MARTIN MARIETTA
news
DENVER DIVISION

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Division earns three solar energy contracts

Three solar energy contracts, totalling $21 million, have been awarded the Denver Division by the U.S. Department of Energy. One is for the design and construction of a solar energy system and two are for conceptual design and experimental work.

The first contract, for approximately $16 million, is for the design, fabrication, and installation of a 350 kilowatt photovoltaic power system in Saudi Arabia. Final elements of the contract will be negotiated with DOE's Solar Energy Research Institute (SERI) in Golden, CO.

The power system comprises 160 photovoltaic concentrator arrays, a storage system of six batteries, and a computer control system. The photovoltaic arrays are computer controlled to track the sun across the sky. Point-focusing Fresnel lenses concentrate the sun's rays onto solar cells that directly convert sunlight to electricity. The electricity will be used by two villages, Al Jabaylah and Al Uyaynah.

Installation of a 50 kilowatt system will be completed in June 1980 and expanded to the 350 kilowatt system by January 1981. As part of a five-year joint effort by the U.S. and Saudi Arabia to advance solar energy technology, the system may be expanded to provide one megawatt (one-million Watts) of power.

The second contract, for $3 million, is for experimental work on preliminary design elements of a central receiver solar energy power system. The design will have nine heliostat fields with a solar receiver tower at the center of each one. Also included are an electric power generation system and tanks and other equipment to store and pump molten salt used as a heat storage and transfer medium.

Under the contract, the division will build a receiver (essentially a boiler) that could be used in a five megawatt power system. The division will run the receiver and support equipment in a series of tests at Sandia Laboratories in Albuquerque, NM.

The third contract, worth $1.7 million, calls for the division to design and build two heliostats and develop a conceptual design for a manufacturing plant capable of producing 50,000 heliostats a year.

The heliostats are the latest in a series of progressively more efficient devices designed by the division. Eventually, hundreds of heliostats may be built for use in large-scale solar energy plants, or to modify existing fossil fuel power plants. The modification would make power plants capable of producing electricity by using either fossil fuel or solar energy.

On the cover

Designed to convert sunlight into electricity, 160 photovoltaic concentrator arrays, like the one shown on the cover, are being designed and built by the division. Under a new contract, the division will also install the arrays in Saudi Arabia. In the photo, quality engineer, Jack Branson, left, and electrical engineer, David Watts, adjust the array during tests.

Credit Union officers chosen; charter sought

Officers were elected and the charter application signed at a formal organization meeting of a credit union for the Denver Division in mid-September.

Chosen to head the organization during its formation were John J. Smith, president; Dorthea E. Gibson, vice president; Robert L. Gale, treasurer; and Fred R. Bennett Jr., secretary. Leroy Hollins will serve as liaison to the organization.

The charter is being sought under Federal Credit Union auspices. Approval is expected in six to eight weeks.

At the September meeting, a representative of the Colorado Credit Union League briefed the officers, board, and committee members on credit union operations.

Employee volunteers, representing most division organizations, are participating as board members and on the credit committee, supervisory (audit) committee, and the education (publicity and sales) committee.

While awaiting charter approval, the volunteers will meet after hours to develop bylaws, determine advertising methods, set membership policies, establish loan regulations, and work on related activities.

"If charter approval is as timely as we anticipate," said Dominic N. Verrastro, manager of employee and labor relations, "employees should be able to begin participation before year end.

"The volunteers are working hard and have broad experience in financial control, planning, and management," he said.

Division to aid postal service cancel stamps

The U.S. Postal Service cancels billions of pieces of first class mail each year with up to seven percent of it rejected by automated cancelling equipment. Some pieces are rejected because they have no stamps, but much of it has stamps that have failed to activate the equipment's photocell. These pieces have to be hand cancelled.

To eliminate costly hand cancelling, the division's materials research and analysis lab has been awarded a contract to develop a material that will more effectively activate the automated cancelling equipment.

The phosphorus compound read by the photocell is added to the varnish that coats postage stamps after printing. The current compound deteriorates as stamps are handled.

David Neiswander, unit head of the lab and program manager for the contract, says, "We have many problems to solve. The compound must pass severe abrasion tests, withstand bending, and not deteriorate when mixed with the varnish."

Key people on the 24-month contract are Kenneth Karki, Patricia Carr, and Harold Papazian.

William R. Johns, manager of MARTON production and support operations, left, and Hiram Brannon, Braniff Airlines representative, discuss equipment the airlines is acquiring.

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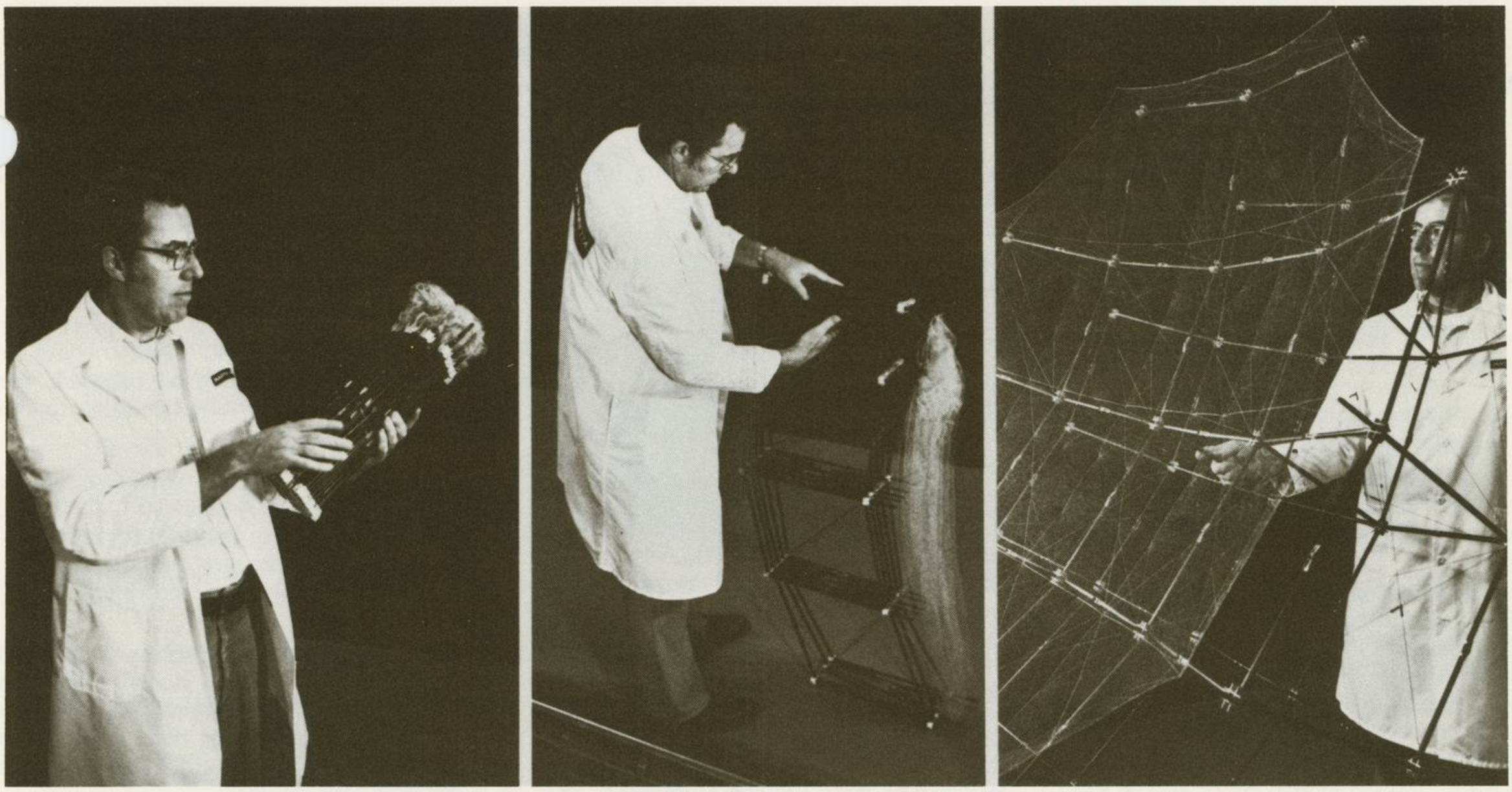


Senior engineer William H. Tobey is shown deploying a scale model antenna. At left, the structure is in the stowed position; in the center, deployment is begun; and at right, the model antenna is fully deployed. In space, the antenna could be up to 600 feet wide.

Division designing space antennas

Denver Division engineers have designed and developed a working, scale-model prototype of giant antennas and space platforms that can be launched into orbit as compact bundles, then unfolded into structures hundreds of feet across.

William H. Tobey, a senior engineer in systems engineering who worked on the design, recently was recognized for his "outstanding contribution to large space systems technology" and for two inventions related to the structures. (See related story, *Eight rewarded for inventions.)*

Collapsed, the model is a 15 by 8 inch bundle of lightweight epoxy tubes and gold-plated molybdenum wire mesh. Unfolded row by row, the tubes and mesh turn into a parabolic antenna 5 feet across and held rigid by the trusswork formed from the jointed tubes.

The space operational version would be built of the same materials, but on a scale 100 times larger. For example, a 600-foot diameter antenna can be built and reduced to a package 26 feet long when collapsed to fit in the cargo bay of space shuttle. Released in space, the antenna would be unfolded via remote control by shuttle astronauts.

"Antennas have applications in space for communications, radar, and Earth studies by radiometry," Tobey said. He added that the same basic design concept could be used to construct large space stations.

JA companies to organize

Junior Achievement companies sponsored by Martin Marietta Corporation will be organized the week of October 15 at the JA Sheridan Center.

The companies, operated by area teenagers, will elect officers and select products to be manufactured. Participants will learn all aspects of managing a business.

Division advisers for the young people are Wallace E. Goodwin, Robert Stanford, Robert Terrazas, Robert Ancell, Robert Rodriquez, Jarrett Peter, and Lyle Graff. Data Center employee advisers are Thomas G. Cook, Gerald P. Klein, Dennis E. Shaw, and Richard T. Mason.

Division leases space

First occupants of newly leased space in Greenwood Commons, at the southwest corner of the intersection of Interstate 25 and Orchard Drive, were moved into the space the second week in October. Computer installation also was begun then.

MX project personnel occupy 70,000 square feet of space in the new buildings.

Initially, telephone service is standard commercial service provided by Mountain Bell. Outgoing long distance calls will be processed through the division's main switchboard. Eventually, telephones in the new building will be tied into the division's system.

Commercial food service vending machines will be installed to provide hot and cold food, with selection changes planned for each day. Hot and cold beverages also will be available through vending machines.

Matching gift program improved

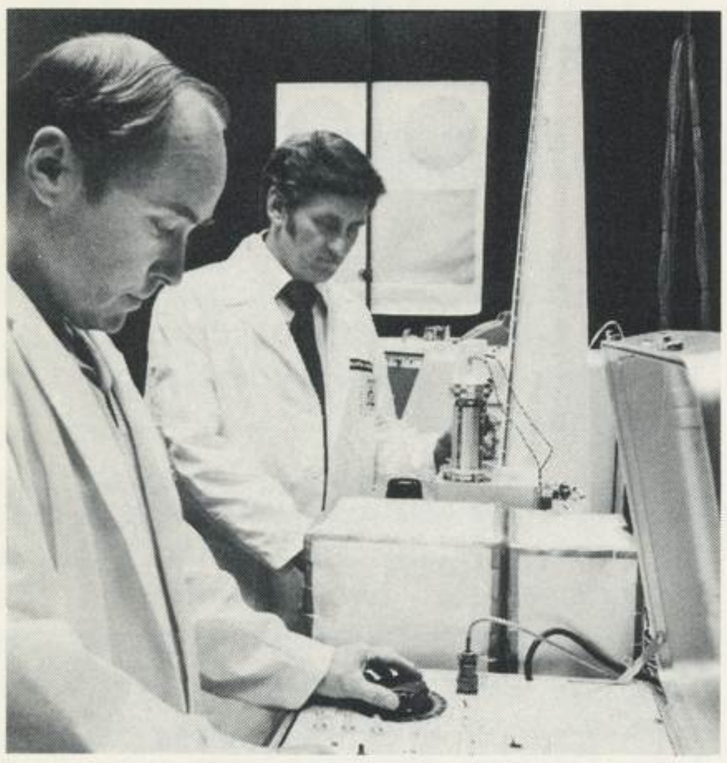
Martin Marietta Corporation has liberalized its program for matching employee cash gifts to colleges and universities.

For each dollar an employee gives to a qualifying school, the corporation will match it with two dollars. Formerly, the program matched gifts dollar for dollar. The matching gift program began in 1968.

The maximum gift by an individual to any one accredited institution has been raised from $1,000 to $2,000 per year. The minimum cash gift that will be matched is $25.

Institutions of higher learning to which gifts are made must be accredited by recognized regional accreditation organizations and have tax-free status under IRS regulations. Employee contributions under the program are tax deductible.

Information may be obtained from the training, education, and employee development office, SSB 409.



The Feature Identification and Location Experiment (FILE) undergoes final testing by Roger Schappell, right, principal investigator and FILE program manager, and technician Gordon White. The experiment has been delivered to NASA and is one of six experiments scheduled to be carried into space on the second space shuttle flight in 1980.

FILE delivered for Shuttle

The Feature Identification and Location Experiment (FILE), one of six experiments scheduled to be carried into space on the second space shuttle flight in 1980, has completed tests at the Denver Division and was recently delivered to NASA.

FILE is capable of selectively and automatically photographing particular portions of the Earth under certain prescribed conditions. Previous Earth resources satellites and experiments collected information indiscriminately. FILE will collect only the information desired.

Division technicians will aid NASA in the installation of the experiment in the shuttle orbiter.

The experiment is composed of a sunrise sensor, the FILE sensor unit containing two solid-state cameras and associated electronics, a 100 mm still camera, a buffer memory unit, and a tape recorder. The experiment will be installed on a 35.5 by 20.0 inch platform. The conical sunrise sensor rises 49 inches from the base. Total weight of the experiment is 84 pounds.

When the shuttle achieves orbit, orbiter cargo bay doors are opened, the bay is pointed toward Earth, and the experiment is turned on. It will operate autonomously until just before entry when the crew will turn it off. The sunrise sensor permits the experiment to operate only when passing over the sunny part of Earth. Images recorded by solid-state cameras will be stored on magnetic tape. Percentages of vegetation, bare earth, water, clouds, and snow in each image will be recorded. The still camera will take color photographs for postflight comparison with images recorded by the solid-state cameras.

The experiment is the first in a series of five increasingly more sophisticated experiments being designed by the division. The ultimate application of the FILE system will be to categorize portions of Earth according to surface features, determine percentages of cloud cover, point at and track specific areas, and point sensors to the area. For example, a future FILE system might be used to locate and track oil spills from space and then point pollution sensors at the spills. Such sensors are typically unable to perform this function.

Roger Schappell is principal investigator and FILE program manager for the division.

Recreation area improvement set

A capital expense request has been approved for immediate improvement of the Denver Division recreation area.

Work scheduled includes fences for softball fields, a sprinkler system, landscaping, permanent restrooms and showers for men and women as part of the exercise room, and a meeting room.

The work is the first part of a five-year long-range plan for upgrading the recreation area.

Recreation

Astronomy Club—An Astronomy Club organizational meeting will be held in the engineering cafeteria at 7:30 am Tuesday, October 16. The club's organization, frequency, nature of activities, and the first event—an observation party—will be discussed. Members and those interested in joining the club are asked to plan breakfast between 7:00 and 7:30 am and to attend the meeting between 7:30 and 8:00 am. For information call Stephen Grant, extension 4695.

Amateur Radio—The Waterton Amateur Radio Society will offer a course in amateur radio theory, regulations, and Morse code beginning October 23. Purpose of the course, to be held Tuesdays and Thursdays for five weeks, is to prepare students for the Federal Communications Commission novice class license. For information call Michael R. Manes, extension 4330, or David R. Roberts, extension 5689.

Floor Exercise, Dance Exercise—Demonstration of floor exercise and women's dance exercise will be given Thursday, October 18 at 10:30 am, 11:00 am, 11:30 am, and 12 noon in SSB 616. Floor exercise classes will be held from 5:00 to 6:00 pm on Tuesdays beginning October 23 for men and women. Dance exercise class for women will be held from 5:00 to 6:00 pm on Thursdays beginning October 25. Both classes will be held in the EMF cafeteria. Cost is $20 for one course or $35 for both. Checks (payable to Leslie Cooper) and registration forms must be turned in to the recreation office by October 17.

Disco Dance—Disco dance classes will begin Thursday, October 30, and will be held from 7:30 to 9:00 pm in the DSC lobby. Cost is $15 for the six-week course. Checks (payable to Gail Andresen) and registration forms must be turned in to the recreation office by October 26.

Basketball Leagues—Two basketball leagues, and a possible third, will be organized in a meeting October 15 in the engineering presentation room. Organized teams and employees interested should attend this 3 pm meeting. The competitive league will begin play Wednesday, October 17, and the open league Thursday, October 18, at Sheridan Middle School. If there is sufficient interest, a third league for women will be formed. Employees, on-site subcontractor representatives, and armed services personnel are eligible to play. More information may be obtained from John Anderson, extension 4609.

Parapsychology Club—Dr. Robert A. Bradley, noted lecturer and author, will be the guest speaker at the Parapsychology Club meeting Monday, October 15 at 5:00 pm in DSC 200K. The club normally meets the third Thursday of each month. Seating is limited for the Monday meeting, so those interested should call extension 4209 for reservations. Dr. Bradley, a Denver obstetrician, gynecologist, and psychic phenomena investigator, will speak of psychic experiences in everyday life.

Matzatlan Trip—Ten seats are available on a first-come, first-served basis for the November 17-24 trip to Matzatlan. Cost is $274 double occupancy. Contact the recreation office for information and reservations.

Artists to have show

The first in a series of art exhibits will open in the division library Monday, October 15, displaying nonwork-related paintings by senior illustrators in the division's graphics section.

"We want to make employees aware of the wide range of talent we have in the section," said Tim Brenner, who heads the group and will select the art to be shown.

The art will be hung so it can be seen from either outside or inside the library, with about six pieces in each exhibit.

The exhibit will be changed every 30 days.

Timothy Brenner and Wayne Williams discuss a painting Williams will have on exhibit in library.

70 earn rewards for referring new employees

Seventy employees have earned rewards in the division's employee referral program.

Among the 70 were two who did not look far from home to find qualified candidates: John W. Mathews Jr. recommended his wife, Carolyn, as a software engineer, and Gary Johnson referred his brother, Ronald. Both were hired.

Since midyear when the reward was increased, an employee receives $500 (less taxes) if the job candidate is hired and begins work within 60 days.

"We are engaged in a long-range recruiting program" R. E. Burnett, director of professional and industrial relations, said. "Each employee can help by referring qualified candidates for the many positions open."

Positions for which candidates may be recommended are in salary grade 43 and above. Lists of needs are posted on the glass-enclosed bulletin boards throughout division facilities. New college graduates are excluded as candidates.

All division employees, except vice presidents, directors, and professional and industrial relations personnel, are eligible for the referral rewards. Supervisory personnel are not eligible when recommending a candidate for a job directly under their supervision.

Employees may obtain applications for candidates from department administrators or the mail room.

Questions on the referral program should be directed to the division's staffing department, extension 7530.

PIC celebrates anniversary with open house

The El Segundo office of the payload integration contract (PIC) celebrated its second anniversary with an open house Friday, September 28.

After birthday cake and coffee were served, participants viewed space shuttle films and were briefed by PIC task managers.

Program director Alan L. Schaefle, hosting the event, commented that the program was in good shape and growing with the addition of a substantial mission operations effort. This effort will complement the PIC activities with the Air Force involvement in the space transportation system.

Eight rewarded for inventions

Eight employees have received cash awards for their inventions from the Denver Division's product development review board.

Among those earning awards was William H. Tobey, systems engineering, who was recognized for two inventions: "Remotely activated unfolding, recockable, structural joint mechanism" and "deployable fox truss structure." (See related article, *Division designing large expandable space antennas.)*

Others recognized and their inventions:

James C. Beblavi, engineering mechanics (assigned to mechanical/structural design at Vandenberg): Pyrophoric ignition system for extreme service.

Frank V. Bilek, engineering mechanics; and David N. Buell, Michoud advanced programs: Deployable parabolic antenna.

Clarence A. Ourada, test: Integrated requirements implementation system.

Gregory F. Kandel, software: Integrated requirements implementation system.

Dr. Robert B. Blizard, electronics: A method of modulation and signal processing for a microwave vapor detector and for intrinsically balanced, broadband microwave bridge vapor detector.

Jimmie D. Osborn, electronics: Technique for removing thermal errors from the near field facility.

John W. Mathews Jr., discusses his wife's new job. Carolyn Mathews was hired after her husband submitted her application through the employee referral program.

At Michoud

New computer system to save money, time

A new computer system being implemented for Michoud operations will avoid the expenditure of several million dollars over the next 12 years, replace about one-third of the existing management systems, and improve the quality and availability of data to the external tank project.

Home base for the new system is Slidell, LA, where about 40 Martin Marietta Corporation employees work in the NASA computer complex to provide data processing for Michoud.

The department provides data processing records required to support the external tank project, including application software, on-site technical expertise, hardware, and operating systems. Many reports generated through systems become working documents for Martin Marietta Corporation personnel.

According to Ron L. Hatfield, Martin Marietta Corporation manager of computer services at Slidell, implementation of the new integrated parts status system (IPSS) will take about two and one-half years. Design of the system has started and implementation is planned in 1981.

When IPSS is online, it will do the work of 15 current systems. With projected production rates in mind, IPSS will avoid expenditure of more than 1.5 million labor hours.

If current computer systems were used, costs could run as high as $6.5 million in paper and systems use alone. There would be 44 million pages of paper used. Even with today's production schedule there is so much paper that trucks transport it daily from Slidell to Michoud.

Once IPSS is implemented, a lot more than reduced paper costs will be realized. Redundant data will be eliminated, improved data accuracy will be achieved, and the system will be self-monitoring. Also, the system will be able to instantly stop all activity of an affected part.

Other benefits will include immediate access to information. For example, rather than read through 40 pages of data to reach a particular item on page 41, the new system will automatically go to the exact item and sequence.

A major difference in the new system will be significantly reduced labor costs. IPSS will eliminate the need for additional personnel to prepare and analyze data to meet increased tank production estimates.

With 491 NASA missions scheduled through 1992, the new system employed through the Slidell computer complex will be busy processing data necessary to lower expenses for the company and the external tank project.

New Orleans' famous Ponchartrain Amusement Park has for years been the center of attraction for millions of residents and visitors along the Gulf Coast. But on Saturday, September 8, the park was for one group only—more than 6,000 family members and friends of Michoud Operations employees at Martin Marietta Family Day at the beach. The order of the day was free rides for everybody, from the slow merry-go-round to the wild and crazy Ragin' Cajun loop-the-loop roller coaster. For the more timid there was the wet and slippery log ride or the Zephyr, another long-famous roller coaster in the South. And there were scores of rides for small children, or the beach of Lake Ponchartrain for those who brought picnic lunches.