

MARTIN MARIETTA

news

DENVER DIVISION

NUMBER 5/1978



Michoud's Shirley Kirk sings the National Anthem before 18,000 people in the Louisiana Superdome prior to the recent New Orleans Jazz vs. Denver Nuggets basketball game. The event was Martin Marietta family night on Easter Sunday. Mrs. Kirk is executive secretary to Allan M. Norton, director of engineering at Michoud.

Skylab reuse to be defined in study by Denver Division

A study to define the benefits of reuse of Skylab and the costs necessary to reactivate the spacecraft is in progress in the Denver Division.

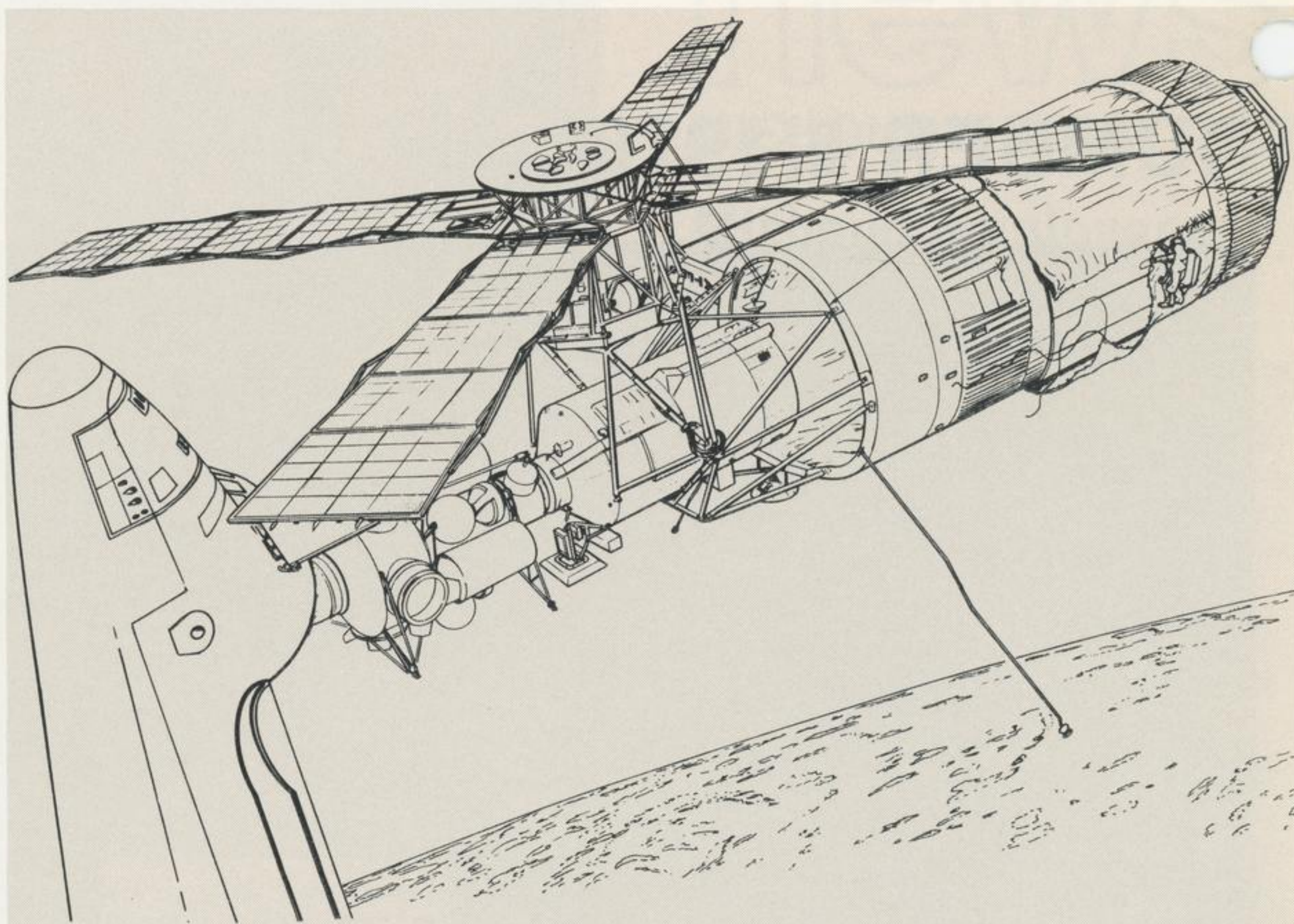
The program, under a contract from NASA, is being managed by J. Kent O'Kelly, who reports to Paul Plank, manager of space platform programs.

Results of recent NASA tests show Skylab to be "in good health," and that critical components, including the computer controlling its attitude are working.

"From our study, which is now about one-half complete, we believe Skylab has a good potential for long duration manned operations to supplement Space Shuttle," O'Kelly said. "We are looking carefully at costs so that we can provide NASA with solid information on which to base a decision."

As planned, NASA will decide in mid-1978 to officially request funding for a Skylab reuse program to start in the 1980 fiscal year. If the decision is made to reuse Skylab, the spacecraft will be refurbished in 1982 and 1983 with manned operations planned for a 1984 beginning. It is expected the vehicle may be used for about 10 years.

The primary uses foreseen for Skylab are to provide crew quarters for extended missions and a large stable platform for payload operations. Skylab complements the Shuttle orbiter by providing increased volume, private sleep areas and additional food and hygiene facilities. During the extended missions, a broad range of payloads will be operated on the orbiter, attached to Skylab itself, or moved into the Skylab. The current



A new interface module is shown in this artist's concept. The module is required to permit Shuttle orbiter to dock with a reactivated Skylab.

study shows that it is feasible to operate all payload disciplines, including astronomy, life sciences, space processing, and solar/terrestrial investigations from Skylab.

Those working with O'Kelly on the study are Rudolph C. Haefeli, Martin G. Winter, James Allison, and Ernest G. Littler. Bendix Corporation is teamed with the division on the study, providing support similar to that given on the original Skylab program.

It is anticipated additional definition work will be conducted by the division in fiscal year 1979.

Counsel named for Division

Jacques H. Croom, has been named Denver Division counsel. He was formerly assistant general counsel for Martin Marietta Aerospace, a position he had held since January 1975.

Before accepting the Aerospace headquarters position he had been assistant general counsel for the Orlando Division.

He joined Martin Marietta in 1967 after serving as attorney for Dynallectron Corp. and the Southern Railway System.

Croom received his Juris Doctor degree from the University of North Carolina law school in 1959. He is a member of the Federal Bar Association, the North Carolina Bar Association, and Phi Alpha Delta law fraternity.



Jacques H. Croom

Your insurance

This is the first in a series in which the most common questions about the Martin Marietta insurance program are discussed.

Question: Do we have dental coverage?

Salaried employees, both exempt and non-exempt, have coverage for extractions and a few oral surgical procedures. Details are in the insurance booklet, page 67 for exempt employees and page 65 for non-exempt employees. The items listed on these pages are the ones covered for dental work and oral surgery.

Hourly in-unit (union represented) employees are covered by a different plan. Generally, there is a \$25 deductible per person per calendar year with a \$75 maximum deductible per family per year. A maximum of \$1,000 will be paid for each person per year for covered expenses. Services covered and the maximum payable for each service are listed on the last page of the insurance booklet for hourly employees.

Treatment for an accidental injury to a sound tooth is covered under the medical catastrophe provisions of the company's insurance program.

Division to lease additional space

Increased business and with it increased employment is requiring the Denver Division to lease additional offsite space.

From late May to mid-June some organizations will be moved to the West Point office building in Academy Park south of the division's systems center building on Wadsworth near Hampden.

Space is being leased on the first, second, third, and fifth floors of the West Point building.

Division functions scheduled to move are legal, contracts, finance, procurement, and NASA programs. Also occupying space at the facility will be Denver Data Center management and non-operating functions.

Martin Bowland, who is supervising the move, said employees may use the independently operated cafeteria in the West Point building or the division's cafeteria in the Denver Systems Center.

The shuttle bus operating between the main plant and the DSC will serve the West Point building.

"We will move copy machines to the new space and plan to install a satellite reproduction facility in the DSC for use by organizations there and in the West Point building," he said.

Telephones at West Point will be part of the division's Centrex system that recently was expanded to serve the DSC.

Division functions in the DSC now are Missile X, NASA programs, the MIOC proposal team, and the employment and wage and salary administration organizations of the professional and industrial relations department.

Division tape recorders ready for SEASAT assignments

An iceberg bearing down on a North Sea oil rig is diverted from its collision course, a U.S. Navy ship sets a more precise course for its next port in the Pacific, and an oceanographer is getting wave height measurements from the Atlantic all at the same time. None of this has happened as yet, but later this year events like these may be occurring.

The Navy will launch SEASAT, an ocean survey satellite in May, and data from the satellite will be recorded by high rate, high density tape recorders produced by the Denver Division.

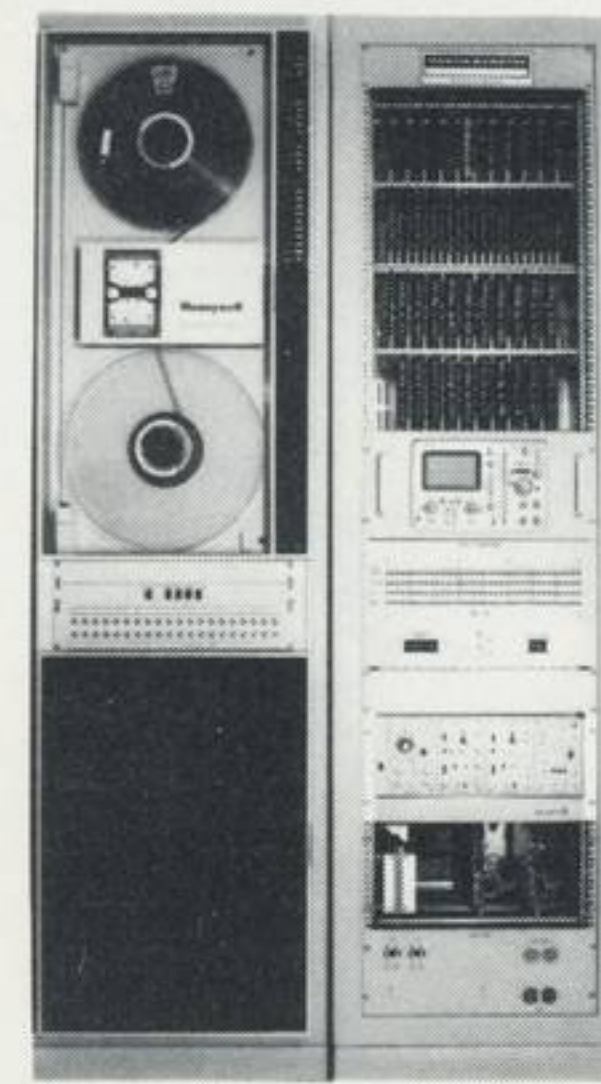
Ten of the tape recorders, which pack one million bits (one million single digits) per square inch of tape at 120 million bits per second, have been delivered for ground station installation.

The recorders are to be used in conjunction with the synthetic aperture radar aboard SEASAT. The radar will be able to penetrate ocean cloud cover and obtain data not available by standard photo optic processes.

The cloud penetration and rapid recording of data is especially important in the North Sea where clouds blanket the area in winter and make normal observation of iceberg movement and efforts to change their course, or objects move out of their way difficult.

Ground stations for SEASAT recorders are in Alaska, at Goldstone and Merritt Island, in Canada, and in England. Others are proposed for Norway and the Grand Canary Islands.

Somewhat slower recorders, 110 million bits per second, have been installed for the Jet Propulsion Laboratory's deep space network and will be used to record data from Pioneer Venus probes into the Venus atmosphere.



SEASAT recorder is 120 million bit per second machine.

Seventeen 20 million bit per second recorders produced by the division are being used for data collection from Landsat at U.S. stations, four have been installed at an Iranian station, two others are being built for Japan, and future installations are proposed for Argentina, Australia, the Upper Volta region of Africa, and in India.

Three Landsat satellites are in orbit.

A fourth Landsat is planned and the division will provide two 120 million bit machines for use with its thematic mapper, a program for thermal mapping of the Earth.

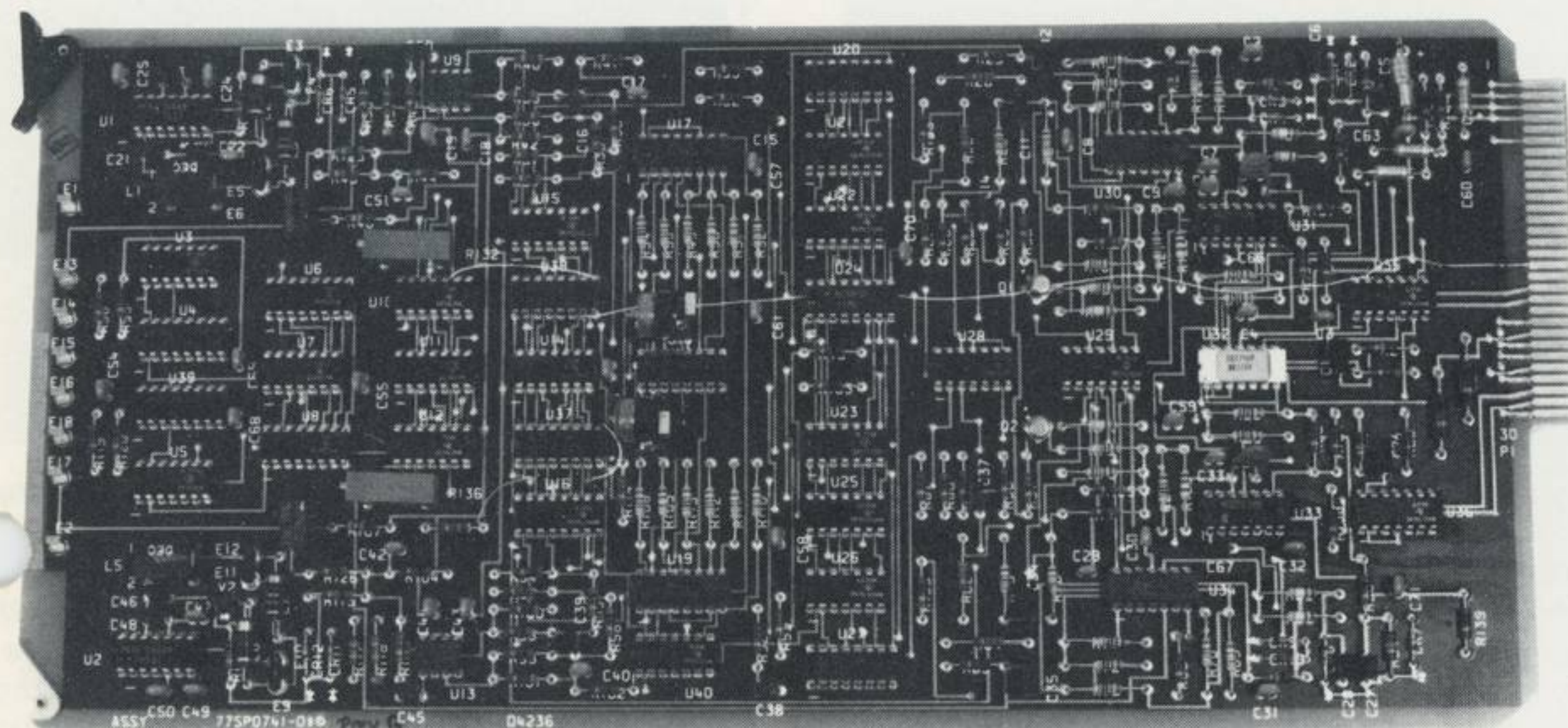
With higher rate, higher density requirements also came higher reliability requirements. The permissible error rate is one error per million bits. Research is going on that would reduce error even further. Division engineers are working to reduce errors to one per 100 million bits.

Development of even higher speed recording is underway in the division's independent research and development (IRAD) program. By synchronizing parallel machines, researchers anticipate being able to record data at from 500 to 1000 million bits per second.

Shipboard and airborne installations also are being studied, particularly for navigational uses.

Another version, an 80 million bit machine, is being proposed to record heartbeats of cardiac patients so the rate and strength of the heartbeat can be analyzed by a computer — and the analysis repeated, a function not now possible.

A 50 million bit per second machine is being studied that will record lightning bolt data for computer analysis.



Division has reduced size, weight, and cost of data synchronizer board for tape recorders.

Instrument business growing

Although Denver Division scientists have been involved in space science programs for more than 12 years, "we backed into the business of building instruments for the programs," S. L. Russak, chief of the electronics department's payloads and sensors section, said.

"Both Skylab and Viking carried an extensive array of instruments and we found it more convenient to build some of them rather than have them supplied by other contractors," Russak said. "That's what I mean by backing into the business."

On Viking, for example, the division built the x-ray fluorescence spectrometer; two temperature probes, one mounted on the aeroshell and the other on a lander leg; and the soil sampler, an instrument adjunct.

"We found ourselves in the instrument business and liking it," Russak said. "We began casting about for more of this kind of business and won a contract to build the solar flux radiometer for the Pioneer Venus project.

"We started late, finished first, received many letters of commendation, and, with the solar flux radiometer, established our reputation as an instrument builder. We had arrived in the instrument business."

Concurrent with that success, the division began building a series of photon counting filter photometers and spectrometers to operate in the ultraviolet spectrum. The instruments use a new kind of imaging detector, a digi-

con. Six of the instruments have been delivered and four have flown.

The same kind of detector will be used on a recently won contract for the faint object spectrograph, an instrument to be used on space telescope.

The division pioneered the space use of digicon, a solid state photo multiplier, and also developed the signal processing technology used with it.

Work is underway on a bid for a sister instrument of the faint object spectrograph, the high resolution spectrograph.

Other proposals are being prepared to compete for contracts to design and build an atmospheric structure instrument for the Galileo program Jupiter probe and for a nephelometer, a device to measure cloud layer characteristics in the Jupiter atmosphere. The two proposals will be submitted in mid-April.

The payloads and sensors section is building an experiment consisting of a series of detectors to be mounted on the focal plane of a large telescope now being flown on a C141 aircraft. Purpose of the instrument is to take snapshots of the Space Shuttle orbiter on reentry. The snapshots will measure the extent to which the orbiter heat shield has been over designed. The division is also providing a small acquisition telescope for the program.

"We know the heat shield has been over designed," Russak said. "Over design was the conservative and proper thing to do."

By measuring the amount of over design, the heat shield weight may be reduced by as much as 6,000 pounds. The weight saved could be added to the payload weight the orbiter could carry.

Clifford J. Choccol is program manager for this project, called IRIS for infrared imagery of Shuttle.

Dr. Frank Bartko is program manager for the faint object spectrograph and his deputy is Kenneth H. Schlichtemeier.

Other key personnel and their assignments in instrument programs:

Dr. Joseph P. Martin is program manager for a unified chemical and biological soil analyzer, a biological instrument for the next Mars lander — if and when that vehicle makes the trip to Mars.

Dr. Benton C. Clark is the principal investigator on the Viking x-ray fluorescent spectrometer and continues to analyze data from that instrument.

Ludwig G. Wolfert is program manager for a portable x-ray spectrometer for mineral exploration.

Management development reemphasized

The Denver Division's management development program is being given new emphasis as the need for highly developed management skills increases.

Working with the first group of individuals nominated for the program, Harry Baum, head of management development, is formulating individual plans that meet short and long-term job objectives and are tailored for each individual.

"We are following a series of steps that provide the employee greater job knowledge, help to improve confidence, and give greater exposure to the needs and management functions of the business," Baum said.

Three steps are being followed by employees in the program. One is *career work experience* in which current position assignments are used to build a solid foundation for the next immediate assignment as well as for future assignments.

Second of the steps is the *career reinforcement assignment*. In this phase, work experience is expanded, there is programmed on-the-job training, special assignments are arranged, and academic training in onsite classes or at colleges and universities is added.

Employee initiated self-development is the third step and usually includes workshops, seminars, and formal classroom work.

Individuals in the development program have their progress evaluated twice a year.

Individual plans are agreed to by the individual and approved by two management levels above the individual as well as by the management development office.

"The division is attempting to provide each individual in the program an opportunity for growth," Baum said. "We are taking into account individual differences and developing specific and well thought out plans for each individual."

Titan launch is unsuccessful

The launch of two military communications satellites aboard a Titan IIIC was unsuccessful March 25. Cause of the failure is under investigation.

The mission was aborted eight minutes after the scheduled 1:09 pm (EST) launch.

This was the fifth unsuccessful launch of a Titan IIIC and only the sixth incomplete mission in 110 Titan flights.

The Denver Division produced launch vehicle has become a space booster workhorse with four Titan IIIA flights, 56 by Titan IIIB, 28 Titan IIIC, 15 Titan IIID, and seven Titan IIIE.

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Mrs. Emilda Pichon, administrator, Slidell Memorial Hospital, receives a \$3,000 check from William T. Gansert, director of production operations, at Michoud. The money is a Martin Marietta Corporation Foundation gift to support the hospital located in Slidell, La. where many Martin Marietta Michoud operations employees live. The hospital will use the gift to purchase a cardiac output computer, a device used in the treatment of heart disease.



Stuart Hodes, executive director of Junior Achievement of Greater New Orleans, seated right, receives a \$500 check from William P. Ewig, seated left, director of resource management at Michoud operations. The check is a Martin Marietta Corporation Foundation gift to support Junior Achievement in New Orleans in 1978. Standing, from left, are William V. Willis and William T. Brown who are coordinators for Martin Marietta's Junior Achievement program at Michoud.

Gold medallion awards presented at Vandenberg

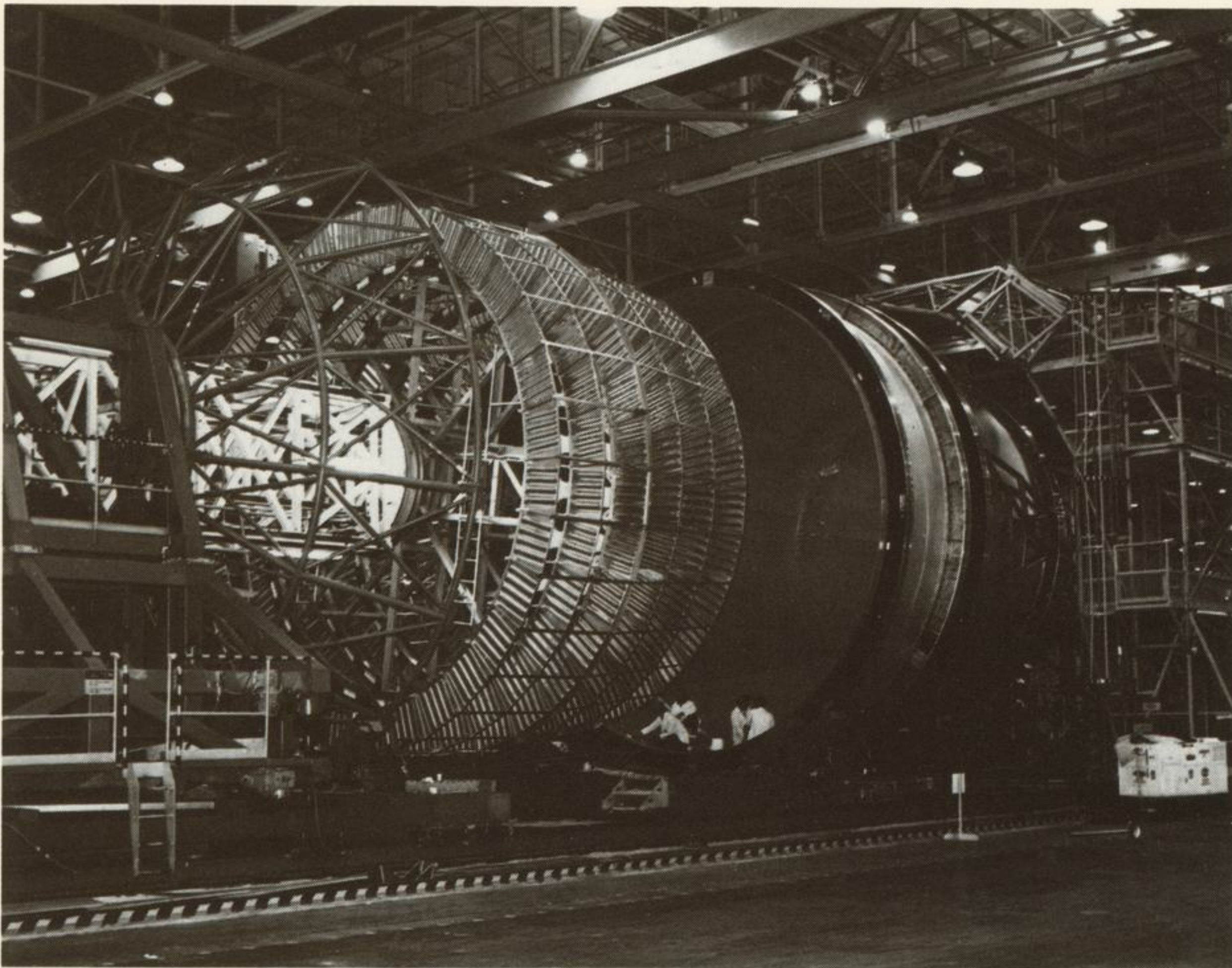
The seventh annual Vandenberg operations Gold Medallion awards banquet was held recently at the Madonna Inn in San Luis Obispo. Awards for the Department of Defense Space Transportation Systems were presented by GSS project director R. D. Rhodus, while T. S. Fujiyoshi, launch vehicles deputy for expendable systems, presented the launch vehicle awards.

In addition to a gold medallion and certificate, R. B. Hooley was awarded top money in recognition of his outstanding performance during the December fire emergency at Vandenberg. T. E. McGee and R. Sizemore received the flight readiness award, with the flight success winners being J. R. Avello and C. A. Sousa. Also receiving monetary awards for sustained and innovative performance were ground support systems employees R. S. Ingerson, J. Havrisik and D. J. Courain.

Gold medallions were received by E. E. Dunn, B. Picasales, A. J. Heller, W. A. Simmons and W. F. Davis for the GSS Project; and G. C. Lauterback, D. H. Brandon, J. J. Brawner, D. N. Loats and R. E. Scolari for launch vehicles.

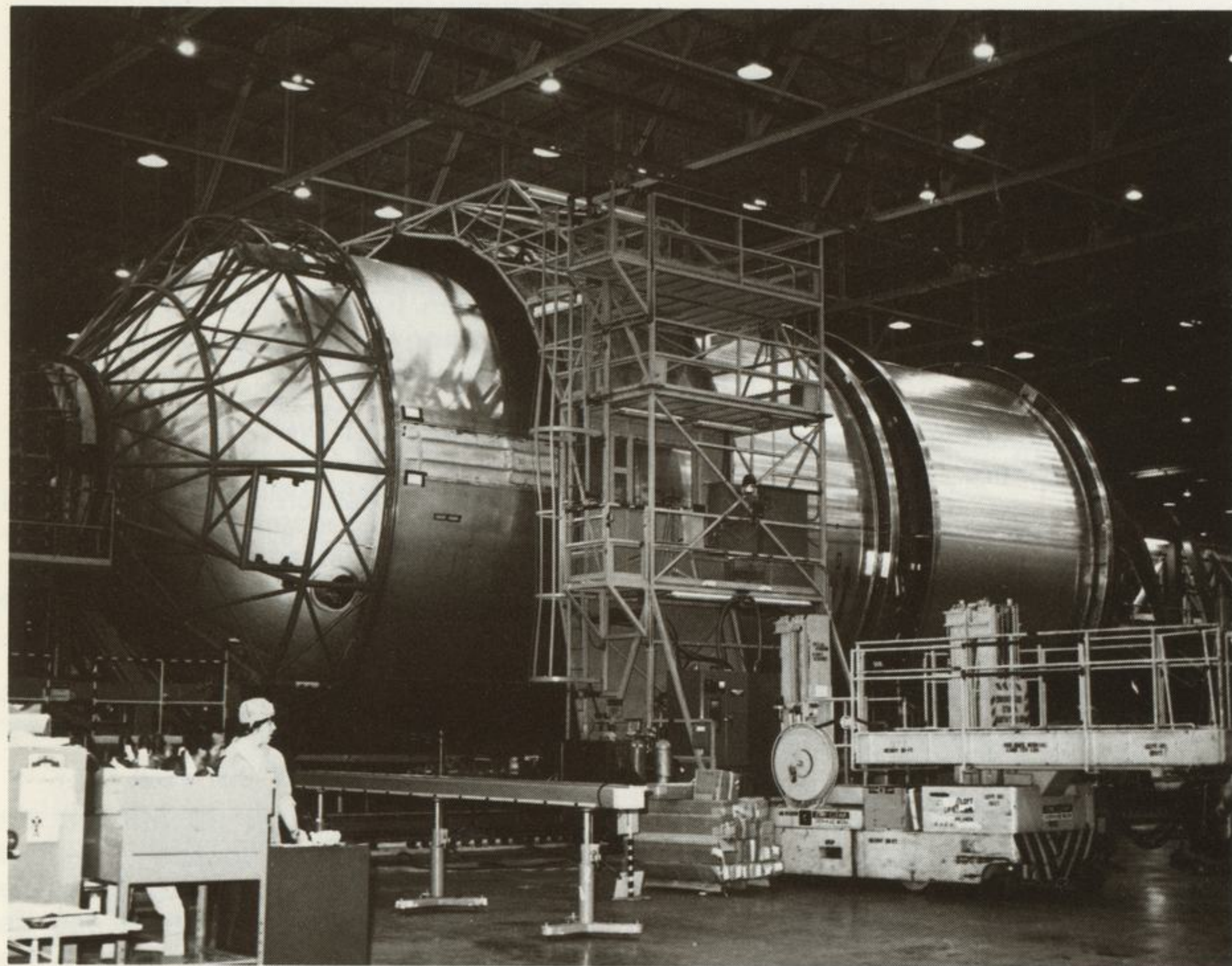


R. B. Hooley, left, received top award from T. S. Fujiyoshi.



Engineers and technicians at Michoud operations prepare the liquid oxygen tank portion of the first flight external tank, right, for installation of the slosh baffles, left. The aluminum baffles line the inside of the tank to prevent

the liquid oxygen from sloshing during launch. The first flight tank will be completed late this summer, and after testing be delivered by barge to NASA at the Kennedy Space Center in December.



The liquid hydrogen tank portion of the first flight external tank is mid-way through completion at Michoud with the third of four barrel sections readied here to be welded into place. The hydrogen tank will next be mated to the intertank which is a structural device that

connects the hydrogen and oxygen tank to form the completed 155-foot long external tank. The external tank will then receive a foam-like thermal protective coating and be tested before delivery to the Kennedy Space Center in December.

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MICHOUD OPERATIONS

Michoud employees enjoy family night

A group of 3,200 Martin Marietta Michoud operations employees and their families turned out Easter Sunday evening at the Louisiana Superdome to watch a basketball game between the New Orleans Jazz and the Denver Nuggets.

The Jazz, lacking their injured star player Pete Maravich, lost to the Nuggets 100-109.

A highlight of the evening occurred before the game began, when Michoud's Shirley Kirk stepped up to the microphone at mid-court and sang the National Anthem before a total crowd of 18,000 fans and a radio audience of thousands more. Mrs. Kirk is executive secretary for Allan M. Norton, director of engineering.

A second highlight was an interdepartmental half-time free throw contest with contestants selected by each of the eight major departments at Michoud. Winner of the event was Clifton Dicksworth, a statistician, who brought the traveling trophy home for the engineering department.



Michoud's Clifton Dicksworth throws the winning basket at a half-time interdepartmental free throw contest during Martin Marietta family night at the Jazz-Nuggets basketball game at the Louisiana Superdome. Dicksworth brought home the traveling trophy for the engineering department where he is a statistician.