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Solar Telephones

A survey carried out in 1979 was trying to find out the preferences of people, living in remote parts of the Northern Territory, for different forms of communication. The survey indicated that a telephone was preferred by more people than broadcast radio or television. As one journalist put it, 'first of all, at the top of the list, they wanted a telephone, secondly they wanted a telephone that worked and thirdly they wanted a telephone that worked all the time'.

In 1988, according to Telecom figures, only about 40 000 people live in areas which are either not serviced by telecommunications or which have very poor quality telecommunications systems. Telecom's Rural and Remote areas Programme, announced in 1984, aims at providing all Australians, no matter where they live, with a modern automatic telephone service. Their ability to achieve this goal depends on inventions developed by Telecom's Research Laboratories in Melbourne.

Communications in remote and sparsely settled rural areas have long posed a problem for Australians. During the 1920s the radio communication service introduced by the Flying Doctor Service (q.v.) spread throughout many remote areas. People living closer to towns erected their own telephone

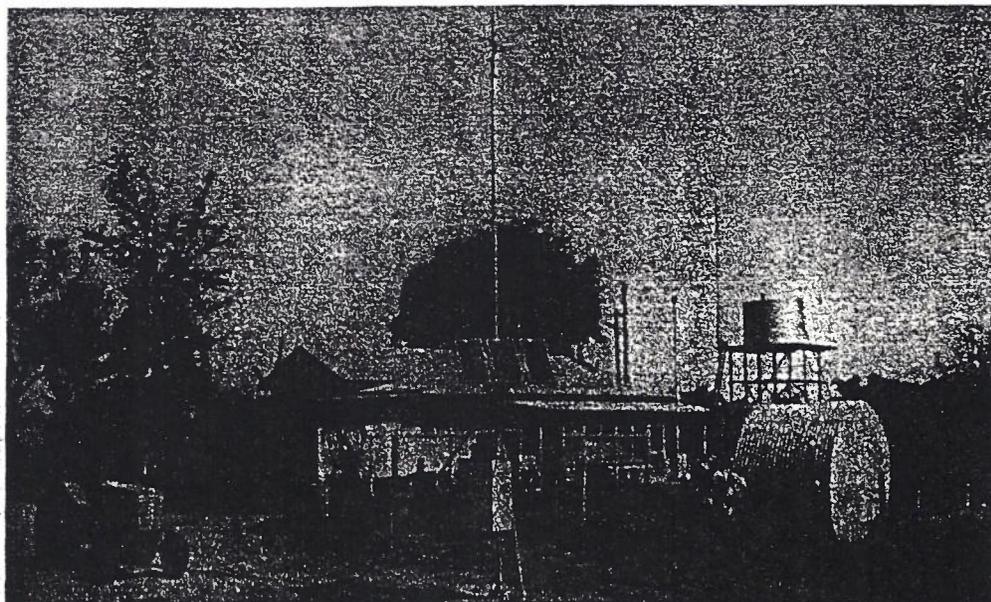


Jack Curtis, the outspoken Telecom director, who persuaded the Australian Government to take advantage of advanced local technology.
(Telecom Australia)

lines consisting of single wires connected to the local exchange via trees and fence posts. They were beset by a number of problems. A great deal of effort was required to generate the current by cranking the handle. On wet days, the water would conduct this current straight down rain soaked poles and trees so that it disappeared into the ground. Even when they could get through to their local exchange, it was often situated in a general store which was only open during business hours.

In the 1950s Telecom began replacing manual systems with automatic exchanges, installing power lines and large capacity trunk lines. 'Wayside' telephone systems could be connected to the trunk lines which often crossed remote areas. Mains electricity was not always available far from townships and Telecom researchers began to experiment with solar power. Necessity was the mother of invention and the researchers were able to develop highly reliable solar-powered equipment which required a minimum of maintenance.

From the 1960s the Australian government had become interested in developing satellite communications. The Telecom management had other ideas. Jack Curtis, managing director of Telecom Australia from 1975 to 1981, believed it would be more cost-effective to work on connecting outlying subscribers by land to the existing telephone network. His views did not enhance his popularity with government ministers interested in the political



Wallal Station in outback Queensland was an early site for a trial installation of the DRCS system in 1983. (*Telecom Australia*)

prestige they could earn backing the satellites which held more appeal for the popular imagination. Curtis was proved correct when workers at the Telecom Research Laboratories in Melbourne in 1978 came up with a new system which used up-to-date digital radio transmission techniques.

The digital radio concentrator system (DRCS) consists of a series of radio repeater towers extending from an exchange and spaced at up to 50 kilometre intervals, depending on the terrain. Anyone within the transmitting area of each repeater tower can have access to the service, so that subscribers can be served up to 6 700 km from the nearest exchange. Each DRCS can connect up to 120 subscribers. Signals are sent as a series of on or off pulses, unlike a normal telephone which transmits a continuously varying signal. The advantage of the system is that it regenerates a signal without including background sound and can thus be passed down a chain of repeaters without accumulating unwanted noise, giving users of the system a quality of transmission equal to that found in cities. A further advantage of the DRCS is its small power requirements, which enable it to be powered by solar equipment.

By the time the DRCS was invented Australians had become world leaders in the use of solar power. The first solar-powered telephone was installed on a farm at Wilkatana, about 35 kilometres north of Port Augusta



A remote public telephone in Breona, northern Tasmania is powered by solar technology. (*Telecom Australia*)



An underground dweller at White Cliffs chats on her solar-powered telephone.
(Telecom Australia)

in South Australia in 1974. A small VHF radio-telephone linked the farmer to the Telecom network. In 1976 solar power was used to power telephone repeater stations in the Pilbara in Western Australia. A solar-powered telephone exchange was installed at Glen Valley, Victoria, in 1977, providing radio telephone connections to 20 subscribers in the Victorian Alps. The first solar-powered public telephone was erected at Breona in northern Tasmania in the early 1980s, with a small solar array and radio aerial on its roof.

The world's first major solar-powered trunk line was installed by Telecom in 1979 between Alice Springs and Tennant Creek in the Northern Territory. In 1983 the world's longest solar-powered link was completed, linking Port Hedland and Kununurra with a series of microwave repeater stations. Wayside radio telephone services were connected to the nearest repeater station by individual solar-powered radio telephones, giving telephone access to many people of the bush. Australia is now sharing its expertise with other countries. In 1979 Telecom members were part of a team set up to advise the Indian Government on the use of solar power.

Today DRC systems are being installed in many remote areas, each customer unit being powered by its own solar panels. The power is stored in batteries for continuous operation. Solar powered DRCS telephones are now being marketed in China and the Middle East where they will be used, as they have been in Australia, to break down the barriers of distance and bring dwellers in remote areas in touch with the rest of the world.