

IMPROVING YOUR CB RADIO EXPERIENCE

The behaviour of the 'Ultra High Frequency' radio waves used in the 'Citizen's Band Radio Service' is described very well at https://en.wikipedia.org/wiki/Ultra_high_frequency

'Radio waves in the UHF band travel almost entirely by line-of-sight propagation (LOS) and ground reflection; unlike in the HF band there is little to no reflection from the ionosphere (skywave propagation), or ground wave. [2] UHF radio waves are blocked by hills and cannot travel beyond the horizon, but can penetrate foliage and buildings for indoor reception. Since the wavelengths of UHF waves are comparable to the size of buildings, trees, vehicles and other common objects, reflection and diffraction from these objects can cause fading due to multipath propagation, especially in built-up urban areas. Atmospheric moisture reduces, or attenuates, the strength of UHF signals over long distances, and the attenuation increases with frequency. UHF TV signals are generally more degraded by moisture than lower bands, such as VHF TV signals.'

Since UHF transmission is limited by the visual horizon to 30–40 miles (48–64 km) and usually to shorter distances by local terrain, it allows the same frequency channels to be reused by other users in neighboring geographic areas (frequency reuse). Radio repeaters are used to retransmit UHF signals when a distance greater than the line of sight is required.

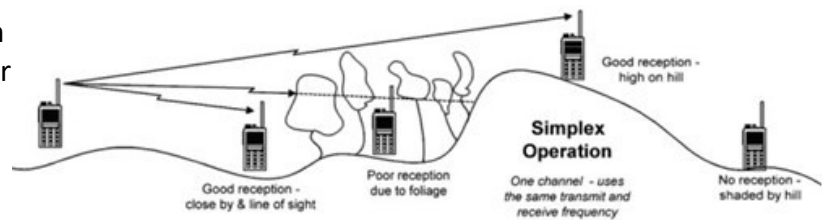
Occasionally when conditions are right, UHF radio waves can travel long distances by tropospheric ducting as the atmosphere warms and cools throughout the day.'

The messages from this are: CB is almost Line-of-Sight, and is blocked by hills, but not (so much by) buildings or vegetation, reflections can cause (very) local fading, moisture reduces range.

So what can we do to optimise our range and the quality of our reception/transmission?

- Hold the radio steady at head-height. Speak across the front of it, rather than directly into the microphone - this reduces 'popping' and makes for more intelligible signals.
- Be aware of the environment around you from a 'radio perspective'. Moving up a slope, your radio may get a better 'view' of those with whom you would communicate.
- While listening to another, move around a little to find a 'sweet spot' where the reception is clearer. Once found, stay there, try not to walk around while on the radio, unless you must.

External antenna - mounted higher than you can comfortably (or safely) hold your radio, will greatly improve communications. Handheld radios typically have a short rubber-covered antenna. Most of these unscrew and can be replaced with a longer one, or a cable to an externally mounted antenna. The external antenna can be an inexpensive portable one that fits in a back-pack and hangs from a cord, or one intended for vehicle mounting, on the rain gutter, chimney or pole. Simple antennas like these will typically double your reception and signal strength. They cost ~\$50.



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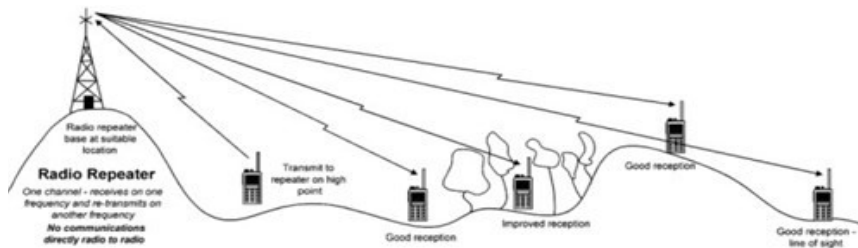
The 'white stick' antenna often seen on tall masts at base stations will at least double that performance again, and cost ~\$200. Any work on roofs or other high locations must be carried out with due regard to safety. Be especially aware of overhead power lines and avoid them.

- 🕒 Flexible 330mm Antenna <https://www.auscb.net/apps/webstore/products/show/5626448>
- 🕒 Compact Portable 370mm Antenna <https://www.auscb.net/apps/webstore/products/show/5900749>
- 🕒 MobileOne – A wide range of quality, locally-made antennas http://www.mobileone.com.au/2g_477mhzbase.html
- 🕒 Probably the best-priced full power, approved 5W UHF Handheld CB on the market

<https://www.auscb.net/apps/webstore/products/show/5626389>

These are all 'Omnidirectional' antennas. They transmit and receive equally well to all points of the compass (although not vertically). For special purposes, directional antennas can be installed. Making up the 'coaxial cable' that connects the antenna to the radio is a specialist job. Measure what you need and order it from the antenna supplier unless you are familiar with these cables and connectors.

Is there a repeater in the area that you can use? *Repeaters extend the range of transmission by receiving and automatically rebroadcasting a transmission using an antenna located in a high location, normally the top of a mountain, tall building or radio tower. Sometimes a transmission range of over 100 kilometres (60 miles) can be achieved through the use of a repeater. Repeaters are on channels 1–8 and 41–48 and the duplex button should be pressed to access the repeater. These radio systems receive on one channel, and simultaneously re-transmit on another.*



In the Northern Rivers, there are several CBRS repeaters. BAL07 at Tregeagle, near Goonellabah, CAS03 at Casino and KGL01 at Fairymount, near Kyogle. Set your radio to 'Duplex' or an 'R'-labelled channel.

This causes it to 'listen' on the displayed channel number (1 to 8), and transmit on the corresponding 'repeater input' channel (31 to 38). Listen for a while, you may hear the 'beacon', a voice announcement or series of Morse Code beeps repeated every 10 minutes or so. You might also hear others using the repeater. If so, call and ask for a signal report. Most users are cooperative and keen to help.

These repeaters are established and maintained by community groups and interested individuals at their own (considerable) expense. The Smith (Kyogle Bus Co) family operates KGL01, Scott Baker of Northern Communications operates BAL07 and the Casino VRA operates CAS03 and also a special-purpose repeater GIB05 at Naughtons Gap, reserved for emergency use only. You may use this in times of dire need, but it is not to be used for ordinary, casual communications. Of course, you must defer to the VRA and other emergency service groups when they are using it.

Discover the repeaters in your area by searching

https://web.acma.gov.au/rrl/register_search.search_dispatcher 'Any Detail', 'Matches', 'CBRS'. This will show the ~1,000 repeaters in Australia. Refine the search by adding '+', 'NSW' for example. The map at https://web.acma.gov.au/rrl/site_proximity.main_page is also very helpful but shows many other service. Filter for 'CBRS' to refine.

https://en.wikipedia.org/wiki/UHF_CB

<https://www.walkie-talkie-hire.co.uk/info/what-is-a-repeater>

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