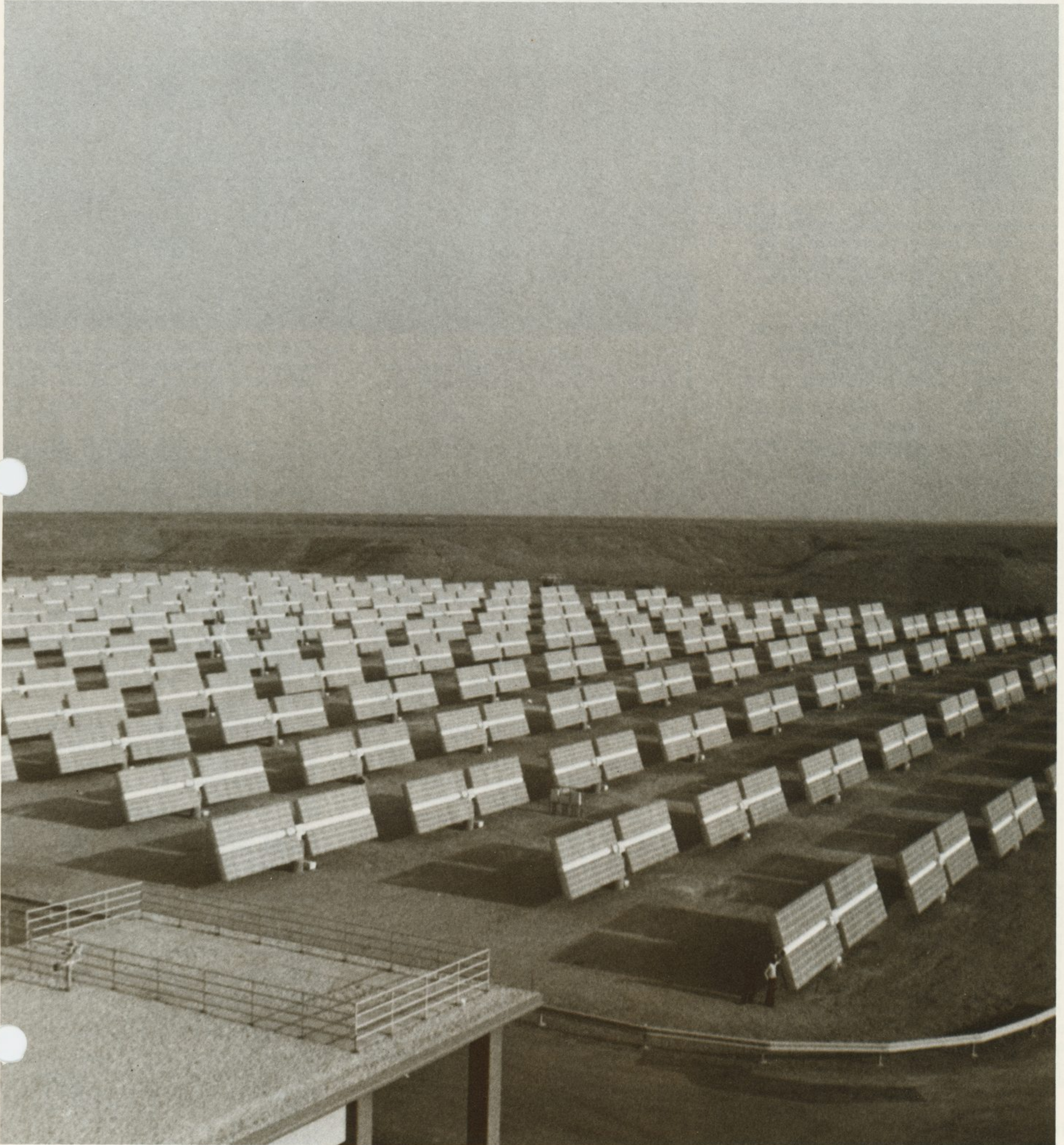




**NUMBER 19/1981**

**MARTIN MARIETTA**  
**news**  
**DENVER AEROSPACE**





# Saudi photovoltaic solar plant begins operation

The world's largest solar power plant using photovoltaic cells to convert sunlight directly into electricity is in operation near Riyadh, Saudi Arabia.

Designed and built here, the facility will supply 350 kilowatts of electrical energy to three villages near the capital city of Riyadh. In addition to design and fabrication, Denver Aerospace installed the plant and will provide operational support for the system.

The photovoltaic power plant is part of the Saudi Arabia-United States program for cooperation in the field of solar energy (SOLERAS), and is under the auspices of the United States-Saudi Arabia joint commission on economic cooperation. The program is equally funded by the two nations and is administered by the Solar Energy Research Institute (SERI).

"The Saudi project is a benchmark in solar technology—a viable demonstration of harnessing the sun's energy for domestic application," according to A.E. Hawkins, vice president for solar energy systems.

The project will supply electricity to the villages of Al Jubaylah, Al Uaynah, and Al Hajrah. It uses 160 photovoltaic concentrator arrays—each containing 256 silicon solar cells that di-

rectly convert sunlight into electrical energy. Fresnel plastic lens intensify by 33 times the amount of sunlight received by each cell.

Denver Aerospace also developed the electronic sun sensors that allow the photovoltaic arrays to

automatically track the sun across the sky.

"Photovoltaic power plants will be able to offer a reliable and efficient source of electrical energy to remote areas where little or no source of electricity exists," Hawkins said.



The solar photovoltaic power plant at Sky Harbor International Airport near Phoenix produces 225 kilowatts using 80 solar arrays, compared with 350 kilowatts from 160 arrays at the Saudi solar plant. Both systems were designed and built here.

## CCMS commended for equipment delivery

Ground electronics production systems has been commended for the installation of check-out, control, and monitoring subsystem (CCMS) maintenance test equipment which makes up the CCMS test and verification set at Kennedy Space Center.

"I would like to relay the appreciation expressed by our CCMS maintenance personnel, for the hard work and outstanding support (your) people have given in the design, production, and installation of this long-awaited equipment, and to add my personal thanks," said P. Thomas Breakfield III, chief of the NASA launch processing system division at KSC, in a letter to Edmund Haeger, director of ground electronics production systems.

"At the risk of omitting some dedicated people, we would specifically like to commend Hank Summers, Tony Romeo, Paul Heitzer, Verle Crow, Wally Searn, Steve Frazier, and in particular, Bob Dorney at the Lincoln Facility," Breakfield said. "At KSC, Don Shigley, Mike Miller, Dick Dummer, Chuck Biby, and Roger Wright were particularly helpful in advising us on configuration and installation."

According to Breakfield, the equipment arrived in "great shape with virtually no problems."

The test and verification set is undergoing testing and soon will be the primary tool for system testing.

## Command, control test system to be built here

Denver Aerospace has been awarded a contract by the U.S. Air Force to build a system to test command, control, and intelligence systems of the U.S. and NATO tactical air forces.

Under the \$11 million contract from the Tactical Air Command, the company will develop a computer-base simulation, monitoring, analysis, and test system called SMARTS.

Tests of the systems that SMARTS will perform include determining the degree of compatibility and interoperability networks that control the various air weapon systems of the U.S. Air Force, other U.S. services, and NATO allies.

SMARTS operates in three modes—test generation, execution, and analysis. Features include central control of both local and remote units; improved sensor simulation, data recording and reduction, and test analysis; automated equipment checkout and scenario and track generation; and on-line operator modification of data.

The first equipment will be installed in January

1983 at TAC headquarters at Langley Air Force Base. Equipment also will be installed at remote sites at Tinker Air Force Base and Kelly Air Force Base.

## Outward Bound program on NBC's Today Show

Denver Aerospace employees participating in the Outward Bound program were featured on the NBC television network's Today Show November 18.

Dr. Roy Yamahiro, manager of education, training, and employee development, who coordinates the program for employees, was interviewed on the show.

More than 400 employees have participated in the program since it started here in 1979 to reinforce and support personal growth on the job and in careers in the company.

The program, held on weekends in the rough mountainous and river country of Colorado, stresses self-confidence, teamwork, and resourcefulness that can be transferred to the work place.

## Schedule of 1982 holidays announced

Scheduled holidays for 1982 are: January New Year's Day; April 9, Good Friday; May 31, Memorial Day; July 4, Independence Day; September 6, Labor Day; November 25 and 26, Thanksgiving; December 24, 27 through 31, Christmas and New Year's.

### On the cover

Solar photovoltaic cells form an orderly pattern against the sands near Riyadh, Saudi Arabia. Part of the world's largest photovoltaic power plant designed by Denver Aerospace, the photovoltaic cells convert sunlight directly to electricity.



## Titan 34D launch scheduled for 1982

The Air Force Space Division has announced that the first launch of a Titan 34D is scheduled for 1982.

The 34D, which will replace the Titan IIIC and IIID, is capable of placing a 4,000-pound payload into a geostationary orbit, or a 30,000-pound payload into a low-earth orbit.

The 34D booster looks like the Titan IIID with the exception of longer solid-fuel rocket motors. The five feet added to each of the solid-fuel rocket motors will provide more thrust at liftoff, and a new payload fairing will range from 40 to 55 feet in length, depending on the payload it shrouds.

For some 34D missions, the Titan IIIC transtage will be used. It can also be fitted with an inertial upper stage (IUS). The basic Titan 34D will be used without the IUS for launches into high-inclination orbits from Vandenberg Air Force Base.

Space Launch Systems designs and manufactures the basic center core and integrates all elements of the launch vehicle. The company also assembles the booster, integrates the spacecraft system, and conducts systems tests and launch operations at Cape Canaveral, Florida.

## Employee named district small business director

The new director for district eight of the Small Business Administration is Carlos Suarez. Until his appointment to the post by President Ronald Reagan, Suarez was senior finance specialist in defense systems.



In his new position, Suarez has final approval on Small Business Administration loans, will rule on appeals from local offices, and is responsible for the management and economic assistance to small businesses through a staff of more than 200 in Colorado, Utah, Wyoming, Montana, North Dakota, and South Dakota.

The six-state region has issued \$207 million in government guaranteed loans this year.

## Course catalogs to be distributed in January

Catalogs for the 1982 spring semester evening education classes will be distributed and placed in reading racks at each facility the week of January 4, 1982.

Student registration will be held by class instructors from 5:00 pm to 8:00 pm January 12 and January 20 at the Goddard Middle School cafeteria, 3800 W. Berry Avenue, Littleton.

Classes will start the week of January 25.



A friendly chess game is played by divisional champions Gary P. McKee (left), upper division, and Rick Alegret, reserve champion and the tournament's only undefeated player. Chess club membership more than tripled this year to 75 members.

## Newspaper cites employee for Army reserve service

The Denver Post has named Mary Lou Jordan as a recipient of its silver medal for outstanding service in the U.S. Army reserve. The presentation was made on Veteran's Day in a ceremony at the Colorado State Capitol.

A planner in systems engineering, SP5 Jordan was cited for devotion to duty, proficiency in military specialties, good citizenship, and community service. She was among 49 enlisted men and women of the army reserve and Colorado National Guard honored by the newspaper.

She has been employed here since May.

## Scholarship application deadline February 15

Application deadline for Martin Marietta Foundation scholarships for sons and daughters of employees for the 1982-83 academic year is February 15, 1982.

To be eligible, the employee, whose son or daughter is an applicant, should have been a Martin Marietta employee 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.

Applications for the \$3000 scholarship awards will be evaluated and winners selected by a committee of three persons not associated with the company. The committee will be chosen by trustees of the Foundation from academic and business communities.

All applications, supporting evidence, and correspondence should be sent directly to the committee.

Application forms and information about the scholarship program may be obtained from R. W. Walker, organization and management development, Eng. 225, Ext. 3395 in Denver.

## Recreation

Information on all clubs and activities may be obtained from the recreation office, Eng. 124, Ext. 6750.

**Flag football:** Co-champions of flag football league play are the Running Runts, team five of the Saturday morning league and the Wild Turkeys, team one of the Wednesday night league, following a tying score championship game. Team standings by league are: co-recreational, 1st place, the Grommets; 2nd place, the Wild Anomalies; 3rd, the Maladroits. In the Wednesday night league, 1st place, the Wild Turkeys; 2nd place, the Titans; 3rd place, No-names and Cold Flow Ice-men. In the Saturday morning league, 1st place, the Running Runts; 2nd place PWA; 3rd place, the Eight Balls.

**Golf:** Volunteers are needed to form two new golf leagues for 1982. Please contact the recreation office by December 10.

**Amateur radio:** Carl Stevenson, managing editor of Communications Magazine will speak at the January 5 meeting at 4:40 pm, Eng presentation room. Topic will be satellites and terminals, with attendance open to all. Officers for 1982 are H.E. Beaver, president, D.H. Cowdin, vice president, and A.L. Zalatan, secretary/treasurer.

## Carpool registration due by December 17

Employees who share a ride by carpooling are reminded to register their vehicles with the Share-the-Ride office by December 17 and replace expired green parking stickers to ensure space in preferred parking areas at all facilities.

For information and registration forms, call Lori Sharp, Ext. 6605.



## MX missile assembly elevator system nearing completion

The MX missile assembly elevator system is nearing completion in the cold flow facility at Waterton.

After final checkout here, the complete assembly, including actuator and hydraulic power supply, will be transported to Vandenberg Air Force Base, where it will be reassembled in early 1982 for the MX flight test program that begins in January 1983.

In operation, the elevator system provides for assembly of MX missiles, stage by stage, and insertion into the canister. All assembly takes place on the same level, and the missile is lowered as each successive stage is attached. The system also provides hydraulic power for canister erection and rotation.

The actuator has a 66-foot stroke, is 72 feet long retracted, and 138 feet long extended. The actuator system, which can handle a 160-ton load, was built for Martin Marietta by Remco Hydraulics of Willits, California.

The 18,000-pound hydraulic power system was designed and built here. The power system provides precision control to the actuator, and has a 1500-gallon fluid capacity.

Donald G. Macumber is the Strategic Systems product integrity engineer for the elevator system.

## Employees aid in Job Hunt '81 program

The Colorado Alliance of Business, with three Denver Aerospace employees assisting in the program, helped find summer jobs for more than 2500 young people this year.

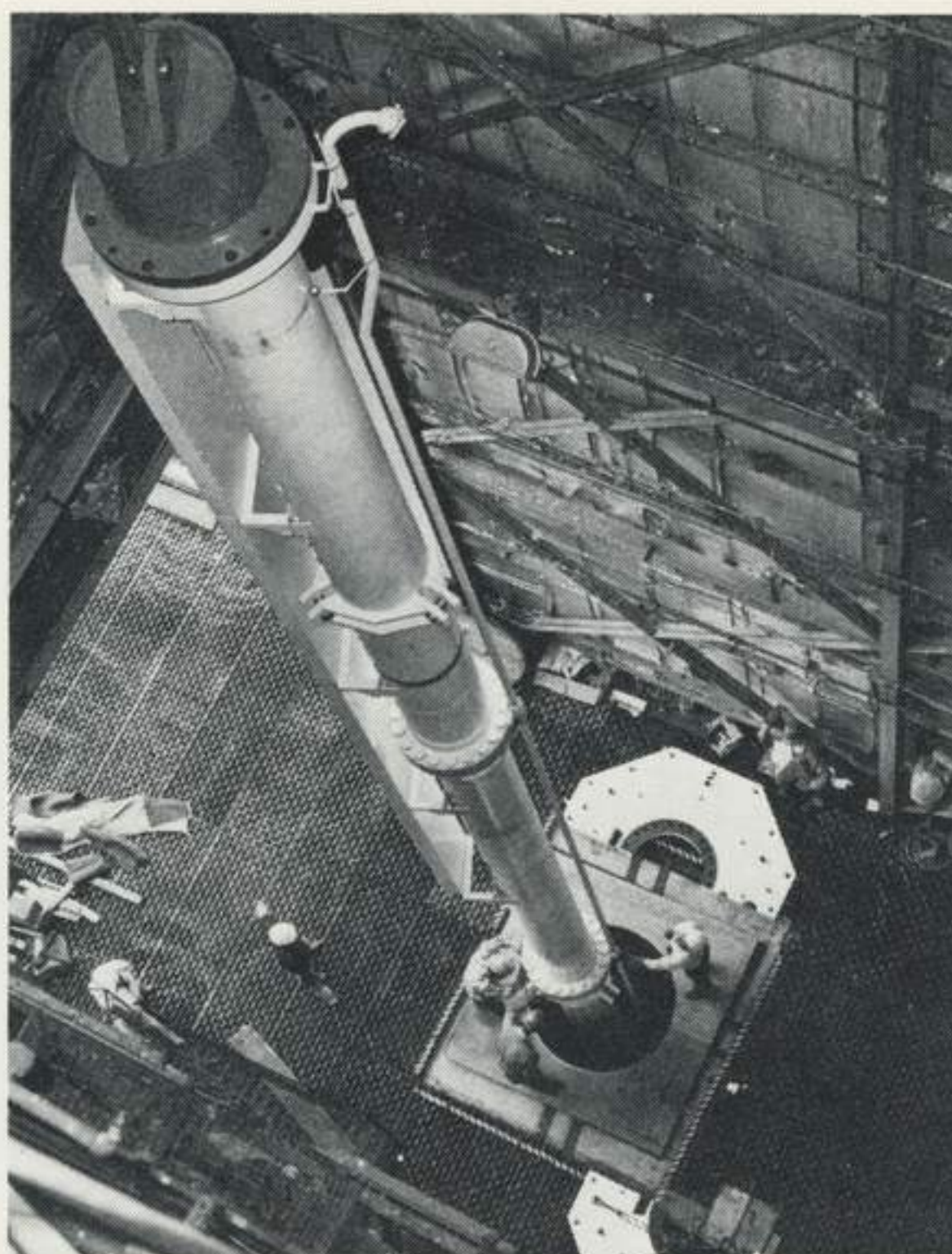
W. O. Lowrie, vice president and general manager of the space and electronics systems division, is chairman of the board of Colorado Alliance of Business, a nonprofit organization working to solve problems on unemployment for Colorado's disadvantaged. Serving on the steering committee that provides program and policy guidance for the board are John H. Pond, strategic systems division, and Fitzroy Newsum, public relations department.

A year-round program to provide unsubsidized employment and work-oriented support services for Colorado youth has grown from the highly successful Job Hunt '81 program, which more than replaced the subsidized jobs lost through federal budget cuts.

## Referral program ends December 7

"The Name Game"—the employee referral program—ends December 7, 1981.

The drawing for the trip to Tahiti, also to be held December 7, marks the close of the highly successful program.



*Dwarfed by the 13-foot MX missile assembly elevator system's actuator, employees give a final checkout to the actuator system at the cold flow facility here.*

## President is keynote speaker at conference

C.B. Hurtt, Denver Aerospace president, was the keynote speaker at the American Institute of Aeronautics and Astronautics second terrestrial energy systems conference in Colorado Springs December 1.

He discussed solar energy projects developed here and the role of the aerospace industry in developing advanced energy systems.

The technical meetings included papers on wind, solar, thermal, and ocean energy.

## Open enrollment period set for health insurance

Employees may change group health insurance coverage during the open enrollment period for Comprecare and Connecticut General.

Information describing the dual choice open enrollment and the two plans has been mailed to employee homes. Employees are urged to read the material carefully. If the information has not been received, call the employee benefits office, Ext. 3009 or 5680, or come to Eng. 124.

Those who wish to change coverage should complete the forms and return them to the employee benefits office by December 11.

### MARTIN MARIETTA NEWS

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

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DENVER AEROSPACE  
P. O. Box 179—Denver, CO 80201  
December 4, 1981

## Michoud division wins plant engineering award

The 1981 Outstanding Plant Engineering Program of the Year award has been won by the Michoud division in the competition's large plant category. The competition was co-sponsored by the American Institute of Plant Engineers (AIPE) and the Loctite Corporation.

The award was presented to Randall A. Tassin, manager of facilities and plant services at Michoud, at the AIPE annual conference and exposition.

A panel of five plant engineering experts judged entrants on criteria such as program balance, maintenance operations, management control, organizational efficiency, and special programs.

Michoud was cited for its highly sophisticated and multi-faceted construction achievements, outstanding plant cleanliness, autonomous on-site hazardous waste management system, demanding critical space hardware handling systems, large-scale multi-phase office upgrade plan, and significant accomplishments in energy conservation.

AIPE, with nearly 100,000 members in the U.S. and Canada, is the only association dedicated exclusively to the plant engineering profession.

Michoud division accomplishments will be reported in the AIPE Journal.

## Credit union offers IRA account in January

Beginning January 1, 1982, the Red Rocks Federal Credit Union will offer Individual Retirement Account (IRA) plans for personal tax deferred retirement savings.

Maximum annual contribution to an IRA is \$2,000 or 100 percent of earned income, whichever is less. Each year's contribution to the IRA account is deductible, as are earnings on contributions.

Between the age 59½ and the end of the year in which the contributor reaches 70½, monthly payments may be withdrawn, after which the balance may be withdrawn in lump sum or periodic payment form. Benefits are taxed at the rate appropriate to the earnings of the contributor at the time of payment, generally with a lower tax effect as most contributors are in a lower income bracket and qualify for greater tax exemptions.

For complete information regarding IRA accounts, call Barbara Bonn, Ext. 6955.

## Performance sharing plan values reported for October

Unit values for the Performance Sharing Plan reported as of October 31, 1981, were:

Fund A (Indexed Equity): 1.5079224363

Fund B (Fixed Income): 1.4135759796