

MARTIN MARIETTA

# news

DENVER AEROSPACE

Number 23/1983

Too tempting to resist



# Michoud division meets its goals

"Another fruitful year on the Michoud plantation," commented Kenneth P. Timmons, vice president and general manager of the Michoud division.

"We're in good shape today because of the great performance of our 5000 people, as measured by mission success, orders, sales, profits, on-time deliveries, and successful launches."

The Michoud division not only exceeded its productivity goals as determined by NASA, it contributed to three successful Space Shuttle missions this year and surpassed sales and profit goals, all while assembling and delivering external tanks on time or ahead of schedule.

Efficient new manufacturing procedures and automated processes (including new robotics technology) contributed to reducing time and costs in external tank manufacture. The division had set a goal of trimming \$66 million from the cost of the first 54 flight tanks. The program concluded six months ahead of schedule, under budget, and bettered its cost-cutting goal by \$7 million.

Changes in material and processes, for example, saved costs in the thermal protection system on the tank. Additional cost savings involved everything from paper savings to design changes, manufacturing processes, subcontractors, technology transfer, and use of tools.

The Michoud division also won many contracts from NASA, including two major ones.

NASA's Marshall Space Flight Center awarded the Michoud division \$505 million to build 26 additional external tanks and to purchase raw materials for another 21 tanks during the three-year contract.

Last month, NASA awarded \$133 million for the design and construction of new tools to increase the production rate of tanks to 24 per year by 1988. Tools will vary in size from small drill fixtures to tools used to trim and weld 28-foot diameter sections of each tank. The division has delivered six external tanks to NASA so far this year; another tank is scheduled for delivery before the end of 1983.

Tanks now weigh less than NASA had originally specified, and the first lightweight tank "performed flawlessly" during the sixth Shuttle launch last April, according to Robert Lindstrom, Shuttle project manager at Marshall Space Flight Center.

Also this year, NASA selected the Michoud division's mission success office to train personnel from all 10 NASA centers in quality circle techniques (known as systems refinement teams at

Michoud). Each one-week training session includes leader training, facilitator training, program administration, and ways to implement quality circles.

"We will provide NASA with additional consulting assistance and any required training materials they request," said Ralph Tortorich, head of the motivation office.

"At the Kennedy Space Center (KSC), our work is winding down as a new contracting group takes over the operational aspects of each launch. The work is winding down, but the vigilance of our people in their quest for perfection has not abated," Timmons said.

"The value of our employees here is demonstrated by the efforts of other



Kenneth P. Timmons is vice president and general manager of the Michoud division where the firm builds the external fuel tanks for the Space Shuttle program. He was named to the position during March 1979. A 1950 mechanical engineering graduate from the University of Washington, Timmons worked his way through school as a toolmaker for the Studebaker Corporation. Earlier he had served in the U. S. Army Infantry during World War II.

Following graduation, he spent 13 years in management positions with the Link Division of Singer-Kearfott at Palo Alto, CA, and the Bendix Missile Corporation at Mishawaka, IN.

He joined Denver Aerospace as manager of the propulsion department during 1968 and became, successively, director of strategic systems, director of the Skylab program, director of Large Space Telescope program, and director of technical operations. During 1973, he was awarded the coveted Jefferson Cup from the Corporation for directing work on Skylab. He also won NASA's 1981 Distinguished Public Service Medal.

areas of Martin Marietta to acquire and relocate the superior performers that Tom Wirth [director of external tank operations at KSC] has gathered over the past decade. Reciprocated loyalty between employee and company prevails, and the continued sense of responsibility for successful launches is evident and pervasive," he said.

And the future?

"The future will be governed by our performance," Timmons said. "From our present reputation for cost-cutting, high productivity, and operational success, we can assure our role for the rest of the century by sustaining, and even improving, our performance. The design of the tank is stable, we have 15 tanks in progress at given time, and production is our forte.

"We learn with each tank how to assemble the next one better and more easily, continuously reducing costs. Our employees are good at what they do — they are the best at what they do. Continuing that kind of performance assures our future. We intend to remain a part of the New Orleans community, to serve NASA in a superior manner, and to sustain our record of success."

The production of external tanks dominates efforts at the Michoud division, but expansion into new areas is assured by technically advanced work on advanced orbital transfer vehicles, aft cargo carriers, heavy lift launch vehicles as derivatives of the Shuttle, and even longer and lighter tanks, said Timmons.

"Based on this impressive list of accomplishments and performance, I believe we'll still be on the Michoud plantation until the close of this century at least," he added.

---

## On the cover

Colorado Governor Richard D. Lamm couldn't resist the temptation to indulge "the kid in me" while visiting Denver Aerospace November 7.

He quickly got the hang of it during the hour he spent on the manned maneuvering unit simulator in the space operations simulation lab, going sequentially from number to number against the familiarization curtain and performing docking maneuvers with the Solar Max model.

He at first explained he wanted to try the simulator because he liked to keep in touch with what is going on in his state. But, he admitted a moment later that "The kid in me couldn't resist the offer to do this." Earlier Gov. Lamm had spoken to a meeting of the large staff at the plant.

# Contracts totaling \$3 million plus announced

Eighteen new contracts totaling \$3,073,370 were announced recently by the Technical Operations division at Denver Aerospace.

Those contracts included:

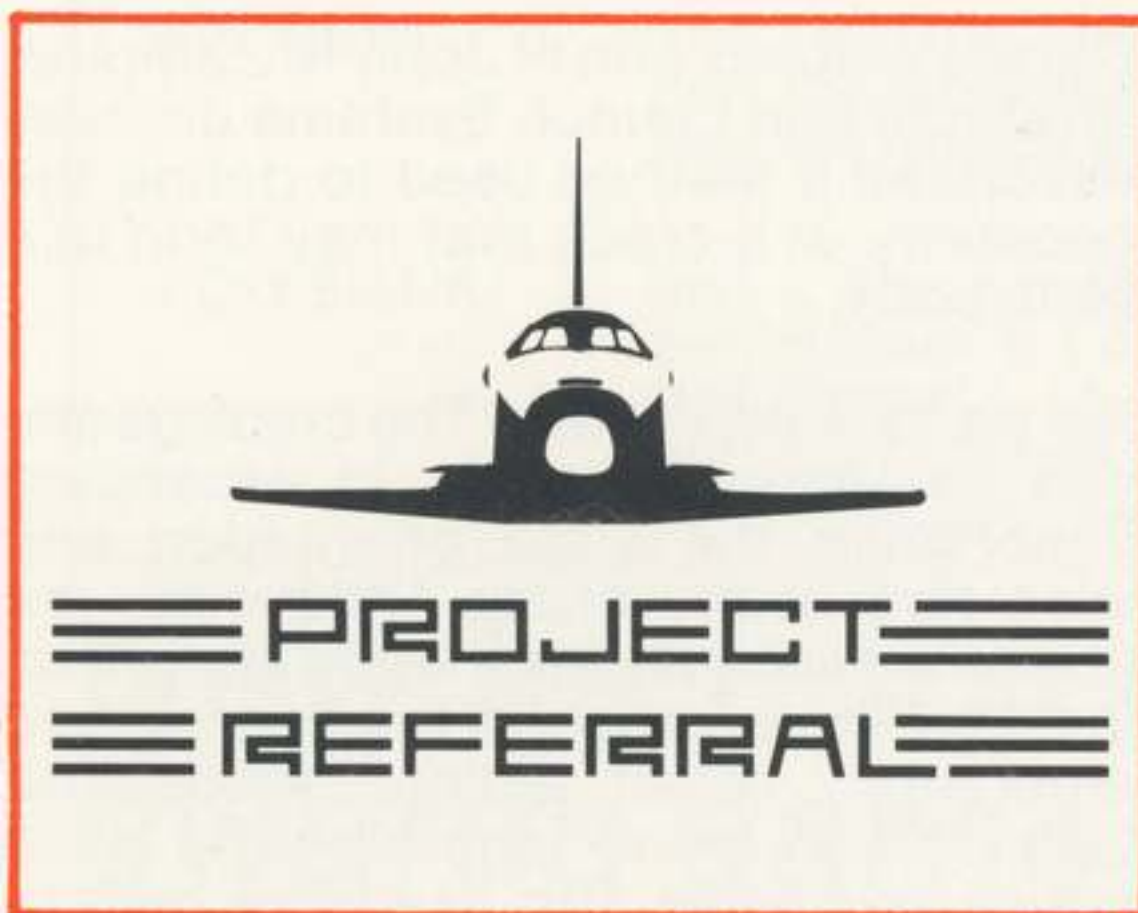
- \$550,922 to prepare and deliver control system fluids to Rockwell International;
- \$307,855 to restart and complete the Light Shade program for Ball Aerospace System Division;
- \$293,475 for the development of Advanced SINDA Thermal Analyzer Computer program for NASA/Jet Propulsion Laboratory (JPL);
- \$287,000 for the Tethered Orbital Refueling Study from NASA/JPL;
- \$269,000 for the operation and maintenance of the Developmental Optics Facility for Kirtland Contracting Center;
- \$264,000 for the Kawasaki Heavy

Industries experimental geodetic payload contamination study for WAKO America;

- \$154,988 for system baseline design studies in support of the Technology for Advanced Space Power (TASP) for General Atomic Technologies, Inc.;
- \$146,940 for model reduction technique for use with the Dynamic Interaction Simulation Controls and Structures (DISCOS) computer program for NASA/Goddard Space Flight Center (GSFC);
- \$123,991 for development of an Advanced Support Technology/Robotics (ASTR) program for Science Application Inc.;
- \$114,825 for fatigue-type cracks in high strength alloys-NDI reliability assessments for NASA/Marshall Space Flight Center (MSFC);
- \$103,991 to re-evaluate non-destructive

inspection capability for aircraft engine components for the San Antonio Air Logistics Center;

- \$99,173 for a feasibility study on the use of lasers for position fixing for the Naval Oceans Systems Center;
- two \$85,800 contracts for High Density Digital Recorder (HDDR) error correction system and modification for NASA/GSFC;
- \$79,008 for MA25S Type I ablative coating for commercial airline application for UDTA/France;
- two \$48,301 contracts for fabrication and evaluation of graphite/magnesium and graphite reinforced metal composite structural elements and composite attachment fitting for space applications for the Naval Surface Weapons Center;
- and \$10,000 for a two-month study on space station autonomy for JPL.



## Space Shuttle named theme for 'Project Referral'

Denver Aerospace, in view of its role as number one and two Space Shuttle contractor, the Air Force and NASA, respectively, has chosen that program as the theme for its newly launched employee referral campaign.

Employees submitting qualified referrals will earn a "Project Referral" notebook imprinted with a gold-stamped Shuttle logo on the front cover.

Any referral that results in a hire means a \$2000 bonus and automatically qualifies that employee for a drawing on a trip for two to Cape Canaveral to view a future Space Shuttle launch.

The trip will include airfare to Cocoa Beach, FL, meals, lodging and a rental car for four days and three nights. The drawing winner and guest will be able to witness the launch from the VIP viewing area and attend other selected activities.

Detailed information on "Project Referral" is available from Personnel Staffing, ext 2731. Referral applications should be submitted to mail stop L-1311, Littleton Systems Center.

## Medical plan changes are coming in 1984

Efforts to continue quality health care and cost-effective health insurance coverage for salaried employees will result in changes in the Connecticut General medical insurance plan for salaried employees, beginning January 1, 1984.

Some medical expenses will be paid at 100 percent, with no deductible or co-payment, as they are under the current plan. However, some changes have been made.

"Walk-in, walk-out," out-patient surgery and all expenses associated with the procedure will be 100 percent paid. This type of surgery generally includes elective surgical procedures not normally performed in a physician's office or which otherwise might involve an overnight hospital stay. Minor ear surgery and minor knee surgery are examples.

Not included in the "walk-in, walk-out" definition are out-patient procedures such as setting a broken bone or sutures, which are considered emergency surgical procedures. Also not included are procedures that normally never require an overnight hospital stay.

Other services covered at 100 percent include:

- Second surgical opinion — charges for rendering second opinion and any diagnostic X-ray lab charges.
- Charges made for certain surgical procedures after a second opinion has been obtained.
- Out-patient chemotherapy (performed in a hospital out-patient facility).
- Out-patient radiation therapy (only for malignant conditions).
- Pre-admission testing.
- Hospice care, home health care, skilled nursing facility care, and use of birthing clinics are covered at 100 percent for only 60 days when used instead of hospitalization.

All other eligible expenses are paid at 80 percent — after the deductible — with limitations for mental and nervous

conditions and alcohol and drug abuse treatment.

Although the deductible will become \$500 per family under the revised plan, a new feature called the Flexible Spending Account, may assist employees in meeting the deductible. The Flexible Spending Account provides \$500 annually to be used for non-covered, out-of-pocket expenses like cosmetic surgery or eye glasses, or it may be used to meet all or part of the family deductible. (Previously, the deductible was \$100 per individual, \$250 per family.)

The coordination of benefits provision is being changed to an approach called non-duplication of benefits. Under the approach, the claim is reimbursed as if it were covered by the best of the two plans as the plans apply to each covered expense.

The stop-loss provision puts a limit on the maximum amount an individual or family will pay during a calendar year — \$1500 per individual; \$2500 per family.

The plan for retirees will be changed to match the provisions for active employees except for the plan deductible, the Flexible Spending Account, and the stop-loss provision. The deductible for retired will be \$200 up to age 65 and \$100 for those 65 or over. Because retirees are not eligible for the Flexible Spending Account, the stop-loss limits are \$1000 per individual and \$2000 per family in a calendar year. Persons retiring after January 1, 1984 will be covered under the active plan until December 31 of the year in which they retire, then will be covered by the plan for retirees.

Additional information on the plan will be mailed to all salaried employees the first part of December. Questions regarding the changes may be referred to the employee benefits office, Eng. 125, ext 3009. Office hours are 10:30 a.m. - 12:30 p.m. and 2:00 p.m. - 3:00 p.m., Monday, Wednesday, and Friday.

# Space Shuttle launch scheduled this month

The launch of the ninth Space Shuttle mission is currently scheduled for Monday, November 28, at 11:00 a.m. (EST), with the launch window extending 14 minutes until 11:14 a.m.

The new launch date was announced by NASA and the European Space Agency (ESA) on Wednesday, November 2. STS-9, originally scheduled for an October 28 launch was removed from its launch pad at Kennedy Space Center and returned to the vehicle assembly building on October 17 in order to repair the insulation lining on one of the solid rocket boosters.

Technicians also took advantage of Columbia's time in the processing facility to replace the Orbiter's three engine controllers and three fuel cells. The Shuttle made its return journey to the launch pad on Tuesday, November 8.

On board Columbia for its sixth mission will be Spacelab 1 and its associated experiments. Built by ESA, Spacelab converts the Shuttle into an orbiting research laboratory.

ESA and NASA are jointly sponsoring the Spacelab 1 mission and contributing investigations for the flight. Scientists

from 11 European nations, Canada, Japan, and the U.S. are providing instruments and experimental investigations that will be carried out in five research areas.

The investigations will exercise hardware and flight and ground systems. NASA has agreed to re-fly seven experiments that will experience a reduction in scientific data because of the later flight date. The overall goal of this first mission is to verify spacelab performance.

Columbia will carry a six-person crew — the largest crew ever on a U.S. spacecraft. John Young, a veteran of five space missions, will command the STS-9 mission, becoming NASA's most prominent astronaut and the first to command two Shuttle missions.

Joining Young are NASA astronauts Brewster Shaw, pilot; Robert Parker and Owen Garriott, mission specialists; and Bryon Lichtenberg, an American, and Ulf Merbold, a West German, who will be the first non-astronaut scientists to journey into space as payload specialists.

The STS-9 crew will work around the clock, dividing into two teams of three

crewmembers, each working a 12-hour shift.

Columbia will return to earth with significantly more payload weight than on any previous Shuttle mission, and is scheduled to end its 216-hour, 11-minute flight with a landing at approximately 8:11 a.m. (PST) on Wednesday, December 7, at Edwards Air Force Base in California.

## Augustine to speak at SOLE meeting

Norman R. Augustine, president, will speak at the November 30, 1983 meeting of the Denver Chapter of the Society of Logistics Engineers (SOLE). His topic will be his book, "Augustine's Laws."

The meeting will take place at the Heritage Inn, I-25 at Belleview, beginning at 6:00 p.m.

Contact Ed Bailey, ext 7200, for information.

## Special assistant named for executive office

Eugene M. Poe has been named special assistant to the executive office of the Martin Marietta Corporation.

He joined the company in September after 29 years active military duty, retiring September 1 as a brigadier general following duty as deputy chief of staff for contracting and manufacturing at Headquarters Air Force Logistics Command, Wright-Patterson Air Force Base, OH.

Poe has a bachelor of science degree from the U. S. Naval Academy and a master of business administration degree in engineering management from the University of Connecticut. He is a graduate of the Air War College and a decorated command pilot with more than 3700 flying hours.



Three Martin Marietta engineers at Vandenberg Operations were recipients of top awards recently when the Robert H. Goddard Chapter of the Air Force Association (AFA) recognized them as "Engineer of the Year" in their respective fields. Awarded citations and plaques were: (from left) Don M. Young, Peacekeeper program, Safety Engineer of the Year; Roger V. Hawkins, Titan program, Titan Engineer of the Year; and Douglas A. Flenneken, GSS program, Logistics Engineer of the Year.

### MARTIN MARIETTA NEWS

Published by Public Relations  
MARTIN MARIETTA AEROSPACE

Call ext 5364 with information or suggestions for articles, or call one of the following coordinators.

Technical Operations:	Floyd R. Teffel Jr. 6872
Production Operations:	Steven L. Cohen 3369
Business Development:	Leonard G. Taigman 4466
Space & Electronics Systems Division:	J. H. Guilfoyle 6944
Strategic & Launch Systems Division:	John H. Pond 9165
Business Management:	Michael T. Cole 1700
Michoud Division:	Daphne R. Gillison 3155
External Tank Operations (KSC):	Evan D. McCollum 3788
Vandenberg Operations:	Melodie deGuibert 3160 William Leary 2202

DENVER AEROSPACE  
P.O. Box 179 — Denver, CO 80201

November 18, 1983

## Congressional Voting: Peacekeeper Funding

Both the U.S. Senate and the House of Representatives have approved spending \$2.1 billion to produce and install 21 Peacekeeper intercontinental ballistic missiles in existing Minuteman 3 silos in Wyoming and Nebraska beginning in 1986.

The Senate vote November 7 was 56-37 in favor; the House vote was 217-208.

	For	Against
ALABAMA	Sen. Jeremiah Denton (R) Sen. Howell Heflin (D) Sen. Ronnie G. Flippa (D)	None within the 50-mile radius of major Martin Marietta facilities.
CALIFORNIA	Sen. Pete Wilson (R) Rep. Robert J. Lagomarsino (R)	Sen. Alan Cranston (D)
COLORADO	Sen. William Armstrong (R) Rep. Hank Brown (R) Rep. Kenneth Kramer (R) Rep. Dan Shaefer (R)	Sen. Gary Hart (D) Rep. Patricia Schroeder (D) Rep. Raymond Kogovsek (D) Rep. Timothy Wirth (D)
FLORIDA	Sen. Lawton Chiles (D) Sen. Paula Hawkins (R) Rep. Bill Nelson (D)	None within the 50-mile radius of major Martin Marietta facilities.
LOUISIANA	Sen. J. Bennett Johnston (D) Sen. Russell B. Long (D) Rep. Robert L. Livingston (R) Rep. Lindy Boggs (D) Rep. W.J. (Billy) Tauzin (D)	None within the 50-mile radius of major Martin Marietta facilities.

## Invention, patents earn cash awards

Patents and inventions have earned cash awards for 12 employees.

Patents have been issued on inventions by Dr. Benton C. Clark, III and Philip R. Horkin. Clark's was for the "Field Portable Element Analysis Unit." Horkin's was for an "Improved Pin Diode Attenuator."

Inventions selected for awards by the Denver Product Development Review Board were:

Philip R. Horkin, electronics: "A Circuit Implementing a Modified Least-Mean-Squared Algorithm to Control Phase Only Weights in Adaptive Nulling Systems";

Frank J. Sosler Jr., electronics: "Modified Dual Mode Biconnical Antenna";

Jarrell W. Besthorn and Thomas A. Milligan, electronics: "Common Mode Current Suppression for Log-Periodic Antenna Balance Transmission Line Feeders";

Gary G. Gardner, electronics: "Improved Microstrip Shorting Stub for Wideband Use";

Richard L. Donovan, electronics: "Very Low Input Power Supply (VLIPS)";

Dr. Raymond D. Rempt, test, and Ludwig G. Wolfert, electronics: "Fiber Optics Displacement Sensor";

David R. Workman, product assurance and system safety: "Use Certification (UCERT)";

William A. Gatz, software: "Automated Diskette Carousel System";

Elvis D. Simon, engineering mechanics: "Convection Barrier for Propellant Tanks"; and

Curtis E. Farrel, systems engineering, Space and Electronics Systems division: "Spacecraft Interactive Analysis Program (SCIAP)."

## New technology, Tech Briefs awards earned by employees

Four employees have earned cash awards for new technology disclosures and 10 others have received awards for publication of their work as NASA Tech Briefs.

(Tech Briefs are a medium for dissemination of technology developed under NASA contracts.)

Honored were:

John C. Tietz and Bonni J. Almand, electronics: "Projected Rainbows and Stereo Ranging Measure Attitude and Position." (Their work also was approved for publication in Tech Briefs.); and

Neil J. Butterfield and Thomas J. Cassidy, engineering mechanics: "Joining Stainless Steel Propellant Management Devices to Titanium Tanks."

Those receiving cash awards and certificates for Tech Briefs were:

Edward C. Fox, engineering mechanics, and Dale W. Macumber, Vandenberg engineering: "A New High Accuracy Cryogenic Propellant Loading System Utilizing a Vibrating Cylinder Pressure Transducer for Determining Liquid Level";

William T. Perreault, electronics: "Base Plate for Power Converter with Improved Thermal Characteristics (BPTCI)";

Fred E. Lukens, electronics: "High Common Mode Voltage/High Common Mode Rejection Differential Amplifier (HHDA)";

Jeffrey L. Hayden, electronics: "Soil Metering System";

Robert L. Berry, engineering mechanics: "Track Train Dynamics Analysis and Test Program";

Eric Mumme, Michoud engineering: "Improved Thermal Isolator Installation Method"; and

Alvin T. Sheppard, Michoud engineering: "Perchloroethylene in Place of Naptha as an Extruding Aid for TFE Teflon."

## 16 employees complete leadership institute

Sixteen employees have been certified instructors following a 10-day course last month in the Kepner-Tegoe method of problem solving and decision making.

They will use those newly acquired skills to assist various Denver Aerospace organizations in clarifying and resolving operational issues. The Kepner-Tegoe method helps gather and organize information to provide a structured approach to analyzing problems, decisions, and potential problems, as well as docu-

menting the analysis.

The program was sponsored by the organization and management development function.

Certified in the program were: Ray Ernst (Michoud), Len Enger (Michoud), Larry Young, George McCone, Barbara Dash, Leslie Rogers, Robert Peak, Donna Sexton, Craig Hansen, Ron Remy, Mike Sumida, Don Brodie (Vandenberg), Al Sandoval, Tom Newell, Fred Trzos, and Robert Heymans.

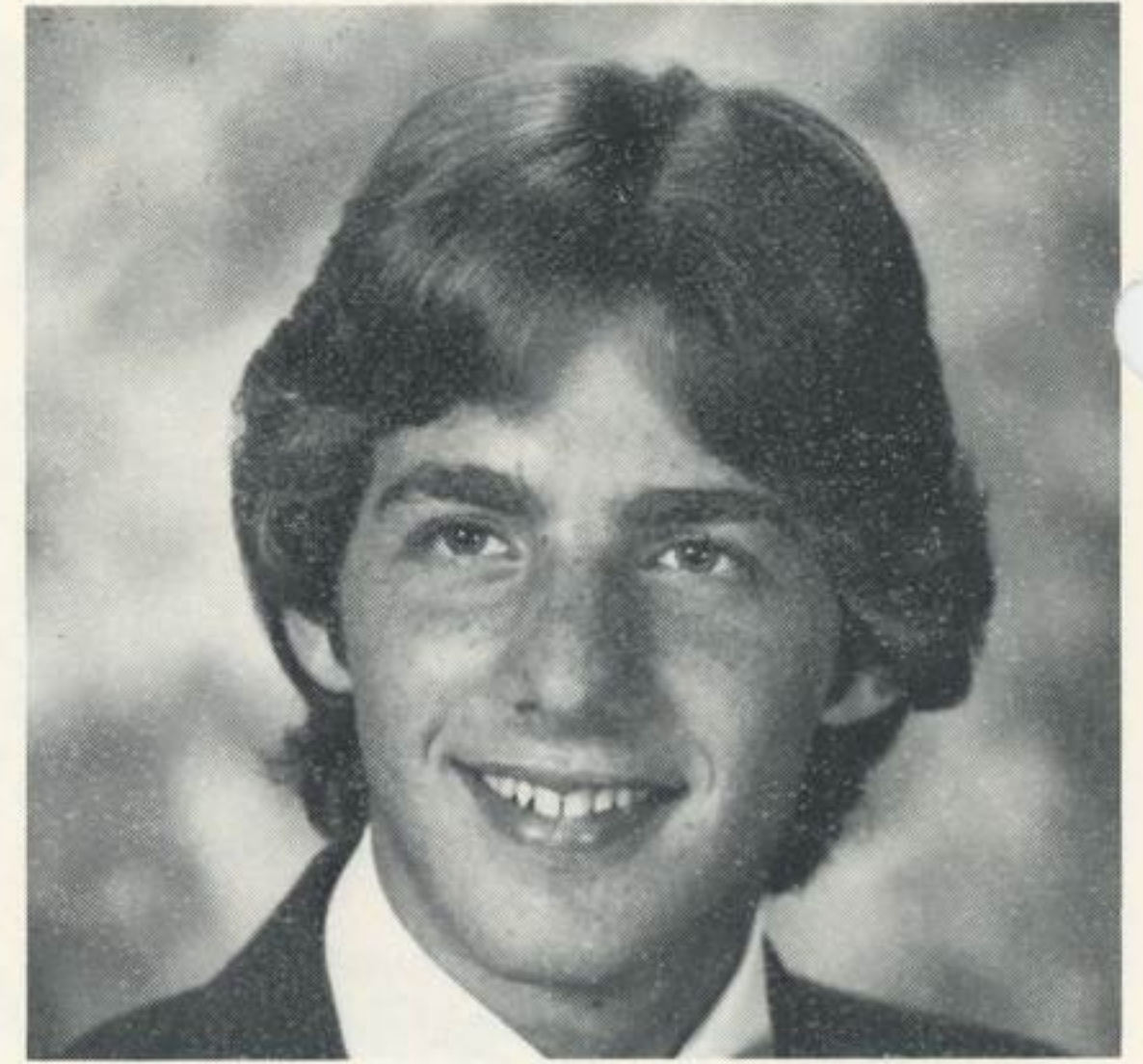
## Burn scheduled in bighorn sheep habitat

In an effort to improve conditions in the bighorn sheep habitat located on Martin Marietta property at Waterton, the overgrown scrub (Gambel) oak in the habitat will be burned out as soon as weather permits.

Bighorn sheep, a species threatened by the presence of man, require open grazing and watering areas, usually available at the Waterton site. Control of natural fire there has allowed the area to be-

come overgrown. There are currently 13 sheep in the Waterton herd.

The preliminary brush clearing has been completed and as soon as the snow is gone and weather conditions are right, the burn will take place in 10 to 12 acres southwest of the main plant, according to Todd Kisling. Kisling is directing the burn along with the Martin Marietta fire department and representatives of various government agencies.



---

## Scholarship applications available

Scholarship applications for sons and daughters of company employees are now available from the Martin Marietta Corporation Foundation.

Employees must have been employed by the Corporation for at least two years, as of January 1 of the award year, and be on the active payroll at the time of the award.

Applicants must be secondary school graduating seniors in the year of the award, and their academic records must qualify them for unconditional admission to an accredited college or university. Applications and all supporting evidence must be received by the selection committee no later than February 15, 1984 for awards to be granted that year.

Detailed information is available from recreation racks and The Scholarship Selection Committee, Martin Marietta Corporation Foundation, 6801 Rockledge Drive, Bethesda, MD 20034.

---

## Winterizing tips

Precautions taken now can forestall motoring problems this winter. Among the many practical suggestions contained in the state's driver's manual are the following winterizing tips:

— Automobile radiators, batteries, heaters, defoggers, windshield wipers, tires, and brakes should all be maintained in good working order.

— "Survival gear" — shovels, blankets, tow straps, first-aid kit, flashlight and batteries, and flares — should be carried at all times for motor vehicle emergencies.

Caution and common sense while at work, such as parking and walking only in designated areas, also can prevent accident and injury. Slip-on boots are recommended against icy pavement. Open-toed shoes invite frostbite and broken toes.

Should extreme winter weather force the company to close its Denver facilities, employees will be notified by emergency announcements on six local radio stations.

The following stations will broadcast closing notices:

KIMN 95 AM  
KLZ 56 AM  
KOA 85 AM  
KAZY 106.7 FM  
KOAQ 103 FM  
KYGO 98 FM

Employees are encouraged to listen to those stations whenever inclement weather threatens.

---

## Flag football teams place in tournament

Two Martin Marietta flag football teams — McCain-Metro Brokers and Conville's Pub — placed third and fourth, respectively, in the recent Colorado Association of Recreational Athletics' Denver tournament consolation bracket.

Sixteen teams, all Front Range leagues champions, competed in the tournament.

Martin Marietta has been holding its own flag football championships since Monday. Those results will be announced in the next issue of Martin Marietta News.

---

## IEEE meeting features tethered satellite

Donald Crouch, tethered satellite system program manager at Denver Aerospace, will be the featured speaker at the Institute of Electrical and Electronics Engineers (IEEE) meeting on Tuesday, November 29, at the Quality Inn, I-25 and Speer Boulevard.

Crouch will discuss development of the tethered satellite and the types of experimental research the satellite will make

## Young scientist presents paper

An 18-year-old Stanford University freshman on a Martin Marietta Foundation scholarship recently presented a research paper to a major structural materials conference in California.

David Zampino, son of John N. Zampino, Strategic and Launch Systems division, described a method used to define the geometry of a crack that may form in a solid body.

His paper said, in part, "The crack geometry parameters include, in ascending importance, the width, orientation, and area size of the crack. Ultimately, the above mentioned may serve as a vital link in the automated sensing of and emergency repair actions associated with critical crack formations in solid structural bodies. Two examples of critical crack formations are cracks which may occur in commercial aircraft or nuclear plants."

The method young Zampino discussed uses a set of equations he developed with Dr. C. A. Salvado at the Rockwell International Science Center at Thousand Oaks, CA.

The conference was held at the University of California at Santa Cruz and was sponsored by Ames Laboratory in cooperation with the Office of Basic Energy Sciences of the U. S. Department of Energy, Defense Advanced Research Projects Agency, Naval Sea Systems Command, and the U. S. Air Force Wright Aeronautical Laboratories.

possible.

Cocktails will be served from 5:30-6:30 p.m., dinner from 6:30-7:30 p.m., and the program will begin at 7:30 p.m. The dinner menu features beef stroganoff. Cost is \$9.75.

Reservations must be in by Friday, November 25. Members and their guests are welcome. Call Henry Rackley, ext 7781, or Norm Sitter, ext 7848.