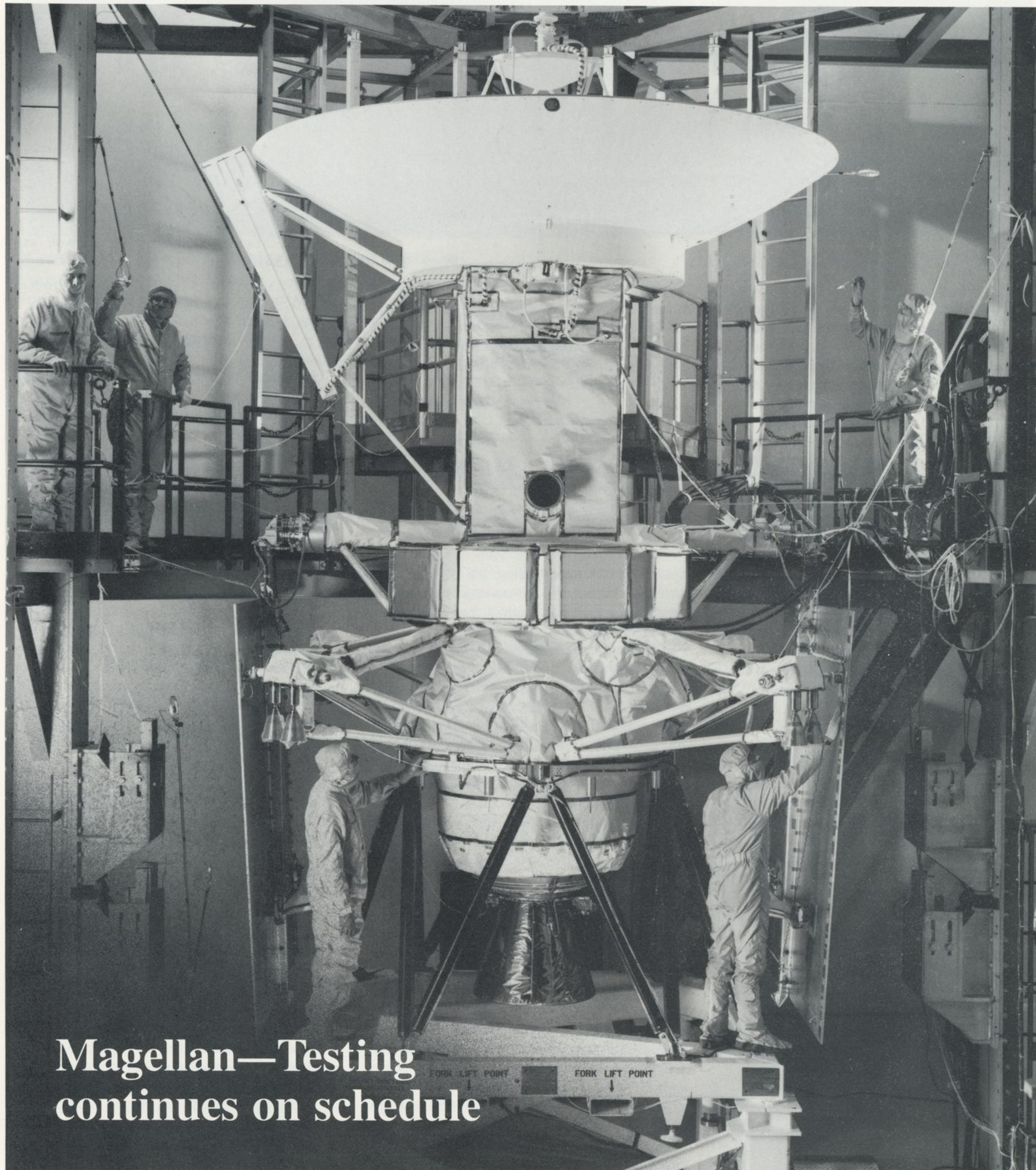


MARTIN MARIETTA

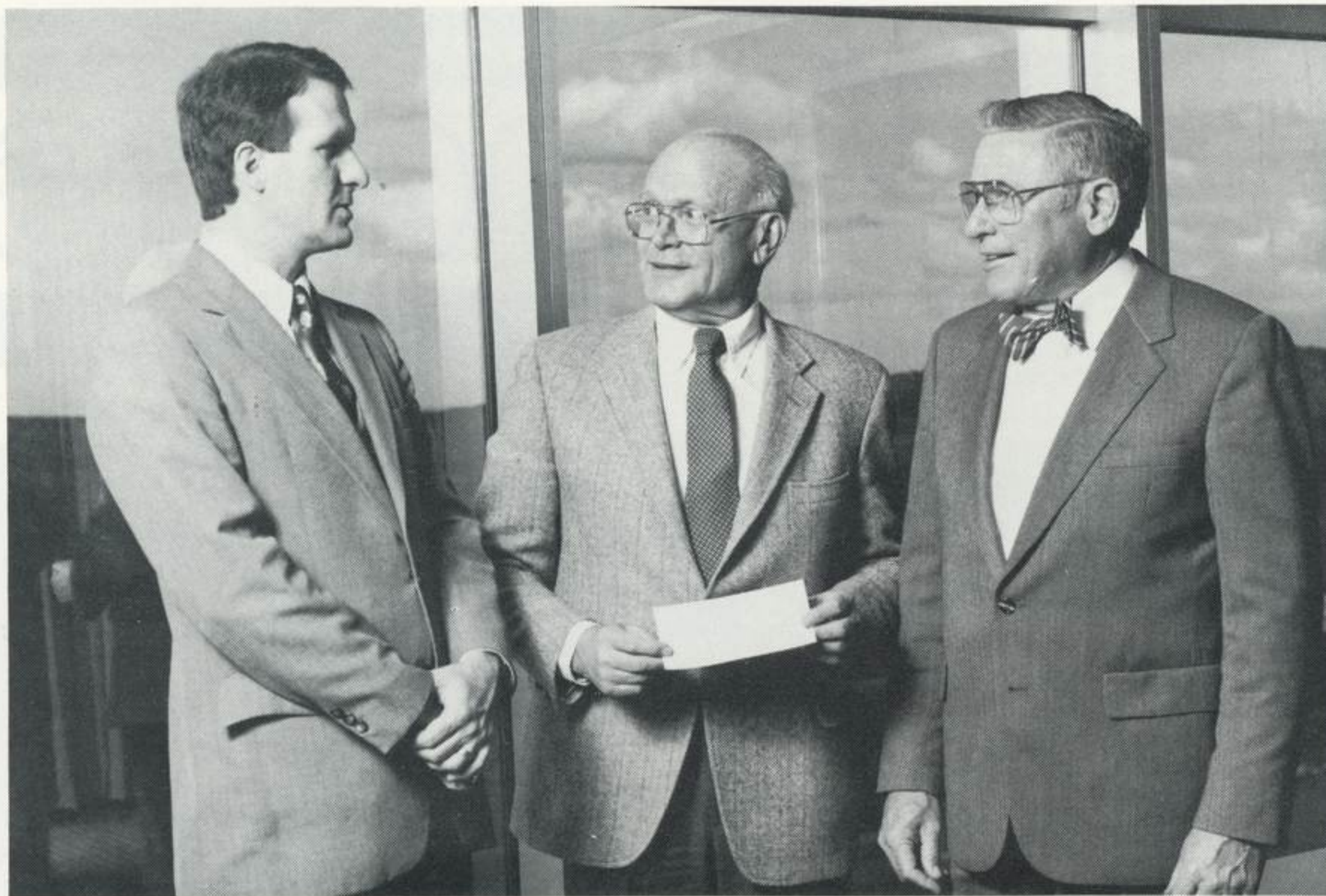
news

ASTRONAUTICS GROUP

March 25, 1988 Number 6



Magellan—Testing continues on schedule



Martin Marietta donates \$5K to orchestra

Martin Marietta Corporation has contributed \$5,000 to the National Repertory Orchestra (NRO), formerly known as The Colorado Philharmonic Orchestra. Left to right are Evan McCollum, Astronautics Group Public Relations manager; Thomas J. Sisk, NRO board member and retired longtime Martin Marietta employee; and James C. Mingee, NRO board member. More than 1,000 promising young musicians audition each year for 90 NRO chairs for a summer apprenticeship in Keystone, Colo. In addition to Keystone concerts, the orchestra performs additional concerts throughout the state.

NASA awards Space Systems company \$4.2 million contract

Martin Marietta Space Systems has been selected by NASA to design and build instruments to measure the extreme heating caused by a new type of space vehicle reentering the atmosphere at 25,000 miles an hour.

The Space Systems company was awarded a \$4.2-million contract by the NASA Ames Research Center in Mountain View, Calif., to build instruments for the Aeroassist Flight Experiment.

The experiment will be the first space test of a reusable reentry system called an aerobrake, which will use Earth's atmosphere to slow down a spacecraft. Temperatures are expected to reach 2,500 degrees Fahrenheit on the surface of the aerobrake, and Martin Marietta is building instruments to measure the energy that will radiate from the aerobrake as a result of the high temperatures.

Called radiative heating, this energy—similar to the heat you feel coming from a fire—is in the form of electromagnetic waves, and is expected to reach 30 watts per square centimeter on the surface of the aerobrake. Martin Marietta also will measure heating behind the aerobrake, which could possibly harm a spacecraft.

Martin Marietta is building three types of instruments to measure radiative heating. Imbedded in the forward surface of the aerobrake and behind the vehicle, the instruments will use sapphire windows to "see" the atmo-

spheric gases surrounding the vehicle. The aerobrake itself will be covered with special heat-resistant tiles to protect the vehicle from the heat.

The aerobrake, a large and relatively light umbrella-shaped structure, is being tested for a future reusable spacecraft called an aer-assisted orbital transfer vehicle (AOTV). The self-propelled AOTV would be able to retrieve ailing satellites from high orbits and return them for servicing at the U.S. space station.

Under the contract, Martin Marietta will deliver the instruments to NASA in June 1991 for a planned September 1993 space shuttle flight.

Briefing date set for master's degree

Sheila Bell, coordinator for the University of Southern California extension program, will be at Conference Room 501 in the Technical Support Building Thursday, April 7. Continuing students pursuing a master of science degree in Systems Management through USC may register for the May/June 1988 term between 11:30 a.m. and 1 p.m.

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

NASA starts safety reporting system

Because of the Space Shuttle Challenger accident, the National Aeronautics and Space Administration (NASA) has established a confidential system for reporting safety concerns about the space shuttle program to NASA Headquarters.

The NASA Safety Reporting System (NSRS) is administered by the Battelle Memorial Institute's Columbus Division. Battelle uses special reporting forms and procedures to ensure the anonymity of the person submitting the safety concern, reports Tom Lebel, safety manager for the Space Systems company.

Battelle evaluates the reported concern to determine urgency and sends a summary (but not an individual's identity) to NASA's safety division. Those in the NSRS evaluate the concern, determine corrective action, and track resolution of the safety concern.

Martin Marietta management, as well as NASA management, support and encourage employees to use NSRS to report concerns. "The Astronautics Group is committed to providing safe products to customers," Lebel said, "and will maintain open channels for employees to express concerns about safety."

The Space Systems company is responsible for providing NSRS information pamphlets and reporting forms to employees. Both can be found on the NASA Systems bulletin board on the sixth floor of the Space Support Building at Waterton. Lebel is the liaison for the NSRS, and can be reached at Ext. 7-5748.

People

— Fifteen Martin Marietta employees from the Career Women's Association (CWA) participated in a Channel 12 public television spring membership drive March 10. "That was the best night—one 15-minute membership break brought in 111 new members for a total of \$8,000," said Cynthia Stone, volunteer coordinator for Channel 12. "We were really busy, but the women kept up and we truly were grateful to have them," Stone said. Geneva Purdy, Ext. 7-5980, will coordinate CWA's participation in the June auction for Channel 12. By then, the studio should have moved from Broomfield to 1531 Stout Street in Denver, Stone said. For more information on the CWA, call Carol Hiatt, Ext. 1-8223.

— Scott Rowland, representing Colorado in the National Voice of Democracy contest, won fifth place and a \$3,000 scholarship March 8 in Washington, D.C. Scott, the son of Jim Rowland, personnel director for Space Launch Systems, was one of 53 finalists selected from more than 300,000 high school students who competed for scholarships by speaking on "America's Heritage." Scott, an honor student at Evergreen High School, graduated a semester ahead of his class and now attends the University of Colorado.



Vowells recognized by Air National Guard

Brig. Gen. George A. Franzen, 140th Tactical Fighter Wing Commander at Buckley Air National Guard Base, seated, far right, presents the Air National Guard Certificate of Appreciation to John H. Vowells, manager of the Prototype Development Shop for the Astronautics Group, seated, center. Vowells earned the distinction, Gen. Franzen said, for steadfast support of the guard, and specifically for adjusting schedules enabling TSgt Thomas R. Elkinton, a senior engineer in Vowells' shop, to serve in the guard. Standing are MSgt William Seiler, base career advisor, left, and Maj. Donald S. Lovisone, Elkinton's squadron commander, both of whom assisted in recognizing Vowells' contributions.

Space Systems awarded option to space-based interceptor contract

The U.S. Air Force Space Division has awarded Martin Marietta Space Systems a \$112 million option to a contract for the space-based interceptor program.

Last June, Martin Marietta was awarded a \$23 million contract by the Air Force to define concepts for an experimental space-based interceptor system for the Strategic Defense Initiative. Called a System Concept and Integrated Technology study, the original contract included two options. Option I was awarded today.

The two-year Option I program will continue development of critical technologies for the system. The option will include the experimental demonstrations of these technologies over the next year. These experiments would be conducted within the bounds of the Anti-ballistic Missile treaty.

The space-based interceptor program covers the design and validation of the complete system, including the interceptor, orbiting platforms, battle management and communications, and ground support. The technology program focuses on a kinetic energy solution to strategic defense and is one of the most

near-term capabilities being evaluated by SDIO.

Martin Marietta Missile Systems of Orlando, Florida, is designing interceptor concepts for the program. ■

Briefing set for degree in science administration

Central Michigan University, in cooperation with the American Society for Industrial Security foundation (ASIS), would like to offer a graduate program in the Denver area for security managers. The program would result in a master's degree in science administration, with a focus in security administration.

To establish the program in the Denver area, the university requires a minimum of 30 students. Steve Kaverman, a Denver ASIS member and local contact, will visit Martin Marietta to brief employees interested in the degree. The briefing will be at 1 p.m. Tuesday, March 29, in the Engineering Presentation Room at Waterton.

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

Gavrilis chosen for Sloan Fellow program



Gavrilis

Theofanis G. Gavrilis, director of the Advanced Research Laboratories for the Space Systems company, has been accepted at the Sloan School of Management at the Massachusetts Institute of Technology.

Gavrilis, selected from all the Martin Marietta operating groups, said "having the opportunity to participate under the Alfred P. Sloan Fellows program is quite an honor.

"I am looking forward to an exciting and rewarding 12 months with the MIT faculty members, Sloan Fellows and world business leaders at a global business and social level," he added.

Gavrilis joined Martin Marietta in 1970. He earned an associate in applied sciences degree from the Academy of Aeronautics in New York, a bachelor's degree in electrical engineering from the University of Colorado, and attended the Defense Systems Management College in Fort Belvoir, Virginia, for a program management course.

As director of ARL, Gavrilis is responsible for development of new technologies and general capabilities for a new product area within the Space Systems company.

The Sloan Fellows program offers a diverse perspective of academic, practical and social experiences, and Gavrilis plans to focus on productivity enhancement and new business opportunities and market areas for the future growth of the Corporation. Gavrilis' wife, Gerda, is a specialist in engineering administration for the Astronautics Group, and also will receive a leave of absence for the year's program. The couple's two children will accompany them. ■

Security slates clean-out

In accordance with the Department of Defense requirement to minimize classified material held by Martin Marietta Astronautics Group, a special one-day "clean out" is scheduled on April 6.

All document custodians and repository custodians (those with classified locks) must identify classified information they possess that is no longer essential for contract performance and can be destroyed.

On April 7 and 8, the classified material will be audited jointly by Security personnel and the control station document custodians. Security then will assume custody of the material and destroy it.

Document custodians and repository custodians have copies of the detailed procedures for the clean-out day. For more information, contact Security, Ext. 7-4709.



Robert McMullen, director of Environmental Management, stands in the new foundation for a containment area that will consist of three 500,000-gallon tanks, part of a two-phase plan.

Treatment plant to be modernized

(Editor's note: Martin Marietta's wastewater treatment plant at Waterton will be modernized in two major steps this year and in 1989. Robert M. McMullen, director of Environmental Management, answers questions in this, the first of a series of articles on environmental subjects.)

Q. Why modernize?

A. Waterton currently has a three-step wastewater treatment plant. This system operated satisfactorily into the 1980s, when increasingly stringent discharge limits such as those for metals, plus stringent new limits for organic pollutants, exceeded the capability of the plant for the removal of some pollutants.

Q. What are discharge limits?

A. They're permit limits specifying the concentrations of pollutants in the wastewater that we can't exceed—our discharge limits for metals and organics at Waterton are similar to the limits for contamination in drinking water.

Q. How does our current system function?

A. Our facility consists of the original sewage treatment plant and industrial wastewater treatment plant installed in the late 1950s, plus a tertiary treatment plant built in the mid 1970s.

The sewage treatment process is based on biological treatment using trickling filters and chlorination.

The industrial wastewater plant uses six batch treatment tanks for aeration and chemical additions, followed by clarification and settling tanks.

Q. What's the third step?

A. When removal requirements for dissolved metals became more stringent in the 1970s, a treatment step was added that consists of precipitation with lime followed by filtration.

Q. Was there additional pressure to modernize this system?

A. Yes. Steps to modernize result from our own heightened awareness and increased public concern about removal of hazardous pollutants such as hydrazine, solvents, lead and cadmium. Also, we're concerned about the system's location upstream from valuable public resources, namely the "gold-medal" trout fishery of the South Platte River, the heavily-used Chatfield recreation area and the Kassler drinking water treatment plant.

Q. What will the modernization involve?

A. In mid-1988, the first phase will be completed with installation of three 500,000-gallon storage tanks on the tail end of the treatment process, plus an initial polishing step in the treatment process.

Q. Why three tanks?

A. The three large tanks are necessary because the existing plant has no holding capacity for treated wastewater. As a result, treated wastewater from the plant currently is discharged to Brush Creek without prior knowledge of whether it meets discharge limits. And sample results aren't received for days or weeks after the discharge occurs.

Q. What are the results of the delay?

A. Wastewater treatment plant operators do not know if the discharged water is meeting requirements until it's too late to correct. The water is long gone when we receive the results.

Q. What will the holding tanks accomplish?

A. All treated water will be held for 24 hours before it's discharged. With increased analytical capability in the environmental lab, we'll be able to sample every batch of treated water before it's released to Brush Creek. If the wa-

ter doesn't meet discharge limitations, it will be returned to the plant for additional treatment.

Q. How much will this cost?

A. We're spending about \$3 million on the modernization, but it's not new capital. We've reallocated money originally planned for other projects.

Q. Are there more improvements to this first phase?

A. Yes, final treatment of the water will be improved by replacing final filters with a new, more reliable filter unit and a final pH control system with a two-step, more sophisticated process.

And we're adding an air-stripping column to remove volatile organic compounds. These are interim changes, however, while an overall modernization of the entire plant is under design.

Q. What does the second phase involve?

A. This project, planned for completion in late 1989, will replace the existing industrial and tertiary treatment plant, modernize the biological plant and add state-of-the-art data collection, operational monitoring and operational control systems to the facility.

Q. What will this accomplish?

A. The overall intent is to provide a facility designed to meet Waterton wastewater treatment needs for the next 10-15 years.

(More details on the second phase of the modernization will follow in a future article.) ■

Two parcel passes now required by Security

Two types of parcel passes for employees carrying classified and unclassified material now are required by Standard Procedure 6.2.

The annual parcel pass (IR-26D) is used to authorize cleared employees to carry classified material within the Denver area, and for removal of specific equipment, such as cameras, tape recorders and automated data processing hardware from Astronautics Group facilities.

This parcel pass must be approved by a department manager or director and by the manager of Security. The pass expires one year from date of issue.

The second parcel pass (DEN500461) is the new pass required by employees who only need to remove unclassified paperwork, test equipment, educational materials and office supplies from Astronautics Group facilities. This type of parcel pass requires only department management approval and is explained further by Standard Procedure 6.2.

If an employee who requests approval for the annual parcel pass also needs to remove unclassified material, the requirement may be noted on the annual parcel pass. ■

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Company sponsors disadvantaged business exposition

Jim Sanford, a chief in central procurement, right, listens to Al Baca, of Conejo Circuits Inc., explain a printed wiring board for ground systems, during the third Martin Marietta-sponsored Disadvantaged Business High-Technology Exposition at the Deer Creek Facility recently. The exposition provided a forum for Martin Marietta program managers, engineers, buyers, subcontract administrators and other interested parties to meet and discuss subcontracting opportunities with representatives of high-technology disadvantaged business firms. Approximately 50 firms from Colorado and throughout the country participated in the exposition.

Magellan undergoes testing on path to launch and exploration of Venus

The program has been cancelled once, delayed four times, and has had three names—Venus Orbiting Imaging Radar, Venus Radar Mapper and now Magellan. It's been called a "second hand rose". But as testing continues on schedule for an April 1989 launch, the program—Magellan—has become one of NASA's most important missions and a key to future U.S. planetary exploration.

Space Systems recently began testing the Magellan spacecraft in the Reverberant Acoustics Laboratory, where it will stay throughout March. There it will undergo testing to ensure that the spacecraft can withstand the acoustic vibration caused by a space shuttle launch. A series of other tests are scheduled this summer. Next November, Space Systems will ship Magellan to Florida to begin processing for launch.

Following launch next year, Magellan will embark on a 15-month journey to Venus, where it will map the planet in greater detail than has ever been attempted. By using a new imaging radar, Magellan will be able to pierce the thick, poisonous clouds that cover the planet, and send back to Earth photograph-quality images.

Charlie Brown, Magellan program director, has been working on the program for nearly ten years, and is eager to see the launch. "Magellan will get the U.S. planetary program back into space," he said. "It will be the first planetary launch since Voyager in the late

1970s and the start of a series of new probes that will visit Jupiter and Mars."

Magellan once was dubbed a "second hand rose" because, to reduce cost, the program uses hardware that was built for other missions, including Voyager. In fact, when engineers needed a structure to duplicate a part of the spacecraft in a test, they took a piece of the Voyager spacecraft that was hanging in the Smithsonian Institution's Air & Space museum in Washington D.C.

Originally scheduled for launch in 1983, Magellan has faced a series of delays. The latest delay, after the Challenger accident in 1986, pushed back the launch date from 1988 to 1989. Also, after NASA decided last year to no longer use the Centaur upper stage on the shuttle, Magellan engineers redesigned the spacecraft's structure to accommodate the Inertial Upper Stage. But there also have been benefits to the delays — for example, the extra time allowed engineers to develop a system verification laboratory that tested spacecraft software commands for extra reliability.

As the program nears launch, the Space Systems team of 300 people is working around the clock to get the spacecraft ready. After launch, a team at Space Systems will continue to work throughout the mission to support NASA's mission operations. Then, in August 1990, the first images of Venus will be beamed back to Earth. "That'll make it all worthwhile," Brown said.

—Jeff Fister

Bond drive slated for April 4 kickoff

The Astronautics Group kicks off its 1988 U.S. Savings Bond campaign April 4, with a goal of increasing employee participation to 96 percent or better.

Peter B. Teets, president of the Astronautics Group, is chairman of the Savings Bond campaign for the Denver geographic area this year, while Joseph C. Spencer, Business Development vice president, has been named the 1988 Astronautics Group Savings Bond chairman.

Eighty-nine percent of the Astronautics Group employees currently are enrolled in the Savings Bond program. In addition to increasing that percentage, bond organizers want to increase the amount current subscribers allocate to bonds.

"Savings Bonds are an important source of funding for our government's operations and provide an attractive personal savings alternative...particularly considering today's uncertain economic conditions," said Teets. "Bonds remain one of the most solid, dependable, safe, secure and competitive investments available today."

The payroll savings plan for bonds offers an easy way to save. Once authorized by an employee, payroll deduction is automatic.

Bond income is exempt from state and local income tax. Federal taxes can be deferred until the bonds are redeemed or reach maturity.

"The popularity of U.S. Savings Bonds today is at its highest level since World War II because millions of savers throughout the country recognize that savings bonds represent both an attractive investment and a symbol of patriotic American tradition," said Teets. ■

**U.S.
Savings
Bonds**

*The Great
American
Investment*



On the Cover

Magellan spacecraft, positioned as it would be at launch, undergoes testing in the Reverberant Acoustic Laboratory. The lab simulates conditions created by a space shuttle launch. This is one of the major tests for Magellan prior to delivery of the spacecraft to NASA.

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. on 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.

Martin Marietta Shepherders Running Club—The club has announced its spring race series in scenic Waterton Canyon. Five races are scheduled as follows: Tuesday, March 29—2 miles; Thursday, April 14—4 miles or 2 miles; Thursday, April 28—5 miles or 2.5 miles; Thursday, May 12—6 miles or 3 miles; and Thursday, May 26—5k or 2 miles. All races start between 4:45 and 5 p.m. Employees have a choice of distances every time out after the first race. Fee for the series is \$2.50. For more information, call Brad Eckhoff at Ext. 7-1299 or 7-9880.

Radio Club—The Waterton Amateur Radio Society will meet at 5 p.m., Tuesday, April 5, in the hamshack at the recreation area. Contact Jeff Owings, Ext. 7-6898.

Aeroriders—The motorcycle club will meet at 5 p.m., Thursday, April 7, in the LSC cafeteria. Contact Paul Betthausen, Ext. 1-5574.

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.

Archery—The Red Rock Bowmen will start an outdoor league in April. Interested employees can contact Rich McNutt, Ext. 7-3324, or Jim Gilmore, 989-5413, evenings. Children ages 8-16 years can take part in an 8-week Junior Olympic archery development class Saturdays, 9 a.m.-noon, starting April 2, at Hinze Archery, 3690 S. Knox Court. The fee is \$4.50 per week. For more information, contact McNutt.

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.

Saddle Club—The club will meet at 7 p.m. Tuesday, April 5; at the SSB cafeteria. Contact Mary Smith, Ext. 1-8154, or Irene Woodzell, 7-5804.

Softball—Rosters and information sheets are in the recreation racks. The deadline to submit rosters is Tuesday, April 19. However, some leagues will reach capacity before the deadline. Employees who would like to play, but are not part of a team, can call the recreation office, Ext. 7-6605, to add their name to a list of individuals forming teams. Team captains will use the list to locate players for their teams.

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

Prompt reporting saves money, time

(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.)

Sherlock Holmes, where are you?

Historically, investigations of material handling incidents are not major "who-done-its," nor do they require the skills of a Sherlock Holmes. The integrity and sense of responsibility displayed by Martin Marietta employees involved in material handling incidents have been a source of pride. When an incident occurs, it is reported and investigated with full cooperation of those involved. Timely and effective corrective actions are taken to prevent future incidents.

Occasionally, however, unreported damage is discovered. The consequences of damage not promptly reported are predictable: delayed corrective action, delayed repair, probable migration of the damaged part into a higher assembly level, possible failure during high assembly level testing, possible escape to the completed flight vehicle level, and always, increased costs of repair the longer the damage goes undetected.

Reporting material handling incidents when they occur is the cheapest, fastest means of correcting the problem. This is especially true when there is no obvious damage because it is more likely to escape subsequent detection, contributing to a major failure.

Determining the facts surrounding an incident when the damage is discovered and reported after the fact would challenge the skill of a Sherlock Holmes. With prompt reporting of material handling incidents, we don't care where Holmes is; we don't need him. ■

Space: The next Renaissance

A one-day symposium on private enterprise in space will be conducted in conjunction with the 1988 International Space Development Conference on Friday, May 27. The symposium will be from 9 a.m. to 4 p.m. at the Stouffer Concourse Hotel.

The program will include speakers from industry and government, and provide opportunities to develop contacts with experienced entrepreneurs. One of the featured speakers will be Spacelab I astronaut Dr. Byron K. Lichtenberg, president of Payload Systems, Inc., the first U.S. firm to sign an agreement with the Soviets to perform experiments on the Soviets' Mir space station.

Other speakers include Tom Taylor, director of engineering for Spacehab, Inc.; Steve Wolfe, a staff member for Rep. George E. Brown, Jr. (D-Calif.); Bob Citron, who played a key role in starting Spacehab, Inc., and is now starting Space Enterprises in Seattle; Hugh Kelso, a key player in Space Research Associates, a Seattle-based company formed by members of the L5 Society; and Art Dula, a space lawyer from Houston who established the Space Commerce Corporation to market launch opportunities on the Soviet Proton rocket and other launch vehicles.

Registration for the symposium costs \$195 (which does not include registration for the conference). Further program and registration information can be obtained by writing: 1988 International Space Development Conference, P.O. Box 300572, Denver, Colo., 80218, or by contacting Jill E. Steele, chairwoman of the 1988 International Space Development Conference and industrial engineer for Information & Communications Systems, at 692-6788 or 388-2368. ■

Sharp elected to second term as DAESRA president



Sharp

Lori Sharp, Employee Services coordinator for the more than 15,000 Martin Marietta employees in the Denver area, has been elected for a second term as president of the Denver Area Employee Services and Recreation Association.

The DAESRA association is a non-profit organization that assists development of recreation and services for employees of business and educational and government agencies in the Denver area. DAESRA, one of 37 chapters under the National Employee Services and Recreation Association, represents 120,000 employees from 50 corporations or agencies, and 40 associate members that offer discount products or services. ■