The Antennas
- Goldstone Consists of 8 Operational Deep Space Stations (DSS)
- Antenna Sizes Range from 34 Meters to 70 Meters in Diameter
  - DSS-13 (34m BWG: R&D)
  - DSS-14 (70m)
  - DSS-15 (34m HEF)
  - DSS-24, 25 & 26 (34m BWG)
  - DSS-28 (34m HSB: GAVRT)

The Complex
- Approximately 45 miles NW of Barstow, CA & 155 miles from JPL
- Goldstone covers ~52 square miles of Territory & is located on Fort Irwin Military Reservation
- 5 Primary Sites (Echo, Mars, Apollo, Venus & Gemini)
- Centralized Control of Assets at the Signal Processing Center (SPC-10) located at Mars Site

The People
- ~ 160 Personnel Operate/Maintain all Aspects of Complex Functions
- Very Diverse Skill-Sets
  - Spacecraft Communication Operators
  - Electronic/Digital, RF, Communications, Hydro-Mechanical Technicians & Field Engineers
  - Electrical, HVAC, System Controls, Fire Protection, Facility Maintenance Technicians & Field Engineers
  - Finance, Logistics, Business & Armed Security Support Staff
  - Outreach
The Goldstone Deep Space Communications Complex

The Environment

- Vast Array of Wildlife
- Goldstone is home to a wide variety of flora & fauna, two endangered species & some dangerous species
- Temperatures Range from Below Zero to +120°F
Operational Efficiency

• High Power Radiation Clearance Process
• Improved Workstations
• 2-Links per Operator

Significant Reduction of Human Errors

• Increasing Demand on Goldstone High Power Radar

Goldstone Radiation Avoidance Map (GRAM)

72 individual radar-generated images of asteroid 2012 DA14 created using data from NASA’s 70m DSN antenna at Goldstone

Workstation Upgrades
Reliability Improvements

- Site-Wide Uninterruptible Power Supply (SWUPS)
- Vast Infrastructure Upgrades
- Extensive Expansion of Infrared & Predictive Technologies
- DSS-14 70m DLM – Life Extension

DSS-14 (70M) Suspended on 3 Sets of Legs

IR ‘Find’ Capture

FAC VLAN Implementation

4MW SWUPS

HVAC Upgrades
The Deep Space Network

DSS-14: 70M Antenna
Life Extension Tasks

- Painting
- Hoists
- Azimuth Gearbox Support
- Azimuth Databases
- Hydrostatic Bearing
- Servo-Hydraulics
- Reservoir Walls Replace Runner
- Elevation Databases
- Elevation Drive Struts
- Master Equatorial
- Antenna Power Modernization
- Radial Bearing Wear Strips
- HVAC Mods
- Pedestal Study

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DSS-14: 70M Antenna Life Extension Tasks

- Epoxy Grout Pour
- Alignment of Runner Segments
- Rotating Structure Support Installation
- El Bearing Replacement
- Removal of Pad
Future Upgrades & Initiatives

- 80kW Transmitter
- Addition of 4th 34m BWG Antenna
- Automated Link Builder (ALB)
- Consolidating Footprint
- Optical Communication

High Communication Rates are Dictated by Future Science Data Requirements
The Deep Space Network

GDSCC

In Action

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