

MARTIN MARIETTA

news

ASTRONAUTICS GROUP

December 22, 1987 Number 25

1987 year end issue



President Peter B. Teets

Martin Marietta Astronautics Group



Peter B. Teets, president

"Thirty-one years ago, we started as the Denver Division of the Martin Company. We had one customer, and one contract. Our division grew to a company with several divisions and now, this year, we became a group with four new companies, 250 contracts and 60 customers.

"The Astronautics Group was one of four groups formed July 1 in a corporate streamlining that concentrates operational responsibilities in highly focused business units. Within the Astronautics Group are newly designated operating companies for Space Systems, Space Launch Systems, and Strategic Systems (elements previously organized as divisions of Denver Aero-

space), and Commercial Titan systems.

"Over the past six years, we have tripled our sales, and have an average annual cumulative sales growth rate of over 20 percent. In addition, we increased our employment by 40 percent during that period. By the end of 1987, we'll have a record backlog of \$5.8 billion—in excess of three years' worth of annual sales. That exceeds the industry backlog average of one year of sales. We anticipate maintaining an average cumulative sales growth rate of 10 percent over the next five years, with sales in excess of \$2.6 billion by 1992.

"1987 has been a year highlighted by mission success, with the successful launch of three Titan rockets and two successful Peacekeeper test flights, giving us a record of 100-percent mission success. Work progressed on the Small ICBM, another strategic missile for the Air Force, and we met important milestones on the National Aeronautics and Space Administration's Magellan program that will send a spacecraft to Venus in 1989.

"I'm especially proud, too, of our productivity initiative begun in March to improve our way of conducting business. Project Challenge is a major effort to improve all Astronautics Group operations, and we've made great strides in providing more cost-efficient and higher quality products to our customers by initiating more modern and streamlined operations.

In addition, we began the Engineering Excellence initiative in June, to achieve cost reductions and create new standards of performance that are both practical and rewarding.

"We acquired a new facility to help consolidate our operations. Martin Marietta bought the former Manville World Headquarters building in Deer Creek Canyon and will have moved more than 300 people into it by year's end.

"We were also honored by President Ronald Reagan's historic visit and address to our employees on Nov. 24, certainly a fitting end to a great year. The president delivered a major address in support of the Strategic Defense Initiative, toured the rapid retargeting/precision pointing lab, a key SDI facility at Martin Marietta, and heard briefings on other SDI programs.

"This year we've improved our way of doing business, becoming more efficient and producing even higher quality products and services. We expect that to continue in 1988, and anticipate dramatic changes to continue our growth through the next decade.

"1987: a year characterized by 100-percent mission success, organizational transition, business success, and a visit by the president. 1987 was a year in which our employees can be proud to have been in the forefront of the drive to produce new high-technology systems for space and defense."

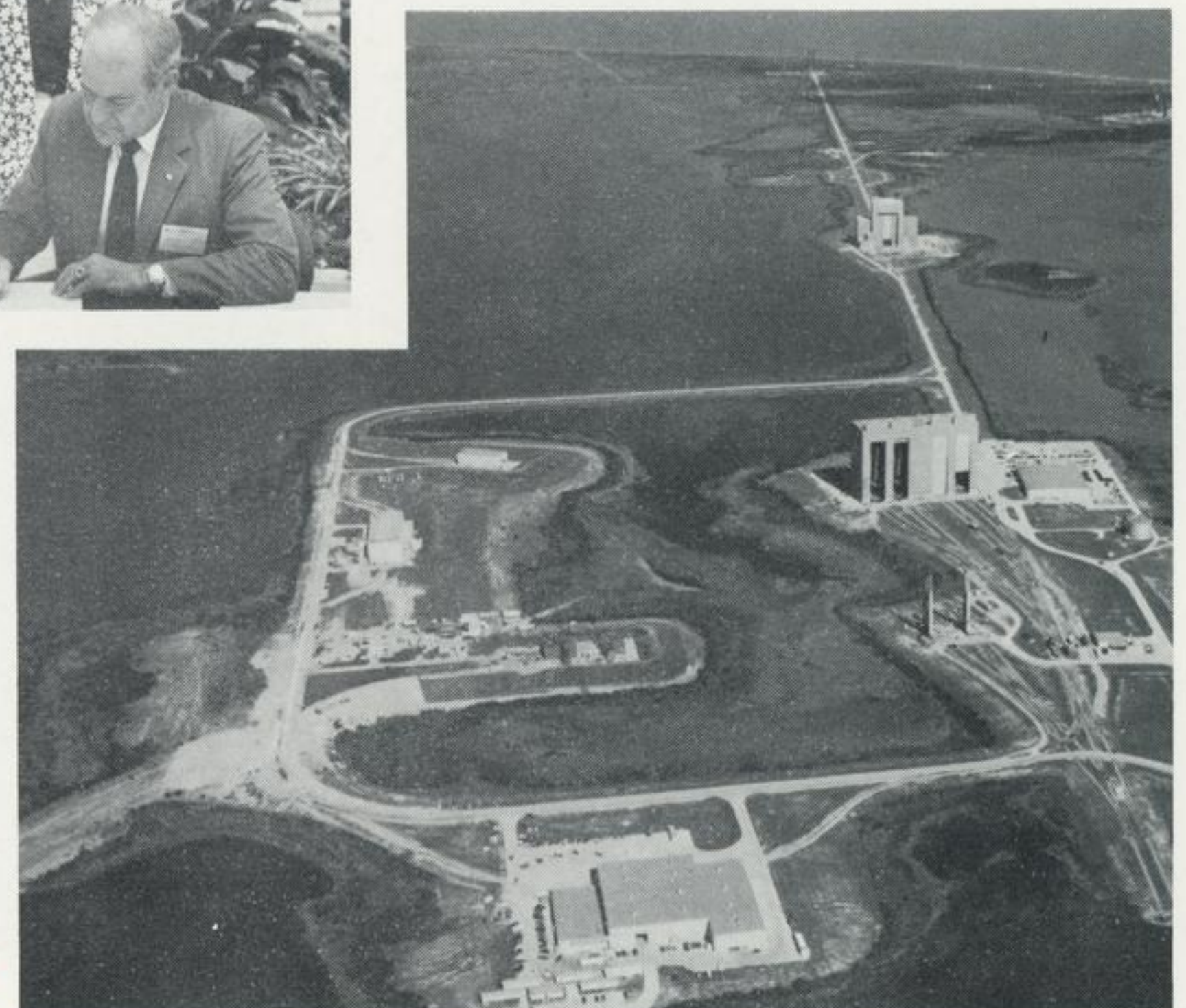
Commercial Titan, Inc.

In 1987, Martin Marietta made significant progress in marketing a version of its Titan space launch vehicle for commercial satellite launches. Commercial Titan, Inc., headed by Richard E. Brackeen, president, was established in April specifically to enter contracts for commercial launches of the Titan. Commercial Titan, Inc., has assembled an international subcontractor team that includes West German and Swiss companies, and has lined up its first three customers—the International Telecommunications Satellite Organization; Hughes Communications, Inc., representing the Japan Communications Satellite Company; and the British Ministry of Defence.

Commercial Titan, Inc., which provides a full range of launch services, will conduct its first launch in 1989 from Cape Canaveral, Fla. In August, the company became the first American launch services company to sign an agreement with the Air Force providing for the use of Air Force launch facilities, range services, and production tooling in providing launch services to commercial customers. ■



INTELSAT signing. Left to right: Dean Burch, INTELSAT director general; Elizabeth Dole, then secretary of transportation; and Thomas G. Pownall, chairman of the board.



Launch Complex 40, Cape Canaveral, Fla.

Space Launch Systems

The Space Launch Systems company continued as one of the world's foremost expendable launch vehicle manufacturers. At year's end, under the leadership of Gareth D. Flora, president, four Titan systems were in various stages of development or production.

Martin Marietta rolled out the first Titan II space launch vehicle to be converted from a decommissioned intercontinental ballistic missile in August. Air Force Secretary Edward C. Aldridge Jr. attended the event, which he said marked "another crucial step in achieving assured access to space for our national security payloads."

The first Titan II launch vehicle was delivered on schedule to Vandenberg Air Force

Base, Calif., and the Air Force exercised an option increasing the number of Titan IIs on order from eight to 13. In addition, the first of a larger, more powerful version of the Titan, called the Titan IV, also was completed. Titan IV will launch critical national security payloads beginning in 1988. In 1987, the Air Force increased its order for Titan IVs from 10 to 23, and initiated programming to increase the orders to nearly 50.

During the year, Space Launch Systems conducted a competition for an upgraded solid rocket motor for Titan IV, further increasing the vehicle's performance and reliability. Key tests of the vehicle's payload fairing were conducted, and a first-stage Titan IV liquid rocket

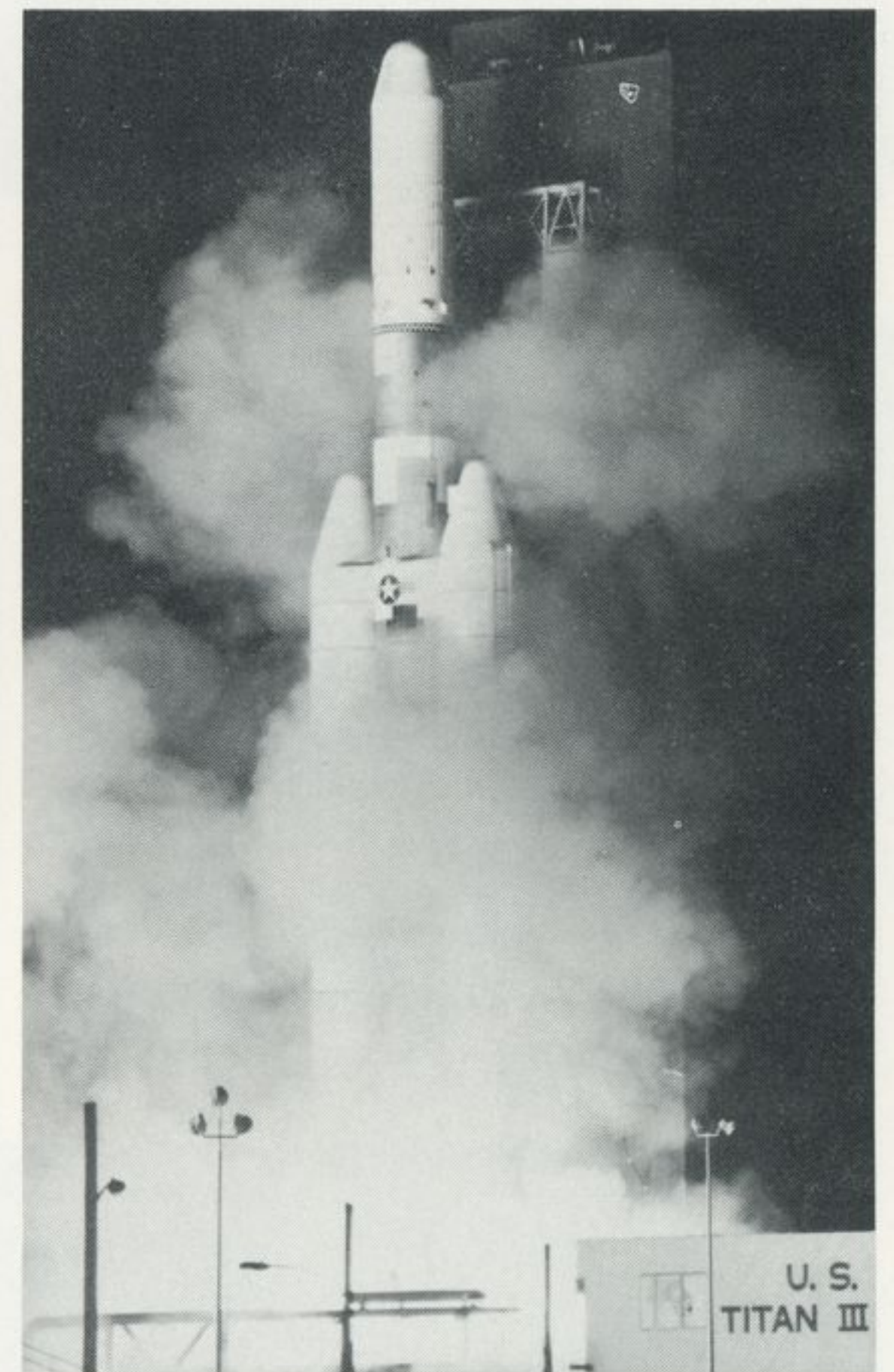
engine was successfully test fired.

Two successful launches of the Air Force's current operational Titan launcher, the Titan 34D, culminated an intensive Titan recovery program. In addition, the last Titan III-B in the Air Force's inventory was successfully launched in February.

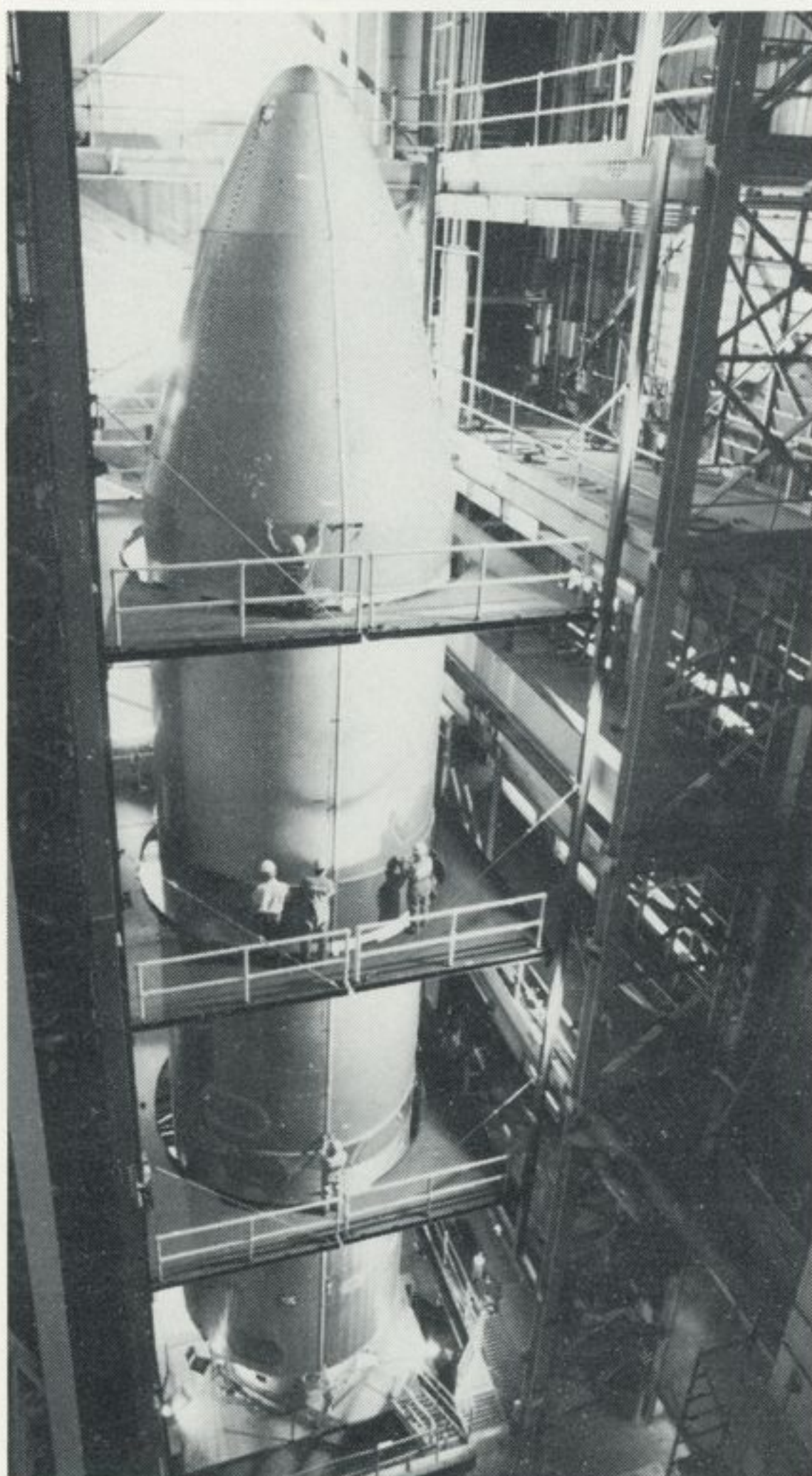
In addition to its Titan business, Space Launch Systems received contracts for the transfer orbit stage to fly NASA's Mars Observer and Advanced Communications Technology satellite, and won a study contract for the next generation space launch system, called the advanced launch system. ■



Titan II rollout ceremony at the Waterton facility.



Titan 34D launch, Cape Canaveral, Fla.



Titan IV payload fairing in the vertical test facility.



Artist's concepts of two advanced launch systems.



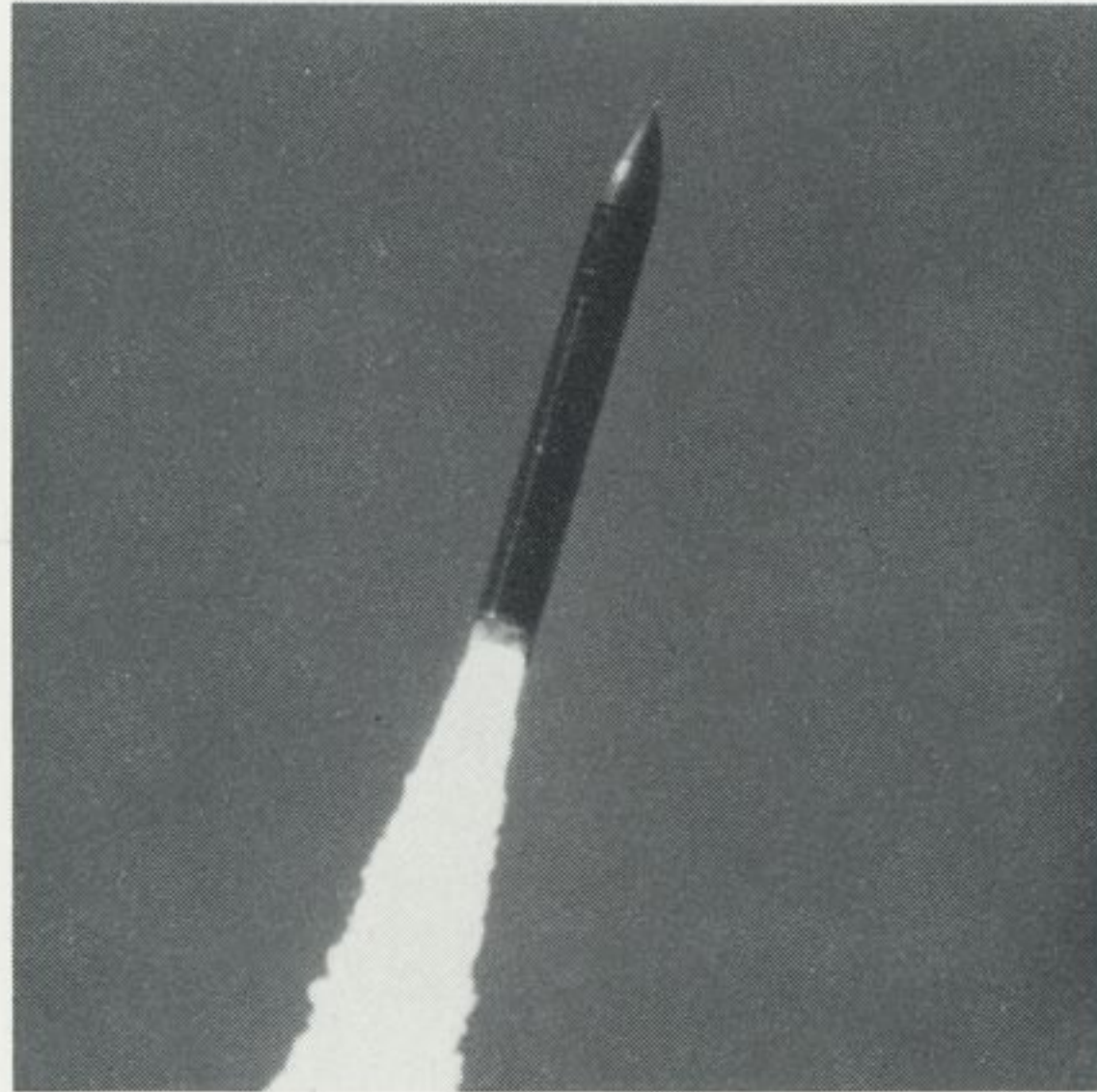
Strategic Systems

The Peacekeeper ICBM flight test program continued its record of success to highlight 1987 for the Strategic Systems company, which is the Peacekeeper assembly, test, and system support contractor. James A. Sterhardt is president of the company.

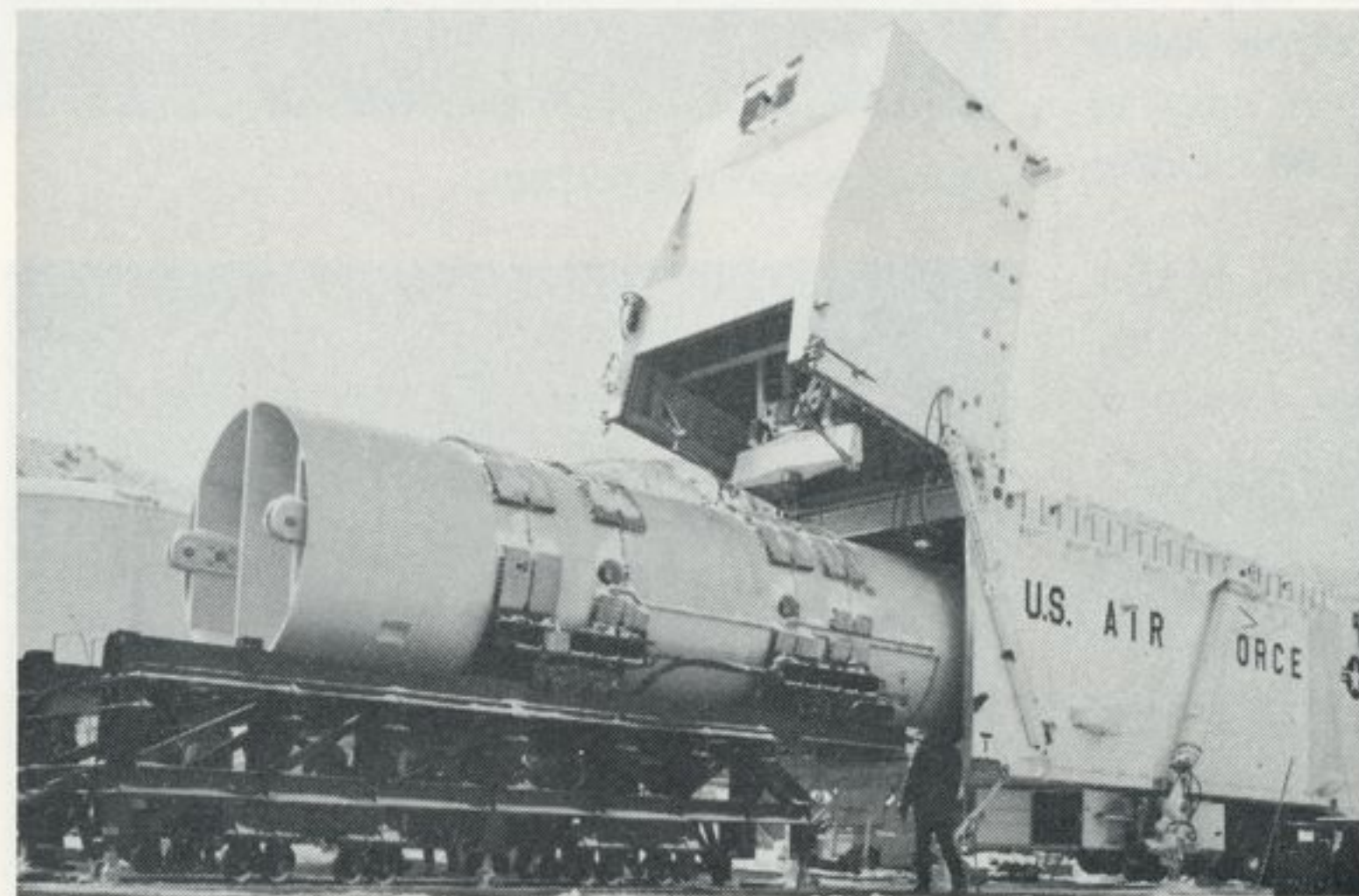
Two additional Peacekeeper test missiles were launched from Vandenberg, bringing to 17 the number of consecutive successful launches, and completing the development, test and evaluation phase of the Peacekeeper flight test program.

As part of the company's Peacekeeper work for the Air Force, three more emplacements, used to raise, lower and align Peacekeeper missile segments in underground silos, were delivered to F. E. Warren Air Force Base near Cheyenne. In addition, the Air Force ordered 24 more instrumentation and flight safety systems (IFSS), which are carried in the flight test missiles to obtain in-flight data measurements and permit safe destruction of a missile should a serious malfunction occur.

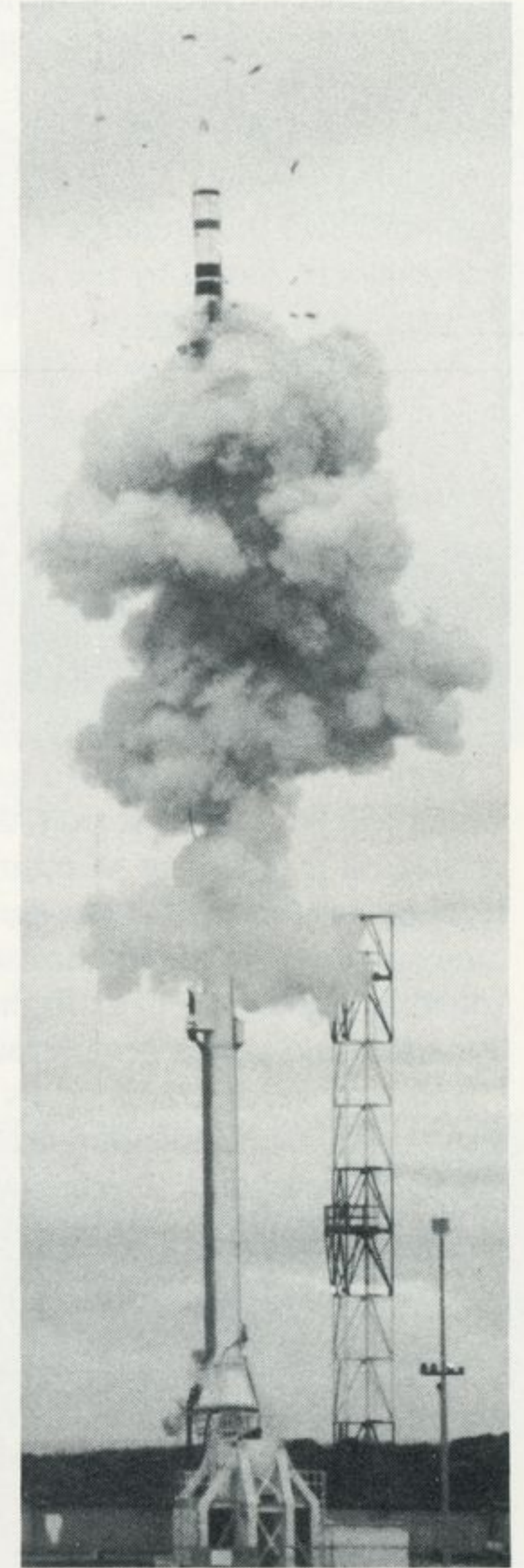
In a similar assembly, test and system support role for the Small ICBM, Strategic Systems recorded several major accomplishments. Among them were two successful full-scale tests of the cold launch system for the Small ICBM, conducted in October and December at Vandenberg, and two successful full-scale hot firing tests at altitude of the Small ICBM's postboost vehicle, for which the company is responsible. Development tests also were completed on the instrumentation and range safety system, similar to the Peacekeeper IFSS.



One of two Peacekeeper launches, Vandenberg Air Force Base, Calif.

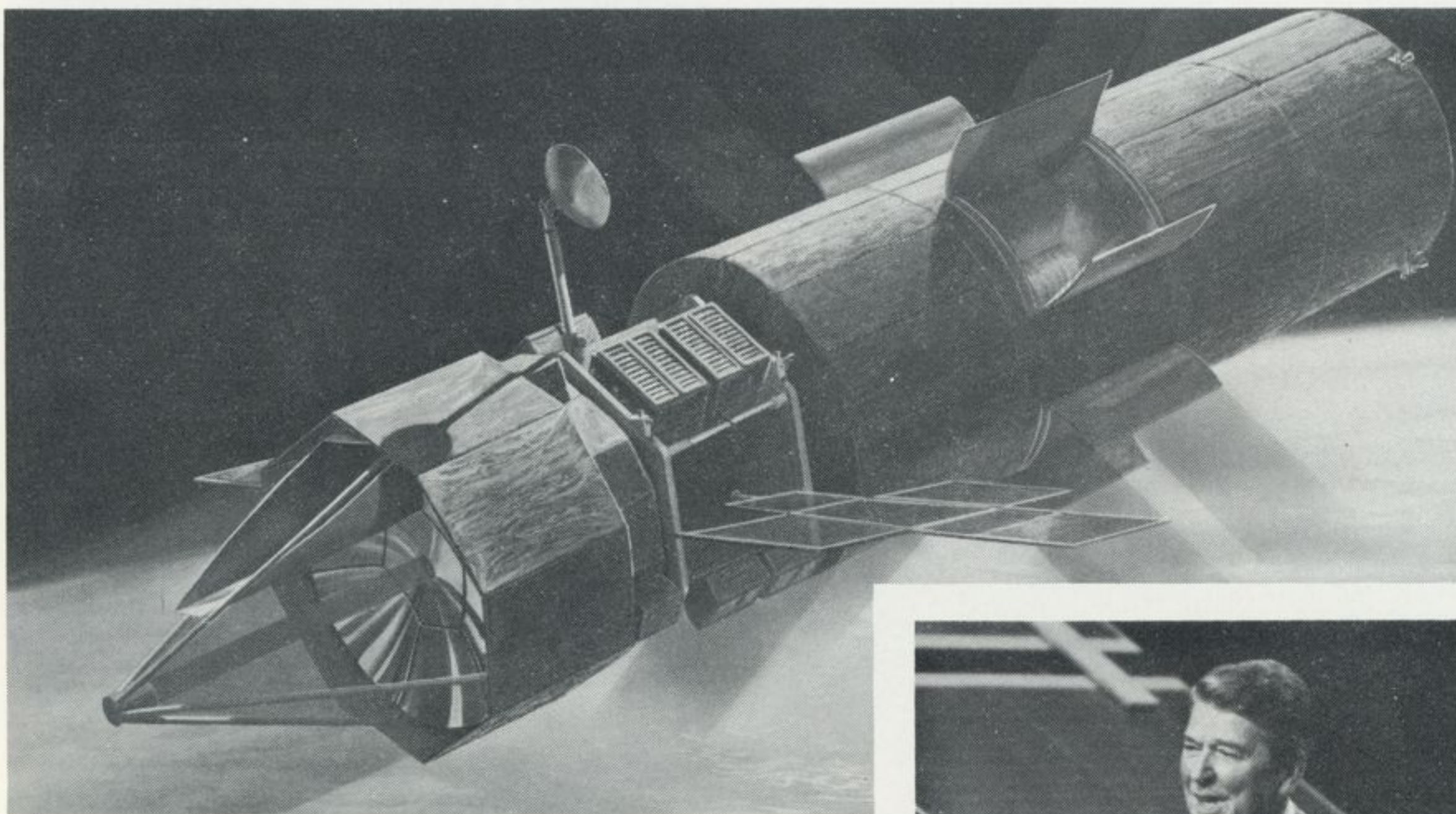


Peacekeeper emplacement.



Test firing of cold launch system.

Space Systems



Artist's concept of the Zenith Star.



President Reagan addressing employees on Nov. 24 at Waterton.

The Space Systems company won or continued work on a number of contracts related to the Strategic Defense Initiative research program, which is designed to look at ways the United States and its allies could defend themselves against a ballistic missile attack. James W. McAnally is president of the company.

One of those contracts, highlighted during President Reagan's visit, is Zenith Star. In October, Space Systems was selected by the Strategic Defense Initiative Organization to be the prime contractor for Zenith Star, a space-based laser for strategic defense. The company is investigating the feasibility of testing Zenith Star.

Space Systems also won a contract to define concepts and develop critical technologies for a space-based interceptor system. The space-based interceptor would consist of a constellation of satellites, each containing several interceptors, targeting sensors and communications devices. The interceptor would maneuver in flight to collide with ICBMs, destroying them by the tremendous energy of the collision.

Continued on page 5

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Space Systems was awarded several contracts related to development of target acquisition, tracking and pointing technology for SDI systems. The company also continued development of the rapid retargeting/precision pointing simulator—a national test bed, which was presented the Strategic Defense Technical Achievement Award by the American Defense Preparedness Association.

Another area of Space Systems worked on crucial NASA programs. Among them is the NASA spacecraft called Magellan, which will use an advanced radar system to map 90 percent of the surface of Venus. A critical test of the interface between the spacecraft and the radar was completed during the year. The spacecraft will go to the Kennedy Space Center in November 1988.

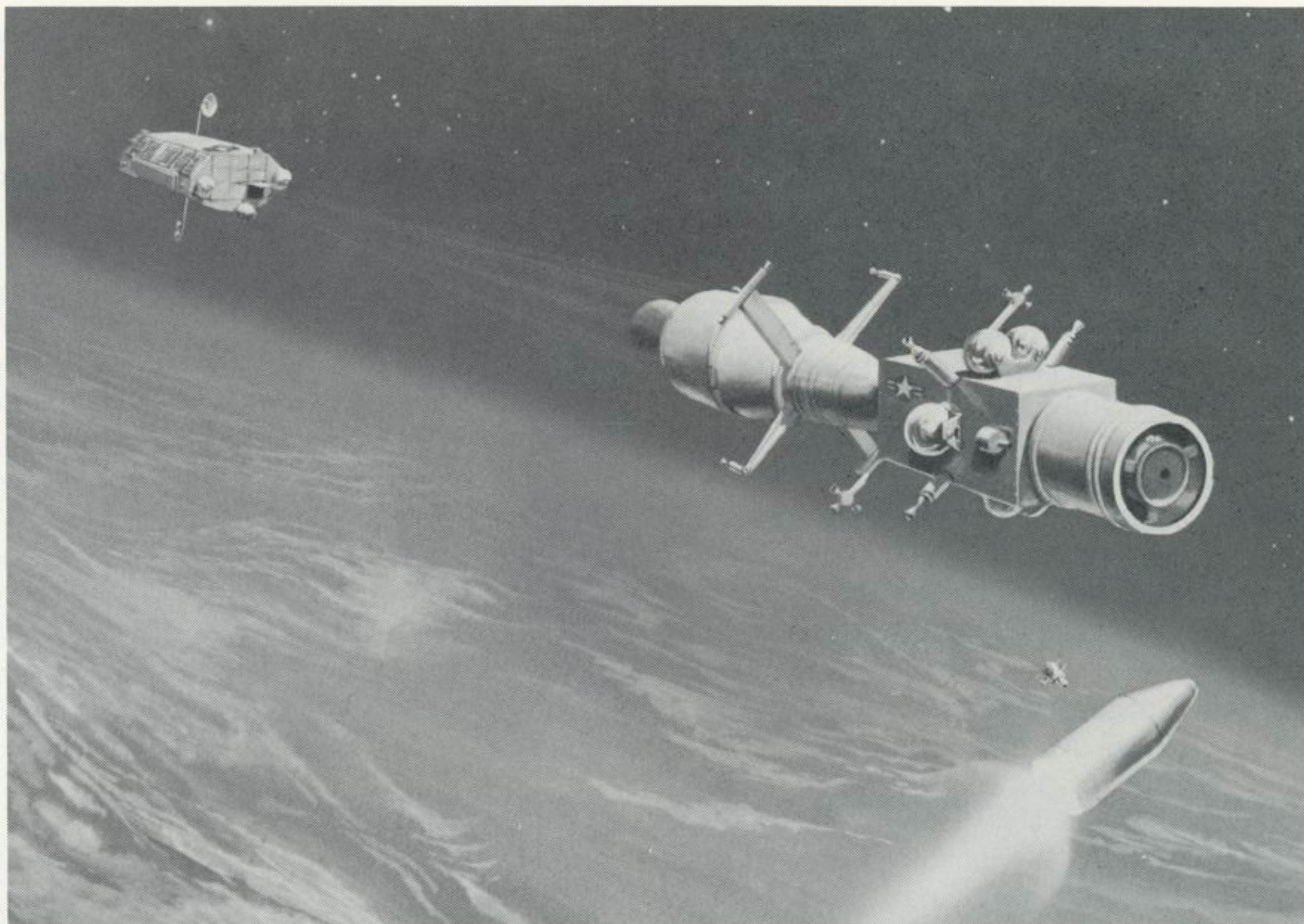
Work also progressed on a tethered satellite, which will be reeled out from the space shuttle orbiter on a tether up to 62-miles long. The tethered satellite will study areas of the upper atmosphere previously accessible only to sounding rockets on brief flights, and electro-dynamics and power generation.

Space Systems expanded its role in NASA space initiatives by winning a contract to study a flight telerobotic servicer—a new kind of space construction worker. The robot envisioned by NASA will enable astronauts to direct routine assembly and maintenance work without leaving the space shuttle or the space station. The company also won three NASA contracts for various Mars studies. ■

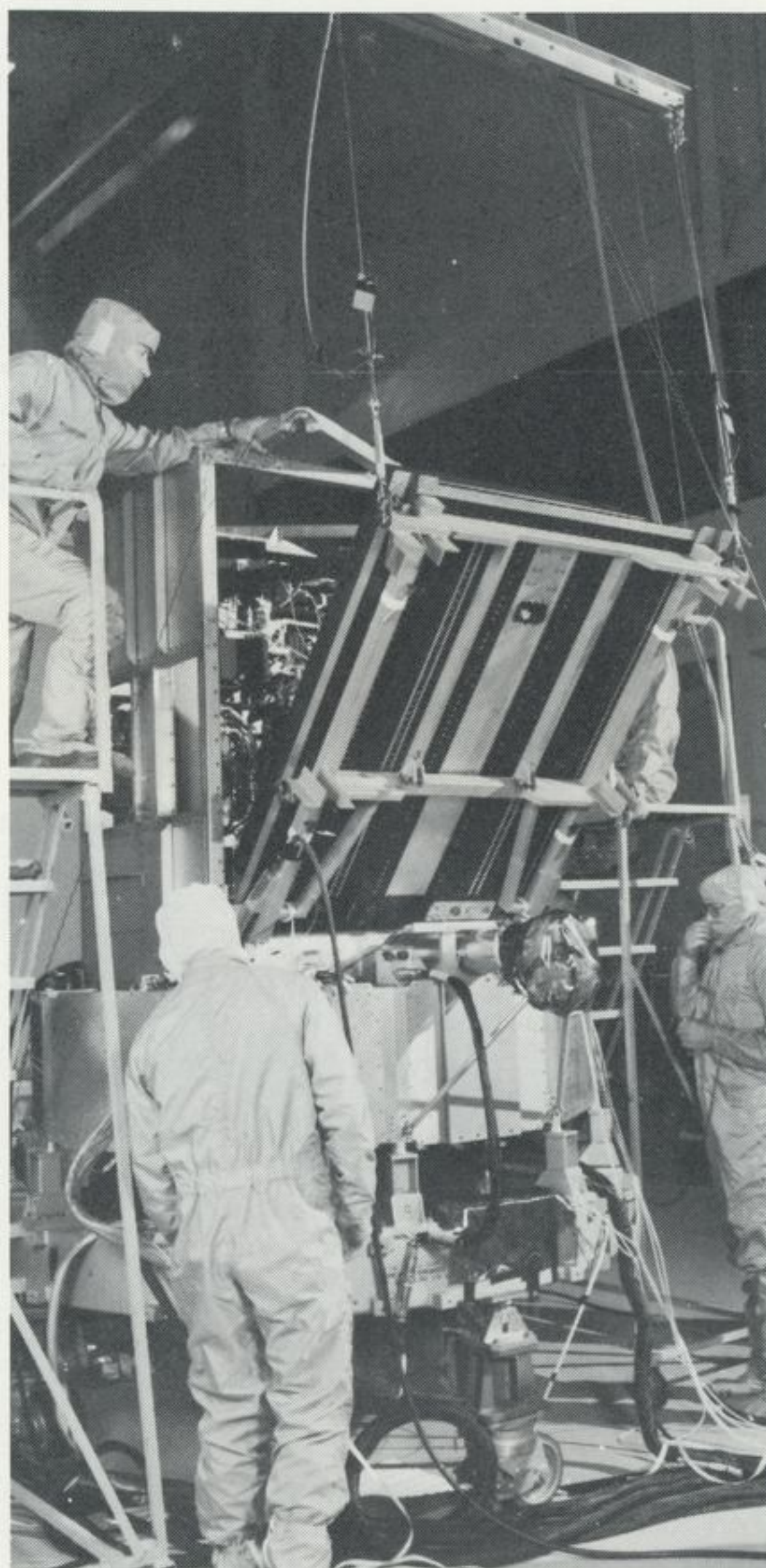
(Editor's note: The following letter was sent to Thomas G. Pownall, chairman of the board, by Lt. Gen. James A. Abrahamson, director, Strategic Defense Initiative Organization, after President Reagan's visit to the Astronautics Group.)

"After the exemplary performance of Denver Astronautics Group during President Reagan's visit, I was once again struck by the quality of the group Peter Teets has assembled there. His team's extra efforts clearly made the visit a success.

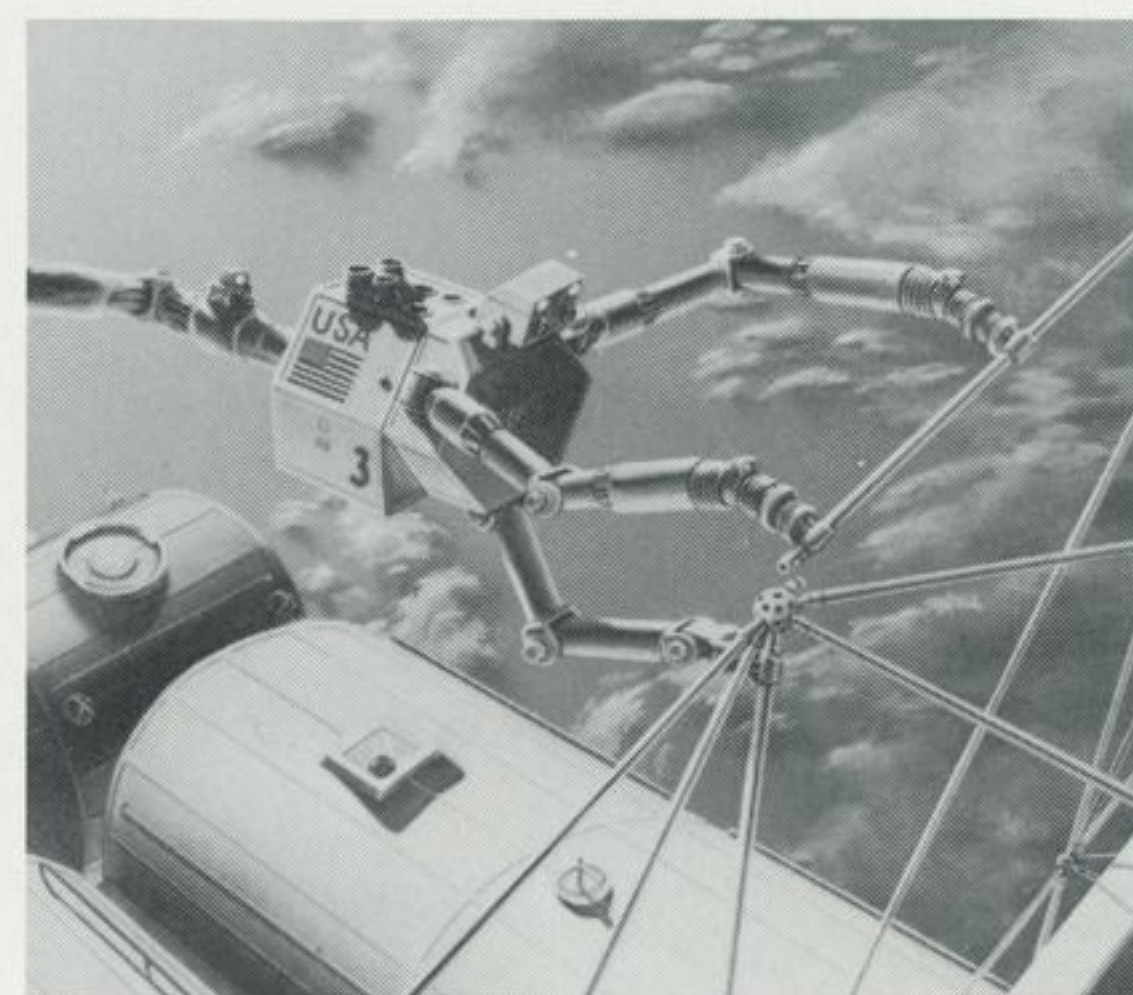
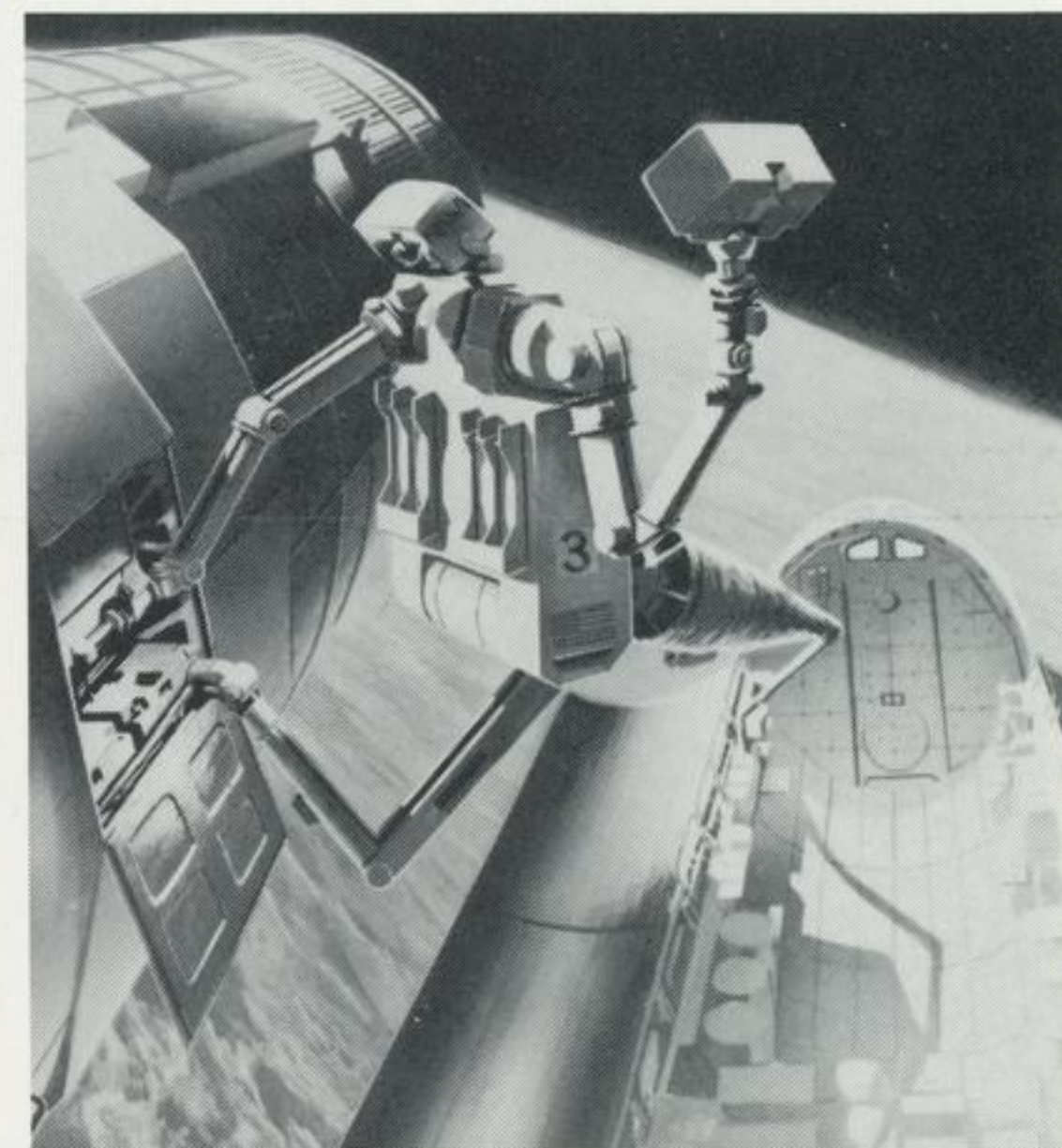
A few universities, several national laboratories, and even other companies own the basic facilities to host such a visit. Only Martin Marietta has the right people with the right attitude to turn a visit into a showcase of SDI advancement and give the President the proper forum to emphasize his commitment to the program and its standing in his vision for the future. Corporate investments come in many forms: new facilities, talented people, IR&D money, etc. Martin Marietta has made these commitments to SDI, but vitality, eagerness, cooperation, and thoroughness have once again set Martin apart from all the others. You can be justly proud of Denver Astronautics Group. They are an asset to your company, the Strategic Defense Initiative, and the Nation."



Space-based interceptor.



Synthetic aperture radar tested in Magellan.



Artist's concepts of two flight telerobotic servicers.

On the cover:
*Titan 34D launch,
Cape Canaveral, Fla.*

MARTIN MARIETTA NEWS
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Technologies

Advances continued on a wide array of pivotal and strategic technologies to support new and advanced products. As part of its technology development work, the Astronautics Group is building a new facility that will simulate the weightlessness of space for testing how spacecraft can be isolated from vibration.

In addition, the Astronautics Group is building a device that will help NASA transfer super-liquid helium between fuel tanks in space. NASA plans to fly an experiment on the shuttle in 1991 to test the ability to refuel future spacecraft with helium. A key part of the system is the Martin Marietta fluid acquisition device, which will feed a pump between two tanks.

In advanced materials, the Astronautics Group built in 1987 the first large structure

using a composite material known as a metal matrix. Using funding from the Defense Advanced Research Projects Agency, Astronautics built a 12-foot high metal matrix truss structure—the largest of its kind ever made. Using company funding, the company also is building prototype space mirrors with metal matrix composites that could be much less expensive than conventional beryllium mirrors.

Also showing significant progress in 1987 was the autonomous land vehicle, which is used as a national test bed to study artificial intelligence and advanced computing. In early November, the self-contained “laboratory on wheels” independently navigated a 2.7-mile course. The modified eight-wheel all-terrain vehicle reached a top speed of 12 mph, twice as fast as it has ever traveled. ■



Autonomous land vehicle.

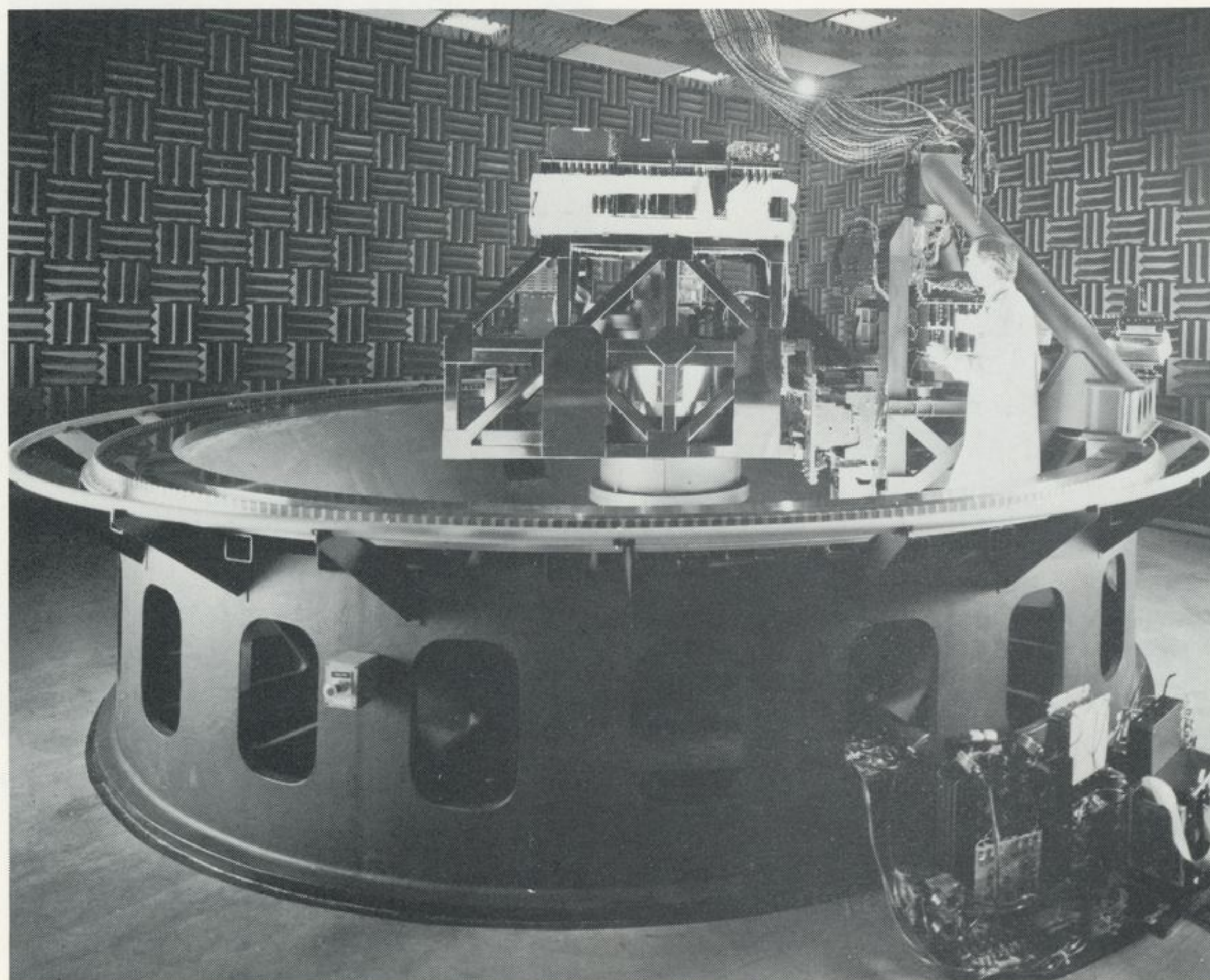
Facilities

In addition to acquiring the former Manville World Headquarters, new facilities completed during 1987 included two facilities for environmental management, an assembly and test facility for the transfer orbit stage program, and successful activation of the Rapid Retargeting/Precision Pointing Laboratory.

A new environmental management laboratory allows the company to analyze waste samples much more quickly than using outside labs. Another environmental facility completed in March intercepts ground water on company property and pumps it to a waste treatment facility. ■



Deer Creek Facility.



Rapid retargeting/precision pointing simulator.

PROJECT CHALLENGE

Under the initial leadership of Stanley F. Albrecht, vice president, Plant Operations, and now Warren G. Beery, vice president, Technical Operations, Project Challenge set an ambitious course for its first year of operation. With Santo Bertuzzi as the project's program director, more than 120 people, divided into seven organizations, devoted their efforts in 1987 to streamlining production to increase Martin Marietta's competitiveness in the marketplace. The group's goal is to increase productivity by 40 percent next year.

One organization is dedicated to process simplification—the necessary prerequisite to automation. Four organizations concentrate on developing automated tools for engineering, production, scheduling and finance. One organization is dedicated to training employees to help them understand and work with the new culture, and one organization is devoted to integrating activities between organizations.