

MARTIN MARIETTA

news

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Titan 34D
soars from pad



Magellan on its way to Venus following successful deployment

"Ecstatic."

That was the word Magellan program director Charlie Brown chose to describe how the Magellan team felt immediately after successful deployment of the spacecraft from the Space Shuttle Atlantis the evening of May 4.

For Brown, the successful deployment was especially sweet. It culminated an effort that began in the late 1970s with the initial studies of the Magellan mission, then known as the Venus Orbiting Imaging Radar. Brown was program manager for the conceptual design phase, and he has followed the program through a cancellation, two name changes, and several delays. Brown has worked on planetary space programs since the late 1960s. "It's great to be part of a program that is getting the U.S. back into planetary exploration."

During launch activities and deployment, Brown led a team of 60 Space Systems employees working in the Magellan control room at Kennedy Space Center—their home away from home for the past seven months.

Following a tense afternoon waiting for bad weather to clear, Atlantis lifted off the pad at 2:47 p.m. EDT. "We were very apprehensive about the weather," said Frank McKinney, operations manager. "But after going through the countdown the week before, down to 31 seconds, our guys were more relaxed the second time around."

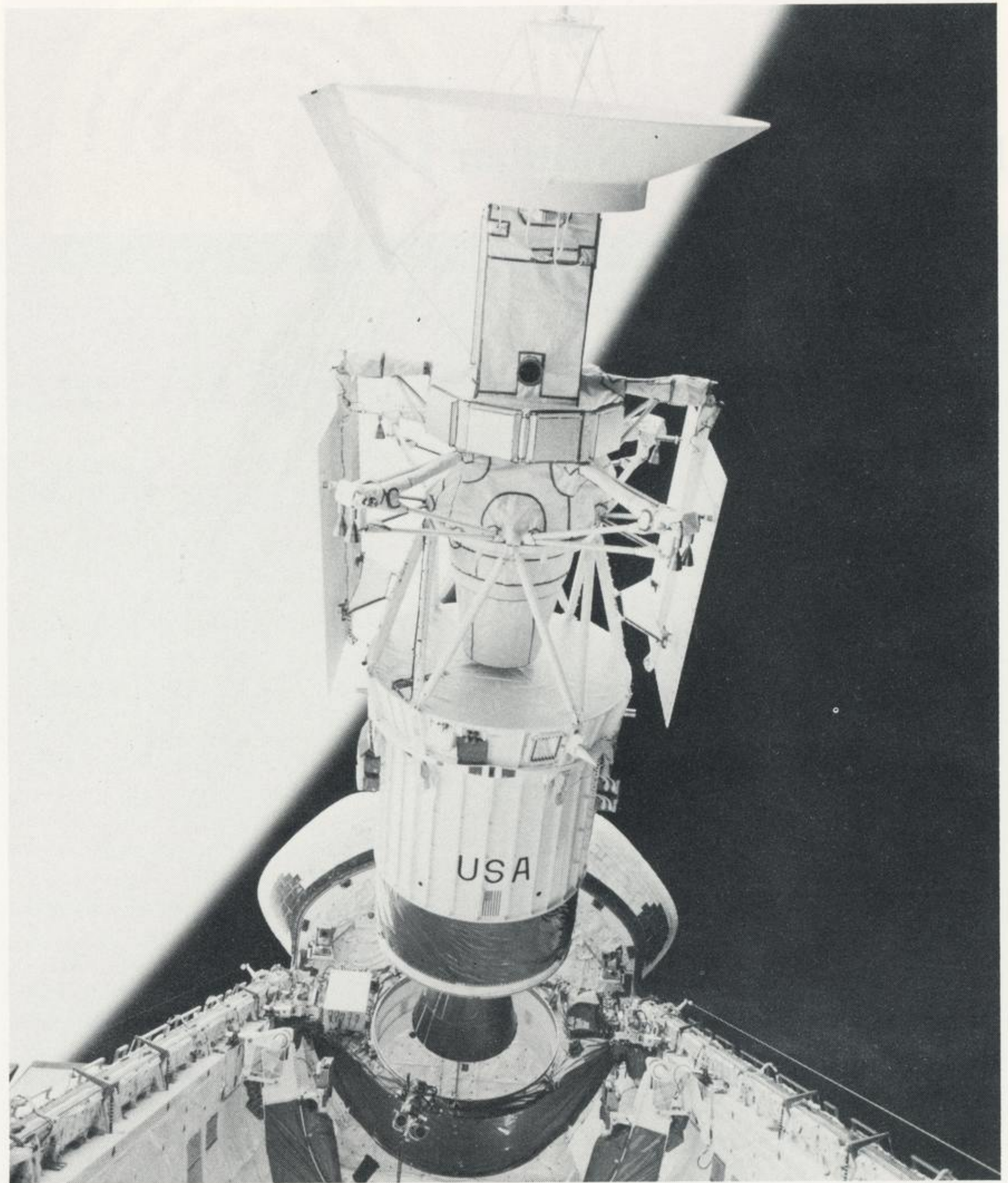
McKinney said the shuttle countdown went so smoothly for Magellan that many Space Systems employees had a lot of "nervous energy." But the work had just started—deployment of the spacecraft was set for a little more than six hours later.

After an uneventful launch, which placed Atlantis into a 160-nautical-mile-high orbit above Earth, a complex series of events took place leading to deployment. The shuttle's payload bay doors were opened, the shuttle was maneuvered to the right position, and a series of checks was made on Magellan and its Inertial Upper Stage (IUS) rocket booster. Then, shortly before deployment, the entire Magellan/IUS assembly rocked gently upward to 58 degrees, and, about 6 hours and 17 minutes after shuttle launch, Magellan was pushed softly out of the shuttle bay by large springs.

Although Magellan was free of the shuttle, it still needed a boost from the IUS. Ten minutes after release from the shuttle, the spacecraft's large solar array panels swung upward and locked into position. Then, 50 minutes later, the first of two IUS stages ignited, and within 25 minutes the IUS was expended.

The deployment sequence had a series of five "discretes" or command sequences that had to be issued to Magellan. "Each event clicked off just as expected," McKinney said. When Magellan cleanly separated from the IUS, it fulfilled a slogan printed on special T-shirts the Magellan team wore during deployment: "happiness is discrete five."

"When the IUS separated, we were on our own," Brown said. Magellan was finally on its way to Venus, traveling 25,000 miles per hour at the start of its 15-month, 795-million-mile journey to Venus.



Magellan deployed

The Magellan spacecraft was deployed from the shuttle Atlantis more than six hours after liftoff on May 4. About 90 minutes later, the spacecraft separated from its Inertial Upper Stage booster and began its trip to Venus. Look for a commemorative color lithograph in an upcoming issue of the Martin Marietta News.

Once Magellan had been "locked-on" by Earth-based Deep Space Network antennae and engineers had performed initial checkout of the spacecraft, a wave of relief and jubilation swept through the control room at Kennedy Space Center. "It's a great feeling," Brown said shortly afterwards, "but boy, am I tired." Most of the team had been up for 18 hours or more, but, according to McKinney, some headed for the beach for an impromptu celebration. The feeling of the team was summed up in two large signs that were posted in the mission control room: "Venus or bust" and "America's return to the planets begins here."

Especially gratifying was the fact that Magellan began operating perfectly. Today Magellan is 2.2 million miles from Earth, traveling at 7,000 mph. with no major problems aboard.

Magellan's trip ahead will be relatively uneventful until it enters Venusian orbit in August 1990. On Sunday, May 21, Space Systems engineers at the Jet Propulsion Laboratory in Pasadena will perform the first of three rocket engine firings to adjust Magellan's path to Venus. Called a trajectory correction maneuver, it will involve the firing of four of eight liquid-fueled rocket engines for about 6 seconds. But thanks to the smooth launch and deployment, Magellan will use less fuel than expected for the maneuver, potentially lengthening the spacecraft's mapping mission at Venus.

For Frank McKinney, deploying Magellan was almost like sending children away from home. "You teach your kids how to behave and you eventually send them on their way," he said. "It's really great to see Magellan acting like such a sweetheart." ■

Magellan team works across the country to send spacecraft on its 15-month journey

While most of the Magellan launch activity was centered at Kennedy Space Center, a half-dozen Space Systems employees worked at Johnson Space Center in Houston and more than 40 worked at the Jet Propulsion Laboratory (JPL) in Pasadena, Calif., where actual control of the spacecraft is now centered.

In Houston, Magellan chief engineer Ron Frank led a team of four who were available in case a problem arose—but none did, and the team was able to track the successful activities. According to engineer Larry Campbell, one of the four, "I have been working in aerospace 23 years, but this was the first time I had participated in a launch. It was very exciting."

Also present in Houston to assist JPL Magellan project director John Gerpheide were Space Systems president James McAnally and NASA Systems vice president Grover Hall.

About two minutes after Atlantis lifted off the pad, Frank McKinney, Space Systems company operations manager, at Kennedy Space Center, "handed" the Magellan spacecraft over to Ken Ledbetter, spacecraft team chief for the Space Systems company, at JPL. Immediately, roles reversed as the California crew took control of Magellan, while team members in Florida switched hats and took a support role.

Ledbetter's crew at JPL had been monitoring the spacecraft 24 hours a day since April

24. That lasted until May 13, and the period inbetween was both exciting and hectic.

"We are extremely pleased with how well the spacecraft is functioning," Ledbetter said. "It has performed well, but we've kept busy because we have done so many things manually. We are still characterizing the craft in its space environment."

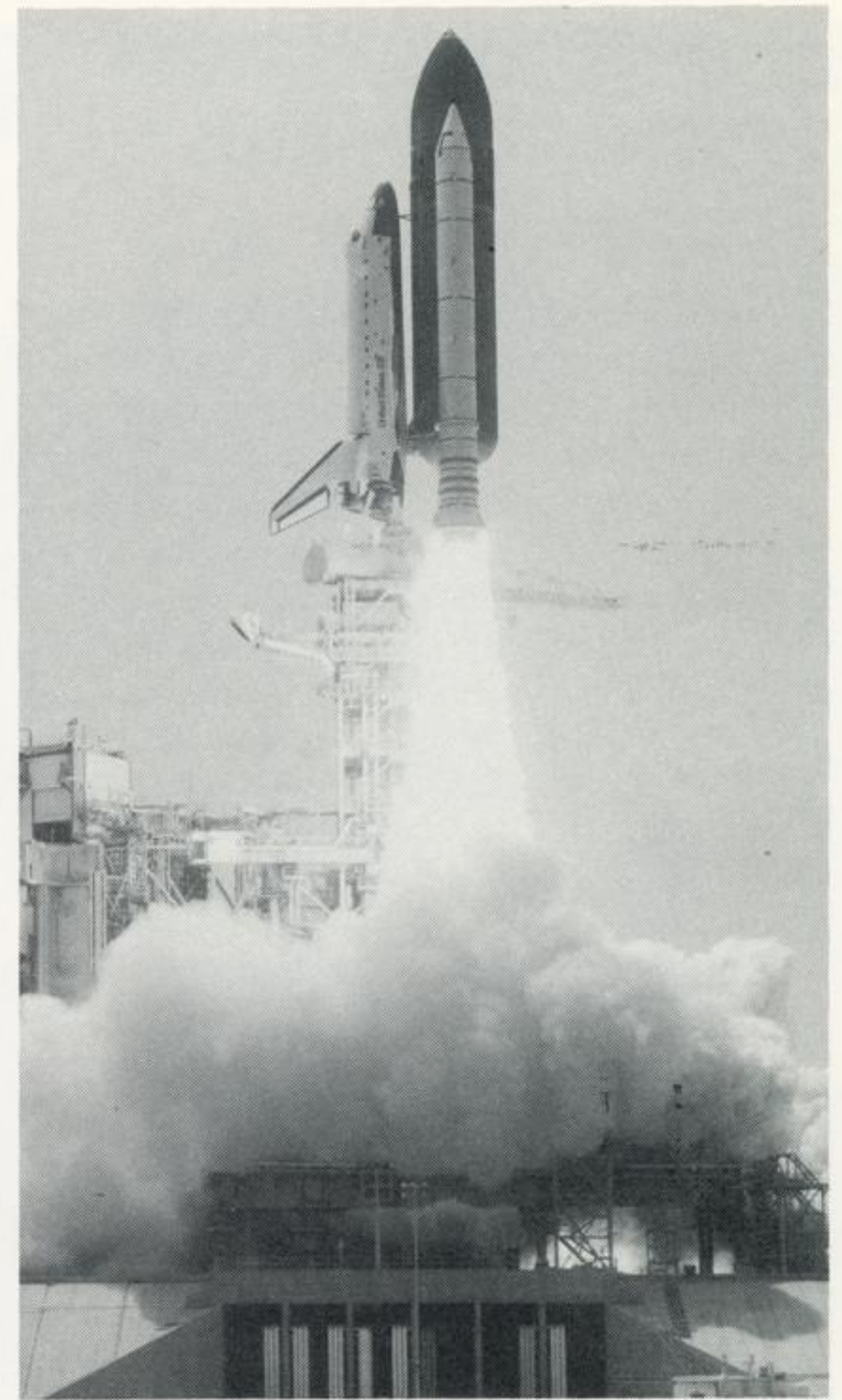
During the 24-hour monitoring period, Ledbetter's crew had planned four command loads. However, those three turned into 26 error-free commands, which have kept Magellan flying smoothly.

"To send this many commands is incredible," he said. "I feel that we've gained the trust and respect of the JPL folks."

The team is currently splitting up for the time being as all but seven employees are slowly trickling back to Denver to monitor Magellan from the Space Support Building at Waterton. At least seven employees will remain at JPL throughout the entire mission, while the rest of the team commutes back and forth depending on certain events.

When the spacecraft is ready for Venus orbit insertion, in August 1990, the entire working team will once again be reunited at JPL.

"We have a good team, and I'm proud of how everyone has pulled together," Ledbetter said. ■



Blast off

The Space Shuttle Atlantis carrying the Magellan spacecraft clears the pad at 12:47 MDT May 4 from Cape Canaveral Air Force Station, Fla. More than six hours later, Magellan was pushed out of Atlantis and began its 795-million-mile, 15-month journey to Venus. Magellan will map the planet for one Venusian day—243 Earth days.

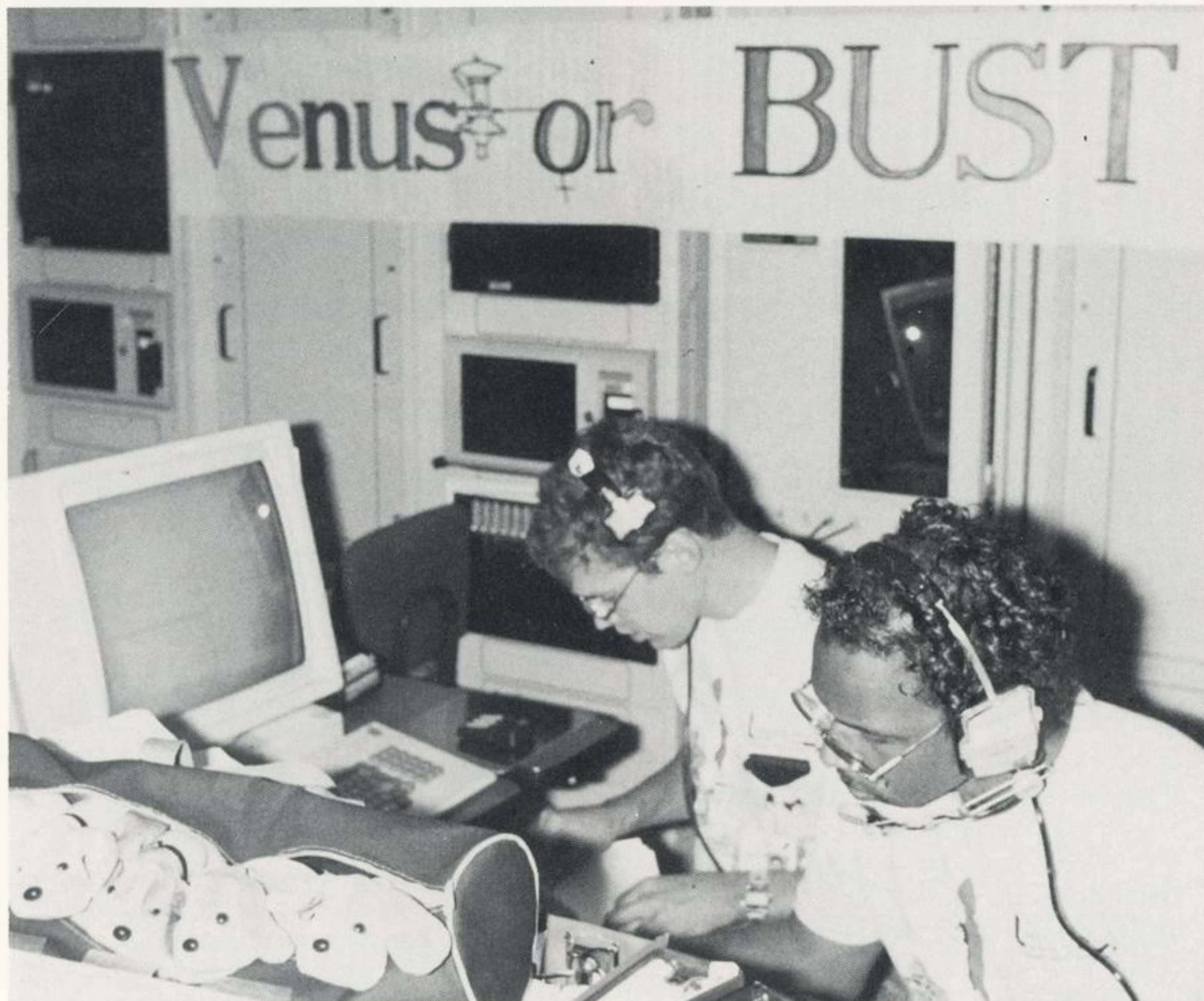
Local teacher almost saw launch thanks to company

A Denver high school teacher came close to seeing a shuttle launch when the Astronautics Group sponsored his trip to a four-day conference at the National Aeronautics and Space Administration's (NASA) Kennedy Space Center last month.

The Magellan Launch Educators' Conference was to conclude with the launch of the Space Shuttle Atlantis on April 28. But when that was scrubbed 31 seconds before launch, Anthony W. Zaragoza, an astronomy and chemistry instructor at Denver's West High School, became just one of many to miss the scheduled launch.

He was in Florida with about 200 educators from around the country at the conference. It was designed to give teachers and educators background on current missions exploring the solar system. In addition to science and math teachers at levels from grade school through university, participants also included planetarium directors, science lecturers, and science education specialists.

The conference was sponsored by the Jet Propulsion Laboratory's Public Education Office with NASA's Educational Affairs Division and NASA Kennedy Space Center's Office of Education and Awareness. ■



Work at KSC

Two Space Systems company command data systems engineers, Stan White, left, and Gary Starks, right, work at Magellan monitors at Kennedy Space Center (KSC) in Florida. About 60 Space Systems employees were working during shuttle launch and Magellan deployment in the Magellan control room at KSC. Some of those employees had been in Florida preparing for the launch for the past seven months.

Students get early start on careers

On average, six local high school students participate in the Astronautics Group's Executive High School Internship Program each semester, Carol Romero, program administrator, said.

The program is designed to provide students with a combination of the practical elements of classroom analysis and the actual experience of the real work world. The program has been working with local high schools to set up these internships for the past ten years.

Students are assigned to various organizations depending on the discipline they hope to pursue in college, Romero said.

"These interns are certainly of value to us," she said. "They go through two or three interviews and if both parties feel there's a beneficial match, then they are placed together for the semester."

Interns get hands-on experience and write weekly activity reports to earn high school credit. According to Romero, "Most importantly, they learn before college if they are really interested in the particular field that they've interned in."

The interns, all either juniors or seniors, were recently honored at a semester-end luncheon at the Deer Creek Facility.

This semester's interns are: An Ho, Strategic Systems Company; Susan Faatz, Space Systems Company; Brittany Klaus, Public Relations; Jessica Montoya, Space Systems Company; Sandra Broman, Strategic Systems.

Anyone wishing to sponsor a student in the future should call Romero at Ext. 7-6619. ■



IRF nears completion

Members of the Astronautics Group's Facilities Design/Construction Team stand in front of the nearly completed Integrated Robotics Facility (IRF). The 56,000-square-foot design, assembly and test facility was constructed to support the Flight Telerobotic Servicer (FTS) program recently won by the Space Systems company. The facility, designed by Facilities Engineering, sports a class 100,000 high bay clean room and associated airlocks equipped with five-ton bridge cranes, computer rooms, engineering support space, and offices for executives and business management personnel.

PSP/SIP open enrollment continues

Open enrollment continues this month for the Performance Sharing Plan (PSP) for salaried employees and the Savings and Investment Plan (SIP) for hourly employees.

Changes in the percentage of payroll deduction and changes in before- or after-tax contributions also may be done during this period. All enrollment changes become effective the first full pay period in July.

Forms are available at the following locations:

- Deer Creek Facility, Benefits office, third floor, near south lobby
- Electronic Manufacturing, lunchroom entrance

- Greenwood Commons, Personnel, Building 6020
 - Littleton Systems Center, Room 201
 - Viewpoint I, Benefits office, Suite 206
 - Waterton, Orb (the building that connects the Administration and Engineering buildings), second floor
 - Space Support Building, Room 607
 - SouthPark West, Room 106f
- Send completed forms to the Employee Benefits office, Deer Creek Facility, Room 3B409, Mail Stop DC1343. Enrollment forms cannot be accepted after May 31. ■

SIP

Unit values for the Savings and Investment Plan (SIP) for United Aerospace Workers (UAW)- and United Plan Guard Workers of America (UPGWA)-represented employees in March 1989 (February 1989 values in parentheses) are:

Fund A	1.0630672518
Indexed Equity	(1.0407232455)
Fund B	1.1174385744
Fixed Income	(1.1104841002)
Fund C	0.9256118769
Company Stock	(0.8776314769)

PSP

Unit values for the Performance Sharing Plan (PSP) for salaried employees in March 1989 (February 1989 values in parentheses) are:

Fund A	5.0838041870
Indexed Equity	(4.9722952838)
Fund B	3.2002609770
Fixed Income	(3.1742579295)
Fund C	4.8810042626
Company Stock	(4.6239325724)

Computer library offers many services

Employees may take advantage of several services available at the Martin Marietta Computer Library, located on the south end of the third floor of the Deer Creek Facility.

Open from 7:30 a.m. to 4:30 p.m., Monday through Friday, the library offers information on discounts available to employees for home use purchase of hardware and software, software for evaluation (to be used only in the library), a collection of reference resources and user guides, educational videotapes, and portable terminals and modems for short-term checkout.

For more information, contact Marilyn Huber at Ext. 7-6716. ■

Hardware/Software Expo scheduled

All employees are invited to attend the Hardware/Software Expo next week at the Deer Creek Facility.

The expo is scheduled for 10 a.m. to 6 p.m., Wednesday and Thursday, May 24 and 25, in the executive dining area on the first floor of the facility.

Participating vendors include: Iomega, Fox Software, Zenith, Lotus, Dest, Apple, Claris, Compaq, Tops, Ashton Tate, Microsoft, Aldus, and Novell.

Drawings will be conducted for vendor-provided wares.

On the cover

A Titan 34D space launch vehicle was launched at 1:51 MDT May 10 from Complex 40 at Cape Canaveral Air Force Station, Fla.

Air Force Systems Command's Eastern Space and Missile Center is responsible for launches of military payloads from the East Coast. Space Launch Systems, along with its associate contractors, builds the Titan 34D for the Air Force Space Systems Division.

One Titan 34D still remains to be launched from the East Coast and the first Titan IV is scheduled for launch this year.

Commercial Titan vice president named

Diana H. Josephson has been promoted to vice president of Washington Operations for Commercial Titan, Inc., with responsibility for all of that company's Washington-based activities.

Edward M. Browne, president of Commercial Titan, Inc., said the appointment is effective immediately.

In her role as vice president of Washington Operations, Josephson is responsible for maintaining ongoing relationships with domestic and foreign customers, handling international trade matters, and developing legislative and policy solutions to commercial launch vehicle industry issues.

Josephson has directed the company's Washington office since it was set up in August 1987. Prior to that, she was vice president, marketing, of Arianespace, Inc., the U.S. subsidiary of the European commercial launch services company, Arianespace, S.A. First launch of a Commercial Titan is set for this fall. ■

Employee Assistance Program sponsors relapse workshop

Relapse is a real issue facing all employees who are recovering from substance abuse.

Help is available for examining and understanding the causes of relapse from local psychotherapist Mark Knippenberg during a workshop from 4:30-6 p.m. May 25, in the Engineering building, Room 202. The workshop is sponsored by the Astronautics Group's Employee Assistance Program.

All recovering employees are invited and encouraged to attend this free workshop. For more information, call the Employee Assistance Program at Ext. 7-5521.



Employees cheer shuttle launch

Many Astronautics Group employees gathered in the lobby of the Deer Creek Facility to watch the launch of the Space Shuttle Atlantis on the Video Information System. About 30 monitors were set up throughout the Astronautics Group for employees to view the launch live. The following day, monitors were set up to play back the launch and deployment footage of the Magellan spacecraft. Magellan updates will be published in upcoming issues of the Martin Marietta News.

Corporate briefs

Martin Marietta names former DARPA head vice president of Advanced Technology

Martin Marietta Corporation has announced the appointment of Dr. Raymond S. Colladay to be vice president for Advanced Technology.

Colladay, 45, has been director of the Defense Advanced Research Projects Agency (DARPA) for the past 14 months and was associate administrator for Aeronautics and Space Technology for the National Aeronautics and Space Administration (NASA) from June 1986

until 1988 when he joined DARPA.

At Martin Marietta, Colladay will report to Robert G. Morra, vice president of Technical Operations, and will be responsible for implementing a recently developed advanced technology plan for the next decade.

Colladay has spent his entire professional career in research and development and the management of technology.

Corporation elects Zelnak corporate vice president

Martin Marietta Corporation has announced the election of Stephen P. Zelnak, Jr., president of Martin Marietta Aggregates at Raleigh, N.C., to be a vice president of the corporation. Zelnak, 44, has been president of Aggregates since 1982. The company is an industrial leader in the production of crushed stone, sand and gravel for construction markets.

Zelnak joined the corporation in 1981. A native of Savannah, Ga., he received his bachelor's degree from Georgia Tech and holds master's degrees in administrative science and

business administration from the University of Alabama.

He is president-elect of the Physical and Mathematical Science Foundation of North Carolina State University, a member of the board of trustees of North Carolina Independent College Fund, and a past director of the National Stone Association.

The Aggregates company, part of Martin Marietta's Materials Group, produces and markets construction aggregates in 19 states, principally in the Southeast and Midwest.

Company sponsors four scholarships to Space Camp

Four Colorado students attended the United States Space Foundation 1989 Space Camp in Huntsville, Ala., thanks to a donation by the Astronautics Group.

Nearly 400 applications were reviewed. The four students receiving Martin Marietta scholarships were: James E. Dickens, Skyline Elementary, Canon City; Danielle Cordova, Freed Middle School, Pueblo; Darin Hoenee, Liberty High School, Colorado Springs; and Laura Smith Conrad Ball Junior High School, Loveland. ■



Mile High
United
way

Employee services/recreation

1989 Company-Sponsored Family Activities—The 1989 Family Activity selection card was mailed to the homes of all employees last month. Cards are still being accepted for processing. If some employees misplaced the card, an additional one can be obtained from the information racks, or from the Recreation Offices at Deer Creek and Waterton. This year's family events include: a Denver Zephyrs baseball game, July 15; an open house, August 5; and a concert at McNichols Sports Arena on October 7.

Satellite Ski Club—The group's annual spring picnic is at 4:30 p.m., May 19, at the recreation area pavilion. Guests and prospective members are welcome. Food and beverages will be provided, and the newly elected club officers will be announced. Non-members must pay a \$5 fee. For more information, call Steve Packard at Ext. 7-3830.

Summer Tennis League—Entry forms are in the information racks for the summer tennis league. Participants must be employees (or spouse/dependent of employees) of the Astronautics Group, Data Systems, I&CS, or armed services personnel assigned to Martin Marietta. Round robin competition is the format for singles, doubles and mixed doubles. Registration forms are due today in the Employee Services office at the Deer Creek Facility.

Photography Club—Platte Canyon Photography Club members will meet at 7 p.m. Monday, May 22, at the Public Service building, 10001 W. Hampden Ave. Club member Phil Elson will talk about table-top photography lighting and exposure techniques. In addition, Deborah Lux, from Positive Printers, will show samples of the company's color slide work. A scenic and wildlife photography seminar will be conducted from 9 a.m. to sunset on June 10 at Roxborough Park. Registration and a \$25 fee is required by Monday, June 5. Contact Bill Privratsky, Ext. 7-4969, to register.

Fitness Equipment Seminars at Deer Creek—Informal, 30-minute seminars on the correct use of fitness center equipment will be conducted at noon and 5 p.m., May 23-25, in the Deer Creek Fitness Center. HealthMark exercise physiologists will teach everything you need to know about using treadmills, bioclimbers, rowing machines, bicycles, x-country ski machines and weight lifting equipment. These sessions are free and do not require registration.

Health Checks at Fitness Center—The following services are offered to employees from 11 a.m. to 5 p.m., Monday—Friday, at the Deer Creek Fitness Center: Free blood pressure checks, done on a drop-in basis; cholesterol testing and education, \$2 charge (appointments necessary); free fitness and weight loss consultations with HealthMark exercise physiologists (appointments necessary); and free individual instruction on equipment usage (appointments necessary). To schedule appointments, call Ext. 7-7575, or 7-7576, between 11 a.m. and 5:30 p.m.

Smoking Cessation Classes—Enjoy a breath of fresh air. The American Cancer Society's "Fresh Start" program is available free to all Martin Marietta and Air Force personnel, their spouses and dependents. Classes consist of four meetings from 5-6:30 p.m., June 5, 8, 12 and 15, at the Deer Creek facility, Independence Room. To register, call Employee Services at Ext. 7-6750.

Shotgun Safety Class—The Skyline Hunting and Fishing Club, Inc., will conduct a class in basic shotgun safety and shooting fundamentals June 19, 21, 28 and on a range date to be announced. Students who successfully complete the class will earn an NRA certificate and safety card. (Note—this is not a hunter education class.) Class fees are \$10 for club members, and \$15 for non-members, and are due with registration by June 12. Enrollment forms will be in the

information racks by May 25. For further information, call Roger Guinn, Ext. 7-3161 or Raymond Ray, Ext. 1-5167.

Colorado Corporate Games—Three employees are needed to fill positions on the Martin Marietta team competing in the 9th Annual Colorado Corporate Games on June 9-10. A male, 35 years or older, is needed for the 1500 meter run for Friday nights track events; a female, 50 years or over and a male, 18-24 are needed for the Saturday morning 5K race. Interested employees should contact the Employee Services Office, Ext. 7-6605, immediately.

Archery Club—Employees Richard McNutt and James Gilmore represented the Red Rock Bowmen Archery Club recently in the state sectional and national archery championships. McNutt placed second in the state, and eighth at the national competition in Kansas City, while Gilmore finished in the top 20 at the state level and in the top 50 at the national event.

Running Club—The top male runners in the recent five and two-and-one-half mile Shepherder races were Clay McGann, Len Crenshaw, Tom O'Brien, Bill Johnson and Dan Jackson. The top female runners were Melanie Baker, Barbara Bariess, Sharon Brooks and Diane Eckhoff. The final race of the series is May 25 in Waterton Canyon. Participants start between 4:45 and 5 p.m. For information, contact Brad Eckhoff, Ext. 7-7102 or 7-1496.

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