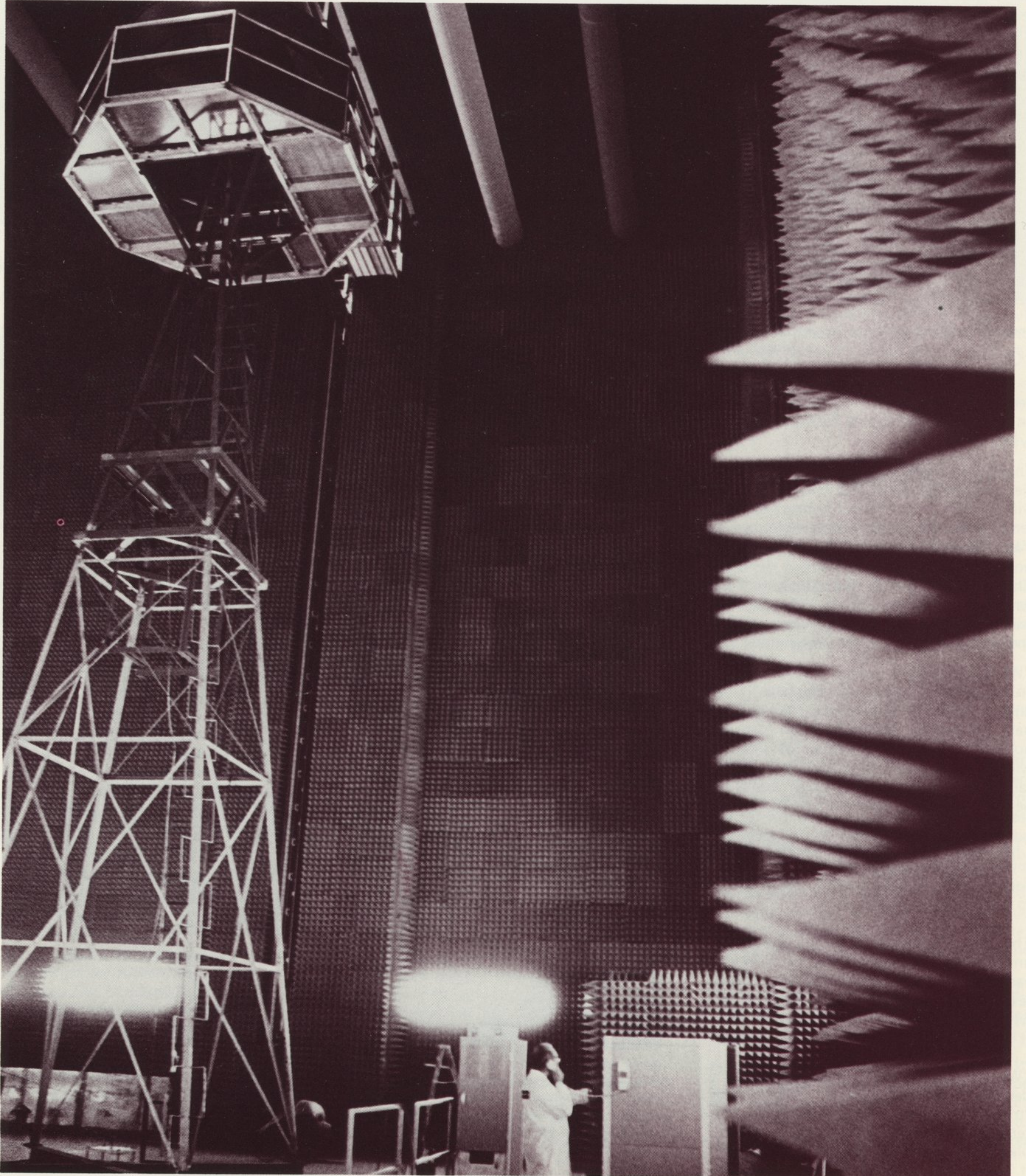


MARTIN MARIETTA

news

DENVER DIVISION

NUMBER 8/1979



President Carter gives go-ahead to MX full-scale development

President Carter announced June 8 the go-ahead for full-scale development of Missile X (MX). The Denver Division has the contract for assembly, test, and system support (AT&SS) for the nation's new intercontinental ballistic missile.

Although detailed schedules have not been completed, it is expected the division will accelerate its effort this summer and will be adding up to 800 employees in the next year to work on the project.

James W. McCown is vice president and director at the division for the MX project.

"The MX is a long-range, multi-year program," McCown said. "It will provide added stability to the division's business and work force."

The AT&SS contract calls for the division to assist the Air Force in design of the missile system and integrate production. Included is the development of test and assembly facilities at Vandenberg Air Force Base and the ground handling equipment.

In Denver, the emphasis will be on engineering and testing the total missile and on building the airborne instrumentation system.

The four missile stages, the reentry vehicle, and the guidance and control system will be built by other contractors and assembled by Denver Division employees at Vandenberg and missile deployment sites.

The decision on how the missile will be based has not been made. The division will assist the Air Force in determining the basing mode to be recommended.

"We have been helping the Air Force study basing concepts and have conducted tests," McCown said. "We anticipate the missile will be in some form of horizontal shelter. A number of shelters will be built and connected either by a rail or road network, allowing missiles to be moved from shelter to shelter."

"The missile's mobility is the key to its survivability, making it difficult for an enemy to detect its location and attempt to destroy it," he said.

The first complete missile is expected to undergo vibration and stress tests in the early 1980s in division facilities. Flight tests are tentatively planned for 1983, with deployment between 1986 and 1989. It will be operational through the 1990s.

"We are pleased with President Carter's decision," McCown said. "We believe strongly that this new ICBM will be a deterrent to war. And we are equally pleased to have a major part in producing it."



James W. McCown is heading MX project.

GE orders division high-speed recorders for new Landsat-D

A \$2.3-million contract has been awarded the division to design and assemble 15 high-speed tape recorders to store data returned from a new Landsat-D satellite. The General Electric Company's Space Division ordered the recorders. GE is building the satellite.

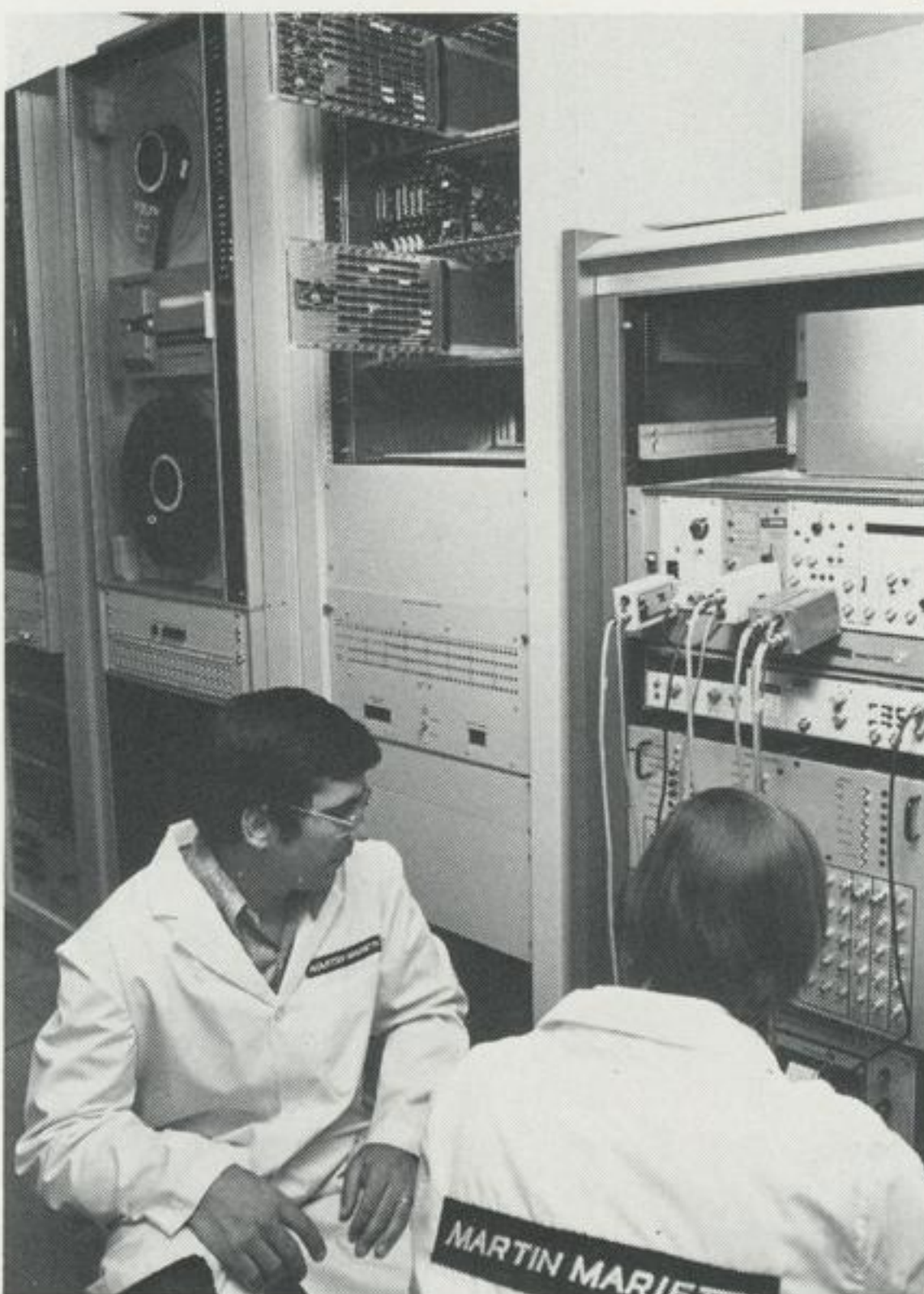
The tape recorders will be installed at NASA's Goddard Space Flight Center in Greenbelt, Maryland. Data received by

the recorders will be computer processed to produce photographs.

The tape recorders are capable of collecting data at a rate of 85 million bits (digits) per second—enough data to reconstruct one photograph every 10 seconds. If the data were translated into letters and numbers, each machine could record the equivalent of the *Encyclopaedia Britannica* every 10 seconds.

Landsat-D is the fourth in a series of experimental satellites designed to explore the earth from an orbit of 400 miles (640 kilometers). By analyzing the photographs, scientists will be able to identify air and water pollution sources; provide geological clues to oil and mineral resources; spot potential fishing grounds; detect ecological changes resulting from forest fires, earthquakes, and strip mining; and guide urban planners.

The recorders are 87 inches high, 24 inches wide, 30 inches deep, and weigh 900 pounds. They operate on 110-volt house current. The 1-inch-wide magnetic tape is up to 12,000 feet long.



Bruce Kennely, senior technician, and Douglas Fardy, technician, monitor electrical tests being run on a division-built high-speed tape recorder. Fifteen of the recorders were recently purchased by General Electric Co. to record data returned to Earth from the firm's Landsat-D satellite.

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Division products could aid in food, fiber production

Denver Division remote sensing equipment and data management systems can play a key role in protecting food and fiber production from insect threats, according to Dr. John T. Polhemus, a division senior staff engineer.

Polhemus recently completed a basic study of the applicability of remote sensing to earth biological problems. The study was done for the Johnson Space Center and will be used by NASA headquarters for program planning. Polhemus was chosen to do the study because of his background in physics, engineering, and biology.

"The study shows that remote sensing from either satellites or aircraft can be used to identify insect habitats as well as insect movement," Polhemus said. "Landsat, coupled with division-produced high-density high-speed tape recorders, could provide data for pest management programs and for solving other earth biological problems."

The desert locust, western rangeland grasshopper, tsetse fly, and cabbage looper were studied as representative of insects that are threats to food and fiber production.

"Remote sensing could have rather immediate and far-reaching application for at least two of these insects," Polhemus said. "These would be the desert locust and the western rangeland grasshopper. While remote sensing would be far less easy to apply to the tsetse fly and cabbage looper, the technique would improve control of these insects. Tsetse fly control has enormous potential impact on the development of tropical Africa.

"The Denver division's recognized ability to produce high-quality remote sensing equipment and data management systems could certainly be put to use in the programs being studied by NASA," Polhemus added.



Dr. John T. Polhemus, left, reviews remote-sensing photos with Richard C. Parker of Denver Division film services.

Division-sponsored Junior Achievers honored at banquet

Watts 'n' Steel, a Junior Achievement company sponsored by the Denver Division, was recently honored at the annual JA Future Unlimited banquet.

The company was a finalist as company of the year and as production company of the year. Bob Galbraith, the company's treasurer, was a finalist in the treasurer of the year category.

International Tow-Strap received special recognition for having \$1,000 in sales.

Individuals honored for sales achievement in the JA program were Jeanette Calhoun, \$500; Dwayne Beuthel, \$300; Dan Ryan and Wally Souza, \$200; Christine Eastridge and Tanya Harder, \$100. All were members of the International Tow-Strap company. Others honored for sales were Tom Barwinski, Brett Goodwin, and Tom Leake, \$100, Watts 'n' Steel; and Megan Evans, \$100, Colorado Designs and Woodworks.

Employee advisers for Watts 'n' Steel were Wallace E. Goodwin, George C. Kenry, James M. Hafer, Laurie O'Shea, and Robert L. Stanford.

International Tow-Strap advisers were Robert J. Ancell, Jarrett Peter, and Robert M. Rodriguez.

Colorado Designs and Woodworks is sponsored by Martin Marietta Data Systems. Advisers are Karen D. Diehl, Lyle E. Borgeman, Howard Flamberg, Robert L. Johnson, and Richard T. Mason.

Co-op student earns spot award

Brian Meyer, who will begin his sophomore college year when he completes his cooperative education work assignment later this month, has been awarded a \$250 Denver Division Spot Award.

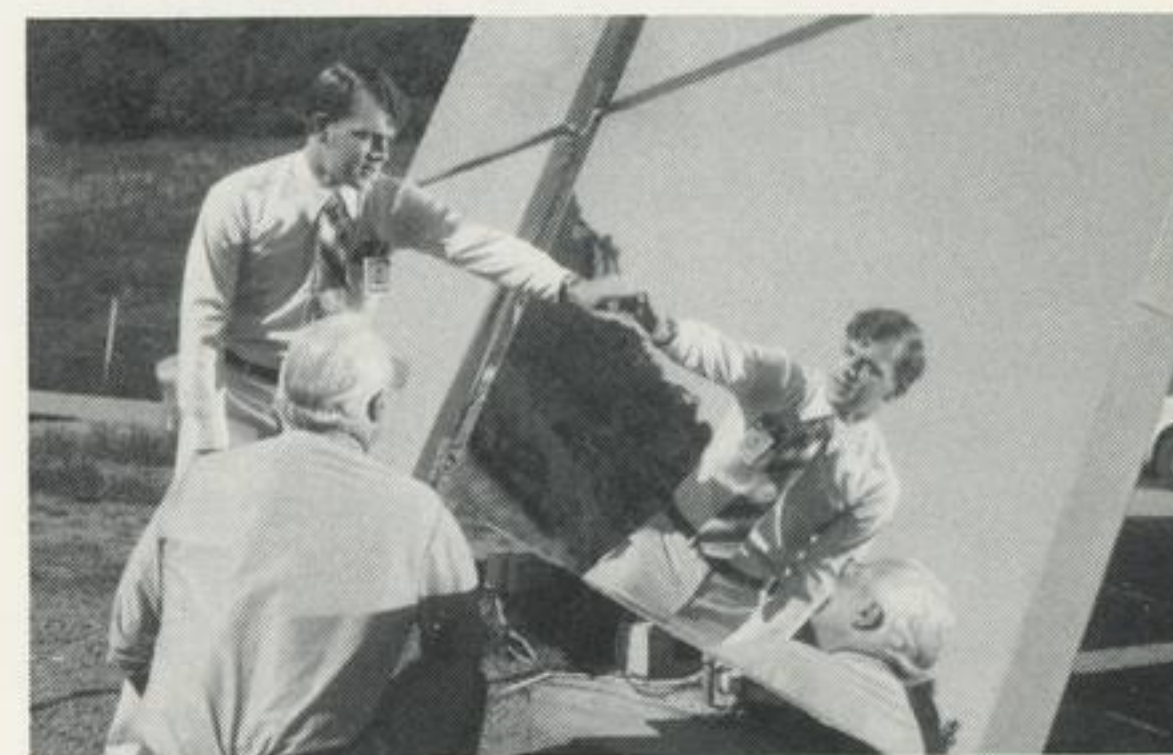
The Embry-Riddle Aeronautical University student was cited for his work on a heliostat program—assisting in setting up a method of determining mirror module contours. He was recommended for the award by Lloyd P. Oldham and Ka Lun Fogg.

Meyer, an aeronautical engineering major, is one of five co-op students on assignments at the division. Others are Debra Watkins, University of Denver physics major; Thomas Sibert, aerospace engineering, Georgia Institute of Technology; David Parker and Richard Jetley, mechanical engineering majors at Colorado State University.

The students, who must have a 2.7 grade point average, alternate work and on-campus classes, spending from three to six months at the division. All have had a variety of assignments in the technical operations department.

The co-op program is supervised by Ms Jerry A. Hardiman, an associate analyst in the personnel staffing department.

She and two mentors, Lyle E. Bareiss and Ernest B. Ress, of systems engineering, were recently honored by the University of Denver. The university presented the three certificates of recognition "for commitment and service to the cooperative education program and career planning and placement" at the school.



Brian Meyer, left, discusses mirror module. His work on the program earned a Spot Award.

On the Cover

Leonard J. Sobas, senior quality engineer, checks a computer readout in the new near-field antenna test facility. The new facility is an addition to the SSB. Near-field tests in the building will simulate a situation where a transmitting source and receiving antenna are separated by great distances, as in space. The facility will be used to test antennas for spacecraft.

Crime van to be on display here

A Jefferson County crime prevention van will be open for tours June 27 from 8:30 a.m. to 3 p.m.

The van, to be parked in front of the engineering building, is used to educate the public about security measures that help reduce criminal opportunities.

Employees quizzed on cafeteria operations

An informal survey of employee customers of the redesigned and refurbished cafeteria in the engineering building indicates that most employees approve the changes.

"It's super."

"It's quieter. The atmosphere is great. There's more selection for lunch."

"It's a lot nicer. The place is more relaxed."

These are samples of the positive reactions.

"But, we have had some employees express concerns," Joseph P. Marcus, director of facilities and services, said. Food services, under Mrs. Phyllis Montgomery, was recently assigned to his department.

"When food services became part of facilities and services," Marcus said, "I sat down with some of the cafeteria's regular customers to get their general comments and suggestions for improvements. I am convinced we have an excellent facility, but we must listen carefully to customer comments to assure that we develop the full potential of the cafeteria for employees."

"Frequently, comments related to apparent price increases," he said. "The standard luncheon combination meal—entree, choice of two vegetables or small salad and one vegetable, roll and butter, and coffee or tea with refill privilege—costs exactly the same as before the new cafeteria opened."

"There was some confusion when the salad was eliminated from the meal price, but this was corrected the first week of May when the small dinner salad was returned," Marcus said. "With the new scramble serving system and the addition of the salad bar, we have significantly increased food selection, but most of these additions necessarily are a la carte."

Other comments related to time spent in line and crowding in the serving and seating areas.

"The scramble system is a proven technique used in many places, including recreational ski areas," Mrs. Montgomery said. "Most of us are creatures of habit, and the new system has required adjustments for many of us. We will study traffic flow and make changes necessary to solve problems."

Commenting on crowding, Mrs. Montgomery said, "We have two periods during the 10:30 a.m. to 12:45 p.m. serving time when crowding has occurred—11:15 to 11:45 a.m. and again from noon to 12:15 p.m. We don't want to dictate when employees eat, but I suggest that some employees consider adjusting their lunch periods to avoid these times."

Marcus said he wanted to clear up a few rumors that have come up: "No, we do not charge for ice, as at least one employee believes. And to those in the non-smoking area, the air circulation system is designed to take smoke from other areas directly into the exhaust system without going through the nonsmoking area."

"Also, I want employees to know that remodeling funds are provided by Martin Marietta," he said. "In no way do these funds come from cafeteria sales. The objective is that the cafeteria be a nonprofit venture. If the total cost of providing fine meals for our customers is exactly offset by income from the cafeteria and vending machines, we have met our objective."

Marcus and Mrs. Montgomery both asserted, "We want to make the cafeteria an excellent place to dine at a reasonable cost. We are anxious to receive suggestions from our customers for possible future improvements in service."

RECREATION

The Ridge Riders Club will hold an open O-Mok-See at the club arena (on Martin Marietta property) June 24. The event is open to all employees, their families, and friends, who would like to join club members in an afternoon of fun and competition.

Pole bending, flag race, cloverleaf barrel, and special barrel and stake events will be conducted in three classes. Costs are: seniors (18 and over) \$1 per event; juniors (13 through 17) 75 cents per event; and subjunior (up to 12) 50 cents per event. Ribbons will be awarded for four places in each event for each class. A ribbon and belt buckle will be awarded to the overall high point winner in each class.

Registration will be at 1 p.m., and events will start at 2 p.m. Food and refreshments will be available from the club kitchen.

For directions or further information, call A. E. Hawkins, ext 3211, or Irene Woodzell, ext 4488.

NIRA fishing contest—A nationwide fishing contest jointly sponsored by the National Industrial Recreation Association (NIRA) and the American Fishing Tackle Manufacturers Association (AFTMA) is open to Martin Marietta employees and their families.

Trophies and prizes will be awarded for the largest fish in each class. Fresh-water division includes bass (small- and large-mouth), bluegill, muskellunge, northern pike, perch, white perch, salmon, and lake and rainbow trout. The salt-water division includes sea bass, dorado, kingfish, marlin, salmon, and yellowtail.

Employee named to state commission

Dr. Charles A. Hall has been named to the Colorado air pollution control commission. He was appointed to the nine-member commission by Governor Richard Lamm and confirmed by the Colorado state senate.

The commission sets state policy for air pollution standards and develops plans to bring the state into compliance with federal standards for air pollution.

Hall received his doctorate in civil engineering with an emphasis in transportation and will use this technical background while working on the commission. His appointment extends to January 1981.

A second division employee, Thomas R. Heaton, has been on the state air pollution control variance board since it was formed in 1966. Heaton is currently chairman of the variance board.

The catch may come from any waters in the United States, Canada, or Mexico.

Identical trophies and prizes will be awarded for two or more fish in the same class that weigh or measure exactly the same.

The contest runs from July 1 through December 1. Entries must be received by the NIRA tournament director within 30 days after the catch. Entry blanks can be obtained from the recreation office, engineering building 125.

Disco dancing class—Discover your disco dancing ability and expand your skills, even without dancing experience, in classes beginning June 25. Course fee is \$15 in advance for six lessons. Class will meet Mondays from 5 to 6:30 p.m. couples encouraged, singles welcome. Contact Gail Andresen, 988-7991 or the recreation office, ext 6750.

Dance exercise class—As disco dancing has conquered the country, dance exercise has gained recognition as an effective way to achieve strength, flexibility, posture improvement, and muscle tone. You don't have to be a dancer to benefit. Classes begin June 26 and will last six weeks, meeting Tuesdays and Thursdays from 4:45 to 6 p.m. Cost is \$12 for one session a week or \$20 for two sessions. Sign up and pay in advance. Contact Leslie Cooper, 756-8449, or the recreation office, ext 6750.

Discount tickets—Information on discount tickets for sporting events, theaters, amusement parks, and restaurants can be obtained from the recreation office.

Martin Marietta increases quarterly stock dividend

Directors of Martin Marietta Corporation have increased the quarterly dividend on Martin Marietta common stock from 45 to 50 cents per share.

This is the fifth dividend increase on Martin Marietta stock in the past 24 months. The quarterly rate was last raised from 42½ to 45 cents on November 16, 1978.

The payment at the new \$2.00 annual rate will be made June 29, 1979, to shareholders of record at the close of business June 5.

Titan launch success

The U.S. Air Force successfully launched a satellite aboard a Titan III booster at 11:30 a.m. Monday, May 28, from Vandenberg Air Force Base.



John G. Havrisik, No. 21, takes his final shot as a member of the Righetti High School basketball team. The 18-year-old, 6-foot 4-inch forward with a 19.6-point per game average has been named to the first team of the All California Interscholastic Federation basketball team. He is the son of Mr. and Mrs. John Havrisik. His father is chief of cost management and pricing for Vandenberg operation's finance and contracts department. Young John is seeking an athletic scholarship for college, where he hopes to major in business administration and computer science.

At Vandenberg



Jimmy Johnston doesn't need the calculator his mother, Kay, is using to come up with the correct answers as they check out a computer tab

run. Mrs. Johnston is an accountant at Vandenberg operations. At 15, Jimmy has been accepted for admission by two California colleges.

Vandenberg accountant, son face difficult academic decision

Kay Johnston, an accountant for Vandenberg operations, and her son Jimmy, have a difficult academic decision to make. Jimmy has been accepted for admission at the California Institute of Technology (Cal Tech) in Pasadena and at the University of California at Los Angeles (UCLA). UCLA has awarded him an academic scholarship. To complicate the decision, Jimmy is only 15 and a freshman at Lompoc High School.

Jimmy's acceptances at Cal Tech and UCLA are legitimate. When he was 12, Jimmy had completed all the mathematics courses available in the Lompoc Unified School District. At 13, under the tutelage of Dr. Gerald Farrell of California State Polytechnic College, he was studying advanced mathematics. In a summer session at the University of California at Santa Barbara, he took German, calculus III, chemistry, and physical education, completing the summer work with a 4.1 grade-point average—he earned an A-plus in the calculus course. He had previously taken courses at Santa Maria's Allan Hancock College, concentrating on mathematics.

Because of his age and the then prevailing California law, Jimmy could not earn college credit for his work. However, educators petitioned to have the law changed to recognize talent such as Jimmy's and

allow credit for completed work. Assemblyman Gary Hart, working with Irwin Wapner, director of special services for the Lompoc school district, introduced a bill in the California state legislature to permit granting credit in such cases. The bill was passed and became law January 1, 1979.

Qualified students under 18 and still in high school may now earn college credit.

Jimmy's mathematical genius has been a challenge to his teachers since kindergarten, when he was able to work percentage and fraction mathematical problems and recite the multiplication tables. However, he does not limit himself to the academic field. Jimmy is active in judo, with some 20 trophies, including a fourth-place finish in the U.S. Judo Federation's Junior National Championship competition last year. He reads and writes poetry and has played the piano since he was 5.

Does Jimmy skip high school and go directly to college? That is the question he and his mother must soon answer.

Jimmy's interest is in medical research. In a scholarship application he said, "I hope that someday in the future I will be able to say that I have made a contribution to the welfare of the human race, no matter how small it may be."

Michoud team completes test program at Huntsville

The Michoud operations team at the Marshall Space Flight Center in Huntsville, Alabama, has successfully completed the fourth major test program on the external tank. The test, considered the most crucial and dangerous to date, was on the liquid-hydrogen-tank test article.

William F. Barrett, Martin Marietta's manager of operations in Huntsville said his team completed six test conditions on the liquid hydrogen tank without any major problems.

Barrett recently received a congratulatory letter from James B. Odom, NASA external tank program project manager, who said the Martin Marietta team has "done an outstanding job under difficult circumstances . . . overcoming obstacles and minimizing the impact of difficulties."

Barrett said the entire Michoud operations team is to be highly commended for creating and accurately analyzing designs, fabricating the test article, and providing quality inspection of the tank.

The crew worked around the clock and on weekends to meet a tight schedule. Only the liquid oxygen tank tests remain to be completed this fall before NASA's flight readiness review. All NASA contractors' Shuttle components will be reviewed six weeks before the launch date.

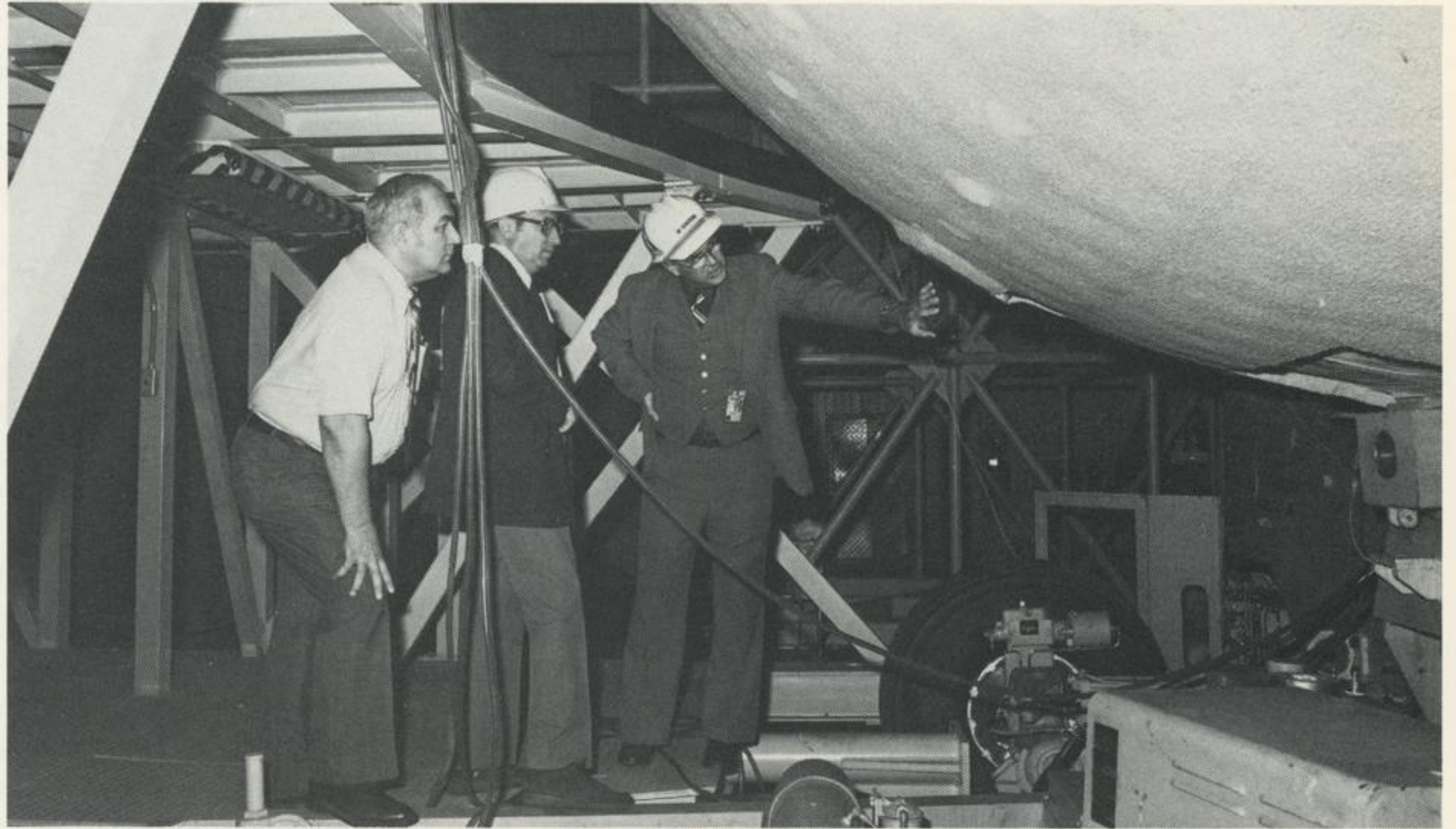
Test programs for the liquid hydrogen tank were geared to the reaction of the test article under strain and deflection of transportation, handling, prelaunch, and flight loads. This involved eight months of testing, during which 4,000 channels of data on each of the six tests were used for evaluation.

The tank successfully tested at 110% of limit load without yielding. (Limit load is the actual load expected in flight.) The tank also tested at 140% of limit load with no structural failure.

Similar tests have never been conducted as effectively without any major problems, according to Barrett.

NASA also highly commended Martin Marietta for its design and successful operation of the "doughnut." Designed by engineer Hebert T. Dieckman, the "doughnut" is a ring-shaped device at the base of the hydrogen tank through which thousands of instrumentation wires are fed to check data from inside the tank.

The device has a moat-like purge filled with inert helium to remove any dangerous hydrogen if leaks occur during testing. There are 163 connectors in the



"doughnut," each containing 61 pins. The entire test was completed without having to repair a single pin.

Before the highly praised liquid hydrogen tests, Martin Marietta tested external tank hardware, including the intertank structural test article, a modal survey of the liquid oxygen tank, and ground vibration tests.

Space shuttle Columbia's first main engine passes flight acceptance test

The first of space shuttle orbiter Columbia's engines to be flight acceptance tested passed with flying colors recently when it was successfully fired for a 520-second endurance test run simulating a launch into space.

The engine will now be given detailed electrical and mechanical checkouts, and data from the tests will be thoroughly reviewed before the engine is formally accepted by NASA's Marshall Space Flight Center at Huntsville, Alabama. Formal acceptance will follow a formal review at the test facility in Bay St. Louis, Mississippi.

After formal acceptance by NASA, the engine will be loaded on a truck for shipment to Kennedy Space Center, Florida, where it will be installed on the orbiter for launch late this year or early in 1980.

The Columbia's other two engines have been delivered to the Mississippi test facility. These engines will be flight acceptance tested using the same procedures used for the first engine.

Dr. Robert A. Frosch, center, administrator of the National Aeronautics and Space Administration, inspects the first flight external tank during a visit to Michoud. With him are, left, Paul R. Donohue, manager of final assembly and checkout, and Richard M. Davis, right, external tank project director.

NASA names new manager of Michoud assembly facility

NASA has named Dr. Mathias P. Siebel as manager of the Michoud assembly facility, succeeding Robert C. Littlefield who died May 12.



Dr. Mathias P. Siebel

Dr. Siebel has been at the George C. Marshall Space Flight Center at Huntsville, Alabama, since 1965. For the past five years, he has served on the technical staff of the director of the space science laboratory, science and engineering directorate. He was deputy director, and later director, of the former manufacturing engineering laboratory from 1965 to 1974.

Born in Witten, West Germany, Dr. Siebel earned his bachelor's and PhD degrees in mechanical engineering at the University of Bristol, England. He became a U.S. citizen in 1962.