

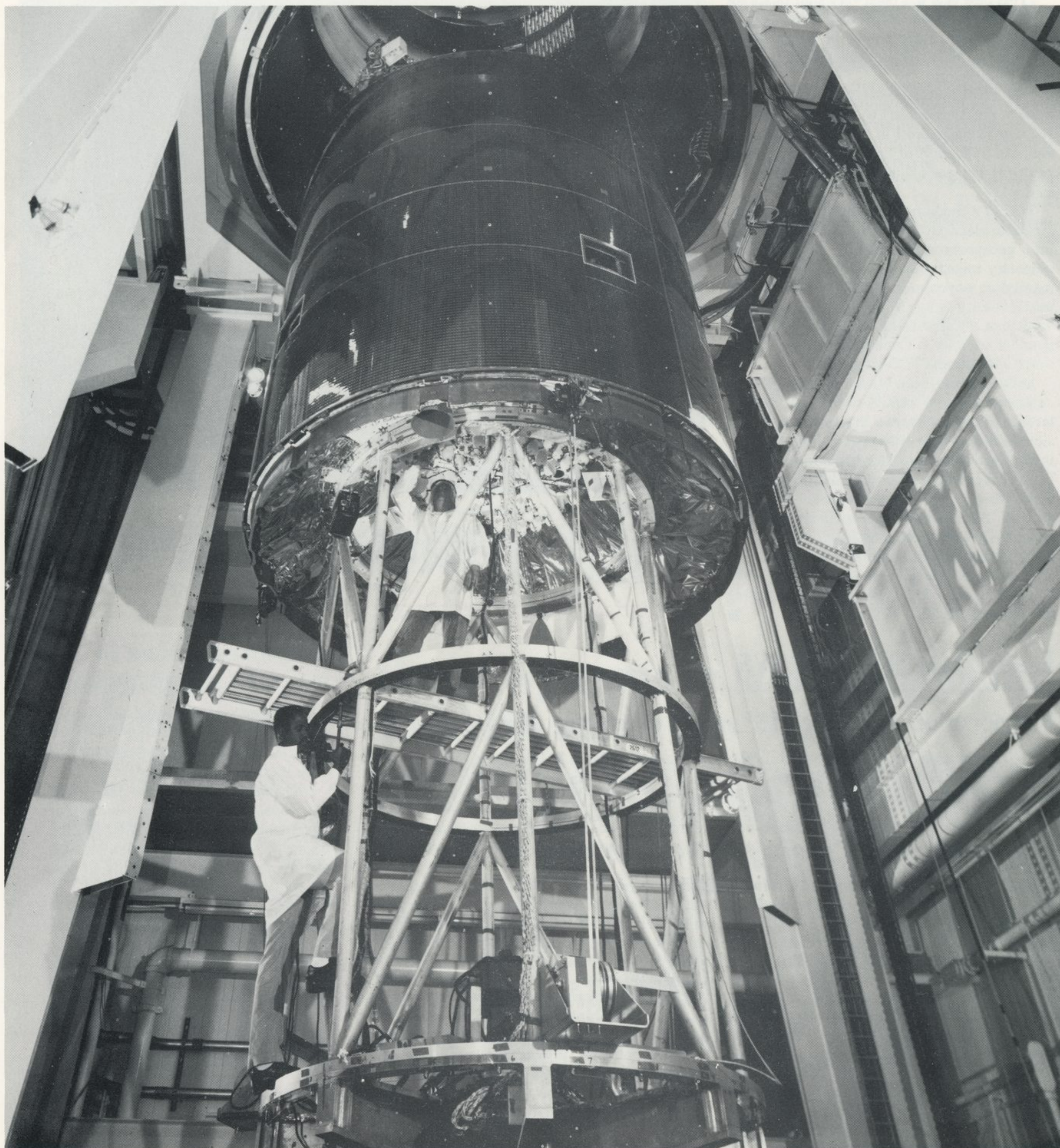
MARTIN MARIETTA

news

ASTRONAUTICS GROUP

March 9, 1990 Number 5

INTELSAT VI set for Commercial Titan ride



TOS passes test in lab

Strategic Systems' Transfer Orbit Stage successfully completed its system qualification program earlier this year at the main plant's Reverberant Acoustic Laboratory.

During the qualification program, TOS was subjected to structural load and modal survey testing, thermal vacuum tests, and acoustic tests.

A series of tests was also conducted to activate the TOS cradle, simulating the operation of these mechanisms in the shuttle's cargo bay.

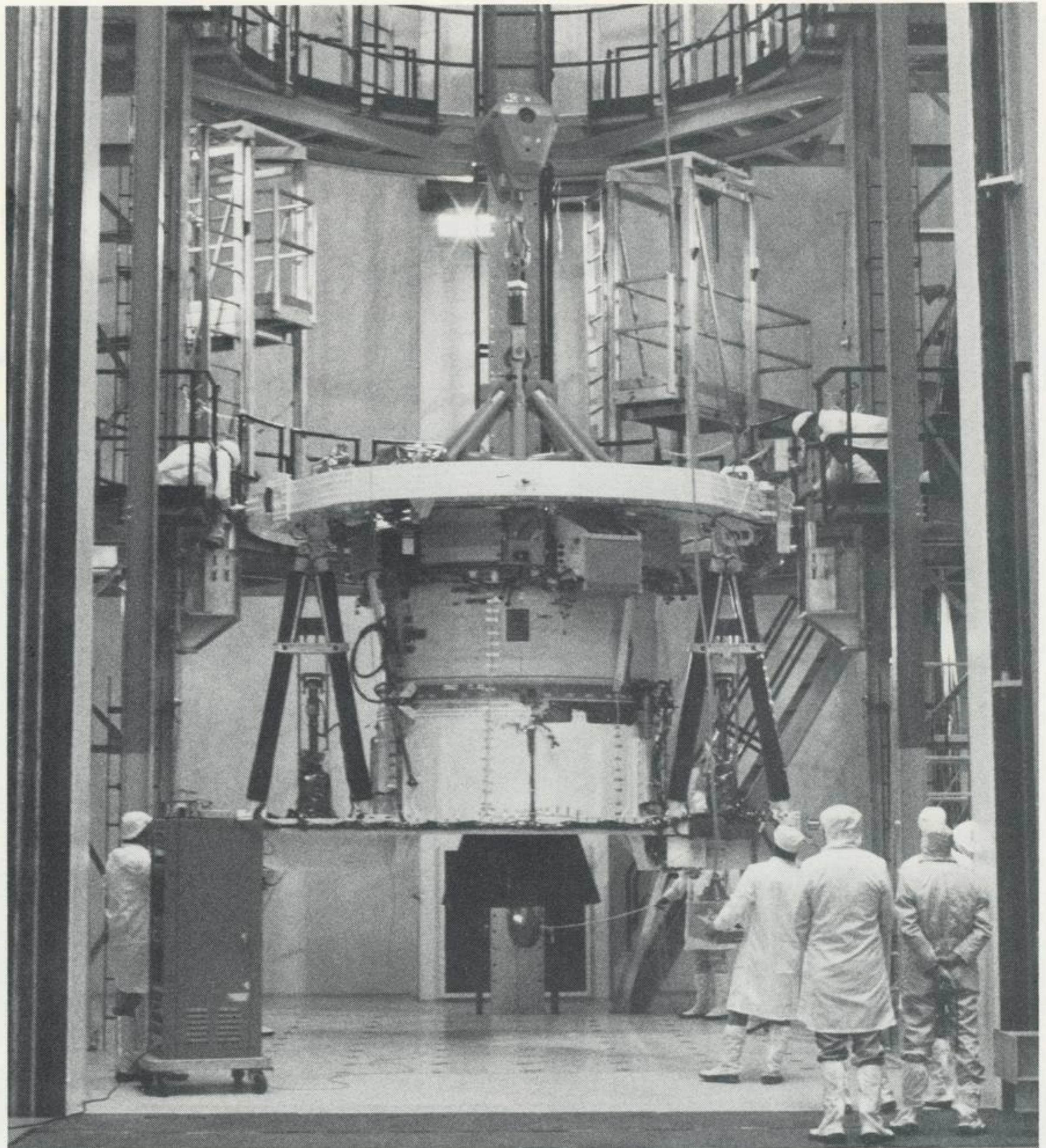
"This past year has been very significant for TOS," Program Director Robert Vosbeek said. "We have turned the corner in resolution of technical problems and completion of system-level qualification.

"With cost containment issues and the development program behind us, we are starting to see a growing interest in providing additional vehicles in support of both Commercial Titan payloads and space shuttle payloads," Vosbeek said.

TOS is a medium-capacity upper stage designed to place payloads of up to 13,000 pounds into geosynchronous transfer orbit or into planetary trajectories. It is available for commercial or government use to boost satellites into low-Earth orbits from a Titan space launch vehicle or the space shuttle. Strategic Systems is under contract to Orbital Sciences Corporation (OSC) for the TOS program.

In November 1986, NASA awarded OSC a contract to supply a TOS vehicle and related technical services for the Mars Observer mission, with hardware delivery in early 1991. Although initially planned for launch on the space shuttle, the launch will now be conducted in September 1992 on a Commercial Titan. In January 1987, NASA contracted for a TOS to boost the Advanced Communications Technology Satellite into geosynchronous transfer orbit after launch by the space shuttle in May 1992.

Total value of the TOS program, including development, is \$154 million. ■



TOS tested

Strategic Systems' Transfer Orbit Stage is tested in the Reverberant Acoustic Laboratory at the Main Plant. TOS will boost two different spacecraft in 1992. Photo courtesy of Orbital Sciences Corporation.

Corporate news

Corporation continues 33³/₄-cent quarterly dividend

The Corporation's board of directors authorized a quarterly cash dividend of 33³/₄ cents per share on the company's common stock, payable March 30 to holders of record at the close of

business on March 5. The action continues the rate on Martin Marietta common, effective in the third quarter of last year, of \$1.35 per share on an annualized basis.

Martin Marietta Canada receives Canadian air traffic control system contract

Martin Marietta Canada Ltd. has been awarded a \$10.7 million contract for additional engineering and technical assistance to the Canadian Automated Air Traffic Control System.

Martin Marietta Canada Ltd. is teamed with Thompson-Hickling Aviation Inc. and Protocols Standards Communication Inc. to provide software verification, system design assessment, and technical review of the automated air traffic system. The project is a major component of Transport Canada's \$5 billion,

15-year Canadian Aerospace Systems Plan.

The six-year contract was awarded by Supply and Services Canada on behalf of Transport Canada, the agency responsible for regulation of the Canadian air traffic system.

Since 1988, Martin Marietta Canada Ltd. has been the systems engineering and integration project contractor, providing overall technical and management support to Transport Canada in implementing a new, highly automated air traffic control and communications system. ■

Employees urged to invest in savings bonds

The Astronautics Group's 1990 U.S. Savings Bonds campaign begins April 2 under the guidance of Human Resources Vice President Stanley F. Albrecht.

For years, savings bonds have been the simple investment choice millions of Americans have used to plan for the future. Now, with the ease of payroll deduction, investing in America and saving for the future is easy.

Bonds offer competitive market-based rates, safety, tax deferral, and freedom from state or local income taxes.

This year, interest earned on bonds purchased after Jan. 1 is tax exempt if it is used for college tuition.

Employees can learn more about the advantages of U.S. Savings Bonds during the upcoming campaign.

Castle Rock astrophysicist will use spectrograph to study universe

Castle Rock astrophysicist Frank Bartko has waited more than 13 years to study the chemical evolution of the universe with the Hubble Space Telescope's faint object spectrograph (FOS), a science instrument he helped build at the Astronautics Group.

He will finally get the chance when the Hubble Space Telescope is opened for business later this year.

Bartko, a Ph.D. astrophysicist who lives in Castle Rock and works in Colorado Springs, will try to clarify details of a theory of the universe's evolution by using the faint object spectrograph to sample the composition of the oldest, most distant celestial objects.

At Martin Marietta from 1972 to 1986, Bartko played a key role in sensor programs including the faint object spectrograph, for which he continues to serve as scientific co-investigator through the launch and operations phases. He also led Martin Marietta's proposal efforts for a number of other NASA and SDI instrument programs.

"Theory has it that hundreds of millions of years after the big bang, the universe was composed of the lightest elements—hydrogen and helium," he said. "Eventually the light elements were pulled together by gravity to form stars, then heavier elements formed and were cast out again when stars died in supernovas. Debris from this constant forming and exploding cycle formed the core of Earth."

The spectrograph takes a chemical "fingerprint" of visible and ultraviolet light waves emitted by very faint objects billions of light-years from Earth. That "fingerprint" reveals the chemical composition of the object and can tell astronomers what elements they contain and therefore what stages of formation objects in the universe have reached.

The chance to look at these distant objects from space is critical because ultraviolet light is screened out by the Earth's atmosphere and can only be seen by a space-based observatory such as Hubble.

"If you walk into any major observatory on Earth, the first things you see on a telescope are a camera and a spectrograph," Bartko said. "The spectrograph is the primary analytical tool. On Hubble, given that your interest is in looking at the faintest, most distant objects, the FOS is the most important analytical tool. We'll see ultraviolet light waves from elements that you can't see anywhere else."

Bartko has looked forward to the Hubble launch since 1977 when he joined Richard Harms, then at the University of California at San Diego, the FOS principal investigator, to help develop the \$50 million instrument. Together with two other collaborators, they wrote the proposal that won the faint object spectrograph competition over four other university-led groups, including Harvard and Princeton.

Martin Marietta served as industry partner in building the instrument. Bartko was the

corporation's faint object spectrograph program manager for a year and then served as technical director as the instrument took form.

"It took nearly three years just to get the design completed and the building started," Bartko said. "Then building, assembling, and integration took another two years, after which it had to undergo a rigorous testing phase to make sure it performed according to specifications."

The same instrument, if built to perform in a laboratory, would have taken much less time and far less money, Bartko said, but a laboratory instrument does not have to survive the rigorous space environment in which it must operate in a total vacuum, bombarded by radiation and tortured by constant cycling between the heat of sunlight and the cold of the Earth's shadow.

"You're pushing this thing for the ultimate performance, and it has to be able to survive a long time in a very hostile environment," he said. "You don't just slap it together, launch it, and expect it to perform."

In 1983, Martin Marietta shipped the faint object spectrograph to a Lockheed facility in Sunnyvale, Calif., where the Hubble Space Telescope was built around the optical system and science instruments. Hubble left Sunnyvale for Cape Canaveral last year, just before the big San Francisco earthquake hit, and is scheduled for launch no earlier than April 12 on the Space Shuttle Discovery. ■



Suggestion program honors Garcia

Monica Ann Garcia, information specialist, center, is honored with the first Success Through Suggestions award of 1990 for her idea to modify a computer process routine used in the Cost Collection Accounting System. Also honoring Garcia are Robert Manning, information systems chief, left, and Donald B. Chasteen, vice president of Finance and controller.

Sculpture exhibit planned for Deer Creek Facility

In celebration of Colorado Business in the Arts month, the Astronautics Group is sponsoring an exhibit of bronze sculptures by artist Ed Dwight at the Deer Creek Facility, March 20-23, on the A level, south of the cafeteria. All employees are welcome to view the exhibit.

The theme of Dwight's art is the black contribution to America. He is noted for his African and jazz series of sculptures, and most of the pieces to be displayed will be from the jazz series.

Dwight was the first black in the astronaut program.

His sculpting career took off in 1975, when he was commissioned by the National Association for the Advancement of Colored People to do a bust of Colorado Lt. Gov. George Brown, the nation's first black lieutenant governor. Dwight, who had not sculpted in bronze before, went to the library, checked out books on the subject, and literally sculpted the George Brown bust chapter by chapter. "The sculpture looked exactly like him . . . I didn't know I could do that," Dwight said.

He then was commissioned by the lieutenant governor of Colorado to do a series of paintings on blacks in the West in celebration of Colorado's Centennial. This resulted in 28 sculptures capturing the spirit of black influence in the West and in a commitment to create and express the richness of African-American culture through the medium of sculpture. ■

Fitness classes offered at two locations

Employees can choose between two locations for aerobics and body toning classes: the Deer Creek Facility's Wellness Center or HEALTHBEAT Athletic and Rehabilitation Club, 151 W. Mineral Ave.

Flyers describing classes at each location are available in the information racks. Employees must complete a medical history form and purchase a class card for participation.

A \$30 card is good for 20 classes, and a \$15 card is good for 10 classes.

The class cards, valid through June 29, are good for these fitness classes only and do not represent club membership. Class cards can be purchased at the locations listed on the information flyer, and questions can be answered by calling Ext. 7-6605 or 7-6750.

Updated benefits booklets mailed to employees

The Employee Benefits office recently sent three updated benefits handbooks to employee mail stops to keep employees aware of benefit changes. The books are:

- 1) "Group Benefits Program for Salaried Employees," revised Jan. 1. This book explains the benefits available to employees and eligible dependents under the medical, dental, vision, basic life insurance, and accidental death and dismemberment programs. In addition to describing the benefits of these plans, specific information about how and when employees and dependents become covered, and when coverage terminates, is included.
- 2) "Group Long-Term Disability Plan for Salaried Employees," revised October 1989. When employees cannot work for a prolonged time because of a serious illness, they need help with more than medical bills. If an employee is eligible for and has enrolled in the Long-Term Disability Plan, the plan will replace, after a minimum six-month waiting period, 60 percent of the basic monthly salary in effect when the employee became disabled. Participation is shown by a payroll deduction from paychecks. Most employees enroll for this benefit on their first day of work.
- 3) "Preadmission Certification and Continuing Stay Review," revised October 1989. This book explains the special feature that applies to the basic medical plan through Connecticut General and the out-of-network portion of the Designated Provider Network through the CIGNA health plan.

Employees who have not received these updated books can obtain them from a Human Resources representative, the information racks, or may call the Employee Benefits office at Ext. 7-4928. ■

30 years of service



Employees celebrating 30 years of service were honored last month at a special luncheon. They are, standing, left to right: Bob Keck, John Gilmore, Earl Gipe, Charlie Harrelson, Don Schaefer, and Maynard Stewart. Seated, left to right: Dick Moog, Jack Kimpton, Bobbie Keel, Al Taylor, and Gil Kyrias.



Standing, left to right: Dennis Herrick, John Zampino, Fritz Karvaski, Marv Loseke, John Sabo, and John Howard. Seated, left to right: Don Cobb, Ken Gates, Leonard Watkins, Jim Beard, and Roger Bell.

Tax forms available for employees

Federal and Colorado state tax forms are available at four locations: South Lincoln facility, Lucy Winka's office; Viewpoint I, Benefits office, Room 206; Waterton, ORB, Room 200; and at Deer Creek, outside the Employee Services office, A level, south end. Tax forms are also available at many libraries and post offices. A branch IRS office, located in Lakewood at 1075 S. Yukon (one block west of the Wadsworth and Mississippi intersection), is open from 8 a.m. to 4:30 p.m., Monday through Friday.



Smeal Midship Pumper christened

Plant Protection recently dedicated its new Smeal Midship Pumper fire truck at a Waterton ceremony with, from left to right: Stanley F. Albrecht, vice president of Human Resources; Paul Nordberg, director of Security and Safety; Bob Kinnison, Air Force Plant Representative's Office; and Tony Hughes, Facilities and Capital Planning. The new pumper represents a capital expenditure of about \$95,000 and can pump 1,000 gallons of water per minute and carry up to six emergency personnel.

Commercial Titan set to go from Cape Canaveral

The second Commercial Titan is scheduled for launch March 14 and will carry a 10,179-pound INTELSAT VI communications satellite into orbit.

The launch is scheduled for 4:49 a.m. MST from Complex 40 at Cape Canaveral Air Force Station, Fla.

Commercial Titans will launch two INTELSAT VI satellites this year. The second launch is expected in June. The satellites are built by Hughes Space & Communications Group.

INTELSAT, the International Telecommunications Satellite Organization, is an international not-for-profit commercial cooperative of 118 member nations that owns and operates the global communications satellite system used by more than 170 countries for a variety of telecommunications services.

The Astronautics Group's first Commercial Titan was launched on Dec. 31, 1989, and placed two international communications satellites into low-Earth orbit. ■

On the cover

The INTELSAT VI gets ready for thermal vacuum testing in preparation for launch. INTELSAT VI is the largest and most complex commercial communications spacecraft in existence. Martin Marietta will launch two Hughes-built INTELSAT VI's on Commercial Titans for the International Telecommunications Satellite Organization this year. This first launch is set for next Wednesday, and the second launch is expected in June.

Employees reminded to follow the rules when using equipment

Two cases of computer theft since the beginning of the year have prompted the Plant Protection department to remind all employees to report suspicious activity immediately to Ext. 7-4646. One case this year dealt with an employee who was apprehended while attempting to leave company property with stolen equipment. The other case centered around the recovery of stolen equipment from a residence. Both ex-employees have been referred to local law enforcement for potential prosecution. Plant Protection asks for the cooperation of all employees when using computer equipment.

Space Systems to study cryogenic fluids in space for NASA

Space Systems has been awarded a contract by NASA's Lewis Research Center in Cleveland to study cryogenic technology that ultimately may be used on the space station or on vehicles transporting crew and payloads to the moon or Mars.

Under the \$415,000 contract, the company will study conceptual designs for a space shuttle flight experiment that will use liquid nitrogen to collect information on the use of cryogenic fluids in space. The contract provides for a possible \$473,000 optional add-on for preliminary design of the experiment, which is expected to fly on the shuttle in early 1995. Space Systems is one of two companies selected to study designs for the experiment.

"The liquid nitrogen experiment will provide data on storage and resupply of cryogenic fluids, such as liquid hydrogen, nitrogen, and oxygen, in space," Bill Bailey, cryogenic

program manager, said. "It also will give us information about how to store nitrogen onboard the space station where it will be needed as a component of breathing air for the life support system."

Cryogenic fluids—liquids and vapors stored at several hundred degrees below zero—are difficult to manage in the low gravity of space. However, cryogenic management technology is essential to future space flight, particularly missions in which vehicles must refuel during long journeys.

The company has been studying the storage and resupply of these fluids in space under a two-year \$1.8-million NASA contract since 1988. That study is part of NASA's Cryogenic On-Orbit Liquid Depot Storage, Acquisition, & Transfer Satellite (COLD-SAT) program, a spacecraft that will conduct cryogenic management experiments in space. ■

Air Force official to address contract management group

Benedict A. "Tony" Kausal will discuss "The Defense Management Review (DMR) in the Air Force" at 6 p.m. March 13 at the Raffles Hotel, I-225 and Parker Road.

Kausal is Acting Air Force Competition Advocate General and acting Director, Contracted Assistance and Advisory Services in the Office of the Assistant Secretary of the Air Force for Acquisition. His talk will cover the role of the new program executive officers, the DMR acquisition system, and additional DMR procurement initiatives.

Interested employees should contact Mary Dillion at Ext. 1-8463 for reservation information. The meeting costs \$15.50 and includes a meal. ■

Cholesterol testing available at three locations during National Nutrition Month

What's your number?

Employees who do not know their cholesterol level can have their cholesterol tested by HealthMark personnel at Astronautics Group facilities this month in conjunction with National Nutrition Month.

The \$16 blood test is not covered by any company medical plans.

Testing takes about five minutes and is conducted on a first come, first served basis. Participants must fast for 12 to 14 hours before testing.

Free feedback sessions take place the

following week to distribute and interpret results and to discuss ways to make changes.

The testing will be conducted from 6:30 to 8:30 a.m. at the following locations: Littleton Systems Center, Room 107, March 19; Waterton, Engineering Building, second floor presentation room, March 20; and Deer Creek Facility, Wellness Center, March 21.

For more information, call a HealthMark representative at the Wellness Center at Ext. 7-7575 or 7-7576.

Wellness Center offers tips for nutrition month

March is National Nutrition Month, and eating properly makes employees feel better and look better. Susan Stevens from HealthMark offers the following substitutions to make meals healthier:

Substitute:	In Place Of:
Two Egg Whites	One Egg
Skinless Chicken Breast	Chicken with Skin
Olive Oil	Oil and Margarine
Brown Sugar or Honey	White Sugar
Cooking Spray	Oil and Margarine

Please call the Wellness Center at Ext. 7-7575 or 7-7576 for a free nutrition consultation. Ask for Diane Nolly or Janice Charles.

Command Media survey distributed to employees

The Astronautics Group's Command Media organization is interested in serving employees with materials that meet concerns and needs for doing the best job possible. Therefore, early this month, more than ten percent of randomly selected employees will receive a short, confidential, command media survey.

Employees receiving the survey are encouraged to take a minute to respond. Employees who do not receive the survey but are interested in participating should contact Joan Wise at Ext. 7-7557 to obtain a copy.

Surveys should be returned as soon as possible to Wise at Mail Stop DC1053. ■

Employee services/recreation

Copper Mountain Discount Week—Martin Marietta employees can take advantage of discount corporate rates at Copper Mountain through March 11. The adult lift ticket is \$23, compared to \$26 at Front Range outlets. Students, ages 13 to 18 years, can ski for \$18, and tickets for children, ages 4 to 12 years, are \$12. The group lesson fee is only \$20, a \$10 savings. To obtain these special lift ticket and lesson rates, employees must go to a special registration on the third floor of the center building at Copper Mountain. One person per group must show proof of Martin Marietta employment and purchase discount tickets for the group. Reduced lodging rates, based on availability, can also be obtained by calling 1-800-458-8386 and asking for the corporate ski week rate.

Aurora Fox Arts Center—Discount tickets to the musical "Cabaret" are available for the 8 p.m. performance March 9, 10, and 15 through 17, and for the 2 p.m. performance March 11 and 18. Martin Marietta employees can call 361-2910 to reserve up to four tickets for \$5 each. Reservations can be made between 10 a.m. and 5 p.m. Monday through Friday

Hunting and Fishing Club—The group will meet at 5 p.m. March 12 in the clubhouse at

the recreation area. For more information, contact Mel Smith at Ext. 1-8682.

Red Rock Bowmen—Archery club members will meet at 4:45 p.m. March 13 in the clubhouse at the recreation area. The club is offering a free seminar, "Bugling the Illusive Wapiti," after the brief meeting. All employees are welcome to attend. For information, contact Hub Hubbard at Ext. 7-0975.

Parapsychology Club—The club will meet from 5 to 7 p.m. March 15 at Southpark West I, MIC room. Greg Storozuk will discuss "Dowsing Applications—An Ancient Art in a Modern World." All employees and guests, age 16 and older, are welcome. To reserve a guest badge or for more information, call Helen Davis at Ext. 1-6887.

Commodore Users Group—The group will meet at 5 p.m. March 20 in the recreation area clubhouse. For more details, contact Chuck Barton at Ext. 7-9950.

Martin Marietta Ada Working Group—Ada/Software Engineering—Interested employees will meet at 5 p.m. March 21 at Littleton Systems Center's Presentation Room. Contact Robert Lewis at Ext. 1-6731 for more information.

Child Care Discount—La Petite Academy child care centers in Colorado offer Martin Marietta employees a ten percent discount off weekly tuition for any child not currently receiving a discount. Obtain an informational brochure in the information racks or from the Employee Services office.

Career Women's Association—Normal R. Augustine will be the speaker for the March 15 dinner meeting at the Hyatt Regency Tech Center. Reservations are due to boosters today. Roslyn Turner will present a "Risk: Payoffs and Pitfalls" workshop for interested employees on Saturday, March 24, from 8:30 a.m. to 1:00 p.m. at the Inverness Park Data Systems Training Center. Call Barbara Martinez, Ext. 1-5398, for reservations.

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