippines and 15,345 to Japan and Korea.

NEW SW STATION FOR HAWAII

From a remote location on the 'big island' in Hawaii, **KWHR**, from **World Harvest Radio** is close to being on air from its new site. With two antennas, one a TCI-611 curtain array with five slew positions, KWHR can cover nine to 18 MHz towards Asia with a 100 kW Harris transmitter.

Unfortunately, building problems have delayed the installation of the transmitter which is now on site. Testing is planned to start on December 6, with an on-air starting time of 0000z on Christmas Day. If this deadline isn't reached station officials expect to be on air no more than two to three weeks later.

KWHR has registered the following frequencies: **0000** on 17,555, **0200** on 17,510, **0600** on 9930, **1600** on 7425, **1800** on 13,625, **2000** on 13,720 and **2200** on 17,510.

Thanks to *Glen Hauser* and *Media Network* for this info. I wonder who will be the first to hear this new station? It also gives DXers a chance to verify Hawaii.

DRAKE BACK WITH FULL FORCE

Drake has announced the release of a new transportable, battery-operated shortwave radio to supplement its popular **R8** receiver. Called the **SW-8**, it is due to begin production around December this year. The radio is about two-thirds the size of the R8, and rests on its handle. The receiver comes with a LCD display and has three filters set at 6.0, 4.0 and 2.3 kHz with SSB detection.

Tuning is via keypad and doesn't have any facilities for computer control.

The SW-8 is expected to sell in the States for around US$700.

Drake has responded to complaints about the layout and operation of the R8 and has changed the way the SW-8 works.

Coverage is from 500 kHz to 30 MHz, FM band and 118 to 137 MHz.

SCANNER COMPANY MOVES INTO SW

Media Network reports that **AOR**, the popular scanner manufacturer, has plans to release the **AOR-3030** around December this year for a retail price around $US750. More on this new radio when it becomes available.

CHINA RADIO BROADCASTS IN ENGLISH

Patrick McDonald has passed along the latest English sked for **China Radio International**, which arrived from the *Shortwave Paradise BBS*.

Broadcasts to North America go out at **0000-0100** on 9770, 11,715; **0300-0400** on 9690, 9770 and 11,715; **0400-0500** on 11,680 and 11,840; **1200-1300** on 15,210; **1300-1500** on 7405.

Broadcasts to Europe are **2000-2200** on 9920, 11,500 and then again between **2200-2300** on 3985, 9880. **1200-1400** to South East Asia on 9715 and 11,660.

1400-1600 to Asia on 11,815, 15,165.

To Australia between **0900-1100** 17,710, 15,440 and 11,755 and again at **1200-1300** on 15,440, 11,795 and finally **1300-1400** on 15,440.

1600-1700 to East and South Africa on 15,130, 15,110, 11,575.

1700-1800 to East and South Africa on 15,345, 11,575 and 9570.

2000-2130 to East and South Africa on 15,110, 11,715.

1900-2000 to West and North Africa on 9440, 6955.

2000-2100 to West and North Africa on 9440.

CHANNEL AFRICA AVAILABLE IN ENGLISH

While no longer broadcasting directly to Australia, **Channel Africa** has been reported here in Australia. Its new sked is valid until March 26 with English at the following times: **0300-0400** on 5960 and 9730. **0500-0600** on 7230 and 11,745. **0600-0700** on 7230 and 17,710. **1000-1100** on 17,805. **1100-1200** on 9730. **1500-1800** on 7270 and 15,240. French broadcasts go out at **0300-0400** on 9520, 9675; **0400-0500** on 9520; **0500-0600** on 9520 and 11,725, **0600-0700** on 17,840, and **1800-2000** on 7225 and 9550.

CHANCE TO CATCH RADIO G'DAY

According to *Claude Crowe*, **Radio G'Day** is expected on air for at least one transmission between December 25 and January 2. Check frequencies between 11,400 and 11,500. Unfortunately no other details have been given.

If you have any questions, or wish to submit some notes, drop me a letter at PO Box 108, Minto, NSW 2566. For a personal reply please include a SSAE

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Cat D-2790

NEW! 2 Year Warranty! **$1199**

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Hands-Free 55MHz FM Transceiver

Cat D-1095

$69.95 ea

This hands-free FM transceiver is ideal for local-area users such as sporting clubs, schools, farmers, antenna installers and bush-walkers and can provide up to 500m range (line-of-sight). Because it operates on a 55MHz VHF frequency, you're less likely to experience noise or interference from CB or other transmitters. It comes complete with belt clip and an earpiece/ lieclasp microphone for voice-activated hands-free operation. Features include selectable push-to-talk or voice activation and a sensitive dual conversion receiver for clearer reception. No license required. Requires a 9V battery.

250MHz Frequency Counter

This versatile 8-digit frequency counter can be used as a standard bench-type unit or can be directly connected to a CB or other low power transmitter for measurement of its transmit carrier frequency. The unit provides two ranges (1-99MHz and 1-250MHz) and can be used with transmitters of up to 20W output. Uses SO-239 sockets for tranceiver connections and an RCA socket for low-level inputs. The counter uses a solid metal case for shielding and is supplied with a mounting bracket. Input sensitivity is from 50mV to 20V RMS. Requires 13.8V DC.

Cat D-2400

$99.95

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STORES ACROSS AUSTRALIA AND NEW ZEALAND

CITIZENS BAND PACKET - HOW TO DO IT LEGALLY

by Peter Berrett VK3KAT

What is packet you ask? It's a little like using your modem to hook up to a bulletin board except that instead of using phone lines to carry the digital data, we use radio waves. Also, instead of the data being sent in a continuous stream, the data is sent in small chunks.

This means that one computer bulletin board can talk to multiple users at once.

One other useful aspect is that a digital repeater can relay these packets for you. For example, let's say we have two packet users on either side of a hill who can't contact each other because of distance or terrain but can both contact a digipeater situated on the top of the hill.

They could connect their computers to each other using the digital repeater. Unlike voice repeaters, however, you can use more than one repeater to pass on messages down the line.

Also each digipeater can handle multiple users over a given period of time.

The best thing is that each time you connect to a packet station elsewhere you are not paying 25 cents to Telecom for the privilege.

AMATEURS LINK TO OVERSEAS PACKET STATIONS

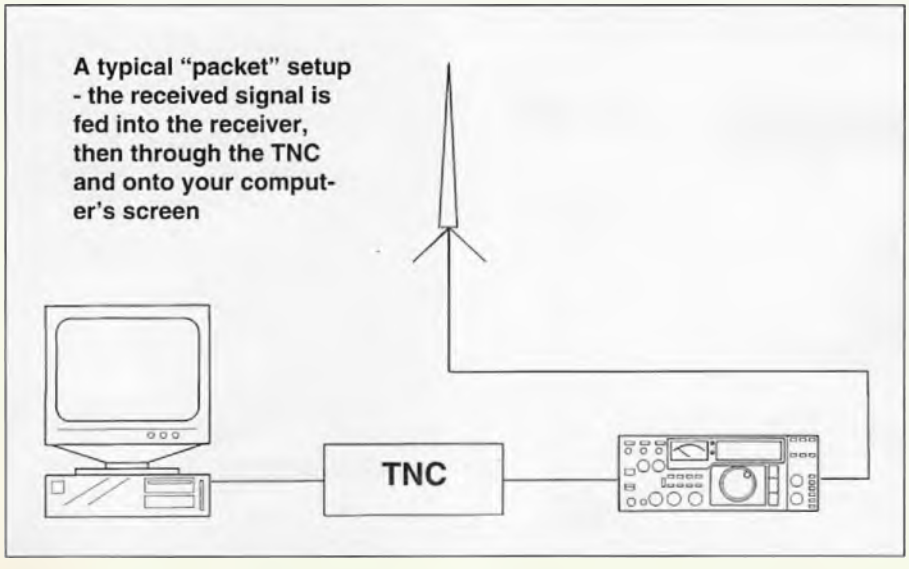
Amateurs are fortunate in that they have arranged to link their packet network to overseas amateur packet networks via an international data transfer facility called INTERNET which is used by government, commercial and educational bodies.

This means that an amateur packet user can link in to his/her local digipeater and then connect to overseas access ports known as 'Wormholes'.

Using the Wormhole one can then connect to overseas packet users and bulletin boards. There is also a real-time conference facility in which users can talk (through their computers) to multiple users in a variety of countries in real time. Recently, I noted amateurs from Finland, Holland, United States, Australia and the United Kingdom all on at once.

Exciting stuff!!.

Mind you one must give credit where credit is due. This magnificent achievement didn't appear out of nowhere. It has slowly evolved as a result of the dedicated efforts of many amateurs through organisations such as the Melbourne Packet Radio Group. I sincerely hope that should packet on the CB bands take off in a big way, CB packet subdivisions could be set up within organisations such as the MPRG so that one digital network could be set up to handle both amateur and CB Packet.



A typical "packet" setup - the received signal is fed into the receiver, then through the TNC and onto your computer's screen

AMATEURS ARE GENERALLY SUPPORTIVE

I have had considerable discussion with other amateurs on the idea of giving non-amateurs access to this exciting new mode. To date a majority of replies have been generally supportive although regrettably there is a diehard element of the amateur fraternity who oppose any efforts to improve the lot of the poor CBer.

One must remember that the spectrum is a natural resource owned by all Australians, not just a privileged minority. In these days of 'off the shelf' equipment, the average non-amateur does not need qualifications to enjoy the benefits of modes such as packet.

Arguments against giving CBers more privileges should be seen for what they are - elitism or as I prefer to call it, communication apartheid.

Anyway enough soap-box.

Recently, there has been discussion as to whether packet transmission on the CB bands is legal or not.

It would appear **not** as a recent reply from the Spectrum Management Agency stated that the relevant regulations do not permit speech telephony (SELCALL) to exceed 3 seconds in any 60 seconds.

THERE IS A WAY!

Nonetheless there is an avenue by which non-amateurs can get involved in packet and other modes of transmission.

According to Radiocommunications Class Licence (RCL) 1993/1 released 1 July 1993, a number of low powered transmitters are permitted without the need for either a licence or type approval. The table on the next page illustrates two of these bands.

Low power transmitters on these bands do not require type approval provided they meet the specifications listed in the table.

There are a number of other bands available for similar purposes, however the two listed are the most convenient because of the availability of equipment, radios and parts for these bands.

Incidentally, it is quite legal to use a baby monitor to send packet!

POWER LEVELS ARE IMPORTANT

One important thing to note is that the power output is EIRP - that is - equivalent isotropically radiated power. Any antenna that is used will have some degree of gain over the theoretical isotropic antenna.

Think of an isotropic antenna as a point in space with radio waves radiating from it in all directions. No matter what antenna you use it will have some degree of gain over an isotropic.

This means that if you use a vertical antenna with say, 3db of gain (2x) over an isotropic antenna, the power output must be reduced by that factor so 1 watt EIRP when using this antenna would mean that you could only use 500mw of power from the actual transmitter.

There is no no point using a highly directional antenna with 20db gain as your power output from the transmitter would have to be reduced to a 1 x (1/100) = 10 milliwatts.

DETERMINING THE EIRP

The EIRP of a device can be determined by measuring the field strength of emissions from the device at a particular distance. The corresponding value of EIRP is then calculated using the equation below:

$$P = \frac{E2 \times D2}{30}$$

where:

P= the EIRP of the device, in watts

E= the field strength of emissions from the device, in volts/meter;

D= distance from the radiating antenna of the device at which the field strength is measured, in metres.'

(From RCL 1993/1)

Using the 27 Mhz and 40 Mhz allocations, here is sample band plan.

Channel	Frequency(Mhz)
A	26.995
B	27.045
C	27.095
D	27.145
E	27.195
F	40.665
G	40.675
H	40.685
I	40.695

A couple of these frequencies used to be used by the old 18 channel CBs so these old rigs may have some limited use for packet. The output power would need to be wound down significantly though.

FM IS THE WAY TO GO

So how do we get as much value for our milliwatt as possible?

Use FM of course!

The regulations do not specify the mode of transmission so we can use AM, FM, SSB etc.[even Morse!].

Amplitude Modulation is less effective as a transmission mode because most of the power ends up in the carrier and we have two sidebands which are identical to each other.

This is a wasteful use of power which in this case is critical..

Single Sideband (SSB) transmission is an effective mode of transmission because all power is directed to one sideband and there is no carrier.

However, the use of Packet with SSB would require a tuning indicator which would add extra cost to our set-up.

Frequency Modulation (FM) is ideal because at all times we have maximum power output in our transmitted signal.

The modulation is encoded on the signal by varying the frequency of the transmitted signal, not the amplitude. Deviation of the frequency modulated would need to be kept to a minimum so that the emission bandwidth did not exceed 10khz.

How far will 1 watt EIRP go?.

From my location in Melbourne , I can contact a digipeater (digital repeater) 25 kilometres away using 1 watt Peak Envelope Power using a vertical J-Pole antenna. I estimate that using 1 watt EIRP, one could get up to 10 kilometres (line of sight) which would be more than adequate for accessing one's local bulletin board.

WHAT SET UP DO I NEED?

You need 3 items - a computer (preferably IBM compatible), a Terminal Node Controller or radio modem, and a suitable radio. We will assume that you have an IBM compatible computer already and have modified a radio to comply with the above regulations.

You can go out and buy a Terminal Node Controller (usually referred to as a TNC) to interface between your radio and your computer but they can cost several hundred dollars.

I use a BAYCOM modem and software which is available from the Melbourne Packet Radio Group for around $135 including software.

Their postal address is P.O. Box 299 St Albans Victoria 3021. This software and modem is designed for use with IBM compatible computers only.

The Baycom modem is built inside a serial cable housing.

One end plugs into your computer and the other has four connections - ground, transmit, receive audio and transmit audio that you wire into the microphone socket of your transceiver. When the system is up and running your computer automatically does all the transmitter keying for you.

You just type into the keyboard. One important thing though - your rig will need a squelch control because the software will not transmit if it hears static. It waits for gaps in the incoming sound and then transmits its signal.

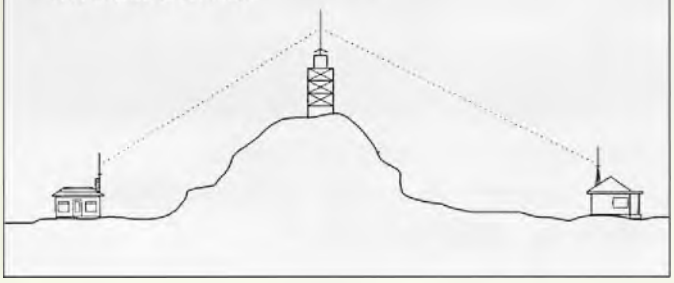
If it hears static it thinks that there are other stations transmitting and waits.

1200 BAUD COMMUNICATION SPEED

The Baycom set-up, along with most amateur packet transmissions is done at

	Permitted Operating Freq. (MHZ) (lower limit exclusive, upper limit inclusive)	Max. EIRP
All transmitters	26.957 to 27.283 if: (a) separation of the operating frequency from the centre of any adjacent citizen band radio channel is at least 5 khz; and (b) the emission bandwidth does not exceed 10 khz.	1 watt
All transmitters	40.66 to 40.70	1 watt

As with a UHF repeater, packet radio can greatly increase the distance covered.



1200 Baud (bits per second).

If there are not many other stations on the same channel at the same time, your computer to computer communication will be relatively quick.

If there are many stations on channel at the same time then responses come back much slower. This is because the computer waits for a break in the digital traffic to transmit its next packet of data.

At this stage there are no legal packet bulletin boards operating on the channels listed earlier.

It is hoped that having highlighted the method by which Packet CB can be legally transmitted, some telephone bulletin boards will add on Packet CB access.

Perhaps an electronics company with a bulletin board such as Dick Smith Electronics [hint, hint and gratuitous plug] will lead the way.

Well there you have it - an exciting new mode and a legal avenue by which to use it. Let's hope that we can see a few radio ports set up on a few bulletin boards before long. It will be interesting to see how far a 1 Watt FM EIRP signal will go. I can just see all those boffins modifying their baby monitors now...

73s de VK3KAT

(What we really need now is some input from readers.

Are there sufficient operators prepared to start operating low-power packet on the channels Peter has listed?

If there are, we will try and provide the necessary technical information to make your task easier - but it's up to you so let's get some mail to:

Packet Radio
PO Box 622
Mount Eliza 3930.

We'll keep you informed how things are looking in the next issue...Editor)

To take the top diagram a step further, packet signals can be re-routed via a "digipeater" with a corresponding increase in distance covered.

BOOKS WORTH READING...

TWO NEW BOOKS TO READ OVER CHRISTMAS/NEW YEAR

During those hot months when you just want to lay around and rest, why not grab one of these new books and catch up on some reading.

The first comes from **Dick Smith Electronics** and is a must if you've just entered the hobby and are looking for a single reference book that will answer all those questions for which you would like an answer.

Shortwave Listening Guidebook by Harry L Helms is a very enjoyable book. It is written with plenty of interesting stories from the experience he has gained from his many years of DXing.

The over 300 pages covering all aspects of HF radio makes its a good all-round book. From A to Z it's all there — Propagation, Utility DXing, choosing a SW radio, antennas, MW DXing, QSL cards, domestic broadcasting and pirate radio.

Harry delves into the big international broadcasters giving you a good understanding of why shortwave broadcasting has developed into such an interesting pastime.

While the book is written from an American perspective, it is general enough to apply anywhere. You'll find that all the technical terms he uses are well explained with plenty of diagrams as required.

The Appendix at the back covers the Q-code, Morse and the Phonetic alphabet as well as some books to read if you wish to follow up on a particular subject. I enjoyed reading the book from cover to cover and I'm sure you will also. The price of the book is $29.95 and represents good value for money. The catalogue number is B-2040.

The other book doesn't need much explanation. DXers around the world have come to know what **Passport To World Band Radio (PWBR)** represents: a highly professional reference tool to keep beside your radio day after day. The 10th edition has just been released and is full of information for all DXers. PWBR covers from choosing a radio to finding your favorite SW program in simple easy-to-read chapters.

As an added bonus the top US mail-order stores are well represented throughout the book with pictures of the latest radios and gadgets. The "address-plus" list includes not only station addresses but contact names, details of their souvenirs and costs. If the station has overseas offices these addresses are also included, together with details on whether they can handle technical inquiries.

Portable radios seem to be popular with manufacturers at the moment, so plenty of space has been devoted to both analogue and digital-display radios. Desktop radios get their own chapter with a brief review of each radio.

The A-Z listing of English broadcasts from around the world helps you pick and choose what you want to go after.

The Blue section, an hour-by-hour breakdown on what you can find on the SW bands over the full 24-hour period, is at the back. With over 400 pages to keep you occupied, the new edition is an excellent supplement to your SW listening.

Copies will be on sale from all the regular outlets, such as **Dick Smith Electronics** and other technical book outlets. Dick Smith sells the book for $39.95 and its catalogue number is **B-2053.**

Online 1994

By Patrick McDonald

It's not true that I was dancing naked on the roof last month, nor that I was waving at UFOs! The neighbors tend to make up all *kinds* of crazy rumors, because they see me going up and down ladders every weekend, adjusting and tweaking my dipoles and discones, and performing other strange high-altitude acrobatics. In fact, I was merely getting a better vantage point to check out the NASA Space Shuttle 'Columbia' as it whistled over Sydney, and following up the accuracy of some new satellite tracking software.

And why am I mentioning this anyway? Well, right here in **CB ACTION** magazine is the place where we talk about how computer software, radios and satellites come together in weird and wonderful ways.

STS ORBIT PLUS SATELLITE TRACKING SOFTWARE

Old-timers to the ONLINE column will immediately guess that I'm talking about the **STS ORBIT PLUS** shareware satellite tracking software. I think I first reviewed this now-famous package a year or two ago and gave it a 99 per cent rating. Since that time Californian author David H Ranson Jr has been hard at work with a number of major upgrades, and SOP9338 is now better than ever.

Packet radio and VHF monitoring freaks will already know all about the SAREX amateur radio experiments carried out aboard 'Columbia' by the US astronauts. In a nutshell, Shuttle crew regularly made contact with earth-bound amateurs around the world via VHF amateur radio transmissions and on-air computer transmissions, known commonly as 'packet' broadcasts.

Of course, those radio buffs not licensed to transmit signals to the orbiting crew of seven could still listen to some interesting traffic whenever the craft passed a few hundred kilometres above their antennas.

And this is where the SOP software comes in very handy.

The program shows a world map and, by reading an appropriate information file, such as a US Space Command 2-line Element, can display the passage of one or more satellites moving around the earth in real time. Element files are readily available from various Australian computer bulletin boards services, and one such system, Paul Britton's **SATCOM AUSTRALIA** on (02) 905 0849 even specialises in satellite communications 24-hours daily.

SOP has as well a rather nifty visual-sighting feature (which I was trying out on my roof when sprung by the neighbors) which provides the user with the dates and exact times that any given satellite should be visible at your own QTH.

And it works!

I eyeballed the magic moving machine as a bright light sailing rapidly over Sydney, from west to east, just before the folks next door began shouting at me and ringing the wife on the phone. Ah well, they were only trying to help.

STS ORBIT PLUS has developed into quite a big and sophisticated program now, but it's very easy to set up. It definitely requires at least a small hard disk, but it works with a variety of video graphics.

Because of the amount of number-crunching required to track up to 32 satellites at a time, a maths co-processor chip (8087, 80287 or 80387) or a 486 computer is a very big asset if you want reasonably fast operation.

Basically, you just dump everything into its own subdirectory, run the executable file, and you see a menu allowing configuration with your own location, date and time, and which particular information file or files you want the program to read.

If you accept the default settings, you'll quickly begin tracking the Hubble Space Telescope on its regular round-the-planet journey.

Of course, there are a great many other features available with SOP, such as the ability to zoom into a close-up map of a particular region, but I think the above info gives a rough idea of the software. Even if you don't listen to satellite comms (and remember that the Russians in MIR are still orbiting and communicating regularly with amateur earth stations), the program is lots of fun visually, and the 170 satellites listed in my recent element file make for hours of interesting investigation.

Moving right along to more radio-related software, another one of my favorites has also been upgraded of recent times. I'm referring to the SWBC radio frequency database, version 3.01, put out by Tom Sundstrom's TRS company in the US.

This excellent program is commercial, not shareware, but is well worth the small price. As well as providing a fully user-editable database for all your international shortwave radio stations, the TRS operation also supplies complete new English language frequency schedules four times a year, ready to plug into the database system.

Changes made in version 3.01 in October include:

- third index added to group schedules (by target area) to make editing schedules easier;
- printer setup routine fixed to accommodate use of machines other than Epson, Okidata or Hewlett-Packard printers;
- 'Utility Schedules' module added to track press RTTY broadcast schedules and broadcast times of weather satellite greyscale FAX photos; and
- the search routine changed to locate the first frequency record beyond the frequency entered in the search when the desired frequency doesn't exist.

When you fire up this database, it can be configured to immediately show you which English language shortwave programs are airing at that particular time, and which are due in the next half hour. You can also search the database by frequency to help identify those mystery broadcasters who never say who they are!

Interested? Contact TRS Consultants in New Jersey by voice on 0011 1 609 859 2447 or via fax on 0015 1 609 859 3226. You can also check in via modem on the company's local BBS, known as 'Pics OnLine!' on 0011 1 609 753 2540 at all speeds to 14.4k bps.

COMPUTER CONTROL FOR THE FRG-9600

Another quite different piece of new 'freeware' software that's just arrived is **APOSRCH.ZIP**, designed to control the popular Yaesu FRG-9600 scanner receiver. Australian author Tony Richardson, VK2APO, writes in the program's documentation: "...After buying an FRG-9600 because of its excellent all-mode ability and frequency coverage, I became aware of its somewhat limited intelligence regarding searching and scanning, one of the limitations being that the 9600 will not completely stop on finding a busy frequency, but waits a few seconds while sequentially blinking each display digit before continuing..." Richardson defines 'searching' as automatically tuning across a particular radio frequency band with a pre-set step size, and 'scanning' as automatically checking a set of pre-arranged frequencies and acting upon what is found.

APOSRCH addresses this problem by allowing the lucky FRG-9600 owner to pre-determine these various factors and to automate both the searching and scanning processes, thereby greatly enhancing an already great scanner. Once either the search or scan parameters have been set, the results can be captured either on a disk file or on the printer.

The program is mouse-driven with pop up windows, which allows the FRG9600's scanning and tuning mode to be easily operated by mouse, even from your armchair!

continued on page 40...

APOSCAN, the scanner version of this software, allows the use of multiple disk files of arrays of frequencies containing mode and identification information (name of channel user, etc). Logging functions then record time, date, mode and the identification information for later referral.

The frequencies loaded at any time may be given individual scan priorities with scan intervals settable from the FRG-9600's maximum speed to once per hour.

It also allows banks of channels to be selected for scanning by entering 'keyword'-style descriptors which cause those frequencies containing that information in their identification fields to be inserted into the current scan list from a database.

Once a scan list is created using this method (or just a screen editor) the list can be saved to disk and reused at any time later.

APOSRCH requires a hardware interface to connect to your PC's serial port. The FRG-9600 uses TTL levels on its CAT port, so an RS232C-to-TTL level converter is required.

The author worked with a Maxim MAX232 chip clone from DSE, catalogue number Z-5369, and gives details of the interface construction in the documentation accompanying the program.

Although the interface isn't difficult to build, some prior electronic construction experience would definitely be in order before tackling this project.

Tony developed this program on a 386SX with one megabyte of RAM and a VGA screen, but thinks successful operation on a 286 and with EGA graphics may be acceptable. If you have questions regarding the software, he invites your voice inquires on (043) 42 1250.

AMATEUR TYPE DECODER

HAMCOMM v2.2 is another kind of software altogether. Written by W. F Schroeder, DL5YEC, of Paderborn, Germany, it's designed for amateur radio communications, supporting reception and transmission of amateur radio teletype and Morse Code signals. Weather station reports in the SHIP and SYNOP formats can also be decoded.

A special converter or modem chip is not required. The audio output of the receiver is connected to the serial port of any IBM compatible computer through a very simple and low-cost circuit.

Only one IC is needed (Op-Amp LM741 or similar) and a few diodes, capacitors and resistors. The supply current is drawn from the serial port.

For transmission mode, the audio signal from the speaker or serial port is connected to the microphone input of the transmitter through a passive R/C filter. Audio frequency generation and decoding, serial/parallel conversion and all other signal processing is done by the software program itself.

The author provides pretty complete documentation with the program, enabling the average operator to construct the hardware interface required.

HAMCOMM will, in theory, run under MS-DOS 3.x or higher on any IBM-compatible PC with at least 320k of free memory. A hard disk is definitely recommended.

On some slower systems (eg old XT 8088s) be prepared for the

possibility that some HamComm functions may not work as expected or may not even work at all. The program will automatically detect the type of video adaptor in use on your particular system. MDA (mono), CGA, EGA, VGA and Hercules cards are all supported.

However, the various graphics display functions are not available on MDAs since these have no graphics mode. The author warns that no attempt has been made to avoid annoying screen flicker (snow) on CGA monitors. The program presents a familiar-looking user interface with pull-down menus, dialogue boxes and considerable online help. The menu bar at the top of the screen is always visible while the display is in text mode. The bottom line has additional information about the currently-selected menu item.

Enthusiasts know that shortwave weather reports are transmitted by many stations throughout the world, 24 hours a day, especially in the frequency range between 4000 and 5000 kHz. Such transmissions are normally in Baudot, 425 Hz shift, at 50 or 75 baud.

The so-called SYNOP format is used for reports from land stations, whereas the appropriately named SHIP format is employed for reports from ships and other maritime vessels. Typical messages include data about temperature, wind speed/direction, cloud cover, precipitation, dew-point, pressure and other meteorological information. SHIP reports also include the current position of the vessel. In its text mode, HAMCOMM will display these signals in readable format on your computer screen.

Land stations are identified by a five-digit station number. These are fixed stations, so their geographical position isn't transmitted with a SYNOP report. To give you a better idea where the reporting station is located, HAMCOMM comes with a handy list of about 10,000 station numbers, with names and geographical positions. The program will automatically pick the correct entry from this list while decoding a SYNOP report. There are other formats in use for different kinds of information; however, at this stage HAMCOMM decodes only the SHIP and SYNOP-type reports.

The interesting 'scope function' mode of HAMCOMM is also worthy of mention. In receiving mode, the tone decoder routine continually calculates the current signal frequency for use by other parts of the program. The scope function can also use this value to display a graph of the input frequency versus time. This data then appears as a blue line on the special scope screen.

The tone decoder also maintains a floating average frequency. The effect is very similar to a low-pass filter and is used for noise reduction. The result of this calculation is displayed at the top of the scope screen as a red line.

A solid green line then marks the currently-selected centre frequency and dotted lines above and below show the 'mark' and 'space' tones. For RTTY reception, for instance, the centre line should be in the middle between the mark and space tones. For CW reception, on the other hand, the signal should match the centre frequency. All signals outside the area marked by the dotted lines are ignored by HAMCOMM.

By the way, display of the decoded signal is normally disabled in this mode. It can be found at the bottom of the screen and shows the mark/space states for RTTY and tone/no-tone states for CW reception.

With some practice the author says it is quite easy to determine the type of signal you are listening to, by watching the colorful and hypnotic scope display! CW, AMTOR, packet radio and RTTY all show characteristic patterns, and you can also observe unstable VFOs sweeping slowly across the band.

In the related 'spectrum function' of HAMCOMM, the current input frequency is checked every millisecond. For each frequency there is a counter and the one that corresponds to the current frequency is incremented. All counter values are then displayed as vertical lines with each sweep from left to right — the higher the count, the longer the line. What you see on the screen is therefore not the true audio spectrum, but rather the result at the output of the tone decoder routine. But the effect simulates a real spectrum analyser. (If you have a slow PC then don't expect much from the spectrum function. There simply won't be enough CPU power to keep the display in motion.)

The spectrum function has been found to be quite entertaining, especially with a VGA color display. The author suggests that the next time you have visitors in your shack, and want instant entertainment, just start up this function to sweep across a crowded band!

Like other shareware regularly mentioned here in ONLINE, HAMCOMM can be used on a trial basis for free. It can also be freely passed on to others. However, if the program is put into regular operation, the proper thing is to send the author his small fee, usually $20 or less. This procedure supports the friendly camaraderie of the shareware community and encourages further development of radio-related packages.

ABOUT BBS SYSTEMS

In the last issue of CBA I was talking about how to connect with, and negotiate around, computer bulletin boards via your PC and phone-connected modem.

Now I'd like to say a few words about how such BBSs are used to pass along radio information worldwide. Each computer bulletin board is, to oversimplify the situation enormously, somewhat like a gigantic visual answering machine, but one on which you are allowed to leave your own messages as well. You can read messages already on the system, and then write your replies, which remain on the system for the next caller.

A BBS usually tries to make sense of all the many messages that build up day after day, by dividing the system into various specialised message areas, each with a different topic. Now, all this would be great in itself, and a single BBS, with lots of people ringing in regularly from a particular area, is indeed incredibly useful for transferring radio-related information about new frequencies, tips on equipment and antennas, and suchlike. But computer bulletin boards long ago evolved far beyond this simple technique!

Numbers of bulletin board operators, or sysops, decided to carry certain message areas in common, and to ring each other daily to exchange messages. This is normally done automatically by the computers and modems, late at night, when phone rates are cheapest. To avoid massive STD charges, phone calls are made from system to system, often at relatively short distances, eventually spanning continents, linking hundreds or even thousands of computer bulletins boards together in a single network.

This means, in practice, that if you leave a message in the 'Scanner News' message area of BBS X in Sydney, within a few days your message may be appearing on hundreds of other systems across Australia and possibly, depending on the particular link-up, right around the world. And, in due course, replies from all these systems will arrive back at your 'home base' BBS X. Because of the repeating nature of the messages, such connections are often called 'echomail conferences'.

FIDONET was one of the first BBS networks, starting in the US in the early 1980s. It's now spread worldwide and connects nearly 25,000 systems on six continents, with several hundred boards participating in Australia.

Another giant grouping is the INTERNET, linking many thousands of university computer systems. Some BBSs, like SHORWAVE POS-

Continued from page 39

SUMS, may carry message areas from more than one network.

The value of this kind of message networking to the radio enthusiast is obvious. You can keep in touch at low cost (the cost of a local phone call) with those around the world with similar interests. Tropical band DXers can get tips from like-minded mates who live a bit nearer to their exotic targets. Medium wave DXers can exchange hints on how to build beverage antennas.

Everyone enjoys hearing news of new receivers and transceivers, and interesting modifications. The list of topics goes on and on...

Now, all these FIDONET and INTERNET bulletin board systems rely on normal telephone lines, but licensed amateur radio operators can in addition connect to special radio bulletin systems via the airwaves. This is what's known as packet radio, and packet communication works in a similar fashion to phone line BBSing. However, the licence requirement means that limited numbers of people can participate on such systems.

Does all this make sense? Next time you log on to your favorite BBS, have a closer look at the various radio-related message areas and note which ones are designated as 'echomail' areas.

You'll get the hang of things very quickly and, I suspect, you'll also have a *lot* of fun. A polite inquiry to the local sysop will also get you assistance if you're confused on the finer points.

While on this topic, I'd like to mention an interesting new computer bulletin board system before I sign off: **OZ DX BBS**, run by well-known DXer Dave Onley down Melbourne way.

Ring (03) 416 8715 for access via modem, but only after 9pm and before 7am. (At other times the phone line is in use for voice communications.) This system specialises in medium wave and tropical band DXing and Dave brings years of expertise to this new enterprise. Of course, Melbourne radio enthusiasts shouldn't forget **SPECTRUM RADIO BBS** on (03) 455 1309 round the clock, especially if they're interested in amateur radio software and packet programs.

Interested in this issue's intriguing software but find yourself still modemless? Well, I keep telling you how cheap and easy it is to get online electronically with a minimum of effort! But there's yet another way to access these programs.

I will physically and manually post you a selection of the shareware packages reviewed in this column if you send $35 plus six formatted floppy disks to the now legendary address:

SHORTWAVE POSSUMS BBS,
Attn Patrick McDonald,
PO Box 357,
Round Corner,
NSW 2158

Remember that all the previously-mentioned software is designed for IBM-compatible computers. I'd suggest including either 1.2 or 1.4 megabyte floppies with your request if your computer accepts these sizes. Otherwise the old-fashioned 360k ones will do, but I won't be able to fit nearly as many programs on them, I'm afraid. Mention any special favorite software packages you want, and I'll do my best to include them. Regular ONLINE readers know that I'd *really* prefer that you get a modem and pick up your software at much, much lower cost via the BBS, especially since these little communication machines are coming down in price all the time.

Once you get connected to a BBS you'll wonder how you ever got along without electronic file and message transfers...

That's it for now, folks!

Check in at SWP BBS 24 hours daily on (02) 651 3055 at all speeds up to 14.4k bps and keep in touch

If you're into monitoring aircraft , Russell Bryant brings you right up to date with the...

LATEST AIRCRAFT FREQUENCIES

For those amongst us who derive considerable pleasure from monitoring the activity above our heads, here is a list of frequencies which are changing the way aircraft are controlled in this country.

CTAF (Common Traffic Advisory Frequencies) and MTAF (Mandatory Traffic Advisory Frequencies) will, over the next 12 months or so, replace many of the airfield tower and flight service channels. The rules applied to CTAFs are that aircraft operating within a five nautical mile radius and at 3000 feet are to report their position and intentions. MTAFs are used when tower services have ceased to report movements and intentions.

As my informant states, "...these are not carved in stone...", so expect some changes to occur to the CTAF numbers listed below.

Place/user	State	MHz
Aeropelican	NSW	126.0
Albany	WA	126.7
Albury	NSW	124.2
Alpha	QLD	126.7
Amata	SA	126.7
Andamooka	SA	126.7
Aramac	QLD	126.7
Ararat	VIC	126.7
Argyle	WA	126.7
Armidale	NSW	126.7
Arrabury	QLD	126.7
Atherton	QLD	126.7
Augustus Downs	QLD	126.7
Aurukun	QLD	126.7
Avalon	VIC	120.1
Ayr	QLD	126.7
Bacchus Marsh	VIC	118.8
Bairnsdale	VIC	126.7
Balgo Hill	WA	126.7
Ballarat	VIC	126.0
Ballina	NSW	124.2
Balranald	NSW	126.7
Bamaga	QLD	126.7
Bankstown	NSW	132.8
Baradine	NSW	126.7
Barcaldine	QLD	126.7
Barrow Island	WA	126.7
Bathurst Island	NT	126.7
Bathurst	NSW	126.7
Bedourie	QLD	126.7
Benalla	VIC	122.5
Bendigo	VIC	119.3
Betoota	QLD	126.7
Beverly Springs	WA	126.7
Birchip	VIC	126.7
Birdsville	QLD	126.7
Blackall	QLD	126.7
Blackwater	QLD	126.7
Bollon	QLD	126.7
Borroloola	NT	126.7
Boulia	QLD	126.7
Bourke	NSW	126.7
Bowen	QLD	126.7
Brewarrina	NSW	126.7
Broken Hill	NSW	126.7
Broome	WA	126.0
Bunbury	WA	126.7
Bundaberg	QLD	119.1
Burketown	QLD	126.7
Burren Junction	NSW	126.7
Caloundra	QLD	118.8
Camden	NSW	120.1
Carinda	NSW	126.7
Carnarvon	WA	126.7
Casino	NSW	124.2
Ceduna	SA	126.7
Cessnock	NSW	126.7
Charleville	QLD	126.7
Charters Towers	QLD	126.7
Chillagoe	QLD	126.7
Chinchilla	QLD	126.7
Christmas Island	WA	122.8
Clermont	NSW	126.7
Cleve	SA	126.7
Cloncurry	QLD	126.7
Cluny	QLD	126.7
Cobar	NSW	126.7
Cocos	WA	118.8
Coen	QLD	126.7
Coffs Harbour	NSW	118.2
Collarenebri	NSW	126.7
Collinsville	QLD	126.7
Condobolin	NSW	126.7
Coober Pedy	SA	126.7
Cooinda	NT	126.7
Cooktown	QLD	126.7
Cootah	NSW	126.7
Coolangatta	QLD	118.7
Cooma	NSW	118.1
Coonabarabran	NSW	126.7
Coonamble	NSW	126.7
Cootamundra	NSW	126.7
Corowa	NSW	126.7
Corryong	VIC	126.7
Cowell	SA	126.7
Cowra	NSW	126.7
Croker Island	NT	126.7
Croydon	QLD	126.7
Cudal	NSW	119.0
Cue	WA	126.7
Cunnamulla	QLD	126.7
Curtin	WA	126.7
Dajarra	QLD	126.7
Dalby	QLD	126.7
Davenport Downs	QLD	126.7
Delissaville	NT	126.7
Delta Downs	QLD	126.7
Deniliquin	NSW	119.0
Derby	WA	126.7
Devonport	TAS	126.7
Dirranbandi	QLD	126.7
Docker River	NT	126.7
Donald	VIC	126.7
Doomadgee	QLD	126.7
Dorunda	QLD	126.7
Dubbo	NSW	134.0
Dunbar	QLD	126.7
Durnam Downs	QLD	126.7
Durrie	QLD	126.7
Dysart	QLD	126.7
Echuca	VIC	119.1
Elcho Island	NT	126.7
Emerald	QLD	126.7
Ernabella	SA	126.7
Eromanga	QLD	126.7
Escott	QLD	126.7
Esperance	WA	126.7
Essendon	VIC	125.1
Eulo	QLD	126.7
Evans Head	NSW	124.2
Fitzroy Crossing	WA	126.7
Flinders Island	VIC	124.2
Forbes	NSW	122.7
Forrest	WA	126.7
Forster/Wallis Island	NSW	126.7
Fregon	SA	126.7
Garden Point	NT	126.7
Gayndah	QLD	126.7
Georgetown	QLD	126.7
Geraldton	WA	126.7
Gilgandra	NSW	126.7
Gingin	WA	118.5
Gladstone	QLD	118.8
Glengyle	QLD	126.7
Glenormiston	QLD	126.7
Goodooga	NSW	126.7
Goolwa	SA	126.7
Goondiwindi	QLD	126.7
Goulburn	NSW	126.7
Gove	NT	126.7
Grafton	NSW	126.7
Granite Downs	SA	126.7
Gregory Downs	QLD	126.7
Griffith	NSW	126.7
Groote Eylandt	NT	126.7
Gunnedah	NSW	118.1
Gympie	QLD	126.7
Haasts Bluff	NT	126.7
Halls Creek	WA	126.7
Hamilton Island	QLD	118.7
Hamilton	VIC	124.2
Hay	NSW	126.7
Hermannsburg	NT	126.7
Hervey Bay	QLD	126.7
Hillston	NSW	126.7
Hobart	TAS	118.1
Hooker Creek	NT	126.7
Hopetoun	VIC	126.7
Horsham	VIC	118.8
Hoxton Park	NSW	118.1
Hughenden	QLD	126.7
Iffley	QLD	126.7
Indulkana	SA	126.7
Ingham	QLD	126.7
Injune	QLD	126.7
Inkerman	QLD	126.7
Innamincka	SA	126.7
Innisfail	QLD	126.7
Inverell	NSW	126.7

Isisford	QLD	126.7	Morawa	WA	126.7	Snake Bay	NT	126.7
Ivanhoe	NSW	126.7	Moree	NSW	126.7	South Galway	QLD	126.7
Jabiru	NT	126.7	Morney	QLD	126.7	South Goulburn Island	NT	126.7
Jackson	QLD	126.7	Mornington Island	QLD	126.7	Southern Cross	WA	126.7
Jandakot	WA	118.1	Moruya	NSW	126.7	Southport	QLD	119.0
Julia Creek	QLD	126.7	Mount Coolon	QLD	126.7	St Arnaud	VIC	119.1
Jundah	QLD	126.7	Mount Gambier	SA	126.7	St George	QLD	126.7
Kalbarri	WA	126.7	Mount Garnet	QLD	126.7	St Helens	TAS	119.1
Kalgoorlie	WA	126.7	Mount House	WA	126.7	Stanthorpe	QLD	126.7
Kalgurung	NT	126.7	Mount Howitt	QLD	126.7	Stawell	VIC	119.1
Kalumburu	WA	126.7	Mount Isa	QLD	120.5	Stonehenge	QLD	126.7
Kamileroi	QLD	126.7	Mount Magnet	WA	126.7	Strahan	TAS	124.2
Karratha	WA	124.5	Mount Sanford	NT	126.7	Streaky Bay	SA	126.7
Karumba	QLD	126.7	Mount Wedge	NT	126.7	Swan Hill	VIC	119.1
Kempsey	NSW	126.7	Moura	QLD	126.7	Tamworth	NSW	119.4
Kerang	VIC	126.7	Mudgee	NSW	126.7	Tara	QLD	126.7
Kidman Springs	NT	126.7	Mullewa	WA	126.7	Taree	NSW	126.7
Killarney	NT	126.7	Mungindi	NSW	126.7	Taroom	QLD	126.7
Kimba	SA	126.7	Muttaburra	QLD	126.7	Telfer	WA	126.7
King Island	TAS	118.8	Nappa Merrie	QLD	126.7	Temora	NSW	126.7
Kings Creek	NT	126.7	Naracoorte	SA	126.7	Tennant Creek	NT	126.7
Kingscote	SA	126.7	Narrabri	NSW	126.7	Thangool	QLD	126.7
Kowanyama	QLD	126.7	Narrandera	NSW	126.7	Thargomindah	QLD	126.7
Kununurra	WA	126.7	Narromine	NSW	126.7	Theodore	QLD	126.7
Lake Cargelligo	NSW	126.7	Newman	WA	126.7	Thylungra	QLD	126.7
Lake Evella	NT	126.7	Ngukurr	NT	126.7	Tibooburra	NSW	126.7
Latrobe Valley	VIC	126.0	Nhill	VIC	126.7	Timber Creek	NSW	126.7
Launceston	TAS	118.7	Norfolk Island		118.1	Tindal	NSW	119.7
Laverton	VIC	135.3	Normanton	QLD	126.7	Tocumwal	NSW	122.9
Laverton	WA	126.7	Norseman	WA	126.7	Tooraweenah	NSW	126.7
Lawn Hill	QLD	126.7	Nowra	NSW	118.3	Toowoomba	QLD	126.7
Learmouth	WA	126.7	Numbulwar	NT	126.7	Tottenham	NSW	126.7
Legune	NT	126.7	Nyngan	NSW	126.7	Townsville	QLD	126.8
Leigh Creek	SA	126.7	Oakey	QLD	120.1	Tumut	NSW	126.7
Leinster	WA	126.7	Oenpelli	NT	126.7	Vanrook	QLD	126.7
Leongatha	VIC	126.7	Olympic Dam	SA	126.7	Victoria River Down	NT	126.7
Leonora	WA	126.7	Onslow	WA	126.7	Wagga Wagga	NSW	118.2
Lightning Ridge	NSW	126.7	Oodnadatta	SA	126.7	Walkeri	SA	126.7
Lingaroy	QLD	122.7	Orange	NSW	119.0	Walgett	NSW	126.7
Lismore	NSW	124.2	Orbost	VIC	126.7	Wangaratta	VIC	119.1
Lockhart River	QLD	126.7	Papunya	NT	126.7	Warrabri	NT	126.7
Longreach	QLD	126.7	Paraburdoo	WA	126.7	Warracknabeal	VIC	126.7
Lord Howe Island	NSW	126.7	Parkes	NSW	126.7	Warren	NSW	126.7
Lorraine	QLD	126.7	Point Cook	VIC	135.5	Warrnambool	VIC	126.0
Mackay	QLD	124.5	Pooncarie	NSW	126.7	Waterloo	NT	126.7
Maitland	NSW	126.7	Pormpuraaw	QLD	126.7	Wave Hill	NT	126.7
Mallacoota	VIC	126.7	Port Augusta	SA	126.7	Wee Waa	NSW	126.7
Mangalore	VIC	121.1	Port Hedland	WA	119.9	Weipa	QLD	126.7
Maningrida	NT	126.7	Port Keats	NT	126.7	West Sale	VIC	118.3
Marble Barn	WA	126.7	Port Lincoln	SA	126.7	West Wyalong	NSW	126.7
Mareeba	QLD	126.7	Port Macquarie	NSW	118.1	White Cliffs	NSW	126.7
Margaret River	WA	126.7	Port Pirie	SA	126.7	Whyalla	SA	126.7
Maria	SA	126.7	Portland	VIC	126.7	Wilcannia	NSW	126.7
Maroochydore	QLD	124.4	Proserpine	QLD	126.7	Williamsons	QLD	126.7
Marree	SA	126.7	Puckapunyal	VIC	121.1	Williamtown	NSW	118.3
Maryborough	QLD	126.7	Queenstown	TAS	124.2	Wiluna	WA	126.7
Maryborough	VIC	119.1	Quilpie	QLD	126.7	Windorah	QLD	126.7
Meekatharra	WA	126.7	Quirindi	NSW	126.7	Winton	QLD	126.7
Merimbula	NSW	126.7	Raminging	NT	126.7	Wollongong	NSW	126.7
Merty Merty	SA	126.7	Redcliffe	QLD	126.7	Wondai	QLD	126.7
Middlemount	QLD	126.7	Renmark	SA	126.7	Wondoola	QLD	126.7
Mildura	VIC	118.8	Richmond	NSW	126.7	Woomera	SA	118.3
Miles	QLD	126.7	Robinhood	QLD	126.7	Wrotham Park	QLD	126.7
Milingimbi	NT	126.7	Robinvale	VIC	126.7	Wudinna	SA	126.7
Millicent	SA	126.7	Rockhampton	QLD	118.1	Wyandra	QLD	126.7
Minjilang	NT	126.7	Roma	QLD	126.7	Wycheproof	VIC	126.7
Minnipa	SA	126.7	Roseberth	QLD	126.7	Wyndham	WA	126.0
Mitchell	QLD	126.7	Rottnest Island	WA	126.0	Wynyard	TAS	126.7
Monkira	QLD	126.7	Rutland Plains	QLD	126.7	Yarram	VIC	126.7
Monto	QLD	126.7	Schofields	NSW	135.5	Young	NSW	126.7
Moomba	SA	126.7	Scone	NSW	118.8	Yuendumu	NT	126.7
Moorabbin	VIC	118.1	Sea Lake	VIC	126.7	Yulara	NT	126.7
Mooraberree	QLD	126.7	Shepparton	VIC	118.8			
Moranbah	QLD	126.7	Smithton	TAS	119.1			

Thanks to JT, of Melbourne, Vic for this extensive listing.

This report tells you what you need to know about...

WORKING DX ON 11 METRES

Part Two

By Jack Haden ex T30JH

A good radio can make or break a good DX station. It's no use having a state-of-the-art antenna system if the radio is a pile of junk.

The radio and the antenna share equal importance in the establishment of a good DX station.

Choosing a good DX transceiver can be a bothersome problem, with so many different makes and models available, not to mention plenty of secondhand units that are no longer produced.

It can become quite confusing picking a decent set which suits your needs and fits your budget. These days it is more-or-less a case of 'you get what you pay for'; some cheap and nasty sets are OK for chatting up the YL across the road or out in the suburbs but lack the punch and clout needed to work DX without having to yell your guts out.

Naturally, if you are going to operate a base station you would look for a radio with base station features to make operation more comfortable. Features like a front mounted speaker and provision for headphones are a plus. It's amazing how much easier it is to hear a weak DX station through a front mounted speaker or, better still, through headphones.

Most base transceivers have decent sized power/SWR meters, so you don't have to strain your eyes to instantly see meter readings. A built-in power supply is an added benefit without having to worry about an external unit with untidy leads.

Over the years many good 27MHz CB base stations have appeared on the market, some aimed at the DXer. Who can remember the big CPI base station that was around a few years back? There was also the popular Pearce Simpson Bengal series and the President Washington base which, along with the Cobra base units were all the rage in the old days. Kraco even churned out a very reasonable base rig too, along with some other manufacturers.

A good base radio certainly beats operating from a mobile set off a battery or power supply, hands down. Of course the latter is OK if you are not a keen DXer.

In reality, a lot of the base station sets were in fact just a mobile rig inserted into a bigger box with some extra fancy knobs and dials, however, some companies did go out of their way to produce a proper base station product with better overall performance.

Of course the 'Real DXer' would be chasing a radio with SSB (Single Side Band) modes, as that is where the majority of good DX can be found.

224-AT-104 ☐
224-RA-01 ☑

OPERATOR: *HANG*
QTH: *P.O. Box 463, Betio, Tarawa Atoll, Western Kiribati, Central Pacific.*

EQUIPMENT: *Kenwood TS-850*
ANTENNA: *Lightning - 6*

CONFIRMING OUR RECENT QSO...

CALLSIGN	DAY	MONTH	YEAR	TIME (UTC)	FREQ	MODE	R	S	T
27I-NI-01	27	JUNE	93	0410	27	SSB	5	5	X

☐ Please QSL ☐ via BUREAU/DIRECT ☐ Thanks QSL ☑

ILLEGAL DEVICES FOR BETTER DXING?

Over the years I have often be criticised for not promoting or mentioning where to find the "rare" DX which populates frequencies outside of the legal 40 channel system.

The main reason for this is that the editor would not appreciate the pages of *DX INTERNATIONAL* being used to promote spectrum abuse. No doubt the people at the Spectrum Management Agency would also take a very dim view of this type of activity being promoted in a national communications magazine such as CBA.

Therefore, I tend to leave things to the readers imagination on how to go about finding some extra space to work DX.

One cannot dispute the fact that a DXer using an amateur radio transceiver modified for 27MHz operation, or a DXer using a Digiscan or similar device to boot with a linear amplifier has the edge over the DXer with just a 40 channel SSB CB radio, running the legal power output. It is two different worlds.

The main difference being that using amateur sets, Digiscans and linears is the risk of doing so, and if you are caught, you must face the consequences, with the matter being dealt with in the courts.

Is the overall risk worth it just for the sake of a few QSL cards and the freedom of less congested frequencies?

Keeping in mind it is in fact illegal to communicate with stations outside the geographical boundaries of Australia on CB radio, the SMA is not duly concerned with DXers who work overseas stations within the legal 40 channel system and, from what I have observed, generally turn a blind eye. However, operate outside the 40 channel system and you take the risk of hefty fines if you are caught.

Do take heart however, there are many DXers about who work quite a lot of good DX on the 40 channel system with a legal CB radio through beam or quad antennas and even verticals. Some have over 100 countries confirmed.

I know it is difficult to hear DX stations on the 40 channel allocation, particularly if you live in either Sydney or Melbourne where channel congestion is heavy, but it can be done. Not having a current copy of the CB regulations I cannot say for sure if power microphones are legal to use or not, perhaps our editor can enlighten us here. I don't think they are really legal, but then I haven't heard of anyone being busted for using one.

However, it is common knowledge in the DX world that a good desk microphone can actually improve the sharpness and give a little more `punch' to the signal by driving the radio better. They don't give you extra power as some newcomers to the hobby are lead to believe, they just drive the radio audio stages a bit more efficiently than their smaller, handheld brothers. Desk microphones come in a variety of models. Some require a small battery to work properly, and some come with added features like `reverberation' (echo) and `Roger Beep', which in my view are not really important, but some do get a lot of fun out of using these extra gadgets.

Some popular desk-mike names which come to mind are Densi, Leson, Piezo Turner and Voicecraft to mention a few. Some need a small battery to power them, some are a total waste of money while others do give your modulation a bit more clout and punch, handy for chasing DX when everything counts!

Some desk mikes can be a real pain, especially when the mike gain control is wound up full, along with the mic gain control on the radio itself. What you get is a filthy radio station that causes splatter and crud across the channels. You will soon be told about it if you are causing this problem, not to mention the potential to cause TVI! A desk-mic (powered variety) can be operated sensibly and that means not flogging it to the maximum but keeping things wound back to a sensible level so not to annoy others. You can identify the offenders; the operator sounds like he is talking from the bottom of a well or is so over modulated he is dragging in background noise and the voice is muffled, a sure sign of an over-driven mike/radio.

Used properly and with a grain of common sense they can give you that little bit more "oomph" needed for working that much sought after DX.

RF PREAMPS

There's not many of these devices on the market these days. In times past they used to be very popular, a small 12 volt-powered device coupled in line between the radio and antenna could boost received signals by the flick of a switch.

Most linear amplifiers have these as a standard feature. They are handy to have, although not much chop in the city where they tend to drag in all sorts of interference but, if you can get hold of one on the cheap they are worth a play with and will boost incoming signals by a couple of S points.

SNARING THE RARE ONES

Apart from the old DXers adage of "being there", on the right frequency at the right time, there are not a lot of real secrets to the fine art of working DX.

The `Real DXer' is always a good listener and doesn't waste time chatting to mates while the DX is rolling in. He is continually checking the frequencies to see who is using them and where they are. Languages and accents can often be a key in ascertaining where the DX is. Regardless of language there are key words that are the same in English - place names, particularly city names, island groups or countries themselves. By taking the time to listen for a few moments you may pick up one of these key words and then decide whether to break in or not. I have picked up many a new country by using this time-proven method.

A reasonable knowledge of skip times is most valuable. Knowing when the band opens to certain parts of the globe helps you plan where to point the antenna and what languages to listen for.

Knowing the difference between a long or shortpath opening is beneficial too - there's not much point in beaming direct to Africa via the shortpath when the band is open via the longpath (opposite direction).

A longpath signal is often recognised by certain characteristics, such as rapid up and down fading; a distinct warble or echo on the voices heard, all indicate a near certain longpath opening.

These observations are irrelevant if you run a vertical antenna, but are most important for beams or quads to get the maximum signal to the radio.

Newcomers to the world of DX chasing often make the fatal mistake of being a `Call Channel Junkie'.

At one time or another everyone has heard the resident `CCJ'. He is the one who sits on the call for hours on end, calling and calling but seems to get nowhere. You are not going to pick up a great deal of rare DX parked on the call channel for hours on end. The `Real DXer' only drops into the call channel at brief intervals to see what is going on and perhaps make one or two quick short calls. He then utilizes the remaining time checking out other frequencies and eavesdropping on others for clues or snippets of DX news.

A common trend for some DX stations is to set up a common `meeting' frequency away from the hurly burly of the call channel and usually leave their radio monitoring that frequency.

Some international DX groups also adopt this system and thus will not be found on regular call channels. This is where our old friend, the CCJ, misses out on some of the action. Here in the Pacific, channel 37 is a meeting place for Pacific island nations, as is channel 39 for some French-speaking stations in Africa and the Indian Ocean.

Quite a few countries in the Middle East have a monitoring frequency also, so, it's a case of listening around to snare some of these rare ones.

BREAKING IN

Breaking into an overseas conversation on the radio can be difficult at times, especially if signals are poor. Break in politely, and do not use a long callsign with a lot of mumbo jumbo tacked on to it. For example, say your callsign is 43-DX-999, to make it short and snappy you could just break by saying "43-DX" or "99 Australia".

After you are called in then you give

This report tells you what you need to know about...

WORKING DX ON 11 METRES

Continued from previous page...

the full callsign and other details. I know some people get very excited and eager to work a station for the first time but don't be a dork by yelling for example "43-DX-999, Melbourne, Victoria, Australia." Not only is it a long-winded mouthful, it doesn't sound too professional and at times doesn't go down to well with the stations you are trying to break in to. The end result maybe that you will be ignored altogether.

Remember, not everyone is an avid DXer. Some CBers meet on certain frequencies to get away from people chasing them for contacts and QSL cards, especially when they announce their presence on a call frequency. This is why meeting frequencies are established.

NON DXERS WHO ARE DX

From time to time you will come across a very rare DX station where the operator is not interested in DXing or QSLing. I remember a few years back there was a guy operating from Midway Island on 11 metres but he used to tell everyone he was in Hawaii!

He wasn't at all interested in DX and just took the radio to Midway Island so he could stay in contact with friends back in the USA, and nothing more. When he first arrived on Midway Island he told people his location truthfully but after the demands made upon him to send QSL cards and work station after station he closed down for a week.

He reappeared, still on Midway Island, but told everyone he was in Hawaii to get rid of the "DX nuts", as he called them, chasing him for QSL cards that he wasn't interested in.

A similar happening occurred not too long back here in Australia. A guy operating from Cocos Keeling Island in the Indian Ocean took a CB with him to talk to his wife in Western Australia, but became so frustrated with DXers chasing him for QSLs that he said he was the north west of Western Australia, just to keep them off his back.

Some operators are wise to the problem from the start and set up arranged schedules on a meeting frequency, don't mention their location, ignore breakers and just switch the radio off when they are finished chatting with family or friends. They are not interested in DXing as a hobby, they just use the radio to save on telephone calls.

Often, we cannot have our cake and eat it too. You just have to be patient and wait for another time to come along.

USING THE CALL CHANNEL

As I mentioned previously, we all know the CCJs. They are there all the time and call every few minutes regardless if there is DX about or not.

The CCJ is often a 'tail-gater' too. As soon as you finish your call he jumps right in there and starts his call without waiting to see if you get a reply. These types are despised by many and are quickly classed as the braindead, or alligators - all mouth and no ears...

The CCJ, for obvious reasons, doesn't seem to work as many countries as other DXers as he spends more time calling and tail-gating than listening about.

The CCJ also has a bad habit of jumping on other people's contacts. Even though the call from the DX station wasn't directed to him, this doesn't worry the CCJ, he will call until he gets the station, regardless.

CCJs are also well known for long-winded and obnoxious calls, tying up the call channel with their droning. They get the maximum out of every call, and it usually sounds like this: "CQ CQ CQDX here is the 43-DX-999, the 43-DX-999 out of Melbourne, Melbourne Victoria Australia, we're calling CQ CQ CQDX and we're standing by for a possible DX copy, break break."

More often than not they throw in a whole heap of silly Q codes - QRT, QRX and QSX as their usual favorites. If by chance we all get lucky and the CCJ has a standby frequency he will give, long and drawn out, "and we're QSYing 27.345, 27.345 on the lower side, we're QRT, QRX and QSY". I can tell you that you are not going to work a great deal of DX with that type of carry on!!

The quick and to-the-point way of calling for DX is to keep things short, brisk and know the limit; if someone wishes to work you then they will answer regardless of the length of initial call placed.

CCJs could save a lot of lung power and time by just calling: "CQDX CQDX 43-DX-999 Australia calling." Short and to the point - you can give out your clear frequency when answered and when you take your contact there you then can let him know you are in Melbourne, Victoria, Australia. If the station calling is a keen DXer he will know you are in Australia by the "43" prefix in your callsign, so you can drop Australia altogether from the initial call.

PUMPING THE CONTACT DRY

Newcomers to DXing on an international level will not be conversant with the term 'Pumping the contact dry'. More or less it is a term borrowed from our big brother, amateur radio, and is considered to be one of the most selfish aspects of DXing.

How many times have you heard a DXpedition station working a pile-up only to have one station ask the DXpedition operator stupid questions, or prolong the contact by giving the DXpedition operator a string of useless information that he is not at all interested in?

The Italian based Alfa Tango International DX Group is by far the best known such operation and in the next issue we will run their DXCC country list.

The main purpose of a DXpedition is to work as many contacts as possible as quickly as possible so that everyone gets a chance to exchange a signal report, and in most cases, issue a 'progressive number'. These are the only two items that the DXpedition operator wishes to communicate with you, brief and to the point. By keeping things quick and simple the DXpedition station can work stations more quickly and thus keep everyone happy.

However, things do not always go as planned. It takes all types to make a world, and sure enough, there is always someone who wants to engage the DXpedition station in some sort of conversation.

Simple questions such as asking the name of the operator, callsign or location are OK because not everyone is aware what is going on, particularly if they haven't taken the time to listen before making contact. The real pain in the Khyber Pass is the dill that asks the DXpedition station unwarranted questions such as what type of equipment they are using, what the weather is like, what the local time is, asking them to give out the QSL address and spell it out in phonetics etc. There is nothing worse to the avid DXer than to listen to some dork pump the contact dry especially when signals are weak or, worse still, the DXpedition station is fading out.

Most well run DXpeditions with experienced operators at the helm regularly announce the location of their station and the QSL routing, with most of them actually giving it out in phonetics, or sometimes announce a QSL manager's callsign. It is sometimes difficult to get this information down due to static or other forms of interference but it is really no excuse to pump the contact dry. QSL information can often be obtained from another DXer who has worked the DXpedition, all you have to do is ask politely.

A method that I adopt is work it first and worry later. If I hear a DXpedition and the signal is fairly good I listen for a few minutes to see what's going on; more often than not you will hear the location and QSL route mentioned at regular intervals which saves the hassle of telling each station individually.

However, if you stumble across a DXpedition in progress and the signal is poor or fading out ~you work it first and then sit back and wait a few moments for the QSL information to be announced. If things are so critical, in other words the DXpedition is just about unreadable, you can always ask the QSL information or location quickly when you acknowledge your report and number, for example: " Thanks for the four by three and progressive 1558, QSL route please, 73 and good luck" Some DXpeditions will give it straight away while others will say "QSL route in a moment". Bad luck if he has faded away by then, but you can always ask around later as someone is sure to have worked him too.

QSL PROTOCOLS (THE TRIMMINGS)

Not so long back I received a letter from a reader of DXI asking me what I mean by "trimmings" when mentioning QSLing. Trimmings is a term used by experienced DXers to indicate that in order for you to receive a QSL card back from the DX station or DXpedition operation you should send a self-addressed envelope and some sort of return postage with your QSL card to increase your chances of getting a card back.

Some QSL managers, or DX stations will not answer cards sent without the trimmings. Put yourself in the place of the DX station or DXpedition, you have worked 400 stations and not one sent you any return postage. Most places outside Australia cost around $1, airmail postage; that adds up to quite a sum so you can see my point.

Not many of us are that wealthy we can afford to send out hundreds of QSL cards. It is a case of user pays and a similar system exists on the amateur bands where QSL bureau facilities are poor, unreliable or don't exist at all, so to get a card direct you have to pay for it.

There is an easy way for you to send return postage and that is by purchasing an "International Reply Coupon" (called an IRC) from your local post office. An IRC costs about $1.35 and you pop that in with your QSL card and SAE and mail it off to the DX station. The IRC is an alternative to sending cash in the mail as 97 per cent of post offices around the world accept IRCs and will swap the IRC for an airmail postage stamp. That is how the DXer pays for the stamp to mail your QSL card. By providing the SAE you save him more out-of-pocket expenses by not having to buy an envelope to put your card in.

Most DXers you hear complaining on air about not getting cards back are the ones who fail to put the trimmings in when they mail their QSL card to the DX station, simple as that.

The same system regarding IRCs applies here in Australia. Should you receive an IRC with a QSL card from overseas all you do is take it to your local post office and they will exchange it for an airmail postage stamp to the country of destination up to the value of $1.20.

However, just a final word of caution. Just because you send off an IRC with your cards doesn't guarantee you a return. Some third world countries have dishonest people working in their postal system and quite often mail from overseas countries gets pilfered along the way and thus doesn't reach the intended destination.

Also, we must keep in mind that there are some DXers who say they QSL 100 per cent, but in fact they don't. You may also keep in mind that, if QSLing to third world or any suspicious country, don't put stamps on the envelope. People in some countries steal the stamps and sell them on the blackmarket and thus your letter never gets to its destination. Ask the post office to either rubber stamp your letter 'Postage Paid' or put a postage paid sticker on which is worthless to would-be collectors.

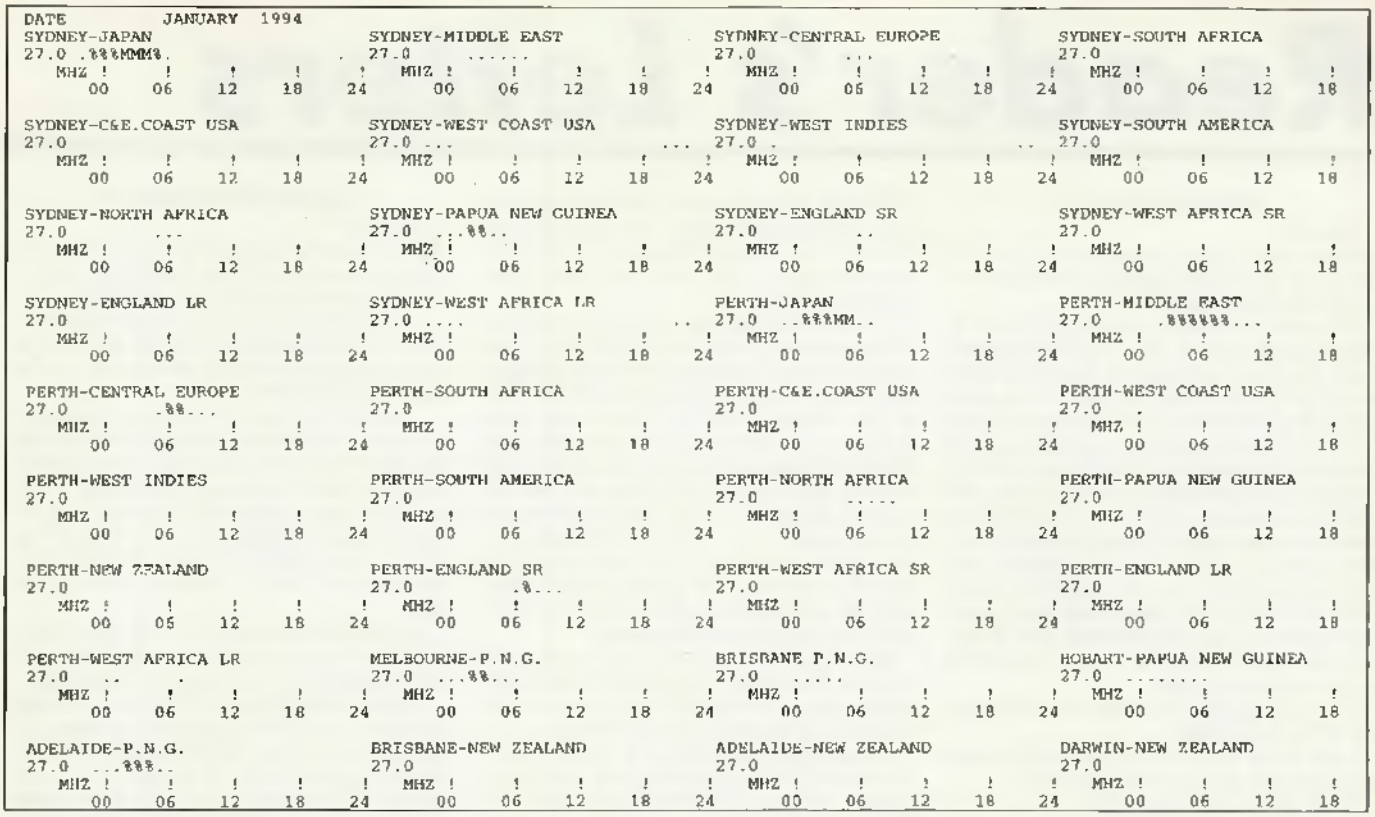
Countries to be cautious of are: Central/South America, Africa, and some countries in Asia such as India, Pakistan, Bangladesh, Vietnam, Cambodia, Laos, Philippines and the newly formed Commonwealth of Independent States (C.I.S), or the old USSR if you like.

If your post office will not put postage paid on your envelope (some post offices in Sydney will not put postage paid on "non-bulk mail" ie: under 30 articles) the best method here is to just take the stamp and clearly tear it in half and stick both portions on the envelope, clearly showing a gap to show it is torn.

Keep in mind that your self-addressed envelope (SAE) should be clearly written. Typed or printed is best and show 'Australia' clearly in block letters to enhance its chances of arriving back to you quickly. Try and send an airmail envelope just to help things along that little bit better. By following these QSL protocol tips you may find that your card return rate increases~ somewhat.

Finally, ensure that you clearly display your return address on the rear of the envelope before mailing it off to the DX station. Sometimes due to confusion or receiving QSL information from others, there could be an error in the address, so if you have your A/D on the reverse the chances of it being returned to you if undeliverable are enhanced, rather than your letter receive permanent residency status in some foreign dead letter office.

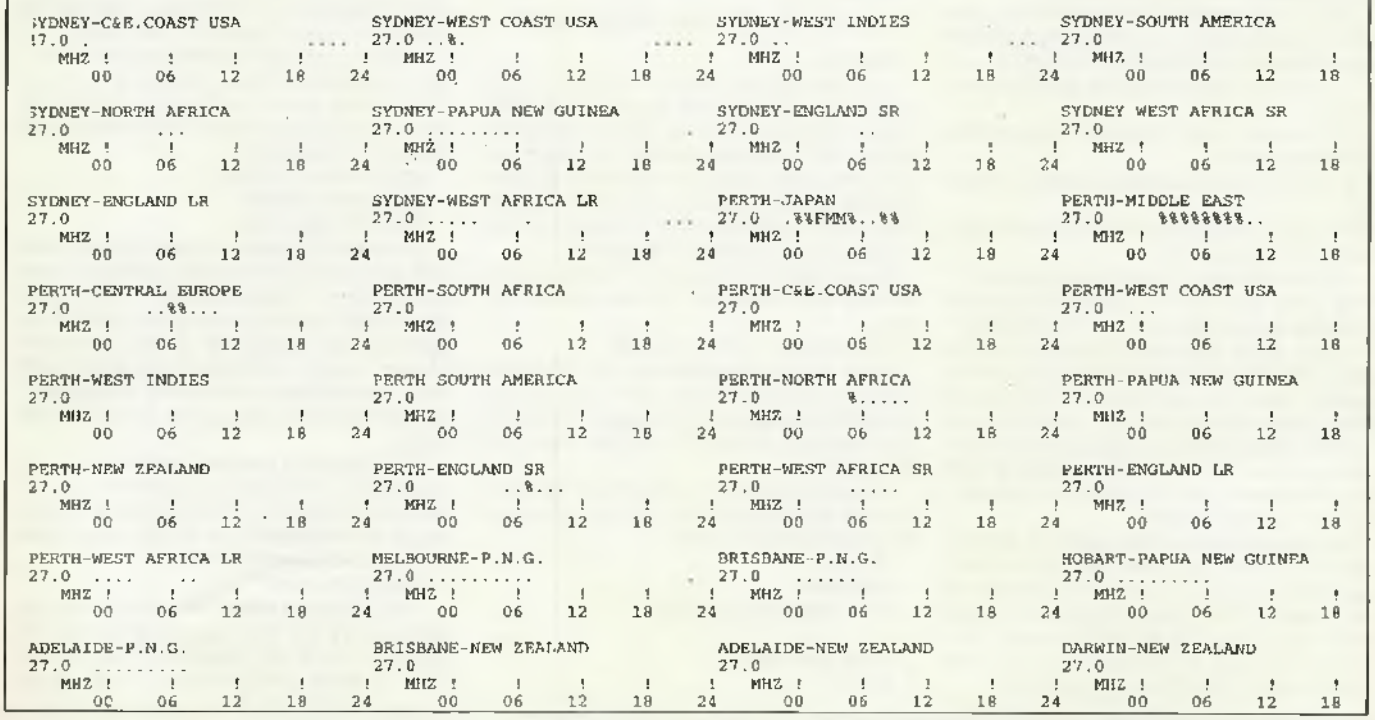
In a number of countries the letter can be classified as undeliverable if only one number in the post code is incorrect; similarly, with some PO box numbers, one number wrong and it becomes undeliverable. DXing is never easy, but if you do it right, you at least improve your chances.



These GRAFEX style predictions present in pictorial form the expected HF propagation conditions between Australia and a number of DX areas. For each circuit, the "East" terminal refers to the eastern half of Australia. The horizontal axis of each graph represents the hours of the day in Greenwich Mean Time (UTC) from 0000 to 2300, reading left to right. A GRAFEX symbol represents the predicted propagation conditions for 11m at a particular time.
GRAFEX Prediction Charts are supplied courtesy of the **Ionospheric Prediction Service, P.O. Box 5606, West Chatswood, NSW 2057**
IPS offers pre-recorded telephone information on (02) 269 8614.

LEGEND TO GRAFEX SYMBOLS

. Propagation is possible but probably on less than 50% of the days of the month.
% Propagation is possible on between 50% and 90% of the days of the month.
F Propagation is possible by the F modes on at least 90% of the days of the month.
E Propagation is possible by the E modes on at least 90% of the days of the month.
M Propagation is possible by both the First and Second F modes on 90% of the days of the month.
S Propagation is possible by the Second 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.



Reader's Letters

NZ DEREGULATION

Dear Sir,

I feel I must write to you following your article in CB ACTION's Sept/Oct Bandspread concerning CB deregulation.

CB radio has been deregulated here in New Zealand since 1 April, 1993. Since then there has been an increase in active CBers as the $45 licence fee per set is now gone and getting on the air is as simple as buying a set and antenna, putting it all together and deciding on a call sign. In my location there is a register set up to issue numbers with a WG prefix for whoever wants one. Emergencies have been answered in a professional manner as always, regardless of a person's call sign and behavior on the band has been good all round. Sure there have been a few that wanted to operate differently from everyone else, but these people were taught the correct way to do things.

All it usually takes is a little talk from a couple of the older CBers.

I am of the opinion that deregulation does work if people are responsible about it.

Keep up the good word CBA.

Keith Hammond, LWC469
168 Karaka Street
Wanganui 5001, NZ.

PS. Could you please let me know the price of a subscription.

Thanks for the letter Keith - you'll find a subscription form elsewhere in this issue.
Editor

WHY NOT INDEED?

Dear Editor,

"Why not packet radio for CBers?"

This is my question for most of the time when asking people on the CB frequencies when the first thing that comes to mind is:

1. You don't need a licence to buy a computer.

2. You don't need a licence to buy a TNC or phone modem.

3. You don't need a licence to buy a phone line.

4. You do need a licence for a radio transmitter (not always - Ed).

So if we use No. 1, 2 and 3 we are legal.

So if we use No. 1, 2 and 4 are we still doing the same thing as in my first example.

I have been and seen the people at the SMA (old DOTAC) and they say it is all the same to them, but one thing, is in the way of CBers, their licence does not permit the use of data communications. Well, I said to them, that is not so. We as CBers can use selcalls on our radios to call each other, or our company, or our fleet of radios.

The both gentlemen said well, it is different type of signal being used. They got me there, but I was not giving up yet. Then I brought up the subject of the equal opportunity board and they said, "They cannot help you because this is a government thing". So now we will have to do something about this.

I would like to see the CB operators put their running packet radio on a legal frequency from 1 to 40 on 27MHz and on UHF CB frequencies to see what the boys in at Spectrum will do.

I know of a packet system running on 27MHz already on 27.540.9 LSB which has been there for 3 years now and getting bigger each year. They have been forwarding data to USA, Europe, UK, Fiji, Tahiti to only name a few that I have seen on my computer and FRG-7700 Comms receiver. This will be a big stepping stone for a lot of CBers who want to become amateurs and with the amateurs outnumbered by 15 to 1 and the amateurs just about losing some of their radio spectrum, why don't some of the amateur people help us or at least give it a good word to the powers to be, to grant us a trial period.

Most of the TNCs out in the radio world now use the same or just about the same frequencies as the selcalls being used in the modern time of radio communications.

I know that it will only be a matter of time before we CBers get packet (or at least use it legally). We will only keep on trying and hope that amateur people will help us, so we can help them keep some of the radio spectrum before it is lost forever.

Peter
Western Victoria.

Peter, I know what you're trying to say and I agree with your thoughts. Elsewhere in this issue is an article on legal Packet on 11m - it's not the answer you wanted - but it's at least legal.
Editor

PACKET ON ILLEGAL FREQUENCIES

Dear Sir,

Concerning the article "Packet on CB Again" on page 31, issue September/October 1993. How can you make packet legal when people are operating packet on illegal frequencies. If the SMA is to approve packet on citizens' band, at least do the right thing by them. Don't upset the SMA or nothing will get done - or they might ban it altogether.

I have just purchased a PK232 packet module and started up my own packet station.

I stand-by on channel 37 LSB.

Here is one suggestion - the SMA are going to abolish AM use (oh?- Ed), so why not allocate channels 1-15 upper side band for morse and channels 1-15 lower side band for packet.

Allocate channel 11 upper side band for morse calling channel and 11 lower side band for packet calling channel.

Simple.

WCK400
Paul, Western Australia

What can I say.
Editor

PEDANT OR PEDANTIC?

Dear Sir,

Thank you for publishing my letter questioning the article in CBA Sept/Oct, 1992 by Ken Reynolds on "Antennas and SWR".

I don't normally buy or read your magazine, but as a friend belatedly drew my attention to your (somewhat caustic) comments on my letter, I feel entitled to a reply.

I suspect your use of the word "pedantic" was meant to give the impression that you did not agree with the accuracy of my statements. In fact it tells me just the opposite and as I read your comments I too had a word come to mind. (Actually several, only one of which I can mention here.) The word is "obfuscation", which means to cloud the issue.

Apparently you chose to do this rather than admit that some of the statements made in Ken's article may be incorrect or misleading.

I realise that explaining SWR and reflected power etc. in simple language is not easy and have noticed similar "simplifications" in other magazines which end up being just as misleading. These were also written by amateurs and professionals in the radio field, which only goes to show that even they are not infallible (as you seem to suggest) and can make boo-boos. However, it is possible as Maxwell and Hearle demonstrate so well.

I note you make no reference to my suggestion of re-printing the ARA Antenna Book 2 article. Do you perhaps think the average CBer would not understand it? How about it. Try them. You may be surprised!

If nothing else it would get the facts over clearly and simply, which I imagine is what you are trying to do. Remember, I did say not to simplify, edit or "explain" it, just reprint!

Although my original letter was not intended for publication it was good to see you did so word for word. I trust you will give the same treatment to this one which this time IS intended for publication.

Noel Davies (VK7EG)
30 Spencer Street
BURNIE Tas 7320.

G'day Noel, thanks for such a nice letter and congratulations on the quality of your dictionary, "obfuscation" even yet. Obviously though you didn't bother to also look up "pedantic" which in my dictionary means "academic, educated, well-read, intellectual, literate and scholastic" to mention but a few...quite a compliment really.

Then again a pedant is described as "one who overrates or parades book-learning or technical knowledge or insists on strict adherence to formal rules; one who is possessed by a theory".

Need I say more?

Look, I hate to admit this, but would you believe we do not have a file copy of Antenna Book #2, however, if you would care to send a photocopy of the article

you're pushing I'll give serious thought to running it - just to make you happy.
Editor

GOOD FOR YOU CATHY

Dear Sir,

Allow me to respond - in part - to Cathy Watts' letter (CB ACTION Sept/Oct).

Good for you Cathy!

You had some specific opinion about the changes likely to affect the current and future CB scene and you certainly stood up to be counted. My response is concerned with your comments regarding ACBRO.

The matter of licence fees is more than a matter of money in the sense that it is the VALUE CBers get for their money and it concerns the procedure whereby the fee(s) are set which ACBRO wanted to pinpoint.

However, I must say that ACBRO may have gone overboard a bit. It is difficult to know when to "let go" as against the viability of continued pursuit and, in the absence of good input from CBers on any issue, a decision is made with whatever consequences.

If ACBRO's responses to MY communications is any indication, I say that YOUR criticisms AND suggestions would be welcomed.

I do not say that everything offered would be whole-heartedly embraced, but you would get a response and an explanation.

So, to use your expression, Cathy, get off your backside; employ your considerable talents (knowledge and obvious concern) and write to ACBRO as an active CB operator and, hopefully, an ACBRO member.

William Benton
ACBRO 252.

PACKET - STILL MORE

Dear Sir,

In reply to your reader who wrote in about Packet on CB in your October issue. I'm currently operating on 27 MHz while studying for my amateur licence. I'm only 13 so my knowledge only stretches so far in the theory. Because of that I will only get a lower class of licence and that means I can't use packet. After communications, computers run second on my interest list. At the moment I'm stuck to using a modem (because of my parents' bank balance). Although I enjoy ringing up a massive phone bill, I'm getting bored with it and would like to move on, ie. up to packet, but because I don't have a licence yet and packet isn't on the CB bands, I've got a problem on my hands. So I would LOVE to see packet introduced on 27 MHz.

You may think it a bit strange for a 13 year old to be writing in to a column like this, but I think it would be pretty good to see more teenagers getting into the fantastic hobby of Amateur Radio. I expect people will take me as a joke but I would like you and your readers to take kids seriously.

So just give them a chance! OK?
Ryan Lovett
PO Box 181, Picton, NSW 2571.

Hey Ryan, where do you get off with the "because of my parent's bank balance" and the "I enjoy ringing up a massive 'phone bill" busines?

Instead of grizzling, why don't you do some part-time work, buy your own equipment and pay for your 'phone calls.

That way maybe our readers will take you seriously.
Editor

UNIDEN GRANTS RULE - OK

Dear Sir,

I have been actively engaged in the world of CB since the 1970s, well prior to it becoming legal and have used a number of sets, too numerous to mention here now. I currently have two sets, both of them are "Uniden" Grants and I could not be more happy with both of them. They have been in the family car and work vehicles, including four wheel drives and trucks.

The construction of the older type sets are far superior to the modern day sets and I am thankful for that construction, as travelling on some of the roads up here is at some stages very hazardous. I would not give, swap or sell them for anything at all.

I work for a government agency which involves a lot of distance travel and they have always lived up to their reputation.

In regards to Ken Reynold's article on packet radio for CB, it would give a lot of people a new lease on their hobby. I know that it would mine. I have always looked for something to update my hobby on CB and feel that this would be a way of doing so, but have stopped short of actually doing it for one reason - the legal aspect of this service.

I have been using another person's system for some time now and feel a bit of a menace at times. The other person also uses this system for his amateur radio and I feel the need for my own system.

What would be the ramifications of putting such a system on CB.

The possibilities of the system being used on CB and the advantages would be enormous for the hobbyist to say the least.

I know that it would allow me to follow another hobby.

Rod Vinson
PO Box 1336
Aitkenvale Qld 4814.

Rod, you'll get no argument from me about the quality of Uniden Grants - I use one, plus a Cobra 148 GTL - great CBs. As for you using packet, good for you, however, I reckon you should at least buy your own as chances are that if you're illegally using your amateur mate's on amateur bands you're both likely to get into trouble. If you're using it on 27MHz you're already in good company as there are quite a few packet stations on air, particularly on the lower end of the band. As for the legal ramifications - we're now into our third month trying to obtain a sensible answer from the SMA.

Have fun...
Editor

TUNING AN ANTENNA

Dear Sir,

Having just started CBing this year, I have been totally confused by the actual procedure for SWRing in my antenna. I have read many books on the subject and have found that there doesn't seem to be a right or a wrong method.

To start with, where is the best place to put the SWR meter?

To correctly SWR the antenna I assume that the antenna must be adjusted with the meter at the antenna end.

However, when the meter is placed at the rig end the SWR can be quite a long way out. I read in the ARRL Antenna book that the coax must be a multiple of a 1/4 wavelength long. This does seem to work although according to Jack Hayden in the November/December issue of CB Action it is best to cut off any excess cable if it is over two or three feet long.

This raises the question of "how do you keep the cable a multiple of 1/4 wavelength long when a couple of metres can be cut off", just keep cable runs short.

As an example, I bought a pre-tuned whip and a gutter mount for my car which included 3.6 metres of cable. When I checked the SWR of the antenna and coax (of which 3.6m is not a multiple of a 1/4 wavelength) the SWR was 3:1. I took the mount back to the shop where I purchased it and the salesman said don't worry about it.

The problem that I can see is that the CB "sees" the coax and antenna together as a whole, so ignoring the coax length to me doesn't make sense.

Please can you finally put this problem to rest. A couple of other things that you may want to clear up. Why do the ionospheric prediction charts only have one Melbourne prediction?

Does that mean that we can only talk to P.N.G.? Thanks for a great informative magazine and I hope that you can help me with my questions and problems.

G.O.
Boronia, Victoria.

CBA has run a multitude of articles on how to correctly tune antennas and feed lines so grab a back-copy and check it out for yourself.

The propagation charts should be read as Sydney meaning the east coast and Perth the west, obviously what is forecast for Sydney will be pretty much the same for the entire eastern coast.
Editor

UPLINK 1994

Although few people appear to be aware of it, satellite TV is already available in Australia.There are various companies marketing and installing satellite TV systems for private homes and in our next issue we will review a low cost ($995 complete) system which works very well indeed.

The concept of global satellite coverage was first proposed by mathematician and science fiction writer Arthur C Clarke in 1945. His concept was based on the calculation that any single geostationary satellite could cover 40 per cent of the surface of the earth, and that three such satellites could be used to cover the entire planet.

Nineteen years later, the world's first geostationary satellite, **Syncom** was launched. This satellite had the capacity to relay one channel of television, or 50 telephone channels. Since that time, a multitude of communications satellites have been launched, and are in use in most countries of the world.

Most international satellite operation is carried out by **INTELSAT**, and occurs in three basic areas of the world, the Pacific Ocean Region (POR), Atlantic Ocean Region (AOR), and the Indian Ocean Region (IOR). A newly designed area, the Asia Pacific Region (APR), will also shortly commence operation. Traffic is highest in the Atlantic Ocean Area, double that in both POR and IOR. These satellites are used as a delivery system for commercial TV networks around the world, and are not intended to be received by home satellite television enthusiasts (although they *can* be with suitable equipment...).

Nevertheless, such satellite transmissions are often the only source of television programming for people living in remote areas.

Even network interchange transmissions provide some entertainment. In recent times, complete systems have become available for under $1000 for the home enthusiast.

These systems allow enthusiasts to view transmissions on the **Optus** satellite **B1**, located at 160 degrees East longitude. **Table 1** shows the transponder loading of Optus B1 (courtesy *AVCOMM*).

Apart from television and telephony, satellites are also used to produce images of the earth, from which weather maps are produced. The primary satellite serving the Pacific area is a Japanese spacecraft, GMS-1, located at 140 degrees East longitude.

This satellite operates a downlink frequency of 1691 MHz, producing high-resolution visible and infra red images of the Australian continent.

These signals can be received using inexpensive home equipment, such as a scanning receiver that covers up to 1800 MHz, and a purpose-built antenna.

Satellites are also used for military communications. In Australia, the US Navy **FLTSATCOMM** satellite located at 172 degrees East carries voice and data communications for the Pacific area.

Whilst not the primary means of communications, this system is often used in areas where HF communications will not operate, or are not practical for tactical reasons.

Most military traffic is in clear voice, and occasionally secure communications using DVP (Digital Voice Protection), other non-military traffic can be also heard around 262 MHz.

In Australia our Defence Forces also have the ability to use the FLTSATCOMM system, and it was used by Australia during the Gulf War.

Reception is easily obtained using a scanning receiver and an active antenna, or a passive antenna such as a discone, with lesser results in my experience. The most active of the frequencies being 261.450, 261.850 and 261.625 MHz which from my monitoring carry mostly secure traffic.

Recent reception reports include information from MIA recovery teams in Laos in Vietnam, and continuous military aircraft movement in and out of the US.

Several other users of this system are the CIA (Central Intelligence Agency), NSA (National Security Agency) and the White House Communications Agency responsible for presidential communications, and numerous other agencies.

As part of a global communications system, Motorola USA and a group of corporate supporters have conceived a network called **IRIDIUM**, a group of 66 low earth orbiting satellites designed to cover the entire globe, allowing cellular phone communications between any two points on the globe.

This system is likely to commence operations in the mid-1990s.

There are also a multitude of Amateur Radio satellites sponsored by AMSAT, the international amateur radio satellite organisations, and other voluntary groups.

These satellites carry voice, packet radio and the latest technology digital store and forward communications. Recently on an Ariane launch, four new amateur satellites were launched from one spacecraft that also carried two commercial satellites, to reduce the cost of the launch!

One of these satellites is now being used by Indian doctors in remote parts of India to allow medical communications with other doctors in large hospitals.

Passive and active antennas provide impressive results for receiving, with transmitting antennas normally being a single dipole or multiple element Yagi antenna specifically designed for the uplink (transmit to the satellite) eg two metres or 70cm.

To aid in keeping the antenna aligned with the satellite, some satellite tracking software such as *InstantTrack* (by AMSAT) allows interconnection of two antenna rotators which takes the manual work out of antenna pointing.

VHF weather satellites are as easy to listen to as the amateur radio satellites, and operate in the 136 MHz range.

There are several US and CIS (Former Soviet Union) weather satellites NOAA 9, 10, 11, 12 and the Meteor range, MET 2-21 being the latest.

Other countries also have satellites in orbit. These weather satellites orbit the earth at a low altitude producing excellent Infra-Red photos, radar imaging for wave height measurement.

Active and passive antennas are also suitable for this, and there are many home-built designs.

There is now a variety of satellite software and accessories for the satellite beginner or expert. Satellite tracking software from basic tabular or text output, to such programs as **STSPlus**, a program which produces extremely impressive visual results on a VGA monitor and can track multiple satellites.

Traksat v2.8 is also a good tracking program but does not have the bells and whistles of STSplus, but produces excellent tracking results on a very basic PC.

Two-line elements are the life blood of any satellite tracking program. Satellite elements contain current orbital information compiled from various government sources with information such

By John Brannigan

as NORAD number, decay date, orbit number etc.

When these are read into the satellite tracking program, complex maths are undertaken and the program then produces either visual or text output.

The Civil Aviation Authority uses the Optus B1 and A3 satellite for en-route air traffic control within Australia. This service enables an air traffic controller (or flight service officer) in Sydney to converse with his counterpart in Perth instantly.

This is called a redundant system — should the normal communications fail, they still have the Optus B1 or A3 satellite. Should a satellite fail, the satellites are mirrored so the system is not down; it just transfers to the working satellite.

With the appropriate scanner from 970 MHz to 1600 MHz, a DC block, 1.2m dish and PLL (Phase Locked Loop) LNB to reduce drift, good results are achieved. Various FM radio stations can also be monitored.

The Optus B1 satellite has a transponder for Mobilsat, Optus's latest satellite mobile phone service.

The transponder is on L Band 1550-1650 MHz and will transmit at 150 watts. The satellite has a translator that converts the L-Band signal and downlinks the telephone calls digitally to a major city Earth Station on Ku-Band 12 GHz.

The Optus Mobilsat system will provide mobile coverage on land and 200 km to sea.

The service is at the moment still in its acceptance stage, and will be implemented in March 1994.

The Mobilsat network management hardware, and Mobilsat telephones are being initially supplied by NEC, with an additional supplier being the Westinghouse Corporation from the US in August or September 1994.

The antenna you will need to access Mobilsat is just a 1m fibreglass helical antenna about 2-3 cm in diameter.

Those who are interested in getting involved in satellite comms can find a good source of satellite data on Satcom Australia Space and Satellite BBS on (02) 905 0849 with speeds from 2400 to 14,400 bps.

John Brannigan is a knowledgeable "satellite" expert and this is the first of his regular columns.

Optus B1 transponder activity chart as at 18.10.93

TR	POL	FREQ MHz	BEAM	USER	MODE	IF
1	V	12,281.9	NA/SE/NZ	OPTUS	——	977.0
2	V	12,344.5	NA/SE/NZ	FREE	——	1041.0
3	LOWER V	12,394.1	NA/SE/NZ	OCCASIONAL VIDEO	PAL	1094.1
3	UPPER V	12,420.1	NA/SE/NZ	NETWORK 7	E-PAL	1120.0
4	LOWER V	12,456.7	NA/SE/NZ	INTERCHANGE	PAL	1156.7
4	UPPER V	12,482.7	NA/SE/NZ	NETWORK 10	E-PAL	1182.7
5	V	12,532.3	NA/SE/NZ	SBS	B-MAC	1233.0
6	LOWER V	12,565.0	NA/SE/NZ	OMNICAST	FM2	1265.0
6	UPPER V	12,596.0	NA/SE/WA/NZ	SKY	B-MAC	1296.0
7	V	12,657.5	NA/SE/WA/NZ	ABC HACBSS	B-MAC	1361.0
8	V	12,725.0	NA/SE/WA/NZ	SKY SPECIAL	B-MAC	1425.0
9	H	12,313.2	NB/HP	CAA COMMS	——	1009.0
10	H	12,375.8	NB/HP	OCCASIONAL VIDEO	PAL	1073.0
11	H	12,438.4	NB/NE/HP	SBS	B-MAC	1137.0
12	LOWER H	12,488.0	NB/CA/HP	NETWORK 9	E-PAL	1180.0
12	UPPER H	12,514.0	NB/CA/HP	FREE	——	1214.0
13	LOWER H	12,550.6	NB/HP	ABC INTERCHANGE	PAL	1249.0
13	UPPER H	12,576.6	NB/HP	ABC RADIO	——	1276.6
14	H	12,626.2	NB/NE/CA/HP	ABC HACBSS	B-MAC	1329.0
15	H	12,688.8	NB/NE/CA/HP	QTV	B-MAC	1393.0

Omnicast services available from Optus B1, Transponder 6:

Tuckerbox Radio	238kHz
Woolworths Supermarkets	330kHz
GAA Satellite FM	1040kHz
4TAB Racing	1150kHz

AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

BRIEF RESPONSE TO READER

Cathy Watts - we need you! If you ever move to Adelaide, South Australia, please make yourself available to become part of the ACBRO committee.

Cathy's well-constructed letter published in the Sept/Oct CB ACTION was full of ideas and opinions that made interesting reading, as did the editorial that followed it. But her comments about ACBRO made history in being the first published criticism recalled over the past six or seven years since ACBRO's administration was revamped.

Cathy claimed that "...All they (ACBRO) seem to complain about are license fees...", so to add credence to her statement, the subject will be given a little space here. She went on to say, "I have never read anything sensible come out of that mob."

ACBRO hopes that Cathy read in the same edition the ACBRO pages where a meeting with the Minister for Transport and Communications was convened at which a number of subjects were discussed, including licence fees, and that she would seriously change her views that ACBRO had only the financial interests of CBers as a concern.

Cathy's address was not published with the letter, and she does not appear to be on the register of ACBRO members, so we would invite her to communicate directly with the ACBRO committee or join as a member, and receive the members' magazine which will broaden her horizons on the activities of ACBRO to result in her next published letter being more accurate in presentation of 'opinion'. This will avoid ACBRO siding with the Editor, who, on another matter on which an opinion was expressed said, "You are quite incorrect.".

LICENCE FEES

At the expense of further upsetting Cathy, this on-going subject continues to dominate thinking with the ACBRO committee. The inequity of the current system, as briefed in a discussion with the Minister for Transport and Communications (detailed in the Sep/Oct issue) prompts further concern, and despite there being little documented record from members of the CB fraternity indicating that no license fee should be levied on CBers, the committee feels that they would not be generally criticised for pursuing such an approach. In raising this issue with the Minister, it was pointed out that to communicate orally across the table, as was done, no license or tax was payable.

It was then pointed out that the speaker at this meeting could go into the passage behind a closed door and continue such a discussion in a louder voice still without having a license.

Emphasis was then given to the fact that if the parties to such a conversation transmitting their voices to each other through the air that we breathed but were doing so through a CB transceiver, they would have to pay a tax (license fee) for the same privilege. A tax on talking seems inappropriate in a country which professes freedom of speech.

So at the expense of being criticised, ACBRO will include the abolition of CB license fees in submissions with the Government. In so doing they will also be considerate of the fact that governments need to raise money by way of taxes, and if a case for sharing some of such income has to come from the CB community, then as reported in the summary of the discussion with the Minister, more equitable methods of taxing CBers should be introduced. Many already canvassed indicate that they would accept the old system where one license covered five sets in a station, providing the fee was reasonable. And ACBRO in being reasonable will include such comments in any further discussions or consultations with the authorities to achieve a fairer system of taxing the hobby followed by CBers in Australia.

SIMPLEX REPEATERS...

To most, it was first revealed in an earlier edition of CB ACTION that a supplier had produced for sale, a modification which would enable a transceiver to double as a simplex repeater.

To many, this did not mean very much, as with the UHF CBRS, repeaters had become most prolific around Australia as indicated by the Repeater List (missing from this isue due to space limitations) published in these pages.

But of course, these are *duplex* repeaters, which require two channels to operate. In discussions, it was generally found that people involved in the Citizens Band Service knew little about the workings of a *simplex* repeater, which operates on a single channel, and because of their contentment with the currently-used duplex service, appeared disinterested in this new facility.

With the manufacturers of the new simplex repeater modification gaining type-approval of their design, it was seen by ACBRO that there may be some problems in having them becoming universally used in the CBRS, despite their usefulness in certain circumstances. ACBRO's action was to have the Minister's office alerted to their concern, and to seek consultation should he envisage permitting their use in the CBRS. In recognising that very few CBers knew of how such a facility

REPEATERS

As was advised in the Nov/Dec issue of CB Action, ACBRO has taken on the responsibility for maintaining the UHF repeater list in as up-to-date a manner as possible. To do this, however, requires the co-operation of UHF repeater owners and local users who are really the only people who canprovide accurate information on a current basis. The SMA provides regular updates, however, their list is often out of date before it is even published. Due to space limitations, the list does not appear in this issue. Please send all information to:

Trevor Colwell,
ACBRO Inc.,
PO Box 170,
Walkerville 5081,
South Australia.

would work, and the great advantage of only having to expend one channel to provide this type of repeater service, they launched an awareness campaign and took every opportunity to educate operators of this new innovation. In addition to talking about such progress on their regular local radio broadcasts, they made up a demonstration model of a device that provided electronic storage of a short message which was activated by a CB-type microphone, to simply show others how a simplex repeater holds a message and transmits it following the release of the TX switch.

This was displayed and demonstrated at a recent Hobby Fair in Adelaide, at a group's annual general meeting and other places where CBers gathered.

Also at the AGM, where a case for and against simplex repeaters was debated, a guest who owns such a facility was invited to speak in favor of this facility that he was having trouble in getting approval to use on the UHF CB band. The opinion offered by those in attendance who listened and watched intently, was that they may introduce problems if generally used in the CBRS, but agreed that they should be licensed for use in the band outside built-up city and metropolitan areas. It was simple to see the great advantage that could be obtained with simplex repeaters in the rural areas, particularly on the large stations in the far north of the state.

DECISION...

At a recent ACBRO committee meeting a vote was called on whether to favor simplex repeaters in the CBRS.

All but one in attendance voted against the motion that this matter should be pursued further at this time.

Whilst there may be more support in favor if such facilities could be approved for use in the country areas, most were aware of the problems in policing such an arrangement. Meanwhile, despite a form of lobby by those who either marketed these devices or owned them and were seeking type approval for them, it is understood now that the Spectrum Management Agency has declared that licences will *not* be issued for simplex repeaters in the CBRS.

This of course does not mean that the decision can't be reversed at a later date, but for that to happen support for the argument will have to be gained.

With the lack of response sought by ACBRO seeking opinions on this subject it can be only assumed that CBers are not interested in having simplex repeaters in the CBRS, or they have not had as yet opportunity to learn about the facilities that they offer.

POWER BAND DATA BASE REVIEW

Armed with a newish Icom IC-R7100, wide-band VHF/UHF scanner come communications receiver, I was anxious to get my hands on an accurate, comprehensive and up-to-date, frequency listing. While I had no desire to discard my several printed frequency registers, I found myself itching for something a bit more sophisticated.

Having recently bought a new IBM 486DX/33 personal computer with 250 megabytes of hard disk space I decided to invest in a computer-type frequency register and ordered a copy of Power Band's new data base program to put both computer and database to the test.

I got the Victoria database ('cause that's where I live) and impatiently read the instructions, entitled "Two minute introduction to SCANMAN" which briefly describes the software package and how to get it up and running in less time than it took to read the fast track instructions. All you need to do — assuming you have a few megabytes of spare HDD space — is to insert a working copy of the supplied floppy into a suitable disk drive and type INSTALL. After a few seconds the installation program builds a new directory titled SCAN on the hard drive, copies into it the appropriate compressed files, explodes them and boots the SCANMAN program into action.

An INDEX routine selected from the main menu quickly sorts the files into categories: USER_NAME, LOCATION, CALL SIGN and FREQUENCY for easy manipulation by the program, assuring almost immediate display of requested data to the screen. In an instant the program extracts the desired information from almost 25,000 entries in the Victoria VHF/UHF database which covers nearly all frequencies between 30MHz and 1,000MHz.

I was surprised to find that the relatively small 430 kilobyte program size on the floppy disk had transformed to 4.5 *mega*bytes after the installation and indexing was completed on to my hard disk. All the memory requirement details are included in the main instructions which, as everyone knows, you only read as a last resort! And anyway, the fast track instructions say the program is easy to use. In fact, the package is very user friendly and I ignored most of the paperwork until I finished my first session with the database.

Without going into extended details, after you install the program the screen displays all the prompts necessary to efficiently use the package and even produce hard-copy lists of requested data. You could even print your own full frequency register is you have the time and paper.

One important feature I noticed about the data records is that there are no records named GOVERNMENT leaving the user to figure out what the hell department is meant. If it is supposed to be CUSTOMS or FEDERAL POLICE that is *exactly* the way it is listed — you are not left guessing.

The management program is a local product written by Power Band Software and in my opinion it is brilliant offering instant access to a huge number of up-to-date records in a very user-friendly environment.

The data base is available in VHF/UHF formats for each state plus one giant file of 40,000 records covering the HF band from zero hertz to 30MHz.

If you are a scanner 'freak' with an IBM-compatible PC and a few megs of HDD to spare you will be hard put to find a more useful and comprehensive radio band directory for anywhere near the price — especially with a legal data management program included for less than $30! The program lets you search for data entries by NAME, LOCATION, FREQUENCY and CALL-SIGN. You can also BROWSE through any of the indexed files from top to bottom and print out specific items of interest.

Power Band informs me they are happy to supply custom packages to your own requirements... The price is negotiable.

For more details contact Power Band Communications in Melbourne on (03) 584 7631.

Become an instant "Yuppie" with a ...

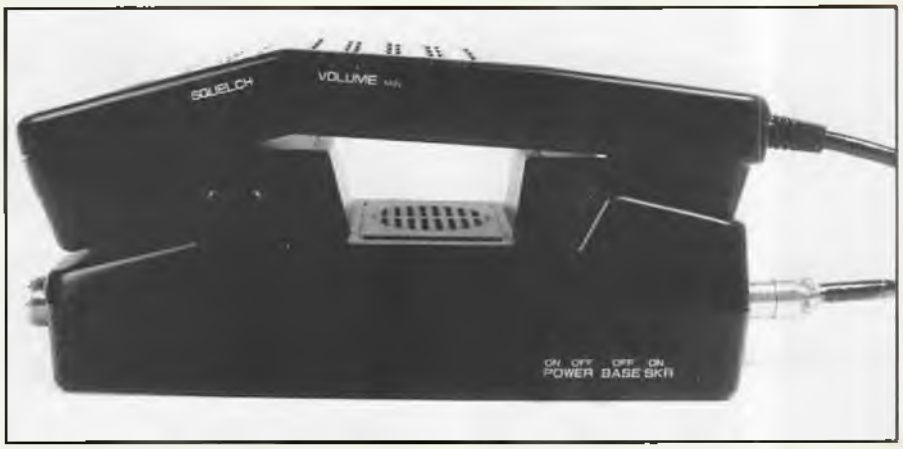
GME-ELECTROPHONE TX-850

Of the many CB rigs we have reviewed during the past 12 months the TX-850 has to be the most innovative.

It was a very smart idea to produce this AM only rig in the shape and style of an expensive cellular car 'phone and for those of us who don't run to the real thing, it provides the opportunity to at least look the part.

Ken Reynolds said in his review, *" this is by far and away the best rig of its type we have encountered over the years. If you decide to buy one of these flashy little units, at least you can't get caught out making bogus 'phone calls on a plastic toy replica that doesn't even work. The TX-850 also offers 10 memory allocations for your favourite channels, but with simple keypad entry of channel numbers the memories tend to be a little extra guilding on the already attractive Lily.*

We were surprised at how well the channel scanning feature works and the transmitted audio sounds sharp - quite a 'clean' little transmitter".



Courtesy of Standard Communications, you now have the chance to win one these rigs simply by finding the answers to the crossword on the opposite page.

The answers to all the clues can be found somewhere in this issue - it's just a case of locating them.

Entries close on 15 Jan 1994 and the first correct entry opened after that date is the winner.

Go to it, but keep in mind that only entries on the actual page will be accepted - no photocopies.

CONGRATULATIONS DONALD JAMES YOU NOW OWN A UNIDEN AX-144 TRANSCEIVER

In the minds of many, the AX-144 rig from Uniden was, and is, one of the best units on the market.

Big and bulky it may be, but for solid performance it takes a lot of beating - why else would it have been around, virtually unchanged, for so many years.

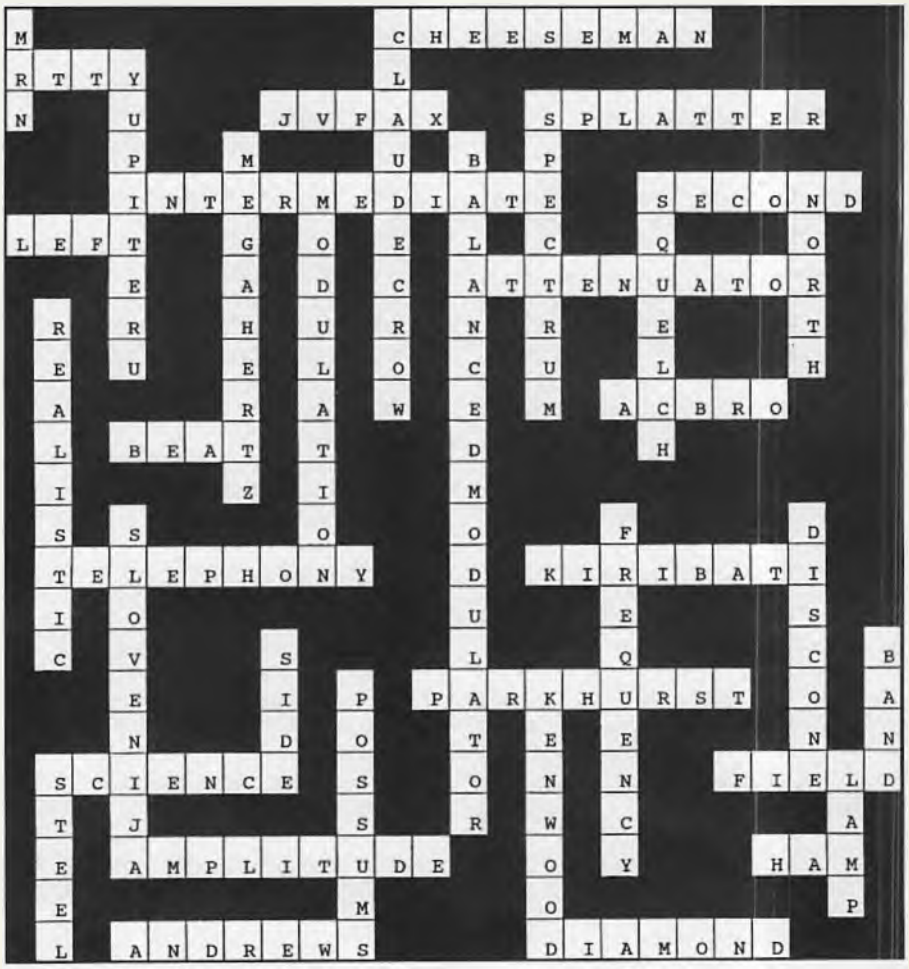
It has always been a highly respected rig, even despite its "glitzy" 1970s type stying. Lots of "shiny bits", heavy and awkward to fit into today's plastic cars, its performance has always out-weighed its negatives and good as Uniden's PRO640e is, many enthusiasts choose to stay with this pretty much out-dated model.

We had one of the biggest entries of all time for this crossword so it's obvious that our readers also know what a good rig it is.

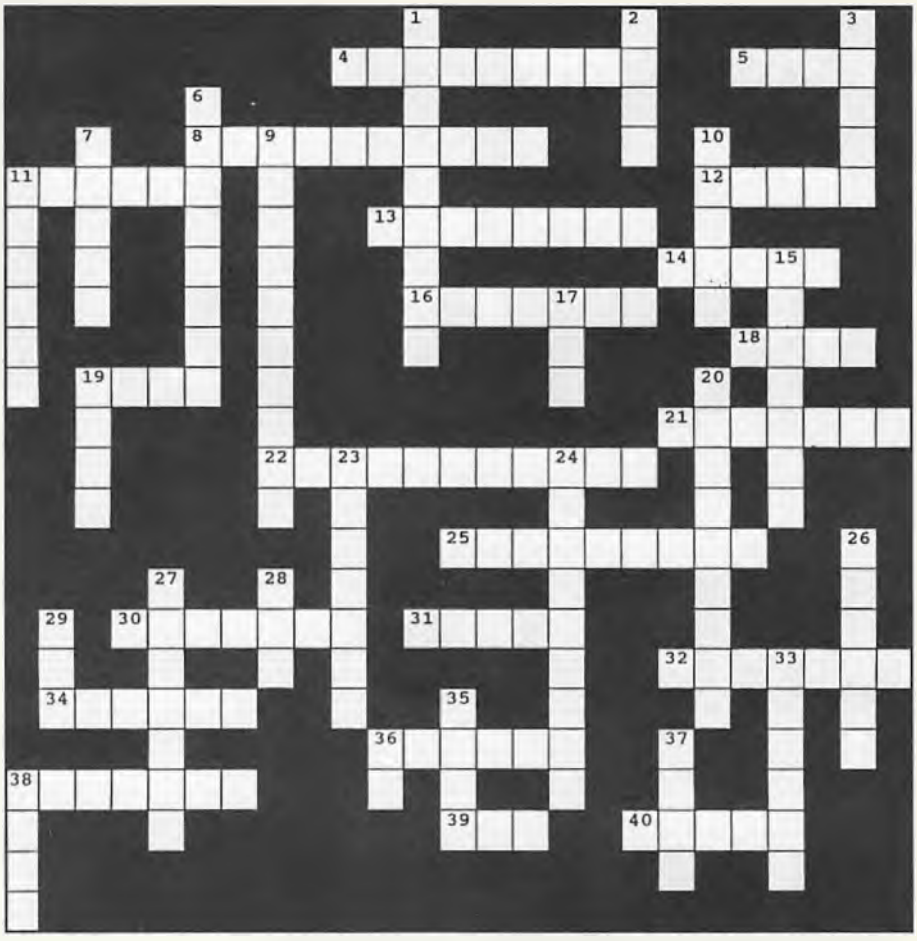
Having said that, all that's left is to congratulate Donald James of Wollongong in NSW who was the first correct entry drawn after the closing date.

It's a nice Christmas present Don and you will be receiving the radio at just about the same time as you read this.

Have fun...



MISSED OUT ON THE AX-144?
DON'T WORRY - HERE'S YOUR CHANCE TO WIN A
TRENDY TX-850 CELLULAR 'PHONE LOOK-ALIKE



CLUES ACROSS

4. What make is the PRO-2021 scanner?
5. The Christian name of the contributor who wrote the line "Basically - Don't Do It - OK?" in this issue.
8. What is a digital repeater, used for packet radio, called?
11. In what city does Noel Davies, VK7EG, reside?
12. MB, from Bondi, NSW is interested in (what?).
13. Who's Theorem states that "you can't win?"
14. In respect to satellites, what does the letter "O" in the term "POR" stand for...?
16. The name of CBA's advertising manager, (3,4).
18. What's the name of the reader who was "first out of the bag" in this issue?
19. In the term "TNC" the letter "N" stands for what?
21. The first name of our regular contributor who mentions "dancing naked on the roof" in this issue.
22. The author of the DX Logbook column, (3,8).
25. Amateur packet users can link to overseas access ports using (what?).
30. Conversations on the Cellular 'phone system are far from what?
31. Who (surname?) is responsible for saying "no matter what goes wrong, it will probably look alright".
32. The name of the author who produced "Listening to Aircraft Radio", (3,4).
34. Peter Berrett wrote about the (word?) radio system in this issue.
36. What's the brand name of the Grant XL?
38. The author of the book "Receiving Antenna Handbook", (3,4).
39. One of Radio Australia's transmitter sites is located at (word?) Peninsula.
40. Claude (surname?) is responsible for the pirate Radio G'Day broadcasts.

CLUES DOWN

1. A type of beam antenna array.
2. The initials of the Christian broadcast station located at Quito.
3. What does the OZU-1 antenna attach to...?
6. In what city is the publisher of the ESG Frequency Registers based?
7. What company manufactures the SW-8 shortwave receiver?
9. Where did the man featured in a poem in this issue come from?
10. Greg Towells makes mention of the SDP-600 'phone (what?) in this issue.
11. The surname of our regular SCAN 1994 columnist.
15. The computer program (word?).ZIP is designed to control the Yaesu FRG-9600 scanner.
17. The suffix of CBA editor Len Shaw's amateur callsign.
19. The FLTSATCOMM satellite is primarily used by what armed service?
20. "Banjo" who?
23. What's the surname of VK3KAT?
24. What's the word often used to describe the method of turning an antenna by hand (or arm).
26. Not simplex.
27. A tracking program associated with satellites.
28. Murphy's (what?) get a page to itself in this issue.
29. What is the three letter "Q" code for "operating with low power?"
33. The surname of VK3DBP.
35. You can now obtain the Australian Amateur Radio Callbook on (what?).
36. What are the prefix letters to the Pearce-Simpson 2020?
37. The correct initials for Australia's CB service.
38. What's the first name of the contributor responsible for Uplink 1994

ADDRESS YOUR ENTRY TO: **CB Xword, PO Box 628E, GPO, Melbourne 3000**

NAME_____

ADDRESS_____

_____

TELEPHONE ( )_____

NOTE: ENTRIES MUST BE ON THIS PAGE - NO PHOTOCOPIES

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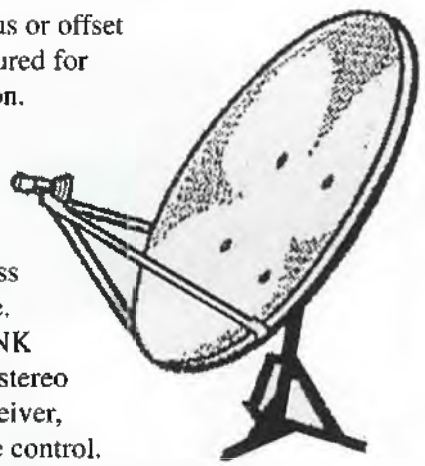

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