



The MILA Spaceflight Tracking and Data Network

Every Space Shuttle launch is a step into the future as astronauts carry out dreams of discovery in space.

The MILA Spaceflight Tracking and Data Network Station contributes greatly to Kennedy Space Center and other NASA centers by tracking the Space Shuttle using radio transmissions during the first 7-1/2 minutes of launch. Because the operation is located away from the KSC processing areas, it is sometimes overlooked as one of KSC's operational areas.

MILA gets its name from an acronym, Merritt Island Launch Annex, which was the land across the Banana River from Cape Canaveral in the area now called KSC.

The tracking station serves as the primary voice, data and telemetry communications link between the Shuttle and the ground from launch until 7-1/2 minutes into the flight. Millions of clues about the performance of the Space Shuttle's main engines and other com-

ponents are communicated to launch managers, technicians and engineers on the ground, who must keep their fingers on the pulse of the Space Shuttle during the critical ascent period. MILA is also used during a Space Shuttle landing at KSC and provides communications beginning about 13 minutes before touchdown. Also, MILA can be called upon to provide data transfer support for NASA's Expendable Launch Vehicle missions and orbiting scientific satellites.

In addition to providing launch support, the tracking station assists KSC, the Johnson Space Center in Texas, the Jet Propulsion Laboratory in California and the Goddard Space Flight Center in Maryland in making sure that communication systems on orbiters, Space Station elements, scientific spacecraft and other payloads receive and transmit information correctly through their antennas before launch. In a typical year, MILA provides through KSC more than 10,000 hours of data between spacecraft and data users.

Although MILA is located at KSC, it actually is a Goddard Space Flight Center operation. The tracking station was originally established at KSC in 1966 by Goddard as part of a global, ground-based data network of 17



(Above) An electronics technician reviews Data Quality Monitoring of the received and transmitted data.



(Right) Another technician controls movement of the antenna.

tracking stations that provided orbital support to the Apollo program and Earth-orbiting scientific satellites. These stations were gradually phased out with the creation of the Tracking and Data Relay Satellite (TDRS) constellation. MILA is no longer necessary for routine orbital communications, but still provides backup support to the TDRS constellation. Yet, the MILA tracking station still remains essential for Space Shuttle launch support until a normal loss of signal. The TDRS system then tracks the ascending Space Shuttle into orbit and throughout the mission until landing.

Beginning with STS-1 in 1981, the Ponce DeLeon Inlet Tracking Annex at Ponce Inlet in New Smyrna Beach, located 30 miles north of Kennedy Space Center, was added to MILA's support capability. Known as "PDL," the station tracks the Space Shuttle during the second and third minutes of flight when the highly reflective plume of the Shuttle's Solid Rocket Boosters impede S-band radio transmissions to MILA.

The most dramatic change for MILA since STS-1 is new technology. The transition to automation is allowing the development of new computerized workstations that significantly reduce costs. Also, analog recorders and data tapes have given way to new digital systems and fiber optics that improve reliability and bandwidth. Equipment and software upgrades continue to ensure the reliability of the data collection and transfer. MILA has supported the missions of several scientific satellites including the Hubble Space Telescope, LandSat-5, the X-Ray Timing Explorer, SAMPEX, WIRE, TRACE, TOMS-EP, and SWAS.

Because the data that it receives and transmits is so vital, MILA has its own set of 250- and 500-kilowatt generators that go into action before launch and landing to ensure that the power supply to the operations remains uninterrupted. MILA's instrumentation systems are tested and retested between flights to ensure that they are 100 percent reliable.

But some things remain the same as they did for STS-1. The same pair of 30-foot-diameter, S-band steerable dish antennas still track the ascending Space Shuttle. These antennas also support the landings at KSC, acquiring the orbiter about 13 minutes before its touchdown at the Shuttle Landing Facility. Live on-orbit television is frequently provided from these same antennas.

Located west of the Visitor Complex about a mile south of NASA Causeway, the visual appearance of the station continues now, as then, to be a field of complex antennas and arrays. A 15-foot secondary S-band antenna has been added as backup. There is also now a second UHF antenna, a "quad-helix antenna" brought to KSC from Africa after the tracking



Above, the 9-meter antenna communicates with the Shuttle Orbiter during launch, in low-Earth orbit and during landing.

station at Dakar was phased out. It is used for air-to-ground voice communication with the astronauts during launch and landing. It also provides on-orbit communications when called upon.

Once the first TDRS satellite was launched in 1983, two 10-foot-diameter steerable TDRS ground antennas were constructed at MILA. One is mounted atop a 140-foot tower. These antennas serve as a communications interface between spacecraft undergoing testing at KSC payload processing facilities and the payload operations control centers at Johnson Space Center, the Jet Propulsion Laboratory, or the Goddard Space Flight Center.

A NASA station director and Near-Earth Network Services contract employees make up the MILA team. Technicians are employed by Caelum, operations supervisors and station management by Honeywell Technical Solutions Inc., and logistics employees by SGT Inc.

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