



NASA's Aeronautics Test Program

Western Aeronautical Test Range

NASA Dryden Flight Research Center's Western Aeronautical Test Range (WATR) supports aerospace flight research and technology integration, space exploration concepts, airborne remote sensing and a wide variety of science missions.

The WATR supplies a comprehensive set of resources for the control and monitoring of flight activities, real-time acquisition and reduction of research data, and effective communication of information to flight and ground crews.

Facility Benefits

- Precision RADAR provides time space positioning information (TSPI) on research vehicles, International Space Station (ISS), and other targets, including satellites.
- Fixed and mobile telemetry antennas receive real-time telemetry data and video and have the capability to transmit uplink commands to research vehicles.
- The processed data is displayed at the engineering stations in the mission control center and archived in a post-flight storage area.
- Audio communication networks support aeronautics research and space operations in the WATR, covering a broad frequency spectrum for transmitting and receiving voice communications and flight termination signals for unmanned aerial vehicles.
- Video monitoring provides real-time and recorded data for the control and safety of flight test missions.



Facility Applications

The WATR supports aerospace flight research and technology integration, space exploration concepts, airborne remote sensing and science missions, as well as the ISS operations.

Characteristics

WATR Mission Control Centers

- 26 test engineering stations in MCC1 and 19 in MCC2 including:
 - Communications (radio and intercom) panels
 - Video monitors,
 - Weather data
 - IRIG-B timing
 - Specialized graphics displays.
- Range and mission control, test operations, range safety and test director consoles provide critical analysis and display capabilities.

The WATR mobile systems

- Available for rapid deployment to a specified location on short notice. These systems provide:
 - Radio-frequency communication,
 - Video and telemetry-tracking support.
 - Telemetry tracking for test missions outside local airspace boundaries.
 - Uplink commands to research vehicles

Data Acquisition and Processing

Data is acquired and merged from multiple sources in various formats to a single, time-correlated, composite stream for processing, distribution, real-time display and storage archival. Segments of post-mission data are immediately available on portable media.

Post-flight RADAR data can also be provided if reverted.

The mobile operations system can process and display data onsite, or reformat data and transmit it to a customer's facility.

Telemetry

WATR telemetry tracking systems consist of:

- Multiple fixed antennas and available mobile systems
 - Downlinked telemetry and video signals in C-, L-, and S-bands.
 - Uplinked commands in either L- or S-bands.
 - Track targets from horizon to horizon.
 - Certified for full on-orbit capability. Downlinked telemetry may be received in either analog or digital format.

Communications

Radio Frequency (RF) Communications:

- More than 40 ultra-high-frequency (UHF), very-high-frequency (VHF), and high-frequency (HF) transmitter receivers.
- UHF flight termination systems, for IRIG or EFTS based systems
- Extensive range intercommunication system consists of:
 - Trunk lines
 - Public address systems
 - Commercial telephone systems
 - Military ground-communication networks.



- An integrated communications system, including:
 - Ground-based fiber optics.
 - Orbital satellites
- Satellite Communication capability.
 - Used to relay telemetry, radar, audio and video data

RADAR

- Two high-accuracy, C-band instrumentation radars.
- Track targets out to a distance of 3,000 nautical miles with accuracies to 0.0006 degrees in angle and 30 feet in range.

Video

- Numerous fixed and mobile camera systems for flight monitoring, safety and mission control.
- Long-range, broadcast-quality, high-definition optical system providing day and night (including infrared) coverage
- Coverage of the flight line, ramp areas and runways.
- Mobile video vans
 - Capability to relay live-action imagery via microwave links.
 - Capability to relay live action imagery via ground video van C-Band TM uplink.
 - Downlinked video from research vehicles or chase aircraft can be received in C-, L-, or S-band frequencies.
 - Video recording is provided on Super VHS, Beta Superior Performance, DVD, and other high-definition media.

Contact Information

www.aeronautics.nasa.gov/atp

Darryl Burkes

WATR Project Manager

Dryden Flight Research Center

661-276-2517

E-mail: darryl.a.burkes@nasa.gov