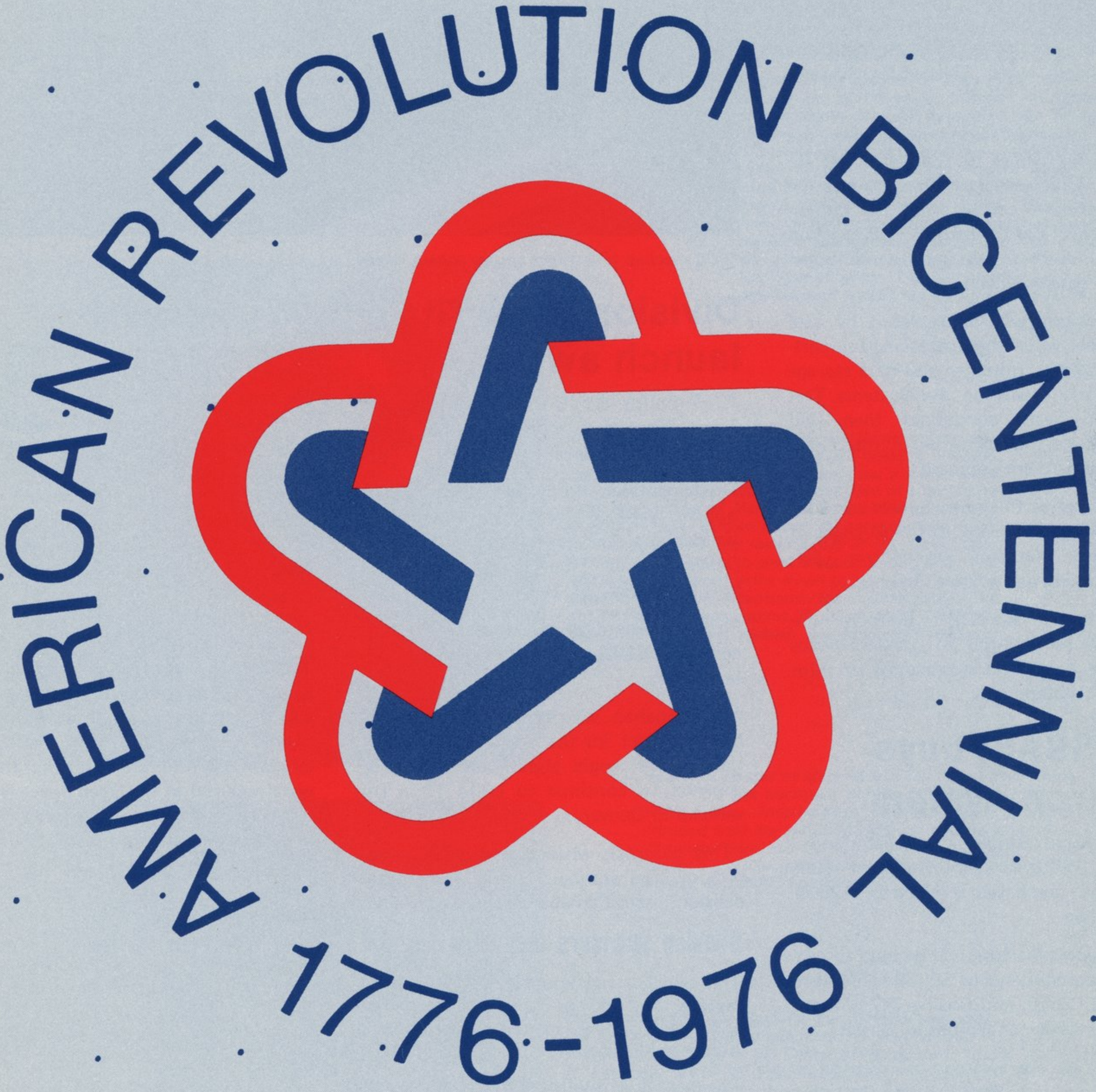


MARTIN MARIETTA

news

DENVER DIVISION

NUMBER 9/1976



# Navy reviews TFCC program

A major review of the division's progress on performance and design specifications for the Navy's Tactical Flag Command Center (TFCC) was conducted this week by two top naval officers.

Getting a comprehensive look at the work on TFCC and the division's organization were Rear Admiral Gordon R. Nagler, deputy director of command, control, and communications programs on the staff of the Chief of Naval Operations; and Rear Admiral Earl B. Fowler, vice commander, Naval Electronics Systems Command.

Among the developments shown the visitors by James B. Sanders, the division's TFCC program director, was the new operations compartment mockup on the second floor of the SSB. The mockup is used in part to help understand human factors requirements.

The mockup will be replaced by real equipment when the operations compartment and the computer and data storage compartment become the Systems Test Facility. Tests conducted then will demonstrate the operation of the TFCC in a shipboard environment.

By the end of this year, Sanders and his team will generate up to 8,000 pages of documents detailing preliminary performance and design specifications.

The facility in the SSB is built so room size may be changed to simulate space available aboard various classes of ships for TFCC equipment.

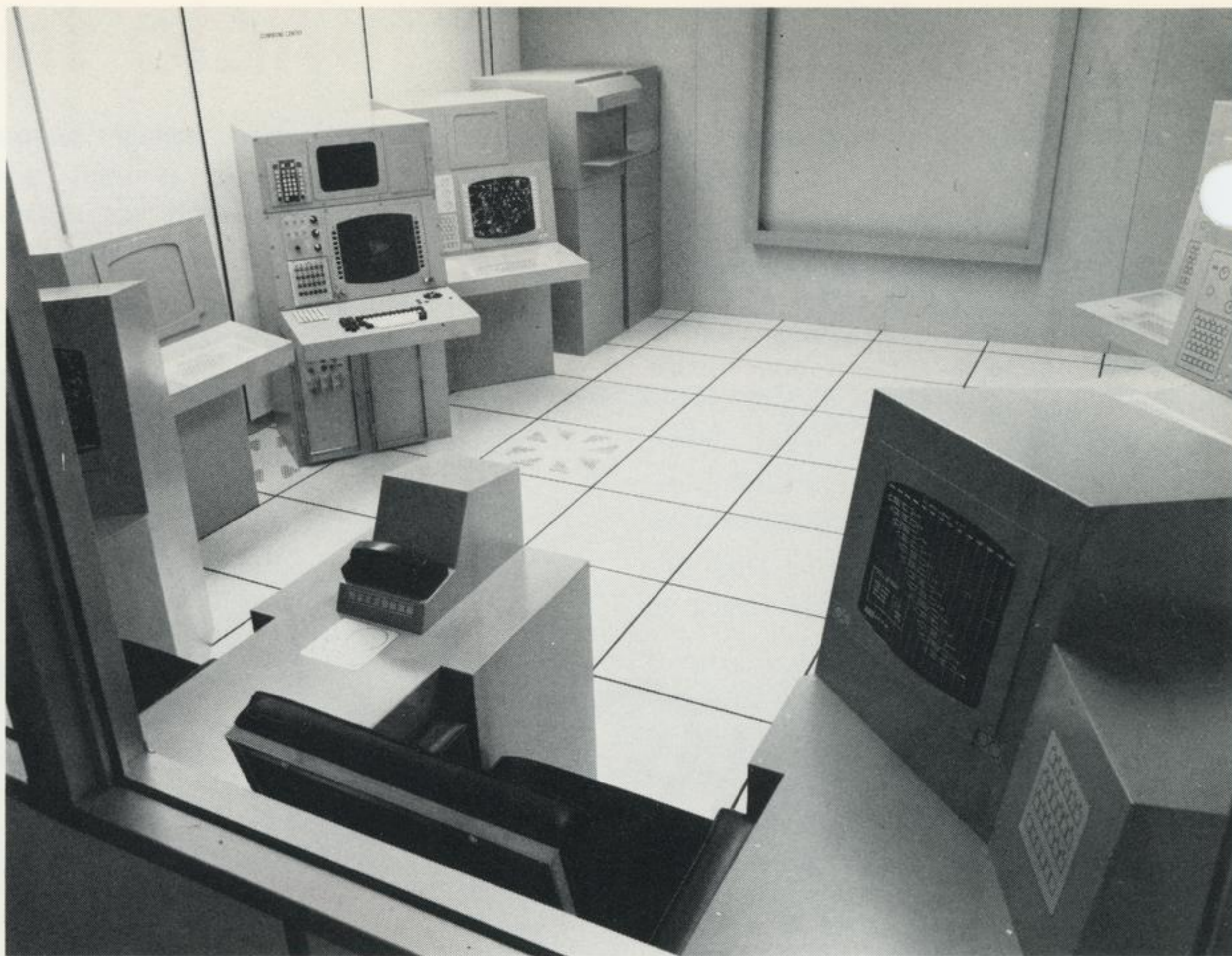
## SWISSAIR buys Martron system

The national airline of Switzerland—SWISSAIR (Swiss Air Transport Co., Ltd.)—has purchased a Martron 12000 ATE system.

The division's Martron will be used to test avionics components of SWISSAIR's fleet of CD-9, CD-10, and Boeing 747 aircraft at its maintenance facilities in Zurich.

The contract was awarded the division in competition with Sperry Flight Systems, Phoenix, and Aerospatiale, Toulouse, France.

Martron Systems are being used by 26 of the world's airlines and the U.S. Air Force and Navy.



*TFCC mockup as it might appear aboard carrier.*

## Division wins Titan launch award

A 27-month, \$80.5 million contract for Titan III launch operations has been awarded to the division.

The contract provides consolidated launch services at Cape Canaveral, Vandenberg AFB, and launch support at Denver for all Titan III launches from now until Sept. 30, 1978.

First increment of the funding for the contract, \$13.2 million, was announced last week.

C.E. Carnahan, who heads the launch vehicles project for the division, said negotiations will begin about July 19 for a contract to continue to build Titan III vehicles in Denver.

"This contract, when awarded, will also provide substantial work for the division," said Carnahan.

## Division sponsors magazine section

The division has sponsored a four-page feature on Viking—including the front and back cover—in the Journal of Aerospace Education.

The magazine, published by the American Society for Aerospace Education, is devoted to aviation and space in elementary, secondary, higher, and career education.

Material for the feature was furnished by the division's public relations department.

## On the cover

America's Bicentennial emblem, stored for more than a year on Viking Orbiter 1's tape recorder and carried from Earth to Mars, was transmitted back to Earth July 3 over a distance of more than 200 million miles. The picture was taken June 12, 1975, by one of the Orbiter's two TV cameras during pre-launch test activities at the Kennedy Space Center at Cape Canaveral, Florida. Viking 1 was launched August 20, 1975, and went into orbit around Mars on June 19, 1976. The red, white and blue star symbol of the United States' two centuries as a nation was recorded three times—through red, green and violet filters. All three frames were played back to Earth and have been reconstructed into the color picture. They were received at the Deep Space Network station at Canberra, Australia, and relayed to the Viking Mission Control and Computing Center at the Jet Propulsion Laboratory in Pasadena, Calif. The Bicentennial emblem will be carried to the surface of Mars on the body of the Viking lander.

### MARTIN MARIETTA NEWS

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## Division employees earn top corporate honors

Three Denver division employees—one of them assigned to Michoud operations—were accorded top honors at the 15th Annual Martin Marietta Corporation Honors Night held in late June in Washington, D. C.

From Denver, **Dr. Howard A. Garcia** and **William J. Owen** were cited as co-authors of the year.

From Michoud, **Allan M. Norton** was chosen engineer of the year.

These three and eight other division employees received the corporation's coveted Jefferson Cup—symbol of Martin Marietta's appreciation for outstanding individual contribution to the corporation.

Garcia and Owen are co-authors of "The Design and Analysis of a Novel Optical Sensor for High Altitude Navigation," published in *Proceedings of the AIAA Guidance and Control Conference*, August 1975.

Norton was cited "for outstanding technical leadership in managing the engineering design and meeting the weight, cost, and schedule objectives of the Space Shuttle External Tank development program."

Others presented the Jefferson Cup and their citations:

**Richard G. Adamson**—for development and institution of management controls that were instrumental toward meeting the company's cost goals during the crucial prelaunch phases of the Viking Mars lander program.

**Floyd A. Blake**—for innovative contributions to the development of solar power systems.

**William W. Brett**—for developing and implementing the technical approach that resulted in successful competition for the NASA Launch Processing System Checkout Control Monitor Subsystem for the Space Shuttle.

**Francis X. Carey**—for leadership in planning and implementing the integrated launch operations for the Viking Mars lander program.

**William T. Gansert**—for outstanding leadership and initiative in developing controls that are expected to result in significant cost savings in production of Titan III launch vehicles.

**Donald E. Hobbs**—for outstanding technical management in establishing and imple-

menting a superior quality assurance program during the qualification, production, and testing phases of the Viking Mars lander program.

**John G. Vega**—for technical leadership in assuring timely delivery of superior hardware for the Space Shuttle orbiter by outstanding management of the caution and warning programs.

**Dr. Roy S. Yamahiro**—for outstanding performance as head of a task force that has been instrumental in expanding career opportunities for women and minorities and for leadership in implementing effective affirmative action programs.

Others attending Honors Night for their performance at the Denver division were **W. G. Beery**, technical leadership; **W. P. Ewig, Jr.** (Michoud), business management; and **H. C. Wroton**, personal achievement.

## Why shouldn't Uncle Sam ?

*(Editor's Note: This is one in a series of articles to help employees understand the economic facts of life).*

Here are four interrelated facts:

Business makes about 4.7 cents profit on every dollar of sales.

The Federal government takes—in taxes—48 cents of every dollar business makes.

The Federal government is currently about \$500 billion dollars in debt—and going deeper each year.

We understand—and even applaud—the theory of taxation.

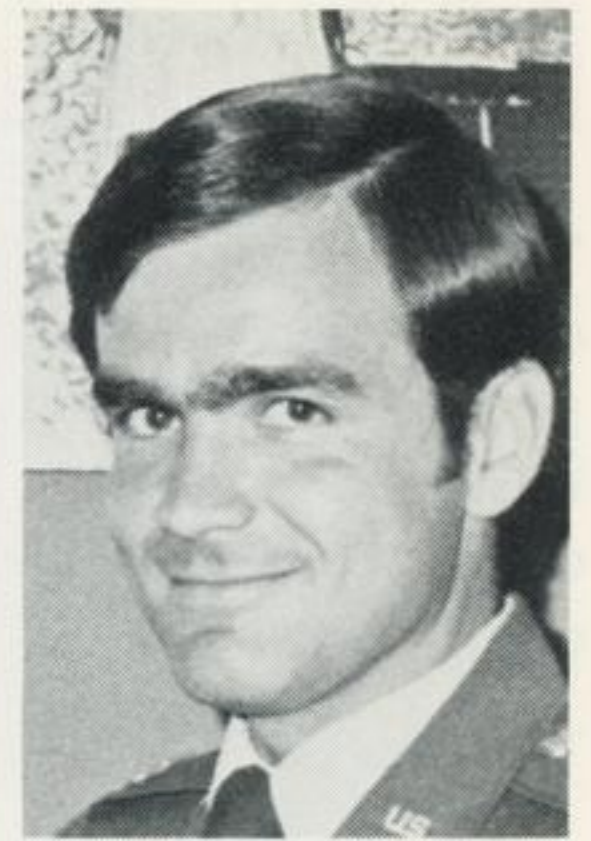
We quit applauding when Federal taxes become so exorbitant they force a reduction of expenses that maintain present jobs and prohibit business expanding and creating more jobs.

Big Government, we all know, costs big money (almost \$400 billion this year)...and here's where it really hurts—40 percent of your annual income is being spent on government services. Are you getting your money's worth?

We know American industry pays more taxes than it can now afford. In addition to taxes, it costs business a frightful sum just to comply with all government regulations. (For example, Goodyear Rubber Company spent \$30 million in 1974 just to comply with government regulations.)



Capt. Fehrenbach



Capt. Wagner

## Two AF officers complete EWI here

Two Air Force officers completed a 10-month Education with Industry (EWI) program at the division June 23.

Capt. Richard J. Fehrenbach and Capt. Gregory H. Wagner received Air University graduation certificates from C. B. Hurtt, division vice president and general manager, at a luncheon in their honor.

The EWI program is a graduate-level program sponsored by the Air Force's Institute of Technology at Wright-Patterson Air Force Base.

Hurtt received a certificate of appreciation for the division's participation in the program from the Air Force Institute.

Captain Fehrenbach has been assigned as administrative contracting officer in the Air Force Plant Representative Office (AFPRO) at General Electric's Evendale, Ohio, facility.

Captain Wagner will become overhead specialist in the AFPRO at General Dynamics in Fort Worth.

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That's money business didn't have for modernizing plants and machinery in order to maintain current jobs or for new equipment to create more jobs.

So, we think it's time for all of us—together—to decide what our government can afford to do and how much we can afford to pay.

Because, if government spending goes on unbridled, we can see the eventual end of it all:

Every one of us will be working for the government. There won't be any free enterprise system—the system that built America and gives each of us all of the creature comforts we enjoy.

Let's write our U.S. Senators and Representatives and tell them we want our government to live within its income. You and I have to live within our incomes—why shouldn't Uncle Sam?

## From Michoud

### PROFILE

#### Willie Jordan

Willie Jordan, associate analyst in production control, is responsible for receiving, binning, and the eventual staging and issuing of materials needed to build tools for the External Tank program. He is active in the daily coordination necessary to assure adherence to tooling fabrication schedules.

Jordan has been a Martin Marietta employee since 1974, joining the Michoud operation after eight years as an expeditor with The Boeing Company.

A graduate of George Washington Carver senior high school, Jordan was in the U.S. Army Signal Corps for three years—one of them in Thailand.

While working for Boeing, he attended night school at Rets Electronic School in New Orleans and became an electronics technician. In September 1973, while working an eight-hour shift, he enrolled at Delgado Junior College. He earned his associate degree in business administration in May 1976.

### Hurricane checklist available to employees

"The time for taking measures for a ship's safety is while still able to do so," Fleet Admiral Chester W. Nimitz said in 1944.

According to Steve Tucker, destructive weather coordinator for Michoud operations, this is also good advice for people on land—especially those who live in areas where hurricanes occur.

To aid employees in preparing for the hurricane season, the safety department is reprinting the Hurricane Checklist. This practical guide has pointers on what to do when a hurricane threatens, what to do during a hurricane, what to do when told to evacuate, and what to do after a hurricane has passed.

"Hurricanes are a fact of life along the Gulf of Mexico," Tucker said, "but, with proper planning and compliance with Civil Defense and National Weather Service directives, loss of life and property can be minimized."

Questions about hurricane preparations can be directed to the safety office, ext. 3970.



Willie Jordan is associate analyst in production control.

### 19 young people in summer program

Michoud operations has hired 19 young people for summer employment. They are working in all departments of the operation.

With the exception of Roosevelt Johnson, who leaves in mid-summer for the U.S. Naval Academy in Annapolis, all will remain until the end of the summer.

Two originally hired as summer employees have become regular employees—Denese Banks and Darryl Derbigny.

Denese is responsible for the management information center and Darryl is coordinator of engineering data files and diazo/press reproduction.

#### In Michoud

Call C. H. Fleischer at 3876 with suggestions or information for articles for the Martin Marietta News

### Pioneer 10 gets new information on planet Jupiter

Pioneer 10 sensors indicate the planet Jupiter has an enormous magnetic tail almost half a billion miles long, completely spanning the distance between the orbits of Jupiter and Saturn.

Magnetic tails are the magnetic envelopes around the planets, stretched out by the force of the million-mile-an-hour solar wind that blows constantly outward from the Sun.

Pioneer 10 crossed Saturn's orbit in early February. In mid-March, it was solidly in Jupiter's tail for at least 24 hours.

Dr. John Wolfe of NASA's Ames Research Center, in discussing the apparent encounter with the tail, said no evidence of a solar wind was seen in data returned from Pioneer during this period.

### 10 honored for company service

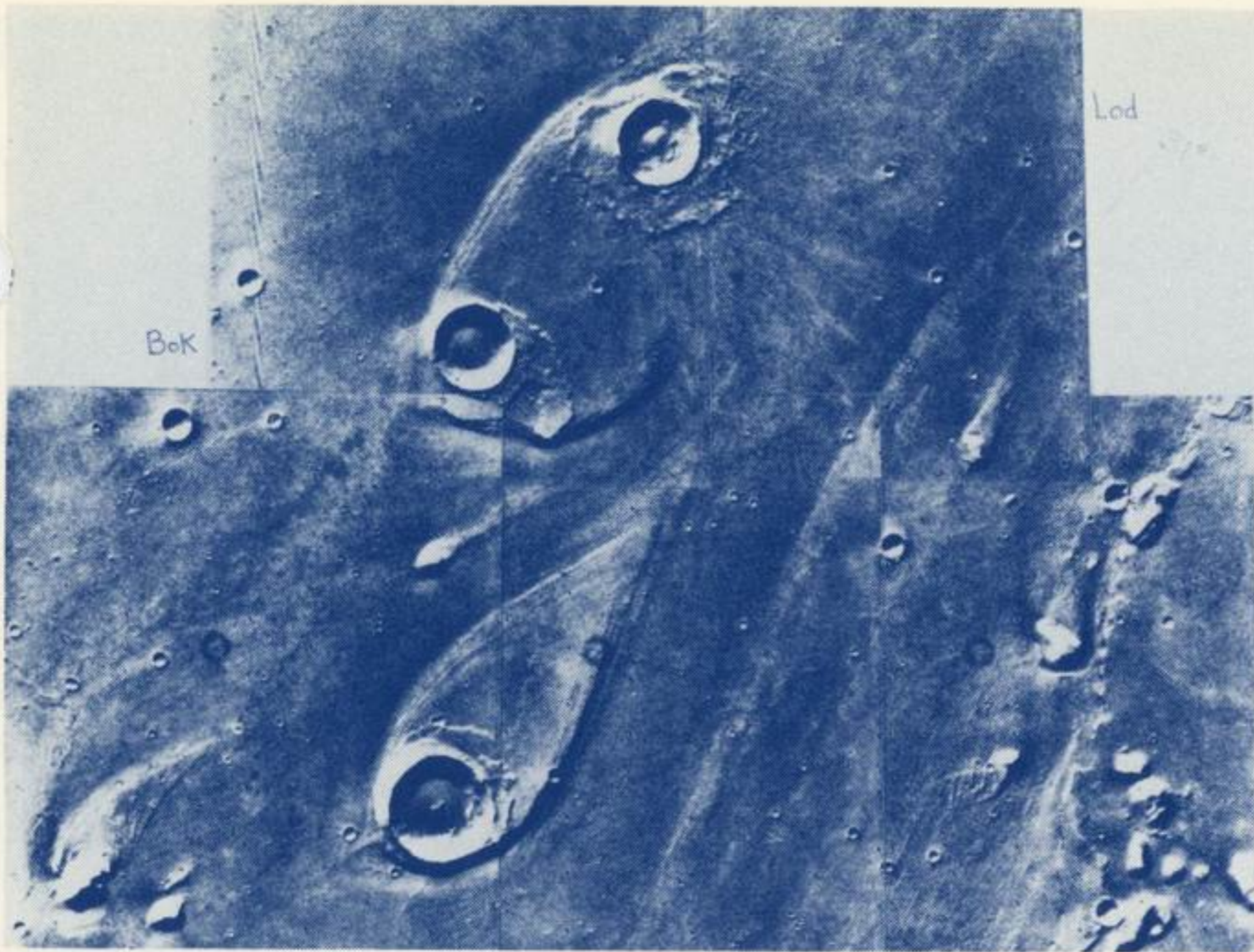
More than 300 years of service with Martin Marietta were represented when 10 Michoud operations employees received service awards recently from George E. Smith, vice president and project director.

Receiving awards were Angelo Rizza, chief, production control, 40 years; Frank Rehrmann, senior engineer, facilities, 35 years; Jerome Coski, group engineer, quality, 35 years; Don Haser, senior engineer, 35 years; Ed Tanner, manager, new technology, 35 years; Vern Brett, chief, procurement support, 35 years; Rolf Seiferth, senior engineer, 35 years; William Van Arnam, staff engineer, 35 years; Bernard Josselyn, senior engineer, 30 years; and Susan Law, senior production planner, 30 years.

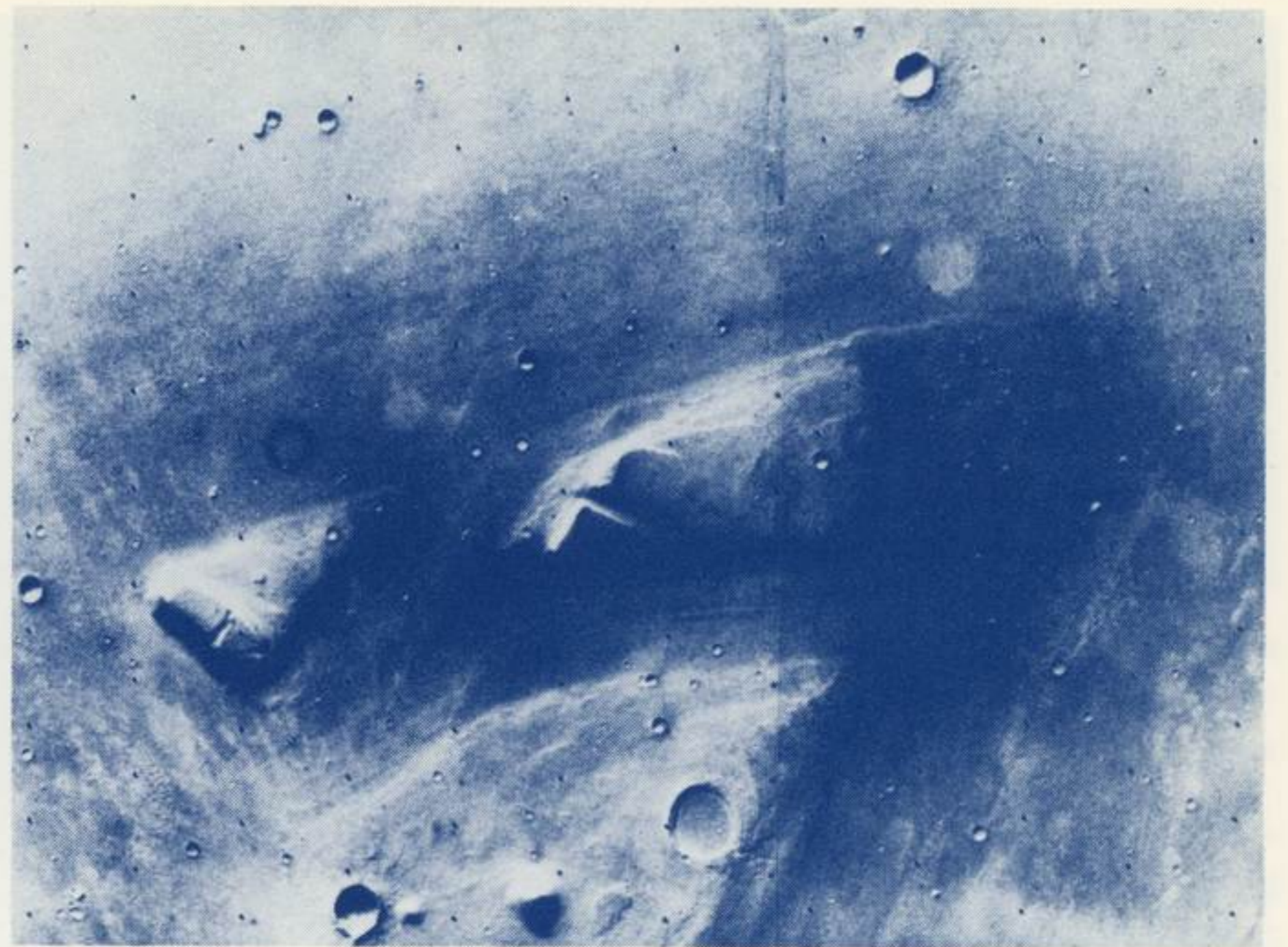
The lack could be attributed to a shutting out of the solar wind by the planet's tail structure. It is "barely conceivable," Wolfe said, the solar wind could have died completely for one whole day when no wind data was recorded.

However, Wolfe believes the findings indicate Jupiter has a "very stretched-out magnetic envelope or tail" extending all the way from Jupiter to Saturn.

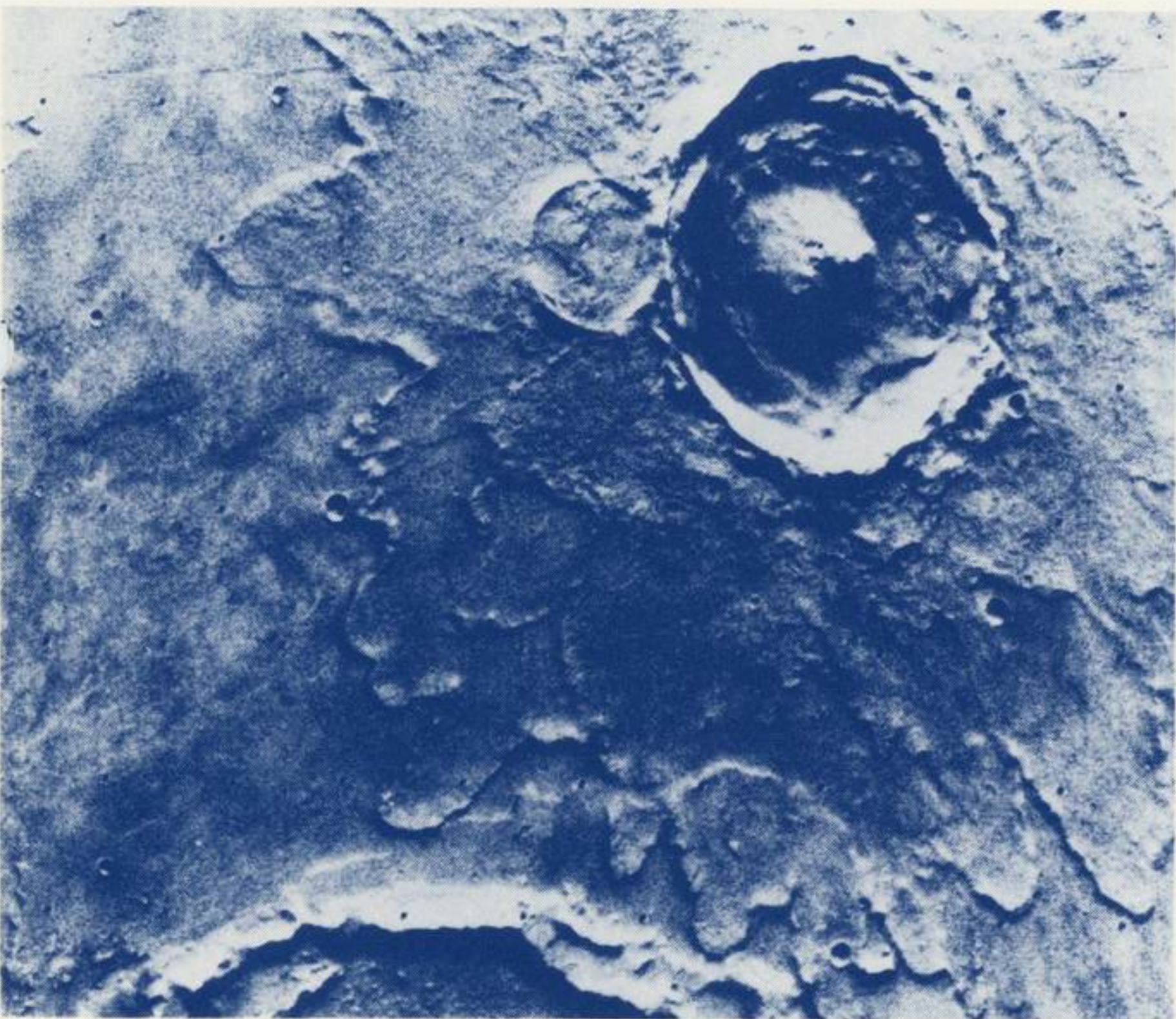
The discovery suggests Saturn itself should enter Jupiter's tail once every 20 years. If so, the next such event should happen in April 1981. The find also means Pioneer 10 has again come under the influence of Jupiter almost two-and-a-half years after its swing around the giant planet.



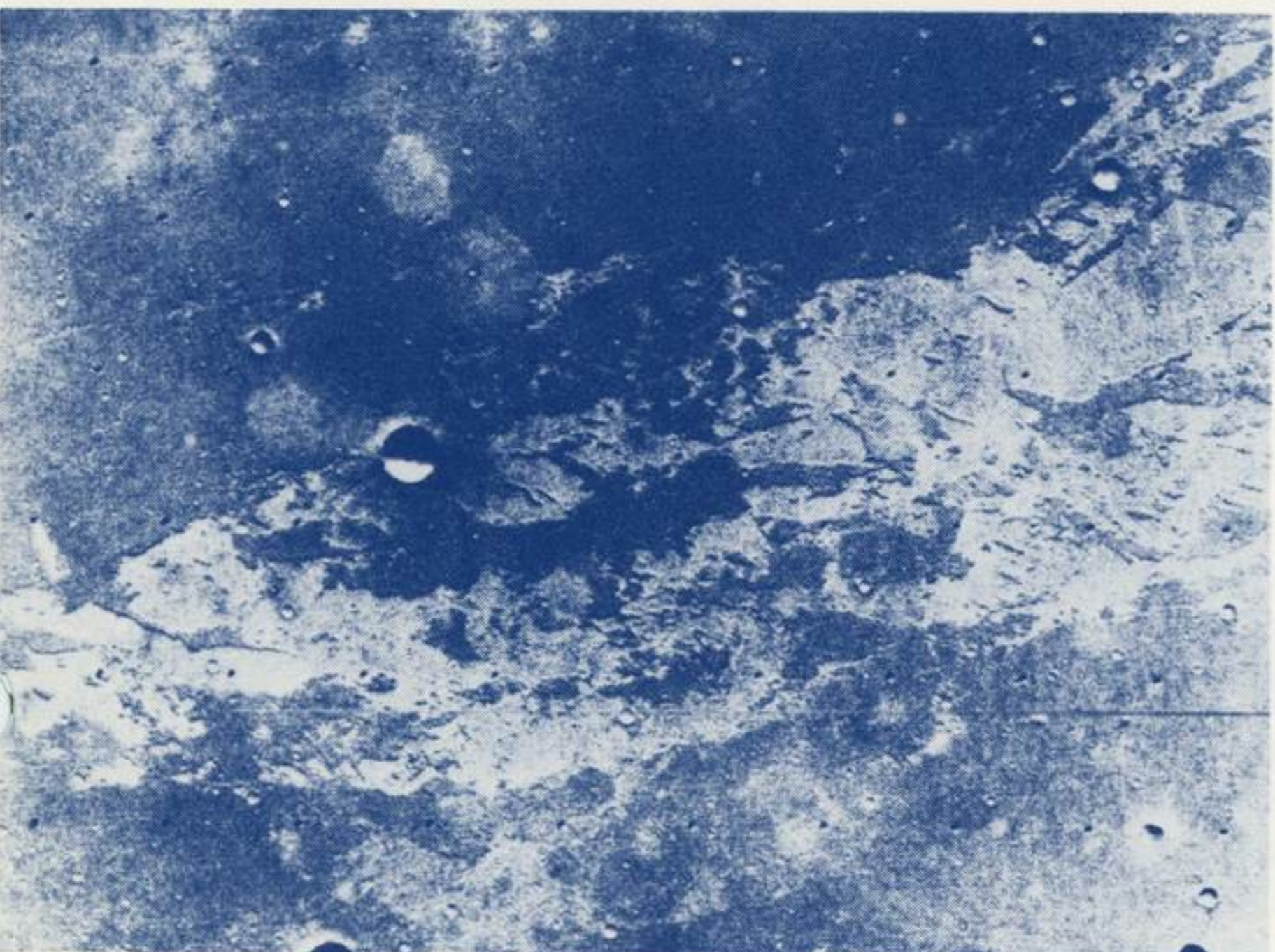
Five Mars pictures taken June 23 by Viking I orbiter cameras form a mosaic to show the eastern part of the Chryse region near the prime Viking I landing site. The cameras were about 992 miles above the planet. Braided channels record water flowing on the planet in the past. Fine grooves and hollows on the upstream side of flow obstacles also are shown. Shore of the channel is at lower right.



Islands in the channel of Ares Valley (Ares is Mars in Greek) are portrayed in this pair of high-resolution photos taken June 23 by one of two TV cameras on Viking I orbiter. The channel is the largest in the Chryse region. Markings on the channel floor probably show the direction of the flow of water. Water and wind have etched out the layers of rocks that form the islands. Seven layers are visible. They may be lava flows or layers of wind-blown material. Impact craters made by meteorites pepper the surface. Further study will allow estimates of the age of the channel and the last flow of water. The two pictures were taken about nine seconds apart from an altitude of 1070 miles.



The crater Yuty, named for a Honduran village, was photographed from a range of 1165 miles by Viking I June 22. Yuty, 11 miles in diameter, has a central peak and probably was made by the collision of a meteorite with the surface of Mars. The lobate flows are layers of broken rocks thrown out of the crater by the shock following impact. The leading edge of the debris flows forms a ridge similar to great avalanches on Earth. The whole area has been worn down by wind and possibly water erosion that accentuates the surface detail. The rim of Wabash crater, about 25 miles across, lies at the edge of the picture. Wabash was named for Wabash, Indiana.



These six photos of Mars were taken June 22 as Viking I overflow the northeast portion of the Chryse region. Meandering, intertwining channels flowing north (toward top) are vividly displayed. It is believed these channels were cut by running water on Mars in the planet's geologic past. Each of the six photos covers an area of about 775 square miles.

During the initial landing site certification sequence, the orbiting Viking photographed this channel floor in the Chryse region June 22. Center of the photo is 18.6° N Latitude, 34.8° W Longitude. North is approximately at left. Irregular depressed areas with straight and irregular edges are common in Mars channels. The straight edges may have been formed by erosion along breaks in the Mars crust. Irregular bright spots occur in the smooth areas; their origin is not yet understood. Many small craters occur in the smooth areas. Some may be secondary craters made by rocks thrown from primary craters, which, in turn, were made by meteorite impact.

# Mars: A different planet than we thought

Viking lander, created by the keen minds and skilled hands of Denver division employees, missed its Independence Day touchdown on Mars—but not because of difficulty with the lander, or the orbiter, or any other Viking I equipment.

The problem was the planet itself.

Mars, when photographed first by Mariner IX in its 1971 Martian flyby, seemed to offer a variety of landing sites, but when Viking I turned its cameras on the planet, the surface proved to be less inviting.

Perhaps the planet has not changed much in the past five years. Perhaps the pictures are just better.

Five days after the successful orbit of Mars, the clearest pictures ever of the planet were taken by Viking I. The details were so startling, the Associated Press reported June 24, "they caused scientists to shout in excitement."

But the rough, cratered surface shown in the pictures caused scientists to postpone the July 4 landing.

"I would have been quite pleased to see nothing," Jim Martin, NASA's Viking

project manager, said. The wealth of surface features that could capsize or damage the three-legged lander had not been expected.

As the photos on these pages show, the planned landing site had broad, barren plains believed to be cooled lava flows, peppered by sharp-edged craters as large as several miles in diameter.

Broad channels containing streamlined islands and irregular patches, which looked like rushing water had plucked boulders from a stream bed, seemed to strengthen the theory that water once flowed on Mars.

The landing site initially picked was chosen because, if water did flow in the low-lying area, it was a likely place to search for evidence of life.

Although that site has been abandoned, scientists expect the new site to offer basically the same opportunities in the search for life.

As the search was on for a suitable landing site, Martin said he had no apologies for his decision to cancel the July 4 touchdown.

"The mission is exploration," Martin said. "No one has ever landed on Mars."

"If one sets out as Columbus did to find a new world, he doesn't rush into the first beach he finds. He probably looks around for a safe harbor."

Martin was looking for a safe harbor for Viking I.

He has a distinct advantage over Columbus in finding that safer harbor.

With all Viking I equipment working well, Martin and his site selection team can check possible landing sites in hours instead of the days or weeks or months Columbus would have taken with his hit-or-miss system.

The best landing site for Viking will not be selected by chance.

Carefully planned photographic missions produce high-resolution pictures of the Mars surface, giving scientists the opportunity to pick a landing site that offers the least risk to the lander. The site picked will also be one attractive from the standpoints of finding life and geological exploration.

The search for a safe harbor continues.

The Viking Flight Team is certain the spacecraft will land on Mars—the earliest date is now July 20—and it will complete its mission.

Dr. James Fletcher, administrator of the National Aeronautics and Space Administration, summed up the feelings generated during the past few weeks when he said:

"Mars is a lot different planet than we thought it would be."

