Planning and Construction of the Dish

Peter Robertson
Parkes Symposium, 31 October 2011
Contents

Finding the funds

Designing the Dish

Finding a site and the construction

Film of the construction

Acknowledgments

All photographs are courtesy of the CASS Photo Archives, except where noted. I am grateful to Helen Sim (CASS) for providing the film footage and to Amelia Ford who prepared the edited version presented here. I am also grateful to the School of Physics, University of Melbourne, for its support.
By the early 1950s the Radiophysics Lab was the largest radio astronomy group in the world.

The two main rivals were the groups at the University of Cambridge and at the Jodrell Bank field station, operated by the University of Manchester.

Both English groups were small in comparison.

[courtesy: Woody Sullivan]
Edward 'Taffy' Bowen
Chief of the CSIRO Radiophysics Lab (1946 - 71)

The driving force behind the Dish
Bernard Lovell (centre) and the Manchester group in 1951

The 250 ft diameter dish planned for Jodrell Bank, to be funded by private and government sources.
• Taffy Bowen's wartime contacts lead to US funds for the telescope

• Carnegie Corporation donates $US250,000 in May 1954
Fred White (CEO of CSIRO), Richard Casey (Minister for CSIRO) and Taffy Bowen in January 1958

- PM Robert Menzies agrees to fund the giant dish in April 1955, but insists that at least one half comes from private sources

- A further $US250,00 from the Rockefeller Foundation in December 1955
Part 2

Designing the Dish
What might have been - three structures investigated in 1954:

[a] Jacks on a turntable

[b] Eyeball floating on water

[c] Hemispherical hole in the ground
• Initial design by leading British inventor and engineer Barnes Wallis

• Famous for inventing the bouncing 'dambuster' bomb in WWII

• Original ideas including the structure of the dish and how to point the telescope with great accuracy
• Design changes at Jodrell Bank led to major cost blowout

• Over five years to build and completed in mid 1957
• Detailed design of the telescope carried out by Freeman Fox in London

• Three year on the design was time well spent

• Though smaller than Jodrell Bank (210 ft diameter compared with 250 ft), the Parkes dish was a much superior instrument

Gilbert Roberts supervised the design project
[courtesy: Argent Studios London]

Harry Minnett was the liaison man between Radiophysics and Freeman Fox
Part 3

Finding a Suitable Site

Building the Dish
Sir Henry Parkes (1815-96) - the father of Australian Federation

• In 1873 the town of Bushmans was named after him

• In 1961 a radio telescope was named after him
A thoroughly international project:
- Funding from US philanthropic organisations
- Design project carried out in England
- Construction of components in Germany

Construction by Maschinenfabrik Augsburg Nurnberg (MAN)

Casting the steel roller track

Trial assembly at the MAN plant near Frankfurt in May 1960
• Onsite construction begins in September 1959

• Most of the tower built by the Australian firm Concrete Constructions

• Most of the tradesmen were recruited from the Parkes district
The hub and preassembled rib sections

Lifting the first rib section into place
Lifting the aerial cabin into position

Over one thousand mesh panels form the reflecting surface of the dish
The Dish tilts for the first time in October 1961, only a few days before the inauguration.
Part 4

National Film and Sound Archive, Canberra

Footage by Ken Nash, Radiophysics photographer

Colour 16 mm film, no audio, running time 12 min
HAPPY FIFTIETH ANNIVERSARY!