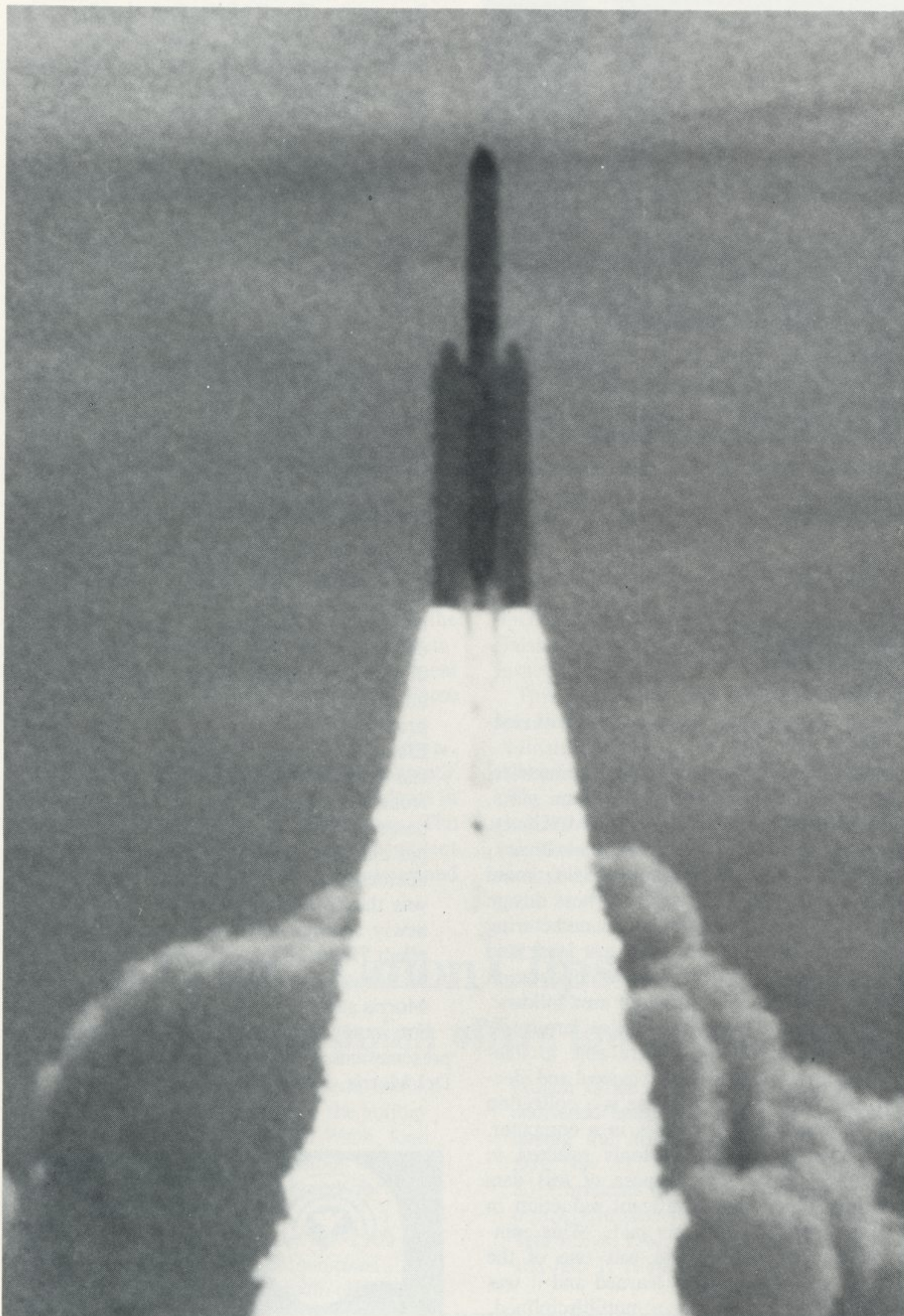


November 6, 1987 Number 22

Titan puts United States back into the space launch business



Edward C. Aldridge Jr., secretary of the Air Force, said the recent launch of a Titan 34D represents a revitalized Air Force in space. "We are back in the space launch business and intend to stay," Aldridge said at a press conference in Washington, D.C., on Oct. 27.

The successful launch from Vandenberg Air Force Base, Calif., of an Air Force Titan 34D bearing a classified military payload occurred at 2:32 p.m. on Oct. 26.

"This event has tremendous significance to the Air Force's space program," Aldridge said. "This Titan 34D success allows us to resume launching critical national security payloads on a regular basis. It also reopens all of our current expendable launch vehicle paths to space, so we can replenish our on-orbit constellations," Aldridge added.

The Titan booster was built by Space Launch Systems. Martin Marietta has contracts to develop, produce and launch four Titan launch systems. In addition to the 34D, they include a Commercial Titan launch system; the Titan IV, the most powerful Titan vehicle; and the Titan II, a low-cost vehicle being converted from decommissioned Titan II ICBMs.

"This launch represents a revitalized Air Force in space . . ."

The latest was the result of a year and a half-long Titan recovery program initiated shortly after the April 1986 failure of a 34D at Vandenberg.

"This launch represents a revitalized Air Force in space," Aldridge said. "Our Titan IIs are coming on line. The development of Titan IVs and Delta IIs is aimed at building an expanded, stable and reliable space program. A space program that will continue to play a vital role in providing us an assured access to space well into the next decade," Aldridge said. ■

U.S. Air Force successfully launches a Titan 34D vehicle from Vandenberg Air Force Base, Calif., on Oct. 26.



Thomas Elkinton, senior engineer, foreground, and Dennis Cupp, research and development technician, built the black box to meet specifications developed by the Project Challenge team. The screen shows a three-dimensional representation of the black box on the Cimline computer integrated manufacturing system.

PROJECT CHALLENGE

A Project Challenge electrical team has reduced from 12 months to 3½ months the time it takes to develop an electronic black box for the Commercial Titan program.

The electrical team, consisting of one manager and seven technical leads, demonstrated the time savings in development of a representative deployment payload and verification unit (DPVU.) The team used computer-aided engineering, computer-aided design and computer-aided manufacturing (CAE/CAD/CAM) tools and an integrated team approach to reduce the time spent from design to fabrication and testing.

Using these automation tools is a new approach to design that incorporates process simplification. Design engineers, test engineers and manufacturing engineers work as a team to get manufacturing and test input into the original design.

The DPVU is an electronic component assembly representative of a unit that will fly on Commercial Titans. The black box was selected as a pilot for Project Challenge based on

its complexity and the broad spectrum of electrical design disciplines required.

The team consisted of Del Morris, electrical CAE/CAD/CAM manager; Bob Owens, parts, materials and processes lead; Al McKinney, circuit design and analysis lead; Dick Broick, electronic packaging and printed wiring board design lead; Fred Frey, cable harness design lead; Jim Paden, electronics manufacturing lead; John Wallack, electronic test lead; and John Yatchak, electrical design integration lead. A summary of each major area follows:

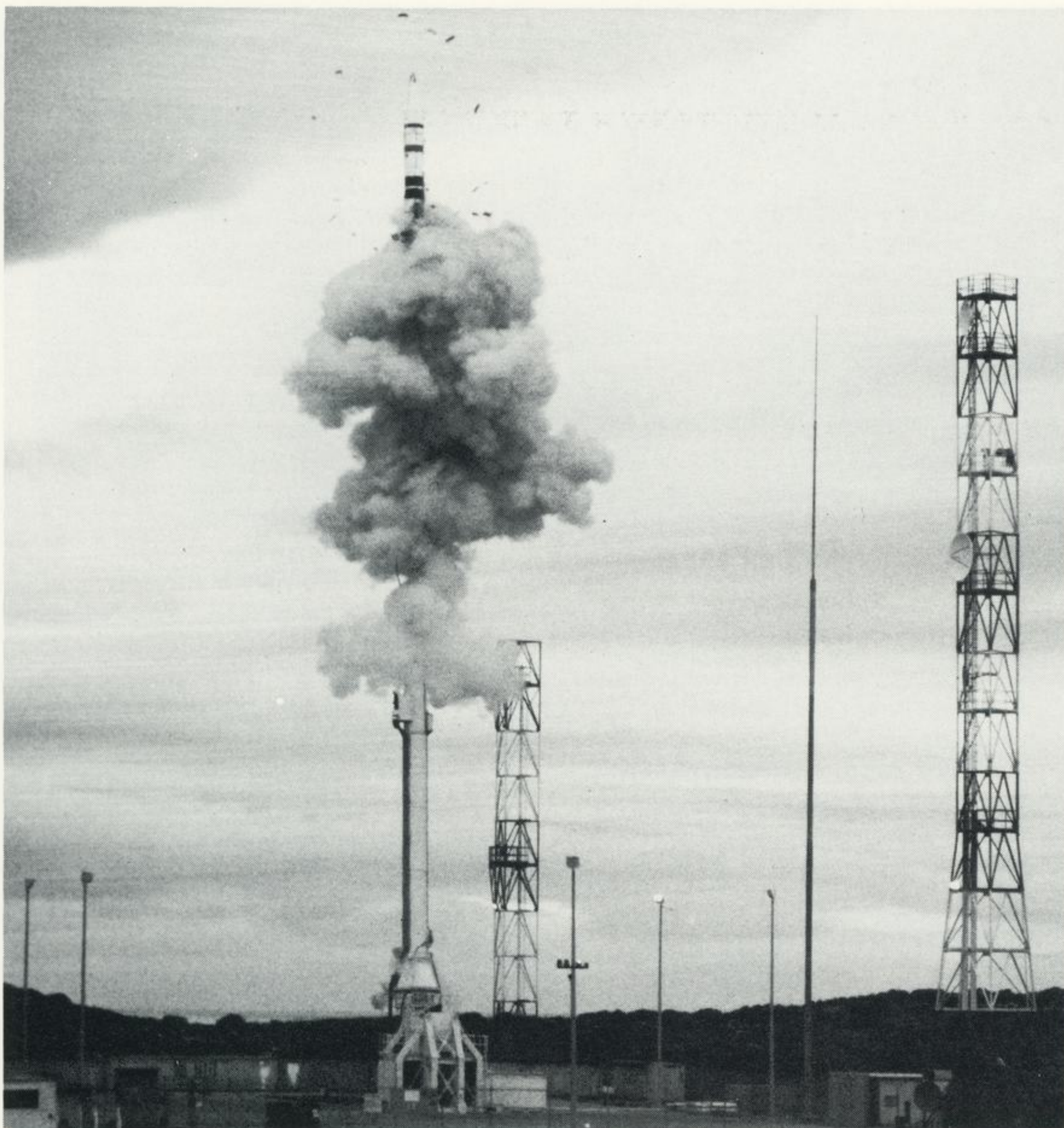
- **Integration**—During the pilot program, CAE/CAD/CAM tools were able to integrate or share the logical, physical and electrical databases. A database is a collection of information that resides in a computer. Using CAE/CAD/CAM tools resulted in fewer human errors because of less data transcription, and significant reduction in turnaround time, Morris said. "This communication enhancement was one of the most important lessons learned and it was strengthened by having a multidisciplinary,

collocated and motivated design, manufacturing and test team working together throughout the development cycle," he said.

- **Parts, Materials and Processes**—A database structure for standard electrical parts, materials and processes was created that can be transferred electronically directly to the design database, minimizing the possibility of human transcription errors.
- **Circuit Design and Analysis**—The CAE/CAD/CAM automation tool allows the designer to create circuit schematics on the computer and automatically extract the necessary data to perform worst-case analyses. The schematic data then can be transferred directly to the printed wiring board design. "The total process is so fast that the designer now has the capability to evaluate numerous approaches, and can understand circuit sensitivities to select the best design," Morris said.
- **Packaging**—The CAE/CAD tools allow the integrated design of mechanical housings, details and internal wiring harnesses and design of printed wiring boards. Information in the database is fed directly into thermal, stress and dynamic CAE analyses tools.
- **Cabling**—The entire cabling design was implemented on CAD, resulting in a more accurate design. An additional benefit occurred because the fit and function were possible without first building a mockup 3-D scale design.
- **Electronics Manufacturing**—The black box was manufactured in the Electronic Manufacturing Facility (EMF), using the process steps developed by the integrated design team. Using traditional approaches, process planning and productivity studies are performed after the design is completed and released. By performing producibility studies during the design phase, many costly changes are eliminated. The black box housing was built on numerical controlled machines, using data extracted electronically from the 3-D CAD design. A paper drawing was not required. This resulted in an exact mechanical fit and a well-built product.
- **Electronics Test**—The printed wiring board test tools were designed using data extracted from the electrical and mechanical databases. Testing was performed using test input data derived from those databases that decreased test tool development time. This was the first electrical design tested on a newly acquired test system at EMF. As a result, future flight electronic designs can be tested confidently with this system, Morris said.

For more information, demonstrations and presentations can be arranged by contacting Del Morris, Ext. 1-9580. ■





The successful cold launch test of a simulated Small ICBM using the Canister Assembly Launch Test Program traveled more than 300 feet into the air. Martin Marietta performed the test under contract to the Air Force.

Small ICBM launch canister test a success

Air Force Systems Command Ballistic Missile Office announced the successful cold launch of a simulated small intercontinental ballistic missile (Small ICBM) recently.

The Canister Assembly Launch Test Program (CALTP) test occurred at 9 a.m. PDT on Oct. 22 from a facility located at Vandenberg Air Force Base, Calif.

Strategic Systems in Denver performed the test under contract to the Air Force. The company is the assembly, test and system support contractor to the Air Force for the Small ICBM. Work performed by Strategic Systems also includes building the missile's postboost vehicle and payload shroud at the Waterton facilities.

The CALTP is a development test designed to evaluate the Small ICBM cold launch system, and test launcher subsystems, and to examine the missile interfaces with the test launcher's subsystems. The test also demonstrates interfaces between test launch components and missile handling equipment and facilities at Vandenberg.

During the test, the missile simulator, which is the same weight and size as the Small ICBM, traveled more than 300 feet into the air and then returned to a predesignated area within 100 feet of the launch pad. ■

Distinguished speaker series begins at CU

Martin Marietta is helping support the Distinguished Speaker Series that the Computer Science department at the University of Colorado at Boulder is conducting this fall and next spring.

All talks take place in the Engineering Center CR 2-6 on the Boulder campus. The next talk, featuring Robert Tarjan of AT&T Bell Labs in New Jersey speaking about "New Al-

gorithms for Network Flow Problems," will be at 4 p.m. Friday, Dec. 4. "Memory Management in Shared-Memory Multiprocessors," by Jean-Loup Baer from the University of Washington, will be the subject on Thursday, Jan. 28.

The series continues through April 28, 1988. For more information, call 492-7514. ■

Company solicits in-state business

About 23 percent of the Astronautics Group's annual purchases goes to Colorado companies, and the company would like to increase its Colorado business even more, according to Chuck T. Wood, director, Materiel.

The company purchased \$444.5 million in goods and services last year, more than ever before, and almost \$100 million of that went to Colorado businesses, Wood said. He expects the company's total annual shopping list to reach \$1.33 billion by 1990.

The list of goods and services ranges from operating supplies to sophisticated systems. Almost 33 percent of the total dollars spent in 1986 went to small businesses. Martin Marietta recently awarded an \$8.1 million contract to Etkin Construction Company, a Denver-area small business, for construction of a research laboratory facility at Waterton.

"Our engineering services requirements are met by a small business, a large business, and a minority business located in the Denver area," Wood said. These three contracts are worth more than \$20.7 million over 2 years.

In March, Martin Marietta held a minority vendor exposition in Denver to provide information regarding business opportunities. Purchases from minority companies who attended the exposition have surpassed \$2 million since March. Approximately 55 companies from Colorado attended, and the amount is expected to increase in coming years, Wood said. ■

SIP values

Unit values for the savings investment plan (SIP) for United Aerospace Workers (UAW)- and United Plant Guard Workers of America (UPGWA)-represented employees in September (August values in parentheses) are:

Fund A (indexed equity)	1.1565175331 (1.1852393182)
Fund B (fixed income)	1.0200531707 (1.0185110825)
Fund C (company stock)	1.1289511068 (1.0994619453)

PSP values

Unit values for the performance sharing plan (PSP) for salaried employees in September (August values in parentheses) are:

Fund A (indexed equity)	5.2335514137 (5.3552683298)
Fund B (fixed income)	2.7717141004 (2.7491925140)
Fund C (company stock)	5.7154348394 (5.5385843153)



Manufacturing productivity team improves glove

A Manufacturing Partners in Productivity (PIP) team contributed an idea that provides better anti-static gloves for use with static-sensitive hardware and certain solvents. The team was recognized by the Success Through Suggestions program and by Manufacturing management. Standing in the back row, left to right, are Gary Hinds, Chris Peterson, Lori Hladik and Jim Ritz. In the front row are Darlene Anderson, Sherry Lacy, Gloria Cordova, Betty McClinton and Ray Schwindt, director of Manufacturing.

NASA selects Martin Marietta as one of three shuttle-C study contractors

NASA has selected Martin Marietta Manned Space Systems and two other companies for negotiations leading to parallel contract awards to perform the first of a two-phase systems definition study for a proposed unmanned, cargo-carrying launch vehicle.

The first study phase, valued at approximately \$1.5 million for each of the firms, is expected to require four months to complete. Each contractor will prepare configuration and operations concept definitions for a new vehi-

cle, named Shuttle-C for cargo. The Shuttle-C concept will supplement the space shuttle orbiter with an unmanned cargo element.

The new vehicle would have a lift capability of 100,000 to 150,000 pounds to low-Earth orbit, giving the U.S. space program a launch vehicle with two-to-three times the payload capability of the present space shuttle.

NASA's Marshall Space Flight Center, Huntsville, Ala., has management responsibility for the study. ■

Program offers free counseling, referrals

Martin Marietta has added a new employee benefit to help solve personal problems. The Employee Assistance Program (EAP) provides free information, assessment counseling and referral services to employees.

The program was established to help employees who have problems with substance abuse; marital and relationship concerns; legal, financial, or stress problems; or emotional difficulties.

Charles Roach, who has a master's degree in psychology, is program administrator. "Assistance is free, confidential and easy to use for employees who have problems that affect their work performance," Roach said. "I usually meet with an employee one to three times, and then can refer them to an appropriate organization or resource if needed. Our talks are confidential and kept out of the employee's personnel file."

Roach sees employees who seek help on their own and those referred by their supervisors. Supervisors can refer employees who may be having problems that interfere with job performance.

Roach said he usually schedules one-hour sessions. "It's a place to turn when you have a problem and don't know what to do," he said.

For more information, call the Employee Assistance office, Ext. 7-5521. ■

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Teets attains highest AAS rank

Peter B. Teets, president of Martin Marietta Astronautics Group, has been elected a fellow of the American Astronautical Society (AAS), the highest ranking a member of the society can attain.

Teets received the honor Nov. 4 at the society's annual meeting in Houston, Texas. He was cited for his "significant contributions to astronautics."

The AAS is a national scientific and technical organization dedicated to strengthening the space program of the United States. Fellows are professionals nominated and elected annually by the active fellows and the board of directors. ■

Harassment awareness training sessions begin

The Equal Employment Opportunity/Affirmative Action Plan department has begun training management on what constitutes sexual harassment. Sexual harassment is an unlawful employment practice, and the course will train management to identify and deal with it if it occurs.

According to U.S. Equal Employment Opportunity Commission (EEOC) guidelines, unwelcomed sexual behavior, advances, requests for sexual favors, deliberate or repeated unsolicited communications or gestures, and other verbal or physical conduct of a sexual nature constitutes sexual harassment when any one of the following three criteria occur:

- Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment.
- Submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting the individual.
- Such conduct has the purpose or effect of interfering with an individual's work performance or creating an intimidating hostile or offensive work environment.

"Lack of awareness of the law in this area is no excuse," said Jerry Pitts, EEO personnel administrator. "Prevention of sexual harassment is an important issue. Sexual harassment is unacceptable and cannot be condoned or tolerated in the workplace," she said.

An employee who believes he or she is subjected to sexual harassment should let the offender know it is unwelcomed, Pitts said. If the behavior persists, employees should notify their supervisors, personnel management or the EEO department.

Martin Marietta's top management is committed to eliminating sexual harassment, and depends on every Astronautics Group employee to keep the workplace free of this behavior or any other form of discrimination, Pitts said.

Managers and directors will soon receive training schedules. Call Jerry Pitts, Ext. 7-1811, or 7-1423, for more information. ■



U.S. Treasury department awards top contributors

Data Systems and Denver Information & Communications Systems (I&CS) received awards and praise for employee participation from the U.S. Treasury for the 1987 U.S. Savings Bond drive. Left to right are Earl Steward, U.S. Treasury, Peter B. Teets, president, Astronautics Group, accepting the award on behalf of I&CS employees, Frank Strahota, U.S. Treasury, and William Seefeldt, manager, communications and administrative support for Data Systems. Teets has been named Denver geographic chairman for the U.S. Savings Bond drive.

Accident insurance available

Employees may enroll in the special accident insurance plan in November; coverage will become effective Dec. 1. Employees enrolled may add family coverage or increase the amount of coverage this month.

The special accident insurance plan offers supplemental life insurance coverage that provides benefits in case of death, dismemberment or total disability following an accident on or off the job. All active full-time employees are eligible to participate. Employees may select coverage from \$20,000 to \$250,000 or

to a maximum of \$500,000 if the amount does not exceed 10 times their annual earnings.

By selecting family coverage, employees can insure the lives of their spouses and dependent children. Employee insurance costs 9¢ per week for \$10,000 coverage. Coverage for the employee and dependents costs 14¢ per week for \$10,000 coverage.

For more information, refer to the special accident insurance booklet, or contact the Benefits office.

—Clare Ryland

Industrial specialists take in-plant course

Three industrial specialists are visiting the Astronautics Group as part of a 2½-week in-plant phase of a production management course offered by Wright-Patterson Air Force Base in Ohio.

Christine F. Hughes of Tucson, Ariz., Harold Key of Richmond, VA., and Lucretia M. Smith of Cleveland, Ohio, are students in the Air Force Institute of Technology. The three arrived Nov. 2 and are involved in plant operations to study industrial organization and

operation, management of raw materials and finished products, and quality control and inspection.

This is the first time Martin Marietta has been involved with the program, which is coordinated by Betty Purkey-Huck for Stanley F. Albrecht, vice president of Plant Operations. "The intent of the program is for us to treat the students as employees," Purkey-Huck said, "and help them understand the production cycle at a major contractor." ■



Credit Union Clips

Credit union offers low holiday rates

The Red Rocks Federal Credit Union is offering low-loan rates for the holiday season, according to Susan Webb, loan officer. "We offer a number of loan packages specially designed for our borrowers," Webb said.

Call the credit union at 797-2900 for more information about loan rates.

Both the credit union main office and

branch office will be closed or have shortened hours on the following days during the holiday season: Veterans' Day, Nov. 11; Thanksgiving Day, Nov. 26; Christmas Eve, Dec. 24 (close at 2 p.m.); Christmas Day, Dec. 25; New Year's Eve, Dec. 31 (close at 2 p.m.); and Jan. 1, 1988.

Bowlathon slated for ailing DU grad

A bowlathon will be held on Nov. 7 in support of John Kammer, a 1987 University of Denver engineering graduate stricken with hip cancer days before beginning a new job with Martin Marietta.

Since Kammer lacks sufficient insurance to defray a medical bill of more than \$65,000 for surgery and rehabilitation, bowlathon organizers hope to raise enough money to help pay the bulk of the bill.

Bowling teams already have been formed and bowlers are seeking sponsors to pledge donations on a per-pin basis. Each bowler is attempting to raise a minimum of \$0.50 per pin for their three-game total score.

The bowlathon will be held from 11:30 a.m.-2 p.m. on Saturday, Nov. 7, at Monaco Lanes. For information and to sign up as a sponsor, contact Louise Carlson at DU, 871-2102, or call 751-9499 on Saturday. Donations may be made after the event.

Kammer recently has returned to the hospital for chemotherapy. ■

Relocations

- The Government Security department will be relocating to the third floor (Area C) of the newly-acquired Deer Creek facility on Saturday, Nov. 14. The department currently occupies Room 520 of the Technical Support Building.

Clearance processing, rebadging and investigative services will be unavailable from noon on Friday, Nov. 13, to 7:30 a.m., Tuesday, Nov. 17. Visitor control services will be available on a limited basis. Office hours and telephone extensions will remain unchanged. The new mail stop will be DC 1392.

- The Organization Development/Management Development department (OD/MD), which includes the Success Through Suggestions program and the Education office, has moved to the third floor of the Deer Creek facility.

All phone extensions have remained the same. The following are new mail stops: OD/MD—DC 1370; Education office—DC 1372; Suggestion office—DC 0092.

- The Benefits office also moved this week to the third floor of the Deer Creek facility, room 3B411. Business hours are 8 a.m. to 4:30 p.m.

Until construction begins on the first floor of the Engineering building, the office will have a representative at the old location, Room 125, from 1 to 4:30 p.m. While the phone numbers remain the same, the mail stop has changed to DC 1343.

Employee Services/Recreation

Denver Symphony Orchestra—Martin Marietta employees can receive a 50-percent discount on all 1987-88 classical, pops, chamber and family concerts (Great Artist recitals not included). Obtain a discount flyer from the recreation racks. Tickets may be ordered in advance by mail or the coupon on the flyer can be redeemed at the symphony box office. Tickets are subject to availability.

Denver Center Theater Company—Coupons offering 25 percent off the price of two tickets to any fall production are available in the recreation racks. The schedule includes "Guys and Dolls," Oct. 16-Dec. 19; and "The Price," Nov. 19-Dec. 19.

Hunting and Fishing Club—The group will meet at 5 p.m. Monday, Nov. 9, at the club meeting room in the recreation area.

Titan Toastmasters—The group meets at 6 p.m., Mondays, at Abe's Cafe, 2489 W. Main St., Littleton. Contact Mark Willey, Ext. 1-6183.

Archery—The Red Rock Bowmen indoor recreational league will meet at 7 p.m. Tuesdays until December at Hinze Archery, 3350 S. Knox Court. The league is open to guests and visitors. The next archery club meeting will begin at 4:45 p.m., Tuesday, Nov. 10. Contact Rich McNutt, Ext. 7-3324, or James Gilmore, 7-4203.

Platte Canyon Photo Club—The next meeting begins at 7:30 p.m. Wednesday, Nov. 18, at DSC, Room 200C. Jack Acrey, a professional wildlife and wilderness photographer, will present a color slide program of his recent wilderness travels. Members and guests are invited. Autographed books and calendars by John Fielder, a professional Colorado scenic photographer, are available at a 20-percent discount off store prices through the club—Colorado images, \$20; hidden valleys, \$16; and wall and engagement calendars, \$7 each. Contact the following members for ordering or for more information: John Smith, Ext. 1-5704; Ninette Brown, 7-3128; Jim Shepp, 7-5704; Steve Bernard, 1-6495; and Bill Privratsky, 7-4969.

Mile High L5 Space Society—The next meeting will be at 7 p.m. Friday, Nov. 13. The shuttle film begins at 6:30 p.m. at SouthPark West in Presentation Room 103A. Dr. Marvin Luttes, of CU Boulder, will discuss activities in near-Earth space. Call Jeff Zerr, 790-3857, on or before Tuesday with names of any non-Martin Marietta employee guests.

Running—Martin Marietta's running team won the 1987 Denver Symphony Run 5k race for the second year in a row on Sept. 27. The team won the Corporate I Division of the largest road race in the Denver area. Team members who scored included Keith Golding, Dave Rice, Tim Williams, Jeff Findle and Louise Hecht. Other runners included Clare Bena, Kalani Scott, Pat Hossle and Bo Rodriguez. The team's total time was 1 hour, 27 minutes and 42 seconds, 5 minutes ahead of the runner-up team.

Theater—STAGEWEST is producing the comedy "Greater TUNA" and offers a \$3 discount to Wednesday and Thursday evening and Sunday afternoon performances during November. The discounted price is \$10.95. A maximum of eight discount tickets may be purchased per coupon. Obtain the flyer with coupon from the recreation racks. Ticket sales are handled by STAGEWEST.

Chess—The Martin Marietta Chess Championships for 1987 will be Saturday, Nov. 14, beginning at 9 a.m. at the DSC snack room. Trophies will be awarded for the top three finishers in two categories, with three-to-five rounds of play scheduled (timed at 1-hour per round maximum). For details, contact tournament director Dick Pickerell, Ext. 7-5891.

Smoking Cessation Classes—Help for smokers: free stop smoking classes are offered to all Martin Marietta and Air Force personnel, spouses and dependents from 5-6:30 p.m. at Goddard Junior High School, 3800 W. Berry Ave., Room 208. Classes will be Nov. 9, 12, 16 and 19. To register, obtain a form from the recreation racks or from the Education Catalog, and mail the form one week before the class to Employee Services/Recreation, Mail Stop 1344.

Ski Discounts—The Steamboat Club Card offers a daily \$6 discount on skiing at Steamboat all season. The card offers more than \$600 in savings with a special coupon book, including discounts for ski school, \$17 ski days, racing programs, restaurant specials, ski rentals, lodging and more. The club card is sold at Steamboat, and is available to all Denver Area Employee Services and Recreation Association (DAESRA) member company employees for \$5 through Dec. 13. To obtain the offer, mail a copy of the flyer "Ski Steamboat at the Half Day Rate" to the Steamboat ticket office. Employees can obtain the flyer from the recreation office or from volunteer recreation representatives.

Aspen Lodging Discount—The Inn at Aspen, located at the base of Buttermilk Mountain, is offering \$25 off the regular room rate to Martin Marietta employees when they present a \$25 coupon at check-in. Employees can obtain coupons from the recreation office. The coupon is valid until Dec. 24, and again after Jan. 3, 1988. The reservation number is (800) 826-4998.

Bicyclists—The Mile High Rollers Velo Club meeting will be at 5 p.m. Wednesday, Nov. 11, at the Pines Clubhouse. Glen Marshman, a competitive bodybuilder and personal trainer to four professional athletes, will give a seminar on nutrition and training. He is an avid cyclist and uses cycling in his own training program. Officers will be elected. Club members are free, non-members—\$1. For information, call Tom Parmentier, Ext. 7-3717.

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

Monte Carlo fund raiser slated to benefit Arapahoe Volunteers

"A Night in Monte Carlo" is scheduled for Friday, Nov. 13, to raise funds for Arapahoe Volunteers, a United Way agency for delinquent youth.

The fund raiser will be held at the Embassy Suites Hotel, located at Arapahoe and Havana. A donation of \$25 will allow guests to try their luck at blackjack, roulette, and craps.

Three Martin Marietta employees currently volunteer with an offshoot of the agency, the SomeBuddies program: Bob Brown, Mitch O'Sadnick, and Phyllis Henderson. The pro-

gram matches youths, ages eight to 17, considered "at risk" for delinquency, with adult volunteers.

In addition to this support, Martin Marietta contributed \$1,000 to the Firehawk Program, another offshoot of the Arapahoe Volunteers. The program pairs volunteers with children who demonstrate firesetting behavior.

For tickets to the Nov. 13 fundraiser, or for information on becoming a volunteer, call 795-8898. ■