The First 50 Years: A Historical Perspective

Deep Space Network

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Agenda

- Deep Space Instrumentation Facility (DSIF)
- The Early Years of the DSN
- The 80’s and 90’s
- The 21st Century
The Deep Space Instrumentation Facility (DSIF)
The Original 26m Antennas

- DSS-11, Pioneer, Goldstone, California
- DSS-41, Woomera, Australia
- DSS-51, Hartebeestpoort, South Africa
The Early Years of the DSN
Establishment of the Deep Space Network

W. H. Pickering

December 24, 1963
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The Early Years

JPL Space Flight Operations Facility (SFOF) - 1964
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The Early Years

JPL Space Flight Operations Facility Darkroom
- 1964
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The Early Years

26M antennas (Operational in 1965) – “Second Network”

- DSS-12
- DSS-42
- DSS-61

64M antennas

- DSS-14 (Operational in March 1966)
- DSS 43 (Operational in April 1973)
- DSS-63 (Operational in September 1973)

DSS-14 – 64m – Goldstone, CA
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The Early Years

Goldstone, California – 1964
JPL SFOF Darkroom - 1969
The 80’s and 90’s
The 80’s and 90’s

- 26M upgrade to 34M and retrofitted with X-band receivers (November 1978 – April 1980)
- MKIVA Upgrade 1981-1985

DSS-12 – 34m – Goldstone, CA
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The 80’s and 90’s

- 64M upgrade to 70M (1987-88) for Voyager Neptune Encounter
- 34M Beam Waveguide Antennas (February 1995 – October 1997)
- Block V Receiver
- DSN special development for the Galileo Low Gain Antenna Mission
  - First inter-continental arraying
  - First full-spectrum combining
  - The “Ultracone”

DSS-14 – 70m – Goldstone, CA
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The 80’s and 90’s

Apollo Valley
Goldstone, CA
USA
The 80’s and 90’s

Madrid
Deep Space
Communications
Complex

Spain
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The 80’s and 90’s

Canberra Deep Space Communications Complex

Australia
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The 80’s and 90’s

JPL SFOF
Designated a United States National Historic Landmark in 1985

JPL SFOF Darkroom – 1997
The 21st Century
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The 21st Century

DSN Facilities 2014
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The 21st Century

• Network Simplification Project (NSP)
• 2003/04 and 2011 Asset (Antenna) Contention Periods
• K and Ka-band implementation

JPL SFOF Darkroom - 2014
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The 21\textsuperscript{st} Century

Film of DSS-35 Dish Lift
References for Further Reading

  Douglas J. Mudgway

- Big Dish: Building America’s Deep Space Connection to the Planets
  Douglas J. Mudgway

- Deep Space Telecommunications Systems Engineering
  Joseph H. Yuen (Ed.)

  Jose Manuel, Urech Ribera