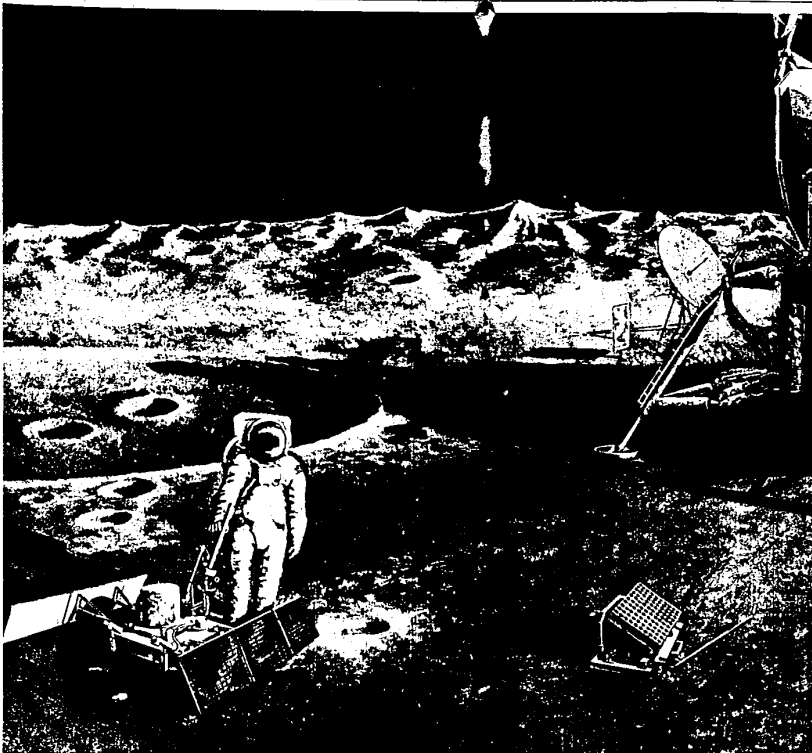




THIS IS AN artist's conception of how the experimental equipment may be deployed by two astronauts on the moon early Monday morning. The astronaut is adjusting the antenna of the Passive Seismic Experiment Package and has

already set up the Laser Ranging Retro-Reflector. Besides these two operations the astronauts will gather a sample of moon substance for analysis on earth.

Landing On Moon: 2 Plymouth Men Know The Answers

Two Observer area men will appear on CBS national television with newsmen Walter Cronkite, Sunday, July 20, at 4 p.m. to explain their roles in the experiments to be performed on the moon Monday by Astronauts Neil Armstrong and Edwin (Buzz) Aldrin.

Raydon Y. Grubbs and Theron (Terry) Tallmadge, both of Plymouth, were part of the team of Bendix (Ann Arbor), technicians who built and designed the Laser Ranging Retro-Reflector Experiment (LRRR) and the Passive Seismic Experiment Package (PSEP) that will be used for the first time in the history of mankind on the surface of the moon.

Grubbs, 1317 Sheridan, is Manager Crew Systems and Operations and Tallmadge, 358 W. Liberty, is supervisor under Grubbs for the Aerospace Systems Division of the corporation.

Both are research and design experts.

GRUBBS' CREW designed the experimental equipment so that it was as easy to use, by the astronauts as possible. They explained that the astronauts are not able to reach closer than 30 inches from the ground because of the restrictions of their bulky space suits.

Besides having limited reach, the astronauts cannot grasp firmly with their fingers because of the protective gloves. All of which means that the equipment had to be simply operated and quickly deployed. Grubbs is a 1953 West point graduate and he later earned his Masters degree in Aeronautical

Engineering from Oklahoma State University. He joined Bendix in 1967, coming from Huntsville Ala., where he worked for the National Aeronautics Space Administration (NASA) in the design of lunar orbiting vehicles.

Tallmadge has been with Bendix since 1966.

Previously he was with the American Motors Corp. for 14 years in its engineering research and development department.

Grubbs referred to Tallmadge as the "one who gets an idea and puts 100 engineers to work." Grubbs said Tallmadge has the ability to take an idea and make it a reality.

TALLMADGE explained that part of the problem involved with designing the equipment for maximum deployment was what position the lunar landing module, (LM) will be in when it lands on the moon's surface.

The LM is 30 feet wide, 23 feet high and weighs 16 tons. It has four legs, 10-feet long, with three feet diameter pads to prevent the craft from sinking too deep.

Attached to the feet are 51/2 foot long probes and when any one of these contact the moon's surface, the astronauts will shut off the engines and will have accomplished what used to be left to the prerogative of Buck Rogers and Flash Gordon.

Tallmadge said the LM has been designed so that it will not tilt more than 18 degrees in any direction. The equipment compartments should end up being no less than 18 inches from the surface and no more than about

six feet at the highest point. Asked how he can be so positive that the LM will land within all the requirements, Tallmadge smiled and crossed his fingers.

ALL THESE requirements were designed into the landing so that the astronauts could reach the equipment compartments and easily get at the experimental packages.

Once the experimental equipment compartments are opened, the astronauts will have the option of bringing out the machines by a boom or by a hand grip depending on how the LM is sitting.

The equipment is released from its moorings by the astronaut pulling a lanyard that releases an arm.

The equipment is designed to be carried the same as a suitcase is carried with all handles and lanyards about 30 inches from the ground.

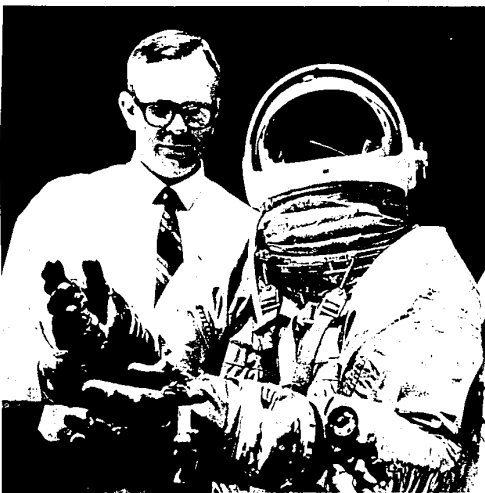
The astronauts will carry the equipment about 70 feet from the LM and set it up for use.

The LRRR will reflect a laser beam from earth along the same path to its point of origin.

This will enable the measurement between the earth and moon to be made within six inches, it will show the wobble of the earth, and also the shift in the continents. All of these things may, someday, help scientists predict earthquakes.

The PSEP will sense vibrations inside the moon and on the moon's surface. From this, scientists hope to be able to tell what the moon is composed of and determine where it came from.

Story
By Henry Teutsch
Pictures
By Harry Mauthe



THE SPACE SUIT, (above), held by Raydon Y. Grubbs, cost almost \$200,000. His crew designed the equipment to be used by the astronauts in the first experiments on the moon. A Passive Seismic Experiment Package, (left) which is skin to a seismometer used for measuring earth tremors, will be deployed to measure lunar seismic activity. The measurements will indicate the structure, strain regime and physical properties of the interior of the moon as well as record meteoroid impacts and tectonic disturbances. The solar panels convert the sun's rays into electricity which in turn will operate the experiment. Grubbs demonstrates how the astronaut will be able to adjust the antenna so that it points to the correct location of earth to be able to pick up the data the apparatus will gather. Theron (Terry) Tallmadge, also of Plymouth, is in the background. Both helped design the equipment for the Bendix Corp. in Ann Arbor.



THE LASER RANGING RETRO REFLECTOR will be a target for earth based laser beams. The experiment will precisely measure earth-moon distance over a period of several years from which fluctuations in the earth's rotation rate, measurements of gravity influences on the moon and other astronomical information can be derived. These reflectors (which are in the circles on the apparatus) have been used here on earth in such things as bicycle and highway reflectors. A corner reflector on the moon will permit a laser ray to be reflected along the same path it originates from. Theron (Terry) Tallmadge, of 358 W. Liberty, Plymouth, demonstrates how the astronauts will begin to set up the reflector on the moon.

July 21 to 26

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