

NUMBER 3/1979

**Intelsat tank
is tested**



Tanks shipped for Intelsat V

Two Denver Division-built fuel tanks for use on Intelsat V, an international communications satellite, were shipped February 21—about a week ahead of the March 1 required date.

The tanks were sent to Ford Aerospace and Communications Corp., Palo Alto, CA.

Seven satellites will be launched by the Comsat Corporation to improve an international communications network. Each satellite will use two of the tanks designed and built by the division. The satellites will each have seven-year missions.

The tanks will contain hydrazine, the fuel used by the engines that will keep the satellites in the desired positions while in orbit.

A propellant management device developed and built by the division has been installed in each tank to allow liquid to flow freely but to prevent gas flow.

The tanks, fabricated from titanium, are 18½ inches in diameter and 35 inches long. They hold 5 cubic feet of fuel and pressurant gas.



New recreation director for the division is Leroy Hollins. He began his assignment February 19, coming to Denver from Dallas where he had been recreation administrator for Texas Instruments for ten years. He was with the Presbyterian Recreation Centers of Dallas before joining TI. Hollins has a BS degree in recreation from Bishop College and an MA in administration and supervision from Prairie View A&M University. He will begin developing a full program of recreational activities and will plan improvements and additions to recreation facilities.

On the cover

A tank for use on the Intelsat international communications satellite begins test to prove its flight worthiness. The test chamber and tank are filled with liquid nitrogen to lower temperature to -320 F. The tank is pressurized to 1100 pounds per square inch—three times the normal operating pressure.

Employees urged to participate in new technology program

Denver Division employees working on NASA contracts are eligible for professional recognition and cash awards in the new technology program.

The program supports NASA's objective to transfer technology developed in the space program to products and equipment used by the general public. According to NASA contracts, the division is required to report "any invention, discovery, improvement, or innovation, whether patentable or not, that is conceived or built and successfully tested" under the contract.

In urging employee participation, W. O. Lowrie, vice president for technical operations, said, "Benefits of the program accrue not only to NASA but also to each individual participant. The Denver Division has been a pioneer in many areas of technology. We depend on the creativity of our employees and the reporting of their efforts to keep us as a leader in new technology development."

The new technology evaluation committee, chaired by Anella Knoke, appraises new technology disclosures and selects outstanding contributors for recognition and cash awards. Others on the committee are Dr. R. B. Blizard, J. R. Lager, and W. D. Rummel.

Information on the new technology program as well as reporting forms may be obtained by calling extension 3208 or 5423.

MARTIN MARIETTA NEWS

Published by Public Relations
MARTIN MARIETTA AEROSPACE
Call Ext 5364 with suggestions
or information for articles

Denver Division
P.O. Box 179 • Denver CO 80201
March 1979

Earth's shadow to provide SCATHA with intense charging

With its five booms deployed, its long antenna approaching full extension, and spacecraft systems operating, SCATHA is ready to face its most intense charging period.

On March 16, the spacecraft will move into the Earth's shadow for the first time. It is during this eclipse period that spacecraft are subjected to the most intense electrical charging—and that is why SCATHA is in orbit.

Satellites passing through the Earth's magnetic field attract charged particles trapped there. The electrical charging can cause satellite components to malfunction.

SCATHA (an acronym for Spacecraft Charging at High Altitudes) and its instruments are gathering data on the charging. Analysis of the information will determine test and design requirements for future spacecraft.

SCATHA will be in the Earth's shadow about an hour each day for a month and a half.

Since its January 30 launch, the spacecraft and its instruments have been checked out. Two of the science instruments have developed anomalies, but information has been received from them as well as from the other instruments on board. The data were recorded by remote tracking stations at Vandenberg Air Force Base, in Hawaii, on Guam, in the Indian Ocean, and in New Hampshire.

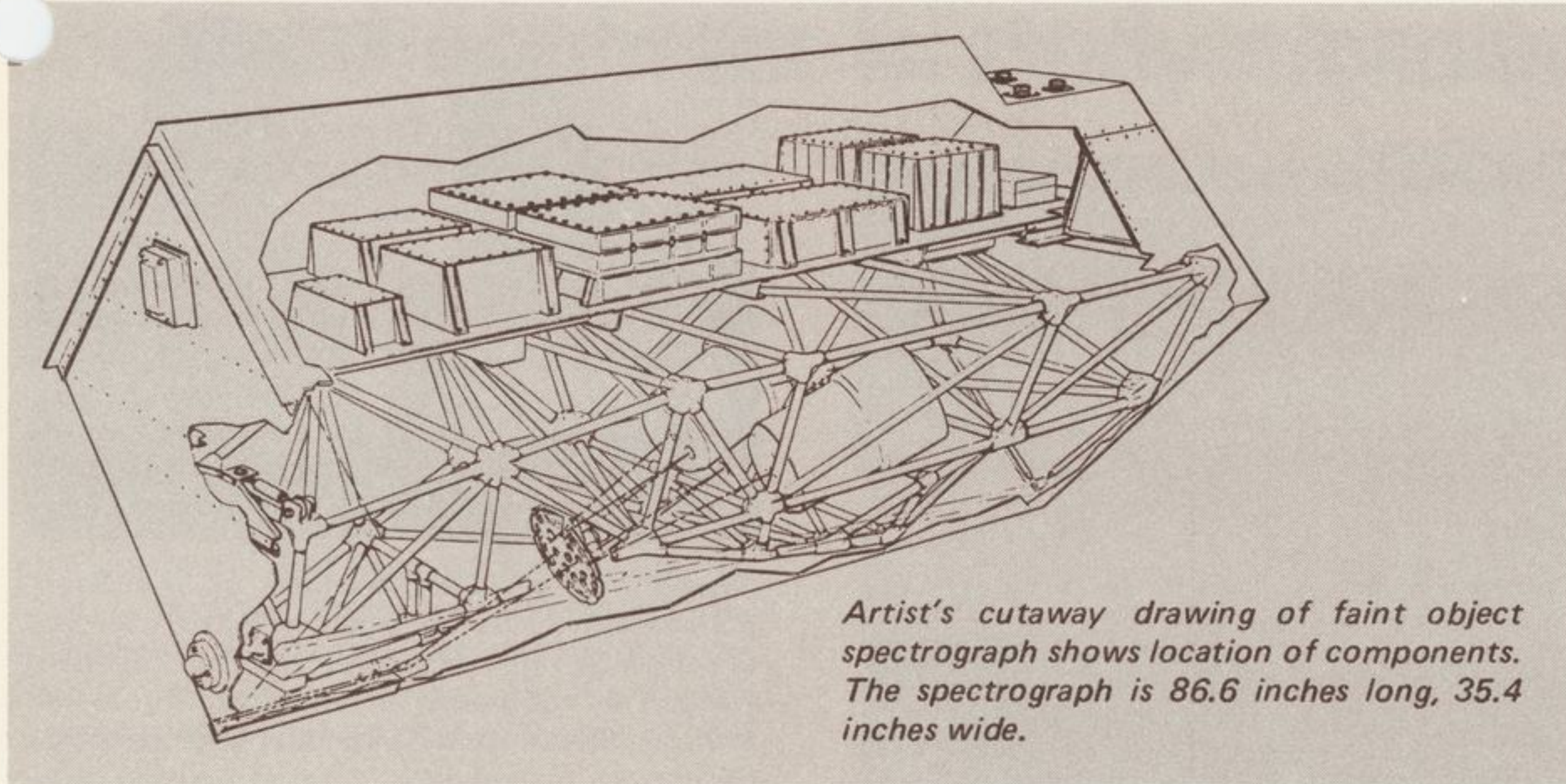
Some data have been transmitted immediately from the remote stations to the Air Force satellite control facility in Sunnyvale, CA. Tapes containing all the data recorded are carried to a data reduction facility at Patrick Air Force Base. At Patrick, the tapes are decoded and data separated for analysis by individual experimenters.

A reduction in data transmission power has been experienced on transmitter number one. However, during troubleshooting of the problem, data are being relayed to tracking stations by transmitter number two.

An antenna the length of a football field started deployment February 27. It will be extended in steps and will be fully extended before SCATHA first goes into the shadow of the Earth.

SCATHA instruments already have accumulated a significant amount of scientific and engineering data and will continue to do so over a predicted two-year lifetime.

Faint object spectrograph design review completed



Artist's cutaway drawing of faint object spectrograph shows location of components. The spectrograph is 86.6 inches long, 35.4 inches wide.

The preliminary design review for the faint object spectrograph has been completed successfully at the Goddard Space Flight Center.

Next step for the project at the Denver Division is to complete the detail design of the protoflight instrument and build a thermal mass simulator for it. The protoflight unit is scheduled for delivery in mid-1981.

The NASA contract calls for the division design, build, and test the instrument for Space Telescope.

The faint object spectrograph will be used to study the physical properties and motions of faint stars and galaxies more than several billion light-years away. Because of its position in orbit about the Earth, the instrument will be able to observe objects about 100 times more faint than can now be seen by the most powerful Earth-based telescope.

Specific scientific studies to be performed using the faint object spectrograph include:

- Determining the physical nature of quasars, including high spatial resolution investigations of the nature of "jets" and "wisps" near quasars.
- Investigating nuclei of active galaxies.
- Determining chemical composition and abundances in nearby galaxies.
- Investigating Seyfert galaxies and determining their source of ionization.
- Making a spectroscopic survey of faint globular clusters (very dense clusters of stars) to determine their origin and evolution.
- Observing comets to provide clues on early stages of solar system formation.

School bond vote March 6

Jefferson County voters will be asked to approve a \$12.9 million bond issue in a Tuesday, March 6 election. The bonds will be used to finance the construction of three elementary schools and a junior high school.

Cards have been sent to registered voters telling them where to vote in school elections.

A voters guide and a question and answer booklet have been published. Information may be obtained by calling Jeffco Schools Information Line, 232-6611.



Burnett



Callan

New directors are named for contracts, industrial relations

R. E. Burnett and Thomas R. Callan have been named directors in the Denver Division, Burnett to head professional and industrial relations and Callan the contracts organization.

Burnett succeeds R. E. Weber who has been promoted to vice president of professional and industrial relations for Martin Marietta Aerospace. Weber will move to Aerospace headquarters in Bethesda, MD.

In his new position, Burnett will be responsible for employee relations, personnel safety, security operations, management development, compensation, and staffing. The assignment begins April 1.

He joined Martin Marietta in 1968 as employee relations administrator at Vandenberg operations and later became professional and industrial relations manager there. In 1973, he was named employee relations manager for the division.

Callan, who has assumed his new duties, started his Martin Marietta career in July 1969 as an engineer in the activation division assigned to work on the installation of Titan test stands for the Denver Division and to activate Titan sites.

In the Denver Division, Callan has been assigned to many of the major programs, including Titan I, Titan II, planetary systems, Mariner Venus Mercury, and launch vehicles.

Callan, who graduated from the University of Colorado in 1955, was most recently business manager for the Missile X program.

Expansion planned for refractories plant

Martin Marietta Chemicals has announced a \$14-million expansion of its Manistee, Michigan, refractories plant.

The third multiple hearth furnace and other improvements, when completed in 1981, will increase the company's capacity for production of light-burn, highly reactive grades of magnesium oxide by 35,000 tons to 350,000 tons annually.



Daniel A. Linn, executive director for plant operations, has been elected chairman of the material management committee of the Aerospace Industries Association (AIA). The AIA is an organization of aerospace executives responsible for representing the industry in governmental and national matters. He will serve one year.

Three contracts awarded MARTRON

In the first 30 days of 1979 three customers have selected the division's MARTRON avionics test equipment.

Contracts have been received from Braniff International, Jugoslovenski Aerotransport (JAT), and Hong Kong Aircraft Engineering Co., Ltd. (HAECO).

Braniff is the ninth U.S. airline to select MARTRON ATE systems.

JAT is the national airline of the Republic of Yugoslavia. It is the first in Eastern Europe to acquire ATE systems.

HAECO operates the largest independent aircraft maintenance and overhaul facility in Asia. It performs maintenance and engineering services for about 30 international carriers at facilities at Hong Kong's Kai Tak airport.

The division is the world's leading supplier of ATE systems to commercial airlines. The U.S. Air Force and the U.S. Navy also use MARTRON ATE systems.

Data Systems wins contract

The Federal Systems Group of Martin Marietta Data Systems has been awarded a contract with the Department of Agriculture's Economic Statistics and Cooperative Services (ESCS). The contract calls for computer processing, telecommunications, and related support services covering 28 statistical and reporting systems in the areas of crop and animal estimating and various farm surveys.

The crop and animal estimating reports are widely used in the commodities market. In many instances, the reports will be furnished by Martin Marietta directly to various commodities traders after announcement by ESCS.

The five-year contract has an estimated value of \$15 to \$20 million.

Cafeteria remodeling is on schedule

Remodeling of the division's engineering building cafeteria is on schedule, with the reopening planned for early April.

Construction is about 30 percent complete, all material is on hand for the work, and all new equipment is on order and scheduled for delivery to meet the April opening.

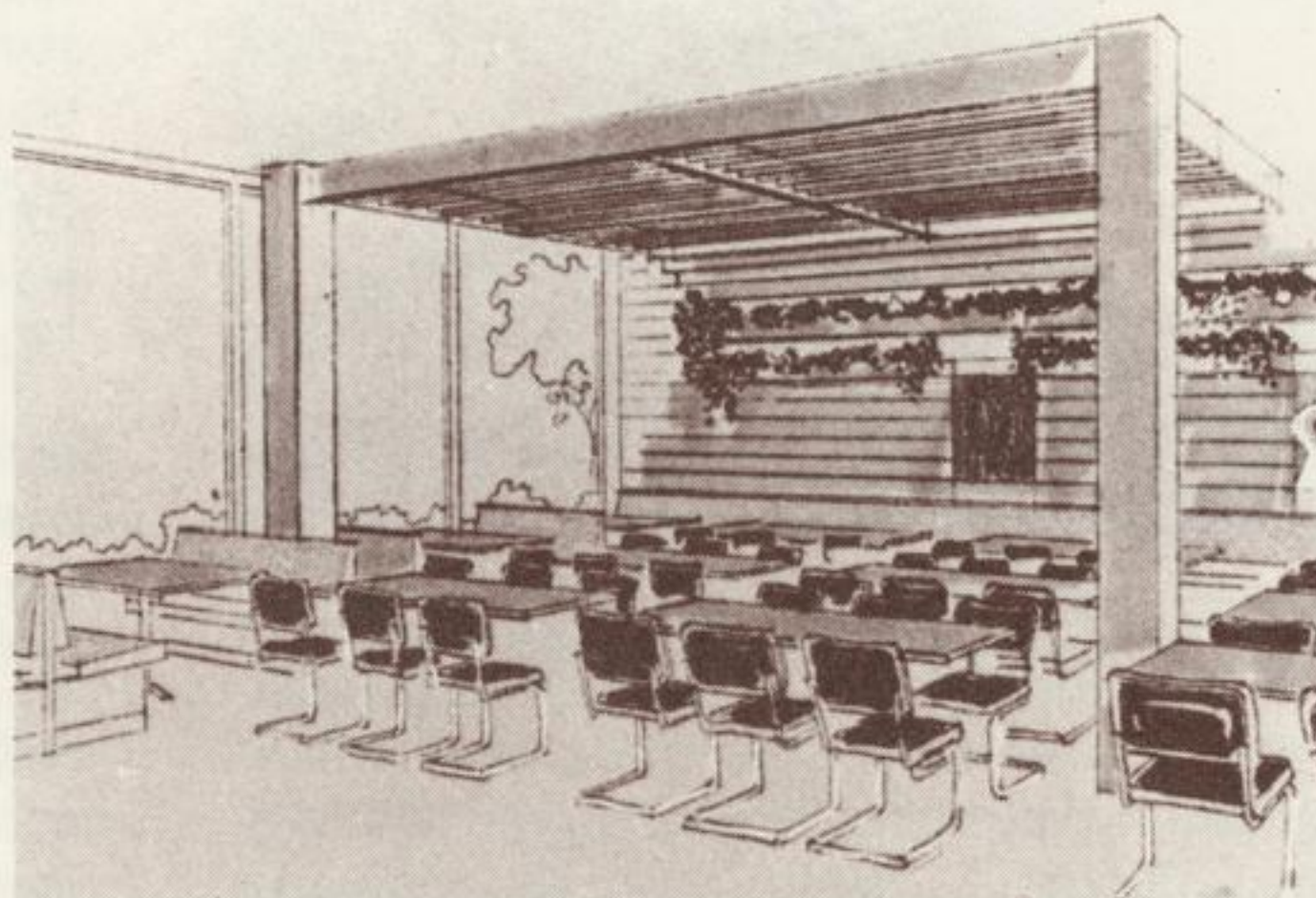


William C. Sanders Jr., a Denver Division mechanical engineer, recently received the Silver Beaver award, highest honor the Boy Scouts of America can bestow on a volunteer scoutmaster. He has been involved in scouting in the Denver area since 1968 and has held a variety of leadership positions.

Partners to discuss program March 13, 14

Partners, a nonprofit organization that matches in-trouble Denver youth with adult volunteers, will have representatives in the division cafeteria March 13 and 14.

Purpose of the visit is to discuss the Partners program and offer employees the opportunity to become off-hours volunteers to work with young people.



Recorder contract won; Galileo AACS goes to TRW

The Denver Division has been selected to build a 42-track high-density tape recorder for the National Security Agency (NSA), but has lost out in a competition to provide attitude and articulation control subsystem electronics for the Galileo program.

The recorder for NSA represents the highest known capability—160 million bits per second—achieved on a one-inch tape machine.

On Galileo, the Jet Propulsion Laboratory has announced it will negotiate with TRW for the AACS electronics.

Two other high-density tape recorder proposals are being prepared, one for 12 to 14 42-track type recorders and the other for a 28-track type.

The 42-track recorders are being proposed to General Electric's space division for use on the Landsat-D program. The proposal is due March 5.

The 28-track recorder is to be proposed for use at the Arnold Engineering and Development Center in Tennessee. Grumman Data Systems and System Development Corporation are seeking the prime contracts. The Denver Division is proposing that each firm include the division-built high-density tape recorders in their bids for the large propulsion test facility.

Seminar planned on productivity

Two division industrial engineers are involved in planning and conducting a one-day seminar on productivity in Denver March 9.

Thomas A. Cooke, an industrial engineer in manufacturing, is president of the Rocky Mountain chapter of the American Institute of Industrial Engineers, sponsor of the seminar.

Alton W. Maness, an industrial engineer for the manufacturing engineering and production control departments, is reservations and finance chairman.

Commenting on the seminar, to be held at the Executive Tower Inn, Cooke said, "The productivity theme is of interest to every business person and emphasizes a concern for one of America's most significant long-range problems."

Cost for the one-day seminar is \$25, including lunch. Those who want to attend may call Maness, extension 4793.

Michoud engineer is studying man's 'inner space'

Michoud engineer James Beal spends his days working on programs for exploring outer space and his free time delving into man's inner space.

Beal, a nondestructive evaluation group engineer, has been investigating field-effects phenomena and negative air ions for beneficial effects on humans.

Beal contends that negative ions in the air have a positive effect on man's moods and health. Big cities, for example, with their noise and pollution, have a lower negative ion count than do mountain and ocean environments.

Beal asserts that residents of these areas have differing abilities to cope with stress. Although negative ions do not cure stress, it has been proven that they remove the symptoms of stress.

"Negative ions act as little batteries giving our bodies extra strength," Beal said. "Positive ions, found in noisy and polluted cities, cause irritability, nasal congestion, general aches, and pains."

Beal offered this explanation for the ion phenomenon: "Ions are believed to affect a body chemical known as serotonin. Serotonin is considered a byproduct of stress and negative ions reduce the serotonin levels."

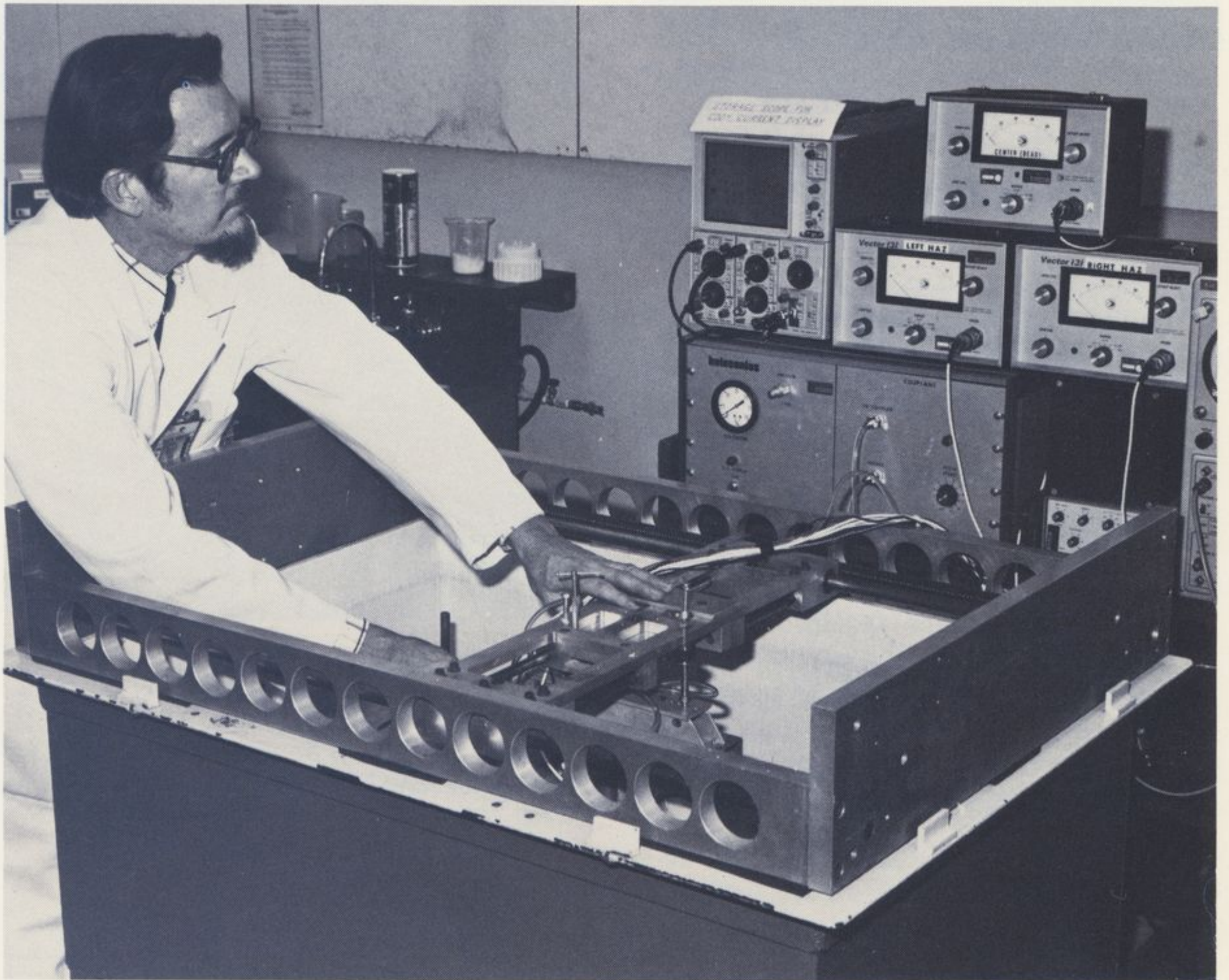
He has a lot to say about atmospheric effects and people are listening. During the past ten years he has presented technical papers in Czechoslovakia, Switzerland, Israel, England, and the Netherlands.

His avocation of studying ion effects has resulted in extensive research and writing in other related areas: unexplained phenomena, induction devices, parapsysics, parapsychology, biofeedback, acupuncture, electrophysiology, and science fiction.

Beal's interest in electromagnetic fields and air ion effects on living systems came about primarily because of advances in space-age equipment and electronics over the past ten years.

"Since the brain and its vast web of nerves operate with electrical signals, it seems logical that artificial application of electronic impulses be used for potential effects on the body and nervous system," Beal said.

Beal applies his professional knowledge to his fascinating avocation. "Space is the most complex problem that we have ever put our minds to. Its solution will bring



the mysteries of our physical world, body, mind, and environment into sharper focus and will lead to many useful benefits—primarily increased knowledge, awareness, and understanding of the universe."

At work in a Michoud operations laboratory, James Beal operates a nondestructive test device to evaluate welds on the external tank. His avocation is exploring man's inner space.

Timmons named vice president



Kenneth P. Timmons has been named a vice president of Martin Marietta Aerospace and will become the general manager of Michoud operations. He will succeed George E. Smith who is retiring in

March, ending a 40-year career with Martin Marietta.

Timmons joined the company in Denver in June 1963. He has had management roles in several of the division's major space and defense programs, including Titan II strategic systems, the Skylab space station, and the Space Telescope studies. Recently he directed the division engineering department and technical operations.

He was named deputy general manager of Michoud operations last October.

Timmons is a native of Indianapolis and was graduated from the University of Washington in 1950 with a bachelor of science degree in mechanical engineering.

Before joining Martin Marietta, he was with the Bendix Company and later with General Precision Company.

At Canaveral

Communications 'payload' lands at Cape Canaveral



It isn't too unusual for Dale Polk, a technician at Canaveral operations, to be involved in launching communications payloads from Cape Canaveral, but recovering them is another matter.

But that's what happened in late January. Polk spotted two balloons bouncing along the railroad tracks at the Titan launch complex. When he retrieved the blue and white spheres, he found a small card attached.

The card was from Melissa Morgan, a third grader at Lamkin Elementary school—a school in Houston, TX.

Melissa had released the balloons as part of an experiment to see how far the message would travel. The class had launched their fleets from the school yard just 19 hours before Polk found Melissa's balloons.

The balloons had flown almost exactly 1,000 miles—averaging at least 50 miles per hour.

When Air Force officials called the school and spoke to Melissa, she could only say, "Gosh!"

Melissa's principal, Margaret Gleason, explained that the experiment was held in conjunction with American Field Service, a foreign exchange program. Each year,

the organization sells balloons to grade school pupils, with the proceeds going to help finance foreign student visits to the United States.

While it may be years before the Air Force develops the technology to recover communications payloads at Cape Canaveral, eight-year-old Melissa already has found a fast and inexpensive method.

Cost reduction goal met at Canaveral operations

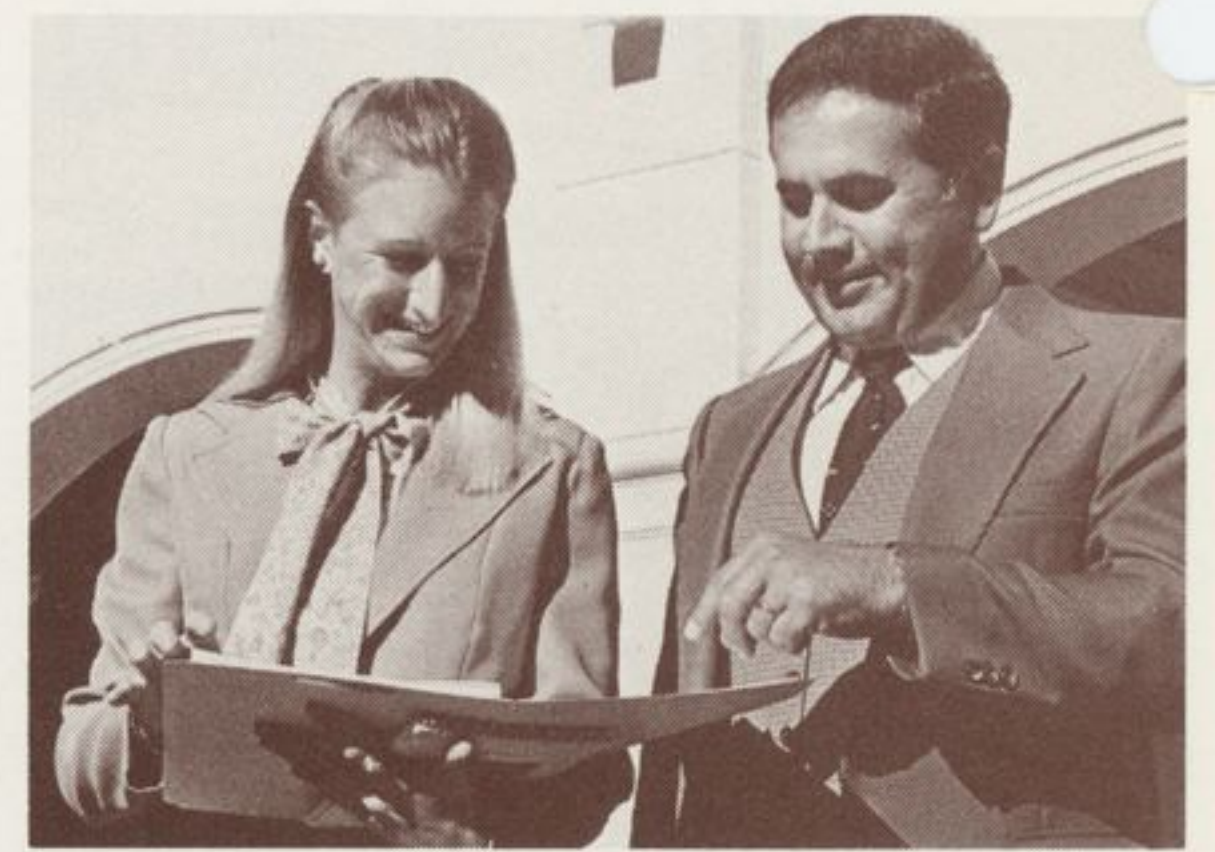
The 1978 cost reduction program goal of \$38,000 was exceeded at Canaveral operations, with 12 employees submitting 11 suggestions totaling \$39,740 in savings.

Those who received cash awards are:

G. C. Rowe, industrial relations and services; D. M. Boger, O. E. Fenske, J. H. Gasko, and J. E. Nagel, finance and contracts; D. W. Fleming and W. R. Perkins, engineering; D. H. Buscher, W. R. McDaniel, M. E. Newsum, and H. M. Solana, materiel; and D. F. McNeill, test operations.

The 1979 cost reduction program goal is also \$38,000.

At Vandenberg



Newest and youngest member of the Santa Barbara-San Luis Obispo counties regional Criminal Justice Planning board is Barbara Forsyth of Lompoc, left, reviewing material from a board meeting with Larry DeMello, OCJP executive director.

Employee is elected to criminal justice board

Barbara Forsyth, an administrative secretary at Vandenberg operations, recently was elected to serve on the board of the California Office of Criminal Justice Planning (OCJP). She will serve as a lay member representing the community-at-large.

Ms. Forsyth was elected from among four nominees from Santa Barbara and San Luis Obispo counties. She was chosen as most representative of young women in her age group—20 to 30 years.

Serving with local public officials, she will be asked for opinions and recommendations for the distribution of state funds for criminal justice and crime prevention projects in the two-county area.

Ms. Forsyth is enrolled in Allan Hancock College in a curriculum leading to an associate degree in criminal justice.



F. C. Radaz, J. L. Thompson, and R. F. Bedard hold sign indicating accumulated years of perfect attendance achieved by 68 Vandenberg operations employees during 1978. A major part of the 134 years was contributed by Radaz and Bedard, each with 11 consecutive years of perfect attendance, and by Thompson, who has 12 years without an absence. D. B. Smith, not present for the photo, has a record 13 years of no work days missed.