

**NUMBER 11/1977**



**MX in  
Launch  
Position**



# MX validation test program awarded division

The division has less than a year to complete the design, build, and test the breakout and erection system for Missile X (MX) and other major components and subsystems for the proposed new buried trench weapon system.

Award of the contract was made recently by the U. S. Air Force Space and Missile Systems Organization (SAMSO).

The phase two contract calls for implementing tests the division recommended in a phase one, study contract.

In addition to work on this contract, the division is putting a major emphasis on preparations to respond to a request for proposal expected this fall for the assembly, test and systems support (ATSS) contract for MX.

"The ATSS will be the single largest bid the division will make this year," W. O. Lowrie, division vice president and MX project director, said. "We believe the MX is a major program. It is vital to the defense of the nation. It is a program that matches our capabilities. We are assigning a top-notch team of people with the right talents to win the ATSS.

"Our work on the phase one study contract for the ground vehicles and the performance we expect on phase two will demonstrate our ability and interest in the MX and should also lead to further work on the program," he said.

The recently awarded phase two contract is a big job in more ways than one, according to James A. Sterhardt, who is directing the work.

"It is big in the sense of the work required and also big in the sense of the size of the product," he said. "For example, the actuators that will move the 100-foot missile canister into launch position are about as tall as the SSB. For the test, we will build three full-scale actuators and a canister that ultimately will be put into the trench so we can actually break through the covering ground and raise the assembly into launch position."

The division will also design and build two nearly full scale blast plugs. The plugs, complicated devices to protect the missile and its launcher from the effects of an outside explosive attack, will each weigh about 200,000 pounds. Tests of the plugs are planned for June 1978 near Gila Bend, Arizona where the breakout and erection system will be tested in July 1978.

Third major component to be designed and built by the division for testing is the shock isolation system, a 12-foot



D. J. Hughes, program planner, arranges model of buried trench weapon system showing, from top to bottom, the transporter/launcher with canister elevated, the mobile launch control center, and transporter.



Phase one study for MX produced concepts for above ground vehicles for a shelter-based weapons system. The models depict the vehicle transport, mobile launch control center, and the missile launch vehicle with the missile canister in launch position.

sophisticated landing gear that will support the MX transporter/launcher in liquid spring suspension. Its purpose is to isolate the launch from ground shock and allow it to return almost immediately to its original position. Test of this system will be conducted in May 1978 in a laboratory capable of producing shock waves the system would encounter during an attack, and again in the summer of 1978 at Gila Bend.

Working with Sterhardt in key positions on the program are H. E. Sparhawk, Jr., deputy director for technical activity; Robert L. Rosenthal, deputy director for operations and test; Loman T. Park, who is leading the breakout and erection test and the mechanical propulsion functions; Joseph C. Pohlen, heading the shock isolation system work and the structures/dynamic design; Kenneth H. Farley, leading systems and studies as well as electronics instrumentation; Arch G. Cousins, liaison with SAMSO at San Bernadino; Roland J. Booth, manufacturing; Randall L. Williams, quality assurance and safety.

## On the move

D. E. Olsen: from general supervisor production control to chief, material control with responsibility for inventory management and control, receiving, in-plant transportation, packaging and shipping, surplus and conservation.

## Don't say it on the phone

"Always assume someone is listening when you are discussing business on the telephone," William L. Miller, chief, security and plant protection, has urged division employees.

"Recent news reports have made it clear that others are listening to business telephone conversations and we at the division are not immune to this kind of eavesdropping," Miller added.

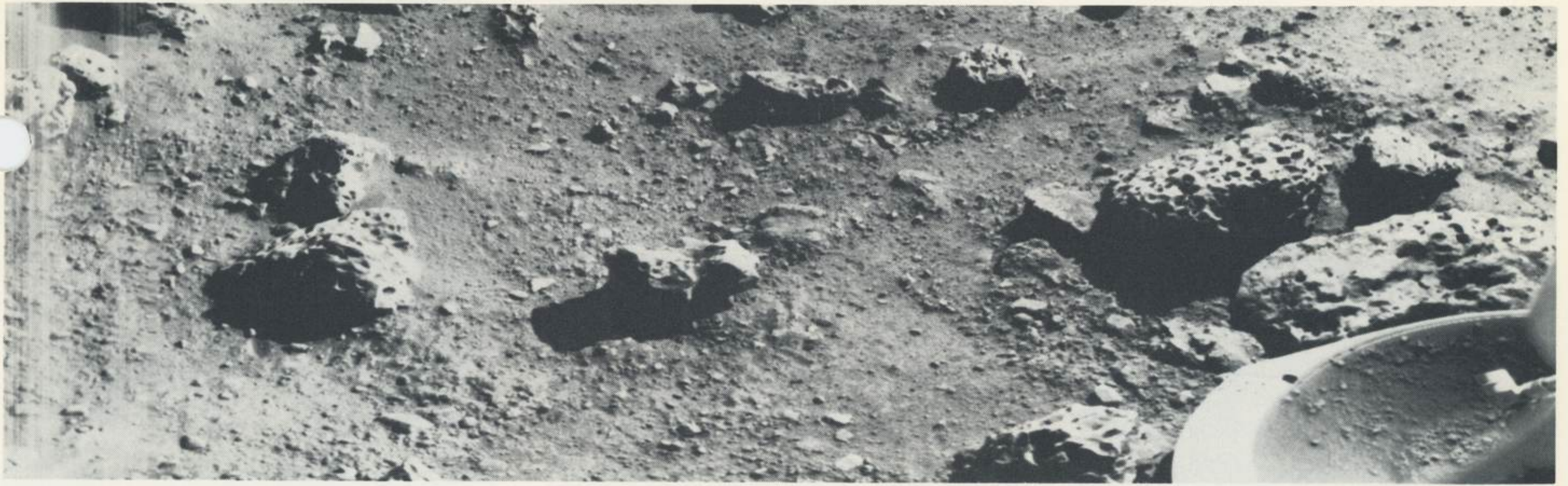
A good guideline to follow in telephone conversation is not to talk about anything that could not reasonably be made public.

"Never discuss classified information with anyone on the telephone," Miller warned. "And don't attempt to use double-talk or jargon to get around the prohibition on discussing classified information."

Equally important to the division's business is the proprietary information about our work. Guard this information in the same way as classified material when talking on the telephone.

"It is imperative that all employees observe these secure telephone habits both on inplant and outside calls," Miller said.





## Viking landers active after year on Mars

It was just a year ago that the U. S. began exploration of the surface of Mars. Viking 1 had landed successfully July 20 and scientists and the mission operations team were anticipating a similar success with Viking 2. They were not disappointed.

The original Viking mission plan was for a 90-day investigation, but both spacecraft are still returning valuable scientific data. Their soil analysis laboratories are filled with Martian dirt and pebbles and the work of these laboratories has been terminated. However, the spacecraft are making daily weather and seismic readings and are periodically photographing the surrounding surface and sky.

"It is testimony to the skill and precision of the design and construction effort that went into the spacecraft," C. B. Hurtt, vice president and general manager of the Denver division, said. The division was the principal industrial contractor to the National Aeronautics and Space Administration for the Viking landers, the scientific experiments, the mission integration, and the mission operations.

"The original plan was for the landers to work for 90 days," Hurtt said. "Now, NASA is considering plans to extend their operations into a third year.

"I believe the nation's investment in planetary exploration is returning handsome scientific dividends," Hurtt concluded.

Thus far, only one of the 14 experiments aboard the two Vikings has not returned data. That instrument is one of a pair of seismometers. Its twin is operating well and has recorded several Marsquakes, and is providing scientists with interesting facts about the subsurface of Mars.

During their first year on Mars, the Viking landers have returned more than 2,500 surface photos in color, black and white, infrared, and stereoscope. The soil sampling arms have picked up 71 samples of Mars soil and rock (more than five pints of material) and processed a large portion in miniaturized biology, organic, and inorganic laboratories inside the spacecrafts.

The sampling arms have pushed aside six rocks in a search for microbial life that might be hidden beneath them.

The spacecraft have made daily Mars weather reports to Earth, telling scientists atmospheric pressure, wind speed and direction, and temperature, allowing the scientists to predict weather on the planet. Weather on Mars is consistent, changing little day to day. On a typical day in July at the Viking 1 landing site, the high temperature was minus 62 degrees Fahrenheit and the low was minus 140 degrees Fahrenheit. Wind was light at 6.6 miles per hour with gusts to 16 miles per hour.

It is now midwinter in the northern hemisphere of the planet where both Vikings landed. Viking 1 is in normal operation at the warmer, equatorial Chryse Planitia landing site. Viking 2 is farther north at the colder, wetter Utopia Planitia site. Because of the severe cold there — minus 175 degrees Fahrenheit — lander 2 has been placed in automatic reduced operations using all its energy to keep warm. It will be reactivated when spring comes in early October.

It is cloudy around the landers so neither of them can see the Sun. Cloudiness this time of year is caused by heavy dust in the air stirred up by high winter winds.

A brief list of Viking's most significant findings to date includes:

*First picture on the surface of Mars by Viking 2 was taken minutes after the spacecraft landed September 3. The scene revealed a wide variety of rock littering a surface of fine-grained deposit. The lander's footpad is shown at the lower right in the photograph. Lander 1 and lander 2 are completing their first year on Mars.*

- The detection of nitrogen, argon, krypton, and xenon on the planet
- Accurate measurement of daily weather conditions
- Identification and measurement of elements in the Mars soil
- A total absence of organic material
- Discovery that seven percent of the Mars surface material is magnetic
- Photographs and other data which indicate large amounts of water once flowed on Mars
- Evidence that the north polar cap is made of water ice
- Accurate analysis and measurement of the complex Mars surface chemistry
- Complete mapping of the Mars surface in detail, using cameras in the Viking orbiters

According to Calvin Broome, Viking project manager for NASA, the two Vikings still show few signs of growing tired. Mission planners are already beginning to plan another extended mission to follow the current one which ends June 1978.

"We don't plan to ease up on the landers until we bring back the last piece of data," he said recently, "and the way they are working now we don't know how long that will be. . . maybe one or two more years."

### MARTIN MARIETTA NEWS

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# Beetle control program underway

The Denver division's Rocky Mountain Pine Beetle control program, under the direction of Thomas W. Johancen, has been racing against time to cut and spray trees affected by the pine beetle before the larvae mature.

During the past five years the front range of the Colorado Rockies has been faced with an infestation of *dendroctonus ponderosae* of epidemic proportions.

The efforts of Johancen's crew must anticipate the effects of the pine beetle's flight from mid-July to late September. Flying several miles, the mature female spreads the disease by leaving blue stain fungus in the holes bored in Ponderosa pine and Lodgepole pine when it lays its eggs. The fungus blocks and clogs the water conducting tissues of infested trees which die in the spring when warmer weather renews the growth cycle.

The pine beetle control program is a continuing program, required for several years to eliminate the threat to company property and neighboring properties.

The program began in early spring with surveying of the affected areas in the hills above the plant on Martin Marietta property. Road maintenance and repair, as well as cutting of new access roads, was done by Don Miller's crews as soon as heavy snows and stream runoff ended. Cutting, limbing, and spraying began as soon as the survey and marking were completed in order to finish before the flight of the mature beetle.

The control program work was done largely by young people hired for the summer like Mark Catron, a senior forestry student from Colorado State University who walked the entire control



Mark Catron checks a tree for beetle infestation by cutting away a section of bark. He was aided in the survey by Jack Bird and Scott Asnir.



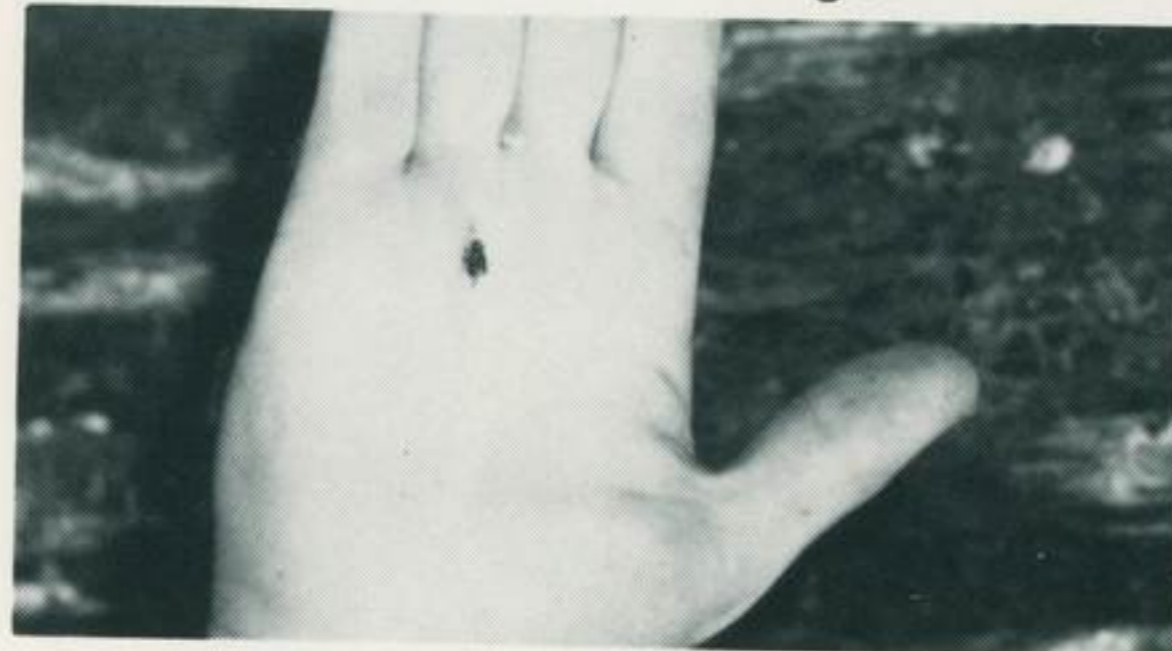
Mt. Warren, elevation 8001 feet, is totally on Martin Marietta property and is part of the 2900 acres of forestland surrounding Denver division facilities being checked for pine beetles.

area and marked 270 trees for cutting. Assisting Mark have been two young men hired through the National Alliance of Businessmen's program for youth. Maurice Robinson and Gilbert Fernandez have done much of the limbing, positioning, and spraying of the logs.

Training for the program is conducted by the Colorado State Department of Forestry, the United States Forest Service, and the division's maintenance department. Before work began in the field, the men were trained in cutting and spraying as well as safety procedures. Regular safety talks were scheduled each morning at the start of the shift. Strict fire control measures were observed, and radio communications with Security maintained.

On the site, infested trees were marked; then felled, limbed, and trimmed to 5-6 foot sections. The logs were sprayed with a mixture of lindane insecticide and diesel fuel, which kills the larvae. After 60 days the spray has dissipated and the wood is suitable for use as firewood.

Efforts of the Rocky mountain pine beetle control program have far reaching effects, for without the controls the program applies to the spread of this disease, there might be a total loss of the pine trees on the front range.



The Rocky Mountain pine beetle, being held in front of a tree it had infested, is about a quarter of an inch long.

## Top safety award goes to employee at Cape Canaveral

R. N. Halcomb, chief safety engineer for the division's Canaveral flight operations, recently received the Space and Missile Test Center (SAMTEC) Commander's Safety Award as the "best contractor individual" for 1976. The award was presented by Col. John C. Bricker, commander of the 6555th Aerospace Test Group.

The SAMTEC Commander's Safety Award is presented each year to a SAMTEC contractor employee whose individual dedication, skill, and overall safety achievements have significantly enhanced the SAMTEC safety record and safety program.

Among the accomplishments for which Halcomb was cited:

- During his 10 years as chief safety engineer, Canaveral flight operations has received 16 awards for outstanding safety records
- Canaveral flight operations has had no lost-time injuries since July 1970, with employees working 4,366,343 manhours since then
- He has prepared several publications in use by Martin Marietta personnel, including a Supervisor's Safety Manual, Handbook of Liquid Propellants, and ITR Railroad Safety Procedures
- He has lectured at Brevard Community College on safety engineering principles
- He developed and implemented the Canaveral flight operations employees' safety committee
- His development of a video cassette Titan III propellant safety lecture system has reduced lecture manhours and satisfies a launch pad personnel entry prerequisite.

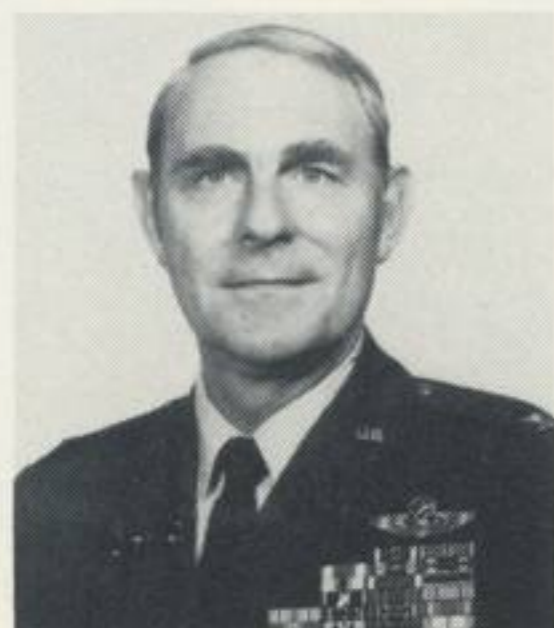


Maurice Robinson and Gilbert Fernandez spray beetle-infested logs with a lindane and diesel fuel mixture. After about 60 days, logs can be used for firewood.



## New Air Force plant representative comes to division

Col. Gerhard L. Schopen has been named Commander of the Air Force Plant Representative office at the Denver division replacing Col. William A. Smith, who retired.



Colonel Schopen

Air Force personnel are assigned to aerospace industrial facilities engaged in government contracts when such contracts are "considered important enough for added emphasis on contract performance and product quality."

Colonel Schopen comes to the division from a similar position at the Fort Worth division of General Dynamics. Prior to that during 1971-72 he was deputy Air Force plant representative at Boeing in Seattle for the AWACS program, and in 1973 was named deputy commander of the Air Force contract management division at Boeing. He moved to General Dynamics in 1974.

During World War II, Colonel Schopen was with the U. S. Maritime Service with duty in the Atlantic, Pacific, and Mediterranean theaters of operation. He became an Air Force aviation cadet in 1949 and was commissioned a second lieutenant in 1950.

Assigned to the 93rd Bombardment Wing at Castle AFB, California from 1950 to 1958, he was an aircraft commander and an instructor pilot in strategic operations.

From 1959 to 1963, Colonel Schopen was chief of flight test operations for the Air Force at the Boeing plant in Wichita,

Kan. In 1965, he was air operations staff officer for the directorate of operations for Headquarters, AFSC.

He began a combat tour in southeast Asia in 1966 and flew 291 combat sorties as an airborne forward air controller. Returning to the U. S. in 1967, Colonel Schopen was assigned to Air Force headquarters at the Pentagon.

While assigned at the Pentagon, he was a staff officer in the area of operational testing and evaluation and directed the combat evaluation of the O-2, OV-10, and AC-119 gunship aircraft.

Colonel Schopen is a graduate of Modesto College, the USAF Instrument Pilot Instructor School, and the Armed Forces Staff College.

He has been awarded the Legion of Merit; the Distinguished Flying Cross with one oak leaf cluster; the Bronze Star; the Purple Heart; Air Medal with three silver and three bronze oak leaf clusters; the Meritorious Service Medal; and the Air Force Commendation Medal with one oak leaf cluster.

### On the cover

The model depicts one concept for breakout and erection of the MX cannister into launch position from a buried trench. (See story *MX validation test program awarded division* on page 2.) Device at right pushed the cannister through trench roof and actuators raised cannister to launch position.

## Director named for planning, control

Thomas M. Crawford Jr. has been named director, planning and control for the division.



Thomas M. Crawford

Crawford, a retired U. S. Air Force colonel, will be responsible for planning, central program control, integration of project reports, reporting of program status, and early identification of problems.

Crawford's assignment before retirement was as assistant deputy chief of staff, plans and programs, for the North American Air Defense Command and Aerospace Defense Command, Peterson Air Force Base, Colorado.

From 1964-68 he worked on the Apollo space program at NASA headquarters, progressing from headquarters project analysis officer for the lunar module, to manager of the spacecraft planning and analysis group, to chief of Apollo program planning.

Crawford began his military career in the Army Air Corps aviation cadet program and was commissioned a second lieutenant in 1945 as a navigator. He served as a navigator instructor before accepting an appointment to the U. S. Military Academy.

He graduated from West Point in 1949, completed pilot training and had a tour as an advanced pilot instructor.

Crawford served in Korea in 1952-53 as a forward air controller and as squadron operations officer. In 1955 he was transferred to the newly formed U. S. Air Force Academy at Lowry Air Force Base as a military training officer and later as an air officer commanding of a cadet squadron.

When the Academy moved to its permanent home in Colorado Springs, Crawford went to the University of Colorado for advance study, earning an MS degree in mechanical engineering in 1960.

He has served in the directorate of space, research and development at Headquarters, U. S. Air Force, first as chief of the development division and then as deputy director for space.

Crawford has been awarded the Legion of Merit with two oak leaf clusters; Distinguished Flying Cross with one oak leaf cluster; Air Medal with seven oak leaf clusters; Air Force Commendation Medal with two oak leaf clusters; Army Commendation Medal; and the Republic of Vietnam Cross of Gallantry.



Thomas S. Fujiyoshi, right, director of Vandenberg flight operations, talks with Laurie Lee West, winner of a Martin Marietta Foundation Scholarship, and her parents Gordon and Virginia West. Laurie was

awarded her scholarship at special ceremonies at Santa Maria High School where she is a senior. Her father is a mechanical engineer at the division's Vandenberg Air Force Base facility.



## Company sponsors minority purchasing group

Martin Marietta is officially sponsoring the Gulf South Minority Purchasing Council for fiscal year 1977. Serving as president and vice president of the council are Vernon P. Brett, chief, procurement support, and Wayne E. Wright,



Wayne E. Wright, president of Gulf South Minority Purchasing Council, at left, confers with Vernon P. Brett, vice president, and Dennis Duclaux, executive director of the council, at right.

minority subcontract specialist of the materiel operations department.

Formed in 1972 by a group of concerned local purchasing executives in conjunction with the U. S. Office of Minority Business Enterprise, the primary functions of the council are to help corporations locate and work with qualified minority suppliers.

The Gulf South Minority Purchasing Council, more than 50 of the larger New Orleans corporations now represented, promotes corporate minority purchasing policies, establishes ways to identify minority suppliers able to fulfill corporate requirements, and assists growing minority-owned companies to become sources of supply.

MARTIN MARIETTA

# news

MICHLOUD OPERATIONS



Young artist Carl Lauto poses with a more conventional mode of transportation than was portrayed in his painting.

## Employee's son wins art contest

Carl Lauto, 8-year-old son of Anthony Lauto Sr., a senior engineer in the facilities and plant services organization at Michoud operations, recently won a top award in a national Cub Scouts arts contest.

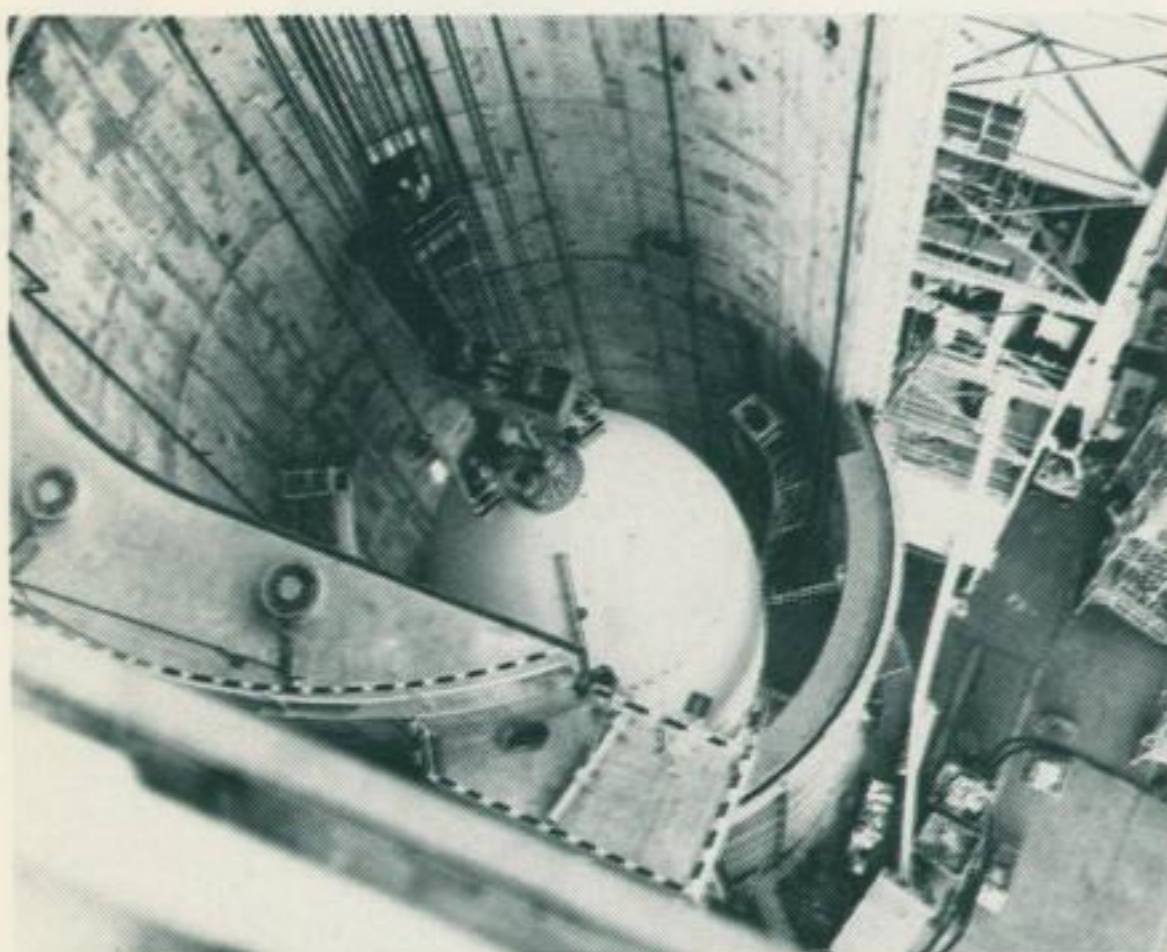
Carl was one of 18 national winners and the sole winner from Louisiana in the competition funded by the National Aeronautics and Space Administration.

Carl's winning watercolor pictures a rocketship leaving Earth for a house in the sky. Carl explained that the passengers were returning to their home in space after shopping at a supermarket on earth.



The first ladies softball team from Michoud operations has completed a winning season with a 7 and 3 record. Their second place finish in the Greater New Orleans Athletic League took them to the Women's Softball Championship playoffs where they placed seventh in the 36-team tournament. Shown in the

top row from left to right are: Pete Gomez, Doyle Carr, Arlene Mouton, Wilda Miller, Doris Gray, Ruby O'Neal, Pam Sherlock, Marlene Crews, Randy Tassin, and Rey Abadie. In the bottom row are Claudia Stein, Debbie Sloan, Cindy Reynolds, Cindy Miller, Janet Alvarez, and Gale Howell.



The forward section of the external tank, which includes the liquid oxygen and intertank, is shown (left and center) being removed from Cell B of the vertical assembly building. The final thermal protection system application having been made to the inner tank, the forward section was positioned (right) in the aisle for additional instrumentation.

