

OPEN HOUSE JULY/1980



# Denver division continues growth in first half of 1980

Employment at the Denver division grew by 1125 during the first half of 1980.

The forecast is to add 1060 employees during the remainder of the year.

Denver metropolitan employment reached 6453 by the end of June. Another 4182 employees work at the division's operations in Louisiana, California, Florida, and Massachusetts.

C.B. Hurtt, Denver division president, said, "We are gratified that our planning and research are bearing fruit in the acquisition of new business. It is important to continue this growth while maintaining our rigorous dedication to mission success."

The new employees are needed to support the increased pace of work on the Missile X programs, elements of the Space Shuttle project, and in command and information systems.

The division has been conducting a vigorous nationwide recruiting campaign, including radio, TV, and newspaper advertising.

## \$89 million spent in state

The division contributed about \$89 million to the Colorado economy in the first half of 1980. Of this amount, \$76.9 million was in payroll; \$2 million in taxes; \$10 million in Colorado purchases; and \$75 thousand in gifts and grants to educational, cultural, and civic organizations. The division has added \$2.36 billion to the Colorado economy since it was established in 1956.

The division has more than 300 active contracts in three major product areas — launch systems, spacecraft and instru-

ments, and command and information systems.

## First half highlights

At the end of June, the division announced that NASA had awarded a \$230 million for additional Space Shuttle external tanks to be built at Michoud. (See *story on award*.) A \$42.9 million contract also was received for work to reduce the tank's weight by 6000 pounds to increase the Shuttle orbiter's payload.

Other new business acquired during the first half included a contract to design and fabricate a repair kit for the thermal protection tiles for the Space Shuttle orbiter; one for scientific spacecraft called a solar wind analyzer; and another to define a propulsion system to give Space Shuttle additional thrust.

The design for a manned maneuvering unit (MMU) — a backpack propulsion unit for Space Shuttle astronauts — was completed during the first half of 1980, and the development of flight techniques for MMU operations was started on a flight simulator.

In February 1980, the principal elements of the latest and most powerful version of the Titan space booster, called the 34D, were turned over to the U.S. Air Force. And two more Titan III space boosters successfully put military satellites in orbit during the first half.

## Facilities improved

Investments in new facilities and equip-

ment will be \$26 million in the Denver area during 1980.

Construction is underway on two new buildings: a 142,000 square foot addition to the division building at Hampden and Wadsworth; and a 72,000 square foot general office building near the SSB.

Other facilities are being refurbished and remodeled and new laboratory equipment is being acquired.

## New business opportunities

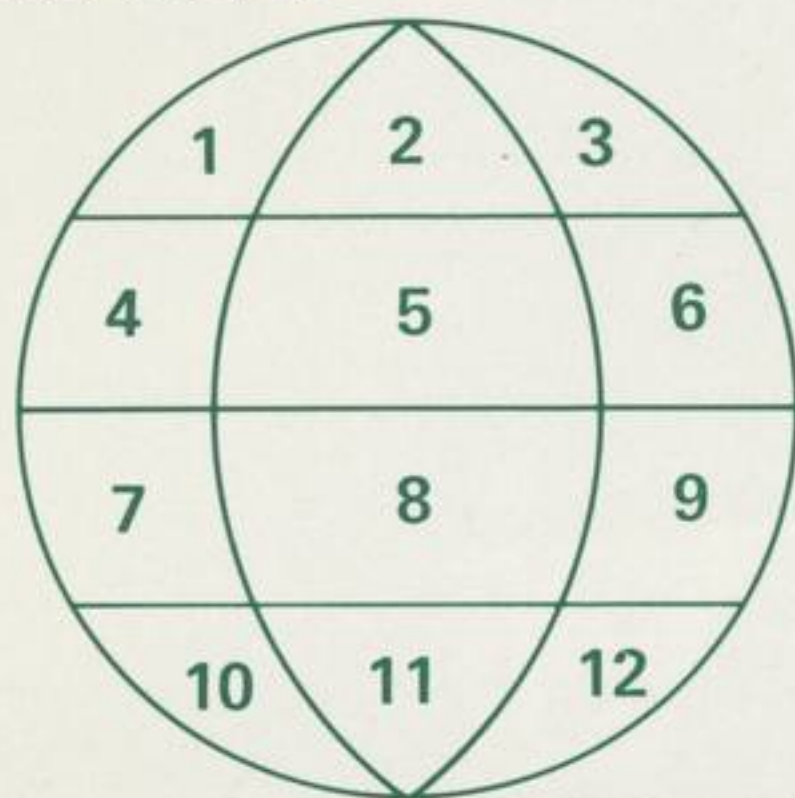
A proposal was submitted to the U.S. Air Force in May for the operational control system for the global positioning satellite system. The winner is expected to be named at the end of July. Contract value is expected to be in excess of \$100 million.

In the spacecraft area, the division will bid on the upper atmosphere research satellite in September and the Venus orbiting imaging radar (VOIR) in December.

The command and information systems group is soliciting new business from a number of U.S. Air Force and U.S. Army agencies for electronic command, control, communications, and information systems.

The division will also prepare a proposal during the second half for the MX missile launcher and another for renewable energy systems for the MX system. The U.S. Air Force is considering both photovoltaic and solar central receiver systems for support electrical power.

## On the cover



Recruiting "tomorrow-minded professionals" is the aim of the Martin Marietta Aerospace commercial being shown in major metropolitan areas of the United States. On the cover, photos of Denver division employees who are tomorrow minded are shown as they appeared in the commercial to represent "a whole new world of careers on Earth and beyond." Employees are 1-Lex Ray, 2-Robert Franklin, 3-Donna Sexton, 4-Kevin Blount, 5-Willie Powell and Dennis Richardson, 6-Cheryl Crump, 7-David L. Watts, 8-Michael Powell, 9-Michael A. Mills, 10-Robert Flanagan, 11-Gene Crandall, 12-Michael L. Lohaus.



Adams



Hurtt



Whalen

## Three Aerospace executives get new corporate ranks

Martin Marietta has announced the election of L.J. Adams as a corporate senior vice president and of C.B. Hurtt and Robert J. Whalen as corporate vice presidents.

Adams will continue as president of Martin Marietta Aerospace, a position he has held since 1976. His elevation to senior vice president of the corporation "is recognition of the continued expansion of responsibility that derives from management of a fast-growing segment of Martin Marietta," said J. Donald Rauth, the corporation's chairman and chief executive

officer. "The same consideration, rapid growth, plus opportunities and responsibilities in the portions of our aerospace business under their direction were responsible for the decision to elevate Mr. Hurtt and Mr. Whalen in the ranks of executive management."

Hurtt will be president of the Denver division; Whalen, president of the Orlando division. Their responsibilities extend to several manufacturing and test or operational facilities beyond the major Denver and Orlando facilities where they will continue to maintain their headquarters.

# Two earn top awards, seven cited at honors night

Two Denver division employees earned top awards at the Martin Marietta Corporation's 19th annual honors night.

Russell A. Chihoski was named Corporate author of the year for his paper, "Expansion and Stress Around Aluminum Weld Puddles," published in the *Welding Journal*.

Wayne E. Simon was chosen the Corporation's inventor of the year for "development of techniques for efficient management and processing of data transmitted from spacecraft."

Both men were presented \$2,000 cash awards and sterling silver Thomas Jefferson cups by J. Donald Rauth, Martin Marietta's chairman and chief executive officer.

Seven other Denver division employees also were honored at the Washington, D.C. banquet and presented Jefferson cups. They were:

**Richard G. Adamson:** For personal leadership devising and administering an array of financial controls that have contributed significantly to Denver division performance.

**William F. Barrett** (Michoud): For sustained excellence in management and technical direction of the Space Shuttle external tank structure test program.

**Gareth D. Flora:** For sustained excellence as the Titan III program manager at Vandenberg Air Force base from July 1976 until January 1980, during which time 12 vehicles of various configurations were launched successfully.

**James T. Josephson:** For development of technology for extravehicular activities in space resulting in the manned maneuvering unit to be used on Space Shuttle missions.

**Fitzroy Newsum:** For significant contributions to civic affairs in the Denver area through sustained involvement with some 30 boards, commissions, social agencies, and community organizations.

**Frederic D. Selbie:** For superior marketing performance that resulted in the award of significant long-term contracts for the Denver division.

**Gerald A. Zionie:** For outstanding leadership in defining the requirements for the design, implementation, test, acceptance, and field support of the SPOTLIGHT program which met or exceeded all performance, delivery, and cost goals.

In all, 46 employees were honored at the banquet from among the more than 30,000 Martin Marietta employees around the country.



Two top awards at the Martin Marietta honors night were received by division employees. In the photos, J. Donald Rauth, left, presents the author of the year award to Russell A. Chihoski in the first photo and the inventor of the year award to Wayne E. Simon in photo at right. Below are other division employees recognized at honors night.



Adamson



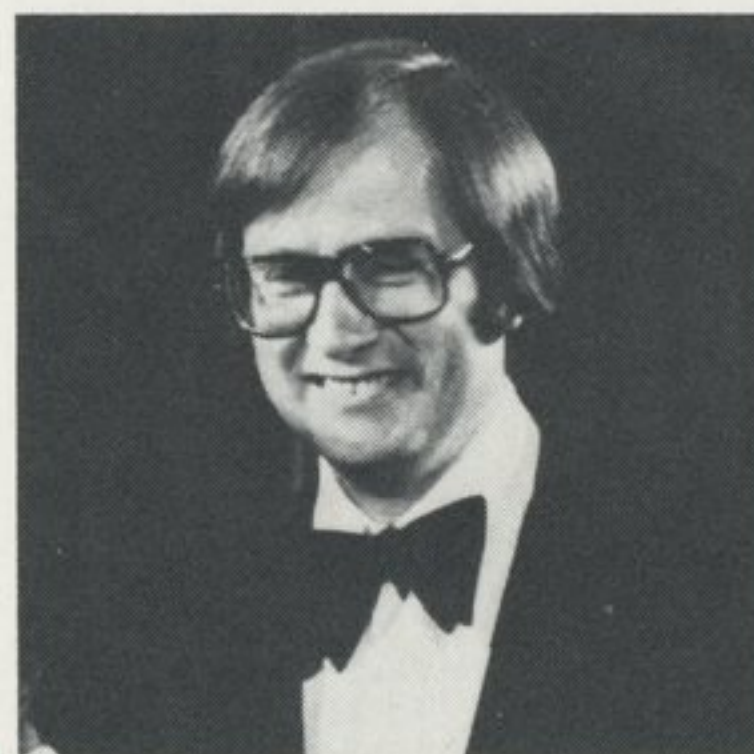
Newsum



Barrett



Selbie



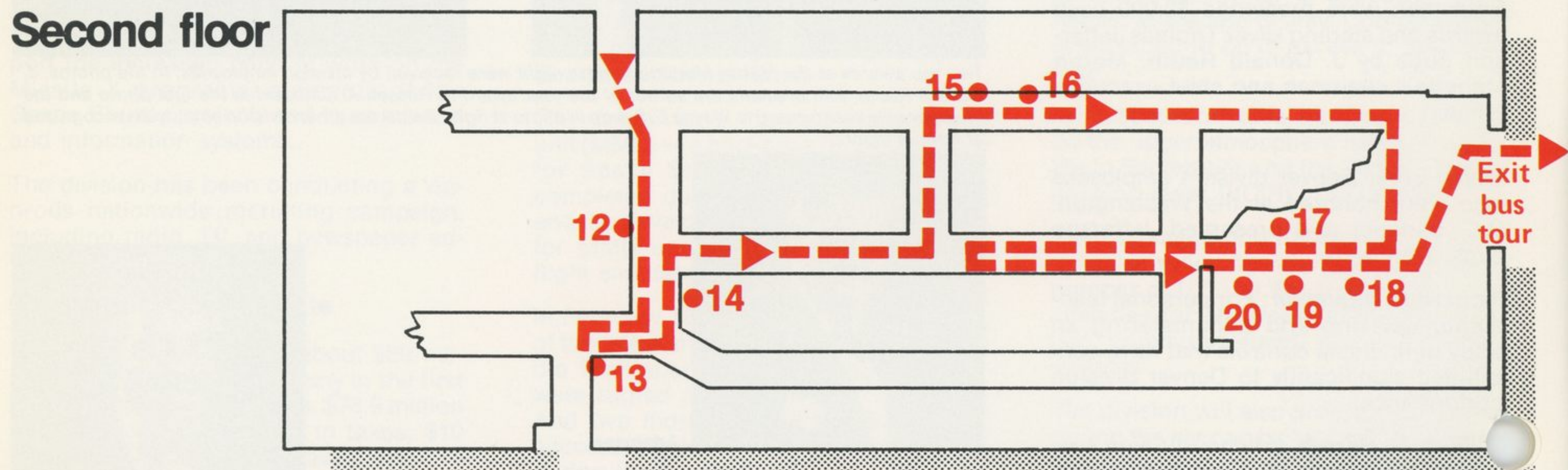
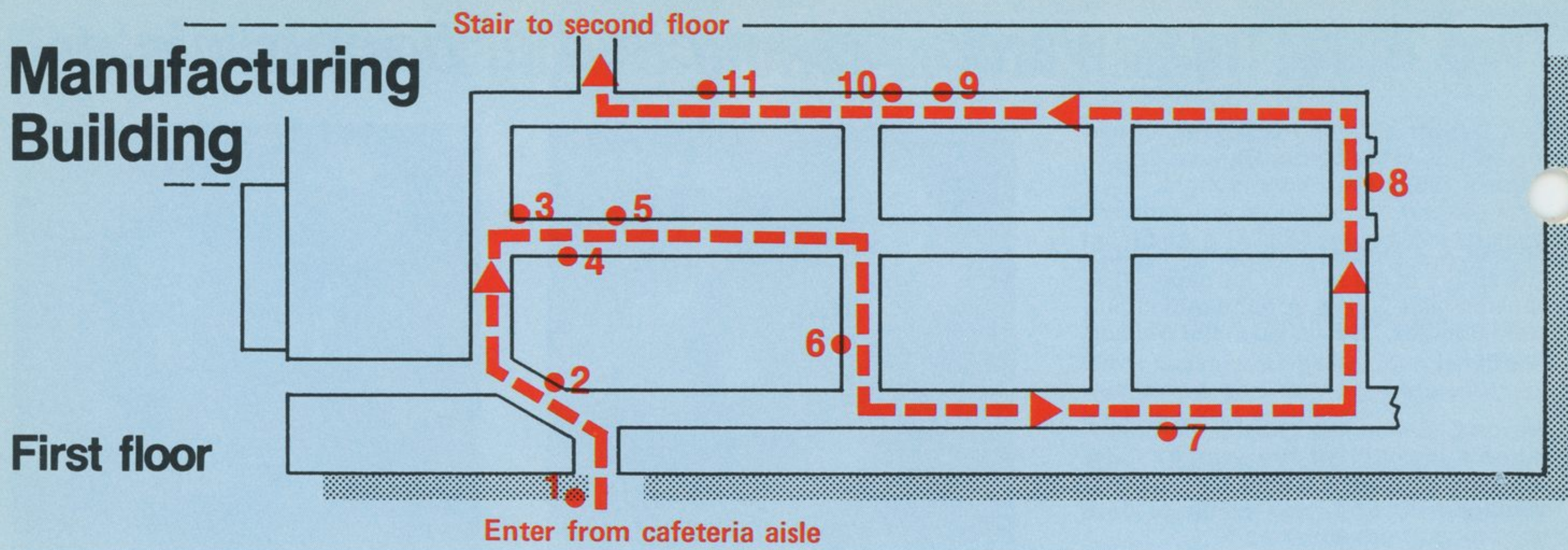
Flora



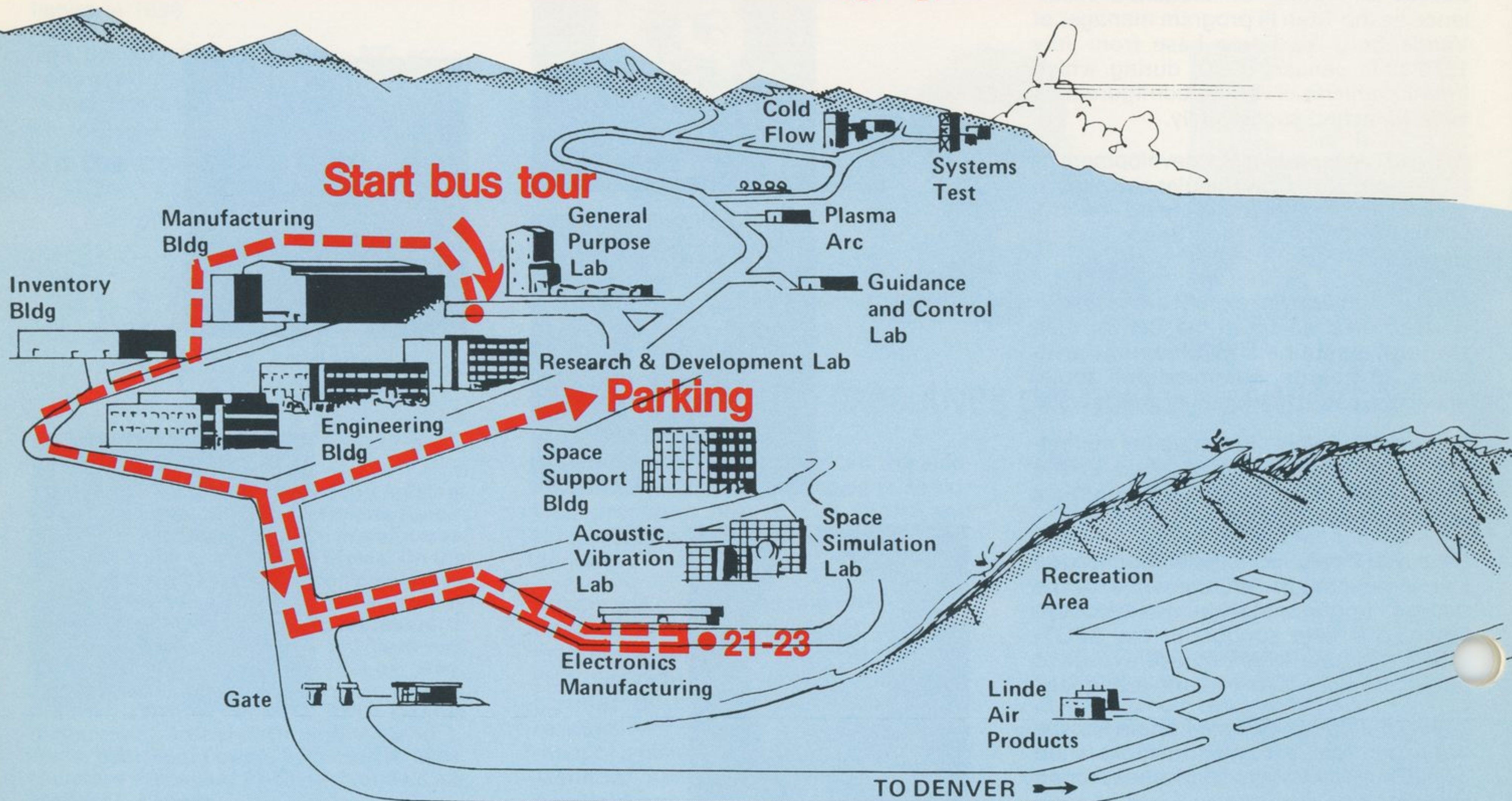
Zionie



Josephson



## What you will see during your tour



### 1-Cafeteria

The cafeteria becomes a theater for the open house. Showing will be the Martin Marietta Corporation 1980 Annual Report film. All the corporation's companies are represented. The film includes scenes from the Denver division.

### 2-Solar

The heliostat mirror module ceramic tool area. The assembly tool will be used to assemble the mirror modules that will be part of the Barstow heliostat field. A sample of the mirrors and a display showing how they will be used will be featured.

### 3-Pacific Power Brake

Launch vehicle parts are formed under 300 tons of pressure. Channels, box sections, and other straight bends are for launch vehicle structural assemblies.

### 4-Hufford Stretch Press

The action of this machine is like bending a poker around the knee. The machine not only bends launch vehicle heavy frame sections, but also stretches them and hammers depressions into the outside rims.

### 5-Farnham Rolling Machine

The rolls," as the machine attendants call it, produces the curvature in the external skins of the launch vehicles and will accept lengths of stock up to 288 inches. The pressure rollers are machined to fine tolerances to produce even curvatures along the entire length of the piece.

### 6-Launch Vehicle Vertical Weld Fixture

This fixture provides automatic welding of tank barrels that are 8 to 16 feet in diameter and from 2 to 35 feet long, with walls up to one-half inch thick.

### 7-Precision Manufacturing Area

Highly critical components for the launch vehicle and other division programs are fabricated in this area. Components manufactured here must be accurate to within .0005 of an inch.

### 8-Chemical Milling

This is an etching process for economical removal of metal that avoids the high cost of machining complex sheet-metal parts to tolerances of .002 inch.

### 9-Giddings and Lewis Numericord Milling Machine

The "G and L" is a completely automatic, magnetic-tape-controlled milling ma-

chine producing complex parts, without templates, to exacting tolerances. Unique vacuum chucks hold massive pieces of work on the machine bed.

### 10-Quality Assurance Laboratories

To achieve reliability of a launch vehicle and other division products, thousands of parts must perform with better than 99 percent reliability. The laboratory is dedicated to finding the quickest and most intensive inspection methods for process control, instrumentation accuracy, and radiography and making comparisons with national standards.

### 11-Aircraft Components

The division is fabricating Learjet wing panels, Cessna landing gear struts, Bell helicopter rotorgrrips, and the spoiler actuator support fitting for the Boeing 747.

### 12-Welding Area

In this area, details and subassemblies are joined together by welding. Welding is a process that heats metal and heats it fast. The temperature in the welding arc is one of the highest heats that can be generated. It ranges up to 11,000°F.

### 13-Titan Scoreboard and Models

The outstanding success of the Titan program is depicted on the scoreboard. The models of the Titan family portray the Martin Marietta development of Titan from an intercontinental ballistic missile to one of the nation's most successful launch vehicles for a wide variety of satellites.

### 14-Stage 1 Oxidizer Tanks and Stage 1 Barrel

### 15-Harness Assembly Area

All Titan electrical and instrumentation harnesses — the bundles of wire — are

put together in this area. The harnesses are moved from here to be installed in the launch vehicle.

### 16-Miscellaneous Launch Vehicle Tanks

#### 17-Titan IIIC Standard Space Launch Vehicle

This vehicle is used for placing communications and research satellites in orbit; Transtage carries the payload and is capable of being restarted several times in space to change orbits.

#### Titan 34D

This vehicle will be used for unmanned military space missions from Florida and California and will serve as a backup for early Space Shuttle missions. It will accommodate a number of upper stages, but the Inertial Upper Stage (IUS) will be the principal one used.

### 18-AIAA Exhibit

Descriptive graphics and working models of the division's more futuristic projects were featured first at the 1980 American Institute of Aeronautics and Astronautics international meeting in Baltimore. Other Martin Marietta Aerospace products are also shown.

### 19-Space Shuttle External Tank

The Space Shuttle is being developed as a reusable space transport vehicle. Martin Marietta developed the 154-foot long, 28-foot diameter external tanks to carry 520,000 gallons of propellant for Shuttle ascent to orbit. Payloads will include science, communications, and other satellites; planetary probes; and scientists and their experiment labs.

### 20-Viking Lander

Two unmanned Viking spacecraft landed on Mars in 1976 and conducted scientific investigations of the planet's surface and environment. After four years, one of the landers is still functioning and sending back information. The Denver division developed the two Mars landers, their propulsion systems, and equipment for the experiments.

### 21-23-Electronics manufacturing

Ninety percent of the electronic assembly work involves microelectronic components — many of them no larger than a thumbnail. The work is done in areas that rival hospital operating rooms for cleanliness.

### 24-Command and Information Systems

Some C&IS projects are depicted in artists' concepts.

### *In case of emergency*

Assistance may be obtained in event of illness or injury during the open house by contacting plant protection, extension 4646.

The same extension number may be used to help find lost children or to get assistance if you have car trouble.

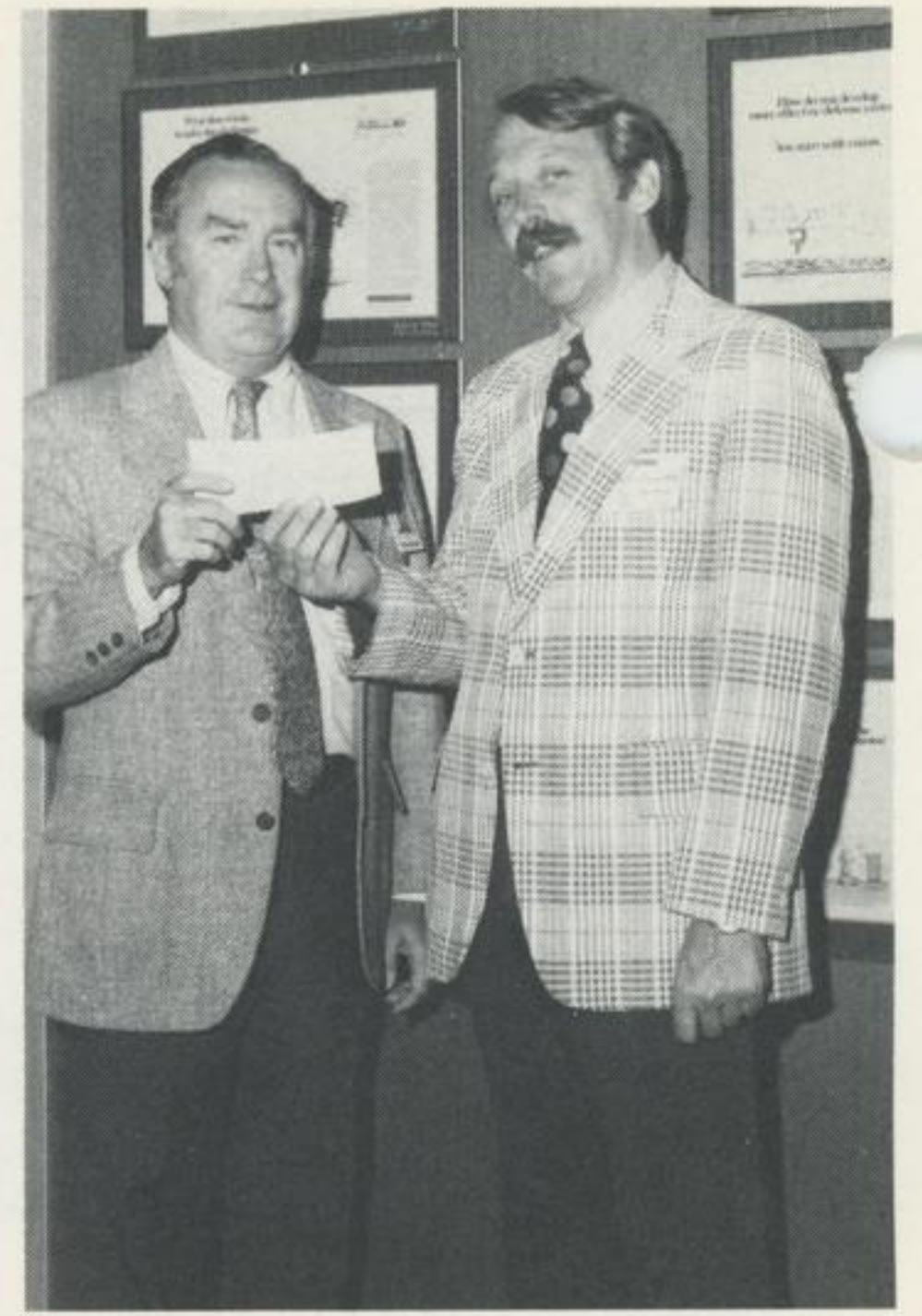
## Recreation

**Radio Club:** The Waterton Amateur Radio Club meets the first Thursday of each month in the club's room with a variety of planned activities at the meetings. The club will begin a 12-week amateur radio course September 9. Meeting each Tuesday and Thursday, students will receive instruction to prepare them for the novice class examination. Employees, spouse, and older children may enroll. Those interested should call Jack L. Crabtree, ext. 4672; David B. Roberts, ext. 5689; or Edward Buchanan, ext. 5215.

**Golf Tournament:** The annual Martin Marietta Open Golf Tournament will be held Saturday, August 23, and Sunday, August 24, at the Aurora Hills Golf Course, 50 South Peoria, Aurora. Entries for 320 golfers will be accepted on a first-come, first-served basis with 160 playing each day. The \$12 entry fee includes cart rental. Separate prizes will be awarded men and women winners for low net, low gross, longest drive, and closest to the pin. The Callaway handicap system will be used for the tourney. Play will begin at 11 am with the last group starting at 3 pm. Entry blanks are in display racks and at the recreation office.

**Special Trips:** Two best-buy tours are being offered by the recreation office. Limited space is available for an August 16 to August 23 Caribbean cruise from Miami to the Virgin Islands, Netherland Antilles, and the Bahamas. The \$1034 per person charge includes the cruise, roundtrip air fare from Denver to Miami, and many extras. Full payment is required immediately for the cruise. The second trip is to Grand Bahama Island by air. The \$439 per person includes round trip air fare and seven nights lodging at the 2000-acre Grand Bahama Hotel and Country Club. Tour groups will leave August 30, September 13, and September 27. A \$50 deposit is required for the trip.

**Bowling:** The Martin Marietta Mixed Bowling League will begin play August 21 with 12 two-men, two-women teams. The teams will bowl at the Bellevue Bowl on Tuesdays at 9 pm for 35 weeks. Last year's members will have priority for league membership. Registration deadline is August 1. A league meeting will be held July 31 at 3 pm in the engineering presentations room.



*Presentations of Martin Marietta gifts to educational, cultural, and civic organizations are regular occurrences in Denver. In this gallery of photos are the most recent presentations. In the photos, left to right and top to bottom: Fitzroy Newsum, division civic liaison manager, presents \$11,400 check to Mrs. Cathy Finlon, Denver Art Museum director of development. John H. Boyd Jr., division public relations director, hands \$5000 check to David Hartman, director of the United Cerebral Palsy Association. Newsum discusses \$10,000 gift to Gallup School of the Suburban Community Training and Services Center, Inc. with Patsy Calligan, summer school director, as Mrs. Connie Stoner, a teacher, and Terry O'Connell, a student, look on. Swedish Medical Center representatives Robert C. Alexander and Jo Hoffman receive \$5400 from division program development vice president, Howard F. Keyser. Junior Achievement manager, Barbara McDonald, receives \$2000 gift from C.B. Hurtt, division president. The University of Northern Colorado Frontiers in Science program is supported by \$1600 received by William Koch from Hurtt. Newsum presents \$2000 gift for the Colorado Council on Economic Education to its executive director, Mrs. LaKay Schmidt. William Hartman represented UNC Leaders of Tomorrow program in accepting \$1400 gift from Hurtt.*

## Major system proposal submitted to Army

The division's first major system proposal for the U.S. Army was submitted recently to the Army's Communications Research and Development Command at Ft. Monmouth, NJ.

Called modular tactical communications center (MTCC), the system is a program of the Joint Tactical Communications Office (TRI-TAC). The army is responsible for acquiring the system and will be the principal user.

The MTCC is to be a mobile, ruggedized digital communications system for handling written messages, data, and command and control messages. It is a computer-based system.

It will be tactically deployed in a shelter that is about seven feet high, seven feet wide, and 12 feet long and is transported by military truck. The system will not be operated while moving.

The division's technical and management proposal is for the full-scale engineering development and also quotes production cost goals for 100, 250, and 500 systems. The division will be the system integrator and supply a major portion of the electronics hardware.

Curtis D. Brudos was the proposal manager and will be the program manager if the division wins the contract. He said the program has "good production potential." It is expected that the contractor who does the development will be selected for production of the system.

Contract award is expected in May 1981.

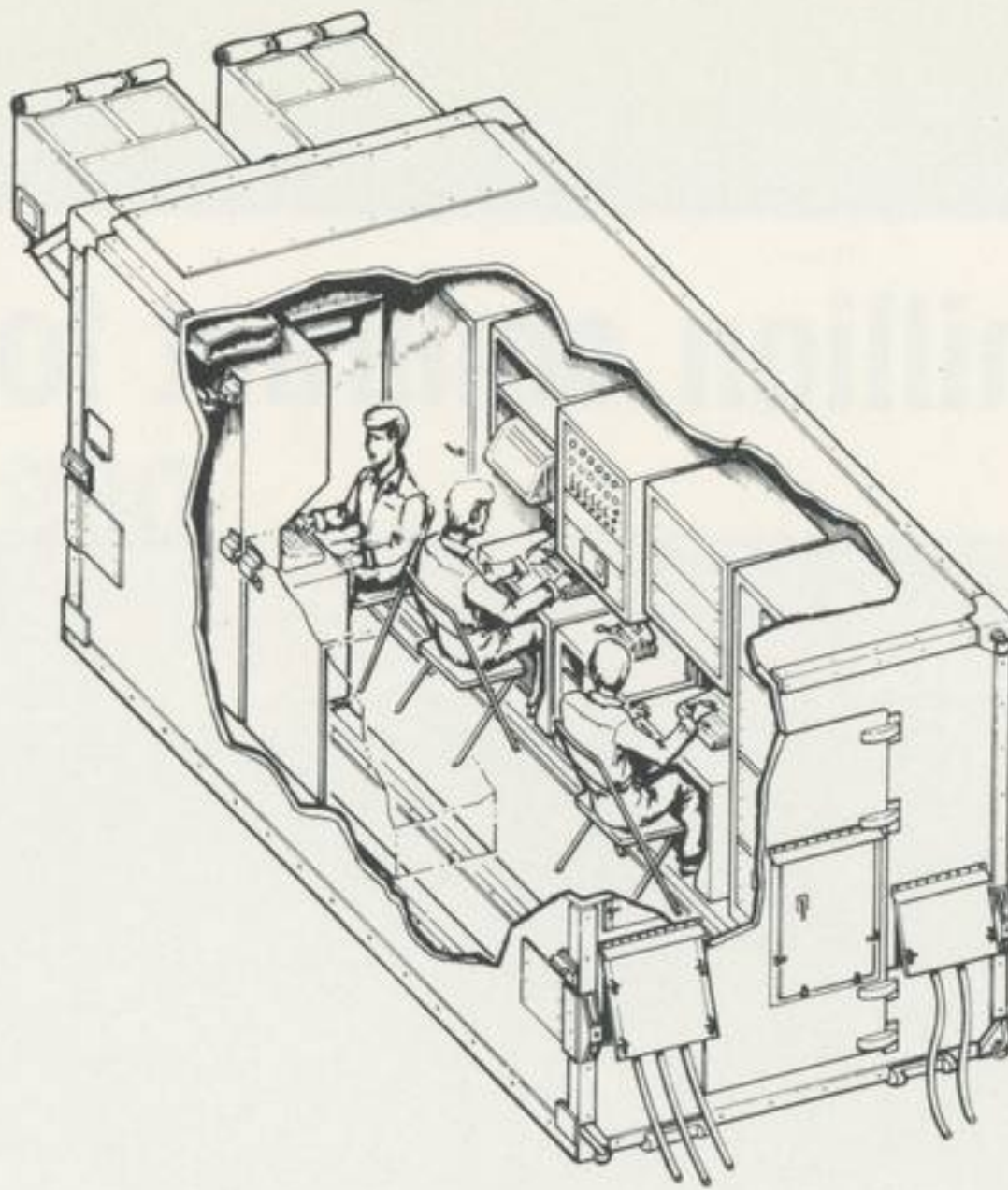
## Division names director of material

Charles T. Wood has been named Denver division director of materiel. He assumed his new responsibilities July 14 after being a materiel program manager.

Wood joined the division recently after more than seven years with Coors Container Company, serving last as material division vice president. Previously, he held material and production control positions with LTV Electrosystems and Sperry Utah Company.

He is a 1965 graduate of the University of Utah and has participated in specialized materials management continuing education programs at Purdue University, Indiana University, and Wichita State University.

Wood is a member of the American Production Control Society, American Production and Inventory Control Society, Packaging Institute of America, and the Purchasing Management Association of Denver.



Artist's concept shows MTCC operators in shelter.

## 5, 15-year service award program is resumed

Resumption of the distribution of five and 15-year service awards has begun at the Denver division. The awards were discontinued in 1976. However, the division will present awards to employees who would have received the award from 1976 through June 30, 1980. Employees who pass these service milestones after June 30 will receive awards after their anniversary dates.

Employees will receive a pen with the Martin Marietta emblem attached indicating either five or 15 years of service.

## Scholarship winner earns CSU degree

Andrea S. Way, awarded a Martin Marietta Corporation Foundation scholarship four years ago, has graduated *summa cum laude* with a BS degree in psychology from Colorado State University. She is the daughter of Mr. and Mrs. M. Lloyd Way. He is a former division employee.

Following graduation, she became Mrs. Greg Bell and lives in Tuscon, Arizona, where her husband is a mechanical engineer.

Mrs. Bell was elected to Phi Beta Kappa, Phi Kappa Phi, and named to the National Dean's List in her senior year. She earlier had been named to Psi Chi, the psychology honor society, and to two freshman honor societies.

In a recent letter to C.B. Hurtt, Denver division president, Mrs. Bell, who is legally blind, thanked the corporation for its "continued financial support . . . throughout my studies . . ."

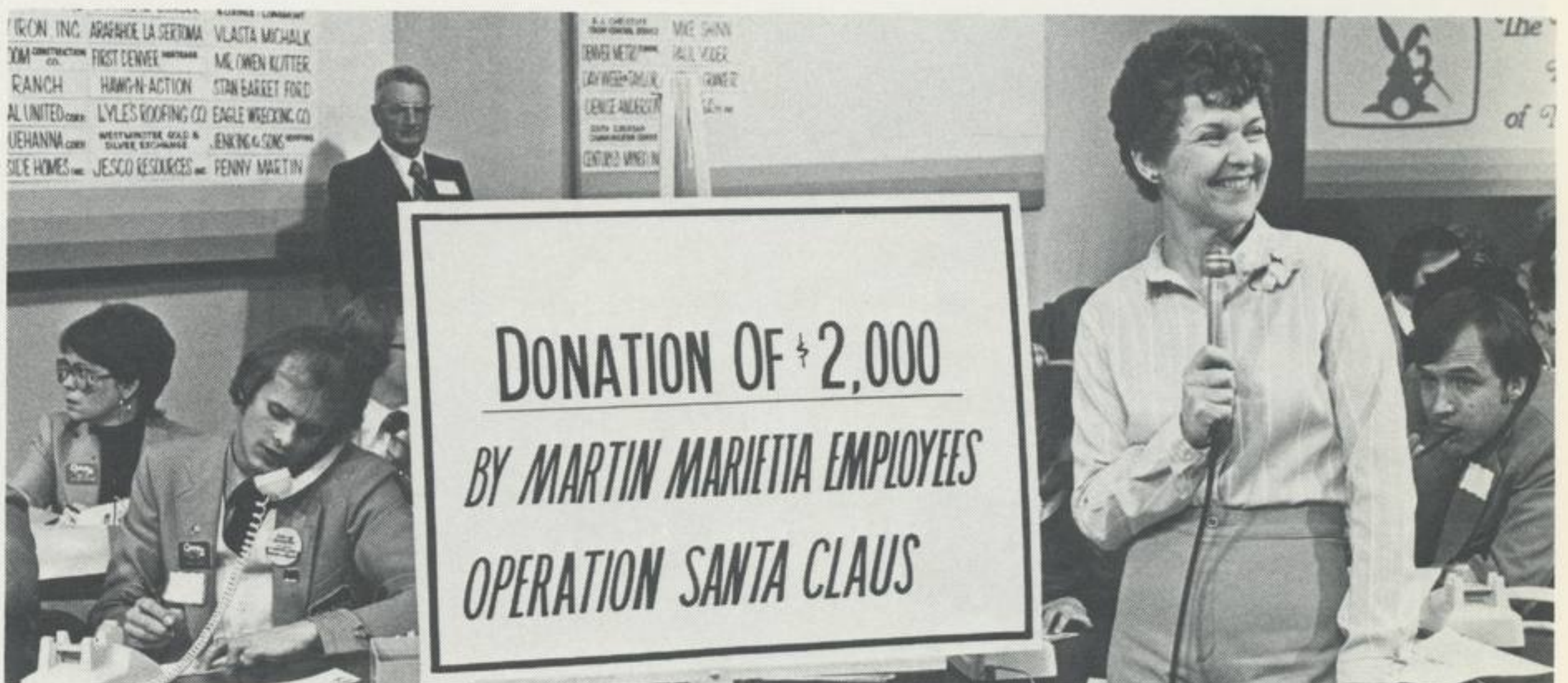
She will enroll at the University of Arizona to pursue a doctorate in clinical psychology.

## Bond drive completed

The formal U.S. Energy Bond Campaign has been completed with 79 percent of employees in all locations participating in the payroll deduction program.

At the major locations, the participation percentages are Denver, 74; Cape Canaveral, 98.3; Michoud, 94; and Vandenberg, 68.6.

Employees who did not sign payroll deduction cards during the campaign may do so at any time.



During the 1980 Easter Seal Telephone, Noell Custer, who hosts a children's television show, recognized division employees for their contributions through Operation Santa Claus. Recently, the Easter Seal Society awarded a plaque for the \$2000 contribution. Operation Santa Claus, the employee-operated assistance program, is busiest at Christmas when it provides food baskets and toys to the needy. However, during the year it provides funds for organizations, like the Easter Seal Society, and for individuals. More than two-thirds of the funds come from the sale of waste paper. Walter Martynec, who heads the paper drive, urges employees to put bond paper, tab runs, and computer cards in the office collection boxes and the large yellow containers for pickup. The firm that buys the paper will not pay for any container in which there is trash.

## At Michoud

# Michoud gets \$230 million contract for external tanks

The Denver division's Michoud operations has been awarded a \$230 million follow-on contract to build additional external tanks for Space Shuttle. Under the contract, Michoud will provide elements of 31 fuel tanks, including seven complete tanks, components and assemblies for five others, and raw materials for 19 additional units to be built in the future.

The contract is from NASA's Marshall Space Flight Center at Huntsville.

The tanks, 154 feet long and 28 feet in diameter, will be delivered as required by NASA's Space Shuttle mission schedule. The seven complete tanks are scheduled for Shuttle flights from Kennedy Space Center in Florida. Later, the Shuttle also will be launched from Vandenberg Air Force Base in California on missions for the Department of Defense.

Employment at Michoud, now 2287, is expected to grow to 2330 by year's end. Depending on launch schedules, an additional 500 employees could be added to the Michoud work force during the three-year contract.

Michoud is working on the original design and development contract for nine tanks — three for test, six for flight. The three test tanks and the first flight tanks have been delivered to NASA. The second flight tank is being prepared for shipment to Kennedy Space Center.

The external fuel tank will provide 520,000 gallons of propellant to the three main engines of the Space Shuttle's orbiter during launch.



The \$230 million contract for production of more Space Shuttle external tanks is signed by Kenneth P. Timmons, left, Michoud operations vice president and general manager, and Belton Jones, right, director of NASA's Marshall Space Flight Center procurement office. Gordon Dison, Marshall contracts specialist, left center, and John Stap Jr., Martin Marietta Aerospace southern region director, right center, attended the contract signing.

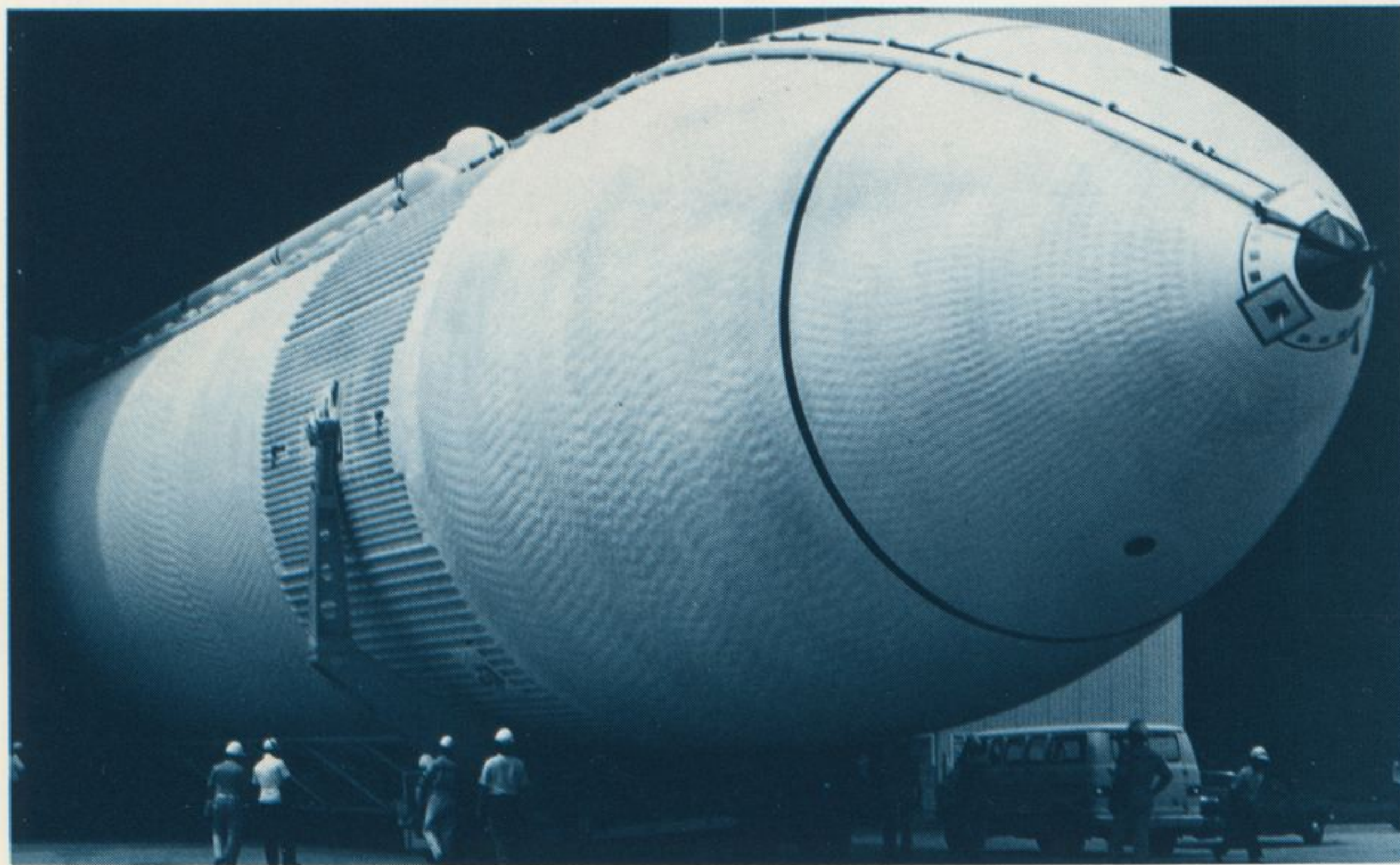
## Michoud gets tank weight reduction contract

Michoud operations' external tank design and development contract with NASA has been amended to add more than \$42.9 million to cover weight reduction redesign and development efforts and to modify tooling to be used in future production.

The Marshall Space Flight Center at Huntsville announced the award and its plan to reduce the weight of Space Shuttle's external tank by 6000 pounds. The change has the potential to increase the Shuttle's payload-carrying capability by almost the same amount.

The design change will apply to tanks to be built under a separate contract that calls for Michoud to begin the initial phase of full-scale external tank production to support operational launches of the Shuttle. The first lightweight tank is expected to be delivered in the summer 1982.

The external tanks, which carry propellant for the Space Shuttle's main engines, are the only part of the Shuttle that is not recovered for re-use.



A completed external tank rolls out at Michoud.