MARTIN MARIETTA
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DENVER DIVISION

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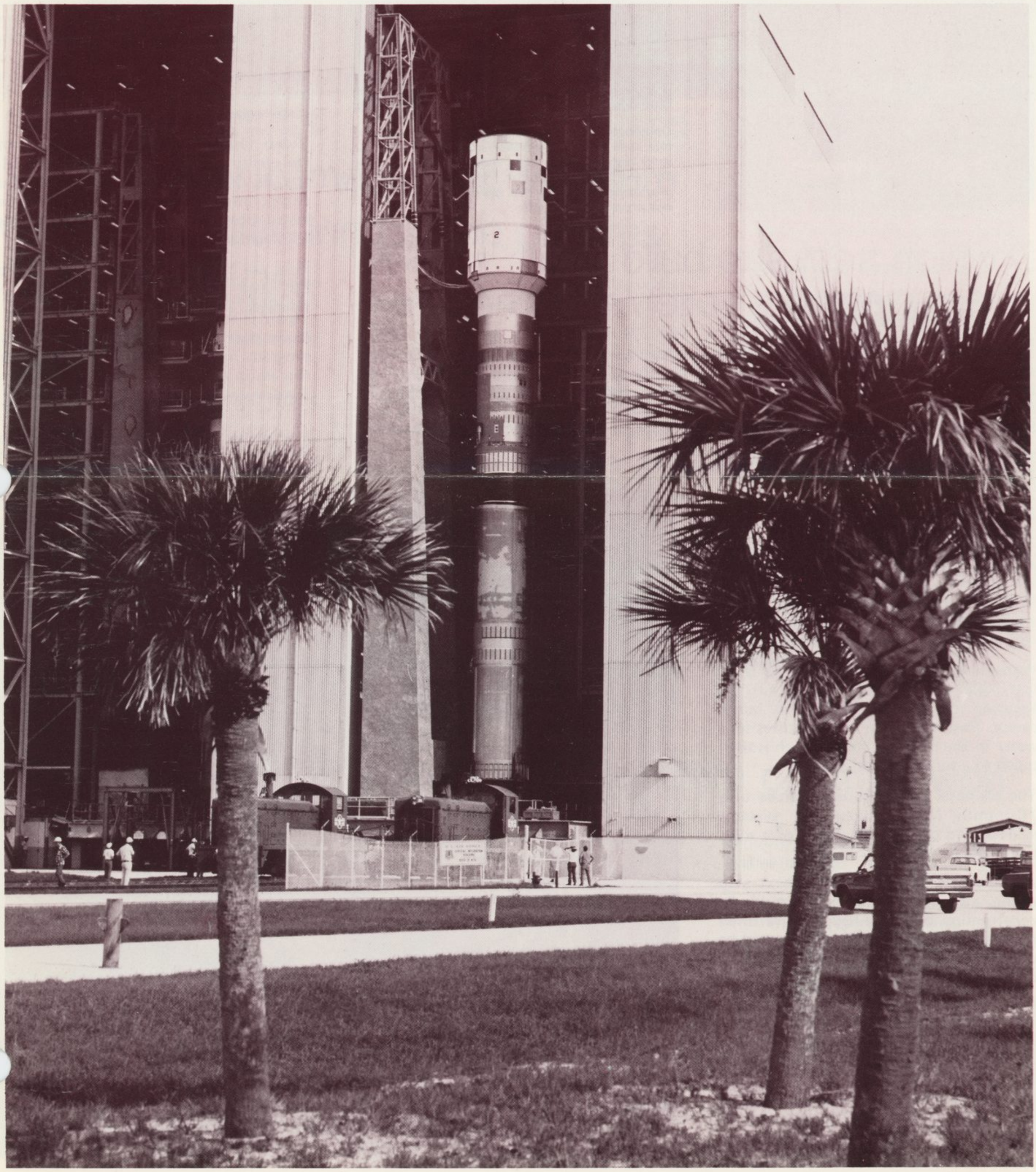

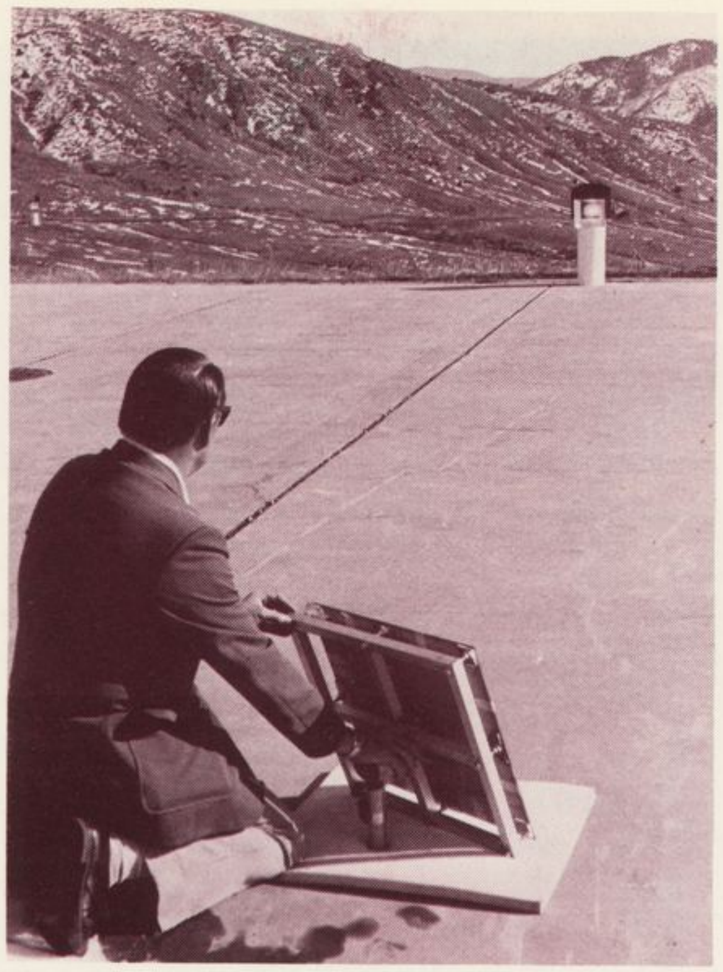

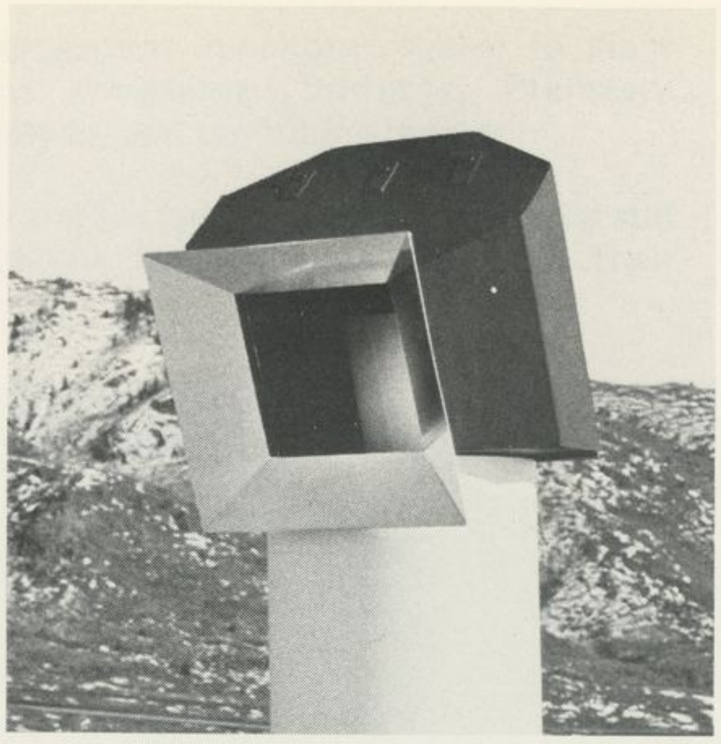

*Demonstrating one of the uses of solar energy, this scale model of a boiler/superheater uses the sun's rays to heat water, making steam to drive an electrical generator. Martin Marietta is proposing to build the device and conduct a test program in France.*

# Division seeks to build scale model of solar energy boiler/superheater

The division will submit a bid to build a scale model of a solar energy boiler/superheater. The proposal will be forwarded this month to the National Science Foundation in Washington, D.C.

The unit will be pyramid-shaped with a 7x7 foot base rising to a height of 5 feet. The solar opening at the top will measure 3.3 feet.

The boiler/superheater would be scaled around the capabilities of the high temperature solar furnace at Odeillo, France, where testing of the scale model will be conducted. It is the only facility capable of powering such a test.

Purpose of the boiler/superheater is to use solar energy to make steam by focusing the sun's rays into a boiler cavity. Resulting super temperatures turn water in the boiler to steam which is then piped to a turbine generator.

The proposal is the follow-on phase of a 10-month NSF program for systems analysis and component design of a solar power plant.

As currently envisioned, the next step after successful testing would be construction of a unit roughly five times the size of the scale model. It would be used for developing pilot plant energy conversion technology.

Work on the current program, which ends in November, is being performed in conjunction with the Georgia Institute of Technology. Floyd A. Blake is the principal investigator.

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# Two new classrooms opened for employee video tape schooling

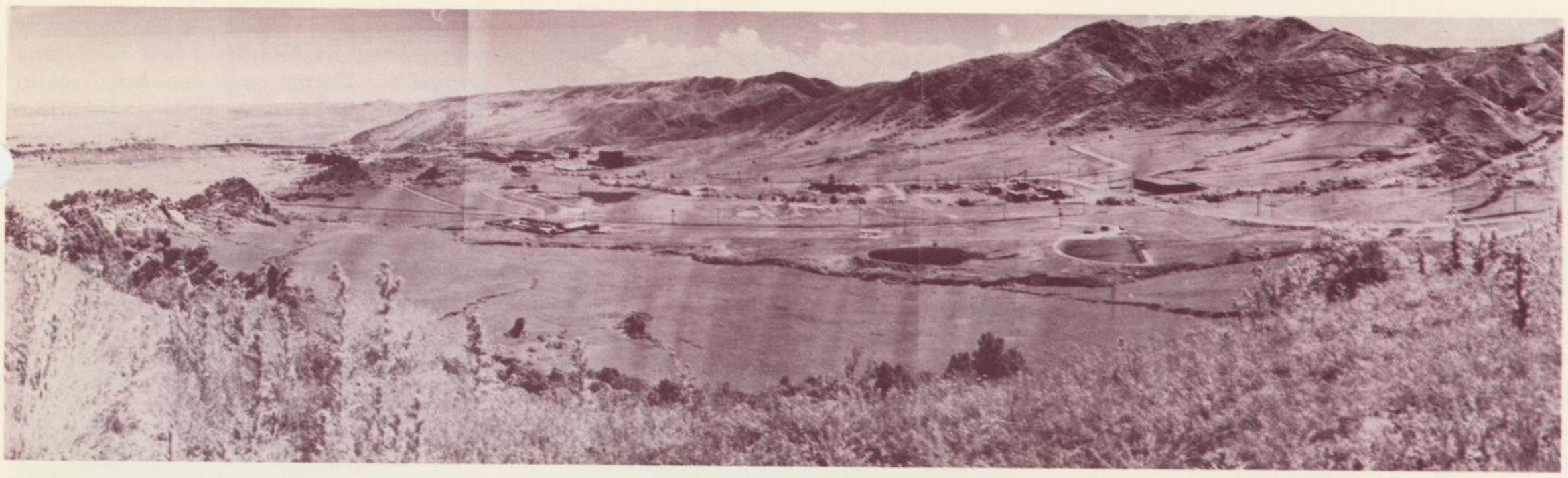
Two new classrooms in the Administration Building, capable of seating 26 people are now in use in the division's continuing Video Tape Education program. Through use of video tapes, employees can take courses leading to: graduate degrees in engineering; masters degrees in business administration; and Engineer-in-Training and Professional Engineer courses for state registration.

Video tape classroom sessions from the University of Colorado provide the EIT and PE refresher courses for professional registration. Colorado State provides instructions for engineering and business administration degrees.

First use of the new classrooms was Sept 23, the start of the division's fall semester. Twenty courses are offered.

Since start of the Video Tape Education program in 1971, a total of 33 masters degrees in engineering have been awarded division employees.

*First session in the division's new Video Tape Education classrooms was held Sept 23, start of the division's fall semester.*



*A test photograph gives an indication of the type of panoramic scenes of Mars that will be taken by the Viking lander camera. The image taken by the cameras is radioed in digital form to Earth where special equipment constructs the photos for viewing by scientists.*

# Viking lander camera/GRE to return detailed Martian landscape pictures

Photographic scenes of the Martian landscape will be returned to Earth from the Viking mission by a unique camera on the Viking lander working in conjunction with special ground reconstruction equipment (GRE).

Chief distinction between the Viking's scanning, facsimile-type lander cameras and conventional photographic imaging is the means by which the image is acquired and reproduced, according to L. N. R. Reed, science test engineer.

The Viking camera acquires an image through a system of nodding mirrors and lenses. The image is focused on an array of photosensory microdiodes rather than on a film or vidicon.

The image on the microdiode array is then broken into electronic signals and relayed via radio to Earth emerging on magnetic tape.

Processed through GRE, the tape's content will be reconstructed and recorded on film by the Jet Propulsion Laboratory in Pasadena, Calif.

## Bid request expected from Goddard for work on new satellite

The Denver division expects a request for proposal in October from NASA's Goddard Space Flight Center, Greenbelt, Md, to design and build a satellite for a Heat Capacity Mapping Mission.

This will be the first of several missions planned in a new series of Application Explorer Missions (AEM) to be conducted by Goddard.

In earth orbit, the HCMM satellite would measure the earth's thermal environment. This would be done in successive day and night passes over the same sections of earth with readings taken on each pass.

Thermal radiation from the sections mapped would then be correlated to provide both daytime and nighttime readings, as well as averages.

The satellite would be built in Denver and instrumentation for the vehicle would be supplied by Goddard Space Flight Center.

## On the cover --

*The core stages and the Centaur portion of the next Titan III/Centaur leave the vertical assembly building at Cape Canaveral on a rail journey to the launch pad. Along the way the vehicle will be fitted with two solid rocket motors. The Helios satellite it will launch will be mounted on the vehicle at the launch pad.*

A new exhibit featuring two Martin Marietta spacecraft models opened this week at the Smithsonian Institution in Washington, D.C.

*Life in the Universe* is a comprehensive multi-media presentation of the Earth's solar system, and illustrations of theories on the creation and make-up of the universe.

The exhibit features the planet Mars and the up-coming Viking mission to explore the planet's surface. A scale model of the Viking lander is part of the display.

In another segment of the exhibit, a model of the Large Space Telescope hangs from the ceiling as an example of man's tools used to seek the secrets of the universe.

The exhibit is in the Arts and Industries building in the Air and Space Museum.

# TV guidance system contract won

A contract has been awarded to Martin Marietta by NASA's Langley Research Center, for the design and testing of a guidance system to automatically guide spacecraft to smooth planetary landings or to interplanetary rendezvous.

The system would use a TV camera to provide terrain data inputs to a spacecraft's terminal descent guidance system, allowing it greater maneuvering capability in selecting a safe landing site.

Three possible uses are:

1. A system that would give spacecraft the mechanical intelligence to detect land marks just before and during atmospheric entry and be capable of guiding the vehicle to a desired landing site;

2. A system to maneuver a spacecraft exploring comets, asteroids, or other such bodies in space;

3. A system on an autonomous, unmanned spacecraft enabling it to rendezvous, inspect, and/or dock with another unmanned spacecraft.

Should all three of these potential applications prove feasible, such a system could possibly be considered on a post-Viking '75 mission.

Spacecraft landings on other planets must be automatic, since radio waves from even our closest planetary neighbor, Mars, take approximately 20 minutes one way.

# Executive Management Profiles

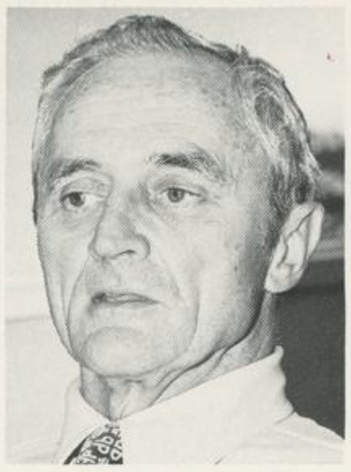
*[Twelfth in a series of sketches of the division executive management.—Ed.]*

Clyde N. Castle directs a department small in size but critical to proper division performance of the tasks and programs performed for its customers.

Castle was appointed director, Division Audit, in November 1973. His basic responsibility is to conduct a coordinated division audit program to systematically appraise financial and operational performance, keep management informed of current or potential problems, and perform the necessary followup to ensure compliance with overall audit objectives.

"Basically, an operational audit is a comparison of how the division actually does business with how our procedures and policies say we intend to do business," Castle explained.

The establishment, maintenance, and monitoring of the audit function is assured by a 13-member panel. The panel ensures that all division objectives are represented and covered.



**Clyde N. Castle**

The panel is made up of top management representatives from each of the division's 13 departments, including the offsite operations at Michoud in New Orleans, Vandenberg Air Force Base in California, and Cape Canaveral in Florida.

Contractually, the audit function could include items as small as divisional proof that welding done on a project was performed by a certified welder, as specified. Or, it could be corporate assurance that overall management of a major program complied in all aspects with customer requirements.

A graduate of Ohio State University, Castle was born June 19, 1915 in Wauseon, Ohio. He received his BS degree in Industrial Engineering from Ohio State in 1938. He joined Martin Marietta in 1939 at Baltimore.

By 1959, Castle was manager, Materials and Design Support, when he transferred to Denver as manager, Engineering Support. Castle has since served in top management functions relative to plans and programs, budgets, Planetary Systems, and the Viking project.

He and his family, including two sons still at home, live in the Littleton area. Their oldest child, Anne, is a computer programmer for Mountain Bell Telephone Company. Castle and his sons spend much of their spare time sailboating, primarily on the lake in Bow Mar where they reside.


*When fully loaded for their trips to Kennedy Space Center in Florida, transporters carrying the Viking lander capsules will weigh 16,000 pounds and carry a self-powered environmental control system for the landers' shipping structures. The transporters will travel through seven states enroute to Cape Canaveral.*

# Transferring Viking lander capsules to Florida demands careful planning

How do you move two multi-million-dollar spacecraft from Denver to Cape Canaveral, Florida?

With great care and a lot of planning, according to John Dwyer, chief of Viking logistics and training.

With launch dates less than a year away, preparations are being finalized to transport two Viking lander flight capsules to Cape Canaveral in January and February.

Route planning was difficult since the lander capsules will be contained in wood, fiberglass-sealed boxes nearly 14 feet wide and 13½ feet tall when on their trailers. When loaded, each trailer will be nearly 38 feet long and weigh 16,000 pounds. Two transporters will be used to move the capsules.

The project will require two escort cars and a crew of seven on each trip. Dwyer said temperature and humidity inside each lander capsule container must be monitored constantly, and manual control of the environment will be performed when necessary.

The vehicles will be equipped with two-way communication systems, including a portable unit for use on stopovers and breaks. The environmental control unit will include a generator unit, power management unit, and nitrogen purge system to be used when humidity inside the container gets too high.

Weather, highway design and conditions, bridge height, stopover facilities, and state laws were all taken into consideration in planning the travel route.

First leg of the route will be directly south, with the vehicles passing through seven states—Colorado, Oklahoma, Texas, Louisiana, Mississippi, Alabama and Florida. Each trip might be made in five days, depending on start times.