

MARTIN MARIETTA

news

DENVER DIVISION

Number 10/1973

OPEN HOUSE EDITION



MARTIN MARIETTA NEWS

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Internal Communication Section
Communication and Public Relations

MARTIN MARIETTA AEROSPACE

Denver Division
P. O. Box 179
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August 1973

Maneuvering unit testing scheduled

The division-built astronaut personal flying machine—the first real-life approximation of the Buck Rogers backpack jets of 30 years ago—will fly about inside Skylab for possibly six hours during the current mission.

The unit, weighing 250 pounds and using 14 nitrogen jet thrusters, is considerably larger than that of the comic strip spaceman Buck Rogers.

Skylab crewmen wearing the unit first make limited maneuvers to calibrate the devices, then fly freely about the space lab interior as though making full inspections. Manipulating two hand controllers, the crewmen can twist and turn and propel himself in any direction.

The flight plan called for a crewman to use the unit 90 minutes on each of four occasions, tentatively Aug. 8, 13, and 17, and Sept. 15.

The equipment, much of it fabricated at the division, was assembled and given full qualification here. It will be used again during the third manned mission. Goal is to develop an astronaut maneuvering unit for use of crewmen outside of the Space Shuttle for payload deployment, inspection, and repair duties.

Apollo 17, Skylab films bring thank you notes from students

"I liked the part where the man dropped the sack and said a word that made me laugh."

This is how one young student from Cunningham Elementary School described the highlight of films about Skylab and the Apollo 17 moon mission furnished by the Denver division.

The youngsters wrote thank you notes to John H. Boyd Jr., director of Communication and Public Relations.

"Weird," one child called the films.

"I give all my thank to you," a courteous student reported.

A budding scientist offered a solution for a problem yet to be encountered—"My

New technology, cost reduction awards presented to employees



Francis D. Hauser, Guidance and Control, left, receives an award check for his NASA new technology disclosure, "Automated Design and Optimization of Flexible Booster Autopilots via Linear Programming," from Reid H. Clausen, manager, Electronics Design Engineering.



Russell A. Chihoski, Advanced Manufacturing Technology, left, and Frank Yashiro, Plant Services, received award checks as co-innovators of their NASA new technology disclosure, "Extending the Range of Large Resistance Welders to Light Material." Chihoski also received additional awards for two other NASA new technology disclosures, "Giant Electrode Used to Mold and Resistance Weld Viking Aeroshell" and "Spot Indexing Through a Pacing Wheel."



Sandor A. Frecska, Space Sciences, center, and Ward D. Rummel, Quality Assurance, right, received award checks for their winning NASA new technology disclosure, "Holographic Evaluation of Fatigue Cracks by a Compressive Stress Technique." Discussing the technique with them is George W. McGee, director of Quality, left.



John Greenwood, Production and Material Control, right, received a cash award for his selection as Cost Reduction Employee of the Month from J. J. Gogenola, director, Manufacturing and Test Operations. Greenwood's winning cost reduction eliminated preparation of Interplant Accountability Documents by Material Control planners. The use of existing documents reduced the requirements for personnel, paperwork, filing, and records retention.

Garcia, Chavez assume new job assignments in Employment, EEO

Two new assignments have been reported in the areas of Employment and Equal Employment Opportunity.

Robert G. Garcia, formerly with EEO, has transferred to Employment, where he will be responsible for hourly hiring and employee assistance.

C. LeRoy Chavez, formerly business administrator at the Denver Data Center, will assume the EEO responsibilities. Chavez has been with Martin Marietta since 1961 and has held assignments as coordinator of the Affirmative Action Plan for the Denver Data Center and in the Denver division's Employment and Payroll departments.

ON THE COVER—Clouds over water create a dramatic backdrop for the Skylab space station in this view taken from the final "fly around" by astronauts on the first Skylab mission.

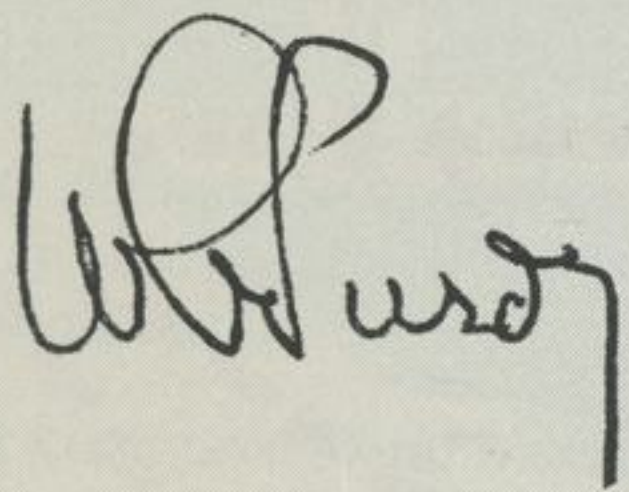
Division Open House to be Saturday, Aug. 11

Welcome to employees and families

I am pleased that you have the opportunity to show your families where you work and to let them see the division products that your skills produce.

The pride your family will show in your work is equal only to the pride I have in the work you have done.

I extend my personal welcome to all who are visiting us during our Open House.



Please bring your copy of this edition of the Martin Marietta News along when you and your family visit the plant for the Martin Marietta Open House. Included in this issue is a tour description which will help identify and explain the points you will see on the tour.

An Open House for Denver division employees and families—the first in more than 10 years—is being held Saturday, Aug. 11, from 8 am to 5 pm.

Major buildings at the division's Waterton facility will be open, with the main tour planned for the Factory, Electronic Manufacturing, and the Space Simulation Laboratory. Special exhibits portraying the division's products will be installed in these three locations.

Other buildings (see schedule on this page) will be open for short periods so that employees may show their families their individual work areas. Buildings not listed in the schedule will be closed.

Employees are urged to bring their families at the times listed for their buildings to avoid traffic congestion. Spacing of visitors will also allow all to get a closer look at the displays and other points of interest.

Admittance to the Open House is by employee badge, with at least one employee accompanying each vehicle entering the main gate. (Special access passes will be issued to families of employees required to work the day of the Open House.)

All visitors will park in lots across from the RDL and Engineering buildings. Shuttle buses will be operated from the north door of the Factory to EMF and SSL. From SSL the buses will return to the parking lots so that visitors may get off near their personal vehicles.

Special parking arrangements are available for visitors who may be using wheelchairs. Vehicles carrying wheelchair users should go directly to the special parking area at the north door of the Factory. It is recommended that those in wheelchairs visit only the second floor of the Factory and the SSL because of the difficulty in negotiating stairways.

Free cold drinks will be provided at the north door of the Factory and at the lunch area in EMF. There is no food service for visitors.

Maps of the tour route and brief descriptions of items on display are published in this edition of the Martin Marietta News.

Drivers and pedestrians are urged to use caution while on division property and to obey plant protection personnel who will be directing traffic.

Visitors are asked not to smoke along the main tour route.

Open House tour schedules listed

Employees are encouraged to bring their families to the Open House during the hours suggested for their work areas. This will help eliminate crowding problems.

Employees will be permitted to take their families into their own work areas only during the hours shown in the schedule.

Work Areas	Suggested Tour Hours
Factory Cafeteria	8 am
Inventory GPL VTF	9 am
EMF EMF Trailers DAC Cinderella City #2 Prince Avenue	10 am
Cinderella City #1 Engineering, 2nd floor	11 am
Administration	12 noon
Engineering, 1st floor SSB, 6th floor	1 pm
SSB, 3rd floor SSB, 4th floor SSB, 5th floor	2 pm
RDL SSB, 1st floor SSB, 2nd floor All others	3 pm

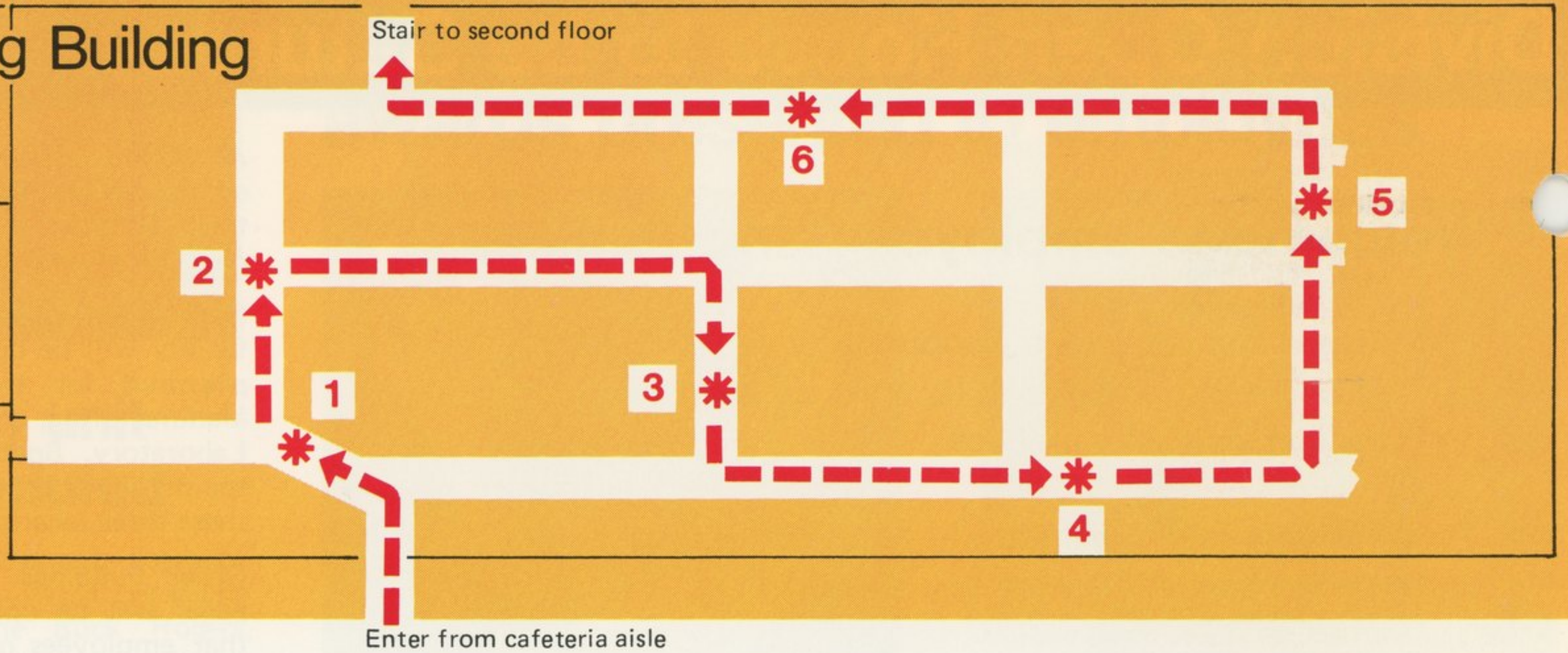
Building or Facility	Hours Open
Factory	8 to 10 am
Cafeteria	8 to 10 am
Inventory	8 to 10 am
GPL	8 to 10 am
VTF	9 to 11 am
EMF	10 am to noon
EMF Trailers	10 am to noon
Engineering, 2nd floor	11 am to 2 pm
Administration	11 am to 2 pm
Engineering, 1st floor	11 am to 2 pm
SSB	1 to 4 pm
Vibration Acoustics	2 to 4 pm
SSL	2 to 4 pm
Cold Flow	2 to 4 pm

(All other facilities will be off limits to visitors)

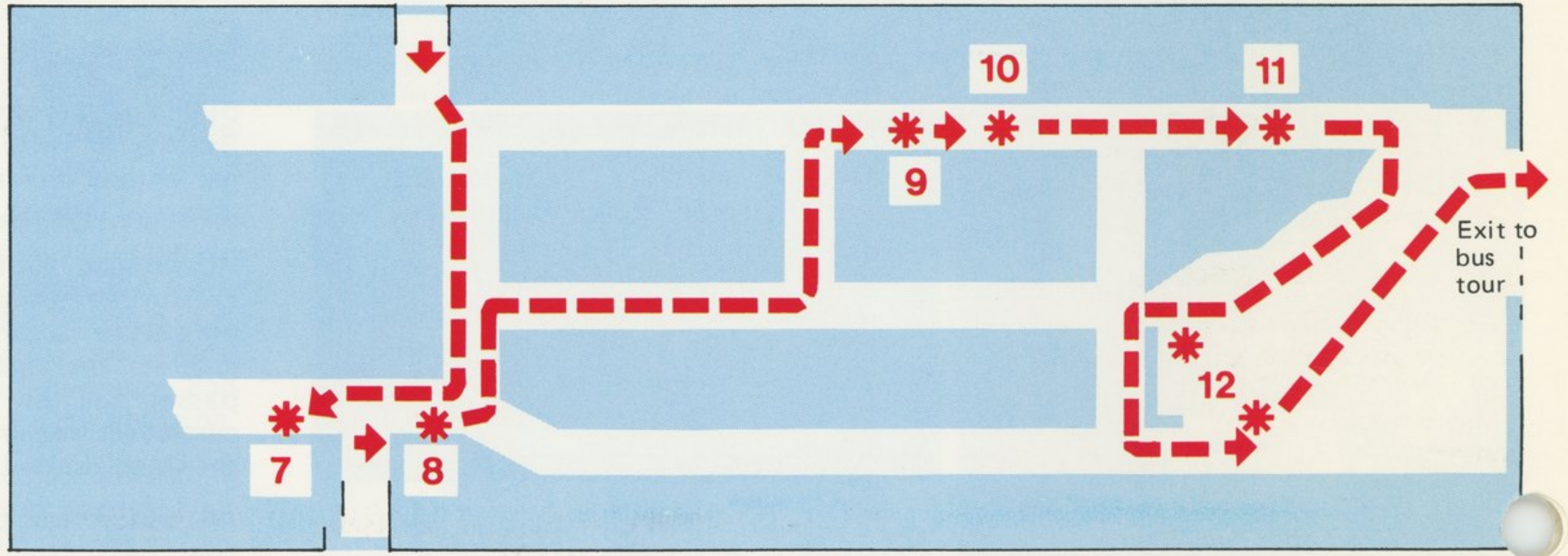


Manufacturing Building

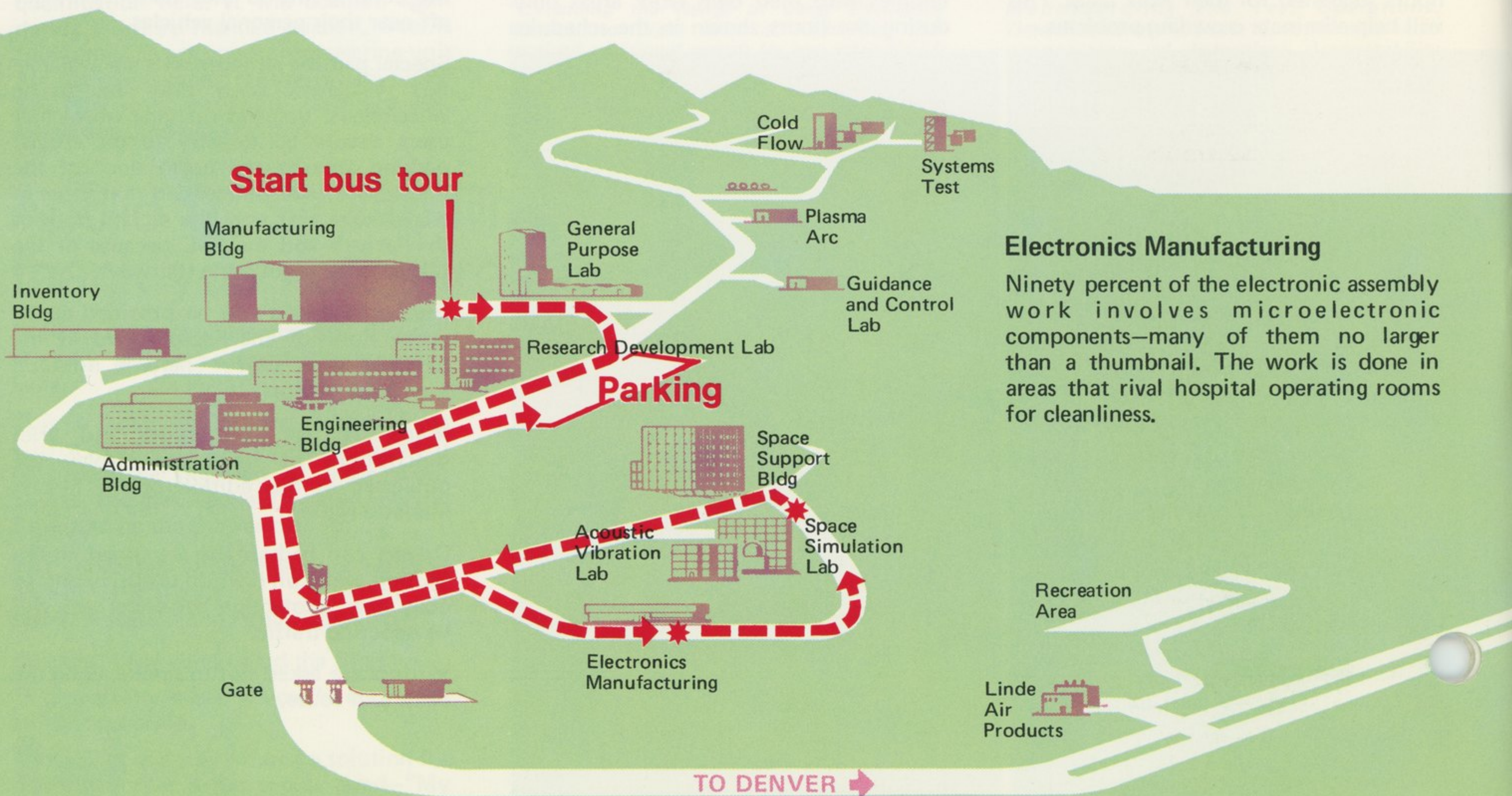
First floor



Second floor



What you will see during your tour



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.

1 Sprint

The U. S. Army's hypersonic, surface-to-air interceptor missile provides close-in defense against hostile reentry vehicles and complements long-range defense provided by the Spartan missile. Sprint is produced by Martin Marietta's Orlando division. At Denver, we produce a part of the Sprint ground equipment.

2 Numerical-Tape-Controlled Machine Area

Numerically controlled equipment automatically machines skin panels for Titan launch vehicles through information read from a computer-punched tape.

7 Pioneer Venus

Companies are participating in a NASA competition currently under way to designate contractors for a proposed unmanned mission to explore the planet Venus in 1978. The Pioneer spacecraft would deliver four probes to Venus to analyze and report the characteristics of its atmosphere.

8 Titan Scoreboard and Models

The outstanding success of the Titan program is depicted on the scoreboard. A recent Titan IIID launch from Vandenberg Air Force Base was the 54th consecutive successful mission of a Martin Marietta produced Titan.

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.

9 Titan IIIC Standard Space Launch Vehicle

This vehicle is used for placing communications and research satellites in

3 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.

4 Precision Manufacturing Area

Highly critical components for the Launch Vehicle and Viking programs are fabricated in this area. Components manufactured here must be accurate to within .0005 of an inch.

orbit; Transtage carries the payload and is capable of being restarted several times in space to change orbits.

10 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.

11 Non-Metals Laboratory

All the glass-phenolic and non-metal assemblies for the Viking structures are produced in this laboratory.

12 Viking Aeroshell

Although Mars has an atmosphere only 1/200th the density of Earth, it is necessary to slow the speeding spacecraft as it enters the Mars atmosphere on its way to a soft landing on the surface. Three methods will be used to slow the craft—a parachute, a descent rocket, and this aeroshell, a cover aerodynamically shaped to decrease the entry speed. The aluminum aeroshell is covered with approximately one-half inch of cork-like material which slowly burns away.

5 Chemical Milling

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

6 Skin Mill

This numerically controlled equipment automatically machines skin panels for the Titans through information read from a punched tape produced by computer.

Viking Bioshield

One of the primary purposes for exploring the surface of Mars is to search for life. Therefore, the spacecraft must be completely void of any form of Earth-life to assure scientists that any life detected on Mars would indeed be of Mars origin. This bioshield will completely cover the Viking lander during its heat sterilization and until it is well out in space.

Viking Lander Body

Although experiments will be carried out in orbit around Mars by a separate orbiting spacecraft, the main emphasis of the mission will be on this lander which will land softly on Mars to carry out photographic, biologic, seismologic, mineralogic and molecular experiments.

Viking Structural Assembly Area

Primary structural elements of the Lander are fabricated and assembled here before shipment to the Structural Testing Laboratories or the Space Support Building for installation of propulsion, electrical, and scientific equipment.

Viking Aeroshell Cover

The basecover mates with the aeroshell to completely encapsulate and protect the Viking lander during its entry.

Space Simulation Lab

Skylab 1/10 Scale Model

A cluster of four major units was launched into a 270-mile orbit May 14, 1973. Major cluster elements are:

- 1) Apollo Telescope Mount—first manned telescope in space.
- 2) Multiple Docking Adapter—Command and Service Module docking station and major experiment control center—equipped and tested by Martin Marietta.
- 3) Orbital Workshop—astronaut living quarters and experiment control station.
- 4) Airlock Module—passageway between the Multiple Docking Adapter and Orbital Workshop.

Multiple Docking Adapter

The adapter provides docking facilities for arriving and departing Command and Service Modules and an experiment control center for solar observations, metals and materials processing, and most of the Earth Resources experiments.

Astronaut Maneuvering Equipment (M509)

This equipment will test and evaluate both equipment and man's ability to maneuver in space; experiments will provide data for development of future maneuvering systems for man in space.

Earth Resources Experiments Package

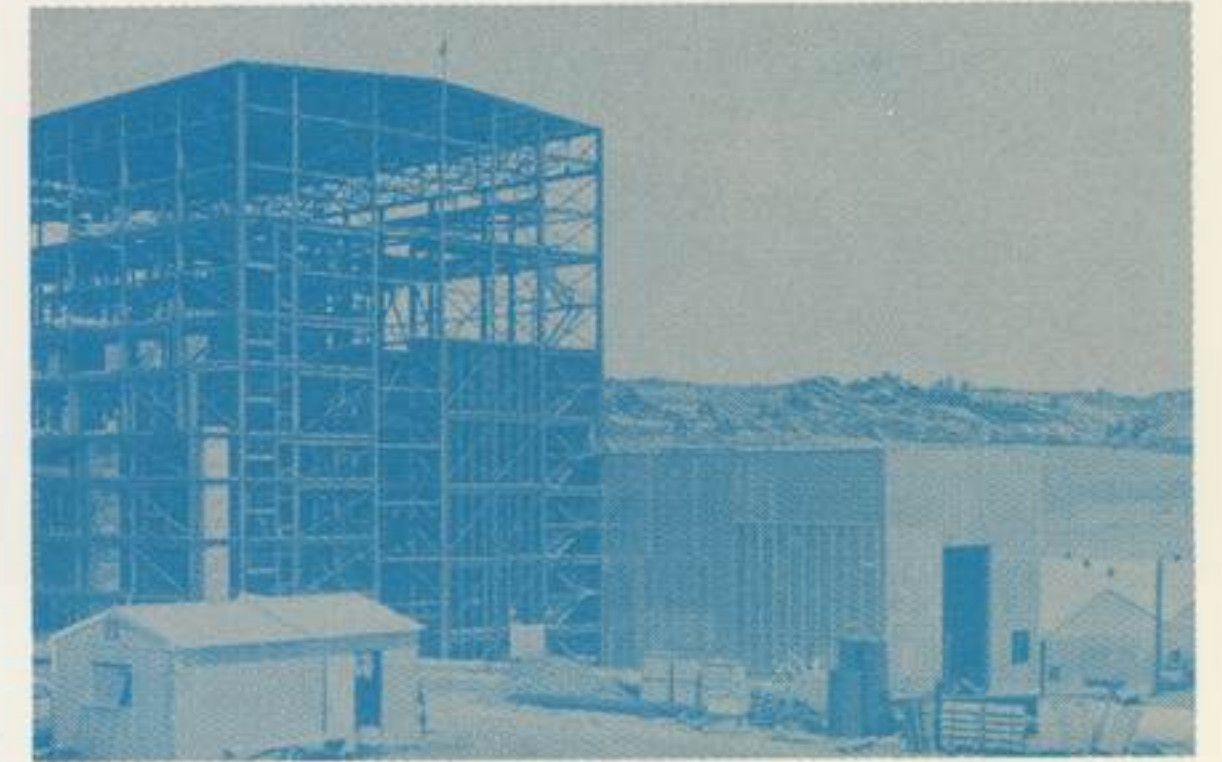
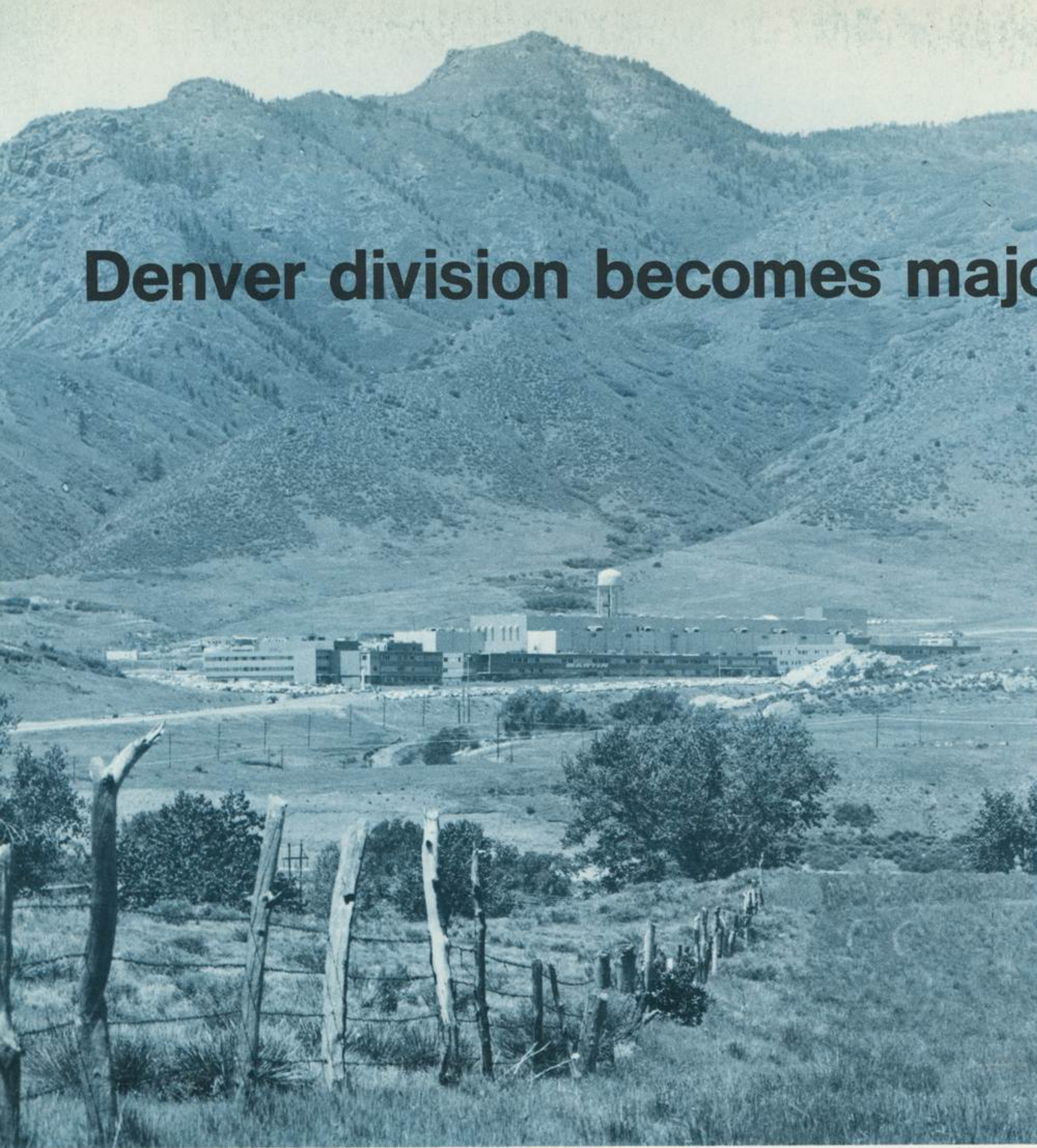
Valuable data for use in oceanography, land management, agriculture, geology, and ecology is provided in this package.

Martin Marietta supplied much of the equipment, some of which is displayed:

- Viewfinder/Tracker System Telescope—mounted outside the Multiple Docking Adapter, used by the astronauts to locate Earth resources targets and aim the Multispectral Scanner (S192)
- Earth Resources Experiments Package Tape Recorder—28-track equipment, designed and developed by Martin Marietta to record and store data from Earth resources sensors for later return to NASA's Johnson Space Center for processing
- Earth Resources Experiments Package Control and Display Panel—central control station for Earth resources experiments; designed and developed by Martin Marietta and produced by Bendix

Conversion of former ranch land southwest of Denver into a major industrial aerospace plant complex began in 1956. This photo, taken in 1957, shows the Administration, Engineering and Factory facilities.

Denver division becomes major space center



Construction on the plant site continued at a rapid pace during the first few years. Taken in the summer of 1957, this photo shows construction of the Vertical Test facility and the General Purpose Laboratory (GPL).

space-research facilities—laboratories and space-simulation and testing equipment. From 13 laboratories in 1966, the number grew to 44 in 1973.

Other space projects in which the Denver division has had a part include:

Developing a lunar drill used by the astronauts on the moon's surface on the Apollo 16 and 17 missions.

Fabrication, testing, and checkout of the Skylab Multiple Docking Adapter.

Outfitting the MDA, control and display equipment for Earth resources experiments and the Apollo Telescope Mount, and integration of all scientific experiments and support equipment.

Developing the Viking Mars soft lander vehicle, scheduled for 1975 launch in NASA's Mars exploration project.

The division will continue to seek major roles in space programs such as the Space Shuttle System and planetary exploration.

The Denver division of Martin Marietta Aerospace has evolved from an intercontinental ballistic missile contractor to one of the nation's major industrial space centers.

Originally constructed to design and build Titan ICBMs, the facility has expanded its role in the nation's space program to include major manned and unmanned space explorations.

In 1955 the Martin Company, predecessor of Martin Marietta Corporation, was awarded the contract to build the Titan I. A major consideration in making the award was the company's willingness to construct a new facility on an inland site.

The 4500-acre site was acquired in 1955, and construction on the Denver facility was begun early in 1956 with the factory and engineering building.

An initial group of 39 employees was transferred from Baltimore to establish offices, manufacturing facilities, and warehouse space. By the end of 1956, there were more than 2,500 employees.

Technical facilities grew with the development of Titan I, and by late 1959 the division was using 20 major buildings.

After Titan I came the more powerful Titan II ICBM program and the Titan/Gemini launch vehicles. The versatile multimission Titan III family of space launch vehicles followed.

The evolution from a weapon systems builder to a major aerospace contractor began in the 1960s with an increased U.S. emphasis on space and space vehicles.

The division's move into the space program required development of

Please-- no cameras, firearms

Plant regulations do not permit cameras, tape recorders, firearms or explosives, alcohol or narcotics on the premises at any time. Please be sure your family observes these regulations when visiting during the Martin Marietta Open House Saturday, Aug. 11.

In case of emergency

Assistance may be obtained in the event of illness or injury during the Open House by contacting Plant Protection headquarters, extension 2476.

This same extension number will also provide help in case of lost children. Lost items may also be reported there.

To obtain assistance if you have car trouble, dial H-E-L-P (4357).

25 get degrees under educational assistance program

Twenty-five employees received college degrees so far this year under the Martin Marietta educational assistance program.

Degrees granted included two bachelors degrees, 18 masters degrees, three law degrees and two PhDs. Disciplines represented included engineering, business, computer science and operations research.

The graduates are:

University of Colorado—E. D. Fox, BS (business); L. E. Davis, MS (computer science); R. G. Doughty, MS (operations research); C. A. Hall, MS (civil engineering); W. E. Sinclair, MBA; P. E. Uney, MS (aerospace engineering); J. G. Vega, MS (electrical engineering); H. F. Zimelman, MS (electrical engineering); and R. B. Rice, PhD (electrical engineering).

University of Denver—R. J. Burtzloff, MS (electrical engineering); G. G. Craytor, Juris Doctor; J. C. Demlow, Juris Doctor; K. H. Hill, MS (electrical engineering); D. W. Johnson, MBA; K. A. Karnes, MSBA; D. E. Mielke, Juris Doctor; J. Y. Peng, MS (chemical engineering); and F. D. Hauser, PhD (electrical engineering).

Colorado State University—C. M. Brown, MS (mechanical engineering); R. V. Danner, MS (mechanical engineering); W. C. Etherington, MS (mechanical engineering); R. L. Parker, MS (mechanical engineering); F. C. Werner, MS (civil engineering); and M. H. Young, MS (mechanical engineering).

Regis College—Amer Plaisted, BSBA.

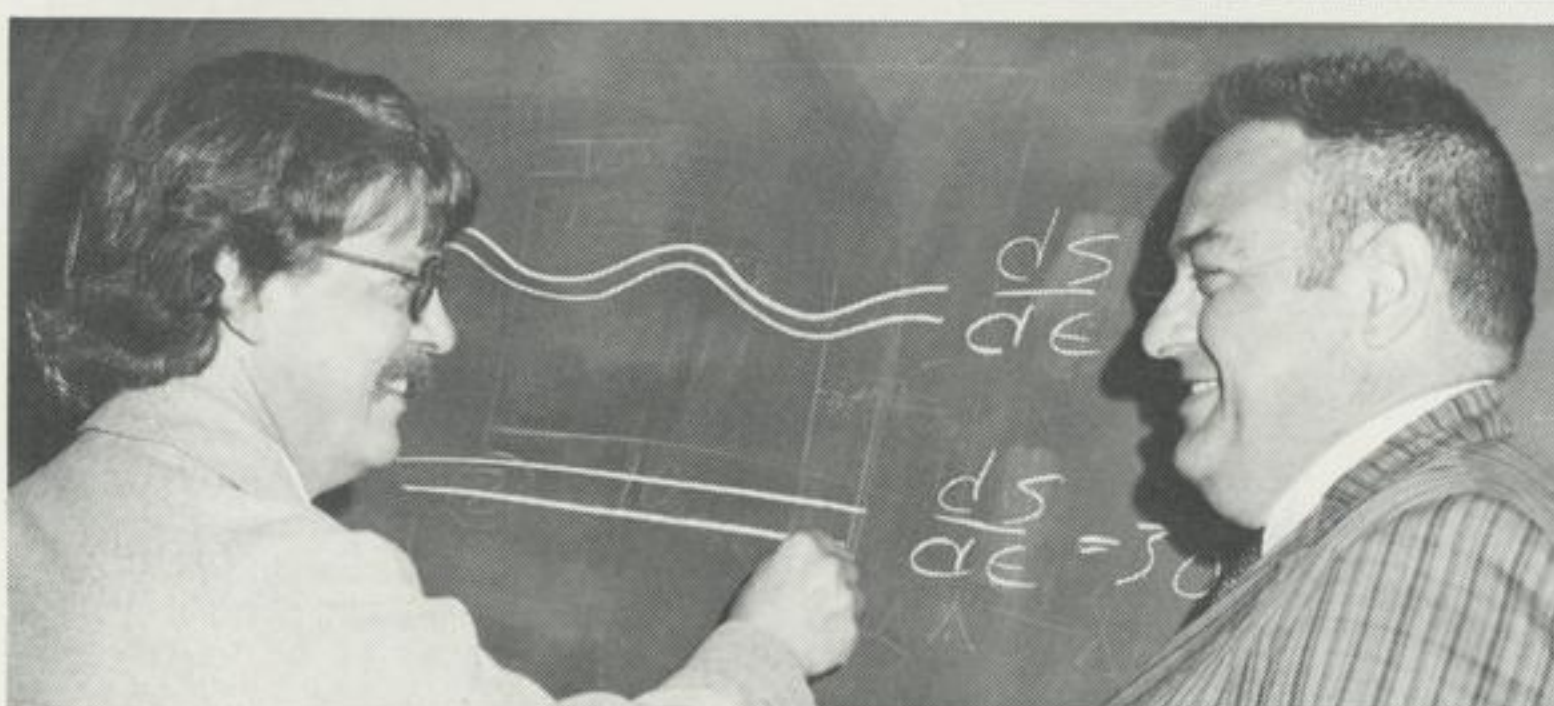


Patti Lynn Parmentier, 11, daughter of Mr. and Mrs. J. T. Parmentier, recently won the title, "Colorado's Our Little Miss Photogenic" and is competing in the "World's Our Little Miss" pageant Aug. 5-11 in New Orleans. Patti's father is in configuration and data management on the Viking Project.

Six receive invention awards



Hernan A. Posnansky, left, and Richard S. Jackson, center, receive congratulations from Reid H. Clausen, manager, Electronics and Design Engineering, for their winning invention, "Control System for a Remote Manipulator."



Dr. Wayne E. Simon, left, explains the telephone cord configuration design of his "Stretched Helix Sensor Wire" invention to Stewart G. Chapin, chief, Planetary Physics.



Joseph W. Macalous, center, and Donald A. Thomas, right, display a sample of the material used in connection with their two award-winning inventions to Daniel E. Sallis, chief, Ablative Systems. The inventions are: "Sprayable Ablative Heat Shield Materials," and "Sprayable Elastomeric Adhesive for Bonding Elastomeric Materials."



Robert A. Booker, right, Manned Experiments and Test, discusses his invention, "Bilateral Control Scheme for a Remote Manipulator System," with Wilfred L. DeRocher, chief, Manned Experiments and Test.

Invention awards are granted for inventions selected by the division Product Development Review Board following objective evaluations of each entry performed by qualified technical personnel. Purpose of the invention awards is to stimulate the submission of new inventions that support basic division product areas or may be marketed commercially.

Recreation Calendar

GOLF—Sept. 22, second annual Seniors Tournament, Willis Case Golf Course.

SOFTBALL—Tournaments, mid-August.

TENNIS—Through Sept. 10, 17th annual open tennis tournament.

SATELLITE SKI CLUB—Sept. 1-9, Lake Powell trip, contact Bill Lapham, extension 4734.

Huntsville Family Day

Food, football, volleyball, water skiing, and golf highlighted the third annual Family Day for Huntsville Operations employees and families June 30 at Val Monte Club on Guntersville Lake. Approximately 250 employees and their families attended.

17 new courses offered this fall

Seventeen new courses will be offered in the division's continuing education program for 1973-74, bringing the total courses offered this year to 66.

Of these, 33 courses are in the professional education curriculum, 23 in management education and 10 in technical education.

First semester begins Sept. 4. Early registration is recommended, but registration will be accepted at the first course meeting. The second semester will begin in January.

Last year, about 1,000 employees were enrolled in the program's 59 courses, designed to meet educational needs and encourage personal and professional growth and development of employees.

Catalogs for the continuing education program are available from Professional Development, Module 117, Administration Building, Mail 6340.

In addition to the continuing education program, the division will also provide assistance to eligible employees for participation in study programs leading to baccalaureate or advanced degrees.

To obtain further information about the Denver division's educational programs, contact Professional Development, extension 3013.



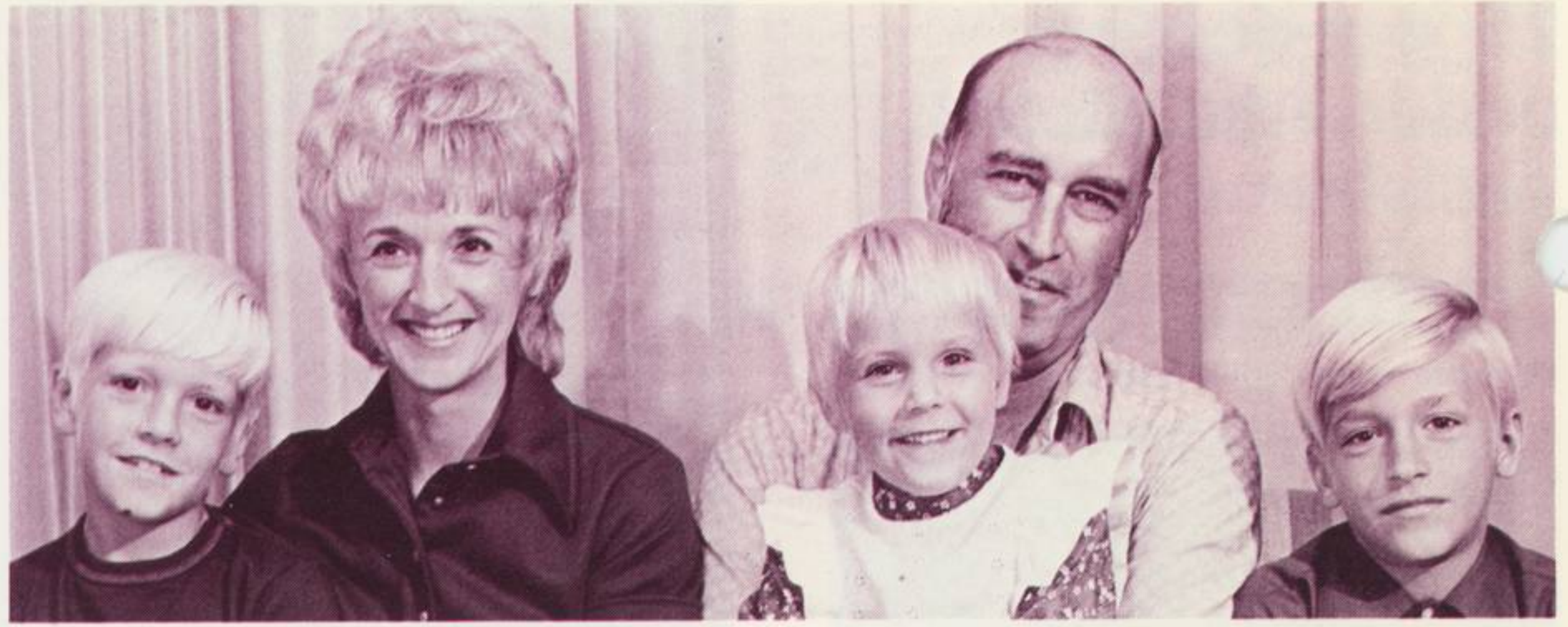
Transportation survey results being tabulated

Twenty-five percent of division employees who responded to the transportation survey taken recently are participating in car pools, according to Roy S. Yamahiro, who is tabulating the survey results.

A high percentage of employees completed and returned the survey forms, according to Yamahiro, manager of the Equal Employment Opportunity Office. "We very much appreciate the reactions of the employees who took time to respond to the survey," said Yamahiro.

Preliminary survey results also indicate that a high percentage of those who responded were interested in bus service from their home geographical areas to the plant. Plans for such express bus service to the plant are now being discussed.

Also as a result of the high interest expressed in car pools in the survey, information on persons interested in car pooling will be relayed to others in the same geographical area in an effort to promote formation of additional pools.



Jack Johnston, structures and payload integration lead engineer, Canaveral Operations, and his family have been selected as "Family of the Year" by the Cocoa Beach, Fla., Women's Club. The award is presented annually to a

member's family which has shown outstanding community service. Mr. and Mrs. Johnston are the parents of, from left, Greg, Jacquell and Boyd. (Photo courtesy of Today Newspaper)

Preventive medicine is practiced in division's medical department

An ounce of prevention is worth a pound of cure, according to the old saying, and that philosophy is now being practiced by the Denver division's medical department.

"We are trying something fairly new in industrial medicine," explained Dr. James A. Stapleton, division physician. "We are trying to set up a type of preventive medicine here.

New employees will remember possibly the most important aspect of this effort—the extensive physical examination and detailed medical history each applicant completes.

The pre-employment physicals take about one hour, and include a medical examination by Dr. Stapleton; a hearing test with an audiometer; a visual test which checks depth perception, muscle balance, and color perception as well as sight; a urinalysis and other tests and procedures as they are indicated.

"These extensive physical examinations really have two purposes," Dr. Stapleton noted. "One is, of course, to make sure we have healthy employees. The other is to try to find things that will be important to the future of the individual and his health."

"This is the place to practice preventive medicine," he said.

The division's medical clinic does not provide treatment, except for first aid for injuries or illnesses. The clinic can give medical advice, provide guidance in locating a family doctor, or make waiting to see one's family doctor more comfortable, but the sheer number of visits precludes extensive treatment, Dr. Stapleton said.

"From Jan. 1 to May 31 of this year, we had 6,117 persons visit the clinic," he

said. Most of these persons were suffering minor ailments, but this figure also includes pre-employment physical examinations and re-examinations of employees when required.

Few of the clinic's visits were as a result of accidents. Dr. Stapleton pointed out that in the aerospace industry, the accident rate is 2.3 million manhours. The division's 1972 accident record was only .33 per million manhours.

Dr. Stapleton is assisted in the clinic by two registered nurses, a paramedical technician and a student who is learning lab technician work.

Employees observe service anniversaries

A number of division employees have observed service anniversaries during the second quarter of 1973.

Completing 25 years of service were: James McKechnie Jr., Communication and Public Relations; E. A. Schumacher, Manned Experiments and Life Sciences; and J. A. Sterhardt, Viking.

Completing 20 years of service were: R. R. Spangler, Design Engineering Mechanical; M. S. Raymond, Business Management; R. M. Davis, Manned Space Systems; L. G. Taigman, Marketing and Advanced Programs;

H. C. Burgan, Contracts; H. N. Hubbs, Communication and Public Relations; P. J. Riley Jr., Design Engineering Electronics; D. S. Crouch, Manned Experiments and Life Sciences;

N. E. Sitter, Design Engineering Electronics; J. E. Greichen, Launch Vehicles; J. C. Hemphill, Viking; and J. H. Nelson, Manned Space Systems.