NASAfacts

Hangar AE

Hangar AE at Cape Canaveral Space Force Station in Florida houses control rooms providing real-time voice, data, and video information for expendable launch vehicle checkout and operations, and is used to support the uncrewed launch vehicle fleet. Photo credit: NASA/Ben Smegelsky

Hangar AE, at Cape Canaveral Space Force Station in Florida, provides real-time voice, video, and data for vehicle checkout and launch operations. The building contains a Mission Director's Center, three Launch Vehicle Data Centers, a telemetry ground station, and offices for payload and contractor personnel. Services can be configured to concurrently support any uncrewed launch vehicles, making Hangar AE a crucial communication center for NASA's Launch Services Program (LSP).

LSP vehicle engineers use Hangar AE to provide independent verification and validation of the launch vehicle and NASA spacecraft readiness. This separation from the vehicle-specific launch system provides managers and engineers insight into processes and operations of the commercial launch market for all of NASA's missions.

Built in 1958, Hangar AE originally was designed for the Department of Defense Mace missile program, housing missile components. The facility was acquired by NASA in 1960 from the U.S. Air Force and modified as a telemetry station for the U.S. uncrewed rocket program and occasionally used during the Space Shuttle Program.

Currently, LSP uses Hangar AE as its communications center and can operate 24 hours a day, seven days a week, 365 days a year. It receives, records, processes, and displays telemetry data signals from pre-launch checkout through launch, spacecraft separation, and orbital insertion. In some missions, like Artemis, AE acts as the prime interface between NASA's Launch Control Center, external ground data stations, and space tracking assets like the Tracking and Data Relay Satellite System, a communication signal relay system.

As access to space grows, Hangar AE is committed to keeping up with the increasing launch cadence by continuing to improve its systems and capabilities.

Mission Director's Center

The Mission Director's Center, or MDC, is LSP's premier control room in Hangar AE. The MDC is designed for senior managers to support ground testing and liftoff of any launch vehicle. The MDC includes

MDC Quick Facts

- 41 console positions
- Dedicated area for two Public Affairs Officers
- Fully configurable voice, video, timing, telemetry, and internet services per console
- 3 high-definition (HD) cameras
- 32-foot mission video wall

The Mission Director's Center (MDC) is a control room inside Hangar AE. Mission managers support ground testing and liftoff of launch vehicles from the MDC. Photo credit: NASA/Ben Smegelsky

34-inch ultra high definition monitors which allow senior managers to see video, voice, and data all on one screen. With the modular design of the systems, the MDC can support missions at both Cape Canaveral Space Force Station on the East Coast and Vandenberg Space Force Base on the West Coast.

Launch Vehicle Data Center

The Launch Vehicle Data Center, or LVDC, is LSP's world-class, multipurpose control room. The LVDC, consisting of three rooms, was developed to support multiple operations in parallel or a single launch. Each room contains up to four 34-inch, ultra high-definition monitors with a side touchscreen voice instrument for heavy data users.

Each LVDC console has a multichannel voice instrument called a Mission Operation Communication System, or MOCS. MOCS provides viewing of 40 voice nets simultaneously. These voice nets are connected to all NASA centers, commercial launch providers, customer mission operation centers, and the U.S. Space Force.

The video system can have up to 256 high-definition video signals from around the Cape, including commercial launch providers, spacecraft processing facilities, and tracking cameras. Each console can display up to eight of the 256 signals via unique, customizable size-and-location video windows. Each LVDC also has a 16-by-9-foot mission video wall.

Console users can view processed telemetry data using in-house applications like WinPlot and Iris Client. Winplot allows users to plot large quantities of real-time or archived data onto graphs, while Iris Client displays real-time measurements on custom, user-built pages. With portable and scalable services, AE can securely display data to any user, anywhere around the world.

Telemetry Lab

The Telemetry Lab, or TMLAB, is designed to process the ground and airborne telemetry streams of any launch vehicle. The TMLAB can process every sample and measurement of 12 simultaneous data streams. Ground testing is conducted through AE's fixed antennas and other antennas around Cape Canaveral. The TMLAB can provide concurrent telemetry streams while analyzing data and the best source selecting from one, to many, launch vehicles. Additionally, TMLAB maintains an online archive of decades of launch vehicle telemetry.

Combining AE products and TMLAB's connectivity to NASA, the U.S. Air Force, commercial sites, and networks downrange, LSP maintains the capabilities to support any vehicle, at any time, and at any location around the world.

Inside Hangar AE's Launch Vehicle Data Center, NASA and contractor managers and engineers monitor progress of the countdown and liftoff of rockets that boost payloads to low-Earth orbit and beyond. Photo credit: NASA/Ben Smegelsky

Historic Timeline

1956

During 1956, prior to construction of Hangar AE, the Vanguard project was intended to be self-contained to the maximum extent possible. Its telemetry stations were located in trailers at the T-Pad, Hangar C, and later, Hangar S. Photo credit: U.S. Air Force

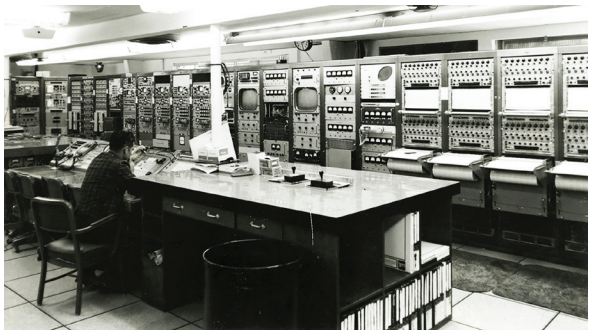
1960

When the Vanguard project concluded, NASA took responsibility for supporting the Thor launch vehicle which was later renamed Delta. Support was provided from Hangar H and additional trailers. Photo credit: NASA

1963

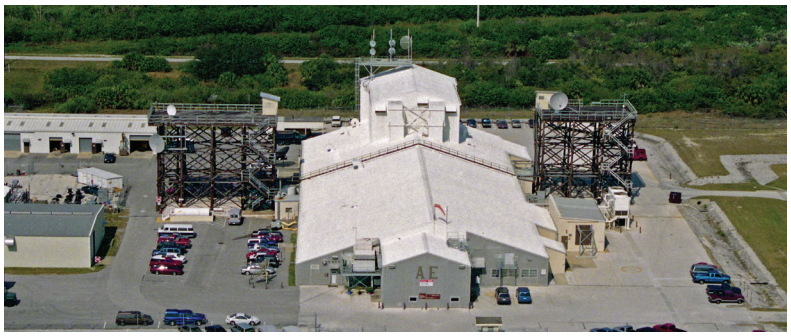
The expendable launch vehicle data station moved out of trailers into Hangar AE, establishing both the Mission Director Center and the Launch Vehicle Data Center. Photo credit: NASA

1967



A view of the Telemetry Laboratory in February 1967. The lab is designed to process the ground and airborne telemetry streams from any launch vehicle in the U.S. fleet and also has supported numerous spacecraft. Photo credit: NASA

1998



In 1998, Launch Services Program is born and NASA's Kennedy Space Center is responsible for agency oversight of launch operations and countdown management. A multi-year project began to upgrade the telemetry processing and voice switching systems in Hangar AE. Photo credit: NASA

2023

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2023

LSP Communication Engineers monitor the progress of a launch countdown in the Hangar AE Communications Room. Photo credit: NASA/Ben Smegelsky