

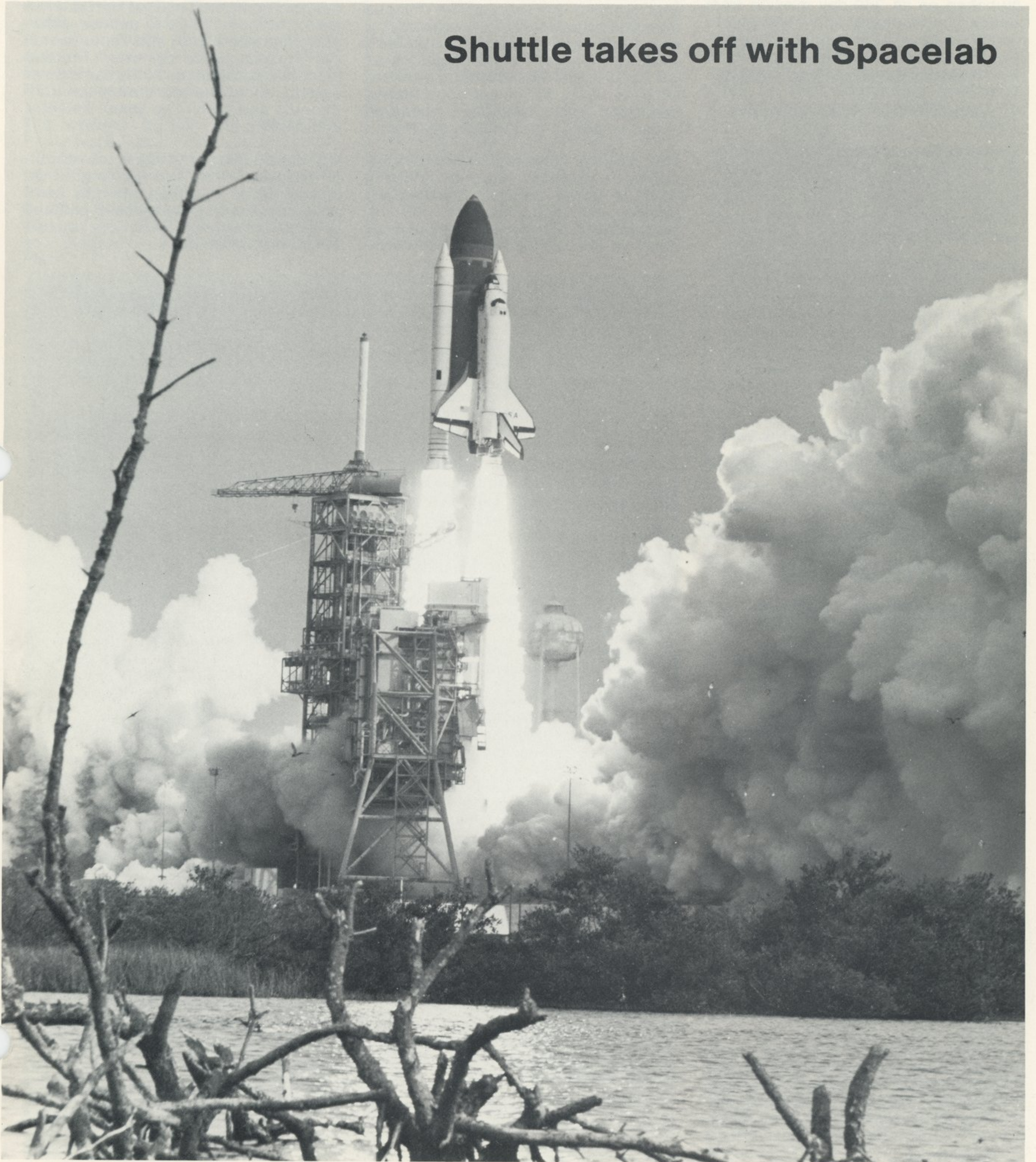
MARTIN MARIETTA

news

DENVER AEROSPACE

NUMBER 24/1983

Shuttle takes off with Spacelab



VRM spacecraft to map Venusian surface

Denver Aerospace has won a \$120,042,000 contract to design, build, and test the Venus Radar Mapper (VRM) spacecraft for the California Institute of Technology's Jet Propulsion Laboratory (JPL) at Pasadena. The program is funded by NASA.

The spacecraft is expected to be launched on its 360-day mission from Space Shuttle during April 1988 and to go into elliptical orbit around Venus during July of that year. VRM will circle the planet every 3.1 hours, transmitting topographical information back to Earth until its primary mission ends April 3, 1989.

Spacecraft assembly and testing will be done in Denver. The company, whose involvement in the project dates from feasibility studies during the early 1970s, also will assist JPL with launch and mission operations.

Venus, the Earth's closest neighbor in

space, has remained a mystery because of the dense, poisonous clouds of sulfuric acid and carbon dioxide that enshroud the planet.

Clouds, however, are transparent to an advanced imaging technique known as synthetic aperture radar. VRM will use that radar to pierce the Venusian clouds and produce photograph-like images from which scientists can construct a map detailing 90 percent of the planet's surface, including height variations as low as 330 feet. The synthetic aperture radar is being developed by Hughes Space and Communications Corporation under an added \$49 million contract.

The orbiting spacecraft's radar is expected to provide images of sufficient detail to reveal Venusian features and geology, including water and wind erosion, volcanic activity, tectonics (the geology of the planet's structural defor-

mation), and surface faulting. In addition to surface investigations, VRM will measure the Venusian gravity field and study its internal density distribution.

According to Charles D. Brown, VRM program manager, "We need to know the topography of any planet before we can formulate any hypotheses in relation to our own Earth. Getting that kind of information will enable us to deduce differences between Earth and Venus, which the ancients called our twin." The two planets are neighbors in the same solar system, about the same distance from the sun, and about the same diameter and density.

"By discovering what makes Earth different from Venus and learning all we can about its evolution, we may learn more about our own planet and perhaps even gain information to help us improve conditions on Earth."

On the cover

The maiden flight for Spacelab began on schedule on November 28 as STS-9 lifted away from Launch Pad 39A. In addition to the European Space Agency-built laboratory that provides a shirt-sleeve working environment in the orbiter's payload bay, the vehicle also carried a six-member crew, largest ever to fly in a U.S. spacecraft.

Columbia visible for next 4 days

The Space Shuttle can be seen from Denver during the next four days according to the following schedule:

- Friday, Dec. 2: for 4 minutes and 20 seconds beginning at 5:43:49 p.m. (1700 hours, 43 minutes, 49 seconds), traveling from the northwest to the southeast at 48 degrees elevation above the horizon and a range of 207 miles away;
- Saturday, Dec. 3: for 4 minutes and 1 second beginning at 5:33:24 p.m. (1700 hours, 33 minutes, 24 seconds), traveling from the northwest to the south at 29 degrees elevation above the horizon and a range of 303 miles away;
- Sunday, Dec. 4: for 3 minutes and 26 seconds beginning at 5:23:07 p.m. (1700 hours, 23 minutes, 7 seconds), traveling from the west to the south at 19 degrees elevation above the horizon and a range of 416 miles away;
- Monday, Dec. 5: for 2 minutes and 22 seconds beginning at 5:13:03 p.m. (1700 hours, 13 minutes, 3 seconds), traveling from the west to the southwest at 13 degrees elevation above the horizon and a range of 539 miles away.

\$9+ million in contracts announced

Denver Aerospace recently negotiated 10 new contracts worth a total of \$9,117,035, and the largest of those has the potential to add another \$5.6 million to the tally.

That three-year contract, worth \$7.4 million, is to operate and maintain Kirtland Air Force Base's state-of-the-art Developmental Optics Facility (DOF) near Albuquerque, NM.

Contract provisions include two one-year options which could extend it to a \$13-million program over a five-year period.

Graham Flint, program manager, explained that work on the DOF project centers on two primary activities — manufacture and refurbishment of mirrors used in laser systems, and design and application of thin film coatings on mirrors and lenses.

The other nine recently announced negotiated contracts involved:

— \$450,000 to fabricate and test a power distribution system breadboard for the satellite power processor development program for Grumman Aerospace Corporation. Program manager is Roger Bell.

— \$423,360 to provide analysis, design, and research testing of a deployable box truss antenna concept for space application for NASA/Langley Research Center. Project manager is John Coyner.

— \$293,475 to improve the Johnson Space Center's SINDA Thermal Analyzer Program which is

used to predict temperature of the Space Shuttle and its payloads. Program manager is Carl Jensen.

— \$247,819 to provide, install, and check-out one second-generation photovoltaic concentrator array plus one additional tracking structure for a Tennessee Valley Authority commercial photovoltaic project. Program manager is Robert Hein.

— \$163,900 to identify problem areas of a satellite command center, addressable by expert systems technology, and to develop a feasibility demonstration for one of those areas for Goddard Space Flight Center. Program manager is Richard Walsh.

— \$99,981 to construct a dust exposure facility for comet and asteroid studies for NASA headquarters. Program manager is Ben Clark.

— \$98,400 for the Jet Propulsion Laboratory's command modulator assemblies program incorporating directed design changes, revised delivery schedule, and increased technical support services. Program manager is Lloyd Thayne.

— \$33,000 for Grumman Aerospace Corporation's satellite power processor development program. Program manager is Roger Bell.

— \$7,000 from the European Space Research and Technology Centre to act as a consultant in the procurement of a large space simulator.

Strategic and Launch Systems look to future

"We must avoid the cliffs."

That's how Peter B. Teets, vice president and general manager of the Strategic and Launch Systems (S&LS) division, describes the strategy behind the new business effort for his division.

"Fortunately, we know where those 'cliffs' are and can develop a plan to avoid them," he said.

"We know, for example, when each of our programs will reach peak effort, when the programs are on a plateau, and when their contributions to our business base will diminish."

Plans are in place to gain new business that will fill in as programs begin their downturn.

"Key to achieving that balance is our performance in two areas," Teets said. "First, we have to meet or exceed all the cost, schedule, and performance goals on current contracts. At the same time, we must commit the resources and effort necessary to win new business."

Peacekeeper, the ground support system (GSS) effort at Vandenberg, and continued work on Titan launch vehicles are examples of the programs "we must continue to perform on in an outstanding way," according to Teets.

Winning a significant role on the small intercontinental ballistic missile and the commercial development of the transfer orbit stage (TOS) are examples of the new business efforts that are crucial to "avoiding the cliffs."

"Peacekeeper is nearing peak effort," Teets said, "and will continue in evolving phases for many years. We expect our role to be expanded soon to cover the flight test program through flight 20. That expansion includes test launches from the Minuteman silos at Vandenberg."

"We are also working to extend other parts of our assembly, test, and systems support contract. And, as Peacekeeper moves to deployment, we expect to be a part of the team that makes that happen. The RFP for this phase will be released in 1984 and we are ready to respond."

The S&SL division's formal role on the ground support system for the Department of Defense Shuttle operations at Vandenberg continues into 1986, but the effort has now reached its peak and will plateau.

"I believe certain elements of our work on GSS will go beyond that date," Teets said. "We plan to perform so well on our current work that the Air Force will select us for a significant continuing role on the program."

Titan continues to provide opportunities for new business, according to Teets. As

evidence, he cites the recent RFP for the 15th Titan 34D. The Air Force is also exploring new uses and new procurement methods for Titan that could prolong the life of the nation's most successful launch vehicle.

"Titan has had another year of 100 percent mission success and we are looking forward to extending that record. Peacekeeper was also 100 percent successful in its flight tests, the beginning of what we hope is a record like Titan's."

The transfer orbit stage should soon be fully under way. Teets sees the commercial development not only as significant new business, but also as an exciting new frontier.

"It's great that we are involved," he said. "It puts us on the leading edge of the commercial use of space."

The TOS will be flown from Space Shuttle to launch commercial satellites and space probes. Denver Aerospace has signed a contract with the Orbital Sciences Corporation to provide that new firm with the TOS for its customers.

"Because we intend TOS to be a cost-competitive, performance-assured, available upper stage, we believe it will be an easy choice for customers looking for such a vehicle to use in conjunction with Shuttle," said Teets.

"The success of TOS certainly could be one route to avoiding the cliffs I spoke of," he said. "However, our highest priority is without a doubt to gain a significant role on the small ICBM program. The small ICBM is something cru-

cial for our nation and for us as a business.

"Major, long-term strategic systems are few and far between in the nation's defense procurement plans. The small ICBM is the next program in this category, and we must be part of it."

Teets is confident that the necessary resources are assigned and extremely talented people are committed to win "a proper role for us" in the program.

Our goal is to obtain a systems integration contract — work similar to that being done for Peacekeeper — and a contract to develop the hard mobile launcher now being considered for the missile.

"We have a great opportunity with our diverse programs in S&LS to assign our talented people where they are needed. This not only gives us the skill transfer the programs require, but also gives our employees growth possibilities that may not be readily available elsewhere.

"We have been moving people to new and challenging assignments and they have been performing extremely well," Teets said. "All of us like to have paths open for growth and I think the paths we are creating are as clear as they can be.

"And, I don't see any cliffs on those paths," he added. "The confidence I have in our people, the commitment we have made in resources, and our record for mission success will keep us moving along the course we have charted for continued business success."



Peter B. Teets is vice president and general manager of the Strategic and Launch Systems division. The Peacekeeper program, the Titan launch vehicle program, and various Department of Defense Space Shuttle activities are part of the division.

He joined Martin Marietta in 1963 as an engineer in flight controls analysis. He has progressed through a series of engineering and management positions. He managed the integration of a new Titan inertial guidance system, was program manager for the transtage program, director of the Space Systems organization, and was vice president of Business Development.

Teets was Martin Marietta Corporation's engineer of the year in 1974.

He holds bachelor's and master's degrees in applied mathematics from the University of Colorado and, as a Sloan Fellow, earned a master of science in management degree from the Massachusetts Institute of Technology.

Teets is a member of the American Institute of Aeronautics and Astronautics and the American Defense Preparedness Association.

'We're for the kids'

Operation Santa Claus serves the needy

It's a story you've heard before. A family falls on hard times; there will be no sugarplums for the children this Christmas. No special dinner, no new clothes or toys, no celebration.

It may be the same story, but every year the characters change, and every Christmas for the past 24 years, Operation Santa Claus has provided holiday cheer for needy children and families in the Denver metropolitan area through the donations of Denver Aerospace employees. Your contributions have made Christmas brighter for more than 6500 children over the past 24 years.

This year Operation Santa Claus will provide food, clothing, and toys to about 400 children in 100 families on December 20. To accomplish this, the group needs to raise \$16,000.

Today marks the beginning of the organization's fund-raising campaign. Department administrators and Operation Santa Claus volunteers will ask each employee to consider a cash donation to this worthy cause. All donations are tax deductible.

"If each of us gave only \$2.00, the program would be fully funded," said George McCone, space and electronics administrator and Operation Santa Claus' financial secretary.

Operation Santa Claus, Inc. is a non-profit organization of employees, but has no formal connection to Martin Marietta Denver Aerospace. The group started nearly 25 years ago in Electronics Engineering and later merged with a group in Engineering Mechanics. A friendly rivalry has developed between the two groups over the years each striving to provide the most volunteers and donations to the organization's various projects.

Various committees of volunteers organize the Christmas project. A selection committee reviews and selects the families who will receive aid. Each family selected is screened through various agencies in the area and will receive aid only from Operation Santa Claus. Not all the families are on welfare — many are just experiencing hard times or a tragedy in their lives.

"Selecting the families is a highly emotional job because there are so many families that deserve help," said Dwaine Schilling, manager of manpower planning and Operation Santa Claus chairman.

Another committee analyzes the children in each family by age and sex and then purchases toys that fit those descriptions.

A food committee works with King Sooper's to purchase groceries for each family. Each family receives between 5 and 10 boxes of groceries, packaged by King Sooper's employees.

Wanted: Santa Claus

"Makes a great family experience."

"Made Christmas more meaningful to me."

— comments from Operation Santa Claus volunteers

Operation Santa Claus is seeking volunteers to package and deliver food and toys to needy families on December 20.

Anyone may volunteer, but it is especially helpful if you have a large car — or a sleigh with eight tiny reindeer. Expect to spend between 2 and 3 hours.

Volunteers will assemble at St. Mary's of Littleton where they will select a family and receive a brief background on the family.

The next step is wrapping the toys purchased for the children of the family.

Boxes of food are then picked up at the King Sooper's located at Belleview and Federal Boulevard (expect 5 to 10 boxes).

Finally, volunteers deliver the packages to the family. (The family will have been notified in advance of your arrival.)

Operation Santa Claus Chairman Dwaine Schilling is requesting that volunteers notify him in advance of their planned participation. This year volunteers will receive a confirmation letter with full details. Your commitment will ensure that there are enough volunteers to make the deliveries.

For more information, call Dwaine Schilling at ext 3614.

Medical insurance open enrollment for Denver metropolitan area employees

Each year eligible employees in the Denver metropolitan area are given a choice of medical plans under which they may be covered.

As in the past, Comprecare, a Health Maintenance Organization (HMO) plan, and Martin Marietta Group Medical Coverage (insured by Connecticut General Life Insurance Company) are available.

For 1984, another HMO plan, Kaiser-Permanente Medical Care plan, is also being offered.

Information on each of these plans will be distributed to employees' home addresses beginning the week of November 28, 1983. A comparison chart will be included to help employees determine which plan best suits their needs.

The option of Comprecare or Kaiser-Permanente is available only to those employees whose home residence lies within the specified service areas outlined in the information packet.

Those interested in changing their health coverage must obtain the proper forms and return them to the Employee Benefits office no later than Friday, December 16, 1983.

Forms and more specific information are available from the Employee Benefits office, ext 3009 or ext 4928. Office hours are 10:30 a.m. to 12:30 p.m. and 2:00 p.m. to 3:00 p.m. on Mondays, Wednesdays, and Fridays in Engineering Building Module 125.

If you do not receive the information by Monday, December 5, 1983, contact the Employee Benefits office for copies.

Kaiser-Permanente open house

Kaiser-Permanente will hold an open house at the following locations on Saturday, December 3, 1983 to provide information on the new health-care plan being offered employees.

The one-hour briefings will begin at 11:00 a.m.

The locations are:

- 8383 W. Alameda Avenue
- 10400 E. Alameda Avenue
- 5555 E. Arapahoe Road
- 11245 Huron Street
- 2045 Franklin Street, 5th floor conference room.

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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 2, 1983

RTD to hold public hearings on route changes

The Regional Transportation District (RTD) has scheduled public hearings to consider proposed new routes and service changes which will affect service to the main plant at Denver Aerospace.

Proposals include splitting the current Route No. 67 into two segments at Southglenn Mall. The eastern portion would be designated Route No. 105 and would serve Martin Marietta via Arapahoe Road, Broadway, Mineral Avenue, Santa Fe Drive, and State Route 75, according to Michael Grovak, RTD senior service planner.

The western portion will retain the Route No. 67 designation and will follow closely its present course, operating from Southglenn Mall via Arapahoe Road, Broadway, Ridge, Prince, Church, Curtice, Main/Alamo, Bowles, Platte Canyon, Ken Caryl, Pierce, Coal Mine, and Wadsworth Avenue to Southwest Plaza.

A transfer could be made to Route No. 76 at Wadsworth and Coal Mine. That route will operate directly to the Martin Marietta plant and is scheduled so that the transfer will be convenient and timely.

Those presently using the Route No. 67 service from west of Broadway may find the new routings less convenient than the present one.

Overall, RTD feels that the service pro-

vided to Martin Marietta employees will be improved.

Employees are encouraged to attend one or more of the scheduled hearings to learn more about proposed changes.

Hearing Schedule

Monday, December 5, 12 noon
Hilton Inn South
Geneva Basin Room
7801 E. Orchard Road,
Englewood

Monday, December 5, 7 p.m.
Montbello Recreation Center
Cultural Arts Room
4397 Crown Boulevard,
Montbello

Tuesday, December 6, 12 noon
Colorado Heritage Center
Classroom E
1300 Broadway, Denver

Tuesday, December 6, 12 noon
John V. Christensen Library
Conference Room
2305 E. Arapahoe Road, Littleton

Wednesday, December 7, 7 p.m.
Midland Federal Savings & Loan
Community Room
6333 E. Colfax Avenue, Denver

Wednesday, December 7, 7 p.m.
Arvada Center for the
Performing Arts
Rooms 1 and 2
6901 Wadsworth Boulevard,
Arvada

Thursday, December 8, 7 p.m.
Prairie Middle School
B Commons Area
12600 E. Jewell Avenue, Aurora

Thursday, December 8, 7 p.m.
Bemis Library
Lower Level Meeting Room
6014 S. Datura Street, Littleton



The crew of STS-9 leaves their quarters on the way to the launch pad. The astronauts are, front rank, from left, Mission Pilot Maj. Brewster Shaw and Mission Commander Capt. John Young; second rank, from left, Mission Specialist Dr. Robert A. Parker and Ulf Merbold, payload specialist from the Federal Republic of Germany; third rank, from left, Mission Specialist Dr. Owen K. Garriott and Payload Specialist Byron K. Lichtenberg.

NASA awards Martin Marietta shuttle derived vehicle study

Martin Marietta Aerospace is studying a side-mounted configuration for a shuttle derived cargo vehicle (SDCV) under a contract from NASA's Marshall Space Flight Center.

The study will investigate both an expendable propulsion/avionics module and a recoverable propulsion/avionics module.

The six-month study will be performed at the Michoud Division where the company builds the external tank for the Space Shuttle.

The shuttle derived vehicle concept envisions replacing the orbiter with an unmanned cargo carrier. This carrier includes a payload module larger than the orbiter bay; a recoverable module to house main propulsion, guidance, and control; and data management systems like those on the orbiter, along with other support systems.

Previous analyses have shown that recovery and reuse of the propulsion and avionics equipment could provide enough cost savings in six flights to pay for the design and development of the new cargo carrier.

The current study also investigates the feasibility of interrupting development of a recoverable system and accelerating production of an expendable system should a strategic need arise for an earlier launch.

State business group honors employees

A large contingent from Denver Aerospace was recognized for contributions to the Colorado Alliance for Business at the group's recent annual luncheon.

Norman R. Augustine, Denver Aerospace president, was honored for his service on the board of directors. Committee members honored included William Curra, Beverly Egger, and Fitzroy Newsum.

Beverly Egger also was recognized for her contribution as a "Loaned Executive" during the group's Summer Job Hunt, an annual program to place youth between the ages of 16 and 21 in summer jobs. More than 28,000 youths have been placed during the three summers the program has been in operation.

Recognized for their work as "World of Work" instructors were Fred Atkinson, Griff Bailey, Jerry Hardiman, Louise Steinhausen, and Betsy Taylor. "World of Work" workshops help area youth develop self-directed job search skills.

'Gift of life' nets 301 donors

This month's Belle Bonfils Blood Drive at the main plant drew 301 donors for the program which benefits the entire community.

'Weekend Hackers' winners

Tennis winners in the recent 1983 Martin Marietta "Weekend Hackers" tournament at Arapahoe Community College:

Men's B Singles — 1) Leon Stewart; 2) Jack Ballard.

Men's C Singles — 1) Ken Robak; 2) Harris Nguyen.

Men's Novice Singles — 1) Paul Cheng; 2) Ken Hogle.

Men's B Doubles — 1) Tom Cencich and Alvin Knight; 2) Chuck Hudak and Leo Ferras.

Men's C Doubles — 1) George Wathen and Ken Robak; 2) Jim Pulliam and Harris Nguyen.

Golf league officers announced

Martin Marietta Ladies' Golf League 1984 officers are:

Diane Fults, president; Karen Fliedner, vice president / HDCP chairwoman; Deborah DiDomenico, secretary; Betty Henson, treasurer; Shirley Housely, special tournament; and Pat Crandall, banquet chairwoman.

Recreation

Hunting Club — Skyline Hunting and Fishing Club will sponsor a "Turkey Shoot" at 1 p.m. Saturday, December 3, on the club's trap range near the main plant. Competition will include both "skill" and "luck" shoots for all employees and their immediate families. See flyer in recreation racks.

Discounts coupons — Save an extra five percent at LaBelle's December 8-10 with coupons available from recreation racks.

Alpine Club — General membership meeting at 7 p.m., Friday, December 16. John McCormick will speak on avalanches. Non-members invited. Call Gordon Voss, ext 8109, or Barbara Converse, ext 4748. The club also will conduct an avalanche field seminar in the Montezuma area near Dillon Sunday, December 18. Contact Steve Zaiontz, ext 5193.

Bowling tournament — Martin Marietta Masters' / Corporate Games Qualifying Tournament will be held during January. Winners, who must be Martin Marietta employees, will represent the company in the fourth annual Denver Corporate Games next June. Entry forms, with \$10 fee per bowler, must be received by the Recreation office no later than 12 noon Thursday, December 22.

Bowling league — Mixed Winter League needs more bowlers: one couple, one male, and one female. League bowls on Tuesday, 9 p.m., at Belleview Bowl, 4900 S. Federal Boulevard. Call Recreation, ext 6605.

Car loans — Red Rocks Federal Credit Union has extended its special rate of 12.75 percent APR for new-car loans through January 1, 1984. Call ext 6000 for details.

Corporation makes FCC applications

Martin Marietta Corporation has applied to the Federal Communications Commission (FCC) for authorization to construct and launch a domestic satellite telecommunications system.

The application from Martin Marietta Communications Systems, Inc., a wholly owned subsidiary, requests positions in geosynchronous orbit for two satellites. The corporation also requested FCC certification as a common carrier.

The two satellites, expected to be

operational by late 1988, will provide telecommunications services to a variety of users, including other common carriers, communications service companies, and private individual users in business and government.

The proposed system would provide significantly greater capacity than existing domestic systems for point-to-point voice, data, teleconferencing, video, and other communications services.



The Titan Manufacturing Team and their families found camaraderie, games, and food at a recent picnic in Englewood's Progress Park. Dixieland music and a giant tug-of-war were just part of the Colorado festivities.