Outback Communications

It's much more relaxing Outback when you know that reliable contact with the outside world is only a button-push away.

We know that 27MHz CB radio contact can be achieved across hundreds of kilometres, using the ionospheric 'skip' effect that bounces these frequency waves from the upper atmosphere back to the earth, and we've heard of freak conditions that allow a cell phone to work outside the cell network, but you cannot expect a mobile phone or any CB radio to provide reliable, long-distance communication in remote areas.

Mobile 'cell' phones are designed to work only when inside the range provided by a transmission tower. For GSM phones using a rooftop aerial that is a maximum of around 30 kilometres and Telstra's Next G units may double that. Some parts of Australia aren't covered by GSM networks at all, so a Next G phone is better.
However, the only reliable, long-distance communications choices for remote area use today are HF (high frequency) radio and satellite phone.

Vehicle to Vehicle Chat

The best use for CB radios is for line of sight communications between vehicles. The height of the aerial, the type of terrain and the transmitting power of the radio dictate how far your signal will reach, but 15km is the practical limit in typical Australian conditions. Handheld radios reach less distance: about eight kilometres for a two-watt unit and around four kilometres for a cheap unit.
A CB is a means of keeping in touch with your convoy mates, or swapping track information with passing vehicles.
In some areas – notably the popular Simpson Desert - the CB is an essential safety tool, to check on the whereabouts of oncoming or overtaking vehicles. The high dunes in this Desert often make relying on visual contact a risky business.
You can broadcast your GPS position regularly and scan the channels for other transmissions, to make it less likely you'll have any dune-top surprises.

HF Radio

The traditional means of Outback telecommunication is HF radio, commonly known as 'Flying Doctor' radio. Before the advent of satellite telephones HF radio was the only means of mobile communication that 4x4 owners could rely on.
High frequency radio transmissions are in the 2-25MHz (megahertz) waveband, just below the 27MHz AM CB band, and HF transmissions exploit the 'reflect and bounce' factor that can sometimes work for 27MHz radios, but with much more power and with tuneable aerials.
Operating an HF radio isn't as easy as simply picking up a mobile phone or a CB radio. There's the additional complication of signals travelling great distances and potentially causing interference, so a licence is necessary to ensure that HF radio operators are aware of correct usage.
It takes a little practice to get used to radio protocol, but once you're in the swing of it the HF world is great fun.

Most 4x4 HF radio users join an organisation that has access to frequency channels, including Royal Flying Doctor Service channels, and a licence to use those frequencies is part of the membership procedure. The most popular 4x4 organisation is the VKS-737 Radio Network, which has base stations in Adelaide, Alice Springs, Cairns, Charters Towers, Darwin, Derby, Newcastle, Perth, Sydney and Swan Hill.

Basic HF radios allow free of charge communication between vehicles and between vehicles and network bases. VKS-737 HF radio bases can provide information on weather conditions and road closures, as well as providing a message service. HF broadcasts include Radio Australia, the BBC World Service and the Voice of America.
The VKS-737 Radio Network has engaged Radtel to perform its radio telephone connections.
We've used HF radios on land and sea for many years and find it reassuring to have the radio crackling from time to time with bush chatter or track condition reports.

Satellite Phone

The best known Australian satellite phone networks are Iridium and Globalstar, but there's a new player in the game, Thuraya. Thuraya phones are becoming available and offer combined GSM/satellite connection.

The Iridium Network provides global coverage by using 66 low-orbit satellites, so a Telstra-Iridium phone can be used anywhere in the world. Globalstar is Vodafone's satellite phone system and is supposed to provide coverage of Australia and New Zealand and about 500 nautical miles to seaward around these land masses. However, recent satellite problems have made Globalstar connection unreliable.

The main limitation of a satellite phone is the need for the handset aerial to have a clear view of the sky.

HF or Sat

There's no doubt that a handset satellite phone is more portable than an HF radio that needs to be installed in a vehicle, with a power supply and a large aerial. A satphone can be carried when bush walking, or out in a 'tinnie', fishing.
In many cases this portability answers the HF or satphone question.

A satellite phone will set you back around two grand, but there are hire companies all over Australia that will happily rent you one for the duration of your trip. Regular Outback travellers may qualify for a Federal Government subsidy that cuts the phone purchase cost to around $500. Info on this cash back initiative is available from www.dcita.gov.au

Where portability isn't an issue an HF radio has some advantages over a satphone, including the ability to have free contact over long distances between vehicles and bases, including the RFDS. There's also the community spirit enjoyed by HF radio club users, who can communicate with like-minded bush travellers and experienced base station operators.

The cost of operating an HF radio is less than using a satphone, provided the user is taking advantage of free and low-cost communications options. However, using an HF radio for phone calls costs around a dollar per minute, or about the same as the average satphone call cost.
A new HF radio with an auto tune aerial is a $4000 investment, but there is a large used radio market, with prices for basic sets starting at $500.

A tip when looking at used Codans is that the first two model number digits denote the age: a 9323 is a later model than an 8528.

It's possible to hire HF radios and satphones, so if your bush communication needs are temporary that's probably the way to go.

Distress Beacons

Distress beacons are mandatory on boats travelling more than two nautical miles offshore, but they're also popular with Outback travellers. Changes to the search and rescue system made many existing distress beacons obsolete from February 2009.

Distress beacon transmitters, commonly called EPIRBs (emergency position indicating radio beacons) communicate with Cospas-Sarsat, the international satellite system for search and rescue operations.

Analogue-signal distress beacons allowed location within a 20-kilometre circle, but the latest digital units shrink the search zone to around 120 metres.

There used to be two operating frequencies - 406MHz and 121.5MHz – but as of 1 February 2009 the 121.5MHz analogue frequency was no longer received by the satellites. Relying on a 121.5 MHz distress beacon is dangerous, because the only receiver of a 121.5 MHz alert would be an over-flying aircraft, if the crew happened to be monitoring the frequency.

Owners of 121.5MHz distress beacons need to replace them with digital 406MHz distress beacons.
The change from analogue to digital was not change for change's sake: the digital system allows quicker, more precise beacon positioning, and much faster response, as well as positive identification of the unit. Digital distress beacons aren't affected by electronic interference that can be a problem with analogue units.

Every 406MHz distress beacon must be registered with the Australian Maritime Safety Authority: it's free and easily done on-line at the AMSA web site. The purpose of registration is identification of the beacon; giving search and rescue people information about the owner, as well as contact details so that the alert can be checked.
Nearly all analogue distress beacon alerts are 'false alerts' and some have resulted in unnecessary and very costly rescue responses. With the contact details provided by registering a beacon an alert can be checked immediately.

The best distress beacons are those with inbuilt GPS that provide precise location, if the unit can 'see' enough sky.

EPIRBS and PLBs

EPIRBS are designed for boats. They must float upright in water and transmit while afloat, operate for 48 hours and may be activated automatically by immersion.
Australian-Standard PLBs (personal location beacons) float, but not necessarily in a manner that ensures signal transmission, operate for 24 hours and are manually activated. PLBs are much smaller than most EPIRBs and many are pocket-sized.
A 406 MHz PLB with inbuilt GPS capability costs around $600.

There are some traps for the unwary distress beacon shopper. PLBs on sale in the USA and Canada are not required to float. These beacons do not meet the Australian Standard and will not be registered in Australia.
A PLB is not a substitute for an EPIRB in the marine environment.

Any 406 MHz beacon registered with AMSA is required to be coded with an Australian country code. There may be difficulties recoding a 406 MHz beacon produced for overseas markets.

How EPIRBSs and PLBs Work

When a distress beacon is activated, it transmits a signal that is detectable by Cospas-Sarsat satellites and overflying aircraft. As the satellites orbit the Earth they ‘listen’ for any active beacons and report their position to rescue authorities.

Beacons developed for the satellite system use digital technology that allows the beacon to transmit a unique code (HexID or UIN) that identifies the beacon. The code can be found on the label of all 406 MHz distress beacons.
When the HexID is decoded it reveals the country code (503 is Australia) and, in the case of beacons with input, a GPS position.

The Australian Maritime Safety Authority’s (AMSA) Rescue Coordination Centre (RCC) then accesses the registration database and finds the owner details, including up to three nominated emergency contacts.
Distress beacons with GPS positioning allow location almost instantly, but positioning of non-GPS units requires several satellite passes and takes longer.

Rescue response times depend on the time it takes for a search and rescue (SAR) unit, such as a helicopter, aircraft or ground party to be prepared and sent to the search area. The further you are from support the longer the rescue takes.

Beacon or Satphone

On Outback trips we always carry a PLB, but we also have Iridium and Globalstar satellite phones. On two occasions we’ve needed to contact emergency services and both times we used the satphone. However, it was comforting to know that the PLB was at the ready.

Regular Outback travelers may qualify for a satphone subsidy, which effectively reduces the price of a satphone to around $500: less than a PLB with GPS.

Satphones and PLBs are available through various hire companies, for those who need only occasional Outback emergency support.