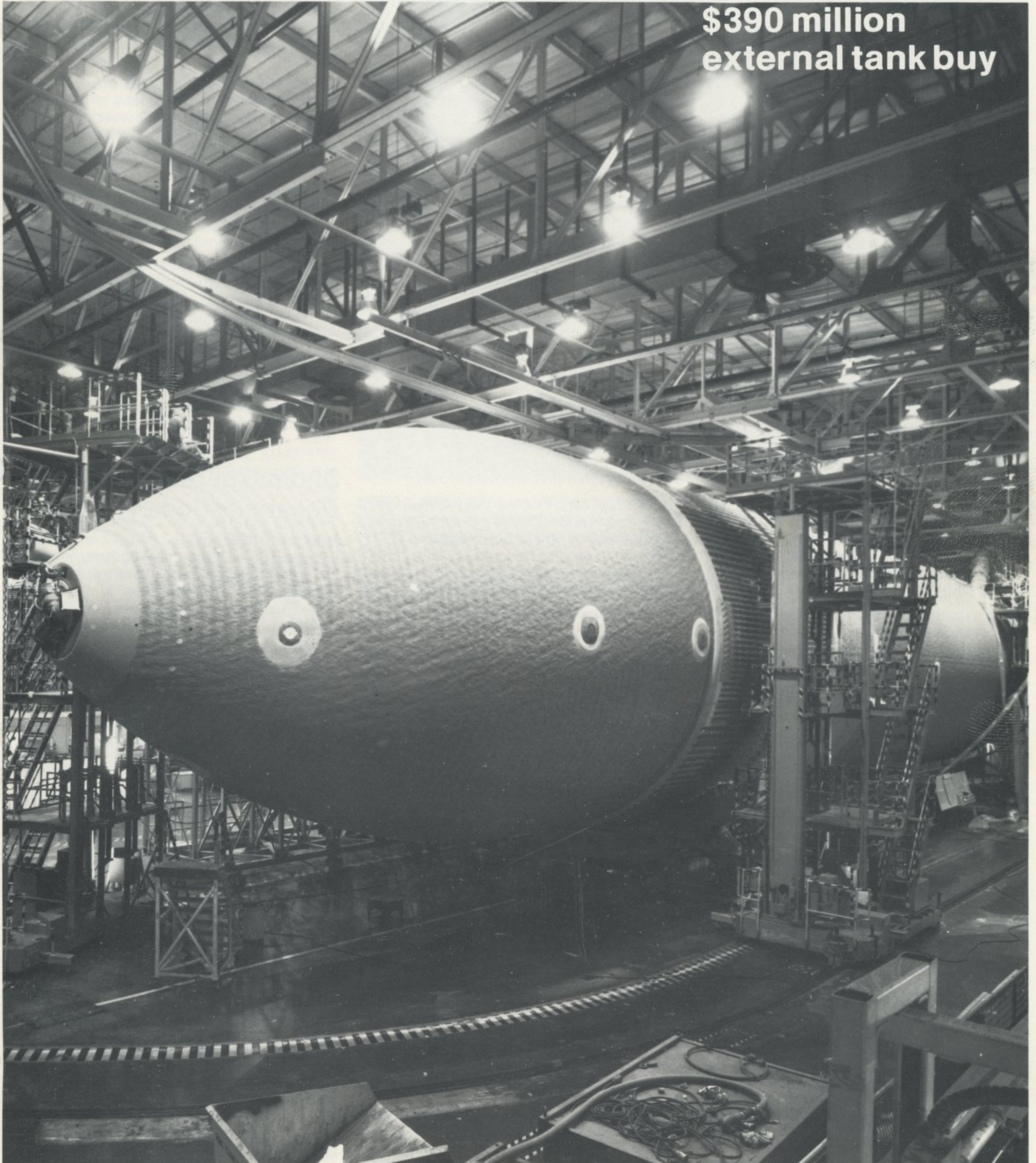


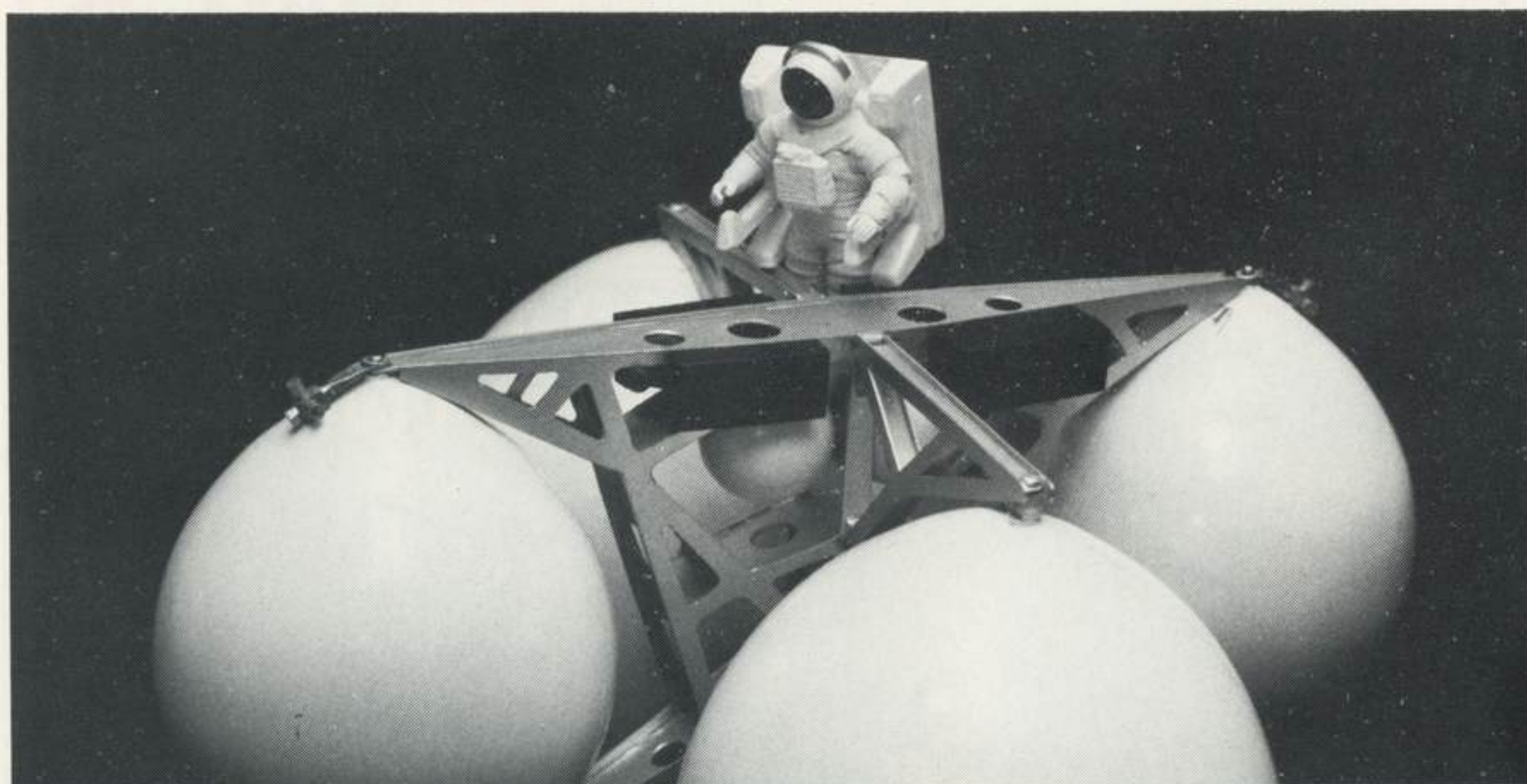
NUMBER 20/1983

**\$390 million
external tank buy**



Reusable OTV to cut payload costs

Model of an astronaut, equipped with the manned maneuvering unit (MMU), prepares an orbital transfer vehicle for stowing in the space shuttle orbiter's cargo bay.



Transportation costs on Earth are high today, but imagine what it's like for NASA, the Department of Defense and commercial companies wanting to put satellites into space. It's expensive.

But a vehicle being designed by Denver Aerospace could provide the answer to reducing payload transportation costs.

Robert B. Demoret, orbital transfer vehicle (OTV) program director, explained the vehicle will be the first reusable upper stage rocket vehicle for boosting space payloads to high orbit. OTV's reusability is one of its big selling points, he said.

"The purpose ... is to develop this upper stage in a way that it can be used with a space station." He added the OTV would be housed at a space station, with payloads brought up to the station by the space shuttle.

The payload then would be attached to the OTV, which would carry it into orbit. After delivering the payload—usually to geosynchronous orbit—the OTV would use its rocket engines to deorbit, passing through Earth's atmosphere at an altitude of about 250,000 feet.

A large aerobrake that looks much like an umbrella would slow the OTV so it could be returned to an orbit altitude of 150 to 200 miles. There, it could be recovered by the shuttle for return to Earth or by an orbital

maneuvering vehicle for return to the space station.

After recovery, the OTV would be refurbished and refueled, a new payload mated to it, and used for another mission. Demoret said the OTV could be used for 20 to 30 missions before it would have to be returned to Earth for total refurbishment or rebuilding.

Denver Aerospace submitted a proposal to Marshall Space Flight Center on March 7 to do a concept definition study of OTV. Two companies are expected to be awarded \$1 million contracts in May.

The earliest an OTV could be flown is 1991, and it is not expected to be used in conjunction with a space station until 1994 or 1995.

"The OTV is a natural extension of the work that we have done on the Titan transstage and the transfer orbit stage (TOS)."

"OTV would maintain Martin Marietta in the advanced rocket upper stage development business that we've been in since Titan III," Demoret said, adding rocket vehicle development work has been the foundation of Denver from the start. "We want to stay in that business. We have many skilled people. This is one of the few liquid rocket upper stages that will be going into development, and we want to be a part of it."

Keyser comes out of retirement to Orlando

Howard F. Keyser, formerly strategic systems vice president and general manager at Denver Aerospace, has come out of retirement to join Orlando Aerospace as vice president for business development.

Until late last year, his strategic system activities here had centered around Peacekeeper and related new business. He continued to work with the company as a consultant after his retirement.

Keyser, who joined the company during 1960, previously had been vice president for program development at Denver Aerospace.

Quinn to head space station development

Brian Quinn, who joined Denver Aerospace a year ago April, has been named program development director for the space station.

He had been director of program development for technical and international operations. Richard Parker has been named acting director of that department.

Quinn joined the company from Aeronautical Research Associates of Princeton, NJ, of which he had been president.

Textbook author visits class tonight

The author of the textbook used in the logistics engineering evening class at Denver Aerospace will be the featured attraction here this evening (Friday), beginning at 4:45 p.m.

Professor Benjamin S. Blanchard, director of the engineering extension department of Virginia Polytechnic and State University at Blacksburg, is the author of *Logistics Engineering and Management*, among numerous other books and papers.

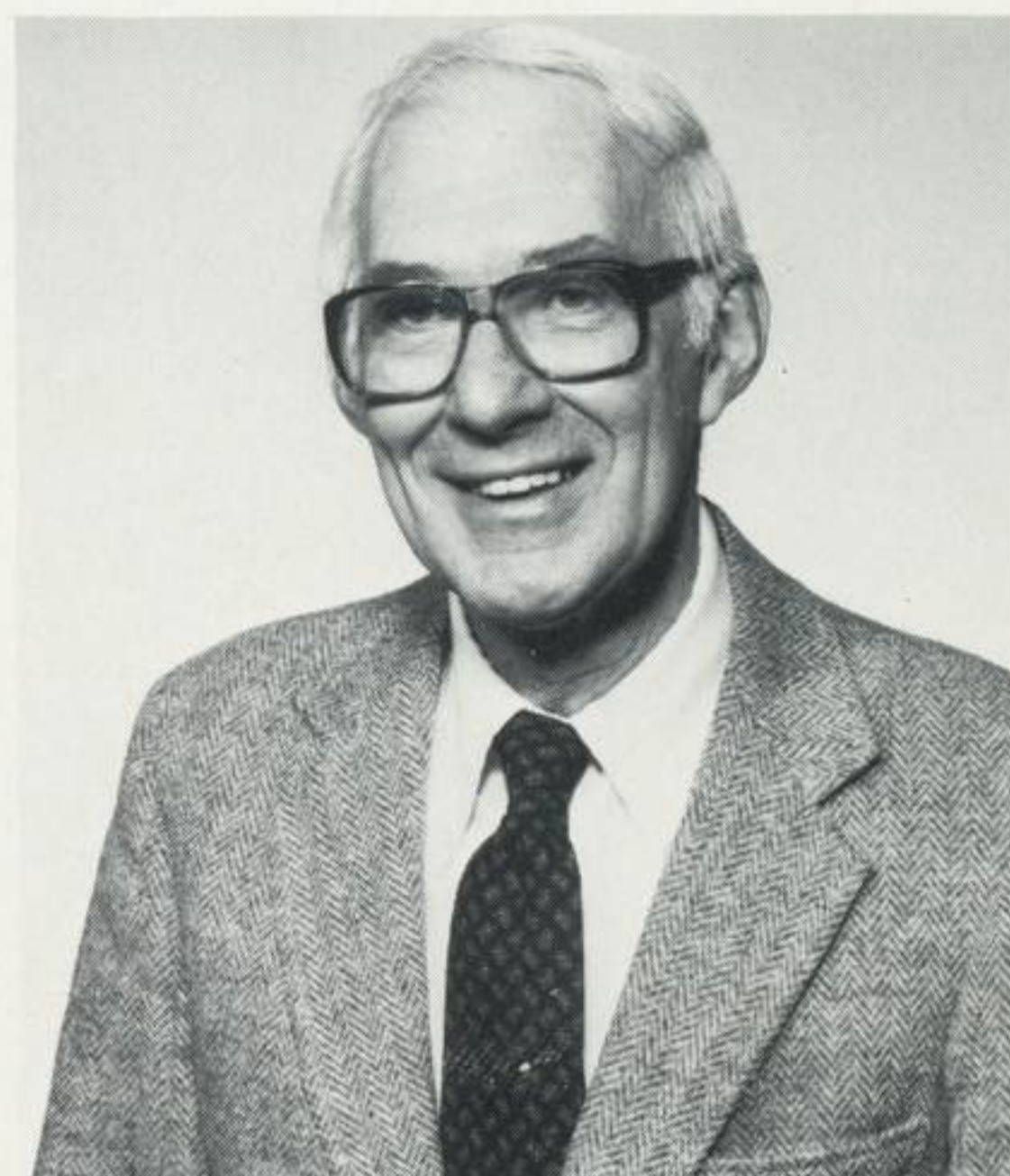
He will meet with past and present students and autograph copies of the textbook in room 200K at Denver Systems Center (DSC). At 6 p.m., he will address the current class during its regularly scheduled meeting.

The professor will be the guest of William E. Rogers, director of logistics for Denver Aerospace, who teaches the EN-107 logistics class.

Internationally known as a consultant and conductor of seminars, Blanchard has written many textbooks on maintainability, systems engineering, and life-cycle costing in addition to logistics engineering. Currently, he is the managing editor of the Society of Logistics Engineers' publication, *SOLEtter*, having served previously as the group's president and vice president.

Shumaker reelected IEEE Reliability Society veep

Maurice J. Shumaker, project engineering manager for special programs, recently was among four vice presidents reelected to The Institute of Electrical and Electronics Engineers' Reliability Society.



The chief of libraries at Denver Aerospace for almost 15 years, Jay R. McKee, is the new chairman-elect for the Special Libraries Association's aerospace division. The association is an international professional organization with more than 11,500 members.

Applicants Flood 'Career Fair;' 'Project Referral' continues roll

Denver Aerospace expects to add about 200 persons to its payroll as a result of its "Career Fair" held two weeks ago at the city's Hilton Inn South.

"The turnout was overwhelming, and more than twice what we had expected," said Dennis F. Cook, director of personnel. Cook noted that about 3500 persons attended.

"Although we had more than 50 managers there to interview applicants, the unexpectedly large turnout meant we were unable to make as many on-the-spot offers as we would have liked in order to talk to as many people as possible," Cook said.

At least five on-the-spot offers were made during the day, with one acceptance. However, about 375 were invited back for indepth interviews at Martin Marietta, Cook noted, adding past experience indicates about 75% of those persons will receive job offers and that about 68% will accept and become new employees.

The "Career Fair," which may be held again during the spring, was just one aspect of a multifaceted hiring program being conducted by the company. The aim is to add 1000 technical persons by July 1984. Hiring primarily will be in technical areas such as software, systems, and electronic engineering.



Job applicants created a traffic jam at Denver Aerospace's recent "Career Fair."

Meanwhile, the company's "Project Referral" program has resulted in a total of 59 new employees to date, according to Dwaine Schilling, referral campaign manager. He added that of the 1878 referrals since the program started in November, 152 have been interviewed and 123 have received employment offers.

The program enables employees to earn \$2000 bonuses for each professional referral hired as labor grade 43 or above. Referral winners also qualify for mid-month drawings for a trip for two to a Space Shuttle launch from Florida's Kennedy Space Center.

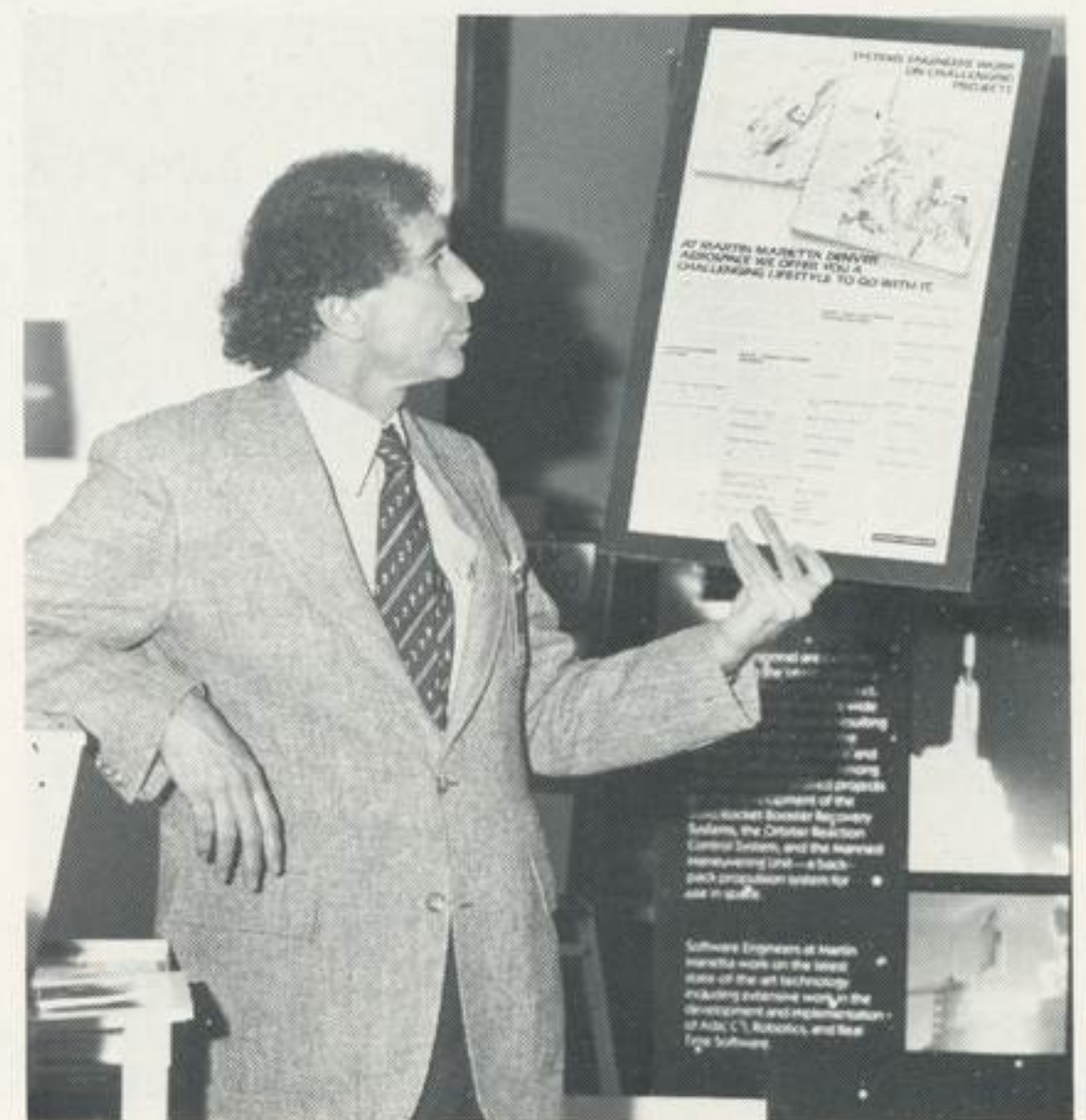
The third and latest drawing winner was the Michoud division's Lois Tyra, a computer systems designer in the computer services department.

Inventors earn cash

Sixteen Denver Aerospace employees have been granted cash awards by the Denver Product Development Review Board for their inventions.

Recipients are:

Gordon K. White, electronics: "Passive Optically Encoded Transporter—POET;" John F. Malm, Michoud production operations: "Failsafe Operation of Robot;" William C. Brown, electronics: "Innovative Laser Applications;" W. Clark Benson and Daryl D. Bielenberg, engineering mechanics: "One Piece Pan Construction for Heliostat Mirror Assemblies;" Kenneth E. Kordes, engineering mechanics: "Kevlar Fiberglass Roving Filament;" Eldon E. Constable and Daniel K. Wisherd, electronics: "High Temperature Compatible Thermal Blanket Attachment Device;" Kenneth A. Karki, engineering mechanics: "Bonding System for the Application of Inorganic White Thermal Control Coatings to Organic Substrates;" Steve W. Wiley, vertical launching system program integration/Vandenberg: "Hazardous Waste Compatibility Software;" Wayne E. Simon, engineering mechanics: "Log Spiral Brightness Function for Robust Digital Stereo Vision;" Kenneth E. Kordes, engineering mechanics, and David T. Ranger, manufacturing: "Application of Polyisobutylene Systems for Heliostat Production;" Tony C.D. Knight and Jeffrey L. Hayden, electronics: "Scheduling Program for a Desktop Computer;" and Patrick C. Hardee, electronics: "Solar Cell Heat Spreader Mount with Controllable Coefficient of Thermal Expansion."



William S. Curra, director of human resources, shows an example of Denver Aerospace's current recruiting advertisements during a recent dinner presentation to hiring managers.

MARTIN MARIETTA NEWS

Published by Public Relations

MARTIN MARIETTA AEROSPACE

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

March 16, 1984

Glover nets labor award

The George Meany Award—organized labor's highest award for service to youth through the Boy Scouts of America program—recently was presented to Delbert Glover, an electrical fabricator in manufacturing.

The medal award and framed certificate are given by the Denver Area Labor Federation to recognize union members who perform outstanding service to youth as volunteer scouting leaders.

Glover, a member of United Aerospace Workers Local 766, in addition to his varied services and years of volunteer leadership to scouting, also has volunteered in the Parent Teachers Association and as rifle instructor to youths.



The life-like golden eagle made from bass wood will be among several carvings Walt L. Smeton will be exhibiting with other Colorado craftsmen March 16-31 at The White Face Bear gallery, 605 Ogden Street. Smeton, electrical power systems senior engineer at Denver Aerospace, spent about nine months carving the 18-inch figure.

OASIS contract closes after six years

Development and acquisition of computer software and related systems for military intelligence should improve dramatically because of the recently concluded Operational Application of Special Intelligence Systems (OASIS) project.

The OASIS project modernized command and control capabilities for the Air Force's tactical fusion center in West Germany. The center, a key element of intelligence capabilities for allied ground and air forces in central Europe, provides battle commanders with status data needed to allocate, by priority, critical military resources.

The \$65 million OASIS project helped pioneer a new way of doing business with the government—in this case, the U.S. Air Force Systems Command's Electronic Systems Division. The keystone of the approach was an "evolutionary" acquisition method, according to Harry Kottcamp, program manager.

Kottcamp explained that under the traditional approach to military acquisition it could take many years to get a new system, such as OASIS, into production. But the new approach involved building a core system, which was fielded within 2 years, then providing four enhancements to that system over the remainder of the contract.

"We had to shorten the system development cycle over the traditional approach," Kottcamp said. "We needed to

be more responsive to user requirements."

Improvements implemented as part of the new approach included changing the way customer requirements are defined and system design is documented, revising procedures for project reviews, and redefining each participant's role in configuration management and acceptance testing.

"Our productivity has improved to the extent that computer software development costs have been reduced by 50% from what they were originally," Kottcamp said.

The Armed Forces Communications and Electronics Association (AFCEA) and the National Security Industrial Association have recommended to the Department of Defense and the Air Force implementation of Denver Aerospace methods used to get the 6-year OASIS job done quicker and cheaper.

Kottcamp said Martin Marietta's performance improved with each enhancement, and the company was awarded 100% of available fees for the last award-fee period. For the two previous periods, 98% of available fees was awarded.

Doors were locked January 20 on OASIS at the company's Wakefield, MA, Operations. All 55 professionals on the contract were offered jobs in Denver, and many came back to promotions and major new responsibilities, added Kottcamp.

STOP PRESS

Company to build 21 new external tanks

Denver Aerospace's Michoud division will build an additional 21 external fuel tanks for the space shuttle under a just-awarded, \$390 million, three-year contract from NASA's Marshall Space Flight Center at Huntsville, AL.

Eighteen of the tanks are earmarked for shuttle flights from Florida's Kennedy Space Center (KSC). The are slated for missions from Vandenberg Air Force Base, CA, where the shuttle launch site is expected to be operational by late 1985.

The company currently employs 4600 persons at Michoud, and could add another 400 during the new contract if needed to meet shuttle launch schedules.

Martin Marietta currently is working on contracts for 39 tanks, 18 of which already have been delivered to NASA. Ten have flown, five await future flights from KSC, and three were used for ground testing. The nineteenth is to be shipped to Kennedy late this month.

The number of shuttle flights is scheduled to increase each year for at least four years, requiring an increased external tank production rate. By 1988, that rate will be 24 tanks a year.

NASA has slated 200 shuttle flights through the mid 1990s. Tank production for those flights would extend work at Michoud into the next decade.

'Employee of the Year' named at Michoud

Clyde Hutton, Jr has been named 1983 employee of the year from among the 4600 persons currently employed at Denver Aerospace's Michoud Division at New Orleans.

Hutton, who joined the company in 1978, directs automatic and manual applications of primer paint and insulation on external tanks for the Space Shuttle. As a mechanic "A," he is credited with spraying primer manually on a mile of external tank skin without a single defect and within a thickness range of 1/100th of an inch. He also sprayed primer and insulation successfully on six 53-foot-long, 28-foot-diameter liquid oxygen tanks during 1983.

Hutton was one of the earliest recipients of NASA's coveted astronaut award in 1979 and has received a number of other commendations. One such award recognized his work last year in helping to develop a new automatic spray system.

Shuttle assembly building ahead of schedule at VAFB

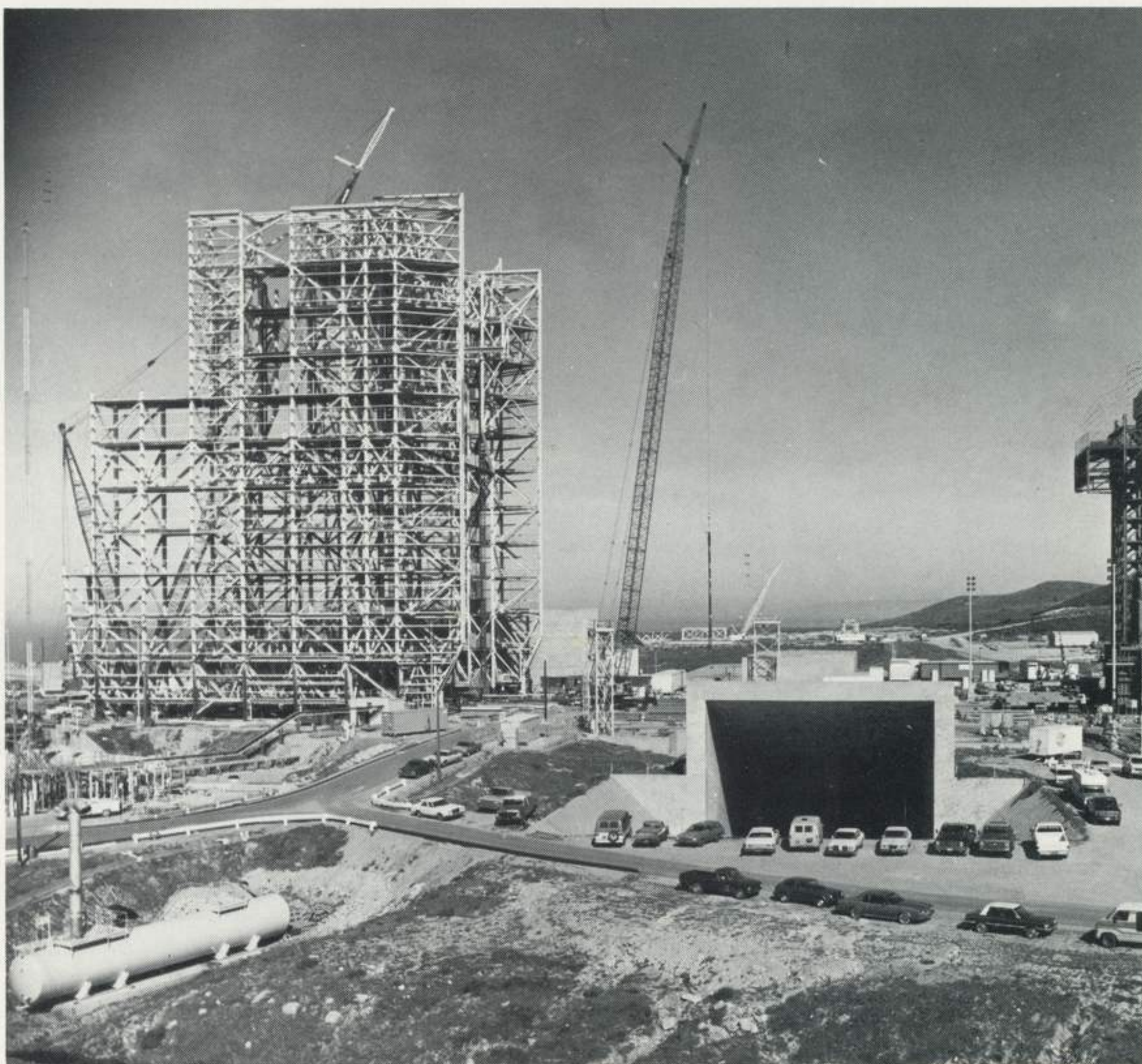
The rapidly expanding steel skeleton of the Shuttle assembly building (SAB) is the newest and last addition to the Space Shuttle launch complex at California's Vandenberg Air Force Base (VAFB)

Construction on the \$29.5 million contract began in September and, according to latest estimates from the U.S. Army Corps of Engineers, is progressing one month ahead of schedule. Completion date is set for October.

Construction is being completed using one of the largest cranes in the world, said James Money, site manager, Ground Support Systems (GSS), who also noted the SAB facade stands 255 feet high. It is 188 feet long and 164 feet wide.

Unlike Kennedy Space Center (KSC) in Florida—where the Space Shuttle is stacked, erected, and mated to the external fuel tank (ET) off the pad and then transported to the launch mount—the entire assembly process is conducted on the pad at VAFB within the sheltered environment created by the mating of the SAB to the mobile service tower (MST).

The SAB houses an overhead 125-ton bridge crane with a 15-ton auxiliary hoist to perform the necessary lifting operations during assembly. Despite its size, the mammoth "garage" is a unique mobile structure that will be self-propelled; it will use hydraulic motors to drive its wheels on rails to mate with the MST. In operational positions, the SAB and MST cranes will be used to hoist the orbiter and the ET to a vertical position within a protected environment. The two-hook hoist is identical with that used inside the Vehicle Assembly Building at KSC.



Once integrated operations have been completed, the payload changeout room (PCR), the MST, and the SAB will return to their original park positions, and the Shuttle will be in its launch configuration—standing alone on the launch mount

awaiting final countdown.

Ground systems testing is expected to begin in May, and a contracted pass-through of the PCR through the SAB is scheduled for early June.

Launch vehicles under study at KSC, VAFB

The impact of four shuttle-derived launch vehicle configurations at Kennedy Space Center (KSC), FL and Vandenberg Air Force Base (VAFB), CA is being evaluated by Denver Aerospace.

The contract for an advanced space transportation systems/group operations study is being conducted by the Michoud division's KSC advanced programs group. The group is headed by Clem DiLoreto, who also assists Michoud's advanced programs with its Marshall Space Flight Center (MSFC), AL.

The work is among the company's two current contracts there since Martin Marietta turned over external tank processing operations to the new space shuttle contractor after February's latest launch.

The other is the launch support services contract for MSFC, headed by Lou Favata. That group and MSFC personnel at the Cape form an integrated team with authority to make design changes in the shuttle's external fuel tank.

Tethered satellite agreement signed in Rome

U.S. and Italian officials in Rome last week signed a cooperative agreement for development of a reusable tethered satellite system (TSS) for launch from the space shuttle during late 1987. (*Martin Marietta News No. 4/1984*)

Denver Aerospace is designing and building the flight hardware to deploy and retrieve a satellite using a 60-mile-long tether. Work is being done under a \$22.35 million contract to NASA's Marshall Space Flight Center in Alabama. The satellite will be provided by the Italian Council for National Research.

The first system of its kind, the TSS will "troll" a 1000-pound satellite from the orbiting shuttle's cargo bay on a line 1/10-inch thick, and reel it back for return to Earth and subsequent reuse up to 20 missions.

The typical 20-hour mission of the system will enable long-duration investigation of Earth's upper atmosphere, crustal magnetic fields, geology, and plasma physics research of the ionosphere. The satellite also is expected to be used to locate mineral and petroleum resources.

Advanced applications foreseen include using the tether as a very low frequency antenna, as a support for large space structures, and to generate electrical power in space.

New Orleans AIAA chapter garners award

The American Institute of Aeronautics and Astronautics (AIAA) has named the Greater New Orleans Section (GNOS) the outstanding section for 1983.

The section led the nation in membership growth in its category. Its newsletter also was picked as the outstanding one during the same judging period, June 1982 to June 1983.

Michoud's Velice Bet Sayad, section chairman, and Leon Ronquillo, newsletter editor, each received AIAA gold rings, becoming the third and fourth persons ever to receive such awards from the professional organization.

Recreation

Photography—The Platte Canyon Photo Club will coordinate Denver Aerospace entries in the National Employee Services and Recreation Association/Guardian Photo three-division photo contest. Entry forms, rules, and other details are available from the Recreation office, Engineering Bldg, module 124, ext 6750. Contest flyers are in the Recreation racks. Featured speaker at the photo club's regular meeting at 7 p.m., Thursday, March 30 in room G-58 at DSC II will be Kathy Demorest, Colorado Division of Wildlife, who will discuss a layman's approach to wildlife photography. Contact Roy Gearhart, ext 3722, or Bill Privatsky, ext 5920 for other upcoming events. Flyers are available in Recreation racks.

Softball—An organization meeting for various leagues will begin at 5 p.m., Monday, March 26 in SSB cafeteria. Contact Paul Shattuck, ext 5439 or Recreation, ext 6750.

Golf—New and existing golf leagues need to be registered by April 27 to be sanctioned. Forms are available from Recreation, Engineering Bldg, module 124, ext 6750. Among the tournaments scheduled this year are the May 6 Partner Best Ball event and the Martin Marietta Open on August 11, both played at Riverdale Golf Course. Winners of the Partner Best Ball tournament will represent Denver Aerospace in the June 2, 1984 Denver Corporate Games.

Skiing—Signup forms are available in Recreation racks for the Satellite Ski Club's "FunDay" at Geneva Basin, Sunday, April 8. The \$13 member fee (\$16 for non-club members) includes lift tickets and a cookout. Contact Dee Hale at LSC, ext 0433; Jim Harris at ADM, ext 6980; Alan Rice at DSC, ext 9474; Roger Miller at ADM, ext 5532; Jennifer Eggers at GPL, ext 6151; or Darrell Deering at DSC, ext 7053. Specially priced lift tickets for Vail and Beaver Creek ski areas are still available at \$17 (\$22 regular). The tickets can be bought at Recreation, Engineering Bldg, module 124; and also from Kay Shuey, DSC II, module G-50; Georgeanne Wood, LSC, module 205; Lucy Winka, SLF, Personnel Representative's Office; Ruth Cobern, GCF, Bldg 8100, second floor; Maree Lazzaro, IPF, Data Systems Personnel Office, Bldg 98.

Alpine—The Rocky Mountain Alpine Club has scheduled a two-day intermediate/advanced cross-country skiing ascent up Mount Guyot beginning Saturday, March 17. Contact Marc Brideau, ext 8346, or 697-1175.

Corporate games need athletes, coordinators

The company is looking for a few good athletes.

Denver Aerospace aims to regain the title during the upcoming fourth annual Denver Corporate Games, scheduled June 2 at the Auraria campus downtown. The company won the games the first two years, but had to settle for second place last season, behind Public Service Company of Colorado.

Athletes are reminded they may participate in only one event and in only one sport.

In addition to event participants, Recreation also needs volunteer event coordinators for the company's racquetball and cycling teams.

Entry forms are available from Recreation in module 124, Engineering Bldg., ext 6750, and from the department's flyer racks.

Sports this year and makeup of teams will be:

TRACK—one man and one woman each for the 100-, 200-, and 1500-meter races, and for the long jump; two men and two women each for the 400-, 800- and 1600-meter coed relays; four men and four women, one from age groups 18-29, 30-39, 40-49, and 50 plus, for the five-kilometer run.

TENNIS—"A" and high "B" players for the men's and women's singles and doubles, as well as one man and one woman for the mixed doubles.

RACQUETBALL—one man and one woman.

COED VOLLEYBALL—six men and six women.

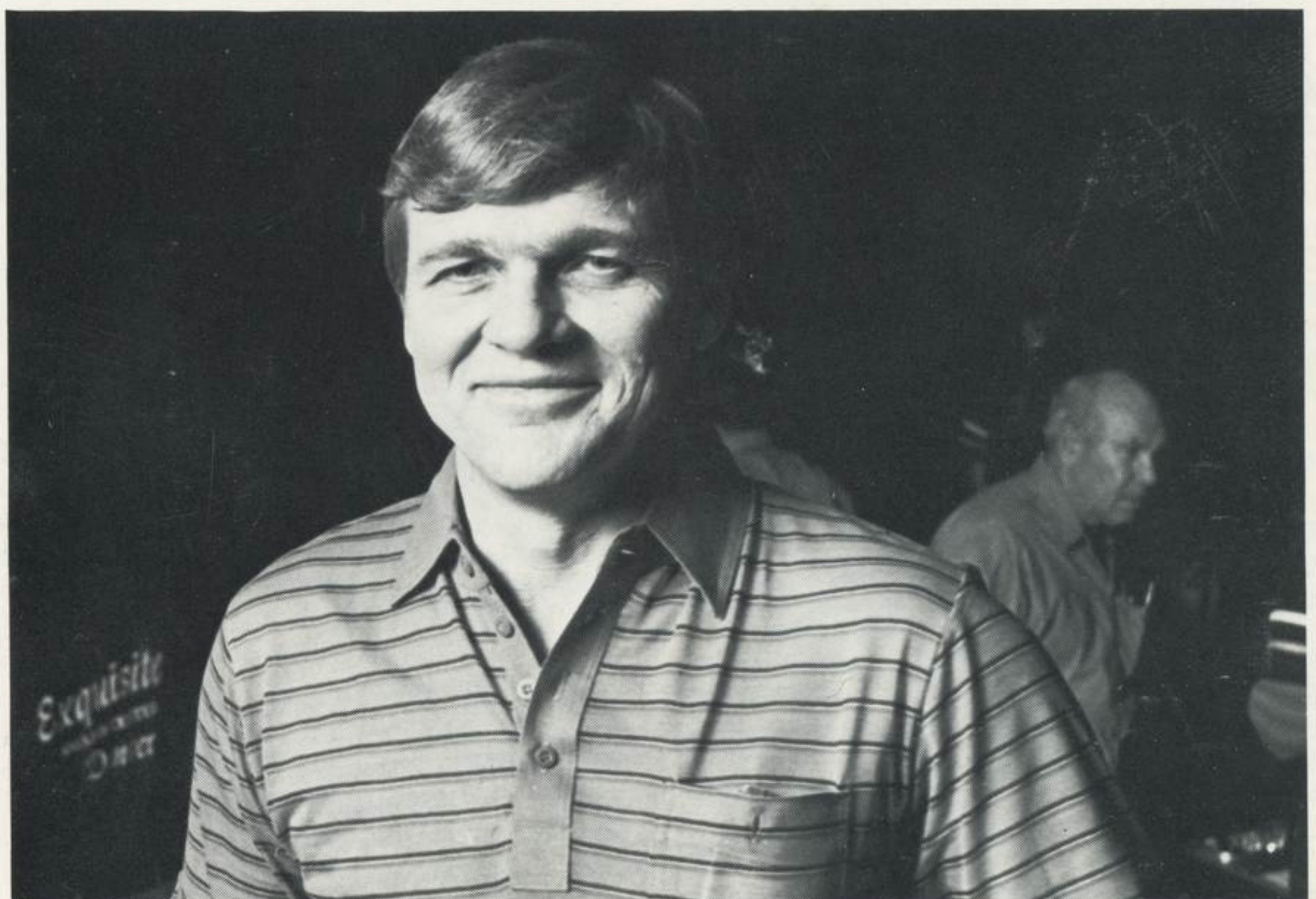


Brian Gallagher serves one up during last year's tennis competition at the Denver Corporate Games.

SWIMMING—one man and one woman each for the 50-yard freestyle, backstroke, butterfly, and 100-yard freestyle events; two men and two women for the 200-yard coed freestyle and the 200-yard coed medley relays.

CYCLING—one man and one woman who are not holders of U.S. Cycling Federation licenses for the 5.5-mile race.

Golf and bowling competitions also are scheduled. However, the man and woman participants on the links will be winners of May 6 Partner Best Ball Tournament; the top three men and two woman bowlers were determined during January's Martin Marietta Masters Qualifying Tournament.



Terry Delp rolled a perfect line during the recent 12-game Martin Marietta Masters Qualifying Bowling Tournament. Despite that 300 score, though, he finished third behind first place Don Watts and Tom Willig in second. They had respective total pin scores of 2624, 2585, and 2571 for the 12-game tourney. Distaff side tournament top two were Cathy Johnson, 2505 total pins, and Shari Holliness, 2228. Those five bowlers will make up the Denver Aerospace team for the June 2 Denver Corporate Games.