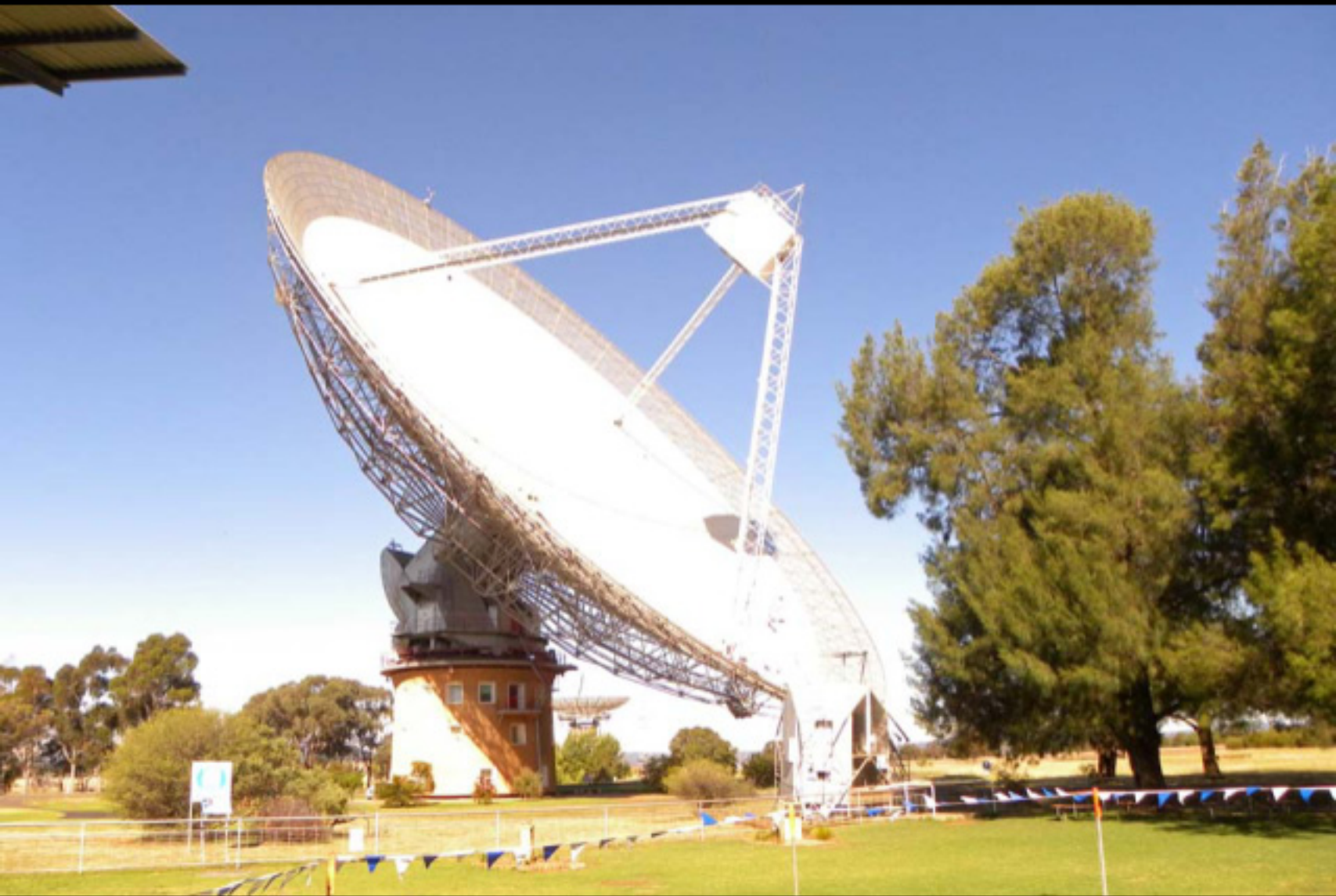




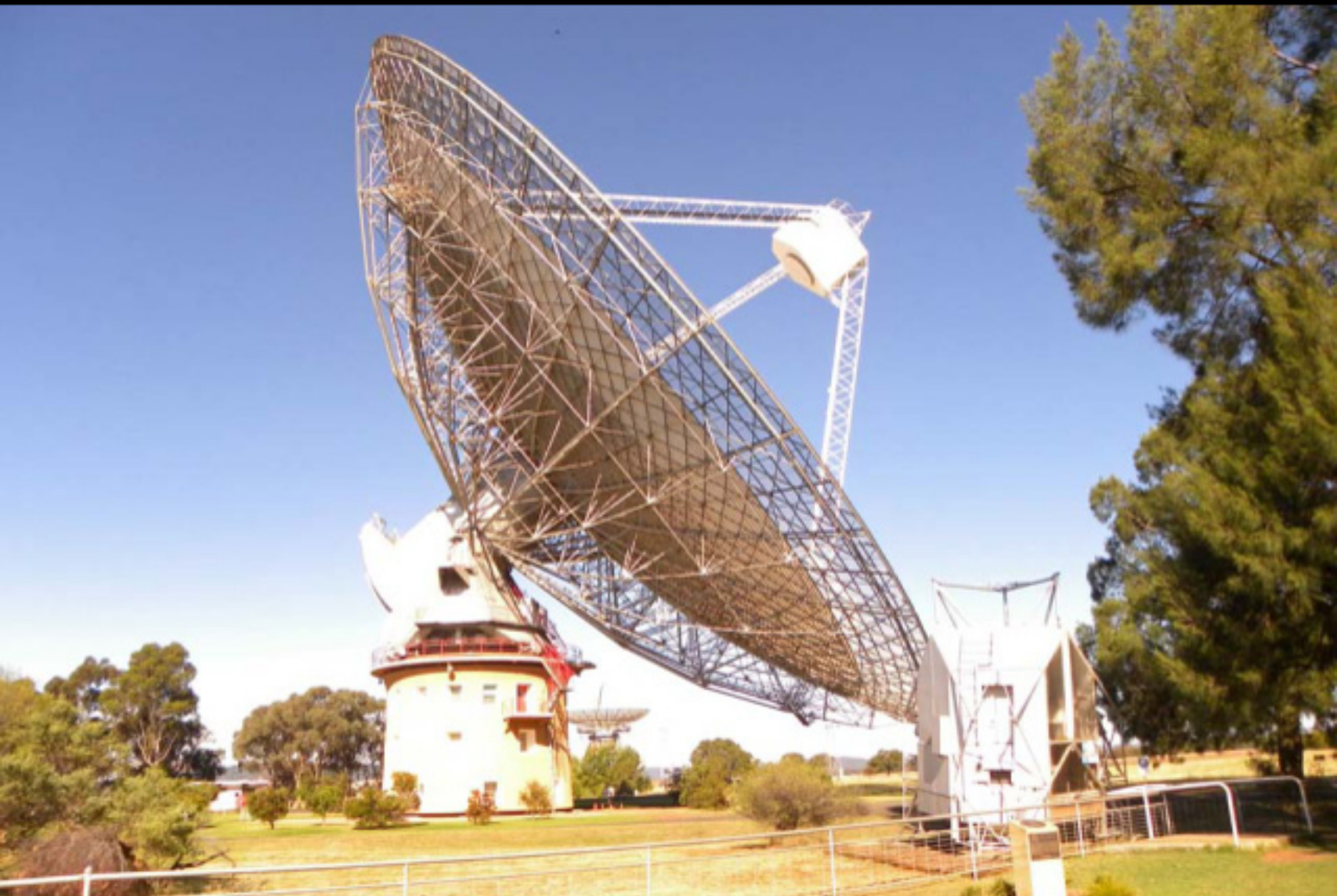






















CSIRO's Parkes Telescope

CSIRO's Parkes telescope is a 64-m diameter parabolic dish used for radio astronomy. It is located about 30km north of the town of Parkes, NSW, and about 100km west of Sydney. It is operated by CSIRO's Radio Astronomy and Space Science (RASS), a business unit of CSIRO. CSIRO also operates the Australia Telescope Compact Array near Murrumbidgee, NSW, and the Pogo radio telescope near Coonambidge, NSW, and is developing the Australian SKA Pathfinder (ASKAP) telescope in Western Australia.

The telescope

The telescope was built in 1961, but only its basic structure has remained unchanged. The surface, control system, fibre optic receivers, computers and cabling have all been upgraded—some parts many times—to keep the telescope current. The telescope is now ten thousand times more sensitive than when commissioned in 1961.

- ASKAP copied the telescope's design for the satellite tracking dishes of its Deep Space Network.
- The moving part of the telescope, above the concrete base, weighs 1000 tonnes—more than two Boeing 747s.
- The telescope can be pointed with an accuracy of better than 11 arcseconds—about the width of a finger seen 150 m away.
- The telescope only receives signals from space, never sends them.
- It can handle radio waves from 7 mm to 4 m long.

Using the telescope

The telescope works day and night, and through rain and cloud. About 95% of all time each year is scheduled for observing. Less than 5% of that is lost because of high winds or equipment problems. Most of the rest of the time each year is used for maintenance and testing.

The moving part of the dish is not fixed to the top of the tower but just sits on it. Because the large surface catches the wind like a sail, the telescope must be 'towed' (pointed directly up) when the winds exceed 35 km an hour.

The telescope is used by 300 people each year. About 80% of these users are from overseas.

Other Statistics

- Diameter of dish 64 m - Feeding area of dish 120 m² - Height to top of focus cable 30 m - Feet length 114 m - Height of dish 30 m - Weight of dish 1000 tonnes - Weight of control tower 100 tonnes - Maximum 60 20° from the vertical	- Time for movement: 10 2 minutes - Time for 180° rotation 12 minutes - Surface accuracy 12 mm (allows for 20°C variation) - Pointing accuracy 11 arcseconds (the resolution of 1000 km radio waves) - Pointing accuracy 11 arcseconds (the resolution of 1000 km radio waves) - Pointing accuracy 11 arcseconds (the resolution of 1000 km radio waves) - Pointing accuracy 11 arcseconds (the resolution of 1000 km radio waves) - Pointing accuracy 11 arcseconds (the resolution of 1000 km radio waves)
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RADIO TELESCOPE, PARKES

THIS 32 METRE DIAMETER TELESCOPE IS THE REALIZATION OF THE VISION OF CARLOS DA E. G. BOWEN, DESIGNED BY FREEMAN FOX & PARTNERS TO A CSIRO SPECIFICATION AND BUILT BY MASCHINENFABRIK AUGSBURG, NURNBERG. MANY MANY OF ITS INNOVATIVE DESIGN FEATURES WERE ADOPTED IN LATER TELESCOPES. COMMISSIONED IN 1961, IT HAS ALLOWED ASTRONOMERS TO EXPLORE THE UNIVERSE IN GREATER DETAIL THAN EVER BEFORE. EXCELLENT ENGINEERING AND THE LATEST IN ELECTRONICS AND COMPUTING HAVE KEPT THIS TELESCOPE AT THE FOREFRONT OF RADIO ASTRONOMY.

DEDICATED BY
THE INSTITUTION OF ENGINEERS, AUSTRALIA
AND CSIRO, 1990.



The Dish

The dish collects radio waves from space, they bounce off the parabolic surface and are focused into receivers inside the focus cabin, which is supported 26 m above the centre of the dish by three legs. The dish has three types of surface: galvanized steel mesh, perforated aluminum panels, and solid steel plates. The dish and focus cabin weigh 500 tonnes, and are balanced by a 250 tonne counterweight. The dish counterweight and support structure rotate horizontally on a track that sits on top of the control tower.

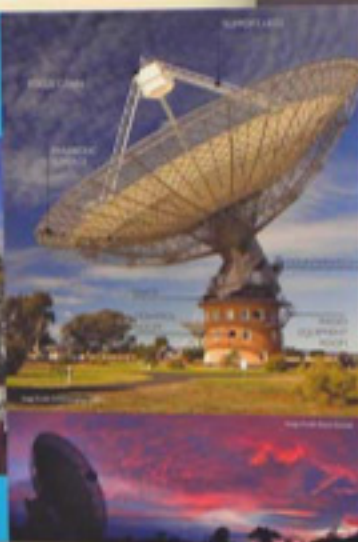
The Control Tower

The control tower houses a radio equipment room and the control room, where administrators use computers to point the dish at specific sky coordinates to study objects in the Universe.

The focus cabin (top)



The control room (middle)



THE PARKES RADIO TELESCOPE

Dish Facts

64 m diameter parabolic dish
Weighs 1000 tonnes above the control tower
Observes 24 hours a day
Observes radio waves 7 mm to 4 m long
Maximum operational windspeed is 25 km hr⁻¹
Takes 15 minutes to rotate 360°

THE TELESCOPE'S SIGN AND ONSTRUCTION

DESIGN

In the mid 1950s many different concepts were proposed for a Giant Radio Telescope, which eventually became the Parkes Radio Telescope.



Early design sketch
The telescope design in 1956 was a simple structure with a single dish.

Proposed design
The telescope design in 1957 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1958 was a more complex structure with multiple dishes.

Sketch of the telescope structure

The telescope design in 1959 was a more complex structure with multiple dishes.

CONSTRUCTION

Construction began in 1959 and took just two and a half years to complete. The telescope was officially opened on 31 October 1961.



Sketch of the telescope structure
The telescope design in 1960 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1961 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1962 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1963 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1964 was a more complex structure with multiple dishes.

UPGRADES

The telescope has undergone a series of upgrades since its completion in 1961. To keep it current it is now set to be upgraded with more sensitive dishes when commissioned in 1961.



Sketch of the telescope structure
The telescope design in 1965 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1966 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1967 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1968 was a more complex structure with multiple dishes.



Sketch of the telescope structure
The telescope design in 1969 was a more complex structure with multiple dishes.





Using the signals from the Moon, the Apollo 11 mission was the first to use a radio signal from the Moon to track the position of the Moon. This was done by the Lunar Ranging Experiment, which was carried by the Lunar Module and the Command Module. The experiment consisted of two parts: one part was to measure the distance between the Earth and the Moon, and the other part was to measure the distance between the Moon and the Moon.

The Lunar Ranging Experiment was the first of its kind, and it was a major achievement for the Apollo 11 mission. It was the first time that a radio signal had been sent from the Moon to the Earth, and it was the first time that a radio signal had been received from the Moon.

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THE DISH



THE DISH & APOLLO 11





OTHER SPACE TRACKING MISSIONS

Apollo 13 to 17

The CSIRO Parkes Observatory tracked all the other manned lunar landing missions following Apollo 11. The Apollo 13, the second to be shot. After an explosion caused the spacecraft to lose power, the Parkes observatory was instrumental in picking up the very faint radio signals from the craft, and helped save the mission from disaster.

Giotto

In March 1986, Halley's Comet made its first in a 76-year orbit. The European Space Agency's unmanned spacecraft, Giotto, was sent to study it at close range for the first time. The Parkes observatory was the main tracking station to receive the signals.

Galileo

Parkes tracked NASA's Galileo unmanned spacecraft, in orbit about Jupiter, for 10 hours every day for 13 months during its orbit in order to maintain strong radio connections for the exploring 10 hours of the day the dish was reprogrammed with a new set of signals from Galileo.

Voyager 2

A JPL (Jet Propulsion Laboratory) spacecraft from the period of the 1960s and 1970s, Voyager 2 was launched in 1977 and has been tracking back of them for many years.





*On 21 July 1969 the Parkes Radio Telescope brought
television pictures of the historic Apollo 11 moonwalk to
600 million people around the world.*

*This remarkable event was achieved thanks to the dedication
and skill of the **CSIRO** and **NASA** staff at the Observatory - a
collaboration that continued until the end of the manned lunar
program in December 1972.*



CSIRO
Commonwealth Scientific
and Industrial Research Organisation

Dedicated this 21st day of July, 1999.



















Welcome to the Visitors Discovery
of the Parkes Radio Telescope











