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TECHNICAL INFORMATION BULLETIN

THE MANNED SPACE FLIGHT NETWORK

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MSFN Will Support EASEP During First Lunar Landing Mission

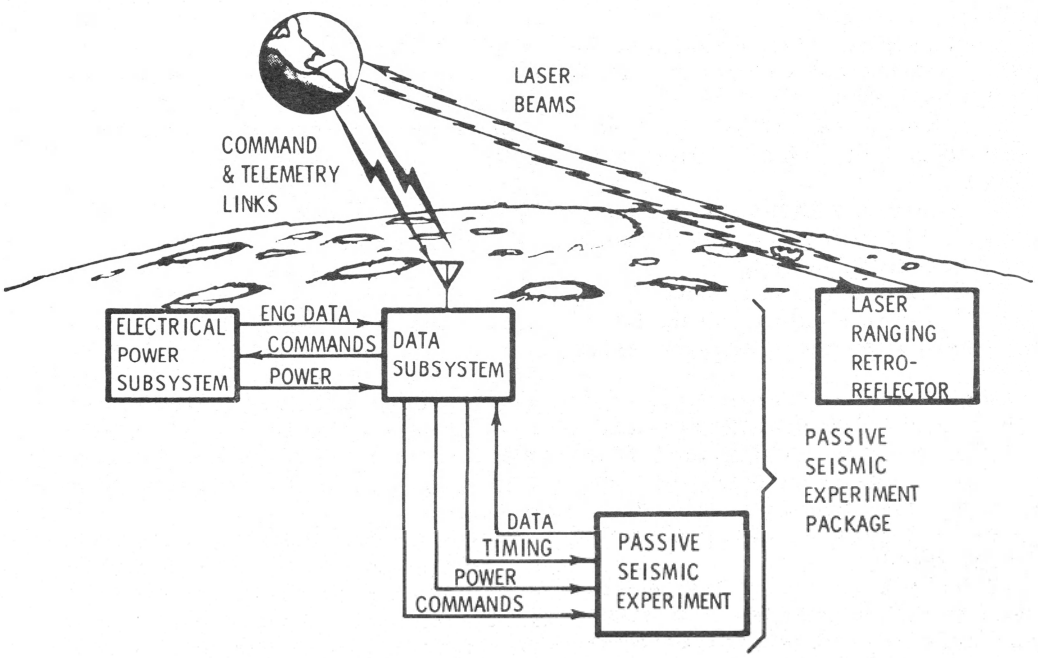
Two experiments that will reveal a great deal about the moon and its environment will be ready for the AS-506 mission projected for this summer. And, the Manned Space Flight Network will add to its support requirements data gathering from the Early Apollo Scientific Experiments Payload (EASEP), the first of four Apollo Lunar Surface Experiment Packages (ALSEP) to be carried on moon missions.

It is expected that all MSFN stations, with the possible exception of Guaymas and Antigua, will be supporting EASEP for AS-506 mission. The 30-foot USB stations will be prime for all ALSEP missions except ALSEP No. 4, which will have high bit rate telemetry which the 30-foot stations cannot handle.

Included in the ALSEP package for the AS-506 mission, EASEP, will be the Passive Seismic Experiment and the Laser Ranging Retro Reflector experiment. Communications for the Lunar package consist of an uplink (earth-Moon) for command transmission to control the ALSEP functions; and a downlink (Moon-earth) for transmission of the scientific experiment and engineering housekeeping data. The MSFN ground support stations will record the downlink data. Assigned uplink frequency for all ALSEP missions, including EASEP, is 2119 MHz. Downlink frequencies are: ALSEP No. 1-2278.5 MHz; ALSEP No. 2 (EASEP)-2276.5; ALSEP No. 3-2275.5; and ALSEP No. 4-2279.5.

Continuous 24 hour receive and transmit telemetry data support will be required by Mission Control Center and the MSFN for approximately 45 days after the package is deployed on the Lunar surface. During this period, all system will be thoroughly checked to see that they meet the minimum experiment objectives and to determine operating procedures for the remainder of the time the package is active. After the

Continued on Next Page



EASEP System Level Description

AS-505 Mission Launch Schedule Is Planned

AS-505 (Apollo 10) scheduled for launch May 18 will be a lunar orbit mission in which two astronauts will descend to within 50,000 feet of the Moon's surface.

The decision was made to fly the mission as previously planned. The decision followed a series of reviews of technical and operational data from the Apollo 9 flight and an examination of options for the next mission.

The eight-day Apollo 10 flight will have Astronauts Thomas P. Stafford as Spacecraft Commander, John W. Young as Command Module Pilot, and Eugene A. Cernan as Lunar Module Pilot. The backup crew is L. Gordon Cooper, Donn F. Eisele and Edgar D. Mitchel.

The purpose of the flight is to provide additional experience in combined system operation during the three-day trip to the vicinity of the Moon and in lunar orbit.

With the exception of the actual landing of the Lunar Module on the lunar surface, the mission plan is the same as the lunar landing mission.

While the spacecraft circles the Moon at an altitude of about 69 miles, Stafford and Cernan, in the lunar module will separate from the command service modules, approach twice to within 10 miles of one of the preselected Apollo landing sites, then rejoin Young in the command module in maneuvers similar to those performed in Earth orbit by Apollo 9.

The closest approach (pericynthion) to the surface will be the lunar module in transfer orbit. Because of propellant limitations in the ascent stage for this flight, it will be impossible to make a landing and subsequent liftoff from the Moon.

During 11 more revolutions of the Moon, the crew will make landmark sightings, take photographs, and transmit live TV views of the lunar surface, the Earth from lunar distance, and their own activities inside the command module.

Fourteen MSFN Unified S-band land stations, four Apollo Instrumented Ships, six instrumented aircraft, and the 85-foot wing stations at Madrid, Honeysuckle Creek, and Goldstone will support the AS-505 Mission. In addition, seven other stations will provide C-band tracking support. 30-foot antenna stations will be used to obtain data during launch, insertion, and earth orbit, 85-foot antennas stations (prime and wing) will be used to obtain data during translunar injection and coast,

Continued on Next Page

Goldstone Qualifies Eight Under New Operator Training Program

The Goldstone MSFN station is in the midst of a training program aimed at qualifying non-technical personnel to operate USB subsystems. Since the program's inception in June 1968, four receiver/exciter operators, two system monitor operators, a TLM recorder operator, and an MSFPT-2 PCM operator have been trained.

Developed under the direction of station director, George Fariss and M&O Supervisor Thomas Turnbull the new program was designed for individuals who did not have extensive backgrounds in electronics. Basic qualifications for the course were a high school diploma, above average reading skill, normal good health, and the ability to deal with a technical vocabulary. The training includes both classroom instruction and practical work on the various items of equipment under study. Twenty percent of the total instruction time is spent in the classroom where students are taught to read flow diagrams, the interface of associate subsystems and are familiarized with the Network Operations Directive and Station Readiness Tests. The remaining 80 percent of the instruction is devoted to actual operation of the equipment and includes equipment operation procedures, system operation procedures, and mission operation procedures. Students also take part in station simulations and Test and Training Satellite Tracking.

After successfully completing the course, students are qualified to perform a variety of sub-professional duties. These include setting up and operating portions of the Apollo Unified S-band system, maintaining records of equipment performance and other output data, and making minor adjustments and replacement repairs to the equipment they operate. The courses offered vary in length. All students receive a 5-day Apollo orientation course after which they are given further training on specified equipment. The receiver/exciter, operators course requires 20 working days to complete; TLM recorder operators and PCM operators are trained in 10 working days. To date, three men and five ladies have completed operator training.

Completing operator training at Goldstone were: William G. Bevins, Miss Cherlye A. Place, Mrs. Pennie F. Eslick, and Mrs. Elaine D. Mooso, receiver/exciter; William G. Workman, TLM recorder; Paul A. Varela, MSFTP-2 PCM; Mrs. Norma J. Wilson and Miss Alice Zamora, system monitor.

"Overall evaluation of the program is still in progress", says Mr. Farris. "However, experience at Goldstone - Apollo indicates that it is feasible to train non-technical personnel to the desired degree of operational competence."

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EASEP Support

Continued From Page One

initial 45 days each station will record for two hours continuously during each 24 hour period.

Other MSFN requirements for ALSEP and EASEP include:

1. Continuous communications, command and telemetry system (CCATS) support and continuous data transmission for some element of the MSFN.

2. Recording received data at the MSFN station and relaying it to MCC for data reduction.

3. Design of RSDP programs independent of other operational programs.

4. A turn-around time of 15 minutes so that ALSEP and other missions can be supported simultaneously.

5. Receiving and recording ALSEP data 24 hours a day during the life of the package by some element of the MSFN.

Station support requirements for ALSEP are: 85-foot stations--Support will be required during the high bit mode (10.6 kbps) for ALSEP No. 4 but must be able to support all bit rate modes and a lunar mission operation simultaneously.

30-foot stations--Support from these stations will be primary. These stations must have the capability to receive and record four ALSEP USB telemetry links simultaneously. Dual USB stations are required.

Two of the first operators trained at Goldstone under their new operating training program receive NT&TF certificates from the station director and M&O supervisor. In the photo are George Fariss, NASA station director; William Bevins, receiver/exciter operator; Cheryle Place, receiver/exciter operator; and Thomas C. Turnbull, Jr. M&O supervisor.

AS-505 Mission

Continued From Page One

lunar orbit, and transearth injection and coast phases. Eight ARIA will provide telemetry and communications support during the translunar injection and reentry phases of the mission. The four Apollo Instrumented Ships are: the insertion ship Vanguard (VAN) positioned in the Atlantic Ocean southeast of Bermuda; the two injection ships, Mercury (MER) and Redstone (RED) positioned off the southern and northeastern coasts of Australia; and the reentry ship Huntsville (HTV) positioned south of the Samoa Islands.

CYI Clock Monitor

During the AS-504 Mission, Canary Island (CYI) MSFN station was able to give Mission Control Center some unexpected help when they informed the Telemetry Instrumentation Controller (TIC) that the CSM Central Timing Equipment (CTE) clock was out of synchronization with GET. The PCM section at CYI installed a spacecraft clock monitor and interfaced it with a MSFTP-1 PCM station (CYI-CRR-06D-007). Using this clock the PCM operator can now monitor the spacecraft CTE clock in real-time during all CSM passes and CSM dump playbacks. The spacecraft clock monitor reduces by 20 percent the man-hours needed to obtain the CTE clock times off CSM dump playbacks.

Logic has been designed and is being installed which will allow the PCM operator to monitor the Lunar Module MET clock. This, according to Roger Lee, Data Systems Supervisor at CYI, will be a tremendous aid when obtaining the MET clock times of LM dump playbacks.