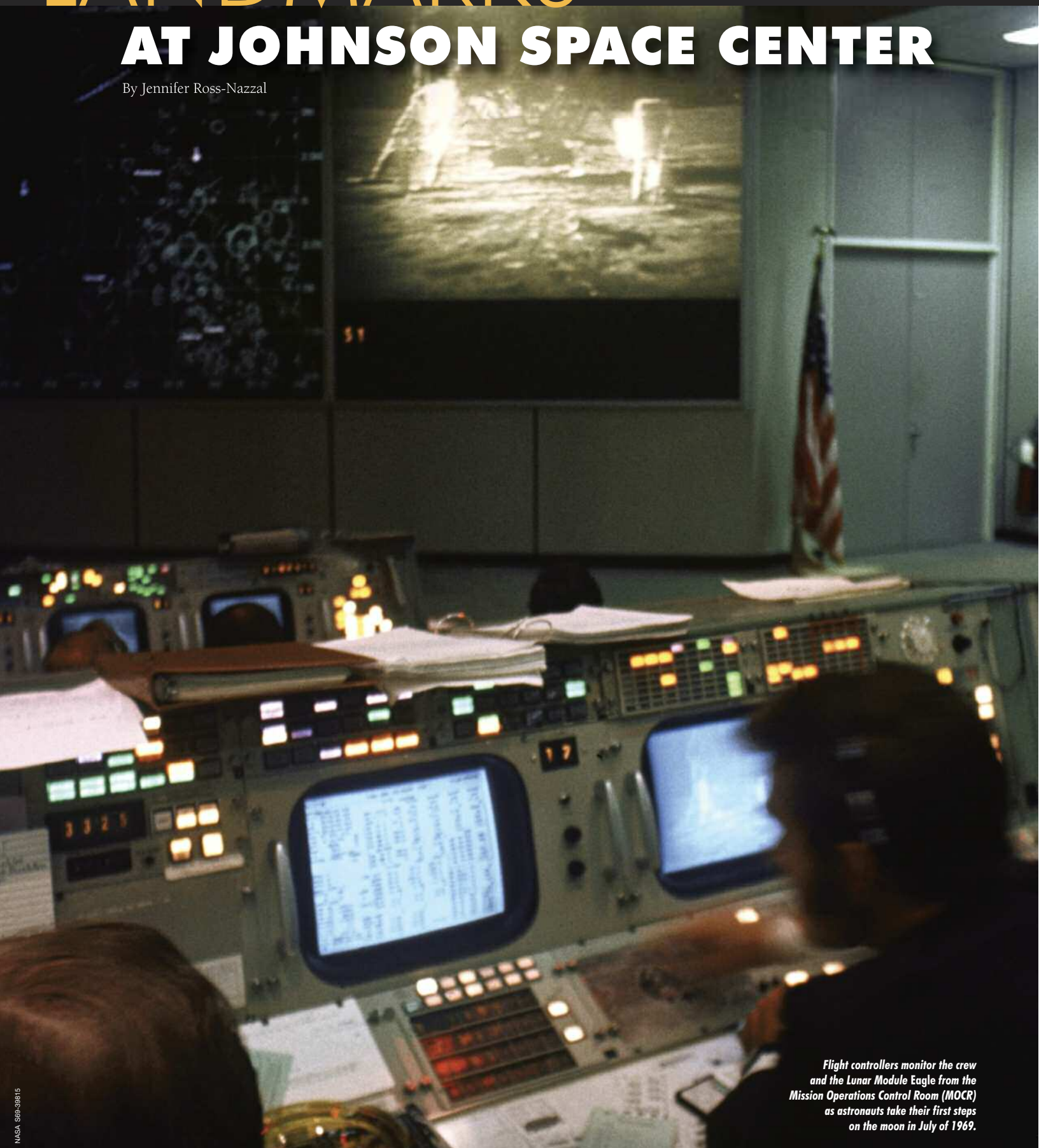


LANDMARKS

AT JOHNSON SPACE CENTER

By Jennifer Ross-Nazzari



Flight controllers monitor the crew and the Lunar Module Eagle from the Mission Operations Control Room (MOCR) as astronauts take their first steps on the moon in July of 1969.

NASA S99-38815



The MOCR, the cathedral of human spaceflight, and her flight controllers quietly await a transmission from the crew of STS-1, the first flight of the Space Shuttle Program.

NASA, S81-30886

Perhaps unbeknownst to many Houstonians, four National Historic Landmarks (NHLs) are in their backyard: the San Jacinto Battlefield and the USS *Texas* in La Porte, and the Mission Operations Control Room, and Chambers A and B of the Space Environment Simulation Laboratory (ESL) at the Johnson Space Center (JSC).

Less than 2,500 historic properties—out of more than 80,000 sites on the National Register of Historic Places, including the Saturn V at JSC’s Rocket Park—have been designated landmarks by the Secretary of the Interior.

Named NHLs in October of 1985, both facilities serve as symbols of America’s achievements in the Apollo era.

Mission Operations Control Room

Construction on the Mission Control Center (MCC) began in 1963. Its purpose was to house the areas to monitor the upcoming Gemini and Apollo spaceflights. Employees of the Flight Operations Directorate moved from their cramped offsite locations (the Stahl and Myers building and the Houston Petroleum Center) into the three-story Building 30 in June 1964. Space was allocated for key NASA engineering and scientific personnel along with representatives of the major contractors to support each mission. Their increased presence strengthened the problem-solving capabilities of the MCC team.

Within the MCC was the Mission Operations Control Room or MOCR. For the first two Gemini flights, the Mercury Control Center at Cape Canaveral directed the missions because the computers and hardware in the MOCR had yet to be tested and installed. In June 1965, the MOCR controlled the historic Gemini IV mission, which featured America’s first spacewalk, and established Houston as the nerve center for the United States’ manned spaceflight program.

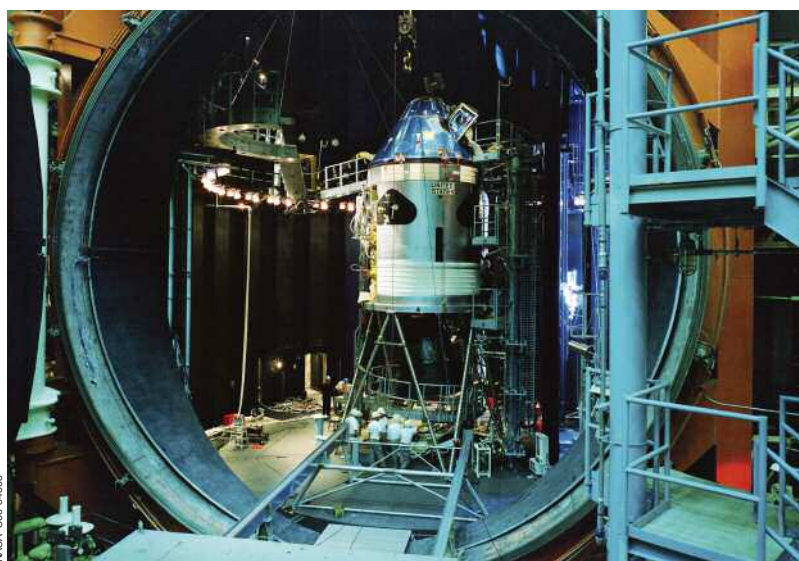
Throughout the Gemini and Apollo Programs, Americans came to identify the MOCR with the spectacular missions flown between 1965 and 1972. The first words spoken on the moon rang out in the control room, “Houston, Tranquility Base here. The *Eagle* has landed.” Television and newspaper reporters filed reports from the space center and frequently used images of the MOCR and flight controllers to convey the excitement of the flights. One of the most popular images was taken after the Apollo 11 crew safely returned home and features flight controllers celebrating the conclusion of the first successful mission to the moon. Since that time, flight controllers working in the Mission Operations Control Room have monitored multiple moon landings, the flights of Skylab (America’s first

space station), the Apollo-Soyuz Test Project (the first international spaceflight), and the early space shuttle flights.

By the 1990s, the technology supporting MCC operations was outdated and needed replacing. A state-of-the-art MCC became operational in July 1995 and the Apollo MCC was set aside as a national historic facility.

Space Environment Simulation Laboratory

JSC’s second landmark, the ESL, was less well known, though the laboratory and its test subjects occasionally appeared in a few newspaper articles. The lab was built to test hardware for



NASA, S89-31803

Chamber A houses the Apollo spacecraft 2TV-1, which is mounted on a rotating platform to expose the Command/Service Module to the temperature extremes found in space. Three astronauts participated in the testing of the 2TV-1 spacecraft in 1968 and spent a week in the chamber to check for any anomalies with the vehicle.

the Apollo Program, by simulating the conditions the systems would face in space, and consisted of two man-rated chambers: Chambers A and B. The Apollo Command/Service Module, which would ferry the crews to the moon and back home, could be tested in the chamber along with a crew of three. At the time, the size of the chamber was much larger than any that had been built by aerospace corporations, the Jet Propulsion Laboratory, or the Goddard Space Flight Center. “So when we undertook to build a chamber that was going to be 120 feet tall and 65 feet in diameter to be able to give these kinds of conditions, it was really one tremendous step, much beyond what the technology could support at that time,” Aleck C. Bond, one of the designers and developers of this facility, later recalled.¹

Testing of Apollo hardware began in 1966. Since that time, every major human spaceflight program has tested hardware in

the SESL, and both chambers remain active, ready to test NASA's hardware for the Space Shuttle and Space Station Programs, and NASA's newest exploration program, Constellation. Even though the SESL is listed as an NHL, the Center has been given permission to make modifications to the facility to enable testing of the James Webb Space Telescope, scheduled for launch in 2013.

Ongoing Preservation

Preservation is an ongoing effort at JSC. Last year, the Center's Planning and Integration Office surveyed and evaluated JSC's facilities in Houston, the White Sands Test Facility in New Mexico, and Air Force Plant 42 in Palmdale, California, to determine whether any of the Center's facilities were eligible to be listed on the National Register of Historic Places. Properties that supported the Space Shuttle Program were considered. Eventually, seven JSC facilities in Houston were determined to be eligible: Buildings 5, 7, 9, 16, 30, 44, and 222. Also included are the White Sands Space Harbor, or landing strip for the shuttle in New Mexico, and two buildings in Palmdale: the Orbiter Lifting Frame and B150.

Building 5, known as the Jake Garn Mission Simulator and Training Facility, is a crew training facility that contains simulators to train the space shuttle crews. Some of the

Chamber A's forty-foot door towers over two technicians.



NASA S74-32122



NASA S88-16883

George E. Mueller, NASA's Associate Administrator for the Office of Manned Space Flight, is briefed during a visit to the SESL Vacuum Chamber and Control Room.

Center's major test facilities—vacuum chambers and advanced environmental system control laboratories—are housed in the Crew Systems Laboratory or Building 7. Building 9 houses, among other things, a Crew Compartment Trainer and Full Fuselage Trainer (mockups of the space shuttle orbiter) to help to prepare space shuttle crews for flight. Building 16 houses the Shuttle Avionics and Integration Laboratory, used to provide software verification. Building 30 is the Mission Control Center, which includes the Shuttle Flight Control Room, and 44, the Communications and Tracking Development Laboratory, tests space shuttle radio frequency communication systems. The shuttle's Thermal Protection System (or tiles) have been rigorously tested in Building 222, the Atmospheric Reentry Materials and Structures Evaluation Facility.

Currently JSC's Historic Preservation Officer, Abdul Hanif, is working with the National Park Service on the recordation of these buildings to determine how the Center can mitigate any adverse effects on these seven properties as the agency begins to close out the Space Shuttle Program and begins ramping up for the Constellation Program. As an active space laboratory working on the cutting edge of technology, the configuration of JSC's facilities were never meant to be permanent. They were built to change over time, not to remain fixed in time as technology and programs changed.

The National Park Service will help the Center determine how JSC's facilities can be modified and what needs to remain to preserve the history of the Space Shuttle Program. Many of the facilities may simply be documented with large format photographs, drawings, and written documentation. While the idea may seem contrary to those who favor preserving JSC's historical facilities, this is an acceptable option for preservation. Following the survey, JSC will begin the process of nominating these buildings for listing on the register. ★