

MARTIN MARIETTA

news

DENVER AEROSPACE

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Lightweight tank,
Challenger make
first flights



First lightweight external tank launched on shuttle

A lightweight version of the Space Shuttle external tank was used successfully April 4 as the orbiter Challenger began its first flight from Kennedy Space Center.

The new tank, built by the Michoud division, weighs 66,824 pounds—10,000 pounds less than that flown on the first Space Shuttle mission and 4545 pounds lighter than target specifications set by NASA in 1979. The significant weight reduction is the result of a program developed to enable Space Shuttle to lift a 65,000 pound payload into near-Earth orbit.

The increased payload capacity enhances the nation's scientific, commercial, and defense potential in space. It allows transportation of heavier satellites into orbit and the addition of scientific and commercial experiments and the mission specialists needed to run them.

The Challenger's principal cargo on its first flight was one of three identical tracking and data relay satellites (TDRS). The satellite was deployed successfully from the cargo bay. Although trouble developed after deployment, the satellite has stabilized and NASA officials anticipate it will soon be ready to carry out its mission.

The mission is commanded by Paul J. Weitz and piloted by Col. Karol J. Bobko (USAF). Donald H. Peterson and Dr. Story Musgrave are the mission specialists.

Peterson and Musgrave are scheduled for a three-and-one-half hour EVA four days into the mission. They are to move throughout the orbiter's payload bay, testing a variety of support systems and equipment designed for future EVAs.

Three Getaway Specials also are riding in Challenger on its first flight. The George Park Seed Company is sending 25 pounds of fruit and vegetable seeds into orbit to determine how seeds must be packaged to withstand spaceflight; a Japanese experiment sponsored by a Tokyo newspaper will attempt to produce artificial snow in zero gravity; and six different experiments ranging from metal purification to the effects of weightlessness on micro-organism development will be contained in a U.S. Air Force Academy canister.

The external tank is the largest component and structural backbone of the Space Shuttle system. It absorbs most of the dynamic stress produced by the three main engines and two solid rocket boosters at liftoff.

"Several techniques have been used to reduce the tank's weight," according to William Barrett, manager of the lightweight tank project. "Structural testing and flight data showed us where design changes could be made," he said.

Selected stringers have been eliminated, fewer ring stiffeners have been used in barrel assemblies, and major frames in the liquid oxygen tank have been modified. A large slosh baffle in the liquid oxygen tank also was redesigned for a 600-pound weight reduction.

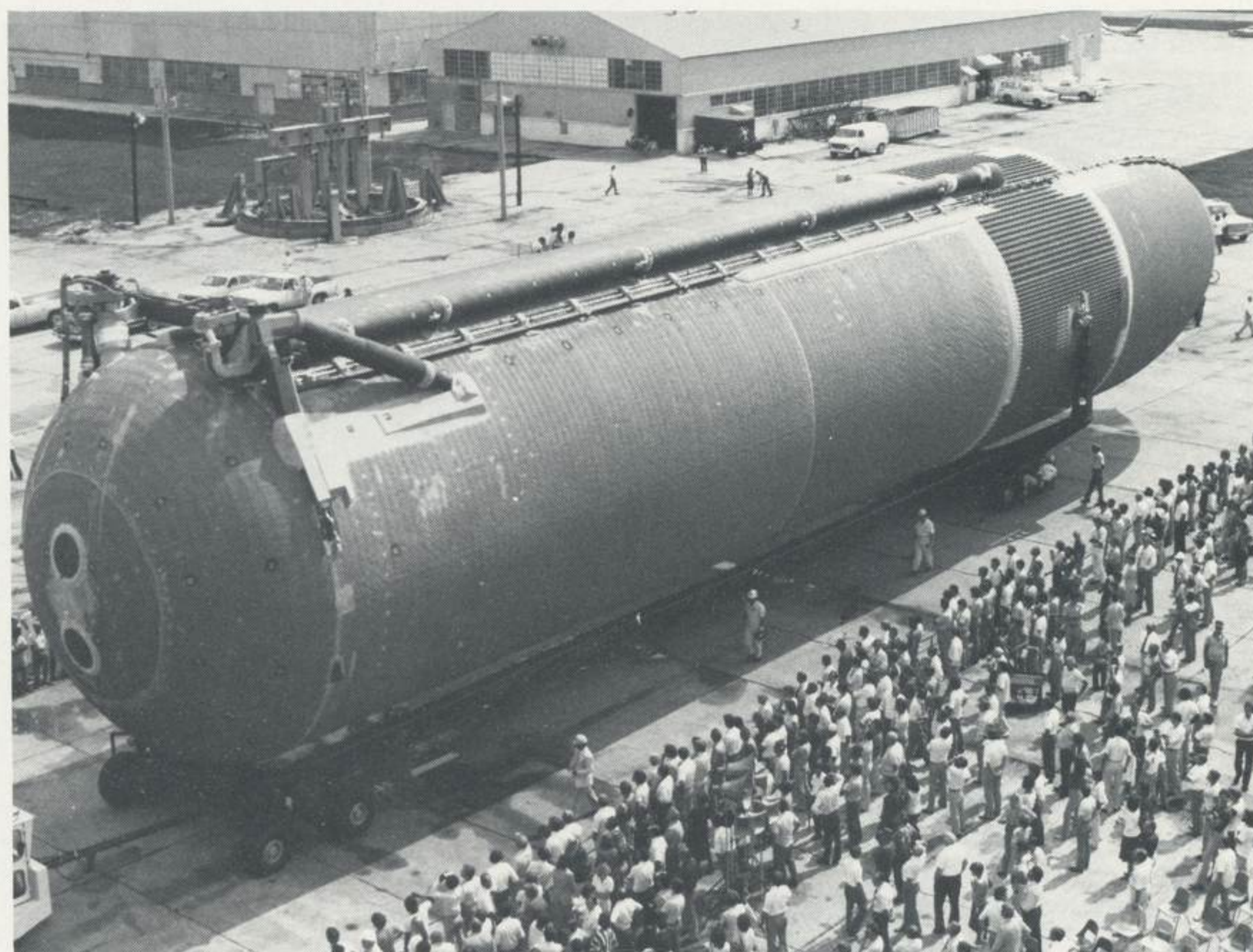
According to Barrett, fabrication techniques for tank components also have been altered. Dome caps, once chemically milled on one side, are now milled on both sides to reduce thickness and weight without reducing strength.

"We've also made some material changes to take advantage of advances in metallurgy," Barrett said. The tank's aft solid rocket booster attachments now are made of a titanium alloy that is stronger,

lighter, and less expensive than previously used material.

Operational and test data have allowed engineers to eliminate an antigeysers line used in the liquid oxygen fill system and to relocate hydrogen pressurization lines.

Additional weight reductions are being evaluated for future Space Shuttle external tanks.



The first lightweight Space Shuttle external tank was used successfully this week on the first flight of Challenger. The tank is shown here as it was rolled out during delivery ceremonies at the Michoud division. Employees look on as the huge tank they built is delivered to NASA.

On the cover

Orbiter Challenger and the first lightweight version of the external tank streak skyward in a picture-perfect launch.

Annual meeting set for credit union

The fourth annual meeting of Red Rocks Federal Credit Union will be May 5 at 5:00 p.m. in the sixth floor SSB presentation room.

All members are invited to attend. A credit union member is the first person named on the account; a joint owner is not a member.

At the conclusion of business, door prizes, including a portable color television and lottery tickets, will be given.

Reservations for the annual meeting should be made by calling the credit union, Ext 6000, by April 26.

College representatives to visit April 19

Representatives from nine Colorado colleges and universities will be here April 19 to counsel current and prospective graduate and undergraduate students.

Counselors will answer employees' questions about eligibility, admissions requirements, curricula, and school policies. They will meet with employees in the engineering building second-floor cafeteria from 2 to 4 p.m.

Representatives will visit from University of Colorado (Boulder and Denver campuses), University of Denver, Community College of Denver, Metropolitan State College, Arapahoe Community College, Regis College, Colorado State University, Colorado School of Mines, Loretto Heights, and the State of Colorado Professional Engineers Board.

For information, call Bette L. Wooster, Ext 7-5698.



Floodlights illuminate a 71-foot tall Peacekeeper test missile undergoing tests at Defense Nuclear Agency facilities in New Mexico. The tests simulate the electromagnetic pulse generated by a nuclear attack. A wooden structure is used to support the missile, which lacks propellants or warheads, because electrically conductive steel frameworks would influence test data.

Nuclear effects tests conducted

An inert Peacekeeper missile is being tested to see how well it withstands the electromagnetic impulses of a nuclear explosion. The tests are being conducted by Denver Aerospace at the Defense Nuclear Agency's advanced electromagnetic research facility near Albuquerque, New Mexico.

The test missile is being subjected to large electromagnetic pulses created by an electrostatic generator and directed to the missile within a small, contained, ground-level area to prevent damage to nearby electronics.

Data gathered are transmitted to recording instruments by nonconductive, fiber-

optic data transmission systems to protect the instruments from damage by the pulses and to eliminate the effect that wires inside the test area would have on data.

Testing of the missile, which is done without warheads or propellant, will produce data on the amount of electric current created by the pulses and the amount that reach critical components. The data will be used to locate any points of entry that may need further shielding and to assist contractors in protecting electronic components they produce. Testing for ability to withstand electromagnetic pulses is common for defense equipment.

Cafeteria pricing to go a la carte

A change in the cafeteria pricing policy will go into effect Monday, April 11.

All items will be priced a la carte.

"We will feature one daily Meal Deal," said Phyllis K. Montgomery, who heads the cafeteria service. "The reduced-price special will include an entree, a vegetable, roll and butter, and coffee or tea. The price will range from \$1.55 to \$1.95."

Most prices in the cafeteria will be increased moderately on April 11, Mrs. Montgomery also said.

"We are a nonprofit service that attempts to break even," she said. "The price increases will bring us closer to the break-even point, where income will meet costs."

The a la carte pricing is an effort to avoid future general price increases.

"With individual item pricing," Mrs. Montgomery said, "we may go up or down in price on each item as needed and eliminate the across-the-board changes of the past."

More than half of all persons working in Denver facilities patronize the cafeterias.

Employees play key roles in human factors workshop

Forty of the world's leading researchers and practitioners in computer systems human factors will begin a five-day workshop in Vail Monday to explore trends and recommend research directions in the specialized field.

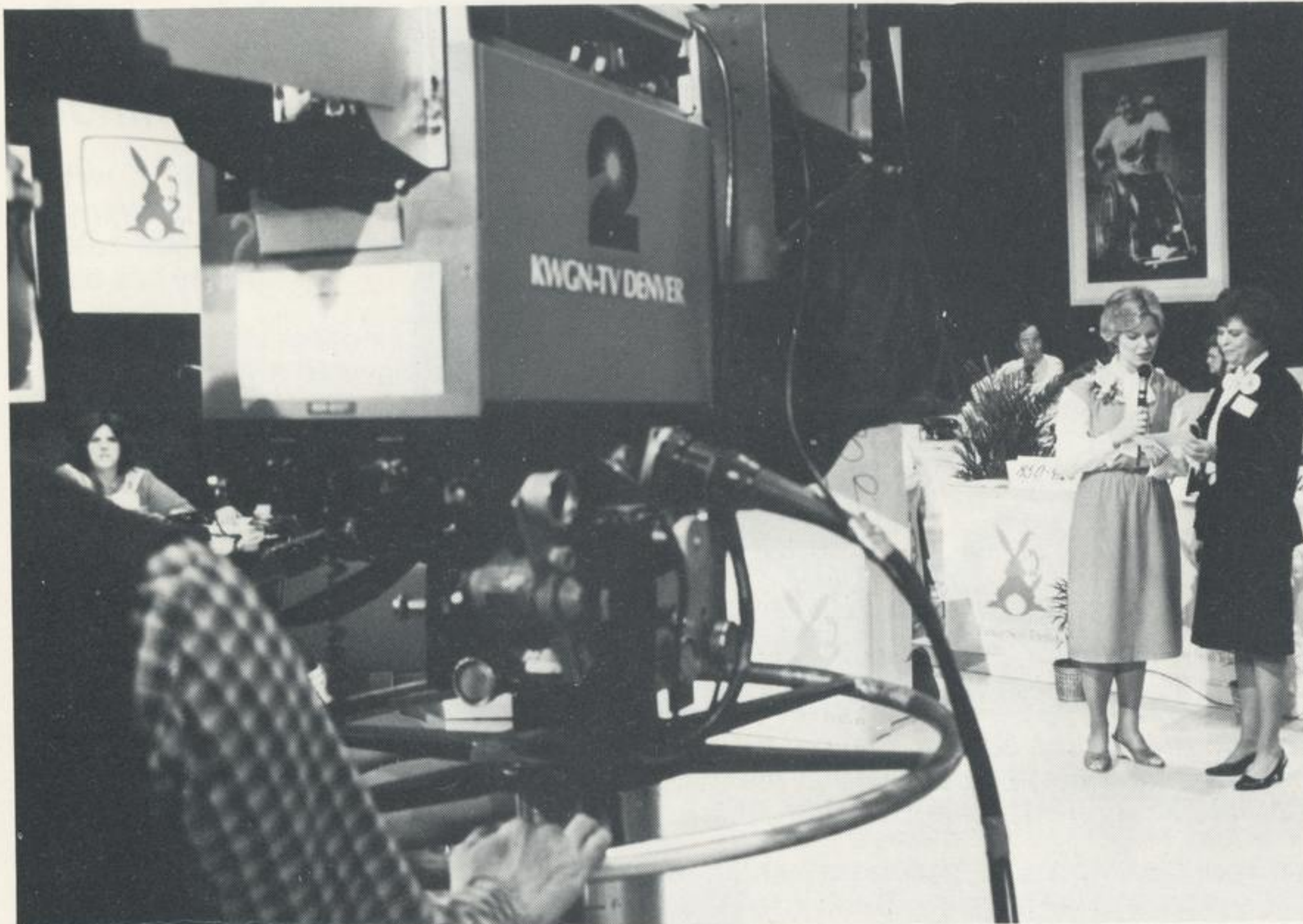
Seven Denver Aerospace human factors professionals have had key roles in the planning and development of the workshop.

William L. Cecil, strategic systems division, is president of the Rocky Mountain Chapter of the Human Factors Society. The chapter is cosponsoring the workshop with the Society's Computer Systems Group.

A. M. (Lex) Ray, space operations simulation lab, is the general meeting chairman. Dr. David R. Lenorovitz, computer systems engineering, is the technical program chairman.

Mark D. Phillips and Richard A. Newman, both of computer systems engineering, serve on the program planning committee. Donna J. Sexton, MMU, and Dr. Richard D. Bloom, systems engineering, are on the program logistics committee.

Human factors is a specialized field dealing with the science of optimizing the interface between the human and the mechanical and electrical components of user-interactive systems. Human factors in computer systems are even more specialized, involving computer workstations, information display devices, display formatting, and graphic techniques.



The Easter Seal Society has received a \$5000 check from the Operation Santa Claus fund. Beverly K. Fuhrmann, right, treasurer of the employee-operated fund, made the presentation to Kim Sherwood, host of the Easter Seal Telethon on Denver's Channel 2. Operation Santa Claus is supported by employee contributions and the sale of wastepaper.

Savings bonds have higher interest rate

The annual U.S. savings bond drive begins in May with added incentive for employee participation—higher interest rates.

The interest rate is set at 85 percent of the average market yield on Treasury securities for bonds that are five years from maturity and held five years or longer.

New and outstanding savings bonds will be able to keep pace with market interest rates, no matter how high they go, while an interest floor of 7.5 percent protects bond buyers from a steep decline in market rates.

The interest rate paid on Series EE bonds bought between November 1, 1982 and April 30, 1983 is 11.09 percent if the bonds are held at least five years.

The rate is adjusted twice a year; the new rate for the six-month period beginning May 1 may be lower than the current 11.09 percent, but Treasury officials are confident it will stay attractive.

Perfect attendance cited at Canaveral

Perfect attendance records were maintained by nearly 20 percent of Canaveral Operations employees in 1982.

Sixty-six Canaveral employees were honored at a Cocoa Beach luncheon, receiving framed certificates citing their records.

Of these, 31 have perfect attendance for periods of two to nine years with Walter W. Kollosch, engineering, marking ten consecutive years of employment without missing a day.

Michoud tours popular

Field trips to the Michoud division's 43-acre manufacturing building are becoming one of the favorite activities of public school teachers and students.

Last year, 77 tours brought 2900 visitors through the Michoud facility. In the first three months of this year, 29 tours have attracted 1100 adults and children to the site, and demand continues to mushroom.

Veteran tour guides include Wayne McAllister, Leonard E. Enger, David M. Guillot, Gordon L. Dyer, Rick Landers, Robert Lombard, Glenn A. Peacock, Marion A. LaNasa, Arthur M. Lang, and David Peri. Recently trained to assist in the tours are R. L. Williams, Peter C. Capdepon, John J. Peterson, Robert Campbell, Charles L. Murray, Bill R. Crowley, Damon J. Wheeler, Steve D. Reffalt, Donald A. Carr, Gerald L. Bultman, and James W. Black.

Performance Sharing Plan unit values are set

Unit value for the Performance Sharing Plan reported as of February 28, 1983, were:

Fund A (Indexed Equity): 1.9873566933
 Fund B (Fixed Income): 1.6526052747
 Fund C (Martin Marietta Stock Fund): 1.5970593055

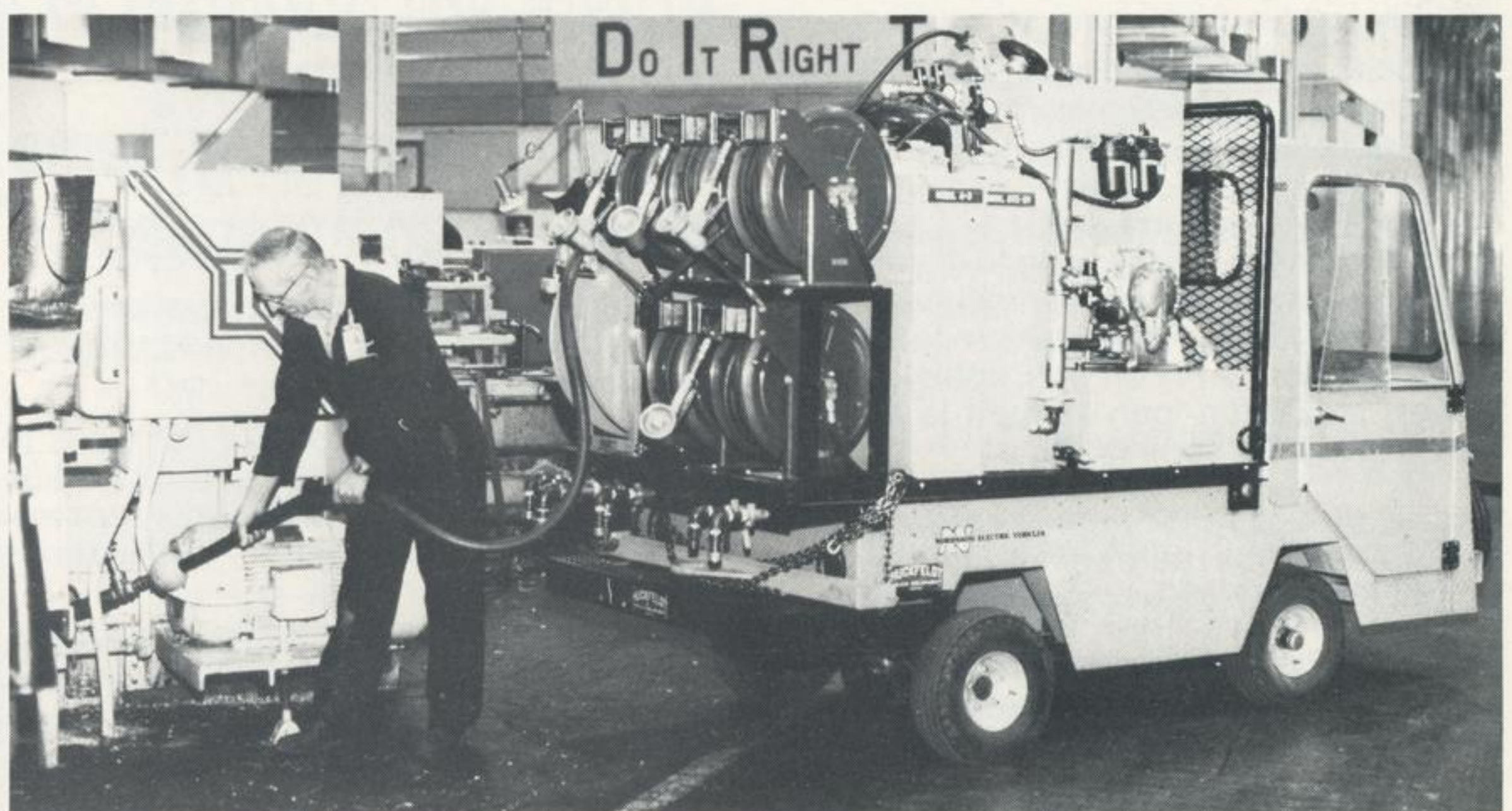
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April 8, 1983



A quality circle-suggested service truck is meeting lubrication needs in the machine shop. The electric truck, being operated here by Roland Kohler, utility mechanic, is equipped to supply lubricating oils and collect waste fluids from the machine shop. The mobile service truck was proposed by the numerical control and grind quality circle after an investigation of the machine shop lubrication system. Members of the circle are John A. Gerech, Wilmer Kenning, Tranquilino Samora, Charles W. Clark, Lee White, Marion L. Allison, Richard H. Runkle, Douglas A. Sherlock, Ralph S. Stansbury, James W. Webb, Harold I. Scholar, and Anthony Globelnik.

Company supports Town Hall rebirth

Opening week festivities and performances at Littleton's renovated Town Hall Arts Center marked the realization of a seven-year dream.

Funds for converting the vacant 63-year-old historic landmark were raised from private and corporate gifts. Denver Aerospace contributed \$13,000 to the effort.

Designed in 1920 by Littleton architect J. J. Benedict, the Italianate facade is reminiscent of the Palazzo della Regione in Vicenza, Italy. Originally, it housed city offices, community theater productions, and the city's only fire truck.

Today, the Town Hall Arts Center theater seats 290 for plays, concerts, and dance recitals. The lobby and arcade will house art exhibits. Future plans include a cabaret with kitchen and bar facilities in the lower level.

Arts Center director Ken Foster dreams the Town Hall will become a nightly focus of activity, with drama classes for all ages, free performances, sidewalk shows, and roving musicians.

"It will be a good-time sort of place rather than a cultural palace," says Foster.

Private donations are still sought. For information or to order tickets call the Town Hall Arts Center, 797-8219.

Credit union makes loan policy changes

The board of directors of Red Rocks Federal Credit Union has adopted new policies affecting financial programs offered.

Personal unsecured loans have a \$500 minimum and a \$2,000 maximum with an 18 percent annual rate (APR).

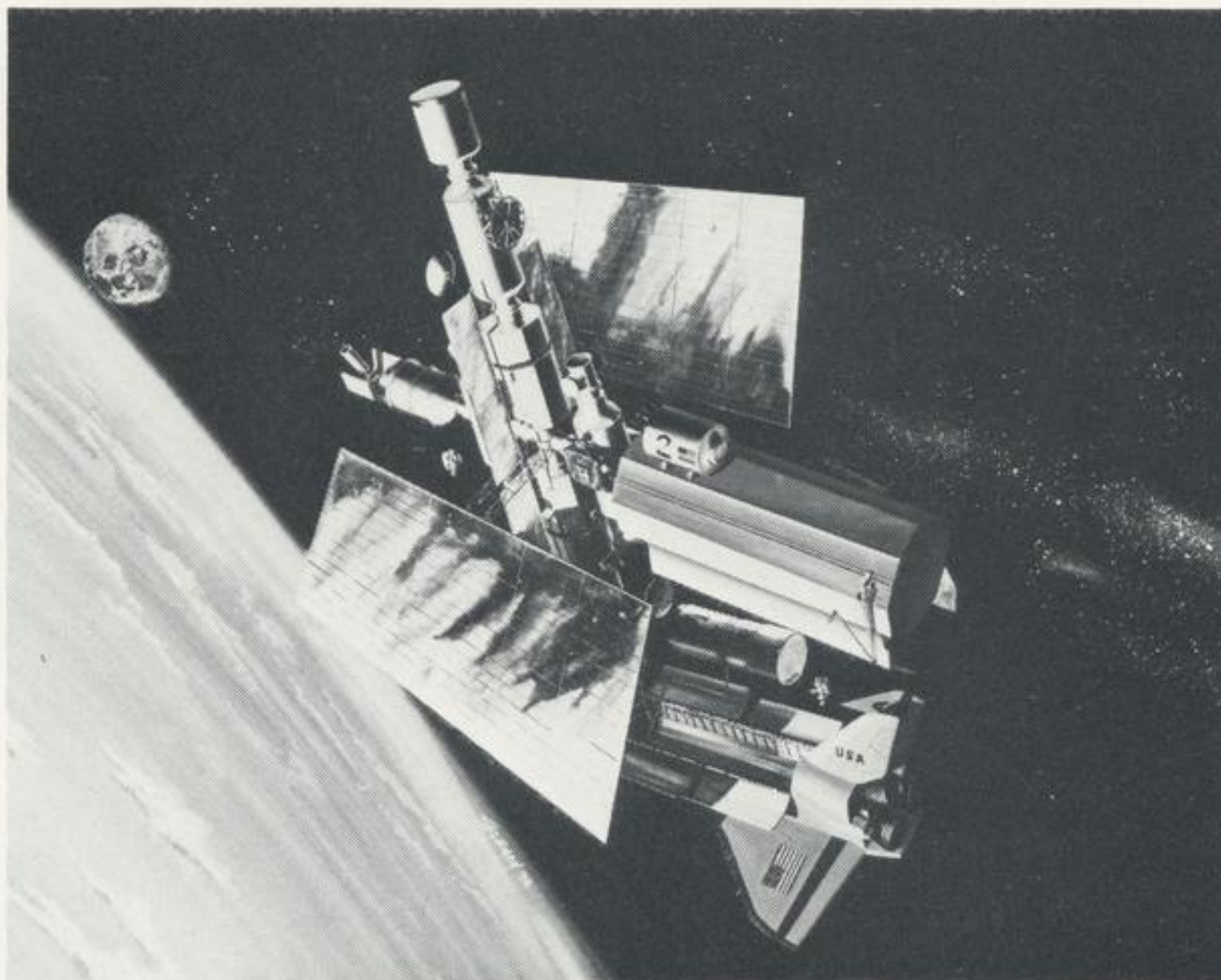
New vehicle loans are set at 14.5 percent APR and will be made for up to 80 percent of the selling price, with a maximum loan amount of \$12,000. Used vehicle loans are at 16.5 percent APR on 1978 vehicles and newer. Maximum loan amount is \$12,000 based on NADA book value.

American Express money orders are available at one percent of the amount purchased or \$1.50, whichever is greater.

Legal services for credit union members are offered, with two half-hour counseling sessions free and reduced rates thereafter.

Citicorp travelers checks are sold with no service charge to members. Notary public services are offered free.

Share account savings now have a minimum withdrawal of \$25. Each member is allowed two free withdrawals per month with subsequent withdrawals assessed a fee of \$1.25 each.



An illustration of Space Station by John Tieleman was selected for a first-place award in the Society for Technical Communication international competition.



William Mitchell's coach and player illustration done for a personnel department presentation took first place locally and second place in international competition.



The Peacekeeper transporter in a southwestern setting earned a first-place award for Thomas W. Burns in the international competition.

Artists are honored in international competition

Ground support systems review is commended

Vandenberg ground support systems personnel have been commended by the Air Force Systems Command.

Commendation was for commitment to Department of Defense cost/schedule control systems criteria during a recently concluded subsequent applications review.

Paul Bacalis, ground support systems finance manager, received special recognition for organizing the subsequent applications review in July 1982, and the action review in October.

Key corporate members of the review team were each major directorate's cost account managers, and representatives from business operations.

The Air Force team included representatives from Air Force Systems Command headquarters, space division, site activation task force, and the Denver AFPRO.

Three Denver Aerospace senior illustrators will have their artwork on display at the 30th International Technical Communication Conference in St. Louis May 1-4.

They also will receive awards in the technical art competition that is part of the Society for Technical Communication event.

John G. Tieleman and Thomas W. Burns will receive first place awards. Burns also will receive a second-place award, as will William Mitchell.

All the art won first place awards in the local competition before being judged in the international contest.

Burns earned the first-place award locally and first place in the international competition for his painting of the Peacekeeper transporter. Tieleman's award was for his Space Station illustration.

Mitchell earned his award for work on a personnel department presentation. Burns's second place award was for a line drawing of an overhead crane used at Vandenberg Air Force Base.

Canaveral engineer serves community with music

After a day's work as an engineer in Canaveral operations, Jill L. White devotes her leisure time to community service and music.

White is in her second year as principal oboist with the Brevard Symphony Orchestra, and is soloist for the Brevard Chamber Orchestra.

The Brevard Symphony Orchestra makes an important cultural contribution to the community, White says. Each year, the orchestra performs for elementary school children, heightening their appreciation and enjoyment of classical music.



Jill L. White

White's background in natural and social sciences makes her a frequent choice for judge in local high school science and engineering fairs.

An employee for three years, White received the Space Launch System Vice President's Award for 1982.

She has promoted nontraditional careers for women as a panelist for the Brevard Community College Continuing Education for Women program, and encourages employee participation in the Martin Marietta Matching Gifts program to promote the cultural arts.

Employee to chair PR association

Donald T. Beck, Canaveral Operations customer and public relations, has been elected chairman of the Space Coast Public Relations Association. SCPRA



Donald Beck

members are public affairs personnel from the Air Force, NASA, high-technology and aerospace firms, and a variety of local businesses on Florida's Space Coast. Beck has been at Canaveral Operations since August 1980.



Top individual safety award at the Western Space and Missile Center was presented to C. D. "Doc" Moore, right, by Col W. J. Murphy.

Michoud building contract awarded

Martin Marietta Aerospace has selected the Atlas Construction Company, Ft. Worth, Texas, from among 11 bidders to build a production support building for the Space Shuttle's external fuel tank.

The 81,000 square-foot building will be situated at NASA's Michoud Assembly Facility.

The \$14,000,000 structure will house facilities to apply insulation to tank components and house support activities and research laboratories.

Site preparation and pile driving have been completed for the new building as part of a three-phase construction program.

Design of special systems and equipment to be used in the facility is about 75 percent complete.

NASA and Michoud division employees will occupy the facility by October with work scheduled for completion by January 1984.

Recreation

Diving—Dr. Werner Lissaver presents suggestions for prevention and treatment of ear maladies at the April 11 meeting of Fathom Dive Club, 7:00 p.m., DSC I Room 200K. For information, call Jeryl Voegtly, Ext 4988.

Computers—Waterton Computer Club features demonstrations of Osborne and Apple IIe computers at the April 21 meeting, 5:00 p.m., SSB sixth floor presentation room. For information, call recreation, Ext 6605.

Tennis—April 15 is the deadline for entries for the Denver Corporate Games qualification tennis tournament May 14 and 15. This tournament is for A and top B players; format will be determined by the number of entries. Call recreation, Ext 6605, for information.

Golf—Entries for the partner best ball tourney to be held May 7 at Aurora Hill Golf Course are due to recreation by April 18. Limited to 120 players. Low gross scorers, male and female, will represent the com-

Safety manager honored for work at Vandenberg

The best contractor safety manager at the Western Space and Missile Center (WSMC) in 1982 was C. D. "Doc" Moore.

Moore is Peacekeeper system safety manager for test operations at Vandenberg.

The award, presented annually by the WSMC commander, recognizes the individual who has compiled the best safety record and who has distinguished himself by "developing and implementing a dynamic and effective safety program."

Moore has been with Denver Aerospace for 15 years. He was the safety engineer on the Titan III program at Vandenberg from 1968 to 1979. He assumed responsibility for the Peacekeeper safety program in December 1979.

The safety staff at Vandenberg is involved in all aspects of the Peacekeeper test program. This includes launch operations safety, system safety analyses, and the industrial hygiene program.

Moore's 25-member staff not only monitors the activities in all of the newly constructed Peacekeeper facilities, but also participates in writing all test procedures, conducts hazard analysis, recommends facility change requests, monitors hazardous material control, and provides radiation protection and emergency first aid services.

During 1982, Moore and his staff made significant contributions to the assembly and checkout of the new Peacekeeper facilities and the writing of checkout, test, and assembly procedures for the Pathfinder missile and first flight test missile.

pany in the Denver Corporate Games.

Bowling—The entry deadline for the mixed doubles tournament to qualify for the Denver Corporate Games has been extended to April 11. Entry forms are available on the recreation racks. The tournament will be April 23, 12:30 p.m., at Celebrity Bowl.

Softball—Coed softball league captains will meet April 11 at 4:45 p.m., SSB cafeteria. Open league captains will meet April 12 at 4:45 p.m., SSB cafeteria. League organization, funding, and scheduling will be discussed. Captains should contact their night directors before their meetings.

Chess—The 1983 five-minute chess championship will be held April 21 at the DSC cafeteria. Registration is at 6:30 p.m. with play from 7:00 to 9:30 p.m. For information or advance registration, call Richard Pickerell, Ext 6909. Play is open to all employees and dependents who are 16 and older.