CB Action

AUSTRALIA'S ONLY CB MAGAZINE

JULY/AUGUST 1993 $3.75

DoTaC AND THE RADCOM ACT

RIG REVIEWS

- Jackaroo UHF Handheld
- Uniden PRO-535e 27 MHz AM
- PRO-39 Handheld Scanner
- Icom GP-22 – Handheld GPS

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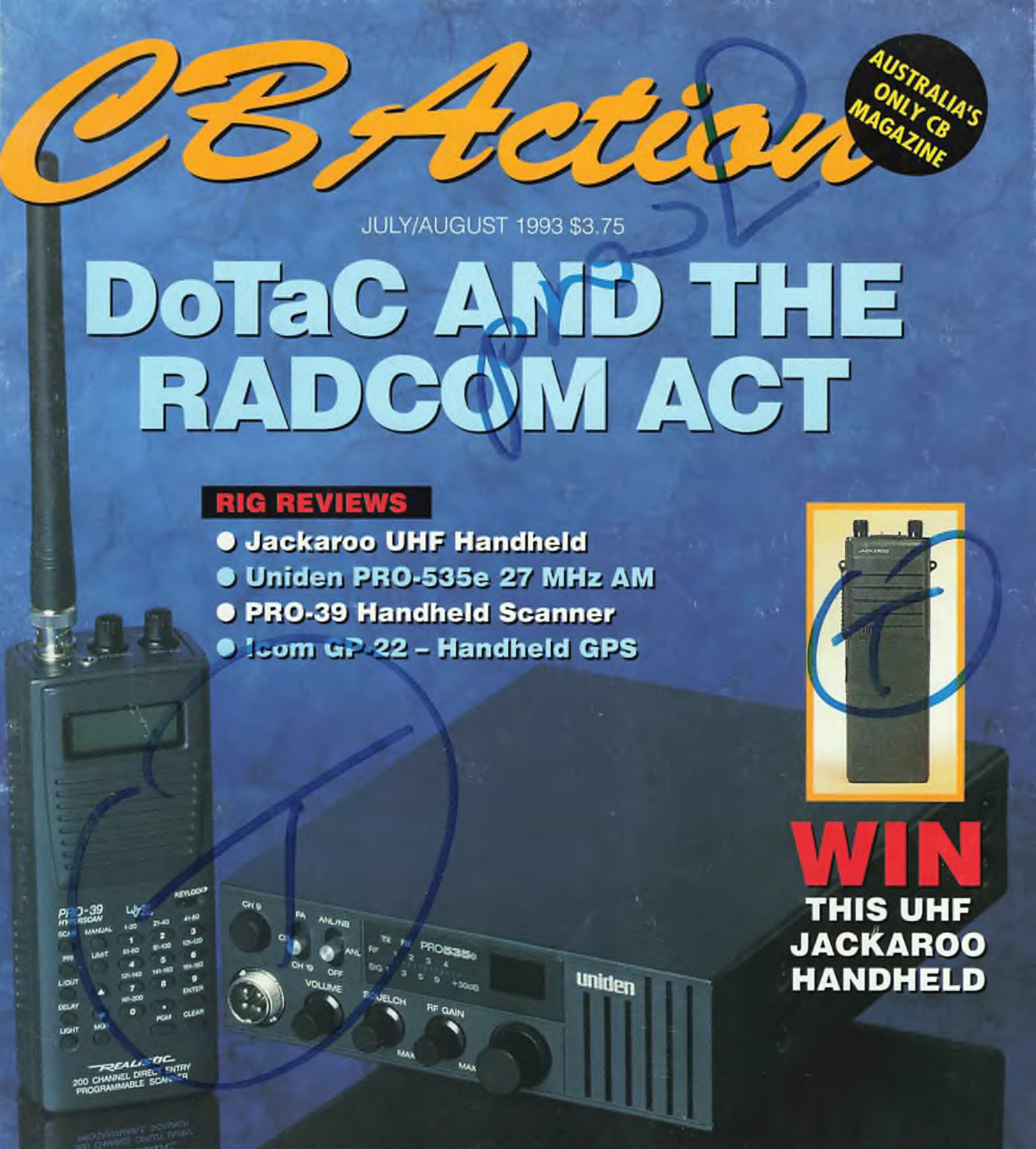

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- FLYING DOCTOR REGIONS
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- HOW TO FIND SOUTH WHEN THE NIGHT SKY IS A FOREST OF STARS
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AUSTRALIA'S CB SPECIALISTS

ON CHANNEL

GO DIRECTLY TO GAOL - MAYBE

The article by "Judicious Rex" (about the new Radiocommunication Act) which appeared in our May/June issue (also our sister magazine ARA) certainly stirred everyone up - including the DoTaC folk.

Our office, and many of our advertisers, received plenty of 'phone calls and/or visits from readers wanting to know just what was going on...would scanners be banned, would "receiver" licences become necessary, who the hell is "Judicious Rex" anyway...and more.

DoTaC eventually decided to make official comment about the article to our sister publication Amateur Radio Action and, with that magazine's permission, we have reprinted their comments, along with a reply from "Rex", in this issue.

It all makes for very interesting reading.

What comes through loud and clear is that the DoTaC and "Rex" beg to differ, however, knowing "Rex's" legal qualifications and knowledge of the Act itself, our money is on him - despite what the DoTaC folk have said in their reply.

To us, it appears that the DoTaC is saying "yes, the Act does say mandatory imprisonment for some offences, but, of course that will not occur."

We suggest that you read the latest on the Radcom Act and make up your own mind.

SOMETHING DIFFERENT

We spent quite some time deciding whether the report on the Icom GP-22 GPS unit was something that should be run in CBA, or whether it was better suited to a magazine such as 4x4 Australia.

The reason is that the GP-22 is a Global Positioning System device which, by bouncing radio signals off satellites, gives you an accurate fix on just where you are - be it in the middle of a city or several hundred kilometres west of Birdsville.

In the end we elected to run it in this magazine as (a) it is after all just a radio receiver - albeit a somewhat different one to our usual review units - and (b) it makes for interesting reading. Technology is increasing at such a rapid rate that each month seems to produce yet another breakthrough in miniaturisation and this little handheld device is truly something different.

VIRUSES AND YOUR COMPUTER

Anyone who has suffered from a computer virus already knows just what damage can be done by this other technological development and, as we have a top virus expert as one of our regular columnists in the person of Rod Fewster, we asked him to produce an easily understood article on viruses, what they are and what damage they can do. Part One of a two part series commences on page 28 and we strongly recommend that you read it.

NEXT ISSUE

Our next issue will have a D-I-Y project on building a Radio Direction Finder which will enable you to pinpoint any "carrier dropper" with a high degree of accuracy. After you've located the signal, it's up to you what you do next. Also in the next issue will be a report on what is either the "ultimate pirate rig" or the "shape of things to come".

Meantime, enjoy the read.

CB Action

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Published and printed by Dallas Swinstead for Syme Magazines, a Division of Syme Media Pty Ltd, A.C.N. 004 765 164, 250 Spencer St., Melbourne 3000. Telephone (03) 6012259; facsimile (03) 642 0852. Printed at Hannanprint Victoria, 504 Princes Highway, Noble Park, Victoria 3174.

CB Action is distributed in Victoria by Magdiss Pty Ltd, 250 Spencer Street, Melbourne, 3000; in SA by John Fairfax & Sons Limited; in Tasmania by the Mercury, 93 Macquarie St, Hobart 7000; in NSW, Queensland, WA by Newsagents Direct Distribution Pty Ltd., 180 Bourke Road, Alexandria 2015.

USER FRIENDLY MOUNT LAUNCHED

SYDNEY, 21 May 1993. Mobile One's Managing Director, Greg Ackman, the man who brought Helical Antennas to Australia, has done it again. In a recent press release, Greg Ackman introduced an entirely new concept of 'SELF INSTALLATION' to two-way radio antennas. Adding to his extensive list of patents and design registrations, the new Shorloc antenna base system has been launched into the communications market to allow anyone to connect their two-way radio cable to the antenna without the awkward use of soldering irons. 'Now anyone can install a two way radio antenna in the field without the need of a soldering iron,' Greg Ackman said. 'The savings in set up time for antenna installers and enthusiasts has meant that Mobile One is seriously thinking of dropping the standard HF antenna base they have been selling for over twenty years because we've just created the NEW standard for the nineties.'

Now Mobile One has released an entirely user friendly antenna installation system that can be installed by the novice CB'er. Shorloc antenna mounts are being packaged with a variety of Mobile One antennas and can be obtained from most communication specialists such as

Dick Smith Electronics.
Cat No D4054

Shorloc

STRAIN RELIEF COAXIAL MOUNTING CLAMP

NEW FOR 93

MOBILE ONE'S SHORLOC patented antenna mounting system enables quick, easy solderless installation in the field to connect any RG58 coaxial feed-line to Mobile One Helical antennas without the use of a soldering iron. Professional antenna installation is no longer required to connect the average HF or VHF transceiver to a standard two-way radio antenna. Follow these simple instructions for trouble free helical antenna installation.

Exploded View

5/16" nut

'O' Ring

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Neoprene Washer

Ground Plate

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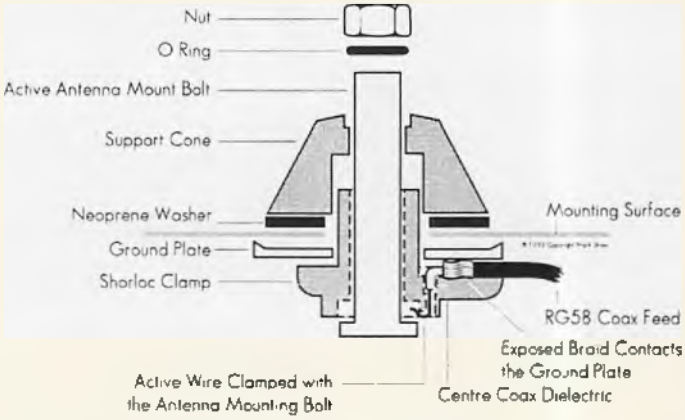
Antenna Bolt

Profile View



AUSTRALIAN PATENT PENDING PL7313 – 1993

Installation Instructions:

Remove 12 mm of the Black outer PVC cover of the coaxial cable exposing the braid. Fold the braid back over the remaining black PVC outer sheath. Remove 6 millimetres of the inner dielectric sheath to expose the inner conductor. Give the inner conductor two or three twists. Feed the inner conductor through the hole in the shorloc clamp so that the inner conductor is placed into a position that ensures electrical contact with the antenna bolt when it is assembled. Insert the coax between the Ground plate and the Shorloc clamp ensuring the outer braid of the coax makes electrical contact with the ground plate.

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FEATURES

Dick Smith Cat. D4437

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SPECIFICATIONS

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Weight	127 Grams	
Tuning	Factory Pre-set	
Termination	Aust. Std. 5/16" x 26TPI Female	
Application	Mobile	
Frequency Range RX	• HF 27 - 38 • LVHF 74 - 85 • FM 88 -108 • AIR 118 - 136	
	• HVHF 152 - 170 • UHF 430 - 512 • SUHF 820 - 1300 MHz	
Frequency Range TX	HF Band	36 - 37.5 MHz
	Low Band VHF	75.5 - 78 MHz
	Air Band	114 - 128 MHz
	UHF	455 - 490 MHz

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Modes	AM, Narrow FM and Wide FM
Scan Speed	Approx 20 channels/second
Search Speed	Approx 20 steps/second
Memory channels	900 channels plus 100 channels auto memory channel, total 1000 channels
Search range memory	9 normal search banks and 1 search banks for automemory search pair
Priority	2 sec of sampling rate
Antenna Input	50 ohm BNC connector
Audio Output	100m W at 10% THD or better
Power supply	6V DC from built-in Ni-Cnd battery pack or 11-18V DC from CHG jack.
Size	55(w) x 152(l) x 40(d)mm
Weight	385gram

AS REVIEWED CB ACTION JAN/FEB 1993
BUY BEFORE JAPANESE YEN AFFECTS PRICE AGAIN
NO LICENCE REQUIRED FOR SCANNERS
MANY FREQUENCY LISTS AVAILABLE

NEWCOMERS START HERE

It should be stated right now that there is no special CB language.

Many newcomers believe that they require a lecture on the basics of CB language before they can operate on air.

This is simply incorrect.

While some stations use esoteric CB jargon, all Australian CBers understand English and this is all you need to go on air.

A half hour spent listening before going on air for the first time will be time well spent as you will hear how to initiate a contact and how pass the conversation back to the other station and, really, that's about all there is to it.

Even so, while it is not essential that you know and understand some of the various abbreviations used and/or the amateur *'Q'* code, it can be helpful to you.

That is what this introduction is all about. One of the first things you will hear is a *QSO*.

A QSO is simply a contact with another station.It derives from the amateur radio operator's 'Q' code - a form of abbreviation used by amateurs when sending *CW* (continuous wave transmission) which is simply another way of saying morse code.

Morse code is not used in CB, however, a number of 'Q' code abbreviations are ...

A *QSL* is a card sent from one station to another confirming that these stations have been in radio contact.

It is not sent after every contact, but, is usually exchanged after a *DX* contact. DX means long distance, usually overseas but often just interstate.

If the station to which you are talking asks whether you QSL the operator is asking whether you will send him a QSL card to confirm the contact.

A *QTH* is the 'Q' code for location so, if you're asked "what's your QTH?", the station is asking where your station is located. It's just as easy to ask in plain English, but, it adds a bit of glamour if you say QTH instead.

You'll hear many stations talking about *SWR* (usually pronounces swer - which is incorrect - it is SWR spoken as letters) and this stands for Standing Wave Ratio.

This is essentially a measure of the antenna's effectiveness and is read off an SWR meter.

You will learn what SWR is from this magazine or from a CB store.

When you hear a station calling *CQ CQ* it means that he is looking for a contact with another station. CQ means 'seek you' while *CQDX CQDX* is different (seek you long distance) in that the station only wants a long distance contact - not a local one.

AM stands for amplitude modulation while *SSB* stands for single sideband.

If you have an AM only rig it's nice for everyone if you stay on the lower channels and, conversely, if you are using SSB you should restrict your activity to the upper channels.

QSB means that the signal has a tendency to fade - that is, it goes from strong to weak and back to strong again, sometimes over a period of seconds and other times over a period of minutes.

It is not a fault of the station, but, of atmospheric conditions.

If a station says there is QSB on your signal it means that your signal is fading and when this occurs it is best to keep your *OVER* short or you are likely to lose the other station while you're talking.

SKIP is essentially the same as DX - if the skip 'is running' it means that there are interstate and/or overseas stations being heard.

BEAM, YAGI and ARRAY all mean much the same. They mean that the station is using an antenna system which effectively (and legally) increases the restricted power output of the CB rig and can be pointed at the other station for improved communication.

A *ROTATOR* is used to turn a beam, Yagi or array. Incidentally, Yagi is spelt with a capital Y as Yagi is the name of the inventor of the beam. *LINEAR, BOOTS, AFTERBURNER, LITTLE HELPER*, etc mean that the station is using illegal equipment to increase the power output and will eventually receive a call from *DoTaC*.

DoTaC is used in this magazine as an abbreviation for the Department of Transport and Communications - the authority charged with the regulations of CB radio. A *POWER MIKE* is an after-market accessory which can also improve your station's 'talk power'.

Whether or not they are legal is open to question, but, they probably aren't.

QRM is when another station is making it difficult to hear due to being too close to your own station, having a rig in poor condition, running illegal power, etc.

QRN, however, is noise made by atmospheric conditions or, more likely, static caused by poorly installed electrical power lines out in the street.

A *SWL* is a Short Wave Listener but an *XYL* is usually the wife - an ex-young lady. YL is of course young lady and a *DOUBLE BUBBLE* is a police vehicle.

GOOD BUDDY is a somewhat derogatory term applied to operators who still use American style CB jargon such as, "what's your 10-20?" or "that's a big 10-4".

This *10 code* originated in America, but, is now rarely used as it indicates that the operator has what can be best termed a 'juvenile brain'.

A *BREAKER* is an operator who wants to get into an existing conversation and there's nothing wrong with BREAKING providing that you only call in the pause between overs.

If you break between overs one of the stations will probably say *ACKNOWLEDGE THE BREAKER* which means that you have been heard and will be invited to join in when the stations are ready - in other words standby and don't keep shouting.

An *ALLIGATOR* is another derogatory name which is applied to an operator who talks too much but doesn't listen - in short, all mouth and no ears. *SANDBAGGING* means to listen to a conversation but not join in yourself.

A *DUMMY LOAD* is a device which should be used when testing or tuning your rig. It can be purchased from any CB store and should be a must in your list of station equipment.

UHF stands for Ultra High Frequency and is the 477 MHz CB service.

LONGPATH means that you are pointing away from a station you are speaking with rather than *SHORTPATH* which of course means the opposite.

Different atmospheric conditions mean that at certain times you can communicate with (usually overseas) stations by sending your signal right around the world rather than by the most direct path.

An operator who works out of the legal channel frequencies or runs illegal equipment is referred to as a *PIRATE*.

An *ATU* stands fro an Antenna Tuning Unit which is used to tune your antenna to a good match with your rig if the SWR is a little too high.

It won't cure any major SWR problems, but, it can adjust a slightly high SWR reading to a 1:1 match with the transceiver.

If you receive a visit from the *RIs* you're probably in trouble for causing *TVI* - Television Interference - or - BCI - Broadcast Interference. RI stands for Radio Inspector - the gentlemen from DoTaC who call around if there are any complaints about your station. RIs are also often called *RED INDIANS*. *COAX* stands for coaxial cable, the link between your rig and the antenna while a *WHIP* is not something wielded by a leather-clad lady but is rather a generic term for mobile antennae.

A *REPEATER* relays a UHF CB signal from one point to another so giving much greater range of communication and a repeater list is published in every second issue of this magazine.

After all of the above we reiterate - it is not necessary to learn CB jargon to go on air. Sure it helps, but, it will all come in time - for now though just use commonsense English and if you don't understand something don't be afraid to ask - remember everyone you hear also had a first time on air.

We hope you enjoy CB and CB Action.

...it really is something of a bun fight isn't it?

DoTaC HAS ITS SAY ABOUT THE NEW RADCOM ACT

Dear Sir

I would like to respond to comments made by your 'anonymous legal correspondent' in his article on the Radiocommunications Act 1992 in pages 12 to 15 of your issue Volume 15, number 12. *(Note: this refers to ARA not CBA Editor).*

As you have noted this is a complex Act and it needs to be read carefully and with an awareness of the balances which are contained within it. Unfortunately this article was superficial to the extent that it may be unhelpful to your readers.

The Government's spectrum management reforms are intended to provide for easier and more flexible access to the spectrum and to minimise regulation for responsible users.

The Radiocommunications Act provides for this. It also maintains the role of radio communications inspectors in support of standards and licensing requirements to ensure that all users of the spectrum are able to coexist and to operate according to their particular needs.

The numerous references in the article to mandatory imprisonment (without provision for a fine) for various offences under the new Act are quite wrong. Section 4B of the Commonwealth Crimes Act 1914 provides a formula for translating prison terms into financial penalties (for example, six months prison could be translated to a $3000 fine). This applies to the Radiocommunications Act as it does to other Acts. In some cases, where the formula seemed to result in financial penalties being inappropriately high or low, a specific level of fine has been stated. To be clear, the point should also be made that all these penalties are the maximum that could be imposed by a court.

This basic error was characteristic of the whole treatment of the enforcement aspects of the Act, giving the impression that no account would be taken of the circumstances of each case.

Three other examples from the article may be enough to indicate that a less sensational reading of the Act would have led to different conclusions.

• At page 13 (ARA), referring to scanning receivers, the writer correctly points to the current distinction between transmission and reception (under which very few receivers require licences). He then, mistakenly and with emphasis, says that "this Act now sets out to include reception in the same mould as transmission".

In fact, the new Act (in section 7) maintains the current distinction between transmitters and receivers whereby transmitters must be licensed unless they are exempted, and receivers do not need to be licensed unless this is specifically required by the Regulations. The new regime is actually more flexible than the current Act, allowing the new Spectrum Management Agency (SMA) to apply strict regulation to high risk devices and lighter regulation to other devices.

• A similar error appears on page 14 (ARA) where the question is raised whether dealers could sell equipment without seeing that the purchaser had an appropriate licence. Section 301 of the new Act makes it possible to institute such controls, but only after Regulations have been made to specify the particular equipment that would be 'eligible' for such controls. A similar power exists under the 1983 Act, but no

The article by `Judicious Rex' which appeared in our last issue really stirred a lot of people - not the least of which was DoTaC. Readers of ARA will have already read their letter - and the response from `Judicious Rex', however, as CBA readers comprise only a small number of ARA readers we have decided to repeat both. The situation is, to say the least, interesting. We should point out that `Judicious Rex' is an extremely well qualified and active legal practitioner and he really <u>does</u> know what he's talking about!

Regulations have yet been made to give effect to such controls. Again, the Act provides the SMA with the flexibility to apply tight controls to specific devices which have a high risk of causing interference while treating other devices more lightly. • On the same page, the very confusing comments made about modification of equipment need to be read in the light of the simple fact that for equipment to be substandard there must first be a specific standard in place. Standards under the Radiocommunications Act are intended to control the risk of interference from specified types of equipment at the point of supply, and standards exist now for devices such as CB radios and cordless telephones. Of course the amateur service is not regulated in this way.

Other services which are not subject to controls through 'point-of-supply' standards operate under licensing requirements for the particular service which include technical specifications for the equipment that is to be used. Both standards and specifications are dealt with in detail in the new Act. The simple rule in both cases is that equipment modifications need to comply with the particular standards or licensing specifications that apply to each category of equipment, and the SMA will have the flexibility to adopt standards and specifications to meet the needs of each radiocommunications service. The new Act and associated spectrum management arrangements have been developed through a testing process of public and parliamentary scrutiny.

The Department of Transport and Communications is now developing the operational and administrative arrangements necessary to give effect to the Government's new spectrum management regime. With the change in legislation and the commencement of the SMA on 1 July 1993, additional information will progressively become available to all users of the radio frequency spectrum.

Your article did acknowledge and applaud the balances in the new Act between management, enforcement and user responsibilities, but it is unfortunate that your readers were not given a more accurate and informative account of it, especially in the light of the objectives of the legislation which are stated very clearly in section 3. I have included a copy which may be of interest to your readers.

Roger Smith, First Assistant Secretary, Radiocommunications Division, Department of Transport and Communications

The object of the Radiocommunications Act

3. The object of this Act is to provide for management of the radio frequency spectrum in order to:

(a) maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radio frequency spectrum;

(b) make adequate provision of the spectrum for use by public or community services;

(c) provide a responsive and flexible approach to meeting the needs of users of the spectrum;

(d) encourage the use of efficient radiocommunication technologies so that a wider range of services of an adequate quality can be provided;

(e) provide an efficient, equitable and transparent system of charging for the use of spectrum, taking account of the value of both commercial and non-commercial use of spectrum;

(f) support the communications policy objectives of the Commonwealth Government;

(g) provide a regulatory environment that maximises opportunities for the Australian communications industry in domestic and international markets;

(h) promote Australia's interests concerning international agreements, treaties and conventions relating to radiocommunications or the radio frequency spectrum.

Judicious Rex responds...

I am delighted that the Department has chosen to respond to my recent article on some of the provisions of the RadioCommunications Act1992. If Government authorities took the time to promulgate material to explain Legislation such as this Act, the public would be better informed. The Government Bookshop is hardly a regular browsing centre for most Australians and most readers of this magazine would not yet know of the new Act but for my article.

Whilst praising the Department for putting pen to paper I feel I must comment on the points they have raised in their letter which appears above.

Let us be clear on one thing in relation to the comments on penalties. The Department is not accusing me of misquoting the Act. What it is saying is that although the Act *says something (that is mandatory imprisonment) it does not mean what it says because of another Act.*

I consider that it is quite irresponsible to suggest that the Department's view is right and mine is wrong if the Department does not tell the full story.

I am as familiar with the Crimes Act provisions as they are. Section 4B does contain provisions which may or may not apply to the RadioCommunications Act 1992. In any case, it is a matter of interpretation as to whether they will apply.

That Section provides, by sub section 2 as follows (and I apologise for bamboozling readers by quoting Legislation but it has become important to do this in order to follow what the DoTaC is saying):

Where a natural person is convicted of an offence against a law of the Commonwealth punishable by imprisonment only, the Court MAY, (emphasis mine) if the contrary intention does not appear and the Court thinks it appropriate in all the circumstances of the case, impose, instead of, or in addition to, a penalty of imprisonment, a pecuniary penalty not exceeding an amount calculated using the formula;

$$\frac{\text{term of imprisonment, months} \times \$3{,}000}{6}$$

Thus in order to satisfy a Court that imprisonment should not be imposed for an offence under the RadioCommunications Act in which only imprisonment is provided for, a person charged would have the onus to establish:

1. That the contrary intention does not appear (that is, that it does not appear from the way the Act is worded that the Crimes Act does not apply);

2. The Court ought to think fit not to impose a term of imprisonment.

In other words a person convicted will be treated as having to go to prison unless he can satisfy the Court that both these conditions have been met.

I can imagine the outcry had I suggested in my article that although the Act contained no provision for fines instead of imprisonment, people could be confident that a Court would apply the terms of another Act and impose a fine.

It is a matter of interpretation by a Court as to whether or not the Crimes Act Section will apply. The Department may assert, as it does in its letter, that my view is quite wrong.

(continued over page...)

DoTaC HAS ITS SAY
(continued from previous page)

In saying this they could have used a more appropriate and informative clause, in suggesting that their interpretation was more likely to be accepted by a Court than mine and then explaining WHY.

I quoted the meaning of the Sections of the Act. I am not sure that a Court would apply the Crimes Act provisions.

One is left to ask why does the RadioCommunications Act 1992 provide for no alternative to imprisonment in some cases and fines in another if the intention was not to require a Court to impose imprisonment in those cases and fines in another? A Judge may some day be called on to decide whether my interpretation or the Department's is correct. Until then I would suggest that your readers assume that the Act means what it says. The other criticisms of my article do in fact support what I was saying. I will deal with them in turn.

The Department refers to the distinction between transmitting and receiving equipment and then repeats the point that receivers do not have to be licensed unless the SMA passes a Regulation requiring licensing. This is the point that I made and I emphasised that Regulations can be made administratively, not requiring debate in the Parliament.

Should the SMA so decide and there was inadequate public knowledge of the intention, it could pass a Regulation requiring, for example, all scanners to be licensed. Readers will recall that I urged them to ensure that the official amateur body, the Wireless Institute of Australia needs to be supported to ensure vigilance against unreasonable Regulations.

I make the point that the Department accepts in its letter, that under the 1992 Act the SMA has gained the power to control such receiving equipment as Scanners. In that therefore, they confirm my comments. Now for the comments about modifying equipment.

I agree that in one respect, for equipment to be sub-standard it must have been subject to a standard. I made the point which applies both to the 1983 Act and that of 1992, that equipment which is modified so that it is capable of transmitting outside the band for which it was designed, is substandard for two reasons, however.

The first is that it is no longer equipment which is only capable of transmitting on the amateur bands and the second is that by being modified, it must (to use the words of the DoTC's letter) ...need to comply with the particular standards or licensing specifications that apply to each category of equipment...

Equipment which was built for the amateur market and modified to transmit outside that part of the spectrum does not qualify in any case of which I am aware, with the "particular standards or licensing specifications" pertaining to the category of equipment intended for use in the Commercial market.

If I am wrong as to this I call on the Department to publish a list of the amateur equipment which may be modified to transmit outside the amateur bands and which does comply with the standards that apply to equipment which is acceptable for Commercial or Marine use.

By way of further example of what I am saying I point to the situation whereby someone builds a transmitter to operate in the Commercial segment of the Spectrum. It is true to say that no standard applies to that equipment itself because it is home built. However it must comply with the appropriate standard for such equipment and to do so it must presently be submitted at the expense of the manufacturer, for type approval.

"I make the point that the Department accepts in its letter, that under the 1992 Act the SMA has gained the power to control such receiving equipment as Scanners. In that therefore, they confirm my comments."

The mere fact that it had never previously been subject to a standard does not obviate the need for it to do so when it is intended for use in a segment of the Spectrum for which a standard is required.

I do not understand the Department to suggest that equipment which is VFO controlled on VHF or UHF does not need to be type approved simply because it has been home built.

My point is that for two reasons, immediately equipment which has been designed for the amateur market is modified, its possession after 1 July will be in breach of the 1992 Act.

Of interest in the letter is the fact that the Department does not appear to disagree with the interpretations of the Act that I have made in relation to the mere possession of modified equipment or equipment which has not been modified but for which no licence is held, but I do not think there is much doubt that I am correct as to this.

I have felt the need to respond to the Department's letter in order to emphasise that it is necessary to realise that we are talking about interpretation of a complex statute that is seeking to break new ground in the management and enforcement of standards of radiocommunications in Australia. Having read the letter and studied it at great length I do not change my views one iota. No one should be encouraged to assume that they can avoid the penalties set out in the Act because the Department has told them (in this letter) that imprisonment was not intended.

I am reminded of a situation that arose in a Court room some years ago when a young lawyer was arguing a point which all of us who were listening, could see was unsound.

In the end, the Judge became exasperated and said that the argument was nonsense.

The young lawyer did not sit down whilst he could but instead the following exchange occurred between himself and the Judge.

L. *Your Honour the point is valid. I have Queens Counsel opinion that it is a very strong point indeed.*

J. *Mr. Edmondson (or similar) how much did you pay for that opinion?*

L. *$2,000 your Honour.*

J. *Well I will give you an opinion and it won't cost you cent. You have wasted your $2,000!*

As Mark Twain is quoted as saying, a town that is too small to afford one lawyer can always afford two.

In saying this he was making the point that the spoken or written word is open to different interpretations and what readers now have is mine and some differing comments from the Department.

No doubt there are many views as to the interpretation that can be placed on some of the provisions of the RadioCommunications Act 1992.

Until a Judge tells me that mine are wrong I would suggest that readers of this magazine assume that the Act meant to impose imprisonment for serious offences against it and hope that if they break the law they can persuade the Court that a fine should be imposed by operation of the Crimes Act, as an alternative to gao

27MHz AM ONLY RIG REVIEW

UNIDEN'S PRO-535e

"This rig targets the truckie", says Ken Reynolds

UNIDEN, in the throws of rethinking their packaging policy, have released the PRO-535e Deluxe AM only 40 channel CB transceiver packed in a graphically illustrated carton displaying the outline of an 18 wheeler silhouetted against the golden glow of sunset over the sea.

A departure from their usual artwork style, this new approach makes for a refreshing change and maybe tells us from whence the UHF Sundowner series drew their names.

BETTER QUALITY PACKING

A second departure from the norm is the two piece custom moulded polystyrene foam packing which completely contains and protects the transceiver instead of the usual styrene `end' mouldings that fit around the front and rear panels with the microphone and minor hardware `stuffed' into one end.

The new packaging is well designed and makes a simple task of re-packing the radio and its accessories - unlike the previous nightmare.

The PRO-535e shares its case architecture with the PRO-640e being identical in size and wearing the same grained, black `vinyl' jacket, the same mounting bracket and screws and similar matte black plastic styled fascia as the sideband transceiver - with one main exception, the `beefy' little loudspeaker which is front mounted behind the vertical slots of a moulded plastic grill.

The audio pressure output from the tiny loudspeaker with its startling blast is ferocious to say the least, however, like most similar speakers that are driven at high level some audio distortion is apparent.

With seven watts of audio power available, the 535e does real justice to a good external loudspeaker which can fill a room with much more static than one can comfortably tolerate.

Similarly, the PA (Public Address) facility offers much more `bark' than your average CB rig.

RIG IS `HARD WIRED'

It is disappointing to find the DC power socket removed from the rear of this new rig. UNIDEN has always provided this handy feature in their `up-market' CB rigs from the year dot and I hope this trend does not creep into their other models.

Most CBers will recognise the importance of being able to quickly disconnect their rig from the car as a means of security when leaving the vehicle parked in a `sus' area.

"UNIDEN has redefined the Deluxe AM only CB radio. In introducing the PRO series 535e transceiver, Uniden specifically targets the truckin' transport market while also offering the regular traveller a better than average highway communicator".

With your rig `hard-wired' into the car one is less inclined to go to the trouble of removing it even though common sense says "do it". PRO-535e owners would do well fit an in-line connector for safety and convenience. Black mark Mr. UNIDEN.

CH 19 PRIORITY

Another small but always annoying feature is the channel 19 priority switch, which, as usual, is not worth a cracker to the Australian consumer who would instead find a channel 8 switch very useful. I just happen to know that UNIDEN sells into the Australian market a huge number of CB transceivers annually - which means big bucks going back to the Japanese parent company.

Channel 8 priority means only a minor alteration to the electronics of the rig and a tiny `CH 8' sticker would conceal the existing `CH 9' fascia designation.

MICROPHONE CORD IS A PLUS

On the plus side, the 535e sports the same long, curly-cord microphone as its predecessor, the PRO-540e.

This is a sensible innovation and although it is intended to make life easier for truck drivers in the vast expanse of a wide cabin, I would like to see the option available for all CB transceivers, no matter what the brand.

There is continual market demand for such a long lead microphone but no-one appears to hear the call.

Why not also sell them as an accessory MR. UNIDEN and tap into another part of the market.

I ran into a dead-end a couple of years ago when I tried to get a replacement long cable mike for a PRO-540e warranty claim.

The receiver performance is very good however there seems to be more than average random noise generated within the transceiver itself.

The measured sensitivity was 0.2uV(microvolts) for the 12dB(decibel) SINAD measurement that takes into account the measured noise and distortion of the recovered signal.

SQUELCH CONTROL IS GOOD

The squelch operation is probably the best I have encountered in an AM only CB radio.

It has a smooth, progressive action beginning with a threshold of about 0.2uV and ending with a `tight' response of 300uV.

The low end response is not at all

'touchy' and it is a simple matter to turn the knob roughly to a quiet setting without fear of excluding all other signals, regardless of how strong they might be. The hysteresis - the recovery time of the squelch after being triggered open by a signal - is a good compromise for CB conditions. Good one chaps.

15 OR 5 SEGMENT BARGRAPH?

Among the features printed on the box, one states, "S/RF METER - An accurate 15 segment LED meter shows the signal strength of the receiver and transmitter."

It's of little concern and only a matter of semantics whether a LED bargraph indicator is a meter or not, however, when a 15 segment LED meter is advertised, then that is exactly what I expect to get!

In actual fact, the LED display in question is printed so as to visually divide each of the five LEDs into three minor portions, thus appearing to have 15 separate LED segments - 9 green, 3 amber and 3 red segments.

While this might be a grey area legally, what would you expect to get from the advertised statement above - a 15 step bargraph or a 5 step bargraph disguised as a 15 step bargraph?

Incidentally, the bargraph works well offering a good range of received levels so why even bother to say it's got 15 segments when it hasn't?.

NOISE LIMITER AND BLANKER ARE EFFECTIVE

The noise limiter and noise blanker both work very well eliminating all but the very worst level of vehicle ignition hash and limiting many other electrical noises encountered round the populated areas.

Power line noise is difficult to remove from a signal but the combination of ANL and NB together even managed to beat some types of power authority 'rubbish'.

The receiver RF gain control is very effective and unlike many of the 20dB level versions I have criticised in the past, the PRO-535e offers variable attenuation from zero up to about 45dB.

This amount of attenuation allows you to converse with nearby stations - in convoy for example - without suffering serious receiver 'front-end' overload resulting in gross distortion of the recovered audio signal.

Top marks again.

SOUNDS GREAT

The transmitter sounds great with the introduction of an electret condenser type microphone producing clean, crisp transmitted modulation with plenty of 'guts' that peaked around 95 percent on the test set scale.

While the results with this new mike insert sound great, there is a built-in trap for young or old players.

The four pin microphone socket is similar to other UNIDEN rigs and most of them presently use a conventional dynamic microphone insert.

For most of CB history UNIDEN microphones have been directly interchangeable from rig to rig except for the 5 pin DIN connector style used on their economy models.

I tested my standard AX-144 microphone in the PRO-535e and it worked okay save for more bassy and lower percentage modulation.

On air test reports definitely favored the correct microphone.

Attempting to use the new electret microphone on the AX-144 brought the expected dismal results - very faint modulation.

Might be a good idea to tell the consumers about the difference and possibly save them the frustration and cost of buying the wrong replacement microphone.

Better still, change the connector style to 6 pins for electret style rigs.

Last but not least is the matter of transmitted RF power.

The best we could get from the test rig - S/No. 25000149 - was 3 watts RMS and that was achieved by the dubious process of raising the source voltage to 16 volts. At 13.8 volts the 535e could only manage 2.6 watts. Usually we get a minimum of 3.5 watts and tops of 4+ watts.

Regardless, the difference in performance is minor and we got consistently good on air reports.

SUMMARY

Notwithstanding the above criticisms, the general performance and demeanour of the PRO-535e establishes it as a force to be reckoned with in the AM only 'Highway Stakes'.
Construction is up to UNIDEN's usual high standard and good quality materials are used throughout the transceiver.

Online 1993

By Patrick McDonald

Greetings, gang!
I've flown back from New York just in time to finish up this issue's ONLINE column, but my arms are so tired from all that flying I can hardly type!

Seriously, though, after a very exciting month in NY it was great to find a few CBA-related letters waiting for me at the office, and lots of electronic messages on the Shortwave Possums BBS, all asking more questions about using computers in the radio hobby.

In fact, maybe I can start right now and answer a few of those questions, and also stimulate your interest in computers!

First off, however, I'd like to review a couple of newish computer packages that assist in controlling some popular scanner receivers.

Like most other software mentioned here in ONLINE, these are IBM compatible MS-DOS program written as `shareware' and offered for free use on the `honour system', on the understanding that anyone who wants to use the program regularly will send a modest contribution to the hard-working and deserving software author.

AR-3000 SCANNER CONTROLLER

Let's look first at a simple but potentially useful local product from Martin Elliot in Victoria, the AR-3000 Scanner Controller (available from computer bulletin boards as AR-3000.ZIP).

Martin's program is in reality a group of four separate but interrelated programs developed to allow the use of a PC with the AR-3000 scanner.

The author writes humbly in his documentation that "even with its problems, it can be used quite effectively to provide a lot of information to the listener."

The radio chores done by AR-3000.ZIP can be described very quickly.

The WRTMEM.EXE sub-program writes a bank file to one of the scanner's memory bank; SEARCH.EXE searches between user-defined limits and records this data into a PC `log' file for later examination; SAVEONE.EXE saves one particular memory bank to a bank file for safe keeping, while SAVEALL.EXE saves all the AR-3000's memory banks in your PC.

There are clearly some limits to what the AR-3000 Scanner Controller can do, for instance it doesn't allow you to delete a memory or swap to a specific memory bank.

However, a number of future enhancements are planned if there is sufficient interest shown by AR-3000 owners.

Elliot has already mentioned the possibility of being able to hold on an active frequency until it becomes inactive, during the `search' function, instead of having the search continue after a pre-set delay period.

He would also like to improve the inbuilt delay routine to allow for faster searching, and to search from a PC-created file of frequencies.

Finally, the whole set of programs might be rewritten, and perhaps combined, in the C computer language, which would make for additional speed of operation (the program is currently written in QuickBasic.)

If you have any ideas for this program's enhancements, constructive comments or problems you can easily contact Martin Elliot via Melbourne's Spectrum Radio BBS and become part of Australia's radio shareware development.

Yet another more complex program, written for the same popular scanner, is AR3000A8.ZIP, from American Lauren A. Colby (W3HEZ) of Frederick, Maryland, a sunny little US college town with many fond associations for me, as a matter of fact, none of which have anything to do with radios or computers!

A weather-info freak, Colby has been using earlier experimental versions of his program on an IBM compatible machine to regularly monitor the Russian Meteor 2-20 and 2-19 weather satellites, among other tasks.

So what can you do with this program?

Well, you can sweep a particular band of frequencies and look for signals and make a record of the active frequencies found.

This will create a dandy little log file in your PC showing all signals detected with the times and signal strengths.

You can also tune to a single frequency and, if you wish to study that frequency over an extended period of time, you can employ the program's special log function.

This will make another log file, noting the signal strengths observed, at the time intervals you specify.

For example, if you want to make a record of the signal strength of Hawaiian time station WWVH at hourly intervals, you can tune to 15 MHz, hit the AR3000A8's log key, and instruct the machine to make reports at intervals of 3600 seconds.

To scan a group of frequencies, already arranged in a written file, you can use the program's scan function.

If `auto' is turned off, the machine will stop whenever the squelch is broken and wait for you to tell it to move on to the next entry.

If `auto' is on, the radio will stay on the channel until the squelch comes back on, and then automatically move to next entry.

To create your own frequency files, use any ASCII text editor.

Frequencies will go in the first column, followed by a comma, followed by the description.

The author includes a sample file to explain how this is done.

If you want to lock out a particular channel, you enter the letter `L' as the first letter of the description.

Couldn't be simpler!

While in the `tune' mode, you can use the up and down arrows to move the tuned frequency up and down.

By adjusting the interval (the default is 10 kHz) you can increase or decrease the rate at which the program will sweep the radio spectrum band, and also the rate of change when the arrow keys are used.

The arrow keys will also allow you to move up and down between entries when scanning a file.

This is all commonsensical and makes the package quite easy to use almost immediately, without much in the way of instruction or practice.

You can use the assigned configuration key to enter the configuration routine and set the amount of delay, the com port and the baud rate (4800 or 9600).

continued over page...

The configuration program will also let you enter a command to bring up your favourite text editor, so you can edit scanning files and look at the log files without leaving the scanner control program, a handy little touch.

The mode key lets you change modes (AM, NBFM, and so forth).

There's no default; the radio will come on in whatever mode it was set to, but you can then change the mode to anything you need.

AR3000A8 uses delay loops to keep fast computers from over-driving the radio. If the program sweeps or scans too slowly, you can change this in the configuration file to establish the best possible performance.

At some point, if you have a very fast computer and reduce the delay too much, the program will over-drive the radio; the antenna relay will then clatter like crazy, says the author, and the radio won't follow instructions!

Sounds like Colby has driven his equipment to the outer limits during his testing.

Note that AR3000A8 will work with mono, CGA, or any other PC screens including EGA and VGA.

Finally, for those interested in a weather satellites, the program's compressed package includes a scanning file with all the known satellite frequencies.

If you're the lucky owner of one of these excellent AOR scanners, it sounds like this software's worth a try, doesn't it? (Check your scanner's documentation for the instructions as to the PC-to-receiver interface hardware required for computer control.)

AND ONE FOR THE FROG

Another similar receiver control program, not exactly new but quite unknown to me until recently, is FRG960.ZIP.

Written by another American radio enthusiast, R. A. Harris WB4HRH, this one caters for the Yaesu FRG-9600 scanner.

This is pretty simple software compared to the last one and, in fact, it doesn't even come with proper documentation.

However, if you have the hardware cable necessary to connect your radio and PC, such as the FC-965DX or FC-1300 converters, you'll find FRG960 pretty easy to operate as it allows the Frog's basic functions to be run off a menu on your PC screen.

It permits choice of frequency and filter from a menu.

Whew! I've been too jet-lagged to test any more software right now, so I've save the rest of the new programs for CBA's next issue.

These will include the new GeoClock world clock/grayline DX aid (version 5), the very latest release of the scanners' favourite database ScanBase (v2.2), plus two more Morse Code teaching programs to help you get up to speed with your novice amateur licence.

A FLOCK OF FREQUENCIES

Now, a common question I'm asked by radio listening enthusiasts is: "I know I can find umpteen good computer database programs, such as ScanBuff, but what I really want is a program with all the frequencies already in it, like all the latest worldwide shortwave program schedules."

Well, dear SWLs, such a program does in fact exist, and it's a kind of streamlined World Radio TV Handbook on a disk! I've even previously reviewed it here in CB ACTION mag.

Designed by veteran DXer Tom Sundstrom of TRS Consultants, it provides up-to-date frequencies for all English language shortwave radio stations.

Once you have bought the database program itself, the four-times-per year frequency list updates are ultra cheap.

As a matter of fact, the main SWBC program, now up to version 2.1, is pretty cheap too by the standards of modern commercial software, about what you'd pay for the cardboard-and-paper WRTH last time I checked.

But remember, this is a commercial product, it is not shareware - you gotta buy it!

Contact TRS in the US via fax (which is what I always do) on (609) 859-3226 or voice on (609) 859-2447. The full address for snail mail is TRS Consultants, PO Box 2275, Vincetown, NJ 08088-275, USA.

I use Sundstrom's SWBC database regularly myself and, if you're a keen SWL with a penchant for the international radio bands, I'm quite sure you'll like it too.

Tom says he plans an update of the main database program in the near future and, when it appears, I'll review the results in these hallowed pages.

SOFTWARE DIRECT FROM THE POSSUMS

Over the past year, I've offered to send a selection of shareware radio software by mail to those of you who still don't have modems connecting their PCs to their phone lines.

I've always said too that I don't want to get into the mail-order disk business, because the computer bulletin board concept is supposed to do away with all that mechanical, administrative stamp-licking hassle.

However, I am willing to help out a bit, and this also brings in the odd dollar to help run the absolutely non-profit

BBS Update

Let's now rapidly change gears and I'll give you a quick briefing on various computer bulletin board systems serving the radio hobby.

Despite a major computer crash that put the whole damn system offline for several days and gave Sysop Michael Evans severe electronic migraines, Spectrum Radio BBS is back, better than ever, on (03) 819-9167, with eleven new radio file areas to boot.

Remember that Spectrum is an especially good choice if you're looking for packet radio software.

Another new system that merits mention is Hot-line BBS in Adelaide on (08) 373-5136. I haven't had a chance for more than a quick visit to this BBS, but this is a generalist board which also carries a good many files of interest to the radio enthusiast. It's definitely worth a look if you live in the Adelaide area.

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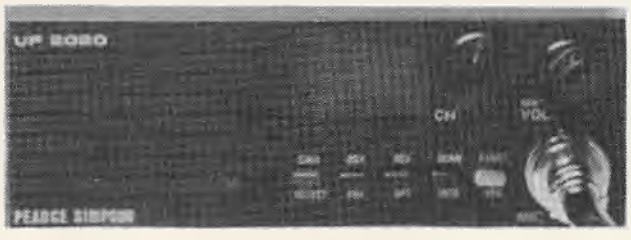

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Online

(and I mean NON-profit, dear readers!) Shortwave Possums computer bulletin board.

Well, it appears that most of you CBA readers have either got your modems or already got your software from me by mail, as I am only getting a few requests after each new CBA goes to press.

Since this present level of requests is not a big practical problem for me, I'm now happy to continue the SWP Disk Offer indefinitely, on the understanding that it's a stopgap effort until everyone in the whole world (or at least Australia) owns a modem!

So, if you're got a PC but no modem and are still hankering for the latest in radio-related software, all you've gotta do is send six formatted floppy disks plus a cheque or money order for $35 to this famous address:

Shortwave Possums BBS
PO Box 357
Round Corner
NSW 2158.

Mention the SWP Disk Offer and make your cheque payable to "Shortwave Possums BBS" and I'll send you back by return mail a wondrous selection of the latest radio-related shareware programs for IBM compatible computers.

If you have your heart set on one or two favourites, please mention this. But remember...it's to your advantage to get that modem ASAP and tap into tons of free and/or cheap radio software as close as your phone line.

So scrawl on your fridge door right now the one-and-only SWP BBS modem number: (02) 651-3055, on-line 24 hours daily.

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GRAB A 2400 BPS MODEM

And before I slip away for another two months, here's a hot tip from the hobby computer communications world.

The last listing of the FidoNet computer network, which numbers some 24,000 individual systems worldwide, shows that 80% of all BBSs run at a speed of at least 9600 bps.

Many, of course, now operate at the higher speeds of 14400 and 19200 bps as well.

A couple of years ago, the same statistics would have shown that most of these same systems offered 2400 baud as their top speed.

As well, a large percentage of BBS users have also opted for the faster modems.

The moral of this story is that there are a lot of used, perfectly OK 2400 bps modems lying around, boys and girls, unloved and unwanted.

If you're still looking for your first modem, why not investigate the used market?

Prices are below $200 for such machines now, and perhaps even below $100 if you bargain a bit.

Nobody who has upgraded to 9600 bps is ever going to use the old modem again, so he/she just wants a bit of extra cash!

Good luck and bye for now!

Scan 1993

By Russell Bryant

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

SCANNING DX

Winter at last! The brisk mornings, cold evenings and the cool sunny days, you can't beat it. Every Australian scanning enthusiast should look forward to the dead of winter.

Whilst we are rugged up like Eskimo Nell, those who live north of the equator are enjoying summer. Summer, the time when radio frequencies, especially those down at the lower end of the spectrum travel from country to country, ignoring international boundaries, immigration checks and passport controls.

This phenomenon is known as skip and the act of chasing skip is DXing.

THE WORLD CALLING

DXing the skip relies on atmospherics. The propagation of radio waves over long distances is effected by the F2 layer and Sporadic E clouds. Because Sporadic E is just that, sporadic, I will concentrate on F2 propagation. F2 is a layer of the ionosphere created by solar radiation and is located between 300 and 400 kilometres above the earths surface.

The ability of F2 to bounce frequencies around the world depends on solar influences, seasonal characteristics and the time of day. Whilst F2 skip is a long term proposition, Sporadic E openings last anywhere from minutes to hours, making them somewhat unreliable for good DXing.

Through these naturally occurring phenomena scanner enthusiasts in Australia are able to receive transmissions from Europe, Africa, South East Asia, and the prize DX source, America.

Not all frequencies lend themselves to long distance transmissions.

High Frequencies or HF, are renowned for their distance covering characteristics.

At the other end of the scale, 800 MHz doesn't skip, in the strict sense of the word.

So lets concentrate on the frequencies just above the HF allocations, the VHF low band from 30 MHz to 50 MHz. It is these frequencies that present a challenge to the scanner user. Logging transmissions from countries thousands of kilometres away, on equipment designed to receive local radio signals.

NEW FOUND POPULATION

Until recently, America, or wherever the US had influence were the only users of frequencies in the VHF low band.

However, the high population of the bands above 50 MHz has forced authorities to look at the VHF spectrum with the view to land mobile allocations on a larger scale.

The application of low band VHF provides medium range communications without, so the text book tells us, interference from cross border licensees.

If only RF followed the rules - thankfully it doesn't.

To track VHF communications from external sources you will need a scanner capable of covering the band from 30 MHz to 50 MHz, preferably in 5 kHz increments.

Other search steps are okay, however, you will miss some of the action on the channels in between.

LOW GAIN IS BEST

A good antenna is also a must. Gain is not essential so the average discone or ground plane aerial should produce acceptable results. For those employing active antennae, minimum gain should be used. The signals we're looking for are emanating from the sky, their angle of reflection being quite steep. Gain flattens the aperture of radiation of the aerial, limiting it's omni-directional characteristics.

Given that the signals you wish to hear have travelled from the other side of the world, they are not overly endowed with signal strength. The last thing you need is to loose some of that strength in the coaxial cable. For this reason the preferred option is RG 213, or a high quality RG 58, such as Cellfoam.

VOX ON

Unless you enjoy sitting in front of your scanner in the small hours of the morning, waiting for that elusive DX, a voice activated cassette recorder in a must.

Most of the DX from American emergency services arrives on our shores between dusk and dawn and the VOX recorder can compresses 12 hours of average density radio traffic into 90 minutes, cutting out the dead time in between overs.

With all the equipment in place, the next question is where to look?

The answer is that the lower end of the low band, around 33 MHz is a good place for starters. I have discovered that these frequencies are better for delivering signals into Australia than the higher frequency areas.

The next trick is to search in small increments, say no more than a megahertz at a time. In that way frequency turn around is quicker and you are less likely to miss a transmission.

If you locate certain channels, or know of a channel that reliably delivers DX into Australia, then monitor it continuously in an attempt to ascertain the user.

WHAT'S ON WHERE

The United States is by far the largest user of frequencies between 30 and 50 MHz. Many government and non government users can be found throughout the bands and, not surprisingly, the government users such as police and fire are the strongest logged in Australia.

Emergency groups are permitted to radiate many thousands of watts.

The primary US allocations are;

FREQUENCY	SPACE	USER
30.00 - 30.55	20 kHz	Government Services.
30.58 - 30.64	20	Industrial Radio Service.
30.66 - 30.82	40	Petroleum Radio Service.
30.86 - 31.02	40	Forestry Service.
30.86 - 31.08	40	Motor Carrier Radio Service.
31.10 - 31.14	20	Motor Carrier Radio Service.
31.28 - 31.96	40	Industrial Radio Service.
33.02 - 33.10	40	Highway Maintenance.
33.18 - 33.38	20	Petroleum Radio Service.
33.44 - 33.68	40	Fire Service.
33.46 - 33.66	40	Fire Service.
33.70 - 33.98	20	Fire Service.
34.01 - 34.99	20	US Government Services.
35.28 - 35.52	40	Industrial Radio Service.
35.74 - 35.86	40	Industrial Radio Service.
36.01 - 36.99	20	US Government Services.
37.04 - 37.32	20	Municipal Police.
37.46 - 37.58	20	Power Service Radio.
37.62 - 37.82	20	Power Service Radio.
37.90 - 37.98	20	Highway Maintenance.
38.27 - 38.99	20	US Government Services.
39.08 - 39.24	20	Municipal Police.
39.48 - 39.98	20	Municipal Police.
40.01 - 40.99	20	US Government Services.
41.01 - 41.99	20	US Government Services.
42.02 - 42.16	20	State Police.
42.18 - 42.30	20	State Police.

Continued over page

42.32 - 42.64	20	State Police.
42.66 - 42.70	20	State Police.
42.80 - 42.94	20	State Police.
43.28 - 43.52	40	Industrial Radio Service.
43.70 - 43.84	20	Motor Carrier Radio Service.
43.86 - 43.94	20	Motor Carrier Radio Service.
43.96 - 44.34	20	Motor Carrier Radio Service.
44.36 - 44.44	20	Motor Carrier Radio Service.
44.48 - 44.60	20	Motor Carrier Radio Service.
44.64 - 45.84	40	Forestry Service.
44.78 - 44.90	40	State Police.
45.08 - 45.64	40	Local Government Radio Service.
45.46 - 45.70	40	Municipal Police.
45.68 - 45.84	40	Highway Maintenance.
45.90 - 46.02	40	Municipal Police.
46.06 - 46.20	20	Fire Service.
46.22 - 46.34	20	Fire Service.
46.36 - 46.50	20	Fire Service.
46.52 - 46.58	20	Local Government Radio Service.
47.02 - 47.40	20	Highway Maintenance.
47.44 - 47.68	40	Industrial Radio Service.
47.70 - 48.54	20	Power Service Radio.
48.56 - 49.58	20	Forest Products.
48.56 - 49.50	20	Petroleum Radio Service.
49.52 - 49.58	40	Industrial Radio Service.
49.61 - 49.99	20	US Government Radio Service.

SOUTH OF THE BORDER

The Latin American countries, strongly influenced by the US, are also primary users of VHF low band frequencies. Details as to their band plans is limited, however, here are a few that will start you on the way.

30.000	Mexican Military.
30.060	Argentinian farmers.
30.475	El Salvador taxi company.
30.545	Mexican telephone company.
31.350	Uruguay paging.
33.375	Cuban farmers.
33.500	Mexican Military.
34.480	Brazilian bus company.
35.550	Brazilian pager.
35.625	Brazilian pager.
36.700	Mexican Military.
41.000	Mexican Military.

Many of South American frequencies are in FM mode, however, several AM users can be found scattered across the channels.

TO THE NORTH

Japan, Korea, Taiwan and the Philippines all allocate frequencies between 30-50 MHz for land mobile services and most of the users appear to be in the band, 30.01-47.00 MHz.

In Japan, 41-44 MHz is allocated to radiolocation (paging) services.

To intercept military communications from Asia stations check those frequencies assigned to the US military.

The following is a mix of South East Asia commercial users;

36.200	Chinese stations.
36.500	Indonesian stations.
39.350	Indonesian stations.
46.125	Radio telephone.
48.240	Malaysia station.

These are but a few of the thousands of communications services that can be found on low band VHF. While it is summer north of the Equator, we are enjoying the winter listening between 30-50 MHz.

So get into it while it is hot, that is cold, or do I mean hot?

Thanks to John of Devonport TAS for supplying the very detailed list of American frequencies.

MAILBAG

BOMBER RADIO

Bob, Ermington NSW has noticed that the Police Parking Patrol Officers are carrying portable radios while performing their duty. He asks what frequency are they operating on? The Parking Patrol Officers are equipped, usually with the older portable radios, such as Shinwa and Motorola radios due to the increase in attacks on them from irate drivers. They work on the normal channels assigned to the district they are covering, eg. Parramatta area - channel 83, Liverpool area - channel 84 and so on. Callsigns vary. He also logs in with some of the more interesting frequencies in the area. 2DAY FM Black Thunders - 490.275, Coca Cola Bottlers - 508.575, NRMA voice channel - 487.425, Naval Police - 493.125, Harbour Bridge - 465.350, Westmead Hospital - 488.950, STA ferries - 157.480, Westbus - 487.675 and finally QANTAS air to ground - 131.700.

LATROBE CORRECTION

In the March/April issue of SCAN I incorrectly gave the police frequency of 168.310 as being used in the Latrobe Valley. The correct frequency is 168.400. As Michael from Newborough points out, the law enforcement authorities have changed frequency at least six times over the last few years. UHF was installed at one stage, however, it was later removed and dispatched to another area. Thanks to Michael and the other readers who wrote in correcting the error.

That's what the column is all about.

QUEENSLAND LAW

These are the major police frequencies covering the South East corner of Queensland as supplied by a reader in Wynnum West.

Ch.3 467.900 Inquiries, Ch.8 468.025, Ch.9 468.050 Inquiries, Ch.11 468.100 Southside Brisbane, Ch.13 468.150 Northside Brisbane, Ch.14 468.175 Ipswich, Ch.15 468.200 Sunshine Coast, Ch.16 468.225 Special Operations, Ch.18 468.275 Redcliffe, Ch.19 468.300 Redcliffe, Ch.20 468.325 Inquiries, Ch.23 468.400 City, Ch.24 468.425 Foot Patrols, Ch.27 468.500 Chat channel, Ch.28 468.525 Southside Brisbane, Ch.30 468.575 Southside Brisbane, Ch.36 468.725 Beenleigh, Ch.37 Beenleigh, Ch.38 468.775 Beenleigh, Ch.39 468.800, Ch.41 468.850 Radar, Ch.42 468.875 Northside Brisbane, Ch.45 Southside Brisbane, Ch.52 469.125 Gold Coast, Ch.56 469.225 Highway Patrol, Ch.58 469.275 Southside Brisbane, Ch.59 469.300 Inquiries, Ch.64 469.425 Special Operations.

AMPS & ANTENNA

David, Penguin TAS, is wondering why his VHF stations have dropped several 'S' points after he attached a pre-amp to his Icom discone.

There is a popular misconception that if you introduce a few dB of gain to an aerial and get good results, then a lot more gain will give you terrific results. No way David.

The gain effects of the various aerials cannot be looked at as the same when when a pre-amp is hooked into the circuit. Adding gain to an aerial flattens the lobe in a similar manner to crushing a funnel while you are pouring water through it.

The smaller it gets the less water it can handle.

Active antennae and pre-amps need to be variable. Unless they are, this problem will arise every occasion. A point made by Tom

Scan 1993

Continued over page....

Moffit, a contributor to our sister magazine Amateur Radio Action, recently caused some concern to scanner enthusiasts in northern Tasmania.

Discones are wide band, unity gain aerials. If their limitations are known they work well, however, you need to be aware of these limitations.

What a lot of scanner users take for granted is that because their scanners cover 25-1000 MHz, then their discone will also.

The average, good quality discone will have a band width of 100-500 MHz without experiencing degradation at either end of the bandwidth...do not expect miracles.

ASK ATIS

Andrew, Windsor Gardens SA, asks if all ATIS, or Automatic Terminal Information Services at airports throughout the world are the same, if English is the principal language and if they carry the same content in their messages?

In the aviation world, English is the common language spoken by all pilots, Air Traffic Controllers and those involved in communicating with aircraft. Accents notwithstanding, English is used throughout the world. Allowing for local content, all ATIS broadcasts follow a basic pattern, location, version, weather and local conditions.

WHITE OR BLACK ?

During a recent incident in Melbourne, Martin, Carnegie VIC, overheard the following between a car and the operator on Ch.45 468.950 TAC 1.

CAR 520: Can we have a couple of litres of milk down here for refreshment of the members?

RADIO: You want two litres of milk down there do you 520?

CAR 520: At least two litres unless you can provide us with a cow.

RADIO: I'll see what I can do for you 520.

WALLAROO TO ADELAIDE

Alan, Wallaroo SA, checks in with some of the frequencies for this Yorke Peninsula town and for Adelaide.

RFDS - 158.530, North Yorke District Council - 163.345, VKA Port Pirie - 169.240, VKA Port Augusta - 169.090, Snowtown SES - 167.410, Teatree Gully CFS - 163.270, Radio 5AU - 170.100, Fisheries - 486.025, VKA Water Police - 156.525, Tea Tree Gully Council - 163.390 and Lloyd Helicopters company - 126.400 AM.

MISSING LINKS

A request from Randal, Melbourne VIC, for any information about changes to the CFA frequency allocations, especially UHF and VHF links that may be in use throughout Victoria.

Our reader has been copying western and north western area mobiles and bases from his east Melbourne location.

If you can help, a quick note to SCAN, I will ensure the information reaches the right person.

CONTACTS

NAME: *Glen Mackintosh*
CONTACT: *PO Box 751 Indooroopilly QLD 4068*
INTEREST: *Police and fire.*

NAME: *David Carroll*
CONTACT: *PO Box 1680, Bathurst, NSW 2795*
INTEREST: *Race frequencies, police, rescue helicopter.*

NAME: *Shane Foley*
CONTACT: *PO Box 17 Morpeth NSW 2321*
INTEREST: *Anything.*

NAME: *Brian Buckingham*
CONTACT: *PO Box 1010, Maroubra, NSW 2035*
INTEREST: *Seeking an Icom IC R-7100.*

PROPAGATION

ARE YOU BEING SERVED ?

I sometimes wonder where the various electronic and radio hobby shops find their staff. I was visiting such a shop recently when I overheard the following conversation. The two were standing in front of a display case stocked with portable scanners, HF receivers, a UHF CB handheld plus many other bits and pieces of radio gear.

CUSTOMER: *"I am after a couple of cheap handhelds to work over a kilometre or so."*

STAFFER: *"We don't really have anything in that line."*

CUSTOMER: *"What about this one?", indicating the UHF CB handheld.*

STAFFER: *"If you are after something to work a kilometre, I suggest one of these handheld scanners."*

CUSTOMER: With a puzzled look on his face, *" What are all the buttons for?"*

STAFFER: *"I am not sure."*

The now totally confused customer leaves the store, sale lost.

It would be interesting to see, if after the customer had purchased the portable scanner, how long he would have spent looking for the press to talk button!

OUT OF CONFUSION . . .

As far as cold blooded murder was concerned, it ranked with the Hoddle St and Queen St massacres. Grafton is now part of criminal and radio history.

The course of events, leading up to a siege outside the northern NSW township of Grafton, had their origins in south east Queensland.

Three men had allegedly kidnapped two young children after murdering at least two other people, and were fleeing to the southern states.

What was to unfold over the last days of March 1993 was to be news for weeks to come.

From the murder of, what turned out to be five innocent victims, the kidnapping of the two young children, a 36 hours siege and the apparent suicide of one of the criminals involved, is an interesting story on radio and its uses.

Once it became apparent that police had cornered the three wanted and heavily armed men in a farm house just outside Grafton NSW, media groups immediately converged on the area, to feed out graphic vision of the drama.

It became obvious, within hours of their arrival, that radio communications in and out of the area were poor to non-existent.

Channel 7 Brisbane dispatched a vehicle fitted with HF radphone equipment to the scene, so that basic telephone links could be established via AOTC coast stations.

Unfortunately antenna problems plagued the HF car, rendering the radio inoperable while cellular telephones were useless in the valley surrounding the tiny rural property.

The search quickly began for ways to pass messages between news rooms and crews at the scene.

One BTQ 7 cameraman discovered while playing with his UHF CB that a repeater was operating on channel 2/32. A general call made contact with Barbara, 650 Base.

From then on Barbara became the communications path

Scan 1993

Continued from previous page....

between the Chief of Staff in the Brisbane and Sydney news rooms and ATN/BTQ 7 camera crews.

The channel 2/32 repeater also served the radio needs of TEN 10 news crews from Sydney.

This time it was the Nymboida Shire Council that came to the rescue, acting as a relay for cameramen and station staff.

The moral behind this story?

During major events, be they as horrific as Grafton or as enjoyable as a car race, don't assume that all the action will be on the tried and true, and well known frequencies.

Check everything, including CB and HF to log the entire picture.

HIGH CAPACITY RECHARGEABLE AA CELLS

Recently released onto the Australian market is the 1200mAH, Nickel Metal Hydride rechargeable AA battery.

These batteries represent a big leap forward in rechargeable technology. The charging characteristics are similar to the more familiar Nickel Cadmium cells, however, NiHyd cells will outlast the standard Nicad for up to double the time.

They are available from Brian Buckingham, PO Box 1010, Maroubra NSW 2035 and the price per cell is $20.00.

Those requiring bulk orders should contact the supplier.

FX GUIDE UPDATE

In the last issue of CBA I featured a run-down on the many frequency guides available to scanner enthusiasts. Changes have occurred to two of the guides.

The SCANWEST book in now in A5 size, not A4 as listed. Secondly, the Emergency and Essential Services Reference List from the Newcastle Scanner Group is available for $10, from PO Box 132, Waratah, NSW 2298, or the Charlestown address.

HOME BAKED ANTENNA MOUNT

This probably applies to CB users, amateur operators, scanners users and commercial two way operators.

For most of us the question of drilling a hole in a car's roof for an antenna mount is basically just not on. Firstly, it's not all that easy to do it properly, secondly the YL or XYL will not take kindly to the idea and finally it's just not necessary.

There are already a number of brackets and devices on the market made just for this purpose and one popular method of mounting a whip on the car is via the 'boot mount'.

A stainless steel box-like thing that slides over the lip of the boot or bonnet where it is held by two grub screws.

A problem with this mount is, however, that it comes in two colours - chrome or black. I don't recall ever seeing a chrome car and black ones are few and far between.

For ten dollars and a little work you can have colour co-ordinated antenna mounts.

The paint applied to every vehicle is given a code number that identifies it to car dealers, panel shops, etc. and that number is usually recorded on the compliance plate attached to the car.

Having ascertained the paint code-number, journey into your nearest car accessory house and search the shelves for cans of auto touch up paint.

Somewhere on the many racks is a colour to match your car, or one that's pretty close anyway.

Before wandering back home with your purchase, grab a can of duco primer as well.

Remove the rubber non-scratch feet and the two grub screws from the boot/bonnet mount and you're ready to customise your antenna mount.

To assist the paint in bonding to the metal, give the boot mount, or any other mount being painted, a good clean in a metho bath to remove oil, silicon and dirt.

Ensuring that you're in a well ventilated area, give the mount several coats of primer, leaving five minutes between coats.

Wait for the primer to dry, say overnight, then coat it with the duco colour suitable to your car. Apply several coats.

With the kitchen oven set to 100 degrees Celsius (and ideally while the YL or XYL are out shopping), place the mount into the oven for ten minutes only. It is best to hang the mount from the top shelf.

This will bake the paint onto the mount to provide a more durable finish.

Beware, however, auto paint is lead based and it should only be used in open areas with a good air flow.

The baking process does produce an odour, so open a kitchen window or turn on a vent fan to assist in removing the smell prior to the loved one's return. If she happens to query the odour (which is highly likely) tell her that you were trying to cook a Hungarian goulash which simply didn't work out properly. Replace the rubber feet and install.

INTERNAL AFFAIRS

A Western Australian reader recently had a visit from the Internal Affairs Section of the WA Police, concerning the publication of police radio codes.

While the police officers, to their credit, understood the hobby of scanning, they were concerned that the public had access to their radio codes thereby destroying one of the reasons for the codes in the first place, radio security.

The police expressed concern that police themselves were making copies of the codes available to all and sundry.

In a roundabout way they are.

Radio codes are good for a little while, but, as they are used more and more they become known to whomever may be listening.

When, for example, they dispatch a car to K Mart for a male 401 (hypothetically speaking) it doesn't take much to work out that a 401 is a shop lifter.

Again to the credit of the WA Police IA members, they respected our reader's right to withhold his source.

They mentioned that VK1 was considering the introduction of scrambling to their radio channels.

This makes a lot of sense if users are concerned about security and it's surprising that so few organisations avail themselves of readily available technology.

Stay tuned for further developments.

THE END

If you've heard a funny story over the scanner, or know something that other scanner users would also like to know, how about telling everyone about it?

SCAN is your column and without regular input, particularly from readers, it doesn't exist.

Frequencies, callsigns and anything that may be of interest, you will find it all here.

Inspired to write? Just send it to the address below.

SCAN
PO BOX 344
SPRINGWOOD
NSW 2777

A stamped self addressed envelope please, if you require a personal reply.

SO YOU WANT TO BE AN AMATEUR?

THE PATH TO AMATEUR RADIO

Part Seven of a regular series by Paul Butler - VK3DBP

In this column over the last few months, we've had a look at a variety of amateur radio topics relevant to the Novice syllabus. Each time, there have been some questions to chew over. We have supplied answers but not worked solutions.

Now we are going to have a look at some more questions, just like those you might get in a typical Novice exam, and give a bit more explanation for each of them. There are no new topics this time but to get the right answers to these questions, you will need to piece together some of the different ideas we have met so far. Here we go, then.....

Question 1.

The wavelength of a signal is 15 metres. The wavelength of its second harmonic is:

(a) 30 metres
(b) 15 metres
(c) 10 metres
(d) 7.5 metres

Every periodic wave, such as a radio wave, can be described by its wavelength (the distance from the peak of one cycle to the peak of the next) and its frequency (the number of cycles per second making up the wave).

Harmonics are related to the original wave because they have frequencies which are simple multiples of the fundamental frequency. The first harmonic has the fundamental frequency; the second harmonic has twice this frequency and therefore half the original wavelength.

Answer: (d)

Question 2.

Six 1.5 volt dry cells are needed to provide a battery for a 9 volt transistor radio.
The cells are connected in:

(a) in series and parallel
(b) in series only
(c) in parallel only
(d) with series capacitance

Electrons in an electrical circuit are supplied with energy by the source of electromotive force or EMF, in this case a set of 1.5 volt dry cells.

By connecting cells like this in series, the amount of energy given to the electrons is equal to the sum of the separate voltages of each of them. Six 1.5 volt cells connected in series make up a 9 volt battery.

Answer: (b)

Question 3.

Power transformers usually have laminated iron cores in order to:

(a) reduce eddy-current losses
(b) increase the output voltage
(c) improve output voltage regulation
(d) reduce copper losses

The primary and secondary windings of a transformer are wound on to an iron core, which concentrates the magnetic field produced by the current in the primary through the secondary, so closely linking the two coils magnetically.

The magnetic field generates unwanted currents, called eddy currents, in the iron core itself, giving rise to heat losses.

By laminating or layering the core with alternate layers of iron and insulator, eddy currents can be kept to a minimum without affecting the magnetic linking of the primary and secondary windings.

This makes the transformer more efficient, i.e. it reduces the energy lost as heat.

Answer: (a)

Question 4.

Three resistors, each of value 30 ohms, are connected in series. The total resistance value of this combination is:

(a) 7.5 ohms
(b) 10 ohms
(c) 30 ohms
(d) 90 ohms

When resistors are connected in series, their individual resistances simply add together. Three lots of 30 ohms adds up to 90 ohms.

(Bonus question: What happens if they are connected in parallel? Answer: 10 ohms)

Answer: (d)

Question 5.

Varactor (varicap) diodes may be used for:

(a) AC voltage regulation
(b) adjusting capacitance in a tuned circuit
(c) impedance matching of an antenna
(d) automatic gain control

The alternative name for a varactor diode, the varicap, tells us that it has VARIable CAPacitance. It is, in fact, dependent on the voltage applied to the diode.

The resonant frequency of a tuned circuit depends on the values of inductance and capacitance in the circuit.

By including a varicap diode in a resonant circuit, the resonant frequency can be altered by adjusting the voltage applied to the diode, thus changing the capacitance of the varicap.

This principle is used in the tuning section of many radios and televisions.

Answer: (b)

Question 6.

100 picofarads is the same as:

(a) .01 microfarad
(b) .001 microfarad
(c) .0001 microfarad
(d) .00001 microfarad

For the Novice exam, you will need to

know several of the prefixes used with units of measurement. In this case, we are talking about the farad, which is the unit of capacitance.

When we see micro - in front of a unit, e.g. microfarad, we read it as one-millionth of a farad.

A few others?

Milli - means one-thousandth (e.g. mm or millimetre), nano - means one-thousand-millionth and pico - means one-million-millionth!

Going the other way, kilo - means one thousand (e.g. km or kilometre) and mega - means one million.

Answer: (c)

Question 7.

A correctly biased PNP transistor will conduct when the:

(a) emitter is more negative than the collector
(b) collector is more positive than the emitter
(c) emitter and base are at the same potential
(d) collector is more negative than the emitter

A PN semiconductor diode consists of N-type and P-type semiconductor materials meeting together. It has the electrical property that it will conduct in one direction only, when the P-type material is made positive relative to the N-type material. A PNP transistor is essentially two PN junctions connected back-to-back, so they share the same narrow N-type central region.

For a transistor to work, it must be connected so that the base-emitter junction conducts, so the base is made negative relative to the emitter.

The base-collector junction is connected so it does NOT conduct, with the collector negative relative to the base, and consequently negative relative to the base, too.

For a more complete discussion of the workings of diodes and transistors, have a look at my Novice Notes in CB Action, January/February 1993.

Answer: (d)

Question 8.

The collector current of a bipolar transistor is controlled by the:

(a) base current
(b) collector voltage
(c) base voltage
(d) emitter voltage

Continuing the discussion on transistors, the electrons passing through the base-emitter junction tend to overshoot and end up going into the collector region to form the collector current. Only a small current ends up leaving the base terminal.

This base current can be varied, for example by the presence of an AC signal voltage.

It turns out that small changes in base current produce much larger changes in the collector current. We summarise this behaviour by saying that the base current CONTROLS the collector current.

Answer: (a)

Question 9.

A 100% efficient transformer would have a power ratio of:

(a) 4:1
(b) 2:1
(c) 1:1
(d) 1:2

A 100% efficient transformer does not exist! If it did, ALL the power entering the primary winding would appear out of the secondary winding, but at a different voltage, so the ratio of output power to input power would be 1:1.

A step-up transformer produces a higher output voltage than the input voltage (but correspondingly less current), while a step-down transformer reduces the voltage (but the secondary current is higher than the primary current).

As we saw above, eddy currents in the iron core of a transformer generate heat, so a real transformer dissipates some of the input power as wasted heat.

Its efficiency is therefore less than 100%. Laminating the core keeps the eddy currents to a minimum but the losses can never be completely eliminated.

Answer: (c)

Question 10.

A full-wave bridge rectifier has:

(a) 1 diode
(b) 2 diodes
(c) 3 diodes
(d) 4 diodes

A single diode allows positive half-cycles of an AC waveform to pass but stops the negative half-cycles. This is appropriately named half-wave rectification. To achieve full-wave rectification, both positive and negative half-cycles must be let through, but the negatives are inverted to become positives!

This can be achieved using two diodes and a centre-tapped transformer, but a simpler and more popular way is to use an ordinary single-winding transformer and four diodes arranged as a bridge rectifier.

Answer: (d)

Question 11.

The ripple frequency of the output from a full wave bridge rectifier is:

(a) one-quarter of the frequency which is rectified
(b) equal to the frequency which is rectified
(c) twice the frequency which is rectified
(d) four times the frequency which is rectified

The frequency of our AC mains supply is 50 Hz, that is, 50 cycles per second. When this is rectified by a full-wave bridge rectifier, each half cycle appears at the output, but the negative half cycles are turned up-side down. The output is therefore a steady stream of positive half-cycles, hardly DC! The `lumpy' output has what is called ripple and the job of the following stages of an AC to DC rectifier is to reduce or remove this ripple.

For each cycle in the original waveform, there will be TWO half-cycles at the output. This means that the frequency of the output ripple will be twice that of the input.

Answer: (c)

Question 12.

The final power amplifier stage in a single sideband transmitter is a:

(a) class C amplifier
(b) linear amplifier
(c) voltage amplifier
(d) modulated amplifier

When the audio-frequency signal from a microphone is amplified and used to modulate the amplitude of the radio-frequency (RF) carrier, the resulting signal consists of the original carrier plus two other signals called the upper and lower sidebands. The sidebands have frequencies equal to the carrier frequency plus and minus the audio frequency.

To save space in the radio band used, the carrier and one sideband can be removed, since enough information is carried in one sideband on its own. The signal is now single sideband. Because of the way the original signal is rebuilt at the receiving end, any amplification of a single sideband signal, for example in a final stage RF power amplifier, must produce an exact copy of the unamplified signal.

The requirement, then, is for a linear amplifier, which introduces negligible distortion into the signal. Although a Class C amplifier is more efficient than a linear Class A amplifier, the distortion introduced by Class C amplification is unacceptable for the single sideband mode.

Answer: (b)

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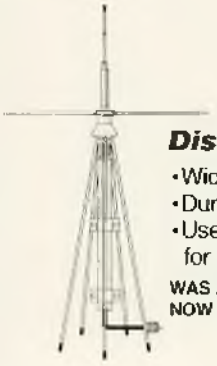

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(continued from previous page)

Question 13.

The bandwidth of an amplitude modulated (AM) signal is determined by the:

(a) strength of the modulated signal
(b) frequency of the carrier
(c) frequency of the modulating signal
(d) strength of the carrier

As mentioned in the answer to the previous question, the spacing of the two sidebands resulting from modulation of the amplitude of an RF carrier is equal to the AF frequency used.

The band space occupied by an amplitude modulated (AM) signal, called the bandwidth, is therefore dependent on the frequency of the modulating signal.

Answer: (c)

Question 14.

A product detector is:

(a) a half-wave rectifier used in oscilloscopes
(b) a full-wave rectifier used in power supplies
(c) a reverse biased silicon diode
(d) a mixing device used for the detection of SSB and CW signals

Continuing on from the previous two questions, we need to able to get out of a single sideband signal the original AF signal. Because the carrier was removed in the transmitter, it must be replaced in the receiver.

One way to do this is to add to the received signal a second RF signal in a mixer. The product of this mixing is then processed further to become the audio output of the receiver.

CW signals are often processed in the same way, so that the burst of RF energy making up each dot and dash in a morse signal generates a beep of audio in the output of the receiver.

Answer: (d)

Question 15.

An AF amplifier is designed to amplify within a frequency range of about:

(a) 15 to 20,000 Hz
(b) 20 to 50 kHz
(c) 15 to 20 MHz
(d) 1.5 to 5 GHz

Audio frequencies are, by definition, those frequencies we can hear!

All the others listed here are radio frequencies.

Answer: (a)

Question 16.

An increase in the height of the ionosphere will cause the skip distance to:

(a) decrease
(b) become more dependent on the transmitter's output power
(c) become unpredictable
(d) increase

High frequency (HF) signal travel as far as they do around the world because they are not dependent on line-of-sight propagation.

Although radio waves travel in straight lines, they can be bent back to earth by the charged layer of the Earth's atmosphere called the ionosphere. The wave is said to 'skip' from point to point on the ground. The distance from where a wave leaves the Earth's surface to where it returns is called the skip distance.

As far as long distance (DX) operators are concerned, the longer the skip distance, the better! An increase in the height of the ionosphere increases the skip distance and so allows the signal to travel further.

Answer: (d)

Question 17.

Transmission of high frequency signals over long distances is generally due to:

(a) surface wave propagation
(b) ground wave propagation
(c) sky wave propagation
(d) direct propagation

As mentioned in the previous question, long distance propagation depends on the ionosphere returning a radio wave to the Earth's surface. This up-and-back wave is called the sky wave, for obvious reasons!

Answer: (c)

Question 18.

Communications over 500 km on the 80 metre band at night depend mainly on:

(a) surface wave propagation
(b) ground wave propagation
(c) sky wave propagation
(d) direct wave propagation

The 80 metre band really comes alive at night! During the day, propagation on this band of frequencies, around 3.5 MHz, is poor. Once the sun goes down, however, the state of the ionosphere is just right for bringing back to Earth radio waves around this frequency. This is a direct result of skywave propagation.

Answer: (c)

Question 19.

The approximate length of a half-wave dipole antenna for 21 MHz is:

(a) 15 metres
(b) 10.5 metres
(c) 7.5 metres
(d) 2.5 metres

Frequencies around 21 MHz (21,000,000 Hz) fall into the 15 metre band. This can be quickly checked using the simple relationship between frequency and wavelength:

wave speed = frequency x wavelength

- in which the wave speed is the speed of light, 300,000,000 metres per second.

Substituting values:

300,000,000 = 21,000,000 x wavelength

So the wavelength is equal to 300/21 or about 15 metres. A half-wave dipole antenna is, be definition, half a wavelength long or, in this case, 7.5 metres long.

Answer: (c)

Question 20.

The impedance of a transmission line must match both the antenna and the transmitter output impedance in order to:

(a) maintain frequency stability
(b) prevent radiation in the vertical plane
(c) prevent radiation in the horizontal plane
(d) obtain maximum transfer of power to the antenna

A transmission line is used to carry RF signals from the output stages of a transmitter to the antenna.

It may be coaxial cable or a balanced line made up of two parallel conductors held at a fixed spacing from one another, like the ladder line sometimes used for TV antennas. All transmission lines have a characteristic impedance, which is the ratio of voltage to current and, like resistance, is measured in ohms.

The transmitter output has its own impedance too, as does the antenna itself.

For the system as a whole to be most efficient, the impedances should be the same throughout. This ensures maximum transfer of power from transmitter to transmission line to antenna.

Answer: (d)

Cheers and 73s from Paul, VK3DBP.

VIRUS THREAT

While almost everyone has heard about computer viruses, few actually realise the damage they can do. Rod Fewster is, among things, extremely well versed in this aspect of computers so we asked him to share some of his knowledge with our readers...here's Part One of a very interesting, not to say educational, report on the how, why and when of the computer virus problem.

An ever-increasing number of CBers and amateurs are becoming involved in hobby computing, and in many areas the two hobbies overlap. Personal computers can be used to control the functions of upmarket scanners, shortwave receivers, and amateur transceivers.

Programs which give precise beam headings to anywhere in the world, keep logs, draw Great Circle maps based on your own location, help you design antennas, as well as lists of HF, VHF and UHF frequencies, newsletters, technical tips and advice — and more — are available by modem from BBSs... electronic bulletin boards you can call by modem via the telephone system.

Bulletin boards like Shortwave Possums in Sydney (02) 651 3055; Spectrum Radio in Melbourne (03) 819 9167; and The Edge of Reality! in Brisbane (07) 886 1886 have hundreds of hobby radio-related files available for download, and feature 'echomail' areas where you can write messages which can be read on participating BBSs all over Australia within a couple of days.

Years ago, most radio hobbyists used the venerable Commodore C64, and many still do, but falling computer prices and the fact that most radio-related software these days is written under MS-DOS have led to this aspect of the hobby being taken over by IBM clones.

Many radio hobbyists are now using powerful high-speed computers which would take pride-of-place in the most modern business office.

THE COMPUTER VIRUS... HOW SAFE ARE YOU?

The short answer is... "You're not!"

Like business users, hobbyist computer users are constantly faced with the threat of losing all their stored information... sometimes the product of months or even years of work... to a computer virus attack.

WHAT IS A COMPUTER VIRUS?

There's nothing mystical about a computer virus. It's simply a small program which attaches itself to other programs. Some viruses are deliberately malicious. Others, while not purposely written to cause damage, contain potentially harmful bugs and conflict-causing code.

Deliberately malicious or not, most viruses do cause damage.

Computer viruses can be likened to ticks... tiny parasites which attach themselves to a host and breed more of their own kind. The host is usually unaware that it's infected, the ticks multiply, and they eventually cripple (or even kill) the host if they are not removed.

HOW DO COMPUTER VIRUSES SPREAD?

Although some infections are deliberate acts of sabotage, viruses are usually inadvertently introduced to a computer concealed inside a legitimate program which is either copied from a floppy disk, transferred electronically over the telephone lines by modem, or transferred on-air by radio modem.

Viruses typically replicate within and between computer systems, copying themselves (sometimes in mutated form) to as many files as they can in an attempt to spread as far and as wide as possible before being detected.

HOW MANY COMPUTER VIRUSES ARE THERE?

This depends on whose promotional hype you believe. Some anti-virus software houses claim that their products will detect many thousands of viruses, but as I write this article there are less than two thousand documented genuine viruses.

The rest belong in a category referred to by anti-virus researchers as 'trash'. This category includes Trojans, droppers, non-functional prototypes, crippled viruses, and 'non-viruses'... programs containing code which makes them 'look' like a virus when in fact they are not viruses at all.

To add to the confusion, a virus may also be known by many different names. There is no standardised virus-naming convention. Anti-virus software houses are free to call a virus whatever they like... and many do just that.

VIRUS TYPES

There are three common types of computer virus... the 'system' virus, the 'file' virus (also known as the 'program' virus) and the 'multipartite' virus .

A fourth type, the 'file system' virus, is extremely rare... DIR2 is the only known example. This virus modifies the file system, the directory and file allocation table.

The virus locates itself somewhere on the disk (not necessarily in a file) and is executed when an infected file is run. There may be other ways to infect PCs that no-one has yet thought of, so new virus types may appear in the future.

System viruses only attack system areas... ie: a disk's master boot record and/or partition table. File viruses general-

ly attack only executable (*.COM and *.EXE) programs.

In order to 'infect', a virus must attack an executable file. It may do this by checking the file extension or simply by just waiting for any file to be executed by DOS... X-Tree Pro's .XTG files, for example. A file virus cannot 'infect' a non-executable file, although it may try to do so by mistake.

Multipartite viruses attack both files and system areas, and may attack from several different directions either immediately or over a period of many months.

Each of these basic virus types may belong to one or more of the sub-groups 'plain Vanilla', 'encrypted', 'polymorphic', 'stealth', 'fast-spreading', or 'slow-spreading.' As with new virus types, new sub-groups may appear in the future.

THE PLAIN VANILLA VIRUS

'Plain vanilla' is the term used to describe viruses which have no encryption , polymorphism, or stealth. This is very basic virus technology, and such viruses are generally easily detected as they make no real attempt to hide themselves from anti-virus scanners.

THE SIMPLE ENCRYPTED VIRUS

Simple encrypted viruses use a small program at the beginning of the virus code to de-crypt themselves so that they can run. This is fairly old virus technology... the de-cryption program itself never changes, and can be used as a signature to scan for the virus.

THE POLYMORPHIC VIRUS

Polymorphic viruses have the ability to mutate as they replicate, and some are reputed to create up to a billion slightly different versions of themselves.

Many use simple encryption with the added ability to pseudo-randomly switch the order of their de-cryption instructions around and insert random 'rubbish code' into the de-cryption loop, thereby creating a new signature every time they replicate.

Signature scanning is virtually useless against a polymorphic virus as it is almost impossible to extract a unique signature, and the sheer logistics of a billion-signature database makes this approach to detection unfeasible even for one virus, let alone hundreds.

THE STEALTH VIRUS

The 'companion' (also known as 'paired' and 'spawning') virus is an early example of stealth programming. It creates totally-hidden *.COM files with the same name as existing *.EXE files and relies on the fact that most computer users type only the primary part of a filename and not the extension ('PKZIP' as opposed to 'PKZIP.EXE' for example) to load and execute a file.

Unless the file extension is forced, DOS's command interpreter loads *.COM files before *.EXE files of the same name, so the virus is always loaded first and then runs the *.EXE file after completing its mission. Modern stealth viruses are much more sophisticated and often employ high-tech anti-detection routines.

They make no apparent changes to file size, date, time, or attributes, and no apparent changes to available memory. Their presence cannot be detected by system-use or memory-use utilities or by debugging tools. Many of the newer stealth viruses are also polymorphic.

THE MULTIPARTITE VIRUS

Multipartite viruses infect both floppy disks and hard drives.

Some have been programmed to specifically target hard drives, using floppies as a means of transportation from one computer to another. All multipartite viruses infect files, and attack the partition table and/or the boot sector. Some particularly destructive multipartite viruses go 'all the way', infecting files and system areas as outlined above as their 'first strike', waiting for three months or more to give themselves a better chance of being transferred to other computers, then going into 'second strike' mode and totally trashing the hard drive's boot sector and partition table... making data recovery extremely difficult and, in some cases, impossible.

THE FAST-SPREADING VIRUS

Many early viruses had the ability to infect files as they were copied. These viruses were loosely termed 'fast-spreading'. Some virus writers extended this ability so that their creations would also infect files as they were renamed, moved, read, had their attributes changed , or opened for virtually any reason, giving birth to the true 'fast-spreader'... a virus which can infect every single susceptible file on a hard drive within minutes. How? Easy! The people who write these viruses want and expect you to look for them! The true fast-spreader thrives on the actions of many shareware and commercial anti-virus programs, and actually utilises their scanning routines to infect files! The scanners 'think' they're looking for a virus, but in reality they're force-feeding the infection into every file they check. If you run just one fast-spreader-infected file from either your hard drive or a floppy, the 'wrong' scanner can infect every susceptible file on your hard drive in one pass!

THE SLOW-SPREADING VIRUS

Some of the newer viruses have been designed to infect files at a snail's pace.

The reasoning behind this is believed to be that a 'creeping' infection spread over a period of weeks or months is less likely to be noticed than a sudden change to a large number of files.

(continued over page...)

VIRUS THREAT

(continued from previous page)

THE 'VIRUS DROPPER'

There is one other program which deserves a mention... the 'virus dropper'. Although not a virus itself, the dropper is an integral part of the virus writers' weaponry. Droppers don't replicate... their only function is to introduce ('drop') a virus into one or more legitimate programs. Droppers usually contain either a heavily-encrypted virus or hard-to-detect bits of virus code distributed throughout the program which 'come together' to form a virus only when the program is run. This makes droppers extremely difficult to detect... there's virtually nothing to detect until it's too late.

HIGH-TECH VIRUSES

There's a full-time technology war going on behind the scenes between virus writers and anti-virus programmers. The 'Top Gun' virus writers are so good at what they do that some 'anti-virus experts' have been publicly shown to be totally outclassed, their once-popular products going downhill fast because they're just not good enough to survive in today's high-tech virus environment .

A fairly new type of virus is the 'smart' virus, a stealth virus sometimes referred to as an 'on-the-fly disinfector'. The smart virus has become a nightmare for many anti-virus programmers. It has the ability to outwit most anti-virus scanners by stripping all signs of infection from the file image presented to the scanner before it is checked, fooling the scanner into giving the file the all-clear even though it may be deadly. Including fast-spreading capability transforms the scanner into the ultimate weapon for the virus writer!

Some of the most recent arrivals on the virus scene have been deliberately programmed to outwit specific anti-virus scanners by name:

• Dudley, the most widespread virus in Australia at the moment (Dudley received world-wide publicity after it infected over a thousand computers at the former OTC's Sydney headquarters) contains a routine designed to prevent the infection of 'SCxx.xxx' (SCAN.EXE?) but a bug in the program prevents it from working.

• T.R.E.M.O.R., a recently-discovered virus from Germany, has been programmed to switch off the checking routines used by Central Point Anti Virus... the anti-virus package which is supplied as Microsoft Anti Virus with MS-DOS version 6.

• Pantera, a rumored virus from an Australian virus-writer who calls himself 'Talon' (the self-admitted author of Dudley) is claimed to be the ultimate virus... multipartite, fast-spreading, smart, with the ability to infect *.COM, *.EXE, *.OVL, *.SYS, *.BIN, *.DAT, *.TXT, and *.BAT files, file allocation tables, disk boot sectors, and partition tables. (This virus has not been seen at time of writing, and may or may not actually exist.)

WHAT DAMAGE CAN A VIRUS CAUSE?

Depending on its writer's intentions, a virus may simply display a humorous message, or it may destroy files, reformat a hard drive and erase all data, or destroy a hard drive's vital boot sector and render the drive totally useless.

Some viruses may 'lurk' for days, weeks, or even months before striking, being programmed to activate themselves only when a set of pre-determined parameters 'triggers' them, perhaps on a particular date... Friday the Thirteenth, for example.

Most viruses go to work immediately, infecting files and/or system areas on both hard disks and floppy disks before making their presence known — if indeed they make their presence known at all. Most of the really dangerous viruses don't announce themselves with on-screen messages. The first indication you get that you've been infected is when things start to go haywire. There have been instances where a virus has infected thousands of computers in a single office building before being detected and brought under control. Some viruses are merely disruptive, while others are extremely destructive.

Two well-known viruses, Cascade and Michelangelo, illustrate these extremes. Cascade is a practical joke which periodically makes whatever is displayed on your monitor collapse into a jumble at the bottom of the screen. Michelangelo can destroy all data on your hard drive when it activates itself on March 6.

THE SUPER-VIRUS... FACT OR FICTION?

For years there have been rumors about 'super' viruses which will physically damage or destroy computer hardware. These are a myth! The closest any virus comes to causing 'hardware' damage is to destroy a hard drive's boot sector. (This is not genuine 'hardware' damage, and it's not permanent, but it may cost more to restore a small-capacity hard drive to useable condition than to purchase a replacement.)

Some newer hard drive controllers feature on-board volatile storage areas for their own internal instruction set. It may be possible for a virus to write its own instructions to such a controller and render the drive unusable, but as far as I know, no virus writer has figured out how to do this... yet! There are some viruses which will reset a computer's BIOS, but these cause no permanent damage and are merely an inconvenience. It is simply impossible for a virus to 'burn out' your motherboard, melt your keyboard, or cause your monitor to explode in your face!

Part Two of this educational (frightening) article will appear in the Sep/Oct issue of CBA - on sale 17 August.

Bandspread

BY GREG TOWELLS

Here we are back again with more `Bandspread'. If you have any thoughts on what is written here, or anything you would like to see here, just drop a line to P.O. Box 577, St Marys, NSW, 2760.

ATS-803A AND REALISTIC DX-440 MOD

The ATS-803A/DX440 are very nice, yet affordable, receivers suitable for reception of AM and FM broadcast bands and shortwave listening. They offer very good sensitivity and selectivity, memories and a number of other features that make them great value for money.

Good though they are, like most things, they are not perfect.

Here is a modification that will enhance their performance by eliminating the annoying "chuff" noise that occurs when tuning the radio...and is especially noticeable when activating the scanning function. This mod also enables the speaker whilst scanning. The procedure is easy to carry out, and once completed you will wonder why you waited so long to get rid of that particular annoyance.

All you need is a Phillips screwdriver and a few minutes of your time.

It is fairly simple, so give it a go.

Here it is:

1. Remove the batteries from the unit and turn it upside down so the antenna is facing away from you.
2. Remove the six screws and remove the cover (be careful that you don't break the antenna wire).
3. Now locate the 8 pin cable.
4. Remove it CAREFULLY and bend the second lead from the left to a 90 degree angle.
5. Replace the cable and make sure the lead is not touching anything.
6. Reassemble the radio, replace the batteries, and do the smoke test!

All working? I told you it was easy.

Now that the noise is gone for good...enjoy the radio.

PHONE PATCH REVIEW - SPD-600.

Phone patching has been legal for use on Citizens Band radio for many years now, the main barrier for most to use this facility is the sheer cost of equipment available in Australia.

The advantages of setting up a phone patch system at home are enormous. If you are operating or using a handheld, provided you are within range of your home base, then you can make or even possibly receive phone calls.

Phone patch systems are not suitable for installation and use over repeater systems given the enormous number of users at any one time, however, in an emergency situation you could place a call for emergency help yourself through your own telephone, without leaving your vehicle.

Something essential with a phone patch is proper security.

A phone patch should have a decent system of access codes to prevent unauthorised access, unless you are planning on providing a free telephone service to CBers in your local area.

I recently had the opportunity to view a demonstration of a very advanced unit available in USA.

Called SDP-600 Personal Autopatch, this phone patch unit has features and functions only available on units in

ODE TO REPEATER USERS

Subject: I kerchunk, therefore I am.

KERCHUNK: Either a verb or noun, but usually a verb. From the German `kerchunken'; to kerchunk a repeater.

I kerchunk, you kerchunk, he/she/it kerchunks.

Whenever I kerchunk, I always identify. This not only keeps many from being `rubbed the wrong way' but has resulted in many a nice QSO.

A good kerchunk tells you many things:

1. Your transmitter is working,
2. Your receiver is working,
3. Your antenna is working,
4. The repeater is there,
5. The repeater receiver is working,
6. The repeater transmitter is working,
7. The repeater antenna(s) is/are working,
8. The call of the repeater.

Sometimes my kerchunk is answered by an anonymous kerchunk. However, it seems my kerchunk is always of a higher quality than his kerchunk.

"I love the smell of kerchunk in the morning" (sort of betrays the origin of this timeless lot!!)

There is a local chapter of Kerchunkers Anonymous to form in this area soon. (There will be thousands of members straight up too!)

MFJ will soon market a Kerchunk Detector which will printout each month the date, time and call for each and every Kerchunk.

This will result in DoTaC charging 20 cents per kerchunk.

It will be added to your income tax. The new 1040-K forms are being printed even as I type (and kerchunk).

National Kerchunk Day will be established by Parliament next year.

On this day ONLY kerchunking will be allowed on repeaters. Anyone actually engaging in a conversation will lose his kerchunking privileges for a period not exceeding 120 days.

Recently kerchunkers have been heard on 11 metres.

Is this a trend?? (You bet, its called carrier dropping, only it's 1 to 2 seconds in duration).

When I operate 11 metres, I sometimes kerchunk my neighbours TV set.

So, have you kerchunked your local repeater lately???

Thanks for that lot to Jack, K9....., to protect the guilty one.

Australia which cost well in excess of $1000.

The SDP-600 retails for US $200, so on that alone I thought it was well worth a look. The unit makes it possible to make AND RECEIVE phone calls from remote locations.

Two transceivers are obviously needed to operate the system.

One is the base station situated with the phone patch and phone. The connection of the system to phone and transceiver is just as simple as wiring up a new microphone, made even more simple with very precise instructions and diagrams. The remote unit can be a handheld or mobile radio which must be equipped with touch tone pad capable of generating DTMF tones.

A normal mobile radio and a DTMF pad used commonly for phone banking seems to work well. Once the right level is set at the base, all programming of the autopatch is done via the remote using touch tone commands and a access code.

Following is a list of the features of the SDP-600 autopatch and I would suggest that you would be well advised to sit down before reading this lot:

It has available full duplex as well as simplex operation.

Obviously in the CB environment only simplex would be available unless you have a dual band (27/477Mhz) radio handy.

At the end of each transmission courtesy beeps sound.

Access to the autopatch is controlled by not one level of access code security but THREE! The master code is set by the station owner and is used to change configuration and calling codes. The calling code is used to make local calls and to receive calls.

An optional toll code can be invoked to make long distance calls while an optional reverse patch operation enables you to answer incoming calls from your remote station.

An activity timer terminates calls automatically after a set period of time if you get out of range of the base station. LED indicators show the status of the patch during all phases of operation.

A very valuable feature of this patch is regeneration of DTMF tones to dial out, so eliminating errors due to noisy conditions.

Many other autopatches allow the tones received from the mobile to go straight through to the phone line where, if the signal is noisy or weak, the call will fail because the tones are mixed with other noise. In this autopatch, the unit regenerates the received tones so ensuring that perfect sounding tones get to the phone which makes sure that the call happens every time.

Whether the phone exchange system works every time is another matter, isn't it Chuckie???

A programmable logic output can be used to control the power to the transmitter for a completely failsafe shut down, or to control other devices at the base station.

Imagine being able to not only make phone calls but also turn on the jug for a cup of coffee when you arrive home.

There are many more functions than those above...I find it absolutely mind-blowing what technology can do these days.

We had a thorough going over of the capabilities of the autopatch and I was very impressed!

Provided we stayed within range of the base station (which has a very, very good range indeed) we could do everything that a mobile and cordless phone could do.

One important thing that became obvious during the test was the great security system the autopatch possesses, and it is absolutely necessary when the unit is used on CB radio.

After we finished the tests, the channel came alive with dozens of stations trying their luck with their DTMF microphones, not one came close!!

A very good unit - this SPD-600 Personal Autopatch was purchased from J-Com, Box 194Q, Ben Lomond CA 95005, USA, for US $200-00.

The same company also markets a range of computer interface computer control for a range of transceivers and receivers.

DECODING DIGITAL SIGNALS ON SHORTWAVE

If you are the proud owner of an HF shortwave radio and a magic box capable of decoding RTTY, morse code, AMTOR and packet radio, (amongst other modes), you will probably have run into the same problem I have suffered from in the past.

It is all very well to set the system up using, for example the Pakratt PK-232, and read the manual for a description of how to tune these stations in. The first thing you need to do is find the appropriate frequencies of stations transmitting in RTTY or morse type modes.

Right, you find them and all you get is a screen full of rubbish, if you get anything at all. On the PK-232 there is a mode called SIAM, Signal Identification Mode.

It is supposed to tell you what type of signal you have tuned in, the mode, speed and how sure the machine is of what it just told you. When it tells you that it is about 35% sure of what it just said, it is just spinning a bit of a yarn.

At about this time, hair pulling becomes the name of the game...lucky I had heaps to start with. Now, however, enter two programs to the rescue, *RTTYTUNE* and *PKGOLD*.

RTTYTUNE is one of the simplest but effective tools you could have on hand to help you to tune in and decode radioteletype and fax transmissions on the HF shortwave bands.

While your rtty decoder has a tuning indicator of sorts, the best way of tuning in signals of any sort remains - your ears.

However, the main problem is knowing what it is that you are listening out for to tune to and, even after many attempts, it is still hard to remember just exactly what the RTTY and FAX signals sound like.

RTTYTUNE solves that by generating the correct RTTY and FAX tones on your computer's speaker, with both narrow and wide RTTY shifts being catered for.

Start the program, and you get RTTY narrow tones.

Hit the space bar and you hear wide RTTY tones.

Hit the 'enter' key and you will hear FAX tones.

This very useful program has been created is by Simeon Cran, VK4ASJ.

A more detailed aid to identifying multimode transmissions in the HF area is contained within a program called *PKGOLD*, probably available on your local phone BBS by the name *PKGOLD624.ZIP*.

PKGOLD gives a brief introduction to the kinds of tones and sounds heard from a number of different digital modes and then provides a step by step tutorial to identifying the following modes:

BAUDOT - known as RTTY, 45 baud, narrow and wide shift.

AMTOR - an error correcting mode, FEC mode B and ARQ mode A.

MORSE - 20 wpm morse code, and **PACKET** - HF packet, 300 baud, narrow shift.

PKGOLD goes through all these modes, allowing you as much time as required to get to know what each mode sounds like on the air.

Both *RTTYTUNE* and *PKGOLD* are invaluable tools to get to know the various digital signals by sound, since this is the main and most frustrating barrier to tuning the fascinating non-voice signals found in the HF spectrum.

Both these programs should be available on your favourite phone BBS in your area or, failing that, can be found on Shortwave Possums BBS in Sydney.

...and remember, if there is anything you know that you think CBA readers would also like to know, drop me a note to:

P.O. Box 577, St Marys, NSW 2760.

Catch you next time around.

BROADCAST BARGAINS

PRO-520XL Deluxe AM CB

uniden

From its sleek, black casing to its instant channel nine (emergency) switch and powerful 7-watt audio output, the Pro-520XL is a whole lot of transceiver for this low, low price! Featuring separate volume, squelch and RF gain controls, its very easy to use. Also includes a noise limiter for reduced ignition noise, heavy duty mic, mobile mounting kit and public address facility (requires optional speaker).

2 Year Warranty!

Cat D-1235 **$139.95**

uniden MS-100 CB Extension Speaker

Cat D-2275

$29.95

A slimline 5W extension speaker for use where only a small mounting space is available. Comes with a flush mounting bracket and lead fitted with a 3.5mm plug to suit most CBs and scanners. Size is 73 (W) x 66 (H) x 37 (D)mm.

uniden Pro-330e Micro AM CB

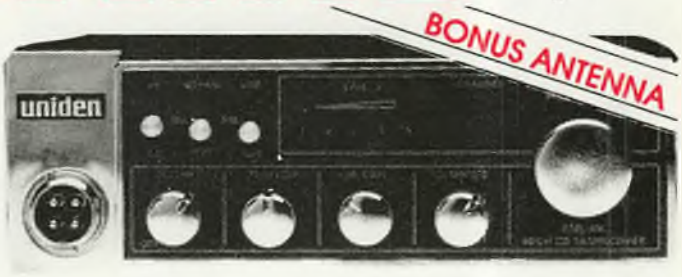
Cat D-1120

$149.95

Finally get that new car and now you find there's nowhere to mount a CB? The sensational Uniden 330e is a totally new concept in CB design that takes up less space and gives more mounting options than ever before. The PRO-330e is a full power 40 channel CB built into a push-to-talk microphone. Its small cradle acts as a wiring block to your outside antenna and power source, and can be mounted on the dash or on the hump between the seats (requires a standard mobile telephone mount).

- Push-button tuning
- All 40 AM channels with switchable Ch. 9 selection.
- Selectable automatic noise limiter to reduce engine noise
- Bright LED channel display and Tx indicator
- Separate Squelch and Volume Controls

2 Year Warranty



Uniden PC-122 Compact AM/SSB CB

The very latest version of the super-compact PC-122. With front-mounted microphone socket and a space-saving design, it's ideal when dashboard space is in short supply. It will fit comfortably in most vehicles and is designed to match modern dashboards. DOTC approved. Superior features include:

- LED received Signal and RF output indicators
- Switchable noise limiter for clearer reception
- Separate volume, Squelch, RF gain and Clarifier controls, for easier operation
- Covers all 40 channels on AM, LSB & USB
- PA facility (requires optional speaker)
- Includes mic, mounting hardware and instruction manual.

2 Year Warranty

uniden

Cat D-1715 **$269**

EXCLUSIVE BONUS FOR CB ACTION READERS

Present this advertisement when you purchase a PC-122 and receive a 5ft helical whip pack (Cat D-4076 valued at **$24.95**) at no extra cost. Offer expires 31st July 93.

Fits In Your Pocket

70 XLT Handheld Scanner

Listen to the fascinating air waves around your city! This lightweight handheld VHF/UHF scanner has 20 memory channels, 8 band coverage (Covers 66-88, 136-174, 406-512MHz) and track tuning for improved performance. With rechargeable NiCad battery pack, AC charger and carry case.

Frequency Coverage:	66-88MHz 136-174MHz 406-512MHz
Sensitivity:	0.4uV 66-88MHz 0.5uV 136-174MHz 0.7uV 406-512MHz

Cat D-2740

$269

2 Year Warranty

Exclusive to Dick Smith Electronics

With Auto Tuning!

Compact 45 Memory Shortwave Receiver

Listening to the world on shortwave radio has never been easier! The super compact compact ATS-606 from Sangean makes finding your favourite shortwave (and local) stations as easy as pushing a button. Let it scan through the bands for you or, with the new Auto Tuning System (ATS), it will locate and put the nine strongest signals on both the AM and FM bands into memory. You can also key in a stations frequency directly from the keypad or put up to 45 frequencies into memory for instant push-button access. It gives continuous shortwave coverage from 1.715 -29.995MHz, and 13 international SW band divisions can be directly accessed. You can also get a dual alarm clock, sleep timer, dual time settings so you can preset any two time-zones, DX/local switch which allows you to set the sensitivity to suit differing conditions, and a lock switch to prevent accidentally changing stations. Comes with stereo earphones for FM stereo operation and has an antenna socket for connection of an external antenna. Requires 3 x AA batteries.

Cat D-2647 **$249**

Frequency Ranges:
FM: 87.50 - 108MHz
LW: 153 - 513kHz
MW: 522 - 1710kHz
SW: 1.715 - 29.995MHz
Includes 13 pre-set shortwave bands

SANGEAN

Hands-Free 55MHz FM Transceiver

This hands-free FM transceiver is ideal for local-area or first-time users such as sporting clubs, schools, farmers and bushwalkers 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/ tieclasp 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.

Cat D-1095

digitor **$69.95**

Portable Shortwave Antenna

Want to boost the performance of your portable shortwave radio? Then you need one of these:
The Sangean ANT-60 is a wind-up reel-style antenna that extends to a full 7 metres (23ft), yet fits in a shirt pocket! It connects via a 3.5mm mini plug or the supplied adaptor that clips onto your portable's telescopic antenna.

$19.95 Cat D-4400

250MHz Frequency Counter

This versatile 5-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

Due August

$99.95

Wideband Receiver Pre-Amplifier

The Jim M-75 is a quality wide-band Japanese GaAsFet pre-amp designed to improve the sensitivity of most scanners. It connects between the scanner an antenna, and provides variable gain (-10dB to +20dB) over the 24 to 2150MHz range. Using surface-mount devices and a GaAsFet amp results in a very low 2dB noise figure, while the switchable band-pass filters reduce the chances of interference from strong out-of-band signals. It's 59 x 80 x 30mm (WHD), and requires a 9V battery or external AC adaptor.

Cat D-3820 **$199**

VHF/UHF Power/SWR Meter

Cat D-1370

$199

A high quality SWR/Power meter suitable for UHF CB, amateur and commercial applications. High-quality Japanese construction assures you of maximum reliability. It has an all-metal case, large meter display, 140-525MHz coverage with less than 0.3dB insertion loss, and 4W, 20W & 200W power scales. Revex model W540.

1.45m 'Monster Stick' Helical Antenna

There's only one way to handle a monster signal, and that's with a Monster Stick antenna! It's constructed with multi-stranded insulated wire on a sturdy fibreglass rod and coated with a tough polyolefin impregnated heatshrink coating. The Monster Stick provides excellent performance in an antenna that's not too long. Uses the adjustable tip tuning system. Standard 5/16" female termination.

5 Year Warranty

Cat D-4414 **$39.95**

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B1501

...and now for something different

GPS - A MINI MIRACLE

Global Positioning System

Icom's GP-22 Global Positioning System is a pocket sized, high-tech terrestrial navigation system of the 1990s using a constellation of orbiting satellites to provide razor sharp accuracy on land or sea.

We had two main reasons for reviewing Icom's latest microwave receiver in CBA this issue.

Firstly, as a high-tech receiver it fits into the ambit of our usual interests in a variety of receivers and scanners, and secondly, because many of our readers drive 4WDs, go fishing, boating, hiking and pursue other activities where knowing your exact `position', or being able to navigate a course accurately or find a spot marked `X' in the ocean really can be a mini miracle.

For example, there are probably more power boats in Australia per capita than any other country in the western world and a big percentage of the owners regularly go fishing.

Most fishermen have their favourite `spots', but they are not always easy to find, especially if they are well off-shore.

As they say in Australia....not a problem!

When you find a good spot you simply take a position reading with your GPS pocket computer and commit the data to memory for future fishing trips.

When you wish to find the spot again you don't have to search all over the ocean, simply enter the `position' as a `Way Point', take a reading of your present `position' and the GPS receiver will navigate an exact course for you from any point in the world giving you a compass bearing, distance to the target and other information if required - like estimated time of arrival.

For ocean going yachtsmen and the like, it sure beats the hell out of sextants and slide-rules!

The GPS system is a brain child of the U.S. Department of Defence and employs a network of 24 satellites orbiting the Earth at an altitude of 20,180 kilometres - that's about 12,500 miles in old figures. The network of satellites is termed the `constellation' and at the time of writing this review only 21 of the intended 24 satellites are in orbit, the remainder of which are expected to be launched towards the end of this year, 1993.

The GPS system is essentially a military instrument to which the USDoD has allowed restricted access for civilian use, having degraded the maximum accuracy to about 30 metres - which is pretty damned good anyway.

"We had two main reasons for reviewing Icom's latest microwave receiver in CBA this issue. Firstly, as a high-tech receiver it fits into the ambit of our usual interests in a variety of receivers and scanners, and secondly, because many of our readers drive 4WDs, go fishing, boating, hiking and pursue other activities where knowing your exact `position', or being able to navigate a course accurately or find a spot marked `X' in the ocean really can be a mini miracle."

This level of information is termed Standard Positioning Service - SPS - while the military grade data is known as Precise Positioning Service - PPS.

GPS receivers actually supply three dimensional information allowing the user to read altitude as well as latitude and longitude, bearings to and from, and time information.

OPERATION PRINCIPLES

The GP-22 is essentially a sophisticated scanning receiver, decoder and calculator operating in the UHF band around 1575MHz or 1.575GHz.

For the record, a giga (pronounced `jigga') hertz is equal to 1,000MHz. So the GPS band is about 3.3 times higher in frequency than UHF CB and about 58 times higher than 27MHz CB.

The GPS receiver has to `acquire' each satellite to be tracked and it requires to `lock' on to at least four satellites to produce an accurate three dimensional position `fix'.

Because there are so many possibilities for acquisition, the receiver carries on board an Almanac of data to reduce the period of time it would take to do a random search of frequencies and directions.

The Almanac contains information about orbit position, frequency, time and code data about each satellite and this information is updated each time satellite acquisition is achieved.

Using the Almanac and the current time the computer can calculate the approximate position and velocity of each satellite.

A decision on which satellites to acquire can then be based on this information.

When sufficient satellites have been acquired the receiver begins to compute `pseudo-range' measurements derived from the time it takes the satellite transmitted signal to reach the receiver and even the time delay in the GPS clock.

The Almanac information is only approximate for any given time, and certainly not accurate enough to plot a position on its own.

Each satellite transmits a continuous data stream describing its own unique orbit information which is repeated every thirty seconds and the GP-22 uses this highly accurate data for computation.

The information is updated hourly and occasional updates are broadcast from ground control.

WHAT CAN GPS DO?

The Icom GP-22, like other GPS systems, is intended for outdoor operation in open areas with wide, unobstructed views of the sky thus allowing best satellite acquisition.

The unit cannot be operated indoors in its standard form, however, Icom offers an outdoor accessory antenna if required. This would be necessary for continuous operation while 4WDing and the like.

The GP-22 uses a five channel parallel digital receiver with a 32 bit 'micro' to determine the best combination of satellites to provide fast accurate position fixes - usually in about 30 seconds.

In October 1992, the GP-22 was the most compact GPS receiver on the market measuring only 131 by 65 by 35 millimetres and weighing only 330 grams including the nickel-halide rechargeable battery.

The unit operates for about 80 minutes on a single battery charge, or for about 5 hours on ordinary AA size alkaline batteries when fitted to the supplied battery case. The older style manganese AA cells are unsuitable having an operating life expectancy of about 15 minutes. The receiver operates in two modes - single calculation where only occasional fixes are required, with considerable battery saving, and continuous calculation mode where information is updated every three seconds.

In addition to bearings based on true North the GP-22 has a correction factor for magnetic north and navigation functions can be easily performed using a magnetic compass for reference.

The GP-22 can perform a wide range of high accuracy navigational functions including positional fix in three dimensions (latitude, longitude and altitude), bearings to and from a 'waypoint' and from one waypoint to another, range between any two 'nav' points and speed with estimated time of arrival, cross tracking error etc. The internal memory accepts the entry of up to 99 waypoints and is capable of storing 9 individual complex routes having up to 10 separate waypoints in each. The reverse routes are automatically stored.

Because the satellite constellation is not quite complete, at certain times of day and in certain locations a lack of confirmed acquisitions prevents the GP-22 from getting a fix.

I should mention that during these periods other GPS units are similarly disabled.

This hiccup will be remedied when the full complement of satellites is operational in the near future.

The GP-22 is compact (palm sized) and has a very legible LCD display that provides a wealth of information in 'pages' corresponding to the navigational function selected.

Initial setup is user programmable and the supplied instructions are simple and explicit allowing no room for confusion.

Each area of the globe is assigned a 'Datum' number which should be entered from the supplied chart of 93 individual specifications.

These numbers describe to the receiver the constant to be applied for greatest accuracy in each area.

The unit has a number of built-in standards that are user selectable.

For example, you can calibrate the instrument for distance in kilometres, miles or nautical miles, magnetic North or true North related bearings (already mentioned), altitude in feet or metres, degrees of latitude & longitude can be displayed or entered in "degrees:minutes:seconds" or "degrees:minutes:hundredths of minutes" and so on.

IN THE FIELD

Just to confirm that you can't get a fix indoors we fired up the GP-22 and positioned it near a window for about 20 minutes in which time the unit only managed to occasionally acquire one satellite.

Outdoors in a relatively open area - the median strip down the centre of Nepean Highway (Melbourne) - we regularly acquired four satellites in the space of a minute or so, however, over a period of a week obtaining a 'fix' at this location was most difficult between the hours of 9am and 11:30am most days.

(continued over page...)

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GPS - A MINI MIRACLE

(continued from previous page)

After that time the GP-22 really was a `mini-miracle' and absolutely fascinating to watch as the receiver responded to the START command and flashed the response "found 0.....found 1..... found 3.... found 4.... found 5...." on the liquid crystal display. You can almost imagine the unit `thinking' for the next 30 seconds while it decides on the best combination of satellites and then displays your position fix. Switched to continuous computation mode the GP-22 rolled-off a list of positional fixes as I walked a zig-zag path across the highway dodging the constant line of traffic. If we'd got run down at least we knew where we were - within a few metres anyway. I tried out the unit at home but I think the trees and foliage prevented the unit from obtaining the necessary four acquisitions, so, out with a ladder and up on the roof..... bingo, four satellites and I knew where I was. According to the GP-22, I was 21.48 kilometres from work and I could get back there on a bearing of 132 degrees. Or, at a range of 27.44 kilometres on a bearing of 323 degrees I could find out where Dick the Tech. had tested the GPS the day before. It's tricky to do anything these days without being found out...isn't it Richard?

I found the GP-22 `one-of-those-things' you just have to own, even if you only use it twice a year. The size is perfect - there is no obvious advantage to having a more compact instrument for normal use - and the construction is excellent.

You need to read the manual thoroughly to get maximum value from the instrument, however, it is possible, with a little imagination, to pick-up the unit and perform a few functions without any tuition.

After a few minutes use - with the book - most of the operations are common sense and the unit is particularly easy to use to its best advantage.

The blue, white and grey colour scheme is pleasing and with rechargeable battery pack fitted the GP-22 feels just right in the palm of your hand.

Fitting the supplied battery case (accepts 5 AA cells) makes the unit slightly more bulky but the extended continuous operating period of about five hours makes the small sacrifice worthwhile.

Icom offers a range of accessories for their instrument which include: external antenna and a variety of leads and mounting hardware with an interface module that substitutes for the battery pack thus allowing operation from an external power source - vehicle cigarette lighter lead for example. The amount of `conventional' navigation equipment that can be replaced by a single Icom GP-22 in nothing less than incredible! Incidentally, Icom supplies a little comparison chart of the GP-22 Vs. three other popular GPS systems and guess who wins by the proverbial `country mile?'

The price for this amazing piece of technology is approx. $1900 inc sales tax - and most people would agree that it would be cheap at double the cost!

SCANFANS PLEASE TAKE NOTE

The following `bulletins' were forwarded to us from America where they apparently appeared on nationwide BBSs and, although obviously having no effect on Australia, they make interesting reading in the light of the upcoming new Radiocommunications Act.

They originated from ARRL (the governing amateur body) headquarters with the first being dated April 30.

Effective April 26, the FCC has banned the importation and sale of radio scanners capable of receiving cellular telephone transmissions. While the FCC denied an ARRL request for specific wording that bona fide amateur equipment be exempted from the new rules, the commission did agree to modify its proposed rule on converters so that it applies only to converters "designed or marketed for use with scanning receivers".

The new regulations change parts 2 and 15 of the FCC rules to prohibit the manufacture or importation of radio scanners capable of receiving frequencies allocated to the domestic public cellular radio telecommunications service (presently 824-849 and 869-984 MHz). The specific wording suggested by the league (and not adopted by the FCC) appears in May QST magazine, page 87. The FCC in denying the league's request said the rule modification "would not adequately ensure that such converters would not be readily available and commonly used to intercept cellular communications."

"However," the FCC said, "we do not believe it appropriate to restrict cable television converters or other devices that might be able to receive cellular telephone transmissions but were not designed for that purpose."

The FCC's new rules, in addition to the anticipated banning of scanners capable of tuning cellular telephone frequencies (or of being easily modified to do so), also prohibit frequency converters that either convert or are easily modified to convert cellular frequencies to other frequencies outside the cellular band that are easily received by most scanners. It is possible that commercial manufacturers may file petitions for reconsideration, particularly for clarification of the "readily modified" definition.

The second bulletin, also from ARRL Headquarters, was issued 5 May.

Changes in FCC rules regarding radio scanners capable of receiving cellular telephone transmissions will be implemented over the next year. Effective with the adoption of the new FCC Part 15 Rules on April 26, 1993, the commission will not grant equipment authorization for receivers that do not comply with the new provisions of Part 15.121. These new provisions do not prohibit the sale or use of authorized receivers manufactured in the U.S or imported into the U.S. prior to April 26, 1994. In addition, the manufacture or importation of scanning receivers, and frequency converters designed or marketed for use with scanning receivers, that do not comply with the new provisions in Part 15.121, must cease by April 26, 1994.

As stated at the start of this report, the above applies to the U.S. only, however, it would be somewhat naive to think that a similar situation is not a possibility for Australia.

DX Logbook

By Rob Williams

Greetings to another round of DX news.
Its' been a busy two months.
With the sudden fire at the WWCR station and so many world events being reported live via shortwave, plenty has happened since the last edition and as always DXers were first on the scene, even though only from the comfort of their armchairs.
All times listed in DX Logbook are in UTC and all frequencies in kilohertz, unless stated otherwise.

WWCR Goes Up In Smoke

The DX media has been busy with news of the fire which swept through shortwave broadcaster WWCR in April.

Several stories circulated as to how the fire started, although at the time of writing no solid evidence of arson has been found.

The fire happened as work was almost finished on WWCR's third transmitter. Dr Gene Scott, the largest user of WWCR air-time, has already started a fund-raising campaign while station management have announced every intention of returning to air as the station is financially sound. As this column was being written Glen Hauser reported that the new transmitter had arrived and once a building was available to house it, it would soon be on air. Apparently the Continental 100 kW transmitter was destined for Dr Gene Scott's own SW station in the Caribbean but a deal worked out with WWCR enabled them to buy the transmitter. This transmitter will then be used to broadcast Dr Gene Scott's own programs.

Danish News From Copenhagen

Radio Denmark has the following Danish broadcasts to Australia and Asia valid to 26/9, all from transmitters in Norway: 0630-0655 on 9590, 15165 and 17815; 0730-0755 on 9590, 11735 and 17815; 0930-0955 on 21595 and 21705; 1330-1355 on 9590, 15230, 15355 and 17860; 1530-1555 on 15335 and 17860; and from 1930-1955 on 9590, 15220, 15335 and 15365.

DX News From The Benelux DX Club

* The Voice of The Islamic Republic Of Iran has English broadcasts to Europe at 1930 in English on 9022 and 15260.
* Radio Portugal can be heard Mondays to Fridays at 1800 in English on 9780 ex 11740.
* Ghana Broadcasting Corp. has been heard at 0705 on 6130 with African religious music followed by religious talk.

DX Tips Via Computer

Here are some of the latest DX tips I've received via the international shortwave echo on Fidonet.

My thanks to Reid Kelly for his efforts in posting these snippets of DX news, which show you how useful a home PC can be in keeping you on top of the latest radio news, frequencies and skeds.

* Azerbaijan's Radio Baku has been heard with a transmission directed to Europe in English at 1700-1800 on 15175
* Radio Cairo sends English between 2115-2245 on 9900
* the English domestic service of Radio Bangladesh from Dhaka can be heard on 15520 at 1255-1300, 1530-1545 and 1705-1710
* National Radio Of Laos has English at 0100-0130, 0600-0630 and 1330-1400 on 7116
* Armenia's Radio Yerevan has English on Sundays at 0842-0855 on 17710 and 17770 kHz and 2142-2155 on 9450 and 11920 kHz.

QSLs from the BBC

DXers around the world know that when it comes to reception reports the most they can expect to get out of the BBC is a nice picture postcard.

One of the ways which DXers have been trying to bypass this problem is by writing directly to the relay stations with a detailed reception report, hoping that the technical staff will verify their report.

To assist DXers still chasing cards, here are the mailing addresses for the BBC relay stations.

* BBC Far Eastern Relay, P.O. Box 434, Singapore.
* BBC Hong Kong, Flat B24, Beacon Hill Road, Kowloon Tong, Hong Kong.
* BBC Caribbean Relay, P.O. Box 1203, St John's, Antigua.
* BBC East Mediterranean Relay, P.O. Box 219, Limassol, Cyprus.
* BBC Eastern Relay, P.O. Box 6898, Ouwi P.o., Muscat, Oman.
* BBC Atlantic Relay, English Bay, Ascension Island, South Atlantic.

Good luck!

WYFR Schedule

Marc Vissers advises WYFR's Z93 English sked to Europe and Asia is 0500-0600 on 11580, 11725 and 13695; 0600-0800 on 7355, 11725, 15566; 1600-1700 on 15355, 21615, 21525; 1700-1900 on 21500; 1900-2000 on 15355, 21615; 2000-2200 on 15566, 17612.5, 21525, 21615, and 2200-2300 on 17612.5 and 21525. Broadcasts to India are also noted at 1302-1502 on 11550.

Bulgarian Sked Update

Tom Sundstrom reports a new English language summer sked for Radio Sofia - at 0000-0100 on 11720, 15330; 0200-0400 on 9850, 11765; 1030-1200 on 13670, 17660, 17830; 1730-1900 on 11720, 13670; 2000-2100 on 11720, 15330; and 2145-2315 on 11720 and 15330.

Radio New Zealand

Here's the winter sked for RNZ, effective to 3rd October: tune daily at 2137-0658 on 15120 and 0659-1206 on 9700; try 1650-1849 on 6035 weekdays and 1850-2136 on 11735 from Sundays to Friday. 9510 is occasionally used between 1207-1648 to cover national and international sporting events.

Reception reports can be sent to RNZ, Broadcasting House, Bowen St, P.O. Box 2092, Wellington, NZ together with three IRC's.

CONTINUED OVER PAGE

Alternative Views From North Korea

Reporting in the international shortwave BBS echo, Marc Vissers provides the following sked for Radio Pyongyang's transmissions to South-east Asia and India: at 0400 on 15180, 15230, 17765; 0600 on 15180 and 15230; 0700 on 15340 and 17765; 0800 on 15180 and 15230, and 1300 on 9630, 13760 and 15230. Broadcasts are 50 minutes in length.

NHK's South-east Asian and Asian sked from 2/5 to 4/9 includes 0530-0554 on 17810 and 11740 and 15420; 1430-1454 on 11815, 9750 and 9535; 1730-1754 on 11815 and 9750; 2130-2154 on 11815, 6035, 15430, 9750 and 9640; 0130 on 17810, 11860, 17775, 15195, 17845 and 11840.

Your best chance to hear Media Roundup is at 0530 on 17810, off NHK's 300kW Yamata transmitter. The site now boasts 7 x 300kW and 4 x 100kW transmitters together with 20

English Sked From Turkey

The Voice Of Turkey has issued the following English language sked: 0300-0400 to North America on 9445; 1230-1300 to Asia on 9675; 2000-2100 to Europe on 9445, and from 2200-2300 to North America on 9445, to Europe on 11895 and to the Middle East on 7185.

The Voice Of Greece

The latest sked to hand has English broadcasts from The Voice Of Greece at 0130-0140 on 9295, 9420 and 11645; 0340-0350 on 9395, 9429 and 11645; 0840-0850 and 1040-1050 on 15650, 17525; 1235-1245 on 15635, 15650 and 17515; 1530-1540 on 15630, 15650 and 17525; 1835-1845 on 11645, 12105 and 15650; 1900-1915 on 7450, 9395 and 11645, and 2245-2300 on 9425 and 12105. Reception reports to the Voice of Greece, P.O. Box 60-019, GR-153 Aghia Paraskevi, Athens, Greece.

Media Roundup Moves Again

NHK has made substantial changes to their program line-up as of April, and local DXers who enjoy their DX program Media Roundup were disappointed to discover that the program is now aired at times which make it harder to hear in Australia.

Rob's Pirate Report

Well-known Melbourne DXer Dave Onley together with Steve Perkins and David Martin made the most of their Easter break with a DXpedition to Malinong, South Australia. They were rewarded with some fine catches. On 6012 kHz they logged TeleRadio Stereo from Rome from 2205-2225 with popular music, although the signal was poor.

Further up the band on 6239.2 they found a European pirate, presumed to be NIRS, at 1950; famous clandestine Radio Caroline appeared on 6295 at 2120 with super signal at times, especially in our mornings around 2100 with many station ID's and pop songs.

Try this one for yourself!

The team also came across Radio Idea between 2052-2150 on 7380, playing light Italian and English pop music; and on 11700 kHz they heard Radio Art from Moscow at 1601, which provides a strong signal of ballads and IDs once KTWR signs off at 1600 UTC.

Also from Moscow on 12010 was Radio Centras, between 0530-0600 with Russian religious programmes and an English ID at 0558. Signal strength was at a fair level.

Other pirate frequencies heard were 6221, 6229, 6238, 6239 and 6272 with most of these being heard between 1930-2030 and some around 0700 UTC. Dave also reports many more shortwave loggings of Indonesians on 2, 3 and 4 MHz.

Malinong sounds like a good place for a DXpedition.

"It's about 200 km east of Adelaide", says Dave Onley, "and about 40 km south of the old rail junction at Tailem Bend.

It's a very dusty arid place, almost desert conditions, and the hall we hired for the weekend is the only building for 30 km around.

It's a great DX location if you can put up with the bush flies, dust and 20 million bees which make their home in the roof of the hall. We won't mention the thousands of mozzies which left a few backsides red and raw in the outside bogger.

You could say we were itching for some good DX!

Thank goodness we had four dozen cans of anti-venom in the fridge".

Thanks for those interesting loggings, Dave.

Pirates are hard to hear, not only because they operate with much lower power than the 'big guns', but their intermittent skeds and propagation make an interesting challenge for DXers.

Dave also reports hearing NZ's new shortwave pirate station Kiwi Radio between 0630 and 0830 Sunday on 7445, with strong signal levels at his QTH in Melbourne. I have logged them here in Sydney, but with a much weaker signal.

The format of the station is near non-stop modern music with several station ID's and address announcements.

There have been several broadcasts so far, so it will pay you to check that channel every weekend. Kiwi Radio announce their address as P.O. Box 1437, Hastings, New Zealand.

To help cover costs, please include an IRC with your letter. Local DXers report a quick reply to their letters, along with verification, so here's your chance to grab another rare QSL.

antenna arrays, making it an impressive station capable of reaching new audiences in the Russian far east.

VOA Sked For Botswana

Here is the English Z-93 sked from the VOA transmitter site in Botswana: 7265 from 0300-0500, 7280 from 0300-0500, 9885 from 0300-0430, 12080 from 0500-0700, 13710 from 1600-2200 and 15600 from 0500-0700. All broadcasts are aimed for the surrounding African continent.

Changes In US Broadcasting?

The US Advisory Commission on Public Diplomacy has issued a 64 page report urging the President to amalgamate all US Government broadcasting services under the United States Information Agency. Some of the recommendations included that VOA should reduce its shortwave broadcasts to target areas where listener interest is falling, in favour of expanding AM/FM broadcasting, and the use of several transmission including satellite, SW, AM or FM as required. Flexibility for the delivery of shortwave services in the event of a world-wide crisis was also considered important by the Commission.

Examples like the Gulf war, where troops are stationed away from normal broadcast, means that shortwave could still be used to reach the troops helping to keep moral high.

There were also suggestions that VOA should strengthen their facilities in the Arab world. This goal is well under way with the new site in Kuwait under construction.

Other options included the phasing out of the USA's Eastern European broadcasters RFE/RL, now that Communist influence in the continent has lessened; and expanding VOA into Asia rather than creating the proposed Radio Free Asia station.

The future of US broadcasting will set the pace for shortwave broadcasting into the next century, opening up new opportunities for non-DXers to hear international broadcasting alongside their favourite AM/FM stations.

Pay TV - New Opportunities For DXing

With all the talk recently on pay TV, very little has been said about pay radio or even cable radio.

Some European countries have radio services added to their cable TV services while others receive radio via their satellite dish. In Europe and the USA we are seeing increasing numbers of international broadcasters including a satellite radio signal for anyone who wants to receive it.

With local pay TV on the horizon, Australia will also have the opportunity to join the satellite radio scene.

At the same time, Direct Satellite Broadcasting (DSB) frequencies have been allocated and when DSB receivers are developed there will be a whole new avenue for international radio there for the taking.

Well, there you have it - plenty of skeds and loggings to keep you busy for the next two months.
If you have any questions, would like to submit your loggings or have some information to share with others then please drop me a letter at:

P.O. Box 108
Minto
NSW 2566
(including a SSAE for reply).

UHF HANDHELD RIG REVIEW

COMMEX JACKAROO - GOOD PERFORMER

By Ken Reynolds
POWERBAND COMMUNICATIONS

After more than a decade of evolution in UHF CB, the wheel has turned full circle and manufacturers are recognising the need to turn back the clock in search of the basic values of economy and simplicity.

We are fortunate indeed to live in an era where evolutionary change is so rapid that we become not only participants in exciting new technologies, but also observers, able to view the world as it is reshaped around us.

In only a couple or three generations our unending quest for more rapid technical development has drawn us into a frenzied environment where technology is emerging the master rather than the servant.

How many people can reliably set their VCRs to record a program a week in advance at 7am on channel 10 and feel comfortable that it will happen?

Electronic communications is an area that we as radio hobbyists can identify as a leading light in the drive for even more intricate technological development, but why complicate an issue when only a simple answer is called for?

The concept of efficient, portable radio communications has captured our imaginations from time almost immemorial, but it is only in the last few years that technology has turned the desire into reality.

ONCE IT WAS ONLY DICK TRACY

Some fifty years ago, a popular detective comic strip hero, Dick Tracy, introduced the wrist watch two-way radio, and from that point, we have never looked back.

Fiction becomes technical fact and eventually the past blurs with the present and we don't easily remember that things used to be different.

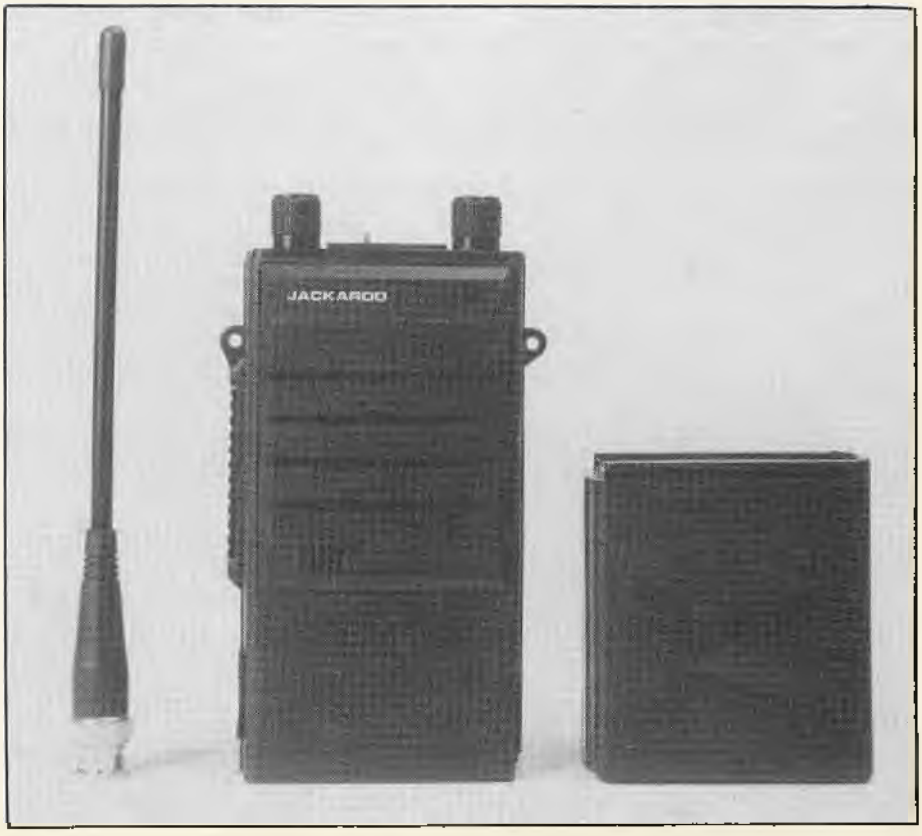
The Commex Jackaroo is a UHF CRS product that gently reminds us of the earlier days of UHF portables when we were content with a pocket sized transceiver that virtually revolutionised CB radio communications. In a few short years, technology has brought us microprocessor control with liquid crystal displays, mini-SELCAL, programmable channel scanning, memory scan, priority channels, time-out-timers... all of which increase 'fuel' consumption requiring the addition of a power saver functions to extend battery life.....

Somewhere amid the chaos is a level of product complexity that satisfies a large portion of consumer demand for reliable, effective communications that is reasonably inexpensive and simple enough to use for an occasional or inexperienced operator.

DO YOU REALLY NEED CHANNEL SCANNING, ETC?

In fact, thousands of regular operators of UHF portable equipment would never use channel scanning or battery saver circuitry if the facilities were installed. A considerable proportion of portable transceiver users are primary producers, government departments, business and other utilities like the State Emergency Service and State Fire Authorities.

(continued over page...)



COMMEX JACKAROO - GOOD PERFORMER

(continued from previous page)

Most of these desire simplicity of operation and probably only a few channel options.

ENTER THE JACKAROO.

The ideal package. Compact, attractive, simple of operation, effective and affordable. There is a big slice of market searching for this recipe and Commex has taken the initiative in providing a suitable vehicle.

The Jackaroo is packaged in a dark brown and black coloured, high impact plastic case borrowing in appearance from a popular commercial hand-held transceiver, but that's where the comparison promptly ends.

EARLY MODEL STYLING

The Jackaroo is styled similarly to many of the early model portable UHF CB transceivers with a small control panel and antenna socket at one end and a slide-on battery pack at the other. In fact the design is downright nostalgic.

Channel selection is achieved through a pair of 'old fashioned' numeric thumb wheel switches mounted centrally in the small control panel.

Two push-button switches account for HIGH and LOW power ranges and REPEATER channel offset. The offset condition is cancelled automatically when channels other than 1 to 9 are selected.

Two rotary controls are for SQUELCH and audio VOLUME with the power ON/OFF function at the usual full anti clockwise detent.

For such a small rig the two machined aluminium knobs are unusually large facilitating easy, positive operation. In my opinion, forget the styling exercise if it impairs easy operation of the product.

The Jackaroo sports the usual BNC antenna connector, mounted in the far left corner of the control panel, and a tough, flexible, quarter wavelength antenna is supplied with the transceiver.

Unlike most of its peers, the Jackaroo's auxiliary speaker and microphone sockets are located on the lower left hand side of the transceiver case - just above the battery pack.

The jacks are industry standard in size and separation permitting the use of the now common, miniature, combination lapel speaker microphones. We tested a few brands and all but one functioned okay.

A TAD DIFFICULT FOR SERVICING

Placement of the sockets is fine until you need to service the radio. This causes some concern when levering the tight fitting plastic case half from around the connectors which are mounted through sub-frame wall.

You get a strong feeling that 'something's gotta give!' A tricky operation but it shouldn't need to be done too often.

The rig is supplied with a 12 volt battery pack measuring 68 millimetres in length, and combined with the electronics package the overall transceiver length is 189 millimetres (7.45 inches) - longer than the standard Icom IC-40 (but with more power) and similar in size to the Emtron Ace, Electrophone TX-474 and the Aus-200.

SPECS ARE CONFUSING

Knowing the approximate transmit power without actually measuring it is a bit of a challenge and a trap for the unwary.

A glossy cardboard cover advertises the RF output power to be a " Big 3 Watts", however, the operators manual specification table describes the power as 2.5 watts.

The text tells another story of how the high/low power switch selects between the 'rated' output of 1.5 watts and 0.15 watts for low power. Is this confusion? The plot thickens. Further examination of the specification table reveals that the transceiver reference test voltage was 8.4 volts which probably accounts for the apparent 'lost' power.

Alas, using a source voltage of 8.4 volts produced less than 1.5 watts, but our test using the supplied 12 volt battery pack revealed 2.5 watts RF output.

It seems strange to supply performance 'figures' for 8.4 volt operation when the radio will probably only ever see a 12 volt source.

This means some of the other quoted specifications are likely to have relatively different values too.

Perhaps the original transceiver was intended for operation at a lower voltage but a final decision was made to standardise on a higher voltage power pack. No reference is made to the capacity of the supplied battery so we make no judgment in this area.

CRISP AND CLEAR AUDIO

Transmitted audio is crisp and clear resulting from the use of a built-in electret microphone insert, the type supplied as standard equipment with most UHF CB portables.

Deviation (modulation) averages around 3 kilohertz peaking to about 4.5 kilohertz in response to some louder sounds. The RF output signal is 'neat-and-tidy' falling easily within DoTaC requirements.

The receiver, like most UHF portables, is ablaze with sensitivity and it compares well with its rivals in more ways than one.

In areas of high RF pollution the receiver circuitry is sometimes overloaded by

strong out-of-band signals resulting in recovered audio that is nothing to do with CB, but originates from other sources that aren't intended for the Jackaroo's 'little' ears. Sensitivity measured on the SINAD scale was 0.2 microvolts for the 12dB standard.

Audio output from the small internal loudspeaker is adequate but considerably better results are obtained by using a larger external speaker.

SIMILAR TO IC-40

Internally the Jackaroo bears a striking resemblance to the Icom IC-40 in board layout and construction including a plug-in module that carries an EPROM programmed with the necessary information to control transmit and receive frequency extremities, repeater off-set data and thumbwheel address validity.

There are two main circuit boards securely fastened into separate metal compartment subframes that are hinged together and designed to close like the covers of a book.

Overlapping metal tabs allow both halves to be secured together with metal thread screws.

The construction is mechanically strong and compact with high grade materials used throughout. Circuit board design is good with a slightly clumsy layout hampering service access to the main frequency determining components, but the Jackaroo is not the first and won't be the last to make things difficult for the technician. Circuit board 'wave' soldering and hand soldering is excellent.

STRONG AND RIGID

With the two frame halves securely screwed together the whole electronics package becomes very strong and rigid promoting a comfortable feeling that the little transceiver could stand considerable abuse with unimpaired reliability.

AND OF COURSE THE ACCESSORIES

Accessories included with the Jackaroo are belt clip, battery charger, light duty vinyl carry case and small rubber bungs to seal off the co-axial battery charging socket and the external microphone and speaker ports.

The operators manual is okay in most respects but watch out for the specs!

You should round-up a Jackaroo for under $500.

RIG REVIEW

REALISTIC PRO 39 HANDHELD SCANNER

A new look accompanies the latest handheld scanner from Tandy.

PRO'S AND CON'S

If my memory serves me correctly, Tandy were the first to release a handheld scanner to the general public in large quantities. It was the PRO 30 which, by today's standards, was large, yet the ease of programming together with it's portability certainly made it popular with the scanning community. Apart from size, the PRO 30's lack of channel capacity was the only other thing that detracted from an otherwise useful machine.

Compared to today's memory hungry portables, the PRO 30 supported a maximum number of 16 memory channels. In a city the size of Sydney, 16 channels filled very quickly. The introduction of the PRO 32 heralded an increase in memory size from 16 to 200 channels. The frequency coverage, however, remained the same as the PRO 30, 68-88 MHz, 108-136 MHz, 138-174 MHz and 380-520 MHz.

Apart from the larger memory and a few cosmetics changes there was little to get excited about with the PRO 32, but, it was one more step along the way.

SIZING UP 800 MHZ

The PRO 34 was the Tandy handheld designed to open up the world of 800 MHz scanning to its owners. It was also a more compact unit being about two thirds the size of the PROs 30 and 32. It retained a 200 channel memory and all functions and features remained the same. The PRO 37 was basically a PRO 34 with a faster timing crystal and this boosted the rate that the receiver scanned or searched out frequencies. Hyperscan, Tandy's name for the additional speed, was the only thing that separated the 34 from the 37, channel capacity, frequency coverage, overall appearance and size had not altered.

DIFFERENT, YET. . .

I didn't know what to expect when the package arrived containing the latest member of the PRO series handhelds - the PRO39. The PRO 39 looks different and feels different, however, it still has a few characteristics that could do with some improvement to make a good rig an even better one. Manufacturers have all but eliminated the curse of the scanner enthusiast from mobile receivers, the dreaded Motorola antenna connector.

"I didn't know what to expect when I opened the box". The newest handheld from Tandy has fuelled some mixed emotions in scanning columnist Russell Bryant.

My dislike for these connectors is well known. For my next crusade, let's rid the scanner of 10 MHz intermediate frequencies. This brings me to my one and only real criticism of the PRO 39 - the 10.7 MHz Intermediate Frequencies. The 10 MHz IF was fine in the early days, however, in today's high tech, low cost silicon chip world it is dated and very much in need of change.

Are you listening Tandy?

SOME IFS AND BUTS

IFs aside, the PRO 39 feels comfortable, especially if you have used a Tandy scanner before. Programming is identical to other units made by GRE for Tandy's brand name Realistic products. It is a solid little radio measuring 145H X 58W X 42D mm and weighing a quarter of a kilogram with batteries and antenna. While its predecessors were basic black, the PRO 39 is a more universal grey colour. It looks more like some of the smaller-smarter amateur handhelds that are available on the market.

Frequency coverage encompasses the VHF mid band, VHF aircraft band, VHF high band, UHF and 800 MHz. Any frequency within range can be entered into one of the 200 channels, which are arranged in ten banks of 20.

While talking about frequencies, something to note is, that out of the factory, frequencies allocated to the cellular telephone network can only be searched in 12.5 kHz increments, however, 30 kHz can be installed with a little time, a steady hand and the following instructions.

WARNING

While we like to inform you of rig modifications, the fact remains that in many instances such modifications may produce legal problems. For this reason we stress that the receiving of cellular telephone conversations is an offence and the following is included for information only, not the wholesale interception of private telephone conversations.

MODIFY AT YOUR OWN RISK

You will need a fine tipped soldering iron, de-soldering wick, rosin core solder, a fine tipped Philips head screw driver and needle nose pliers. First up remove the antenna and batteries from the unit. Remove the four screws that secure to back plate and remove the back cover.

Disconnect the two wiring connectors from their sockets and remove the six brightly coloured screws that hold the circuit board in place.

De-solder the earth wire from the bottom right corner of the board. De-solder the two connectors between the BNC connector and the circuit board using the de-soldering wick.

Carefully lift the board from the radio.

REMEMBER YOUR WARRANTY

Remove the two brightly coloured screws holding the next circuit board. Unplug the wire connector carefully. De-solder the shield covering the area of the board that supports the diodes. The diodes

are surface mount components. Locate diode D7 and remove from the board. Having done the above, the modification is complete, so reassemble and test.

REMEMBER, any alteration or modification you carry out on the scanner will most certainly void any warranty apart from also being illegal. If you lack the skills to carry out the job, **DON'T.**

For those of you who may be interested, D4 (in position), enables VHF mid band 68-88 MHz; removing it enables VHF low band 30-50 MHz. D5 (in position), enables 800 MHz operation, whilst D6 disables cellular frequencies.

Back to the topic at hand. The PRO 39 is the start of something good from Tandy and the IF of 10.7 MHz is the only thing that detracts from an otherwise excellent little handheld.

The PRO 39, (catalogue 20-9303), is available from all Tandy stores and dealers. It is priced at $499.95 and comes with manual, a battery holder requiring 6 AA dry cells or rechargeable nicads, (batteries not included) and broad band rubber duckie aerial.

Maybe Tandy might consider bringing the PRO 43 into Australia...now that's another story.

Reviews...

COMMUNICATION RELATED BOOKS WORTH READING

TRAVELLERS' GUIDE TO WORLD RADIO

The constant demand for world broadcasting information has led the World Radio TV Handbook company to release this neat little publication aimed at the business or recreational traveller who wishes to listen to shortwave, mediumwave and FM broadcasts. Slightly smaller than A5 in size, the "Travellers' Guide To World Radio" is an ideal companion to a portable shortwave radio.

I know from experience just what it's like to be in a strange land, not knowing where to find English broadcasts.

Sure, you can aimlessly tune around the bands and eventually find something to interest you, but I wish I had this book when I was travelling around Europe in my younger days (oh come on, they didn't have radios back then..Ed).The guide includes a survey of portable shortwave radios, and a chapter on AC plug and socket configurations from around the globe. An alphabetical listing of capital cities provides everything the travelling radio enthusiast needs to know, including local time/UTC, AC power requirements, currency details and the international telephone prefix.

There's nearly 200 pages of broadcasting data, using easy-to-read bar charts to cross-reference frequency against time so you can quickly find the program you're after.One improvement I would like to see in future editions is some indication of the type of programming carried by the local AM or FM stations - rock, easy listening, classical, news and so on.The guide is not designed for shortwave listeners or DXers, and is by no means a replacement for more comprehensive broadcasting references such as the WRTH.

Instead, this book is one for the non-enthusiast who simply wants to keep in touch with home on their travels.

Reviewed by Rob Williams

"Travellers Guide to World Radio": $US9.95

WRTH EQUIPMENT BUYERS GUIDE

1992 was a good year for international radio. With the Gulf War making press headlines for many months, demand for shortwave radios soon outstripped the supplies. The staff of the "World Radio TV Handbook" were perhaps the first people to recognise this, the 1992 edition of the handbook being given an unprecedented second print run.

Based on the new influx of shortwave hobbyists, and response from readers to the handbook's annual receiver reviews, the company has now launched a new publication devoted to reviewing shortwave receivers.Authors Willem Bos and Jonathan Marks have put considerable effort into this first edition, to produce a book that is worthy of the WRTH name.

The "WRTH Equipment Buyers Guide" is a comprehensive review of some 43 shortwave receivers in all, including several new releases and many established models which have recently been upgraded.

There's also a lot of information on understanding receiver specifications, active and passive antenna systems and accessories, while for those who want to do some drive-time DXing there's a full chapter devoted to using a shortwave radio in the car, together with reviews of the latest mobile sw rigs.

And in the nineties, no good book on shortwave receivers would be complete without a look at software which can control your sw set via your PC, plus a list of world-wide computer bulletin boards where sw fans congregate.

But the "WRTH Equipment Buyers Guide" is more than a book with receiver reviews - it is yet another first-class reference book from the WRTH, and one which you will turn to time and time again, long after you buy your sw radio.

Reviewed by Rob Williams

"WRTH Equipment Buyers Guide": $US19.95.

WHAT'S LEGAL AND WHAT'S NOT

In our last issue Rod Fewster looked at what's legal and what's not in respect to CB operations in Australia and the USA.
This time around he looks at the legalities of CB in several other countries.

CANADA

*26.965 - 27.405, AM/SSB, 40 channels, 10 kHz spacing,
4W/12W max power. Only "USA-standard" 27 MHz CB radios are permitted. No licence is required. You may identify yourself with your name or by a handle of your choice.

JAPAN

No licence is required.
You may identify yourself with your name or by a handle of your choice.
Japan has 3 radio bands that do not require licences.
Very low power limits two of these to extremely short-range use.
The third has a maximum power output of 5 Watts.
"USA-standard" 27 MHz CB radios are illegal in Japan.
26.968 - 27.144, AM, 8 channels, 8 kHz spacing,
0.5W max power.

1=26.968	2=26.976	3=27.040	4=27.080
5=27.088	6=27.112	7=27.120	8=27.144

Channels between these eight are assigned to fishing vessels at 8kHz spacing with 1W max power.
*422.200 - 422.300, FM, 9 channels, 12.5kHz spacing,
0.01W (10mW) max power.
Mainly used in handy-talkies. * 903.0125-904.9875, FM, 158 channels, 12.5 kHz spacing, 5W max power.
Radios must be equipped with automatic station ID.

CEPT-CONFORMING COUNTRIES

The following countries have implemented the Conference of European Postal and Telecommunications (CEPT) recommendations T/R20-02 and T/R20-07 for CB radios. CEPT-approved CBs from any one of these countries can be used legally (FM only) in any other country on the list. Austria ,* France, Norway, Belgium, * Germany, Sweden, Cyprus, Luxembourg, Switzerland, Denmark, Netherlands, * United Kingdom, Finland, Portugal, Vatican City
* 26.965 - 27.405, FM, 40 channels, 10kHz spacing,
4W max power.
If you travel to another CEPT-conforming country, your licence from your own country allows you to legally use your CB radio.
Only FM is CEPT-approved. AM and SSB are *prohibited* in all CEPT-conforming countries *except* France, Germany, and the United Kingdom.
CEPT-approved CB radios are not legal in non-CEPT-conforming countries, and "USA-standard" 27 MHz CB radios are not legal in any CEPT-conforming country. Channel 19 FM is the Official Calling Channel in CEPT-conforming countries, but some countries also have "unofficial" calling channels.
In France, Germany, and the United Kingdom, CB radios which depart from the EPT FM-only standard may carry CEPT-approved identification.
These may be used in other CEPT-conforming countries, but only in FM mode unless the regulations of the host country allow otherwise.

FRANCE

A licence is required but there is no examination.
The licence costs FF190 and is good for 5 years.
Telecom France requires the "agreement number" from your radio. You may identify yourself with your name or by a handle of your choice. France will honor licences from CEPT-conforming countries. A CEPT licence may be used under the terms of the country which issued it. France uses the same frequencies as the USA, but also allows FM in the same band. Only CB radios approved by France Telecom may be legally owned and used by French residents. AM is the most commonly-used modulation method in France.
* 26.965 - 27.405, AM/SSB/FM, 40 channels, 10 kHz spacing,
1W/4W/4W max power.
Channel 19 AM - calling.
Channel 11 FM - DX calling.
Channel 27 AM - calling channel for base stations.

GERMANY

A licence is required whether you plan to use FM or both AM and FM. The licence costs more if your CB radio has both FM and AM. You may identify yourself with your name or by a handle of your choice. Germany will honor licences from CEPT-conforming countries. A CEPT licence may be used under the terms of the country which issued it. Germany uses the same frequencies as the USA. AM and FM are the only legal modes of modulation, and FM is the most common.
Tone-calling is allowed on both FM and AM.
* 26.965 - 27.405, AM/FM, 40 channels, 10kHz spacing,
1W/4W max power.
AM is restricted to Channels 5-15
FM is allowed on all 40 channels
All signals must be vertically polarised.
Channel 4 FM - Unofficial FM/AM Calling Channel
Channel 15 AM - Unofficial AM Calling Channel
Channel 19 FM - Official FM Calling Channel

UNITED KINGDOM

A licence is required in the UK. The UK honours licences from CEPT-conforming countries. A CEPT licence may be used under the terms of the country which issued it.
The UK has 3 bands for CB radio as follows:
* 26.965 - 27.405, FM, 40 channels, 10 kHz spacing,
4W max power.
Radios using this band are marked "PR 27 GB" or "CEPT PR 27 GB", with the latter being CEPT-approved.
* 27.60125 - 27.990125, FM, 40 channels,
10 kHz spacing,
4W max power.
Radios using this band are marked "27/81-UK" and are legal only in the UK.
* 934.0125-934.9625 FM, 20 channels, 50 kHz spacing,
4W max power.
Radios using this band are marked "CB 934/81" and are legal only in the UK.
No new radios of this type are being made but existing equipment can still be used legally.

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AH-7000 discone 25 to 1300MHz.....$229
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IC-R100 100KHz to 1856MHz.....$925
IC-R7100 25MHz to 2000MHz $2100
IC-R72A 100KHz to 30MHz.....$1599
IC-40G UHF handheld c/w BP7 orCM96 battery pack.....$649

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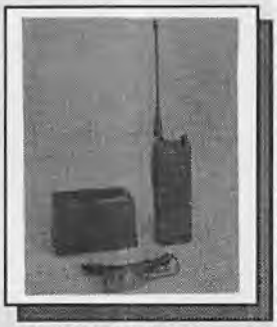
BUSHRANGER MK 2 10 pos multicall selcall, opt DC convt **$295**

EXECUTIVE 9 mem ch, keypad multicall, selcall selection, scan, LCD **$380**



JACKAROO H/H .25/2.5 watt, carrycase charger **$450**

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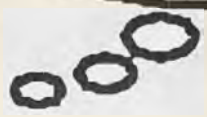

GME TX4000R $535
Ranger RCI 2950 $545
*** **Uniden UH-055** scanning H/H $475 Philips FM 650D $419
** **Sawtron 999 $785** * KG107 **$1085** * KG109 **$1285**
Scramblers **** **ST-20** voice inversion reasonable security fitted **$155**
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HF Utilities

By Richard Jary

Well, it's now the depths of winter and another issue of CB Action is here to give you something to read while curled up in front of a nice warm fire. Hopefully you've managed to get the fire into the radio shack so that you can keep listening...

Let's start off with somewhere a little bit warmer than southern Australia. Alex Wellner reports that an organisation called The Christian Mission in Papua New Guinea performs a similar function to our Royal Flying Doctor Service. They use 5895 kHz as their main frequency and 5892 as a backup.

DXING THE DOCTORS

While on the subject of the RFDS, many years ago I went on a guided tour of the School Of The Air station at Broken Hill. The School Of The Air shares some facilities and frequencies with the Flying Doctor, and lessons are suspended while a medical emergency is going on. The advantage of this is that all farms within a certain area are tuned to one frequency only and know if any of their neighbours require help. As with most operations, different frequencies work better at different times of the day, and of the year, hence the allocation of several frequencies to each site.

If you visit one of these towns, I recommend a visit to the station, it's quite educational.

Frequency allocations for the various RFDS stations are:

Alice Springs:	6950, 5410, 5370, 4351.5 kHz
Broken Hill:	6920 kHz
Cairns:	6866, 6845, 5300, 4881.5 kHz
Carnarvon:	6890, 5230 kHz
Charleville:	7307, 5227, 4981.5 kHz
Derby:	6945 kHz
Kalgoorlie:	7550, 6825, 2657.5 kHz
Katherine:	5731 kHz
Mount Isa:	7475, 6950, 5445, 4607.5 kHz
Queensland:	7465, 7410, 7392, 5145, 5110, 5011.5 kHz
S.A./N.T.:	5845 kHz
Western Aust:	7517, 6880, 5740, 5360, 4045, 2281.5 kHz
Wyndham:	2806.5 kHz

Also listed for use are Outpost Stations on 4936.5 and 2261.5 kHz. All stations use SSB transmissions.

ON THE AIRBANDS...

We have a number of aeronautical loggings this month, by "AS" from Sydney and Lino from Cranbourne in Victoria.

Here's a selection - naturally, all frequencies are in kHz and all use upper sideband.

FL is an abbreviation for "Flight Level", which is the plane's height in hundreds of feet - for instance, FL390 is 39,000 feet.

5547	Qantas 11 working San Francisco radio.
5643	Singapore 7295 working Sydney at FL310.
5667	NorthWest 26 with a position report and Selcall check with Honolulu.
8867	Coast Watch 110 working Sydney control.
11384	All Nippon 912 working Tokyo at FL310.
11396	Continental 599 working New York and maintaining FL330.
11396	Qantas 1 Selcall check GQEL with Djakarta.
13306	Coastguard 1502 working New York, with instructions to contact Bermuda control on 128.5.

"AS" has also noticed that some aircraft in the Pacific are transmitting position reports via satellite. This is known as Satcom and if anyone has more information on this please feel free to pass it on.

Alan from Wallaroo in South Australia has some different loggings for us:

4620	Coffin Bay Base morning radio skeds with prawn and fishing trawlers.
5845	VNZ Port Augusta - School of the Air
10170	Commercial traffic, mainly outback transport
13172	Portshead Radio, England with weather
14415	Antarctic station to VIS Sydney
15485	Casey Base Antarctica to Tasmania (ANARE HQ?)

SWISS RADIO DUMPS RTTY SKED

A few months old now, but Swiss Radio International have discontinued their RTTY service. This RTTY message was received off air by someone in New York and may prove of interest to our RTTY fans:

"Dear SRI RTTY-users, Swiss Radio International (SRI) will be discontinuing its RTTY transmissions as of 31 March 1993. We are currently examining more efficient and technically developed means of intercontinental text transmissions.

The present RTTY service, as a source of information, proved to be uneconomical and did not arouse the interest anticipated. SRI hopes to offer a new text service via satellite in the near future.

Please let us know if you have any suggestions. We thank you in advance for your appreciation and interest. Swiss Radio International, PR+Marketing, P.O. Box CH-3000 Bern 15 Switzerland."

THE BLACK ART OF UTE DXING

Some people may wonder why they can hear Voice Of America and the like from the other side of the world, and yet cannot hear utility stations from the same area. There are a number of reasons for this, unfortunately most can't be overcome by the listener at this end. Stations such as Voice Of America and the BBC are trying to achieve worldwide coverage.

To achieve this they have relay stations in a number of countries and run transmitter power of around 500 kW (about 10 times that of your average commercial city medium-wave station).

Their antenna types also help in long distance reception by using a low angle for the main transmitted signal. Without entering into complicated diagrams, this means the main power lobe of the antenna is just above the horizon, so it travels further before hitting the ionosphere and "bouncing" down to the ground.

Many utility stations are designed for semi-local coverage.

I have worked at the Sydney coast radio transmitter site and they had an aerial specifically designed for a high take off angle, so the signal would bounce in behind the cliffs around Sydney and the NSW coast. Others have aerials specifically aimed at areas where there aren't many DXers, such as Antarctica.

Power is also only a relatively 1-2kW, if that much.

All these factors make it that much harder to hear these stations - but this only adds to the challenge.

To help, the usual and oft-repeated advice of more sensitivity, more selectivity, and a bigger aerial will make a difference to your DX.

Remember that if you want advice, info, or to simply share your logs, drop me a line. Letters are always welcome to me; c/- P.O. Box, E160, St James NSW 2000.

Readers' Letters

Dear Sir,

OK, you've got my attention.

Having just finished reading the article by "Judicious Rex" in your last issue I am now well and truly petrified. I have always believed myself to be relatively honest in all things, although maybe just a little bit of a pirate when it comes to 11 metres.

My position is this. I own a Kenwood TS-440S and operate a fair bit above the legal 40 channels. I certainly do not transmit on anything other 11 metres although I listen a lot to amateurs on other bands. I do not have a linear amplifier and only run the Kenwood at about 50 watts most of the time - except when there is a DX station I really want to speak to and then I wind it up to 100 watts.

I have been very careful about running a 'clean' signal and regularly check with my neighbours in respect to any TVI or BCI and they have never had a complaint about my operation - mind you, they don't know that I run a Kenwood anyway and still think I use a normal CB rig.

From what the author of the "Judicious Rex" article said (and how about telling us who he is and what are his qualifications to make comments like he did) I gather that I am about to have a major problem.

Either I get rid of the Kenwood (which took me a long time to save for) or I am likely to find myself in gaol. If I get rid of the Kenwood I cannot operate outside of the legal 40 channels so I'm wasting my time trying to work overseas' DX anyway. Like let's face it, the only real DX you ever hear is always from stations running amateur rigs and some of them are in countries which don't even have the legal use of sideband 11 metres.

Even the overseas' stations you hear on the legal channels are always running amateur rigs for the simple reason that no-one will hear them running the piddling little CB radios.

Legal CBs are just fine if you want to talk to someone down the road or maybe even in Melbourne or Brisbane but if you want to work real DX you just have to run power - and you sure won't do that with a CB.

So where's all that leave me? Off the air I guess, or have I hopefully misunderstood what bloody "Judicious Rex" said...?

name and address supplied.

Nope, you haven't misunderstood what was said and yes, you might well go to gaol if you decide to ignore the new regulations. "Judicious Rex" is a very well qualified legal practitioner, also an amateur operator, and is well verse in the legal aspects of the new Radiocommunications Act so he does know what he's talking about.

The aims of the new regulations were pretty clearly spelt out and the penalties are as they were described in the report.

The report was, however, an interpretation of the new Act and I guess there are various interpretations which could be placed on it.

One interesting thing that happened as a result of the stories in our sister magazine Amateur Radio Action and this one is that the folk from DoTaC finally decided to make some comments. Now this came as a pleasant surprise because when we were trying to obtain official comment prior to the "Judicious Rex" articles no-one wanted to know us.

As you can see from other letters we received, most of the questions were in respect to scanners and whether or not licences would be required for them and/or receivers.

From reading the DoTaC comments (published elsewhere in this issue) it now appears that DoTaC, while agreeing that it (or more correctly the new Space Management Agency) will have the authority to inflict horrendous penalties, does not intend to use them as a mandatory sentence.

Nor do they intend to introduce 'listening licences' or at least not immediately.

It would seem that scanner owners have little to worry about - not for now anyway.

I am afraid, however, that you have a major problem. It is of course common knowledge that most 'real DXers' use modified amateur transceivers both here and in other countries but they already risk prosecution and loss of all equipment if they are caught. What the new Act does is to make it far easier for the authorities to first catch them, and then inflict far heavier penalties than in the past.

You should note, however, that CBers aren't the only ones in the gun sight. Every user of the radio spectrum who does not conform with the Act's requirements is likely to feel the wrath of the authorities. This covers such unlikely people as drivers of 4WD vehicles who have an amateur rig (which they shouldn't have) modified to cover Royal Flying Doctor Service frequencies (which it shouldn't be) are candidates for prosecution - likewise fishermen who may be using an 11 metre CB modified to cover marine frequencies...and a whole lot more people along the way.

Amateurs who have modified their rigs to operate on 11 metres are now furiously putting them back to 'type approval specs' so there is really no 'them and us' in the Act - everyone cops the same attention.

I think the only thing to do is literally wait and see.

Editor

Dear Sir,

Let me ask just one question - are scanners going to become illegal - no, make that two questions - if they are not going to become illegal will we be required to licence them?

Bob Hower
Manly NSW

From everything we know and/or have heard the answer is that scanners are not going to be made illegal - at least not immediately, if ever. No, the DoTaC comments elsewhere in this issue indicate that they will not necessarily being introducing receiver licences - again, not immediately anyway.

Editor

Dear Sir,

I simply cannot believe that someone is thinking about sending me to gaol because I use a Yaesu FT757, modified for RFDS frequencies, in my truck.

My work regularly takes me into the bush around Darwin and I have always used some sort of amateur radio with RFDS frequencies available just in case of major trouble. I do not use it for anything else and even have a 27 Meg CB which I use for general contacts and the occasional chat when I'm camped out overnight. I think the 757 is what you would call a 'general coverage' rig and I suppose I could pop up on commercial radio frequencies if I

was that stupid, but, I'm not that stupid!

I use it to make 'phone calls on through the RFDS and they have certainly never queried me on what make of radio I'm using.

Will you please clear up the situation as I'm buggered if I'm going to stop thinking about my safety (and others too for that matter) just because some bloody pollie thinks there is a quid in bringing in new rules and regulations.

Jack Cumberland
Darwin. NT

Jack, you've got problems.

The facts of the matter are that it has always been illegal to modify an amateur rig to operate on RFDS frequencies...it's not something that has just become illegal because of the new Act.There are specifically designed radios for RFDS and OTC frequencies and there's no reason on earth why you should be using a 757 to do the same job. I confess that I wonder whether you're being strictly honest - if I had a 757 and heard some good DX up high on 11 metres I'm bloody sure I wouldn't be trying to work it on my trusty old CB.

Either way, if you continue to own the Yaesu - with or without RFDS/OTC access frequencies - you risk prosecution under the new Act, whether you use it or not, because you are not an amateur and therefore not allowed to own one.

For that matter, I hope that you've got a licence for the CB too!

Editor

(The letters above are but a few of many, however, we simply do not have space for them all. Elsewhere in the magazine is a further update on the new Act with comments from DoTaC and further comments by "Judicious Rex". We'll keep you informed as things develop.)

Dear Sir,

I really enjoy your magazine but please tell me why you run so few photographs. I think there is too much type and a few photos would make it look better.

J. Rhodes
Elsternwick. Vic

The simple answer is that CBA is not a pictorial magazine - it is an information-based one. We try to provide as much info as possible about a wide variety of topics and, basically, the information will not be improved by a photo. When we run rig reviews and other articles which will benefit by accompanying illustrations we do of course use them. Even then, we use them sparingly as we do not believe a reader has to see a dozen photographs of the same unit taken from different angles.

I hate to say it, but, some so-called 'info' magazines run lots of photographs just to fill up space. Editor

AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

NEW "RADCOM" ACT - WELCOMED BY SOME

Following the publication of views by "Judicious Rex" in the last issue of CB ACTION, members of the ACBRO committee listen intently to some of the comments heard on air about them and prepared to enter into discussions on the subject. While some comments are quite critical of the new Radiocommunications Act 1993, many it appears, welcome the sight of any new law that provides tools for the policing authorities to deal with those who, as offenders, take the pleasure out of the CB hobby by way of their anti-social behaviour. It is not unreasonable to think that those who fit this mould would be equipped with something that the new Act may declare "spurious" and a visit from the friendly "R.I." on such form of suspicion would present a platform for some type of confrontation where a very "big stick" could be waved.

The whole article by "Judicious Rex" proved most interesting reading and, if nothing else, alerted readers to the fact that there was to be a new set of laws under which radio operators, including CBers, must operate. He referred to the tough penalties and fines dictated in the Act and no doubt scared the pants off many of his readers. But, as most would know, no Court in the land would actually imprison a CBer for two years merely for having an extra switch in his rig to tune into another section of the band where his counterparts in another country may well be able to talk legally.

Discretion of Judges, it is hoped, will always permit the penalty to fit the crime, despite any controversy that currently exists on this issue. However, the thought by some, that their nuisance neighbour misbehaving on his or her CB could be given a two year spell in the "can", prompts credence to the claim that many will welcome the new Act if it serves to make it easier for some of the "CB Hoons" to be dealt with.

But, more particularly, one of the bottom lines to "Rex's" offering which would have created some of the "welcome" referred to, and can be accepted by ACBRO Inc. is the fact that it (the new Act) has a number of very positive features which should assist the genuine CB operator to enjoy his or her hobby more than before.

It does not suggest that there will be any increased restrictions on the use of CB equipment for its intended purpose.

What it will do, however, is make it easier to determine the identity of the cowboys who give the hobby a bad name, and show who is, and who is not, licensed. It is expected that as consultation continues between the Acbro Committee and the members this view will be shared by them. Also, "Rex" made reference to the need for a strong body to represent the CB fraternity in retaining their section of the band against others who may wish to buy the frequencies that are set aside for community use.

ACBRO will seek the support of all operators to be that representative body.

Comments in ACBRO's bi-monthly publication to do with this new set of laws drew a parallel to the way in which the general public are crying out for harsher penalties for perpetrators of some of the heinous crimes that are being committed against society. And it may well be that any survey of CBers would find that they too were in favour of harsher penalties to achieve better conformity to the laws which will in turn make the system more workable and enjoyable for all CBers.

The article also gave some hope to scanner freaks who felt some pain when it became possible that, as a result of the introduction of the 1983 Act which replaced the Wireless and Telegraphy Act, it appeared 'receiver' type licences may become necessary.

Now, 10 years later, more and more scanner enthusiasts are listening to the greater variety of appliances that give access to the many bands - and still no licenses are required. Judges are not in the habit of sending people to gaol for not being in possession of something that is not procurable. However, ACBRO's members' magazine did comment on this subject, suggesting that any cash strapped government in need of more funds, may create a new tax (license fee on receivers) by way of introducing a simple regulation which the text of the "Radcom" Act provides. Meanwhile, ACBRO would agree that "Judicious Rex" did offer some good advice to CBers.

In a nutshell it is - "Get your ACT together if you do not wish to be a victim of the new Radiocommunications ACT."

ACBRO ASSOCIATED CLUBS

Below is a list of clubs and organisations affiliated with ACBRO Inc. If you have one of them in your area, please give them your support of membership. Full details can be obtained by contacting the group of your choice from below.

For membership or affiliation enquiries please contact:
ACBRO Inc., P.O. Box 170, Walkerville 5081, South Australia.

Cleveland Bay Radio Club	P.O. Box 1641, Aitkenvale,QLD 4814
SA Rotten Radio UHF Assoc.	P.O. Box 4, Dry Creek,SA 5094
LT Club Inc.	P.O. Box 626, Launceston,TAS 7250
Albany Communications Group	65 Hassell St Elleker, WA 6330
Radio City Australia	26 Wootten St. Greenacres SA 5086
Pioneer Radio Association (SA)	P.O. Box 1017 Salisbury, SA 5108
Plantaganet Rep't Institute of WA	PMB 306, Cranbrook, WA 6321
Burnie Citizens Radio Club	P.O. Box 655, Burnie, TAS, 7320
Transworld CB Radio Club	90 Crozier Avenue, Daw Park SA 5041
Canning River Radio Club	53 Parkside Ave, Mt. Pleasant WA 6153
Overland Radio Club	P.O. Box 1010, Murray Bridge, SA 5235
Eureka CB Radio Club	P.O. Box 27, Reynella, SA 5161
Transworld Sidebanders (The X/Ray Club)	13 First Street, Port Pirie, SA 5540
Eagle Radio Group	P.O. Box 302, Morphett Vale SA 5162
Rotten Radio Group Intnl	P.O. Box 4, Dry Creek SA 5094
Broken Hill UHF Repeater Club Inc.	P.O. Box 1023, Broken Hill NSW 2880
Riverland CB Club	P.O. Box 742, Loxton, SA 5333
Gippsland Repeater Assoc. Inc.	P.O. Box 555, Maffra, VIC 3860
Murray Bridge Agric & Hort Society	P.O. Box 315, Murray Br., SA 5235
Samba Club	P.O. Box 16, Salisbury, SA 5108
Tweed Radio DX Group Intnl	P.O. Box 773, Murwillumbah, NSW 2484
The Pathfinder Radio Soc. Club	P.O. Box 24, Woodridge, QLD. 4114
Dirty Dozen Radio Group	P.O. Box 380, Blair Athol, SA 5084
Hotel Zulu Radio Group Inc.	P.O. Box 66, Elizabeth, SA 5112
White Fox Radio club	P.O. Box 288, Salisbury, SA 5108
Mega Mouth International	P.O. Box 1534, Launceston, TAS 7250
The Triple "R's" Group	451 Regency Road, Sefton Park, SA 5083
Tru Blue Radio Group	P.O. Box 379, Blackwater, QLD. 4717
Blue O Radio Group	P.O. Box 53, Monaro Cresc, ACT 2603
Sydney Radio Group	P.O. Box 185, Gordon, NSW 2072
UHF Assoc. of WA Inc.	P.O. Box 1238 East Victoria Pk, WA 6101
Ratbag CB Radio club	P.O. Box 227, Welland, SA 5007
Sun Centre CB Radio Club	P.O. Box 912, Swan Hill, VIC 3585
Pegasus CB Radio Club	Cab 1 100 Jabez St. Broken Hill, NSW 2880
South Australia Radio	P.O. Box 162, Campbelltown, SA 5074
Port Adelaide Radio Club	P.O. Box 218, Alberton, SA 5014
Cherokee Indian Aust. Group	P.O. Box 1679, Mildura, VIC 3502
Sth. West District CB Radio Club	P.O. Box 620, Warrnambool, VIC 3280
A.M.O.S. CB Radio Club Intnl	P.O. Box 351, Broken Hill, NSW 2880
Pioneer Radio Association Aust.	P.O. Box 112, Bentley, WA 6102
Naracoorte UHF Association	P.O. Box 465, Naracoorte, SA 5271
Gosford Citizens Radio Club	P.O. Box 447, Gosford, NSW 2250
Ultra-Lite Radio Club Inc.	P.O. Box 634, Wynnum, QLD 4178
Felix Radio Club	P.O. Box 78, Goodna, QLD 4300
Inlander CB Radio Club	P.O. Box 5712, Rockhampton, QLD 4702
Aust. Red-Heeler Soc. Radio Club	P.O. Box 313, Drysdale, VIC 3222
Central West CB Radio Club Inc.	P.O. Box 628, Orange, NSW 2800
Vic Red Heeler Radio & DX Group	P.O. Box 1802, Ballarat, VIC 3354.
Kilo Romeo Circle of Friends	P.O. Box 16, Cleveland, QLD 4163
Radio Hobart Group	P.O. Box 266, Glenorchy, TAS 7010.
Welsh Dragon Radio Club	P.O. Box 581, Belmont, VIC 3216
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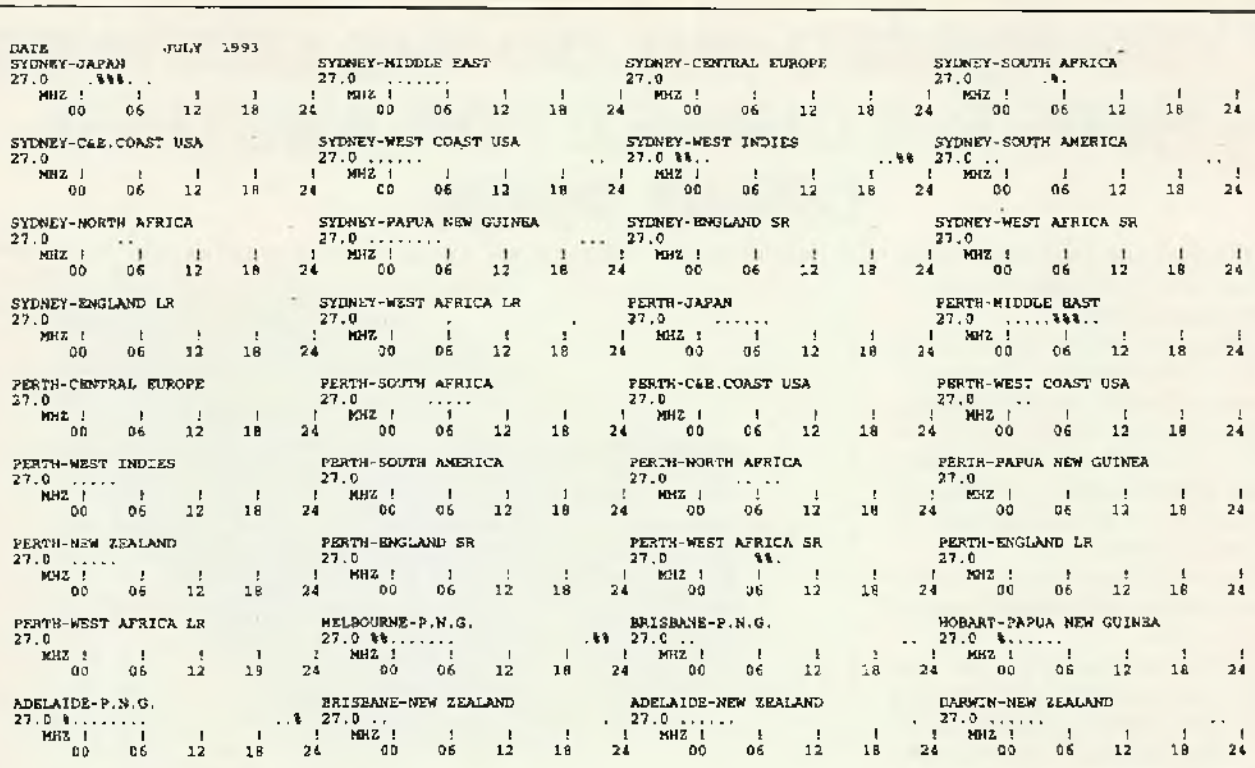
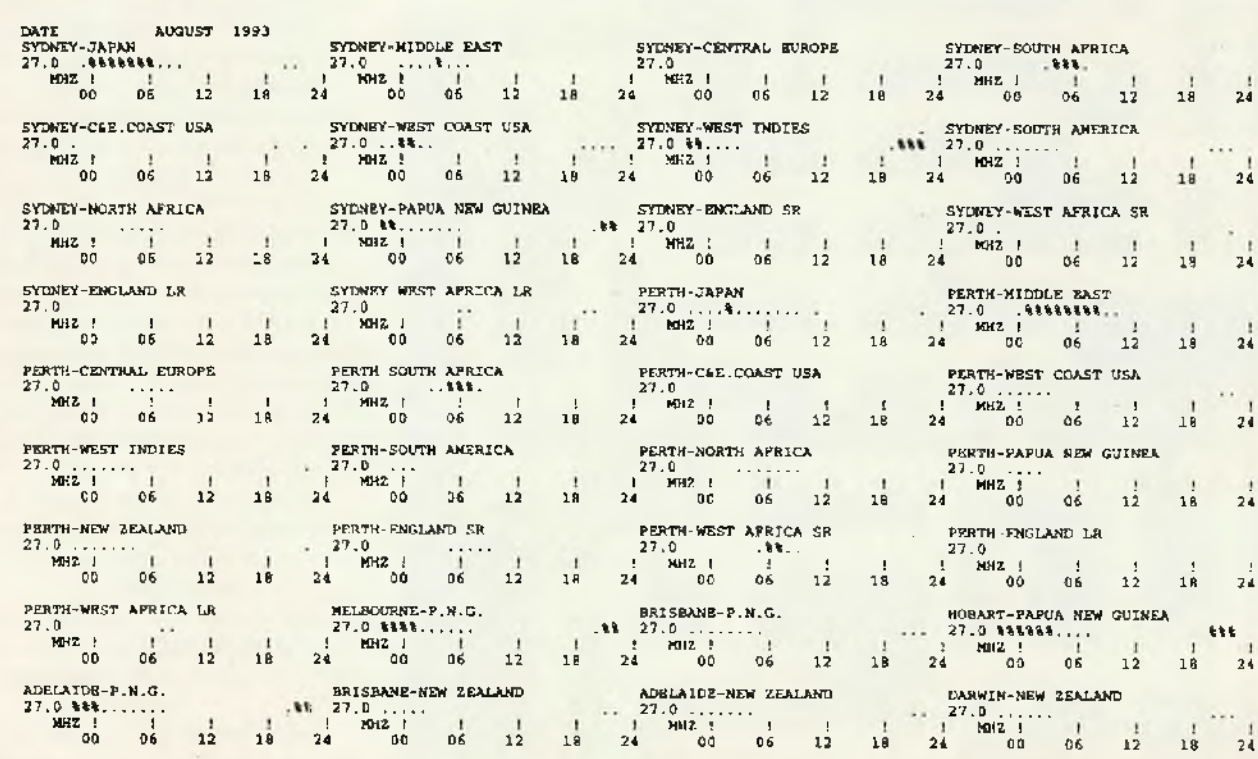


These GRAFEX style predictions present in pictorial form the expected HF propagation conditions between Australia and a number of DX areas. For each circuit, the "East" terminal refers to the eastern half of Australia. The horizontal axis of each graph represents the hours of the day in Greenwich Mean 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, 162-166 Goulburn Street, Darlinghurst, NSW.
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.



IF YOU MISSED OUT ON THE SCANNER - HERE'S A CHANCE FOR ANOTHER GREAT PRIZE

The prize for this issue's crossword is a Jackaroo UHF handheld courtesy of Commex Communications.

Ken Reynolds, who is certainly not given to "rave reviews" at the best of times says of this unit *"the ideal package. Compact, attractive, simple of operation, effective and affordable. The receiver, like most UHF portables, is ablaze with sensitivity and it compares well with its rivals in more ways than one."*

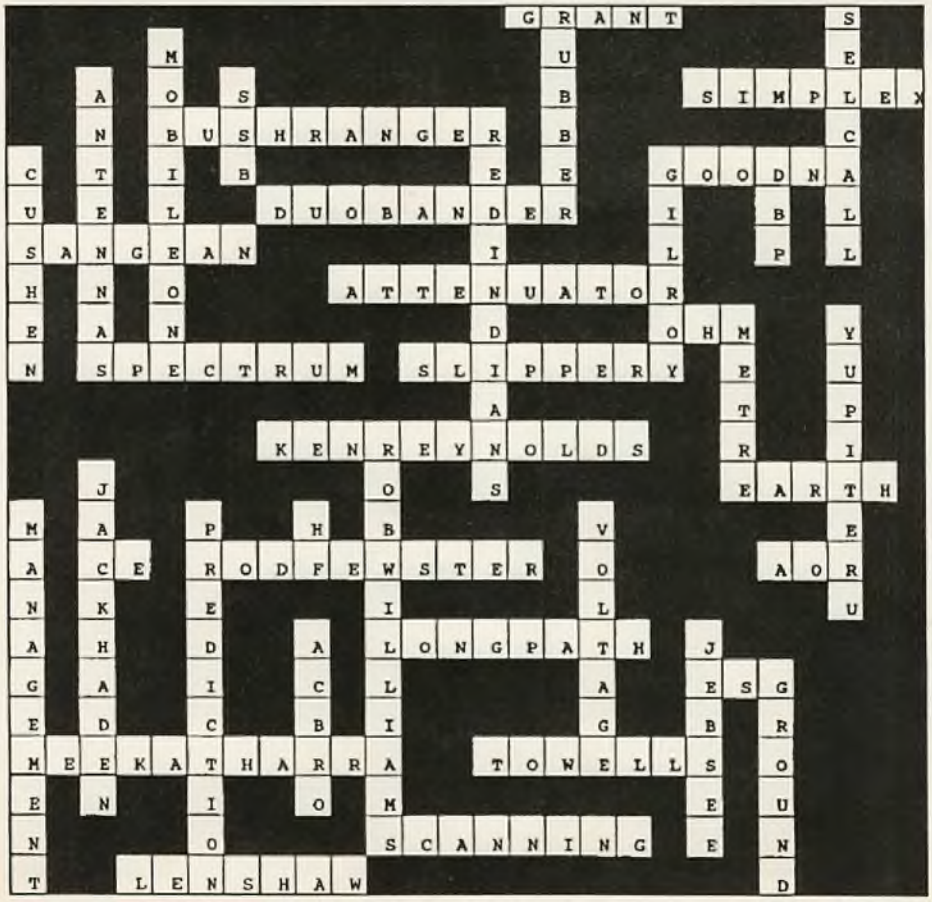
As with most of our crosswords, you don't have to be a qualified technician to answer the clues.

Virtually all the answers can be found by careful, repeat careful, reading of this issue of CBA. Some can be found very easily, others might take a little more time and effort, however, we try to make the contest one that can be won by anyone.

Closing date for the contest is 15 July and the winner will be the first correct entry opened after that date.

Keep in mind that entries must be on the page opposite and photocopies will not be considered. The prize is well worth winning and the winner will be announced in the Sep/Oct issue.

Go for it - and good luck.



AND THE WINNER IS...

First off, our thanks to all the readers who had a go at winning the Bearcat 70XLT scanner supplied by Dick Smith Electronics as the prize for the May/June issue crossword.

It's a great little scanner and an ideal unit to get you started on a very fascinating aspect of hobby radio.

Our thanks also to DSE, a company which gives this magazine some great support, and one which we think you should support when buying equipment.

It was one of the biggest entries ever which, considering the fact that we stuffed up the initial crossword contest, surprised us somewhat. The entries received for the "stuffed up" version were included in the drawer and the winner is:

Mr W. Larsen of Busselton, WA.

Our congratulations Mr Larsen, your scanner will be on its way to you within the next few days.

The winners of the two consolation prizes - a six issue subscription to CBA are:

Mr G. Armstrong of Port Augusta, SA and

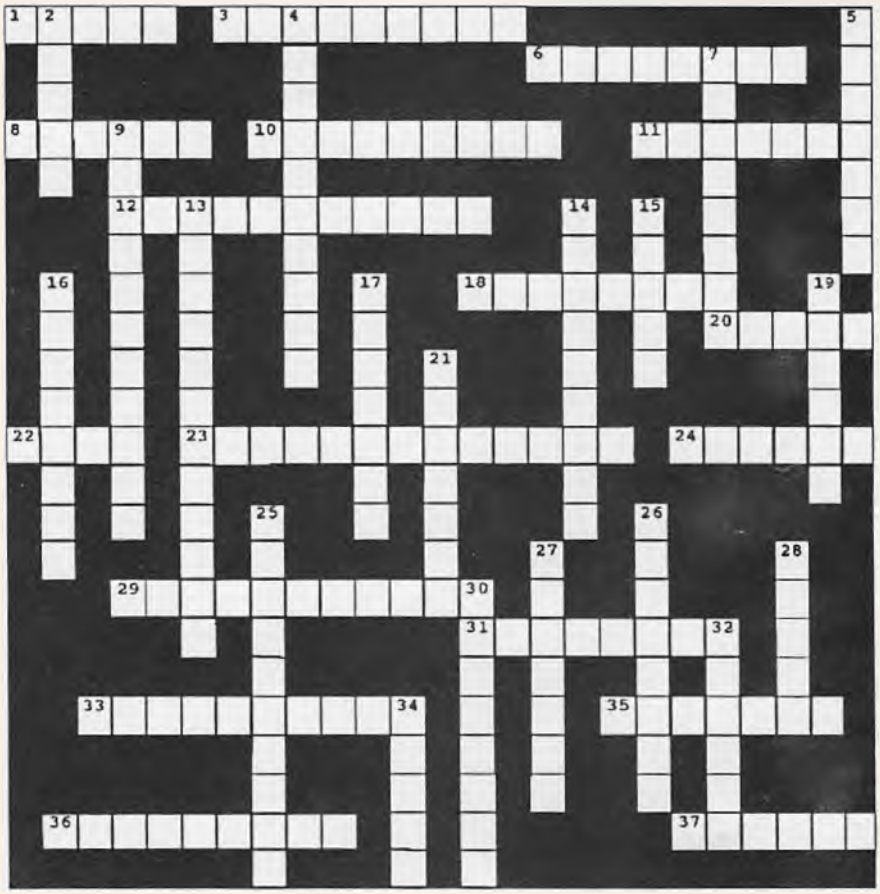
Mr M. Savage of Robinvale, Vic.

Your free subscriptions will commence with the Sept/October issues.

WIN A JACKAROO UHF HANDHELD

Courtesy of Commex Communications

Devised by Wurds-r-Us



CLUES ACROSS

1. The Australian Association Of Citizen and Band Radio is generally known as (word?).
3. There was a diagram of an R7 vertical antenna in our last issue - name the company that makes it.
6. A reader had a bit of a whinge about our crosswords in the last issue - what was his surname?
8. The unwanted noise generated by the circuitry of a scanner is generally known as a (what?).
10. What word is MHz an abbreviation of..?
11. In our last issue you had a chance to win a Bearcat 70XLT (what?) courtesy of Dick Smith Electronics.
12. Who wrote the article `Time for a change - but a change for the better?', in our last issue, (3,8).
18. What's the name of the company that had AR1500 scanners for just $699 in our last issue, (4,4)?
20. The thing that most CBers would like to have in their backyard so that they can hand their antenna on top of it.
22. Hy-Gain's 15m 5 element `Long John' has a (word?) of 12dBi.
23. One of our regulars produces the `Handbook Of Australian Railway Frequencies', what's his name, (7,6)?
24. If you're using a UHF 3/33 repeater you're using a (word?) system.
29. What's the name of the contributor who writes the regular `Bandspread' column, (4,7)?
31. One book reviewed in our last issue was the `(word?) To World Band Radio'
33. What's the name of our regular who has the amateur callsign VK3DBP?
35. The name of the company which produces the `Australian Maritime Radio' frequency register is (word?)
36. The author of the article on the new Radiocommunications Act in our last issue was `(word?) Rex'.
37. The name of the company importing/distributing the Jackaroo is (word?) Communications.

CLUES DOWN

2. What's the Christian name of the amateur who has the callsign VK3CE - look in our last issue.
4. Rob Williams wrote in the last issue that (word?) may soon be used by European SW stations for international broadcasting".
5. The column written by Rod Fewster is `Spectrum (word?)' - you'll find it in our last issue.
7. What's the name of the frequency register produced in Western Australia by RADAA?
9. A beam antenna is a (word?) antenna.
13. If you want to buy some QSL cards, what's the name of our regular advertiser that specialises in them, (4,8)?
14. The primary mode encountered during scanning is usually (word?) modulation.
15. Patrick McDonald wrote about the `(word?) Communications Program' in our last issue.
16. What's the model name of the UHF handheld that you're trying to win?
17. There's a duplex repeater and of course there's the other one - what's the other one called?
19. What's the name of the antenna rotator reviewed in our last issue?
21. Name the author of `Listening In To Aircraft Radio', (4,4).
25. What's the name of the function that reduces the strength of the signal being fed to a receiver.
26. A scanner usually has one channel programmed by the operator which is a (what?) channel.
27. What type of broadband antenna is best suited to scanning?
28. Name the popular desk microphone advertised by Time Plus in our last issue.
30. Michael Evans is the sysop of the (word?) Radio BBS.
32. In last month's `DXinternational' column there's a line that reads "Trindad & (word?) was noted by way of KP-360".
34. Why wrote the article `WA 000 Calling' in our last issue?

ADDRESS YOUR ENTRY TO:
CB XWORD, P.O. Box 628e, GPO, Melbourne 3001

NAME _____

ADDRESS _____

_____

TELEPHONE ( ) _____

Entries must be on this page - no photocopies

DXinternational

By Jack Haden

THEY COME AND THEY GO

Sunspot Cycle 22 has been an interesting and occasionally exciting one for DXers.

Many so-called DX clubs appeared, grabbed a few members along the way and, with the decline of DX activity, have quietly drifted off into the sunset.

The stronger groups such as Alfa Tango, Sperimental Radio and Sierra Alfa, however, you don't hear too many Knight Patrol or Coca Cola members these days.

Some of these clubs ran a fairly good operation while others just issued callsigns like progressive numbers in a DXpedition pile-up and few, if any, qualifications were required to become a member.

These are the ones which have drifted off into the distance, never to be heard of again. A lot of this can be attributed to the numerous callsign 'junkies' who inhabit 11 meters with some claiming to be members of anything from five to 15 different DX clubs. This doesn't make much sense in my book and in turn doesn't contribute much to club morale or loyalty.

More and more operators are now going it 'alone' and working just as much DX as those with the fancy callsigns but without the expense of belonging to a club or group.

Discontent with DX clubs is growing and many are just opting out of the hassle to "do it their way' instead of a club's.

...and so to what's been heard and/or worked during recent weeks.

Good DX conditions have found their way to the 11 metre band in past weeks and this has made the year to date a reasonable one, this despite the fading sunspot cycle 22.

While there hasn't been the activity of recent years, there is still plenty of action if you have the time to chase it.

The sunspot cycle is fast decaying and conditions are not going to get better for quite a few years, however, there are still days when there are a lot of big overseas' signals coming in so work it while you can.

AFRICA AND INDIAN OCEAN REGION

The path to this part of the world continues to be pretty haphazard with signals ranging from poor to reasonable. Given the generally poor band conditions, dedicated monitoring and a good quality directional beam or quad is an essential if you hope to work stations in the region.

Somalia was twice heard on the band with both stations associated with the United Nations team based in that country. At 0511Z I noted ADX-222, operated by Noel, with a poor three by three report and later, at 0604Z I logged 159-UN-159 with Keith at the microphone. The signal was also a poor three by three and Keith was looking for a contact into Victoria but wasn't having much luck due to interference from Indonesian stations.

Djibouti was heard at 0450Z by way of UNIT-604, operated by Fran and this time the signal was four by two. She was looking for a French speaking contact as she speaks no English at all. From what I could gather Fran is associated with the French Red Cross and is based at Djibouti for a few months so, if you speak French, you're in with a chance.

Tanzania was also about at the fairly early hour of 0456Z when I noted SAFARI-69, operator Col, who was a fair five by two on the meter. Col was suffering modulation problems due to his 12 volt battery going flat fast.

Botswana, by way of Toby (BWR-101), was heard at 0456Z with a five and five report and he was looking for a mate of his on Reunion Island and so ignored the many calls directed to him from Australia.

Ethiopia might have made a brief appearance at 0545Z by way of some Italian guy operating 'portable' somewhere in the country, callsign unknown, name unknown who may or may not have been actually where he said he was. Either way, the Europeans were happy to work him but his signals here were a poor three by one.

At 0449Z an impressive five by eight signal was logged by the 189-AT-100 on **Mayotte Island**, unfortunately he ignored Australian DXers and worked only French speaking stations.

Maldive Island appeared by way of STATION-909 operated by German national Karl. Contacts with this station do not count as a

THE SIDEBAND DEBATE CONTINUES...

The continual bitching on 11 metres about upper sideband versus lower sideband becomes somewhat wearing after a time. Throw in AM as well and you have the basis for an ongoing brawl for years to come.

I recently heard a DXpedition operating on upper sideband with a huge dog pile of operators trying to get through. In the middle of this, up came a Yank from Stateside complaining that the upper sideband operation was wiping out his local rag chew on lower. What followed was a heated exchange which culminated with the Yank moving to upper and playing music interspersed with the occasional insult.

Upper sideband is generally considered to be the correct mode of operation on the high channels of 11m and a majority of the 'splatter' and 'break-through' can be directly attributed to over-driven linear amps, speech processors being flogged to the limit and just plain old filthy transceivers emitting spurious harmonics.

Adding to the congestion at the top end of the band are the AM operators who are now moving from the lower channels in a bid to escape the cretins, brain-dead and general over-crowing.

Unfortunately, this is merely moving the problem to the high legal channels and, of course, to the even higher illegal ones.

continued over page...

country because Karl, whose signal was a good five by six, was operating maritime mobile aboard a cruising yacht in the Maldive group of islands.

Madagascar was noted by way of station callsign 888, operator's name unknown. The signal report was a good five by three peaking six at times, however, he was calling for European contacts and appeared `not to hear' Australian calls.

As usual, there were plenty of regulars being heard out of **South Africa** and **Zimbabwe** together with the occasional one from **Reunion Island** and **Mauritius**.

CENTRAL/SOUTH AMERICA AND THE CARIBBEAN SEA

Excellent daylight paths have again favored this part of the world with some really good signals breaking through, especially from Brazil, Uruguay, Argentina and Chile with some signals well up to the S9 and better.

A DXpedition to the West Indies' **Dominica Island** signing as the 194-AT-DX and operated by Peter got a bit of business with signals in the region of four by one, the QSL route is unknown to date. The 37-AT-104 and operated by Gyro was also heard from the Dominican Island and he had a good five by six with a number of Pacific stations calling him.

Saint Vincent Island was also activated by a DXpedition in March by the same Peter ex Dominica Island. At 2331Z I noted him operating as 220-AT-DX with signals down in the noise and barely readable at three by three, again no QSL route at this time.

Cuban station CO-001, operator Raoul, made an appearance at 2211Z with a good five by eight signal which was badly over-modulated on occasions and thus very hard to understand. Raoul operates some 15 miles out from Havana, the Cuban capital.

The BW-10 station out of the **Falkland Islands** was heard (just) at 0115Z with a poor three by one report from operator Brian. He was not getting many takers although one Melbourne station managed to make contact but due to the weak signal was unable to obtain the necessary QSL information.

Ascension Island in the Atlantic remains a difficult one for many DXers and I was fortunate to log ZD-1000, operated by John or Don (I'm unsure about the name as the report was a poor three by one. By 0300Z he had completely faded out.

Miquelon Island off the coast of Canada was heard at 0106Z by way of Alain signing as the FM-201. Due to Alain not speaking any English, the response to his CQ calls was minimal although a station in French Polynesia managed a contact. Miquelon Island is part of the 141 Division prefix and sorry, I did not get the QSL route.

Panama was heard loud and clear by way of the 24-AT-111 at 2106Z and had a big five by nine signal as he called for small Pacific islands.

Colombia was logged at 0429Z by way of Jairo with the callsign 6-AT-104. The signal was a good five by seven peaking to nine at times.

Some big signals have been heard from **Alaskan stations**, in particular 33-AT-109 and 33-AT-107, who both had good signals and were heard for quite some time before fading out.

Mexico stations are always about somewhere on the band and at 2030Z I noted 10-AT-119 calling for South Korea with a signal report of five by eight peaking the occasional nine.

As normal, Guatemala, Nicaragua, Honduras, Ecuador, Paraguay, etc. are about, however, a reasonable command of Spanish is necessary to secure a contact with most stations in

ALFA TANGO MEMBERSHIP

It had to come sooner or later. For the past year or so I have felt that the once ultra strong Alfa Tango was losing much of its zip, not to mention money. The organizations Italian upper echelons have been expressing concern about the declining membership and the reluctance of members to purchase the numerous AT awards.

It now looks as though the people in Asti (headquarters of the group) have woken up to the fact that by changing the rules a little they might still be able to make another buck or two. They have really worked at promoting membership during the past 12 months, but largely with little success.

The decision has now been made to make American AT members pay more for the annual AT Directory (callbook) and the price has been hiked from US$15 to US$20 for this year with a strong rumor that it will again increase in 1994, this time to US$25 - convert that to Australian currency and you'll get a nasty shock!

The AT team is also formulating rule variations which will incorporate basic membership in the price of the directory so, in reality, you will have to purchase the directory each year to remain a financial member. I have known for some time that the AT callbook is not selling as well as they in the Asti bunker would like and complaints about the price have been becoming louder and more numerous with each passing month. There have also been plenty of grizzles about the late and/or non delivery of the callbook and while some of these can probably be fairly traced to the `lost in transit' problem many group members remain unhappy about the overall situation.

To get around the problem, many members have pooled their cash and purchased one directory only which is then shared around. This makes economic sense to all - except the AT upper echelon.

Sorry fellas, the Asti folk are right onto this little `lurk'. It was good while it lasted but the headquarter coffers need refilling so in the near future you either buy the directory to remain a member or not do so and become an AT `drop-out'.

DXinternational

this area. Other regulars from Martinique, Puerto Rico, Bahamas, Barbados, Bermuda, Curacao and Aruba have all been heard on the daytime path with fair signal levels.

MIDDLE EAST AND ARABIA

Interference from European and Indonesian stations often makes it hard to work into this region from the South Pacific, especially when the band is in poor shape. Even so, with some perseverance and a good antenna it is still possible to scratch up a good contact from time to time.

Israel now seems to be quite common on 11 metres and between 0355Z and 0800Z I logged around six stations from this country with the strongest signal belonging to 97-MV-101 with five by five from Tel Aviv while Avi, the 97-AA-123, was a good five by two into Melbourne at 0510Z.

Bahrain was heard by way of station ATN-100 operated by Naz who was mobile with a poor three by three signal. At the time Naz was calling "CQ Kuwait City" but had no takers. From past experience we know does not QSL and he is difficult to work due to a poor command of English.

Abu Dhabi in the United Arab Emirates was heard on 11 metres by way of Aliz, 94-AD-01, at 0434Z with a fair three by four signal into Australia. It seems that some DXers still experience trouble extracting a QSL from the UAE countries and one reason is simply that they do not supply the correct QSL information, including Zulu (UTC) time.

There are several regular **Kuwait** stations about including 102-DD-101, operated by Sali and logged at 0558Z along with 102-KW-105, operator being Khaled. Both were a good five by seven and they were found on the `Middle East Call Frequency' chatting among themselves. Problem is, if you don't speak Arabic the chances of a contact are small.

Saudi Arabia is still about for those who need this country and at 0606Z I noted 68-DX-109, operator Mohammed, who was a good five by five at the time and had a small pile-up going.

A **Jordanian** station, 111-??-102 was heard, again on the `Middle East Call Frequency' but the three by one signal was too weak to even obtain the full callsign let alone work.

There was a strong rumor that Syria was being heard on the band but the station signing as SR-101 proved to be a `slim' operating from Italy.

Algeria is also rumored to be about on 11 metres but to date I haven't heard anyone boast about a recent confirmed contact although there have been a couple of European `slims' heard.

EUROPE

The usual hurly-burly of signals emanating from Italy, France, Spain, Belgium, Netherlands, UK, Germany, etc. continue to be about the band along with the invariably over-driven linears and speech processors. Also worth a mention is the mandatory mating call "Oooooolaaaaah" which seems to precede most signals coming out of Europe.

Aland Island was logged at 0945Z by way of Jari operating as 212-AT-DX who had a good five by four signal into Melbourne. QSL for those who need this one goes via 56-AT-485 in Finland along with the usual trimmings (SASE, IRC or green stamp).

Greece is always about with various operators and a variety of callsigns. At 1102Z I noted 18-AT-109, 18-AT-115, 18-SA-103, SPEC-105 and another signing as Radio Helios (or something similar) and signals ranged from three by three to five by eight.

Scandinavia is not difficult to find with solid signals still coming into Australia. I logged 20-AT-240 at 1055Z with a five by seven, along with hearing several stations from Denmark, Finland and Sweden.

Svalbard Island was heard on the band at 0931Z but the very weak three by one made it impossible to get a firm grip on the callsign which was 171-AT or 171-AZ or something similar.

Albania was logged by way of 251-NN-03 operated by Andre who, at 0855Z, was four by two from the capital Tirana. QSL route is not known

Romanian station 233-AT-101 was heard at 0800Z with a five by four signal in to the southern states of Australia and QSL is via 19-AT-128 with SASE and return postage compulsory.

PORTABLE DXpeditions QUESTIONED

There has been a lot of discussion, both on-air and off, about the credibility of many `portable' DXpeditions which are being heard from the Commonwealth of Independent States (CIS) - which used to be Russia - over recent months. It would seem that some of our old `comrades' are being somewhat less than truthful and are in fact operating from locations other than where they say they actually are...

A couple have already been exposed as frauds and it seems likely that this is only the tip of the iceberg.

With the current economic situation in the CIS, the quest by stations in that part of the world to obtain foreign currency is understandable given that their own currency is virtually stuffed.

The rouble has pretty much gone the way of the Argentine Austral and the Brazilian Cruzado and with rocketing inflation in the CIS any foreign currency and/or `green stamps' (American dollars) enclosed for the return of QSL cards is greatly appreciated by the operators.

Given this, it is not difficult to understand why CIS stations are claiming `portable' DX operation from new regions in the hope of receiving bulk overseas' return mail.

There is no simple way of telling whether a station is in fact operating from where he claims to be and my own advice is to be both cautious and patient when QSLing to this part of the globe.

Realistically, there's nothing that can be done about the situation. After all, working this type of DX is basically illegal - and it becomes even more illegal when you're also working on illegal frequencies.

Bulgaria was heard by way of 179-CE-101, name unknown, at 0911Z and Poland now seems to have more operators on air than any other Eastern European country with 161-AT-106, 161-KZ-108, 161-BG-003, 161-PL-1009, 161-PL-989 and 161-ZZ-101 all being heard over just a few nights.

Kaliningrad is a semi-rare one with 310-AT-102/307-AT being logged at 0852Z as he worked through a small pile-up with five by three signals. QSL route is via 19-AT-128.

Czechoslovakian station 179-CZ-108 was heard at 1134Z with signals peaking at five by seven but subject to both fading and interference from Indonesian stations.

If you are into chasing IOTA (Island Of The Air) you should be on the lookout for some of the Scottish Islands, also some of the small islands off the coast of France as there have been a few of these IOTA stations appearing in recent months.

ASIA AND THE PACIFIC REGION

Complaints are again circulating about the poor track record of two, possibly three, particular operators hailing from 224 and 226 prefixes in the Republic of Kiribati with the stations being referred to on Tarawa and Christmas Island. All I can say is that you should be careful when QSLing with these operators.

Western Kiribati has been active through Hang who signs as 224-SA-01, or sometimes as the 224-AT-104. At 0345Z Hang was five by nine with a lot of Australian stations working him. Hang says to please be patient with QSLing as he has just ordered some new cards from Bint Services in Melbourne and will QSL just as soon as they are received back at Kiribati. *QSL via P.O. Box 463, Betio, Tarawa Atoll, Kiribati, Central Pacific with SAE and return postage a must.*

Vanuatan station 197-AT-101 operated by Gerry who is with a church organisation, appeared at 2115Z with five by seven signals into Australia. He is located about 200 kilometres North of the capital Port Vila and runs solar power from the mission station.

American Samoa appeared briefly by way of KDC-336, operator Saa from the capital Pago Pago, and at 0655Z he had a five by three signal on the popular 'Pacific Islands' channel.

Western Samoa was also heard at 0421Z on this channel. The operator was Joe who was not using a callsign and his base was on Savaii Island. He was also suffering from battery problems.

Guam is still quite active with Annette, the 62-AT-105, always putting in a good signal. At 0147Z she was a solid five by nine plus 10dB and was working plenty of Australians. Also heard was 62-RSW-501 at 0811Z with five by six signal.

Saipan, in the Commonwealth of the Northern Mariana Islands has quite a lot of activity due largely to the number of Filipino laborers imported to the island. Some have brought their CB radios with them to talk back home while also giving DXers a chance to work the 133 prefix. At 0703Z I logged 133-CS-016 with Tyler at the microphone and a five by five report; another regular is 133-AT-102, also located on Saipan.

Cambodia was noted at 1016Z using the callsign DX-101 and going by the name of Rod. He claimed to be running 15 watts into a dipole up at 25 feet between two big buildings and that he was with the United Nations organisation, however, there is some doubt about his authenticity and he may be a 'slim' - work now, worry later.

Nepal was heard at 0952Z with station 86-AT-119, operator Willy; **Asiatic USSR** was heard at 0636Z by way of 302-RN-0, Stan operating mobile with a five by six signal; **Tadzhikistan** was logged at 1050Z in the DXpedition mode with a call of 313-SL-00 on 4 April, the QSL route is not known at this time.

Armenia was another DXpedition operation during April with 301-VS-0, operator Alex, calling the shots. At 1041Z he had a strong five by nine signal and a huge pile-up of eager Europeans chasing the contact; QSL via VS DX Group, P.O. Box 7051, Genova, 16148, Italy.

Okinawa Island off Japan was heard by way of JST-110. Operated by Masa in Naha, the main settlement of Okinawa, he was five by six at 0945Z and no, Okinawa is not a separate DXCC country and counts as Japan (prefix 25) only.

Hong Kong often appears on the band with a wide variety of callsigns, heard at 0600Z was HAPPY RADIO operated by Cheung-Lu from Kowloon Island, part of the Hong Kong territories, he was a good five by six with his 10 watts into a ground-plane 35 floors (yes, 35 floors) atop of a high rise building.

As Cheung-Lu put it: "Me do no QSL".

As normal the usual noise is there from **Hawaii, Japan, Philippines, South Korea** and Indonesia etc. to keep us amused when the other countries are absent.

That's another DX International out of the way and I hope you found something of interest in it.

Thanks go to those who kept me informed on what's being heard and/or worked around the country, especially Dave in Melbourne and Keith in Queensland.

Good DX...Jack

FINES FOR PIRATE OPERATION

Three Washington state men have been fined 2,000 each by the FCC for unlicensed operation on 2 meters.

The FCC received a complaint from an amateur on November 17, 1992, alleging that people aboard fishing vessels were operating on 144.170 MHz. The FCC agent was unable to receive adequate signals from the operations and asked for a tape recording from the complainant. The FCC conducted an investigation, using telephone, marina, and U.S. Coast Guard information to identify the source of the transmissions. The FCC said that since all three accused men were individuals (rather than commercial operations) and because of the nature of the violations and the fact they were first offenses, it would set the fines at 2,000 instead of the 8,000 "base forfeiture" set by its rules.

Receiving Notices of Apparent Liability for 2,000 were Randy Baxter, Kevin Marilley, and Mark Karuza, all of Bellingham, Washington.

AUSTRALIAN UHF REPEATER LIST

NOTE: Corrections and updates may be sent to:
CBA Repeater Listing, P.O. Box E160, St James, NSW 2000.

ACT

Canberra	2/32
Canberra	8/38

NEW SOUTH WALES

Albury	6/36
Armidale	4/34
Barraba	6/36
Bathurst	8/38
Bega	6/36
Belbora	1/31
Binya	3/33
Blue Mountains	2/32
Bombala	8/38
Booral	7/37
Bowral	6/36
Braidwood	3/33
Brewarrina	1/31
Brindabella Ranges	7/37
Broken Hill	4/34
Broken Hill	7/37
Buladelah	7/37
Casino	6/36
Cobar	8/38
Coffs Harbour	6/36
Coolah	6/36
Cooma	4/34
Coonabarabran	4/34
Corowa	2/32
Corowa	5/35
Corwa	7/37
Deepwater	5/35
Denliquin	1/31
Dungog	3/33
Eden	2/32
Glen Innes	7/37
Grafton	8/38
Grenfell	1/31
Gundagai	7/37
Gunnedah	2/32
Guyra	1/31
Warden	1/31
Hampton	1/31
Hay	4/34
Inverell	2/32
Jindabyne	1/31
Junee	5/35
Kariong	8/38
Lismore	2/32
Manilla	3/33
Monkey Hill	6/36
Mt Lambie	2/32
Murrurundi	3/33
Muswellbrook	4/34
Narrabri	2/32
Narranderra	8/38
Narromine	5/35
Narromine	6/36
Newcastle	1/31
Newcastle	2/32
Newcastle	5/35
Newcastle	6/36
Nundle	7/37
Orange	3/33
Port Macquarie	2/32
Sydney	5/35
Sydney (south)	1/31
Sydney (west)	3/33
Sydney (outer-west)	4/34
Sydney (north)	7/37
Tamworth	4/34
Tenterfield	3/33
Tumbarumba	3/33
Tumut	6/36
Tweeds Heads	4/34
Wagga Wagga	1/31
Wagga Wagga	5/35
Walbundrie	2/32
Walcha	2/32
Walcha	6/36
Walcha	8/38
Warrumbungles	1/31
Wingham	1/31
Wilcannia	1/31
Wollongong	8/38

NORTHERN76 TERRITORY

Bushy Park	1/34
Darwin	1/31
Eridunda Station	3/33
Katherine	2/32
Maryvale Station	4/34
Mt Swan	2/32
Queensland	
Alpha	2/32
Atherton	8/38
Amiens	8/38
Ayr	3/33
Barcaldine Downs	1/31
Bathurst Heads	1/31
Bauhina Downs	4/34
Biloela	7/37
Blackall	8/38
Blackwater	6/36
Brisbane	1/31
Brisbane	5/35
Brisbane	7/37
Buncaberg	4/34
Buncaberg	7/37
Cairns	3/33
Chinchilla	8/38
Clermont	6/36
Clermont	7/37
Crows Nest	6/36
Dimbulah	6/36
Dirranbandi	8/38
Double Island Point	3/33
Edward River	3/33
Emerald	8/38
Gladstone	6/36
Gold Coast	3/33
Goondiwindi	4/34
Gympie	2/32
Gympie	5/35
Gympie	7/37
Hervey Bay	8/38
Hughenden	1/31
Ingham	2/32
Inglewood	1/31
Innisfail	1/31
Ipswich	4/34
Jericho	4/34
Kilcoy	3/33
Lakeland Downs	2/32
Longreach	3/33
Mackay	3/33
Mackay	6/36
Marlborough	2/32
Maryborough	6/36
Maxwelton	2/32
Miles	6/36
Monto	3/33
Moranbah	4/34
Moura	1/31
Mt Isa	1/31
Mundubbera	6/36
Murgon	7/37
Quilpie	2/32
Rockhampton	1/31
Rockhampton	4/34
Roma	1/31
Springsure	3/33
Sunshine Coast	6/36
Sunshine Coast	8/38
Tambo	6/36
Taroom	2/32
Thargomindah	6/36
Toowoomba	2/32
Toowoomba	4/34
Townsville	1/31
Townsville	4/34
Wavell Heights	2/32
Warwick	1/31
Wide Bay	1/31
Yaraka	7/37

SOUTH AUSTRALIA

Adelaide	5/35
Angaston	4/34
Blinman	3/33
Carrietown	1/31
Ceduna	1/31
Clare	7/37
Cleve	2/32
Coonalpyn	6/36
Coppudurba Hill	1/31
Crystal Brook	1/33
Hawker	7/37
Kangaroo Island	4/34
Murray Bridge	8/38
Mt Bryan	8/38
Mt Gambier	5/35
Mt Gambier	7/37
Myponga	2/32
Naracoorte	4/34
Orroroo	2/32
Port Lincoln	8/38
Port Pirie	4/34
Renmark	6/36
Snowtown	6/36
Tarcoola	6/36
Wilkatana	8/38
Yorketown	7/37

TASMANIA

Burnie	8/38
Central Highlands	7/37
Devonport	1/31
East Coast	6/36
Flinders Island	1/31
Hobart	1/31
Hobart	5/35
Launceston	2/32
Launceston	6/36
Midlands	4/34
North East Coast	3/33
North West Coast	4/34
North West Coast	6/36
Sandfly	2/32
West Coast	2/32

VICTORIA

Alexandra	1/31
Ballarat	2/32
Ballarat	5/35
Balmsdale	7/37
Beech Forest	3/33
Bendigo	4/34
Cavendish	8/38
Currajung	4/34
Echuca	6/36
Euroa	3/33
Falls Creek	3/33
Foster	6/36
Geelong	4/34
Halls Gap	6/36
Hamilton	5/35
Harcourt	8/38
Hawkesdale	4/34
Horsham	3/33
Kerang	2/32
Lavington	4/34
Mansfield	2/32
Melbourne (north)	1/31
Melbourne (metro)	3/33
Melbourne (metro)	5/35
Melbourne (south)	7/37
Mildura	3/33
Moe	2/32
Mornington Pen.	8/38
Mordiake	7/37
Mt Cann	8/38
Mt Concord	6/36
Mt Delegate	3/33
Mt Terrible	8/38
Myrtleford	8/38
Penshurst	1/31
Shepparton	7/37
St Arnaud	1/31
Swifts Creek	1/31
Talangatta	7/37
Wangarrata	6/36
Waubra	7/37

WEST AUSTRALIA

Albany	3/33
Augusta	7/37
Bencubin	2/32
Boyup Brook	4/34
Bunbury	2/32
Carnamah	2/32
Carnarvon	2/32
Coolgardie	7/37
Darkin	6/36
Denmark	1/31
Esperance	4/34
Kalgoorlie	2/32
Kambalda	1/31
Katanning	1/31
Kellerberrin	1/31
Kulin	4/34
Lancelin	4/34
Mandurah	7/37
Manjimup	6/36
Margaret River	6/36
Meekatharra	1/31
Merredin	2/32
Mia Mia	1/31
Mt Manypeaks	6/36
Mt Barker	5/35
Mt Barrow	7/37
Mt Saddleback	1/31
Mt Solus	4/34
Nannup	2/32
Perth	1/31
Perth	3/33
Perth	5/35
Perth	8/38
Ravensthorpe	8/38
Stirling Ranges	7/37
Wickham	1/31
Wongan Hills	8/38
Wyalkatchem	6/36
York	7/37

UF2020

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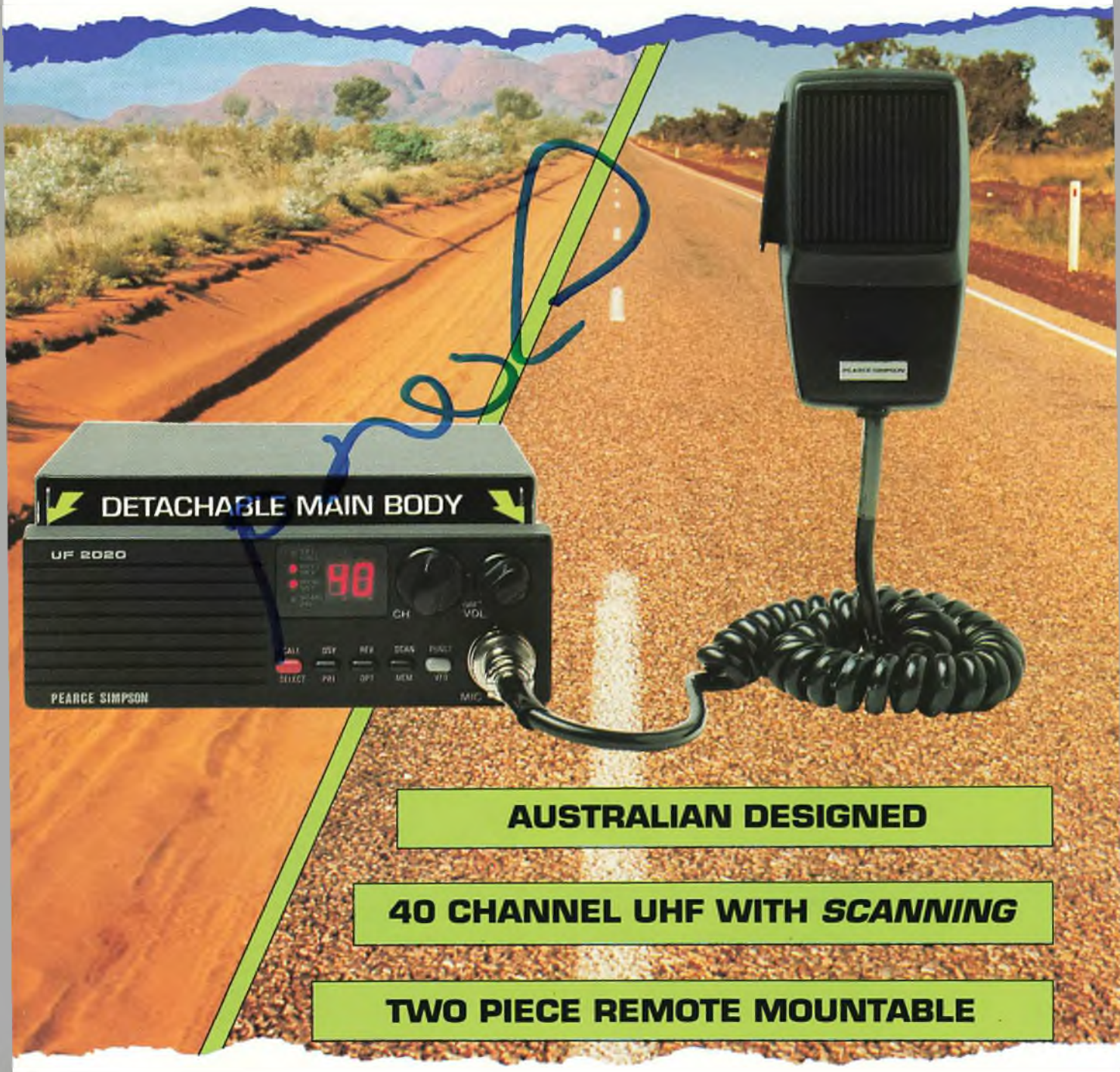

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