

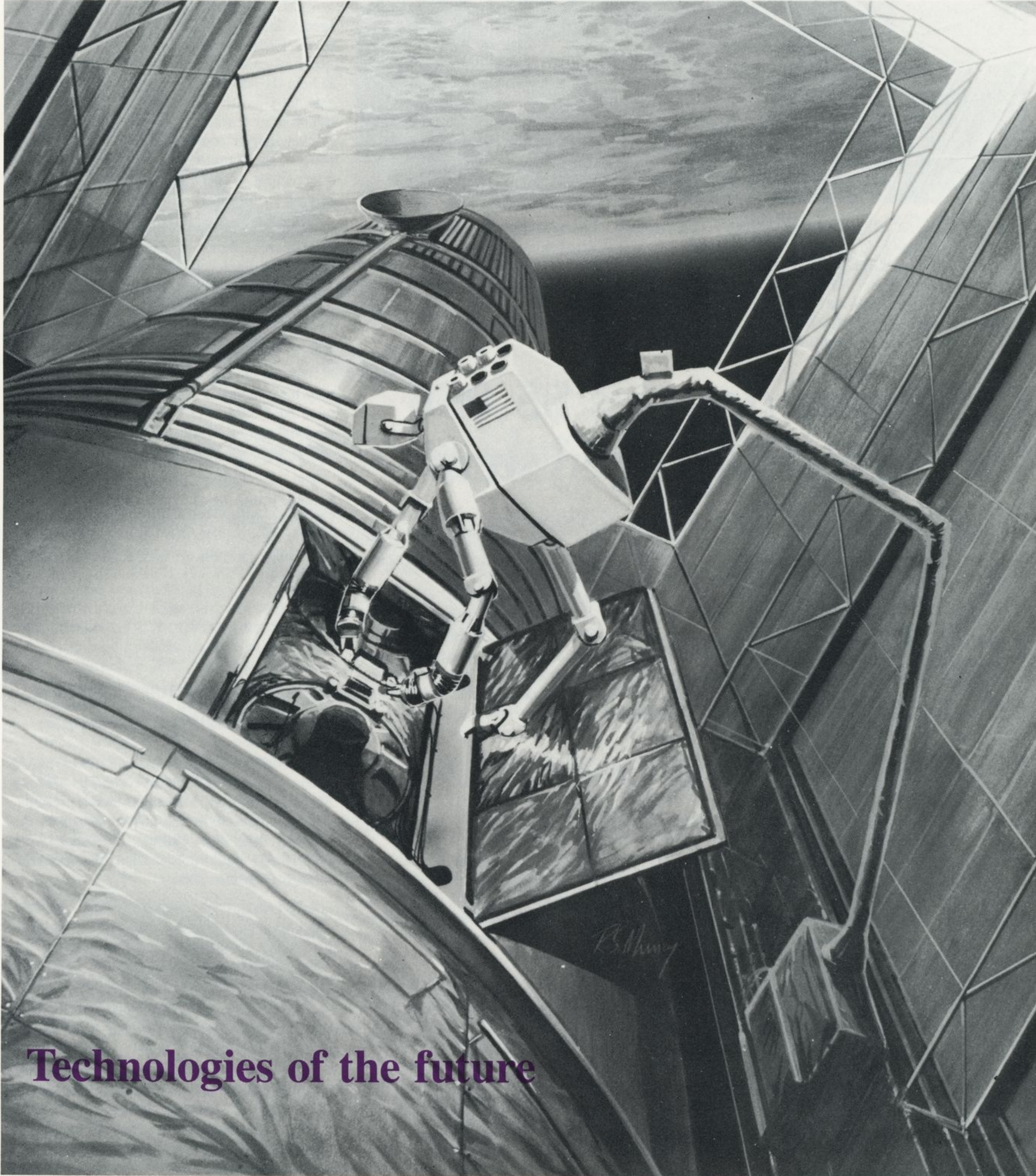
MARTIN MARIETTA

news

ASTRONAUTICS GROUP

April 8, 1988

Number 7



Technologies of the future

Service groups seek volunteers

Joint Action in Community Service, Inc. (JACS), is looking for volunteers to advise youths, ages 16 to 22, who have attended federal Job Corps programs and are trying to find work in Denver or Colorado Springs.

JACS is a national, non-profit volunteer agency founded in 1967 by a coalition of Protestant, Catholic and Jewish organizations. The JACS office in Denver needs more volunteers to help the 45 young men who return or relocate to Denver and Colorado Springs each month after learning such skills as carpentry, bricklaying, or cooking at Job Corps centers. Most of the young men are high school drop-outs, often from broken homes and low-income families.

A JACS volunteer advisor must commit a total of about four to six hours over a period of a month. Volunteers, who must be 24 or older, can be either male or female. Volunteers advise the youths on such things as how to look for a job, finding a place to live, and opening a bank account, or just offer a "friendly ear."

"Volunteers get the satisfaction of knowing they have helped a youth get his life straightened out," said John F. Roehm, Jr., the JACS regional administrator in Denver. If interested, call Roehm at 844-2189.

There is a similar volunteer organization for helping young women who have attended Job Corps programs. It's called Women in Community Service (WICS). The coordinator of volunteers in Denver is Cecelia Garcia at 844-5839. ■

Visiting Scientist program needs volunteer speakers

The Colorado Alliance for Science (CAS) needs scientists and engineers for its Visiting Scientist program. Volunteers make presentations at area schools and answer questions describing their own careers, including work performed, required education, and opportunities for advancement.

CAS seeks people from businesses, schools, and universities who are dedicated to improve the quality of science education in elementary and secondary schools throughout Colorado. The objective of the Visiting Scientist program is to encourage interest in science and engineering careers by presenting the variety of career options available.

Presentations and question sessions last approximately one hour. Those interested should send a note to Dr. Tom Giordano, Mail Stop H0341, describing their area of expertise. Anyone requesting further information may call Giordano, Ext. 7-3709. ■



Martin Marietta has contributed \$5,000 to the Jefferson County Hazardous Substance Response Authority to help purchase a paging system. Attending the presentation were, left to right, Robert H. Brown, Assistant Chief of the Bancroft Fire Department; Bob Lovato, Operations Chief of the Westminster Fire Department; Donald L. Little, Commander of the Arvada Police Department; Mark H. Gutke, Authority Chairman and Hazardous Material Specialist with the Jefferson County Sheriff's Department; and Robert M. McMullen, Director of Environmental Management for the Astronautics Group.

Company donates \$5,000 for Jeffco paging system

The Astronautics Group has given \$5,000 to the Jefferson County Hazardous Substance Response Authority to help purchase a paging system for use in the event of a hazardous materials accident.

The authority includes Jefferson County, 11 incorporated municipalities, and 19 fire protection districts. It coordinates the response to any hazardous materials incidents in Jefferson County.

The authority currently leases a paging sys-

tem to notify members of the Jefferson County response team. With the help of the Martin Marietta donation, the authority will be able to purchase its own system.

"The service provided by the authority is vital to the protection of the health and environment of the citizens of Jefferson County," said Robert M. McMullen, director of environmental management for the Astronautics Group. "Martin Marietta is pleased to be able to help out in this worthwhile endeavor." ■

I&CS selected for upgrade of AF operations center and command post

Martin Marietta Information & Communications Systems has been awarded a \$26-million Air Force contract for software development and support to upgrade the operations center and command post located in Cheyenne Mountain, near Colorado Springs.

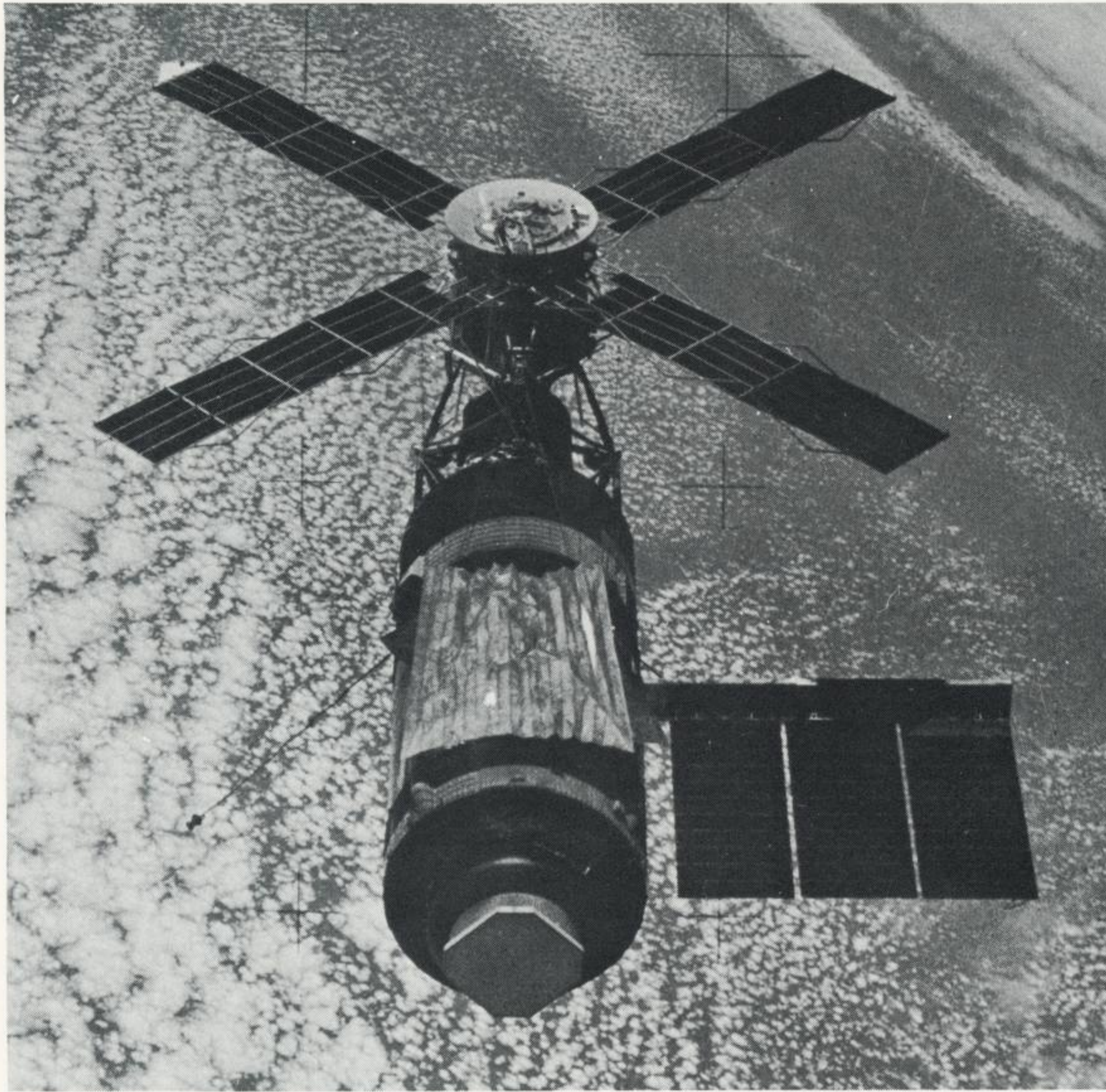
The five-year contract, awarded by the Air Force Space Command headquartered at Peterson Air Force Base, covers software development, integration, testing and follow-on maintenance for upgrading the command-and-control systems of the North American Aerospace Defense Command (NORAD) and the United States Space Command.

The new systems provided by I&CS will include the Air Force's Granite Sentry program, which will replace portions of the existing

NORAD computer and modular display systems with new processing and display subsystems for the NORAD Command Post as well as Air Defense Operations, Battle Staff Support Center, and Weather Support Unit inside Cheyenne Mountain.

Two other Air Force command-and-control systems also are covered in the software development. One provides a mobile control facility to assume the war fighting mission in the event all fixed control centers are incapacitated, and the other provides rapid and secure communications among the Joint Chiefs of Staff and military commanders around the world.

Martin Marietta will perform the work on-site at Cheyenne Mountain. ■



Skylab, the world's first space station, in orbit around the earth. The 100-ton Skylab was launched May 14, 1973, and was visited by three astronaut crews for 28, 59 and 84 days.

World's first space station celebrates 15th anniversary

The nation's goal for a permanently manned space station within the next decade gives impetus to reflections on Skylab, the world's first highly successful manned space station, reports Dr. William Schneider, Vice President of Development for Computer Sciences Corporation, in charge of Skylab's 15th anniversary commemoration.

On May 11, a unique conference will be held at the Von Braun Civic Center and the Alabama Space and Rocket Center in recognition of the 15th anniversary of Skylab, Schneider said. Speakers and panelists will include designers, engineers, and astronauts involved in the significant milestone in the nation's history of manned flight.

Martin Marietta built the Multiple Docking Adaptor, and Apollo Telescope Mount, supervised the design and construction of the experiments to ensure they were compatible with Skylab, and designed and built a contamination measurement experiment, a backpack-type maneuvering device for astronauts (forerunner of the Manned Maneuvering Unit), a vehicle-disturbance experiment, and an astronaut foot-controlled maneuvering unit.

Skylab Revisited is sponsored by the National Space Club, Huntsville Committee; NASA; the University of Alabama in Huntsville; the AIAA, Huntsville Chapter; and the Chamber of Commerce, Huntsville/Madison County. ■

SPACE CAMP discount offered

Employees' children interested in a SPACE CAMP experience in NASA's launch site environment can attend five- and three-day sessions and receive a 20 percent discount.

Because Martin Marietta is one of 12 principal donors to the Space and Rocket Center and U.S. SPACE CAMP, employees may receive discounts to the U.S. SPACE CAMP programs

in Florida near Kennedy Space Center or the U.S. SPACE ACADEMY in Huntsville, Alabama. Principal donors are companies that have pledged at least \$100,000 to either program.

To obtain more information or to register for U.S. SPACE CAMP programs, call 1-800-633-7280 or 205-837-3400. ■

Help to prevent material damage

(Editor's note: The following article, part of a series on the increase in material handling incidents that occurs each spring, and the need for employees to reduce the incidents, was written by Ray Cannon, chief of System Safety for the Astronautics Group.)

Recently a Titan IV first-stage fuel tank was damaged when it was moved from one tool to another. Because the fuel tank was not properly supported, it tipped enough to strike one of the tools.

The resulting damage to the fuel tank was limited to a few superficial scratches and a dent in a removable part of the tank. In this instance, a manufacturing engineering plan and manufacturing process plan, both covering the handling of the fuel tank, did not agree. Past experience in handling Titan III first-stage fuel tanks was misleading because of the weight distribution in the heavier Titan IV first stage fuel tank.

Two valuable lessons resulted from this incident:

- Stop work and resolve differences in procedures as soon as they are discovered.
- Titan IVs may resemble Titan IIIs, but their differences are critical, and must be recognized when handling either vehicle. ■

Briefing date set for systems management MA

Sheila Bell, coordinator of the University of Denver program for a master of science in systems management, will brief those interested in the program at 11:30 a.m. Wednesday, April 13, in the Independence Conference Room on the 'R' level at the Deer Creek Facility.

New students and continuing University of Denver students pursuing this degree may register for the program from noon to 1 p.m.

For more information, contact Educational Services, Ext. 7-4050. ■

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Company donates \$5,000 to Girl Scouts—Mile Hi Council

Martin Marietta contributed \$5,000 recently to Girl Scouts—Mile Hi Council for improvements at Tomahawk Ranch near Bailey, Colorado. The ranch is the primary council camping facility used for troop camping, area events, intertroop events, winter weekends, and resident camps. The improvements at Tomahawk will provide facilities to support a wide variety of programs and services for the growing number of Girl Scouts in the metropolitan area.

Representatives to explain new onsite evening grad programs

Representatives from the Colorado School of Mines will be at Waterton to explain the school's new evening onsite study program at the Waterton facility for those interested in a master's or doctorate degree in materials science.

The degree programs cover fundamental aspects of all materials, followed by a wide selection of elective courses from the departments of chemistry, metallurgy, physics, and other departments such as mathematics and engineering. All elective courses are offered on campus at the Colorado School of Mines.

A minimum of ten students is required by

the school to hold core classes onsite at Martin Marietta. The first core class, Structure of Materials, will be offered this fall.

Colorado School of Mines may also offer a series of Finite Element courses that could apply toward a master's degree in applied mechanics.

The representatives will be at Waterton on College Day, held from 2-4 p.m. Wednesday, May 4, in the second floor cafeteria of the Engineering Building at Waterton. For more information, call Educational Services, Ext. 7-4050.

Titan Major Weld improves process

(Editor's note: The following, the first of an ongoing series of articles on process simplification and its importance to Martin Marietta operations, was written by members of the Project Challenge team.)

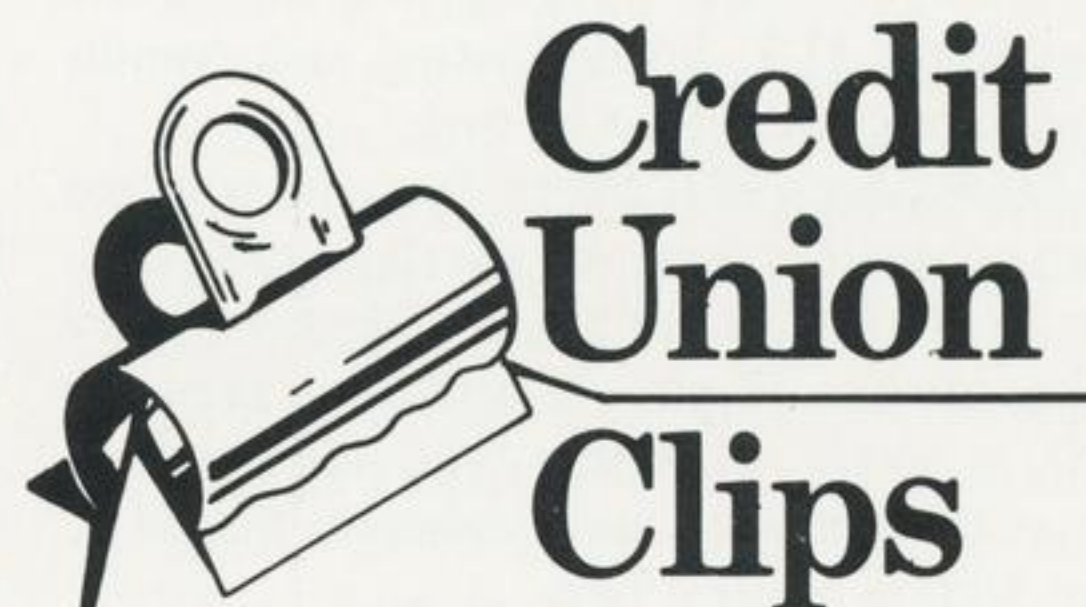
The Titan Major Weld Team from the Space Launch Systems company has devised a way to simplify a segment of the major weld acceptance process by decreasing the amount of time spent in rework before final acceptance by Quality.

Team members Ted Mossman, Kent Tullis, Dan Kloberdanz, Phil Oatman, Rick Hansen, David Lee, Bob Holton, Denise Reeves, and Dennis Huang studied the weld records from 10 Titan-IIIs and one Titan IV, and found that 40 percent of the defects on Titan IV were cracks, and that 55 percent of the cracks had required rewelding. That meant that 29 percent of the total weld crew's time was spent reworking welds.

The team analyzed the current process and proposed to simplify the weld record forms and eliminate nonvalue added steps. Members currently are validating data for a presentation of their recommendations for performance improvement to management.

Initial estimates of savings could run as high as \$302,000 for firm Titan orders and future benefits of \$405,000—a total savings of \$707,000.

The team plans to apply process simplification skills to other segments of the Titan major weld process to improve the productivity of this critical process for Titan IV and Commercial Titan production. ■



The Red Rocks Federal Credit Union will hold its annual meeting at 5 p.m., Thursday, April 28, at the Lakewood Holiday Inn, Hampden Ave. and Wadsworth Blvd.

Members will elect the board of directors and door prizes will be given. Prizes include a trip for two to Las Vegas for three days and two nights, gift certificates to Denver area restaurants, and lottery tickets.

Hors d'oeuvres will be served, and members and their guests are eligible to attend. For more information, call 797-2900.

SIP Values

Unit values for the savings and investment plan (SIP) for employees represented by United Aerospace Workers (UAW) and United Plant Guard Workers of America (UPGWA) in February (January values in parentheses) are:

Fund A	Indexed equity
.9536113000	(.9129038396)
Fund B	Fixed income
1.0397204936	1.0353514751)
Fund C	Company stock
.9508795751	(.9538291325)


PSP Values

Unit values for the performance sharing plan (PSP) for salaried employees in February (January values in parentheses) are:


Fund A	Indexed equity
4.4247920854	(4.2170793200)
Fund B	Fixed income
2.8869856477	(2.8647909229)
Fund C	Company stock
4.9276799574	(4.9426089169)

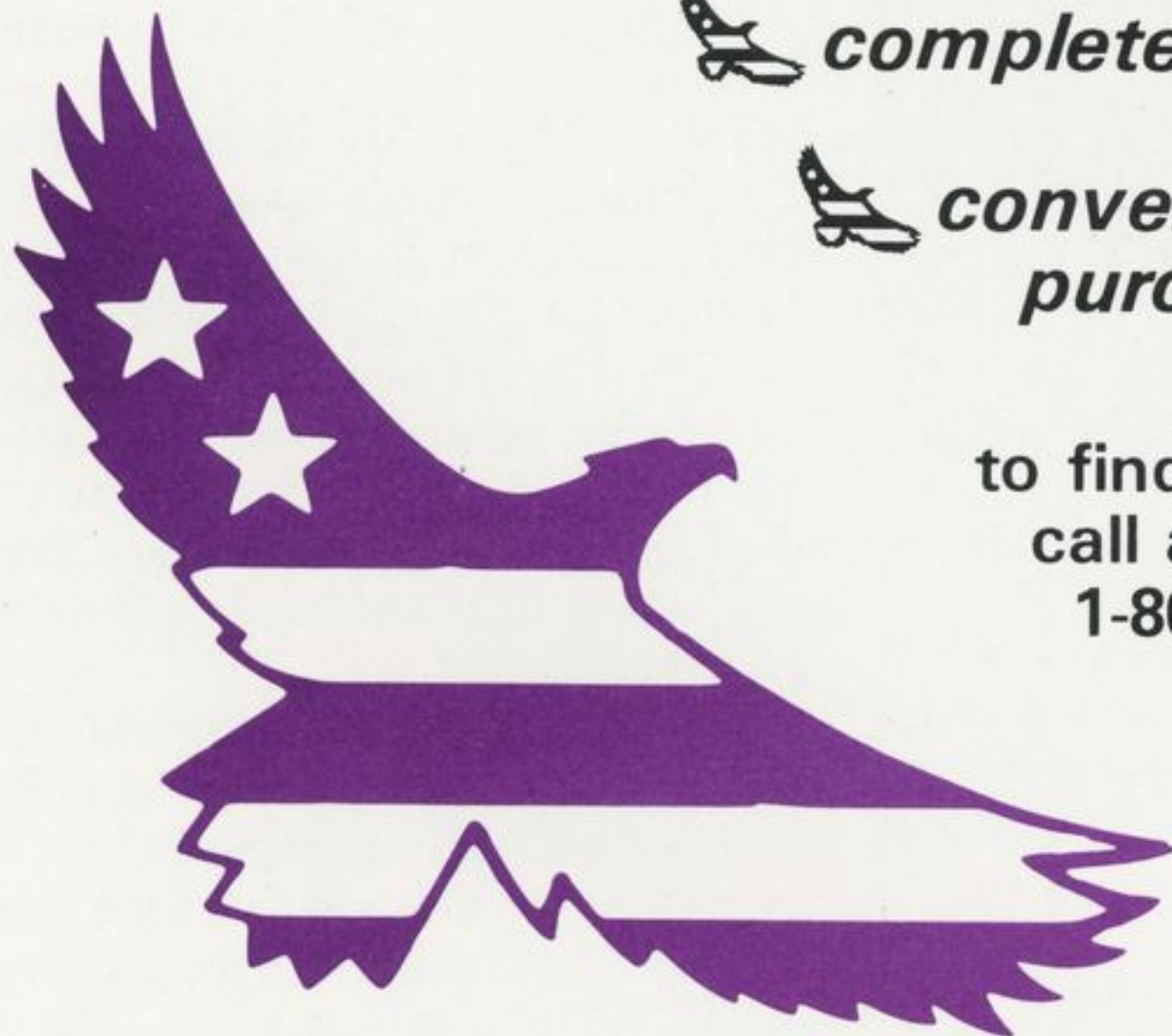
U.S. Savings Bonds now offer

 **competitive rates**

 **exemption from state
& local income taxes**

 **complete safety**

 **convenient
purchase**



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Chasteen named VP of Finance and Controller



Chasteen

Chasteen was director of Government Finance for Corporate Headquarters since 1986.

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Chasteen joined the Corporation in 1969 in Orlando. He has held a number of increasingly responsible positions, including controller for what was then Orlando Aerospace. Before joining the Corporation, Chasteen was a senior logistics specialist for LTV Aerospace.

Born in Texas, Chasteen earned a Bachelor of Science degree in Business Administration from the University of Texas. ■

Donald B. Chasteen has been appointed vice president of Finance and Controller for the Astronautics Group, with responsibility for accounting and treasury, overhead and financial control, government audit/disclosure, program control, estimating, and company area business operations and functions.

Space Systems tackles challenge with FTS

Martin Marietta has built robotic devices for gathering Martian soil samples, for inspecting aircraft components, and for autonomously roving over terrain. But Space Systems engineers are now tackling a new challenge, designing a space robot that will help astronauts assemble the U.S. Space Station and eventually service satellites on its own.

In December 1987, Space Systems was one of two companies awarded parallel study contracts by NASA for definition and preliminary design of the Flight Telerobotic Servicer (FTS), a space robot that will initially help astronauts assemble and maintain the U.S. Space Station in the 1990s.

"We're very pleased with our work on the program so far," said Steven J. Ducsai, Martin Marietta FTS program director. "We're bringing together the corporation's extensive experience in space systems, robotics, and artificial intelligence for the program."

As envisioned by NASA, the robot will enable astronauts to direct routine assembly and maintenance work without leaving the Space Shuttle or Space Station, enhancing crew productivity and safety. The FTS will be equipped with multiple, highly dexterous robotic arms, advanced control systems, and video cameras for viewing. When Space Station assembly is complete, the FTS will employ advanced computer programming called artificial intelligence that will enable the computer to "think" like a human to perform tasks.

A final contract award for development and assembly of the servicer is expected later this

year. NASA is planning a technology demonstration flight of the FTS on the Space Shuttle as early as 1991, with a prototype vehicle to be tested on the Space Shuttle in 1993. The FTS will be launched in the mid-1990s aboard an early shuttle flight ferrying Space Station equipment to orbit.

Under the contract, Martin Marietta is also studying use of the servicer in conjunction with the Orbital Maneuvering Vehicle, a transport vehicle able to service satellites away from the Space Station.

The FTS will employ technologies not used on previous NASA spacecraft. Robotics technologies developed in the FTS program are expected to have terrestrial applications and will play a role in enhancing the United States' industrial competitive posture worldwide.

Toward that end, Martin Marietta is bringing together robotics and artificial intelligence technologies developed through extensive re-

search and a number of development programs. Martin Marietta has been active in space robotics since the early 1970s, when the company developed the first space robotic arm for the Viking spacecraft that landed on Mars in 1976. The robotic arms on the two Viking landers were used to collect soil samples for analysis on the spacecraft. Current robotics efforts include the Intelligent Task Automation program, which is developing "smart" robots for industrial uses such as assembly of aircraft and launch vehicles.

In the area of artificial intelligence and image processing, Martin Marietta has developed the Autonomous Land Vehicle, a self-guided roving vehicle that uses television and laser sensors to "see" the road ahead, and advanced computers to guide it. Using high-speed parallel processing computers and artificial intelligence programming, the ALV is pioneering the kind of technologies needed for the Flight Telerobotic Servicer. ■

Jeff Fister

On the cover

Graphic artist, Bob Murray, painted this concept of the Flight Telerobotic Servicer, a space robot that will initially help astronauts assemble and maintain the U.S. Space Station in the 1990s.

As envisioned by NASA, the robot will enable astronauts to direct routine assembly and maintenance work without leaving the Space Shuttle or Space Station, enhancing crew productivity and safety.

Employee services/recreation

Get a Fresh Start—Free smoking cessation classes are available to all Martin Marietta and Air Force personnel, their spouses and dependents. Classes consist of four meetings from 5-6:30 p.m., April 18, 21, 25, and 28 in Room 208 at Goddard Junior High School, 3800 W. Berry Ave. To register, call the Employee Services office, Ext. 7-6750 or 7-6605.

Commodore Users Group—The club will meet at 5 p.m., Tuesday, April 19. For more details and the location, contact Chuck Barton, Ext. 7-9950.

Parapsychology Club—The group will meet from 5-7 p.m., Thursday, April 21, in the cafeteria at LSC. Nonemployees are welcome to attend, but corporate policy requires a minimum age of 16. Employees must provide escorts for their guests, and give names of guests to Janna Winkel, Ext. 7-7814, DSC, or Helen Hussander, Ext. 1-6887, Southpark West II, 24 hours before the meeting.

Skyline Hunting and Fishing Club, Inc.—The club will meet at 5 p.m., Monday, April 11, in the Deer Creek cafeteria (A level), to discuss the proposed Two Forks Dam and Reservoir.

Skyline Hunting and Fishing Club, Inc.—The club will conduct hunter education classes in April, May, June, and July. The April dates are: April 19-22, 7-9:30 p.m. at DSC I, and April 25, 8 a.m.-1 p.m., at the Skyline Hunting and Fishing Club Range. Those enrolled must attend all six classes. A minimum of 10 students is needed at the first class to continue classes. The cost is \$7, and there is no need to preregister. For more information, contact instructor Dick Benson at his home, 985-3728, or Recreation, Ext. 7-6605 or 7-6750.

Mile High L5—The local chapter of the National Space Society will meet at 7 p.m., Friday, April 8, in Presentation Room 103A at Southpark West. The program will be "The Early History of Ballooning". Dr. Emily Frisby will recount her experiences with Raven Industries and their pioneering work in atmospheric science.

Scuba Diving—The Fathom Dive Club's general membership meeting will be at 7 p.m., Thursday, April 14, at 5973 S. Owens Ct. An information flyer with a map is in the recreation racks and on bulletin boards. All club members and prospective members are invited. Planning of future trips and scuba classes will be discussed. For more information, contact Bob Roe,

Ext. 7-6589, or Larry Espelage, 7-8068.

Corporate Games Update—Martin Marietta's employee team will compete June 3 and 4 in the 8th Annual Denver Corporate Games. Swim team: Terry Heggy has volunteered again to be the company's swim team coordinator, and interested employees can contact him for practice times at Ext. 1-5849. All swimmers are urged to try out; women are especially needed. Track team: Try-out details will be available soon from Diane Eckhoff, Ext. 1-1241, or Pat Hossle, Ext. 1-1445. Aspiring track team members will also have the opportunity to be on the Martin Marietta team at the Regional Corporate Cup Relays on June 18. Bicycle team: Prospective members should contact Ken Rillings, Ext. 1-1056. Employee Marty Carter will be the bicycle race coordinator at the Corporate Games.

Dates of the racquetball and tennis tournaments, and trap shooting competition will be announced soon and interested competitors will be notified.

Employees of the Astronautics Group, Data Systems, or Information & Communications Systems who have not completed a Corporate Games try-out form, and are interested in trying out for any of these events, can call the Recreation office, Ext. 7-6605 or 7-6750. Employees may try out for any event, but can compete in only one event at the Corporate Games. The one-man and one-woman golf team members will be determined at a competition separate from the Partner Best Ball tournament. Details will be announced later. Any employee or spouse interested in volunteering at the Corporate Games can call the Recreation office.

Rocky Mountain Regional Corporate Cup Relays—Martin Marietta will enter a team in this track and field event on June 18 in Boulder. Employees are needed to compete in all track events, including high jump, long jump, and shot put. Interested employees should contact Diane Eckhoff, Ext. 1-1241, or Pat Hossle, Ext. 1-1445.

Denver Symphony Orchestra—Martin Marietta employees can receive a 50-percent discount through June 4, 1988 on all classical, pops, chamber, and family concerts (Great Artist recitals not included). Obtain a discount flyer from the recreation racks. Tickets may be ordered in advance by mail or the discount flyer can be redeemed at the symphony box office. Tickets are subject to availability.

Funplex Discount—Coupons offering one free activity (bowling, skating, or miniature golf) with the purchase of the same activity at full price, are available from the Recreation office located in Room 124 of the Engineering Building, from 10:30 a.m. to 12:30 p.m., and 1-3:30 p.m. daily. Coupons are also available from volunteer recreation representatives.

Theater—Stagewest, located at the Galleria in the Denver Arts Center, 14th and Curtis Streets, offers 25-percent off ticket prices to the musical "Beehive" for Wednesday and Thursday performances. The show features music made popular by female groups and soloists of the 60s. Obtain the card with discount details from the recreation racks. Ticket sales are handled by Stagewest.

Titan Toastmasters—The group meets at 6 p.m. on Mondays at Mission Trujillo Restaurant, 181 Ridge Road (Broadway and Ridge Road). Contact Mark Willey, Ext. 1-6183.

Cafeteria highlights—Beginning in April, customers in the Engineering Building cafeteria will be able to purchase freshly-baked pies on a daily basis. Each pie will cost \$5.50 and the selection will vary daily. Boxes for take-out convenience will be available.

On Friday, April 15, the cafeterias will hold a Sadie Hawkins Day Special. Women may purchase a second dessert for a special man for only a quarter.

Martin Marietta Barber/Styling Shops—Convenient, professional, low-cost hair cuts are available to all employees and Air Force personnel at the following locations: Waterton—basement, Engineering Building, barber/stylist Bill Baker, Tuesday through Friday, 6 a.m. to 3:30 p.m., Ext. 7-3029. LSC—barber/stylist Bill Baker, Monday and Friday, 6 a.m. to 3:30 p.m., Ext. 7-0560. Greenwood Commons—Bldg. 6050, barber/stylist Deb Baker, Monday and Tuesday, 6:30 a.m. to 3 p.m., Ext. 7-1321. DSC—basement, barber Doc Allison, Tuesday through Thursday, 6:30 a.m. to 5 p.m., Ext. 7-9157.

Titan Toastmasters—The group meets at 6 p.m. on Mondays at Mission Trujillo Restaurant, 181 Ridge Road (Broadway and Ridge Road). Contact Mark Willey, Ext. 1-6183.

LSC Toastmasters—The club meets at 4:30 p.m., Wednesdays, in Room 217 at LSC. Contact Kathy DeWitt, Ext. 7-0397.