Centre for Appropriate Technology

Using a mobile or satellite phone in remote Australia

Mobile phones are now a well established part of the Australian communications landscape. But while the networks provide good coverage in urban areas, access to services in remote areas is limited, and satellite phones may be needed to maintain mobile contact. An understanding of some of the basic features of both services can help users to make the most of the available services.

HOW MOBILE PHONES WORK

A mobile phone uses a radio signal to connect to a nearby base station tower that forms part of a service provider's network. The network itself is made up of a web of interconnected base stations and exchanges, each capable of handling multiple simultaneous phone calls. The best signal is obtained if the line of sight between the mobile and base station tower is clear of obstructions, and if the distance between them is short. The phone will switch to another base station if it moves too far away from the first one, or if the path to the first one becomes obstructed.

COVERAGE

Network coverage is the area around the towers where the signal is strong enough for normal customer mobile phones to work properly.

The larger mobile phone networks claim to cover the homes of well over 90% of Australia's population. However, coverage by land area is much less - as low as 1% in some remote areas.

Telstra has by far the greatest land area coverage in remote and very remote Australia, with about 5 to 10 times the number of base stations in those areas as either Optus or Vodafone, which have the next largest regional networks.

COPING WITH POOR SIGNAL STRENGTH

SMS messages

Mobile signals get weaker with distance and terrain. At the limit of coverage, it is usually possible to send and receive SMS messages (SMS = Short Message Service) well beyond the distance that allows acceptable speech quality. SMS also incorporates a 'store and forward' feature: when the network is busy the messages are queued until transmitting resources become available later. With SMS there is no guarantee of delivery time — it may be quick (a few seconds) or it may take hours on a busy network.

Antennas

Handheld mobile phones have a small built in antenna. These models trade off coverage for compactness and convenience. Models that allow connection of a more efficient external antenna such as a vehicle mounted antenna provide an increased radius of operation away from the base station (improving from about 10km to about 30km)[1] for remote area use. Antennas are rated according to their gain in dBi units — a higher number means a stronger signal. An external antenna mounted on a mast or building roof can also make the difference between a reliable and an unreliable service. Most antennas are shaped like a short pole, and work equally in all directions so long as the pole is held upright.

Vehicle mounted higher gain mobile antenna. (In Centre of picture)

Obtain advice on appropriate antennas and connecting cables from a rural telecommunications supply shop.

Making yourself heard

When the signal is weak or there is strong interference, there are some techniques which you can use to get important information across. First, speak more slowly than usual, and deliberately announce and repeat important words or numbers. Second, take turns at speaking a sentence or two without interruption, then ask the other person if they understood.

POWER AND BATTERIES

The talk and standby times for modern mobile phones are substantial (usually measured in hours and days). However, when travelling away from base, take a car cigarette lighter charger as well as a mains charger. Charging time is

shortest if the phone is turned off.

A car kit combining external antenna, charger, and hands-free operation is the most convenient for in-car use, but can prove expensive if phone models are changed frequently because the cradles are often customised to suit only one phone model.

USE IN A DISASTER SITUATION

The capacity of the mobile network is not unlimited. In a disaster situation, the network can become overloaded because of the large number of callers. In these circumstances, try to keep the duration of calls very short, or use SMS if the timing is not critical.

RUNNING COSTS

Mobile service providers offer a range of plan and pre-paid options. Pre-paid usually offers cheaper calling, but this may not be the case if the mobile account is linked to other services such as fixed lines, or is part of a group of business phones.

SATELLITE PHONES

Satellite phones support connectivity in areas without mobile coverage. This is important for services such as ambulances which must keep continuous contact while travelling between remote community and a distant hospital.

Satellite phones work in a similar way to mobile phones, except that the 'base station' is mounted on a satellite at a great distance above the earth's surface. The two main types are: geostationary (e.g. the Optus service) where the single satellite remains in a 'fixed' location in the northern sky, and low earth orbiting (e.g. the Iridium service) where a fleet of satellites is continuously moving across the sky. Both types provide continuous coverage, but the signal is often weak and there is a noticeable delay.

Speech may be difficult to understand on a satellite phone, especially where the call is satellite phone to satellite phone or satellite phone to mobile — try to call a landline if possible. Portable satellite phones do not work well inside vehicles, because the roof metal blocks the signal path. For best reception with a portable satellite phone, turn the vehicle motor off, stand outside it in the open, and make sure the antenna is fully extended and vertical. Talk slowly and in longer bursts to lessen the effect of the signal delay. Taking the satellite phone out of its protective case may also help. Satellite phones also work better when connected to an external antenna.

Satellite phones use more energy than mobiles, so they typically have shorter talk and standby times. Remember to fully charge portable satellite phones the day before you leave on a trip. Phone calls are also more expensive, often around $2 per minute: a good reason to be economical in their use.

Other features of satellite phones and mobile phones are similar.

Purchase subsidies

The Australian Government offers subsidies to individuals and organisations to help cover the cost of purchasing a satellite phone when mobile coverage is unavailable in the areas in which they live or work. This subsidy scheme runs until 2013. For further information contact the Department of Broadband, Communications and the Digital Economy on 1800 674 058.

Coverage

Search for mobile coverage maps on the service provider's website. For example: www.telstra.com or www.optus.com.au

[1] These distances should only be treated as a guide, because there are so many variables that affect the signal strength and coverage

REFERENCES
Department of Broadband, Communications and the Digital Economy: http://www.dbcde.gov.au/communications_for_consumers/mobile_services/the_satellite_phone_subsidy_scheme.