

MARTIN MARIETTA

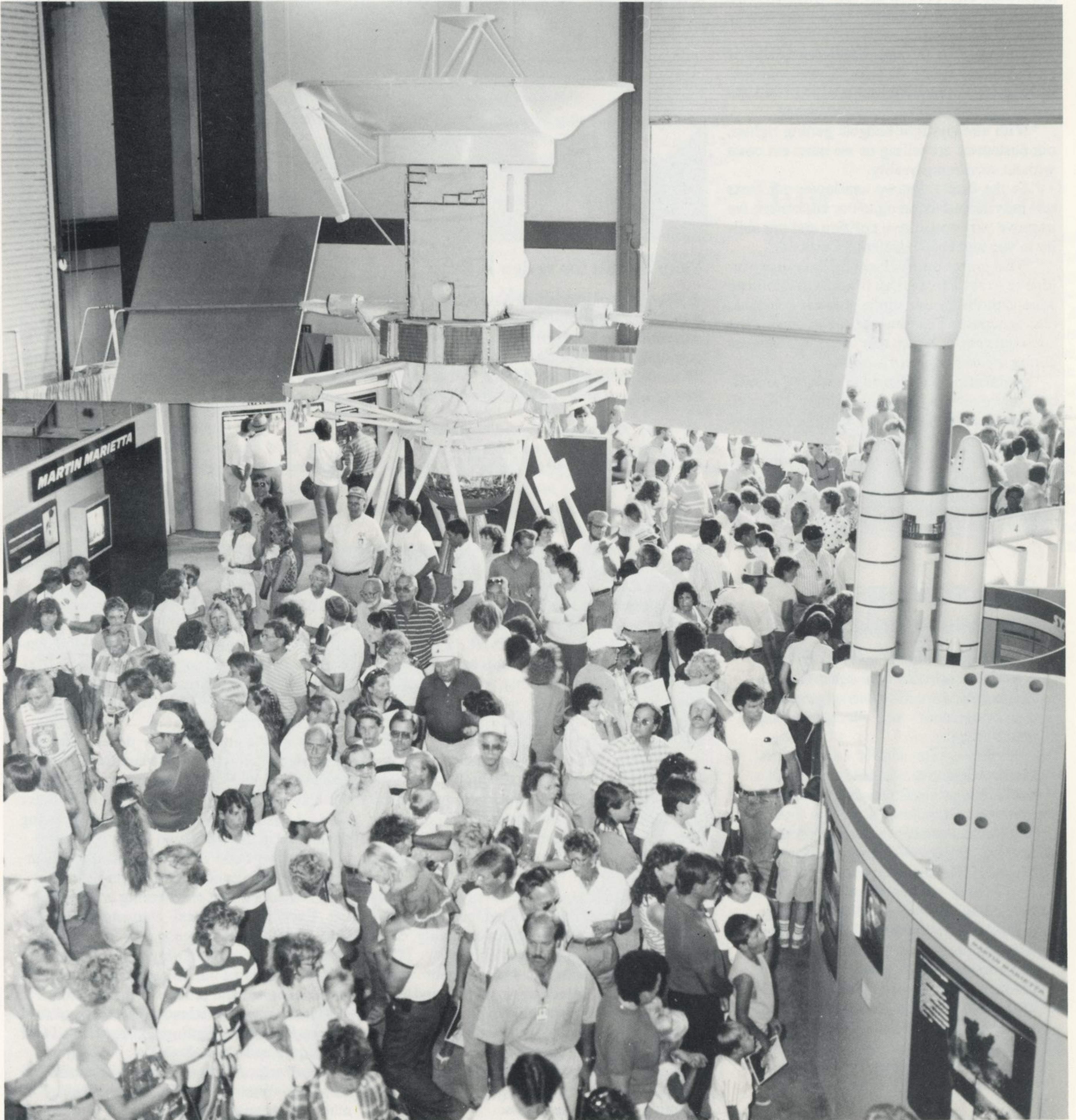
news

ASTRONAUTICS GROUP

August 11, 1989

Number 17

Family Open House a huge success



Engineering Excellence helps cut costs

The Engineering Excellence initiative got a boost from an unexpected quarter recently.

"Engineering Excellence seems to offer the most promising single area of opportunity for us to reduce costs through improved quality," said Bob Curts of Space Systems company business development. "Obviously, this will enhance our competitive position."

Providing a marketing perspective on Engineering Excellence at the most recent Engineering Excellence technical interchange meeting, Curts cited high costs as the concern most often voiced by Martin Marietta's customers and by senior Washington officials.

"Cutting costs through improved quality is critical to our future success," Curts, manager of long-range planning and analysis, told the group.

"With already-tight budgets getting tighter, our customers are telling us we must cut costs without sacrificing quality.

"To the extent that we can lower our costs and pass the reduction on to our customers, we improve our competitive position and our ability to win and keep business," Curts said.

"What makes the Engineering Excellence initiative so attractive is that it works to eliminate what is probably our single greatest avoidable cost generator: The time needed to correct the consequences of errors that creep into designs during the development process.

"Engineering Excellence is yielding significant improvements in design quality," he said. "The people who are achieving these improvements should be applauded."

Technical interchange meetings are internal meetings held quarterly to keep the Martin Marietta technical community abreast of Engineering Excellence progress and activities. ■

Two students receive scholarships

Christopher Huffer and Ray Helmick have been selected to receive Foundation scholarships after two original winners decided to accept other scholarships.

Huffer is the son of Mr. & Mrs. Gordon C. Huffer. Mr. Huffer is a senior staff engineer for Strategic Systems. He graduated from Arapahoe High School and plans to study environmental engineering at the Colorado School of Mines. Huffer has been active in soccer, Boy Scouts, and youth group and is a member of the National Honor Society.

Helmick is the son of Mr. & Mrs. Allen Helmick. Mr. Helmick is a logistics engineer for Space Systems. A graduate of Heritage High School, Helmick plans to attend Colorado School of Mines. He is active in cross-country biking and running and enjoys reading and working with computers.



Titan II table top review in factory

A Titan II engineering review team conducts a table top review in the factory, with participation from the mechanics who build the product. Before the review, the team posted a storyboard to help get suggestions on engineering that production people felt may need to be changed to reduce liaison calls. This review, and another that followed, identified some 30 items for possible change. Table top reviews were begun as part of Engineering Excellence, which is a TQM initiative under concurrent engineering.

TQM is here to stay

Total Quality Management has become a familiar phrase around the Astronautics Group recently. It means one thing to some people, another thing to others.

Total Quality Management—TQM—is an idea whose time has come. TQM is here to stay. The Corporation recently adopted a policy supporting TQM. It's number GP-20, dated May 4.

And the Astronautics Group has prepared a Group-wide TQM plan that will soon be disseminated widely.

Meanwhile, the *Martin Marietta News* will attempt to clarify what TQM means.

According to a definition published by the Department of Defense, Total Quality Management is "... continuous process improvement activities involving everyone in an organization—managers and workers—in a totally integrated effort toward improving performance at every level."

This definition goes on to say: "This improved performance is directed toward satisfying such cross-functional goals as quality, cost, schedule, mission need, and suitability. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous process improvement. The activities are ultimately focused on increased customer/user satisfaction."

Within the Astronautics Group, TQM is spanning the entire enterprise.

The strategy for implementing TQM involves commitment, people empowerment, the Annual Performance Improvement Program (APIP), customer satisfaction, and continuous process improvement.

A number of initiatives are already underway or are being developed. Number one among these initiatives is the formulation of High Performance Work Teams. By summer's end, more than 1,800 Astronautics Group employees will have undergone High Performance Work Team training.

Among the initiatives in development or early implementation are Manufacturing Resources Planning (MRPII) training, subcontractor involvement and UNIS, which stands for Unified Information System, a program being developed in the Advanced Launch System.

Other key TQM initiatives include concurrent engineering and process control.

Under concurrent engineering are Engineering Excellence, critical characteristics, and CAE/CAD/CAM, which stands for computer-aided engineering/design/manufacturing.

Process control initiatives include statistical process control and process simplification.

This is only a partial recap of how the Astronautics Group is adopting and applying TQM techniques and technologies.

The *Martin Marietta News* will expand on these initiatives and publish other TQM information in coming issues. ■

Art contest originals available for pick-up

Employees may pick up their children's 1989 Family Open House artwork and a certificate of participation from the Publications department at Waterton.

The department is located in the Administration building, Room 104. For more information, contact Jimmie Jacobs at Ext. 7-5787.

People

- Robert Gammill, University Relations programs manager, has been named president of the College Placement Council (CPC), a national professional association for the college career planning, placement, and recruitment field. Gammill has been associated with CPC as president-elect, vice president for employee members, and chairman of the strategic management committee.

- Cindy Scholz, an engineer on the Space-Based Interceptor program, has been awarded one of three 1989 International Rotary Foundation scholarships for the Denver area. With the scholarship, Scholz will work toward a master of science degree in Applied Oceanographic Sciences at the University of Southampton in England.

- Donita Wolters, a staff specialist in Compensation and Benefits, has been elected president of the Colorado Society for Personnel Administration (CSPA). The organization's purpose is to further the development and competence of human resource professionals. Wolters served previously as vice president and publicity director for CSPA.

- Donna Rillings, systems support engineer, recently won the Colorado state time trial cycling championship while setting a new course record for women. At the national level, she placed sixth and, as a member of Team Montgomery, won a gold medal for the team time trials.

- William E. Rogers, director of logistics for Strategic Systems, has been selected by the AIAA Support Systems Technical Committee to receive its 1989 National Support Systems Award. The award will be presented at the Total Quality Management Symposium Nov. 1-3 at the Deer Creek Facility.

- Orlando T. Hooks, senior engineer for Space Systems, is one of 50 professionals from around the state participating in the Colorado Association of Commerce and Industry's 50 For Colorado program. The program involves leadership education, professional development, management training, and research projects. ■

Space-Based Interceptor technology test successful

The U.S. Air Force has successfully demonstrated key technologies needed to locate an enemy missile and guide a Space-Based Interceptor to destroy it. The technologies could also be applied to other weapon systems.

Part of the Strategic Defense Initiative, the Space-Based Interceptor (SBI) program is being conducted by Space Systems and the Electronics and Missiles Group for the Air Force Space Systems Division. The SBI system, as envisioned by the Air Force, would consist of orbiting interceptors to destroy enemy ballistic missiles by colliding with them.

Called "On Target," the test demonstrated the capability of the seeker and image processor, the "eyes" and "brain" of the interceptor. The combination of sensor, signal processor, and software enables the interceptor to find the relatively dim missile in the presence of the bright plume from a solid rocket motor. The test took place on Aug. 1 at the Air Force Astronautics Laboratory at Edwards Air Force Base, Calif.

In the demonstration, a seeker was able to locate and lock onto a target while simultaneously stabilizing a hovering test vehicle. The test vehicle hovered in mid-air on its rocket engines inside a building while the seeker "looked" at a burning rocket engine outside the building.

Along with demonstrating the technologies needed to locate the missile and guide the interceptor to a collision with it, the test showed that the interceptor can be controlled by the seeker and image processor while the platform's

rocket engines are firing to maintain a hovering flight.

"The test successfully demonstrated, using Martin Marietta-developed image processing techniques, the feasibility of a Space-Based Interceptor to locate and track a dim booster hardbody, even in the presence of the booster's bright plume," said Dr. John Stevens, director of the Space-Based Interceptor program. "The test was executed flawlessly and the experiment/flight support team from Martin Marietta Missile Systems deserves recognition for a job well done."

Among the components involved in the system are a sensor known as a staring focal plane array, made of mercury cadmium telluride, and a parallel processing computer and advanced software to guide the interceptor to its target. The seeker's design eliminates the moving parts of the gimbal mechanism found in most other seekers.

"The test was an important step in demonstrating several critical technologies, such as the ability to identify enemy missiles quickly and accurately and maneuver properly for a direct hit," said Richard B. Caime, vice president of SDI and Tactical Interdiction Systems for Missile Systems. "These capabilities are crucial to the success of SBI and would be effective for other weapons designed to intercept enemy missiles."

The test, one of three scheduled this summer, was conducted under a \$7-million Air Force contract to the Corporation. ■



Bergquist receives invention royalties

Retiree Lyle Bergquist, center, recently was presented a \$10,000 royalty sharing check from Andrew J. Stofan, vice president of Technical Operations. Bergquist received the award through an agreement between Martin Marietta Corporation and ALCATEL, of France, that has marketed his patented helium leak detector invention. The product, which Bergquist invented while working as a staff engineer on an Independent Research and Development (IR&D) contract, checks for leaks in sealed components. "I've worked with a great team, and this is the reward of working with such a cooperative organization," Bergquist said. His wife Barbara also is pictured.



"Open Door" gets \$2,500

Rev. Leon H. Kelly, left, thanks Willie Powell, of Commercial Titan, for a \$2,500 donation to Kelly's "Open Door" anti-gang program. The \$2,500 was raised by Astronautics Group employees who purchased \$1 Denver Nuggets playoff tickets last spring. Kelly's program is designed to provide Denver area youths with an alternative to joining gangs.

Draft environmental report submitted to EPA

A draft remedial investigation report, prepared by three of the top environmental consulting firms in the country, has been submitted by the Astronautics Group to the U.S. Environmental Protection Agency. It confirms that groundwater contamination found at the main plant at Waterton poses no danger to public health.

The report was produced as part of an ongoing program to investigate and clean up contamination from past waste disposal and handling practices at Waterton. It summarized results of more than three years of environmental studies performed under a consent agreement with the EPA.

The report identifies the sources of the contamination; its extent and migration characteristics; the potential risk to human health and the environment; and objectives to be addressed in the remainder of the study.

"The results of the remedial investigation provide the basis for selection of the most appropriate cleanup method," said Dr. Willard Haas, manager of remedial programs, Environmental Management department. "The next step is to complete a feasibility study, which we expect to be done by December."

Haas said the feasibility study will look at each contaminated site and conclude what cleanup method should be used. Following the feasibility study, the EPA will issue a "record of decision" which describes the approved cleanup method. ■

How to contact your U.S. Congress delegates

Following is a list U.S. Congress delegates to contact about concerns, by mail or phone:

Sen. Tim Wirth
1129 Pennsylvania St.
Denver, Colo., 80203, (303) 866-1900

Sen. Bill Armstrong
1625 Broadway, 780 Dome Tower
Denver, Colo. 80202 (303) 844-5980

Rep. Patricia Schroeder
1600 Emerson St.
Denver, Colo. 80218 (303) 866-1230

Rep. David Skaggs
9101 Harlan St., Suite 130
Westminster, Colo. 80030 (303) 650-7886

Rep. Ben Nighthorse Campbell
720 Main St., Suite 400
Pueblo, Colo. 81003 (719) 543-9621

Rep. Hank Brown
301 S. Howes, Room 203
Fort Collins, Colo. 80521 (303) 493-9132

Rep. Joel Hefley
10394 W. Chatfield Ave, Suite 104
Littleton, Colo. 80127 (303) 933-0044

Rep. Dan Schaefer
3615 S. Huron St., Suite 101
Englewood, Colo. 80110 (303) 762-8890 ■

Corporate news

Company to produce subsystem for new Navy torpedo

The Corporation has been awarded a contract to begin production qualification and limited-rate production of the command and control system for the U.S. Navy's new Mark 50 anti-submarine torpedo.

The work will be performed by Aero & Naval Systems, Baltimore, as a member of a Westinghouse Electric Corp. team that will compete for a production award planned late next year.

The command and control system directs torpedo functions, including navigation and attitude control, sonar data processing, and tactical decision-making, and provides guidance commands for control of the torpedo.

Westinghouse is responsible for overall systems integration and for the torpedo's acoustic sensor systems.

The Mark 50 will be quieter, more accurate, and able to operate at greater depth and with increased speed and maneuverability than the Mark 46, which it will replace. It also will use advanced countermeasures and better homing characteristics. The Mark 50 will be used by both aircraft and ships and is projected to serve as the payload for the Sea Lance missile, an anti-submarine stand-off weapon. The Mark 46 has been in the Navy inventory for more than 20 years.

Voyager approaches Neptune

The Voyager II spacecraft, launched in the summer of 1977, will explore Neptune and its satellite Triton later this month, completing its "Grand Tour of the Planets." Neptune is the fourth and last planet the spacecraft will encounter before sailing off into deep interstellar space.

Voyager will complete its 3-billion-mile journey, which has featured flybys of Jupiter (July 1979), Saturn (August 1981), and Uranus (January 1986), when it passes within 3,000 miles of Neptune—the spacecraft's closest encounter during its 12-year mission. Following this encounter on Aug. 25, Voyager will continue toward Triton to investigate its size, mass, composition, and temperature.

Originally commissioned to investigate only Jupiter and Saturn, Voyager continued to Uranus and now heads toward Neptune to retrieve what scientists hope will be the spacecraft's sharpest and most accurate data.

Because Neptune is 2.7 billion miles from Earth and nearly 1,000 times dimmer than our planet, Voyager's two television cameras were reprogrammed for longer exposure times. At this distance, a single one-way transmission from Voyager to Earth will take more than four hours to receive.

To launch both Voyager spacecraft within weeks of one another, NASA used Martin Marietta-built Titan launch vehicles, with Centaur upper stages, that were developed for interplanetary missions.

Martin Marietta also provided several other components for Voyager.

The company designed and built the guidance system and a computer hardware and software system that interprets commands from ground controllers and commands the

spacecraft's rocket thrusters to alter Voyager's course. For 12 years the system has steered both Voyagers to their planetary destinations.

James W. McAnally, now president of Martin Marietta Space Systems, was program manager for elements of the Voyager guidance system, a job for which he received a public service award from NASA. He recalled the launch being broadcast on television sets throughout the Denver plant and Titan workers cheering the successful launches.

"It was a great feeling for all of us when both Voyagers were launched successfully," McAnally said. "But Martin Marietta's role in the Voyager missions didn't end with the launch—it was just the beginning," he said.

Martin Marietta also built Voyager's propellant control assembly system, which distributes the hydrazine fuel from the storage tank to the propellant thrusters, and an instrument called a radio astronomy receiver, which measures the planets' radio emissions. The receiver has operated continuously for Voyager's 12 years in space, analyzing the planets' rotation rate and interaction of charged particles and magnetic fields, Dr. Gene J. Lang, one of the system's designers, said.

One other Martin Marietta-built item for Voyager was approximately 200 linear feet of fibrous tubing used in the construction of support structures. The tubing is 55 percent lighter than equivalent metal tubes and can withstand distortion from extreme heat.

At this point, scientists can only guess about the findings Voyager will provide. But with the tremendous information that the spacecraft has already given researchers, many of the pieces missing from Neptune's puzzle might soon be discovered. ■

Magellan watch

Date: Aug. 11, 1989

Distance
from Earth: 17,826,765 mi.

Velocity:
Geocentric
(Earth): 18,278 mph

Heliocentric
(Sun): 74,154 mph

One-Way
Light Time: 115 sec.

Next
Maneuver: . . . December 1989

How's your level?

Are you concerned about your cholesterol level? To assist employees in reducing and keeping their cholesterol levels low, a selection of HealthMark-approved food items is now available in Astronautics Group cafeterias. A variety of items low in fat, cholesterol, sodium and calories is offered for designated entrees, the fruit and salad bar, and soft-serve desserts.

HealthMark provides medical services and educational programs aimed at reducing risk for eight of the leading causes of death in the United States: heart disease, stroke, high blood pressure, diabetes, and certain cancers (colon, breast and prostate). The risk factor for these diseases can be lowered by exercising regularly and by eating less fat, cholesterol, sodium and calories. ■



Ice cream time!

About 100 employees and special guests gathered on the Deer Creek patio earlier this week to help kick off the 1989 Mile High United Way pacesetter campaign. The employee campaign is officially underway. At the ice cream social, John Jaco, president of Mile High United Way, Peter B. Teets, the Denver area campaign chairman, and Jim Sterhardt, the Astronautics Group chairman, gave pep talks about the importance of providing assistance to the community.

On the cover

Some of the more than 30,000 employees and families who attended the 1989 Family Open House last Saturday gather in the Reverberant Acoustic Laboratory (RAL) at the Main Plant. The RAL housed the full-scale Magellan model, a Titan IV model and several Astronautics Group video programs. Also, astronauts Mary Cleave and Mark Lee, from the STS-30 Magellan mission, spent time signing Magellan color lithographs. In addition to the astronauts' visit, guests enjoyed several musical performances, including a full concert by the National Repertory Orchestra; plenty of food; roving entertainment; and a variety of souvenirs, including a commemorative clock. Employees who did not attend the open house may still obtain the clock and some of the other gifts later this month at locations soon to be announced.

Learn to health walk during Wellness Fair

Evening clinics promoting the theme 'Get Heart Smart' will be offered free during the 5th Annual Wellness Fair.

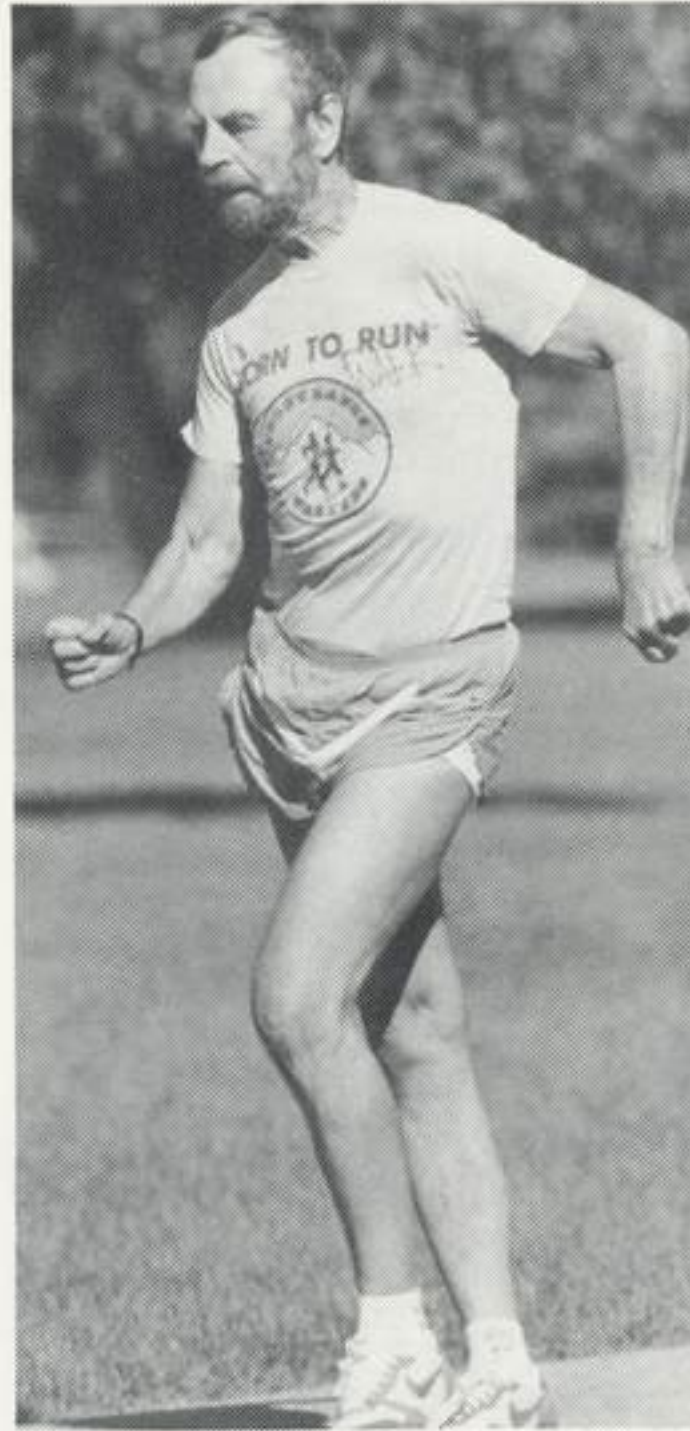
One of the 10 most prominent walking leaders in the country, Bob Carlson, will demonstrate and teach employees how to health walk from 5 to 7 p.m. on Aug. 23 and 24, in the recreation area at Waterton. Employees are encouraged to bring spouses and family members to one or both of the clinics.

Mary Gillach, an exercise physiologist with HealthMark and the Wellness Center, will also provide instruction on how to use exercise equipment correctly. These clinics will be from 4:15 p.m. to 5 p.m. Aug. 16 and 17 in the Wellness Center.

The Wellness Fair is scheduled at the Deer Creek facility, Aug. 16-17; Waterton—Engineering Building, Aug. 18 and 21; Waterton—Space Support Building, Aug. 22-23; and Littleton Systems Center, Aug. 24-25.

Health tests and screenings will be offered from 10 a.m.-2 p.m. and will include blood pressure/cholesterol testing, health counseling, lung function analysis, posture evaluations, and percent body fat, hearing, skin cancer, diabetes and optometry screenings.

The topics for the lunchtime seminars, from 11 a.m.-11:45 a.m. and noon to 12:45 p.m., include snoring, stress management, workaholicism, alzheimers disease, osteoporosis, teen

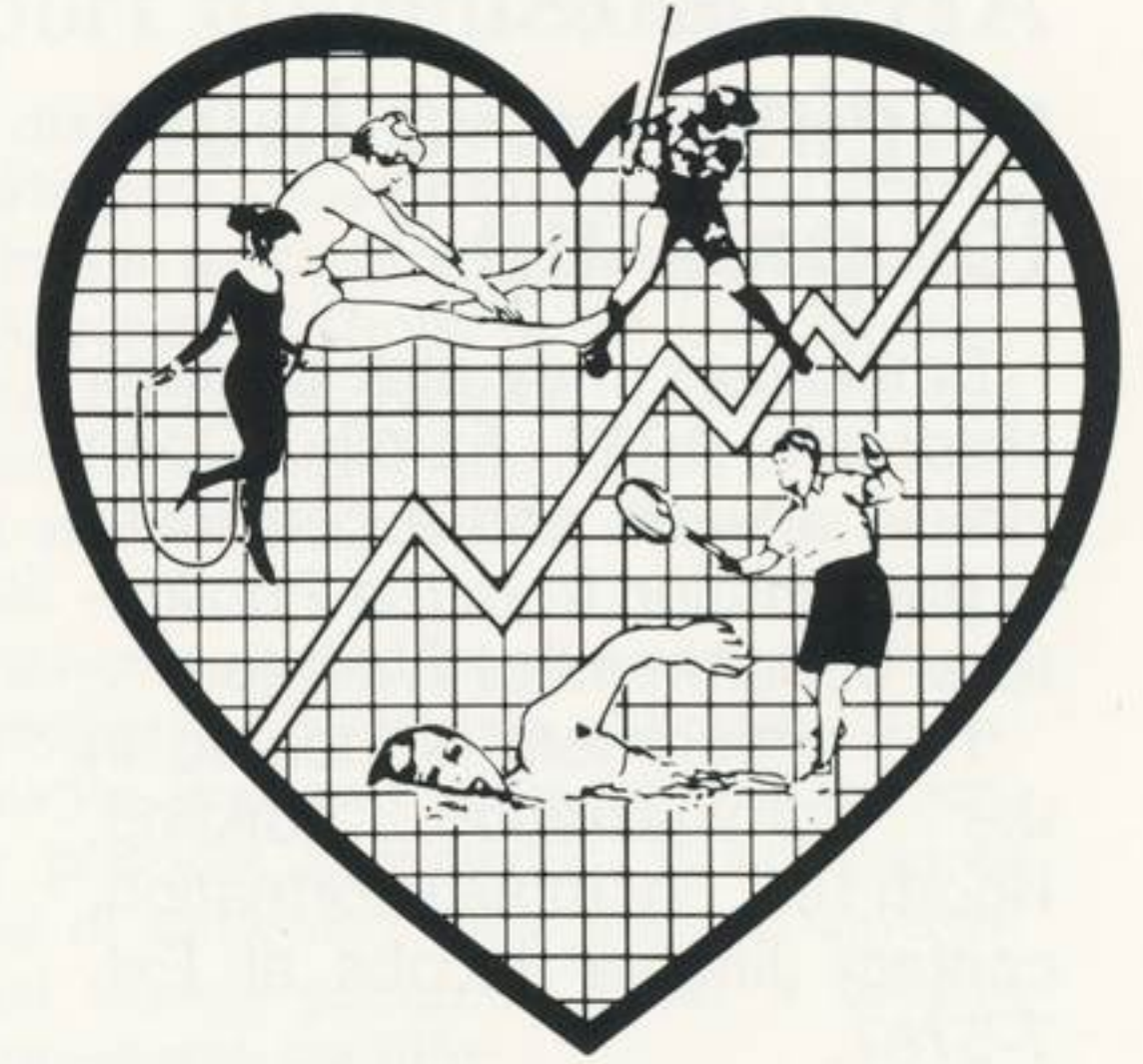


Carlson

intervention, and cancer of the reproductive organs.

Employees can register for door prizes at any health screening, seminar or evening fitness clinic. The grand prize is a 10-speed bicycle.

Complete details of daily events may be obtained from the Wellness Fair schedules located in the information racks. ■



Bonfils blood bank scheduled this month

Employees at Littleton Systems Center, SouthPark West, South Lincoln, and surrounding areas can contribute to the community blood supply on Tuesday, Aug. 29, at LSC, Room 107. Belle Bonfils Blood Bank staff will take donations from 9 a.m. to 2:40 p.m.

Employees are encouraged to schedule appointments in advance. I&CS employees should contact Sue Lloyd at 7-0484, and Astronautics Group employees should call the Employee Services office, Ext. 7-6605 or 7-6750, for appointments. ■

Employee services/recreation

Lose Weight at Work—Join the Weight Watchers at Work Program beginning Thursday, Aug. 17, at Littleton Systems Center. The eight-week session meets from 11 a.m. to noon in room 201. The \$15 registration fee has been waived. The \$64 class fee must be paid by Friday, Aug. 11, to Sue Lloyd, Ext. 7-0484. A two-check payment plan is available. Details are on the registration flyers located in the information racks at LSC.

Hunting and Fishing Club—The group will meet at 5 p.m., Monday, Aug. 14, in the clubhouse at the recreation area. For more information, contact Mel Smith, Ext. 1-8655.

Commodore Users Group—The club will meet at 5 p.m., Tuesday, Aug. 15, in the clubhouse at the recreation area. Amiga users are welcome. For more information, contact Dan Whittemore, Ext. 7-6324, or Chuck Barton, Ext. 7-9950.

Flag Football—An organizational meeting for men's competitive and recreation flag football leagues will be at 5 p.m. Thursday, Aug. 17, in the Space Support Building cafeteria. Attendance is required for team captains. Those interested in forming a team can obtain a roster at the meeting. Rosters and \$5 player fees are due in the Recreation Office by Thursday, Aug. 31.

Hunter Education Classes—Class dates are set for 7-9:30 p.m., Aug. 16, 17, 21 and 22 at the VFW Hall, 3860 S. Jason St., in Englewood. The range date is Aug. 19, from

8 a.m. to 1 p.m., at the club's shooting range. Students must attend all class sessions. Registration will be taken at the first class, and a minimum of 10 students is required to continue meetings. The cost is \$7. Employees, family members and friends are welcome to attend.

Bowlers Needed—Employees are needed to form teams for the Colorado Alliance of Business Bowl-a-thon, Sept. 9 and 10, at Celebrity Sports Center. The bowl-a-thon is a fundraiser for the Alliance Youth Programs. Pledges and/or donations are optional. Those raising pledges or donations will be eligible for prizes. The five-member teams will have a choice of 9 a.m., noon, or 3 p.m. playing times on Saturday, or noon on Sunday. Interested bowlers/team captains should contact Mardi Emerson, in the Employee Services/Recreation office, Ext. 7-6750 or 7-6605, by Aug. 17 to obtain a team registration form.

Ada/Software Engineering Working Group—The first meeting will be at 5 p.m., Monday, Aug. 21, at Littleton Systems Center—SCOE 133 classroom. This initial meeting will cover the many ramifications of Ada and its interface to the Software Engineering Life Cycle. Please contact Robert Lewis at Ext. 1-6731 for further information.

Photography Club—Platte Canyon Photography Club members will meet at 7 p.m., Monday, Aug. 28, at the Public Service

building, 10001 W. Hampden Ave. Contact Bill Privratsky, Ext. 7-4969, for details.

Mixed Bowling League Forming—The mixed league that bowls at 6 p.m. on Tuesdays will have a general meeting at Green Mountain Lanes at 6 p.m. Tuesday, Aug. 29. League play begins Sept. 5. All interested employees and immediate family members are welcome. For additional information, contact Betty Leach at Ext. 7-3686, or 933-0229.

Eltich's Amusement Park—Discount coupons for unlimited ride tickets at Eltich's are available at the recreation offices at Deer Creek and Waterton and from recreation representatives at Littleton Systems Center, Viewpoint I, Space Support Building, and Greenwood Commons. The coupons are good seven days a week through August 27. With the coupon, the unlimited ride ticket is \$8.75 (regular price \$10.95).

MARTIN MARIETTA NEWS
Published by Public Relations
MARTIN MARIETTA

R. Christopher Talley Editor

Call Ext. 7-5364 with information for articles.

Prepared and produced by the publications department.

ASTRONAUTICS GROUP
P.O. BOX 179—Denver, CO

August 11, 1989