

MARTIN MARIETTA

news

DENVER DIVISION



Vanguard's twentieth anniversary March 17

On the cover
Vanguard lifts off from launch pad
March 17, 1958

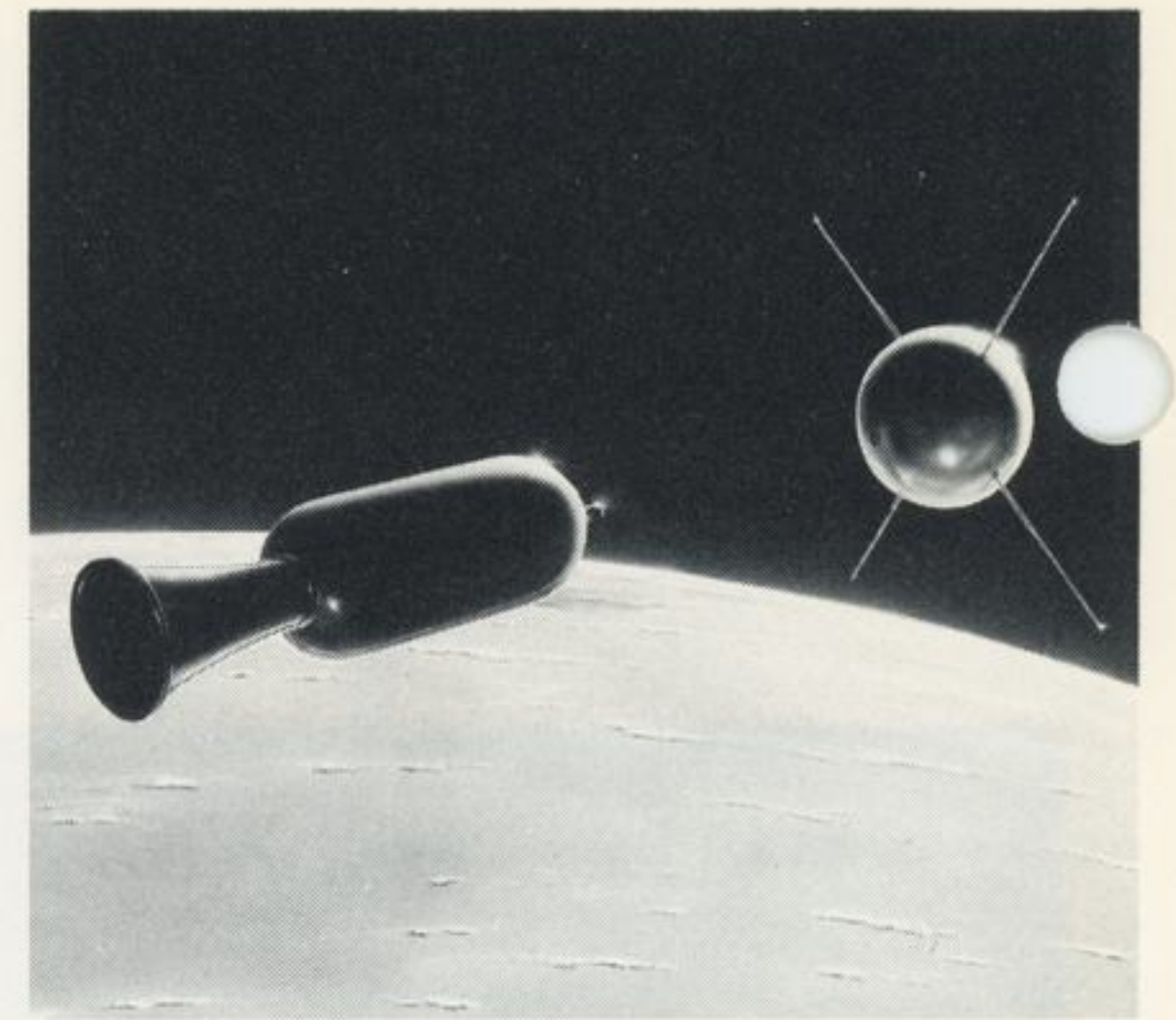
Twenty years ago March 17, a three and a quarter pound, slightly more than 6-inch diameter satellite was launched from Cape Canaveral — the second put into space by the United States.

Vanguard I rose to an orbit of 2,513 miles on top a three-stage Vanguard rocket built by Martin Marietta Corporation's predecessor, The Martin Company.

Simple and tiny by today's standards, the satellite followed by less than two months the January 31, 1958 launch of Explorer I. Vanguard was the first with solar-powered batteries. It also determined that the Earth was pear-shaped.

Both Explorer and Vanguard were part of Project Vanguard initiated by President Dwight D. Eisenhower as part of the 1957-58 International Geophysical Year.

At least eight employees now at the Denver Division were part of the Vanguard program, according to David A. Mackey, who gathered the names for the Vanguard Association, a group made up of



Vanguard I satellite goes into orbit from final rocket stage.

those who worked on the program. In addition to himself, Mackey named John M. McCorkle, Joseph Burghardt, H. Allen Davis, Arthur E. Homewood, Rudolph C. Haefeli, William L. Simonini, and Edwin L. Sipos.

"There may be others, but I haven't been able to track them down," Mackey said.

McCorkle was with the Naval Research Lab when it was assigned the task of building the satellite. He says of those days, "Those were exciting times and in some ways disappointing times. We were literally feeling our way along."

As part of the launch crew, McCorkle had a hand in propellant loading, flight mechanics, trajectory analysis, range, safety, and missile performance activities.

A few months after Vanguard's successful launch, McCorkle came to the Denver Division to become part of another successful missile program — Titan I.

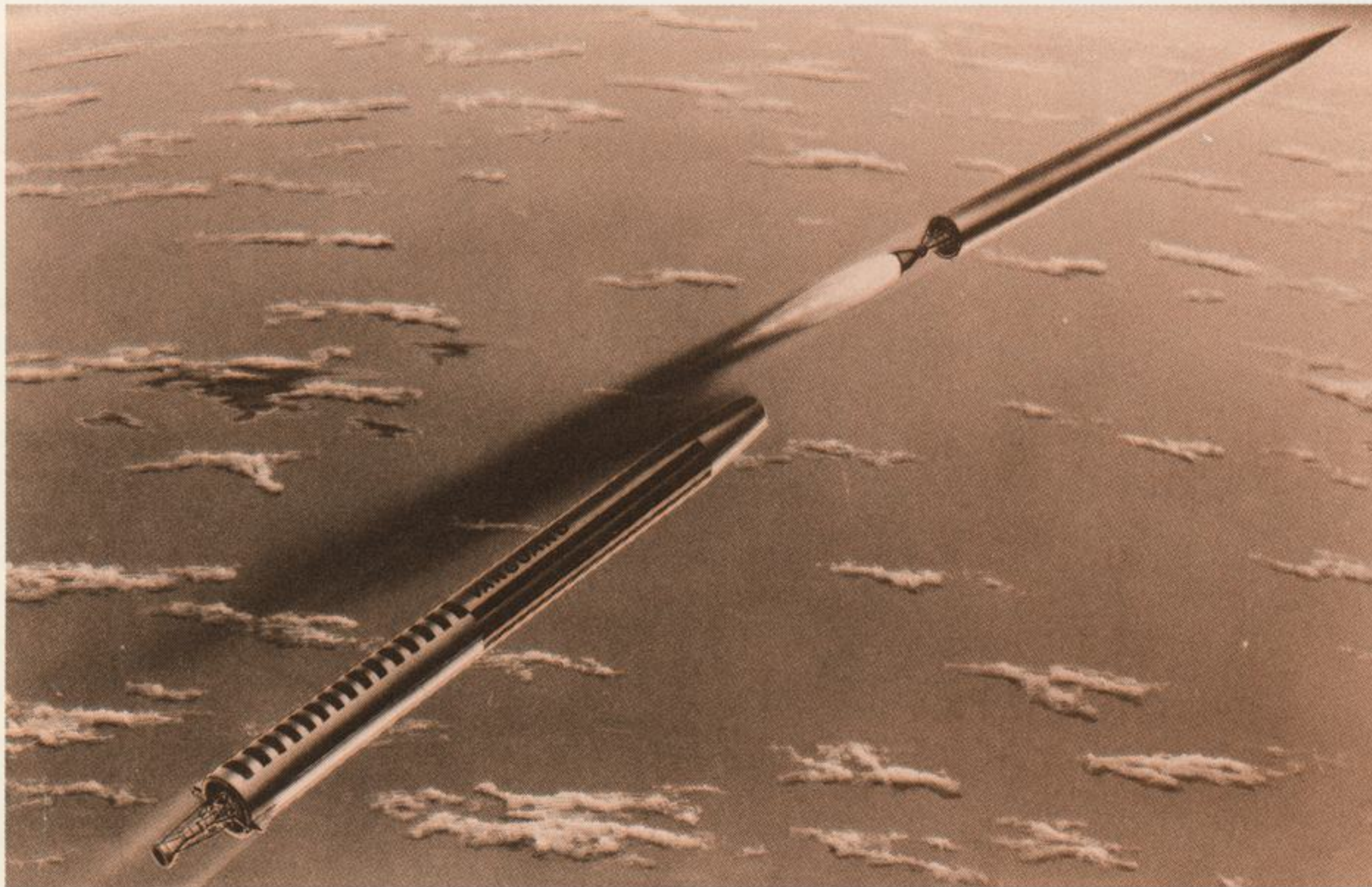
Mackey was also part of the blockhouse crew with responsibility for airborne and ground instrumentation for the then Martin Company.

Compared with today's meticulously clean conditions for space launches, the Vanguard conditions were primitive.

Mackey cited these two examples: "Once we couldn't get a valve to operate. We went out to take a look and found that a mud wasp had built a nest around the valve.

"Another incident I remember," Mackey said, "was equally frustrating. We had tested a circuit and proved it worked. The next day the circuit would not work. Florida's humidity had shorted out a connector."

Both men agreed that those primitive conditions were the foundation for the succeeding 20 years of success the United States has had in space exploration and the anticipated success for Space Shuttle.



Vanguard second stage separates from first stage in this artist's conception.

Bus service is available to DSC

A shuttle bus service is available between the Denver Division's main facility and the recently reopened Denver Systems Center (DSC) building on Wadsworth. The bus stops at the main entrance to the Engineering building and the Space Support building (SSB) as well as the DSC. There are four round trips each day and employees are urged to use this service rather than private automobiles.

The schedule:

	Departures		Arrivals
Main facility	7:30 am	DSC	8:00 am
DSC	8:10 am	Main facility	8:40 am
Main facility	9:30 am	DSC	10:00 am
DSC	10:10 am	Main facility	10:40 am
Main facility	12 noon	DSC	12:30 pm
DSC	12:40 pm	Main facility	1:10 pm
Main facility	2:00 pm	DSC	2:30 pm
DSC	2:40 pm	Main facility	3:10 pm

OASIS contract awarded division

The Air Force has awarded the Denver Division the contract for the operational application of special intelligence systems (OASIS). Allan M. Spencer Jr., named program manager for the division, has moved to Massachusetts where the electronics system division of the Air Force systems command will manage the contract at Hanscom Air Force Base.

The 24-month first phase of the contract is valued at \$6 million. This is a significant win in the new business area of the division's command and information systems organization.

OASIS is a program to update a command and control system for control of NATO Air Forces in Europe. The division's initial work will include cataloging and analyzing computer programs that exist at the Static War Headquarters (SWHQ) for use with in-place command and control hardware. As this is being done, improvements will be designed to enhance the programs and make them more responsive to the needs of the SWHQ commander and his staff. This represents significant growth to the original contract.

As the division's proposal says, "The ability to rapidly collect, receive, process, correlate, and disseminate information within the Static War Headquarters (SWHQ) is a complex task. Under periods of stress, communications to and from the SWHQ may be less than optimum.

"Large amounts of data will tend to overpower the capability of the . . .



Janet McMillan, a secretary for the Air Force plant representative office quality assurance, space support section, has been presented the AFPRO excellence award for the July-December 1977 period. Purpose of the award is to give recognition to clerks, typists, and stenographers for their excellent work.

software and hardware unless adequate reserve capacity is available. Information must be provided to the user as quickly as possible in usable form and properly correlated with available sources."

The problems, the proposal stated, are similar to those the division has had to resolve in the design work for the Tactical Flag Command Center (TFCC), which brings intelligence assets to bear on the Navy's command and control problem.

Orland Lew Butler is deputy program manager and technical director for the program for the division.

Harry L. Kottcamp will go to Europe as the Martin Marietta representative to the Static War Headquarters.

The division's command and information system organization is headed by John L. Slack. O. C. Moore will have overall responsibility for the new program as well as other Air Force systems work.

Employees earn invention awards

Seven Denver Division employees have earned awards for inventions.

Employees and their inventions:

Bruno J. Jambor, electronics: Laser Visibility Concept—A technique for measuring visibility of the atmosphere. Two potential customers have expressed an interest in the invention.

Delbert A. Morris and *Gary D. Rea*, electronics: High Speed Automated Encoder Checkout Unit—The invention is being used to sequentially check the more than 8,000 separate positions of each of the incremental encoders used on the heliostat program for the solar test facility at Albuquerque.

Theofanis G. Gavrilis and *Manuel R. Moreno*, electronics: Two Element Radial Array Antenna—Permits a reduction in size and complexity of biconical horns or phased array antennas. It is being used on the SCATHA program.

Elvis D. Simon and *Wayne E. Simon*, mechanics: Saturated Vapor Blanket to Prevent Screen Dryout—Produces a saturated gas vapor environment using liquid reservoirs of braided cable or tiny cylinders of fine mesh screen. Developed under the RCS propellant tank program, this idea expands the division's capillary tank testing capability.

Foundation endows George M. Bunker Chair at M.I.T.

The Martin Marietta Corporation Foundation has made a major commitment to the Massachusetts Institute of Technology to establish and endow a professorship in honor of its former president and chairman of the board, George M. Bunker.

The chair will be known as the George Maverick Bunker Professorship of Management in M.I.T.'s Alfred P. Sloan School of Management.

Mr. Bunker, a 1931 graduate of M.I.T., stepped down as chairman of Martin Marietta in August 1977, thus ending more than a quarter century of association with the enterprise he began shaping in 1952 when he took over leadership of the Glenn L. Martin Company. He guided Martin successfully into emerging new missile and space markets and in 1961 was instrumental in its consolidation with American-Marietta Company, a multi-industry enterprise, to create Martin Marietta Corporation.

Besides marking Mr. Bunker's managerial accomplishments, the new chair reflects the long association between the Sloan School and Martin Marietta Corporation. Dean William F. Pounds of the Sloan School noted that seventeen managers of Martin Marietta have participated in recent years in the School's Alfred P. Sloan Fellows Program and the M.I.T. Program for Senior Executives.

J. Donald Rauth, who succeeded Mr. Bunker in 1972 as Chief Executive and in 1977 as Chairman, said, "The chair is our acknowledgement of the vitality and managerial creativity that George Bunker personally devoted to the Corporation he was instrumental in creating. His was the guiding influence in the development of foundations upon which we have built Martin Marietta's new levels of success."

A native of Chicago, Illinois, Mr. Bunker received the B.S. degree in mechanical engineering from M.I.T. in 1931. He held positions with several companies, including the presidency of Trailmobile, Inc., before joining the Glenn L. Martin Company in 1952. He has held directorships in a number of companies.

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Folsom Dam and power plant are in operation.



Keswick Dam equipment is being installed.

Challenge turns to achievement for Central Valley project

The Central Valley Project was a major challenge for the Denver Division when the contract was awarded in mid-1975 and it is now being translated into a significant achievement.

"This is a fascinating program," says the division's program manager Wayne Faber. "It is one the word 'challenge' aptly described."

The Great Central Valley of California cover about one-third of America's third largest state. Years ago, uncontrolled water from the valley's river system roared through the valley during winter and spring, flooding the land with mountain rain and melting snow. In the summer's heat, the rivers often became mere trickles, forcing the valley's farmers to dig deeper and deeper in search of an ever-dwindling underground water supply.

In the 1930s, the Central Valley Project, the largest water development of its kind in the world, was begun as an effort to control floods and provide irrigation. In addition to meeting these goals, the Project has also become a substantial producer of hydroelectric power.

The division is providing a major improvement for the far-flung complex of water and power facilities operated by the U.S. Department of Interior's Bureau of Reclamation with a computer-based information and control system.

"It is perhaps the largest computer sys-

tem of its kind the division has developed," Faber said, "and it is working."

First part of the giant computer controlled system to become operational was at Folsom Dam.

"One goal of our work was to design a system that could be installed and then turned over to the customer for operation," Faber said. "Folsom was the first installation step in meeting that goal."

The system designed and developed by the division, when fully installed at Central Valley facilities later this year, will automatically regulate the output of power plants, and provide automatic switching aimed at the most efficient allocation of electrical resources. Status reports will be immediately available on the facilities on electronic displays in the project control center at Sacramento. Thirteen facilities will be controlled from the Sacramento center.

The Sacramento equipment installation will be complete in a month. It will then undergo three months of functional testing, a month of communication testing, and a 90-day acceptance test.

Shasta Dam equipment is in its acceptance test now.

The government is installing Martin Marietta produced equipment at four facilities, Trinity, Spring Creek, Nimbus,

and Tracey. Martin Marietta people are installing equipment at Keswick.

Equipment for the Spring Creek debris dam and for electrical switching points at Hurley and Cottonwood has been shipped and Martin Marietta produced software and hardware is ready for shipment to Lewiston, Carr, and Elverta.

"We have been asked to equip an additional power plant," Faber said, "and are in the process of producing equipment for New Melones."

Eight employees are assigned to work in California and four others will be going later this month. William Hughes is in charge of installation and test and currently is at the Shasta Facility. With him are Bruce Nelson, Ronald C. Cutter, John Dierks, and Ralph Trickey. Loren Snodgrass, Orville Dunn, and Lon L. Capps are at Sacramento. Scheduled to go to California this month are Robert Knickerbocker, who will be in charge of Sacramento check out and acceptance; Edward S. Chuhta; Gary D. Buehler; and Larry G. Trometer.

Systems similar to that at Central Valley are being planned by the Bureau of Reclamation, Army Corps of Engineers, and private industry. Under consideration are process control systems for other power generation plants and for more specialized process control systems, one of which could be used at a water desalting facility.



Gary Buehler, Philip Rockenbach, Donna Wadman, and Ann Habeger check out equipment for Sacramento central control.



Display panel at Sacramento Central Valley Project control center keeps operators continually informed of facilities status throughout area.

New ad program begins for Aerospace company

The first ad in the 1978 Martin Marietta Aerospace advertising program will begin appearing this month in five wide-circulation trade journals.

Headlined, "What is the value of experience in developing big systems? It reduces risk," the two-page spread will appear in *Aviation Week*, *Air Force*, *Army*, *Naval Institute Proceedings*, and *National Defense*.

At the same time, the program is being expanded to Europe, where selected ads from the 1977 United States program will appear in *Wehrtechnik*, a German publication, and in *International Defense Review*, a multilingual, multiedition magazine circulated throughout Europe. The ad will be translated into the language of each country in which it is published.

General themes for the 1978 company advertisements are precision acquisition and guidance; command, control, and communications; system reliability and the company's long history of building reliable systems and producing reliable hardware; and the preception of advance technological needs and the production of systems and hardware to meet those needs.

John H. Boyd Jr., director of public relations for the Denver Division, is directing the production of the advertisements for the broad capabilities of Martin Marietta Aerospace.

Performance Sharing Program administrator is named

With the Martin Marietta Corporation's Performance Sharing Program scheduled to start soon, the Denver Division has begun a series of orientation sessions for salaried employees eligible to participate in the program.

The program will be administered by Ilene Goorman, recently promoted to specialist-employee relations.



The new plan will provide salaried employees the opportunity for a systematic, substantial, and personal investment program. It also will provide a way to reward employees on the total Corporation performance.

Employees may contribute up to six percent of their base salaries into a choice of investment funds. The Corporation will match the employee's annual contributions based on the Corporation's results for the year.

Mrs. Goorman has been at the division since May 1956 and has been the secretary in the employee and labor relations organization for all but two years of that time. In the early 1960s she was a personnel counselor.

In her new position she will administer the new Performance Sharing Program as well as coordinate the division's United Way and Savings Bonds campaigns and the recreation program.

No initials, please

There is a new policy clarifying the nomenclature for the use of the corporate names and eliminating the use of initials as company designators.

The use of MMC or MMA for elements of the Corporation has lead to confusion

and will no longer be used in internal or external communication.

The policy also points out that the Corporation's complete and legal name is Martin Marietta Corporation. It should be used in all initial references in correspondence, articles, contracts, and other documents. Subsequent reference may be shortened to Martin Marietta, or the Corporation if there is no loss of clarity.

Initial reference to any of the five operating companies should be by the legal name, such as Martin Marietta Aerospace. Thereafter, it may be referred to as Aerospace or company, using a lower case "c."

Each of the Aerospace company operating elements are identified as Denver, Baltimore and Orlando Divisions, with an upper case "D," for division when the full name is used. Alone, division, with lower case "d" is permissible. Again, use of initials such as MMD, or contractions like MM Denver, are no longer in use.

Any exception to this policy requires the approval of the vice president of Public Relations.



J. W. Boh Jr., a senior engineer in the electronics department, received the first \$200 referral award in the division's program to find critically needed skills. Presenting the check is T.J. Perry, manager of personnel administration and staffing. Boh referred John C. Ricker who has been assigned as a senior engineer in software systems development. All employees are eligible to participate in the program. Information and application forms for job candidates may be obtained from the staffing department. Six referral job candidates have start dates and nearly 200 more referrals are being evaluated.



A completed Space Shuttle external fuel tank is loaded on its covered barge at Port Michoud in preparation for an 11-day journey on the Mississippi, Ohio and Tennessee Rivers to Huntsville, Alabama.

Two Space Shuttle test tanks head for Huntsville

Two giant external fuel tanks for America's Space Shuttle program left the Michoud assembly facility last week on a long river voyage to NASA's Marshall Space Flight Center at Huntsville, Alabama.

The tanks, traveling by barge because of their massive size, are the last of three ground test tanks to be built and delivered by the Denver Division's Michoud Operations.

The tanks will undergo ground tests duplicating vibration and structural stresses they will encounter during launching and flight.

The tanks will travel up the Mississippi River to Cairo, Illinois, turn eastward on the Ohio and then southward on the Tennessee River to Huntsville, an 11-day journey.

One tank, called the ground vibration test article, will be mated in Huntsville

with the Space Shuttle orbiter and two solid fuel rockets. The entire assembly, vertically mounted in launch configuration, will be subjected to launching and flight vibration stresses produced by an electromagnetic shaker.

The other tank, called the structural test article, will be subjected to weight loads as well as temperatures as low as minus 423 degrees Fahrenheit. The cold temperatures are produced by the super-cold liquid fuel the tank will carry.

The first tank, which had its rollout September 9, 1977, is undergoing propulsion tests at the National Space Technology Laboratories in Mississippi. A series of tests there on the Space Shuttle's main engines will use fuel fed by the tank.

Construction of the first flight external tank is progressing on schedule at Michoud, with the first flight tank scheduled for delivery late this year.

Nose cone being tested at Denver

Wind and rain are being simulated on a nose cone of the Space Shuttle external tank in a Michoud operations test program now underway in Denver's cold flow laboratory.

Primary purpose of tests is to determine if ice is formed from the atmosphere on areas of the tank where extremely cold gasses are vented from the liquid propellants at launch.

"We must assure ourselves that ice breaking away from the tank during launch does not damage the exterior of the orbiter which is mounted beside the tank," said Thomas J. Schneider, thermal analysis engineer who is conducting the tests for Michoud.

Ice formation has not been so significant a factor on previous manned missions because the propellant tanks and consequently the ice have always been below the spacecraft.

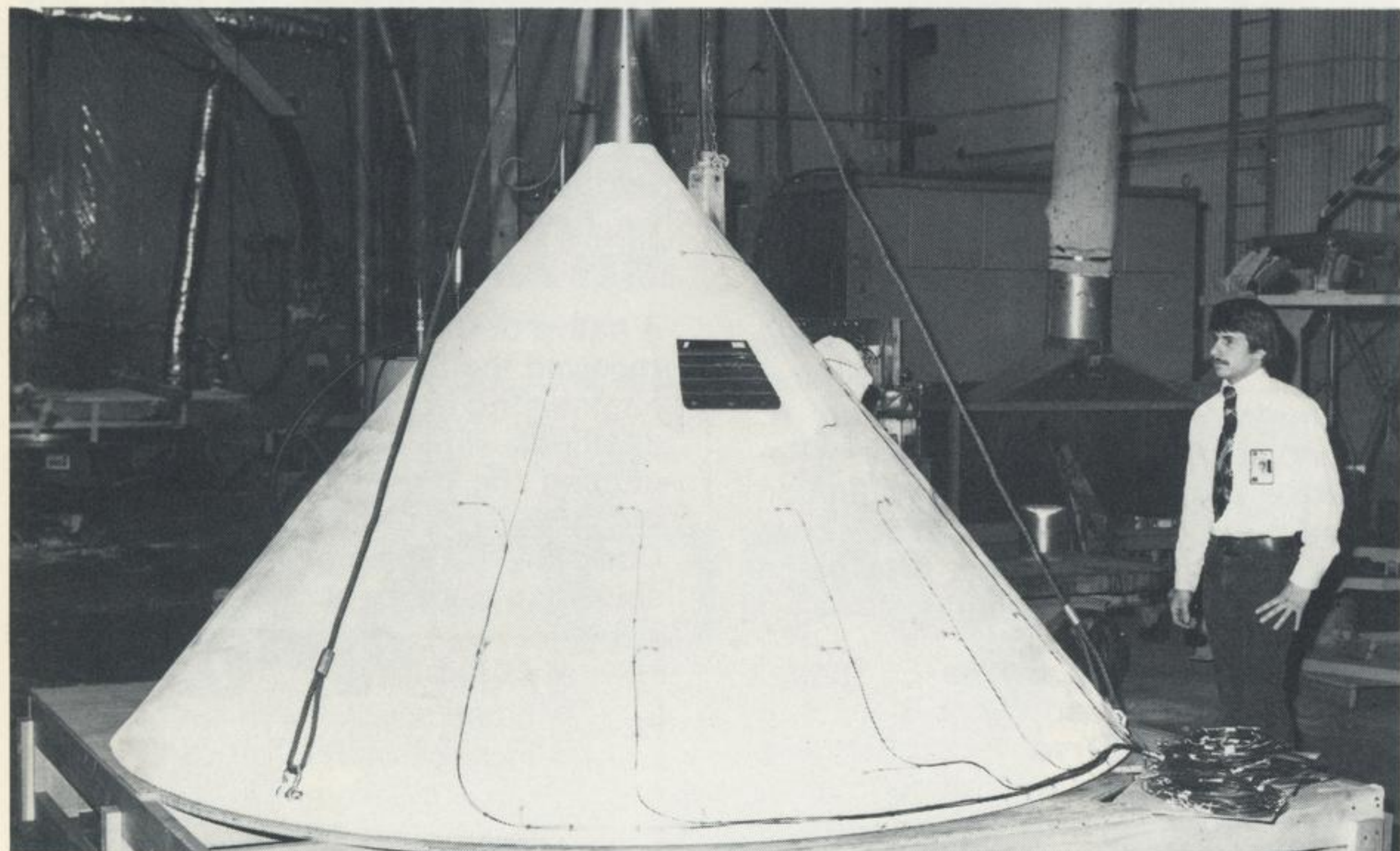
Michoud engineers have developed several new design concepts for certain fittings on the tank where ice buildup is anticipated, and will simulate these ice and frost conditions in the cold flow laboratory to test the concepts.

The test article used in Denver is a replica of an external tank forward oxygen tank section and nose cone, including the pointed lightning rod at the top, and a coating of the tank's foam-like thermal protection system.

A rain simulator made of spray nozzles mounted above the nose cone is used to determine the effects of a rainstorm on the external tank during launch.

A large blower is used to simulate the effects of ten and thirty knot winds on outlets of the tank.

Following completion of the tests about a month, Michoud engineers will then assess the effects of the wind and rain conditions to verify the current design of the fittings now attached to the outside of the external tank.



An external tank nose cone to be used in wind and rain tests in the Denver division cold flow laboratories is inspected at Michoud by thermal analysis engineer Thomas J. Schneider. This test article is a replica of an external tank nose cone, including the pointed lightning rod at the top, and a coating of the tank's foam-like thermal protection system.