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ON CHANNEL

HAS CBA CHANGED DIRECTION?

I received a 'phone call from a reader during the Christmas period asking why CB Action was fast becoming a "Popular Communications" type magazine rather than, as its title indicates, a CB "only" title.
...and that's a fair question.
When CBA kicked off back in the mid-70s, HF (11m) CB was very much "the thing" to be into with everyone from Dick Smith to Dick Tracy promoting and using this new to Australia form of communication.
CB boomed with 96 page, monthly issues of CBA and literally dozens of assorted makes of CB rigs on sale - and more arriving on the market each week.
The boom, however, couldn't last indefinitely and while a strong core of HF CBers remained, the scene started to quieten down. The introduction of UHF CB rekindled some lost interest and there was another surge of activity which, like HF CB, remains today - but on a much smaller scale.
During the 16 years of so of CBA's existence, it has published as a monthly, a bi-monthly, a quarterly - not at all for about a year - and again as a bi-monthly.
All of which brings us to 1994.
I think it is fair to say that CBA has not been a strictly CB magazine for the past couple of years.
The reasons are many and varied but not the least of them is the broadening of interests by many current and ex-CBers to include scanning, shortwave listening and, of recent times, satellite television and packet radio - not to mention those who have moved on to amateur radio.
Our regular reader surveys (the last about 18 months ago) reflect these changing interests and scanning is now by far the most popular area of communications - if of course you can really call it "communications".
As a matter of interest, our largest selling issue (by far) during recent years was during the Gulf War - people were looking for frequencies on which they could listen to the action in the air or on the ground, on shortwave radio, direct from the war-front.
We could not even find a new HF or UHF CB to review for this current issue although we believe there may be some in the not too distance future. As a result of all this the magazine has steadily broadened its base to present "hobby communications" rather than just CB - if we didn't we would be neglecting the majority of our reader's interests, however, we retain as best possible straight CB editorial content in each and every issue and this is not about to change. As an example, this issue carries the current CB DXCC listing, a DXinternational section from Jack Haden and a rundown on the new licence proposals while our previous issue reviewed the new Uniden Grant (the Cobra revisited) along with part two on working DX on 11 metres.
In coming issues we will still be carrying CB editorial, whether it is about antennas, rig reviews, power supplies or whatever, but, the fact remains that there is at this time insufficient "CB only" material to fill a magazine - even on a bi-monthly basis...and it has been so for some time.
CBA is in fact one of the very few magazines in the world to continue to provide anything at all on CB - and the few remaining overseas publications have a far greater number of CBers from which to draw readers (and to which advertisers can sell products) due simply to their much larger populations.
So there you have it. There will always be CBers and CBA will ***always*** *provide CB news and information, but, whether we like it or not, hobby communications will continue to play an important part in the magazine's content.*

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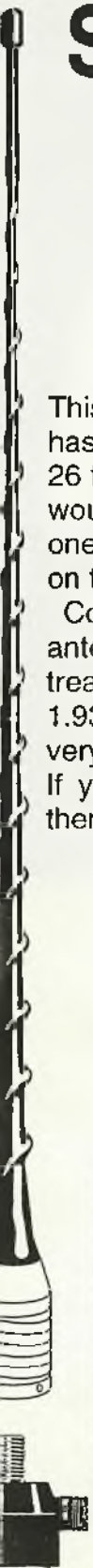

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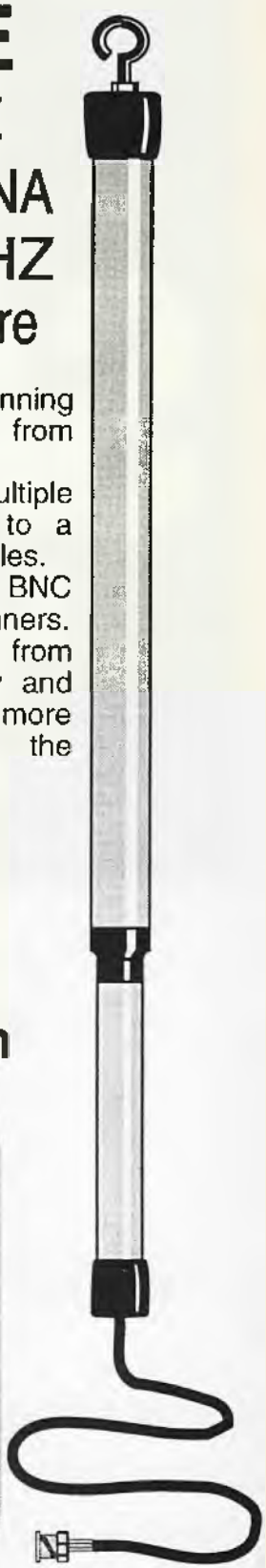

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SCANNING

NEWCOMERS START HERE

Scanning is basically the VHF/UHF version of shortwave listening. Whilst there is no special language associated with scanning, there are a few phrases and terms that may confuse the newcomer.

While it is not necessary to understand or even know what these terms mean, it does enhance one's enjoyment of the hobby if you obtain a basic knowledge. Anyone who purchases a scanner can find out enough information on the basic operation of the receiver from the accompanying handbook or magazines such as CBA. However, there are a number of words that may not mean a lot to the newcomer, or have significance outside the engrossing hobby of scanning.

Unlike other aspects of hobby radio, such as amateur and CB, scanners do not require any licence, either to purchase or operate.

Apart from transmissions which are in some way connected to a telephone conversations, scanner enthusiasts are free to monitor whomever they choose. This page is designed to introduce you, the newcomer to scanning radio receivers.

One of the first things that you will come across are the different types of transmission ***MODES***, such as ***AM*** or Amplitude Modulation...it is found mainly on 27 MHz CB and VHF/UHF aircraft frequencies. The primary mode encountered, however, is ***FM*** or Frequency Modulation. FM comes in two types, narrow band, which is for normal two way radio transmissions and wide band which is used for TV audio transmissions and FM broadcast stations. A portion of the radio spectrum is called a ***BAND.***

Bands are made up of ***MEGAHERTZ*** (usually shown as MHz) and ***KILOHERTZ*** (usually seen as kHz). As far as the scanner owner is concerned, the main bands are ***VHF*** (Very High Frequency). The VHF band embraces all frequencies between 30 MHz and 300 MHz while frequencies between 300 MHz and 3000 MHz are known as ***UHF*** (Ultra High Frequency). Some scanners can receive ***HF*** (High Frequency) which are the frequencies between 3 MHz and 30 MHz.

There are many type of users through out the spectrum. ***AERONAUTICAL MOBILE*** is for the exclusive use of aircraft and associated services while ***MARITIME MOBILE*** is for the exclusive use of marine craft and associated services. ***LAND MOBILE*** is for services where both stations are terrestrial, or land based. As the scanner has become more and more sophisticated, other radio bands, such as space to earth, earth to space communications can now be monitored. However, for the main we will stick to the three standard user types. Many operators in the Land Mobile bands use ***REPEATERS***. A repeater is a combined receiver (using one frequency) and transmitter (on a second frequency) which retransmits the received signal in real time...this is known as a ***DUPLEX*** system.

Others use ***SIMPLEX*** frequencies.

Simplex is the method in which two way transmissions are made on the same frequency, for transmit as well as receive.

Transmitters (including handheld, mobile and fixed) are rated in ***WATTS***.

A watt is a unit of power and the more watts the better the signal.

Scanners have the ability to ***SEARCH*** out new and interesting frequencies.

An upper and lower frequency is programmed into the receiver and this then seeks out active frequencies within the assigned limits. If there is a frequency that has special status it can be entered into a ***PRIORITY*** channel. The scanner will then sample that channel at regular intervals (programmed by the operator) for activity. This process will overide any other functions being carried out at the time. If a channel is carrying too much traffic or is subject to interference which may cause it to continually open the ***SQUELCH*** control, it can be ***LOCKED OUT*** of the scan sequence.

To open a scanner's microprocessor to receive the frequency data, it is often necessary to press ***PROGRAM***. By pressing ***MANUAL*** your scanner will advance channel by channel through it's memory banks.

Scanners normally come with an antenna of some description and this is usually either a ***TELESCOPING WHIP*** or ***RUBBER DUCKIE***. An external aerial can be employed to further enhance the reception. The most common external antenna is a ***DISCONE***. This is a broadband aerial well suited to most listening applications. If, however, you live outside built up areas or wish to monitor services well away from your location an ***ACTIVE ANTENNA*** may be the best for you.

An active antenna has a wideband ***RF*** (Radio Frequency) amplifier built into it. It can boost the incoming signal by as much as 20 dB (decibels) in gain. The higher the gain of the antenna the better the received signal.

A glance at most scanner handbooks will reveal words like ***SENSITIVITY*** and ***SELECTIVITY***. Sensitivity is the minimum usable input required to activate the receiver. It is usually expressed as a decimal of a microvolt (0.2 microV or 1.0 microV) or similar. The lower the figure the better the sensitivity.

Sensitivity is sometimes given with a reference, either ***S/N*** or ***SINAD***. S/N is the ratio of signal to the background noise. Sinad is the ratio of signal, noise and distortion. Selectivity is the receivers ability to discriminate between closely located signals.

AUDIO OUTPUT is the power output of the speaker and this is usually given in watts or part of a watt. As you become more familiar with your scanner, another term that may be encountered is ***IMAGE.*** An image is the receiver duplicating a false transmission on a frequency some distance from the genuine one. To determine whether or not a received signal is an image or not, it is necessary to determine the ***IF*** or Intermediate Frequency of your receiver (the IF is sometimes given in the "Specifications" section of the handbook).

By doubling the IF then either adding or subtracting it from the suspect frequency you can easily check to see if it is an image or not. While searching out new frequencies the scanner may stop on a frequency where no signal is present, just a humming noise.

This noise is being generated from within the circuitry of the scanner and is known as a ***BIRDIE.*** To ascertain if a frequency is a birdie, simply remove the aerial. If the signal is still there, chances are it is a birdie. Little can be done to eliminate these annoying channels other than to "lock them out".

Strong signals can overload a scanner.

The result is a transmission that sounds like several people talking at once.

Some scanners have ***ATTENUATORS*** built into them and this function reduces the strength of the signal being fed to the receiver thereby cutting the overload.

It doesn't matter if you have a scanner worth $100 or $10,000, the principals are the same. Some have more memory, others have better built-in antennas or more powerful speakers, however, they all operate pretty much in the same way. These devices are to be used in a responsible manner.

Don't chase ambulances or hang around accident/fire scenes with your scanner blasting out the channel being used by the emergency services personnel.

All handheld and most mobile scanners have some method by which an ***EARPHONE*** can be connected, so you and you alone can overhear what is going on...use it!

A scanner can be an excellent travelling companion, alerting you to possible road dangers or delays up ahead.

A scanner can enhance your enjoyment of many things. Listening to aircraft involved in an airshow is one while another is listening to pit crew and crew to driver instructions at a motor race meeting.

Whatever your reason for having a scanner, CB Action welcomes you to an engrossing hobby.

CB RADIO FROM NOW TO THEN or WHAT WAS IT LIKE BACK IN THOSE EARLY DAYS?

By Ken Reynolds

The BEGINNING of CB in OZ, according to the SMA (Spectrum Management Agency), occurred back in 1977, on the day of legalisation when CB radio was first officially recognised by an Australian government department. In those days it was called the Department of Post and Telegraphs, which was later to become the Department of Communications, then the Department of Transport and Communications and finally the Spectrum Management Agency. From the outset, it was decided that UHF CB was to be legal and unique to Australia while all 27MHz operations would be phased out by a given date.

Well, anarchy reigned, and 27MHz flourished while the new kid on the block could hardly get a foothold until the introduction and legalisation of UHF CB repeater stations.

Would you believe, operators were actually banned from communicating over a range greater than 32 kilometres? Younger operators probably doubt the honesty of this statement, but every word is true. So, in the end P&T (Post & Telegraphs) wisely decided to permanently retain the old band along with the new UHF allocation. I suspect their philosophy went something like this: since 27MHz won't go away we might as well collect licence fees and make money out of it anyway.

Who remembers that the 27MHz Citizens Band used to be the 11 metre amateur band? Not too many, I suppose — apart from a few piqued amateurs, of course! Amateur operators have always jealously guarded the operating privileges bestowed on them by way of passing the Amateur Operator's Certificate of Proficiency (AOCP) or one of the other classes of amateur licence.

But, in truth, 11 metres wasn't ever a popular amateur band, but, it was suggested that if the band saw more occupancy then perhaps it might be saved from a fate worse than death. In Melbourne I used to listen to a lone crusader day after day fruitlessly calling CQ for hours into an empty void — except for the pirates.

It seemed nobody really cared all that much about retaining the band — it was just a matter of principle. Everyone knew that 11 metres offered little (relatively speaking) in the way of DX or anything else worthwhile and it was a shared allocation with 'whiz-by' industrial machines and many other man-made noise sources. In fact, if the real truth be known, CBers inherited a high frequency allocation that no-one else really wanted. The same can't be said for UHF CB, so be grateful for small mercies. UHF CB is smack in the middle of one of the most sought-after commercial allocations in Oz and the authorities are probably cursing long and loud for ever 'giving' it away.

Setting a date in 1977 for the beginning of CB was a bit like saying that world religion began with Christianity. Of course it didn't, and while this is a convenient way to package and observe the past 2,000 years, it is an incomplete chronicle, because events happening prior to this date are excluded from the overall picture.

As a kid of about 12 or 13, a school friend and I used to build 'micro'-power, crystal-locked transmitters using a single transistor with which we would sometimes successfully communicate from house to house over a range of a few hundred metres using Morse Code. We both had war surplus communications receivers at the time; mine was a Philips No 4 set and John's was a bulky AR-7 with clumsy plug-in band modules each larger than a modern sideband CB rig. Johnno ended up working until recently as an electronics engineer at Woomera rocket test range.

My first recollection of the term CB radio dates back about 30 years to when I first read about it in an American magazine. The idea of radio communications for the masses caught my imagination and I made a series of local phone calls in an attempt to find out more about this elusive radio service and where one could buy suitable equipment. After

much searching I finally reached the most knowledgeable government authority of the times, who promptly told me over the phone "There's no such thing".

When I pursued the point he hung up on me, and that was that...

Some time around 1970 I picked up a company 27MHz walkie-talkie to use for a job and who should 'chirp' out of the little speaker but the **Silver Fox** himself. So who was this Silver Fox? I dunno, but after a short and very illegal encounter with the Fox it became clear that CB was in fact alive and well in Oz as revealed by the dozen or so radio contacts I made in the ensuing few days. All on 27.240MHz I might add, for that was the only channel fitted to the Sony portables we had. It was also the most common channel licensed for business use those days.

So, how did you get on air in 1970?

Well, it wasn't all that easy and about the only 'off-the-shelf' rigs available were hand-held battery-operated portables from a few main-line Japanese manufacturers. Also, because information was in short supply, most would-be CBers had no way of knowing what frequencies to use or where to get the crystals. There were no PLLs (Phase Locked Loop synthesisers), just one pair of crystals per channel. And, to make matters worse, most existing operators were paranoid about being 'busted', so it took new chums a while to become accepted and finally trusted by their more experienced peers.

So, CB in Australia really came into being around the late 1960s to early '70s, and it has been evolving now for around a quarter of a century.

The first CB radio I owned was a mobile set commonly known as a **Sharp Blue Dial**. The Sharp corporation was the maker and the Blue Dial nickname referred to the rig's appearance. It used one pair of quartz crystals for each frequency with room for about 10 channels, but it was a winner over its chief rivals of **Lafayette** and **Pony** for one good reason — it had a built-in separately-tunable receiver which covered the whole band, and in this way one could easily find out the other popular frequencies — except the dial accuracy was somewhat questionable.

Within a short time the Australian CB pioneers had managed to assemble a kind of band plan of about six or seven channels which were about to become defunct courtesy of the Stars and Stripes. The American 23-channel Citizens Band was well-established, and because of an increasing demand for CB radios from within our shores signs of Americana began creeping on to the local scene in the form of compact, 23-channel AM-only transceivers.

The trickle soon became a flood and, almost overnight, thousands upon *thousands* of multi-colored, multi-styled, multi-branded, multi-sized (use your imagination!) 27MHz transceivers were thrust upon the local market in much the same way that mobile phones are marketed today. This, then, was the legendary CB BOOM of the 1970s.

You could buy CB radios almost everywhere towards the peak of the boom, and I don't think we will ever know the true extent of CB transceivers sold in this country during this period, but it was certainly well into six figures. The band was congested to the point that if you removed three quarters of the operators the channels would *still* have been in chaos. Now *that's* a boom...

Pre-legalisation, there were only 23 channels available on 27MHz. That was the standard in the USA and, as usual, we down-under tend to inherit the spin-offs from the States. We will look at some of the rigs a little later.

....☞

Right: Our first issue announced the coming of legality, however, the then-Government stated that it would ban 27MHz and UHF would be the only CB mode. Many other countries did in fact get UHF only but we also got 11 metres.

Below: Lafayette was but one of the dozens of HF CB rigs available during the early days. where are they now?

CB RADIO FROM NOW TO THEN or WHAT WAS IT LIKE BACK IN THOSE EARLY DAYS?

(continued...)

By the mid-seventies CB rigs had become more sophisticated and single sideband transceivers quickly forged their way into popularity and became the order of the day. In fact, at one stage they were selling so fast that for many months demand considerably outstripped supply.

About the mid-seventies the Department of Post & Telegraphs finally recognised that the interest in CB radio had become so intense that just ignoring its very existence would not make it go away. In fact, the illegal radio communications cult of radio piracy had grown to such proportions that control was almost impossible.

In a brave assault on the problem P&T decided that 27MHz would have to go, to be replaced by a new UHF Citizens Band sited in frequency between 476 and 478MHz.

In a risky undertaking, Philips TMC in Australia designed, and committed to manufacture, the pioneering FM-320 UHF CB transceiver. The new radio cost Philips in the order of several *million* dollars to launch into an uncertain market where the effort almost failed due to bad publicity about the new band and its characteristics.

At this point I would like to point out that, had it not been for the courage of Philips TMC and a dedicated team effort from within, UHF CB would probably have never have been born.

Philips has not been a serious force in the CB market for the past couple of years. However, it should be noted that all the present leading brands like Electrophone, Uniden and the others waited bravely in the wings while Philips venture capital led the way. For the record, it was Philips which produced the first UHF CB radio in Australia and it was its continuing efforts alone which saw the world's first legal, experimental UHF CB repeater station into operation at Lysterfield, in the foothills of the Victorian Dandenong Ranges.

It was also Philips which sponsored a string of 'free' repeaters around Australia for public use after the green light was given by the Department.

So with a new entry into the CB communications stakes and an existing service on 27MHz still rapidly growing in the face of its own illegality, the problem was actually compounded instead of solved.

Then, with a stroke of sheer genius, P&T legalised 27MHz CB radio in Australia. This meant that any Australian could pay a licence fee permitting them to operate a 40-channel UHF CB radio or an 18-channel 27MHz CB radio...

Huh??? Wait on, there ain't no such thing as an 18-channel CB, or *is* there? Right the first time. P&T had unleashed another monster worthy of becoming a 1990s computer game. While the USA was busy expanding its 23-channel allocation to embrace 40 channels we were busy *reducing* an already insufficient band to 18 channels! Well done guys. And, to top it off, the new 18-channel rig was yet to even be designed. To make a long story short, the Department finally saw the light and eventually restored the status quo to 40 channels consigning God knows *how* many thousand now illegal 18-channel rigs to the big CB graveyard in the sky!

As with most popular trends, the early CB retailers reaped the rewards while late starters got caught up in the discount wars and achieved little in return for the heavy mortgages on their homes.

Then in one final, giant orgasm, the explosion which had carried so many dealers and operators on its wave of ecstasy was expended. Almost overnight, fanatical enthusiasm for CB radio waned and died — probably as much from congestion on the band as anything else — leaving hundreds of importers and retailers on a collision course with destiny and a set of downhill skids with no brakes.

In fact, interest in CB at this stage was so low and with loss of advertisers and circulation that we actually closed down CB Action for the first time. At the height of the boom, CB Action was carrying more than *twice* the number of pages you now see before you — and most of these were advertising.

So, in a few short years we had seen the rise and fall of an era. CB in Oz, which had began as a summer shower, quickly progressed to a deluge then just as quickly evaporated leaving barely a sign of its passing.

As history has demonstrated so many other times before, CB would become a cyclic phenomenon. While the near future wouldn't ever see CB reach quite the same heights as the initial boom or the same depths as the first collapse, it would continue to wax and wane in response to external influences like the solar activity cycle which is largely responsible for long range radio propagation on the high frequency band.

THE RANGE OF RIGS

The earliest rigs falling into the category of true CB transceivers probably began with a couple of old valve (electron tube) sets which appeared on the American market more than 25 years ago. A very few rare specimens of these turned up in local hands in the early days.

A few local innovators modified some low-band VHF commercial transceivers to operate on 27MHz, but they were generally poor performers with a few added channels for extra flexibility.

The lack of suitable equipment forced CB enthusiasts to consider modifying high-power amateur transceivers to operate on 27MHz, and while all CB was illegal during this period, it could be reasoned that the lack of foresight and inflexibility of the authorities of the day were partly to blame for not recognising the desire of the country's citizens to use two-way radio. While the SMA might not agree, the radio spectrum is as much part of public property as the air we breathe, and each and all deserve to share in its benefits as a personal communications medium.

The development of cheaper, more robust RF power transistors heralded a new era in miniaturisation for radio transmitters, allowing compactness of equipment previously unobtainable with valves. Valves sets required hefty power supplies to produce the high voltages required and separate low voltages to light the cathode heaters which boiled off the free electrons necessary for operation.

This new technology was quickly adopted by the radio industry and soon compact, efficient, economical mobile and portable transceivers suitable for CB were rolling off the assembly lines of Asia.

Initially, most 27MHz transceivers offered low-power transmitters (about three to five watts) with one to several

operating channels, the pairs of crystals being supplied by the user.

The demand for multi-channel CBs quickly grew, and when the USA introduced its 23-channel CB service it became immediately apparent that if the discreet channel method was retained every AM-only CB transceiver would require at least 46 individual crystals and single sideband sets would require maybe three times as many crystals.

Another technique known as crystal synthesis was employed to reduce the number of crystals required. Crystal synthesis used the principle of mixing the outputs of two oscillators together to produce new frequencies which were the sum or difference of the original crystal oscillator frequencies. In this way the outputs from one bank of four crystals could be mixed with another bank of six crystals to produce 24 different channels, one which was unused, accounting for the blank switch position on the old 23-channel CB transceivers. The space and cost savings of this method were instantly obvious...

The introduction of single sideband rigs compounded the problem, but crystal synthesis was retained in its various forms until about 1976/77. Around this time a world shortage of suitable quartz crystal forced manufacturers to search for a new method of frequency generation which was even more economical and effective than the existing crystal synthesisers.

It was simply a matter of supply and demand. All forms of radio communications were experiencing a worldwide boom and the demand for high-quality quartz crystal had outstripped the ability to grow the crystals. CB radios were now counted in the millions of units, and growth was increasing as European piracy added to the existing demand from America, Australia and New Zealand.

ENTER THE PLL

PLL is the abbreviation for **Phase Locked Loop** whose invention was the saviour of the radio communications industry and the birth of other industries like electronic music synthesisers. All present-day 40 channel 27MHz CB and UHF CB transceivers employ the PLL method of frequency synthesis.

A PLL frequency synthesiser in its basic form uses a reference frequency (one crystal) oscillator from which many frequencies are generated by electronic manipulation of the original frequency. Briefly, the constant reference frequency is divided in frequency by a logic circuit known as a *programmable divider* which, as its name implies, can be adjusted to divide by a variety of different numbers.

This 'division ratio' is controlled in a CB radio by the channel switch. Another device compares the difference between the new frequency and a tunable oscillator known as a **Voltage Controlled Oscillator** (VCO) and, if a difference is detected, a correction voltage is produced and passed to the VCO in order to lock the two frequencies together in unison. The **comparator** makes continuous measurements and correction voltage variations, thus causing the VCO to hold the new frequency almost as stable as the crystal reference signal.

If the division ratio is altered by the channel switch the comparator will immediately detect the difference in frequency and produce an error voltage to bring the VCO into check. Bingo. The output from one crystal can produce an almost *infinite* number of highly-stable new frequencies.

As a general rule of thumb, almost all 23-channel CB rigs used the crystal synthesis method of frequency generation while AUS model 18-channel and 40-channel AM and SSB transceivers employ the phase locked method.

WHAT DOES IT ALL MEAN?

In a recent issue of CBA we revisited the **Uniden AX-144** AM/SSB transceiver, which was one of the early PLL rigs on the market. The AX-144 remains virtually unaltered from the original model. Not because Uniden is lazy or disinterested but because, even with the continual advances over the past two decades, there isn't really much to report in improvements to fit into the CB budget.

The first UHF CB from Philips used two PLLs to produce the desired result, but the only really new innovation in current models is the addition of a computerised brain, the CPU or Central Processing Unit, which is used to manage the rig's vitals.

Of course there is also the brilliant GME-Electrophone remote head UHF, Hatadi's UF-2020 and a new Philips UHF coming up soon.

The only thing that varies dramatically in CB these days is the solar activity and its effect on HF propagation and the cyclic changes of band population in response to interest and economics.

With the Cycle 22 downturn HF CB is fairly quiet and many CBers have tumed to scanners and shortwave listening - but as you can see from this article - we've seen it all before.

Just look at the range back then - Kraco, Eversonic, XTAL, Johnson Viking, Bengal Base, Roberts and Granada - all 23 channel rigs. The Pace handheld is interesting as it came fitted with crystals for 27.085, 27.240, 27.880, 27.890 and 27.910 - legal out of band operation?

Bandspread

By Greg Towells

CB AROUND THE WORLD

Many CBers have experienced DX on 11 metres and many have managed contacts with other stations in overseas locations. Generally details such as local weather, happenings and equipment used come into the conversation, but how many readers have actually wondered about 'the' CB scene in these faraway countries? Do you know if the other station is fully legal or operating at the risk of his/her life? What frequencies are legal, and what sort of equipment is allowed? Have a look at the following and see what you think...

CB IN USA

This is where it all began, the home of 27 MHz CB, the source of the worldwide CB boom and the headache of countless administrations around the world. Things have changed greatly over the years for the US CBer. A licence is no longer required to operate a CB radio although for many years the FCC (Federal Communications Commission) required a Class D licence, which was simply a matter of a form and a licence fee.

The FCC then sent you a callsign something like KKR 3345. This was all abolished during the boom during the mid 70s when the FCC decided that the paperwork burden was not worth the effort and put CB under blanket authorisation.

CBers in the States are now permitted to identify themselves by either their old Class D callsign or their first and last initials and zip code (eg gjt 27600), or even by the operators' name or some unique nickname or handle. This certainly sounds like the unofficial operation on Australian CB channels! An additional rule change in 1992 now allows one-way transmissions about highway conditions on any CB bands.

This is to allow local authorities to use unattended audio warnings about road construction or other hazards.

The authorised frequencies for use by US CBers are identical to the Australian 27 MHz band, with similar power outputs. Any type of antenna system is also allowed.

There are also two additional radio bands beside CB which are intended for use by individuals with minimal regulation. These are the **GMRS** — the General Mobile Radio Service — and a microwave band between 31.0 and 31.3 GHz for GMRS and other licensed users.

GMRS is not specifically known as CB but rather as 'Personal' radio. There are eight repeater channels from 462.550 to 462.725 MHz in 25 kHz steps with inputs 5 MHz higher, and seven simplex low power-only channels 462.5625 to 462.7125 MHz, also in 25 kHz steps.

GMRS is used for mobile to mobile or base to mobile communications but base to base communications are prohibited.

Businesses cannot obtain GMRS licences and business communications are prohibited in this band after rule changes in 1989.

GMRS licensees can use the 31.0 to 31.3 GHz band for fixed and mobile use, with each transmitter location to be registered with the FCC. It seems that CB in Australia is a lot better than in the States, particularly as far as UHF CB goes...

EUROPEAN CB

A number of European countries have adopted the CEPT (Conference of European Postal and Telecommunications administrations) recommendations for CB radios.

These countries, at last headcount, are Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Luxembourg, Netherlands, Portugal, Norway, Sweden, United Kingdom, and Vatican City.

CEPT approval is significant and unique because, with some exceptions, CEPT-approved radios from any one of these countries may be used in any of the other member countries, under the terms of the originating country's licence.

Basically the frequencies used are 40 channels from 26.965 to 27.405 MHz, the same as the USA, 4 watts output but using frequency modulation (FM). Immediately that means that 'made for USA' radios cannot be used in Europe, nor can CEPT-approved radios be used in USA or Australia.

Like the situation concerning type approval in Australia, CEPT-approved radios must have a marking specifying CEPT approval. As an example, UK radios marked 'CEPT PR 27 GB' are legal for use throughout CEPT countries whereas a radio marked 'PR 27 GB' is not.

UK CB

A licence is required for operation in the UK. Licensing info and a set of CB information sheets is available from DTI (Department of Trade and Industry). Its address is CB Licensing Section, Radiocommunications Agency, Room 613, Waterloo Bridge House, Waterloo Road, London SE1 8UA, UK. Licences from other countries using CEPT-approved equipment are honored in the UK.

There are three CB bands available in the United Kingdom. These are:

- 26.965 to 27.405 MHz: 40 channels, same as CEPT and US, using FM with CEPT-approved radios.
- 27.6 to 27.99 MHz: 40 channels, 10 kHz spacing, 4 watts output. Radios

must carry the mark 27/81-U and are only legal for use in UK.

• 934.0125 to 934.9625 MHz: 20 channels, 50 kHz spacing and 4 watts output. Approved radios are marked CB 934/81 and are legal only in UK. No new radios of this type are being made but existing equipment may continue to be used.

Rigid restrictions on antennas apply in the UK. Antennæ must be omni-directional — beams and Yagis are illegal. Furthermore, antenna systems must stand vertically at a height no greater than 1.65 metres.

JAPANESE CB

There are three bands for CB use in Japan and none requires a licence for use. Two have low power limits and are restricted to very short range communications. The following are frequencies and power available for Japanese CBers:

• 26.968 to 27.144 MHz: AM only, no SSB. Maximum power is 500 milliwatts. Eight channels only for use, being 26.968, 26.976, 27.040, 27.080, 27.112, 27.120, and 27.144 MHz. Channels in between these are assigned to fishing vessels with one watt output.

• 421.8125 to 422.300 MHz: FM only. Known as Specific Low Power Radio. Granted in 1989, it is limited to 10 milliwatts (yes, that's 10mW, generous or what!) and is mainly used for handitalkies and ski patrols.

There are nine duplex channels and nine simplex channels with 12.5 kHz spacing.

• 903.0125 to 904.9875 MHz: Known as Personal Radio. Maximum power out is five watts using FM only.

There are 158 channels with 12.5 kHz spacing.

External antennas are permitted and, the best yet, radios must be equipped with a control ROM for automatic ID.

This should have been introduced at the start of our UHF CB here in Australia and would have made the ratbag an extinct species.

FRENCH CB

As of 1993, licences were not required to operate a CB in France. However there is a tax on new CBs sold which is approximately the same as the old licence fee.

Like most of Europe, France does not issue a callsign, so you may identify with any name you wish.

France will honor licences from other countries using CEPT-approved radios under the terms of the issuing country. Frequencies used are standard CEPT with AM, SSB and FM being permitted. Channel 19 AM is the calling channel, 11 FM is used for long distance contacts, and channel 27 AM is generally used for base station calling.

GERMAN CB

A licence *is* required for operation in this country. AM and FM operation is permitted although the 'agreement card' costs more if your radio has AM mode. CEPT radios and frequencies are used, SSB is not permitted and AM only on some channels. AM is allowed on channels 4 to 15 and FM on all channels.

Channel 4 FM is the calling channel with FM the most common mode used. Antennae systems must be vertically polarised.

ITALIAN CB

CEPT frequencies and radios are permitted, as are AM, FM and SSB modes with maximum power of four watts. Directional antennæ and tone squelch are not allowed. Channel 9 is the emergency channel with five used by truckers on AM. Operators using linear amplifiers are reputedly quite common.

CB IN RUSSIA

CBers in Russia are allowed the same frequencies as the US and CEPT. AM and FM are permitted with an output of four watts.

There is no restriction on distance of communications so it would seem that Russian CBers are the only ones worldwide to be legally able to work overseas DX.

OTHER COUNTRIES

• **Switzerland** uses FM on the CEPT frequencies, but CBers do not appear to be very common.

• Channel 19 is the calling channel in **Poland** and was also used for this purpose in the old **Czechoslovakia**.

• Calling channels in **Austria** are 4 and 9 AM.

• **Mexico** uses AM on the same frequencies as the US.

• **NZ** CB has been well documented in the pages of CBA in the past, however channels, power and modes permitted have been greatly increased since the introduction of CB there.

In virtually all countries where CB is legal, radios must be type-approved, meaning they must be manufactured specifically to comply with one or more countries' specifications.

They must be unmodified and properly marked for use in that country, or CEPT marked for use in countries that are signatories to that agreement.

An important hint for readers going overseas and thinking of bringing back a CEPT-type radio, UK 27MHz or other type of 27MHz CB radio to Australia.

The Prohibited Import (PI) regulations are very specific in prohibiting the import of non type-approved radios operating within the 27 MHz area into Australia.

If you attempt to bring back same, the radio will be seized by Customs unless you can prove it is type-approved for use in *this* country.

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S023CB

PRO-2022 SCANNER MODIFICATIONS

Here is a whole bundle of mods for the Realistic PRO-2022 scanner:

TURBO-SCAN

Some people would like a much faster scan/search rate. Well if eight channels a second scan rate is not fast enough, here is the answer.

Locate CX-1 (the ceramic oscillator) It is a rectangular white block on top of the main PCB behind the volume and squelch knobs.

You need to change this for a ceramic oscillator of a higher value. Use a standard CX-501 as fitted to a PRO-2004. Just order CX-501 for a 2004 from your Tandy shop. Its value is 7.37 MHz. (If you have a scrap CB rig you should find a 10.7 MHz inside.)

Turn your rig over and remove by de-soldering the large protective shield. Locate the legs of CX-1 and de-solder them. Now fit a socket to carry the new crystal; you can cut off three adjacent legs of a standard IC socket. Replace the shield and fit your new crystal into the socket. You will get 60 channels a second without losing any functions, using 7.37 MHz. And the scanner still stops at a signal!

Don't forget that there is a limit to which you can expect the scanner to whiz through frequencies and still stop when it finds one. As this crystal also times other functions check all controls after fitting.

DISPLAY LIGHT

Sometimes, when using a scanner at night, there can be situations where the display light is a distraction. The PRO-2022 can be easily fitted with an ON/OFF light switch.

Disconnect the scanner from the mains. Remove the covers and locate the Orange + lead going to the position marked EL (it is behind the display screen just in front of the transformer). Interrupting this lead with a small switch fitted to the rear panel gives you the ability to switch off the light at will. (You will need to use some extra wire to reach the rear of the set). You may be surprised to find that in daylight the display is easily read with no backlight at all, and at night either in the car or by the bedside your scanner will monitor the frequencies in discreet darkness.

FORCED AM/FM SWITCHING

One of the faults with many of the scanners on the market today is that they decide for you which reception mode the set is in for any given frequency. For the PRO-2022 this is NFM for everything other than air band. The problem is there is still other radio traffic using the AM mode.

As standard it is not possible to force the PRO-2022 into AM mode, but all you need is a single-pole switch, some wire and a soldering iron. You may fit the switch to either the front or rear panel.

On the main PCB find link JW48. (It is marked '-' just to the right of the mains transformer.) Cut JW48 and solder a length of wire from the right-hand side of this cut link to your switch. The other connection is made from the other side of the switch to the emitter of Q27. Q27 is on the underside of the PCB and is not marked, but is directly below and slightly above JW48. The diagram in the service manual identifies it clearly and shows a small unused solder pad connected to the emitter which is ideal to connect to.

That is all you need to do. Flicking the switch will now put the receiver into AM mode on any band.

FITTING A MAINS SOCKET

When using scanners in a car, the mains lead and plug are difficult to accommodate. All that is needed is to fit a small two-pin socket as used on most small cassette tape recorders to the back of the PRO-2022. This allows the whole mains lead to be removed. I would recommend experienced experimenters to proceed with this mod or find someone competent to carry it out. Proceed as follows:

1) DISCONNECT YOUR PRO-2022 FROM THE MAINS!!!

2) Cut the mains lead as close as possible to the back of your set.

3) Remove the four retaining screws and slide off the outer cover.

4) Using a small screwdriver, ease out the grommet holding the mains lead to the back of the rig.

5) Place the socket against the set and scribe around it to mark out the new hole required. Use a small flat or square needle file to enlarge the existing round hole to accept the socket. This should be a tight fit.

6) Mark the positions, remove the socket, and drill two small holes to secure the socket to the rear of the set. Fit the socket and pins.

7) Strip back the insulation from the mains lead inside the set and solder one wire to each of the post on the rear of your socket (either way around is okay). Insulate these with tape or sleeving.

8) Refit outer case and screws.

9) Fit plug onto the lead you cut from the PRO-2022.

You now have a much tidier PRO-2022, especially when mobile.

The PRO-2022 is a top quality scanner - it's even better with a few easy modifications carried out to improve performance.

DX Logbook

By Rob Williams

Welcome to the first SW column for 1994. If this is the first time you've seen the column then a special welcome to you. What we try to do here is pass on the latest news and information on SW broadcasting from around the world. All frequency are in kiloHertz (kHz) and all times are in UTC (expressed as 'z', but it's the same as GMT).

For our regular readers I say thanks for your support. Now on with the column...

WANT YOUR OWN SW STATION?

It was announced in Washington back in November that the **Voice of America** has put it relay station in Belize, Central America up for sale, as part of its requirements to meet budget constraints. The US Information Agency is going through a metamorphosis and needs to make cutbacks which will have minimum effects on its major services.

The station will cease broadcasting by the end of March and VOA plans to have moved out by the end of September this year. The relay station at Orange Point on the Gulf of Honduras, which occupies some 240 acres on lease from the government, relays Spanish and English programs to Honduras and Guatemala using two 100kW MW transmitters. Two directional antenna arrays, together with various pieces of peripheral equipment, are all included in the sale. The offer doesn't include the land or the right to transmit and will need approval from the government before the sale can proceed.

CHURCH TO SELL SW STATION

The Christian Science Church has agreed to sell **WCSN** to Prophecy Countdown, Inc for US$5 million. Prophecy Countdown is a Seventh Day Adventist group, but is not associated with the other Seventh Day broadcasting group AWR. It was planned to have up to 30 hours of programming on the air by January 17. The final sale is expected to be completed by September next. Prophecy Countdown is a non-profit organisation which already runs a television ministry, church and school.

BRUSSELS CALLING

Radio Vlaanderen International has the following sked 'til March 26 for English:

0730-0755z to Europe and Australia on 9925 kHz.
1000-1025z to Europe on 9925 kHz.
1400-1425z to Sth East Asia on 21,810 kHz.
1900-1925z and **2200-2225** to Europe on 5910 kHz.

German broadcasting's 41st year

1993 was a truly historic year for broadcasting in the new united Germany. Besides celebrating its 40th year of broadcasting, the European services of **Deutschlandfunk** was taken-over by **Radio Deutsche Welle**, at last meaning all international foreign language services were under the one roof.

As well, staff have been transferred from the German/American station **RIAS** to DW. On the down side, it has been decided to reduce staff over the next three years from 2140 to 1800 without reducing the high quality services which DW is renowned for.

Broadcasts to Asia and the Pacific are aired at two times, giving us a chance 'down-under' to keep up with events from one of the main players in the new united Europe:

0900-0950z on 6160, 11,715, 12,055, 17,780, 17,820, 21,650, 21,680 kHz, and **2100-2150z** on 6185, 9670, 9765, 11,785 kHz. DW, like many of the world's largest broadcasters, continues to expand its services, with emphasis put on satellite broadcasting rather than shortwave.

ALGIERS ON SW...

The international service of **Radio Algiers** transmits to Europe, Africa and the Middle East as follows: 1500-1600 in English and 1600-1700z in French on 11,715, 15,205 and 17,745; 1700-1800z in English on 7145; 2300-0000z on 9640 and 15,215 in Spanish.

MIDDLE EAST NEWS

The Voice Of The Islamic Republic Of Iran, which transmits from Teheran, has been reported on 11,790 between 1530 and 1627z. Thanks to *Sees Van Oudheusden* from the Netherlands for that logging.

The Voice Of Lebanon has been heard on 6550 kHz between 1800 and 1813z in English followed at 1815 to 1828z in French, also by Sees Van Oudheusden.

George Thurman reports a new frequency for **Radio for Peace International** to replace 7385 to 9375 kHz.

ELWA in English

Radio **ELWA** from Monrovia, which is the Christian religious station from the Sudan Interior Mission, is broadcasting in English from 0600 to 0830 and 1630 to 2200z on 4760 kHz. Its address is Box 10-192, 1000 Monrovia 10, Liberia. Thanks to that tip from the *Benelux DX Club.*

ISLAMABAD ENGLISH BROADCASTS

Radio Pakistan transmits with English at the following times:

0800-0900z to Europe on 17,900 and 21,520 kHz.
1600-1630z to Middle East on 9470, 11,570, 13,590 and 15,675 kHz.
1700-1800z to Europe on 7355 and 9855 kHz.

French can be heard from 1930 until 2030 on 9885 and 11,570 kHz.

ENGLISH BROADCASTS FROM ATHENS

English bulletins appear during the following Greek broadcasts from Greece.

0000-0350z to North America on 9380, 9420 and 11,645 kHz.
0800-0950z to Australia on 15,650 and 17,525 kHz.
1200-1250z to Central Africa on 9425, 11,645 and 15,650 kHz.
1300-1450z to Europe and North America on 15,630 and 17,515 kHz.
1800-1850z to South Africa on 15,630, 15,650 and 17,525 kHz.
1900-1950z to Europe on 7450 and 9380 kHz.
2200-2300z to South America on 9425 and 11,595 kHz and, finally,
2300-2350z to South America on 9425, 11,595 and 11,645 kHz.

POLISH ENGLISH VIA SW

Polish Radio from Warsaw has English broadcasts at the following times and is valid until March 27 next:

1300-1355z on 6135, 7145, 7270, 9525, 11,815.
1600-1655z on 7285, 9525.
1800-1855z on 5995, 7270, 7285 and
2030-2125z on 5995, 6135, 7285.

Thanks to *Reid Kelly* for that sked which was posted on Fidonet.

ENGLISH FROM SWAZILAND

TWR from Swaziland carries English broadcasts at the following times and frequencies until March 5:

0430 to 0530z to Central Africa on 7215 kHz.
0430 to 0700z to South Africa on 5055 kHz.
0530 to 0805z to South Africa on 6070 kHz.
0530 to 0805z on 11,740 kHz.
1600 to 1700z to East Africa on 9500 kHz.
1700 to 1715z to Central Africa on 9520 kHz.
1715 to 1730z to Malawi on 9520 kHz (Mon-Fri only).
1800 to 1845z to East Africa on 9500 kHz.
1800 to 2015z to South Africa on 3200 kHz.
1900 to 2045z to South Africa on 3240 kHz and
2015 to 2045z to South Africa on 3200 kHz (Sundays only).

Thanks to *Reid Kelly* for this sked.

WEWN'S SKED TO MARCH 27

English from **WEWN** is carried on the following frequencies:

0000 to 0800z on 7425 kHz to North America.
0100 to 0300z on 9825 kHz to India.
0900 to 1000z on 7425 kHz to Brazil.
0900 to 1000z on 7465 kHz to UK.
0800 to 1600z on 9350 kHz to North America.
1600 to 1800z on 13,615 kHz to North America.

1600 to 1700z on 17,510 kHz to UK.
1900 to 2000z on 9985 kHz to UK.
1800 to 2300z on 13,740 kHz to North America.
2100 to 2200z on 18,930 kHz to Brazil.
2300 to 0000z on 7425 kHz to North America.
2300 to 0000z on 11,820 kHz to Brazil.

Thanks to *John Kecskes* for providing the latest news on WEWN.

...AND MORE US NEWS...

WINB, from Red Lion, Pennsylvania, hit the news on *Media Network* with a report that, with small changes to its antenna, it can broadcast in the opposite direction to its regular target area. With its Rhombic antenna now being able to switch between 62° and 242° it can broadcast to Mexico.

Using an old 50 kW Continental transmitter which has just been re-built and put back on air, we have a far better chance of hearing the station. Its current sked is **1600 to 2345** to Europe on 15,295 kHz and **2345 to 0330** to Mexico on 15,145 kHz. The station had originally planned to re-built an old MW transmitter for use on SW, but this project has been stopped for the time being. The report went on to say that, with the assistance of a new frequency consultant, the station will be making frequency changes as the sun-spot count continues moving down.

SWISS NEWS AND VIEWS...

Swiss Radio International (SRI) has English broadcasts to these parts on the following frequencies:
0900 to 0930z to Australia on 9885, 13,685, 21,820 kHz.
1100 to 1130z to the Far East on 9885, 13,635 and 15,505 kHz.
1300 to 1330z to South East Asia on 13,635, 15,505, 11,690 and 7480 kHz.
To Asia at **1500 to 1530z** on 9455, 13,635 and 15,505 kHz.
The sked is valid until March 27 this year.

VOICE OF RUSSIA'S ENGLISH

One of the hardest tasks for DXers these days is trying to keep up with events inside the CIS. No only is it in political chaos, but many changes to the broadcasting scene make it just as hard to keep up with frequency changes.

So, as a hand to DXers, here is what I have available on the **Voice Of Russia** English broadcasts to Australia and the Asia region. By the time this column hits the streets you can be assured that there will have been changes to the sked, but at least it's a starting point!

South-East Asia
2100-0100z 7185, 7255, 7170, 9510, 15,210 kHz
0100-0200z 7255, 11,925, 15,160, 15,210, 15,295, 15,505, 21,750 kHz
0200-0300z 11,925, 15,160, 15,210, 15,295, 15,505, 21,635, 21,750 kHz
0300-0800z 11,925, 15,160, 15,220, 15,295, 15,505, 21,565, 21,635, 21,750 kHz
0800-0900z 15,160, 15,220, 12,295, 17,795, 21,635, 21,750 kHz
0900-1000z 7170, 15,210, 15,220, 15,295, 17,795, 21,635, 21,750 kHz
1000-1400z 7170, 7185, 9675, 15,210, 21,750 (21,635) kHz
1400-1600z 7185, 9600, 9675, 11,860 kHz
1600-1700z 7220, 11,820, 11,860 kHz
1700-1900z 7220 kHz
1900-2000z 9510, 11,975 kHz
2000-2100z 7185, 9510, 11,975 kHz

FAR EAST AND AUSTRALIA

2100-2400z 6145, 7170, 7185, 7235, 7270, 9510, 9865, 11,975, 15,210 kHz
0000-0300z 7160, 7170, 9510, 9625, 9865, 15,210, 15,505, 21,750 kHz
0300-0400z 9625, 9855, 9865, 15,160, 15,295, 21,505, 21,635, 21,750 kHz
0400-0600z 9625, 9855, 9865, 11,675, 13,625, 15,260, 15,295, 15,505, 21,565, 21,635, 21,750 kHz
0600-0900z 9625, 9855, 9865, 11,675, 11,740, 13,625, 15,260, 15,295, 15,505, 21,565, 21,635, 21,750 kHz
0900-1300z 4810, 6145, 7170, 7185, 7245, 7270, 9625, 9675, 9845, 9895, 9600, 15,210, 21,750 kHz
1300-1500z 4810, 6145, 7185, 7270, 7245, 9625, 9675, 9600, 9845, 15,210, 21,760 kHz
1500-1600z 4810, 6145, 7185, 7270, 9600, 9675, 9845, 11,820 kHz
1600-1700z 7220, 11,820 kHz
1700-1800z 7220 kHz
1800-1900z 7220, 7235 kHz
1900-2000z 7235, 9510, 11,975 kHz
2000-2100z 6145, 7185, 7235, 9510, 9865, 11,975 kHz

NEWS FROM THE AWR CAMP

Dr Adrian Peterson, well know SW DXer and radio announcer, recently reported in *DX Post*, the monthly magazine from the Southern Cross DX Club, that the station **Union Radio, AWR**-Guatemala is on the air in Spanish and English on 5980 between 1100 and 0200z.

The SW transmitter is a 10 kW unit currently operating at around 3.5 kW. At a recent AWR board meeting, confirmation was given that the 5kW sender currently in use at AWR-Costa Rica will be moving to Guatemala City and will provide additional programming on an additional channel most likely in the 25 metre band to residents of Guatemala.

Dr Peterson went on the explain that AWR plans to expand its usage of SW transmitters in Russia. AWR's **Voice of Hope** stations are linked by landline to Radio Moscow which then feeds the program out to the relay stations. Its plans call for using the following sites and power during 1994:

site	**number and power of transmitters**
Moscow	two 250 kW
Ekaterinburg	two 100 kW
Samara	one 250 kW
Novosibirsk	two 100 kW

And while we're on the subject of DX clubs, let me remind you that if you are interested in joining a DX club and want to keep up with the latest news (besides what you read here in CBA and in ARA, of course) then take a look at the *Southern Cross DX Club*.

Based in Adelaide, its monthly magazine covers the whole gamut of radio broadcasting, and is a very good starting point for any SW DXer. The club's annual membership fee is $25 for Australians and $33 for our readers in New Zealand and PNG. The address is GPO Box 1487, Adelaide SA 5001.

And that ends the SW news for this edition. As always, if you wish to contact me with a question or with some information you would like to share through this column drop me a letter at:

PO Box 108,
Minto, NSW 2566.

If you want a reply please include a SSAE.
See you next time around.

11 METRE BAND DXCC COUNTRIES LISTING

Compiled by Jack D. Haden

With DX conditions on the 11 metre band deteriorating quite quickly one now has plenty of time to rummage through the QSL cards collected in the past 12 months or so.
Now is an ideal time to sift through them and see where they all actually *do* come from in relation to DXCC status.
The observant will no doubt notice that some countries are still missing from the following listing.
The reason for this is that details provided to me were conflicting and thus rather than run with the possibility of wrong information I elected to let it be and list it as it was in the last annual listing.
Some deletions still stand, prefixes yet to be reallocated, and of course the usual additions have been inserted where information has found to be correct in every respect.
Countries that have yet to be added to the listing for various reasons are: Eritrea, North Korea, Macedonia, and Bosnia Herzegovina.
A possible new one to the DXCC ranks could be Pratas Island which lies off Taiwan, however, there is only a "dollar each way" on its eventual chance of making it to the listings as a new one.
Just sit back and wait and see.
Of course if you hear it, WFWL - *work first and worry later!*
As you will no doubt notice, the 179 prefix, previously Czechoslavakia, is left deleted (void).
I cannot understand why this happened as either the Czech or Slovakia Republic could have been left there and thus saved a lot of messing about issuing an extra new prefix.
Then again, some of the so called "DX hierachy" on 11 metres have yet to adopt a more professional attitude on DXCC changes as in the case of our radio amateur "brothers".
Anyway, what you see is what you get, and in reality I suppose it is better than nothing,
Good luck with your DXing pursuits.. *Jack Haden.*

Number	Country	Zone	Worked	QSL Rcvd
1	Italy	EU		
2	U.S.A	NA		
3	Brazil	SA		
4	Argentina	SA		
5	Venezuela	SA		
6	Colombia	SA		
7	Neth Antilles	SA		
8	Peru	SA		
9	Canada	NA		
10	Mexico	NA		
11	Puerto Rico - WI	NA		
12	Uruguay	SA		
13	Fed Rep of Germany	EU		
14	France	EU		
15	Switzerland	EU		
16	Belgium	EU		
17	Hawaiian Islands	OC		
18	Greece	EU		
19	Netherlands	EU		
20	Norway	EU		
21	Sweden	EU		
22	French Guyana	SA		
23	Jamaica - WI	NA		
24	Panama	NA		
25	Japan	AS		
26	United Kingdom (G,B)	EU		
27	Iceland	EU		
28	Honduras	NA		
29	Rep of Ireland (Eire)	EU		
30	Spain	EU		
31	Portugal	EU		
32	Chile	SA		
33	Alaska	NA		
34	Canary Islands	AF		
35	Austria	EU		
36	San Marino	EU		
37	Dominican Rep	NA		
38	Greenland	NA		
39	Angola	AF		
40	Leichenstein	EU		
41	New Zealand	OC		
42	Liberia	AF		
43	Australia	OC		
44	Rep of South Africa	AF		
45	Serbia	EU		
46	deleted see 13 prefix			
47	Denmark	EU		
48	Saudi Arabia	AS		
49	Balearic Islands	EU		
50	Rep of Russia	FU		
51	Andorra	EU		
52	Faroe Islands	EU		
53	El Salvador	NA		
54	Luxembourg	EU		
55	Gibraltar	EU		
56	Finland	EU		
57	India	AS		
58	East Malaysia	OC		
59	Rodi Dodecanese	EU		
60	Hong Kong	AS		
61	Ecuador	SA		
62	Guam Island	OC		
63	St Helena Island	AF		
64	Senegal	AF		
65	Sierra Leone	AF		
66	Mauritania	AF		
67	Paraguay	SA		
68	Northern Ireland	EU		
69	Costa Rica	SA		
70	American Samoa	OC		
71	Midway Island	OC		
72	Guatemala	NA		

Number	Country	Zone	Worked	QSL Rcvd
73	Suriname	SA		
74	Rep of Namibia	AF		
75	Azores Islands	EU		
76	Morocco	AF		
77	Ghana	AF		
78	Zambia	AF		
79	Philippines	AS		
80	Bolivia	SA		
81	San Andres /Providencia	NA		
82	Guantanamo Bay	NA		
83	Tanzania	AF		
84	Ivory Coast	AF		
85	Zimbabwe	AF		
86	Kingdom of Nepal	AS		
87	deleted...see 323 prefix			
88	Cuba	NA		
89	Nigeria	AF		
90	Crete Island	EU		
91	Indonesia	AS		
92	Libya	AF		
93	Malta	EU		
94	United Arab Emirates	AS		
95	Mongolia	AS		
96	Kingdom of Tonga	OC		
97	Israel	AS		
98	Singapore	AS		
99	Rep of Fiji	OC		
100	Rep of South Korea	AS		
101	Papua New Guinea	OC		
102	Kuwait	AS		
103	Haiti - WI	NA		
104	Corsica Island	EU		
105	Botswana	AF		
106	Ceuta & Melilla	AF		
107	Monaco Prin'lity	EU		
108	Scotland U.K	EU		
109	Hungary	EU		
110	Cyprus	AS		
111	Jordan	AS		
112	Lebanon	AS		
113	West Malaysia	AS		
114	Pakistan	AS		
115	Qatar	AS		
116	Turkey	AS/EU		
117	Egypt	AF		
118	The Gambia	AF		
119	Madeira Islands	AF		
120	Antigua & Barbuda	NA		
121	Bahamas-WI	NA		
122	Barbados-WI	NA		
123	Bermuda Island	NA		
124	Amsterdam & St Paul Is	AF		
125	Cayman Islands - WI	NA		
126	Nicaragua	NA		
127	U.S. Virgin Is	NA		
128	British Virgin Is	NA		
129	Macquarie Island	OC		
130	Norfolk Island	OC		
131	Guyana	SA		
132	Rep Marshall Islands	OC		
133	Mariana Islands	OC		
134	Rep of Belau (Palau)	OC		
135	Solomon Islands	OC		
136	Martinique Is FWI	NA		
137	Isle of Man U.K	EU		
138	Vatican City	EU		
139	deleted...see 323 prefix			
140	Chilean Antarctica	AN		
141	St Pierre/Miquelon Is	NA		
142	Lesotho	AF		
143	Saint Lucia Island	NA		
144	Easter Island	OC		
145	Galapagos Islands	SA		
146	Algeria	AF		
147	Tunisia	AF		
148	Ascension Island	AF		
149	Laccadive Islands	AS		
150	State of Bahrain	AS		
151	Islamic Rep of Iraq	AS		
152	Maldive Islands	AS/AF		
153	Kingdom of Thailand	AS		
154	Islamic Rep of Iran	AS		
155	Taiwan R.O.C	AS		
156	Cameroon	AF		
157	Montserrat- WI	NA		
158	Trinidad & Tobago- WI	SA		
159	Somalia	AF		
160	Sudan	AF		
161	Poland	EU		
162	Zaire	AF		
163	Wales U.K	EU		
164	Togo	AF		
165	Sardinia Island	EU		
166	St Maarten Saba Eustatius Is	NA		
167	Jersey Island UK	EU		
168	Mauritius Island	AF		
169	Guernsey Island UK	EU		
170	Burkina Faso	AF		
171	Svalbard Island	EU		
172	New Caledonia	OC		
173	Reunion Island	AF		
174	Uganda	AF		
175	Chad	AF		
176	Central African Rep	AF		
177	Sri Lanka Island	AF		
178	Bulgaria	EU		
179	deleted...see 329/330 prefixes			
180	Sultanate of Oman	AS		
181	Syria	AS		
182	Guinea Republic	AF		
183	Benin	AF		
184	Burundi	AF		
185	Comoros Islands	AF		
186	Djibouti	AF		
187	Kenya	AF		
188	Malagasy Republic	AF		
189	Mayotte Island	AF		
190	Seychelles Islands	AF		
191	Swaziland	AF		
192	Cocos Is (C. America)	NA		
193	Cocos Keeling Islands	OC		
194	Dominica Island - WI	NA		
195	Grenada - WI	NA		
196	Guadeloupe FWI	NA		
197	Rep of Vanuatu	OC		
198	Falkland Islands	SA		
199	Equatorial Guinea	AF		
200	South Shetland Islands	SA		
201	French Polynesia	OC		
202	Bhutan	AS		
203	China	AS		
204	Mozambique	AF		
205	Cape Verde Islands	AF		
206	Ethiopia	AF		
207	Saint Martin Island	NA		
208	Glorioso Island	AF		
209	Juan De Nova Island	AF		
210	Wallis & Futuna Islands	OC		
211	Jan Mayen Island	EU		
212	Aland Islands	EU		
213	Market Reef	EU		
214	Congo	AF		
215	Gabon	AF		
216	Mali	AF		
217	Christmas Island	OC		
219	Anguilla - WI	NA		
220	St Vincent & Dep	NA		
221	South Orkney Islands	SA		
222	Sandwich Islands	SA		
223	Western Samoa	OC		
224	Western Kiribati	OC		
225	Sultanate of Brunei	OC		
226	Malawi	AF		
227	Rwanda	AF		
228	Chagos Archipelago	AF		
229	Heard Island	AF		
230	Fed States of Micronesia	OC		
231	St Peter & St Paul Rocks	SA		
232	Aruba DWI	SA		
233	Romania	EU		
234	Afghanistan	AS		
235	I.T.U Geneva	EU		
236	Bangladesh	AS		
237	Myanmar (Burma)	AS		
238	Cambodia (Kampuchea)	AS		
239	Laos	AS		
240	Macau	AS		
241	Spratly Islands	AS		
242	Vietnam	AS		
243	Agalega & St Brandon Is	AF		
244	Patalu Island	AF		
245	Niger	AF		
246	Sao Tome & Principe Is	AF		
247	Navassa Island	NA		
248	Turks & Cocos Islands	NA		

Number	Country	Zone	Worked	QSL Rcvd
249	North Cook Islands	OC		
250	South Cook Islands	OC		
251	Albania	EU		
252	Revilla Gigedo Island	NA		
253	Andaman & Nicobar Islands	AS		
254	Mount Athos (Greece)	EU		
255	Kerguelen Island	AF		
256	Prince Edward /Marion Is	AF		
257	Rodriguez Island	AF		
258	Tristan de Cunha Island	AF		
259	Tromelin Island	AF		
260	Baker & Howland Island	OC		
261	Chatham Islands	OC		
262	Johnston Atoll	OC		
263	Kermadec Island	OC		
264	Kingman Reef	OC		
266	Eastern Kiribati	OC		
267	Kure Island	OC		
268	Lord Howe Island	OC		
269	Mellish Reef	OC		
270	Minami Torishima Island	OC		
271	Rep of Nauru	OC		
272	Niue Island	OC		
273	Palmyra & Jarvis Island	OC		
274	Pitcairn Island	OC		
275	Tokelau Islands	OC		
276	Tuvalu Islands	OC		
277	Sable Islands	NA		
278	Wake Island	OC		
279	Willis Island	OC		
280	Aves Island	NA		
281	Ogasawara Island	AS		
282	Auckland & Campbell Islands	OC		
283	St Kitts/Nevis Is	NA		
284	Saint Paul Island	NA		
285	Fernando de Noronha Is	SA		
286	Juan Fernandez Island	SA		
287	Malpelo Island	SA		
288	San Felix & Ambrosio	SA		
289	South Georgia Island	SA		
290	Trindad & Martin Vaaz Is	SA		
291	Sovereign Base Cyprus	AS		
292	deleted...July 1993			
293	Guinea Bissau	AF		
294	Peter 1 Island	AN		
295	Sudan	AF		
296	Clipperton Island	NA		
297	Crozet Islands	AF		
299	Desecheo Island	NA		
300	West Sahara & Rio de Oro	AF		

Number	Country	Zone	Worked	QSL Rcvd
301	Armenia	AS		
302	Asiatic Russia	AS		
304	Estonia	EU		
3Q5	Franz Josef Land	EU		
306	Georgia	AS		
307	Kaliningrad	EU		
308	Kazakhstan	AS		
309	Kirghizia	AS		
310	Latvia	EU		
311	Lithuania	EU		
312	Moldavia	EU		
313	Ta jikistan	AS		
314	Turkmenistan	AS		
315	Ukraine	EU		
316	Uzbekistan	AS		
317	Byelorussia	EU		
318	Sov Mil Order of Malta	EU		
319	U.N HQ New York	NA		
320	Banaba (Ocean) Island	OC		
321	Conway Reef (Fiji)	OC		
322	Walvis Bay	AF		
323	Yemen Republic	AS		
324	Penguin Islands	AF		
325	Rotuma Island	OC		
326	Malyi Vysotski Island	EU		
327	Rep of Croatia	EU		
328	Rep of Slovenia	EU		
329	Czech Republic	EU		
330	Republic of Slovakia	EU		
331				
332				
333				
334				
335				
336				
337				
338				
339				
340				

ZONES

AF = Africa
AN = Antarctica
AS = Asia
EU = Europe
NA = North America
OC = Oceania
SA = South America

ADDITIONAL NOTES

The prefixes 331 through to 340 have been left blank for your future use as the time you read this there may be one or two new countries to add to the listing.

Eritrea should be a new one for the list by the time you read this. Also there should be some firrn decision on the entrance of North Korea to the listing if not by now, very soon

YOU ASK THE QUESTIONS AND WE'LL ANSWER THEM

Technical expert Ken Reynolds provides the answers to your questions.

WHAT IMPEDANCE CABLE?

I have got a real mess of RG-59, 75 ohm co-axial cable my Dad brought home from a job he was doing. I was going to use it on my CB but a bloke at the local CB shop said I should use RG-58, 50 ohm impedance cable instead. Is this true or was he just kidding me? The two cables look the same to me. If they are different, what makes the difference.

From John in Randwick, NSW

ANSWER

The `bloke' in the shop is absolutely right. For CB you need 50 ohm impedance cable and RG-58 is the right code number for the smaller cable whereas RG-213 is the most common description for the larger cable used for CB.

You could use the 75 ohm cable if you really wanted to but the SWR (SWeR) would be detrimentally effected. It would be best to use the correct cable.

Describing the difference between the two cables is not so easily understood without some basic electronic knowledge, however, let's have a go.

The `characteristic' impedance of co-axial is described mathematically by the following not too difficult formula:

Zo = 138 x log of D/d

Where:

Zo = Characteristic Impedance

log = Logarithm based on 10

D = inside diameter of the outer conductor

d = outside diameter of the inner conductor

** assuming the dielectric is air (see diagram).*

Pretty easy really isn't it?

There is another factor not mentioned in the formula above which relates to the `dielectric' which is simply the insulating material used between the two conductors.

This is known as the dielectric constant. Air usually represents a dielectric constant of `1' so we can leave it out of the expression.

For dielectrics other than air the dielectric constant must be considered - but let's not complicate the issue too much.

While the formula describes how to make a coaxial cable of a nominated characteristic impedance it does not help us understand the real definition of characteristic impedance.

The name `characteristic impedance' implies that this is the underlying cable impedance under all operating conditions - which is essentially true.

Therefore we have to accept that this argument is true at all possible operating frequencies.

In electronics there are three main factors:-

1. resistance of a conductor

2. capacitance

3. inductance

These three components are present in coaxial cable and in combination it is these factors that will ultimately control the final result.

Resistance of a conductor is the most commonly recognised factor caused by the ability of the conductor - copper conductor in this case - to `resist' the passage of an electric current.

This is a linear component and the longer the cable the greater will be the loss.

Capacitance occurs when an alternating current - the polarity continually reverses - is applied to a pair of conductors insulated from each other as in the case of the inner and outer conductors of a co-axial cable.

The distance between the conductors and the type of insulation material also has a bearing on the outcome.

This is a bit tricky to understand, but, when a voltage is applied to the two conductors it forces a small current to flow until one conductor (plate) has a surplus of electrons and the other conductor (plate) has a deficiency of electrons.

he amount of electrons `stored' in this condition is described as the `capacity' of the network involved - the value of capacitance.

The longer and larger the pair of conductors the larger the volume of electrons moved and in turn the larger the value of capacitance.

In a Direct Current circuit where the conditions remain the same after the circuit is connected the result is fairly insignificant. However, when an alternating voltage is applied - as in radio frequency voltages - the small initial current that flowed into the `capacitor' finds that the voltage which caused it to happen is changing and actually reversing in polarity.

To comply with those laws of physics called into action the reversing voltage will cause the current flow to also be reversed and the electron surplus in one conductor will flow into the other thus leaving a deficiency here.

Imagine this process occurring 27 million times per second and you can begin to see the dynamics that apply at 27MHz CB - not to mention the struggle occurring at UHF CB.

If there's something you want to know, drop us a line and we'll pass the query to tech-expert Ken Reynolds who will, hopefully, be able to give you the answer.

Very large values of capacitance can store immense quantities of electrons and what can appear to be a `black-box' with two terminals can store lethal energy sufficient to kill `10-men' or vapourise a heavy metal conductor used to short circuit the component

ARC OF THE COVENANT

Around a conductor carrying electrical current there exists a magnetic field.

You can prove this with a battery and a small coil of wire and a magnetic compass.

Set a current flowing in the wire and the compass needle will respond with movement as the coil of wire is brought into the sphere of influence.

Once this magnetic field is created it resists change - especially changes of large magnitude - and should the current that produced it be removed the magnetic field collapses back towards the wire at great speed causing it to act like a generator and produce its own `reactionary' voltage in the conductor.

The process of the collapsing magnetic field actually returns energy back to the conductor by generating this new current with its voltage and current in the opposite direction to the force that produced it.

Again, if an alternating current is applied to the circuit, this resistance to the change in magnetic field will again be produced, its value determined by the `inductance' or the conductor concerned.

The principles of inductance mentioned here are the main factors involved in generating electricity and using the generated energy to drive an electric motor.

If we consider a length of co-axial cable and its inherent electrical properties, we find that the copper wire has resistance and inductance combined with capacitance between the conductors the value of which relates to the size of the conductors and the type of material that holds them apart.

The longer the cable the greater will be the value of all the components - Resistance, Capacitance and Inductance.

Now if we take a infinitely long piece of our selected cable - any impedance or frequency will do - and connect a test signal source to one end the energy flowing into the cable will reach a point of equilibrium with the combination of resistance, capacitance and inductance existing in that cable where all the energy will be absorbed by the cable and nothing will be returned to the source - and none of the original energy can be detected at the other end.

The cable will exhibit a certain impedance - a combination of the three factors - equivalent to a certain value of pure resistance. This is the characteristic impedance of the cable.

At most frequencies the length of cable will be quite finite and the higher the frequency the shorter the cable length will need to be to ascertain its characteristic impedance.

We can also see from this that lower frequencies will incur less loss than the higher frequencies whose polarities change so quickly that the capacitance of the cable does not have time to fill up before the voltage reverses and similarly the inductance becomes monumental compared with the frequency over a very finite cable length.

The dynamic resistance of the conductors also changes but that's another story.

WHAT KIND OF MATCH?

I built the 11 element UHF beam project in CBA (May/June 1992 issue) and found that it worked very well ,but, a couple of my friends say I should use a folded dipole for the feed element because it is better than the one shown in the magazine.

Is it worth the trouble to change the feed?

ANSWER

In a word, NO.

The driven element described in the project is ideal for this particular antenna - it is easy to build, gives a good match and does not require any special construction techniques.

The driven element style has been raised many times over the years since the project was first published about ten years ago. If you wanted you could substitute a `gamma' match on the driven element, which, contrary to popular belief, performs quite well at UHF CB. The only real drawback with the gamma match is that its use may skew the beam's radiation pattern a little to one side which, if you think about it, does not alter the situation much at all.

This occurs because a gamma match is known as an unbalanced tuning network. Once you know the individual characteristic of your beam and how the pattern has changed, there should not be any confusion.

As it happens, few operators would know exactly how symmetrical is the pattern of their UHF beam (or vertical for that matter either)...it works and that's basically good enough.

There is nothing wrong with using a folded dipole on a Yagi style beam antenna and it is especially useful on beams intended for commercial use where a manufacturer produces several models with medium gain designed to cover relatively large chunks of spectrum.

In this way there is no need to manufacture a different antenna for every few megahertz of band as just a few models cover the whole UHF band from 450MHz to 520MHz.

Since UHF CB uses only one megahertz of the UHF spectrum, a beam need not cover any more bandwidth than one megahertz.

In fact, it is very desirable for your UHF CB antenna to offer minimum band coverage for a very good reason...INTERFERENCE!

Many UHF operators - especially in areas of concentrated commercial, high power Group Site activity - suffer `break-over' or `bleed-over' signals from those stations, or at least largely caused by those stations. Because UHF CB transceivers are `de-rated or de-tuned' when compared with their business radio counterparts, their propensity to be interfered with is much higher.

A folded dipole antenna - driven element in this case - is intrinsically a very wide bandwidth radiator and when operated alone it might conceivably radiate efficiently with an acceptable VSWR (reflection co-efficient) over a bandwidth of 40 to 50MHz in the UHF band. When used as the driven element on a beam antenna the other elements tend to restrict the effective bandwidth to some extent but the antenna could still cover many megahertz. The matching network described in the project has a relatively narrow bandwidth - a gamma match is usually even narrower - and it should now become obvious that this type of driven element, while offering proper performance on the desired frequency, is actually beneficial with a tendency to reject out-of-band signals.

In fact, the performance of the project antenna drops off fairly quickly either side of the UHF CB design frequency and actually is a fairly narrow bandpass filter for the desired range of frequencies while attenuating a wide range of unwanted frequencies.

And when you suffer from `bleedover' problems every decibel rejection of the problem signal is a help.

Scanning 1994

By Russell Bryant

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

SCANNING THE WIRELESS MICROPHONE BANDS

Hands up all those readers who own scanners which cover the 800 to 1,000 MHz band. Those who know where the cellular band starts and finishes, keep your hands up. Now for the tough question: How many of you who own a scanner capable of receiving 900 MHz allocation know what is above the cellphone band? Not too many hands showing now!

Tucked away at the lower end of the 900 MHz allocation is a band allocated to something we have all seen yet many take for granted, the **wireless microphone systems** used by television stations, rock and roll bands, convention halls, department stores and just about anyone else that needs roving public address facilities.

LOW POWER, LOW RANGE

Scanning the elusive devices is not easy. They are of extremely low power (around 100-200 milliwatts), and are usually confined to TV studios, entertainment centres and shopping malls. It will take a little bit of leg work on your behalf to be able to monitor what's going on... but then, that is what scanning is all about — detective work.

Whenever I talk to people about scanning wireless mics, the first thing they mention is "...all you can hear is what's going over the speakers...", but that's not so.

The control of the microphones is up to the sound engineer or audio switcher. They turn mics on and off, as well as balance the audio so that no one mic overrides another. The switcher is capable of hearing what is coming in from each microphone in the group, even though the PA speakers may be quiet. Sometimes people forget they are 'wired for sound', as it were, and say things they shouldn't.

HOT MIC, HOT COMMENTS

Of course, if an audio controller keeps the mic 'hot', then everyone hears the comment or expletive. Probably the most interesting part of pursuing wireless microphone is when you are not within the studio, concert hall or whatever, and are able to catch the entertainment.

During outside broadcasts, the production of movies and television programs, wireless microphones are employed to deliver audio back to the sound technician, who then records the sound track. This eliminates the need for a boom operator to follow, out of shot, the actors/personalities around the set in order to capture what is being said. Again, not everything is suitable for transmission to the general public! Only a smart scanner owner near the action will know the true story.

To avoid co-channel interference between microphones, their frequencies are divided into groups. Generally, microphones operating on frequencies from within a group can be used simultaneously in the same place at the same time. Units from different groups, used in proximity to each other must be at least 100 metres apart or shielded to avoid interference.

MAGIC NUMBERS

The frequencies, groups and channels for the wireless microphone systems approved for use in Australia are:

GROUP	CHANNEL	FREQUENCY
1	11	902.75
	12	904.00
	13	905.00
	14	908.25
	15	909.00
	16	911.00
	17	912.75
	18	915.75
2	21	908.50
	22	909.75
	23	910.75
	24	914.00
	25	914.75
	26	916.75
	27	918.50
	28	921.50
3	31	914.25
	32	917.25
	33	919.00
	34	921.00
	35	921.75
	36	925.00
	37	926.00
	38	927.25

IN THE OLD USA...

As I said, the above channels are the official bands for Australia. American enthusiasts have an entirely different set of frequencies to tune to, as many of the above frequencies fall in a uniquely-American amateur band. Their frequencies are:

GROUP	CHANNEL	FREQUENCY
1	11	947.25
	12	948.25
	13	950.25
	14	951.75
	15	949.00
2	21	947.75
	22	949.75
	23	950.75
	24	951.25
	25	948.50
3	31	949.25
	32	948.75
	33	950.00
	34	951.50

FOREIGN IMPORTS

As with many things in this world, just because the American system is not approved for Australian conditions doesn't mean their gear is not used here! I would imagine that because they can be purchased for considerably less than the domestic product, foreign wireless microphone systems have found their way to Australia.

Because they are of such low power and limited range, unless a (highly unlikely) complaint about interference was made to the authorities, no one would ever be any the wiser.

As always, if you monitor any activity on the above frequencies, remember where you read about it and drop us a line here at SCAN.

MAILBAG

For me 1993 was a very busy year. A return to shift work meant not having the time to devote to other things, such as family, friends and pastimes.

My involvement with compiling the **Handbook of Australian Railway Frequencies** Second Edition, further reduced my spare time.

Accordingly, in an effort to reduce the

Continued over page...

backlog of mail which built up over this period, here is almost an entire column of Questions and Answers which readers have sent in!

LOOK UP IN THE SKY...

DC, Bathurst NSW is first up with a list of airband frequencies: 122.750 outside 160NM west of Sydney, 128.200 Sydney Control (Cobar), 132.800 northwest of Broken Hill, 128.100 Moomba area, 128.850 Alice Springs, 131.800 Ayers Rock, 132.900 Oodnadatta, 135.000 south of Mt Hope, 135.400 Woomera SA, 132.700 Nullarbor, 130.900 Warburton WA, 134.200 Caiguna WA, 133.200 Esperance WA. The airband frequencies listed for Mt Canobolas at Orange NSW are: 118.500, 125.000, 127.300, 128.400 and, finally, 134.700 FM for CAA technicians. With the exception of 134.7 MHz all other frequencies are AM.

FASTER THAN A SPEEDING BULLET...

AG, Templestowe VIC visited the 1993 Grand Prix at Adelaide, calling it 'scanner heaven'. Here is the list of services and radio users he monitored whilst checking out the action trackside, and above. Also included is a general list from Melbourne: 126.200 AM RAAF Roulettes at the AFL Grand Final, 133.900 AM Roulettes at the Grand Prix, 160.210 Calder Park Drag and NASCAR Marshals, 461.675/452.175 Triple M's Traffic Doctor, 462.625 RTA Traffic Control, Triple M helicopter can be heard here also. In Melbourne 466.325 is used by the Melbourne City Council Parking Inspectors, 467.300 Doncaster Shoppingtown, 470.250 Herald-Sun Newspapers, 470.900 Myer Stores Security, 487.425 ABC TV, 491.675 GTV-9 Helicopter, 492.550 GTV-9 OB units and, finally, 507.675 Lube Mobile Mechanics.

Qantas/Australian company channels are 129.500 AM, 130.850 AM and 132.650 AM. For Ansett try 130.650 AM. When the Victorian state trunking network is fully up and running I will do a write up on it and how to monitor it.

AND FROM MACKAY...

DO, Mackay QLD checks in with some of the frequencies he listens to in the northern Queensland City: The police in Mackay use 76.520, Proserpine to Mackay 76.430, Moranbah 76.550, Mackay City Buses 469.450, the local taxi company has a link on 460.300, and a commercial repeater is fed using 460.425. The local airport tower uses 124.500 AM, whilst the ATIS is on 128.000 AM, another ATIS can be monitored on 119.850 AM. Amateur groups have a repeater VK4RMK on 147.000 and use 146.525 to talk amongst themselves. For railway activity search between 418 and 420 MHz.

BEARCAT MYSTERY

GP, Warooka SA asks if I was correct in saying that the Bearcat 100XLT will not support 800 MHz channels, especially since the radio displays several 800 MHz frequencies after the processor has been reset.

Firstly, the 100 XLT doesn't have the necessary electronic bits and pieces to receive 800 MHz transmissions. The frequencies that appear after the resetting process are simply those entered into the PLL by the factory for testing purposes. The display will show, if memory serves me correctly, 30 MHz frequencies as well, but will not receive these either because the radio is set up for the Australian market, 68-88 MHz.

The memory retention circuit within the Bearcat 100/200 series hand-held scanners is a large capacitor which discharges slowly, acting somewhat like a rechargeable battery. Yours loses its grunt slower than most, a characteristic unique to your scanner.

After entering the search limit the wrong way around GP's Bearcat has locked up on search mode. By resetting the microprocessor (with the radio turned on, hold the 2 button, 9 button and manual button down at the same time, turn the radio off and on again), it should clear the lock-up problem you have on search. It will also clear all the memories, so write them down beforehand!

WORD FROM WA

JL, Capel WA sent in a few of the frequencies from his part of the world: First along is VKI ch10 468.075 inquiries, SW mobiles to Perth, St John Ambulance 413.425 covers north of Wanneroo, south to Pinjarra and everywhere in between, Perth FIS can be heard on 120.000 AM, Bunbury 126.700 AM CTAF/MTAF, RAAF Pearce 132.500 AM, RAAF training 135.900 AM, departures 261.400 AM, approach 335.800 AM.

FROM UP ON THE MOUNT...

From a reader in Mt Isa QLD, comes a host of frequencies for the major mining centre. Our reader says that the 13 frequencies allocated to mobile phones in Mt Isa between 871.800 and 879.360 should be avoided as they are illegal to monitor. (I knew that, didn't you?)

Our reader recently spent some time on Queensland's Gold Coast, where he monitored the following activity: Fire 467.500, Police 469.075, 469.125 and 469.150, Ambulance 412.750, MSS Security 157.735 and 494.150, Wormald's 169.150, Australian Security 489.050, Sea World 164.545 and 164.845. A good deal of marine activity could be heard on 156.375 weather, 156.425 Coast Guard, 156.800 distress, 156.675 Seaway Tower and Sea Phone 161.750 and 161.975.

BUS'D IF I KNOW

BH, Ermington NSW is inquiring after the frequencies used by Hopkinsons Coaches, Harris Park Transport Company and Lube Mobile. As no listing for the first bus company appears in the frequency lists, I would suggest they are using a rented shared repeater, so perhaps you could check the aerials on the buses for the band.

From memory, Lube Mobile and Harris Park Transport Company work on an 800 MHz trunking network, so check out 865.000 to 870.000 MHz, in 12.5 kHz steps for activity. Some of the frequencies our reader monitors are Murrays Coaches 462.100, Home Tune 507.550, Sydney Medical Service 474.050, Busways Blacktown 488.550, Westfields Parramatta 469.500, West Bus 487.675, Telegraph Mirror 509.275 and finally Radio Rentals 492.850.

FROM THE BEGINNING...

BS, Williamstown VIC is new to scanning and looking to but his first. Thus arises a number of questions I am asked on a regular basis: Which is the best scanner for my needs? or What do I think of such and such brand scanner?

In this case our reader asks for my comments on the Realistic PRO-2006 base scanner. As a first scanner the PRO-2006 is ideal. It has more than enough memory channels, covers more

POWER BAND COMMUNICATIONS

1289 Nepean Highway
CHELTENHAM. 3192
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Fax (03) 583 0846

NEW UPDATED DATA BASE

For Scanner Enthusiasts Using IBM Compatibles...

Latest up-to-date frequency listings for all States and Territories including new VHF/UHF band 12.5kHz assignments with thousands of new entries. Available in compressed form only on Hi-Density floppy formats of 1.2M & 1.44M. Comes with FREE updated viewing program.

Files are Dbase format & can be manipulated by Dbase programs - Dbase 3 plus and higher. View and sort in XTree Gold 2.5 etc. The data base is compiled in VHF/UHF State-By-State format listing:-User Name, Location, Call Sign & Power for each entry. HF data base listing includes all States & Territories.

VHF/UHF Disk per State $29.00
National HF Data Disk $35.00
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GME Electrophone TX4000 UHF TRANSCEIVERS

INTEGRATED SELCAL
PROGRAMMABLE SCANNING
FRONT MOUNTED SPEAKER
ELECTRET MICROPHONE
'S' SIGNAL STRENGTH INDICATOR

Options programmed to customer's choice FREE with TX-4000 sales....
$419.00 Plus $12 P&P

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Have your radio equipment expertly repaired and aligned by qualified technicians using Hi-Tech Hewlett Packard and IFR diagnostic equipment. Work is carried out on our premises.

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Rugged reliable Compact Powerful
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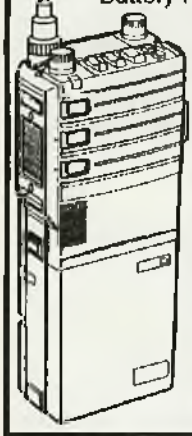

RING for PRICE

40 channels
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Wide range accessories
Nominate batt pack with order.
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Communications Receivers
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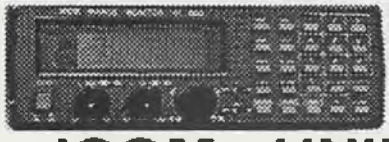
NEW UNIDEN GRANT NOW IN STOCK

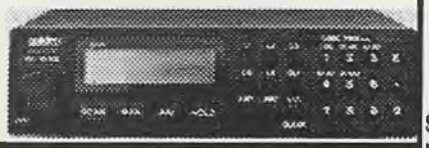


SCANNERS

Heaps of scanning receivers available at competitive prices. Many models to choose from.

ICOM - UNIDEN - AOR

Uniden 100XLT	$365
Uniden 200XLT	$429
Uniden 760XLT	$429
AOR AR1000	$625
AOR AR1500	$675
AOR AR2800	$695



SCANNER FANATICS REGISTER
Vic-NSW-Qld-WA-SA-Tas

User friendly frequency register listing general users & frequencies with separate categories & maps of main interest subjects - Emergency Services, Aircraft etc.

Now Only $25.00
Plus $5 P&P

Battery Pack Rebuilds

Send us your old, tired NiCad battery pack (if you see it listed below) and we will rebuild it with brand new, heavy duty, high capacity cells - for a fraction of the cost of a new pack- and return it to you freight FREE. Most rebuilds will have higher capacity. E.g., Icom BP-8 from 800mAh to 1000mAh.

REBUILDS TO SUIT.....

GME TX-475s		$69
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Icom IC-BP5/BP-5A		$79
Tandy Pro-20		$55
Tandy Pro-34		$39
Tandy Pro-35		$55
UNIDEN	From....	$49

Many other formats available - Please call for a quote.

ORDER C.O.D. BY PHONE...

AMATEUR RADIO RF POWER AMPLIFIERS

P&P $10

TX-2250 HF 3 to 30MHz	180W	$245.00
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CVS-50J HF	30W	$175.00
CVS-400 UHF	up to 25W	$220.00

All HF amplifiers include receive preamplifier.

PB-60

HIGH GAIN UHF Ground Independent

The complete package including 6dB whiptop, unity gain whiptop, SO239 mount, three metre cable, connector & weather cap. Out-hustles most *claimed higher performance* antennas.

$69.00
THE LOT
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PHILIPS OWNERS

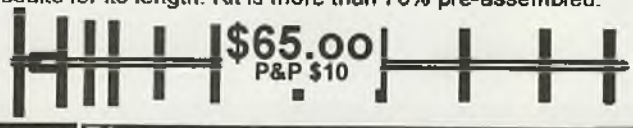
If you're sick of that old push-in antenna connector... Let us fit a new high reliability UHF style SO-239 for less then a service charge.

FULL RANGE OF 27MHz TRANSCEIVERS & ACCESSORIES

S-Adaptor
Converts from SO-239 mount to 5/16" standard thread mount.
$10 plus $3 P&P

PB-11E UHF CB BEAM KIT

PB-11e is a high forward gain Yagi-Uda style array consisting of 1 driven element & 10 parasitic elements mounted on a 2m long, square section, aluminium boom giving excellent results for its length. Kit is more than 70% pre-assembled.



$65.00
P&P $10

Roadrunner UHF AR-477

Pocket size portable with scanning, 5 W output, carry case, belt clip & LCD. Accessories available include fast charger, spk/mic.

$549 P&P $10

MAIL ORDERS

Phone or Mail your order to above address. PAY BY.... CASH-CHEQUE-MONEY ORDER-CREDIT CARD-C.O.D. COD only available through Australia Post...Size limits

Scanning 1994

By Russell Bryant

RF bandwidth than the average scanner enthusiast needs, and is simple to operate. Given all the PRO-2006 offers, it is reasonably priced and available all over the country... for that matter the world.

Another question that crosses my desk from time to time asks about the best outside aerial? Whilst the discone is the most popular, it presents mounting problems. I have recently looked at a number of scanning dipoles and would recommend any of those available. These aerials are sold by Dick Smith Electronics, Benelec retailers and other radio stores.

They make a cheap alternative to the more expensive discone. By the way, the PRO-2006 covers the band above 800 MHz, including the mobile trunking channels 865-870 MHZ and the cellphone bands 870-890 MHz.

HF QUESTION

JB, Devonport TAS, has a question relating to the use of HF by Australian police forces. HF is alive and well and used regularly by all police departments, some more than others. By convention all police forces are required to maintain and test regularly their HF systems. Cross-border tests are conducted at 10 o'clock EST or ESST every Wednesday morning. Frequencies used are 3752, 4557, 7657, 10,505, 14,572 and 18,542 kHz upper sideband.

HF communications has not and *will* not be replaced with cellphones, secure landline or satellite technology in the foreseeable future.

The AMFAR/SMIS frequency releases from DoTaC/SMA are no longer available on microfiche. They can be purchased on CD-ROM at some considerable cost.

My suggestion would be to purchase a copy of your state's frequency list, either on disk or hard copy from ESG PO Box 1200, Adelaide 5001. They include data on all users of the bands, without much of the garbage that the official documents contain.

If you are interested in specific services like aircraft, railways, marine, railways or railways, then there are specialist publications like the Handbook of Australian Railway Frequencies Second Edition available from me at PO Box 344, Springwood, NSW 2777 at $19.95 posted. There are others that cater to other special interests.

WELCOME ABOARD

JG, Rockhampton QLD was recently introduced to scanning by a friend. He was bitten hard and purchased a PRO-37 to follow his newly-acquired hobby. He has monitored these frequencies around town: police 76.520, ATIS 116.9 AM, tower 118.1 AM, taxis 158.380, Rockhampton City Council 466.200 and Wormald Security 166.240.

He has also heard traffic on several frequencies which he cannot identify. They are: 476.425 UHF CB channel 1, 464.275 which is Capricornia Electricity Board, 459.625, an input frequency to a repeater which has its output on 469.125 — police channel 52. The unidentified Brisbane frequencies are 494.150 MSS Security and 160.585 Development Equity Corporation. Armaguard in Rockhampton uses 493.550 MHz.

TASMAN DX

Last year New Zealand changed the conditions applicable to HF CB licensing conditions. While those conditions have been detailed in previous issues of the magazine, the frequencies used on the other side of the Tasman may be of interest to those who chase 10/11 metre DX:

Ch1	26.330
Ch2	26.340
Ch3	26.350
Ch4	26.370
Ch5	26.380
Ch6	26.390
Ch7	26.400
Ch8	26.420
Ch9	26.430
Ch10	26.440
Ch11	26.450
Ch12	26.470
Ch13	26.480
Ch14	26.490
Ch15	26.500
Ch16	26.520
Ch17	26.530
Ch18	26.540
Ch19	26.550
Ch20	26.570
Ch21	26.580
Ch22	26.590
Ch23	26.620
Ch24	26.600
Ch25	26.610
Ch26	26.630
Ch27	26.640
Ch28	26.650
Ch29	26.660
Ch30	26.670
Ch31	26.680
Ch32	26.690
Ch33	26.700
Ch34	26.710
Ch35	26.720
Ch36	26.730
Ch37	26.740
Ch38	26.750
Ch39	26.760
Ch40	26.770

PROPAGATION

NOT-SO-SMART SCANNER...

Seen in a recent edition of the Sydney Trading Post the following ad: **Really thick PRO-2005, 400-channel scanner.** One wonders if the scanner was thick in dimension or intelligence. Or perhaps it was it was the telephonist who took the call at the Post who may have been a bit thick — Realistic probably sounds like 'really thick', to the uninitiated.

ONE HELL OF A BIG THANK YOU

This column nearly didn't make it into this issue. At the time it was due (mid-January) I was preparing, along with many others, to evacuate my home in the Blue Mountains, west of Sydney, due to bushfires.

Winds gusting up to 70 km/h were pushing the fire along at an alarming rate. Without the efforts of the NSW Fire Brigades, NSW Bush Fire Brigades, Country Fire Authority of Victoria, Melbourne Metropolitan Fire Brigade, Country Fire Service of South Australia, Airport Rescue Fire Service, Conservation and Land Management Department of Victoria, and Navy, Army and RAAF personnel you may not be reading it at all.

To those involved, thanks.

That about wraps up another edition. If you have anything to contribute to this column please write to the address given below. Please don't leave it to someone else; if you have frequencies, questions or news *let everyone know.* All questions will be answered through the column.

SCAN, PO Box 344,
Springwood, NSW 277

DICK SMITH ELECTRONICS

See Us For uniden®

Bonus Stainless Steel Antenna Pack!

Uniden UH-011 UHF CB

Our best selling UHF CB now comes with a great bonus offer! The Uniden UH-011 features quality construction and a 2 year warranty for your peace of mind and has an informative front panel for ease of use.

uniden.

Cat D-1766

$299 ***2 Year Warranty***

BONUS **Present this advertisement when you buy this CB and you'll receive a bonus 4dB stainless steel Antenna Pack (D-4000) valued at $29.95.** *Offer extended until 30th April 1994.*

Uniden PRO - 810e Base Station AM/SSB CB

When you're looking for a CB base-station with top-of-the-line performance, you won't beat the Uniden PRO-810e! It's fully featured and includes an inbuilt AC power supply plus large front panel speaker.

Cat D-1485

$399 LIMITED STOCKS uniden.

2 year warranty

SUPER BONUS OFFER

Present this advertisement when you buy PRO-810e and pay only $24 for a Mobile One Base Station Vertical Antenna (D-4427) valued at $79.95!

Offer expires 30th April 1994.

Uniden Grant XL AM/SSB CB

The great new "Grant XL" is now available in limited quantities at most Dick Smith Electronics stores! This eagerly awaited successor to the popular Grant now includes an inbuilt SWR meter plus an audio pitch control, and sports a restyled black front panel. The new Grant XL retains its predecessors excellent audio quality, solidly built chassis, and smoothly operating squelch circuit, along with heaps of audio output.

Cat D-1482

$399 uniden.

2 Year Warranty

Exclusive to Dick Smith Electronics!

70 XLT Scanner

Listen to the fascinating airwaves around your city! This lightweight hand-held VHF/UHF scanner has 20 memory channels, 8-band coverage (covers 66-88, 137-174, 406-512MHz) and track tuning for improved performance. With rechargeable NiCad battery pack, AC charger and carry case.

Frequency Coverage: 66-88MHz
137-174MHz
406-512MHz

Sensitivity: 0.4uV 66-88MHz
0.5uV 137-174MHz
0.7uV 406-512MHz

Cat D-2740

$269

2 year warranty

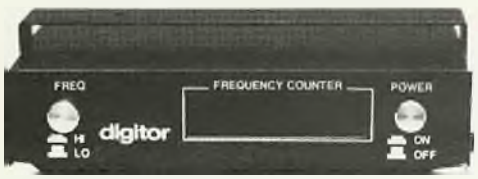
uniden.

Yaesu HF Receiver

Advanced Features For High Performance!

The sensational FRG-100 high performance communications receiver gives extended coverage of the 50kHz to 30MHz range in AM, SSB, CW and FM (optional) modes, as well as a huge range of new features. It provides the user with easier access to most receiver functions. A back-lit LCD screen shows the frequency down to 10Hz resolution and an array of status indicators clearly display what receiver functions are being used. New features include: User-programmable tuning steps, 50 tunable memories (which store frequency, mode and filter setting), sharp IF filters for improved SSB reception, a special memory group scanning mode, and IF bandwidth selection by mode. Features such conveniences as twin 12/24 hour clocks, a programmable on/off timer and 16 pre-programmed international shortwave bands, while an SSB carrier offset function allows you to customise the receiver's audio performance. It comes complete with detailed instructions and a DC cable for connection to an external power supply. Cat D-2790

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



digitor Transmitter 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 transceiver 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

$79.95

SAVE $20

Offer expires 30/4/94.

As Reviewed In CB Action

Wideband Scanner 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 and 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 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

Diamond D-130J Discone Antenna

This high-quality Japanese discone antenna covers the frequency range 25-1300MHz and comes complete with mast-mounting hardware and instructions. It's easy to assemble and install with extensive stainless-steel construction making it extremely durable. Its wide frequency coverage means that it's ideal for use with scanning receivers, as well as transmitters up to 200W PEP for the 6m, 2m, 70cm and 23cm amateur bands, plus UHF CB.

Cat D-4840

$179.95

VHF/UHF Power/SWR Meter

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.

Cat D-1370

$199

NEW **Revex W56ON HF/VHF/UHF SWR/ PWR Meter** ***(Not Illustrated)***

Another quality Revex wideband SWR/PWR meter, offering 2 inbuilt sensors for 1.8MHz to 525 MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), SWR (at low and high power levels) and uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm.

Cat D-1375

$369

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STORES ACROSS AUSTRALIA AND NEW ZEALAND *** STORES IN RED ARE OPEN SUNDAYS.**

SMA TO REVIEW ENTIRE LICENSING SYSTEM

There are currently some 880,000 licences on issue, covering a range of uses from school of the air, to marine and air navigation, to fixed telecommunications links used by Telecom. The bulk of the licences are held by truck and taxi drivers for their CB and two-way radios.

The inquiry will look at reforming "apparatus licences", held by individuals, businesses and emergency services, and will be run by the Federal Government's Spectrum Management Agency.

"The current system is outmoded and cumbersome", Mr Beddall said, "with 94 types of transmitter licences, 10 types of receiver licences, and 131 fees for various licences."

One of the biggest reforms to be considered in the inquiry are "class licences", which have been made possible by recent Federal legislation.

These class licences would let people use their equipment within a set of published rules rather than having to apply for individual licences.

Licence fees will be another key part of the inquiry, with the Government aiming for a more equitable, efficient and transparent system.

The Government currently nets $82 million in revenue from licence fees.

The inquiry will report by 31 May 1994, and public seminars will be held in all the capital cities and seven regional centres in February 1994.

A discussion paper will be released in the near future and interested parties invited to make submissions.

The aim of the inquiry is to develop a streamlined, simplified system of licensing, incorporating a transparent, equitable and efficient licence fee structure, consistent with the objectives of spectrum management established by section 3 of the Act.

The Act establishes three licensing systems for providing users with access to the spectrum:

- **spectrum licence system;**
- **apparatus licence system; and,**
- **class licence system.**

All three licence systems authorise the operation of radiocommunications devices. However, each system differs in terms of the flexibility afforded by the licence and the applications for which it is most suited. For example, a class licence is not appropriate for all types of spectrum use.

The spectrum and class licence systems are new to the 1992 Act. The apparatus licence system, which embodies the traditional approach to licensing spectrum use, has been slightly modified under the new Act.

An apparatus licence authorises the licensee, and any authorised person, to operate the radiocommunications devices to which the licence relates. An apparatus licence may be either a transmitter licence or a receiver licence.

Following are the terms of reference with edited descriptive notes.

TERMS OF REFERENCE

The terms of reference for the inquiry require that the SMA consider the following matters:

1. appropriate categories for apparatus licences, taking into account the need to increase the flexibility and reduce the complexity of the apparatus licensing system and to accommodate new technologies and new uses of existing technologies

The SMA determines the types of transmitter licences and the types of receiver licences it may issue. It must not issue an apparatus licence of a type not so determined. There are currently ninety-four types of transmitter licence and ten types of receiver licence.

2. the opportunities for increasing operational flexibility for apparatus licensees, including, but not restricted to, facilitating the transfer of licences between users, providing for different licence periods up to the statutory limit of 5 years and flexibility in payment arrangements

An apparatus licensee, or any authorised third party, is subject to the conditions of the licence and any other rules determined by the SMA - that is, in relation to third party authorisations or those qualifications required to operate certain radiocommunications devices.
Operation of a radiocommunications device is not authorised by the relevant apparatus licence if it is not in accordance with the licence conditions.
General apparatus licence conditions, and those applying specifically to transmitter licences, are as set out in the Act, which also provides for additional conditions to be prescribed in the regulations or specified in the licence.

3. the use of the class licence system in some circumstances.

A class licence authorises any person to operate a radiocommunications device of a specified kind and/or for a specified purpose, provided operation is in accordance with the conditions of the licence. The SMA may attach any condition it thinks fit to a class licence.
A class licence is issued by notice published in the Gazette. Individual licences are not issued to persons operating in accordance with a class licence and no licence fee would be payable.
To date, the SMA has issued three class licences, relating to telecommunications devices; those with low interference potential; and devices that comply with prescribed standards.

4. the framework to be adopted for organisations providing public or community services.

The licensing system for CB radios and two-way taxi radios will be under the microscope in a public inquiry announced in December by the Minister for Communications, Mr David Beddall.

One of the objectives of spectrum management is to make adequate provision of spectrum for use by public or community services. Under the apparatus licence system, provision for public or community services involves the creation of special licence categories, either defined to accommodate the provision of such services or attracting a reduced licence fee, remissions on licence fees and licence fee exemptions.
Special provisions also exist in relation to spectrum for defence and broadcasting purposes.

5. the setting of charges for SMA services in a transparent manner on the basis of equity and efficiency, to recover the costs of the SMA.

The SMA may charge, on a cost recovery basis, for the services and facilities it provides and for any matter specified in the regulations in relation to which it incurs expenses. For example, the SMA may charge for advice it provides on the operation of radiocommunications devices, use of the Register, conciliation of interference disputes, accreditation procedures and other matters.

6. the setting of fees for apparatus licences in a transparent manner on the basis of equity and efficiency, to recover costs of the SMA and to obtain a return to the Commonwealth for the use of a community resource

7. transitional arrangements for the introduction of any changes to the apparatus licensing system arising from the inquiry.

Transitional provisions provide for the saving of regulations made, instruments granted or various actions begun under existing arrangements.

8. identifying any changes to the Act and the Tax Acts, or any regulations made under these Acts, which would be necessary to implement any proposed changes arising from the inquiry.

The inquiry may require some amendments to be made to the Act and/or the Tax Acts and/or regulations made under these Acts.

ACBRO COMMENTS...

On the face of this release, it appears that ACBRO's concerns have not been ignored on this one issue. The words used would be generally understood by the CBer., "shake-up on CB licensing system", "under microscope", "outmoded and cumbersome", to point to just a few.

The paragraph relating to "one of the biggest reforms...are class licences" should be re-read.

ACBRO feels that most CBers would accept that this new class provided by the "Rad-Com Act" is the slot into which they should be placed - where no license fee is required to operate within the CB hobby.

The planned Enquiry appears as if it will cater for most who would wish to contribute and ACBRO was not backward in seeking an invitation.

Of course many other users of the spectrum will seek their say on matters pertinent to their cause, but the text of the "release" appeared to point to those in the CB category getting most mention.

A little reference to the background and terms of reference for this Enquiry are of interest despite such meetings having been now held.

Of matters raised at a meeting with the Minister for Communications and ACBRO representatives in June last year, the license fee issue appears to have been grasped by the Minister in a period when it was thought ACBRO's agenda had been placed on the backburner.

ACBRO's approach seeking elimination of license fees for CBers or a more equitable method of this form of taxing was acknowledged when the then Minister, David Beddall issued the media release above during December 1993.

So, with such terms of reference, there appears to be adequate scope for ACBRO to present a case for no license fees, or for an improvement to the system that is currently in existence.

It is noted that the "inquiry" will report by 31st. May 1994.

With the knowledge that the Government will present its budget this year in May, will the results of the "inquiry" be too late to be implemented for the next financial year?

If there is to be good news for the CBer resulting from this "inquiry", the sooner it is implemented the better.

For far too long the CB fraternity has felt that the license fee payable is a tax for which they get little or nothing in return.

SATELLITE TELEVISION FOR LESS THAN $1000

While Messrs. Packer, Murdoch and others battle for the rights to bring satellite television to Australia, a small band of "in the know" viewers are already watching a selection of overseas' TV.

No, they haven't laid out huge amounts of cash for the privilege.

Most of them have spent less than $1,000 and reckon the expense is well worthwhile.

What they are viewing is known as "fortuitous TV" - or "what you see is what you get". There are no program guides as the material viewed is not officially available to the general public, rather it consists of un-encoded programs of international news, sporting events, direct station "feeds" of news items, etc., but, it is both legal and entertaining.

This report is not meant as a technical description of either satellite TV or the Melbourne Satellite system. Rather, it is to give you an idea of how simple it is to install and what you will be able to view. The particular system reviewed here is sold by the Melbourne Satellite company and sells for just $995.

For this modest cost you receive everything you need to be watching satellite TV in a matter of hours. A 1.2 metre dish complete with pole mounting assembly, a low-noise block convertor, a 50 channel receiver (pre-programmed to the popular Aussat/Optus transponder) with remote control and 25 metres of low-loss coaxial cable.

If you don't know the difference between a transponder and a length of coax, don't worry - it's not necessary. Just as few CBers know the difference between a potentiometer and a crystal, it's not necessary to know how the system works - only how to turn it on.

For less than $1000 you can be watching satellite TV today. The equipment is easily installed and the viewing is certainly different from what you're used to...

The most difficult part is digging a hole for the dish mounting pole (or for a few extra dollars you can buy a frame which simply sits on the ground) and correctly aiming the dish at the satellite...and for the Optus satellite this is not difficult. Basically the dish is pointed towards the north and then, with the angles supplied by Melbourne Satellites, the dish is tilted to the correct bearings and locked into position. The feedhorn is then locked into position above the dish, final adjustments are made - and you're almost there.

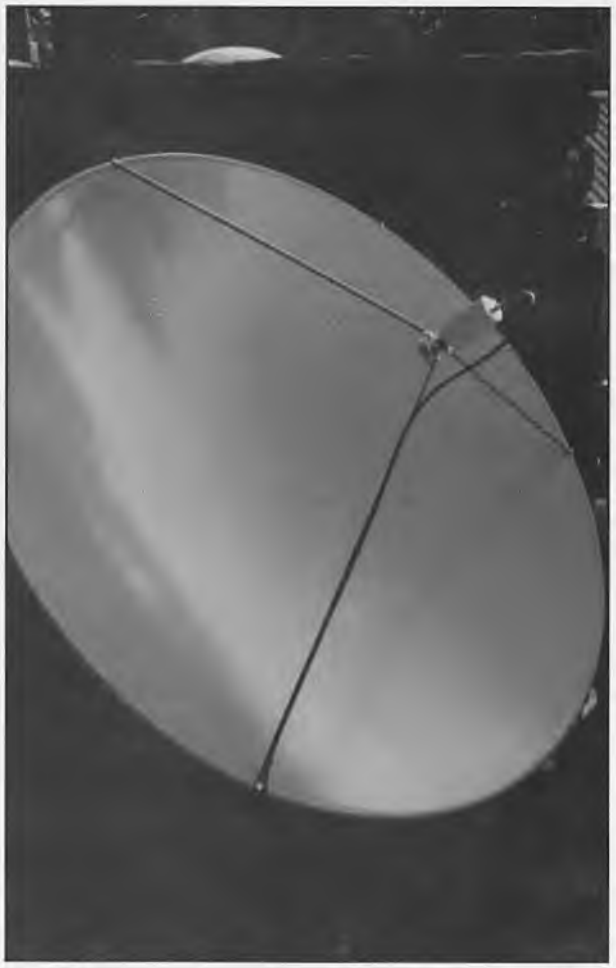
The 50 channel receiver is connected to the dish, turn the receiver on - and watch whatever happens to be there.

It really is as simple as that.

Over the several weeks I've had this system I have watched the American CNN International and American ABC on a daily basis and in terms of news coverage it has been brilliant. Keep in mind that the pictures of the Los Angeles earthquake you saw on your local TV station were but a small fraction of what was shown on the American stations. Additional to this overseas coverage are the local feeds which go out via satellite to other Australian stations... there are some very funny scenes happening behind the camera which of course do not go to air and satellite TV brings them right into your home.

One host of an evening current affairs type program has a definitely R-rated vocabulary while sitting in front of the camera waiting to go live. In fact it is reasonable to say that a top quality "TV Bloopers" type show could be quickly made up of the off-screen action which occurs on a regular basis.

Keep in mind that this is K Band Sat TV - you will need to pay several thousands dollars to watch C Band - and a suitable analogy would be that K Band Sat TV is to satellite TV what a CB rig is



to an amateur transceiver. It works fine but it is limited to what's available. You could of course get really keen and build up your own Sat TV system, however, chances are that it will cost pretty much the same as this "ready to go" system - and maybe not even work as well. A major point which should be mentioned is that although the receiver has 50 channels, only five or six of these are viewable with this basic system as the other channels carry encoded signals.

Still, you will find a wide and varied spread of viewing even given the system's limitations.

Opposite Page: The Satellite TV receiver is smaller than a video recorder, has 50 channels and a remote control.
Above and Below: Sat TV pictures using the Melbourne Satellite system were of excellent quality, color was good and extraneous noise levels low.
Top Right: Dish measures 1.2 metres in diameter and is fixed into position using either a single pole cemented into the ground or (as in the picture) a movable frame (an additional cost to the basic system).
Bottom Right: The LNB (low noise block) attaches to the dish using three arms which automatically place it into the correct position.

SCANNING THE SCANNER

Russell Bryant asks, "which scanner best suits my needs?"

It was a letter from a reader, asking which scanner he should buy, that prompted this look at the why and wherefore of choosing your first scanner. The questions most often asked are these:

- Which scanner best suits my needs?
- Do I need to continuously cover 500 kHz to 1300 MHz?
- If I purchase a scanner, will I be able to use it properly?
- What about aerials and cable?

Asking which is the best scanner is akin to asking which is the best computer. The answers to your questions can only be determined after careful consideration of the needs to be filled.

The first (and possibly the most important) factor is money. How much do you want to spend? (How much are you allowed to spend?!) After working out the budget, list those receivers which fit the category of listening you are into, be it railways, air bands, marine or whatever.

SCANNING THE BANDS...

For basic emergency services, with perhaps a little aircraft thrown in, you need only buy a scanner which covers 68-88 MHz, 108-136 MHz AM, 138-174 MHz and finally 400-520 MHz. The minimum number of memory channels needed may only be 20 or so, however buying a scanner with one or two hundred memories allows for unexpected expansion without the added expense of purchasing a new scanner. To make the most of new technology, consider a receiver which can also tune 800-1000 MHz, for it will open up the challenging world of trunking radio.

From here we enter the world of the specialist bands. Linked closely with the civilian aircraft bands are the military aviation communications channels found between 220-400 MHz AM. Intermingled amongst the AM users are dozens of FM satellite frequencies which, when active, make for very interesting listening.

Another band which may be of interest to the Australian scanner user is the American low-band VHF, which extends from 30-50 MHz. Any experienced scanner enthusiast will tell you of transmissions emanating in the US being heard here in Australia. This usually occurs during our winter, their summer.

The bands below 30 MHz are, by statute, part of the HF allocations, and traditionally outside the interest of the scanner hobbyist. That doesn't mean you set an inflexible limit of 30 MHz and not venture below it. Scanning traverses all boundaries.

SCANNING THE BRANDS...

Determining which brand of scanner to purchase is largely linked to the type of scanner you have chosen. With one or two exceptions, all scanner manufacturers offer portable and mobile/base setups. Yaesu and Kenwood are probably the only two not to produce portable or hand-held scanners.

With doubt, the two highest-selling brand names in Australia would be Tandy (the Realistic PRO series) and Uniden with its Bearcats. Both brands have basic, easy-to-use, hand-helds and mobile/base sets, as well as top of the range, almost continuous coverage scanners.

Prices are about the same for comparable Tandy and Bearcat scanners. Other brands found in Australia in large numbers are AOR, Yupiteru, Icom, and the previously-mentioned Yaesu and Kenwood.

Which scanner is right for you depends on the bands you wish to cover and whether you require variable reception modes. A scanner which simply has AM and FM would be considered basic. Should you decide on a general cover-

age unit, ensure that the reception mode is selectable; in other words, you choose what mode goes with a specific frequency.

The desired frequency coverage will largely dictate the brand of scanner you will eventually buy.

SCANNING THE TYPES...

Do a lot of driving? Visit special purpose events, such as air shows?

Spend a more time at home than anywhere? Your answers to these questions will determine the type of scanner to obtain. In the car, a mobile would be the optimum choice. If scanning is an extension of another pursuit, such as air shows, train-spotting or sporting events, then a hand-held would be more practical. For listening at home, a base unit would be better.

However, if all three are a part of your scanning timetable, then I would suggest a hand-held. They work in the car, at home and on the go.

If you go with a hand-held, make sure additional battery packs are readily available and, more importantly, cheap. Some battery packs can equal a quarter of the purchase price of a new scanner — not very economical.

The best type of hand-held is one which accepts loose NiCads or dry cell batteries, because these are relatively cheap.

Using a hand-held at home presents a problem for those who live in noisy environments.

Their speakers can be inadequate due to their size. An external speaker will usually (not always) solve the problem. No one add-on speaker works better than the other, so any of those currently available in hobby shops will do the job.

And remember, the average car is even noisier than a noisy home environment. Be certain you'll be able to hear your chosen rig in the noisiest conditions or it won't be of much practical use to you.

(Here's a free tip: get a CD-to-cassette adaptor (you know, one of the things which looks like a cassette but has a wire coming from it) and plug it into your scanner and car cassette player. You'll get PLENTY of VERY LOUD signals from the smallest hand-held! Ed.)

SCANNING THE TERMINOLOGY...

There is no special language associated with scanning. Rather, there are just a few terms which may give the newcomer a few headaches. Whilst it is not necessary to know what these terms mean technically, it will enhance your knowledge of the hobby if you obtain a basic understanding.

Different types of transmission modes are the first things which a potential scanner user might encounter.

AM or Amplitude Modulation, is the mode found mainly on 27 MHz CB and VHF/UHF aircraft frequencies. FM or Frequency Modulation is the primary commercial communications transmission mode. FM comes in two types, narrow band, which is for normal two-way radio transmissions.

Wide band FM is used for TV audio transmissions and FM broadcast stations. Words like sensitivity, selectivity, intermodulation, image rejection, SINAD and dynamic range may also conspire to confuse the first-time scanner user.

Sensitivity is the minimum useable signal input strength required to activate the receiver.

It is usually expressed as a fraction of a microvolt, (0.2 µV or 1.0 µV, or similar). The lower the figure the better the sensitivity. Sensitivity is sometimes given with a reference, either S/N or SINAD. S/N is the ratio of signal to the background noise. SINAD is the ratio of signal, noise and distortion.

Selectivity is the receiver's ability to discriminate between closely-located signals. In heavy RF areas the finer the selectivity the better.

Audio output is the power output of the speaker, usually given in watts or parts of a watt.

Dynamic range is the scanner's ability to handle both strong signals and weak signals. Few scanners have good dynamic range.

Intermodulation (intermod) occurs when strong signals are mixed together within the scanner.

Intermod can best be described as sounding like two people talking at the same time.

Images occur in all receivers. Usually they happen at twice the IF of the scanner and, usually but not always, higher than the legitimate frequency.

In scanners with low IFs or Intermediate Frequencies (around 10.7 or 10.8 MHz) Images present themselves at frequencies within the range of the scanner. For example, a frequency of 465.000 MHz will have an image of 486.400 MHz or 486.600 MHz depending on the manufacturer.

Scanners such as the AOR-1000, on the other hand, with a first IF of a whopping 556.325 MHz, will have a first image of 465.000 MHz somewhere around 1,577.650 MHz, which is well outside the operating range of the receiver.

The jigsaw should be starting to fit together. The model, frequency range and brand have been decided. Okay, but what about antennæ?

It's about now that we enter an frightening arena of black science and the unexplored unknown.

This is the twilight zone of scanning, where the brave and experienced refuse to venture.

A bit melodramatic, perhaps, but more fights have been fought over aerials, and which is the best or worst, than any other subject associated with the scanner.

For local and medium distance communications, the discone is an ideal antenna.

It exhibits no gain, therefore strong signals are not 'boosted' before getting to the radio. So for long distance or DX transmissions, the discone is not particularly well suited. So the theory goes...

In this brief overview of scanners and their accessories we will deal only with what should happen, not with what does happen.

After all, I have trapped signals coming from the States using a discone, a task beyond the theoretical capabilities of the aerial.

...☞

The handheld Bearcat 70XLT scanner is a good quality, low cost unit. It's easy to operate, has a good frequency coverage and costs around $270.

SCANNING THE SCANNER

(continued from previous page...)

For DX an amplified aerial, such as an active vertical should be considered. The active has a built in RF hybrid amplifier. The amp 'beefs' the signal beyond any noise, usually producing a full-on signal. In heavy RF areas active antennæ should be avoided.

Now for the extra-long DX: directional aerials are they only way to go. They exhibit high gain in one direction, 'notching' out signals to the rear and sides. Commercial Yagis or beams and log-periodics make ideal scanner antennæ.

The abovementioned are all aerials suitable for home use. The car presents a different set of values. Usually you are moving around, varying the distance between you and the transmitter pumping out the signal you are trying to receive. An amplified aerial would be more of a hindrance than a help, constantly changing the gain as you moved closer to or further from the source.

My best suggestion is a standard commercial base and aerial. A VHF mid-band whip cut at 90 cm, or 80 MHz, will do the job. Using harmonics, the aerial will receive signals on the VHF mid, VHF high and UHF bands. Whilst several manufacturers produce 'mobile scanner whips', few, if any, perform beyond my harmonic whip idea.

Hand-helds are a different story. Most come standard with a 'rubber duckie' aerial. Not the best, however given that anything longer than about 30 cm reduces portability, they will suffice. When using a hand-held at home, a telescoping whip should be considered.

Whichever design you decide upon, choose one of good construction and materials; it will last a lot longer than a thrown-together 'cheap and nasty'.

SCANNING CABLES

Again we enter a subjective area. Basically, two cable types are used in scanning: RG213 and RG58. RG58 is the thin cable more commonly used on mobile installations, whilst RG213 is the thick stuff found on base setups.

On my log periodic, which sits atop a rotator, I prefer to use a RG58 cellfoam double-shielded low-loss cable. It has almost the loss characteristics of RG213 without the weight. It is also cheaper and easier to use than the thicker RG213. For non-moving aerials RG213 would be the preferred cable. Again, when deciding on cables, don't go for cheap 50 cents a metre stuff — I guarantee it will let you down.

FINALLY, ALMOST!

You should now have a picture of the scanner you will be buying. Before running out and parting with the cash, shop around, speak to someone who may use the model you have in mind. Ask their opinion. Get several comments on the scanner, compare it to an equal model from the opposition, then buy it, before your spouse says NO. Sexist? You bet.

The following is a list of scanners currently available, their features and user ability level. Scanners listed in Category 1, have the basic bands, 66-88 MHz, 144-174 MHz and 400-520 MHz. Channel capacity is less than 100 and operation is simple. Price generally below $300. A Category 2 scanner will have all of the above, plus airband 108-136 and/or 800 MHz capabilities, either in part or full. Channel capacity will probably be greater than 100, operation is slightly more than above.

The finally list features Category 3 scanners. They have continuous coverage, or thereabouts, channel capacity greater than or equal to 100 and operation which requires a greater degree of attention than normal units. Cost?

The sky is the limit...

Here goes.

CATEGORY 1...

Tandy: PRO-36, PRO-41, PRO-58, PRO-2023, PRO-2024 and PRO-2025.
Bearcat: 50 XL and 70 XLT.
AOR: AR880.

CATEGORY 2...

Tandy: PRO-35, PRO-39 and PRO-2022.
Bearcat: UBC-100XLT, UBC-200XLT and 760XLT.
AOR: AR900.

CATEGORY 3...

Tandy: PRO-2006.
Bearcat: None at this stage in Australia.
AOR: AR-1000, AR-1500, AR-2800 and AR-3000.
Yupiteru: MVT-7100.
Alinco: DJ-X1.
Yaesu: FRG-9600.
Icom: IC-R1, IC-R100, IC-R7100 and IC-R9000.

Now go it, capture all those frequencies, enjoy the listening and, most importantly, share the experience with other scanner enthusiasts by writing to SCAN.

AR-3000 has long been a popular "base" scanner with an abundancy of channels and virtually continuous frequency coverage.

SO YOU WANT TO BE AN AMATEUR

THE PATH TO AMATEUR RADIO

Part 10 of a regular series by Paul Butler, VK3DBP

This month, we are going to take a look at interference. If amateur radio operators are to get on peacefully with their neighbors, interference is to be avoided at all costs. However, it does occur, despite due care and attention to transmitters, transmission lines and antennas. And the would-be amateur, heading for that all-important examination, *must* be fully aware of the regulations regarding interference, its nature, prevention and cure.

The courteous amateur should be able to respond in a helpful way to complaints about suspected interference — remember that it is *your* responsibility to prevent unwanted signals escaping from your gear. Be aware, also, that you may get complaints directed at you for interference which is not your fault.

You should aim to work always from a position of strength. This means that you need to have accurate information about the various types of interference and about your system and its performance.

You should be fully set up with the right test equipment that will enable you to monitor your outgoing signals, so that you can demonstrate that interference does *not* come from your location.

But even then, be prepared to help the other party to identify and deal with the interference they are experiencing — a bit of positive public relations is never wasted!

Complaints of interference usually arise from a problem occurring with television, radio or hi-fi equipment. In some cases, an amateur radio operator is clearly at fault, because his or her transmission contains radio energy that simply should not be there.

The power output may be too high, for example, in contravention of the legal power limits imposed on us all.

Or the amateur equipment in use may not be operating within its specification and so producing RF at the wrong frequencies.

Photo below shows cross-hatching which is caused by the beat between the picture carrier and an interfering signal inside the TV channel.

Above shows sound bars or modulation bars accompanying amplitude modulation of an interfering signal.

SOMETIMES IT'S NOT YOUR FAULT - BUT...

Secondly, sometimes the complainant's own equipment is the problem — but it's not very diplomatic to start with that assumption!

The input and amplification circuitry in many domestic audio and video systems is extremely susceptible to incoming RF that may have been generated quite legally by an amateur operator just down the road.

My own cheap and relatively nasty sound system (I won't grace it with the name hi-fi!) used to pick up transmissions from the fellow amateur with the big beam just down the road, but I am sure he was staying within the regulations.

My more recent and more expensive truly hi-fi purchase does not show the problem at all. Television sets in particular do not seem very forgiving when is comes to high levels of RF appearing at their antenna socket.

A third possibility is that a particular mix of different and apparently unrelated frequencies produces a problem.

As we will see below, RF signals can be mixed together in the early stages of a radio or TV receiver and produce sum and difference products which find their way into the later stages of the equipment and appear as interference.

This mixture is just one of those unfortunate coincidences and it is certainly up to the amateur to diagnose what is going on, in as friendly a way as possible, and to do something about it.

Now let's look at a variety of types of interference and see what should be done about each of them...

The amateur's transmitter may be faulty and lead to interference of one form or another.

It may, for example, produce **harmonics**, radio frequency emissions which are produced on a frequency different from but related to that of the main (and legal) signal, typically twice or three times the original frequency.

A common cause of harmonics is that the particular part of the transmitter which should be linear is, in fact, non-linear.

Instead of signals passing cleanly through each stage of the transmitter, as should happen in the linear case, they are distorted by a non-linear stage and extra frequencies (harmonics) are generated.

It is impossible to avoid completely the generation of harmonics but a good transmitter will reduce their strength (attenuate them through the careful use of tuned filter circuits.

If a transmitter does generate an excessive amount of harmonics, signals from it will pop up in all the wrong places.

Continued over page...

SO YOU WANT TO BE AN AMATEUR

THE PATH TO AMATEUR RADIO

Continued from previous page...

If television interference (TVI) is the result, the TV picture can be wiped out, to become covered with horizontal bar or cross-hatching.

A test transmission into a dummy load will soon show if harmonics are being generated by the transmitter — if so, a filter is the solution.

A low-pass filter in the antenna lead will let your legal signals out, while stopping higher frequency harmonics.

If harmonics are still escaping from your rig, even though a low-pass filter is fitted to the antenna system, they are obviously getting out through other than the antenna.

One possibility is that the interference is being produced because the mains power lead or another lead is radiating RF energy.

It is possible, in a case like this, to fit a mains line filter, which stops the RF escaping that way, or to have by-pass capacitors fitted to the transmitter where the offending lead connects to it.

Under certain conditions, a transmitter will produce splatter, which spreads the normal signal into a much wider bandwidth than it should occupy.

BASICALLY - DON'T DO IT - OKAY?

This type of interference often affects fellow amateur operators on nearby frequencies. If you allow this form of interference to occur, you are using their space in the radio spectrum as well as your own.

I personally find this kind of interference *extremely* annoying, since I tend to work on relatively low power (50 to 100 watts on HF) and get *very* uptight if some power junkie splatters their signal over the top of mine *and* that of the poor bunny halfway round the globe who is trying to talk to me.

Basically — don't do it — okay?

The root cause of splatter is usually over-modulation.

Some stage in the transmitter is being overloaded because the gain of the preceding stage is excessive.

Too high a setting of the microphone amplifier, for example, can upset the modulation of an SSB signal and generate splatter.

The solution?

Turn it down — high microphone gain does *not* mean that you will be heard more easily at the other end!

Parasitics are unwanted radio emissions generated at odd frequencies within the equipment itself.

A well-designed and properly maintained system should not produce problems with parasitics but nothing is ever perfect.

Even such a state-of-the-art device as the AR-3000 scanner receiver can produce its own parasitics.

The particular HF frequency used for aircraft communication in the Pacific area to the east of Australia, for example (8867 kHz), matches very closely a spurious parasitic produced internally by the AR-3000 and the resulting whine is rather a nuisance when listening to this frequency.

Some detective work may be needed to pinpoint and eliminate a parasitic if other possibilities have been eliminated.

FERRITE BEADS MIGHT BE THE ANSWER

Carefully placed parasitic chokes or ferrite beads are often the solution, but the answer will be different in every case.

If transmitter faults have been eliminated as possible causes of TVI or broadcast interference (BCI), the next step is to look at the receiver showing the symptoms of interference.

One possibility is that the amateur transmitter is close enough to the TV or radio and of high enough power to overload it.

The front-end circuitry in a TV or broadcast receiver should ideally be linear and reject everything except the desired signal.

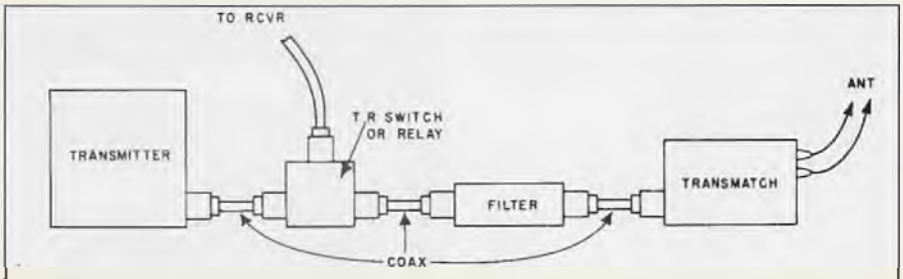
A strong nearby signal can overload these sensitive stages in a receiver, however, and give rise to non-linearity.

This causes the circuit to act like a diode detector and to extract unwanted information from the incoming signal.

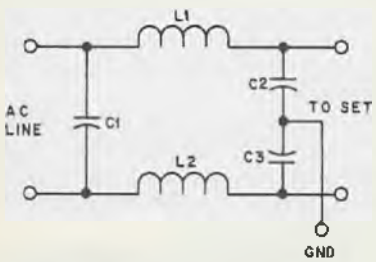
A clue to diagnosing this form of interference is that it will affect all TV channels equally, unlike a harmonic which is more likely to appear on one particular channel than on the others.

Decent hi-fi systems have circuitry included in their design to minimise this form of interference.

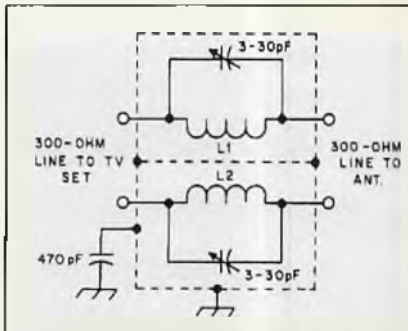
A solution to the overloading problem — but clearly not the best from the amateur operator's point of view — is to turn the power down.



The proper method of installing a low-pass filter between a transmitter and Transmatch. The transmitter and filter must be well shielded. If a TR switch is used, it should be installed between the transmitter and low-pass filter.



A "brute force" ac line filter. C1, C2 and C3 can be any value from 0.001 to 0.01µF, rated for ac-line service (or 1.4 kV dc). L1 and L2 are each two inch long winding of no. 18 enameled wire on a half inch diameter former.



Parallel tuned traps for installation in the 300-Ω line to a TV set. Mount the traps in a shielded enclosure with a shield partition as indicated.

TRY A HIGH-PASS FILTER

A better alternative is to fit a high-pass filter to the system showing symptoms of interference — this will prevent overload by the amateur's signal, while letting the higher broadcast frequencies through.

But try to avoid poking around in someone else's hi-fi pride and joy to fit fancy filters. If you do, from then on it will be *your* fault every time something goes wrong!

The hardest form of interference to diagnose, and possibly the hardest to fix, is cross modulation.

Radio frequencies can add together or subtract from one another in all sorts of odd ways.

Mixing two frequencies, for example, produces sum and difference frequencies, an effect used to advantage in 'superhet' radio designs. The same thing can happen by accident if your transmission adds to another, say from a local TV station, to produce sum and difference frequencies.

There is a possibility that the sum of difference frequency resulting from this mixture is by coincidence the same as that of another local broadcaster, and so it may find its way into a neighbor's radio or TV set.

CROSS MODULATION CAN PROVE DIFFICULT TO CURE

Cross modulation is an unusual form of interference, because it is unlikely that the exact frequency you choose happens to match up exactly in this way with the frequencies of two local broadcasters.

However, it *does* happen, and when it does, it can be difficult to pin down.

Other electrical equipment can pick up radio transmissions for all sorts of weird reasons, usually to do with non-linearity and subsequent detection of the signal by something not designed to detect.

I have a tape recorder, for example, which chatters away to itself when a 'big gun' down the road fires his megawatts (at least that what is sounds like!) over my location — and it does so even when it is switched off!

There have even been stories of unfortunate souls who pick up radio transmissions in the metallic fillings of their teeth. The answer in all cases is careful detective work, piecing together the clues and testing out all possibilities. If all else fails, your friendly local radio inspector may be able to help, but make sure your own transmission are 100 per cent correct before you call him in!

Here are some questions for you to think about:

1. Parasitic oscillations are suppressed by:

(a) increasing the resonant frequency of a tuned circuit
(b) removing unwanted resonances in a circuit
(c) increasing the power supply voltage
(d) using capacitive coupling between amplifier stages.

2. In a single sideband transmitter, parasitic oscillations would be most likely to occur in the:

(a) audio stage
(b) crystal oscillator stage
(c) power supply
(d) radio frequency (RF) stage.

3. Over-modulation of an SSB transmitter will cause:

(a) frequency instability
(b) splatter
(c) harmonics
(d) parasitic oscillations.

4. A carrier wave is over-modulated when the percentage of modulation is:

(a) between 0% and 25%
(b) between 25% and 50%
(c) between 50% and 100%
(d) greater than 100%.

5. Harmonics are produced when:

(a) a transistor is biased for class A operation
(b) an LC circuit is at resonance
(c) a sinusoidal wave is distorted
(d) a crystal oscillator operates on its fundamental frequency.

6. The diagonal lines that can appear on a television screen due to radio transmitter interference are known as:

(a) sound bars
(b) cross hatching
(c) transmission lines
(d) vision bars.

7. An interfering signal from a novice transmitter appears on 56.6 MHz. This could be due to the:

(a) crystal oscillator operating on its fundamental frequency
(b) second harmonic of a 10 metre transmission
(c) third harmonic of a 15 metre transmission
(d) seventh harmonic of an 80 metre transmission.

8. Cross-modulation in a broadcast receiver can occur due to:

(a) rectification in an early receiver stage
(b) detection in an audio stage of the receiver
(c) harmonics of the transmitter
(d) over-modulation of the transmitter.

9. The best method of eliminating TV set front-end overload caused by proximity to a 10 metre amateur transmitter is to:

(a) use a high-pass filter on the TV receiver
(b) use a low-pass filter on the transmitter
(c) install a wave-trap in the TV set's feedline
(d) install a power-line filter.

10. A selective network which allows some frequencies to pass through while attenuating other frequencies, is called:

(a) a converter
(b) a balanced mixer
(c) a filter
(d) a translator.

11. The filter best suited to suppress the third harmonic from a 3.5 MHz transmitter which is connected to an antenna via this filter is:

(a) a low pass filter with a 5 MHz cut-off frequency
(b) a high pass filter with a 5 MHz cut-off frequency
(c) a low pass filter with a 15 MHz cut-off frequency
(d) a high pass filter with a 30 MHz cut-off frequency.

12. One function of the output stage coupling network of a transmitter is to:

(a) eliminate key clicks
(b) reduce harmonic radiation harmonic radiation
(c) prevent the oscillator frequency from drifting
(d) improve linearity.

Answers
1 (b), 2 (d), 3 (b), 4 (d), 5 (c), 6 (b), 7 (b), 8 (a), 9 (a), 10 (c), 11 (a), 12 (b).

Cheers and 73s from Paul, VK3DBP

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By Patrick McDonald

Have you ever felt that you have no personal freedom, that your life is always controlled by an all-seeing, all-knowing, all-powerful *Force*? Well, you could be a very religious person or you could, like me, be the owner of a fast 486 IBM-compatible computer with a Super VGA screen!

Yes, I confess that I've been obsessing about my personal computer again, and have been trying out lots of new radio-related software. 1994 already looks like it's going to be a good year especially for 'shareware' computer programs designed for use within the many facets our great radio hobby... 'ham' radio activities, SWLing and monitoring, CB radio, VHF/UHF scanning — the lot. So let me kick off another ONLINE column by telling you about some of my favorite new software packages.

Among the perennially popular types of radio computer software are the various Morse Code training programs, and one of the best of these has always been **Morse Academy**. A new version of MA has now turned up on the shareware scene and is definitely worth a review in these hallowed pages. Compressed under the name of **MA_51T.ZIP**, and released by Japan-based American author Joseph Speroni, AHØA, in the last six months, this package is designed to help you bring your sending and receiving code speed up to the level needed for your amateur licence.

Morse Academy is a program incorporating what is officially termed Computer Aided Instruction (CAI). It's designed to help students who have no knowledge of the code or even of computers. Operation is quite simple, with functions selected from menus by a single key. Several different kinds of practice sessions are provided to allow students to vary the way they learn the code and avoid boredom.

For those of you with more modest computers, it's worthwhile pointing out that MA will operate off a floppy disk. It will also run under the popular WINDOWS operating system. Although based on US amateur radio licensing requirements, Morse Academy is generally applicable to Australian or New Zealand standards.

Like most modern software, Morse Academy includes on-line help for each menu or session via the F1 function key. It also features option settings which can be saved on diskette or disk so they are not lost when power is turned off; the ability to edit and sequence the character set used in all sessions; a set of sample code tests for student practice; the ability to create, save, and reload text for replay; the option to save all computer-generated text for later printing; the ability to select your own desired character weightings (frequency of occurrence of particular characters); the saving of the history of mistakes from the last *MA Receiving Game* for optional use in computing character weighting; the possibility to allow the Receiving Game to automatically reorder the character set in worst-to-best sequence; the ability to adjust the code sending speed to suit of different PCs; and, finally, built-in support for the popular ADLIB type compatible music synthesiser cards, the Disney Sound Source Adaptor, RS232 ports or an external tone generator via the printer port.

In my humble opinion, I believe Morse Academy's excellent range of features will definitely help a student learn the dreaded code. It's still true, and always will be, that a small amount of hard work is needed to learn Samuel Morse's dit dahs. But high-quality computer feedback during the process of learning Morse Code greatly helps a student, so picking up the essentials is relatively painless with Morse Academy.

The innovative 'Receiving Game' feature of Morse Academy is a challenging interactive game that allows a student to practice code by listening to a random group of one to nine characters, typing the characters on the keyboard, and then having the computer check if replies are correct. If you are correct, a short high pitch tone is emitted. If you're wrong, a long, dismal low frequency tone sounds, the correct answer is displayed in the centre of the screen with an indicator showing the character that caused the error. This feedback allows students to learn characters through continual repetition and correction.

The number of characters employed during any given game is determined by a user-controlled menu. For the first Receiving Game, you can, for example, select just a few characters. Then you decide on sending speed, character speed, duration of game, group size and weighting, as desired, before starting off. The speed key allows the selection of the average speed that text is sent, whereas the character speed key sets the speed that individual characters are sent.

Morse Academy is designed to send at a relatively fast character speed. The author believes that the default character speed of 18 WPM is a good choice for students aiming for an eventual code speed of 13 WPM. This may seem a bit speedy at first, but learning the individual characters at this rate, with longer pauses between them, makes progress easier in the long run. At faster average sending rates, the speed of characters remains the same but the length of the pauses between them shortens.

The weight option selects different frequency patterns of sending of characters. This allows the student to control the frequency of repetition of certain characters to stress those requiring more emphasis.

The results of a Receiving Game can be used to re-sequence the characters on the Learning Menu. If this option is selected and the Learning Menu is brought up after a game is played to completion, the characters will be displayed in order of the 'worst' scoring characters, giving the student a history of those characters causing him/her the most trouble.

When the Receiving Game eventually becomes too easy you can try switching to the Endurance Trials feature to get practice in copying long character sequences without errors. Students can adjust the mix of sessions to match available free time and the desired pace of learning. The author recommends spending at least 30 minutes every other day practicing, and with this regular effort over a few weeks, Morse Code skills will start to come easily for most people.

The Morse Academy Endurance Trials send characters or words continuously at selected speeds until the student makes an error. Starting average speeds and character speeds can be set before each session. Code is then sent as continuous characters or in groups of random length. A complete session is 15 trials, but it can be ended at any time by pressing the ESC key.

Each Endurance Trial displays the number of characters received correctly. At the end of a trial the last five characters sent just before an error are displayed. The character in reverse video in the middle of the screen is the expected correct one that caused the trial to stop. During an Endurance Trial the reason for an error is often not actually the last character sent, but rather, one of those just preceding the error. A character that causes the student to pause and think too long can be the real reason for a subsequent error, even if it is eventually correctly copied. Examining the characters preceding the error will therefore give the student information about the characters requiring more work.

For every 20 correct inputs, Morse Academy relentlessly increases the sending speed by 1 WPM so the student is forced to advance in his/her skills! Author Speroni advises: "Don't be concerned with the mistakes made when using the Endurance Trial option; they're a natural part of learning!"

Variable tone selection can be used to force each session to start with a randomly-selected tone, only slightly different from the current setting. Either 1, 3 or 5 different tones are chosen depending on the selected range of 0, plus or minus 10 or 20 Hz. Each time the V key is depressed the range advances. It's of course a good idea to use this option to get experience copying code with different frequency tones.

Maybe the above outline is enough to give you an idea of the new and improved Morse Academy. If you're looking to get that much-desired licence in 1994, please give it a try... and good luck to you!

Now let's check out an entirely different kind of program, also of interest to radio amateurs and those on the path to this much sought-after distinction This software is named **QQSL55.ZIP** in its compressed form, but titled **QUICK QSL LABELS** by its author, Bill Mullins, AA4M/6, an amateur hailing from San Diego, California. The latest version 5.5 of QQSL was released this last October, so the program has certainly gone through many useful revisions, and all of the major bugs have apparently been ironed out.

The author imagines that you're probably saying to yourself right

continued on page 44...

now, "...So this is a program that prints labels — big hairy deal!" Although it's true that QQSL is indeed basically 'just' a QSL label printing program, it should also be considered a major application program, as probably no other package in existence does the job as well, as fast, as nicely, and has as many 'bells and whistles' besides! Another way of putting all this is that most programs produce QSL labels as an afterthought. With Bill Mullins' QQSL software, printing QSL labels is the one and only thought!

Mullins writes in his detailed documentation, included with the executable files: "QQSL was originally written solely for my private use. But, as I worked on the program, I felt that others would have similar needs, so I decided to rewrite QQSL for use by the general QSLer."

Mullins' primary personal need for QQSL was to respond to many incoming QSLs from DX QSL bureaus. He was averaging approximately 100 incoming cards monthly, and always felt obliged to reply to all QSLs he received, with the traditional goodwill of the amateur radio fraternity. After some 25,000+ QSL cards, he no longer got quite so excited about receiving QSLs and felt he badly needed to automate the time-consuming process of filling out QSL cards.

Although there were many other programs which would produce suitable QSL labels, none of them used a format Mullins liked. It seemed that they all simply printed the minimum information required to confirm a QSO, without any thought about some of the 'niceties' which could also be included. QQSL solved this problem for dot matrix printer users by continually switching fonts, printing the first line (the call sign) using a large five characters per inch font and the remaining lines using the very small 17 char/in font.

This allowed the total number of characters printed on a QQSL label to be 219. And a great deal of information can be conveyed with this many characters. Additionally, the call letters on a QQSL label stand out attractively, often eliminating the need to write the call separately in large letters as required by some QSL bureaus. The niceties mentioned above are included in label lines 4 and 5, which may be customised by the QUICK QSL LABEL user.

In addition to the lack of multiple fonts, the author had noticed as well that many other label programs require compatibility with a fully computerised electronic logbook, and would only generate labels using information from this file. Bill found it faster to write labels straight from written logs and/or the QSO information from cards received and made sure his software focussed on this capacity. Nevertheless, QQSL also incorporates an extensive import capability for amateurs who work out of electronic database programs.

QQSL will produce appropriate QSL labels for all amateur bands from 1.8 MHz to 48 GHz, for all modes, and it won't let you enter an invalid band, mode, RS(T), date, or time. Additionally, QQSL provides you the capability to customise your labels with personal comments, rig information, etc. There's also the capability to quickly produce labels for SWLs.

The program will run on 486s, 386s, 286s and old XTs, with SVGA, VGA, EGA, CGA and mono video, so it's a package that anyone with an IBM-compatible computer can utilise — it will even run on a single floppy disk system! However, the author says QQSL will not presently run in a WINDOWS environment.

So-called 'meaningful sound' has been incorporated into QUICK QSL LABELS in the form of two quick 'up tones' or two quick 'down tones', lasting approximately 4/18ths of a second for each pair of tones. Generally speaking, the down type tones mean that you made a dumb error or that you need to pay attention to a message on the

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screen, and up type tones mean that an operation was successful. (These meaningful tones may, however, be disabled if they start to drive you bonkers.)

Now, QQSL as it's distributed via the computer bulletin board network is shareware and it's also 'crippleware'. This latter term means that one of its chief functions will *stop* functioning if you don't register your copy with the author and pay your US$20 fee.

Put in simple terms, the program will only print out three labels, and will then stop dead in its tracks, printer-wise!

Everything else in the shareware program works just like the commercial version.

There's a lot of discussion in shareware circles about the philosophical validity of releasing crippleware, but I guess such is the author's prerogative. It certainly means that you must register this program if you want to do more than run a few trials with it, and fair enough, as this is the spirit of shareware. Three print runs should be enough to see if you like what QQSL produces and whether is will help your own QSLing endeavours.

Now let's take a quick look at two completely different computer programs that have just come out in new versions over the past few months: **Geoclock v5.1** and **Earthwatch v3.0**, both mentioned previously here in ONLINE for the purpose of assisting in 'greyline DXing', defined as trying to log those 'tough to hear' DX stations when the sunrise or sunset line passes simultaneously through their transmitter site and your own QTH.

The **Earthwatch** version 3.0 program, written by American Larry Nagy, will graphically display, in beautiful living color, the majestic march through time of the earth-moon system showing the 24-hour night/day cycle, the monthly phases of the moon, and the earth's annual trip around the sun, with the passing of the four seasons.

Actually, two separate programs are included in the compressed file package (entitled **EWATCH30.ZIP** on most computer bulletin board systems), one for computers with VGA graphics and another for those limited to CGA.

A Mercator format map of the world will slowly scroll eastward across the screen as the continents in turn move daily from pre-dawn darkness through sunrise and daylight, then through sunset back to night. You can watch the shape of the daylight zone change ever so slowly from day to day as the seasons progress, with the days shorter in winter and longer in summer for the Northern Hemisphere and vice-versa in the Southern Hemisphere.

Sunrise and sunset times along with percentage of daylight for your city or town or any damned place you care to designate are calculated and displayed for the present date or for any date that you choose. The phase and position of the moon will also be displayed numerically and graphically.

The VGA version of Earthwatch additionally allows the tracking and display of latitude and longitude coordinates and major cities as you move a mouse-driven cursor over the map display. This version also offers the option of selecting between two map types, elevation and natural — a nice touch.

A special Almanac screen can be called up to display some additional information such as a comparison of sunrise and sunset times with those of the previous day, the number of days remaining until the beginning of the next season (solstices and equinoxes), and more. Additionally, you can see at a glance the local time anywhere on the populated earth and observe whether that location is experiencing night, day, dawn, dusk, or anywhere between. Up to 10 locations around the world may be highlighted on the display to help you monitor the status of various cities and regions, QTHs of amateur radio friends, special transmitter sites, and so on.

And all of this may be done accurately and in real time while it is actually happening! Or, if you wish, reset the date and/or time to monitor the earth in the past or future. You can replace your ordinary calendar or menu graphic program with Earthwatch when your PC is in 'standby' mode for an informative and fascinating earth monitoring clock. Very impressive as a screen saver!

Geoclock version 5.1, released last October by Joe Ahlgren in the US, is a similar program, but somewhat more sophisticated and aimed at least partly at radio enthusiasts. It contains nearly all the same features as Earthwatch, but also offers special options, mainly in the special registered version, which assist further in the greyline DXing effort.

Geoclock allows zooming in to show close-up views of various parts of the earth, plus many extra local maps, available at a small extra cost from the author in Arlington, Virginia, USA. Geoclock also provides a special 'Ham Package' for registered users.

Features of the Ham Package include Great Circle maps and day, night and twilight zone display, the parameters of which can be set to indicate the boundaries of sun illumination on the F and D layers of the ionosphere. Of interest to amateur radio operators is the Call Sign Analysis feature, based on a user-maintainable call sign database, showing remote station location, remote station azimuth and range, DXCC and WAE country identifications, CQ and ITU zones, and much more.

Which is best, then, Earthwatch or Geoclock? I guess I'll have to go for the latter. The basic shareware version has all of Earthwatch's features, plus many more. Add the specialised Ham Package for registered users and there's *no* comparison. Anyhow, you can check out both versions yourself, and make your own decision!

Now, a couple of keen readers have asked me to briefly answer the following questions: What is shareware? What is freeware? How are these different from the software you buy in the local computer shop?

Okay, I've already mentioned crippleware, which is a form of shareware. **Shareware** basically refers to computer software which the author distributes for free, often via computer bulletin board networks.

If, after tying out such a program for a month or so, you find it's useful and want to continue to run it, you are bound by the shareware 'honor system' to send the author his/her modest registration fee. This fee often entitles you to an upgrade of the program, with more features.

Freeware software is distributed in a similar fashion, but the author requests no fee. What you buy in the shop is usually commercial software, though I have increasingly seen shareware available in computer and electronics shops over the past year or so. But shareware programs bought in shops or by mail order can be out of date, so beware. Computer bulletins boards are usually your best source of the very latest versions.

Remember that the extension (the final three letters) of a compressed file package simply indicates the mode of compression. **ZIP**, **ARJ** and **LZH** are the most common. HAMCOM22.ZIP and HAMCOM22.ARJ would, for example, be exactly the same program, but compressed with different compression utilities.

Well, that's probably all the ink I can spare for descriptions of new radio-related software, dear radio nuts. In the next CBA issue I'll try to review two major electronic logbook programs, **HYPERLOG** and **HAM_LOG**, both of which have attracted considerable interest in various radio circles.

But I'd like to take some of the remaining space to mention a few useful radio-orientated computer bulletin board systems before I sign off. Melbourne's **OZ DX BBS** is going strong with lots of new participants modeming in on (03) 416 8715, but for the time being is only online after 9:00 pm and before 10:00 am. (At other times the phone line is in use for voice communications.)

This particular system is unique in specialising in medium wave and tropical band DXing.

Melbourne radio enthusiasts shouldn't of course forget Melbourne's **SPECTRUM RADIO BBS** on (03) 455 1309 round the clock, especially if they're interested in amateur radio software and packet programs. Also available in Melbourne is the **JK Amateur Radio Club BBS** on (03) 888 7741.

In Sydney, try the **RADIO-ACTIVE BBS** on (02) 399 9268, also online for modem traffic 24 hours daily. Naturally 'the Original' **Shortwave Possums BBS** is still going strong, thank you very much, and always carries the shareware programs reviewed here in ONLINE. Contact details are listed at the end of this column!

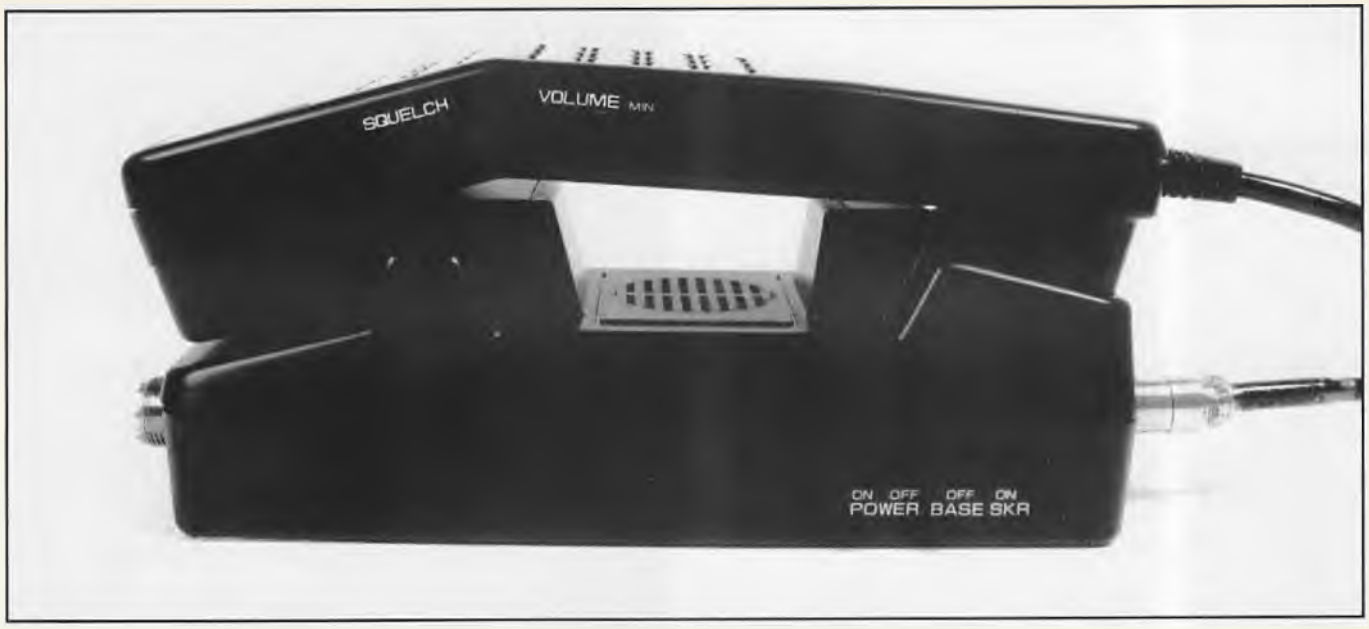
I'm often asked about radio-related BBS systems in Adelaide, Brisbane and Perth, but unfortunately can't find any to recommend at present. Sysops (system operators) in these areas who cater for radio buffs might want to get in touch with me electronically, at FIDONET address 3:713/605, and I'll pass on relevant telephone numbers to CBA readers in the next issue.

Finally, are you perchance interested in this issue's intriguing software but still not hooked up to the worldwide system of computer bulletin boards with a modem? Well, there's yet another way to access these programs. I will manually post you a general selection of the shareware packages reviewed in this column the old-fashioned way if you send $35 plus six formatted floppy disks to the now legendary postal address:

Shortwave Possums BBS
attn. Patrick McDonald
PO Box 357
Round Corner
NSW 2158

Remember that all the software reviewed in this column is designed for IBM-compatible computers using the MS-DOS operating system. I'd suggest including either 1.2 or 1.44 megabyte floppies with your request, if your computer accepts these larger sizes. Otherwise the ancient 360k types will do, but I won't be able to fit nearly as many programs on them, I'm afraid.

So that's it for now, boys and girls! Poke your computer's electronic nose into SWP BBS doorway 24 hours daily via the magic telephone number of (02) 651 3055 at all speeds from 1200 up to 14.4k bps, and keep in touch electronically with the worldwide radio hobby!



Become an instant "Yuppie" with a ...

GME-ELECTROPHONE TX-850

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

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

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

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

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

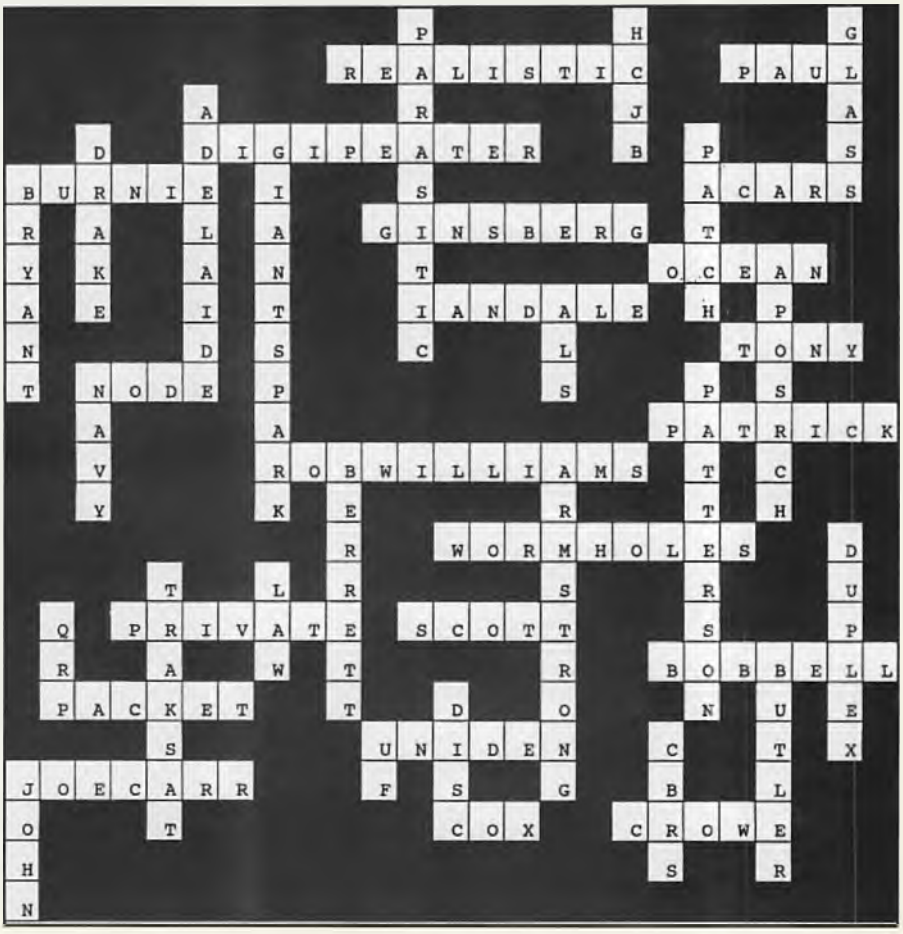
The answer to all the clues can be found somewhere in this issue - it's just a case of locating them.

Entries close on 18 March 1994 and the first correct entry opened after that date is the winner.

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

The winner of the first TX-850 is Michael Banovic of Wodonga, Vic - congratulations and have fun.

The correct answers to the Jan/Feb Xword appear below.



MISSED OUT ON THE FIRST TX- 850?
DON'T WORRY - HERE'S ANOTHER CHANCE TO WIN THE

TRENDY TX-850 CELLULAR 'PHONE LOOK-ALIKE

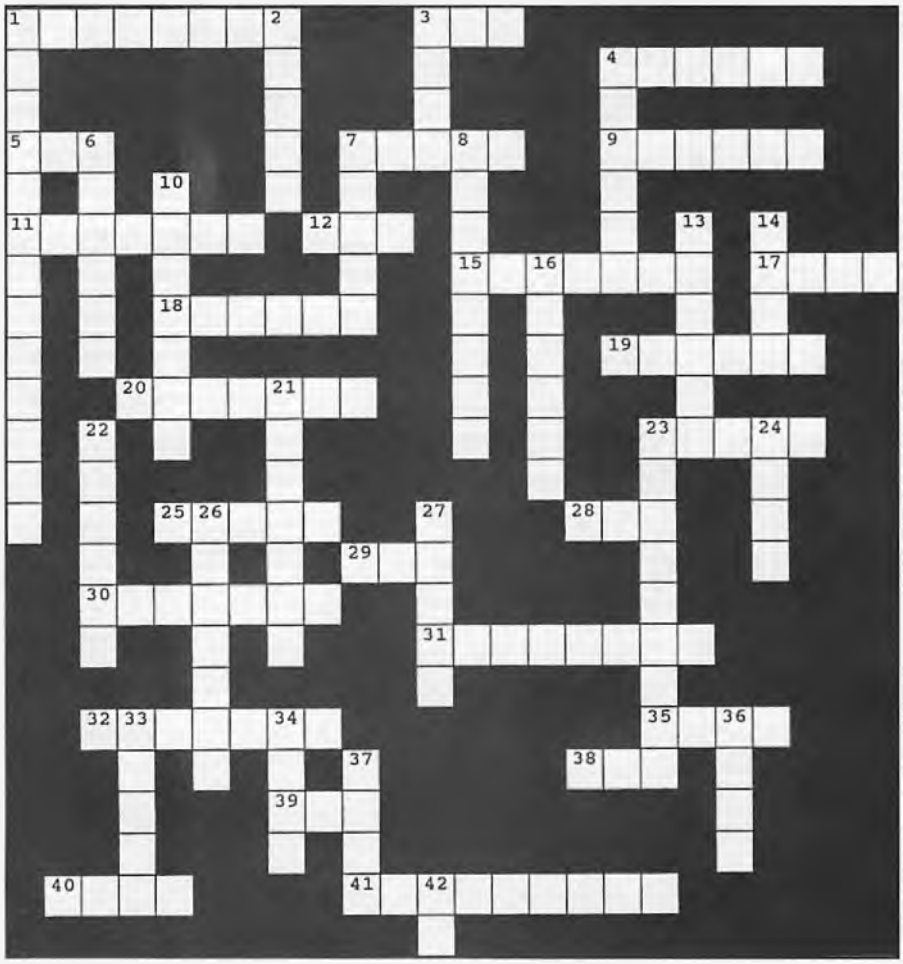
Devised by Wurds-r-US

CLUES ACROSS

1. GME-Electrophone is a division of (name?) Communications Pty Ltd.
3. Australia's official amateur body (init).
4. The 27MHz band is also known as the 11 (word?) band.
5. In Japan, CB radios must be fitted with a control (what?) for automatic ID.
7. In respect to the AT DX group, the letter "T" stands for what?
9. Russell (name?) writes most of our scanning material.
11. CB DX station "SURCOUF" is located in what country?
12. The leading American TV news station that can be viewed on satellite TV.
15. You should contact Trevor (surname?) to update the CBA repeater list.
17. What's the emergency channel on UHF CB?
18. In the term SMA, the "A" stands for what?
19. The DX station 55-AT-113 is located in Gibralter and the operator's name is (what?).
20. The surname of the Minister for Communications.
23. One of the best morse code training programs has always been the (word?) Academy.
25. Rob William's PO Box is located in what city?
28. To confirm a contact you would send a (what?) card.
29. The Q Code for on-air contact.
30. Where is the UHF repeater OGU04 located?
31. Melbourne's (word?) Radio BBS is a communication oriented bulletin board.
32. The FM series of UHF transceivers are made by what company?
35. IN CB jargon the term "handle" means what?
38. It comes before Electrophone.
39. What Governmental authority is examining the current licence system (init)?
40. A very early CB with a name like a small horse.
41. A brand of CB rig available during the early days here in Australia.

CLUES DOWN

1. The first CB owned by Ken Reynolds, (5,4,4).
2. Where is the UHF repeater NEE01 located?
3. The Christian Science Church's broadcast station.
4. In the term GMRS the letter "M" stands for (what?).
6. The DX station 226-AT-102, Ron, operates from what country?
7. The PRO-35 scanner is marketed by (company?).
8. A very popular computer program to assist in "greyline DXing".
10. CBers operating "out of band" are generally known as this.
13. The make of a DJ-X1 scanner.
14. Work first - worry later.
16. In the term PLL, the middle "L" stands for what?
21. In terms of the CB DXCC country list, the number 35 indicates what country?
22. Acbro's associated Sydney Radio Group is located in what city?
23. The Satellite TV system reviewed in this issue is made by the (word?) Satellite company.
24. CB jargon for DX.
26. CBA's Victorian advertising manager, (3,4).
27. In the term LNB (sat TV) the "N" stands for (word?).
33. Jack (surname?) provides most of CBA's DX information.
34. The P & T was the forerunner of the DoTaC and SMA - what did the letter "P" stand for...?
36. CB jargon for Megahertz.
37. Mr Butler's first name.
42. What mode was originally planned for Australian CB?



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NOTE: ENTRIES MUST BE ON THIS PAGE - NO PHOTOCOPIES

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AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

An interesting struggle is currently taking place in Europe where the ECBF (European Citizen's Band Federation) is trying to create CB history by obtaining an AM/FM/SSB "norm" for the whole of Europe.

The Federation claims to represent CBers of almost all European countries and disagrees with the CEPT (European equivalent of the American FCC), particularly in respect to the general use of FM as the main CB mode throughout Europe.

The ECBF wants to obtain AM/SSB modes, 40 channels, 26.965 - 27.405 MHz (as in Australia) as the CB "norm" throughout Europe and to this end it is requesting all CBers, worldwide, to complete a petition for presentation to the European authorities.

The campaign is strongly supported by the influential "France CB Magazine" and ACBRO makes the offer to all CBA readers to forward a stamped, addressed envelope for a copy of the petition which can then be completed and returned to the ECBF.

At this time there is no world "norm" which leaves the various CB bands open to being replaced by another service, or simply eliminated, because someone in authority decides that commercial or military use could make more profitable/better use of these frequencies.

The petition has already been signed by over 10,000 European CBers.

This is an exciting opportunity and ACBRO applauds any efforts made to have the CB operator recognised at the ITU (International Telecommunication Union) and hopes the petition receives Australian support.

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, Altkenvale,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 5253
Eureka CB Radio Club	P.O. Box 27, Reynella, SA 5161
Transworld Sidebanders (The X/Ray Club)	13 First Street, Port Pirie, SA 5540
Echo Romeo CB Assoc.	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 5253
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 426, Morphett Vale, SA 5162
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
Port Adelaide Radio Club	P.O. Box 352, Pt. Adelaide, SA 5015
Cherokee Indian Aust. Group	P.O. Box 1679, Mildura, VIC 3500
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 1415, Mount Isa, QLD 4827
Naracoorte UHF Association	P.O. Box 465, Naracoorte, SA 5271
Gosford Radio Club	50 Pacific Highway, West Gosford, NSW 2250
Ultra-Lite Radio Club Inc.	P.O. Box 17, Strathpine, QLD 4500
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
Oscar Romeo CB Club	P.O. Box 203, North Geelong, VIC 3215
Coal Miners Wonthaggi CB Club	P.O. Box 420, Wonthaggi, VIC 3995
East Coast Radio Club	P.O. Box 412, Bexley, NSW 2207
MBV 08 Repeater Assoc.	c/o Post Office, Charleston, SA 5244
Q'land Radio DX International Club	P.O. Box 586, Warwick, QLD 4370
Q'land Blue Heeler Soc. Radio Club	P.O. Box 1122, Castle Hill, NSW 2154
The 43 Australian Radio DX Club	P.O. Box 96, South Oakleigh, VIC 3167

DXinternational

By Jack Haden

TROPOSPHERIC OPENINGS ABOUND ON 27MHZ

Quite a lot of tropospheric scatter has been with us in recent months, creating quite a lot of confusion as to who is in fact a 'local' and who is really DX! Non DXers and DXers both have found an abundance of 'short-skip' openings during the hours of daylight and sometimes well into the evenings too. Strong to excessively strong signals have been encountered during these tropospheric openings, which have an effective radius of around 70 to 500 or more miles.So DX contacts are possible within one's own home state, with stations seldom heard before possible during these openings. I have worked people located in Broken Hill, Bathurst, Maitland, Orange, Taree and Tamworth with relative ease from my location in Sydney with good signal reports exchanged in both directions.

Another well-known trait of tropospheric scatter sees rapid changes of path — one minute Queensland is belting in to Sydney, next minute they drop away quickly only to be replaced by South Australia or Victoria with five by nine plus signals being part of the event. One minute DX is from the north, then from the west, south or east, or maybe anywhere in between! One minute they are strength nine or nine plus and possibly splattering you, then they disappear, and the fade can be very rapid too, happening in just 10 seconds or so in a lot of cases...

DXERS BE WARNED...

Being bushfire season in most tinder-dry states of Australia — and especially in view of the recent Sydney and coastal NSW disasters — I shouldn't have to remind older DXers about staying well clear of the bushfire brigade handphone station frequencies on the 27MHz band.

A lot of new operators to 'out-of-band' DXing make the fatal mistake of believing that all the frequencies their illegal sets will transmit on are there for the taking. They are not! Quite a few sectors of 26 and 27 MHz are still occupied by SMA licensed and approved stations and thus are *entitled* to be there and use that particular frequency allocated by SMA.

Getting back to the bushfire season, the frequencies you as a responsible DXer should stay clear of are: 27.550, 27.560 and 27.580 MHz. Those frequencies are allocated and are, of course, used by various bushfire brigades around Australia during fire spotting and fighting operations.

So show everyone how responsible you are and avoid using those frequencies, especially during the summer period. You may also keep in mind that other handphone services are allocated the frequencies: 27.590, 27.620, 27.660 and 27.760 MHz on 11 metres. So then again, DXing on these frequencies only brings attention to yourself and places you in good stead for a possible visit from your friendly local SMA inspector!

Welcome to the first DXI for 1994. I trust that everyone enjoyed the festive season holiday period. Perhaps during the break you bagged a new country or two on 11 metres?

Although Solar Cycle 22 is acknowledged by the experts to be on the decline, in the weeks leading up to and beyond Christmas the 11 metre band was *far* from dead, DX wise.

There was excellent DX about with good to fair signals — as usual It was just a case of being there, at the right time of course, to reap the benefits.

Signals have been very poor from the southern region of South America, although some good strong signals have been logged from Costa Rica Honduras, Nicaragua, Guatemala and Panama from time to time. The big gun signals from Brazil, Argentina, Uruguay and Paraguay have been most conspicuous by their absence.

However, the usual hum-drum from North America is still there to keep us amused if all else has failed. Mexico, the USA and Canada have all been about, although at times rather spasmodically due to varying band conditions. Unless you are keen on working all 50 states of the USA or have a mate there to chat with you will be diverting your attentions elsewhere on the look out for potential new countries.

MIDDLE EAST & ARABIA

Some good DX has been emanating from this part of the world with some very good signals to match. Be on the lookout for some long path signals in our early- to mid-mornings, but don't expect signals to be too strong or last for too long. As usual, short-path is the best bet with early evenings onwards being the prime time to this region with good signals to match!

Saudi Arabia was logged just after Christmas by way of 48-AA-01 with Khaled at the helm, at 0821z, who was a good five by five signal and peaked a seven at times. Khaled is located in Riyadh. Due to his heavy accent I could

Now that you ask - no, it doesn't look like a CB rig to me either - and is that a linear I can see - whatever, it's a great looking station.

continued over page...

not understand the QSL route announced.

Qatar was represented on the band by way of regular 115-AB-98 operated by Mousa. At 0959z he was a good five by nine from his home in Doha, the capital of Qatar. Also noted was 115-AT-??? operated by Ahmed. At 1010z he was a poor four by one as the band was dropping away at the time.

Bahrain was noted quickly at 0765z by way of ATN-100 operated by Nal. He was a poor three by one and was calling in Arabic for a station in Kuwait.

United Arab Emirates has been about the band by way of Almah, signing as the 94-AT-107 from Dubai in the UAE. At 0525z Almah was a good steady five by five signal and requested that QSL cards go via: PO Box 4800, Dubai, United Arab Emirates.

Jordan was logged around 0659z by way of a very weak station I I I-AT-??? operated possibly by Stan. Heavy interference from Indonesia prevented me from hearing a great deal as his signal was extremely poor at the time. Another Jordan station operating from the capital Amman was noted at 0802z with a call-sign being just '102'. He was chatting in Arabic to a station in Lebanon.

A gentleman in Melbourne reported working a station in Alexandria, northern **Egypt** in early January with a barely readable signal at 1059z, so it just goes to show what is possibly about when you least expect it.

AFRICA & INDIAN OCEAN REGION

Some excellent DX has been filtering through from this part of the world with the best signals being reported in Queensland, Northern Territory and Western Australia, whilst those on the southern part of the east coast and Tasmania reported poor to unreadable — if any signals at all — being heard!

Malawi has been doing the rounds by way of Ron, who signs as the 226-AT-102. Ron was logged at 0646z with a fair five by one report but fading badly. Also from Malawi at 0755z was regular Noel the MZ-10 running 50 watts into a vertical. Noel was a fair four by two at the time.

Cape Verde Islands were *just* heard at 0602z by way of 205-CVX-?? with operator unknown. The signal was a barely readable three by one. The station was located at Mindelo somewhere in the islands.

Ivory Coast was logged by way of Jean, who signs as the 84-??-01, at 0759z. Jean was a poor three by two here from his home at Bouake, although a station in Queensland gave him a five by three report. The QSL route was not heard here.

Gabon has been about the traps by way of 215-AT-??? operated by Reno. At 0811z Reno was a very poor three by one at the best. Again, the QSL route not heard/known.

Zambia was coming in five by five by way of SAFARI-01 operated by Pete. As usual Pete was mobile at the time and told a DXer in Perth that he operates mobile only and has no intentions of setting up a base.

Somalia was noted by way of an American operating out of the capital Mogadishu. Chuck, operating as KBN-831 was five by three at 0901z and was looking for a mate of his in Eritrea at the time. Some report this one as a slim so work first and worry later!

Madagascar was logged briefly by way of the '888' name, but the exact location not given. At 0546z the 888 was calling for Reunion Island and was five by two at the time.

Tanzania was about by way of regular SAFARI-69 operated by Colin. At 0800z Col was a four by two report here.

Diego Garcia in the Chago Islands was represented by regular yachtie Karl signing as STATION-909. At 1106z Karl was five by six, however, being maritime mobile contacts with Karl do not count for IOTA or DXCC credits.

Equatorial Guinea made a brief appearance on the band by way of an unknown station located in Malabo. At 0946z this station was a poor three by one and was being flattened by some Asian stations on the same frequency.

Mauritius was noted at 0601z by way of Paul who signs as the '401', but poor English stops Paul from working non French-speaking DXers. Paul was a good five by one peaking five at the time from his home in Port Louis.

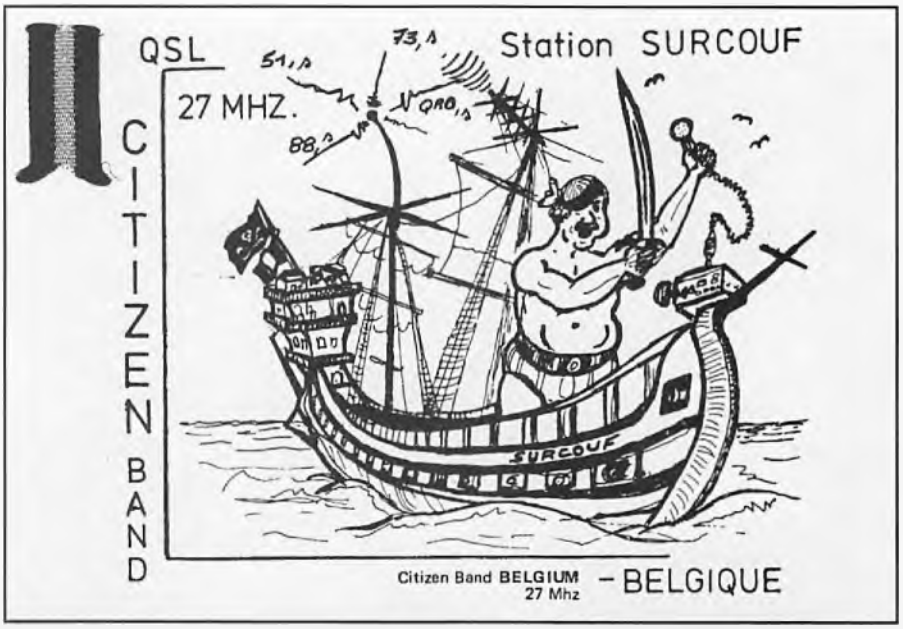
Canary Islands has been putting very big signals into Australia via the night-time short path. Daytime long path signals have also been reported to be quite good although fade is ever-present.

EUROPE

As usual, the hurly burly of the main centers of Europe have been with us, although some semi-rare DX has been mingling amongst the usual garble. It is just a case of *looking* for it.

The **Czech Republic** has been very active on the band, with the following already logged this year: 329-HD-04, 329-CZ-106, 329-CZ-110, and 329-AT-10? all between 1155z and 1430z with good readable signals.

Croatia is still about for those who need it: 327-AZ-102, 327-CVX-01, 327-



DXinternational

AT-102 and a number of others were heard between 1200z and 1440z with good signals.

Slovenia is usually about with the southern European onslaught and at 1320z I logged Mick the 328-VV-103 with a three by six report. Mick was having trouble with his microphone and quickly wound up the contact and closed down for repairs.

Hungary has quite a large number of stations on 11 metres: 109-AT-101, 109-AT-102, 109-HH-01, 109-HR-69 and 109-HH-09 were amongst those heard in the period 1100 to 1500z with good signals noted .

The **Slovak Republic** was logged at 1313z by way of Tibor signing as the 179-XS-101 with a fair five by two report.

Poland is in there amongst the thick of it too: 161-PL-103, 161-AB-108, 161-CV-103m 161-PP-01 and 161-XP-161 just to mention a few heard between 1200z and 1430z

Sardinia was good and strong by way of Antonio the 165-KK-100. At 1255z Antonio was five by nine plus 10dB — and about 10kHz wide too!

The **Ukraine Republic** was represented by way of the 315-EU- 106 operated by Yuri and the 315-CZ-10 operated by Kaz. They were both heard at 1033z with five by six or so reports.

Byelorussia was noted very weakly at three by one at 1017z by way of 317-CT-1?? name unknown.

Malta was heard amongst the rabble of a large European pile-up by way of 93-AT-DX and at 1006z was a poor three by one here. The QSL route was not heard at the time due to jamming and incessant calling out of turn, with one idiot in Australia yelling 'QRZ please' all the time!

ASIA AND THE PACIFIC REGION

The **Yemen Republic** was noted very weakly on the band around 0700z by way of 323-AT-101. The name was not heard here at the time because the signal was a very poor three by one, however I believe some DXers in Queensland and Western Australia made it through for a good contact.

West Malaysia is still about the traps for those who need this one. At 0251 z I heard Glen, the 113-AT-101 on air with a fair five by two report which increased to a six about five minutes later.

Okinawa Island was heard by way of JCO-63 operated by Nob at 0311z, and Nob was five by eight at the time.

Christmas Island in the Pacific was logged at 0321z by way of Teiua operating-as '266-DIV' and was five by six at the time. Just be cautious when QSLing the 266 division, as reports have not been good in their favor.

Israel, by way of a special operation from Bethlehem, was heard in the period 1146 to 1207z by way of two stations signing as 4-YZ-16 and 4-YZ-28, noted at five by one to five by three reports. They were heard requesting minimum US$2 for QSLing plus a 'gift' from Bethlehem — tax deductable, I wonder? Also from Israel I heard Henri the 107-AT-018/97 with a very weak four by zero report.

Mongolia was logged at 0450z by way of 95-AT-101 who was a poor three by one here, but had no shortage of Japanese callers.

Marshall Islands are still around for those who need this one in the bag. At 0208z I logged Tom the 132-KX-105 on the band, and Tom was a good five by seven from Majuro Atoll, the capital.

ARE WE BEING ROBBED?

In late August I received a letter from a reader in the Northern Territory calling himself "DX Dan the radio man" bringing to my attention the frequencies allocated to the 27Mhz 40 channel system. Dan says we are being short changed by five channels and, in reality, a 45 channel system should exist on 27MHz HF.

I checked the five frequencies Dan mentioned against the CB channel list in the back pages of a Dick Smith catalogue and found that, yes, Dan is right.

The frequencies we have `missed out' on appear to be 26.995, 27.045, 27.095, 27.145, and 27.195MHz.

Thinking back over the years I seem to remember that 27.095 and 27.195MHz were once CB channels allocated within the totally ridiculous and now mostly forgotten Australian 18 channel system.

Maybe those who own both an old 18 channel set and a current 40 channel set have two extra channels to play with..?

I am sure that the old 18 channel rigs have 27.095 and 27.195MHz as part of the channel block while the current 40 channel units don't!

Taking the time to examine the 40 channel frequency allocation block shows that while most of the channel spaces are 10kHz apart, some are

The Portugese station 31-AT-141, operator Jose, also has a strong station running what appears to be an old valve Uniden 2020 - an amateur rig which included 11m operation as in the days when this radio was new the amateurs had 11m - not CBers.

20kHz for some reason.

If we sit back and think about it like Dan, and counted in 10kHz steps from 26.965MHz (channel 1) to 27.405MHz (channel 40) we would tally a total of 45 channels, spaced 10kHz apart - would we not?

WHY THE MISSING CHANNELS?

Why the five missing channels, or three if we count the two previously allocated in the Australian 18 channel system? I do know that some services other than CB operate within the 40 channel block, many hospital pagers for one, and the bush walking frequency of 27.240 is another, but, it still doesn't explain why the missing channels exist!

Perhaps it was easier to adopt the American 40 channel system rather than 'release' the five extra channels for CB usage?

Crikey, we had enough stupidity with the silly 18 channels, why not repeat it and give everyone the benefit of an extra five channels by introducing the 45 channels from the start.

Stuff the Yanks, we don't have to copy every little thing they do just for the sake of simplicity! In the past we inconvenienced the manufacturers by getting them to produce the 18 channel Aussie set (let's also remember the flirtation with 23 channel rigs Ed), so why not ask them to whip up a 45 channel set and release the five vacant channels?

LET'S HAVE 'EM BACK

After all I think we are entitled to them as they ARE within the CB allocation that currently exists!

Recently I took the time to monitor each of the five vacant channels and heard totally nothing on them except for the odd contact on 27.095MHz and 27.195MHz which enforces my statement about them being left behind from the 18 channel fiasco of times past.

Casting my mind back to the bad old days of `10kc steps' and `5kc sliders', these vacant channels did see quite a bit of use. In the old days 27.145MHz was to be the DX call channel with 27.045MHz being the chit-chat channel. Who can remember the time when the Japanese founded International Wireless Association (IWA club), which had members in Australia (me being one of them, ex IWA-710).

We used 27.145MHz as a meeting and call frequency, however, today there is zero activity on these two once-popular `channels'. Surely they could be released and put to good use?

MARINE FIXED SERVICES ON 27MHZ

While on the subject of 27Mhz frequency allocations, I cannot understand the structure of the 27MHz marine section, devoted to the professional fishing industry and the operators of pleasure craft. The channel spacing for this important system also seems to jump about.

One particular frequency, 27.680MHz, seems to be cast adrift from the rest of the allocation with the actual channel spacings varying from 10, 20, 30, 40, to a whopping 100kHz apart. The reason for all of this is anyone's guess. Surely the spectrum can be managed on a better basis. I can understand a 20kHz spacing either side of the emergency channel but the rest, well, your guess is as good as mine. It would be interesting to know, as in the case of the five missing CB channels, why these anomalies have occurred and what the official response would be from the Spectrum Management Agency (SMA).

After all, they (DoTaC) allocate these frequencies and there must be a method in this madness, surely?

It is a pity that the top end of 27MHz is in such a mess and the problem continually remains unaddressed as the years go by.

From time to time I have noticed `coded' traffic being passed on 27.600MHz, 27.620MHz and 27.630MHz SSB, originating in the Sydney region.

These operators are very professional in their radio procedures and mannerisms which leads me to believe that it could be military or police traffic. On two or three occasions I have actually heard them use scramblers so that the traffic or code passed remains secret.

I only stumbled across these by accident when listening about for DX so I was naturally surprised by the proceedings.

THE MILITARY ON 27MHZ

It may come as a surprise to some `out-of-band' operators but many of those Indonesian stations that you hear on the band are in fact military stations and not CBers as first thought.

In 1991 I had an Indonesian friend in the shack and I asked him to tell me what various stations were saying on the frequencies outside of the 40 channels.

It appears that at least five frequencies are regularly used by the Indonesian Army.

They were logged in both SSB and FM modes giving out position reports and other military details associated with field training and manoeuvres. In 1992 when the band was wide open to Asia I was lucky enough to have one of my non-radio mates around for a few ales.

His wife is from Vietnam so I asked her to listen to some chatter, which I suspected was Vietnamese, on the higher range of 27MHz. Like the Indonesians, it appears that military-type institutions in Vietnam also use 27MHz SSB and FM modes as the traffic was a just riddle of codes.

All traffic was conducted in a very professional and serious manner which points to a military-style operation.

Well, that's it for this issue, have fun and good DXing....73 de Jack.

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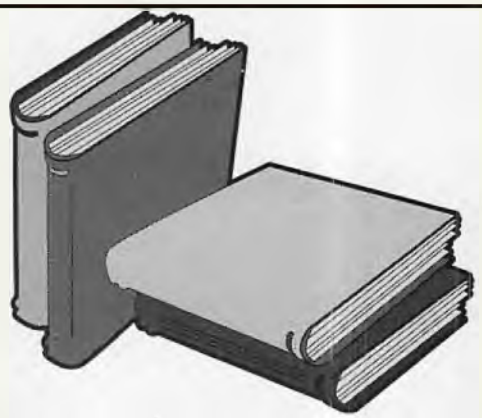
1993 "ESC" QUEENSLAND SCANNER FREQUENCY REGISTER....$32 INCLUDING POSTAGE!

SSB ENGINEERING ... VOLUME 1
Covers crystal switching methods, synthesized rigs, and early PLL rigs. The mountain of slide information makes this book a classic. Price $15, $1.50, P&P.

SSB ENGINEERING ... VOLUME 3
Covers the latest PLL-ICs, has a ham radio modification section and an AM to FM CB conversion section. Price $20, $1.50 P&P.



THE CB PLL DATA BOOK is the CB modifier's Bible. This all-new international edition covers fifty specific phase-locked loop ICs, with manufacturers' cross-references. Price $15, $1.50 P&P.

THE SCREWDRIVER EXPERT'S GUIDE will enable the average non-technical CBer to locate and repair up to 95% of CB radio problems, as well as helping the advanced hobbyist to tune and modify his equipment for improved performance. Price $15, $1.50 P&P.

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SOUTH PACIFIC RADIO
6 Sylvan Court
KALLANGUR
PHONE (07) 204 5000

MAIL ORDER DEPT-
PO BOX 29, KALLANGUR,
QUEENSLAND, 4503

SC036OB

CB UHF REPEATER LIST

The updated Repeater (UHF) list appearing in this issue has been prepared by ACBRO Inc. as indicated would occur in the last issue of C B ACTION.
Thanks are acknowledged here for the assistance given by the Adelaide State Office of the Spectrum Management Agency (SMA) and the readers who forwarded information as a result of the invitation to so do.
The basis of the compilation of this list emanate from the records of the SMA coupled with the information provided from others.
With limited knowledge of the national geography and names of places used by locals in a particular area, the possibility of some confusion may exist in the minds of readers.
Efforts have been made to have the brief detail describing a Repeater as its general location of effectiveness.
For instance, in South Australia, the Glenelg Repeater ADL 03 is listed as Adelaide" , as that is the area which it serves.
Changes such as this result from local knowledge and may not appear consistent in the listing.
To provided adequate time for preparation of this new list by the publishers, all mail received with further changes will be analysed and noted for a future edition.

As a result of information received and investigations made, it is learnt that some repeaters have a method of operation which may confuse some travellers.
We are aware that some repeaters operate without a "tail", and this may add to some confusion for strangers to a particular area.
Others appear to get switched off occasionally for short times to combat mischievous behaviour.
All of this adds to the confusion of the travelling CBer who is advised to seek information from operators local to an area.
Repeater users are encouraged to make welcome visitors to your area and assist them in any way possible. This will enhance the service that is generously provided by Repeater Clubs and proprietors who meet the cost of this facility that "Repeaters" provide.
Many clubs cater for the tourists in this way.
A letter from the Tamworth Repeater Assoc. Inc. offers the invitation for tourists (and others) to make contact if in need on their Channel 1. Repeater, on which they try to maintain a 24 hour "Radio Watch Base", as well as catering for the emergency situations that require response on Channel 5.
Congratulations to them and others who provide such good service.

NEW SOUTH WALES

Callsign	Town/Locality
	CHANNEL 1
BEL01	Belbora
BHI01	Broken Hill
BIN01	Bingara
BOB01	Harden
BRE01	Brewarrina
BRH01	near Broken Hill
BUN1	Bunnan
CHT01	Charleston
COR01	Corowa
DNQ01	Deniliquin
GRE01	Grenfell
GUY01	Guyra
JIN01	near Jindabyne
KGL01	Kyogle
MBI01	near Tamworth
MRT01	Wilcania
MTE01	Mt Eagle
NEE01	Dubbo
NIM01	Nimitable
NYN01	Nyngan
RYL01	Rylestone
SYD01	Sydney
ULA01	Ulladulla
WAG01	Wagga
WGT01	Walgel
	CHANNEL 2
BER02	near Gloucester
BRH02	Broken Hill
CAN02	Cangai
EDN02	Bega / Eden
GDH02	Gunnedah
INV02	Inverell
KHN02	Khancoban
KOS02	near Thredbo
KUR02	Sydney - Blacktown
LGW02	Mt Lambie
LIS02	near Lismore
MAC02	Port Macquarie
NBR02	Wee Waa / Narrabri
NOW02	Nowra
PAR02	Parkes
WAL02	Walcha
WAN02	Wanaaring
WBD02	Walbundrie
	CHANNEL 3
CAN03	Central Tablelands
COM03	Mt Kophi
DUN03	Dungog
GIL03	Braidwood
GTH03	Griffith
MDI03	near Ardglen
MNA03	Manilla
MOR03	Moree
MTI03	Tubramurra Shire
PLO03	Point Lookout
RWT03	Hay
SYD03	Sydney
TEN03	Tenterfield
	CHANNEL 4
ALB04	Albury
ARM04	Armadale
CBN04	Coonabarrabran
DRK04	Girard
GLB04	Goulburn
HAY04	Hay
MON04	Middle Bald Hill
MUS04	near Narranderah
OGU04	Ogunbil
RIV04	Mt Riverview
SOU04	near Cooma
THA04	near Broken Hill
TUL04	Tullibigeal
TWH04	Banora Point
WAN04	Mt Wandera
WAR04	Warialda
YNG04	Young
	CHANNEL 5
	EMERGENCY REPEATERS
BIN05	**Mt Bindo**
BKE05	**Mt Gunderbooka**
CAP05	**near Tenterfield**
CHN05	**Charlstown**
COR05	**Corowa**
FOR05	**Mount Tallabung**
GLB05	**Goulbourn**

The following channels are the Input channels for a repeater:

Ch	Frequency (MHZ)	
1	467.425	
2	467.450	
3	467.475	
4	467.500	
5	467.525	** for emergency use only
6	476.550	
7	476.575	
8	476.600	

The output channels are listed below:

In	Out	Frequency (MHz)	
1	31	477.175	
2	32	477.200	
3	33	477.225	
4	34	477.250	
5	35	477.275	** for emergency use only
6	36	477.300	
7	37	477.325	
8	38	477.350	

JIN05	**Jindabyne**
MTS05	**Narromine**
MTU05	**S-West Slopes, East River**
OXY05	**Bourke**
ROB05	**Illawarra**
SYD05	**Sydney**
TAM05	**Tamworth**
TBO05	**Mt Talbingo**

CHANNEL 6

BAR06	near Narrabri
BON06	Mandoe Mountain
COF06	offs Harbour
COL06	Oakey
GGG06	Glengary
LGW06	Lithgow
MAL06	Mallanganee
MTG06	Bowral
MUM06	Mumbulla Mountain
NAR06	Narromine
NEW06	Sugarloaf Range
ROB06	Mt Robert
TUM06	nowyMountains
WAL06	Walcha
WEN06	Tofamo

CHANNEL 7

BAL07	Buckombil Hill
BOM07	Bombala
BO007	Cabbage Tree Mountain
COW07	Cowra
GLH07	Glen Lyon
GLI07	Glen Innes
MIL07	Milton
NUN07	Mt Crawley
SYD07	Sydney
WAL07	near Yarras, w of Port Macquarie

CHANNEL 8

BAT08	Bathurst
COB08	Cobar
CON08	Condoblin
EUC08	near Eucumbene
GLE08	Glen Innes
GRE08	Underbank
GRF08	near GraRon
KEM08	Kempsey
MER08	near Merimbulah
MUR08	Tomewin
NAR08	Narrandera
ROB08	Illawarra
TBC08	Tooleybuc
URA08	Tooloom, near Casino
WAL08	Walcha
WOY08	Kariong

NORTHERN TERRITORY

Callsign	Town/Locality

CHANNEL 1

ALS01	85 KM SE of Alice Springs
BPK01	90 KM N of Alice Springs
DRW01	Darwin
KVB01	Double Hill
MLG01	Milingimbi

CHANNEL 2

ALC02	115 KM NE of Alice Springs
DDB02	Garibaldi Station
SWN02	150 KM NNE of Alice Springs

CHANNEL 3

ELK03	325 KM NE of Alice Springs
ERL03	185 KM SSW of Alice Springs
MMI03	Mistake Creek Station

CHANNEL 4

DPW04	70 KM S of Alice Springs
MST04	110 KM S of Alice Springs

CHANNEL 5

None assigned

CHANNEL 6

HEN06	120 KM SW of Alice Springs

CHANNEL 7

AMB07	85 KM SE of Alice Springs
ASP07	Alice Springs

CHANNEL 8

None assigned

QUEENSLAND

Callsign	Town/Locality

CHANNEL 1

ANN01	St Annes Range
BAR01	near Barcaldine
BAT01	Bathurst Heads
BNE01	Mt Cotton
DEL01	Collinsville
HAN01	Hannaford
HUG01	Hughenden
ING01	Inglewood
INN01	Innisfail
MDT01	Middlemount
MOR01	Mt Hope
OWN01	Mt Oweenee
RKY01	Mt Archer
ROM01	Mt Bassett
SPC01	Windorah
TSV01	Townsville
TTH01	Twin Hills
WBB01	Mt Perry
WCT01	Charters Towers

CHANNEL 2

GLD02	Gladstone
GLN02	Glenden
ING02	Mt Cordelia
JCK02	Julia Creek
LAU02	Laura
MAB02	Broadsound Range
MIN02	Glenlyon Dam
POR02	Drummond Range
SPC02	Bowen
TAM02	Tambo
TAR02	Taroom
TRN02	Quilpie
TWB02	Mt Kynoch
WAG02	Aranyi South
WAV02	Wavell Heights
WBR02	Mt Kanigan
WON02	Cogango Range

CHANNEL 3

ABC03	Gold Coast
CHI03	Chinchilla
CTS03	Charters Towers
INK03	Mt Inkerman
KIL03	Kilcoy
LAI03	Mt Beau Brummell
MBO03	Tinana
MTO03	Monto
MTW03	Mt William
PCC03	Edward River
SPR03	Springsure
VHO3	Mt Isa

CHANNEL 4

BBG04	Sloping Hummock
DIP04	Double Island Point
EID04	Eidsvold
GDI04	Goondiwindie
HOP04	Rockhampton
IPS04	Ipswich
JER04	Jericho
MBH04	Moranbah
MOW04	Darling Downs
TSV04	Townsville
VHN4	Expedition Range
VHW4	Cannonvale

CHANNEL 5

EMERGENCY REPEATERS

ABC05	**Springbrook**
BNE05	**Mt Glorious**
CEM05	**Clermont**
FSB05	**Mt Goonaneman**
GEM05	**MtWolvi**
ING05	**Mt Cordelia**
MIL05	**Commodore Peak**
QBM05	**Darling Downs**
VHN05	**Charters Towers**

CHANNEL 6

BLK06	Blackdown Tablelands
BRA06	Sea View Range
CBT06	Mundubbera
CHT06	Mt Janet
CLE06	Police Mtn
CNE06	Bergen
DIM06	Mt North Iron
GLD06	Mt Larcom
MIL06	Palardo Hill
MKY06	Gympie / Mackay
PRR06	Clermont
RIC06	Yan Yean
TAM06	Tambo
THG06	hargomindah
VHN06	Wilkes Knob

CHANNEL 7

BIL07	Banana Range
BNE07	Toohey Mtn
CTR07	Towers Hill
DMD07	Clermont
ESK07	Esk
GEM07	Gympie
IND07	Fraser Island
ING07	Mt Mercer
MUR07	Mt England
VHO7	Mt Hutton
WBB07	Mt Watalgan
WRA07	Warwick
YKA07	Mt Slowcombe

CHANNEL 8

AMI08	Amiens
AMP08	Monto
BAL08	Noondoo
BLL08	Blackall
CHN08	Mt Peanga
CHT08	Charters Towers
EMD08	Emerald
HBY08	Ghost Hill
MBR08	Mt Brisbane
NEB08	Nebo
ONV08	Ocean View
TLD08	Atherton
VHN08	Barkly Downs

SOUTH AUSTRALIA

Callsign	Town/Locality

CHANNEL 1

CDA01	Ceduna
MJN01	Oodnadatta
MTR01	Leigh Creek
PRC01	Carrieton (Nth of Orroroo)
PAR01	Adelaide (North)
TYN01	Oodnadatta
VLA3	Crystal Brook

CHANNEL 2

BOR02	Bordertown
BRP02	Orroroo
CLV02	Cleve
MYP02	Myponga
VLA4	Kingoonya

CHANNEL 3

ADL03	Adelaide (Central)
ALN03	Yunta
BLN03	Blinman, Flinders Ranges
CTR03	Moonta

KBY03 Port Elliot
UNO03 Port Augusta

CHANNEL 4

BLF04 Port Pirie
BAR04 Nuriootpa
KOK04 Lake Gairdner West
NAR04 Lucindale
PKI04 Kangaroo Island
Leigh Creek (North East of)

CHANNEL 5
EMERGENCY REPEATERS

ADL05 Adelaide suburb
BEE05 Crystal Brook
EUD05 Eudunda
MNT05 west of Woomera
MTG05 Penola/Mt Gambier

CHANNEL 6

LST06 Elliston (Eyre Peninsula)
NON06 120 Km West of PtAugusta
REN06 Renmark
SNO06 Snowtown (nearPt Pirie)
TIN06 Coonalpyn
WKI06 Kangaroo Island
WLG06 Tarcoola
WLP06 Willpena

CHANNEL 7

CLR07 Clare
MTG07 MtGambier
MUT07 south of Cockburn
UNO07 Kyancutta
VLA7 Streaky Bay
WIL07 Hawker
YKP07 Warooka

CHANNEL 8

BRYY08 Burra
MBV08 Lobethal/Murray Bridge
MTA08 Port Augusta
PTL08 Tumby Bay/Port Lincoln
Oddnadatta (200 KM SW)
Yalata (187 Km N/W of Ceduna)

TASMANIA

Callsign Town/Locality

CHANNEL 1

DEV01 Devonport
FIS01 Flinders Island
SET01 Grasstree Hill

CHANNEL 2

CHN02 Herring Back
LCN02 Launceston
TWC02 Mt Read

CHANNEL 3

NEC03 Ben Lomond

CHANNEL 4

MID04 Millers Bluff

CHANNEL 5
EMERGENCY REPEATERS

HBT05 Hobart
LTE05 Fingerpost Hill

CHANNEL 6

REC06 Mt Paul
VJA6 Mt Lloyd
WCT06 St Valentines Peak

CHANNEL 7

CHT07 Barren Tiet
TNE07 Mt Victoria

CHANNEL 8

BRN08 Burnie
TBL08 Table Mountain
TNE08 St Marys

VICTORIA

Callsign Town/Locality

CHANNEL 1

ALX01 Eildon
APS01 Apsley
MEL01 Melboume
OME01 near Omeo
ROU01 near Hamilton
STA01 St Arnaud
WAL01 Walhalla

CHANNEL 2

BAL02 Ballarat
KER02 Mt Kerang
MAN02 Mansfield
MOE02 Moe
PYA02 Pyalong

CHANNEL 3

ABE03 South
DEL03 near Bega
HOR03 Horsham
FAL03 Falls Creek
JNR03 near Dartmoor
WBT03 Mt Wombat
WPH03 Weeaproinah
YLA03 Yelta

CHANNEL 4

ANA04 Mt Anankie
ARA04 Ararat
BEN04 Bendigo
HAW04 Hawkesdale
MCA04 Marambingo Hill

CHANNEL 5
EMERGENCY REPEATERS

BAL05 near Ballarat
MAN05 Mansfield
MEL05 Melboume
RFY05 Ruffy

CHANNEL 6

FOS06 Mt Fatigue
HLV06 Healesville
ECH06 Echuca
BRN06 Mt Concorde
MSS06 Mt Seldom Seen
SWH06 Swan Hill
WAN06 Wangandry
WIL06 Mt William

CHANNEL 7

BOL07 Mt Bolton
BND07 near Bendigo
MEL07 Melbourne
MOR07 Mt Shadwell
MVL07 Mt Gordon
SHP07 Shepparton
TAL07 Mt Granya

CHANNEL 8

ART08 Safety Beach
DUN08 Western Victoria
HAR08 Mt Alexander
MCN08 Mt Cann
MYR08 Mt Porepunkah
TER08 Mt Terrible

WESTERN AUSTRALIA

Callsign Town/Locality

CHANNEL 1

COL01 near Mungalup
DEN01 Denmark
GER01 Geraldton
KAM01 Kambalda
KAT01 Katanning
KLB01 Kellerberrin Hill
LEN01 Leonora
MIA01 Mia Mia Station
MKT01 Poison Hills
PER01 Perth
WAR01 Warakuma
WIK01 Wickham

CHANNEL 2

BIN02 Bindoon
BUN02 Near Bunbury
CAR02 Camamah
KAL02 Mt Charlotte
LYN02 Lyndon Station
MRD02 Menredin
VLN5 Mt McLure
WLP02 Walpole

CHANNEL 3

ALB03 Albany
CLA03 near Carlotta
NOR03 Higginsville
PER03 Roleystone
VET03 near Bardoc

CHANNEL 4

BYB04 Dinninup
ESP04 Esperance
GNG04 Lancelin
KUL04 Kulin
MTB04 Cranbrook
NEW04 Newman

CHANNEL 5
EMERGENCY REPEATERS

PER05 Orange Grove
MTR05 Mt Barker
VLN6 Perth

CHANNEL 6

DAR06 Barkan
JUR06 Mt Lesueur
MGR06 near Margaret River
MNP06 Mt Many Peaks
MTS06 Mt Solus
VKM06 Wyalkatchem

CHANNEL 7

BDG07 Bridgetown
C0007 Coolgardie
MGR07 Augusta
MTB07 Stirling Ranges
PIN07 Pinjarra East
VRK07 Mt Bakewell

CHANNEL 8

MAN08 West Manjimup
MSA08 t Saddleback
NCM08 Kalamunda
QUN08 Quinorlup
RVT08 Ravensthorpe

A.C.T.

Callsign Town/Locality

CHANNEL 1

CBA01 Canberra (Portable)

CHANNEL 2

CBA02 Isaacs Ridge

CHANNEL 7

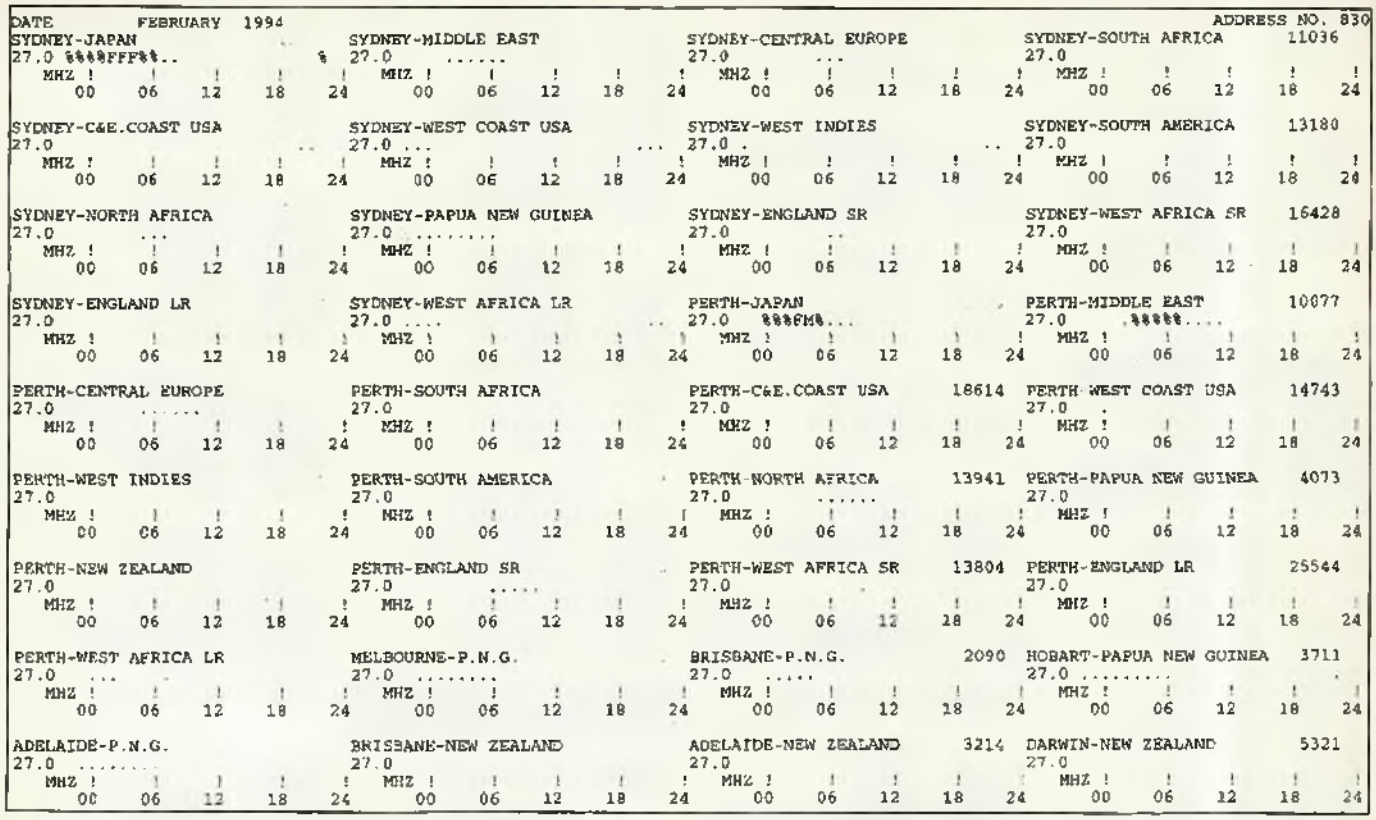
GIN07 Mt Ginini

CHANNEL 8

CBA08 Isaacs Ridg

REPEATER UPDATE

To maintain the UHF repeater list in an up-to-date manner requires the co-operation of repeater owners and local users. Please ensure that when an error is found, or an update is required, that you contact:
Trevor Colwell, ACBRO Inc.,
PO Box 170,
Walkerville 5081, South Australia
who will ensure that this information is included in the next repeater list.



These GRAFEX style predictions present in pictorial form the expected HF propagation conditions between Australia and a number of DX areas. For each circuit, the "East" terminal refers to the eastern half of Australia. The horizontal axis of each graph represents the hours of the day in Greenwich Mean Time (UTC) from 0000 to 2300, reading left to right. A GRAFEX symbol represents the predicted propagation conditions for 11m at a particular time.

GRAFEX Prediction Charts are supplied courtesy of the **Ionospheric Prediction Service, P.O. Box 5606, West Chatswood, NSW 2057**

IPS offers pre-recorded telephone information on (02) 269 8614.

LEGEND TO GRAFEX SYMBOLS

. Propagation is possible but probably on less than 50% of the days of the month.

% Propagation is possible on between 50% and 90% of the days of the month.

F Propagation is possible by the F modes on at least 90% of the days of the month.

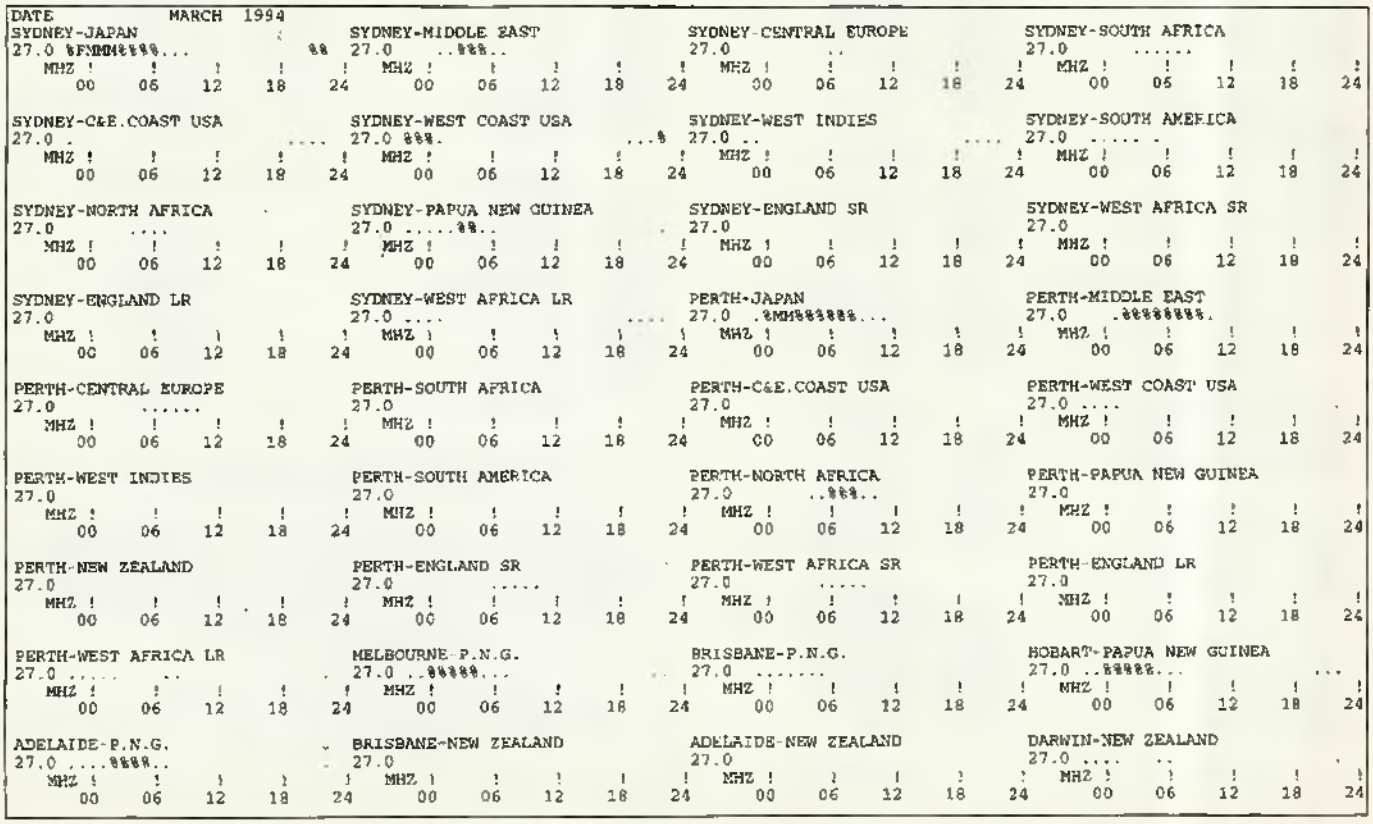
E Propagation is possible by the E modes on at least 90% of the days of the month.

M Propagation is possible by both the First and Second F modes on 90% of the days of the month.

S Propagation is possible by the Second mode on 90% of the days of the month.

A High absorption - above the ALF but probably too close to it for good HF communication.

X Complex mixture of modes including the Second E mode.



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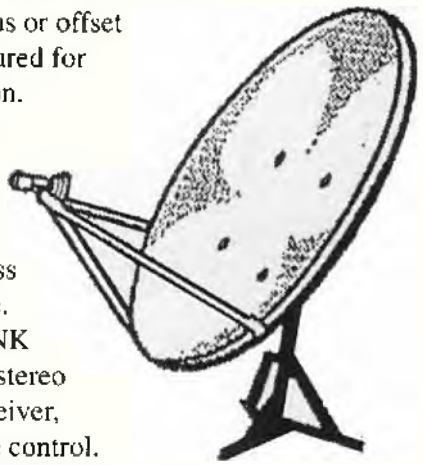

YES, PLEASE send me more information on K-band satellite systems

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