A large, white, dome-shaped antenna structure is mounted on a rooftop. A person is standing on a ladder next to the structure, appearing to be working on it. The sky is a clear, light blue. The text "NASA LaRC" is centered at the top, followed by "Langley Research Antenna System (LRAS)" in a larger, italicized font.

NASA LaRC

Langley Research Antenna System (LRAS)

*Providing tracking, command / control, telemetry for aircraft,
orbital spacecraft, and celestial objects.*



Langley Research Antenna System

--- History ---

2015 – Learned from the Federal Communications (FCC) and National Telecommunications and Information Administration (NTIA) of potential pull back of “L” Band Frequencies Authorizations and other spectrum frequencies .

2015 – Proposal submitted to NTIA for possible funding.

2016 – Proposal was approved. Develop Requirements Document. Begin system design

2017 – Antenna installation.



Langley Research Antenna System





Langley Research Antenna System

--- New Antenna ---





Langley Research Antenna System

- The telemetry system operates on S-Band and C-Band systems and is capable of uplink (C-Band only) and downlink.
- There is also a plan to upgrade the system to provide X-Band capability to track CubeSats.



Antenna System Specifications

- Dual axis dual drive tracking system
- 3.2-meter (10 foot) diameter parabolic reflector
- Track signals in the S and C-Band Frequencies in the ranges of 2200-2400MHz and 4400-4940MHz respectively.
- System is frequency agile and tunable to specific channel frequencies within these ranges.
 - Currently Approved For The Following:
 - Three (3) S-Band Downlink Radio Frequency Authorization (RFA) Frequencies.
 - Three (3) C-Band Downlink RFA Frequencies.
 - One (1) C-Band Uplink RFA Frequency.



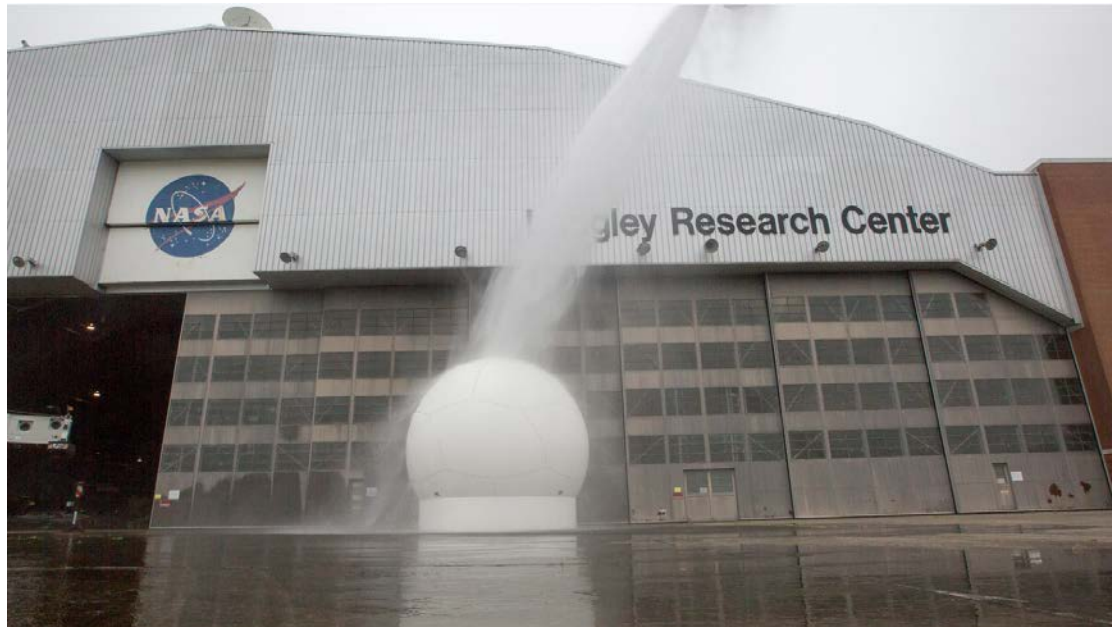
Antenna System Specifications

- Within the RF antenna network, this system can provide simultaneous Right Hand Circular Polarization (RHCP) and Left Hand Circular Polarization (LHCP) signals.
- Radio frequency signals from the antenna feed are converted to optical fiber compatible signals and sent to fiber receive modules in the Antenna Control Unit (ACU) located in the Flight Operations Support Center (FOSC) Control Room.
- In addition, this system has a Solid State Power Amplifier (SSPA) for C-Band uplink that can provide command, control, video and data to properly equipped aircraft, unmanned aerial vehicles (UAVs) or rockets.



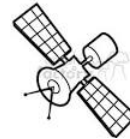
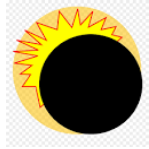
Antenna System Specifications

- Data bandwidth of 25-Mbs (mega-bits per second).
- The antenna system is housed in an 18-foot diameter fiberglass radome to provide environmental protection and allow for nominal telemetry operations in most weather conditions.





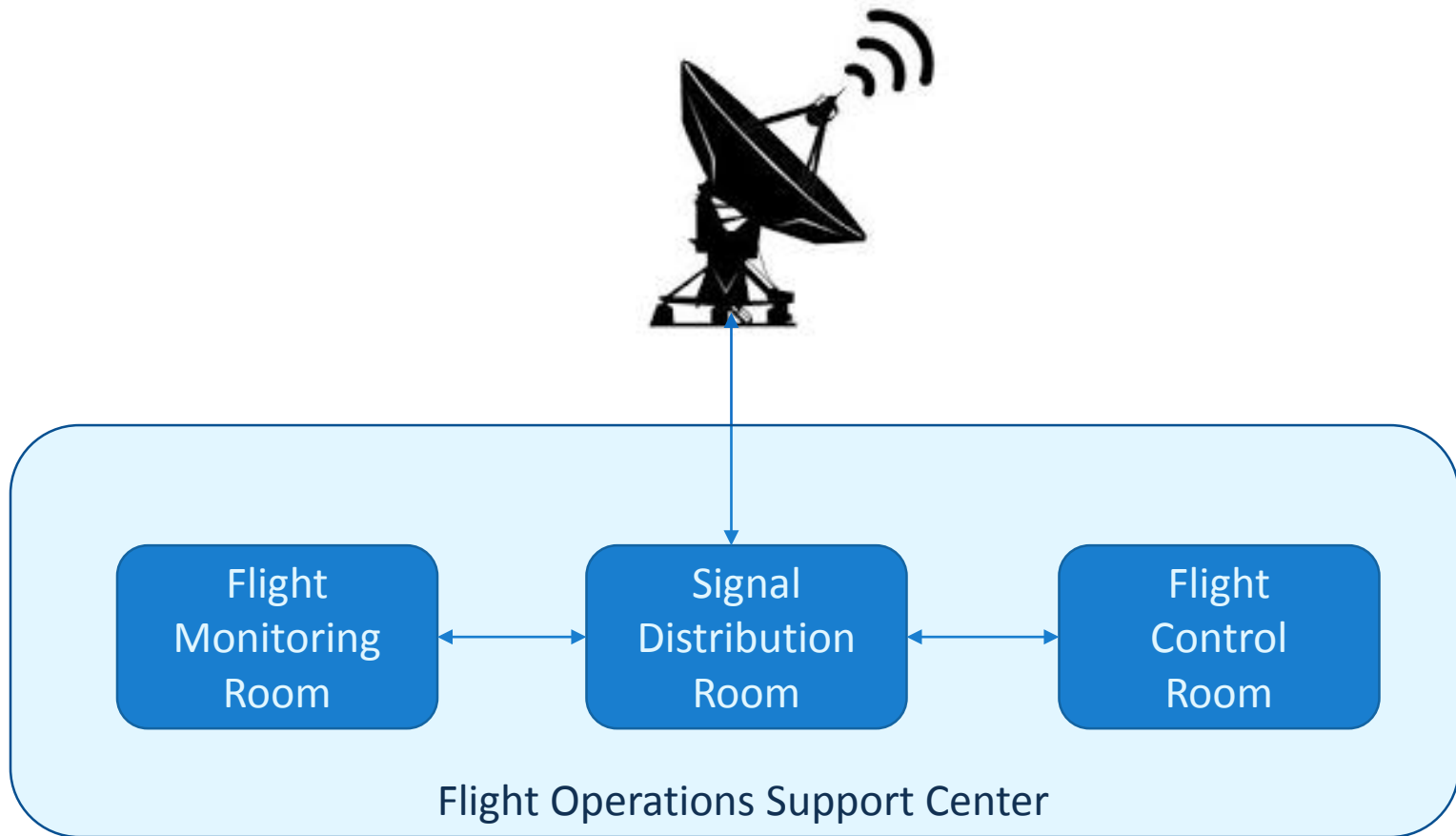
Antenna System Support



Flight Operations Support
Center



Antenna System Support





Antenna System Support





Antenna System Components

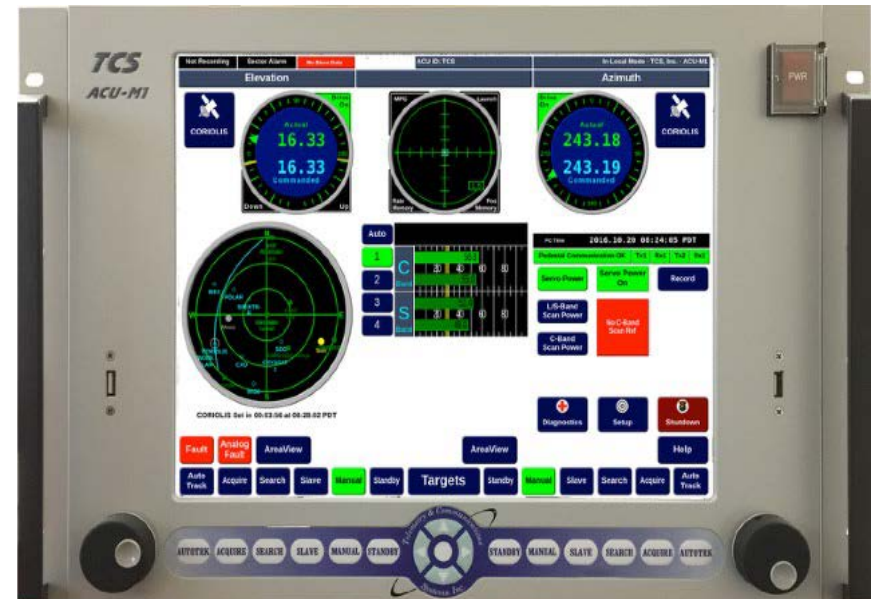


Antenna System Components



Antenna Inside Radome

Antenna Control Unit (ACU)





What's Next

Langley Research Center is now able to provide command and telemetry support for aircraft, unmanned aerial vehicles (UAVs) and rocket missions launched from NASA's Wallops Flight Facility.

Several technical officials from Wallops, Fort Eustis, and Patuxent River have visited NASA Langley to see the new telemetry system and to discuss the possibility of using the system to support their work.

Also discussed was the possibility of forming an East Coast cooperative telemetry and tracking network that would cover a much wider area than the individual systems. This cooperative network would allow one system to hand-off tracking and telemetry duties to another as the subject vehicle moves across boundaries. Currently, there are no formal or informal agreements between facility operators.



LRAS Team





Questions??



Backup



Polarizations

