CB Action

AUSTRALIA'S ONLY CB MAGAZINE

March/April 1993 $3.75

Win A BEARCAT 70XLT SCANNER

REVIEWS:

- Brilliant TX-4000R UHF Rig
- Top Shelf AM810 27MHz CB
- Commex 'Bushranger' UHF Rig

FEATURES:

Gulf/Iraq Frequencies
So You Want To Be An Amateur!
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NEXT ISSUE (MAY/JUNE) ON SALE APRIL 20

ON CHANNEL

NO-CODE - WHAT'S HAPPENED?

The answer to the above question is that we've got no idea.

In the latter part of last year there was good reason to be confident that the proposed no-code licence would be up and running early this year - it isn't and we have no idea when it will be...

DoTaC staff have been remarkably tight-lipped about the delay and, while we have some strong rumors about why it hasn't happened, we do not have sufficient (confirmed) information with which to go to print.

We'll keep you informed when/if we have anything worth knowing.

BIG PENALTIES

Our sister publication Amateur Radio Action has been looking at the situation with general licencing, sub-standard and non type approved equipment and they have received legal advice which will make many operators, amateurs included, start to wonder whether they can afford a $10,000 penalty and/or five years gaol.

To give you an idea of what we're on about - if you are a CBer using an amateur rig which will transmit (even though you of course do not use it) on 11 metres - you aren't looking good...nor is an amateur! 11 metres is not an amateur band allocation so an amateur who has modified his rig to transmit on 11 metres is also using a non type approved rig...and is in just as much trouble as the CBer.

Just having such a piece of equipment in your possession (even tucked away in a cupboard) can bring you the above penalties.

The same applies to an amateur rig which has been "snipped" to provide DC to Daylight transmit capabilities even though the operator (CBer or amateur) might only use, say the 27MHz, RFDS and/or marine frequencies once or twice a year.

It's long been common knowledge that many (most in fact) amateur transmitters (and CB rigs also) can be quite easily modified to transmit on other than amateur or CB band allocations - that is, in commercially allocated bands.

It is also common knowledge that some retail outlets are quite prepared to modify an amateur rig to transmit on RFDS frequencies and/or marine bands while others will modify a CB UHF rig to scan (not transmit) police frequencies.

DoTaC (or the new Spectrum Management Agency - which is expected to replace DoTaC) are very anxious (take our word for it) to let all operators, CB, amateur and commercial, know they are serious about the current level of "spectrum anarchy" and you can expect to see some hefty penalties being applied in the near future.

Believe us - you need to catch up with the current state of play in respect to what you can and cannot do - or pay the price!

ARA (issue #11 and now on sale) has the details.

IN THIS ISSUE

If you're into scanning, we have some active Iraq/Gulf frequencies plus of course heaps of scanning news from Russell Bryant, you can win a Bearcat 70XLT scanner by getting the Xword right, there's a 27MHz propagation chart, questions from readers with answers from Ken Reynolds, several rig reviews along with all our regular columns...including Spectrum Anarchy which has returned...enjoy the read.

CB Action

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Modes: AM, narrow FM, wide FM, and SSB

Scan Speed: Approx 20 channels per second

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Audio Output: 1 Watt at 10% THD

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Size: 52 x 145 x 180mm

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NEWCOMERS START HERE

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

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

This is simply incorrect.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

We hope you enjoy CB and CB Action.

YOU ASK THE QUESTIONS AND WE'LL ANSWER THEM

By Ken Reynolds
POWER BAND COMMUNICATIONS

Since we have recycled the most common questions and answers several times over the past decade, in this issue of CBA we decided to have a go at some of the less common enquiries and clear up a few ambiguous items once and for all.

It's well into 1993 already and reflecting on unfinished business for the past year I discovered a file of unanswered CBA readers questions, that for one reason or another, got left behind with the passing of 1992. Because we receive so many readers' questions, it is all but impossible to answer them personally, so, when there is space available in the magazine, I try to catch up on the backlog.

A LOUD HUMMING NOISE

From Michael of Moorabbin, Vic.

When I turn on my 27 meg CB radio I often hear a loud humming/rattling noise that sometimes wipes out the whole band from minutes to hours. Sometimes it covers just a few channels and seems to move around the band.

What causes the noise and can it be stopped? I find it very annoying and usually end up turning off my rig.

ANSWER:

One of the conditions of using 27MHz CB is that operators agree to share the frequency allocation with other services. Even if you paid your licence fee (and I hope you did) you are still obliged to share the band with users other than CBers.

CB radio is considered by the authorities to be a secondary service which means that CB operators don't really have any special priority and must "cop" whatever interference is caused to them by the other services co-occupying the band.

Worst of all is that some of your competitors for channel space are industrial machines that use high power radio frequency energy for welding plastics and the like.

The machine operators are usually unaware that they are a major source of interference to CB radio operations and probably some of the "offenders" also curse the "Brrrr" noise makers on the band without knowing what causes the noise.

Even if the interference causes you a headache day and night you have no recourse to action in getting rid of the pests unless of course the plant causing the interference is operating illegally.

Most CBers find the interference is most prevalent in the daylight hours, its disappearance coinciding with the close of business hours.

The interference radiation field of these machines should be fairly localized as the machines are intended to focus the RF energy into the immediate area of their work rather than transmit a nuisance signal.

The more "rubbish" they radiate the less efficient they become. However, faulty machines can sometimes cause havoc on the band without the owners initially being aware of the problem.

MORE HUMMING and BUZZING NOISES

From Peter in Minto, NSW

I am a SWL (Short Wave Listener) and CBer. In the evenings when I do most of my operating I am plagued by a type of humming-buzzing interference that often drowns out the stations I am trying to receive. Sometimes the noises are very strong while at other times they are not too bad. I think it has something to do with TV sets because when my parents go to bed - I usually stay up late chasing DX - and turn off the television, the noise usually dies away a bit. Other times the loudness of the noise does not change much at all. Could there be something wrong with our TV or have I got it all wrong?

ANSWER:

Worse luck Peter, you were right the first time!

In every television set are a number of potential noise sources, the worst of all being the LINE Oscillator. As its name implies the line oscillator is responsible for producing the considerable electrical energy used to drive the electron beam that produces the horizontal lines across the picture tube screen.

(continued over page...)

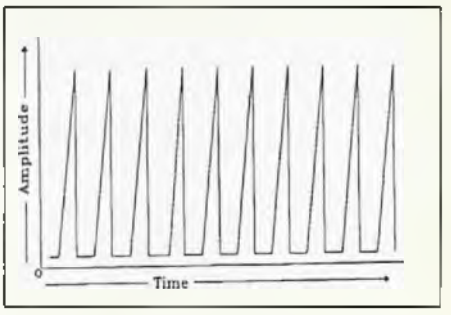


Figure 1. This wave shape approximates output signal from a TV line oscillator. It is rich in harmonic content and can be received many megahertz away from its fundamental frequency.

YOU ASK THE QUESTIONS AND WE'LL ANSWER THEM

Continued from previous page

The oscillator operates at a frequency of 15,625 Hertz (cycles per second) and because of the specialised job it has to do the output wave shape is called a sawtooth wave similar to that shown in Figure 1.

It is stray radiation produced from the electrical energy in this wave shape that is largely responsible for the generation of your humming-buzzing interference.

The energy produced by the line oscillator is not intended to be radiated as a signal and most of it is used in driving the electron beam across the TV screen, however, some radiation always escapes to produce a localised radio field around the TV set and some of the energy gets into the power wiring of your house and radiates from there also.

You probably think it strange that this low frequency radiation effects your CB and short wave radio reception.

If you have read some of our previous discussions about "dirty" CB transmissions and how they can interfere with other services you might begin to grasp how the TV line oscillator causes us all so much grief.

As discussed previously, a pure sine wave (see Figure 1) has no interference components in its make-up. If the wave is completely "clean" it will transmit a signal quietly on its "Fundamental" frequency without its presence being noticed on any other frequency. If we change the wave shape even the tiniest bit from a pure sine wave the result is that "harmonic" frequencies are produced and they are each capable of transmitting their own little signal. For example, an oscillator producing a fundamental frequency of 10,000 Hertz (cycles per second) will have its "Second Harmonic" at exactly double the fundamental frequency at 20,000 Hertz. The Third Harmonic will occur at 30,000 Hertz and the Fourth Harmonic will appear at 40,000 Hertz and subsequent harmonics generated will retain the same relationships to the Fundamental frequency and each other harmonic extended out to infinity.

Fortunately, each subsequent harmonic will contain less energy than the previous wave so that eventually the potential for interference "dies" away in a natural mathematical regression.

This is why a "tweaked" (or for many other reasons) CB radio can cause monumental interference problems to other services if the transmitted signal is distorted by some means from its usually "clean" sine wave shape. Distortion causes harmonics to be produced.

The line oscillator in your average TV set is by design the "dirtiest" of wave shapes and as a result its high level harmonic content is extremely high. In simpler terms, the harmonic output of the line oscillator has a huge number of high energy waves - all mathematically related to the fundamental wave of 15,625 Hertz - appearing as low power transmissions right across the HF radio spectrum and up in to VHF and UHF as well.

Because the energy content of the harmonic waves is low in terms of transmitted signal strength the radiated interference field extends only a matter of meters from the TV set, however, because of the large number of televisions operating simultaneously in the same geographic area the potential for interference to HF communications systems is a very real concern.

Television sets are responsible for a considerable amount of "background radiation noise" around the towns and cities and if you think it's bad on HF CB, readers should have a listen to some of the lower frequency bands some evenings to appreciate the really insidious nature of TVI..... not to the televiewer but from the televiewer.... the guys who usually complain about us.

TVI ON SOME TVs

From Bob in Dandenong, Vic.

I just put up a base station antenna for my CB radio and two of our neighbors are now complaining that I am coming through their TV sets. I checked with our other neighbors and they are not having any trouble. I don't come through our own TV and the people complaining are two houses away.

What can I do to fix the problem.

My rig is an ordinary AM CB that hasn't been boosted or had anything else done to it.

I got a TVI filter from a friend but it did not have any effect either.

ANSWER:

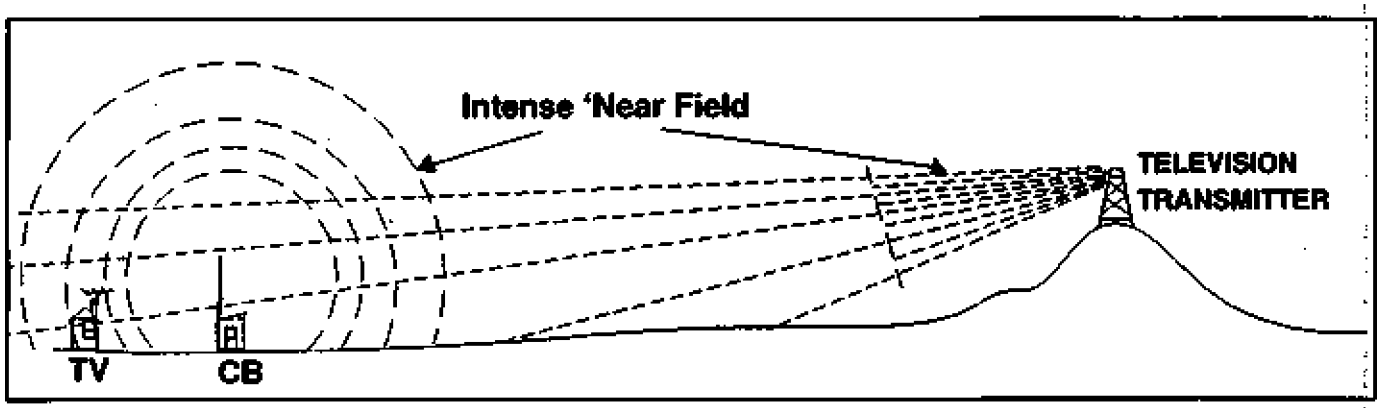
A pretty common problem Bob that is probably no fault of yours or your CB transceiver.

If your CB was at fault with too much harmonic output, the chances are that the TVI filter would have had some effect in reducing the interference, even if it did not completely cure the problem.

The TV sets suffering from the interference problem are probably suffering from "RF overload".

In other words, your transmitted signal is stronger than the television sets are capable of dealing with and because their "out-of-band" rejection is inadequate your "unwanted" transmission saturates the circuitry and

Figure 2. CB station "caught" in a direct path between the TV broadcast station and the viewer might cause serious TVI.



virtually brute-forces its way into the TV receiver chain...see Figure 2.

While it is your transmitted signal getting into the TVs and causing the interference, the actual fault is most likely due to poor design of the television receivers in respect to interference filtering - if they have any filtering at all.

Up to date there has been no laid down standard for interference rejection in this country - or many other countries - and since production cost is tantamount to the final retail price of television receivers, manufacturers often cut corners wherever they can.

Many older TV sets suffer more seriously than later designs. Fortunately, the FCC in America now has interference standards for TV receivers and being such a large consumer in the world market place, what happens over there eventually effects the rest of the developed world.

So we get the spin-off in better specification equipment.

You probably can't do a great deal about the interference problem yourself except for fitting a High Pass filter to the problem TV sets. In many cases this will completely fix the problem. You can also try moving your antenna around your property and testing to see if the level of interference changes with different locations. If your antenna is located directly in the reception path of the TV set it could compound the problem. If the neighbor is only using an indoor antenna or "rabbit-ears," or the like, it might pay you to suggest that they install a proper outside TV antenna. In fact, it is sometimes best to swallow your pride and supply the antenna. It might seem a stupid thing to do but there is good reasoning behind the concept. In many good TV reception areas the signals are so strong that some sets will operate ok without any antenna or with a minimum of aerial. The TV signals received in that situation will be fairly weak and the picture could probably be improved, however, many viewers don't care too much about the picture quality just so long as there is a picture of "sorts".

In the close vicinity of a CB transmitting antenna the "near-field" radiation is very dense and may completely over power the received TV signal. If the TV is connected to a good antenna properly sited and directed at the TV transmitters, often the ratio of TV signal compared with the interference source will be improved so much that the interference may be completely overcome.

Along the same lines, some TV antennas have been in place since the beginning of Australian TV broadcasting and the connecting feedline (usually ribbon cable) may have corroded away many years ago. This usually occurs at the exposed connection terminals right at the TV antenna.

Again, because the TV signals in an area are more than adequate, the viewer may not know the fault exists. Reconnecting the antenna - a new feeder might be needed - can sometimes fix the problem.

A good way to check if the feedline has broken or corroded off an old antenna without doing the "roof fairy act" is to check it out with a pair of binoculars.

DX STATIONS DON'T ANSWER

From Lance in Central NSW

I live in a good area for DXing and we get really good skip coming in for hours at a time. I get to work plenty of DX stations all over the Pacific and Europe. Sometimes a station that I really want to catch will not answer me no matter how hard I try. If I can get most stations I can hear at a good signal strength why can't I get others? I've got a four element beam up at 75 feet and I use a Washington Base station rig.

ANSWER:

There are a couple of main reasons for not getting through to DX stations - and even closer stations as well - unless of course they choose not to talk to you.

All things being equal - radio and antenna performance - under favorable conditions every operator should be able to contact another station whose signal is of adequate strength.

(continued over page...)

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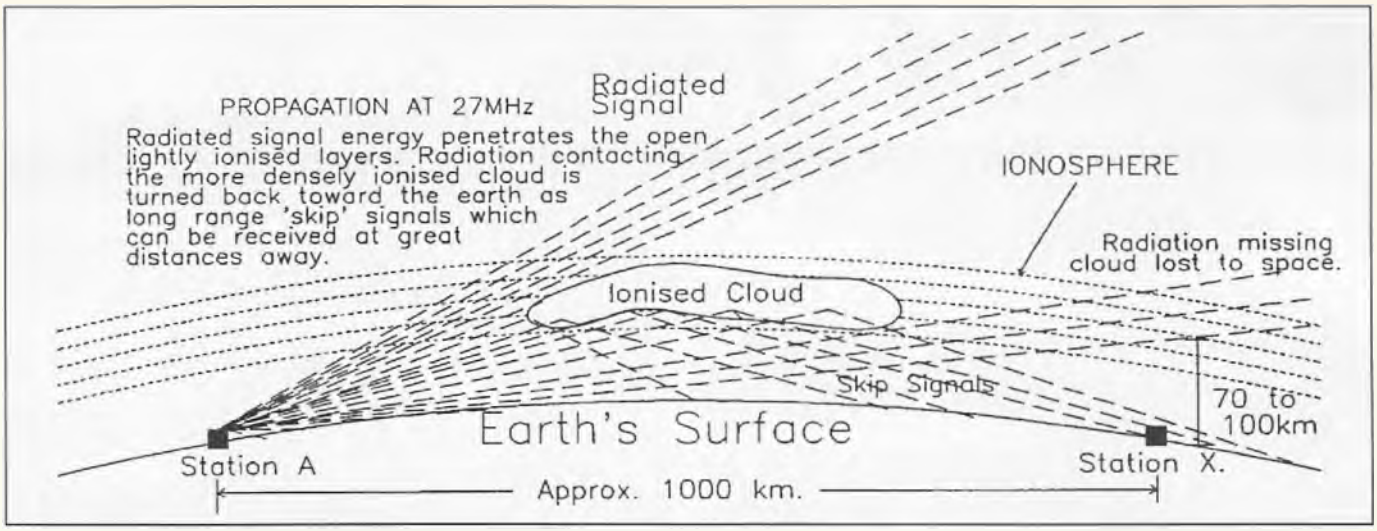


Above: Profile view of the skip path between stations A & X. Much radiation is lost into outer space as the signal penetrates low density ionisation.

YOU ASK THE QUESTIONS AND WE'LL ANSWER THEM

Continued from previous page

A natural law of reciprocity causes the performance to be just as good in one direction as the other direction.

Let's examine the variables which might affect this reciprocal effect.

If the station you can hear but can't contact is using unusually high power, chances are you can hear him above the background chatter but because of your limited legal power he is unable to pick you out of the background noise level...in fact you are probably a part of the background noise yourself.

Excess power under normal conditions does not give you much extra range, but when the skip comes in, a high power station's signal usually "leaps" out above the cacophony of other stations.

Propagation conditions can also cause your signal to be lost in one area but allow signals from that very same area to be heard easily by you. The diagrams in Figure 3 show how this is possible. The density of the ionosphere controls how much of your signal is reflected (actually refracted) back to earth and the height above the earth's surface determines the skip distance.

People tend to think of the ionosphere in fairly tangible terms when in fact it is invisible to the eye and consists of ionized gas particles in a very thin atmospheric jacket about 70kms above the planet's surface.

Bombardment with ultraviolet radiation from the Sun is largely responsible for the ionisation and as the earth rotates daily on its axis the depth of the ionised layer and its density continually changes as a function of relative angle to the sun's radiation. In dense air, ionisation still takes place but because the gas molecules are very close together, any stray electrons "knocked" out of orbit are quickly absorbed by adjacent atoms.

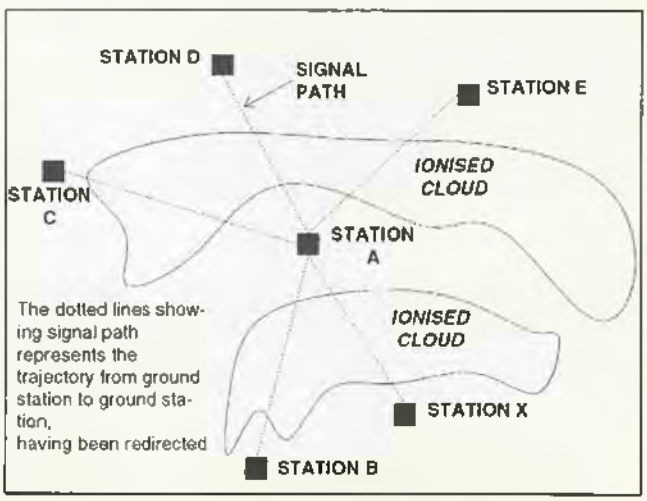
In a very thin atmosphere the gas molecules are considerably more distant from each other and a wandering electron might stay on the "loose" for an extended time before it finds an ion that requires its charge for balance. As each part of the earth's surface travels through the day/night terminator (what a good name for a movie) most of the ionised atoms reach equilibrium.

The ionised layers then deplete and continually change in their height above the earth's surface, their density and depth or thickness.

Because of this always changing phenomonen, patches or "clouds" (not the weather clouds you see every day) of higher ionisation often occur.

These ionised clouds can range from quite small to extensive areas covering thousands of square kilometres. From the diagram, let's nominate station A as the strong DX station, B,C,D and E are other stations with access to skip conditions via ionised clouds, and finally X marks your spot on the map. It should all be coming together at this stage. As you can see, station B is receiving signals from a number of areas that have enhanced ionospheric conditions and because of the reciprocal laws of nature, station A's signal will be heard by all the others at B,C,D and E. So station A has access to a much larger range of possible stations than you at point X. Some or all of the stations could well be much stronger than your signal received at point A and so your signal may be even undetectable by station A, even though you can hear him "wall-to-wall".

Below: Plan view of stations all having access to "skip" conditions. Stations B,C,D,E, & X can all communicate with station A. Station X only has a "path" station to A and cannot hear B,C,D or E.



SCAN 1993

By Russell Bryant

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

SCANNING THE PIRATES

Like motor vehicles, guns and just about everything else in this world, the RF spectrum is controlled by rules and regulations. The laws that govern the use of radio frequencies is administered, in this country, by the Federal Government, via the Department of Transport and Communications.

Among the licensing and general administration of the spectrum, DoTaC's responsibility extends to the detection and, where/when necessary, the prosecution of non-authorised users - pirates and out-of-banders.

A difficult job, given their limited resources.

Imagine trying to keep tabs on the thousands of usable frequencies and hundreds of thousands of licenced users. This in addition to those who flaunt the law by operating on unauthorized frequencies and often at illegal power levels.

Your scanner can open up to you the world of these illegal operators.

The trick is in knowing where to listen, especially as most pirates go to extreme measures to protect themselves from detection.

Changing frequencies on a daily basis, employing scrambling devices and operating under a `borrowed' (read stolen) callsign are just some of the methods of disguise.

LAND BORNE BUCCANEERS

Australia is an island nation and we make good use of our excellent weather and ideal boating conditions. Any `boatie' worth his salt will go out to sea equipped with a VHF marine radio. It is therefore safe to assume that all activity on marine radio occurs within a short distance of our waterways and harbors. Wrong! Not all pirates are aboard things that float

The low cost, together with easy access to 156 MHz marine radio, means they are sometimes used in places well away from any of our waterways and boating establishments. In the outback, far from the licensing authorities, the unauthorized use of marine radio is widespread. Property owners, trucking firms and general users find the excellent propagation of VHF frequencies, especially over the flat plains and desert areas, very much to their liking. Check out the frequencies 156 - 157.45 MHz for activity not associated with marine services...you're guaranteed to hear plenty of illegal activity.

PLUNDERS FROM THE SKY

Keep in mind that a pirate is someone who is not authorized to use a particular service or frequency.

Another band prone to pirate onslaught, is that legally allocated to aircraft - the VHF aircraft bands. Any airband enthusiast will know that 123.450 MHz AM is used for air to air chit chat and informal communications between pilots and ground crews. It may surprise you to learn that pilots and others are not permitted to use the `numbers' channel, as it is know, for communications of any type.

In fact the CAA/DoTaC authorities will prosecute anyone found using it.

Spread amongst the tower, control and other airband channels are `company' frequencies. Certain groups, such as refuelers, mechanical services and terminal facilities have a need to talk to aircraft and they have available to them a number of these company channels in order they may be able to conduct their business.

As the majority of company frequencies are located at large city and regional airports, their use away from these areas would go largely undetected.

Some frequencies to keep your scanner tuned to for this type of action are: 121.1, 122.7, 122.8, 122.9, 126.35, 126.4, 128.8, 128.9, 128.95, 129.1, 129.9 and 135.55, all in AM mode.

AMATEUR TREASURE

Amateur allocations are another area open to abuse by pirates.

This is particularly so as the equipment is relatively cheap, available in large quantities and more importantly, easy to purchase without licence or qualification.

It was not that long ago since a NSW State Government department was taken to task for employing 144 MHz frequencies for their in-house communication needs.

The amateur bands that come in for the most attention from pirates are 28 MHz, 54 MHz, 144 and 430 MHz allocations. The latter two being most prone to unlicensed operators.

BRING IT BACK

One American ham band that is not used here in Australia is 220 MHz FM.

As a population we have become more transient, visiting foreign shores and acquiring equipment that is not type approved for local conditions. Radios for use within the 220 MHz allocations are readily available both in the US and Asian markets and many are brought back by pirates.

If you doubt this, tune the frequencies 220 to 225 MHz in FM mode and you'll soon be convinced.

Marine, aircraft and ham frequencies are not the only bands over which pirates have hoisted the Jolly Roger. The abundance of second hand commercial equipment at very low prices, no doubt has lead to pirate activity amongst the VHF and UHF land mobile services.

SIMPLEX CANNON FODDER

Highlighted in a previous issue of SCAN were the UHF simplex frequencies used by services requiring short distance communication. Out of the dozens of frequencies in use, four are more likely to attract pirates than any others. Available for `short term rental' from the authorities, they can have many and varied users spread across a city.

Dial up 471.475, 471.625, 471.900 and 471.975 MHz.

The same situation exists on VHF high band.

With several frequencies set aside for short term allocations and low power services it is an ideal area for looting. The frequencies that pirates can often be heard on are; 158.080, 166.510, 168.670 and 173.310.

AND SO TO CB

Twenty or so years ago 27 MHz was the bane of DoTaC's existence.

It seemed that everyone with a flair for piracy was attracted to this previously under-utilised home of ham communications. Rather than try to beat them, DoTaC authorised the use of eighteen frequencies between 27.015 and 27.225 AM for CBs.

The idea behind 18 channels was to minimise the impact that imported American 23 channel sets had made on the (originally illegal in Australia) hobby.

Some time later 40 channels between 26.965 and 27.405 were set aside for CB operation. Even with the licensing of CB and the subsequent expansion of the band, 27 MHz still attracts considerable pirate activity.

PIRATES ARE MADE NOT BORN

Back in the 70s, when all the lobbying for a CB band was taking place, the regulatory authorities decreed that AM/SSB would

Continued over page

be the only modes permitted on 27 MHz. Anyone who has used or listened on 27 MHz AM frequencies, will no doubt be aware that AM is not the best mode for clear, noise free communications.

To achieve this end many have had their AM sets converted to FM.

While the skip distance is certainly reduced, most users believe that the lack of noise and interference more than makes up for the switch to FM, however, even when operating on the authorised frequencies, it remains illegal to use the unauthorized FM mode.

While we are looking at this area of the spectrum, let's take a look at what else we can find.

It is common knowledge that illegally converted radios that can transmit across huge chunks of the 10 and 11 metre bands have found their way into the hands of pirates. Some unscrupulous dealers have converted these radios with little regard to the interference they may cause due to spurious emissions. Set your scanners to search between 26 MHz and 30 MHz for this type of activity.

SPLITTING THE DIFFERENCE

UHF CB also appeals to the pirate with higher than legal power levels and 12.5 kHz channel spacing in lieu of the legal 25 kHz being two of the most common infringements.

Although I have only concentrated on VHF/UHF allocations, SHF and especially HF are plunder for the RF pirate. Just because the transmission you are monitoring sound okay, don't assume they are automatically legal. There's a good chance they are being made by 'pirates', not authorised to use the frequencies being used.

If you tire of the usual radio fare, enjoy something different and tune around to check out the pirate activity that may well be as close as your next door neighbor.

MAILBAG

CANBERRA NEWCOMER

EB of Curtin, ACT congratulates CBA on being a fantastic magazine and would like to see a beginners' section for scanner users. We are one step ahead of you - a scanners' `Newcomers Start Here' page has featured in past issues and will feature in future editions of CBA. It is specifically aimed at newcomers. Some ACT frequencies sent in by EB are AFP - 468.400, 468.425, 468.475, 468.700, Parliament House - 467.550, US Embassy - 162.520, NRMA - 487.250, Fire - 466.850, SES - 168.820 and 168.850.

PRO 2006 MODS

SW, Whyalla, SA is seeking information on how to modify his PRO 2006 to enable 30 kHz spacing on cellular bands. Firstly, modifying the radio will void any warranty. Secondly, monitoring cellular phones is illegal. Having said that, the procedure is, however, easy.

With power switched off, remove the upper case taking care as the speaker is attached and the wires are not that long. Locate diode D504, which can be found on the vertical board directly behind the keyboard. D504 should be directly behind the number '3', facing the insides of the scanner. Snip the top leg of the diode and separate it from the body of the component. Test the radio. If, during search, the 30 kHz indicator is not showing, press the reset button.

BACK ISSUES

MA of Townsville, Queensland is wondering if back issue of CBA are available. All enquiries regarding back issues should be forwarded to *CBA, GPO Box 628E, Melbourne, VIC 3001.*

To improve the performance of his FRG 9600 our reader obtained Tom Moffat's interface kit and computer program called SCANCAT. Infinite scanning speed control, step control and memory are just a few of the features that are added to the receiver.

For FNQ readers Townsville ambulance are now using 79.650 and the police 76.385.

SATELLITE POLICE

Graham, Lawson NSW, asks if the US police, fire and ambulance departments use satellites as apart of their communication networks. To the best of my knowledge and sources in the US, American emergency services don't use satellite, their communications are restricted to VHF low and high, UHF and 800 MHz.

FleetSatCom is one of a few satellite users on 200 MHz. Most are now in standby mode and not used unless everything else fails. AMSAT stands for Amateur Satellite service and these operating frequencies can be found in the 144 and 420 MHz ham bands. `Oscar' is the name of one of the ham sats.

The frequency 152.060 could have been issued to the RAAF at Glenbrook many years ago and their licence is renewed automatically, even if they no longer use the channel. It is listed as 20 watts voice but could be for anything...or may have been retired from use 10 years ago.

PRE-AMPLIFIERS

MB, South Hedland, WA is seeking help with pre-amps for scanners and CBs. I don't know of any pre-amps for CBs apart from those found in bi-linear amplifiers, however, scanner pre-amps are another story.

GRE America manufacture an excellent little scanner pre-amp called the Super Amplifier. It operates over the frequency range 100 MHz to 1 GHz (I have found it goes below 100 MHz without degradation) and provides gain up to 20dB and can be powered by either internal battery or an external 9 VDC supply. Depending on your circumstances, a pre-amp can improve reception to the point of hearing services previously unheard. The Diamond D 707 is a good all-round performer, especially for those enthusiasts who reside outside main cities and strong RF areas.

Information regarding GRE products can be obtained from *GRE America Inc., 425 Harbor Blvd., Belmont, CA 94002* (and mention CBA).

APPLE ISLE ATIS

Jason, Summerhill, TAS is a regular contributor to SCAN and writes to say that Hobart ATIS has changed frequency from 124.4 to 124.3 MHz AM. Some humor has found its way into the Launceston ATIS 112.6 MHz AM. After the tower closes at 10pm the ATIS has messages such as "lights are on but nobody is home" or sounds of knocking on a door go unanswered.

On FltSatCom Navy Relay channel Alpha 10 (268.250) transmissions from various locations within Korea and Vietnam concerning the whereabouts of prisoner of war camps have been monitored. Our correspondent has tried a FM Trap from Tandy, cat 15-577, for filtering out unwanted transmissions from VHF signals. He says for $10 it has reduced BCI to almost nil.

AIRBORNE FIRE

Andrew, Euroa, VIC is a CFA volunteer interested in finding the frequencies used by fire services, particularly those within the aircraft bands. In NSW, Victoria and WA 119.100 MHz AM is available for Fire Control stations to communicate with aircraft overflying the fire ground or assisting in fire fighting. Also in Victoria, 131.450 MHz AM is licenced to the CFA for similar purposes.

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SCAN 1993

Continued over page....

OVERLOADING UNDERSTOOD

GT, Goulburn, NSW has a few problems with overloading whilst using a pre-amp and wonders what, if anything, can be done to reduce the problem. The modern scanner, with a few exceptions, use an intermediate frequency of 10.7 MHz, the PRO 2006, AORs, Icom and Yaseu rigs being a few that don't. The problem lies in the use of 10 MHz for filtering. The PRO 2006 would have similar sensitivity to your current model (PRO 2020), however, due to the better filtering (around 600 MHz) it would reject the overload a little better than the 2020. When you add the pre-amp at 20 dB you are risking overload by a factor of three.

The AR 3000 will perform at roughly the same level as your Realistic with regard to sensitivity. Selectivity and image rejection will be superior as will the elimination of some of your overload problem. Without seeing your setup, proximity to RF sources, cable, location and general bits and pieces, it is hard to say if one unit will do this while another won't.

Generally speaking, I find the PRO 2006 (I use one myself) hooked to a pre-amp has little problem with overload caused by the amplifier. There are some frequencies that can cause trouble, such as 83.760 police VHF channel 1, however, most are trouble free.

The fact that you cannot receive UHF seems to be your location in relation to the transmitter...you may be in a slight depression or hidden by hills or buildings.

What type of cable are you using?

The thick RG 213 is the only way to go but is hard to work with.

Thin RG 58 is okay for short runs but is subject to loss and, more importantly noise, especially when using pre-amps.

MOE MIX

Michael of Moe in Victoria is seeking the answers to a number of questions. First though are some frequencies for this small Latrobe Valley town.

The police in the township of Moe use channel 8 - 168.310 MHz. The CFA can be monitored on channel 4 - 163.150 MHz. The ambulance services use channel 50 - 76.730 for general dispatch and 412.475 (channel 67) for UHF portables on Morwell. The SES use 468.600, 468.625 and 468.650 MHz.

His next question concerns his antenna setup.

The Itron aerial is as good as any other and if it works at your location there is no need to spend money. However, if you wish to up-grade your system, any of the popular discones will do the job.

Finally, he asks "Are scanners legal?"

Scanners are perfectly legal, just don't monitor mobile telephone calls with them.

MORE FROM WA

In the last issue of SCAN I featured a list of frequencies supplied by a cameraman from one of Perth's television stations.

Here are some more numbers from this extensive list.

Aircraft (AM), Perth ATIS - 113.700, Jandakot Tower - 118.100, Jandakot Ground - 119.900, Perth Flight Service - 120.700, Jandakot ATIS - 120.900, Perth Ground - 121.700, Perth Approach - 123.700, Perth Control - 125.200, Rottnest Island - 126.000, Perth Clearance - 128.100, Australian Airlines company - 129.500, RFDS company - 129.600, Ansett company - 130.600, Police - 131.600, Qantas company - 131.900. SES channel 1 - 163.270, channel 2 - 163.390, channel 3 - 164.440, channel 4 - 164.890, channel 5 - 165.070, channel 6 - 164.230 and channel 7 - 163.240.

ABW 2 News - 161.230, ABW 2 Master Control - 164.500 and 171.900, TVW 7 News - 165.460, STW 9 News - 169.960, Radio 6PR - 172.770 and Radio 96FM - 173.250. Municipal Councils are next with Armadale on 159.760, Rockingham - 160.150, Swan - 160.240, Wanneroo - 160.420 and Nedlands - 162.130.

Fisheries Department - 163.720, 163.990, 164.560, 164.830, 165.320. CALM spotter aircraft - 168.715, 168.910, 168.970 and 169.540.

OH CONSTABLE

TJ, Kings Meadows, TAS is new to scanning and seeking frequencies for the 000 services. I have the following on file although some may have changed. Ambulance 78.130 Devonport, Burnie, 78.160 Launceston, Georgetown, 78.385 Hobart, Huonville.

Urban Fire 77.030 Georgetown, 77.150 Zeehan, 77.210 main operations channel Hobart CH.1, 77.735, main operations channel Launceston 77.915 Hobart Major Incident backup CH.2.

Country Fire 76.460, 76.520, 76.745, 77.405 Bridgewater, Hobart, 77.435 Hobart, Southeast, 77.585 Midlands, 77.645 Launceston, Northeast, 77.975 Southeast, Northeast, Northwest, 78.055 Southeast Main channel.

Police 76.640 CH.1 Hobart Special operations, Devonport City, 76.670 CH.2 Launceston City, 76.700 CH.3 Hobart City, Burnie City, 76.085 CH.4 Launceston Country, 76.115 CH.5 Hobart Special Ops, Radar, RBT, Demonstrations, 76.145 CH.6 Hobart Country, 76.175 CH.7 Launceston Special Operations, 76.205 CH.8 Burnie Country, Queenstown, Zeehan, Ulverstone, 76.235 CH.9 not used, 76.790 CH.10 Emergency liaison channel, CH.16 468.225 Foot Patrols, Inner City car patrols, CH.17 468.250 Simplex.

CAN'T STOP THE MUSIC

In the last few months I have received a number of letters from across the country from readers who say they are monitoring weird music on frequencies within the 150 MHz band.

They would like to know who/what and where it is coming from.

The services in the 150 MHz form part of the Multi Point Distribution Services.

Known as VAEIS (Video, Audio Entertainment and Information Services) programs relating to specific ethnic groups or other demographics are broadcast to those who have paid subscriptions. Three years ago it was possible to monitor these services on any scanner, however, DoTaC now stipulates that all VAEIS transmissions be encoded. While most are, a few run clear unencoded programming and that monitored on 152.175 in Sydney is an example.

FREQUENCY HUNTER

Steven, Muswellbrook, NSW details some of the frequencies found in and around the Hunter Valley town.

Telecom - 158.700, Drayton Mine - 494.325, Bayswater Coal - 489.175, Muswellbrook Coal - 74.180, Shortland Electricity - 460.350 link, 76.340, Water Resources - 172.215, Elcom - 82.050, National Parks - 460.475 link, 73.550.

Police - 83.955, 459.9/469.4.

Fire - 78.010.

Ambulance - 76.670.

Bushfire Brigade - 173.640.

Muswellbrook Council - 410.275.

Scone Council - 72.680.

KFC Drive-Thru Muswellbrook - 40.490.

CONTACTS

NAME : Ian
CONTACT : PO Box 2409, Southport, QLD 4215
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SCAN 1993

Continued from previous page....

NAME : Alan Waye
CONTACT : 41 Cornish Terrace, Wallaroo, SA 5556
INTEREST: HF, VHF, UHF, SWL and amateur radio

PROPAGATION

ANTENNA MAINTENANCE

Now that summer is all but over, it is time to look at what we have stuck up a pole. For those scanner users who use an external aerial, it is necessary to make sure that all is well and working efficiently.

Whilst we have had some rain during the summer months, it has been relatively dry and this can be a good reason why your antenna system is not working as well as it might.

Metallic antennae attract airborne salts which lodge on the metal and can reduce the effectiveness of your antenna(s). Also, spiders find aerials ideal frame work for construction of webs and a combination of webs and electrolytes can result in a severe reduction in the performance of an externally mounted receiving element.

Everybody knows that stainless steel and aluminium do not grow on trees...everybody but me that is.

I can be see watering my external aerials at regular intervals, usually to the great amusement of my neighbors. The reason for entertaining my next door neighbors is simple, a good wetting down removes the spider webs and electrolytes, thereby returning the aerial to its original condition.

WHAT'S NEW

WECAM GROUND PLANE ANTENNA

To work effectively an antenna must have a ground plane. Even those aerials that are advertised as `ground plane independent' have in fact the ground effect built into them rather than relying on an external one as does a non-ground independent unit.

For those who use their scanners as a base, the discone is the most obvious aerial that employs a ground and radiating element in one package.

Now for something new but built on an old theme.

The WECAM Folding Ground Plane Antenna.

This well constructed, simple design, low cost alternative to the discone is set to capture a number of markets. Standing around a metre tall, the WECAM is well suited to the enthusiast who resides or travels in a caravan, as well as to the fixed base station.

Four legs fold out to form the ground plane. They are secured in place by screws and tooth washers so are not likely to collapse or break. When not being used the WECAM folds into a neat package able to be easily stored in a cupboard.

A vertical whip insulated from the ground section forms the radiating element. Leading from the square body section which holds all in place is a good length of RG 58 coax, terminated in a BNC plug. Should you wish to mount the WECAM on a mast, two buckle and strap type attachments are affixed to the antenna body. Otherwise the WECAM can rest on the ground elements which form four secure legs.

It is difficult to determine what frequency the WECAM is tuned for just by appearance and no mention is made of operating band width, etc in the instruction sheet.

For the scanner user this doesn't matter for it appears to work well from 30 MHz through to 800 MHz with reduced performance either side of the above stated frequencies.

In testing, performance within the limits of 70 MHz and 520 MHz was equal to, or exceeded that, of a discone.

The aerial sat on the roof of my house about half the height of the comparison discone.

Overall, the WECAM impressed as good performer especially for handheld scanners being used whilst travelling in a caravan or even when camping. While the WECAM has the performance of a discone, its cost is significantly less retailing for $63 including postage to anywhere in Australia.

All enquiries should be forwarded to CANAVAN, PO Box 202, Melton, VIC 3337.

NEW FROM ESG

1993 will see a few newcomers to the ESG catalogue with some of the less popular frequency registers being dropped.

Complete guides are now available for every state.

They join the standard type state guides.

State HF registers and Emergency Service guides are also available but the Railway and Aviation registers have been dropped. ESG claims that 99 percent of government users are correctly identified in their guides.

Write to ESG, GPO Box 1200, Adelaide, SA 5001 for further information.

NEW, BUT NOT FOR US

Tandy USA have released the replacement for the PRO 37 handheld scanner. Designated the PRO 43, it is a departure from the now somewhat outdated design and specifications familiar to most Tandy users.

The 43 has improved filtering with 608.005 to 611.200 MHz as the first IF, 48.5 as the second and 455 kHz as the third.

Triple conversion means less image and selectivity problems.

Apart from the electronics, the PRO 43 is aesthetically different to the 30 series of scanners being smaller and appearing more as a compact amateur handheld radio, rather than a scanner.

Frequency coverage for the US model is 30-50, 118-174, 220-512, 800-1000 MHz, minus cellular allocations.

Sensitivity is not quoted.

The PRO 43 covers its 200 memory channels at 25 channels per second, or searches out new frequencies at 50 cps.

Sound good...

Unfortunately we will not be seeing the PRO 43 as Tandy have decided to release the PRO 39 to the Australian market.

Feel like a trip to the states?

SCAN THE BEST!

To the best of my knowledge, SCAN is the only regular column catering for scanner users.

Whether you come from Western Australia or Far North Queensland you will find something that relates to your pursuit of the hobby.

If you wish to write to me about anything to with scanners, frequencies, technical problems or just to say G'day, the address is at the end of this column.

I look forward to hearing from you but please remember that a stamped self addressed envelope is essential if you want a personal reply.

Russell Bryant
SCAN 1993
P.O. Box 344
Springwood NSW 2777

"AM ONLY" RIG REVIEW

PEARCE SIMPSON AM 810

By Ken Reynolds
POWER BAND COMMUNICATIONS

What can you say when you've lost count of how many 27 MHz 40 channel "AM only" compacts you have reviewed in the last fifteen years?. Here is another "low cost" unit aimed primarily at those looking for budget-priced CB action.

The Pearce Simpson AM-810 is, however, more than just another economy model CB that does its intended job quite well...it's much better than that.

The 810 offers a slightly different combination of features to other Pearce Simpson models and while still remaining different to its competitors.

You will see from the photograph that the 810 is attractively packaged with a predominantly matte black color scheme matched up with light grey knobs and white decals clearly labelling the functions.

SOLID CONSTRUCTION

The chassis and case halves are all pressed steel with the case sporting a matte black painted finish.

The pressed steel mounting bracket supplied with the unit is

similarly decorated and a bit up-market to the usual budget-specials as it offers sturdy four bolt mounting of the radio with provision for angle adjustment.

The supplied small, neat, black plastic microphone uses an electret insert and is attached to the rig with a 5 pin DIN locking connector via a light but tough "curly-cord" cable. Transmitted audio is particularly good for an economy rig - due in the main the electret microphone with its crisp audio response.

COMPREHENSIVE MANUAL

The owner's manual is comprehensive - reminiscent of the "early days" of CB - giving the first time CBer a good basic grounding in installation of the unit and mobile and base antennas and where to mount them, some tips on usage and a short list of the 10-Code, etc.

For absolute beginners it even explains that the microphone must be plugged in to receive sound from the loudspeaker.

Front panel slide switches provide for CB & PA functions and priority channels 9 and 19 which have little relevance to the Australian operator.

If you use the Public Address function the bright green LED display tells you in no uncertain terms by illuminating the letters "PA" and the priority channels flash the selected channel number. The channel display is the brightest I have seen up to date in an AM rig with its luminous green color visible under quite bright lighting conditions...a feature not necessarily found on far more expensive rigs.

SENSITIVITY IS UNBELIEVABLY GOOD

Receiver sensitivity is unbelievably good with signals below 0.1 microvolts being quite readable.

I carried out the SINAD test several times thinking I was in error, but no, the AM-810 kept turning in a figure of 0.15 microvolts for 12dB SINAD. I pulled down the test setup and gave the rig to our technician Richard for a second opinion, saying, "Put this thing through its paces and tell me what you find".

The results were the same....pretty good huh? The squelch threshold opened at 0.5 microvolts and when set to maximum a signal strength of 1,500 microvolts was required to "open-the-gate".

Initial transmit output power was 3.3 watts and after five minutes it was still constant. Similarly, the frequency accuracy was good and remained unchanged after the test. Internally the 810 is pretty well designed for an AM only transceiver.

It employs a single sided, phenolic, main printed circuit board which is neatly laid out and uses mainly miniature, conventional pigtail style components. This is the first economy model CB I have seen in years that has a "trimmer" fitted to the reference crystal for accurately netting the transceiver on frequency.

Soldering is quite good with all the joints neat, bright and shiny.

SUMMARY

This new rig from Hatadi is very definitely one "out-of-the-box".

The AM-810 retails for under $100 and, presuming it is reliable, has to be good value for money.

The performance is excellent and the construction is solid and compact. What more could you ask for in an AM CB rig?

Bandspread

By Greg Towells

MIDLAND UHF CB

Do you give your UHF CB a thrashing through normal everyday use? Are your radios used in rough, humid, dusty or rugged conditions? If you find your normal type UHF CB radios coming apart under these conditions, like knobs falling off, or just failing at the worst moment, maybe you need to look at a radio designed to commercial specifications made for extremely hard working environments.

Since the Department of Communications started to take a more liberal line regarding type approval of radios for CB use, it has become possible for radios designed directly for commercial use, with some changes like lowering of power, to be type approved for CB use.

This enables radios with far tighter specifications, cleaner transmitters, and much better receivers to be available for use on the UHF CB band.

Many users of UHF CB are there for business purposes, and the radio is a tool that has to be able to take the punishment handed out and not stop working.

I had a look at a Midland radio Model 70-530D, a commercial radio that has been programmed for UHF CB, and approved for that use. The radio has that commercial feel about it with no flashy chrome or fancy features, just a solid, professional looking radio.

BIG AND HEAVY - BUT POWERFUL

It is also BIG, and heavy, about the size of the old SSB CBs of days gone by. The mounting bracket alone is about the size of some UHF CBs.

The Midland would be suitable for 4WD work in the outback, or wherever humid and/or wet conditions prevail. It has a grey front panel with front mounted microphone and speaker, controls for volume, squelch and channel selector and buttons for squelch disable, priority scan and normal scan.

To allow the radio to be type-approved for CB use, the power has been reduced to the legal 5 watts and, as the radio was designed for in excess of 25 watts output, this means that the finals will last forever, probably without ever becoming warm.

The radio is EPROM programmed, and can take up to 80 frequencies.

As standard, the UHF CB channels are programmed into channels 1 to 40 with repeater operation on channels 41 to 48 (corresponding to channels 1 to 8 duplex operation) and selected UHF police RECEIVE ONLY channels from 49 to 80. For some extra money, the radio could be setup to operate on discrete commercial frequencies (appropriate license required), provided these frequencies are within 12 MHz of UHF CB channels.

Other frequencies for receive only purposes could also be included into the EPROM at extra expense. The hand microphone supplied is one of the pre-amp type so replacement with a normal mic would not be a good idea.

he receiver is a triple conversion type with sensitivity to burn. Being designed and built to high commercial specifications it excelled in its ability to reject strong adjacent channel signals, even if they emanated from a local power station; it also appears to be totally immune to break-through from local commercial base stations.

This is a far cry from the poor performance of early UHF CBs (and also a couple of more recent ones).

TWO WAY SCANNING

Scanning is available by two methods. The first is Normal Scan, as used in most CB rigs. When activated, the radio scans the programmed channels, stopping on occupied channels. An unusual feature of the scan in this radio is that if you hit the transmit button while scanning, the radio will go back to the channel that it last stopped scanning on.

Priority Scan is the other scan mode. Start that up and the radio will scan the programmed channels stopping on occupied channels, whilst checking the priority channel. The difference here is that when you hit the transmit button the radio goes straight back to the nominated priority channel.

It is simple to nominate the priority channel for the scan; the channel that the radio was on immediately prior to the priority scan being activated becomes the priority channel.

ON AIR OPERATION IS GOOD

The received audio was nice and easy to listen to although I did notice a slight hiss with some signals copied. The total absence of adjacent channel interference was great, despite some massive signals that were thrown at the Midland. Transmitted audio was a surprise.

A local station, with a reputation for being fussy, commented on the natural, clear nature of the transmission while more than one other station made similar comments, some casting unfavorable remarks on the signal from my usual radio when compared with the Midland.

What a way to spoil my day!

These radios are available from Andrews Communications Systems and cost around $750. This price, for a commercial radio of this quality and performance, is a bargain. Apparently, there is heavy demand for them from users such as security guards and the like, who have their commercial frequency, police receive and UHF CB channels programmed in. Farmers are another group who need the reliability of a commercial type radio such as the Midland in a harsh working environment.

27 MHz PACKET OPERATION

Tuning around the HF spectrum over Christmas revealed a lot of action on the high 27 MHz channels. More stations than ever hit the air during the holiday season, no doubt putting Christmas presents into service as soon as possible.

There was, somewhat surprisingly considering the recent poor propagation, lots of DX was around the channels both on the legal ones and outside of band.

Tuning to 27.540 MHz (just listening!) there was the unmistakable sound of packet radio - with very strong signals. Now I have monitored stations using packet before on 27 MHz, however, most have been of very short duration and barely long enough to get tuned into...

I rushed to connect the receiver to the PK-232 to see what was happening this time. What I saw on the monitor was a bit of a surprise, with contacts continuing for hours. Licensed radio amateurs use packet to forward and send mail, programs and files of various types while packet bulletin boards, very much like phone BBSs, abound on legal amateur frequencies functioning with similar uses to their phone cousins.

What was happening on 27.540 MHz could well have been on amateur frequencies - excepting for the callsigns of course!

Callsigns such as AUS1PG, AUS4JC and AUS2DP appeared on my screen and it seems that AUS1PG was set up and running as a packet bulletin board system, advertising itself as the South Pacific Net and located at QTH PG88AT. The sysop of this system seemed to be John, situated in Central Queensland according to information sent on request by other stations connected to the BBS.

HOW LONG HAS THIS BEEN GOING ON?

There were frequent beacons showing the outstanding unread mail list for stations such as GUY1AH and US1FLA. One piece of information that was sent said "BBS Australia Full Forwarding Mail Available". Seems that there is a whole network of pirate packet stations operating in the South Pacific region using the high 27 MHz frequencies.

The software being used by the BBS was FBB V5.13, a popular program in amateur radio circles. While I was monitoring the transmissions, a number of stations connected to this BBS station to send and/or read messages.

I can't work out their callsign system, however, as one station connected with the call AUS56M and other stations commented that the station must be located in Queensland or Tasmania. Looks like there are heaps of stations out there with the amateur gear all ready to go who just couldn't wait for the license to come. There must be some readers who can shed some light on this operation for everyone, so how about writing to me at the address on page three, under 'CONTRIBUTORS'...with details of who's involved, how callsigns are allocated and how long it has been going on for.

SCANNER MODS HANDBOOKS

Two books recently came my way for review thanks to a kind reader in the west (thanks Alek). The books, titled Scanner Modification Handbook Vol.1 and 2 contain a wealth of information on how to expand the operating capabilities of VHF/UHF scanners, mainly late Realistic models and Bearcat/Uniden type units.

They are aimed at the average scanner user and involve the use of easily available electronics tools.

The instructions for each modification are written in an easy to follow step by step manner and most are simple enough for most of us to do.

Don't despair, however, if your scanner is not of the Realistic or Uniden brand as lots of the information contained in these books is easily adaptable to many other radios.

Modifications in volume 1 include restoring blanked out frequency bands, such as low VHF and cellular phone bands, increasing speed and scanning rates, protecting your scanner against electrical surges, improving audio and headphone outputs and improving squelch operation.

There are even ways explained on how to interface your scanner with a shortwave receiver for vastly improved reception, increasing memory channels from a few hundred to 6400 or adding an automatic tape-recorder VOX facility.

Any single one of these modifications would be enough to enhance the performance of your scanner while also learning about the workings of the radio.

Volume 2 takes up where the first edition leaves off with mods such as adding signal strength meters, varying scan delay times, adding shielding and event counters, reducing interference and restoring locked out bands.

There are also projects like decoding CTCSS tones and adding centre-tuning meters.

This book also updates some of the many mods included in the first book.

Information on aligning certain models, using a VCR to record scanner action, diagnosing common scanner problems and using computer BBSs to improve your monitoring is also included.

Both books have a load of information and tips on antennas, feedlines and connectors while many types of pre-amps, converters and power supplies are also covered.

No modifications are left to chance in either book with heaps of photographs, tables and information ensuring that you are never lost half-way through a mod.

The equipment needed is simple to get hold of and use so the information is useful for just about everyone.

I certainly learnt a lot from a read of these books, and I think they are a worthwhile addition to every scanner enthusiast's library.

Contact CRB Research Books Inc, P.O. Box 56, Commack, New York, 11725 USA for more information.

DICK SMITH ELECTRONICS

COMING IN LOUD 'N' CLEAR!

PRO-520XL DELUXE AM CB

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

Cat D-1235

uniden *2 Year Warranty!* **$139**

UNIDEN UH-011 UHF CB

It's here! The new UH-011 follows on from the popular and reliable UH-001. You get the same high quality construction, plus a new improved front panel and handy signal strength meter. What's more, it retains all the best features of the UH-001, including repeater access facilites, Tx & Rx indicators, superb audio quality and a tone squelch option. With microphone and mounting kit.

Cat D-1766

uniden *2 Year Warranty* **$299**

Fits In Your Pocket

70 XLT SCANNER RADIO

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

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

Cat D-2740

$269

2 Year Warranty

uniden

Exclusive to Dick Smith Electronics

YAESU FRG-9600 VHF/UHF SCANNER

This exceptional scanner has an impressive array of features and offers outstanding value for money. Frequency selection is by keypad or dial, with a variety of scanning modes and 100 memories provided.

It covers the complete 60 to 905MHz VHF/UHF spectrum in the FM, AM and CW modes and SSB to 460MHz. FM-wide covers FM radio and TV sound transmissions while FM-narrow covers commercial two-way communications - emergency services, police, business, UHF CB, military and amateur radio. Aircraft bands plus other amateur frequencies are accessed through the AM and SSB modes.

Specifications

Frequency:	60-905MHz continuous (up to 460MHz for SSB)
Sensitivity:	FM-n (12db SINAD) 0.5uV FM-w (12db SINAD) 1uV AM-n (10db S+N/N) 1uV SSB (15db S+N/N) 1uV
Tuning steps:	FM-n, AM-w 5/10/12.5/25kHz FM-w 100kHz AM-n, SSB 100Hz/1kHz
Voltage:	DC 12-15V

Cat D-2825

Only **$999**

2 Year Warranty

BONUS
Deluxe Scanner Base Antenna
Cat D-4438
Valued at $69.95

YAESU

With Remote-mountable panel!

PEARCE-SIMPSON

UF-2020 SCANNING UHF CB

The new Pearce Simpson UF-2020 is our most sophisticated scanning UHF CB and has new features for greater convenience and enhanced performance. A remote-mountable front panel with an inbuilt speaker and supplied extension cable allows you to mount the rig's panel on your dashboard and have the main body of the rig relocated out of the way (under a seat). In addition, its dual microprocessor design provides a number of scanning functions (including open scan, group scan and a priority channel with 4 selectable modes) plus a repeater reverse mode, programmable one-touch recall CALL channel and digitally adjustable squelch system. Specialised functions include a programmable timeout timer and selectable squelch hysteresis. All settings are stored in an internal memory located in the transceiver's front panel and automatically saved when the transceiver is switched off at its on/off switch. Comes complete with microphone, mounting brackets (rig and front panel), extension cable and DC power cable.

Cat D-1802

Now Only $399

PULL IN THAT SIGNAL!

DIAMOND D-130J DISCONE ANTENNA

This 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 and has extensive stainless steel construction — making it extremely durable! Its wide frequency coverage makes it ideal for use with scanning receivers, as well as transmitters up to 200W P.E.P for the 6m, 2m, 70cm and 23cm amateur bands.

Cat D-4640

DIAMOND ANTENNA

$169

UHF CB 4dB ANTENNA PACK

MOBILE ONE

A high quality stainless steel 4dB antenna with UHF antenna base. It's exceptional value, durable and easy to install. Includes 3.6m of high quality Mil-Spec Coax, fitted with a PL-259 plug, and instructions.

Cat D-4000

5 year warranty

$29.95

1.5M HEAVY DUTY ANTENNA KIT

MOBILE ONE

A complete, heavy-duty 27MHz CB antenna kit in one pack! Comes with rugged 1.53m 'Superhelical' medium to long-range antenna, heavy-duty stainless spring and base with cable and plug. It's the economical way to buy!

Cat D-4088

5 Year Warranty

Only $69.95

MEGATRON 27MHz BASE ANTENNA

A superb 5.75m ground-independent 'no-tune' base station antenna from Benelec. It uses a matching network in a sealed, thick-walled base housing, giving excellent corrosion protection. It also allows high-power operation (up to 1000 watts) while maintaining low SWR across the band. High quality T81 grade aluminium tubing and stainless steel screws ensure excellent durability. The base section is water-sealed with a DC ground path for static reduction and an SO-239 socket for easy coax connection. Comes complete with mounting hardware for connection to your mast.

Cat D-4430

5 Year Warranty

$89.95

BENELEC

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STORES ACROSS AUSTRALIA AND NEW ZEALAND

SO YOU WANT TO BE AN AMATEUR?

THE PATH TO AMATEUR RADIO

Part Five of a regular series by Paul Butler - VK3DBP

In Part 4 of this series, we found out a little about semiconductors and their importance in the field of electronics. The most common applications for transistors and diodes are in amplifier and oscillator circuits. In the NAOCP syllabus, these circuits get a whole section to themselves, so we'd better have a look at them...

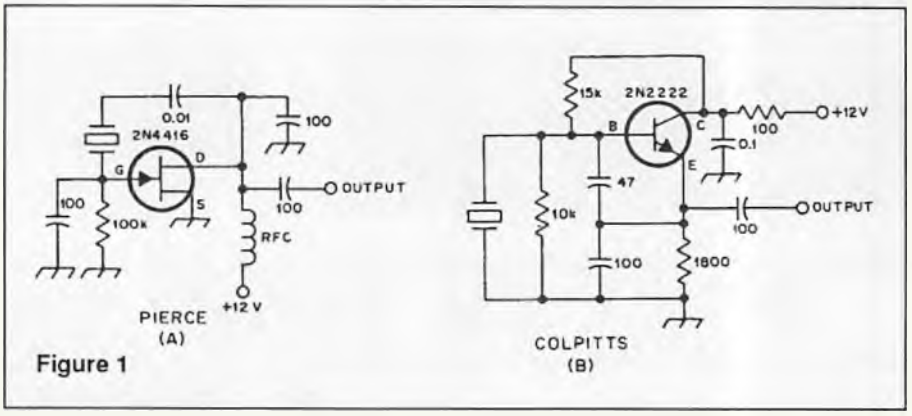


Figure 1

OSCILLATORS

Oscillators come in two basic types, the crystal oscillator and the variable frequency oscillator (VFO). The crystal oscillator usually produces a single fixed frequency, while the VFO produces, as its name implies, a variable frequency. Things are not QUITE as simple as this, as we will see in a moment, because some crystal oscillators are variable!

Crystal oscillators

A crystal-controlled oscillator depends for its operation on a piece of quartz ground to just the right dimensions for the job it does. You may recall from high school physics the idea of resonance. If not, imagine pushing a child on a swing - to get the highest swing, the push must be applied at just the right time, at the top of the back-swing. A swing has a resonant frequency determined only by its length. Similarly, running a wet finger around the rim of a wine glass can cause it to "sing", producing a clear note at the resonant or natural frequency determined by the physical dimensions of the glass and its contents.

It is just the same with a quartz crystal. If it can be made to vibrate, it will most readily do so at its natural resonant frequency, which is determined by its physical dimensions. The main controlling dimension is the thickness of the crystal, although stray capacitance makes a contribution, too. Remember that a capacitor consists of two parallel metal plates separated by an insulator. Because of its shape and the way it is used in a circuit, a quartz crystal behaves a little like a capacitor. Its capacitance will contribute to determining the resonant frequency of the circuit in which the crystal finds itself.

Vibrations in the crystal are produced by an electronic circuit based around an active device such as a bipolar transistor or field effect transistor (FET), as in Figure 1, or an integrated circuit (IC) or thermionic vacuum tube. Small vibrations of the crystal are amplified by the active stage, then fed back to the crystal to reinforce and add to the initial vibrations. This is known as positive feedback.

The level of feedback must be carefully controlled, since too little will mean that the oscillator will be hard to start and therefore be unreliable. Too much feedback will send the whole lot out of control and run the risk of generating so much heat in the crystal that it will eventually destroy itself.

A crystal oscillator may operate at its lowest natural frequency, called the fundamental, or at some multiple of this frequency, known as a harmonic or overtone. It is very like a stretched violin string, which produces vibrations not only at its fundamental frequency, determined by its length and tension, but also at harmonic frequencies. The mixture of fundamental and harmonics produces the violin's characteristic rich tone.

The particular frequency which appears at the output of an oscillator, whether it is the fundamental or a harmonic, is determined by a filter circuit associated with the active element, the vacuum tube or transistor. The filter lets through certain frequencies, those wanted in the particular application, and blocks the others, preventing them from appearing at the output of the oscillator.

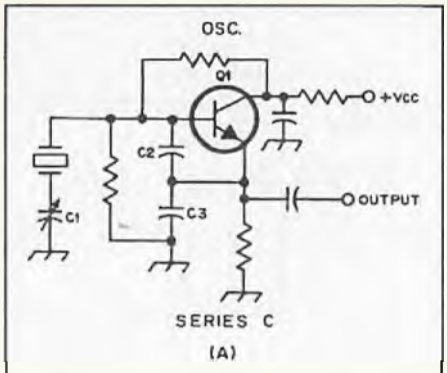
The variable crystal oscillator

The addition of a trimmer capacitor across the crystal allows the frequency to be changed slightly, so that the actual frequency of oscillation can be set anywhere within a certain range, although a rather limited one.

Figure 2(A) shows the trimmer capacitor placed in series with the crystal, while Figure 2(B) shows it placed in parallel.

An oscillator of this type is known as a variable crystal oscillator or VXO, and can provide trouble-free operation at low cost for many applications.

An alternative multiple- frequency oscillator can be built using a set of crystals, one for each frequency, switched using mechanical or electronic switches as shown in Figure 3.



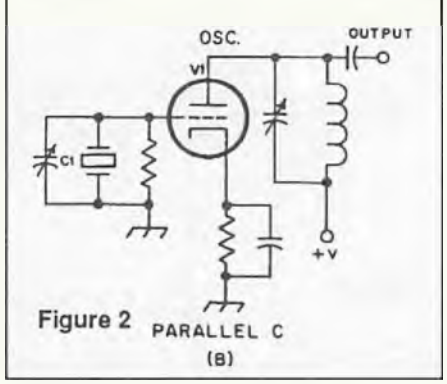


Figure 2

Variable frequency oscillators

For greater frequency coverage, a variable frequency oscillator (VFO) is used. The resonant frequency of this kind of circuit does not depend on a crystal but is determined instead by a combination of inductance (L) and capacitance (C) in a resonant L-C circuit. Variable capacitors and the inductor can be clearly seen in the typical circuit shown in Figure 4.

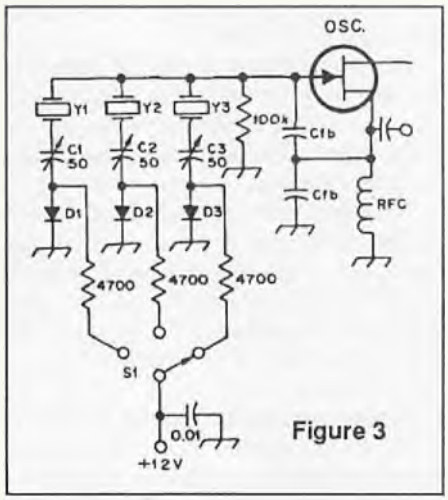


Figure 3

The output frequency of a VFO is made variable by making the capacitor variable, so changing the resonant frequency of the circuit. A variable capacitor has a fixed set of plates interleaved with a second parallel set which can move in and out of the fixed set. Rotating the spindle of the capacitor alters the amount of overlap between the two sets of plates and so changes the capacitance. The rotating spindle appears on the front panel of a transmitter or receiver as the main tuning knob.

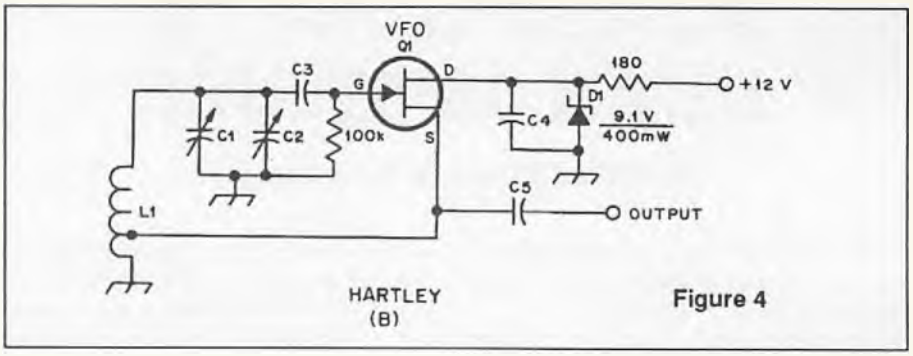


Figure 4

Once again, an active element such as a tube or transistor is needed to provide the energy to run the oscillator. Just the right amount of positive feedback ensures easy starting, as for the crystal oscillator.

Doublers and triplers

High frequencies may be generated by multiplication of the output of a low fundamental frequency oscillator using circuit stages called doublers or triplers. This is a technique often employed at very high frequencies (VHF and above), when it is difficult to generate the final high frequency using a crystal oscillator or VFO. An alternative is to mix the output of a low frequency variable oscillator with that of a fixed crystal oscillator at a higher frequency, to produce an output which is the sum of the two frequencies (see Figure 5). This technique is known as heterodyning and will appear again as we progress through the Novice course.

Phase-locked loop oscillators

Modern amateur equipment may go even further than this and employ a fully synthesised oscillator. This is based on digital circuitry which produces an output consisting of a square wave varying between two states, OFF and ON, or 1 and 0, as used in binary (base-2) arithmetic. At the heart of a typical frequency synthesiser is the phase-locked loop or PLL. The output of an oscillator is continuously sampled by the digital circuitry and an error voltage is generated if the oscillator drifts from its correct frequency.

This voltage is fed back to the oscillator and used to return it to the correct operating frequency. The error voltage results when the master oscillator and a reference oscillator are out of step (out of phase) and the feedback to the oscillator completes a loop - hence the name, phase-locked loop!

The PLL arrangement produces an extremely stable output frequency and is favoured for many modern applications because of its relative simplicity and reasonable cost. Remember, as a potential NAOCP operator, you need to be aware of PLL applications and should be able to recognise when a PLL is used, but you do not need to know in detail how one works.

AMPLIFIERS

It is a fact of life that builders of electronic devices spend inordinate amounts of time preventing amplifiers becoming oscillators and oscillators becoming amplifiers. The basic components are very similar - a few active elements such as transistors or tubes, resistors and capacitors to provide time constants and a good dose of feedback.

Continued over page...

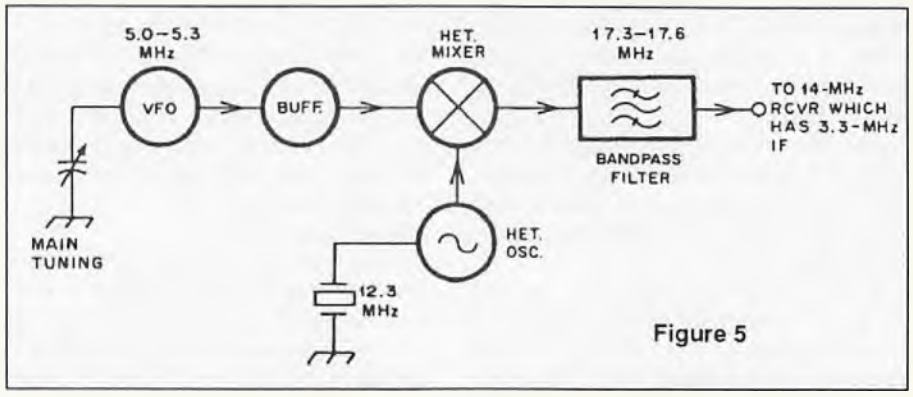


Figure 5

SO YOU WANT TO BE AN AMATEUR?

(continued from previous page)

The main difference revolves around the two types of feedback, positive feedback and negative feedback.

As we have seen, an oscillator relies on positive feedback. Initially small oscillations are amplified by the active device in the circuit.

The amplified vibrations are then fed back in such a way that they add to the original vibrations. These amplified oscillations are in turn amplified further and so large oscillations build up rapidly.

In an amplifier, however, the name of the game is precisely the opposite - oscillations must be avoided at all costs! The gain must be reduced so that a controlled amount of amplification is produced. But why is the gain reduced?

Doesn't this defeat the object of amplification?? We need to go back to our transistor theory to understand what is happening here.

Transistor amplification

The transistor is often referred to as a CURRENT amplifier. The current flowing through its base terminal is very small compared with the current passing from emitter to collector, and a small change in base current causes a large change in the output current.

Most of the time, however, we look at signal voltages and make use of the VOLTAGE amplification produced by a transistor resulting from its transfer-resistor (TRANS-ISTOR) characteristics.

Comparing input and output voltages for a typical transistor, a high input voltage (close to supply voltage) causes the output voltage at the collector to drop to a low value (close to zero). Conversely, a low input voltage produces a high output voltage. Firstly, then, the single transistor stage is an inverting device - a signal going into a transistor stage comes out upside-down.

Imagine a situation in which the base voltage is made to rise steadily from zero. The output voltage will be high to start with and at some point will switch from high to low.

But it does not do so instantly - the drop in output voltage occurs over a small but non-zero range of input voltage. A small change in input voltage within this range causes a much greater change in output voltage. The device is now operating as a VOLTAGE AMPLIFIER. Its gain, a measure of how much large the output is than the input, is found from the steepness of the sloping part of the voltage in/voltage out graph.

The importance of bias

When an amplifier circuit is built, the base terminal is set at a voltage in the middle of the sloping part of the characteristic.

When a small signal voltage arrives, the base voltage will vary either side of this value. As long as the voltage variation does not move out of the linear sloping section of the graph, the output will be a faithfully reproduced but larger copy of the input. The no-signal base voltage is known as the BIAS voltage and is fixed using a network of resistors.

Problems arise when components do not behave exactly as they should. Even though a batch of transistors may carry the same label, their characteristics can vary quite considerably.

The actual value of a fixed resistance is guaranteed only within a band of tolerance, typically 5 or 10 per cent of nominal value.

A typical circuit has to operate reliably over a range of temperatures, too, and not change its electrical characteristics too markedly.

The supply voltage may wander from its nominal value, too, and cause variations in performance.

To minimise the effects of supply voltage, temperature and component variations, part of the output of an amplifier stage is fed back so that it does not add to but SUBTRACTS FROM the input.

By controlling the amount of this negative feedback, the stage can be designed to exhibit voltage gain, although much reduced, together with much greater immunity from component, temperature and supply variations.

Classes of operation

A transistor stage biased in this way is operating as a CLASS A amplifier. Even when no signal is present at the input, the bias network makes sure that current is flowing in the base terminal and therefore a much larger current is flowing through the transistor. This no-signal current generates heat and so energy is wasted. The Class A amplifier, therefore, introduces little distortion into the signal (its amplification is LINEAR) but it is very inefficient.

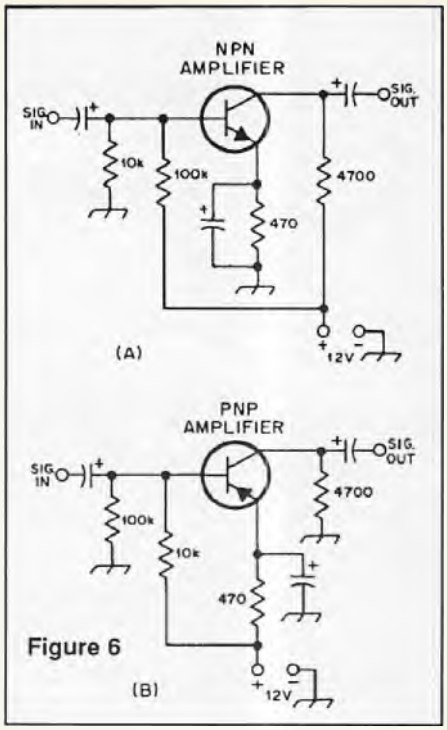


Figure 6

A more efficient alternative is the CLASS B amplifier. This time the biasing is established so that no current flows under no-signal conditions. This makes the stage very efficient.

The problem now is that the stage will conduct only for half of the input cycle, that half which turns the transistor on. Such extreme distortion is intolerable for most applications.

The solution is to use a pair of Class B amplifiers in push- pull mode, so that one transistor amplifies the positive half-cycles of the input signal, while the other amplifies the negative half-cycles. The two halves are often reunited using a transformer.

A more extreme form of bias is found in a CLASS C amplifier. This time, the input drives the amplifier stage into saturation, a state in which no more current can flow through the device.

This produces pulses at the output, a very distorted copy of the input. But the Class C amplifier is very efficient and can be used, for example, as a frequency multiplier because of the rich output of harmonics produced as a result of the extreme distortion.

Amplifier circuits

Finally, have a look at Figure 6, which shows a couple of real amplifier circuits, one using an NPN transistor, the other a PNP transistor. Three resistors in each case (10 kohms, 100 kohms and 4700 kohms) set the DC bias conditions so that the three electrodes, collector, base and emitter, are at the right voltages relative to one another. The 470 ohm emitter resistor provides negative feedback to keep the stage immune from the problems mentioned above. The capacitor on the input allows the AC signal voltage to pass onto the base while separating this stage from any previous components which may affect the DC bias conditions.

The capacitor across the emitter resistor shorts out the feedback resistor for AC signals and therefore increases the signal gain of the stage while again leaving the DC conditions unchanged.

And now for some questions as usual.....

1 The two essential components in a tuned circuit are:

(a) a resistor and a capacitor
(b) a capacitor and an inductor
(c) an inductor and a diode
(d) a resistor and a inductor

2 A characteristic of a bipolar transistor used in the common emitter mode is:

(a) no appreciable power gain
(b) low current gain with high input resistance
(c) high current gain with low input resistance
(d) low current gain with low input resistance

3 If the emitter resistor of a common emitter amplifier is bypassed, the effective AC gain of the stage is:

(a) increased
(b) reduced
(c) unaffected
(d) normal at high frequencies and reduced at low frequencies

4 Positive feedback from output to input is essential for normal operation in:

(a) an amplifier stage
(b) a mixer stage
(c) a detector stage
(d) an oscillator stage

5 The carrier frequency of a simple CW transmitter is generated in the:

(a) power amplifier stage
(b) buffer stage
(c) oscillator stage
(d) beat frequency oscillator

6 Crystal oscillators are often used for frequency control in transmitters because they:

(a) are more stable than L-C oscillators
(b) have more output than other oscillators
(c) radiate fewer harmonics than other oscillators
(d) generate more harmonics than other oscillators

7 To keep a circuit oscillating it is essential to:

(a) have negative feedback from output to input
(b) maintain positive feedback from ouput to input
(c) neutralise the oscillator
(d) follow it up with an amplifier stage

8 The function of a doubler stage in a transmitter is to:

(a) multiply the frequency of the incoming signal by two
(b) halve the frequency of the incoming signal
(c) enable two final stages to be fed by the one oscillator
(d) act as an impedance doubling device

9 A single sideband suppressed carrier signal on 9 MHz may be changed to a single sideband signal on 21 MHz by:

(a) filtering
(b) frequency division
(c) frequency mixing
(d) amplification

10 Class A operation is characterised by:

(a) low gain, low distortion, high efficiency
(b) high gain, low distortion, low efficiency
(c) high gain, high distortion, high efficiency
(d) low gain, high distortion, low efficiency

11 An amplifier stage operating under Class "B" conditions is biased to:

(a) near cut-off
(b) three times cut-off
(c) twice cut-off
(d) half cut-off

12 The highest power efficiency in a radio frequency (RF) power amplifier is obtained when it is operated in:

(a) Class B
(b) Class A
(c) Class C
(d) Class AB

ANSWERS

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

Dxlogbook

By Rob Williams

Welcome back to CBA's shortwave spot - if you enjoy listening to what's happening on the other side of the globe read on. In this edition we have the latest on a new US shortwave station and tons of new broadcast schedules to keep you going. As always, all frequencies are in kilohertz and all times are in UTC (same as GMT) unless specified otherwise.

WEWN Issues New Sked

By the time you read this, America's newest shortwave broadcaster WEWN will have finished testing and begun full-time broadcasting.

Listen from 2000-2200 on 7540, 2200-0000 on 5825, 0000-0100 on 17510, 0100-0300 on 9825, 0300-0500 on 7520 and 0500-1000 on 7465.

Three more transmitters will be coming on air over the coming months and their eight antenna arrays are ready for operation.

Thanks to Glen Hauser for this info.

TWR-Bonaire Leaves Shortwave

TWR-Bonaire has announced that from June 1993 they will be turning off their transmitter on the island of Bonaire. They have decided to move out of shortwave based on harsh economic conditions and the high costs of maintaining a modern station, combined with what they perceive as a declining interest in shortwave.

Their 250 kW transmitter looks like being scrapped, and while TWR's religious programming will continue to be produced, it will be fed to satellite for local use and also by domestic stations in South America.

English From Cambodia

Patrick McDonald reports hearing the Voice Of The People Of Cambodia in English from 1200-1215 on 11938 daily. Reception varies from fair to poor at his QTH in Sydney.

BBC Relays Via Transmitters In CIS

Here is the latest BBC sked for English-language services from transmitters in the CIS:

Via Chita, Siberia at 2200-2230 with their "English by Radio" program on 7330; also from Irkutsk, Siberia from 2200-2230 on 7420; via Tashkent, Uzbekistan from 1330-1545 and 1630-1700 on 9725; and via Yekatarinburg in the Ukraine from 0500-0530 on 12020.

Radio Netherlands from the CIS

Yet another shortwave broadcaster has made use of transmitters in CIS.

From the first week of January, Radio Netherlands' transmitters in the CIS have the following sked for English programs:

from 0030-0127 on 7305 (250kW), 0130-0325 on 12025 (500kW), 0930-1125 to East and South East Asia on 9865 (250kW) via Irkutsk and 7260 (250kW) via Petropavlovsk.

OZ-DX Announces 1993 DX Surveys

OZ-DX, Australia's respected source of specialised DX material for Latin, Asian and other rare DX catches, reports that they will be conducting a series of DX surveys during 1993 and are looking for loggings from all DXers.

The first is to be held over February and March for all shortwave stations from Indonesia with frequencies, sign-on and sign-off times. Their Latin America survey will cover frequencies up to 7000 kHz which can be heard from 0500-1300 between May and August.

Now that you have advance notice there is no reason for you not to have a listen for yourself.

Send your own notes to OZ-DX editor *David Martin at 19 Jullian Ave, Highett 3190, Victoria* - and tell him CBA sent you!

Current subscriptions to OZ-DX are 60 cents per issue within Australia and $US1 for those overseas, with cheques made out to Mr Peter Bunn.

Pacific FM DX Log

To more SW club news, DX Australia are soon to release their 1992/93 edition of the Pacific FM DX Log.

This 150 page book has been painstakingly put together by David Hedland and provides details of all FM stations operating in Australia and the South Pacific region between 87.5 and 108 MHz.

Frequency, callsign, power, polarisation, transmitter site, target zone, address and phone number, licence category, stereo or mono transmission, translator info, on air ID's, transmission times, sub-carrier details as well as maps of the transmitter sites have been incorporated into this extremely comprehensive book.

The book is expected to sell for around $20 and will also be available on computer floppy disk for MS-DOS PCs.

For further details write to *DXA, PO Box 285, Waverley 3149.*

Norwegian Danish?

Radio Denmark has advised Andy Sennitt of the following sked effective 1/12/92:

0100 on 9560, 0400 on 9565, 1500 on 11850, 1600 on 15335, 1700 on 15335, 2300 on 9655 and 0000 on 9675. The first half hour is Radio Norway and the second half is from Radio Denmark.

VOA Signals To Australia

Dan Ferguson has provided us with the latest Voice of America sked for Australia - VOA is one of the shortwave world's "big gun" stations and besides being good listening they are a great way to kick off your SW QSL collection. Try these English-language broadcasts - those frequencies followed by a "U" indicates transmissions on upper sideband.

To East and Southeast Asia and the Pacific at 1000-1100 on 5985; 11720, 15425, 1100-1200 on 5985, 6110, 9760, 11720, 15155, 15425; 1200-1230 on 6110, 9760, 11715, 15155, 15425; 1230-1330 on 6110, 9760, 11715, 15155, 15425; 1330-1400 on 6110, 9760, 15155, 15425; 1400-1500 on 6110, 9645, 9760, 15160, 15425; 1900-2000 on 9525,11870, 15180; 2100-2200 on 11870, 15185, 17735; 2200-2400 on 7120, 9770, 11760, 15185, 15290, 15305, 17735, 17820; 0000-0030 on 7120, 9770, 11760, 15185, 15290, 17735, 17820; 0030-0100 on 7120, 9770, 11760, 15185, 15290, 17735, 17820; to South Asia at 0100-0300 on 7115, 7205, 9740, 11705, 15250, 17740, 21550, 7651U; 1400-1500 on 6110, 7125, 9645, 9760, 15395; 1500-1530 on 6110, 7125, 9645, 9700, 9760, 15395;1530-1600 on 6110, 7125, 9645,9700, 9760, 15395; 1600-1700 on 6110, 7125, 9645, 9700, 9760, 15395; 1700-1800 on 6110, 7125, 9645, 9700, 15395. 11870 has been offering good reception here in Sydney at 2100.

On Sunday mornings "Communications World" provides an insight into the changing world of telecommunications and sometimes carries shortwave information.

Your Daily Dose Of Solar Radiation!

Keeping up with the propagation changes can be a bit difficult for DXers, as we don't have large budgets and can't afford to subscribe to expensive ionospheric prediction data.

But there is one way of getting reliable and up-to-date data.

At 18 minutes past the hour on sw station WWV and 45 minutes past the hour on sister station WWVH, the Geophysical Alert Broadcast gives an outline of current propagation conditions including the latest solar-terrestrial indices.

If you haven't heard these 45 second broadcasts before, tune into WWV on 2.5, 5, 10 or 15MHz or on WWVH on 2.5, 5, 10 and 15MHz.

It could save you wasting precious DX time if there is a shortwave fadeout or a disturbance which prohibits propagation.

Amateur radio operators use these and other daily reports to check whether DX propagation is going to be good and what are the best frequencies to use.

But understanding these reports requires some background knowledge into propagation and knowing what can be included in the reports.

A free 19 page publication from The Space Environment Laboratory is very helpful in explaining some of the terminology of radio propagation, together with a guide to the broadcasts.

The book is entitled "A Radio Frequency User's Guide to the Space Environment Services Center Geophysical Alert Broadcasts - NOAA technical memorandum ERL SEL-80, May 1992".

How's that for a short title?

The address to write to is the;

Space Environment Services Center,
NOAA/ERL/SEL- R/E/SE2,
325 Broadway Boulder, Colorado 803303, USA.

Overseas DX Clubs

Arthur Cushen has sent me a recent copy of DX Times, the monthly magazine from the New Zealand DX League.

This impressive magazine caters both for the shortwave and mediumwave DXer.

For our New Zealand readers, here is an ideal opportunity to join a local DX club, meet new friends and keep up with the local scene.

And for those Australian DXers who want to join a responsible overseas club, this may be the one for you.

Each edition of DX Times includes the latest SW loggings, Arthur Cushen's review of the shortwave scene, a run-down of the latest QSL's received as well as utility catches, information and news from the AM broadcast scene.

Of particular interest during our summer months, when propagation between our two continents is a regular occurrence, is their TV/FM DX column.

The New Zealand DX League is a founding member of the South Pacific Association of Radio Clubs (SPARC) with over 500 members in NZ, Australia and throughout the world.

12 months membership costs $30 Australian, with sample copies of DX Times for 80 cents - contact the;

New Zealand Radio DX League,
PO Box 3011, Auckland, New Zealand.

That wraps up another column - as always, if you have any questions or want to share some DX information through these pages then write to me at PO Box 108, Minto 2566, NSW (please enclose a SSE if you require a direct personal reply).

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GME TX-840	$200
Tomcat MK-2	$110
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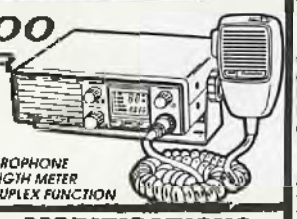

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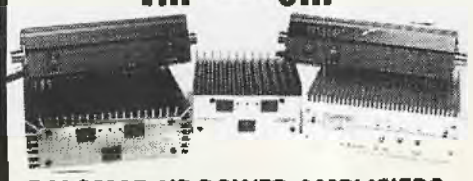

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SCANNER REVIEW

BEARCAT 70XLT SCANNER

A Scanner To Go

Rob Williams takes time out from CBA's shortwave desk to assess the Bearcat 70XLT scanner - and he reckons it's a real "pocket rocket"!

Want a light-weight go-anywhere scanner that really WILL fit in your shirt pocket? After a reliable model from reputable company you can trust? Well, Uniden and Dick Smith Electronics may have just the scanner for you.

The UBC-70XLT is ideal both as a scanner for the beginner and as a radio you can take with you.

Although the bulk of the Uniden range is imported through Uniden Australia, the 70XLT is sourced directly from Uniden Japan by DSE. Chris Ayres, the company's resident radio man, offered me a chance to play with - oops, I mean "evaluate" - this mini-monitor.

"THAT'S WHAT I LIKE..."

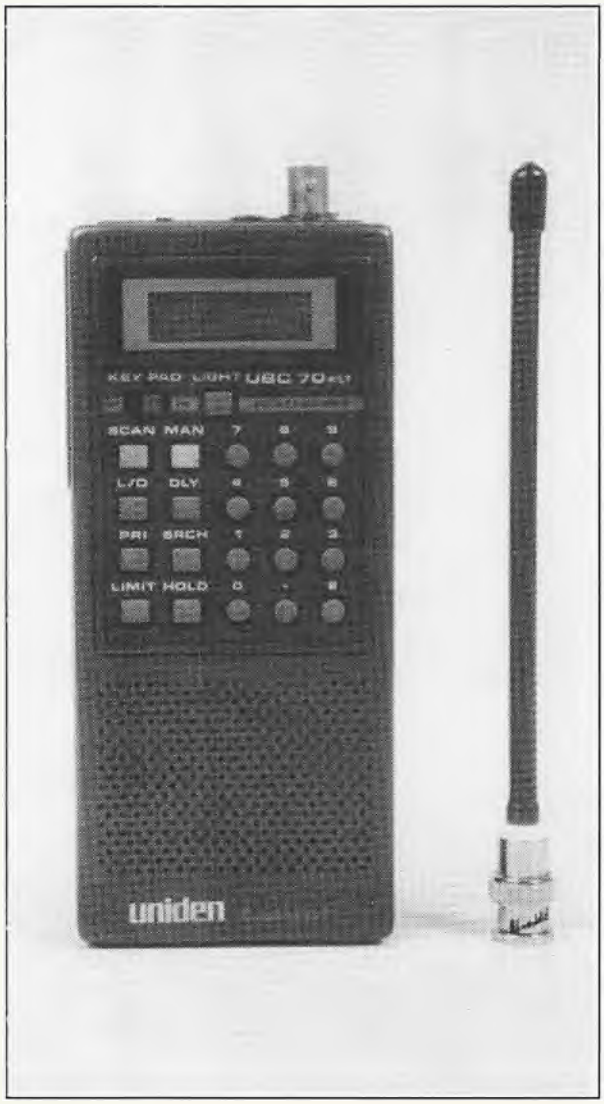
When the scanner was delivered I immediately unpacked it, charged it up and put it to use - deliberately not first reading the instructions. I was able to use almost all of the radio's functions without effort.

That's what I like in a radio...ease of use without the need to wade through a manual just to find out how to turn it on.

Uniden has designed it with the user in mind, and by making it easy to use you can jump into the fun of scanning right away rather than getting frustrated in trying to work it all out.

The total frequency coverage of 66-88 MHz, 137-174 MHz and 406-512 MHz takes in many thousands of active channels which will keep you occupied for quite some time.

The 70XLT has a good control layout - the power switch is on top of the radio, a position well-suited for portables which are often carried on the belt or in the shirt pocket, with an earphone socket protected by a weather-proof plug.



The volume and squelch can be found of the side of the radio enabling you to change the settings with the hand that is holding the scanner. By separating the volume control from the power switch you can preset the scanner at your preferred volume level.

The programming keys are in their traditional front-panel location and are well laid out and easy to use. The 70XLT has all the functions which most scanner buyers should look for - such as scan, search, hold, lockout and delay.

PRIORITY CHECK EVERY TWO SECONDS

The priority channel is preset to cock an ear to memory channel 1 every two seconds.

The search delay is particularly useful when you program the 70XLT to search for activity between two frequency limits, so it will hold on a channel long enough to let you look at the LCD display and note the frequency before the search re-commences.

The sliding keypad lock switch is another good feature if you intend carrying it in your pocket - when you have a scanner in your pocket it can be all too easy to accidentally bump the key, disabling the lock and maybe even re-programming your scanner along the way.

The LCD display reads channel number, delay and priority status and can be illuminated for use at night. A small power socket on the side allows you to recharge the built-in nicad battery pack using the

charger which is included with the radio.

The scanner is well protected by a tough leather case with cut-aways around the controls on the front, top and side panels.

20 CHANNELS - ENOUGH FOR MOST...

Programming the 20 channels is a simple process of calling up the memory channel you want, punching in the frequency and hitting "E" for enter.

If you think that 20 channels is a drawback consider how many channels you really listen to at each sitting.

Even on my personal 200-channel handheld scanner I very rarely tune across more than 20 at a time for the simple reason that it can take too long for the scanner to search from beginning to the end and then back again.

This becomes important if those channels you are monitoring are particularly active and you don't want to miss any traffic.

Weighing in at 300g and measuring just 70 x 155 x 25mm, this compact scanner is just right for carrying to work so that you won't miss any action during business hours or while you're on the way to or from the office.

I found that I could take it with me where ever I went, even on the train, ready for any action. Just like a photographer who carries his camera wherever he goes, I was equipped to do the same.

AUDIO OUTPUT IS GOOD

The audio output is very good for a scanner of this size. It can even be heard in the car while driving around, above all the background noise...a fact not necessarily true with some bigger and more expensive units.

And if you are on the move via your own two feet, the leather pouch can be threaded onto your belt for ease.

With an earphone running up to your ear and a pair of sunglasses you too can look like a secret agent - you could even hide the scanner inside a cut-out section within a book, just like you see in the movies!

I programmed all 20 channels with a wide range of my favorite VHF and UHF frequencies I monitor to see how it stood up.

To be honest, I didn't expect the 70XLT to perform as well as it did. It even held up well in the Sydney CBD, where one would expect it to suffer from overload from the many other strong signals in the area, and in the mobile as well.

The small antenna works well across the VHF and UHF bands, although naturally it represents a compromise in gain over such a wide range of frequencies.

The BNC socket allows you to connect a base station antenna for even better range.

TWO YEAR WARRANTY - AND A CHANCE TO WIN ONE!

With its two year warranty, Uniden really put their reputation on the line. I'm sure you will not be disappointed.

My thanks to Dick Smith for the opportunity to see what this littlest Uniden can do. As a special bonus for CBA readers, DSE has donated a Bearcat 70XLT to give away - see this issue's crossword for your chance to win!

"GULF" FREQUENCIES WORTH WATCHING

With the recommencement of what appears to be "limited" action by the UN in Iraq, we have received a number of enquiries about likely frequencies. The following appeared recently on packet and we have heard action on several of them so think that's it reasonable to assume that they probably pretty much correct.

RADIO KUWAIT	AM 15.495 MHz
RADIO IRAQ	AM 9.515, 9.690, 11.810 13.660 MHz
RADIO DUBAI	AM 21.605 MHz
RADIO JORDAN	AM 13.655 MHz
VOA	AM 9.530 MHz

MILITARY FREQUENCIES

(all in Upper Side Band mode)

6.713, 6.738, 6.741, 6.750, 6.753, 6.757, 6.710, 6.7625, 6.826, 7.300, 8.967 8.989, 8.993, 9.010, 9.130, 11.018, 11.245, 12.112 MHz

AWACS

11.176 (INCLARE), 11.226 11.243 13.201 13.215 13.244 15.015 15.044 15.015 18.002 20.680, 11.346 Dutch Airforce ?

RTTY

8.439	USB	850	SHIFT	74 BAUD	Ned. Marine
12.840					Ned. Marine
13.5246	USB	425	SHIFT	50 BAUD	????
14.932	LSB	850	SHIFT	50 BAUD	Algiers
14.373	USB	425	SHIFT	50 BAUD	Iraq
14.490	USB	425	SHIFT	50 BAUD	Tass

The following frequencies are all in use by the U.S. Airforce;

Albrook (Panama)	5710 6683 6688 8993 11176 11229 15015 18019
Andersen (Guam)	6738 8967 11176 13201 18002
Andrews (USA)	4721 6756 9018 13247
Ascension (Ascension Island)	6750 6753 8993 11176 1324 15015
Clark (Philippines)	6738 8993 11176 13201 18002 18019
Croughton (UK)	3067 5703 6750 6757 8967 9011 11176 13201 15036
Diego Garcia (Indian Ocean)	11176 23227
Elmendorf (Alaska)	5710 6738 8989 11176 11226 13201
Hickham (Hawaii)	3144 6738 8964 8967 11176 13201 13215 18002
Incirlik (Turkey)	6738 11176 13215 15015
Lajes Field (Azores)	3081 4746 6750 8967 11176 11226 13244
Loring (USA)	5688 6750 8989 9014 11176 11179 18002
MacDill (USA)	4746 5688 6750 8967 8989 8993 11176 11246 13210 13215 13244 18019
McClellan (USA)	4746 6738 8989 11239 11246 15031 18002
Scott (USA)	6727 9014 11182 15015
Thule (Greenland)	5710 6738 8967 11228 13201
Yokota (Japan)	4747 5710 6738 11236 13201 13215 18002
Saudi Arabian Airforce	3095 8967
Kuwait Airforce	5683 8970 21410 21415

All airforce frequencies are in Kilohertz and transmisions are almost always in USB

Above information courtesy G3ZHI

Online

By Patrick McDonald

Hi there, boys and girls out there in radio land! Any of you like to play around with computers? Well, then, you've come to the right place. This here is the special part of CB ACTION magazine where we like to talk about such stuff. Even if you're new to chips and bytes and such things... fear not! Why not read on a bit and see what we're on about?

* Which Computer Is Best?

A very common query I hear all the time from radio buffs is, "What kind of personal computer should I choose for radio work? I'm totally confused!" As many ONLINE aficionados will already realise, I always recommend the IBM or MS-DOS compatible range of PCs for radio use, for a number of reasons.

They are the most common machines in use for all types of general computer work; they're found universally in all offices all over the world; they're relatively cheap and have interchangeable parts; and, very importantly, most new radio software is now written for this type of machine. I know it is possible to do a great deal with the Apple Macintosh, Atari, Amiga and even Commodore 64. However, radio folks using these other machines continually drift over into IBM usage and never come back...and I have never heard of anyone going the other way. Anyhow, this is my humble opinion and you can take it for what it's worth.

Today's standard "entry level" IBM compatible machine is based on the "386SX" microprocessor chip, with 1-2 megabytes (Mb) of RAM, a 40 Mb hard disk and a quality VGA color screen.

You will see these advertised widely for around $1500 or so, sometimes cheaper, depending on the amount of RAM and the size of the hard disk.

The above configuration is considered minimal by most computer folks, although I myself still do useful work on an older and slower "XT" model with a basic CGA screen and only 640k of RAM. A great many of the programs I review in these pages will certainly work OK on such an antiquated IBM system.

There is, however, little point starting out in this lowly manner, unless you get a pretty good deal on a second-hand system. As prices for new IBM compatibles continue to fall, it's probably more sensible to start out with the kind of 386SX system I've outlined.

I realise I've not mentioned a printer, which you may or may not want to purchase at the outset, but you can usually pick up a simple but quite adequate dot-matrix type for $300 or so, and upgrade to a nice laser or "bubble-jet" printer at a later date.

* How Many Megs of Memory?

Of course, just as no-one is ever too rich or too thin, no computer user ever has too much RAM or too big a hard disk!

Four megs of RAM will run many new programs much faster and 120 megs of storage space on your hard disk will most certainly be fully used, believe you me! If your budget allows it, a faster machine, such as a full 386DX or a 486 will never be regretted. Anyhow, there you have it, ONLINE enquirers...my brief advice to those of you in the radio hobby who have yet to take the big plunge into computer use! Do a bit of your own further reading and research and then shop around. Read all the newspaper and magazine adverts you can find. Don't buy the first machine you're offered and don't be afraid to bargain a little!

* Antenna Design Programs Available

Now let's look at a couple of new radio-related computer programs (for IBM compatible computers) that have arrived here lately via electronic, telephonic means, both written by software author and radio amateur J. Scott Hedspeth WB4YZA who hails from North Carolina in the US.

The first is called MINILOOP and provides some general information on the design of small circular loop antennas (small meaning a loop with a circumference of less than a third wavelength).

When you start up the program you are asked to nominate the circumference of the desired loop, the gauge of the wire and the frequency you're interested in, and MINILOOP instantly displays all the relevant lengths and other data.The second program, which really got me dreaming in technicolor about improving my current rather modest antenna farm, is called ARIEL 1.5 and was written, Hedspeth says, to provide a basic design program for high frequency (HF) antennas, such as Extended Double Zepps, Lazy H's, Bobtail Curtains, Two Element Quads and Bruce Arrays, to name just a few.

After being fired up, ARIEL presents you with a simple main menu, listing all the various possible HF antennas. You choose one to your liking and are then prompted for the frequency you are aiming for. Enter this and you immediately find yourself looking at a diagram of the desired antenna, with the dimensions in both imperial and metric measures.

Note that ARIEL will only

SPECTRUM BBS FOR MELBOURNE READERS

Let's turn next to the world of computer "bulletin boards" that cater for the radio hobbyist. The latest news from Melbourne's SPECTRUM RADIO BBS is that sysop Michael Evans is now carrying extensive packet radio software.

This kind of computer program allows licenced radio amateurs to send computer information and programs over the airwaves instead of the telephone lines. The result is sort of a "BBS of the air" and an exciting new field of endeavor. Of course, you must pass the relevant licensing test to be allowed into this side of the hobby, just as for entry into amateur radio.

More information is available 24 hours daily via SPECTRUM RADIO BBS on (03) 819-9167.

You can also contact the Wireless Institute of Australia and check out the pages of CBA's sister magazine Amateur Radio Action. As well as expanding its collection of radio files, SPECTRUM has been building up its "Online Database" of radio frequencies and, by the time you read this, SHORTWAVE POSSUMS BBS should have its own similar database up and running too, thanks to help from our neighbor down south.

Those of you familiar with the radio related computer bulletin boards in general will know that you can easily find endless files with lists of HF, VHF, UHF and other frequencies, and message areas full of discussions about the latest channels in use on all bands.

However, it is a relatively new development in BBS circles to be able to offer users entry into an actual database while connected via the telephone.

This allows the user to search for specific frequencies or stations, and even to enter new data to assist others. I think this kind of feature is the way of the future and invite you to check out either SPECTRUM or SWP to explore the possibilities and see what you think.

By the way, this particular BBS program is the "door" version of SCANNER BUFF! (or SCANBUF), currently the most popular frequency database program in use by radio enthusiasts in my neck of the bush.

design antennas below 30 MHz.

Inputs of "letters" when the program asks for "numbers" will produce crashes and supplying invalid numerical inputs will certainly give you invalid numerical outputs, the author warns relevantly, on the old computer theory of GIGO (garbage in, garbage out).

Otherwise, this is an extremely simple program to use and its operation will be obvious to most radio enthusiasts straight away.

Some basic knowledge of antenna theory, general maths and wire antenna construction techniques is of course recommended for a full appreciation of AERIAL, but most of the antenna designs included in this version have been constructed, analysed and tested already by the author. On-air testing was done on either 21 or 28 MHz. Again, the primary purpose of ARIEL is to provide a dimensional starting point for the construction of various HF antennas. The program won't do all the work for you! Hedspeth recommends that the more complex arrays be modelled by one of the above programs and then fine tuned to suit your individual location. As with MINILOOP, no provisions are made in ARIEL for hard copy print outs. You will have to use the old-fashioned "print screen" function on your computer if you want a paper copy to work from. This will not print the graphic characters used for the antennas but will give you a working copy of the dimensions and associated text information.

* Special Bonus

As a special little added bonus, the ARIEL program includes some other basic RF related calculation utilities that might prove useful (although there are separate and more elaborate programs available that can do the same job). These extra ARIEL tasks include finding the impedance of a quarter-wave matching section, solving LC calculations, converting solar flux measurements to sunspot numbers, working with open-wire transmission line dimensions and finding sunrise/sunset times anywhere in the world at any time. Note that MINILOOP and ARIEL are not commercial software, but distributed as 'freeware' by the author. No fee is charged for their use and they can be copied and distributed freely.

* Get The Message!

Questions have also arrived lately on my messy desk regarding "offline mail readers". So what are these damn things, and what do they do? Well, if you do much electronic travelling around computer bulletin boards with your modem and telephone line, you will realise that in each special interest message area, or "echomail area", there are a heck of a lot of interesting messages to read, with dozens or even hundreds arriving from all over the world every day. If you want to keep up with ongoing conversations and find replies to your messages, you can easily spend a lot of time "on-line" at one or more BBSs (connected via your telephone.)

This can be both tedious and expensive, especially if you are ringing STD.

Offline mail reader software (such as the popular programs Silver Express, Bluewave and many, many others) simplify the whole process of dealing with messages on your favorite BBS. They allow you to specify in advance which particular message areas you are interested in, what kind of mail you want to find (only that which is personally addressed to you, only mail with certain key words in it, only new mail since a particular date, etc.) and then they pack it all up for you in a few seconds into a compressed bundle that you can "download" like any other file. After logging off the BBS you simply look through your catch, answer whatever messages are required, write new mail and so forth, at your leisure. These are then bundled into another compressed "reply" packet which can be uploaded onto the BBS next time you call. The BBS unpacks the mail and automatically inserts all your new messages in the correct BBS message areas. Then you "download" any messages which appeared since you last logged on, and the process continues. Sounds damn handy, doesn't it?

If you are dealing with a great quantity of mail, in a dozen or more busy international message areas, each perhaps concerned with a different facet of radio, such offline mail readers are in fact almost mandatory. Check your local BBS and see if this service is available. It certainly is at SWP and SPECTRUM. If you can't find one, leave a polite message for your sysop.

* SWP Special Disk Offer

And finally, yep, directed to those unfortunate enough to have not yet purchased a modem, we'll repeat our special SWP disk offer again with this issue, due to the continuing requests for computer programs raved about here in ONLINE.

Send your cheque or postal money order for $35, with 6 formatted floppy disks, any size, to the now-classic address of Shortwave Possums, PO Box 357, Round Corner 2158

Cheques may be made out to "Shortwave Possums."

I will then most reliably return to you, post haste, a sample collection of the best and brightest radio-related software suitable for IBM compatible computers.

Remember, however, that these same programs are available via modem at many BBSs around Australia, at extremely modest cost. Why not consider adding a cheap modem to your radio and computing gear, getting "on-line" and giving Australia Post a big miss?

So that's it for another ONLINE, gang. Off I zap into the electronic never-never for another two months. However, I will as always be happy to hear from you in the meantime via SWP BBS on (02) 651-3055 or care of the above address with comments and opinions and suggestions for future ONLINE columns. Bye for now!

BEWARE MARCH 6
MICHELANGELO VIRUS

The Michelangelo virus was first reported in April, 1991 in Sweden and the Netherlands. The first usable sample of this virus was actually received in June, 1991.

Michelangelo is a memory resident infector of diskette boot sectors and the hard disk partition table.

It is roughly based on the Stoned virus, though very different in its behavior.

The Michelangelo virus becomes memory resident the first time the system is attempted to be booted with a Michelangelo will become memory resident.

Total system and available free memory, as measured by the DOS CHKDSK program will typically decrease by 2,048 bytes. Michelangelo will be resident at the top of system memory but below the 640K DOS boundary.

Interrupt 12's return will be moved to insure that Michelangelo in memory is not overwritten.

Once Michelangelo is memory resident, it will infect diskette boot sectors as diskettes as they are accessed. It will also infect the hard disk partition table when the user attempts to access a file on the hard disk.

On 360K 5.25" diskettes, the original boot sector will be moved by the virus to sector 11, the last sector in the root directory. On 1.2M 5.25" diskettes, the original boot sector will be relocated to sector 28, part of the root directory, any entries which happened to be in the overwritten sector of the root directory will be lost.

Partition table infections will result in the original partition table having been moved to Side 0, Cylinder 0, sector 7 on the hard disk.

Michelangelo activates on March 6, which time it will format the system hard disk.

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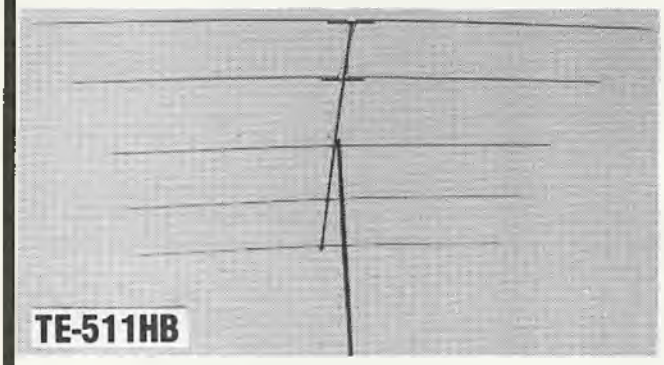

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BOOM LENGTH	5 M	MAX. ELE. LENGTH	5.3 M

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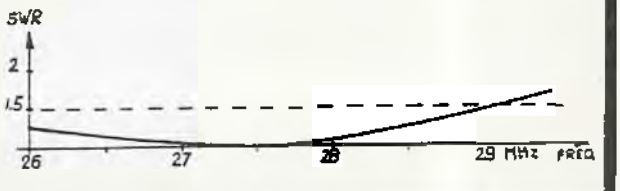
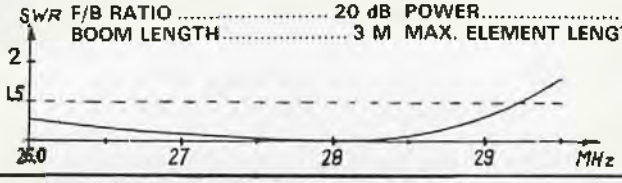


THIS NEW TET-EMTRON 3 ELEMENT DUAL DRIVE TE-311HB ANTENNA FAVORABLY COMPARES WITH 4 ELEMENT BEAMS. ITS ALL ALUMINIUM AND STAINLESS STEEL HARDWARE ASSURES LONG LIFE AND RELIABILITY.

SPECIFICATIONS:

BAND	26 to 29 MHz	GAIN	MIN 8.5 dBi/6.3 dBd
F/B RATIO	20 dB	POWER	2 KW
BOOM LENGTH	3 M	MAX. ELEMENT LENGTH	5.3 M



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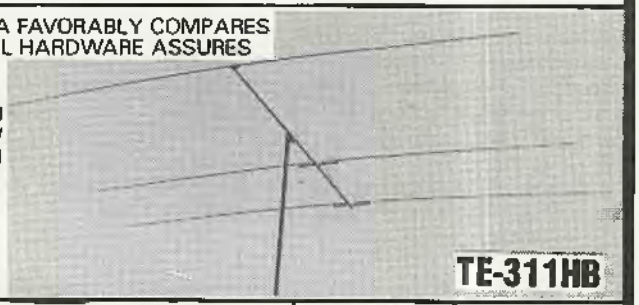

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  EMTRON EP2000 1.6-60MHz
- ★ Co-ax Seal ..... $6.00 per roll
- ★ Co-ax Switches 2 position
  4 position
- ★ Scanning Antennas — base
  DIAMOND D130 Discone $199
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There's usually quite a difference when you start...

COMPARING CB RIGS TO AMATEUR TRANSCEIVERS

Part Two

When we last met we were discussing some of the more obvious differences between CB and amateur transceivers. We had discovered that there are a lot more controls on the average amateur rig, and that amateur HF rigs are the most obviously different.

From the outset you notice that there are three main groups of amateur rigs: the hand-held radios, the HF rigs and the VHF/UHF rigs.

We'll deal with amateur hand-helds later, as these are so varied and astonishingly capable that they warrant an article (or two...) on their own.

Generally, the HF amateur transceiver is a big, feature-laden radio designed from the outset to be used at home.

It has many controls and is sometimes surprisingly complex and confusing to operate. The older-style rigs were touchy to drive because the tuning of the final (valve) stages required a deft touch with drive and loading controls, and the new radios can be equally complex with many levels of computer command and strange controls.

Most modern entry-level HF rigs, however, are relatively simple to drive, as they don't share the level of sophistication of their more expensive relatives.

VHF/UHF rigs, on the other hand, fall into an entirely different basket.

Just as the HF rig was destined for service at home, the average VHF/UHF rig was designed from the outset to be installed in a car.

There are hundreds of thousands of them doing service around the world, and the amateur repeater network is now famous for its easy domination of many higher-frequency bands.

These pre-defined purposes are the reasons that amateur HF rigs are generally physically large and VHF/UHF rigs are generally physically small.

By Chris Edmondson
VK3CE
Editor
Amateur Radio Action

Clearly, a mobile rig needs to fit into a car, where the base station rig needs to look impressive to attract the buyers. Mind you, there are a fair few people who run HF transceivers in the car, and a helluva lot more who have mobile VHF/UHF rigs set up at home.

Nevertheless, if you follow the basic formula it's clear that most 11 metre CB rigs are aimed at a mobile environment, although there have been a few unashamedly base-oriented rigs over the years. (It always makes me laugh to see them though: those monster CBs don't appear to have anything extra beyond a simple inbuilt power supply — and some of them don't even have that!)

HF belongs at home...

There are other reasons why most amateur HF operation takes place at home — simple practicality.

With HF you're talking practicality of antennas more than anything else.

The smallest antenna with any real effectiveness is the quarter-wave whip, which we usually see stuck up a mast with a groundplane underneath.

The groundplane is usually composed of 'radials' with the same electrical length as the radiator — these simulate the ground as the quarter-wave antenna is not ground-independent and needs a ground to 'work against'.

Okay, so a nine-foot whip is a bit of an eyesore on 27 MHz, but so what?

It's simple: an antenna's length is determined by the desired wavelength which, literally, is the length of the radio wave.

To confuse things, the relationship is inverse — as the frequency increases the wavelength decreases.

The electromagnetic wave is generated by a circuit which oscillates (or vibrates) at a very fast rate.

(continued over page...)

COMPARING CB RIGS TO AMATEUR TRANSCEIVERS

(continued from previous page...)

This rate is the frequency, and can be represented as a sine wave on a graph.

The wave moves to either side of the zero point of the graph at a constant rate — at a constant number of such shifts each second. This number is the frequency, where the word 'frequency' literally means the number of times.

Now let's take the analogy a bit further: visualise if you can the radio signal travelling at the speed of light, which is the speed it attains in free space.

(It moves more slowly through the atmosphere, more slowly again through water and, no doubt, would move even more slowly through something thick like molasses.)

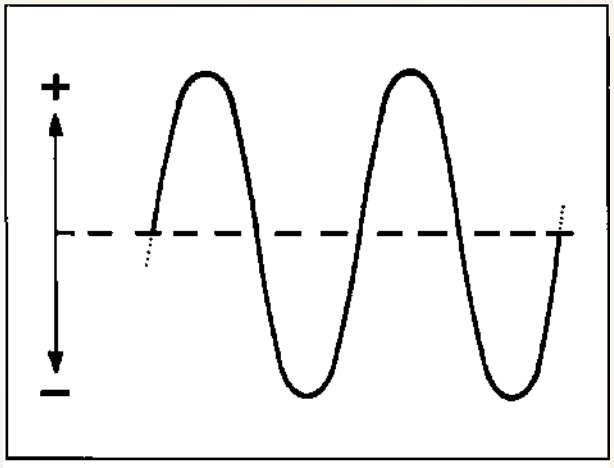
If your piece of graph paper from the above paragraph was the same length as the distance your radio signal or beam of light could travel in one second (300,000 kilometres) a 27 MHz (27 million Hertz or 'cycles') signal would have crossed the zero point heading upwards on the graph 27 million times.

If you examined your very long piece of graph paper more closely you'd also see that there was approximately 11 metres between each upward cross of the zero point.

This, simply, means that 27 MHz has a wavelength of approximately 11 metres.

If you moved up to 30 MHz your wavelength would be exactly 10 metres — there'd be exactly 10 metres between each upward cross of the zero point — while 25 MHz is exactly 12 metres.

The easy way to determine wavelength is to grab your calculator, enter 300, hit divide, then enter your frequency in MHz.



This above graph of a sine wave represents an unmodulated radio wave. If you were to count the number of times the trace crosses the zero mark heading upwards in one second you would have the frequency (27,000,000 times = 27MHz). If there was 11 metres between each 'riser' you'd be on the 11 metre band, which is approximately 27MHz.

The higher the frequency, then, the more times the trace crosses the zero point on the graph and the shorter the distance between each cross.

The lower the frequency, the fewer times the trace would cross the zero point on the graph, and the longer the distance between each cross — in other words, the longer the wavelength.

Simple. (Awfully hard to explain though!)

The UHF CB band is at around 477 MHz, which is an ultra-high frequency. Its wavelength is around 63 cm (300÷477=0.6289), which is very short indeed compared to the 11 metres of 27 MHz!

The amateur 10 metre band has a very similar wavelength to the 27 MHz CB band, so an 11 metre CB antenna would probably work after a fashion on that band.

However, remember that as you go lower in frequency the wavelength increases.

The lower amateur bands are on 12, 15, 17, 20, 30, 40, 80 and 160 metres respectively — and yes, a quarter wave whip on 160 metres (1.80 to 1.86 MHz, just above the AM broadcast band) would measure roughly 40 metres — just over 130 feet — which would be a bit impractical for a car, particularly each time you went under a power line!

Obviously, antenna dimensions like these make mobile operation quite a challenge, which is one of the main reasons that most HF operation takes place from home.

It is, however, possible to fool a radio into thinking the antenna is that long. Nobody ever said the 160 metre mobile whip's 130 feet of wire had to be put in a straight line, so the antenna for mobile HF is usually helically-wound, which is a fancy way of saying that a resonant length of wire is wound onto a fibreglass whip.

The actual length of wire required for a helical antenna is slightly longer than for the antenna made from a straight length of wire — it's determined by the diameter of the fibreglass blank used as the whip, by the spacing of the turns in the coil, by how many turns are used, by the diameter of the wire, and by a number of other factors.

Well aware of this, the commercial antenna manufacturers generally carefully calculate and compare all of the factors for the chosen frequency... then just guess how to build it!

That's right, most antenna construction is pure guesswork.

You experiment until you find a formula which works then, if you're running a commercial operation, you simply duplicate the guess which worked best... Obviously there's a whole lot of experimentation involved.

So antenna length is one important determining factor for operating mobile.

On HF, although you can use a helical whip, the lower the frequency you select

means the narrower the range of frequencies at which the antenna will be capable of resonating, to the point where a 160 metre whip which resonates (tunes) at 1825 kHz may well not tune even a very small way from that frequency. Even as close as 1820 or 1830 kHz may be too far away, which means the operation will be very limited.

With such a touchy antenna you'll also find that moving it on the vehicle would put it right out of tune, as would parking close to another vehicle and so on.

A total waste of effort... Other critical factors affecting mobile operation include noise, both natural and man-made, and the mechanical and electronic performance limitations of the radios themselves.

You're not so limited on VHF or UHF, as the antennas get progressively smaller as the frequency increases.

This means you can use an antenna of the same size but with a higher gain, which is something like running a linear amplifier into a small antenna.

The extra bonus here is that you also supercharge the receiver!

(By the way, don't ever let people fool you into thinking that the best way to boost your signal is to run an illegal amplifier.

Although that obviously makes your signal a bit bigger at the other end, by far the best way is to improve your antenna.

If you double your power from five watts to 10, although you're burning up roughly twice the electricity to produce the extra power, the difference at the other end may not even be noticeable. (Doubling your output power means an increase in received signal of just 3dB, which is half an S-point — about the thickness of the meter's needle!).

You may need to increase your power to something like 50 watts before you've made any real improvement at the other end — and your receiver will still be capable of hearing only those stations you could hear before.

The amplifier may well make you audible to people you have no hope of hearing a reply from. It could also put a big strain on your car's electrical system or your home station power supply. On the other hand, improving an antenna installation reaps a rich reward: every improvement on transmit is echoed on receive. If you're 10 times better at the other end you'll also hear 10 times better.

Using a better antenna costs no power but can mean the difference between a very poor signal and a very good one.)

There has to be a point at which shorter wavelengths (permitting higher gain for size antennas designs to be used) is balanced out by shorter propagation distances — and there is.

We'll discuss this point and talk some more about the differences between amateur and CB transceivers in the next issue.

Cheers until then from Chris Edmondson, VK3CE.

THE 'NO-CODE' AMATEUR LICENCE WHAT'S HAPPENING?

Okay, so why are we *still* waiting?

Despite assurances that the all-new regulations for the amateur service were to be introduced in January, we are still waiting for an official release from the **Department of Transport and Communications** (DoTC) telling us the good news.

Way back in June last year a proposed set of new amateur regulations was published in our sister magazine **Amateur Radio Action**. A new grade of licence designed to appeal to those who hankered for a simpler path to amateur radio would be introduced, we were breathlessly told. The **Limited Novice**, as it was to be called, would herald a new, much simpler way into amateur radio. What aroused the most excitement, however, was that the new grade of novice call was to be a *no-code novice* — very basic theory, simple regs and *no* Morse - - and it would also have access to the 70cm UHF band as well as getting access to digital transmission modes like Packet Radio.

So what happened?

Well now, that's a damned good question, and if anybody has a publishable answer we'd certainly be pleased to hear from them.

You see, back in October last year Minister Snowden, representing the Minister for Transport and Communications, stood up at an amateur convention in Darwin and told the assembled crowd that the new licence — as well as a whole load of new provisions, including a substantial power hike for Novice stations — *had* been approved, and was now simply a matter of a hard-working public servant somewhere puffing on his big black stamp and whacking it onto the nearest ministerial minute. All that remained was a couple of bits of tidying-up in the documentation, we were told. But it seems that public servant still hasn't found the ministerial minute, or something to that effect. And Canberra, usually the *first* place to look for copious amounts of paper in the form of press releases and great volumes of hot air, hasn't said a *thing* about the new regs. Nothing at all. The phones are quiet, too. Even the usually-forthcoming rumor mill remains silent. The new regs seem to have vanished without trace.

So what's happening? Like we said: when you find out please give us a call...

Spectrum Anarchy

By Rod Fewster

It's 1993, and I'm back!
For how long depends on you.
Without your input I have
bugger-all to write about,
so put pen to paper and let me
know what's happening
around the place.

There will be some dramatic changes in the RI world this year. DoTaC will cease to be a Government Department and will officially become a Government Agency ...probably known as the "Spectrum Management Agency". "Spectrum" seems to be the buzzword for 1993, with "Spectrum Reform" and "Spectrum Audit" on the agenda. The SMA will be looking at leasing "blocks" of the spectrum to some users (government bodies and large companies with hundreds of transceivers, two-way radio manufacturers and suppliers, etc) on a semi-permanent basis.

VHF EQUIPMENT UPGRADE

The VHF Band is being re-shuffled into 12.5kHz spacing, and users with "old" equipment will have no choice but to upgrade if they want to stay on-air. The annual recommendation by various State Police Forces that scanners be prohibited seems to have fallen on deaf ears, so we have a bit of breathing space.

DO THE RIGHT THING

On the CBRS side of it...the overall policy towards Bad Buddies will be one of help and education in an attempt to get people to "do the right thing" rather then pinching them after an offence has occurred.

My spies tell me that stern warnings will be issued in place of the current "bust" for first offenders in most cases, but the penalties for not heeding these warnings will make your bloody eyes water.

No changes are planned to the "Marine CB" allocation at this stage.

NO CB LICENCES?

I guess the big news is that serious consideration is being given to the abolition of CBRS licences.

This won't give pirates Carte Blanche to ride roughshod across the electromagnetic spectrum, though.

Out-of-band activity will still be heavily policed, and possession of the dreaded "sub-standard equipment" will still put you in a world of hurt.

MAJOR PROSECUTION COMING UP?

Speaking of sub-standard equipment...my spies tell me a major prosecution involving the modification and supply of UHF-CBs to transmit and receive outside the CBRS allocation is on the horizon. The parties involved will be charged under the tough Ministerial Standards.

I'm told that the evidence is so strong that a verdict of "Guilty" is a foregone conclusion.

The Crown will recommend maximum penalties and the fines are expected to be astronomical.

(The Brisbane RIs are close-mouthed about this and deny all knowledge of such a case, so we'll have to wait and see if my spies are still as reliable as they used to be.)

Remember ... you read about it here first!

WRONG MOVE

As the skip fades, the demand for CB linears is increasing.

Wrong move! If you're keen on DX and want to improve your station you're far better off putting the money into a decent beam and playing it safe. Simply having a linear stored in a box under your bed is enough to get you in deep poo-poo these days, and if you're caught using one you can lose not only the linear but ALL your gear...27MHz and UHF-CB transceivers, antennas, cables, power supplies, SWR meters, the bloody lot ... and cop a stiff fine into the bargain!

Think about it...

(Read the current issue of Amateur Radio Action for some interesting information on this topic..ed)

FAR NORTH QUEENSLAND NEWS

By Greg Curnow

In December of last year there was a meeting held by Innisfail Operators at which time a vote was taken to treat 27.355 MHz as an "Unofficial call Channel".

This now appears to have been forgotten as channel 35 is now as it was before - a "talk channel". The motion that was voted upon at that meeting appears open to a loose interpretation of the rules as, since then, variations have appeared that were not part of the original motion. After careful reviewing of the recorded minutes of the meeting held eight weeks ago, I feel that although the original concept was good, it just hasn't worked out that way

Operators who wanted the meeting in the first instance - many of whom were not heard on air beforehand and haven't been heard since, have only achieved in the clearing of the airwaves completely. The meeting was a success in the fact that operators came together peacefully to discuss their problems, however, operators of 10 plus years are now talking about going clear permanently and packing their gear away or selling it because of the poor working situation on and around "35".

Some operators QSY off "35" - a much appreciated practice - but is very frustrating when high powered stations move only one channel up or down the scale. They effectively wipe out ch. 35 plus three or four channels on either side of it. Surely it would be just as easy to move five channels up or down rather than just one?

Operators must not be selfish as we are all using CB for our enjoyment.

We should be more considerate of others, so making DXing more enjoyable for everyone.

Something else that requires a mention is the number of sets that are operating so far off frequency that the users sound very much like a deep sea diver on helium. Surely it's not all that difficult to have your rig properly set up to actually ttansmit on the channel frequency rather than give or take a few kilocycles either way.

Book Review...

AUSTRALIAN RADIO FREQUENCY HANDBOOK

By Doug Simpson

I'm not a scanning guru and I don't know all that much about the technical or advanced parts of scanning, so when I saw the `Australian Radio Frequency Handbook' at my local Dick Smith store I thought it would be the just the thing.

This book isn't just a frequency register - I've already got a few of those, what I wanted was really useful information about the hobby itself.

About half of the "The Australian Radio Frequency Handbook" is exactly what every newcomer should have.

It explains the history of scanning, the use of scanners, looks at the different bands and how they fit in to the overall radio frequency picture.

There's a glossary of radio and scanning terms which is particularly helpful, especially when you're reading through magazines like CBA and come across words like selectivity, image rejection, AM/FM and so on.

The book has lots of easy to read articles on antennas, scanners and other associated gear and also introduced me to HF monitoring, which I'll get into when I get a shortwave set.

But, although the information section is good, the other half of the book - a frequency directory - contains data which is simply incorrect. I live in NSW and reckon that at least 50% of the frequency information in the NSW section is wrong.

I hope the other states have received more research than this!

Comparing this book to my other frequency guides (an ESG register and Register of Government Radio Frequencies) is simply "no contest".

I started by checking on listings for the Bush Fire Brigades, one of my special interests, and discovered that every listing for the NSW brigades was wrong!

Penrith BFB is listed as being on 168.550 MHz, which they have not used for at least a year.

The Blue Mountains BFB is listed as 72.887, a frequency that I can only assume came from a scanner that was out of tune, because they are really on 72.890.

There is also a listing for "Glenbrook Shire Council", and there's no such thing - the channel belongs to Penrith Council, but the transmitter is located at Glenbrook.

There were also several users listed as being in the 457 MHz band, but these are the inputs to repeaters and so pretty useless to scanner users.

Author Jack McDonald has given newcomers like me a lot of good information to help us get into scanning, but as a frequency guide - which the name suggests it is - the book is disappointing .

The "Australian Radio Frequency Handbook" is available from all Dick Smith stores for $14.95 and is probably worth it if you're after general scanning type information.

You can, however, do better if you're looking for frequencies.

UHF RIG REVIEW

Electrophone's UHF TX-4000R...

"Remotely" different.....to the TX-4000

By Ken Reynolds
POWER BAND COMMUNICATIONS

Well here it is. The eagerly awaited GME TX-4000R remote mounting UHF CB transceiver that boldly challenges its competitors to build a better rig.

This article should be read in conjunction with the TX-4000 review appearing in the September/October edition of CB ACTION. Because the electrical specifications of the two transceivers are similar, in this issue of CBA we only pursue the different features provided by the new model. When GME released the TX-4000 UHF CB transceiver a few months back it got a reception unparalleled in the history of UHF CB.

At last, someone had gone to the trouble of researching what the customer really wanted instead of the old "this is what we think you want attitude" that has always dominated the new rig market.

I have always maintained that the first manufacturer to pack all the desirable features into a single package and then costed the package at an acceptable price would 'clean-up' so to speak.

HARD PRESSED TO MEET THE DEMAND

Since the TX-4000 hit the streets, GME-Electrophone dealers around the country have been scrambling for supplies to meet the demand.

At the time of this rig test Blair Campbell, the Victorian and Tasmanian Manager for GME, told me that he has a back-order list of more than 500 units for this week alone. GME's Gladesville production line is running 'flat-out' in an attempt to catch up with the demand for TX-4000s, however, I am told it will be some time before the necessary quotas are filled. And that's before the release of the TX-4000R - the 'R' suffix stands for remote mounting of the control head from the main electronics 'black box'.

EXPERTS - WRONG AGAIN!

Contrary to what you've probably heard from the usual clutch of know-all experts, the TX-4000R is an entity unto itself and you can't just take your existing TX-4000 and upgrade to an 'R' series model simply by plugging in a remote control kit.

While the transceiver electronics are similar between the two rigs resulting in similar on air performance, the TX-4000 has an integrated control panel which is 'hard' wired and bolted to the sub-frame of the transceiver and can't be easily detached. The TX-4000R on the other hand has been blanked off with only an 8 pin microphone style connector interfacing to the world through a 2.5 metre umbilical permanently attached at the opposite end to the compact control panel.

The control head measures 54 millimetres wide by 52 millimetres high and is 33 millimetres deep not allowing for other projections like the volume control which adds another 15 millimetres or so to the depth. The 8 core connecting cable exits the control head through a rubber grommet recessed into a little 'square-ish' moulded nook at the right hand, lower rear of the head with a similar but larger recess provided on the left hand end for connecting an external loudspeaker. Don't expect to find an internal speaker in this radio...there isn't any.

A second external loudspeaker socket is provided at the rear of the 'black box', identical to the TX-4000 integrated model.

You will see from the photograph of the TX-4000R that it carries only a single rotary control - the volume control. What happened to the familiar old Squelch control you might ask? It has been relegated to a toggle on/off function accessed via the SQL press button on the left hand column of buttons. Also missing is the rotary channel selector switch which to me is a disappointment. Rotary analogue style controls - for some functions - provide user feedback to the senses accompanied by a feeling of being in 'full control' which is largely lost with the 'new' all-press button technology.

PUSH-BUTTON CHANNEL CHANGING

Channel change is effected by the use of left and right arrows that allow the operator to decide which is UP and which is DOWN, or by direct entry via the keypad...it's just not the same is it?

The product as a whole is designed and executed very nicely with the electronics box sharing the same case halves, back panel and frame as the 4000 model.

Thus, the transceiver is just slightly smaller than the 4000 by the space occupied by the front panel controls - 171 millimetres wide, 52 millimetres high and 143 millimetres deep.

The power inlet and antenna entry are via flying leads as usual with GME's later model equipment.

"CUTE" CONTROL HEAD

Because of its small size and good looks, cute is the best way to describe the appearance of the control head.

The keypad is large and easy to use - even for very blunt fingers - and the liquid crystal (LCD) display window is well illuminated with big legible figures.

A neat mounting bracket is provided for securing the control head at a variety of angles. The plastic case mouldings fit together well and the assembled module feels strong and 'secure'.

The microphone is also shared with the TX-4000 - using the electret insert to produce very clean, high quality audio.

The following pars (in italics) are reprinted from our previous test of the TX-4000 and are also applicable to this remote-head version.

Remote head rigs such as the TX-4000R are very much the answer to the problem of fitting radios into today's plastic dashboard vehicles.

PERFORMANCE

The transmit and receive performance of the radio follows along similar lines to its predecessor and while it lacks the blistering receive performance of the SAWTRON our test rig turned in a healthy sensitivity of 0.25 microvolts for 12dB SINAD which is better than the claimed spec of 0.3 microvolts.

Squelch threshold sensitivity is 0.1 microvolts with the tight (maximum) level set at 1 microvolt however we felt a touch more hysteresis would be in order to hold up 'choppy' signals a bit better.

There is heaps of recovered audio level and with the use of an external speaker the quality is very good - the internal speaker is not bad either, however, with its restricted size it doesn't quite do the receiver capability justice. Transmitted audio is excellent - hats off to the ELECTRET microphone insert - with the deviation "spot-on" and frequency stability also good.

The TX-4000 measures only 171mm x 143mm deep by 52mm high and with the covers removed the internal view is of neat layout and good quality componentry. The sensitive frequency generation section is now housed within a zinc diecast compartment bearing the GME insignia in raised letters.

The TX-472 contained a clumsy secondary circuit board for the "micro" and with the SELCALL board fitted the rig suffered severely restricted service access that virtually closed off the main circuit board.

Although there are striking similarities in circuit board design style between the old and new, the TX-4000 and TX-4000R are much more accessible with the whole main circuit board in view from above and below.

Extensive use is made of SMD (Surface Mount Device) technology on the underside of the main circuit board with the conventional hardware items and power ICs and electrolytic capacitors etc., mounted on the topside of the board.

The perimeter frame is strong, fabricated from pressed and shaped sheet steel sides with the rear section stamped from aluminium sheet. The panels are joined together with machine screws while the main circuit board is retained with self-tapping screws.

In the September/October issue we made mention of not having had time to carry out our usual RF pollution 'overload' tests on the TX-4000 and promised to carry the results in the ensuing issue - when we hoped to review the 4000R. As history discloses, the data did not appear and neither did the 4000R.

INTERFERENCE LEVEL IS DISAPPOINTING

It is disappointing to report that the TX-4000 and the TX-4000R both suffered from interference - in the form of high level unknown signals - through various Melbourne suburbs, usually in proximity to known trouble RF areas where high power commercial and government transmission towers are sited. GME produced a modification for the transceivers, however, while some improvement was experienced the problem is still not totally overcome. It should be stressed that similar interference problems are found in 99% of the various makes of UHF rigs available and is not confined to GME, nor is the interference any worse than that encountered in most CB UHF rigs.

GME is still working on it and this alone is very much in the company's favor as many companies tend to simply ignore the problem with the claim that "all rigs suffer from interference in bad RF areas".

This claim may be pretty much correct, but, it doesn't mean that you just accept the situation and do not work at eliminating, or considerably improving, such a shortcoming.

Maybe the simple answer is for DoTaC to start attacking the RF "noisemakers" rather than manufacturers having to solve problems not of their making.

Postcard from Cambodia

By Richard Jary

Cambodia has been through a pretty rough time of late. A number of centuries ago it ruled much of South East Asia from the capital of Angkor Wat, a city whose ruins remain an impressive sight.

But a thousand years on, following US invasion during the Vietnam war, it fell prey to the genocidal policies of the Khmer Rouge from 1975 to 1979.

Nowadays Cambodia is a land of hope. I recently spent six weeks in Cambodia with work, contracted to the United Nations to help set up a communications network before the May 1993 democratic elections. I'd never considered Cambodia as a holiday destination, but it turned out a fun and fascinating experience.

There are over 22,000 United Nations people working there, all of whom are a symbol of future peace for the locals.

A United Nations pass carries a lot of weight around Phnom Penh, though I don't know if I'd want to be flashing it in zones controlled by the Khmer Rouge!

On arrival in Phnom Penh the first thing that strikes is the large picture of former king and now Prince Norodom Sihanouk. His picture is plastered on all government buildings, as well as the airport. The airport itself is like something out of the dark ages - the shiny new UN pass becomes very useful at times like this!

The bustling city of Phnom Penh is full of motorbikes and push-bikes. The French architecture is very obvious, as is the typical overcrowding of many Asian cities. Yet photos in the Genocide Museum of an empty Archar Mean Boulevard, the city's main street, are almost impossible to believe given the current crowded conditions.

SO WHAT'S ON THE AIR?

When I first arrived the natural temptation was to tune through the radio.

One trick for new players is that the Cambodian "mains supply" power varies by about 100 volts each side of a nominal 220. I ran solely on batteries except when I was on a known safe diesel supply.

There was nothing in English to listen to, and from talking to a few of our villa's security guards, it turned out that most of what was to be heard on mediumwave was from Vietnam.

Recently a French FM station started up on 92.0 MHz, with French TV (Canal France International) on UHF. Prior to that all the locals had was it was the local Khmer radio and a TV channel which broadcast from 6pm to around 10pm.

A 1/2 HOUR OF TV ADVERTS

That TV station is the only one I've ever seen that can show half an hour of ads in a row and still keep the locals enthralled. I did pick up one other FM station about 80km north of Phnom Penh on 99.9 MHz carrying European instrumental music and an unidentified Asian language (not Khmer).

Due to the fading I suspect it may have been skip.

The United Nations operates UNTAC Radio on 918 kHz and 1575 kHz for daily transmission in Khmer. The Khmer Rouge also have a station, but I have no details on it's frequency or schedule.

Hotels provide satellite TV for general entertainment. The most common is Asiasat 1, which carries the Star TV network.

Star takes feeds from BBC World Service TV, America's 24-hour MTV, Prime Sports and Star Entertainment, as well as a Chinese channel. Some of the more up-market hotels had three satellite dishes on their roofs, but I'm not sure what else they were seeing.

AK47 IN THE RENTAL CAR!

As might be expected after the turmoil the country has gone through, there is still an incredible amount of armament around the country.

The two largest factions, the Khmer Rouge's National Army of Democratic Kampuchea and the government Cambodian People's Armed Forces, are still having skirmishes around the countryside and I saw some tracer and mortar off in the distance one night when away from Phnom Penh. We even found a loaded AK47 rifle magazine in a rental car we collected from the hotel!

One of the main problems facing the country is the number of landmines and unexploded shells. Much of the country is not cleared and mines are still being laid.

In fact many villagers place them around their land at night to protect it from thieves - which must beat a burglar alarm any old day.

One unexploded shell was found about a metre from where we had sited a satellite station, but I never found out if they managed to remove the shell safely!

"IN THE CLEAR" TRANSMISSIONS

The United Nations, like any armed forces, use a number of channels for two way transmissions. Part of our contract was to replace some of these with satellite links and Codan digital radios, but much is still uncoded or "in the clear".

All local radio talk is on VHF, some simplex and some via repeaters. Long distance communications is HF - some of the frequencies used were 4390, 5415, 6671, 7312, 8371, 9503 and 24118 kHz.The locals have taken to radio with a vengeance.

All hotels and restaurants have staff carrying two way radios.

On close inspection, these turn out to be low power Icom 2 metre ham transceivers, available at the local market for a nice cheap price. There were also some real (genuine that is) radio amateurs present, in fact one of our staff was running a station from the hotel on 15 and 20 metres for a few weeks.

MAJOR 'PILE UP"

This caused a nice pile-up of stations keen to get a rare "XU" call-sign card for their QSL collection. There are some other amateurs there, as far as I know all are United Nations or embassy staff, so if you are still after a QSL then stay tuned.

Cambodia has a number of airfields - most unusable.

The only ones open for commercial flights are Phnom Penh and Siem Reap, the others are only used by United Nations helicopters - if at all. Phnom Penh has a longwave beacon like most airports and also one stuck right in the middle of mediumwave on 752 kHz.

At this stage I don't know if I'd recommend Cambodia for a holiday, although it is worth a short visit.

If the peace process goes as planned, given the amount of foreign investment already evident in Phnom Penh, the city will be one of the big boom places in Asia until it catches up to the 1990s.

Richard Jary reports on the communications scene in Cambodia, following his "tour of duty" with the UN to establish a new communications system for the emerging Asian nation.

HF Utilities

By Richard Jary

We're barely into a brand new year as I type this, even though you're reading the March/April edition of CBA. I've made it back safe and sound from Cambodia, with all limbs reasonably intact! Besides Cambodia, one of the other big United Nations efforts at the moment is Somalia. I believe my company has tendered to establish a communications network there as well, but I might just pass on that one if I'm asked to go!

Operation "Restore Hope"

* **DXers in America** have been monitoring lots of air traffic related to operation "Restore Hope" in Somalia, all on the Air Traffic frequencies of 11176 or 11300 kHz. These are the frequencies used for northern Africa and includes sites such as Nairobi, Khartoum, Djibouti and of course Mogadishu.

A commonly heard callsign is "Reach xxxx", the current callsign for the Air Mobility Command, which replaces the old Military Airlift Command. The numerical part of the callsign is the tail number of the aircraft.

Apart from normal air to ground communications, one listener was lucky enough to hear a Hercules C141 transport being asked to QSY to 11220 kHz for a phone patch.

This frequency was used for a live cross to "The Larry King Show" in the USA, with the talk show host interviewing the crew.

The United Nations are also heavily involved in Yugoslavia, one which my company has luckily (for me!) turned down in respect to a communication installation.

European listeners have been monitoring lots of traffic on 5310 kHz connected with the trade embargo for ships in the Adriatic Sea.

Aircraft Loggings

* **Steve from the ACT** has written in with some recent aviation loggings.

He notes that ground stations are usually much better heard than the aircraft themselves, probably due to their higher power output. His current aerial consists of twenty metres of copper wire strung around the house and he is soon to invest in an indoor active aerial.

He also asks for more reviews of receivers. Steve, what we get to review in CB Action generally depends on what the manufacturers can give us to review. I'm still waiting for my Icom R9000!

On the 2nd of December Steve logged the following all, on 5643 kHz between 1030 and 1120 UTC:

NZ2 wkg Auckland on route to Los Angeles
QF44 wkg Auckland on route from Auckland-Sydney-Cairns
UA816 wkg Honolulu on route from Melbourne-Sydney-Los Angeles-Orlando
NZ5 wkg Honolulu on route from Los Angeles-Auckland-Melbourne
QF12 wkg Honolulu on route from Los Angeles-Sydney-Melbourne
QF11 wkg Honolulu on route from Melbourne-Sydney-Los Angeles
QF18 wkg Los Angeles-Honolulu-Nandi-Sydney

Steve has also asked for some company frequencies.

I've come across the following on Sydney's Shortwave Possums computer bulletin board (all frequencies in kHz):

7402, 9324	VH2MKB	Southern, NSW wide
7405, 10165	VH2NDU	Noels Transport, Hay
7405, 10165	VH2NEJ	Coolbaroo Transport, Jerilderie
7518	VH2NPX	Silver City Earthmovers, Broken Hill
7841, 9966	VH2LPM	Graeme Pedemont Removals, Dulwich Hill (Sydney)
9321	VH2KJW	Hayes Transport, Orange
9401	VH2KAG	Intergrain Produce Co., Moama
9966	VH2MWL	Herbig, Armatree
12067	VH2JQY	Westoil Petroleum Distributors, Orange

Help Anyone?

* **Gary from the Blue Mountains** west of Sydney has heard an unknown signal on 21460 USB at 0139 UTC on 17/11/92, causing interference to HCJB on 21455. The signal was a male Asian voice repeating several phrases, with pauses as though waiting for acknowledgment from another station. The signal was very strong, and Gary would like to know if anyone can help identify this one.

VOLMET Addresses

* **Aircraft seem to be** a popular topic this month, with Gary also supplying some addresses. The VOLMET services transmit on the air bands, with updated weather forecasts for various airports. Tokyo, Honolulu, Oakland, Hong Kong, Auckland and Anchorage all share the frequencies of 2863, 6679, 8828 and 13282 kHz.

The address for Tokyo VOLMET is NTIA, National Weather Service Centre, Japan Meteorological Agency, New Tokyo International Airport, Narita City, Chiba, Japan.

Sydney shares frequencies with Calcutta, Bangkok, Karachi, Singapore and Bombay, and can be heard on 2965, 6676 and 11387 kHz.

Sydney's address is Flight Service Centre, Building 237, PO Box 211, Mascot 2020.

More Loggings

* **Alan from South Australia** has added some more loggings for this issue's section, and asks for more info on aerials, frequencies, and radios.

Well Alan, the sort of radio and aerial you need for normal HF listening and the one you need for utility listening are one and the same. The only real difference is that you must have sideband capability for most utility stations. Otherwise the more sensitive and selective, the better.

Some of Alan's loggings are:

5100 School of the Air frequency with children discussing cricket scores (0205 UTC)
5950 Crayfishing trawlers needing good bait as losing catch due to soft bait (0300 UTC)
8086 VIS Sydney Radio talking to ship in Hawaiian Islands with doctor's instructions for a premature birth. Birth successful, and ship advised to head for nearest port (0850 UTC)
12300 NMN Virginia US Coast Guard with weather reports (1020 UTC)
13282 Honolulu Radio put on Hurricane Alert with estimated 240 knot winds, during the visit of Hurricane Iniki
13270 New York Radio with weather reports (2310 UTC)

That about wraps up this edition of HF Utilities.

I suspect DX has been a bit quiet due to the slightly reduced sunspot activity, though something must be around as I was getting some UHF skip on the scanner today.

There are still plenty of Utility stations around the world just waiting to be logged,
so keep those radios tuned in and remember to share your catches with everyone else via the pages of CB Action.
So until next month,
have fun and good DX.

UHF RIG REVIEW

COMMEX BUSHRANGER MKII

UHF Basics with Potential...

By Ken Reynolds
POWER BAND COMMUNICATIONS

Tried and proven over the last few years, this reliable, generic Taiwanese frame might have changed our history if the Kelly Gang had got their hands on a few. But that's another story.

If you think the BUSHRANGER MK-II looks a bit familiar, you are absolutely right. The basic chassis has appeared under various other names in the past few years, often with construction attributed to other manufacturers.

On this particular occasion this 'regulation' sized package is marketed under the true manufacturer's name of Commex Communications Corporation which is a division of the Ranger Electronic Communications Inc. based in Taiwan, the Republic of China (ROC).

Cosmetically the Bushranger MK-II looks more like the traditional 'old' CB rig rather than the usual styling we have come to expect from UHF CRS equipment. I suppose it's the analog style moving coil meter mounted smack in the centre of the control panel that causes one to draw the parallel with 27MHz transceivers. The meter indicates incoming signal strength and power output in the transmit mode and the signal strength meter specifically indicates the following:

S1 = 0.2 microvolts
S2 = 0.5 microvolts
S5 = 1.0 microvolts
S9 = 5.0 microvolts
S9+ = 50 microvolts

The 'S' meter function suffers from the usual scale compression associated with most UHF CB transceivers, however, between S9 and S9+ there is still perceptible meter movement right up to 50 microvolts where the circuit saturates, showing no further change for increased signal strength.

In the window directly to the right hand side is the bright red LED channel display - brighter than many but still no match for diffused daylight while to the right again are three single LEDs to indicate from the top, Transmit, Scan and Receive respectively.

The label 'SCAN' is somewhat deceptive since the scan function is more like a DUAL WATCH that flicks between the indicated dial channel and a user selectable preset priority channel which is programmed internally by the use of a series of binary weighted DIP switches. The scan function is accessed through the squelch control which has a built-in 'PULL' to scan switch. To the upper left hand side of the panel is a horizontal row of round press buttons labelled from left to right REPEAT, QUIET and CALL. REPEAT stands for repeater operation which most makers name DUPLEX or DU, or something of that nature.

OPTIONAL SELCALL

Repeater is the most accurate designation since duplex operation is more akin to using the telephone where both communicating parties have full interrupt facilities....which means that you can talk over the top of the other party. The 'quiet' and 'call' buttons relate to SELCALL operation which is an option in this radio.

Among the other standard controls of Channel Selector, Squelch and combination Volume and Off/On switch is

a 10 position rotary switch labelled SELCALL No(Number) enabling the operator to select one of 10 tones in the SELCALL code sequence thus calling up to 10 different individual stations. While this addition has obvious possibilities, I was disappointed to note the switch connections are not wired up (just a blank switch) so the owner would need to employ a technician to do the extra work.

To offset this minor drawback, the SELCALL board is a plug-in unit requiring little skill or time for fitting. A single printed sheet accompanying the radio lists the following optional features:

1) 12 position front panel selectable scan (the front panel wired to give front panel selection of 1 of 12 channels for memory scan)

and

2) The SELCALL board can be wired to give remote Page option, also Alarm Input and can give a switched ground Alarm Output.

Mechanically, the Bushranger is quite rugged using an all steel sub-frame and rigid steel case halves that, when screwed together, substantially reinforce the whole assembly.

The front panel is a plastic moulding vacuum plated with a bright 'chrome' lamination and matte blackened on the control face.

A thick, fibreglass, single sided, main printed circuit board is mounted rigidly to the sub frame also adding to the considerable mechanical strength of the rig.

The board is neatly arranged with 'pigtail' style componentry all seated securely and soldered in place with bright shiny assembly line soldering - just the way they should be.

As an alternative to printed wiring on the upper side of the circuit board, the Bushranger employs a network of tinned copper wire straps strategically connecting underside foils together - about 30 straps in all.

All wiring between the front panel and the main printed circuit board is through a series of multi-pin connectors enabling the fascia to be completely removed if desired.

Great service access if ever necessary.

The whole frame assembly uses plated 'spring' steel contact strips to maintain a 'cool' earthing perimeter around the case. The channel selector logic board, mounted directly behind the selector switch, uses double sided PCB and carries the miniature in-line switch assembly for programming the 'priority' scan channel.

As an aid to user programming of this function, the under side case half (the side with the loudspeaker) has a table of instruction securely attached to the inside surface.

This is a great idea because many operators soon lose the instruction manual and end up with no reference on how to 'do it yourself'.

BUILT IN 12/24V CONVERTER

An important feature electrically is the built-in 24 volt to 12 volt DC converter that makes this rig ideal for the 'Truckies' out there as in many cases it negates the purchase of voltage converter.....also saves your rig when the car electrical system 'takes five' and uses your CB as a fuse.

The rig has a receive sensitivity of 0.28 microvolts for 12 dB SINAD and the squelch threshold begins with 0.2 microvolts and ends at 0.8 microvolts in the 'tight' condition. Received audio sounds good. Unfortunately the Bushranger suffers from the 'old' out-of-band interference problem that plagues Melbourne suburbs and can make listening difficult in some areas.

Transmit frequency error was well within specifications with the output power reading just a shade over 5 watts on our HP meter.

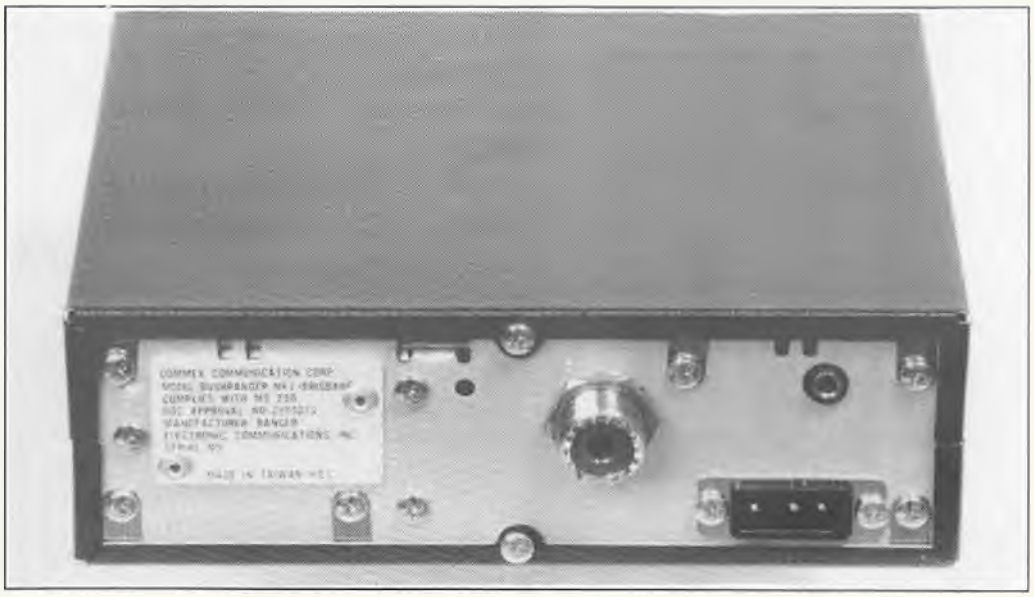
The standard 5 minute transmit test saw the RF power output fade by one watt to 4 watts while the frequency drifted about 200 Hertz from minus 150 Hz through zero to plus 50 Hz...and that's not at all bad.

SUMMARY

The Bushranger UHF CB transceiver is a damned good little rig offering 'ultra' strength combined with a good level of performance. I feel this rig is being a bit pretentious with all the SELCALL options offered when in fact it will never be a TX-4000, however, not everybody needs all the whistles and bells offered by GME along with the bigger price tag.

The Bushranger MK-II has its own target market level and it should appeal to many users.

Judging from the rig's performance under other names I have no reason to doubt the rig's reliability or mechanical integrity.



IN LIKE FLYNN

A few months back I was contacted by a scanning enthusiast with a story to tell. It was a story of just how foolish some people can be.

It was also his own story. Richard lives just north of Parramatta, the heart and hub of Sydney's greater west. As such, "Parra" - as any true westie calls her - is home to many emergency services and her airwaves fairly buzz with activity.

Over the years Richard found his way from 27 MHz to UHF CB to scanning. So far, so good - scanning is a fascinating hobby, as legitimate as any other aspect of radio.Richard's mistake, and the one he warns others to avoid, is that he wanted to get closer to the action. Some people call this `ambulance chasing'. In his days, Richard preferred to call it `going mobile', although some other like-minded enthusiasts went to the extreme of calling it `on patrol'. Richard now is quite frank, and thinks that `bloody stupid' is the best description to give his activities.

"I had a fairly average desk job," says Richard, who got into CB in the mid-80s and a few years later discovered scanning at a local radio store. "I lived about 10 minutes drive from work, and had one room of the flat set up as a radio shack.

"The scanner was a Realistic desktop model, and as soon as I turned it on I got hooked . . . there was just so much happening out there! The scanner didn't have a lot of memory channels and didn't cover 800 MHz, so a while later I decided to buy something with a little more, and went for a portable this time around".

It wasn't long before Richard became curious about what was really happening out there, behind the microphone.

"I've lived most of my life out here, so I know Parra like the back of my hand, and when VKG were calling local jobs on channel 24 I could almost see the places.

A lot of times the cars or vans would go right past my place, or I'd be walking down George Street, see an H-district car and hear the officer's voice and think `I heard you attending that domestic in such-and-such street the other night'.

Once I phoned in a complaint about a noisy party and a few minutes later heard my call going across VKG - it was a really strange buzz, like being on TV or something!". Richard got into the habit of carrying his portable with him whenever he went for a drive, "just to keep in touch - you get really annoyed when there's cars going by, sirens flashing and you don't know what it's about".

"Ambulance chasing, being "mobile" or whatever you call it - this activity ranks somewhere between stupid and dangerous. That's all there is to it. For a start, the police, ambos, firies and others are all professionals, out to do their job and keep you and me and our loved ones alive a little longer. They are trained at their job, and trained for the risks. The very last thing they need is for you or I to get in the way."

And so, late one evening on his way back home, Richard heard a call for cars to attend a brawl at a nearby hotel. "I was literally around the corner so I detoured and parked just down the road where I could see this crowd and this fight outside the pub. At the same time I could hear all the cars and caged trucks responding, and saw them pull up one by one, calling in, checking warrants and all that.

It was absolutely amazing, I felt like I was part of it".

This is where the story takes the wrong turn. Richard says that he then began to go out looking for `incidents'.

"If I was out late of a Friday night I'd take the longer way home, cruising through the main streets, up and down hoping to hear or see something and be right on the scene so I could watch it all first-hand. And if there was a serious domestic, an accident or a break-in or even a TRG siege, and it was close by, I'd drive on over and watch.

"I discovered a few other local guys with scanners did the same thing, although I lived and worked so close to it all that I was pretty much on top of it," says Richard. "I really got scared one evening when I heard what sounded like a surveillance job on one of the special ops channels. They were being cagey about locations but because I knew Parra I quickly sussed out where it was. I got real curious about how these things would be done, all the undercover cars and stuff, so grabbed the portable and went for a drive just to see. "It was a pretty long street, this one, and the first time around I couldn't notice too much different, and I was so stupid I went back for a second look.

Of course I was driving a little slower and looking around a bit, and before I know it I heard one of the cars call VKG for a rego check on my car - they said I was acting suspiciously, and when they got my name and address they then called for a warrant check.

I just kept driving and got right out of there, just before I heard them suggest that if I drove past a third time one of the local cars would have pulled me over and checked my bona fides.

"That got me thinking about it all . . . I mean, I could have screwed up the operation, which I read in the paper a few days later was a fairly large drug bust and part of a Sydney-wide operation.

Last month one of the other local `patrol' guys turned up at a fire with his scanner going full-bore, and got pulled aside by a Firie and asked who he was and what he was doing there!"

Now I'm normally a pretty light-hearted chap. When I write a column you've got lots of jokes, jibes and other funny stuff guaranteed. This time it's a very different story, and I make no apologies for it.

`Ambulance chasing', being `mobile" or

whatever you call it - this activity ranks somewhere between stupid and dangerous. That's all there is to it. For a start, the police, ambos, firies and others are all professionals, out to do their job and keep you and me and our loved ones alive a little longer.

They are trained at their job, and trained for the risks. The very last thing they need is for you or I to get in the way.

Okay, you want to think of yourself before anyone else? Then think of this . . . you hear a report of "shots fired" at some shopping centre just around the corner, so you charge down there to get a first-hand look at the action and find yourself across the road from or face-to-face with the gunman. Click. Bang.

You're dead. Goodbye scanning. Goodbye girlfriend and mates and whatever you used to live for.

All you get is a few seconds on the TV news as a body under a sheet of black plastic, a few paragraphs in the paper and the story of why you were there - how dumb you were to go running to your death. Think I'm being fatalistic? But plenty else could happen. "You could easily end up with a police record," warns CBA scanning expert Russell Bryant.

"Anybody who deliberately obstructs a police officer in the execution of their duty is liable to a charge of hindering police. By deliberate it means if it is a conscious act, it's deemed to be deliberate. "And at a rescue scene, a person who attends to watch someone being rescued could end up being rescued themselves. It's so easy to say 'I'll go and have a look' and suddenly find yourself in the middle something you can't get out of.

In this case an innocent by-stander becomes an innocent victim."So why do people do it? According to Russell, "human beings are basically voyeurs.

They like to know what's going on around them and they like to see the uglier side of life without being involved themselves. This way they can be part of it and yet forget about it, which they'd find hard to do if they were right there alongside the police or ambos".

So here's a word of advice, a word of warning, to scanner fans - keep your distance.

Read our articles, tune into those frequencies, but for your own sake, and that of the rest of the public, don't go madly running off to the scene. It's not exciting, it's just plain dumb.

Yaesu's FT-470 is one hot handheld...

TWO INTO ONE DOES GO!

If you're thinking about the new "novice limited" licence, you'll probably be interested in one of the rigs that you'll be able to use - report by David Flynn

The newly heralded "novice limited" amateur radio licence has attracted an enormous amount of attention in Australian hobby radio circles.

A quick straw poll taken from letters to CBA, comments heard on 27 MHz and UHF CB, and traffic on the computer bulletin board network's OzRadio forum, tips the new no-code ticket to be a winner, perhaps even more so than the original CB-inspired novice licence of the mid-70s.

But it's not just the "fast track" into ham radio which is exciting people - it's what that piece of paper gives you.

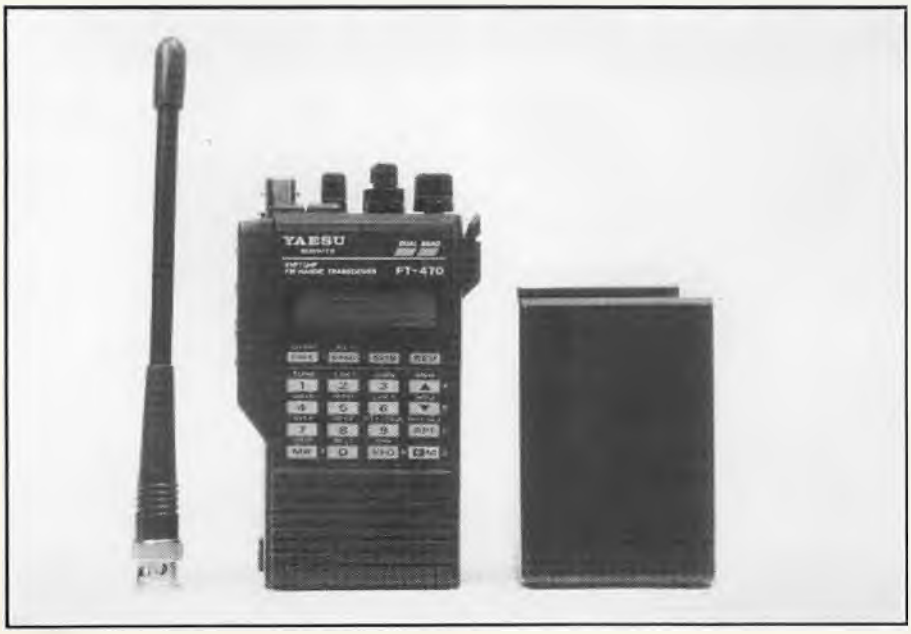
Having duly studied the arcane art of morse code, which to most people is a language as dead as Latin, novice ticket-holders until recently had to content themselves with slices of the HF bands. Two years ago they received the WIA and DoTaC's blessing to work on the popular 2 metre VHF band between 146-148 MHz.

Now, both they and their code-less cousins are about to extend their horizons to the 70cm UHF band at 420-450 MHz, with the lure of digital "packet radio" thrown into the bargain.

For many of our readers, the novice limited ticket is likely to be the stepping stone from CB to amateur radio.

And with the new bands comes new gear - great stuff which both in terms of features and performance would leave most CB sets eating dust.

So as if the Novice Limited alone isn't temptation enough, we're about to look at what might be considered a "typical" ham handheld - the FT-470, from Yaesu Musen, one of the "big three" in the ham world. You'll get to know the sort of features these rigs have, what they can do and how they help you find your way around radio bands many times larger than any CB allocation.



FT-470 is a great dual band handheld and has much to offer the new "novice limited" operator - and of course the "fullcall". Component on the right is the slide-on battery pack.

ONE RIG, TWO BANDS

When I call the FT-470 a "typical" rig, I mean just that. It is not "average" in the usual sense of that word - but since the introduction of dual-band rigs some years back - the combined VHF/UHF mobile and handheld has become a hot item.

Looking at the Yaesu show you why this is so. Here is a rig not significantly larger than the average UHF CB handheld or portable scanner - yet this single radio covers both the 144-148 MHz VHF and 420-450 MHz UHF ham segments.

That's two quite separate bands, totalling 34 MHz between them - larger than the entire HF spectrum - in one compact package.

Is it any wonder than sales of stand-alone 2m and 70cm rigs have dropped as these "duo-banders" or "twin-banders" grow smaller, stronger and more affordable with each year?

When it comes to local city-wide communications and a quite respectable, indeed extensive repeater network, 2m and 70cm are the best of both worlds. But it doesn't stop there.

First there were rigs which let you pack two bands into one black box.

Nice, indeed a revolution at the time.

In short time came the second generation of duo-banders, sets which could cross-band in duplex mode.

Translation - you could not only talk on VHF and listen on UHF, but you could do both at the same time - just like a telephone!

Next off the drawing board, and generally speaking where we are today, are rigs which add to this the facility to receive on both bands at the same time.

This is not some "dual-watch" trick of quickly switching one receiver across two frequencies.

It is, in effect, two separate receivers and each with their own speaker.

This is where the FT-470 sits - and it takes some getting used to - to hear idents and chat both on the local 2m and 70cm repeaters at the same time!

FEATURES PLUS!

Now we'll work our way through the offerings of the typical twin-bander, again as represented by the FT-470... and if this doesn't tempt you to bone up on Paul Butler's novice theory course in these pages, then you're a lost cause!

The sheer size of the VHF and UHF ham bands and the number of repeaters dotting the landscape creates a need for plenty of memory channels, so you can program your favorite chat channels and local repeaters for easy recall.

The FT-470 has a total of 42 memory spots divided equally among the two bands. 18 of each are for general use, another labelled "C" is earmarked for instant one-key access to a user-nominated call channel (which could just as easily be a simplex or duplex allocation), and a further two labelled "L" and "U" are used to store lower and upper frequency limits for a scanner-like "search" of any segment of the band.

Another feature familiar to most readers would be the FT-470's ability to scan the memory channels for activity, either in whole slabs or by locking out individual channels from the scan sequence, along with the ability to monitor a chosen "priority channel".

Each memory stores a complete profile of the programmed channel - not just the frequency but also repeater offset and tone options.

The use of two different repeater offsets on the 2m band - +600 kHz or -600 kHz, depending on which side of 147.000 MHz

you are - has always been a pain in the rear. And between the repeater input and output sections are slabs of simplex channels - thus, if you do any sort of hopping around the band you have no choice but to keep re-adjusting the offset from up to down to none at all, as the case may be. So Yaesu gave the FT-470 some in-built smarts in the form of an "automatic repeater shift" facility - the rig comes pre-programmed to honor the Australian bandplan, so all you need to is dial up the frequency and the radio does the rest. Clever!

Naturally, all the smarts in the world won't help you use a rig with a dead battery - and the best of us have sat there watching that tx light grow dim, listening to the audio level drop into a low "hsss" or just flicked the "on" switch and had absolutely nothing happen at all...

POWER SAVING CIRCUITRY

So the newest ham handhelds, the FT-470 included, now offer some form of power-saving circuitry. The simplest way of doing this is to shut down the rig, except for essential circuitry, for a while, and then briefly enable the receiver to check for any signal. It's an electronic form of hibernation, expect that here we are dealing in time periods measured in thousandths of a second - fast enough to be unnoticeable.

As a rule this sleep function can be set by the user to one of many options. In the case of the FT-470, the factory setting is to receive for 30 milliseconds and then sleep for 200 milliseconds - which reduces current consumption to around 10 percent of the norm.

Partnering this is an automatic power-off facility, which can shut down the radio if the keypad or PTT switch is not used for a selectable period of 10, 20 or 30 minutes.

For all this, much careful thought and design has gone into making rigs like the FT-470 easy to use.

Here you have memory channels, scanning, searching, power-management features, repeater offsets and straight-forward frequency selection all done with no more buttons than the average touch-dial telephone.

ANTENNAS, TOO...

I've said it before and will say it once more - a good whip antenna is the first and best accessory for any handheld. Try adding a 3 dB stick to your UHF CB handheld, or a frequency-specific whip to your scanner, and you'll be amazed at the difference.

Likewise, add-on whips will give your ham rig a real range-boost, so much so that you might be able to drop down to the lower power setting and conserve battery life even more. If you are successful with your novice limited ticket, your first purchase should be a duo-band handheld and your second a good dual-band whip.

That's not to slam those aerials issued as standard kit with the likes of the Yaesu FT-470.

It's simply that in my experience aerials are like the tyres on a car or the speakers of your stereo - expect in rare instances are they given anywhere near the same design and performance priority as the main hardware.

They are sufficient for the average user, but there are many of us who are willing to spend a little more and get a lot more in return.

(continued over page...)

Top control panel has good-sized knobs - not necessarily a feature of all handhelds.

TWO INTO ONE DOES GO!

(continued from previous page...)

Australian Yaesu agents Dick Smith Electronics, by dint of their having as a radio buyer an enthusiast the calibre of Chris Ayers rather than a suited Filofax-carrying Yuppie, have put proper effort into sourcing a range of add-on whips from the likes of Maldol and Diamond.

I fired the FT-470 into three specialised whips. Maldol's HS-702S is a 440mm-long flexi-whip which acts as a unity-gain quarter-wave on 2 metres and a 3.2 dB five-eighth wave on UHF, and was far and away my favorite, providing just enough edge to tackle those fringe repeaters to the north and south of my locale.

It's works damned well on the handheld scanner, too! Diamond have gone for raw gain with their RH-770 telescopic whip - from a compact 20cm it extends to nearly a metre, giving you a centre-loaded 3db half-wave at 144 MHz and some 5.5 dB on 430 MHz. If your domain tends more towards 2 metres then you might want to look at the Diamond RH-205.

This pocket-sized telescopic job works as a quarter-wave when compacted and a five-eighth wave extended, and you can always plug on the standard Yaesu whip when you want to do some local work on 70.

What it all comes down to is that there's some great gear out there - portables, mobiles, base stations - all waiting for you to get your ham ticket!

AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

DOTC ACKNOWLEDGE A PROBLEM

THE ISSUING OF A MEDIA STATEMENT RELATING DIRECTLY TO CB RADIO IS A VERY RARE OCCURRENCE.

Yet on December 1st. last such did happen.

It related to a problem to do with UHF CB and referred to an area, being some parts of rural New South Wales. It certainly provides evidence that the Department is aware that there is a Citizens Band Radio Service (CBRS).

Do they think, however, that there is only one problem, and that it only exists in some parts of rural New South Wales?

The following is the text of this somewhat exclusive Press Release.

ILLEGAL USE PUTS EMERGENCY CB RADIO UNDER THREAT

D53/92
1 December 1992

Citizen Band (CB) radio operators improperly using repeater channels are causing major headaches for authorised users in some parts of rural New South Wales.

"Worse still they could be putting people's lives in danger," a spokesperson for the Department of Transport and Communications said today.

Channels 5 and 35 are for emergency use only and unauthorised users could cause interference to emergency calls.

Rescue squads and bush fire-fighters use these channels in emergencies and rely heavily on them to get their messages through.

Serious interference also often occurs when operators use one side of a repeater channel (1-8 and 31-38).

"When a local UHF repeater input channel is used in single frequency mode, conversation will still be relayed to all users within the repeater's range, often up to 150 km or more," the spokesperson said.

"These single frequency users will not hear the repeater's output and could inadvertently speak over the top of someone else in an emergency.

"Loss of communications in a disaster could easily occur through improper use because local emergency services monitor and use these repeater channels."

"Loss of a single message in these circumstances could mean a tragedy which would otherwise have been avoided," the spokesperson said.

Information about use of VHF repeaters and the licensing of two-way radios is available from the District Radio Inspector's office, Department of Transport and Communications, Cnr. Bourke and Marius Streets, Tamworth, Ph: 067 66 7211.

Media contact: Graeme Barrow, Ph: 06 274 7856.

The text is informative and educational, and provides a direction for UHF repeater users, but would have had little impact on editors of major newspapers around Australia who would not have given much publicity to such a matter which is of importance to operators in the CBRS.

Was the highlight of the statement, the fact that some of the CBers in a particular area are having worse headaches than those elsewhere, or was it the fact that some lives are in danger?

Was the "Press Release" an effort to educate CBers through the media on this matter which was judged as important?

These are just two questions that may be posed in assessing the value of such a Media Statement.

Certainly, here in an area where the CB fraternity may be expected to browse a published statement, the release will have its purpose served, but probably nowhere else.

And at the same time, the CBer who has been seeking change or improvement on the "Band", may ask what is being done about all of the other problems on which complaints have been made over the years, and do these concerns need to emanate from a particular rural area to gain attention.

In the eyes of some, other than mention of this Media Statement here, it could be looked at as being a bit of a "fizzer".

It can be learnt that the Department knows that there is a problem whilst little evidence is shown of how the problem will be solved.

It could probably be said that a Media Statement indicating that some CB operators, following warnings, had been apprehended for some form of abuse of the emergency channel which put lives at risk, would have been more effective.

Maybe a mention of the large fines that may be imposed would have roduced a statement that would have attracted more attention in the bigger city publications serving the areas where most CBers can be found.

But of course, to do this, the villains have to be found, and the rate of apprehensions by the authorities to do with CB matters appears to be equal to their issuing of Media Statements on the same subject.

The reaction from most CBers to such Media Statements would be, "Don't tell us what we already know, tell us what is being done to relieve the problems".

The issuing of such Media Statements alone will not solve the "major headaches" of CBers unless a more positive approach can be seen to be made. The issuing of Media Statements will be greeted more warmly if they

announce what is being done about the many problems that exist, one of which they have now acknowledged despite them thinking that it only exists in one region of this large continent.

AMATEURS & CBERS UNITE

Amongst the groups affiliated with ACBRO and others around Australia, it is pleasing to see the amateur radio operators and CBers overcoming animosity that was evident in the early days of legalisation.

At that time it was through by the "Hams" that some of their band was being taken to provide for the citizens who naturally represented a majority of the community.

Now of course, with Amateur numbers falling and the catch-cry being, "use it or lose it", greater unity of the two groups is being viewed by all as progress.

After all, where will the next batch of Amateurs come from if not from the CB fraternity?

Some clubs which foster CBers have had mention in these pages previously, but one Amateur group in South Australia, the Barossa Amateur Radio Club Inc., appear to have gone one step further in uniting all radio users in at least a once a year union.

This is the Radio Field Day to be held at the Mt. Pleasant Showgrounds on Sunday 28 March in South Australia.

This is expected to be a bigger event than the well known Gosford Field Day in NSW and certainly more so than some of the similar events known to be held elsewhere around Australia.

This function carries the support of many very well known sponsors in the radio area, the major one of which is Dick Smith Electronics.

It has the support of over thirty organisations including, A.C.R.M., REACT, CFS, WICEN, SCOUT, St. John Ambulance Aust., to name just a few.

ACBRO will also be in attendance with its unique museum display of "Radio Relics".

ACBRO encourages all CBers, not only members, to attend this very interesting Radio Picnic Day and suggest that visitors from other states should make an effort to attend.

Even if you only win the prize in the Transformer Throwing contest, it will justify your effort.

ACBRO is keen to again see CBers outnumbering their counterparts in this fourth annual event.

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.

Alpha Whisky Alpha Radio Club	**P.O. Box 1457, Albany, WA 6330**
Albany Communications Group	**65 Hassell St. Elleker, WA 6330**
Radio City Australia	**26 Wootten St. Greenacres SA 5086**
Pioneer Radio Association (SA)	**P.O. Box 1017 Salisbury, SA 5108**
Plantaganet Rep't Institute of WA	**PMB 306, Cranbrook, WA 6321**
Burnie Citizens Radio Club	**P.O. Box 655, Burnie, TAS, 7320**
Transworld CB Radio Club	**90 Crozier Avenue, Daw Park SA 5041**
Canning River Radio Club	**53 Parkside Ave, Mt. Pleasant WA 6153**
Overland Radio Club	**P.O. Box 1010, Murray Bridge, SA 5235**
Eureka CB Radio Club	**P.O. Box 27, Reynella, SA 5161**
Hackman Radio Club	**P.O. Box 13, Hackham, SA 5163**
Eagle Radio Group	**P.O. Box 302, Morphett Vale SA 5162**
Rotten Radio Group Intnl	**P.O. Box 4, Dry Creek SA 5094**
Broken Hill UHF Repeater Club Inc.	**P.O. Box 1023, Broken Hill NSW 2880**
Riverland CB Club	**P.O. Box 742, Loxton, SA 5333**
Gippsland Repeater Assoc. Inc.	**P.O. Box 555, Maffra, VIC 3860**
Murray Bridge Agric & Hort Society	**P.O. Box 315, Murray Br., SA 5235**
Samba Club	**P.O. Box 16, Salisbury, SA 5108**
Tweed Radio DX Group Intnl	**P.O. Box 773, Murwillumbah, NSW 2484**
The Pathfinder Radio Soc. Club	**P.O. Box 24, Woodrigde, QLD. 4114**
Dirty Dozen Radio Group	**P.O. Box 380, Blair Athol, SA 5084**
Hotel Zulu Radio Group Inc.	**P.O. Box 66, Elizabeth, SA 5112**
White Fox Radio club	**P.O. Box 288, Salisbury, SA 5108**
Mega Mouth International	**P.O. Box 1534, Launceston, TAS 7250**
The Triple "R's" Group	**451 Regency Road, Sefton Park, SA 5083**
Tru Blue Radio Group	**P.O. Box 379, Blackwater, QLD. 4717**
Blue O Radio Group	**P.O. Box 53, Monaro Cresc, ACT 2603**
Sydney Radio Group	**P.O. Box 185, Gordon, NSW 2072**
UHF Assoc. of WA Inc.	**P.O. Box 1238 East Victoria Pk, WA 6101**
Ratbag CB Radio club	**P.O. Box 227, Welland, SA 5007**
Sun Centre CB Radio Club	**P.O. Box 912, Swan Hill, VIC 3585**
Pegasus CB Radio Club	**Cab 1 100 Jabez St. Broken Hill, NSW 2880**
South Australia Radio	**P.O. Box 162, Campbelltown, SA 5074**
Port Adelaide Radio Club	**P.O. Box 218, Alberton, SA 5014**
Cherokee Indian Aust. Group	**P.O. Box 1679, Mildura, VIC 3502**
Sth. West District CB Radio Club	**P.O. Box 620, Warrnambool, VIC 3280**
A.M.O.S. CB Radio Club Intnl	**P.O. Box 351, Broken Hill, NSW 2880**
Pioneer Radio Association Aust.	**P.O. Box 112, Bentley, WA 6102**
Naracoorte UHF Association	**P.O. Box 465, Naracoorte, SA 5271**
Gosford Citizens Radio Club	**P.O. Box 447, Gosford, NSW 2250**
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 32**

THERE IS ONE BEARCAT 70XLT SCANNER UP FOR GRABS - *AND IT COULD BE YOURS!*

Dick Smith Electronics has supplied this issue's Xword prize - a well worth winning Uniden 70XLT handheld scanner.

Reviewer Rob Williams reckons that it's a real "pocket rocket", ideal for both the newcomer to this interesting hobby and the old-hand with a drawer full of frequencies.

The Xword questions certainly are not all that difficult and the answers to most of the clues can be found somewhere in this issue.

There are, however, a few clues for which you will have to chase the answers elsewhere, but overall, it really is all pretty simple.

While there is only one first prize, we will also give six issue subscriptions to the next two correct entries opened after that of the winner.

We stress that all entries must be on the original page opposite and no photostat copies will be accepted.

All entries must be received at the address on the coupon opposite no later than 22 March and the winner will be the first correct entry opened.

The winner can look forward to a whole new world of radio communications - go for it - and best of luck.

SOLUTION TO XWORD #5 - JAN/FEB

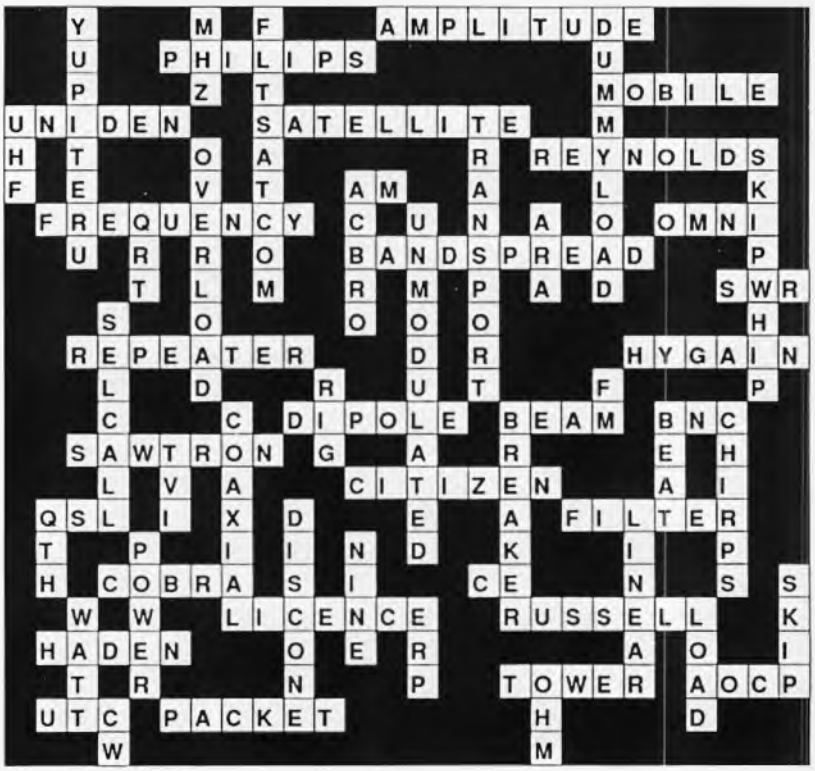
WERE YOU A WINNER?

As always there was a large number of entrants for our Jan/Feb issue Xword, unfortunately however, there could be only one winner for this competition and the lucky person was;

Mr H. Connolly
Hazelbrook, NSW 2779

Congratulations Mr Connolly, your GME-Electrophone TX-850 will be delivered to your door within the next few days.

We're sure you'll get a lot of enjoyment from it.



WIN A BEARCAT 70XLT SCANNER

COURTESY OF DICK SMITH ELECTRONICS

CLUES ACROSS

4. What's the name of the person who reviewed the "Australian Radio Frequency Handbook" (4,7)?
8. In his column, Jack Haden warns to "be cautious with (what country?)".
9. A well known association of CBers (init).
10. Radio Inspectors are sometimes called this (3,7).
13. The UF-2020 UHF rig is sold by Dick Smith Electronics - what's the brand name of the rig?
15. In like (who?).
17. What oranisation supplied the DX Propagation chart on page 63 (abbrv.)
18. A derogatory term applied to an operator who talks a lot but doesn't listen - mouth but no ears.
21. Two into (what?) does go!
22. What's the suffix of Paul Butler's amateur callsign?
24. A Commex UHF model.
27. The (first name?) Corporation made the old Bearcat 20/20 scanner.
30. What's the prefix to GME-Electrophone's 4000 series?
32. Who start here on page 9?
36. The name of the Melbourne based radio-oriented BBS?
37. Selective calling.
38. The two essential components in a tuned circuit are a capacitor and an (what?).
39. If your antenna was pointing 180 degrees to a shortpath heading you would be working a (what?) heading.
40. In his article in this issue, Paul Butler discusses "the variable (word?) oscillator".
41. The Q-code that means a "signal is fading".
42. A West Australian 1/31 UHF repeater is located here.

CLUES DOWN

1. Dick Smith Electronics are a major outlet for this brand of CB rig - both HF and UHF.
2. The name of a well known frequency register.
3. When listening to a scanner, you could be said to be (word?) the channels.
5. Name one of the two components discussed by Paul Butler is this issue.
6. The computer virus which strikes on 6 March?
7. Ken Reynolds talks about "a large (what?) noise" in his questions and answers article.
11. Name the editor of this magazine (3,4).
12. Name the company which manufactures the SC Base Scanner antenna (6,3).
14. Who, in this issue, warns that "You could easily end up with a police record" (7,6).
16. A postcard from (where?).
19. Name the person referred to in the article "In Like Flynn".
20. An amateur transceiver which covers both the 2m and 70cm is generally known as a (what?).
23. The suffix of Chris Edmondson's VK3 callsign?
25. Richard Jary writes the "(what?) Utilities" column.
26. The (name?) 70XLT scanner is reviewed in this issue.
28. A Tasmanian 2/32 UHF repeater is located here - also the name of an insect.
29. A type of cable terminator plug - like a PL259 or BNC.
30. Greg (who?) writes the "Bandspread" column.
31. Positive (what?) from output to input is essential for normal operation in an oscillator stage.
33. Rod (who?) is back in this issue.
34. In Russell Bryant's column there is a sub-head which reads "(what?) are made not born".
35. Which company donated the scanner for this issue's crossword prize (init).

The solution to this crossword will be published in the next issue.

ADDRESS YOUR ENTRY TO:
CB XWORD, P.O. Box 628E, GPO, Melbourne 3001

NAME**.....**

ADDRESS**.....**

.....'PHONE ( ).....

ENTRIES MUST BE ON THIS PAGE - NO PHOTOSTATS!

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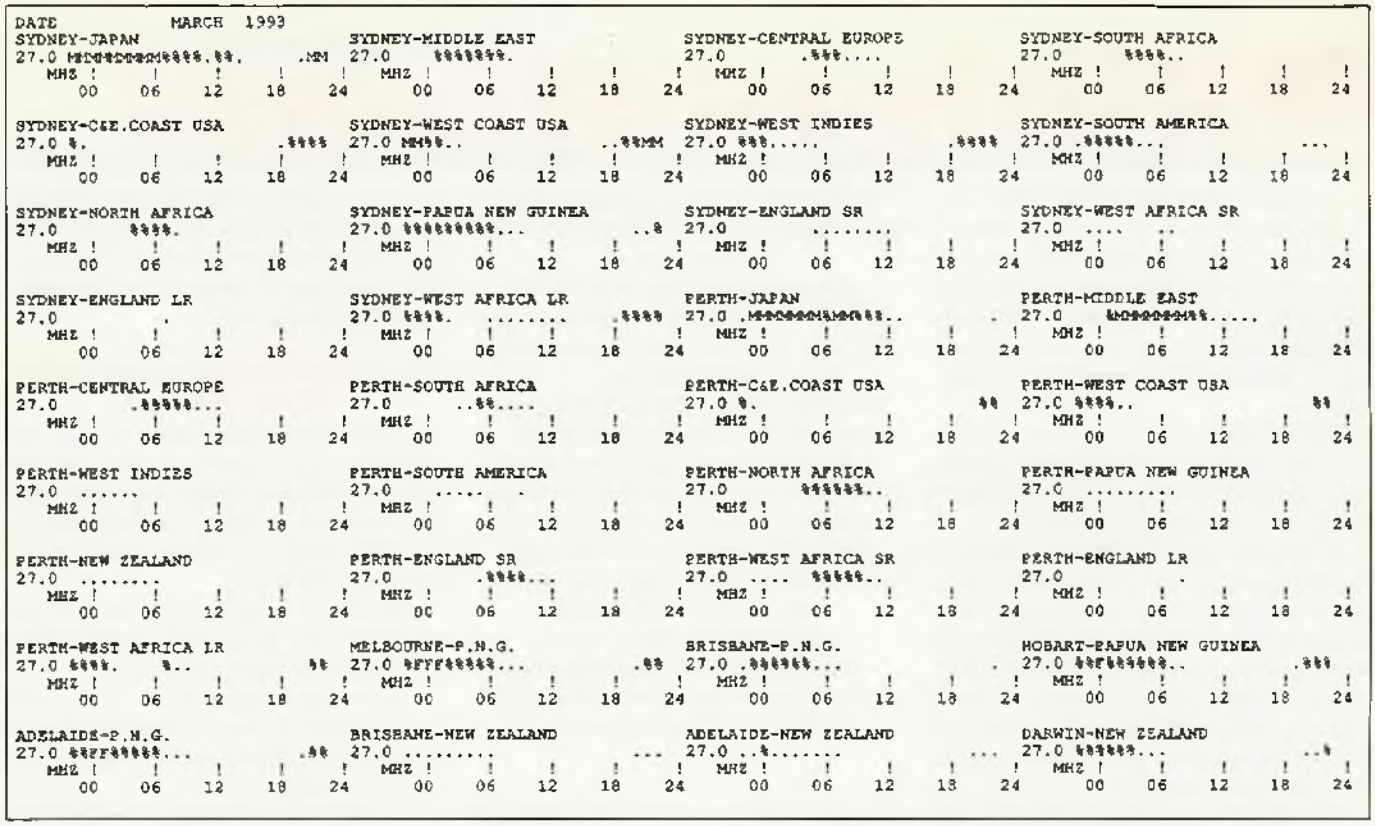


These GRAFEX style predictions present in pictorial form the expected HF propagation conditions between Australia and a number of DX areas. For each circuit, the "East" terminal refers to the eastern half of Australia. The horizontal axis of each graph represents the hours of the day in Greenwich Mean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

GRAFEX Prediction Charts are supplied courtesy of the Ionospheric Prediction Service, 162-166 Goulburn Street, Darlinghurst, NSW.

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

LEGEND TO GRAFEX SYMBOLS

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

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

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

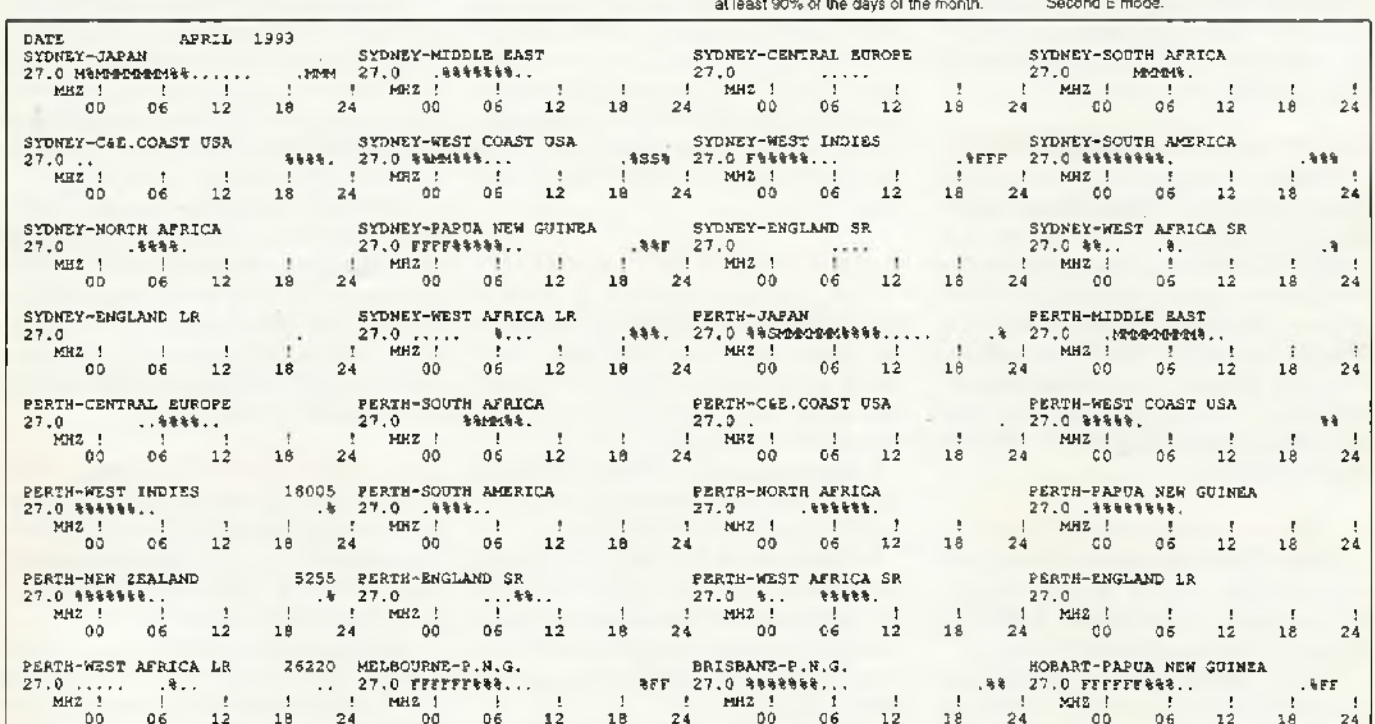
E Propagation is possible by the E modes on at least 90% of the days of the month.

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

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

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

X Complex mixture of modes including the Second E mode.



DXinternational

By Jack Haden

AFRICA AND MIDDLE EAST

African DX has been rather poor, although I have received news that the odd contact has been made into this region by stations located in Western Australia but with only fair to reasonable signal reports being exchanged both ways.

The gang in the west have also snagged the odd good opening to Africa and the Middle East thus keeping people on the alert for a possible opening.

As I have stressed before, those with a decent beam or quad array will be in a better position to drag out the weak signals of choice DX that is missed by those running simple verticals and dipoles. Just by being there at the right time is another key in working some of the rare ones, as the old saying goes 'If you cannot hear it, then you cannot work it'.

Inter-Pacific and Asian DX as usual keeps most of us on the alert for the odd new oneand this path seems to be at its best in the daylight hours although it can quite often extend into the early evening.

Signals from the islands in the Northern & Central Pacific region have been quite good with some going well over nine on the meter and holding for hours on end with slight fade from time to time.

PACIFIC STATIONS BEING HEARD

Notable island countries heard in recent weeks on 11 meters were: Guam, Hawaii, Okinawa, Ogasawara (in Japanese language), Federated States of Micronesia, Eastern Kiribati (Christmas Island), Western Kiribati (Tarawa & Abemama Atolls), Marshall Islands (Ebeye & Majuro), Papua New Guinea, Kingdom of Tonga, plus the usual regulars from New Caledonia, French Polynesia etc.

GOOD SIGNALS FROM ASIA

Some excellent signals have been coming from South Korea, Japan, Philippines, Indonesia, Thailand, Singapore, Taiwan, and Hong Kong.

There have also been some reports of a station coming on air from Cambodia and this is quite possible as there are quite a large number (approx 20,000 which includes the Military presence from abroad) of foreigners now in Cambodia and quite a few have already appeared on the amateur radio bands so the possibility of 11 meter band activity is quite good.

Sporadic openings to Europe have appeared in recent weeks and signals have been fair to reasonable. DX wise, it's better than nothing and as usual the 'Big Gun' stations from Europe have been there to entertain us and dominate the more popular DX portions of the band. Interestingly enough, some of the semi-rare DX countries within Europe have also been about from time to time with Andora, Luxembourg, Leichenstein, Monaco and San Marino being noted on the band amongst the other rabble. However, I think most seasoned DXers should have most of these, if not all, in the bag by now.

Work now and worry later is the only viable option.

A similar situation is starting to exist with regard to Vietnam, so don't be surprised if the odd signal from this country pops up on 11 meters as again, there is quite a sizable number of Australia expatriates in Vietnam so again be on the alert...both for slims (pirates) and the real thing!

BE CAUTIOUS WITH BURMA

T his country is reported as active in recent weeks, although detail concerning the station concerned is unclear. I have heard a couple of Queensland DXers saying they have just worked it so maybe the rumors are correct.

A word of caution when QSLing to Burma, Thailand, Cambodia, Vietnam, South Korea and the Philippines.

It is well known that mail pilfering goes on in these countries. Either the letters are tampered with in search of foreign postage stamps or the "greenstamp" (US $) which is enclosed with the card for return postage.

The end result is, of course, that the card fails to reach the operator concerned. The best method to avoid this problem is to mark the outside of the envelope "Postage Paid" in lieu of placing stamps, and to put an IRC with your SAE instead of the "greenstamp", then your card may have a better chance of reaching its destination intact.

STILL REASONABLE VALUE FROM NORTH AMERICA

Signals have been down to the east coast of North America and to certain extent Caribbean signals have been poor also, however, as usual, the west coast of the USA still presents reasonable value for money DX wise.

Actually some American stations have been causing quite a few problems on the 26MHz sideband call frequency.

Apparently some of these "lids" have been holding their chit chat sessions on the call frequency instead of moving off to a clear channel.

Recently I heard a New Zealand station politely ask a group of Americans to clear the call frequency only to be told where to go by the American stations concerned with a quite liberal sprinkling of four letter words.

This is one major reason why I will not publish the DX frequencies on 11 meters.

We have enough dregs and other associated riff raff on the band causing trouble on prime DX channels and call frequencies without publicising them simply to attract the noddies of the world.

Within reference to the above, it is not surprising that an increasing number of rare DX country operators avoid the international call frequencies in favor of finding their own clear frequency where they often chat in total peace while the even more cunning ones do not announce their country prefix or their location.

THE EVEN CHANGING DXCC LIST

The DXCC countries list is forever changing as also is the criteria involved. The latest addition to the listings has been the long awaited acceptance of North Korea into the fold.

Amateur radio activity has in fact already commenced from North Korea with the December 1992 appearance of P5RS7 on the major HF amateur bands.

The pile ups were of course horrendous as were the manners of a lot of the callers.

So, it is only a matter of time before a station appears on the 11 meter band in due course.

AT headquarters have yet to assign North Korea with an international number prefix.

MORE DXCC MATTERS

Whilst on the subject of DXCC matters, the break up of the old Yugoslavia has already resulted in three new acceptances into the DXCC criteria with Croatia, Slovenia and Bosnia-Herzegovina already being accepted at DXAC in the latter months of 1992.

A fourth possibility is Macedonia, but due to problems deciding on a suitable name for the new Republic, things have been placed more or less on hold for the time being.

At present Alfa Tango has yet to issue these three new ones with a number prefix.

AND ANOTHER NEW ONE

Another new DXCC country will emerge in the early months of 1993 with the break up of Czechoslovakia into the two separate countries of Czechos and Slovakia.

No doubt one of these countries will retain the 179-AT prefix and my hunch will be that Czechos will retain the 179 prefix with Slovakia being issued a new number prefix from AT headquarters.

At least one good thing is that this will be a peaceful separation, unlike that of Yugoslavia which is still embroiled in war.

CEUTA AND MELLILA

Despite some rumors going around concerning Ceuta & Mellila regarding the DXCC status, I can tell you they still count as one country only and were not separated despite statements to the contrary. Also, DXAC voted against the deletion of the Spratley Islands from the DXCC list and the same decision was also reached within regard to Southern Sudan.

So in reality there has been no change to the DXCC status of those three countries, it's business as normal so to speak.

MALICIOUS INTERFERENCE

Browsing through a few old copies of "QST Amateur Radio" I came across the following from the March 1980 edition.

"Now, in the 1980's amateur radio faces another crisis, and it's one brought upon us by ourselves.

As the guy in the comics said, "We have met the enemy, and he is us".

Malicious interference to amateurs by amateurs is causing increasing consternation.

Repeaters are being disrupted. Nets handling emergency traffic are being harassed.

The appearance of a rare DX station triggers off a veritable barrage of deliberate interference.

What kind of sick people are loose in our midst? Must we suffer these indignities? What can we do?"

Well, that was back in 1980 and things haven't changed a great deal 13 years down the track, in fact, in my opinion, things have become worse in a lot of cases.

IS IT ALL GETTING TOO EASY?

Some of course blame the dropping of morse code from some of the license requirements, while others are quick to blame the gradual deregulation of the amateur service as a whole.

Voluntary license exams conducted by radio amateurs have been in force in America for some time now and from time to time some volunteer examiners have been caught out accepting bribes from potential amateur license candidates in return for a license test pass - sometimes without even sitting it in the first place.

CHEATING - MAYBE OR MAYBE NOT

Similar suggestions have been made about the development of the amateur service license examining system here in Australia and I dare say that "where there is a will there is a way".

Already there have been some rumblings on the amateur bands by resident "Old Timers" saying that the standard of new amateurs to the hobby often leaves a lot to be desired.

Maybe things are becoming a little too easy with regard to obtaining the amateur ticket, but then again, we in Australia, like the rest of the world, must keep abreast of changes if we are not to be left behind.

Then again, problems with new operators into the amateur service has been a problem from time to time since the beginning of the hobby.

Some can be attributed to the lack of suitable pre-on air training, but we all, including the "Old Timers", must keep in mind that we all had to learn sometime, and that is what a hobby is all about, learning by your own mistakes.

AUSTRALIAN UHF REPEATER LIST

NOTE: Corrections and updates may be sent to:
CBA Repeater Listing, P.O. Box E160, St James, NSW 2000.

ACT

Canberra	2/32
Canberra	8/38

NEW SOUTH WALES

Albury	6/36
Armidale	4/34
Barraba	6/36
Bathurst	8/38
Bega	6/36
Bellbora	1/31
Binya	3/33
Blue Mountains	2/32
Bombala	8/38
Booral	7/37
Bowral	6/36
Braidwood	3/33
Brewarrina	1/31
Brindabella Ranges	7/37
Broken Hill	4/34
Broken Hill	7/37
Buladelah	7/37
Casino	6/36
Cobar	8/38
Coffs Harbour	6/36
Coolah	6/36
Cooma	4/34
Coonabarabran	4/34
Corowa	2/32
Corowa	5/35
Corwa	7/37
Deepwater	5/35
Denliquin	1/31
Dungog	3/33
Eden	2/32
Glen Innes	7/37
Grafton	8/38
Grenfell	1/31
Gundagai	7/37
Gunnedah	2/32
Guyra	1/31
Warden	1/31
Hampton	1/31
Hay	4/34
Inverell	2/32
Jindabyne	1/31
Junee	5/35
Kariong	8/38
Lismore	2/32
Manilla	3/33
Monkey Hill	6/36
Mt Lambie	2/32
Murrumundi	3/33
Muswellbrook	4/34
Narrabri	2/32
Narranderra	8/38
Narromine	5/35
Narromine	6/36
Newcastle	1/31
Newcastle	2/32
Newcastle	5/35
Newcastle	6/36
Nundle	7/37
Orange	3/33
Port Macquarie	2/32
Sydney	5/35
Sydney (south)	1/31
Sydney (west)	3/33
Sydney (outer-west)	4/34
Sydney (north)	7/37
Tamworth	4/34
Tenterfield	3/33
Tumbarumba	3/33
Tumut	6/36
Tweeds Heads	4/34
Wagga Wagga	1/31
Wagga Wagga	5/35
Walbundrie	2/32
Walcha	2/32
Walcha	6/36
Walcha	8/38
Warrumbungles	1/31
Wingham	1/31
Wilcannia	1/31
Wollongong	8/38

NORTHERN76 TERRITORY

Bushy Park	1/31
Darwin	1/31
Erldunda Station	3/33
Katherine	2/32
Maryvale Station	4/34
Mt Swan	2/32

Queensland

Alpha	2/32
Atherton	8/38
Arriens	8/38
Ayr	3/33
Barcaldine Downs	1/31
Bathurst Heads	1/31
Bauhina Downs	4/34
Biloela	7/37
Blackall	8/38
Blackwater	6/36
Brisbane	1/31
Brisbane	5/35
Brisbane	7/37
Bundaberg	4/34
Bundaberg	7/37
Cairns	3/33
Chinchilla	8/38
Clermont	6/36
Clermont	7/37
Crows Nest	6/36
Dimbulah	6/36
Dirranbandi	8/38
Double Island Point	3/33
Edward River	3/33
Emerald	8/38
Gladstone	6/36
Gold Coast	3/33
Goondiwindi	4/34
Gympie	2/32
Gympie	5/35
Gympie	7/37
Hervey Bay	8/38
Hughenden	1/31
Ingham	2/32
Inglewood	1/31
Innisfail	1/31
Ipswich	4/34
Jericho	4/34
Kilcoy	3/33
Lakeland Downs	2/32
Longreach	3/33
Mackay	3/33
Mackay	6/36
Marlborough	2/32
Maryborough	6/36
Maxwelton	2/32
Miles	6/36
Monto	3/33
Morarbah	4/34
Moura	1/31
Mt Isa	1/31
Mundubbera	6/36
Murgon	7/37
Quilpie	2/32
Rockhampton	1/31
Rockhampton	4/34
Roma	1/31
Springsure	3/33
Sunshine Coast	6/36
Sunshine Coast	8/38
Tambo	6/36
Taroom	2/32
Thargomindah	6/36
Toowoomba	2/32
Toowoomba	4/34
Townsville	1/31
Townsville	4/34
Wavell Heights	2/32
Warwick	1/31
Wide Bay	1/31
Yaraka	7/37

SOUTH AUSTRALIA

Adelaide	5/35
Angaston	4/34
Binman	3/33
Carrietown	1/31
Ceduna	1/31
Clare	7/37
Cleve	2/32
Coonalpyn	6/36
Coppuduba Hill	1/31
Crystal Brook	1/33
Hawker	7/37
Kangaroo Island	4/34
Manum	8/38
Mt Bryan	8/38
Mt Gambier	5/35
Mt Gambier	7/37
Myponga	2/32
Naracoorte	4/34
Orroroo	2/32
Port Lincoln	8/38
Port Pirie	4/34
Renmark	6/36
Snowtown	6/36
Tarcoola	6/36
Wilkatana	8/38
Yorketown	7/37

TASMANIA

Burnie	8/38
Central Highlands	7/37
Devonport	1/31
East Coast	6/36
Flinders Island	1/31
Hobart	1/31
Hobart	5/35
Launceston	2/32
Launceston	6/36
Midlands	4/34
North East Coast	3/33
North West Coast	4/34
North West Coast	6/36
Sandfly	2/32
West Coast	2/32

VICTORIA

Alexandra	1/31
Ballarat	2/32
Ballarat	5/35
Bairnsdale	7/37
Beech Forest	3/33
Bendigo	4/34
Cavendish	8/33
Currajung	4/34
Echuca	6/36
Euroa	3/33
Falls Creek	3/33
Foster	6/36
Geelong	4/34
Halls Gap	6/36
Hamilton	5/35
Harcourt	8/38
Hawkesdale	4/34
Horsham	3/33
Kerang	2/32
Lavington	4/34
Mansfield	2/32
Melbourne (north)	1/31
Melbourne (metro)	3/33
Melbourne (metro)	5/35
Melbourne (south)	7/37
Mildura	3/33
Moe	2/32
Mornington Pen.	8/38
Mortlake	7/37
Mt Cann	8/38
Mt Concord	6/36
Mt Delegate	3/33
Mt Terrible	8/38
Myrtleford	8/38
Pershurst	1/31
Shepparton	7/37
St Arnaud	1/31
Swifts Creek	1/31
Talangatta	7/37
Wangarrata	6/36
Waubra	7/37

WEST AUSTRALIA

Albany	3/33
Augusta	7/37
Bencubin	2/32
Boyup Brook	4/34
Bunbury	2/32
Carnamah	2/32
Carnarvon	2/32
Coolgardie	7/37
Darkin	6/36
Denmark	1/31
Esperance	4/34
Kalgoorlie	2/32
Kambalda	1/31
Katanning	1/31
Kellerberrin	1/31
Kulin	4/34
Lancelin	4/34
Mandurah	7/37
Manjimup	6/36
Margaret River	6/36
Meekatharra	1/31
Merredin	2/32
Mia Mia	1/31
Mt Manypeaks	6/36
Mt Barker	5/35
Mt Barrow	7/37
Mt Saddleback	1/31
Mt Scius	4/34
Nannup	2/32
Perth	1/31
Perth	3/33
Perth	5/35
Perth	8/38
Ravensthorpe	8/38
Stirling Ranges	7/37
Wickham	1/31
Wongan Hills	8/38
Wyalkatchem	6/36
York	7/37

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