



For Network Personnel Only

TECHNICAL INFORMATION BULLETIN

THE MANNED SPACE FLIGHT NETWORK

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Apollo 11 Mission A Success— Americans First On The Moon

"Houston—This is Tranquility Base Here. Eagle has landed."

With these few historic words, man achieved another goal. A goal that even those who had spent the last decade in quest of that goal found difficult to comprehend and believe. Emotionally, for those involved in the Apollo program, including the thousands in the Manned Space Flight Network, it was probably the most significant event in their lives. And, when the Goldstone tracking station received the first television signals from the lunar surface the MSFN again performed their expert job in support of the Apollo program.

Throughout Project Apollo, as it was in Projects Gemini and Mercury, the MSFN made significant contributions to the success that culminated in the landing of the first men on the moon.

Touchdown on the lunar surface was at 4:17 p.m. EST (102:45:42 GET), on July 20. The Goldstone 85-foot antenna station was tracking during the Touchdown phase as they were also for the lunar EVA phase of the mission about six hours later.

During the EVA, astronaut Neil Arm-

strong unveiled a plaque attached to the descent stage of the Apollo lunar module. The plaque, signed by President Nixon and the three Apollo 11 astronauts -- Armstrong, Michael Collins and Edwin Aldrin bears images of the two hemispheres of the Earth and this inscription:

HERE MEN FROM THE PLANET EARTH FIRST SET FOOT UPON THE MOON JULY 1969, A.D. WE CAME IN PEACE FOR ALL MANKIND

Another memorial to be left on the moon was a 1 1/2-inch silicon disc bearing messages of goodwill from heads of state of many nations. The messages were placed on the wafer using the technique of making microcircuits for electronic equipment.

The planting of the flag was symbolic of the first time man has landed on another celestial body and does not constitute a territorial claim by the United States.

In addition, the Apollo 11 crew carried four-by-six-inch flags of other nations of the world, the 50 states, Dis-

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Honeysuckle Creek Engineer Develops 642B Software Utility Package

Astro has a new meaning in the Manned Space Flight Network.

B. Sullivan of Honeysuckle Creek has developed a 642B software utility package called ASTRO - Apollo Simulation Tape Reduction and Organization. The system is designed for use by remote station personnel as an aid to simulations, station readiness testing and fault finding in all areas associated with command activity. The package will provide capabilities to:

1. Generate command functions and loads.
2. Store in core of up to 300 variable length command data blocks received via the Data Transmission Unit (DTU).
3. Provide selective dumping of this stored data onto magnetic tape, together with a descriptive translation



Mr. Sullivan

Mariners 6 and 7 Are Nearing Mars

Mariner 6 and 7 spacecraft are now less than a month from the planet Mars.

The two unmanned planetary vehicles will conduct a comprehensive scientific investigation of Mars, including television pictures of nearly the entire planet during the approach, as well as high resolution pictures of selected surface areas.

Pressure and chemical composition of the atmosphere will be measured and atmospheric temperature readings will be taken.

Mariner 6 was launched on February 24, 1969 and will complete its 50 million mile, 156 day Earth-to-Mars journey at 1:18 a.m. EDT July 31, when it reaches a point only 2,000 miles from the planet.

Mariner 7, launched March 27, will fly by Mars at an altitude of 2,000 miles at 1:05 a.m. EDT on August 5.

Command center for the Mariner missions is in the Space Flight Operations Facility (SFOF) at NASA's Jet Propulsion Laboratory in Pasadena, Calif. JPL manages the Mariner 1969 project for NASA.

Tracking is being performed by Deep Space Network (DSN) stations in Goldstone, Madrid, Tidbinbilla, and Johannesburg, South Africa.

If all goes well, the '69 Mariners could take up to 191 pictures, ranging from full-disc portraits to overlapping closeups. Under maximum conditions, Mariner 6 will be asked to take 50 long shots, starting 48 hours before close encounter, and Mariner 7 will be set for 93 long shots, beginning 72 hours out. If conditions appear less favorable, each spacecraft will take only eight long shots.

4. Provide an I/O console listing of the GMT time that each data block was received by the system.
5. Modify each command data block, e.g. change of Site Identification or data contents.
6. Transmit command data blocks to a DTU at predetermined time intervals.

The following examples, says Mr. Sullivan, indicate some of the ways in which these capabilities can be used:

1. Stations can record incoming command data on an M22 recorder during CADFISS checks. At the station's convenience this tape can be played back into the 642B for the purpose of making a library on digital tape. If problems are encountered during

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Historic Landing

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tract of Columbia and territories of the United States and the United Nations. These flags were carried in the lunar module and brought back to Earth. They were not deployed on the Moon.

Two other United States flags were carried in the Apollo 11 command module and will be given two Houses of the Congress of the United States upon return to Earth. They were flown over the U.S. Capitol before the mission and will be flown again over the Capitol after their return.

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CADFISS then the data recorded on the M22 can be analyzed in non-real time.

2. Command tracks for Station Readiness Test phase 3 checks can be made. The advantage of this software package over existing methods is the flexibility of the data that can be generated and the various error conditions that can be simulated in the data.

3. Stations can thoroughly check out their 642B CMD systems prior to CADFISS by using ASTRO in one system and the mission command software in the other.

4. MSFN stations can participate in local simulations in which one station can duplicate Mission Control Center using ASTRO to simulate RTC and Load Control functions and the 2.4 decom software for Cap analysis.

Doc Status

MSFN operations documentation distributed recently includes:

Change 4 to Revision 2 of the NOD--distributed June 19.

Annex C to the NOD (ALSEP operation)--distributed June 23.

Station Readiness Test (Land stations)--distributed June 4.

Station Readiness Test (Class 19 ships)--distributed June 5.

Univers of Command and Telemetry System manual--distributed June 11.

Moon View tabulations for AS-506 mission--distributed June 12.

Change to Moon View tabulations --distributed July 29.

Alphabetical Index to the NOD --distributed July 3.

Postmission Report for AS-504 mission -- distributed July 25.

Network Operations Plan for TETR-c -- distributed July 23.

Revision 1 to Pioneer E Network Operations Plan -- distributed July 22.

Ascension Vital To Lunar Mission

The "Devil's Ashpit", located on the southeastern portion of Ascension Island, is one of 25 ground stations of the MSFN.

Located 5,160 miles downrange from Cape Kennedy, Ascension Island is vital in providing data on the Apollo spacecraft soon after earth orbit insertion. Also, the 30-foot unified S-band antenna provides in-flight checkout of the Apollo spacecraft prior to injection into the lunar transfer orbit, furnishes data on early stages of the lunar flight, and supplies data lost between the 85-foot antenna facilities supporting the lunar phases of the Apollo missions.

Ascension Island, a British Colonial possession, was first discovered on Ascension Thursday, 1501, by the Portuguese Admiral, Jose Da Nova Gallegos. Composed of volcanic rock, lava, cinders, and ash, it was undisturbed until 1815 when the British took possession in order to prevent its use as a base to rescue Napoleon, imprisoned at St. Helena, 700 miles to the south. After Napoleon's death, the island was retained as a stopover for British warships. Registered as a ship by the British, it was named HMS Ascension.

Volcanic in origin and circular in shape, Ascension Island has a diameter of only seven miles - 34 square miles in area. Green Mountain, which rises to 2,870 feet, is the only part of the is-

land with vegetation. The few trees on the mountain, cedars and pines, were imported from as far away as Bermuda and Australia. Other vegetation includes varieties of fern, grass, bamboo, guana, ginger, rock roses, and mosses. The one natural water spring on the island, which causes a limited resource of water, is also on Green Mountain.

Water shortage is emphasized by an average annual rainfall of five inches. The only appreciable rainfall being above 1500 feet elevation on Green Mountain. The monthly temperature ranges from 74 degrees in September to 81 degrees in April with an average 73 percent humidity.

Three settlements on the island: Georgetown; Two Boats; and the USAF, house 300 permanent residents and 350 Americans working on the island.

The NASA station director at the Devil's Ashpit site is Donald Dunsmore, the M&O supervisor is James Murphy; the assistant M&O is Mel Fetzer. Other supervisory positions are held by B. Currin, operations supervisor; R. Tucker, communications system supervisor; H. Donnally, data systems supervisor; J. Jarboe, telemetry lead engineer; L. Hoppe, lead engineer; J. Kenworthy, acquisition aid lead engineer; C. Snyder, TDD/APP lead engineer; and L. Parker, digital ranging lead engineer.



The Ascension Island MSFN Tracking station plays a vital role in support of the AS-506 lunar landing mission and future Apollo flights.

The *Technical Information Bulletin* is published twice monthly by the Manned Flight Operations Division for Network personnel only. Since information contained herein may not have been released outside the project organization, it is to be considered privileged. Release of this information to others must be approved by the Public Information Office, GSFC. Address other communications to J. Mulvihill, TIB Editor, NASA, Goddard Space Flight Center, Code 821.1, Greenbelt, Maryland 20771, or use the MSFN teletype facilities.

Reporters Wanted

The *Technical Information Bulletin* is published for personnel of the Manned Space Flight Network.

We are asking that all who are a part of the MSFN, especially Station Directors and M&O supervisors, become TIB reporters and relay accounts of important events in your area to us.