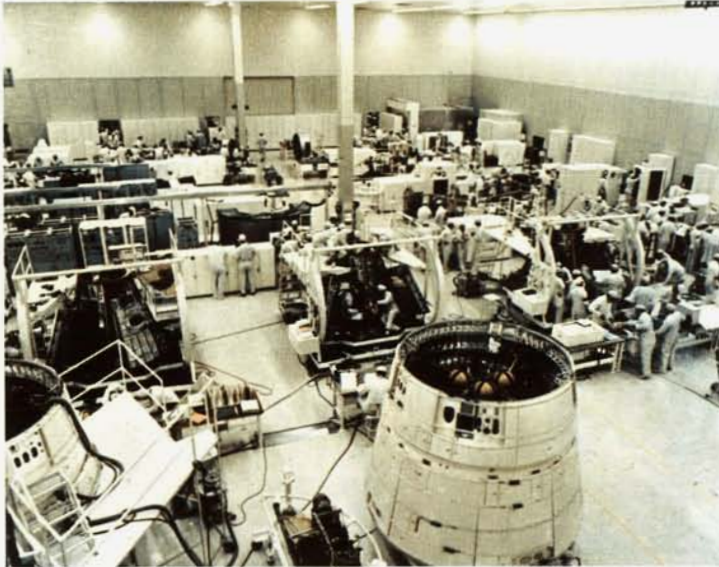


# EARTH PHOTOGRAPHS from Gemini VI through XII



*Scientific and Technical Information Division*  
OFFICE OF TECHNOLOGY UTILIZATION  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
1968  
*Washington, D.C.*



1



2



5



6

- 1 Gemini spacecraft were built at the McDonnell Aircraft Corp. plant in St. Louis, Mo. Two are shown here undergoing tests in the plant's "white room."
- 2 The Gemini V crew, Gordon Cooper and Pete Conrad, acknowledged the good wishes of the pad crew as they walked toward the gantry for their flight.
- 3 The Gemini spacecraft were launched from the Kennedy Space Center on the east coast of Florida. The countdowns were heard throughout the world.
- 4 Gemini VI and Gemini VII were the first two to rendezvous in space. Gemini VII also set an endurance record of 14 days during its mission.
- 5 An Agena target was photographed from Gemini XII while connected to it by a Dacron tether. This permitted stabilization by the gravity gradient.
- 6 The first two-man crew in space, John Young and Gus Grissom, were photographed inside the cabin of Gemini III just before their flight in March 1965.
- 7 Astronaut Ed White's "walk in space" was the first extravehicular activity by U.S. astronauts. Some photos were taken with the hatch open.
- 8 Gemini astronauts landed on the sea. A recovery carrier and rescue swimmers are seen here attaching a flotation collar before opening the hatch.





3



4



7



8

# EARTH PHOTOGRAPHS from Gemini VI through XII



*Scientific and Technical Information Division*  
OFFICE OF TECHNOLOGY UTILIZATION  
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1968  
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# FOREWORD

PHOTOGRAPHS of terrain and weather taken during Gemini flights showed that both geological and manmade landmarks and storms in the Earth's atmosphere could be viewed advantageously from orbital altitudes. The many spectacular color photographs of the Earth brought back by the astronauts have both heightened men's appreciation of their environment and increased scientists' knowledge of it. This Special Publication contains a mere sampling of the photographs available.

The Gemini program was approved in November 1961 to develop long-duration manned flight and rendezvous capabilities. In 1963 the program goals were broadened to encompass four more objectives: precise reentry control, attainment of flight and ground crew proficiency, extravehicular capability, and scientific experiments. When this program was completed in November 1966, the astronauts had acquired nearly 2000 man-hours of space-flight experience and all six objectives had been achieved.

The two-week flight of Gemini VII in December 1965 was the culmination of a series of progressively longer missions, and demonstrated that men could survive and work in space effectively for longer periods than a lunar voyage would require. A further requirement for the journey to the Moon is rendezvous and docking, and this was accomplished repeatedly by a variety of techniques. In postdocking maneuvers the Gemini astronauts used the thrust of the Agena target vehicle to set new altitude and speed records, thus increasing confidence that their successors will be able to proceed farther into space.

When the Apollo spacecraft returns from the Moon, its high velocity requires that its flight path into the Earth's atmosphere be controlled with great precision. The Gemini astronauts used aerodynamic lift generated by their spacecraft and an onboard computer to guide their vehicles to preselected landing areas. Their successes, and early Apollo flights, provided increased assurance that the men going to the Moon could return safely.

Both flight and ground crews demonstrated great proficiency during the Gemini program. On rendezvous missions, the Gemini spacecraft had to be launched after the target vehicle with precision measured in seconds. This was done with complete success. Dual

launching made a rendezvous possible in less than one orbit after the liftoff of the Gemini spacecraft on the 11th mission. The Mission Control Center in Houston, Tex., repeatedly controlled missions involving more than one space vehicle, and controlled a dual mission in which both vehicles were manned during the Gemini VII/VI mission.

Extravehicular activity by Gemini astronauts showed the need for body restraints, and on the final mission numerous planned work tasks outside the vehicle were performed without difficulty. The technological experiments also included tethering a target vehicle to a spacecraft, as an aid to station keeping and a means of inducing a small artificial gravity field by rotation.

The scientific experiments undertaken at the same time as these unprecedented demonstrations of what men can do in space yielded information that was hitherto beyond the reach of scientists. A total eclipse of the Sun was observed from space for the first time and the airglow and zodiacal light were photographed.

The personnel, equipment, and facilities employed in the Gemini program have since been integrated into other NASA and Department of Defense manned space flight programs. The technological legacy of the Gemini flights lives on. It is a harbinger of greater achievements both in space and on Earth, achievements with more beneficial results than our generation can now foresee.

GEORGE E. MUELLER

*Associate Administrator for Manned Space Flight, NASA*



# PREFACE

THE photographs in this volume resulted from two of 22 scientific experiments that were part of the Gemini program. These were the experiments in Synoptic Terrain Photography (S-005) and Synoptic Weather Photography (S-006). Many of the pictures obtained in these experiments already have been put to geologic, meteorologic, and oceanographic use. Historians and directors of human affairs, as well as students of physical phenomena, have found the perspectives afforded stimulating, and the value of such portraits of the Earth in agricultural, urban, and other kinds of research is becoming increasingly evident.

The Gemini science experiments were a continuation and expansion of work begun during the Mercury series of flights. These experiments were designed to take advantage of man's presence in space. The astronauts acted as the sensors, manipulators, and operators of the equipment, and exercised judgment based on their understanding of the objectives. Their interest, imagination, and ingenuity contributed greatly to the success of the program.

JOHN E. NAUGLE  
*Associate Administrator,  
Office of Space Science and Applications, NASA*



The first rendezvous of two space vehicles is shown here in fine detail as photographed by Tom Stafford in Gemini VI. Gemini VII's thruster ports appear as dark, round spots from 40 feet away. The yellowish covering on the right end is a thermal shield that protected various subsystems mounted in the adapter section. The trailing straps covered an explosive cord that severed all connections between the spacecraft and its launch vehicle when they separated. Gemini VI was starting its sixth orbit when this picture was taken.

GEMINI VI DECEMBER 15, 1965 S65-63204

Gemini VII appears balanced on the horizon as the two spacecraft orbit the earth. Its rendezvous and the recovery section in the spacecraft nose, which housed the parachute and other recovery aids, is shown in this picture. The small white objects to the left of the words "United States" are horizon scanners that measure spacecraft attitude. The command pilot's window is directly above. The two protrusions from the white, adapter section are cryogenically cooled radiometers, part of the Gemini in-flight experiments program. Cloud formations seen below the spacecraft result from convective clouds pushing up through broad areas of cirriform clouds.

GEMINI VI DECEMBER 15, 1965 S65-63188

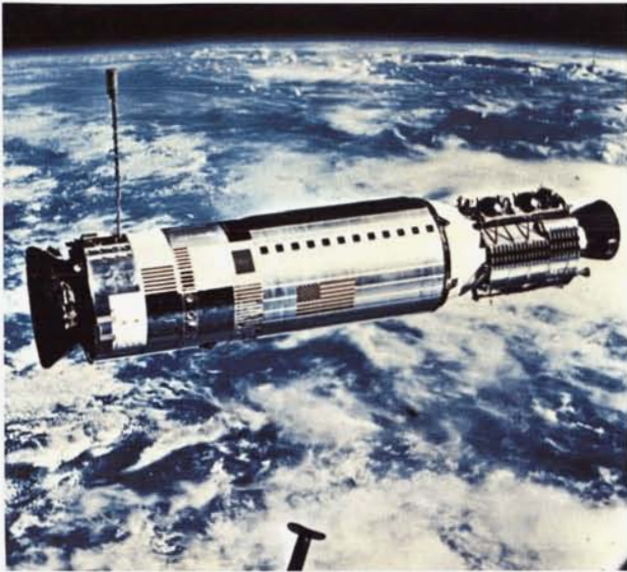


The rendezvous target for the Gemini XII mission was the Agena space vehicle, shown (on the next page) before docking over the Pacific Ocean near the end of the third orbit. The naillike object in the foreground is a heavy metal bar that is attached to the nose section of the Gemini spacecraft to facilitate docking. When docked, the Agena was able to propel the two spacecraft to the highest altitudes achieved by man up to that time. This was done during the Gemini XI mission when Astronauts Pete Conrad and Dick Gordon looked down at the Earth from 741.5 nautical miles.

GEMINI XII NOVEMBER 15, 1966 S66-62756

Gemini IX rendezvoused with an augmented target docking adapter (shown at the far right) that was launched as a replacement for an Agena target which had failed to achieve orbit on an earlier attempt. Docking with this spacecraft was not possible because its plastic nose fairing did not separate and it was quickly named the "angry alligator." "Early in the first daylight after rendezvous," Astronaut Thomas P. Stafford wrote of this picture, "our suspicion that something was amiss was photographically confirmed. The 'angry alligator' appeared to be nibbling at Roques atoll." This happened over the Caribbean, north of Caracas, and the Isla Orchila can be seen. Clouds in the upper right hide the coast of Venezuela.

GEMINI IX JUNE 3, 1966 S66-37923



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# ACKNOWLEDGEMENTS

THE photographs in this book were chosen from among hundreds that the Gemini astronauts took in the course of scientific experiments that included synoptic terrain and weather photography. In these particular experiments, Paul D. Lowman, Jr., of the Goddard Space Flight Center, and Kenneth M. Nagler and Stanley D. Soules, of the Environmental Science Services Administration, were the principal investigators. Robert E. Stevenson, of the Bureau of Commercial Fisheries at Galveston, Tex., joined them as a representative of oceanographic interests.

Since NASA's charter requires disclosure of scientific information likely to be generally useful, Robert E. Gilruth, Director of the Manned Spacecraft Center, proposed that a representative group of the pictures now available be published for the use of the many scientists who are concerned with features of the Earth's surface. Jocelyn R. Gill, Gemini Science Manager, was responsible for the organization of the book and headed the technical panel that recommended publication of these photographs.

Richard W. Underwood and Herbert Tiedemann, of the Manned Spacecraft Center, identified the areas shown in the photographs. The principal investigators provided information for the captions with the help of Dr. Stevenson, Mr. Tiedemann, Herbert Blodget of the Goddard Space Flight Center, James Williams of the Environmental Science Services Administration, James Bailey of the Bureau of Commercial Fisheries, Lawrence Dunkelman of Goddard Space Flight Center, and Samuel H. Hubbard of the Office of Manned Space Flight. The U.S. Geological Survey library staff was especially helpful to them.

Senor Ing. Guillermo Salas contributed geological information regarding pictures taken over Mexico. A. L. Grabham and L. Moskowitz of the U.S. Navy Oceanographic Office and other representatives of Government agencies and contractors served with NASA personnel on the technical panel, and a roster of the individuals who assisted its members would be extremely long. Among those who contributed especially valuable help and advice were John Bridgewater, Le Forrest Miller, Jose Toro, Ronald Dalrymple, Robert Dubinsky, and William Vest.

## Part I. Introduction

THIS is a companion volume to *Earth Photographs from Gemini III, IV, and V*, which was issued in 1967 as Special Publication 129. This one presents photographs taken on seven later flights, those of Gemini VI-A, VII, VIII, IX, X, XI, and XII. The crews, the dates, durations, and altitudes of these flights are listed in table 1, which also shows the cameras and films that were used on each flight.

In these seven flights, Gemini spacecraft orbited the Earth 421 times and the astronauts took nearly 1900 high-quality color photographs of its surface from above the atmosphere. Those reproduced here are a representative sampling of them, chosen with the current interests of earth scientists in mind.

In the previous volume, SP-129, the pictures taken on each flight were separated and presented sequentially. In this one they are juxtaposed, to group them geographically. This was done for two reasons: To enable a person interested in a particular geographic area to turn quickly to the photographs of that area, and to enable the reader to imagine himself circling the world and seeing it in somewhat the same way that it appeared to the astronauts.

The pictorial journey in the pages that follow begins at the launching site of the Gemini spacecraft, the Kennedy Space Center in Florida. It proceeds eastward between the latitudes of approximately 30° North and 30° South. Photographs taken on different flights and different revolutions, at different altitudes and times of day, and in different seasons of the year are intermingled in this presentation. The first and the last pictures in the book are both of Florida, but they are separated here by pictures taken at various times between December 15, 1965, and November 16, 1966, on many journeys around the world. The dates given below the photos are in Greenwich mean time.

The nine groups into which the pictures are divided in this volume correspond approximately with ways in which the Earth is often divided in an atlas of the type readily available in many homes and in most libraries. This facilitates use of common maps while examining these photographs. Attention is called in many of the captions both to geological divisions of the Earth and to national boundaries.

The explanatory notes beneath the pictures suggest some, but by no means all, of the ways in which scientists concerned with features of the Earth are finding high-altitude photography helpful. The objectives of the Gemini flights included a variety of scientific experiments for investigators representing numerous distinct scientific disciplines. These are listed in table II.

A Hasselblad 500C camera and a Hasselblad super-wide-angle camera, modified by NASA, were used on the Gemini flights. On the last four flights a specially designed 70-millimeter camera built by the J. A. Maurer Co. also was used. The pictures chosen for this book are presented in the square format of the original film.

Overlapping photographs were taken of many areas and can be used to obtain stereoscopic views. NASA can provide either transparencies or photographic prints of these pictures to members of the academic and scientific community who have

specific professional uses for them in mind. Researchers should address specific inquiries, indicating their requirements, either to the National Aeronautics and Space Administration, Manned Spacecraft Center, Science and Applications Directorate, Houston, Tex. 77058, or to the National Space Science Data Center, Code 601, Goddard Space Flight Center, Greenbelt, Md. 20771.

Persons having commercial or industrial applications in mind should address their requests for such photographic materials to Technology Applications Center, University of New Mexico, Post Office Box 181, Albuquerque, N. Mex. 81706.

TABLE I.  
*Gemini Flights VI-A Through XII*

Flight	Crew	Date	GMT	Duration	Orbit (approx)	Camera	Film <sup>2</sup>
VI-A <sup>1</sup>	Capt. W. M. Schirra, Jr. Maj. T. P. Stafford, Jr.	Dec. 15, 1965 Dec. 16, 1965	13:37 15:28	25 hr 51 min, 16 revolutions	100 by 161 miles (statute)	Modified Hasselblad 500C, 80-mm Zeiss planar lens, <i>f</i> /2.8	Eastman Kodak Ektachrome MS (S.O. 217)
VII. . .	Lt. Col. Frank Borman Comdr. J. A. Lovell, Jr.	Dec. 4, 1965 Dec. 18, 1965	19:30 14:05	330 hr 35 min, 206 revolutions	100 by 204 miles	Hasselblad 500C w/80-mm Zeiss planar lens <i>f</i> /2.8 and 250-mm Zeiss sonnar lens, <i>f</i> /4.5	S.O. 217 8443 (infra-red) 3400 2475
VIII. .	N. A. Armstrong Maj. D. R. Scott	Mar. 16, 1966 Mar. 17, 1966	16:41 3:22	10 hr 42 min, 7 revolutions	100 by 161 miles	Hasselblad 500C w/80-mm planar lens, <i>f</i> /2.8	S.O. 217
IX. . . .	Lt. Col. T. P. Stafford Lt. Comdr. Eugene A. Cernan	June 3, 1966 June 6, 1966	13:39 14:00	72 hr 21 min, 45 revolutions	99 by 166 miles	Hasselblad 500C w/80-mm planar; Hasselblad super-wide-angle-C w/38-mm Zeiss Biogon, <i>f</i> /4.5; J. A. Maurer 70-mm space camera w/Schneider 80-mm lens, <i>f</i> /2.8	S.O. 217



Persons wishing such pictures for other purposes should address their inquiries to the Audio-Visual Branch, Public Information Division, Code FP, NASA, Washington, D.C. 20546 (telephone: Area code 202, 96-21721).

Additional information regarding the Gemini program will be found in NASA SP-138, *Gemini Summary Conference*, priced at \$2.75 and for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. NASA SP-129, *Earth Photographs from Gemini III, IV, and V*, may be purchased for \$7 from the Superintendent of Documents.

TABLE I (Continued)  
*Gemini Flights VI-A Through XII*

Flight	Crew	Date	GMT	Duration	Orbit (approx)	Camera	Film <sup>2</sup>
X . . . .	Comdr. John W. Young Maj. Michael Collins	July 18, 1966 July 21, 1966	22:20 21:07	70 hr 46 min, 44 revolutions	100 by 167 miles and excursion to 475 miles	Hasselblad super- wide-angle-C, Zeiss Biogon 38-mm lens, f/4.5; J. A. Maurer 70-mm w/Schneider 80-mm lens, f/2.8	S.O. 217
XI . . . .	Comdr. Charles Conrad, Jr. Lt. Comdr. Richard Gordon, Jr.	Sept. 12, 1966 Sept. 15, 1966	14:42 13:58	71 hr 17 min, 44 revolutions	100 by 177 miles and excursion to 850 miles	J. A. Maurer 70-mm space camera w/80- mm Schneider lens, f/2.8; Hasselblad super-wide- angle w/38-mm Biogon lens, f/4.5	S.O. 368
XII . . .	Capt. J. A. Lovell, Jr. Maj. E. A. Aldrin, Jr.	Nov. 11, 1966 Nov. 15, 1966	20:46 19:21	94 hr 34 min, 59 revolutions	100 by 175 miles	J. A. Maurer 70-mm space camera w/80- mm Schneider lens, f/2.8; Hasselblad superwide-angle w/38-mm Zeiss Biogon lens, f/4.5	S.O. 368

<sup>1</sup> Gemini VI was rescheduled to follow Gemini VII and was renumbered "Gemini VI-A."

<sup>2</sup> Films used for synoptic terrain and synoptic weather photography experiments were:

Name	Type	Size mm
S.O. 217	Eastman Kodak Ektachrome transparency . . . . .	70
S.O. 368	Eastman Kodak Ektachrome transparency (improved) . . . . .	70

8443	Eastman Kodak Ektachrome, infrared . . . . .	70
3400	Eastman Kodak Panatomic X (ASA-80) . . . . .	70
2475	High Speed (ASA-1200) . . . . .	70

TABLE II  
*Gemini Science Experiments*

+, experiment successful; —, experiment incomplete

No.	Title of investigation	Principal investigator	Flights									
			III	IV	V	VI	VII	VIII	IX	X	XI	XII
S001..	Zodiacal Light and Airglow Photography	E. P. Ney, University of Minnesota.....			+			—	+	+		
S002..	Sea Urchin Egg Growth —Zero-G	R. S. Young, Ames Research Center.....	—									
S003..	Frog Egg Growth— Zero-G	R. S. Young, Ames Research Center.....						—			+	
S004..	Effect of Zero-G and Radiation on Blood	M. A. Bender, Oak Ridge National Laboratory...	+								+	
S005..	Synoptic Terrain Photography	P. D. Lowman, Jr., Goddard Space Flight Center.....		+	+	+	+			+	+	+
S006..	Synoptic Weather Photography	K. Nagler and S. D. Soules, Environmental Science Services Administration.....		+	+	+	+			+	+	+
S007..	Spectrophotography of Clouds	F. Saiedy, Environmental Science Services Administration.....			+			—				
S008..	Visual Acuity in Space	S. Q. Duntley, Scripps Institute.....			+		+					
S009..	Nuclear Emulsion	M. M. Shapiro, Naval Research Laboratory, and C. D. Fichtel, Goddard Space Flight Center.....						—			+	
S010..	Agema Micrometeorite Collection	C. L. Hemenway, Dudley Observatory.....						+	+	—		—
S011..	Airglow Horizon Photography	M. J. Koomen, Naval Research Laboratory...							+		+	+
S012..	Gemini Micrometeorite Collection	C. L. Hemenway, Dudley Observatory.....							+	—		+
S013..	Ultraviolet Astronomical Photography	K. G. Henize, Dearborn Observatory.....								+	+	+
S026..	Gemini Ion Wake Measurement	D. Medved, Electro- Optical Systems.....								+	+	
S029..	Libration Regions Photography	E. C. Morris, U.S. Geological Survey.....										—
S030..	Dim Sky Photography/- Image Orthicon	E. P. Ney, University of Minnesota and C. Hemenway, Dudley Observatory.....									+	
S051..	Sodium Vapor Cloud Photography	J. Blamont, University of Paris.....										—
S064..	Ultraviolet Dust Photography	C. L. Hemenway, Dudley Observatory.....										—

## Part II. Across the Atlantic

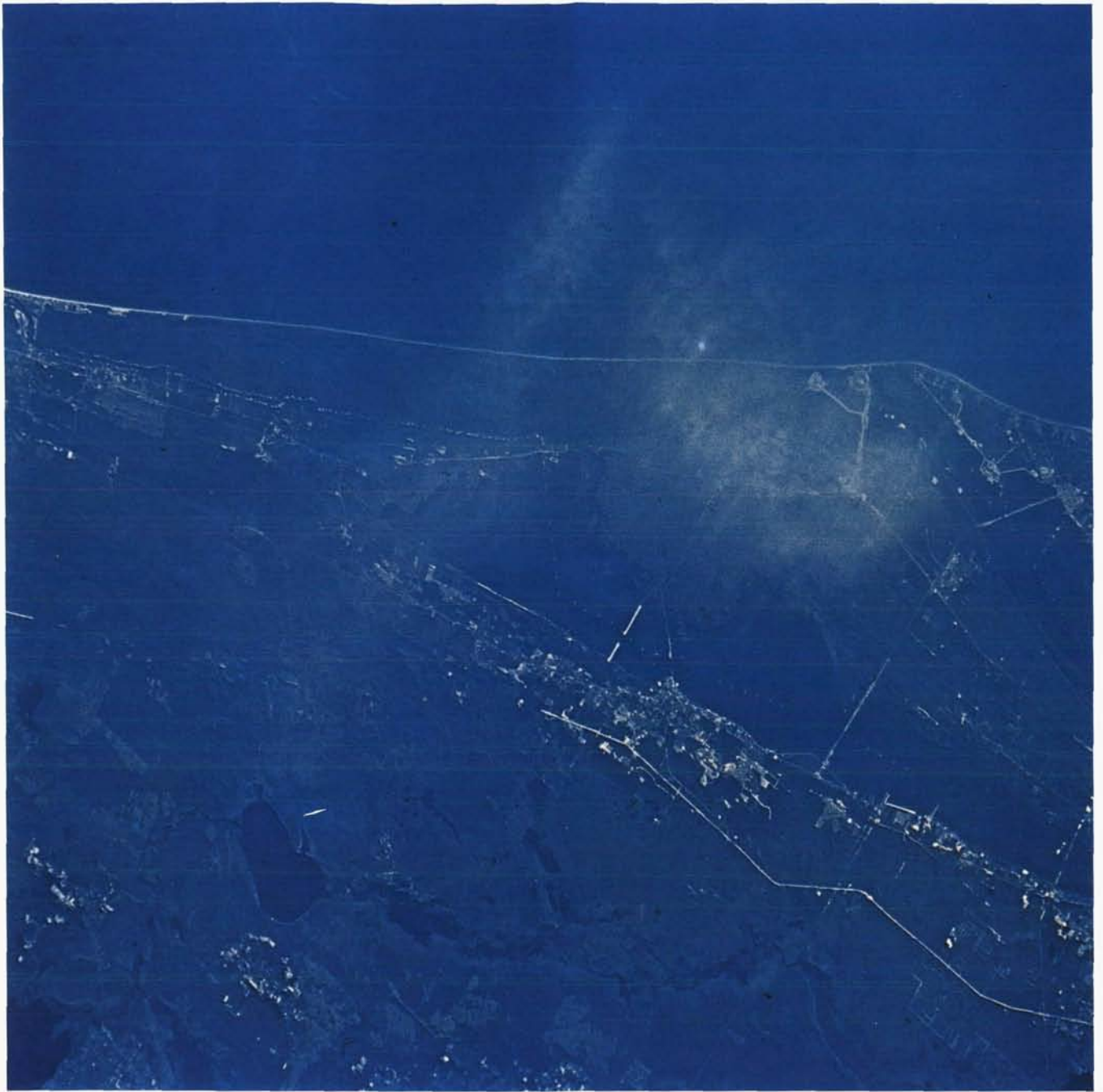
I'LL put a girdle round about the world in forty minutes," said Puck in *A Midsummer-Night's Dream*. The pages that follow show the Earth as one might see it from such a girdle.

This imaginary tour begins and ends at Cape Kennedy, from which the Gemini spacecraft were launched. The astronauts turned their cameras in numerous directions while going around the world and photographed some sights from several sides and angles. Pictures that they took are not shown here in the order in which they were taken, but the date of each one is given below it.

Cape Kennedy is on Florida's east coast, near St. Augustine, the oldest city in the United States. The astronauts sped east from Florida, over steppingstones of history that are still called the West Indies. On some of their many crossings of the Atlantic, their first glimpses of the Old World were of the Canary Islands, from which 15th-century explorers sailed south and west to discover a relatively small planet's immensity. Several of their photographs of the West Indies and the Canary Islands have been included here because contemporary oceanographers and meteorologists are finding them highly informative.

Gemini photographs already have been used to check interpretations of pictures transmitted to Earth from unmanned weather satellites, and there is no longer any doubt that a multitude of constructive uses will be found for photographs taken from high altitudes. "Our unearthly satellites," Edgar M. Cortright, Director of the Langley Research Center, has written confidently, "will help us solve a host of earthly problems."





This nearly vertical view of Florida's Atlantic coast includes both Ponce de Leon inlet at the far left and, along the shore near the right edge, a row of pads. The Gemini spacecraft were launched there. Taken with a telephoto lens, the picture clearly shows the highway through Titusville, buildings along it, lakes west of it,

and the bridges to the Kennedy Space Center on Merritt Island. Between a thin cirrus-cloud layer and the bulge in the shoreline are two white circles. A prominent roadway leads to crawlerways that end at the circles, which are the sites of launch pads built for manned flight to the Moon.

GEMINI VII DECEMBER 6, 1965 S65-63807



The Gulf Stream enters the Atlantic here. Its border is marked in this photo by a cumulus cloud line extending northward from Florida's east coast. Astronaut Edwin E. Aldrin, Jr., stood in the cockpit seat while the spacecraft hatch was open to take this picture. It includes a western part of Great Bahama Bank, Cuba,

and the Isle of Pines beyond Cuba in the upper center. Smooth waters can be seen beyond the tip of Florida, and an area of divergence shows parallel to its west coast. Such features denote water conditions that are significant to the fisheries in the Gulf of Mexico and the Caribbean Sea.

GEMINI XII NOVEMBER 12, 1966 S66-63418



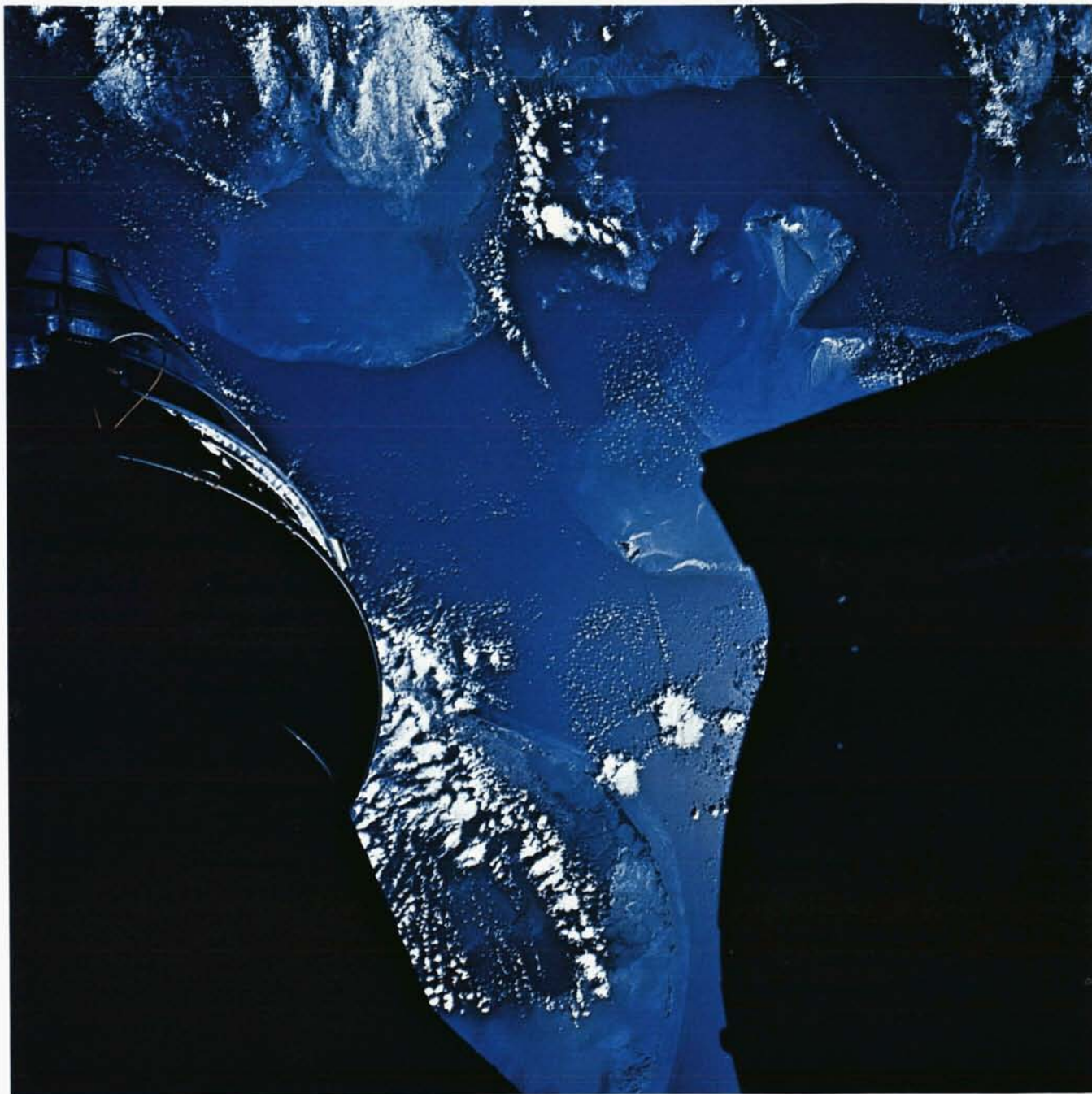


The Sun's glitter pattern had shifted eastward when this picture was taken, a minute after the preceding one. Oceanographers can obtain information about the changes in the sea's surface from pairs of pictures such as these. Cuba extends nearly all the way across the top of this one. Near the center, to the left of Grand

Bahama Island, is Great Abaco Island. The islands of Andros, New Providence, and Eleuthera also can be seen despite the scattered clouds. A dark irregular spot in the sea near the center, left of an intense reflection of sunlight, indicates the location of the Little Bahama Bank.

GEMINI XII NOVEMBER 12, 1966 S66-63423



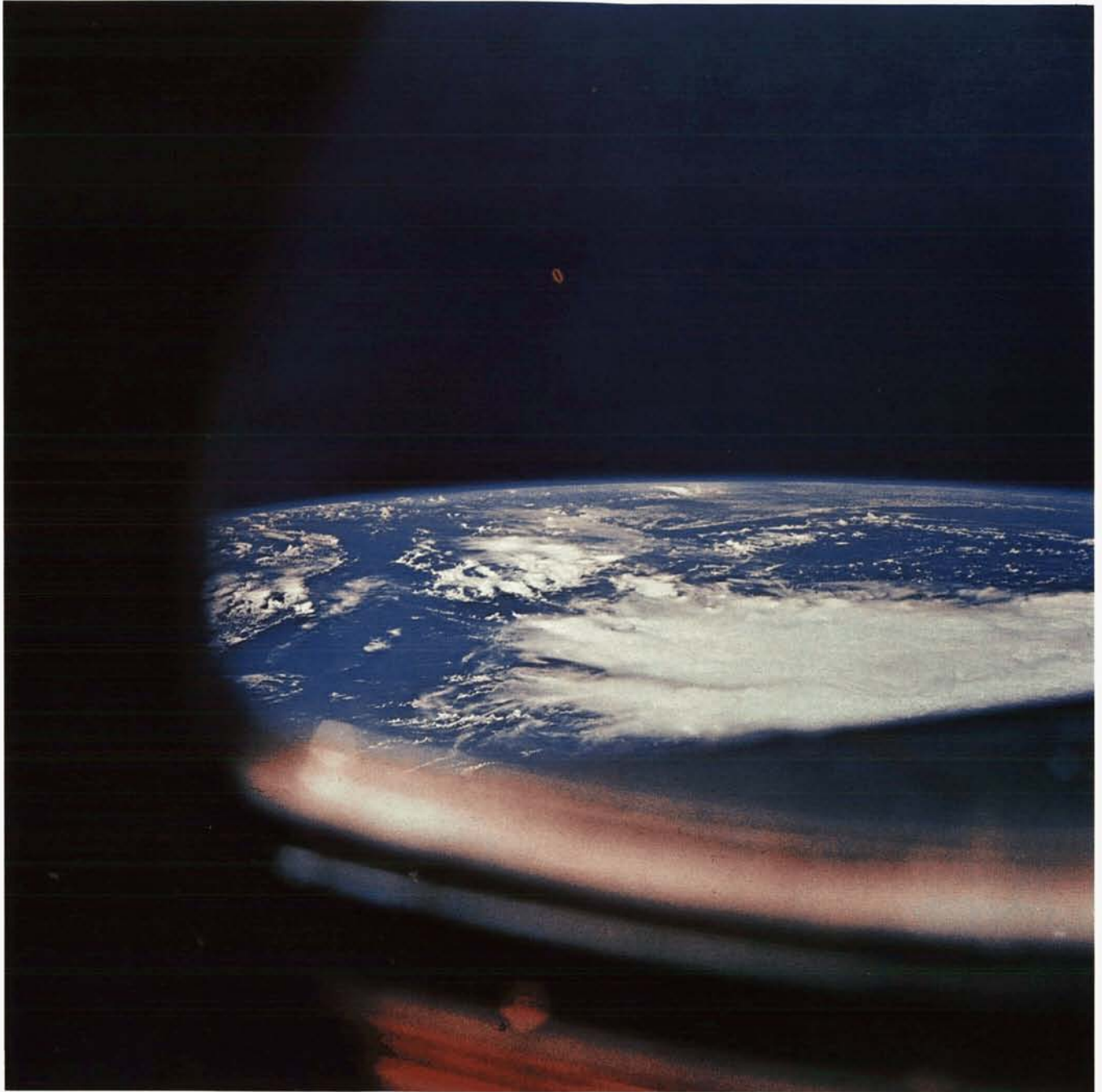


Bimini Island is in the center of this eastward view from over the Florida Keys in the foreground. South of Bimini, U-shaped bars indicate the spillover of water onto the shallow surface of the Great Bahama Bank. Similar bars can be seen around the Berry Island group and the northern end of Andros Island in upper center. In

each case the water spills toward a central portion of the Great Bahama Bank during storm surges. A long sandbar is formed where flooding waters meet. On the ebb, water flows into a channel between the Great Bahama Bank and Grand Bahama Island to follow the Gulf Stream northward.

GEMINI XII NOVEMBER 12, 1966 S66-62908





The large mass of cirrus and cirrostratus clouds in this northwesterly view of the sky over the Atlantic Ocean is the western edge of tropical depression Celia, which rapidly intensified and became a hurricane the following day. Cuba is at the left edge of this photo, and the coast of Florida, Georgia, and South Carolina can be seen near

the horizon. The cumulus-cloud streets at the left edge of the cloud mass are aligned with the low-level wind, which spirals around and inward toward the storm's center. Pictures from operational meteorological satellites, less detailed but covering larger areas than the Gemini views, are used to track tropical storms.

GEMINI X JULY 19, 1966 S66-45692

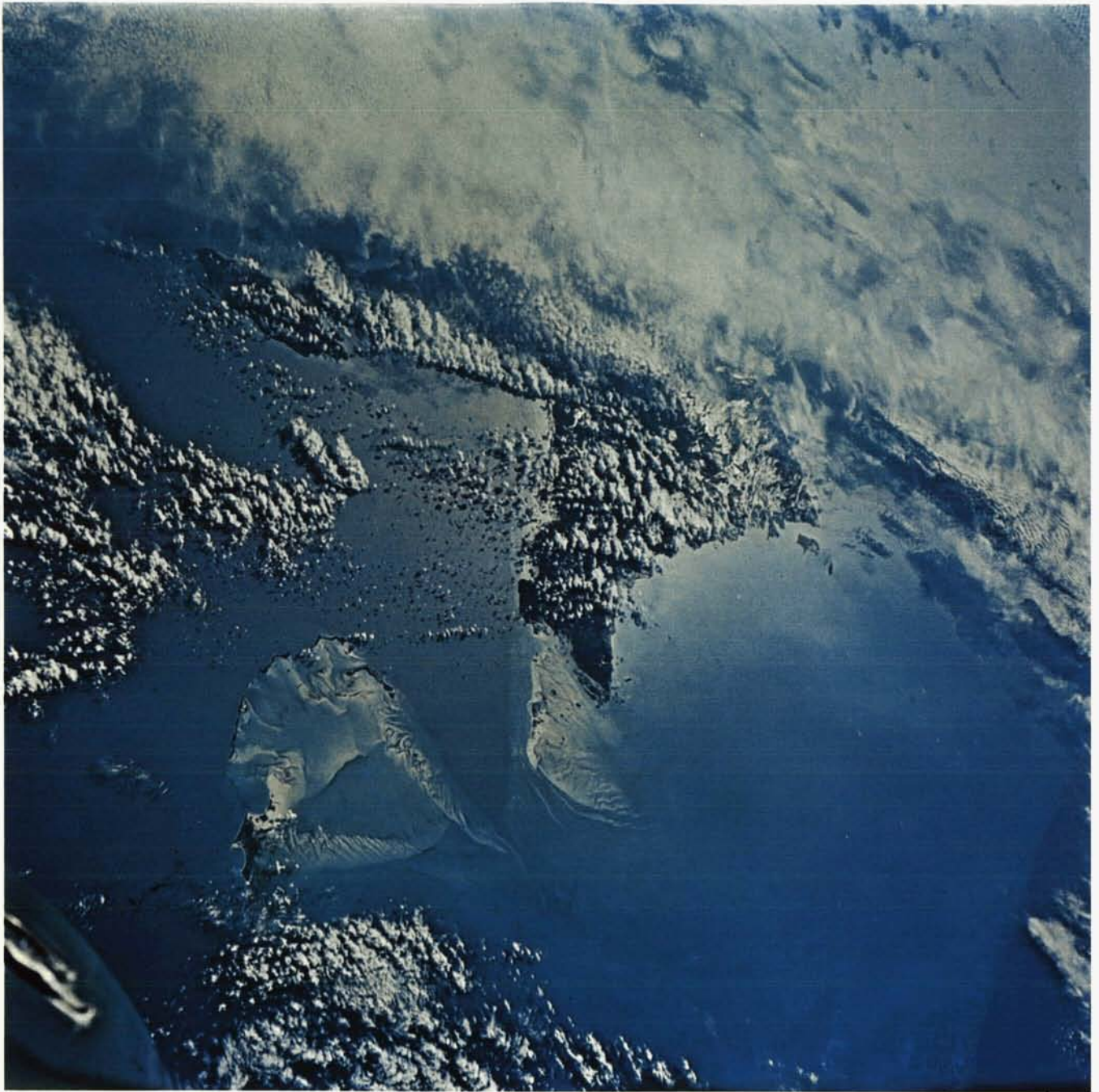


From left to right above the spacecraft's nose here are parts of Abaco Island, shoals and flats around the Berry Islands, and the tip of Andros Island. New Providence Island, the site of Nassau, is in the upper center. Sand flats and the elongation of spillover bars show the direction of the currents. The net flow between the Ber-

ry Islands and Andros Island is from east to west. Layers of stratocumulus in the upper right are spread across the deep waters of the Tongue of the Ocean. In those clouds one can clearly see an unusual break. This kind of pattern has been noted in other pictures of stratocumulus over the sea.

GEMINI VII DECEMBER 11, 1965 S65-63753





Above the northern tip of Andros Island, in the center, the sea off the Florida coast is light blue where it is shallow and darker blue where the Northeast Providence Channel leads into the Tongue of the Ocean to the south. Dunelike depositions of sand can be seen in the shallows. The Berry Islands are in the fore-

ground, and New Providence Island at the upper left. Patches of cumulus and stratocumulus cover some of the view, and a band of cirrus crosses the upper part. Although the Great Bahama Bank began to form in the Cretaceous period, coral built up the present islands after the sea-level rise that followed the last glaciation.

GEMINI VII DECEMBER 5, 1965 S65-63825



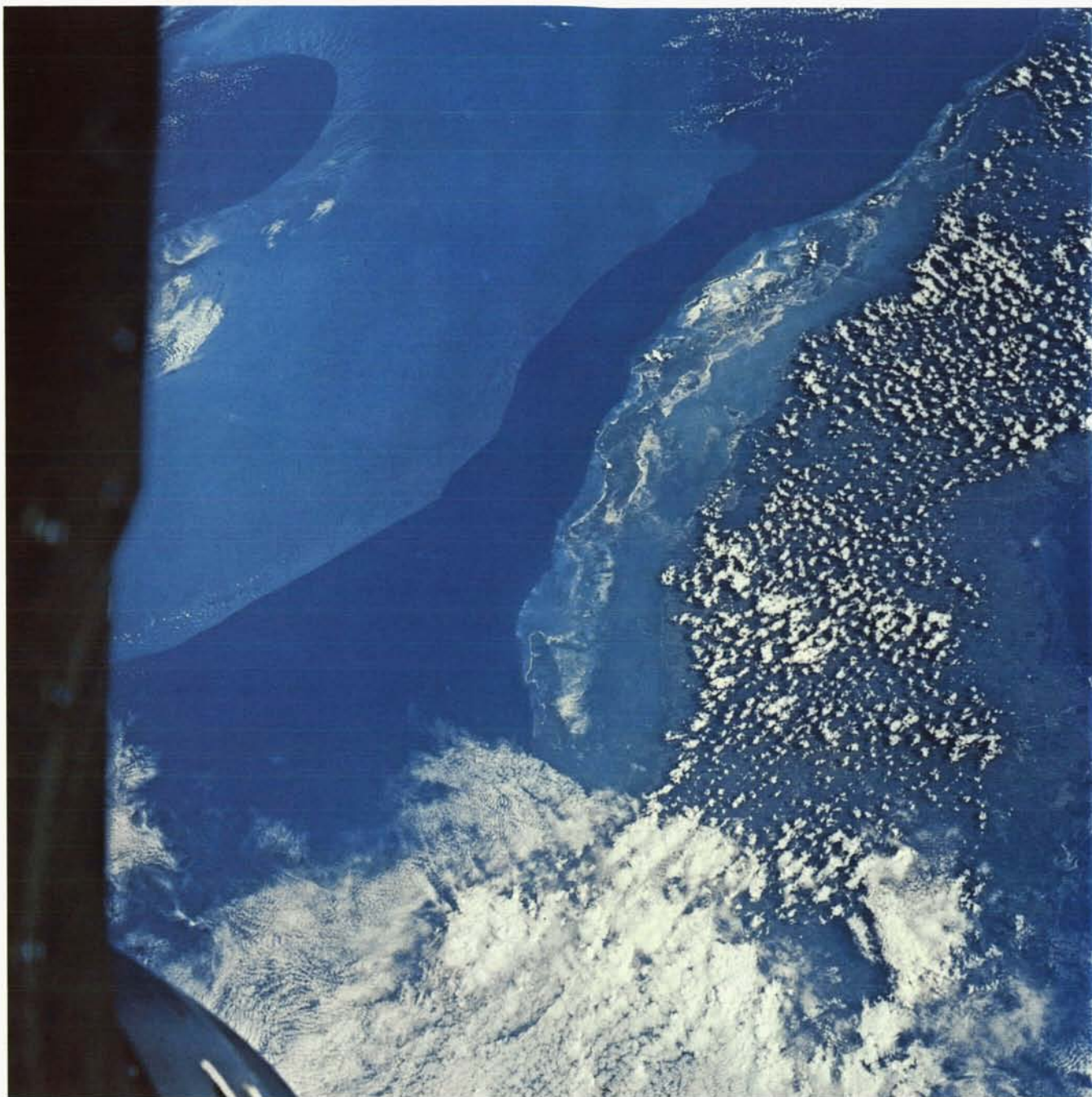


Tropical clouds camouflaged the islands bordering the Caribbean Sea when this photo was taken. The Agena target vehicle was tethered to Gemini XI, and Jamaica lay directly above it in this northeasterly view. In the upper left, cirrostratus covered a disturbed area containing thunderstorms, and elsewhere cumulus and

cumulus congestus covered the region under a sparse veil of cirrus clouds. Eastern and central Cuba were in the top center and beyond them the Great Bahama Bank was visible. Serranía Bank was left of center at the lower edge, and reefs and cays of Bajo Nuevo were to the right of the Agena.

GEMINI XI SEPTEMBER 14, 1966 S66-54571



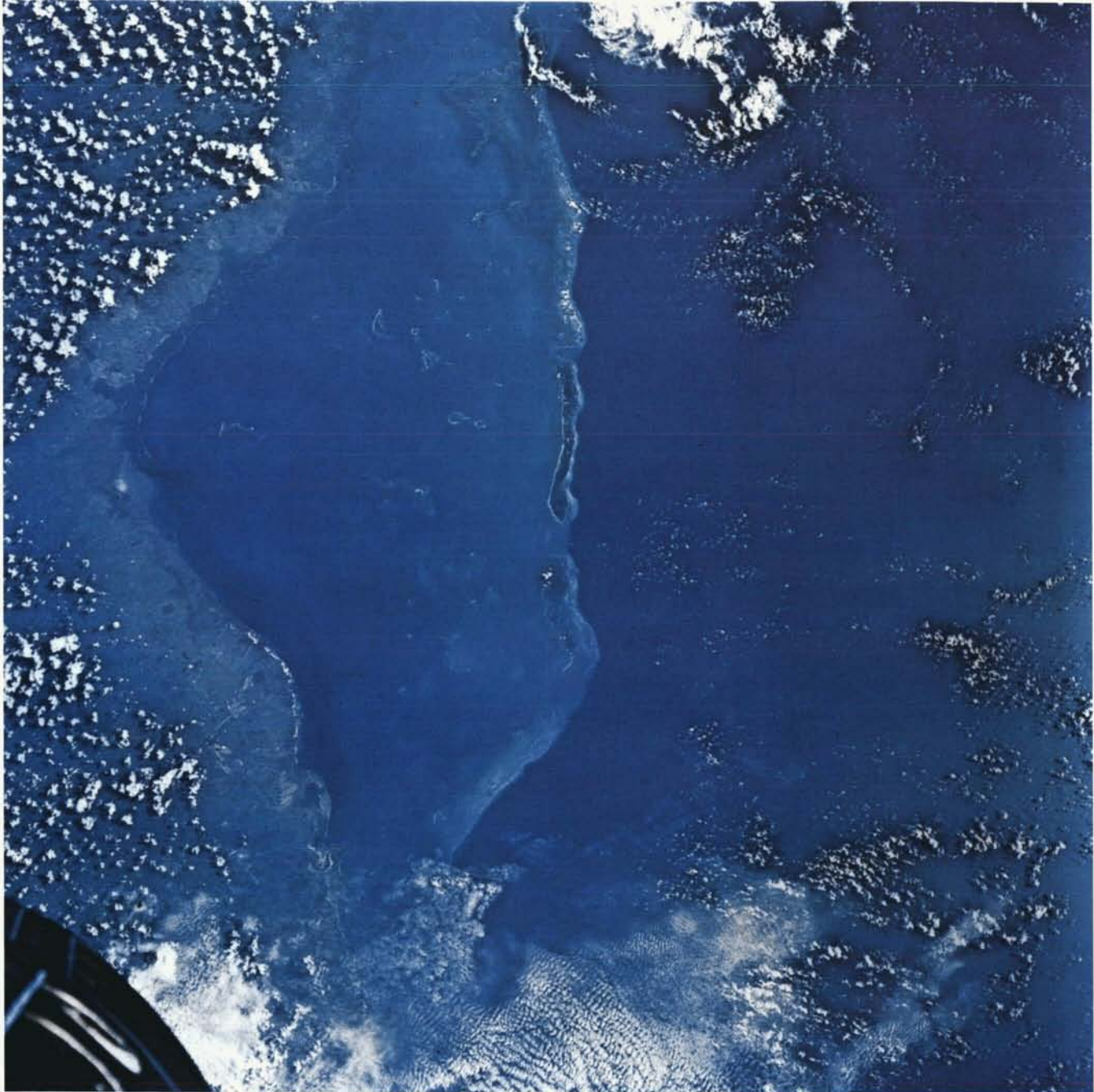


The roughly diagonal line here is Cuba's north coast. Cumulus and cirrocumulus clouds hover over its farms. Caibarién is under the clouds at the lower left, and the pouch-shaped harbor of Nuevitas is in the upper right corner. Slight submergence of the land in recent geological time has notched this shoreline, and left many is-

lands, reefs, and bays. The light-blue area offshore is the Great Bahama Bank, where the sea is only about 30 feet deep. The darker, circular area at the upper left edge is the Tongue of the Ocean, where it is about a mile deep. One can see how submarine erosion has notched the sea floor around this deep area.

GEMINI VII DECEMBER 13, 1965 S65-64025



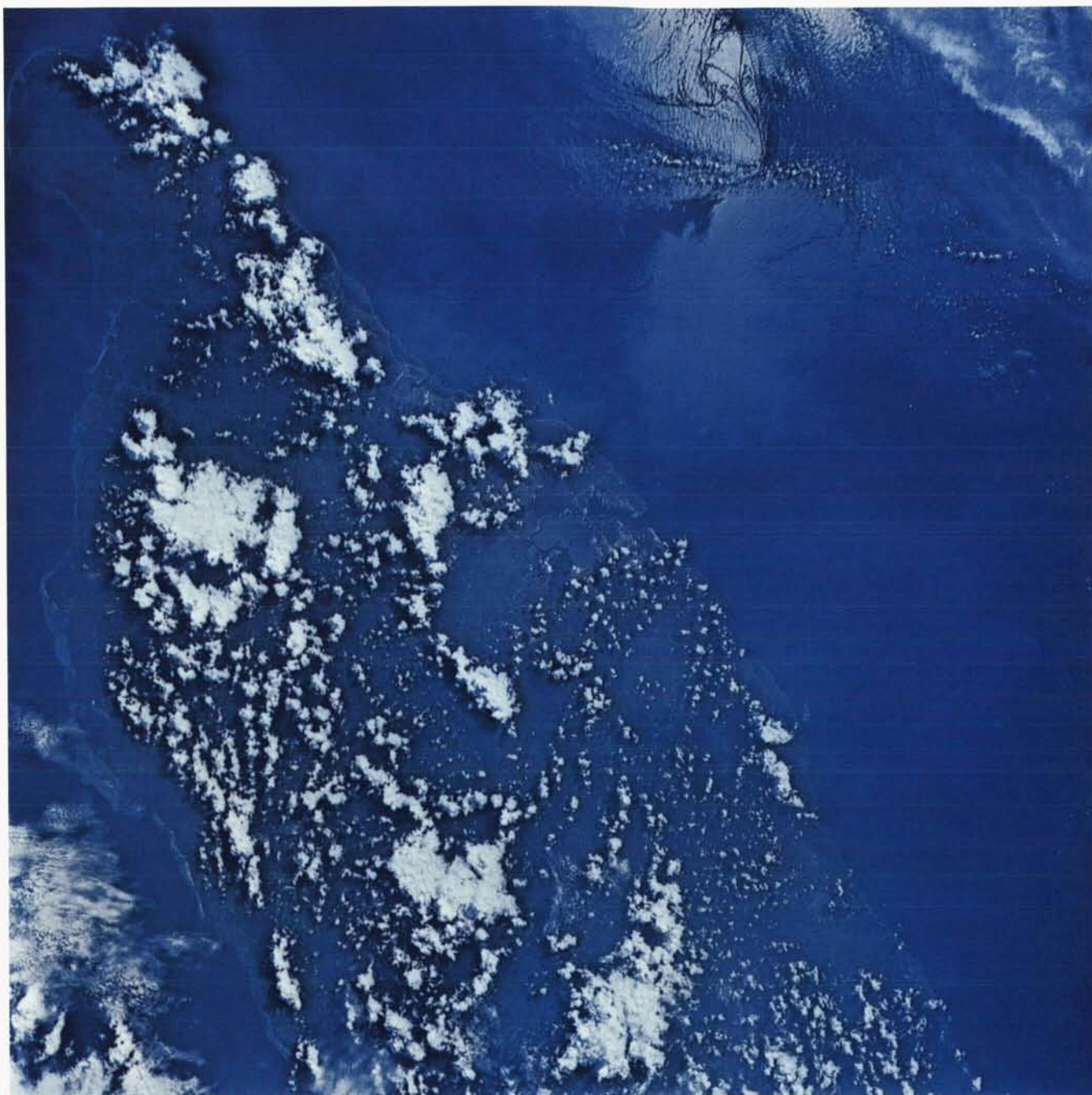


At the left here is Cuba's southern coast. The keys of Jardines de la Reina, south of Camagüey province, are in the center. Santa Cruz del Sur is a short distance beyond the upper end of this strip of the coast, and Trinidad is below it. The keys shown are on the outer edge of large shoal banks and are heavily ringed with coral

reefs. Submarine features of the area between the keys and the mainland can be seen clearly enough to be charted from this photograph. The geology is mostly Tertiary sediments overlying folded Cretaceous and Jurassic strata. Marine sediments are confined to the coast and offshore areas.

GEMINI VII DECEMBER 13 1965 S65-64026



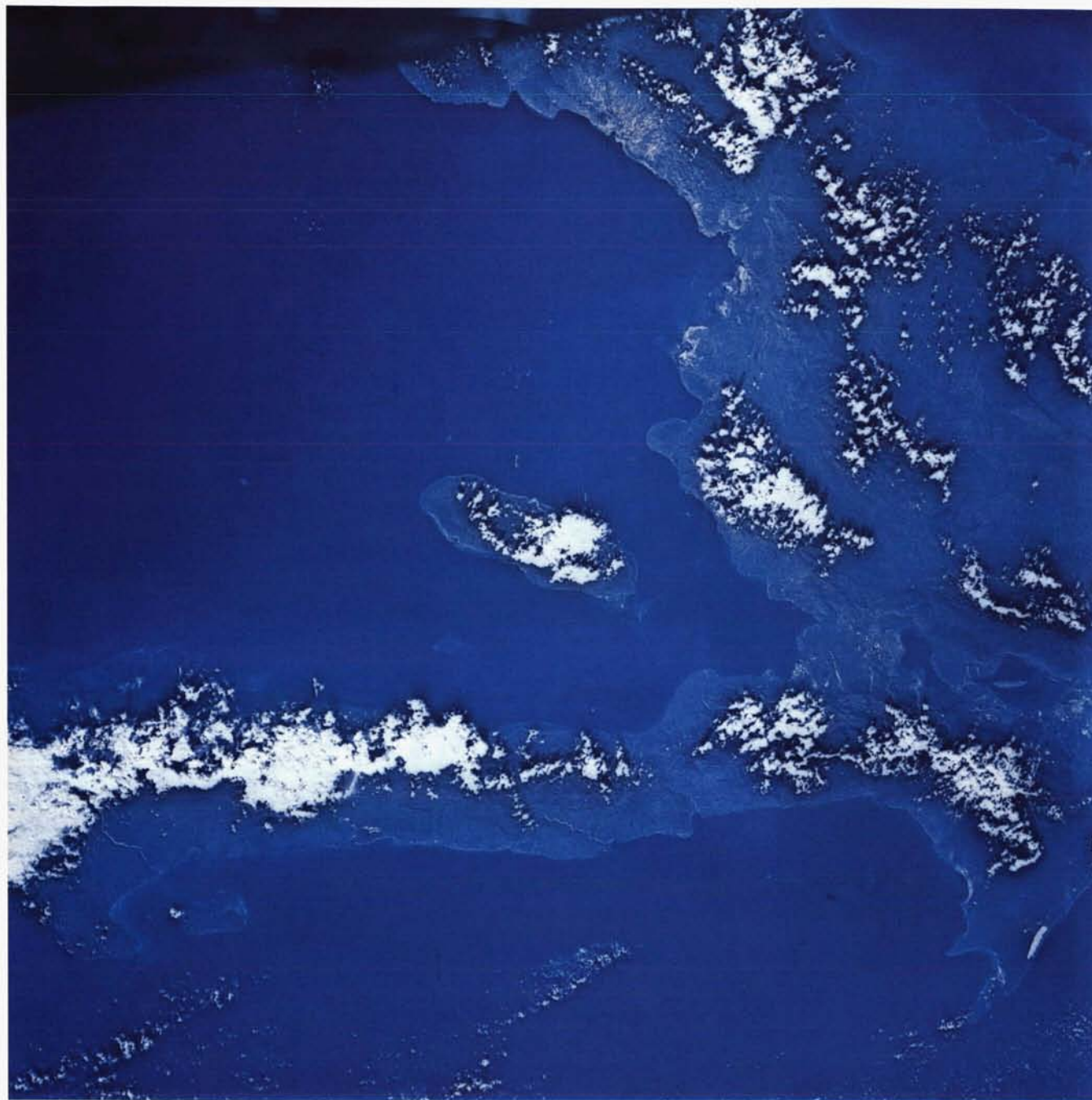


The eastern tip of Cuba is at the upper left here, the U.S. naval base at Bahía de Guantánamo in the center, and Santiago de Cuba farther down the south coast. Daytime heating of the land had caused typical cumulus activity over Oriente Province. Above Guantánamo Bay you see the edge of the Sun's reflection in the Wind-

ward Passage. Wave trains and slicks in the glitter pattern indicate the general water motion. A shear in the cloud line indicates low-level convergence over a shear in the water. Water motion and waves often can be seen best when a photo includes the Sun's reflection from the sea.

GEMINI VII DECEMBER 5, 1965 S65-63826

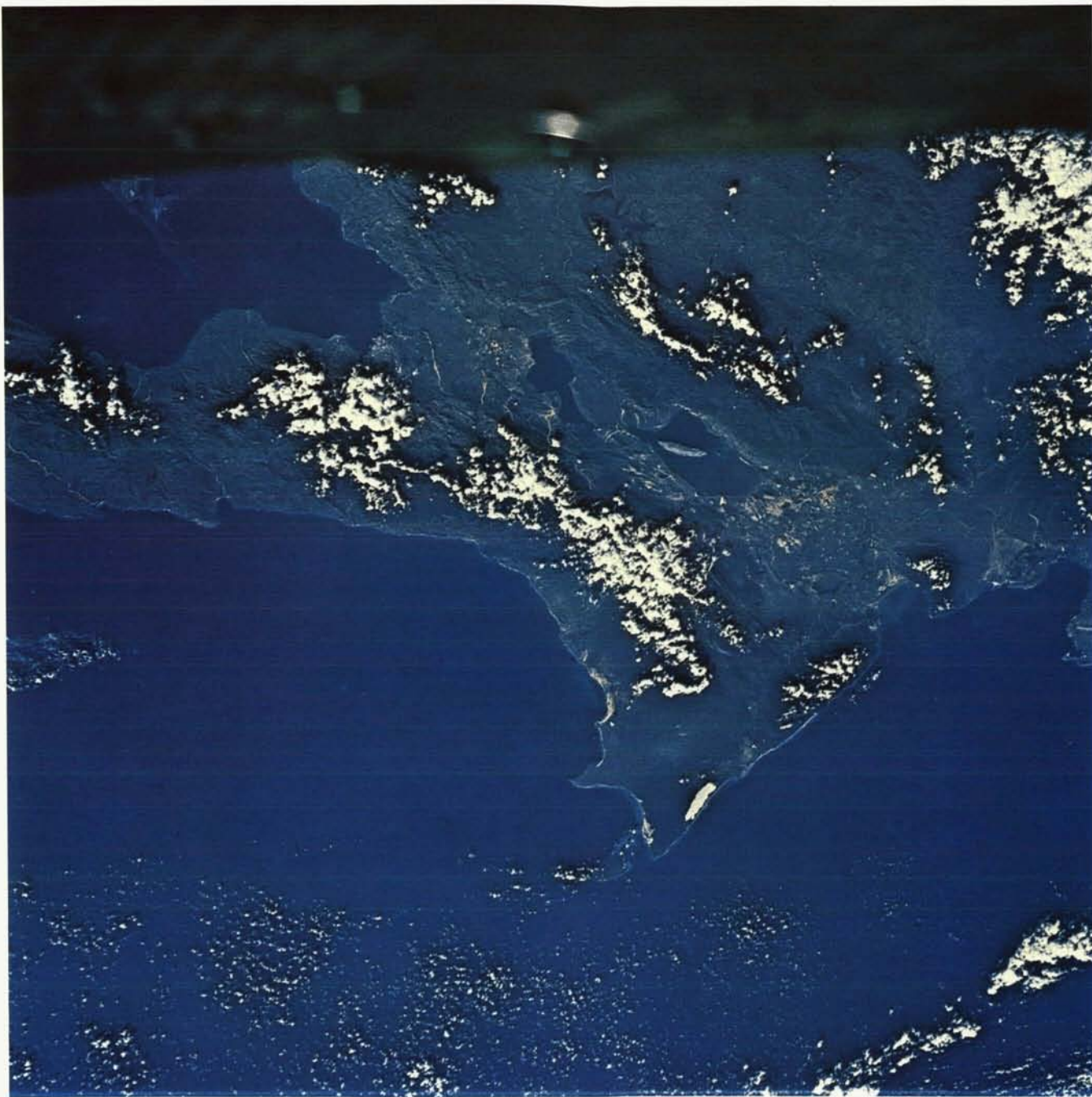




Most of Haiti is shown here with cumulus clouds piled over the highlands. The large island in the center is the Île de la Gonâve. East of it, at the lower right end of a nearly rectangular harbor, is Port au Prince. Near it are two large lakes, between which the common boundary of Haiti and the Dominican Republic runs; it ends left of

the prominent capes in the lower right corner. Coral reefs border much of the coastline. The upper peninsula is an extension of the Cordillera Central. It has a core of Cretaceous and older rocks, flanked by Tertiary and younger sediments. The lower peninsula's structure and stratigraphy are similar.

GEMINI VII DECEMBER 13, 1965 S65-64027



The southernmost tip of Hispaniola is now in the foreground. The large lake above the peninsula is Lago Enriquillo in the Dominican Republic. The smaller lake above it is the Étang Saumâtre in Haiti. Lago Enriquillo is 131 feet below sea level and contains a large island. The Valle de Neiba is to the right. The big valley

in the upper center is the Plaine du Cul de Sac, adjacent to the harbor of Port au Prince, Haiti's Capital. Graben faulting along a major wrench fault on the south side of the island produced this coast-to-coast valley and lake system. To the north, another mountain mass is also bordered by a fault valley.

GEMINI VII DECEMBER 13, 1965 S65-64028



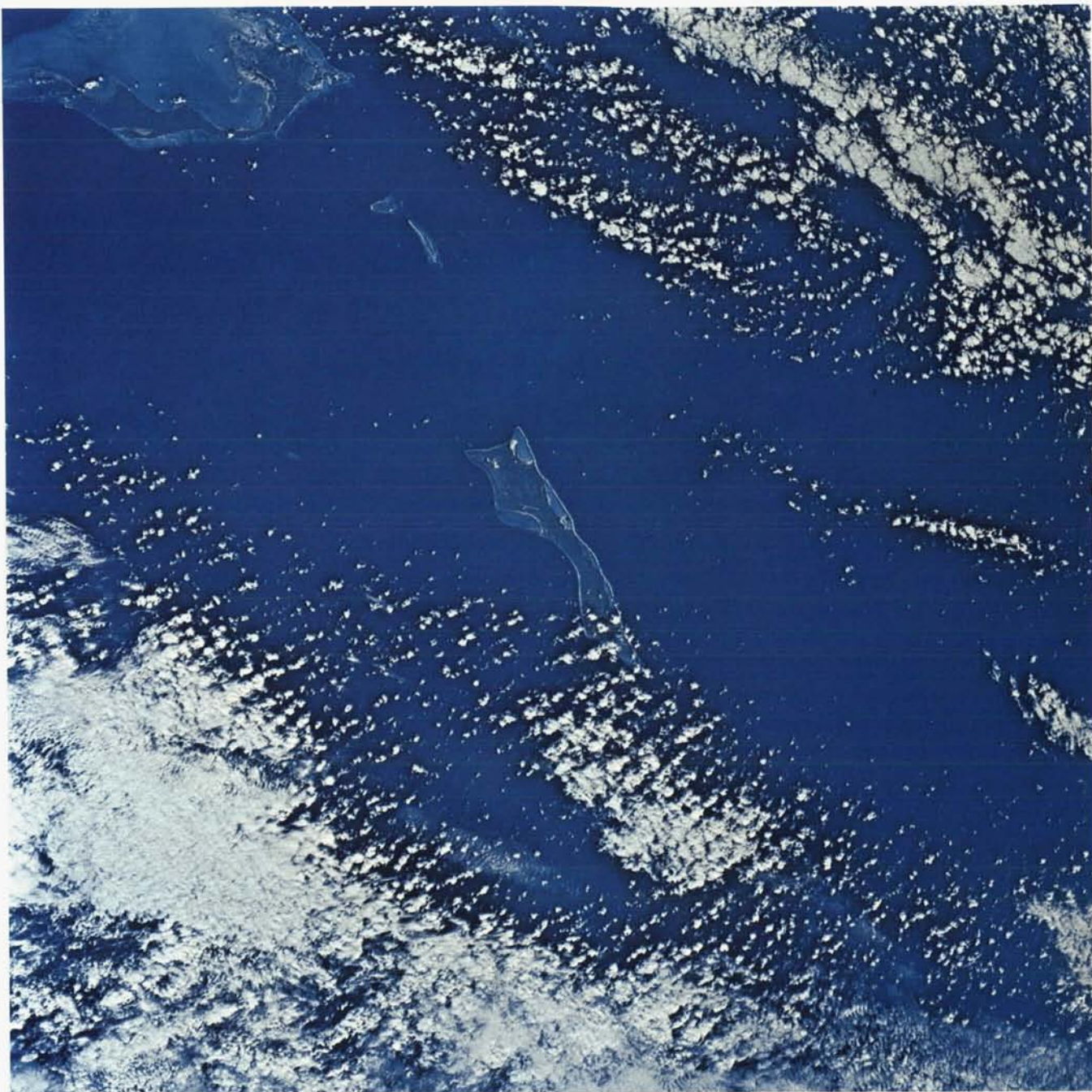


Crooked and Acklins Islands are in the center, and Long Island above them in this photo taken north of Cuba's eastern tip. Part of Mayaguana Island is in the lower right. Thin white lines along the northern shores of the islands are surf from long waves coming from the open Atlantic Ocean. Variations in color in the Bight of

Acklin reveal calcareous sand and spillover bars. The small cumulus clouds are in lines parallel to low-level northeast winds. Several large-scale cloud bands are aligned in northwest winds aloft. An upper air trough moved through this area a few hours before the picture was taken.

GEMINI VII DECEMBER 8, 1965 S65-63857



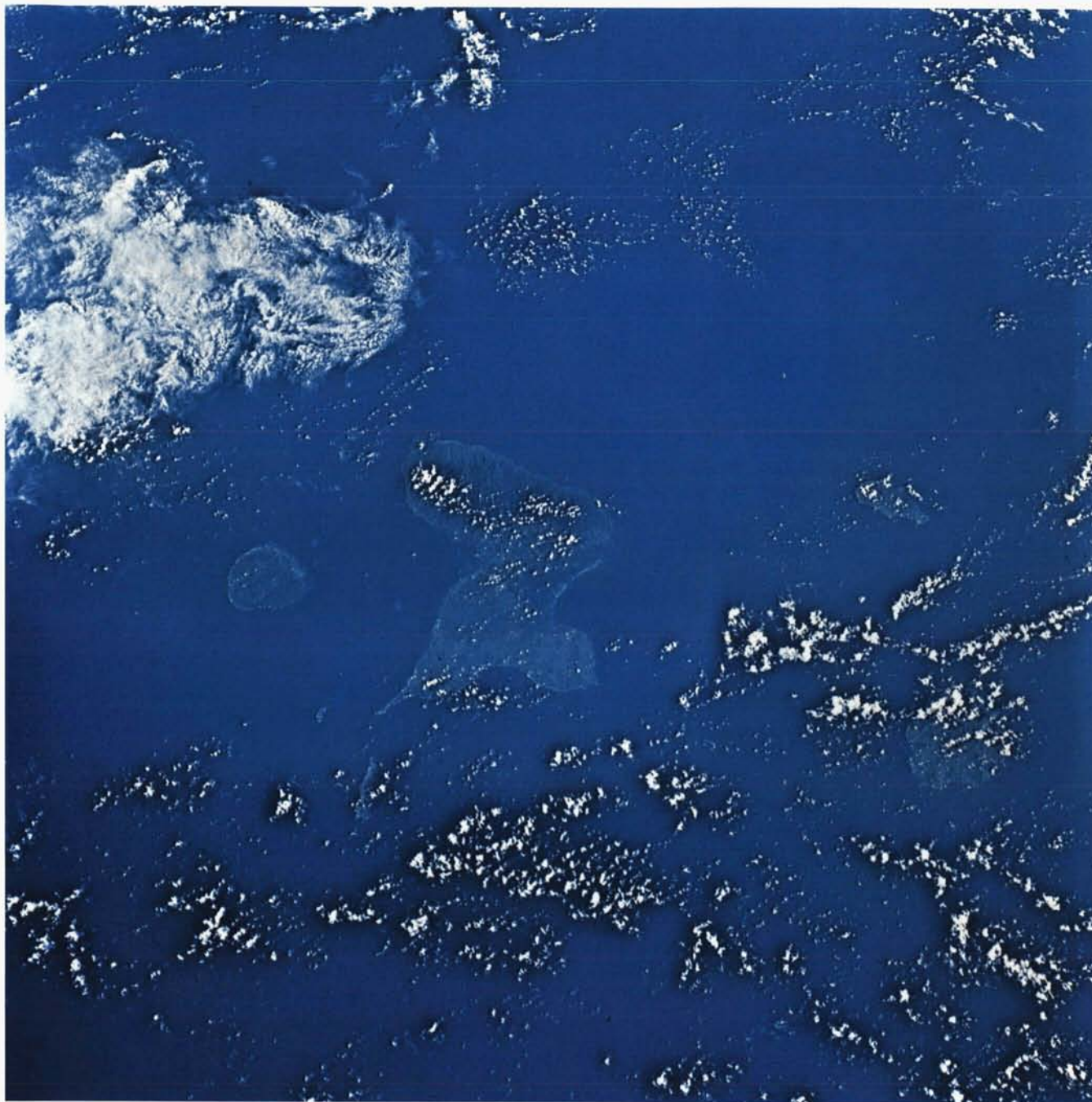


Mayaguana Island is in the center, and Acklins Island in the upper left of this photo taken as the spacecraft proceeded east over the Bahamas. Abraham's Bay is on the left side of Mayaguana. Although no ocean currents can be seen around the islands, strong surf and wave action is visible off their northeastern shores. A heavy

surf produced the white fringe on the eastern end of Mayaguana. Surf also sharpens the image of the Plana Cays that rise from the sea between the two large islands; waves were rolling over a reef half a mile offshore, while the winds were from the east.

GEMINI VII DECEMBER 8, 1965 S65-63858





Guadeloupe's twin islands, Grande Terre and Basse Terre, are in the center of this photo of the French West Indies between the Caribbean Sea and the Atlantic. Marie Galante is to the left of the 583-square-mile main islands. One also can see La Désirade, Iles des Saintes, and Îles de la Petite Terre. The Dominica

Channel is left of Guadeloupe and the Guadeloupe Passage is to the north. Montserrat is in the upper right and Antigua in the lower right. The cloud distribution is typical of a fair-weather regime in the subtropics, and the weak alignment of the clouds indicates light, low-level winds from the southeast.

GEMINI VII DECEMBER 8, 1965 S65-63855





Meteorology has been one of the first and greatest beneficiaries of man's recently acquired ability to view the weather from high altitudes. This cyclonic circulation over the Atlantic Ocean was photographed about 400 miles southeast of Bermuda, while a Gemini spacecraft was docked with an Agena target vehicle. The storm's

center was near the circular clouds that you see around the antenna of the Agena. Dense cirrostratus formed the cloud shield at the left, north of the center. The winds in the lower and middle troposphere were blowing counterclockwise about this center.

GEMINI XII NOVEMBER 12, 1966 S66-62913





This is a southeasterly view of the same cyclonic storm over the Atlantic southeast of Bermuda that was shown in the preceding picture. It covers the region to the right, and again the center of the disturbance is shown near the antenna of the Agena. Numerous cumulonimbus clouds can be seen throughout the right half of this

photo. Their anvil-like tops usually point with the wind direction at their level. A few cellular-shaped lines of cumulus are seen near the right center. Operational use of data from cameras and other sensors in satellites has become routine in the first decade of man's exploration of space.

GEMINI XII NOVEMBER 12, 1966 S66-62914

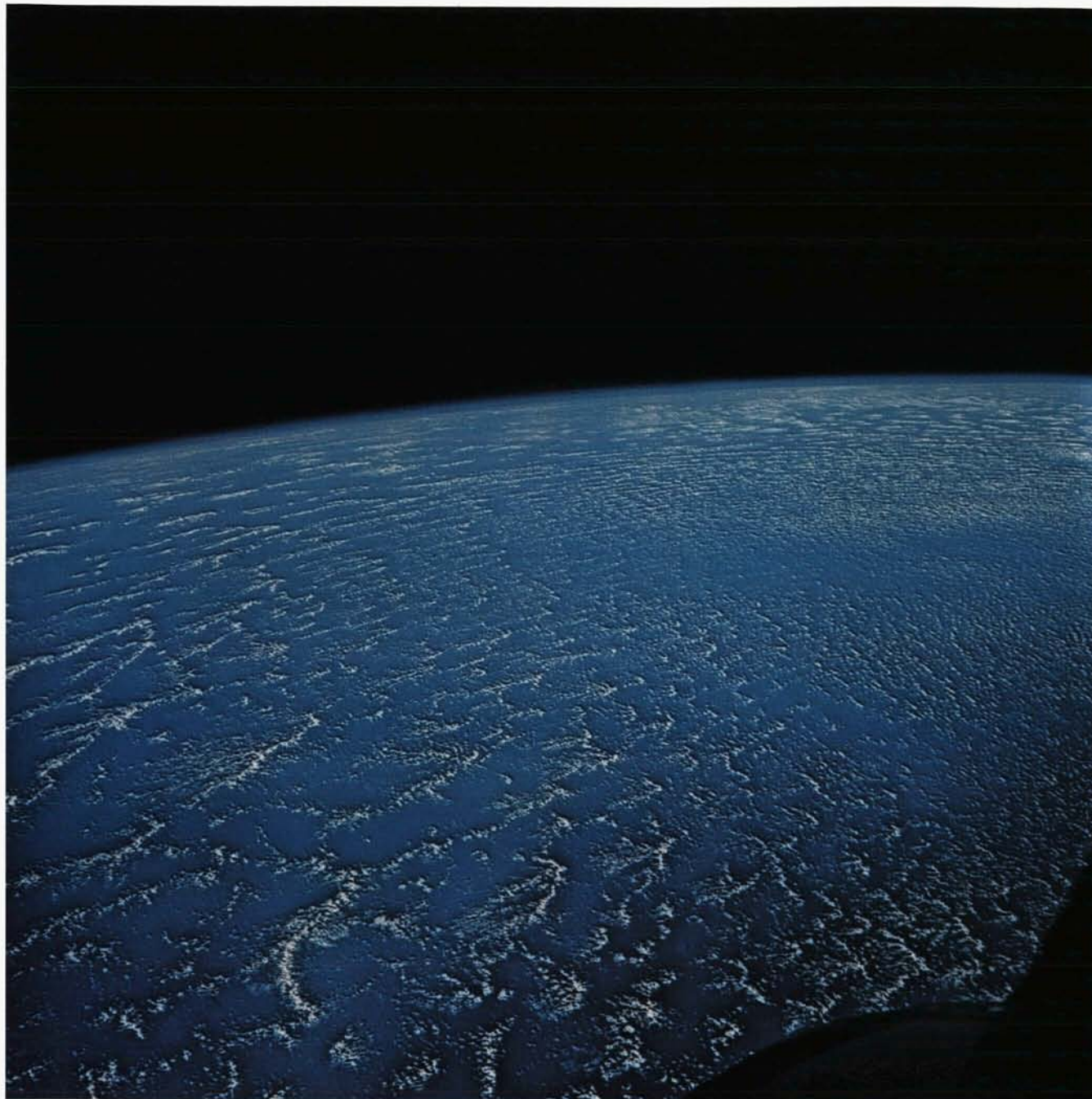




What appears to be a large break in these clouds, associated with a cold front about 2000 miles east of Cape Kennedy, is really a shadow cast by a high cloud deck upon a lower one in early-morning sunlight. Such dark bands have been seen frequently in pictures transmitted from operational weather satellites and interpreted as

shadows from higher clouds, often oriented parallel to the upper wind flow. The Gemini astronauts were asked to look for and obtain pictures such as this, and their pictures have helped to convince students and skeptics that the operational weather-satellite pictures can be diagnosed correctly and beneficially.

GEMINI VI DECEMBER 16, 1965 S65-63143



This vast network of stratocumulus clouds lay near 20° N and 20° W. These are open cellular-type convective clouds in which air rises along the cell walls and sinks in the centers. This is the opposite of what occurs when a closed cellular pattern is formed. The surface wind in the foreground here was from the northeast, right to

left, at 15 to 20 knots. Downwind the cloud openings decreased, and in the background they tended to align themselves in rows parallel to the wind. This type of organized convection is typical of fields in which the wind's speed increases with height. The blue band along the horizon is the Earth's troposphere.

GEMINI VI DECEMBER 16, 1965 S65-63264





These stratocumulus clouds organized in approximately polygonal closed cells were seen southwest of the Canary Islands. To produce this type of pattern, there is a general weak rising motion below and in the cloud patches up to a stable layer, perhaps 1000 or 2000 feet above sea level. This stable layer inhibits further vertical mo-

tion, so there is an outflow from the cloud area and a descending and, hence, drying, motion in the clear bands between the clouds. This type of mesoscale convection frequently occurs in an oceanic anticyclone. The large hole at the lower right was an eddy caused by wind blowing past one of the islands.

GEMINI VI DECEMBER 16, 1965 S65-63146



Here, on a June day, the Canary Islands come into view. The tiny one at the left is Hierro. Geographers once drew the first meridian there because they knew nothing of the world west of it. The dark circular spot as your eyes swing to the right is Gomera. Above it is La Palma. That big arrow in the sea is Tenerife. Below its

tip is Gran Canaria. The day that this photo was taken, cumulus clouds were piled on the windward, northeastern slopes of the three Canary Islands that lay closest to Africa, and clouds connected with an upper-air, low-pressure system were at the right near the horizon.

GEMINI IX JUNE 6, 1966 S66-38442





This and the next picture of the Canary Islands were taken in morning light, actually on the revolution before the previous picture. The patch of cirrus and cirrostratus clouds off the Morocco coast and the streaks of cirrus over the land are aligned with a southwesterly upper-level wind. The large bright area in the lower left is

sunlight reflected from the sea. Apparently the sheltering effect of the Islands calmed the surface and greatly reduced the reflection towards the camera southeast of the Islands. The most conspicuous dark "tail" extends from Gomera, which lies between Tenerife, the largest island in this view, and La Palma and Hierro.

GEMINI IX JUNE 6, 1966 S66-38404

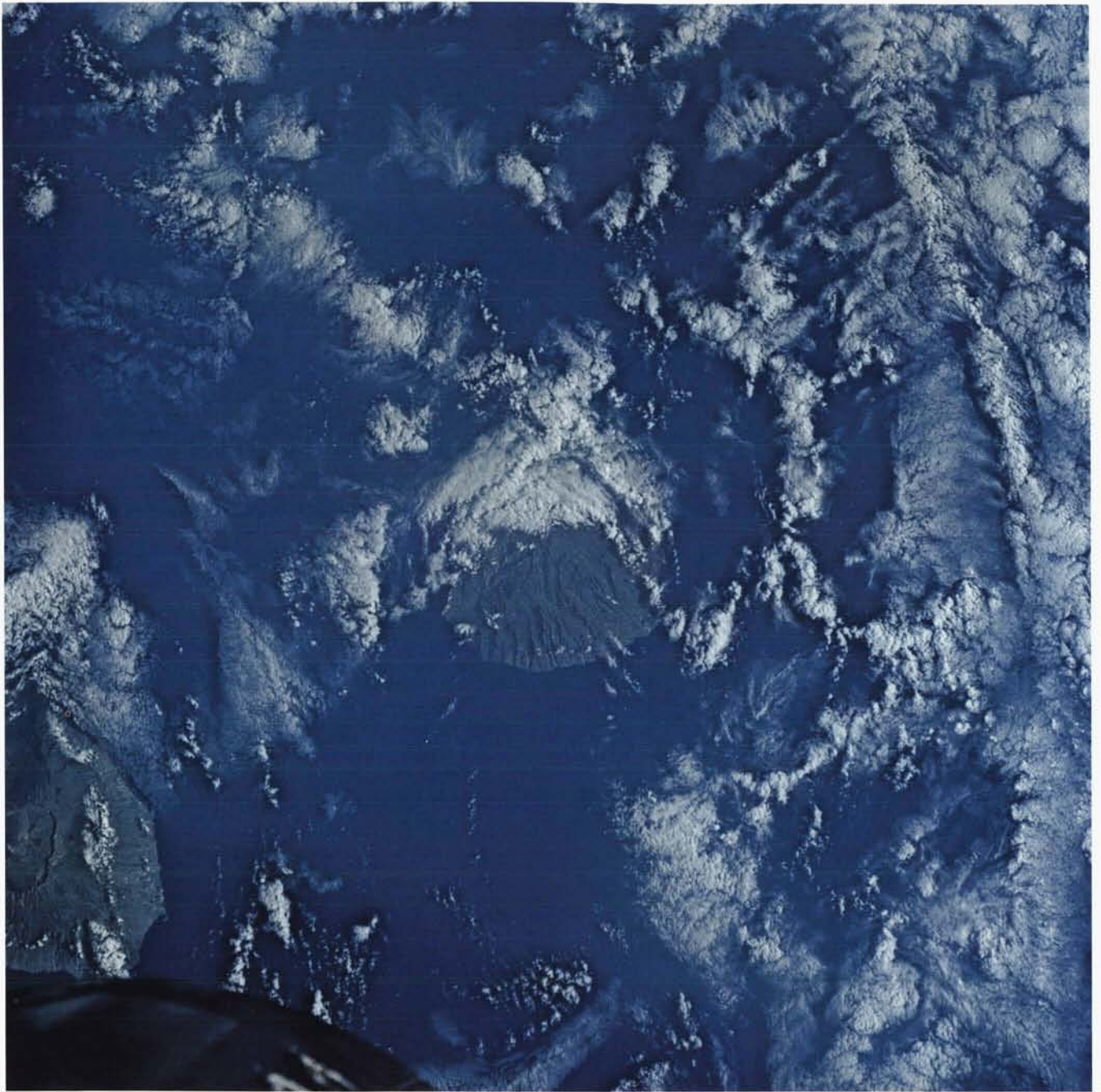


Centuries ago the Canary Islands were known as the Fortunate Islands. They are less than 100 miles from Africa, and this photo shows both the islands and the coasts of Morocco and Spanish Sahara. The Sun rising over Africa made the sea glisten and small lines of cumuli at the left cast shadows on the water. The re-

flective pattern to the right of the Sun glitter was caused by waves on the surface of the sea. The crest-to-crest distance of the waves was about a nautical mile, which is unusually long. The sea was smoother and darker to the southeast in the lee of the islands.

GEMINI IX JUNE 6, 1966 S66-38405



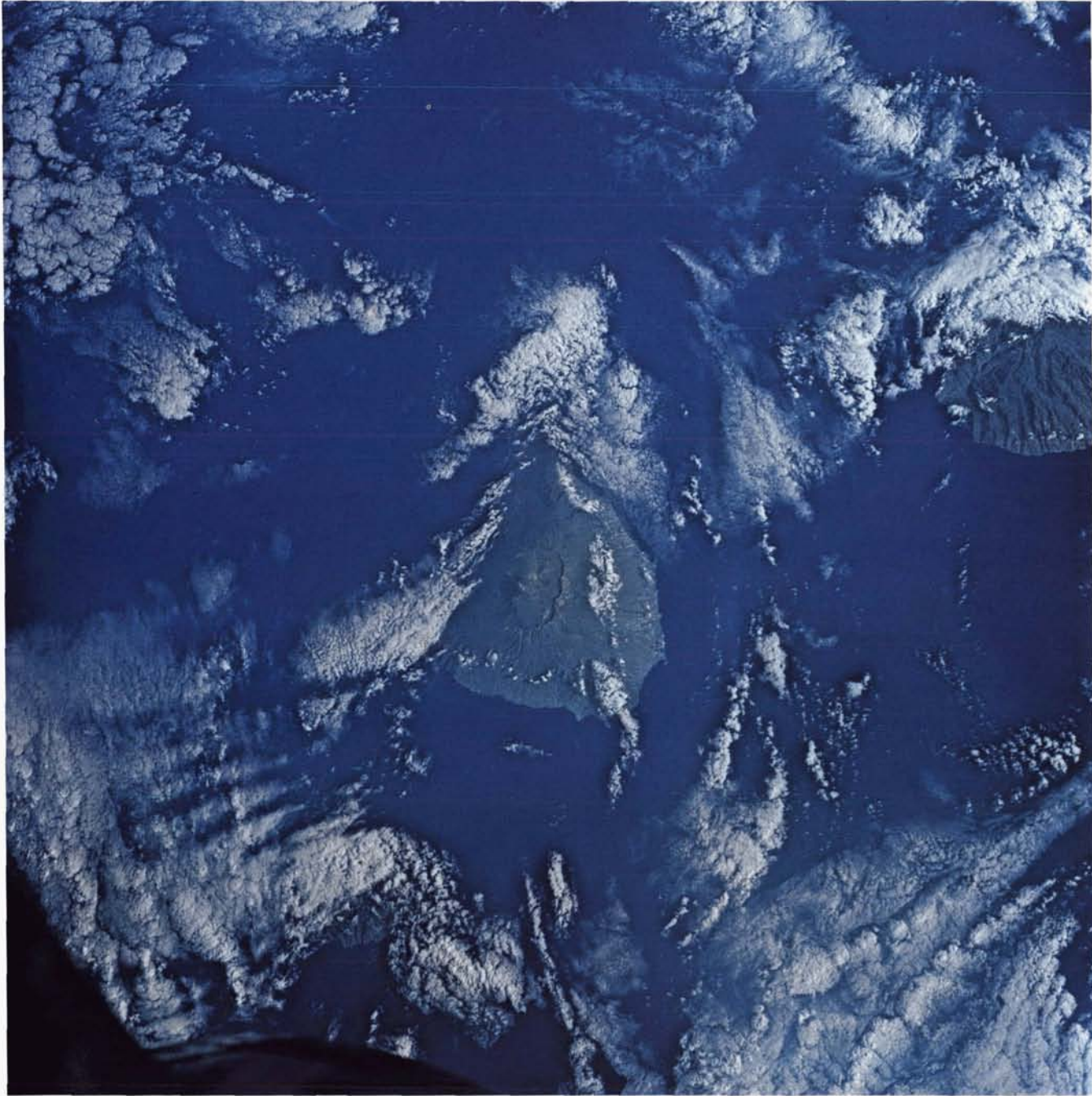


This and the next three pictures of the Canary Islands and their environment were taken in December. They reveal how such mountainous islands interrupt the flow of air over the sea and create eddies downstream in the lower atmosphere. Gran Canaria is in the center here, and part of Tenerife is visible. Clouds cover the upwind

slopes of Gran Canaria's 6394-foot peak. Las Palmas, the islands' largest city, is on Gran Canaria. The climate is warm and pleasant. Rainfall on the coast reaches 10 to 15 inches annually, and vegetation at the lower levels includes the species found throughout the North African Mediterranean littoral.

GEMINI VI DECEMBER 16, 1965 S65-63151



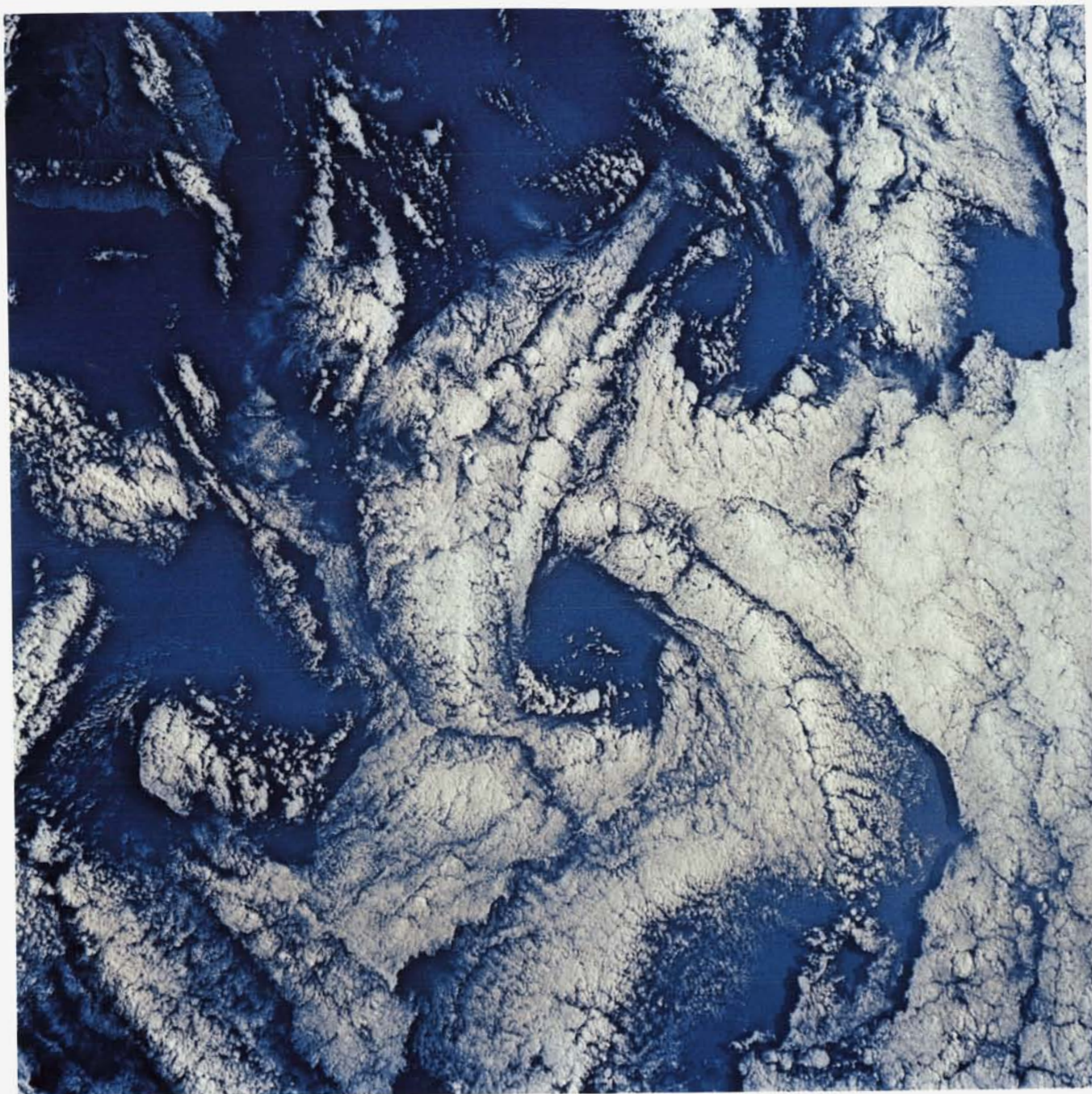


Tenerife is in the center of this view of the Canary Islands. Its Pico de Teide crater is 12 198 feet high. These islands rise from great depths and present precipitous cliffs to the sea at many places. They consist of trachytes and basalts erupted intermittently from the ocean floor. They emerged toward the end of Cretaceous time and

subsequent volcanic activity has increased their size. The last reported eruption was in 1909 on Tenerife. The stratocumulus clouds seen here are typical of the area. Dark, parallel lines in some of them are billows caused by undulations in the wind flow at the altitude of the clouds.

GEMINI VI DECEMBER 16, 1965 S65-63150



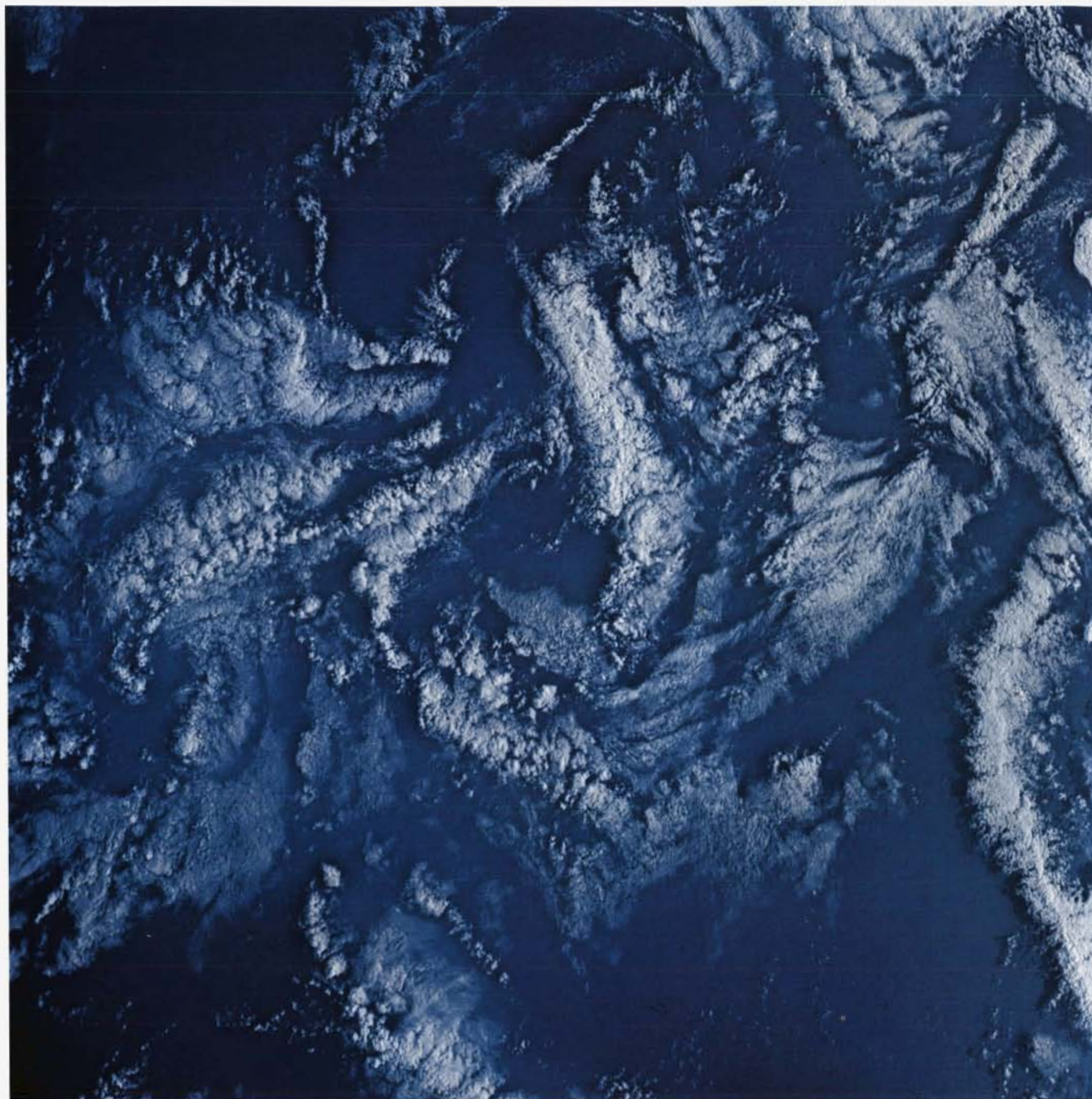


"This beautiful vortex is typical of the varied weather phenomena that can be seen from space," Astronaut Thomas P. Stafford wrote of this photo taken over the Canary Islands. Tenerife is in the upper left here. When northeast winds, under a temperature inversion layer, blow past the mountainous islands, the air is frequently

swirled into a chain of eddies similar to a Von Kármán vortex street. The eddies become visible when strato-cumulus clouds are present. The center eddy here was 60 miles from Tenerife and its eye was 13 miles wide. Alongside it, about 35 miles away, other eddies rotated clockwise.

GEMINI VI DECEMBER 16, 1965 S65-63149





This photo shows clouds west of those in the preceding picture. The island of Hierro was at the lower edge of the eddy eye in the lower right center, but was almost entirely obscured by stratocumulus clouds. The eddy chain reaching from the top to bottom was a part of a Von Kármán vortex street formed in the lee of the larger

Canary Islands. This phenomenon is also found frequently near Guadalupe Island off Baja California. By studying photos of these eddies, researchers can obtain data to relate the physics of the natural vortex streets to their laboratory experiments. This is the last view of the Canary Islands area in this series.

GEMINI VI DECEMBER 16, 1965 S65-63148





This unusually fine display of cirrus clouds was photographed during an approach to Africa about a dozen degrees south of the Canary Islands. These clouds lay off the coast of Senegal and Gambia. Cap Vert can be seen jutting into the Atlantic Ocean at the lower left edge. A radiosonde ascent at Dakar, which is on that

cape, indicated that the winds were east-southeast at 20 knots at an altitude of about 6 kilometers, and becoming southwesterly at 25 to 40 knots above 8 kilometers at the time this picture was taken. The clouds in the foreground were probably 9 or more kilometers high.

GEMINI VII DECEMBER 11, 1965 S65-63754



Ilha de Madeira is north of the Canary Islands, and about 535 miles southwest of Lisbon. On an approach to this island, noted for wines and embroideries, the astronauts found a cyclonic eddy in the stratocumulus clouds at the right. The island is a tiny dark spot about an inch to the left of the eddy. It is 35 miles long, up to

13 miles wide, and has a peak elevation of more than 6000 feet. It obstructs the broad northeasterly wind flow, and thus can induce eddies in the low-level wind similar to those caused by an obstruction in a wind tunnel. In this case the result was a fairly simple vortex in the sky near it.

GEMINI X JULY 20, 1966 S66-46040





"Europe and Spain enjoying good weather," Gemini X reported on one approach to Africa, "but not for long if that storm off Gibraltar is an indicator." Actually, the cyclonic circulation southwest of the entry to the Mediterranean was only an eddy on the edge of a large-scale northerly wind flow over the Atlantic, induced by the

configuration of the land and revealed by stratocumulus clouds. Portugal and Spain are at the left and Morocco is at the right. The geologic unity of southern Spain and Africa is suggested in this photo by the evident continuity of the Sierra Nevada and related mountains in Spain with the Riff Atlas in Morocco.

GEMINI X JULY 20, 1966 S66-46044

## Part III. Northwest Africa

ASTRONAUT James A. Lovell, Jr., thought that the broad western bulge of Africa was “truly the most interesting area of the world” to see from a spacecraft. Its dry and desolate terrain was nearly always free of clouds, and he found it a delight to photograph because there was so little haze to dim its beauty.

The atmosphere’s heat and aridity over the sands of the Sahara is less welcome to travelers on the surface. For centuries this land was as hostile a barrier to explorers as the Atlantic Ocean. Men went around rather than across Africa to learn about the world, and the chroniclers of their journeys dubbed it the “Dark Continent.” In photographs taken from very high altitudes, it now often seems to be the most brilliantly lighted continent.

Photographs spanning vast areas can be obtained more quickly and frequently from orbiting spacecraft than mosaics can be produced. They are increasing the geologists’ knowledge of the structure of Africa. They can help engineers estimate the volume of flow in its watersheds. They can facilitate surveys of the distinctive resources available to the people of Africa’s many ambitious new nations. Such photographs, as you will see in the pages that follow, are also often remarkably beautiful.





Africa's westernmost point, Cap Vert, is in the upper center here. The camera was pointed west, the spacecraft was starting over the Sahara, and the view includes part of Mauritania and all of Senegal and Gambia. Here one can clearly see the transition from tropical rain forests to open savanna and the desert. The Sene-

gal River flows through the prominent valley in the upper half of the photo. The escarpment in the lower right is between the Aouker Basin and the barren land of the Tagent Plateau. Senegal's glittering capital, Dakar, on Cap Vert is an historic port, about halfway between Europe and South America.

GEMINI VI DECEMBER 16, 1965 S65-63251

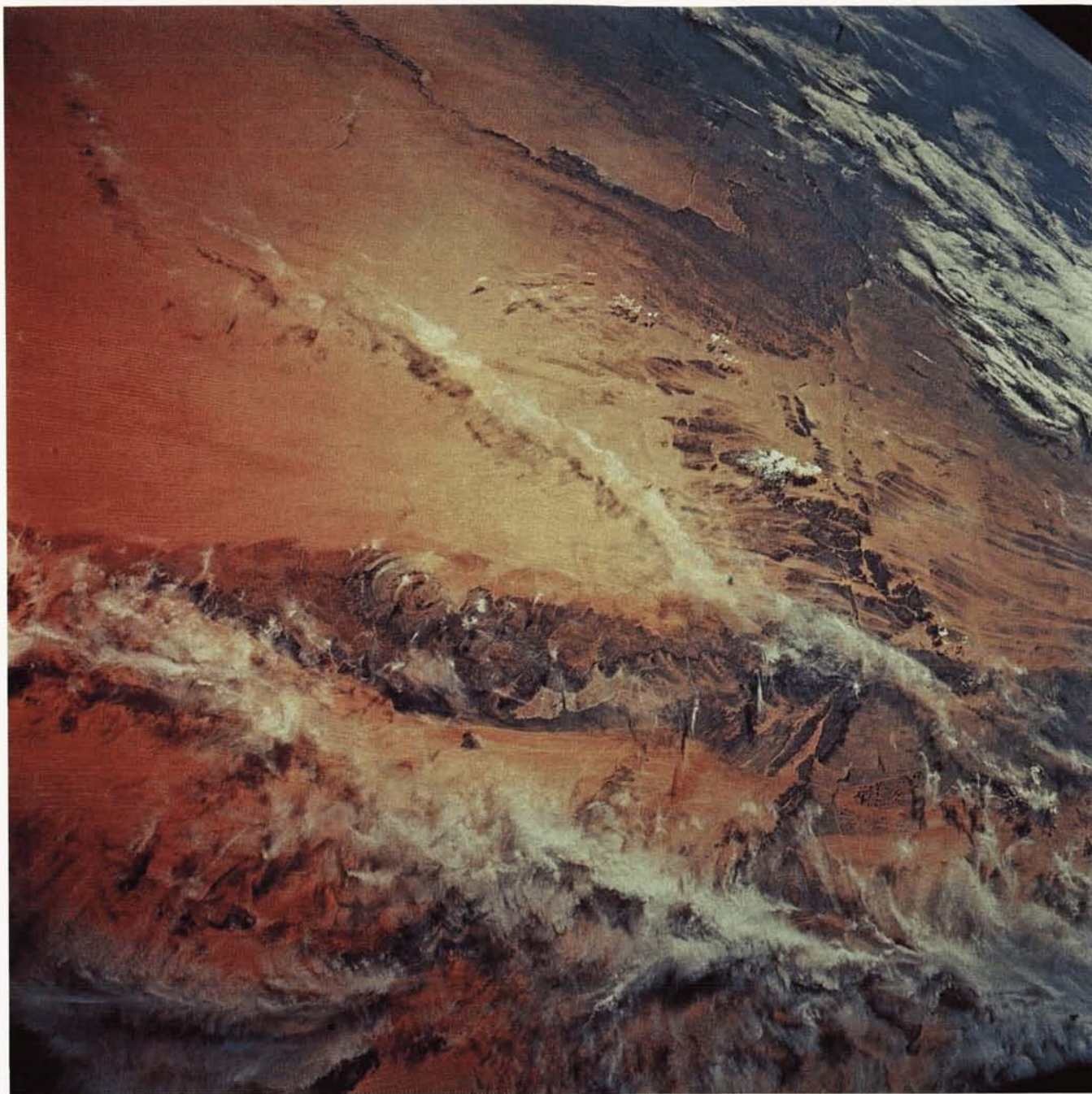


Here you see the Atlantic coast of Africa north of Dakar and the most western part of Mauritania. There the dunes of Azefal and Akchar extend far inland and cross part of Spanish Sahara. The white spots in the upper left are salt flats called Sebkha de Ndrhamcha. Toward the right is the Baie du Lévrier, flanked by Cap Timiris

on the south and Cap Blanc on the north. Port Étienne is on the latter, at the northern end of Mauritania's portion of the coast. Note the prominent fault in the right center of this photo. You will see more of northwestern Africa's geological structure in the next few pictures.

GEMINI VI DECEMBER 16, 1965 S65-63255





The Dhar Adrar in Mauritania is the broad ridge under cirrus clouds in the lower center of this picture. Near its center are the circular Richat structures that intrigue geologists. One is more than 25 miles wide, the other only 5 miles wide. These structures have been ascribed to meteoritic impact, partly on the basis of a reported

discovery of coesite, but volcanic rocks in the large structure throw doubt on this theory of their origin. Igneous intrusions such as laccoliths may have produced them. Under the clouds at the top of the picture, vegetation darkens the view of the terrain of Mauritania and Senegal.

GEMINI XII NOVEMBER 13, 1966 S66-63471



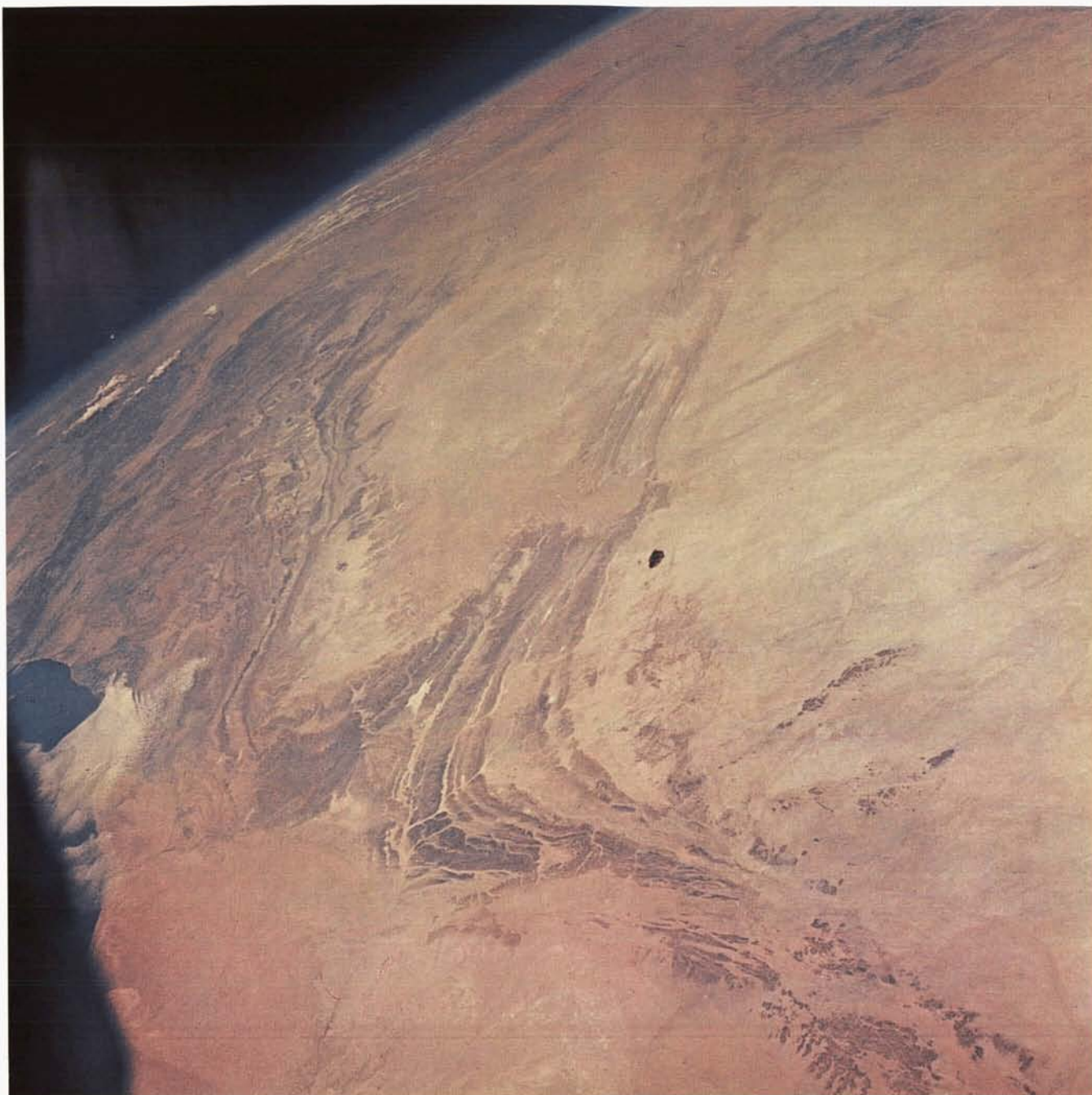


This is one of the best photos yet obtained of the Dorsale Reguibat. Geographers know it as the Yetti and Karet Plain. The south limb of the Tindouf syncline, at lower left, borders it on the north; and the Hank and El Hank bluffs, at upper right, border it on the south. The latter are a limb of the Taoudeni syncline,

of Hercynian age (Late Paleozoic), which has been listed among the world's largest. The apparent dip in the horizon at the right was caused by the window of the spacecraft. The long streaks at the left center are the southwestern end of the Erg Iguidi, which extends into Algeria from northern Mauritania.

GEMINI XII NOVEMBER 15, 1966 S66-63083





This view to the northeast over parts of Mauritania, Spanish Sahara, and Morocco includes some of the coast south of Agadir at lower left. A few cirriform clouds are along Morocco's southern coast. The view is approximately along the axis of the Tindouf syncline. Outcrops of rocks on each side dip inward, forming

limbs of the syncline. The immense uplift of Precambrian rocks at the right is the Dorsale Reguibat. It may have resulted from removal of Paleozoic and younger rocks by erosion, or may have been a positive area that did not receive a great volume of sediments. Faint dark ridges show where it is cut by dikes.

GEMINI X JULY 21, 1966 S66-46063



Morocco's Cap Juby is near the lower center here. Light spots near it are salt flats. Its annual rainfall is less than 10 inches and comes mostly in the winter, but the cool Canaries Current produces summer cloudiness that resembles California's stratus. Note how the cloud-cell size changes over the sea. Streaks of cirrus in the upper

left are over the Atlas Mountains. At the right is the Hamada du Dra, a plateau underlain by the Tindouf syncline. Discordant geologic structures on each side of the Atlantic are often cited to support the theory of continental drift, but this photo of Morocco and Spanish Sahara shows concordance to the African shore.

GEMINI IX JUNE 6, 1966 S66-38408





This is part of the area shown in the photo on the preceding page. At the left is the Hamada du Dra's western end; in the center is the south limb of the Tindouf syncline. These are Paleozoic (chiefly Devonian) sedimentary rocks that have been folded, tilted, and eroded. The broad desert at the right is the Dorsale Reguibat.

It is a large eroded area of Precambrian rock in Spanish Sahara and Mauritania. The deflection of the Tindouf syncline is apparent here, but the reasons for it are not clear. A major wrench fault may pass through the area in the foreground and be partly responsible for this deflection.

GEMINI IX JUNE 6, 1966 S66-38409





The Atlas Mountains extend southwest of Gibraltar to Cap Rhir, at the top in this photo. The clouds near it are over a major tectonic boundary, the south-Atlas line coincident with the Agadir fault. This fault geologically separates Mediterranean Africa from the bulk of the continent. The Atlas Mountains were formed in the

Tertiary age with the Alps, Zagros, Caucasus, Himalayas, and others on the site of the former Tethys geosyncline. The contorted ridges at right are eroded remnants of older (Paleozoic) structures. Air flowing past Cap Rhir from the northeast may have caused the eddy-like pattern offshore.

GEMINI XI SEPTEMBER 14, 1966 S66-54764



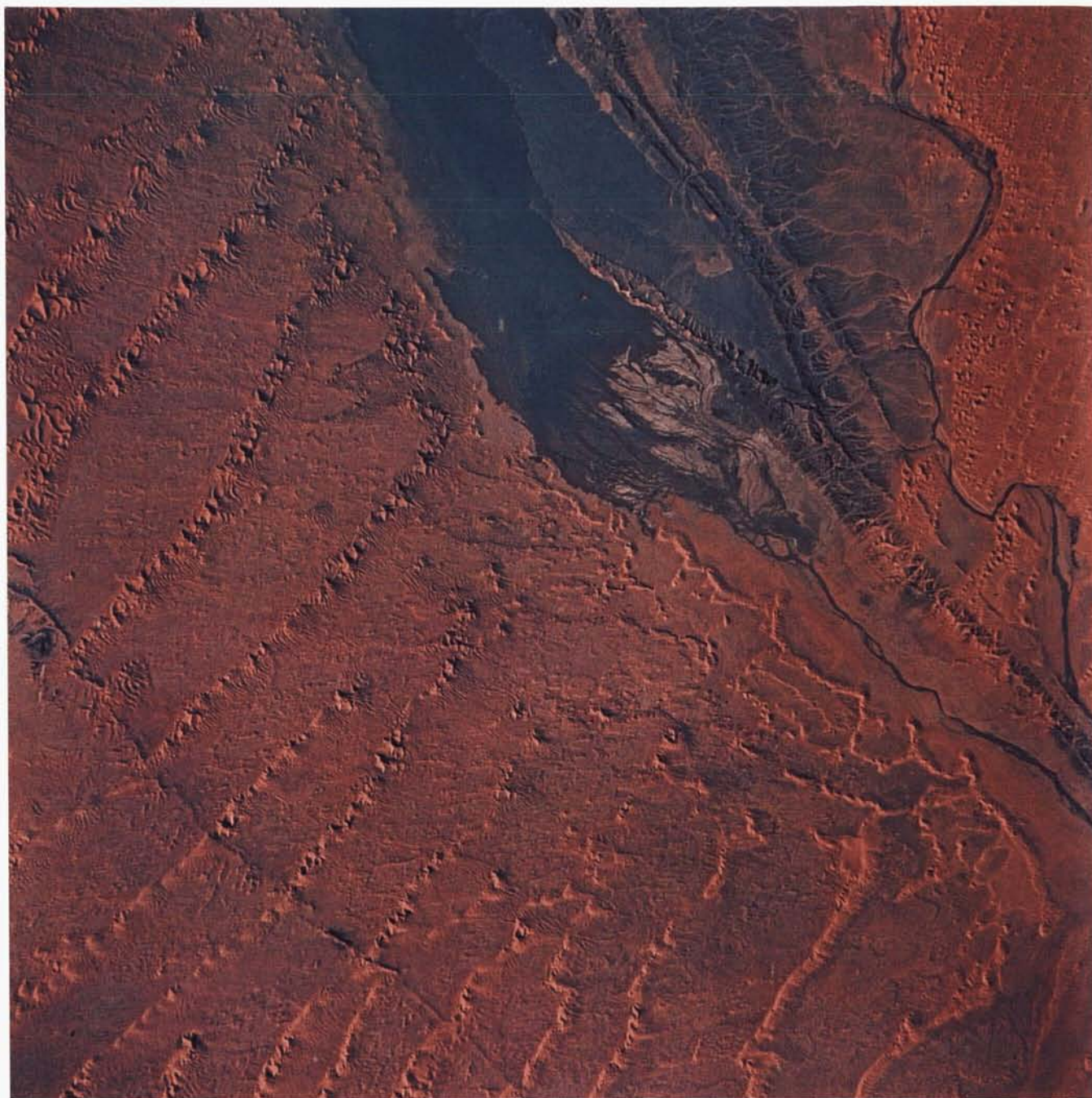


The bright lines across this photo are sand dunes of the Erg Iguidi (an erg is a sand-covered part of the desert) in western Algeria. They parallel the dominant north-east trade winds and are formed by reworking of alluvial sands. The bands at the left are the topographic expression of Paleozoic sedimentary rocks in the south limb

of Sebkhia de Tindouf. The black areas above the dunes are rhyolite intrusions of El Eglab, a Precambrian massif composed chiefly of igneous and metamorphic rocks. Photos taken of this part of Africa during a Mercury flight in 1961 have increased scientific knowledge of the area.

GEMINI VI DECEMBER 16, 1965 S65-63155

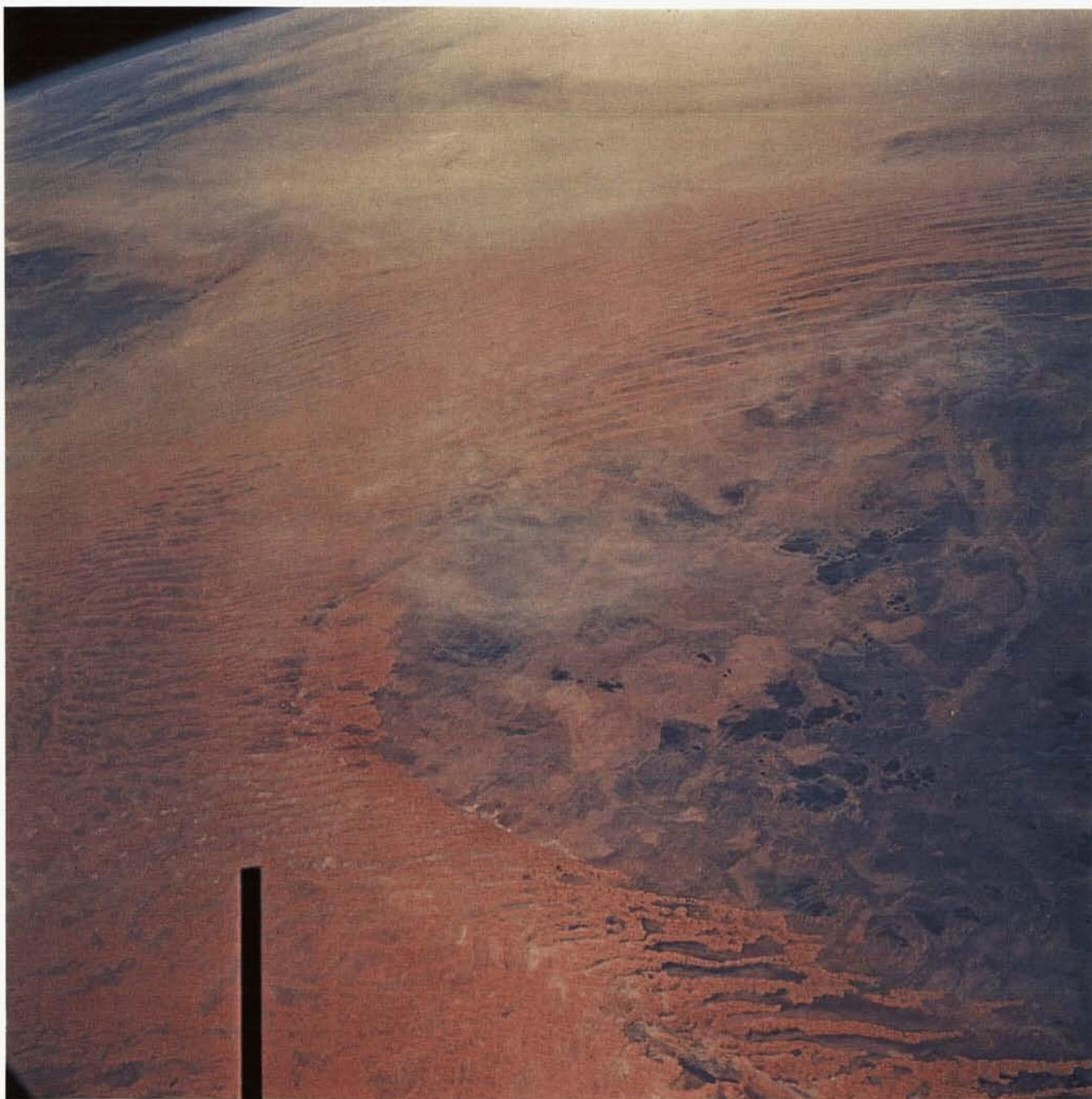




This picture of the Oued Saoura, a wadi in western Algeria, was taken through a longer focal length lens than the photo that precedes it. This area is usually dry and a source of sand for long dunes, but at the top you see an ephemeral lake that was produced by runoff from the Atlas Mountains northwest of this region. The

desert absorbs water before it can flow much farther south. The bedrock structure resembles that of the Atlas Mountains, but is considerably older and is perpendicular to the northeasterly Atlas trend. It consists of sedimentary rocks with minor volcanics that were folded in the Paleozoic era.



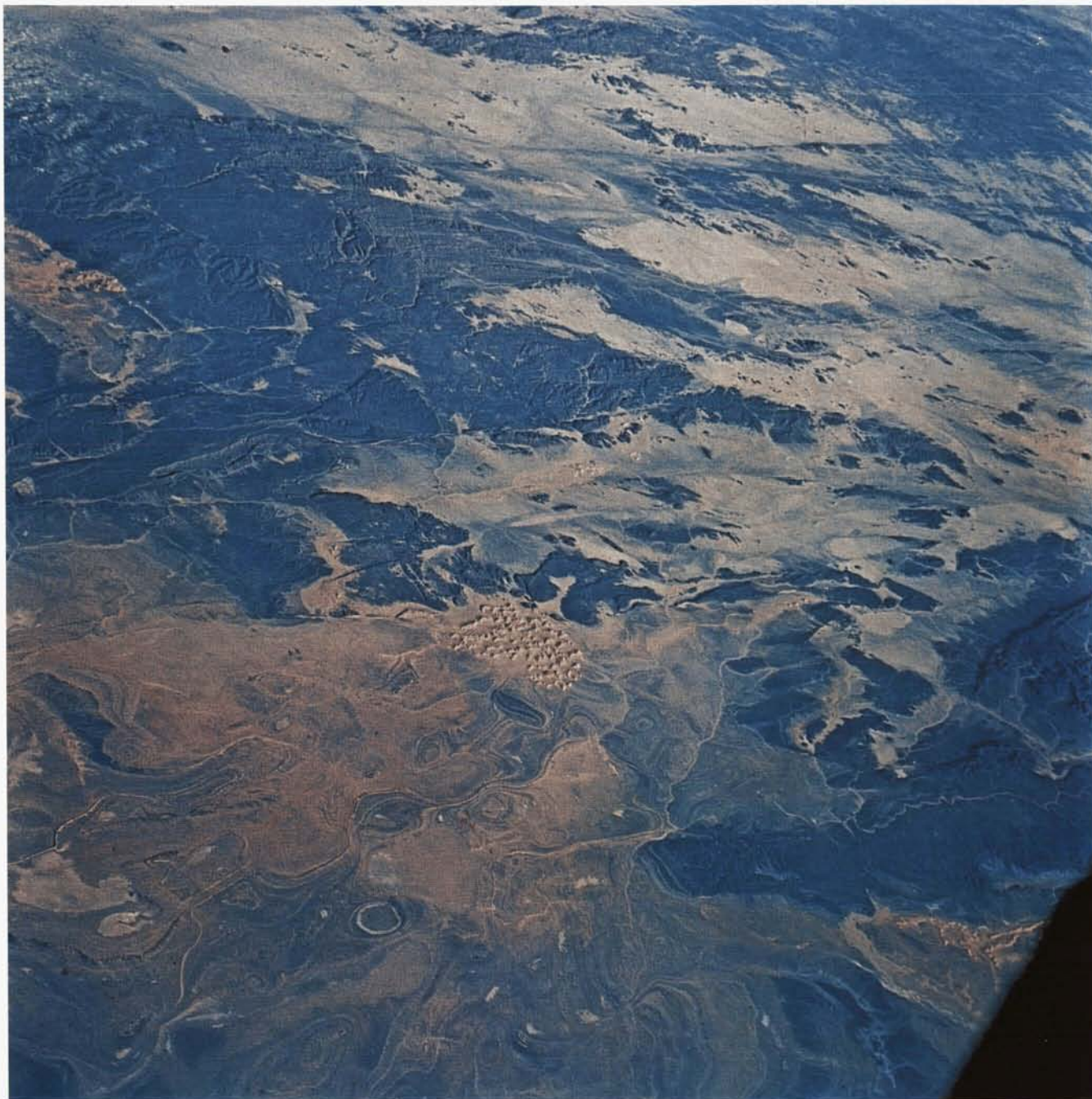


The Erg Iguidi dunes rule the foreground, and a dust-storm farther east whitens the top of this photo. The dark area at the right is the Eglab Massif. It is one of northern Africa's three major Precambrian highlands (the others are the Ahaggar and the Tibesti). These massifs were uplifted and erosion removed whatever

Paleozoic or Mesozoic rocks had been deposited on them. Volcanic activity often accompanies such uplifts. Interpreters of earlier photos such as this believe that the dark blotches at the lower right may be rhyolite intrusions, with lighter toned microgranite aureoles.

GEMINI IX JUNE 6, 1966 S66-38413





Centered here you see a small dune field resembling a cluster of tents. This photo was taken over central Algeria and shows the southern edge of the Plateau du Tademaït, which extends more than 600 miles from the Dhar Adrar to the Libyan border. Its easternmost part is called the Hamada de Tinrhert. The plateau is under-

lain by Cretaceous limestone. This dark rock has been moderately deformed by basin-and-swell movement accompanied by faulting. The long, straight watercourses that locally cut the plateau probably follow faults. Wind erosion of sedimentary strata produced the closed basins in the left foreground.





Earth presented this colorful view when the astronaut-photographer looked down on the central Tassili-n-Ajjer, at the junction of Algeria, Niger, and Libya. The broad, brushlike streaks across the photo appear to be incipient wind-erosion features, and the prominent curving cuesta at the top is the western border of the Marzuq

Sand Sea. Overlapping pictures of this area, taken from spacecraft, are increasing knowledge of wind-erosion phenomena. The physiography of this area reflects the prevailing basin-and-swell geologic structure of this part of northwest Africa.

GEMINI XI SEPTEMBER 14, 1966 S66-54773





This photo includes both the area shown on the facing page and the Mediterranean's southern shore. The Gulf of Sirte is under the cumuliform clouds in the upper left, Egypt is on the far horizon, and the Tassili-n-Ajjer in Algeria is in the foreground. The yellowish circular area in the center is the Marzuq Sand Sea. The dark

spot between it and the gulf is Al Harūj al Aswad, a 200- by 100-mile Quaternary volcanic field. Few geologists outside of Africa are familiar with this impressive field because such a thinly populated area has long been difficult to visit. This picture clearly shows the basin-and-swell tectonic structure.

GEMINI XI SEPTEMBER 14, 1966 S66-54525



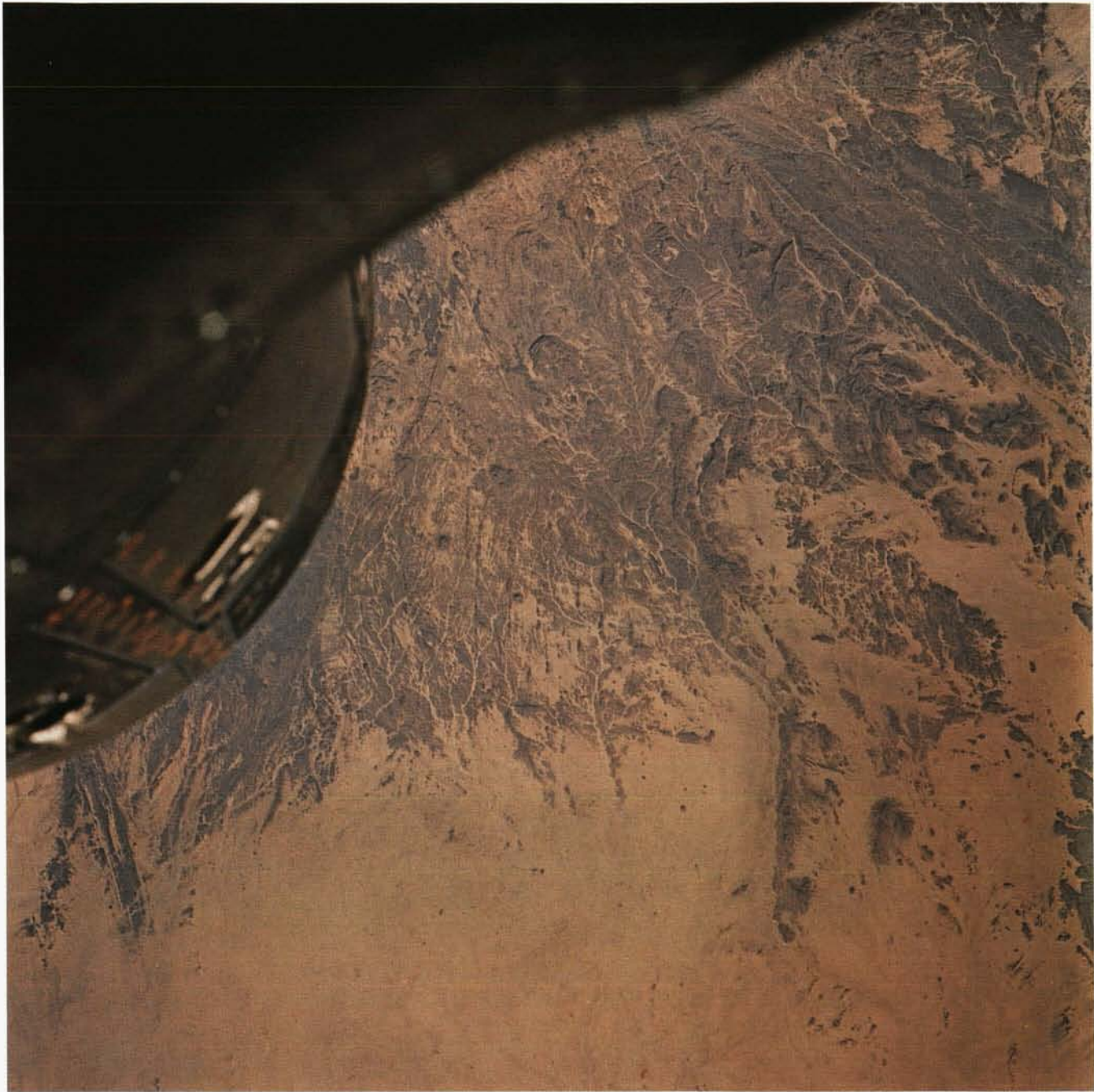


This view is along the southeastern end of the Tassili-n-Ajjer in eastern Algeria. The Marzuq Sand Sea of Libya is in the upper left corner. The black formless feature in the lower center is the Telut, a large Quaternary basalt field. Its linear features extend toward the upper right and are probably the reflection of structure

in the metamorphic rocks of the Ahaggar Massif. The ridges cutting across this structure nearly at right angles are products of erosion and indicate the direction of the prevailing winds. The rocks at the lower right constitute the edge of the Ahaggar Massif and probably are Precambrian.

GEMINI IX JUNE 6, 1966 S66-38418



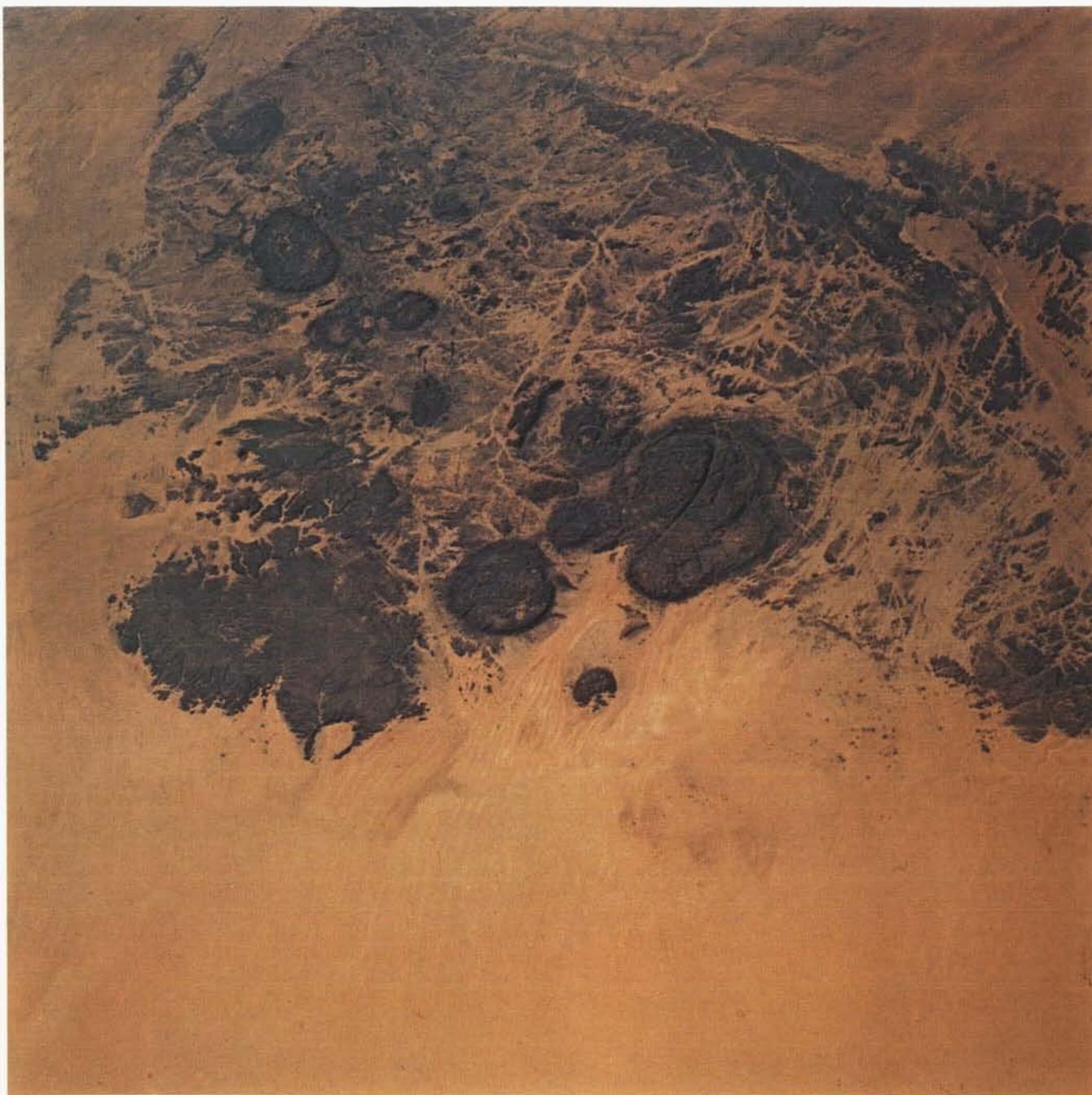


This photo was taken as the spacecraft approached the southern slope of the Ahaggar Massif in southern Algeria. The Ahaggar is a rugged mass of Archean and Paleozoic rock that rises high above the Sahara. One of its peaks is partly visible in the upper right corner of

the picture. A small outpost called Tamanrasset is just below the spacecraft. The light area in the foreground is part of the sandy wasteland known as the Tanezrouft, or "Land of Thirst," south and west of the mountain massif.

GEMINI VI DECEMBER 16, 1965 S65-63157





The Aïr mountain range in the north-central part of Niger, Africa, is an outlier of the Ahaggar, and is underlain by Precambrian igneous and metamorphic rocks. The big, dark, roughly circular areas so prominent in this picture of the range are plateaus of resistant masses of granite, intruded as ring complexes. The curved,

fracturelike feature cutting the plateau at the right is shown on an unpublished map by R. Black and others as a gabbroic ring dike. A crater in the lower left is probably a volcanic feature associated with Quaternary massifs. Niger is in a part of the Sahara where rain may evaporate before reaching the surface.

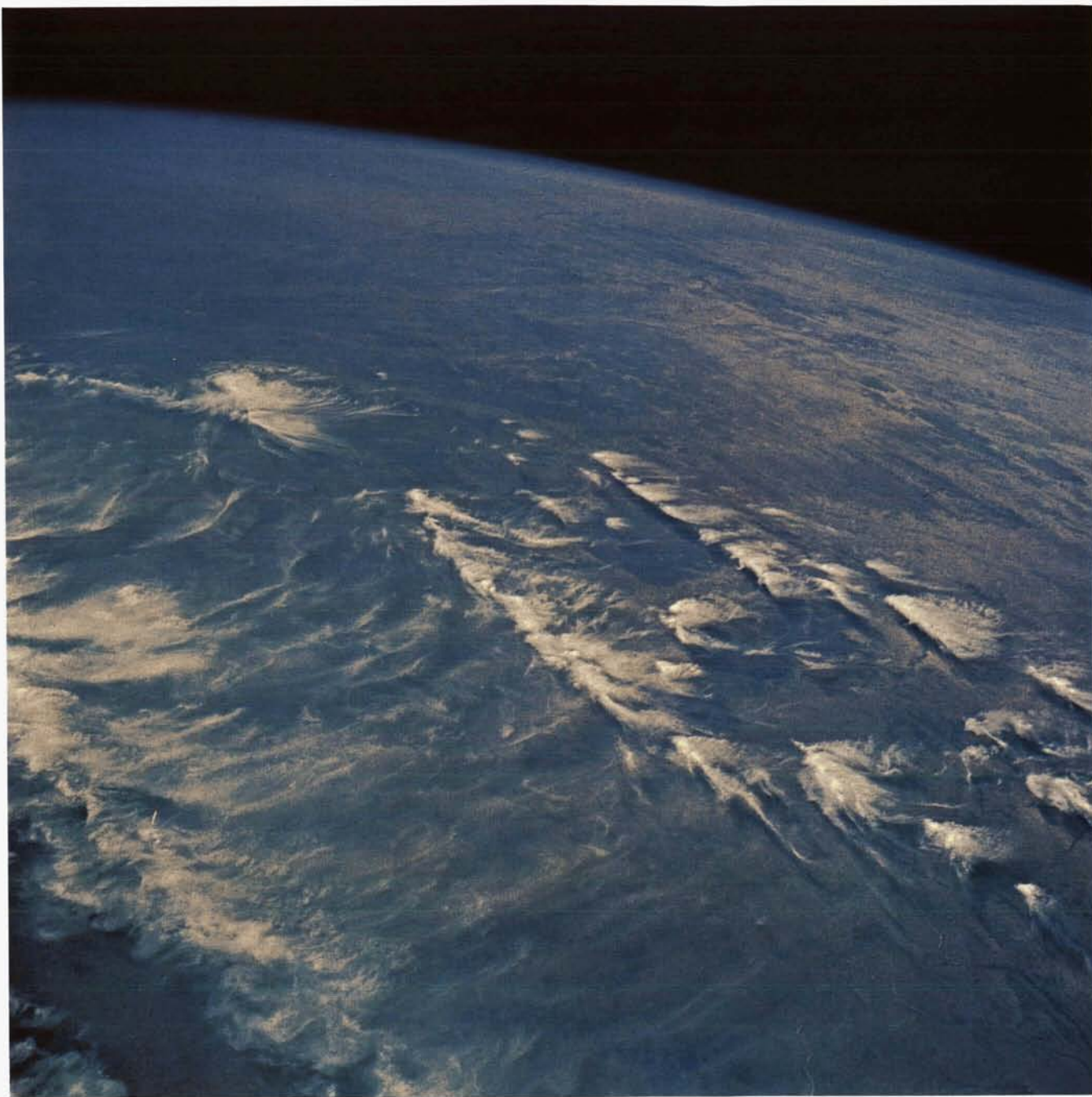
GEMINI VI DECEMBER 16, 1965 S65-63158



Mali and Niger, south of Algeria, have no seacoast. The Niger River flows through them on its way to the Gulf of Guinea, and this photo shows it in central Mali. The long dart above and to the right of the striated area is Lac Faguibine. The city of Timbuktu, which Christians formerly were forbidden to enter, is between

the lake and the river. The dark linear pattern south of the river is the result of flooding of stabilized sand dunes. El Djouf Desert at the upper right is still one of the least known parts of the Sahara. A cuesta separates this sandy desert from the Aouker region to the west.





Parts of several African countries are in the foreground, and Mali and northwest Niger are in the background of this view. The area shown includes northwest Nigeria, southwest Niger, northern Dahomey, eastern Upper Volta, and northern Togo. This part of the world was not explored in detail by Europeans until many years

after America was discovered. The remarkably straight lines of cirrus-cloud tufts are oriented east-west over Nigeria, although their filamentlike structures are nearly perpendicular to this direction. The filaments in the lower left corner of the picture extend for distances up to 30 or 40 miles.

GEMINI VI DECEMBER 16, 1965 S65-63240

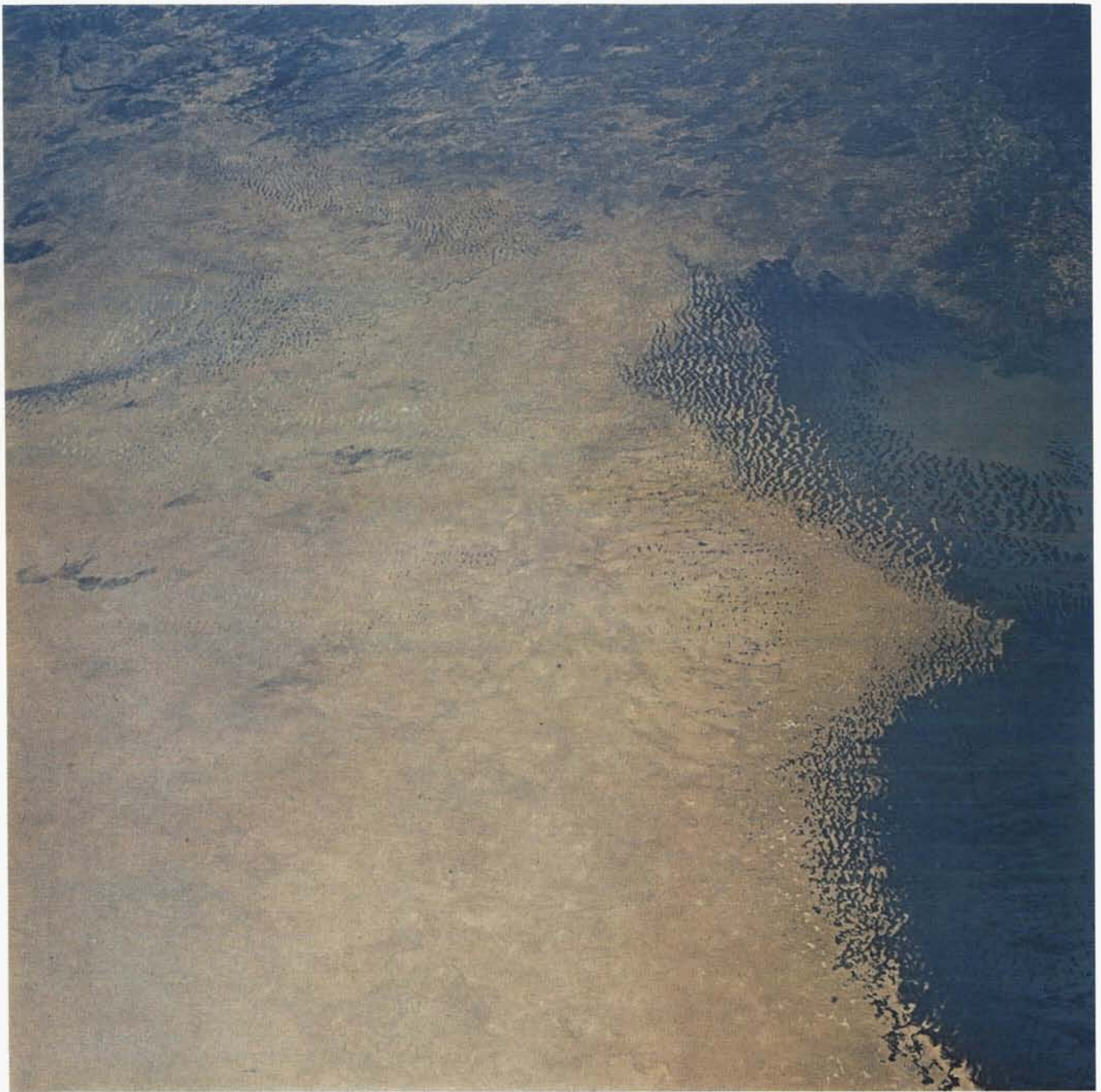


Cumulonimbi of various sizes dominate the center of this view of the northern part of the Central African Republic and the southern part of Chad. Both nations are landlocked, and the rainfall in this region is produced mainly by thunderstorms. Several smoke plumes emanate from the tropical savannatype forest in the

lower right quadrant of the picture. To the north the desert land gives a reddish hue to the area between the thunderstorms and the horizon. The blue band along the horizon is the lower, more dense region of the atmosphere called the troposphere.

GEMINI IX JUNE 6, 1966 S66-38445





This southwesterly view over Lake Chad shows the sands of the Sahara encroaching on it. Chad is in the middle of Africa between the desert and the Sudan grassland. The lake is much smaller now than when Europeans first saw it. Progressive desiccation has left only a remnant of what was an extensive lake system in

recent geologic times. Lac Fitri, in the upper left, is only about 20 feet higher than Chad. The Chari River, at the upper right, drains a large basin ringed by the Mbang, Chaîne des Mongos, and Jabal Marrah Mountains. Isolated, water-filled depressions can be seen between many of the sand dunes.

GEMINI VII DECEMBER 17, 1966 S65-63969



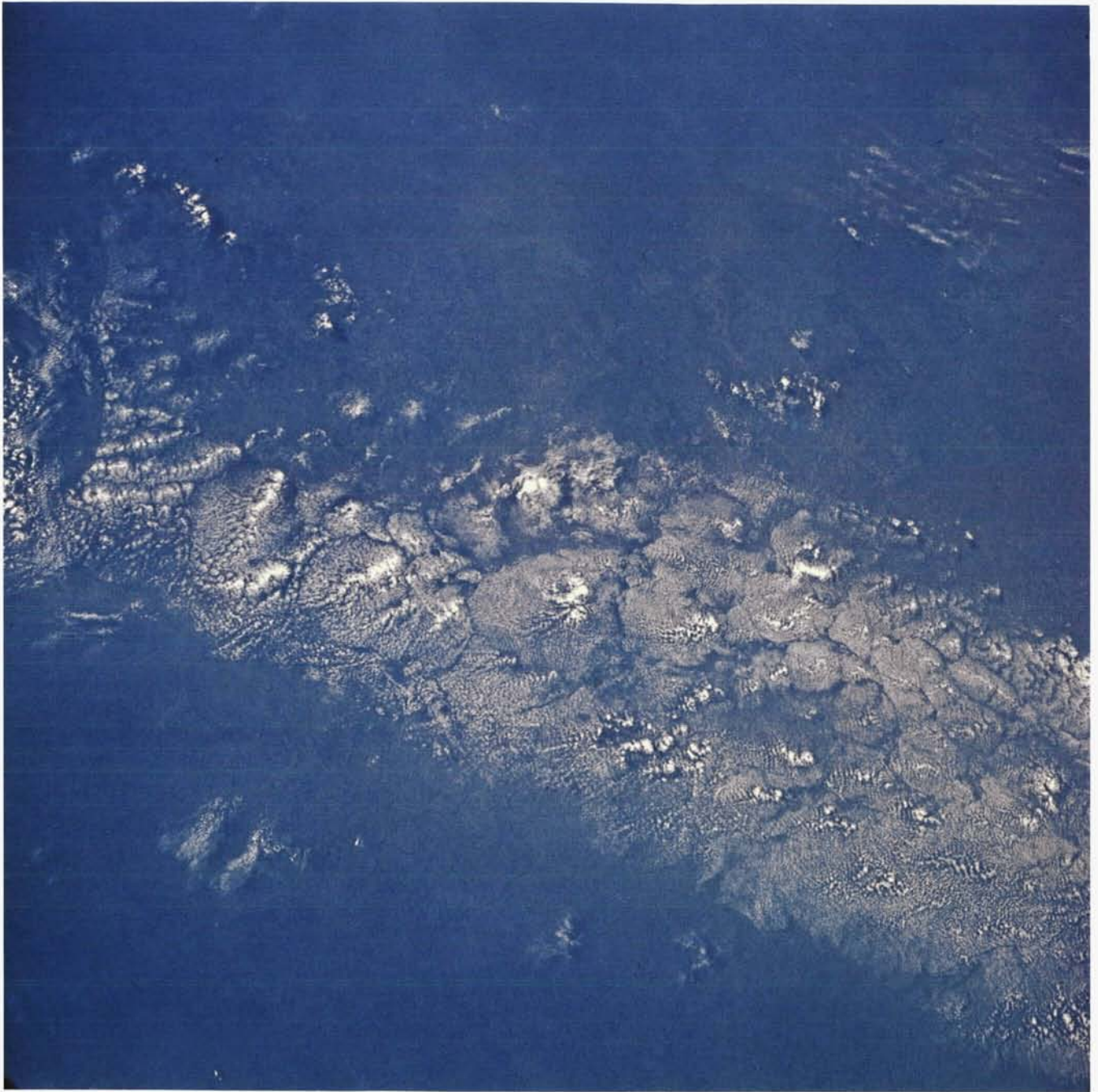


This northwesterly view includes most of Lake Chad. Four countries—Niger, Nigeria, Cameroon, and Chad—share its shores. In early June when this photo was taken, the lake was shrinking as the flood waters from December and January rains evaporated. The submerged dunes show how it becomes progressively small-

er as the desert robs it of water. Its principal affluent, the Chari River system, flows northward to enter the lake below the spacecraft. The only other affluent of significant size is the Yobe River, visible here at the left, which drains a small basin in Nigeria. Few roads lead one to its shores.

GEMINI IX JUNE 6, 1966 S66-38444





These cellular clouds were photographed over Cameroon and the Central African Republic. The light areas in the center of these large cells show where they are thickest. They are from 5 to 15 miles wide. The air is rising in the center of these cells and descending around the edges. They are in a slightly unstable layer about

2 to 3 miles high. Such cells have been seen more often over the oceans and at lower levels. The ratios between the width and the thickness of these cells are much greater than those found when such phenomena are produced in laboratory studies. Vegetation and the humid tropical atmosphere obscure the land's features here.

GEMINI VI DECEMBER 16, 1965 S65-63236



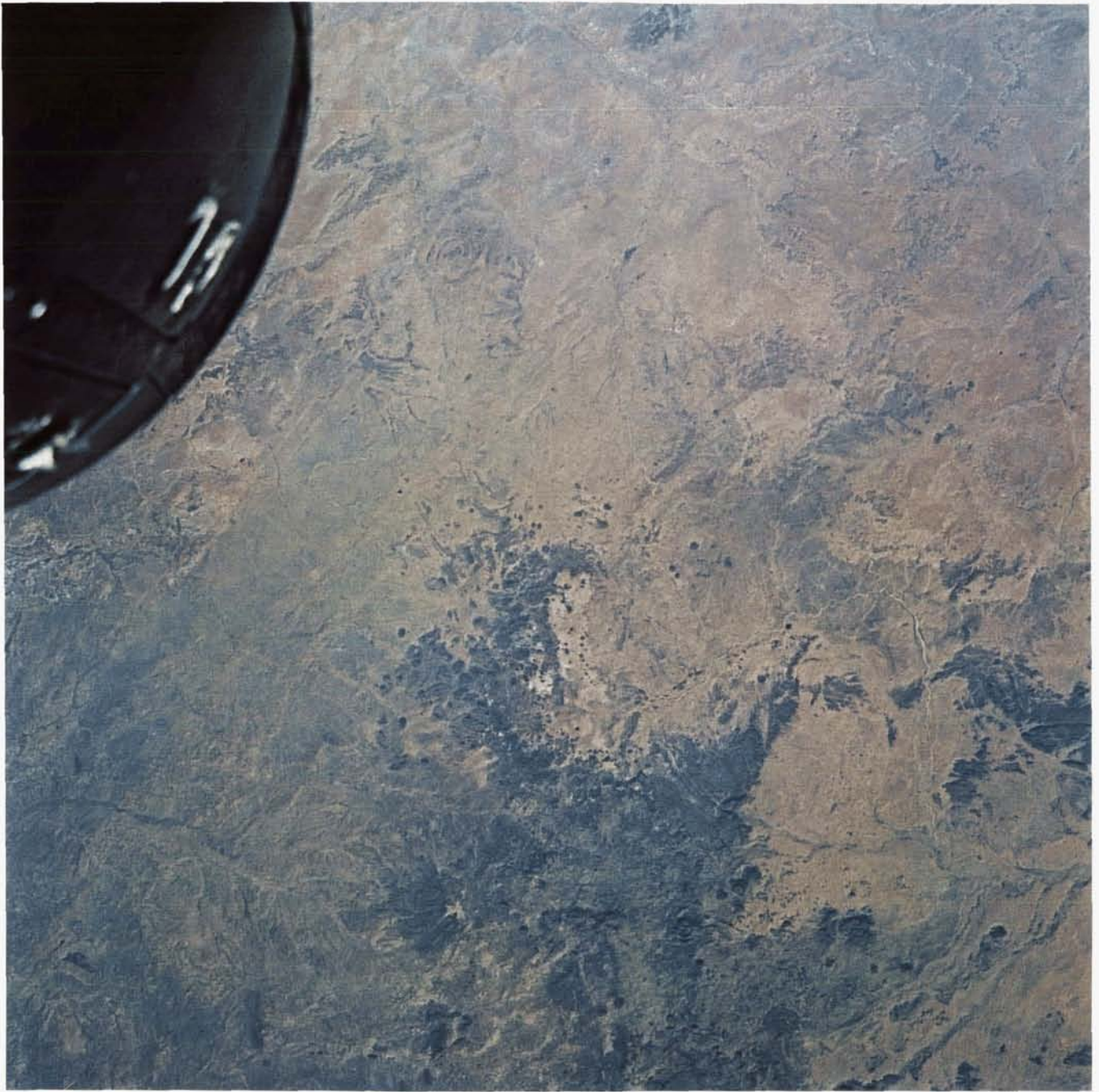


Africa's northern desert meets the continent's jungles in eastern Chad near the Sudan border. The transition zone is either wooded steppe or savanna in which the vegetation is mainly grass between scattered trees. This probably accounts for the darker hue in the foreground of this photo, which includes a large part of Chad.

Some clearing and farming of the land, as well as the increasing density of natural vegetation, may have contributed to the pattern visible here. The area is chiefly Precambrian igneous and metamorphic rocks and the circular structure in the upper center may be a ring dike or some similar intrusion.

GEMINI VII DECEMBER 17, 1965 S65-63963





This and the next photo are overlapping views of the mountains in western Sudan. Here one sees the northern end of the Jabal Marrah range on the Darfur plateau. These volcanic mountains form the divide between the area around Lake Chad and the Nile Basin. In the lower left here, Jebel Gurgei rises 7864 feet. The

town of Kutum is on a wadi near it and the provincial capital, El Fasher, is 50 miles southeast of Kutum. Sudan is Africa's largest country, and its boundaries touch Libya, Chad, Central African Republic, the Democratic Republic of the Congo, Uganda, Kenya, Ethiopia, and the United Arab Republic.

GEMINI VI DECEMBER 16, 1965 S65-63159

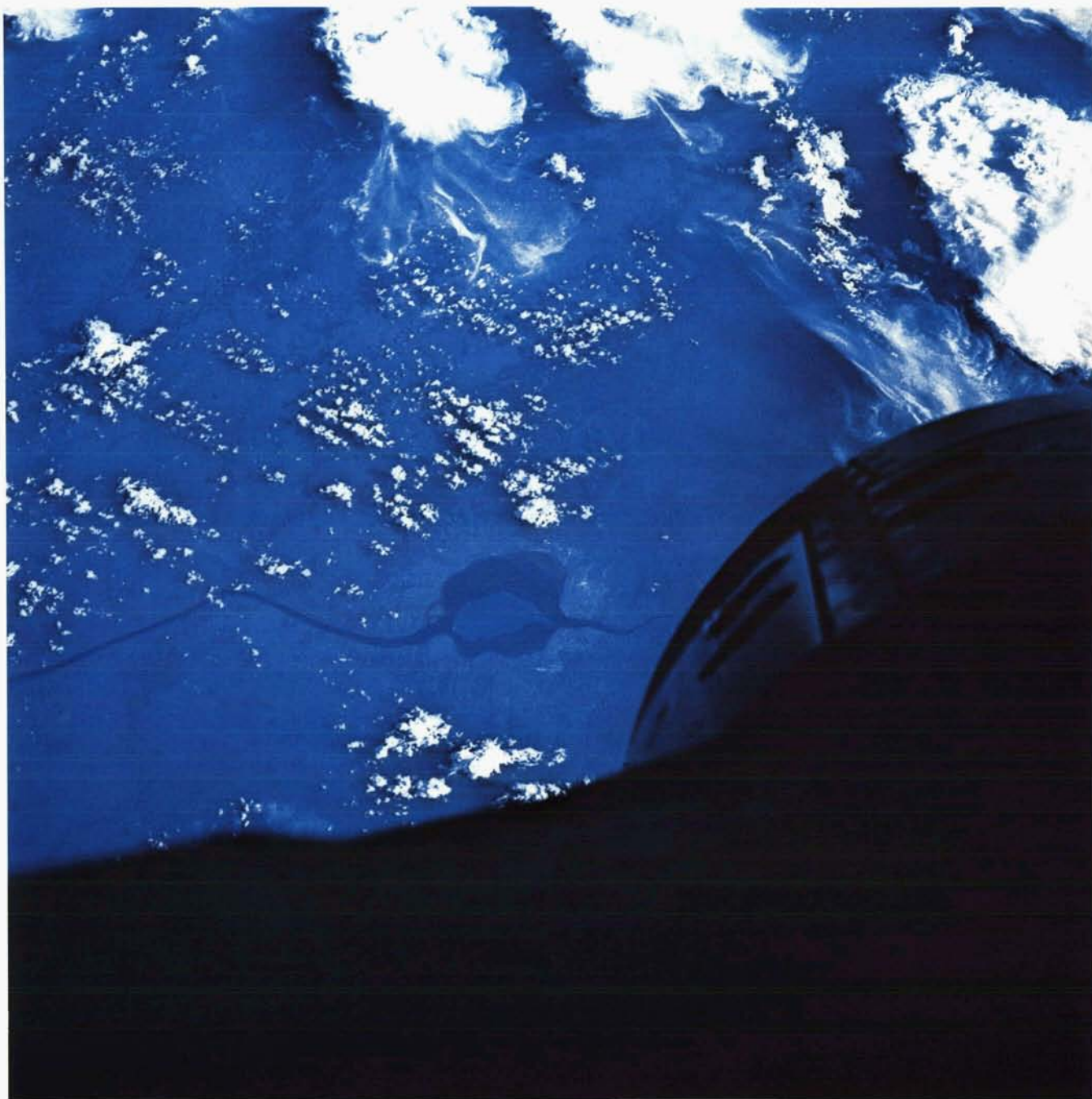




This second view of western Sudan shows the southern end of the mountains there. The volcanic crater of Jebel Marra, in the center of this picture, is at an elevation of more than 10 000 feet and contains two lakes, known as the Deriba Lakes. The town of Nyala is located along the prominent stream that can be seen flow-

ing west at the left side of the picture. The clouds in the lower right are high cirrus. These mountains stand between the area depicted in this section of the book and the photographs of the countries around the Nile that are presented in the next section.





This photo was taken over the Congo on an approach to northeastern Africa from its equatorial area. The clouds at the top show thunderstorm activity near Stanley Pool, the lake in the lower center. This area is mainly a broad plateau, from which water drops 900 feet in 215 miles, and the Congo River's course can be traced

here for about 100 miles. Stanley Pool is about 20 miles long and contains a low marshy area called Ile Mbamou. Upriver to the left, steep-faced hills confine the stream to a width of 1 or 2 miles. Brazzaville is on one bank and Kinshasa on the other at the right end of the pool.

GEMINI VII DECEMBER 13, 1965 S65-64022

## Part IV. Northeast Africa

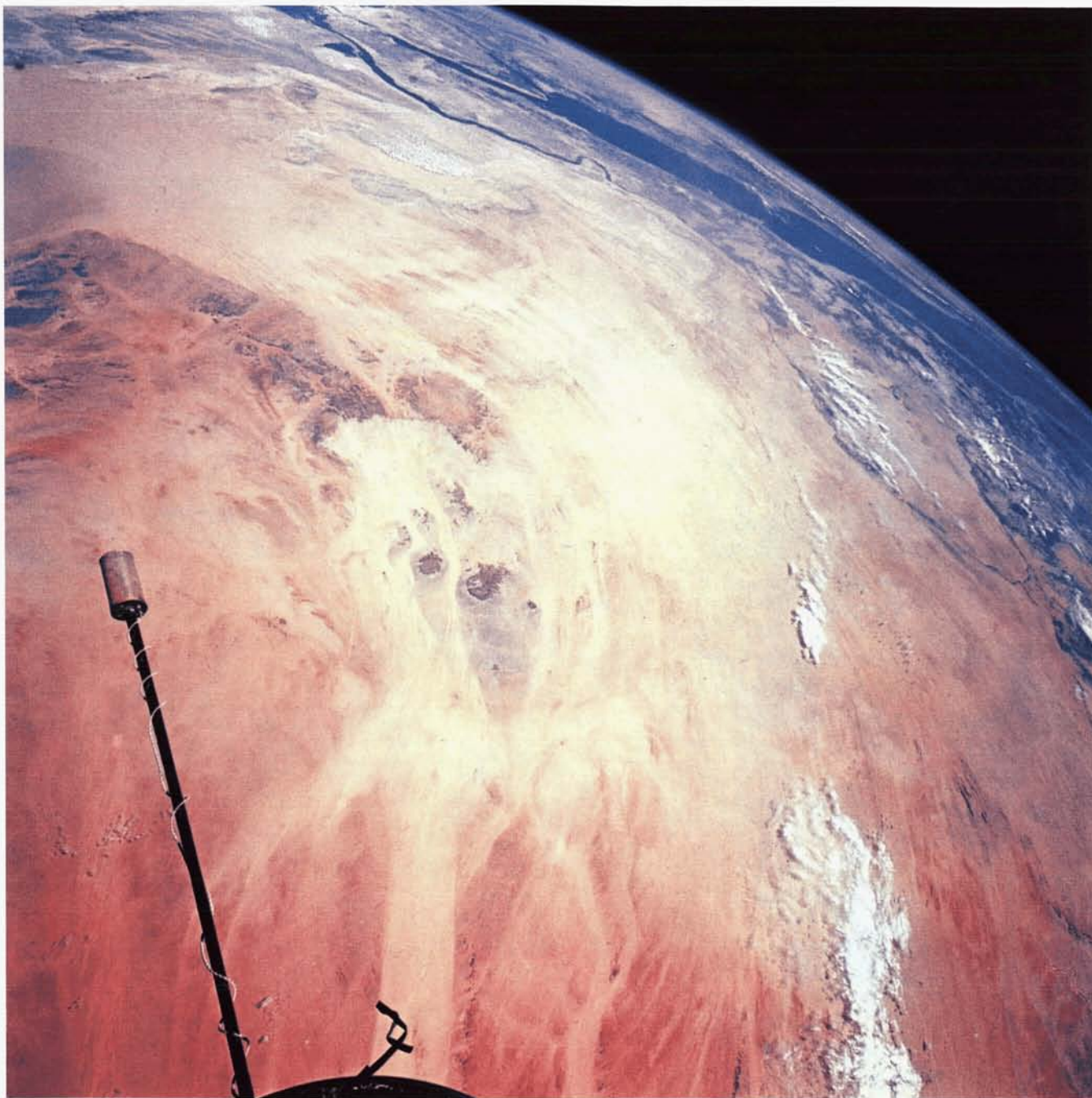
No other river has been as intently studied for as many centuries as the Nile, but neither its source nor the reason for its floods was discovered until this century. The Nile drains nearly 1 300 000 square miles of Africa, and Aristotle thought that its waters came from the Silver Mountains—that were later called the Mountains of the Moon. Gemini photographs now enable one to see vast stretches of the Nile at a glance.

They also show the whole of the 1450-mile-long Red Sea. At this sea's northern end, the Gulf of Suez and the Gulf of Aqaba are separated by the Sinai Peninsula. The Bible describes a parting of the waters thereabouts for the children of Israel on their return from Egypt to the Holy Land.

The Red Sea occupies a huge crustal rift in the continental shield and its swampy shores end abruptly in high tableland. Wind erosion has created distinctive features in the terrain there that are not recorded even in recent maps, but that can be seen clearly in the Gemini pictures.

The currents in the waters around the Arabian Peninsula are complex. Large numbers of pelagic fish have long been found in the Gulf of Aden on the southern coastline, and may be confined in certain areas by the ocean currents. Photographs such as those in this section may be helpful to evaluators of both the inland and marine resources of this part of the world.



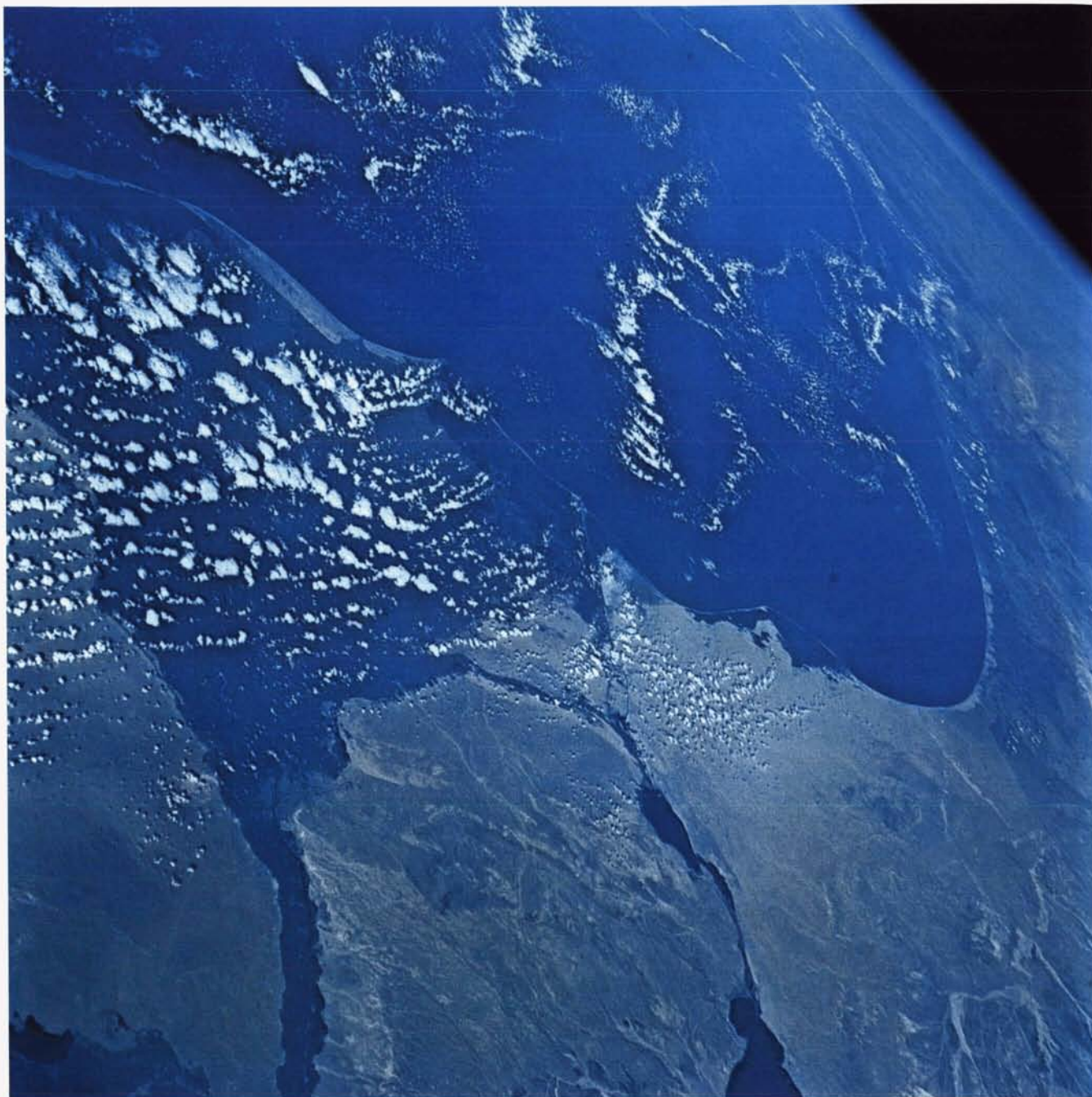


The contrast between western Egypt and the Nile Valley is sharp in this photo. Libya is in the foreground, and the Red Sea is above the river near the horizon. The large elliptical feature in the upper center is the Gilf Kibir Plateau. Gently dipping sandstones underlie it and there is a V-shaped escarpment to the left. The

larger of two dark circles below the Gilf Kibir is the Jebel Uwaynāt, which is bisected by the border between Libya and Egypt. These jebels were formed by erosion and are said to consist of Precambrian rocks with aegirine syenites and granites dominant. The desert here gets less than 2 inches of rain annually.

GEMINI XI SEPTEMBER 14, 1966 S66-54529





This is the eastern end of the Mediterranean. The Nile River and its delta dominate the left half of the view; the right half includes Israel, Lebanon, and parts of Cyprus, Jordan, the Syrian Arab Republic, Iraq, and Turkey. The Suez Canal is in the lower center, and the Gulf of Suez in the foreground. The narrow body of

water on the right edge is the Dead Sea. The smaller waterbody in the fault extending northward from the Dead Sea is the Sea of Galilee. A lake, the Birkat Qarun, is in the dark lower left corner of the picture. A light northerly wind had alined cumuliform clouds over Egypt in parallel rows when this picture was taken.

GEMINI VII DECEMBER 8, 1965 S65-63849



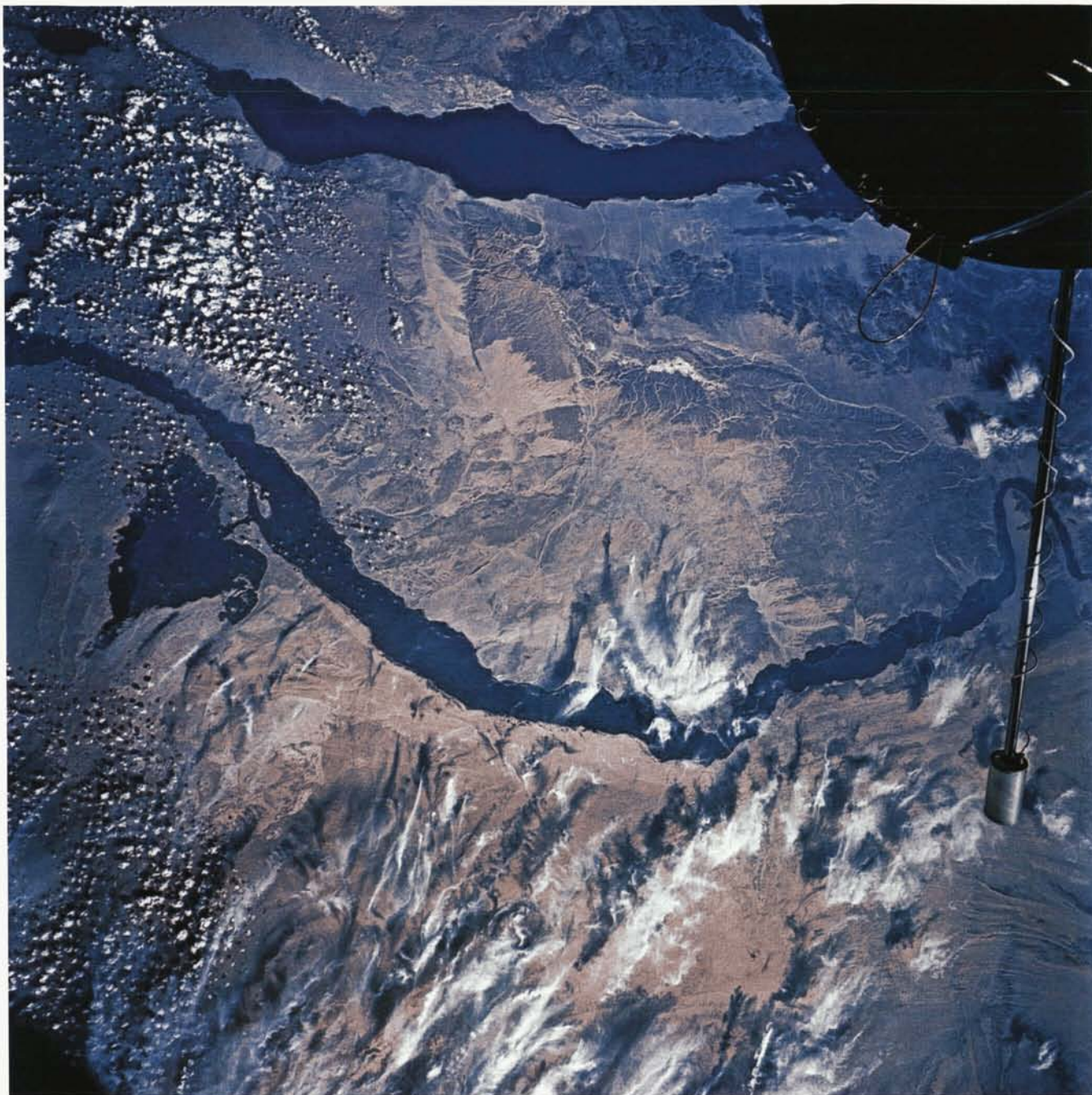


"This picture, accentuating the blue of the Red Sea separating Egypt from Sinai and Saudi Arabia, was taken while inverted, pointing south and moving sideways in orbit," Astronaut Edwin E. Aldrin, Jr., reported. "The radar transponder pointing toward the Nile River and the wire loop of the tether are on the Agena

which was docked to Gemini XII at this time." The Gulf of Suez at the bottom of the photo extends northward from the Red Sea, and the Gulf of Aqaba to the left edge. A few cirrus clouds lay east of the Nile, and cumuliform clouds can be seen over the Red Sea and Saudi Arabia at the upper left.

GEMINI XII NOVEMBER 13, 1966 S66-63481





North is at the left in this view of Egypt's Nile Valley. The dark triangle at the left is El Faiyum, a natural depression 148 feet below sea level. It contains the lake, Birkat Qarun, and a large irrigated area. Amenemhet I of the XII Dynasty controlled the level in the lake to attain some control of Nile floods. The pronounced

bend in the river under the antenna has been ascribed to the same major fault system that probably influenced the shape of the Gulf of Suez and the northern Red Sea. The cirrus clouds in the foreground are embedded in southwest winds from Libya and the cumulus clouds at the left are in winds sweeping in from the north.

GEMINI XII NOVEMBER 13, 1966 S66-63477





Jetstream cirrus clouds extended across the Red Sea and the Nile Valley when this high oblique view to the southeast was filmed. These clouds are so named because they occur near the strong core of the upper westerly wind, the jetstream, at altitudes between 35 000 and 45 000 feet. This photo also shows important lithologic

and structural features trending toward the southeast. Tertiary sediments underlie most of the area, but Precambrian igneous and metamorphic rocks comprise most of the Sinai Peninsula and surround the Gulf of Suez. Farms darken the valley in which the Nile flows northward through Egypt from Sudan.

GEMINI XII NOVEMBER 15, 1966 S66-63530



This photo of the Red Sea, looking south, was taken from the same spacecraft but on a later revolution than the preceding one. It shows the cirrus cloud bands still over the region. They are parallel to the upper wind and hence indicate its direction. Saudi Arabia is at the left, and Egypt at the right. Sun glitter brightened the

water of the sea in the lower right. The Red Sea was so named because occasionally a free-floating form of microscopic algae "blooms" so profusely that it reddens the water. Although this sea became a commercial artery when the Suez Canal was built a century ago, most of the ports along it are small communities.

GEMINI XII NOVEMBER 15, 1966 S66-63081





Only a few cumuliform clouds covered the northern end of the Red Sea between Egypt and Saudi Arabia the morning this photo was taken. The Nile can be seen in the lower left. The spacecraft transponder points to the tip of the Sinai Peninsula, the Gulf of Aqaba, and the Dead Sea in the upper left corner. The dark Pre-

cambrian rocks on the far shore of the sea in this view are part of the Arabian-Nubian Massif. An Nafud, a large sand desert, is in the upper right. This photo shows distinct dune trends that are aligned in the dominant direction of the wind.

GEMINI XI SEPTEMBER 14, 1966 S66-54664





At most points the Red Sea is less than 200 miles wide. This is a closer view of part of the Arabian shore seen on the preceding page. This photo shows the coast of Saudi Arabia between Dubā and Ras Bariji. The dark massif towering above the blue water is a complex of Precambrian igneous and metamorphic rocks that is

parted by graben faulting below the Red Sea. The black, crablike feature at the far right is a Tertiary-Quaternary lava flow. The lightly colored sediments are stream deposits of alluvium and related surficial deposits of Quaternary age. The shadows of the clouds indicate that they were at a great height.

GEMINI XI SEPTEMBER 14, 1966 S66-54895





This is a photo of the Red Sea taken from east of it. Yemen and Saudi Arabia are in the foreground; Ethiopia, Sudan, and the United Arab Republic are on the far shore. Oceanographers have found gold, silver, zinc, and copper associated with sediments in a 7000-foot-deep part of the Red Sea northwest of Jiddah, a city

near the shore in the right center. In the depths the water is 56° C and has 10 times normal salinity. Submarine eruptions and ancient salt beds probably explain these conditions. Jiddah had a west wind of 15 knots, and Port Sudan, across the sea, a 10-knot southeast wind when this photo was taken.

GEMINI VII DECEMBER 13, 1965 S65-64006



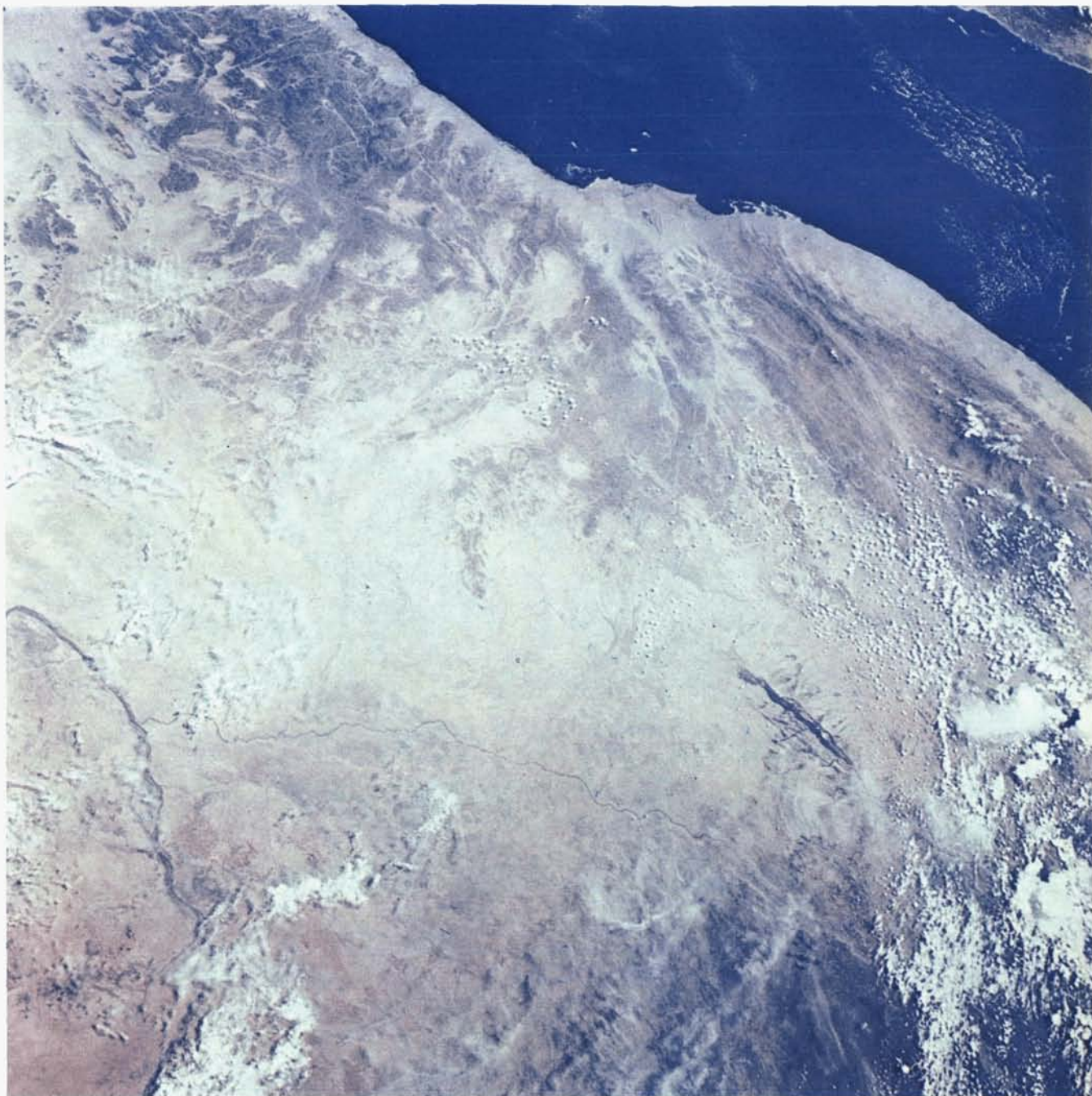


Ethiopia is in the upper left and the Arabian Peninsula in the foreground of this photo taken east of the Red Sea. The dark area in Ethiopia is the Danakil Depression, a below-sea-level part of the Great Rift Valley. Islands and reefs are visible off R'as Isa, the cape on the near shore. Dark areas in the lower left are volcanic

rock. The prominent fault in the lower right is in Yemen. It brings granitic rocks into contact with Jurassic sediments of the Amran Series in the light central part of the photo's lower half. There are batholiths of Mesozoic or Cenozoic age in the Amran Series which darken parts of the picture.

GEMINI VII DECEMBER 13, 1965 S65-64007





For this view of the Nubian Desert east of the Nile, the camera was pointed east from over southern Egypt and Sudan. The Red Sea waters at the top are in the northern part of the Great Rift Valley of Africa, which has been shown to be a graben or downfaulted block. The dark areas bordering it are Precambrian igneous and

metamorphic rocks. The dark linear depression at the right is north of Kassala, Sudan, and is undoubtedly a subsidiary structure related to the main Rift Valley faulting. Thin cirrus filaments hide the nearby desert and several cumulonimbi rise amid the cumulus clouds at the right.

GEMINI XI SEPTEMBER 14, 1966 S66-54779





Before flowing north into Egypt, the Nile curves southward in northern Sudan. To the right of the antenna rod, where the river is relatively straight and there are no clouds, is its third cataract. Most of the area in the foreground is underlain by Nubian sandstone. Circular features here are similar to those of the Jebel Uwaynāt.

Vegetation increases from left to right as the color of the landscape darkens. To the east the main structural features of the Nubian Ramp, the Precambrian highlands bordering the Red Sea, are visible. Some cumuli-form and cirri-form clouds are shown drifting over the desert on both sides of the Red Sea.

GEMINI XI SEPTEMBER 14, 1966 S66-54531



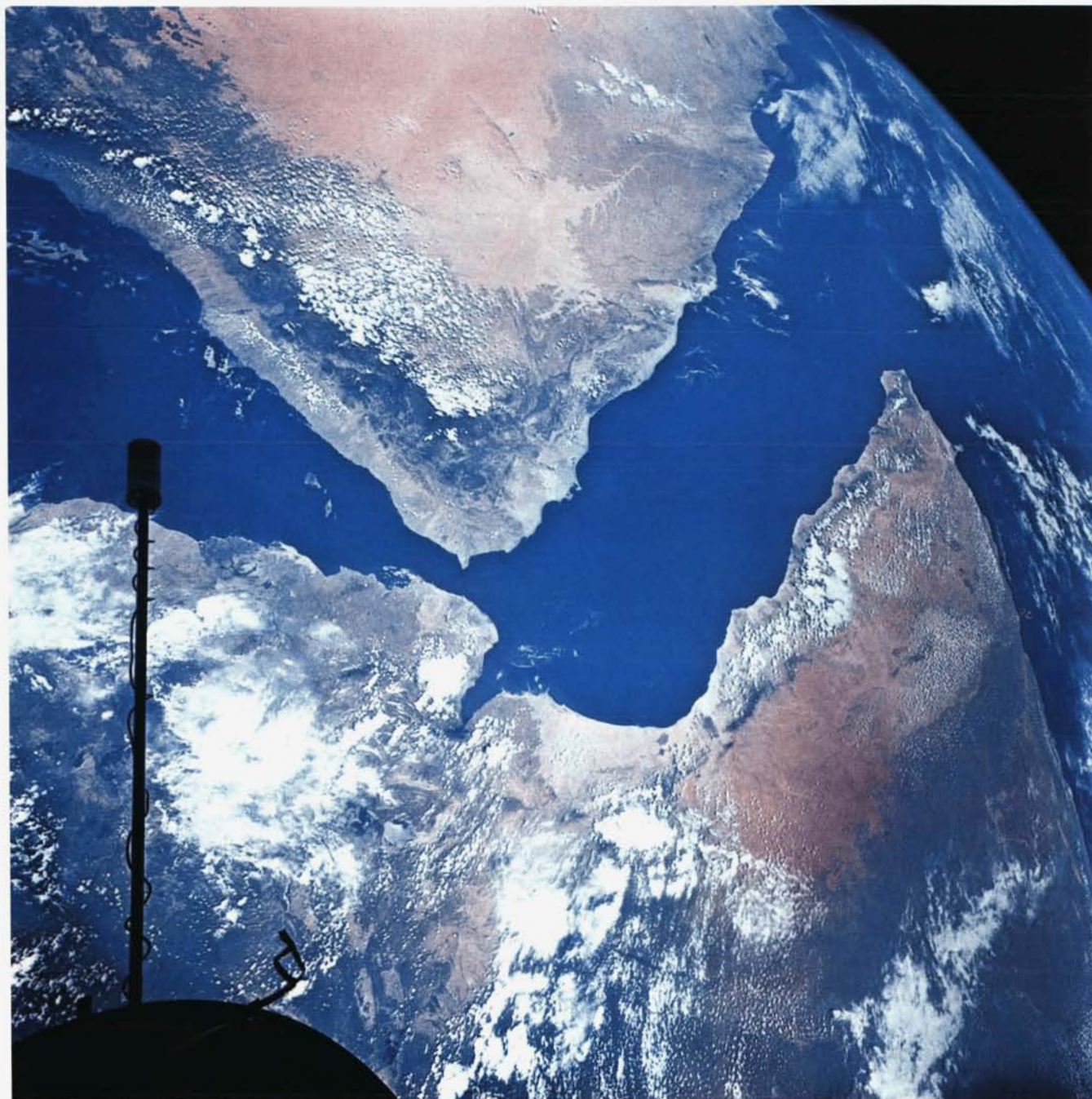


This and the next three pictures were taken only minutes apart from altitudes of more than 300 miles. Lake Tana in Ethiopia is in the lower right. Beyond is nearly the whole southern end of the Arabian Peninsula. The bare orange expanse there is the "Empty Quarter" of Saudi Arabia and Yemen. Showers apparently were fall-

ing on the lava-covered Abyssinian plateau from the clouds in the foreground. This plateau's average elevation is more than 6000 feet. Dark areas below the cumulus clouds along the Red Sea's far shore are part of the Arabian shield, which the Red Sea rift separates from the African shield.

GEMINI XI SEPTEMBER 14, 1966 S66-54533



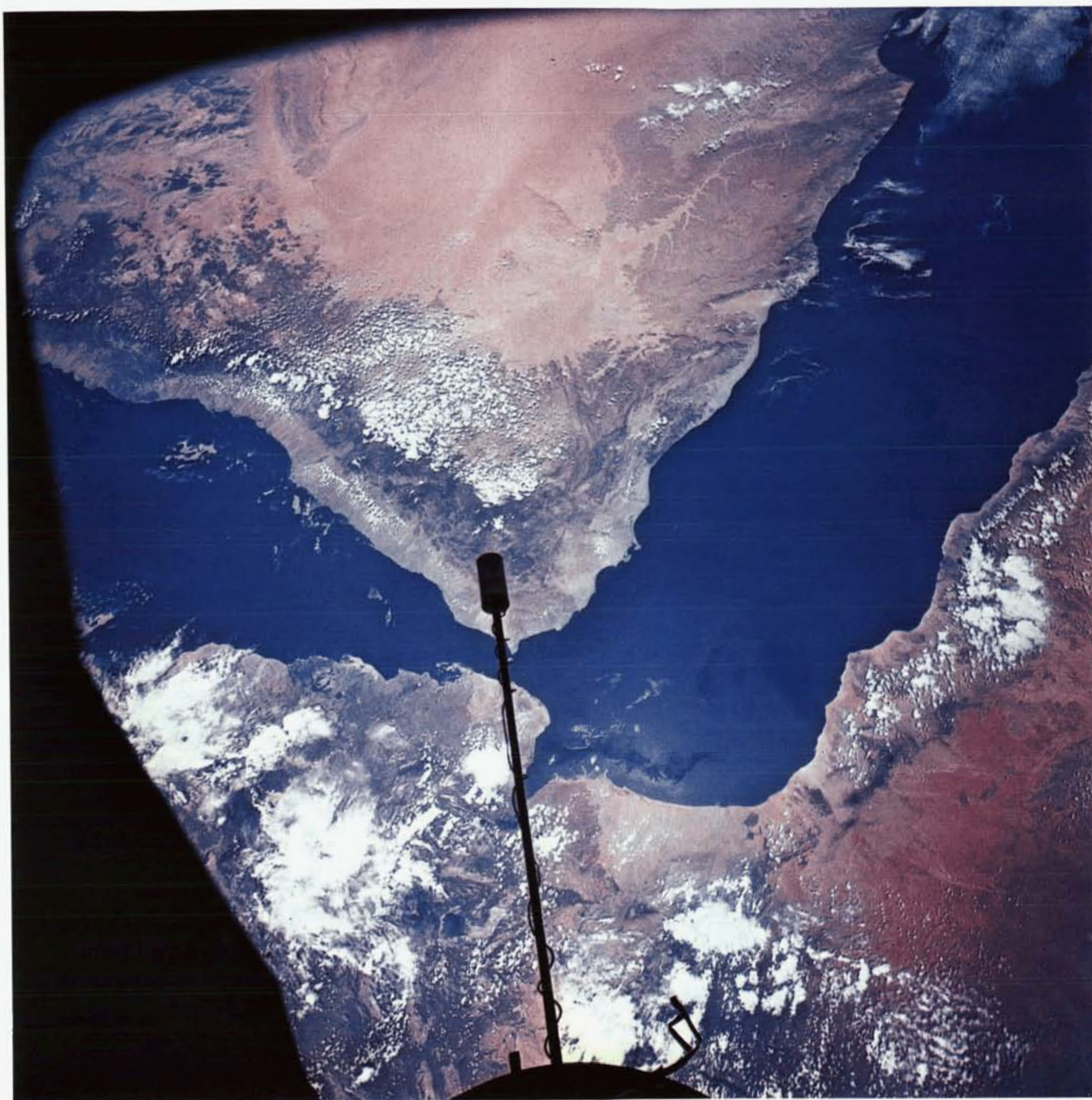


The Red Sea is at the left. From it the Gulf of Aden extends to the Indian Ocean on the horizon. Between the spacecraft and the V-shaped Tadjoura Gulf in the lower center of this photo is Lake Abbe. The boundary between Ethiopia and the Somali Republic crosses that lake. Yemen occupies the left part of the Arabian Pen-

insula shown here, and Aden is along the shore to the east. Major structural lineaments of the Arabian shield, and the dendritic wadi system of the Hadramawt Plateau, can be observed in this and the next picture. The spacecraft was ascending when this and the next photo were taken from an altitude of more than 350 miles.

GEMINI XI SEPTEMBER 14, 1966 S66-54536



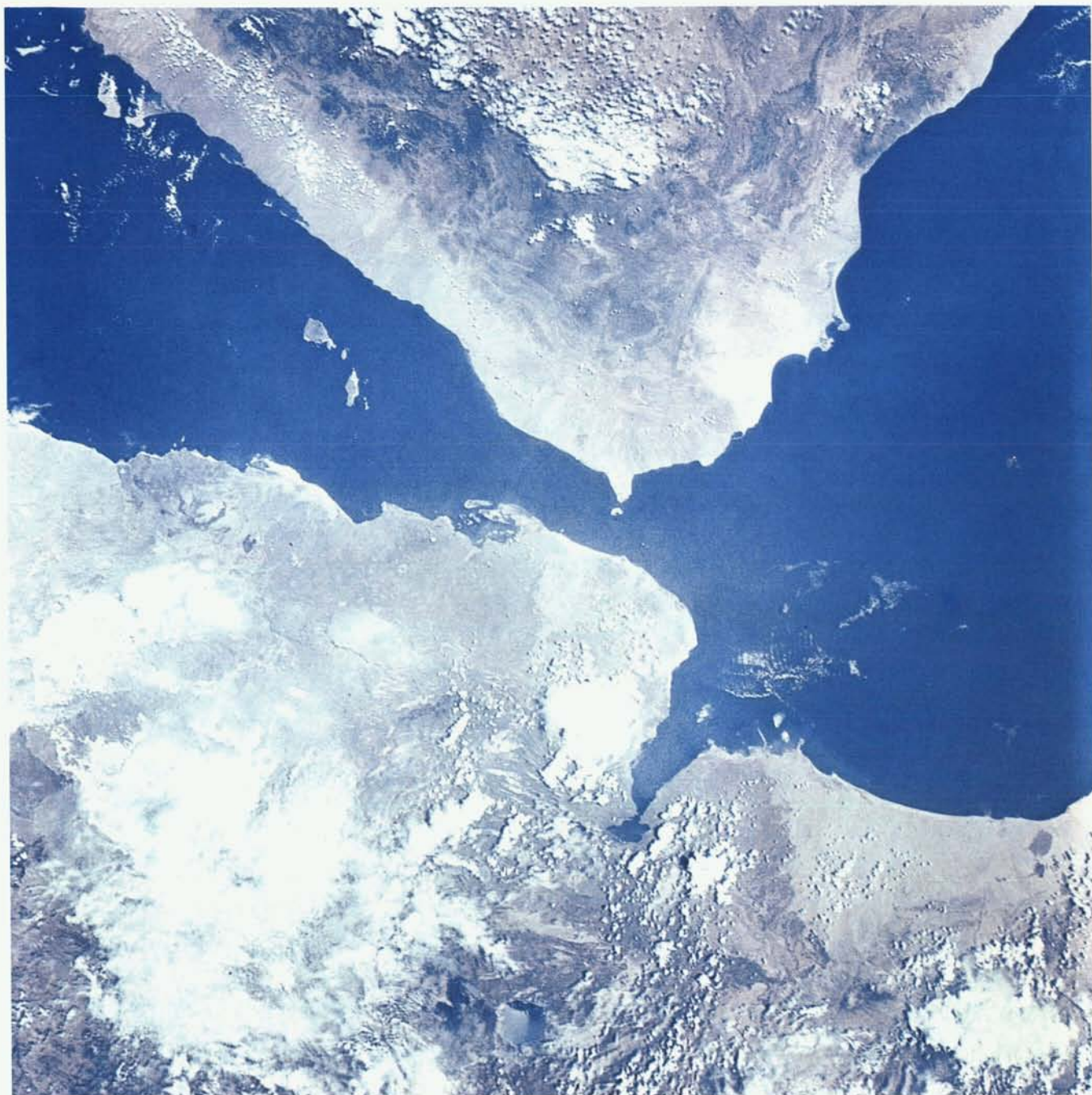


The resolution of this photo, showing some of the same area as the preceding two, is greater because the view is more nearly vertical. In the upper center the gently dipping Paleozoic and Mesozoic sediments that form the arcuate central interior homocline of the Arabian Peninsula can be seen emerging from below Ar Rab al

Khālī. In September the Red Sea's warm waters pour into the Gulf of Aden over the sill of the strait you see beneath the spacecraft's transponder. A portion of that flow, about 150 miles long and 75 miles wide, can be detected by a difference in the water's hues, caused by its relative roughness.

GEMINI XI SEPTEMBER 14, 1966 S66-54537



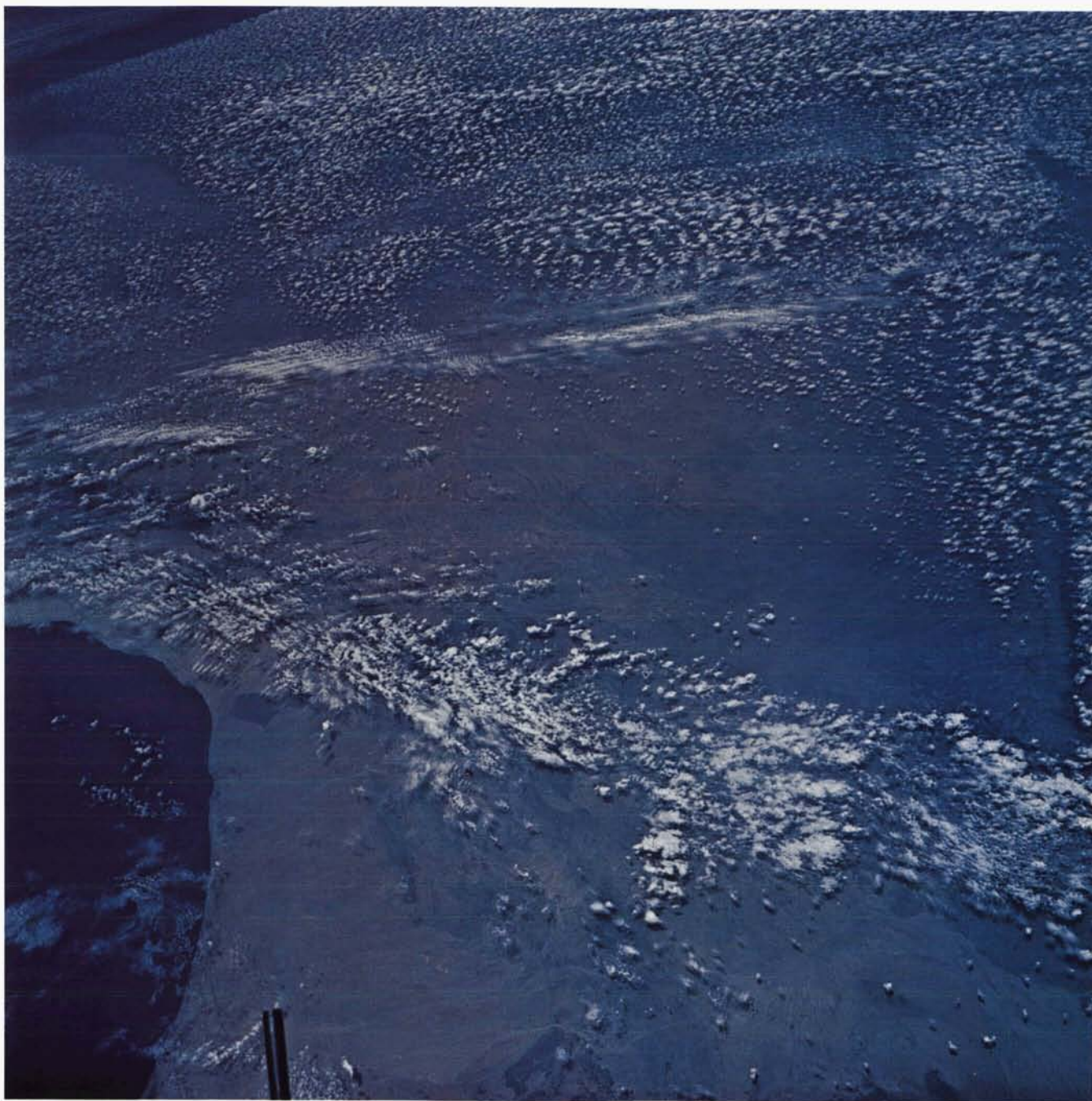


The Red Sea and the Gulf of Aden are in a geologically important area. The Gemini photos show several major structural lineaments which traverse Precambrian and Cretaceous rocks in this area. The view includes the bifurcation of the Great African Rift valley—to the east under the Gulf of Aden and to the southwest under

Africa to form the Abyssinian rift. The Afar depression in Africa, in the foreground, consists largely of volcanic rocks. It appeared to be raining on Ethiopia's highlands when this series of pictures was taken; air temperatures reached 100° F along the Red Sea coast 3 hours later.

GEMINI XI SEPTEMBER 14, 1966 S66-54783





Now our view is to the east across the dry lands of the horn of Africa toward the Gulf of Aden. The Indian Ocean shore between Eil and Garad is visible in the upper left. The cumulus-cloud streets shown here are parallel to the southwest wind and the clear swath is over the valley of the Nogal River which flows across

the Somali Republic. A narrow Precambrian ridge extends eastward from the bottom of the photo and roughly parallels the coast of the Gulf of Aden in the foreground. The dark areas on the right represent Mesozoic deposits.

GEMINI IX JUNE 6, 1966 S66-38424



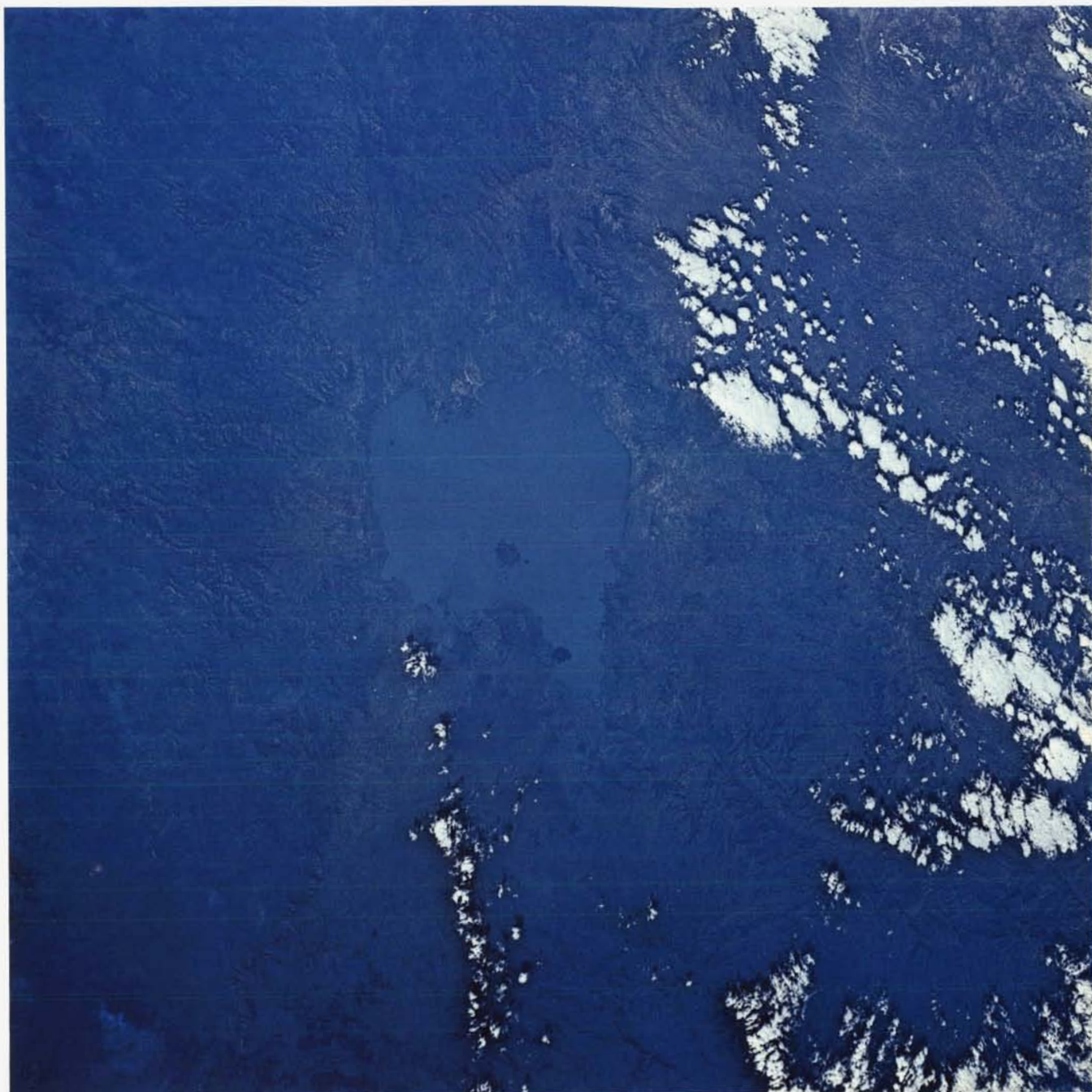


Ethiopia is dotted by large lakes south of Addis Ababa. They are in the northern part of the Great African Rift valleys that extend from Syria to South Africa, and are thought to be graben; i.e., large blocks of the crust that have been downdropped along fractures. The parallel lines northeast of Zeway, the northernmost dark lake

here, are indications of these fractures. The three center lakes are Shala (left), Hora Abyata (middle), and Langana (right). Cumulus clouds partially hide Awusa lake at the lower left. The sharp brown marks at the upper right and a curlicue on Langana's shore are defects in the photographic film.

GEMINI VI DECEMBER 16, 1965 S65-63162



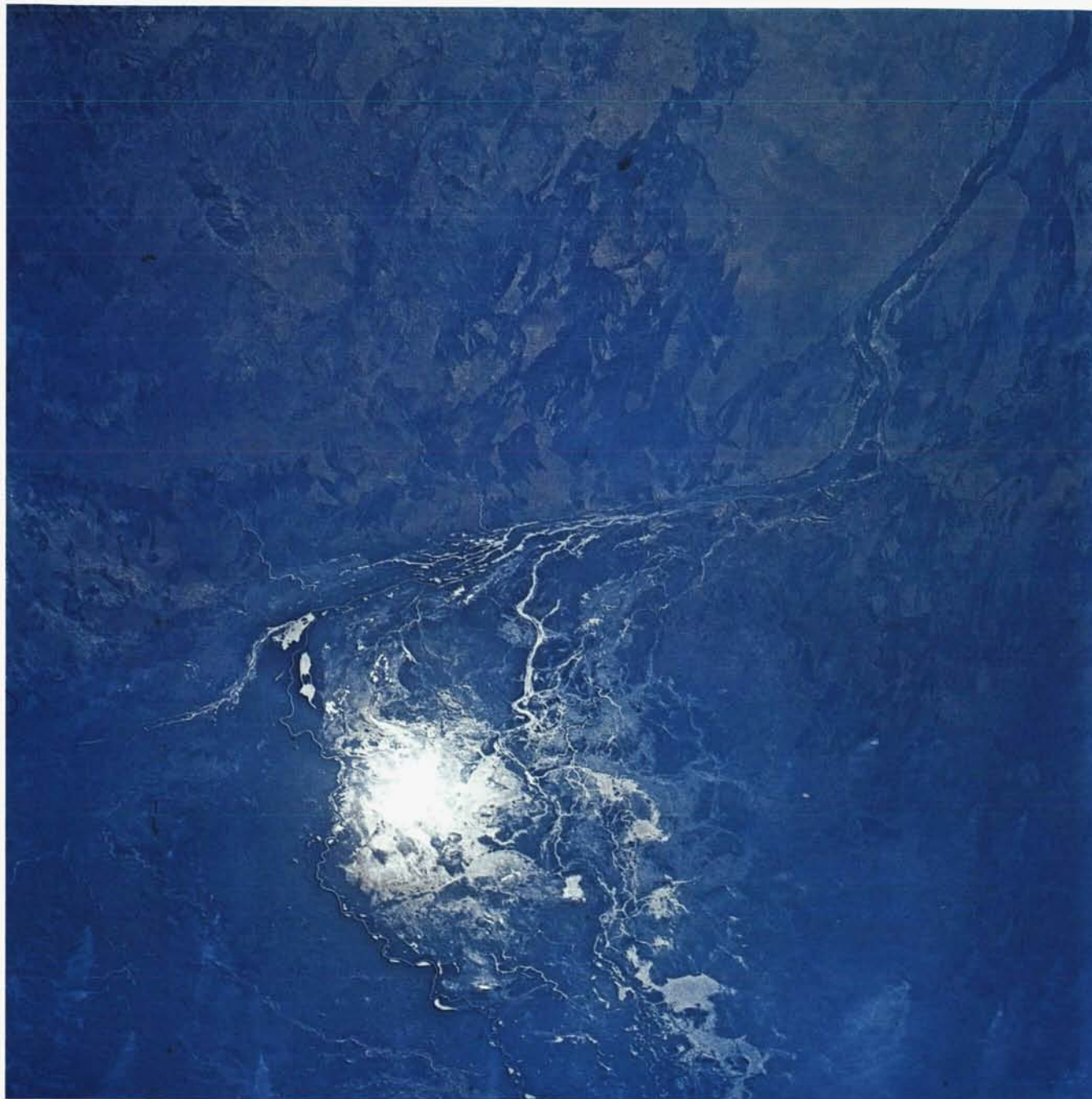


Lake Tana in northwestern Ethiopia is the source of the Blue Nile. It is on a plateau more than 6000 feet above sea level, and its water flows to the southeast (lower right) before curving west to irrigate farms in Sudan and Egypt. Monasteries on the islands in Lake Tana date back to the 14th century. Extensive lava flows of

late Mesozoic or Cenozoic age overlay the plateau. The lineament left and above the lake may be the expression of a fault, suggesting that the lake is of tectonic origin. Mountains rise nearly 13 000 feet in the region near the pancake-shaped cumulus clouds to the right of the lake.

GEMINI VII DECEMBER 13, 1965 S65-64014



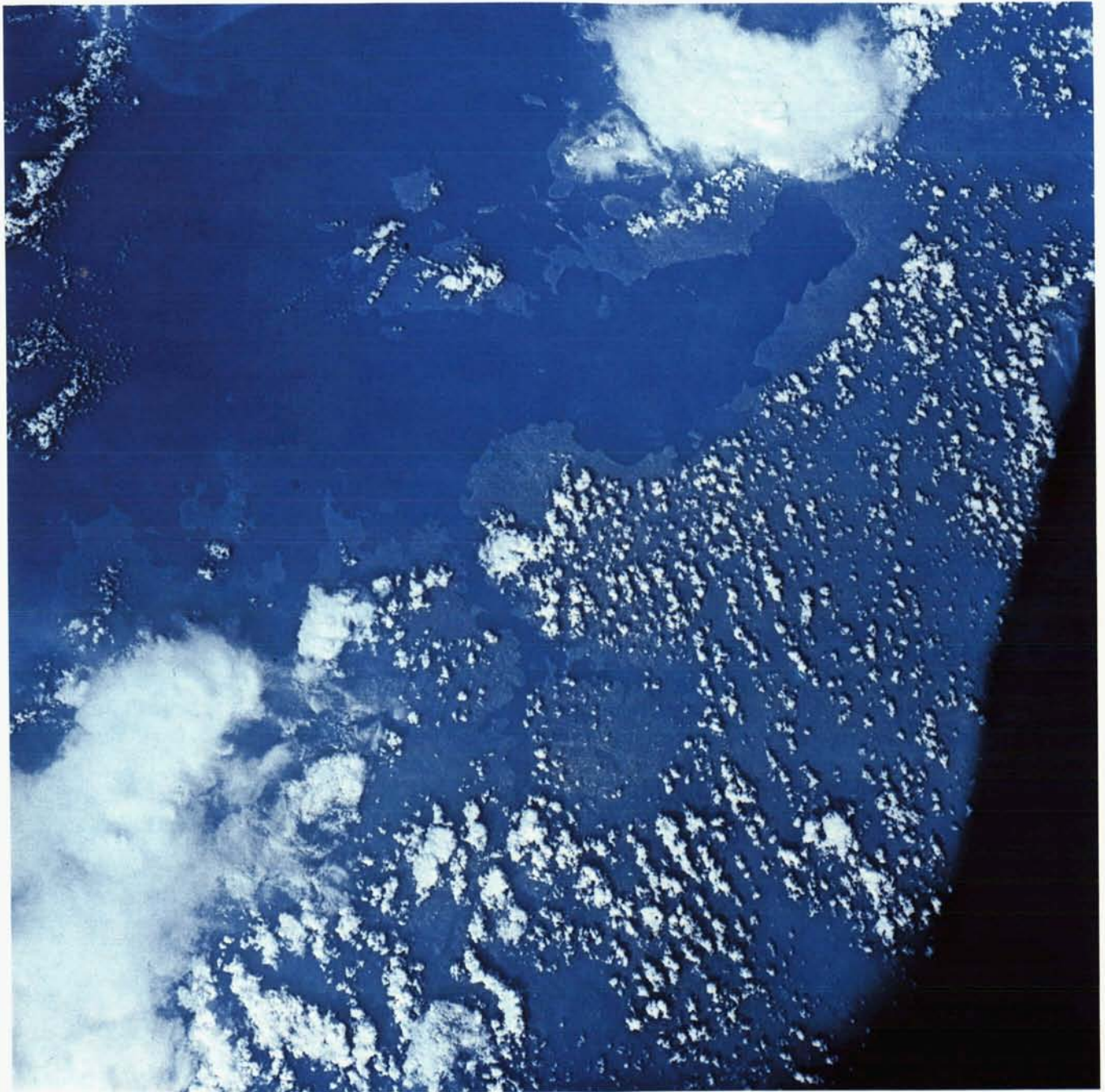


This photograph shows the Sun brilliantly reflected in the immense swamp called As Sudd through which the White Nile flows in Sudan. During Mid-Tertiary time the Sudd region was an enclosed drainage basin. Then tilting of the east African plateau during Pleistocene time changed the direction of drainage of Lake Victoria

and additional waters were supplied to the lake here. This lake soon overflowed, draining off most of the water and leaving the swamp which exists today. Smoke from clearing operations on farms is visible at the bottom of the picture.

GEMINI VI DECEMBER 16, 1965 S65-63161



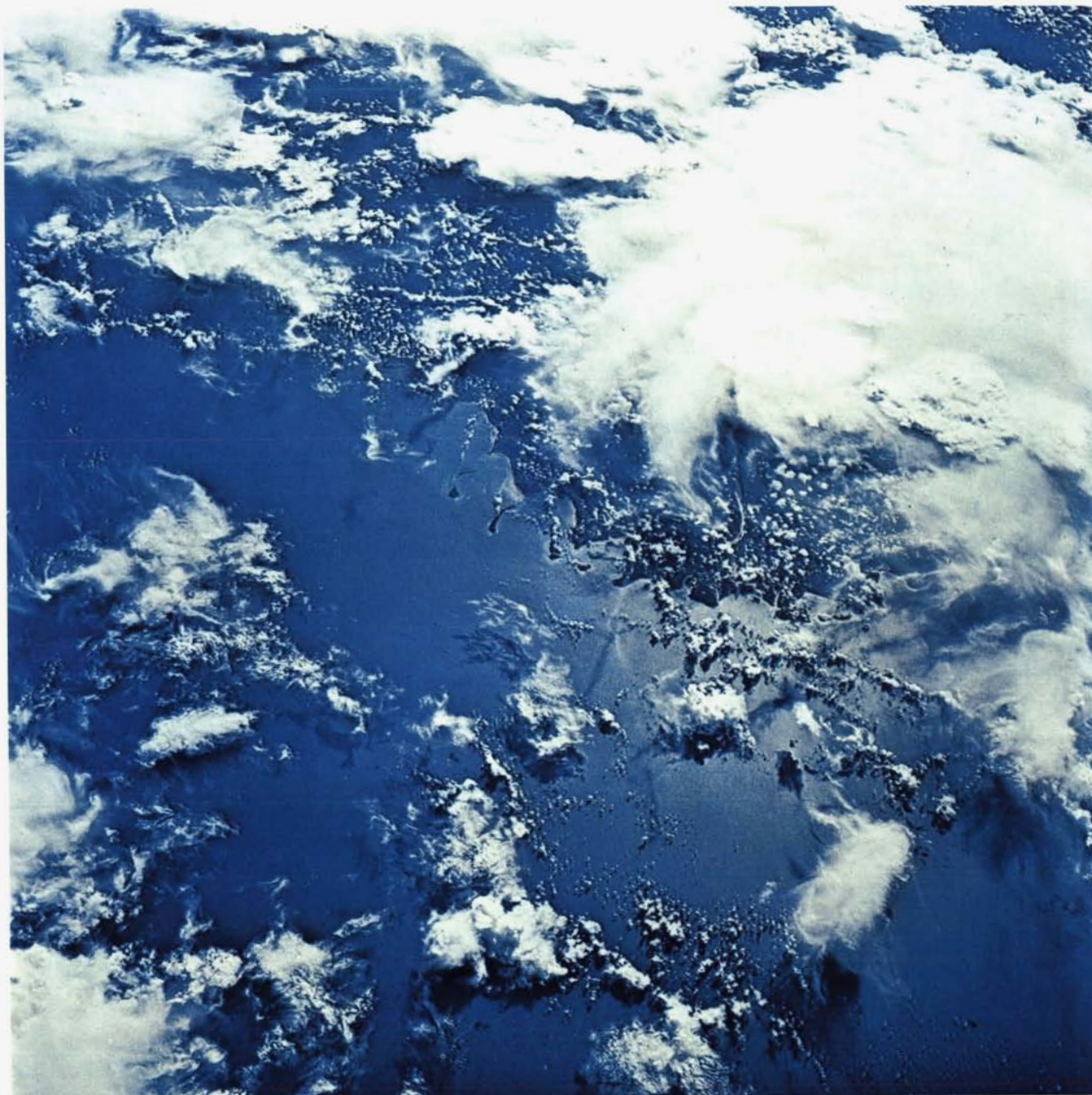


Lake Victoria extends southward from the Equator. This is its southern shore in Tanzania, where it has many deep inlets and steep bluffs. The rows of cumulus clouds running northward direct your eye to Speke Gulf in the upper center of the picture. The large island at its entrance, called Ukerewe, rises 650 feet above the

lake water and is densely populated. The town of Mwanza is at the head of the inlet below the gulf. There were thunderstorms northeast of Speke Gulf when the spacecraft passed over this tropical region in December on its way to the Indian Ocean shore of the continent.

GEMINI VI DECEMBER 16, 1965 S65-63232





Thunderstorms had generated a canopy of cirrus, penetrated by turrets from upward currents of air, when the astronauts took this picture of Africa's east coast south of the Equator. The spacecraft was over the northern end of the Mozambique Channel. The view extends from south of Vila do Ibo, Mozambique, to

north of Mtwara, Tanzania. The boundary between the two countries is the Ruvuma River, which can be seen entering the Indian Ocean to the right of the center of this picture. High rocky headlands and steep cliffs on this part of the coast consist of marine sediments, and tiny coral islands stud the sea near the shore.

GEMINI VI DECEMBER 16, 1965 S65-63228





For this photo of eastern Africa, the camera was pointed west from off its shores. Kenya's coastal lowlands are in the foreground, and Tanzania's famous safari lands are near the horizon. Mount Kilimanjaro is the dark object left of center, flanked by Lake Eyasi on the left and Lake Natron on the right. The clouds suggest

how the mountains disturb air flowing from the southeast. Several isolated cloud patches to the right lay near high peaks; the one farthest right is around 17 050-foot Mount Kenya. Although these volcanic mountains are close to the Equator, ice fields and glaciers are found on their summits.

GEMINI IX JUNE 6, 1966 S66-38453

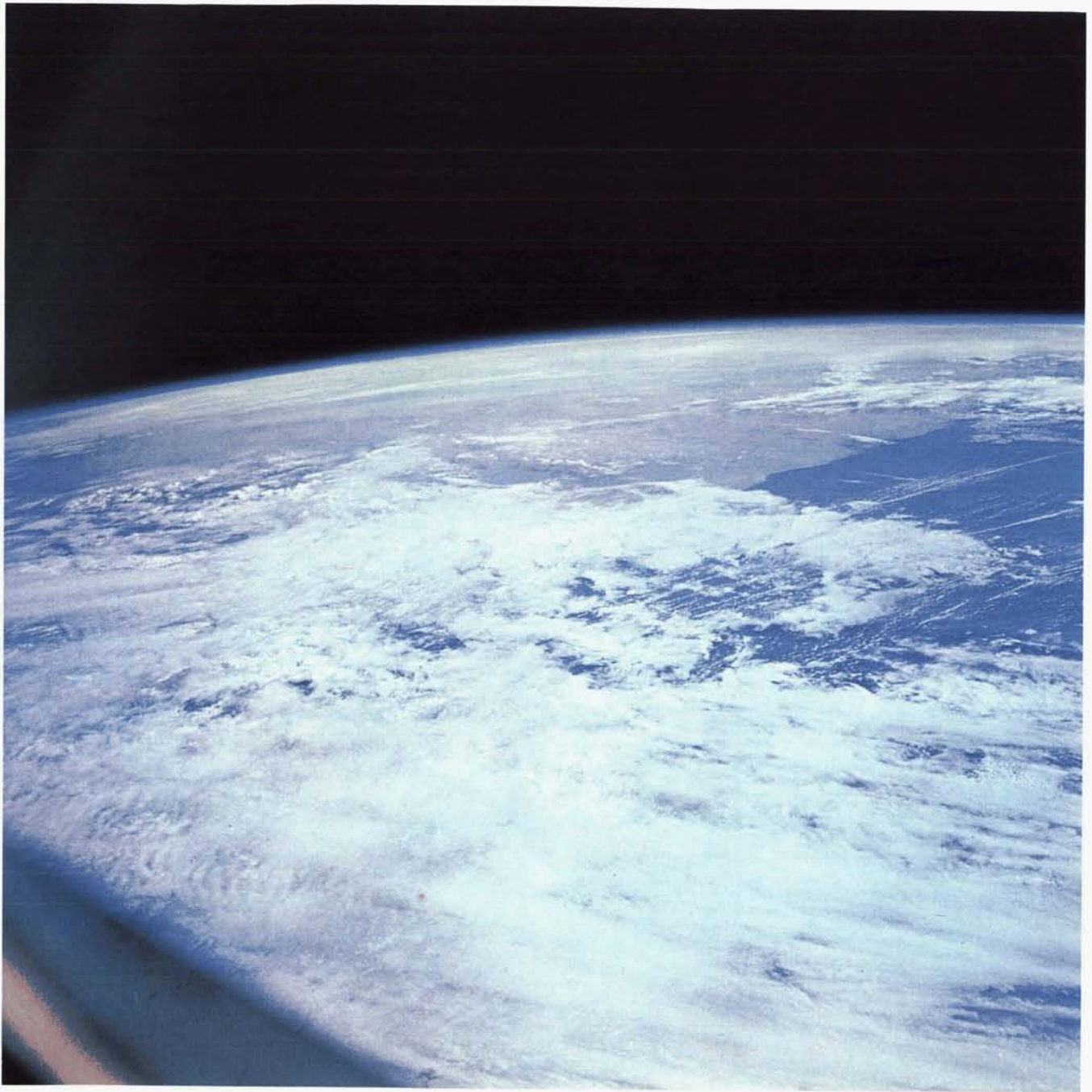


This view is similar to the preceding one, but the coastal strip shown is farther north and is part of the Somali Republic. The Equator crosses this area from the upper left to the lower right. Here the sea-surface temperature in the Somali Current is about 79° F in June, and you

see fewer clouds over the water than over the land. The convective cloudiness covers the coastal lowlands and extends into northeastern Kenya, but over the highlands at the upper left—the region between the Indian Ocean and Lake Victoria—the sky is mostly quite clear.

GEMINI IX JUNE 6, 1966 S66-38454

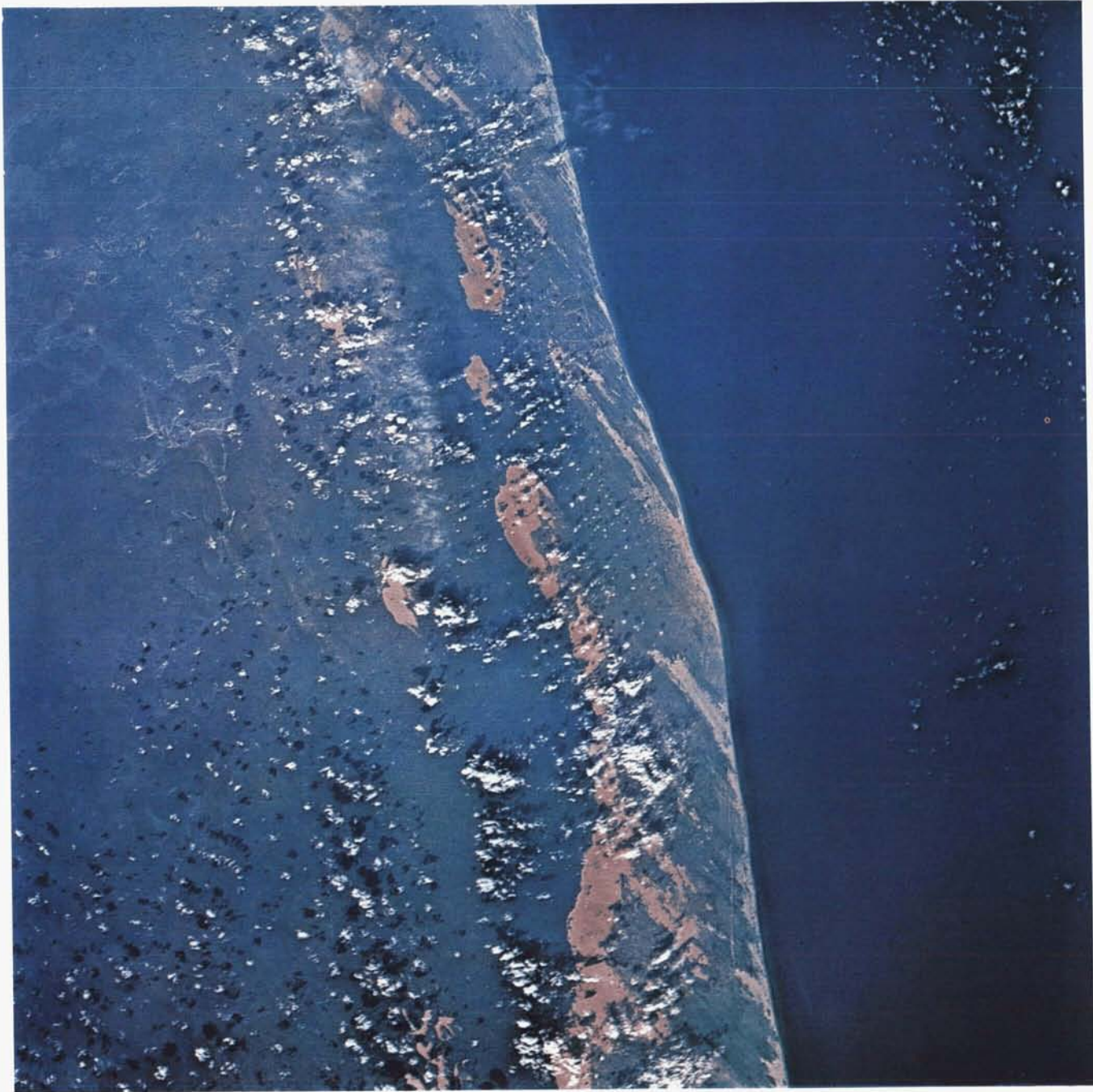




Several cloud decks are discernible in this picture of Africa's Indian Ocean coastline. East-west banding has occurred in the highest deck of cirrostratus, while cumulus-cloud streets have been embedded in a southwesterly airflow parallel to the coast at a low level. The camera was pointed northwest and a strip of the coast of the

Somali Republic near Eil is visible in the clear zone at the right. Beyond the cloud field, the mainland has a reddish hue because the landscape is arid here. Eil is on the Baia del Negro at the mouth of the Nogal River, which flows eastward from higher areas inland.

GEMINI X JULY 21, 1966 S66-45878



South of Ras Hafun and just north of the city of Mogadishu, the capital of the Somali Republic, this vivid image of the Indian Ocean shore of Africa was recorded by one of the astronauts. The sand dunes extend inland and show a typical increase in red coloration as

the distance from the shore becomes greater. The orientation of the dunes follows the dominant winds along this portion of the continental shelf along the shore. This strip of the coast is only a few degrees north of the Equator.

GEMINI VII DECEMBER 13, 1965 S65-64021



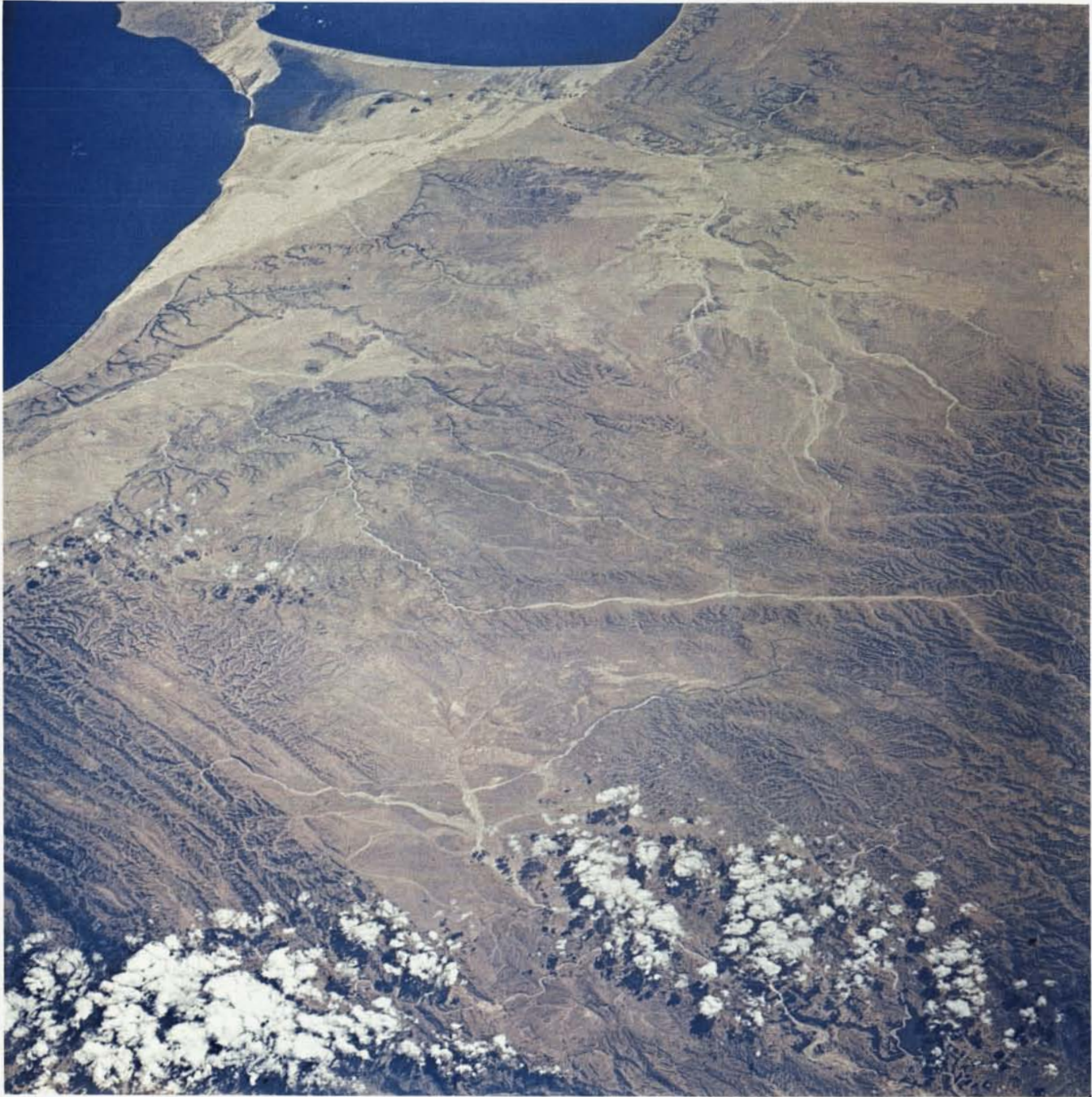


Near Africa's eastern tip, the Indian Ocean nearly surrounds Ras Hafun, as you see in the center of this photo of the coast of the Somali Republic. A narrow strip of land connects it to the continent. Tidal action on river affluents has discolored the water of the bay. The smaller cape at the left is Ras Binnah. It is near the eastern

entrance to the Gulf of Aden. The river running from the lower right corner of the picture is the Uadi Giael; it flows into the sea south of Ras Binnah. Two more pictures of this area follow. They were taken at nearly the same time as this one. Ras Hafun illustrates what geologists call a tombolo.

GEMINI VI DECEMBER 16, 1965 S65-63130



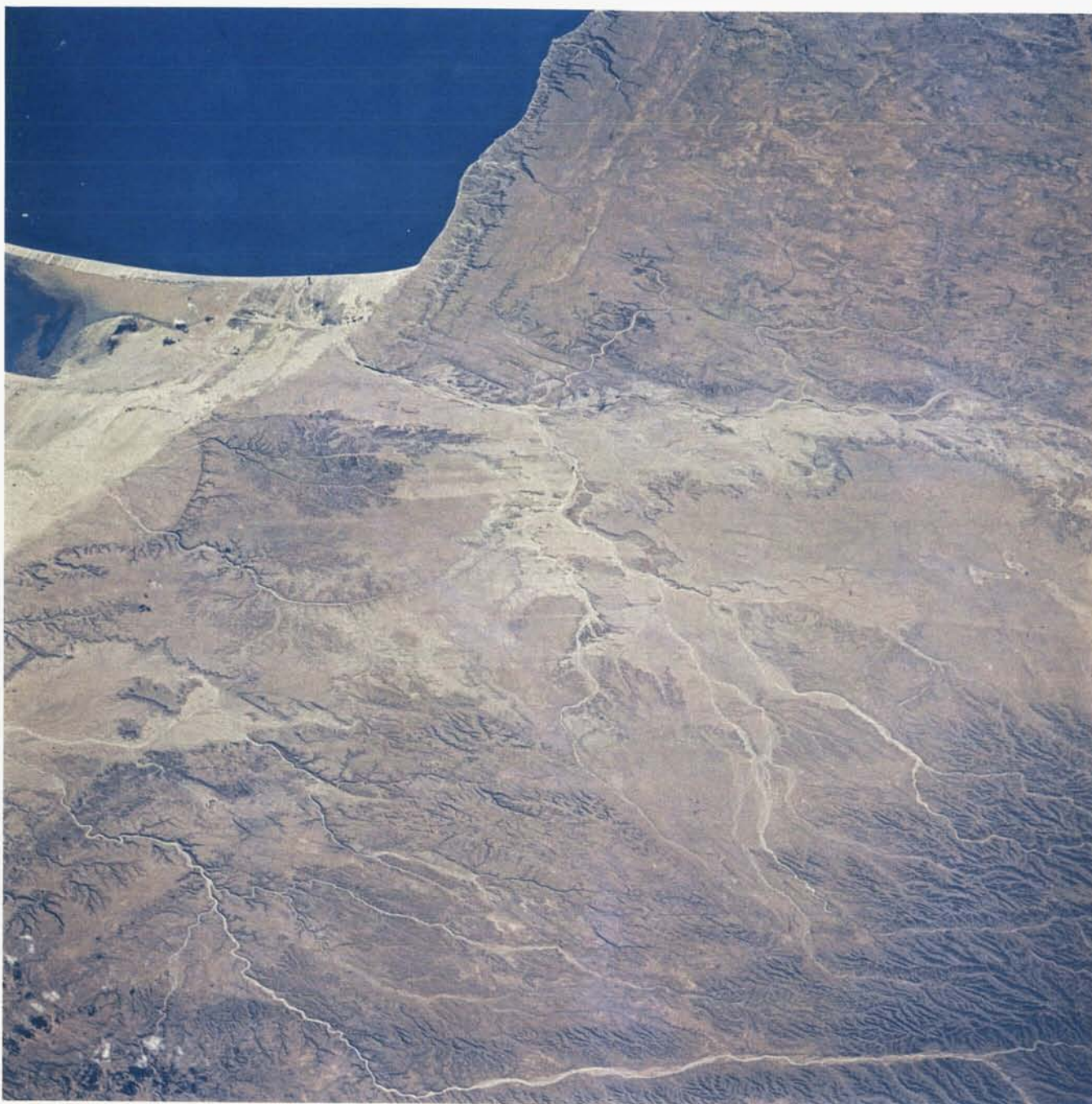


This is a closer view of some of the area shown on the preceding page. Ras Hafun is in the upper left. The river draining into this large bay is the Darror. The Uadi Giael crosses this picture near the center. Cumulus clouds cast shadows on the Earth in the foreground. The

desert here is underlain by Cenozoic marine and continental sedimentary rocks. The ancient Egyptians called this northeastern horn of Africa "the land of aromatics" because in their time, as in ours, Somalia was a principal source of frankincense and myrrh.

GEMINI VI DECEMBER 16, 1965 S65-63131





This is an even closer view than the previous two of the Somali Republic. At the upper left is the strip of land between the discolored Baia di Hafun and the Indian Ocean. This appears to be a recently emerged coastline. Indications of this are the raised beach terraces, scarps parallel to the coast, and a youthful landscape that is

only slightly dissected by erosion. The climate is hot and dry. Upwelling of cool water in the sea nearby contributes to the region's aridity. This region can be seen again on the next page in a photo taken from a much higher altitude. Ras Hafun is on the right side of the land shown there.

GEMINI VI DECEMBER 16, 1965 S65-63132





This high-altitude, wide-angle photo of the eastern tip of Africa helps one relate features of the Earth shown in other photos that precede and follow this one. The narrow dark outcrops trending approximately parallel to the gulf on the coast of the Somali Republic at the left are exposures of the Precambrian basement com-

plex, overlain and concentrically flanked by Mesozoic rocks. Near the Indian Ocean at the right, Neogene and Quaternary deposits lay over Palogene sediments. The cloud streets above the sea show how the winds off the entrance to the Gulf of Aden generally parallel the coastline.

GEMINI XI SEPTEMBER 14, 1966 S65-54538





## Part V. The Indian Ocean and Australia

GEMINI astronauts crisscrossed the 5000 miles of water between Africa and Australia many times. On most flights the spacecraft passed over Australia at night, which limited the number of photographs obtained of that continent.

The first pictures in this section were taken south of the Arabian Sea and the Bay of Bengal, and show some of the many storms that are born and die in that lonely part of the world. Even though Magellan's men crossed the Indian Ocean to circumnavigate the world in 1521, European scholars knew very little about what lay beneath its waters until the oceanographers began to probe them late in the 19th century.

Socotra, the first island pictured in this section, is a continental island like Ceylon. But the next islands shown are volcanic, and the Chagos and Maldive Archipelagos mark the site of a great submarine mountain range that extends far south of the tip of India.

When the spacecraft approached Australia, the astronauts could look down on one of the stations tracking them. Their photographs show the arid lands of Western Australia, and that continent's northern coast, where the Timor and Arafura Seas link the Indian Ocean to the Pacific Ocean.

Photos of India and other portions of southern Asia are in the next section of this volume; many of them also show vast stretches of the Indian Ocean.





Little is known about the geology of Socotra, an island about 75 miles long in the Indian Ocean south of Aden and Muscat and Oman. A British party resurveyed it a few years ago for the first time in more than a century. The surf often makes landing difficult, but it was moderate when this photo was taken and shows as a mere

white line. The light, northerly winds typified those of the early monsoon season. The tiny islands above Socotra here are The Brothers, and the slender one in the Sun's glitter at the top is 'Abd Al Kūrī. The Brothers lie on an insular shelf around Socotra, but the channel is deep between them and 'Abd Al Kūrī.

GEMINI VII DECEMBER 13, 1965 S65-64013





This panoramic oblique view from over the Indian Ocean embraces nearly the whole Arabian Sea. The horn of Africa and parts of Dhufar, and Muscat and Oman are at the left. On the right the view extends past Pakistan, and well down the coast of India. The low-level wind was southwest in the foreground and

northwest off India south of the Gulf of Cambay. The Gulf of Oman is near the upper left. South of it one can see the archlike structure of the Oman Range, and to the north the general trend of the Makran range in Iran is visible. The relationship between these mountains has long been an enigma.

GEMINI XI SEPTEMBER 14, 1966 S66-54670



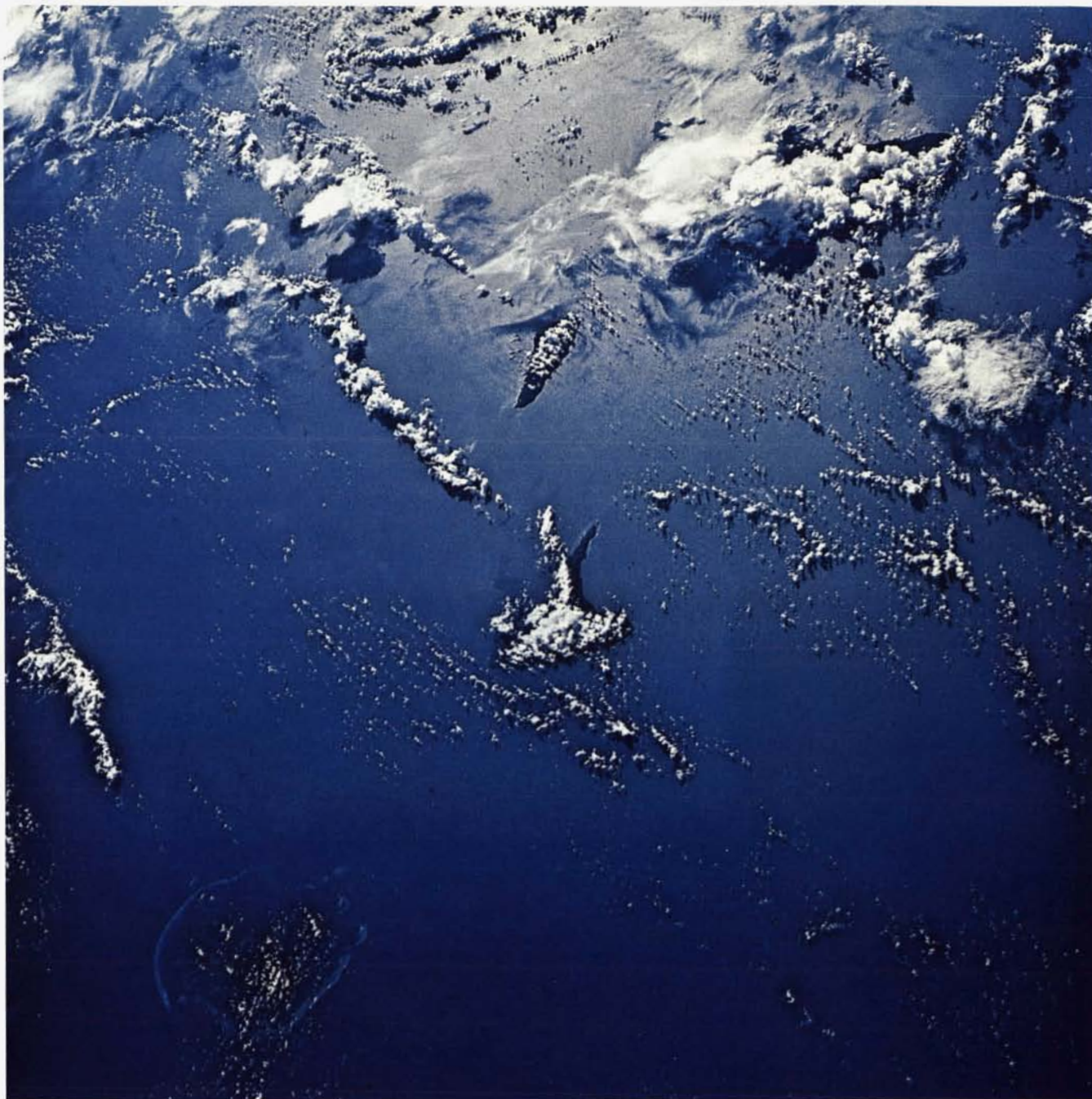


In this view to the east over the Indian Ocean off the coast of the Somali Republic, one sees long rows of cumulus clouds. Some small rows appear to be enhanced, others have been suppressed, and the larger cloud elements form other rows at an angle of approximately  $30^\circ$  to them. A broad line runs from the top

center to the lower right where the clouds have been suppressed. The mechanisms that produce such phenomena in the atmosphere are poorly understood. Wind shear, atmospheric stability, and sea-surface temperature may all enter into the creation of patterns such as these. The next photo was taken much farther south.

GEMINI IX JUNE 6, 1966 S66-38429





The Mayotte Archipelago is in the Mozambique Channel between Africa and the Malagasy Republic. This is a westward view of the Comoro Islands there. At the lower left is Mayotte, surrounded by an extensive, dangerous coral reef. In the center is Anjouan, which has a central peak 5170 feet high. Moheli, directly above

it, is the smallest of these volcanic islands. Grande Comore is at the upper right, but covered by cumulus congestus clouds. The varied alignment of cumulus indicates a complex low-level wind pattern. A small cloud eddy induced by the light flow of air past the islands can be seen near the top of the picture.

GEMINI VI DECEMBER 16, 1965 S65-63227





Shadows and curving lines of cumulus clouds broke the Sun's glitter on the Indian Ocean between the Malagasy Republic and the Mascarene Islands farther east. The curvature of the rows of cumulus may have resulted from the eddy effect generated by air flowing past mountainous islands. The island of Réunion is barely

visible in the lower left. The coastline of the Malagasy Republic is near the horizon where the flattened tops of thunderstorms rise high into the atmosphere. Several bands of cirrus clouds are to the left of the Sun glitter. The reddish image at the top was caused by reflections within the camera.

GEMINI VI DECEMBER 16, 1965 S65-63283



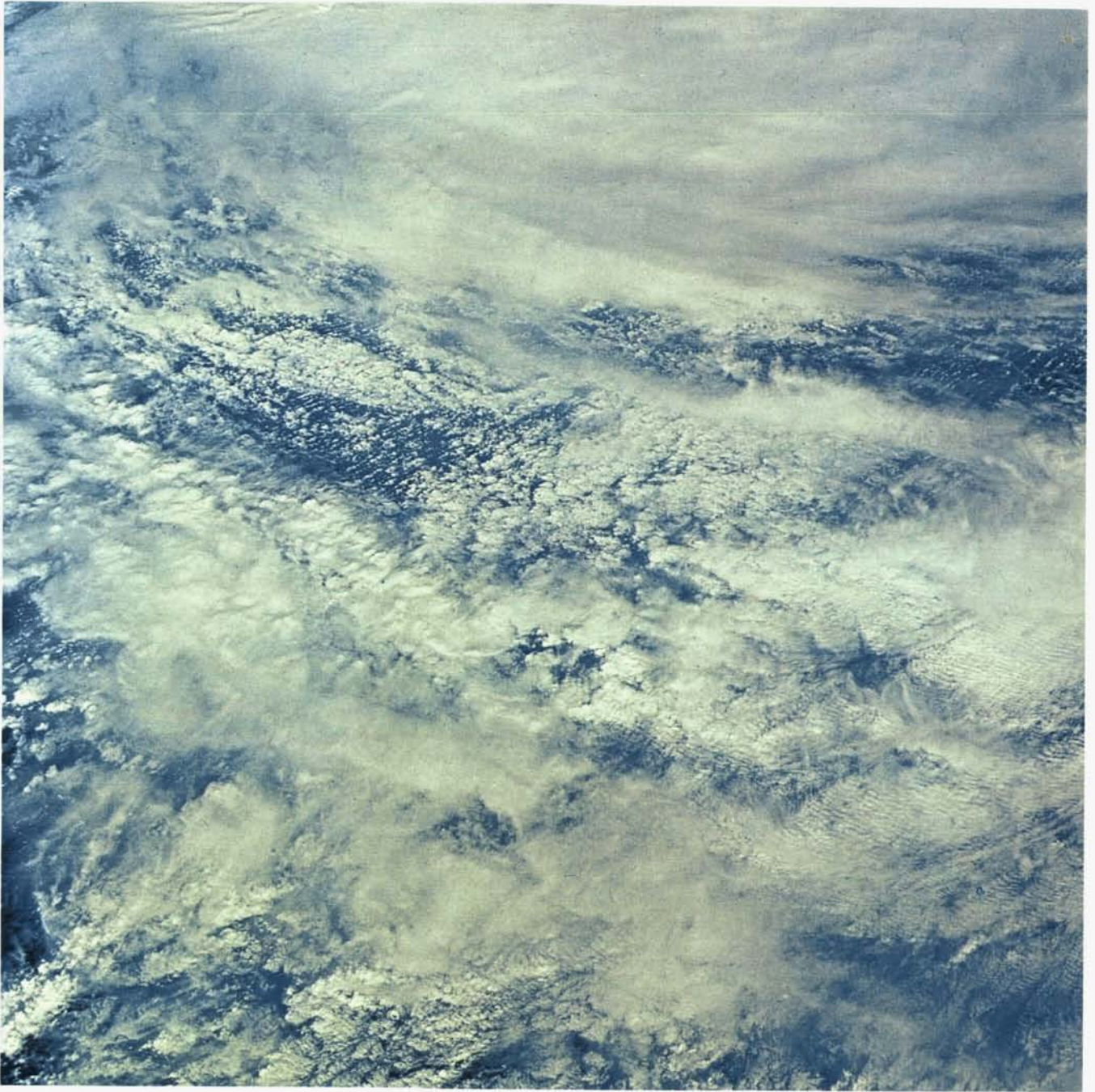


Several hundred miles east of the Malagasy Republic, the camera recorded this view of the Mascarene Islands in the Indian Ocean. Mauritius, in the center, is a roughly oval island composed of basalt and surrounded by coral. Uninhabited when discovered in the 1500's, its population now exceeds 500 000. The rows of cumu-

lus clouds over it are alined east-west. At the left, south of the island, is an outstanding example of the classic open convective cloud cell. Réunion, the island in the upper center, is dominated by two volcanic masses, the largest of which, Piton des Neiges, rises 10 069 feet.

GEMINI VI DECEMBER 16, 1965 S65-63284



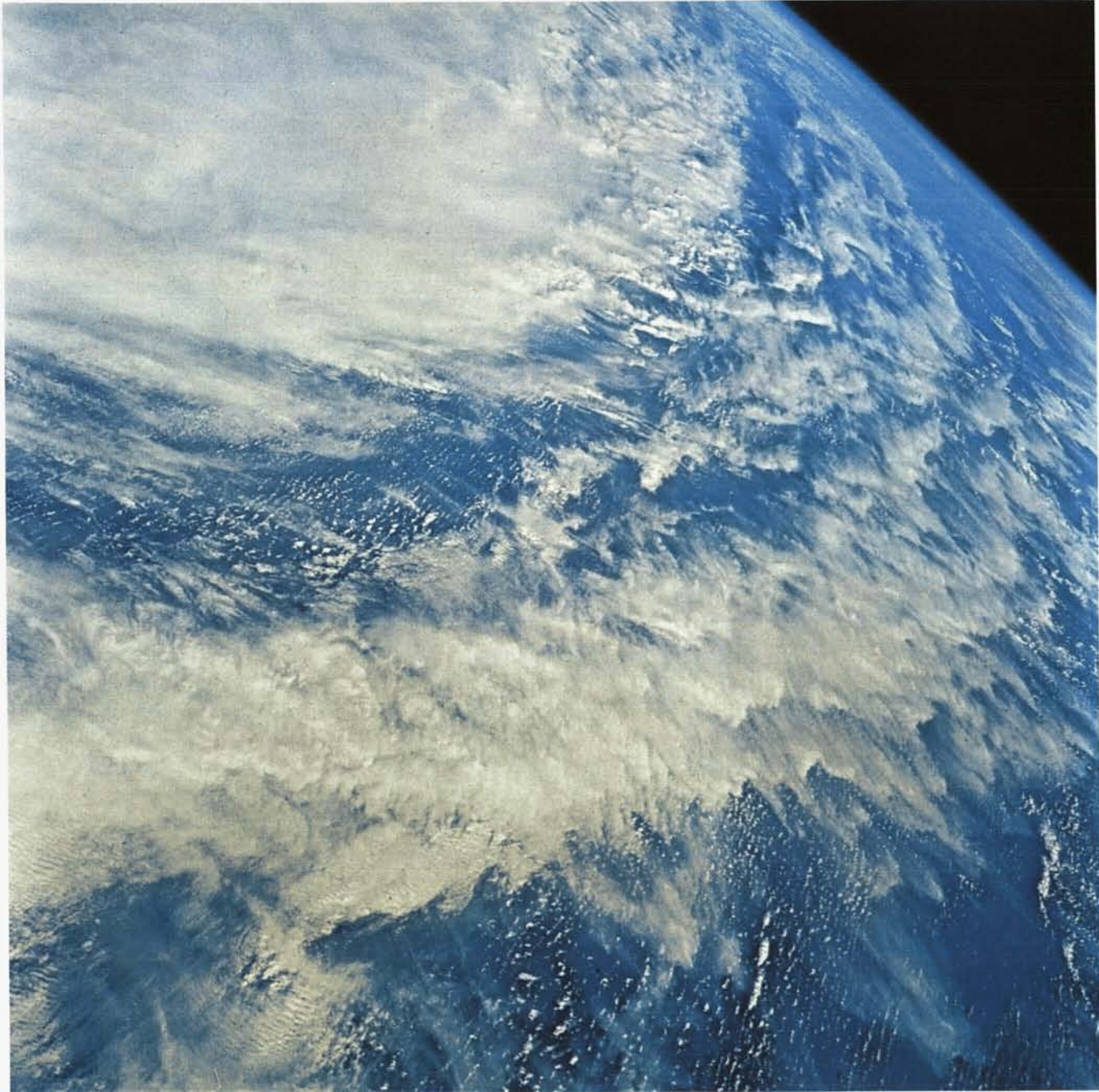


This and the next two photos of clouds were taken far east of Africa, almost directly south of the tip of India. The clouds in this photograph belonged to a weak tropical vortex that was visible near  $13^{\circ}$  S and  $80^{\circ}$  E. You can see several decks of clouds in it, from high-level

cirrus to low-level cumulus, arranged in distinct lines. Tropical storms are frequently spawned on both sides of the Equator in this lonely part of the Indian Ocean. Some of these storms grow to be vigorous, destructive typhoons; others remain weak, tropical circulations.

GEMINI VI DECEMBER 16, 1965 S65-63280



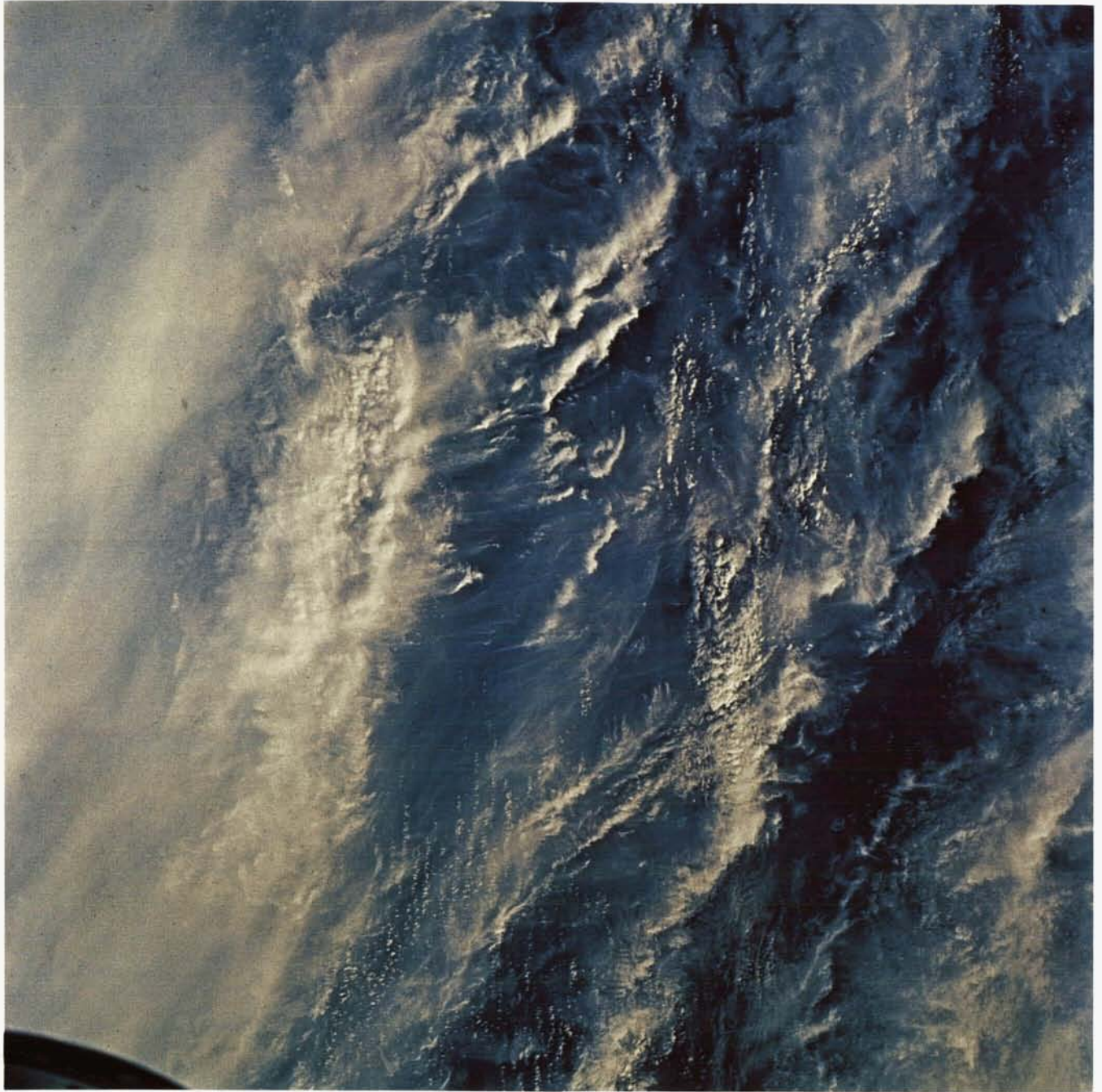


This picture overlaps the one on the preceding page and includes the same clouds along its left edge that were shown in the photo there. This is an eastward look at the southern edge of a tropical vortex seen over the waters of the southern Indian Ocean. The alinement at different altitudes shows the changes in the wind di-

rection with height. Of particular interest here is the apparent alinement of the lower clouds. This suggests that there was a diverging northeasterly flow, but because such a flow is not likely so near to storms, the apparent alinement may have resulted from the perspective of the photograph.

GEMINI VI DECEMBER 16, 1965 S65-63279





This is a nearly vertical view of a part of the area shown in the two preceding photographs of clouds in a tropical vortex over the southern Indian Ocean. The fine streamers of cirrus clouds in the center are being blown in a direction perpendicular to the rows of low cumulus

clouds. A canopy of cirrus obscures the lower levels at the left. Many of these storms originate over the tropical seas west of Sumatra, and some of them travel for several weeks before striking land or curving into higher, colder latitudes to fade away.

GEMINI VI DECEMBER 16, 1965 S65-63278



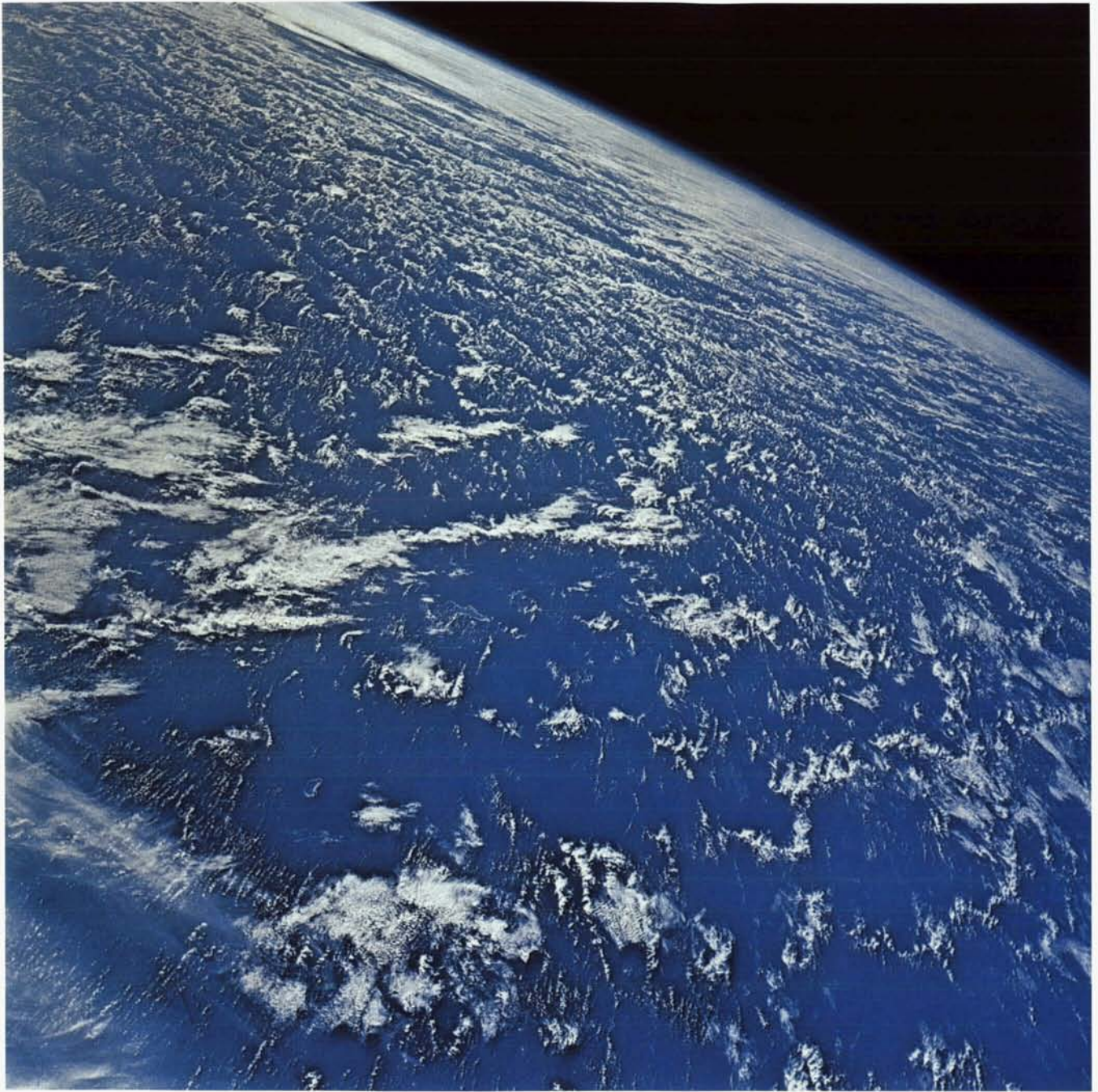


All scales of convective clouds can be seen near the Chagos Archipelago. The clear area at the lower right was over the Egmont Islands. The cirrus anvil tops of several cumulonimbi in the Sun-glitter area project toward the southwest. Small cumulus-cloud streets in the boundary layer are aligned with the southeast trade

winds. The large area of cirrus and cirrostratus in the foreground is a small part of a massive cloud volume of convective activity. Weather-satellite photos have revealed similar masses. Their lifetime is 1 or 2 days and their role in the circulation of the equatorial atmosphere is not well understood yet.

GEMINI X JULY 21, 1966 S66-45846





The Chagos Archipelago, about 250 miles south of the Maldivian Archipelago, consists of five main coral atolls called the Oil Islands. Two of them, Egmont and Three Brothers, can be glimpsed between the clouds in the foreground. The small cumulus clouds there are aligned with southeast trade winds at the surface, while in the

background a vast area of cumulus clouds is organized in various patterns. These islands are in the equatorial counter current; fish are plentiful, and green turtles thrive on their shores. The largest atoll in this group, Diego Garcia, totals only 11 square miles and had only 650 local residents in 1960.

GEMINI X JULY 21, 1966 S66-45848





Five atolls of the Maldives, a group north of the Chagos Archipelago, are in the foreground here. From the right edge they are Nilandu, Kolumadulu, Haddummati, Suvadiva, and Addu. The Equator is between Suvadiva and Addu. Winds from different directions are warping the towering cumulus clouds west of Addu

at the lower left. At low levels the trade wind bends the towers toward the northwest; at an intermediate level they are being bent to the southwest; and at high levels, plumes containing ice crystals are being carried westward. The convection that dominates a large area near the horizon is producing more cirrus clouds.

GEMINI X JULY 21, 1966 S66-45853





Suvadiva is the large atoll here, Addu Atoll is below it, and the small island and reef of Fua Mulaku Island is between them. Within the lagoon of Suvadiva, the white spots are cumulus clouds, and the dark ones are coral knolls typical of Pacific and Indian Ocean atoll lagoons. The white, pearllike fringe on the shores of

both Suvadiva and Addu is the reflectance from strong surf produced as waves approach from the south. The prominent large white cumulonimbus in the foreground had reached the upper levels of the atmosphere, and the tops of these clouds were being blown to the southwest when this picture was taken.

GEMINI X JULY 21, 1966 S66-45851





This picture shows a thin veil of cirrus clouds being swept along by high-altitude east winds over the Indian Ocean south of Ceylon. The camera was pointed west, and the Maldives Islands are near the horizon, but too small and far away to be seen. Thunderstorms spew out

long cirrus streamers which may extend for hundreds of miles in this tropical region. A different, lower level wind regime had aligned the cumulus clouds in the foreground in a north-south line at the time this picture was taken.

GEMINI X JULY 21, 1966 S66-45859



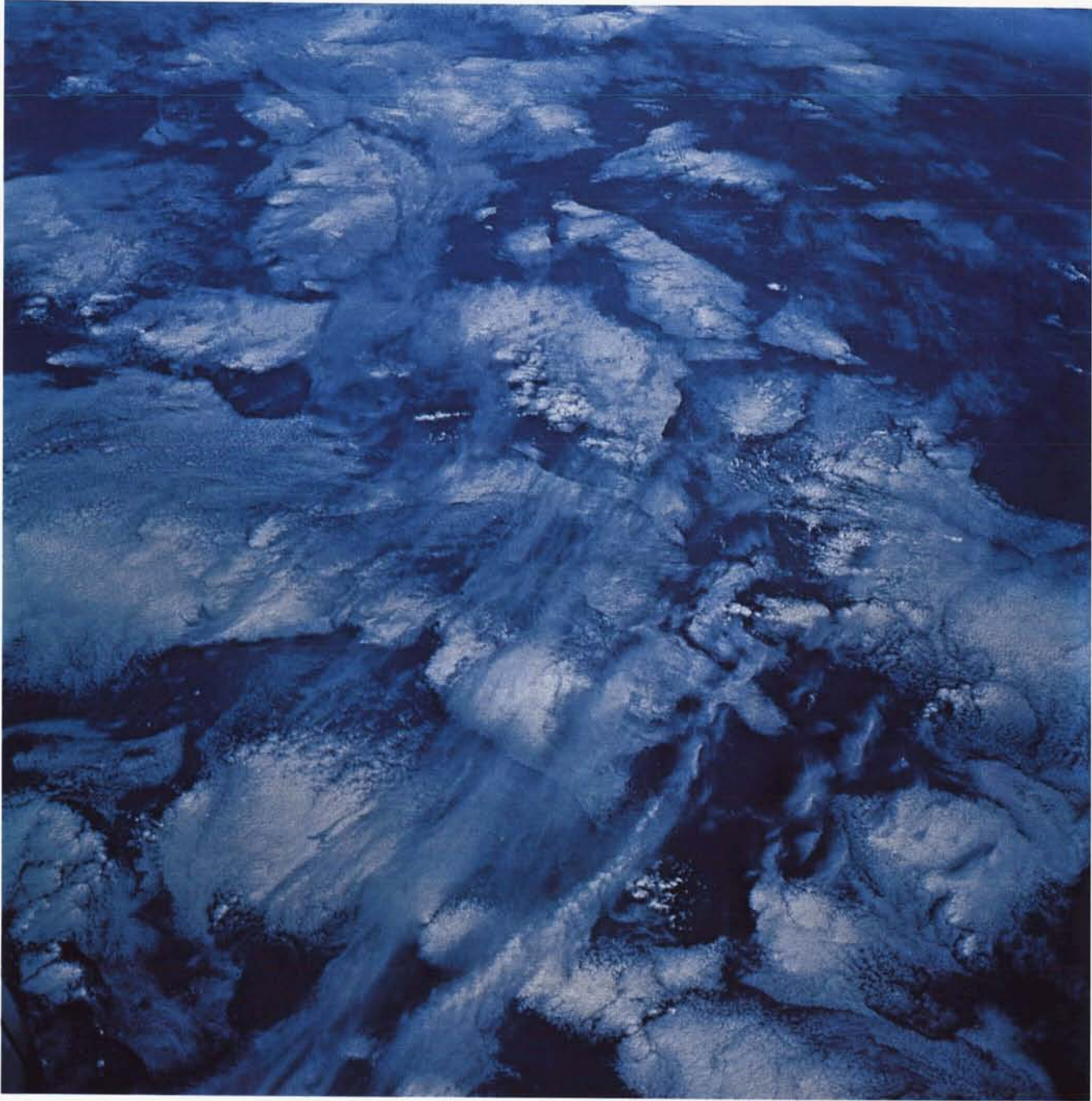


Only about 200 of the 2000 small Maldivé Islands southwest of Ceylon are inhabited. They are grouped in 12 atolls. Suvadiva Atoll is near the center of this early-morning photo, for which the low Sun brightened the sides of high towering cumulus clouds. The cirriform clouds were in thinner, less dense layers and appear

darker. The Maldivé Islands are coral caps on the high, central portions of a long, submerged, partly granitic ridge. It begins at the approximate latitude of Bombay and extends southward along the west coast of India. This Chagos-Laccadive Plateau joins the Mid-Oceanic (Carlsberg) Ridge near the Chagos Archipelago.

GEMINI XII NOVEMBER 14, 1966 S66-62974





These stratocumulus clouds seen over the southeastern Indian Ocean looked like floating fields of ice, but the orbits of the Gemini flights kept them well away from the polar regions of the Earth. Similar cloud forms frequently are seen off the coasts of California and Peru

where the waters of the Pacific are relatively cool. Some cellular patterns are discernible in this stratocumulus, indicating that a Bénard cell-type circulation might be found in the lower atmosphere. A few cirrus clouds also are scattered throughout the photo.

GEMINI IX JUNE 6, 1966 S66-38440





A late-afternoon Sun spread dark shadows of cumuli-form clouds over Western Australia the day that this and the next photo were taken. The Ashburton River valley is in the upper left, and the Indian Ocean shore in the lower right. The large light area near the sea is Lake McLeod, a dry salt lake (visible again in the low-

er left corner of the next photo). Lake McLeod is a short distance south of the Tropic of Capricorn, and the town called Winning Pool is north of it. Many nations helped to assure the safety of the American astronauts; Australia contributed to the cost of operating a tracking station on its western coast.

GEMINI VI DECEMBER 16, 1965 S65-63135





Shark Bay and Denham Sound dominate the center of this view of Australia's westernmost shore. The Carnarvon Tracking Station, a part of the NASA worldwide network used to track manned space flights, is near the mouth of the Gascoyne River in the lower left corner of the picture. The cumulus and cumulus congestus in

the upper half of the photo are over the higher parts of the mainland between this shore and Australia's great deserts. In the central foreground are Dorre Island and Bernier Island. The city of Wooramel is on the left side of the large bay in which the topography below the shallow water is discernible.

GEMINI VI DECEMBER 16, 1965 S65-63136



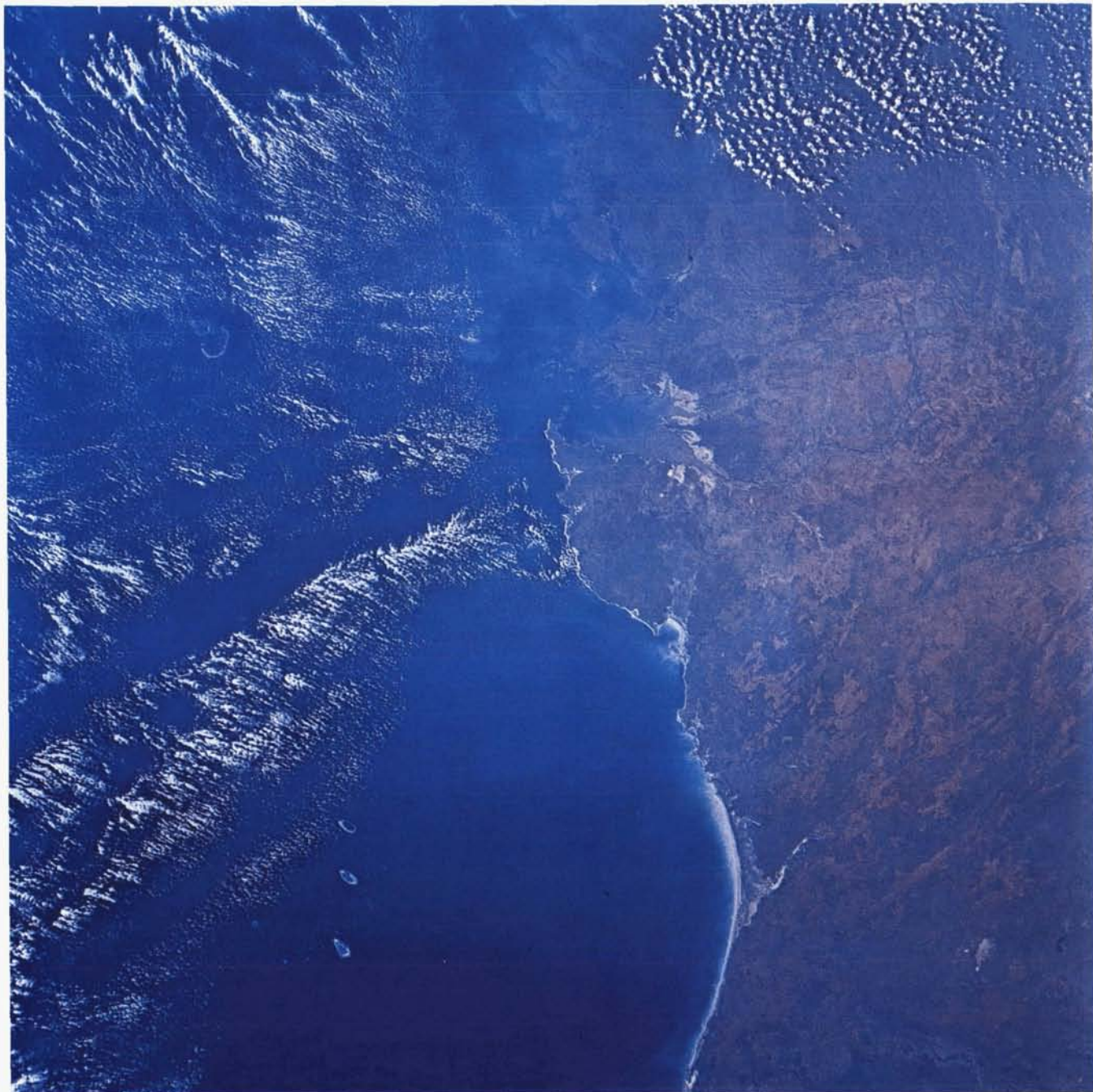


This is a wide-angle photo of Australia's northwestern coast with Eighty Mile Beach in the foreground. Inland is the Great Sandy Desert; the Lake Mackay is near the center of the right edge. In the upper left, parts of Timor are visible despite dense clouds such as persist over Indonesia much of the year. The Gulf of Carpen-

taria is near the horizon on the right. Cumulus-cloud patterns cover hilly regions below it. A vast Precambrian shield extends across Australia from Perth to the Gulf of Carpentaria. The area is a broad complex of pillow lavas, tuffs, and greenstones, flanked by metasediments, all of which are intruded by granites.

GEMINI XI SEPTEMBER 14, 1966 S66-54700



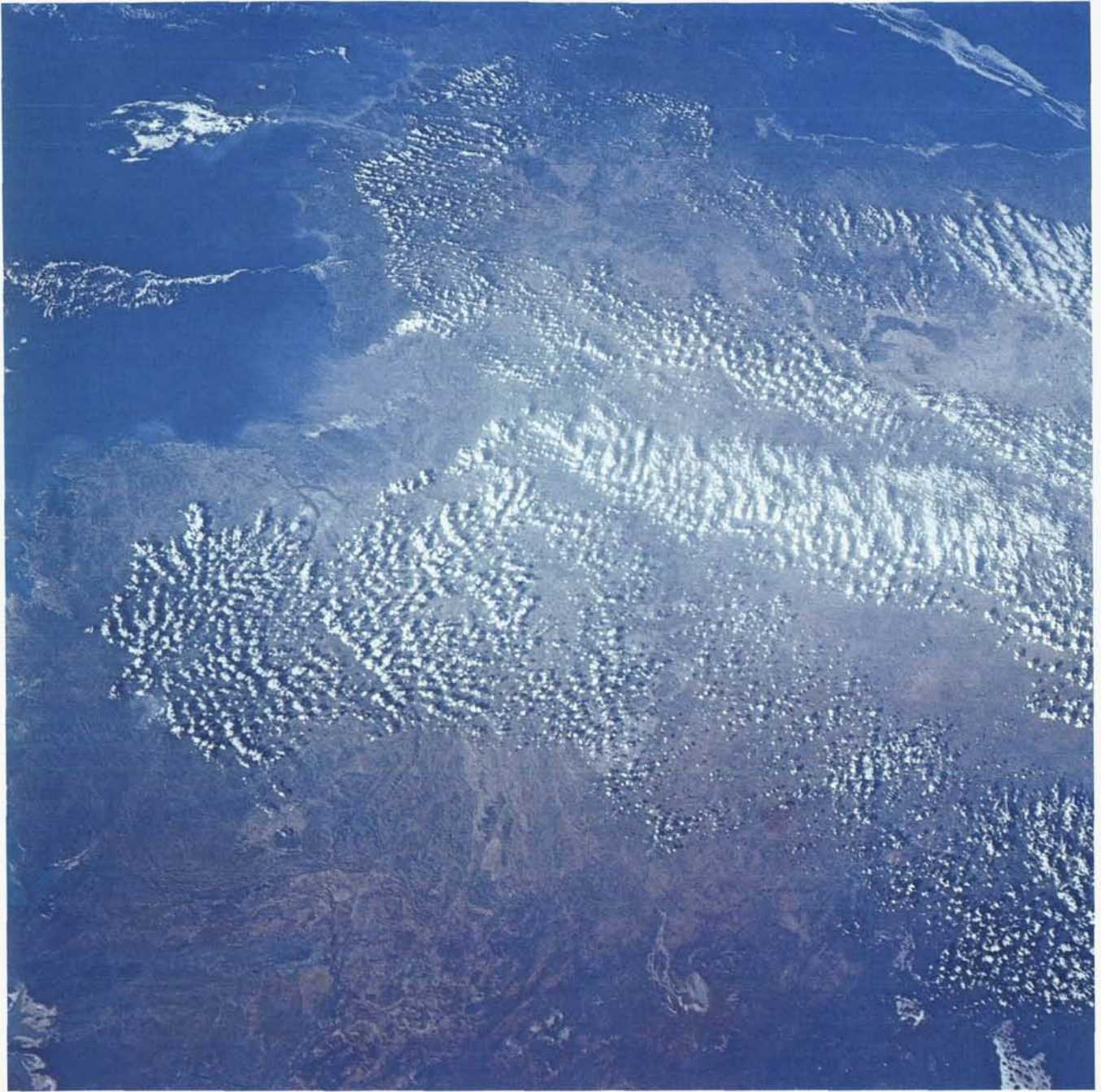


In this view of Australia's Eighty Mile Beach, three coral reefs stand out at the left below a fine-structured network of cumulus clouds over the sea. The shore here shows the simple contours and sand beaches of a mature coast. In the desert inland, long linear dunes cover a basin of Permian rocks. The V-shaped bay in the upper

center is King Sound, filled with muddy, silty water by the Fitzroy River. At Tampi Point, above it, much iron has been mined from Precambrian granites and pegmatites. Collier Bay, Brunswick Bay, Prince Frederick Harbor, and York Sound are indentations in the coastline at the top of this photo.

GEMINI XI SEPTEMBER 14, 1966 S66-54918



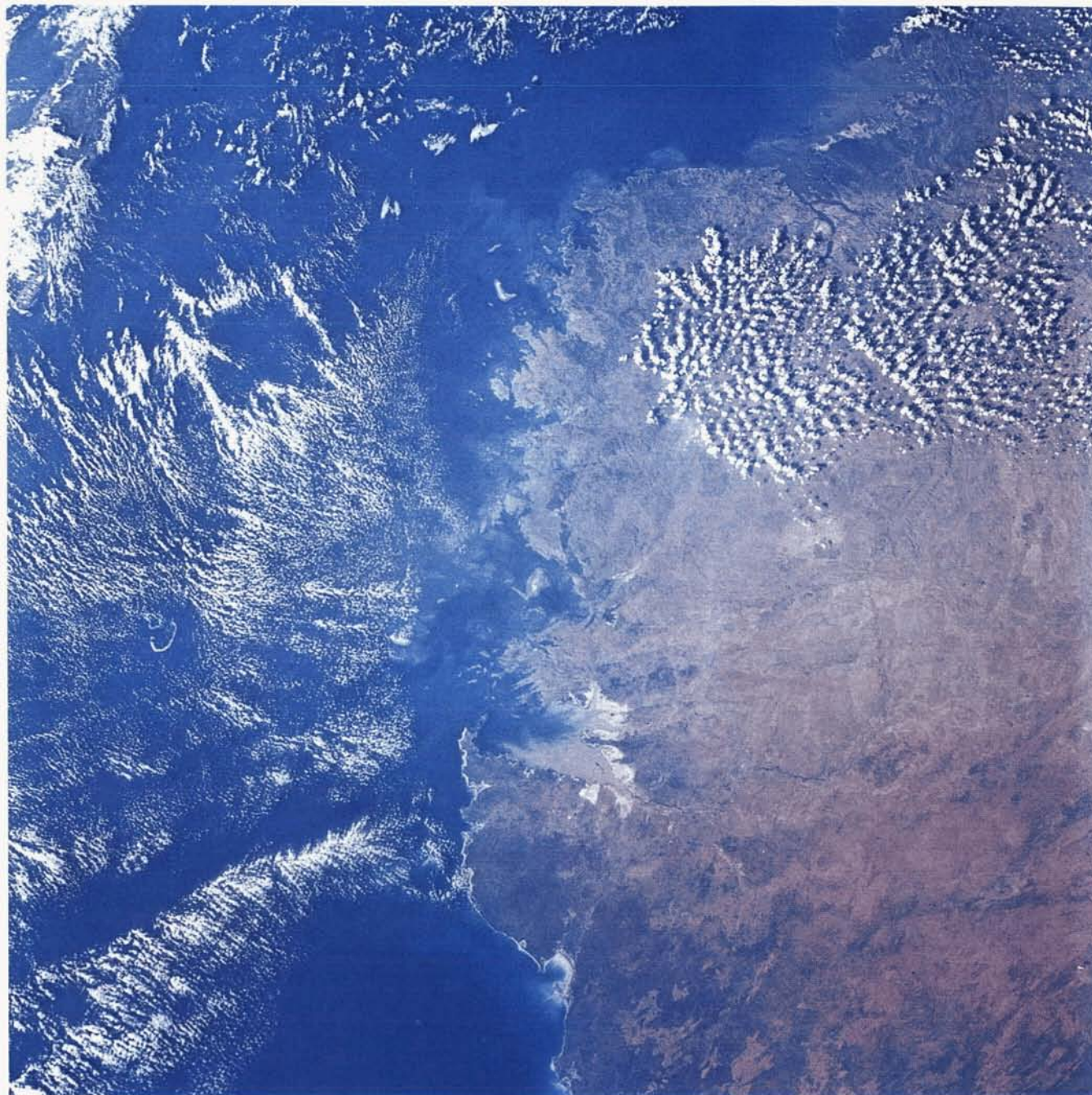


Here is Australia's Northern Territory from Joseph Bonaparte Gulf, in the upper left, east to Cape York. On the far side of the gulf are Bathurst and Melville Islands, which shield Darwin from the Timor Sea. The prominent river entering the gulf is the Ord. The King Leopold ranges curve across the lower part of this pho-

tograph. Gregory Lake is in the lower center. The plain area in the upper center is Arnhem Land, a plateau capped by Jurassic shale and sandstone, with important mineralization of granodiorites and pegmatites around Pine Creek on its western end. The next picture is a more nearly vertical view of this area.

GEMINI XI SEPTEMBER 14, 1966 S66-54925





This picture overlaps the preceding one. Cold ocean currents sweep along Australia's coast here and through the straits to the Timor Sea. Winds from the Great Sandy Desert were blowing turbid water away from the shore when this picture was taken. The light-blue areas near the center, left of King Sound and Joseph Bona-

parte Gulf, are shoal waters around islands and archipelagos. The coastline here is one of submergence, with tides of 15 to 30 feet, and up to 46 feet in King Sound. In the right center, the Margaret River joins the Fitzroy River. The King Leopold Ranges cross the upper right center of the picture.

GEMINI XI SEPTEMBER 14, 1966 S66-54924





## Part VI. Southern Asia

GEMINI XI rose farther above the Earth's surface on September 14, 1966, than men ever had gone before. Astronauts Charles Conrad, Jr., and Richard F. Gordon, Jr., first realized how high they were when the whole subcontinent of India came into view. Commander Conrad was so impressed by "how small the world is" that the sight always will be one of his sharpest memories of the flight.

When photographed from an altitude of more than 400 miles, India's whole coast was nearly cloudless. A small low-pressure system lay in the north, the wind was toward the shore on all coasts, and there for India's people it was a pleasant sea breeze. The air temperature along the coast was about 80° F and only from 7° to 10° higher in the interior.

Man's newly acquired ability to "see" such a system in toto can be very helpful in quantitative studies of his environment. Not only can the seaward extent of the ocean breezes be measured, but the sea-surface wind drift, areas of potential upwelling, and convergences can be plotted for an entire coast. Were such a view available daily, the value to fisheries, shipping, and meteorology would be incalculable.

Some of the pictures in this volume were taken at the request of the U.S. Navy Oceanographic Office and the U.S. Geological Survey. They contain information that is frequently lost when photos taken from aircraft are combined to show large areas.



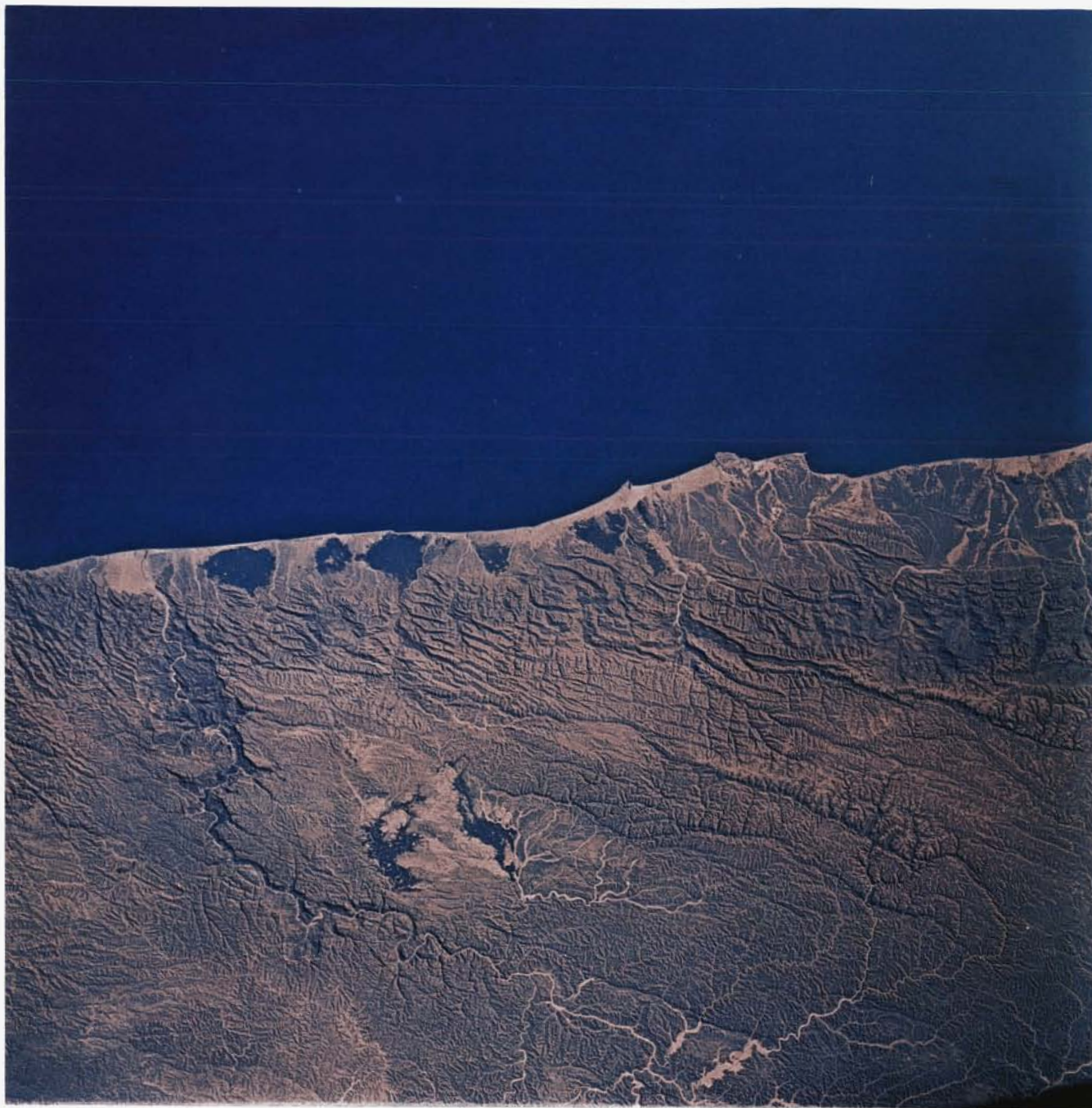


You are looking directly down now on 100 000 square miles of the Arabian Peninsula's Hadramawt Plateau. The dark areas near the Gulf of Aden in the upper left are igneous and metamorphic rock including Quaternary volcanics, and the light area is a sand-dune field. The Hadramawt Plateau's sedimentary rocks dip gently

to the north, and stream piracy is evident in the foreground. Several tributaries of the immense wadi in the lower right have lost their headwaters to the stream in the center. This dendritic drainage pattern is typical of a morphologically youthful stage of erosion on nearly flat strata.

GEMINI VII DECEMBER 13, 1965 S65-64010





This view spans about 150 miles of the southern coast of the Arabian Peninsula, and partially overlaps the preceding picture. The Hadramawt Plateau is in the foreground and the Gulf of Aden in the upper part of the photo. The drainage is partly dendritic, but shows a trellis pattern near the shore, which may have resulted

from the dip of strata or from faulting. The dark areas near the water are Quaternary volcanics of the Aden Volcanic Series. Five old lagoons have been filled and their inlets closed by depositions that contrast with the sharp coastal features of the erosional headlands. This area is immediately east of Al Mukalla.

GEMINI VII DECEMBER 13, 1965 S65-64011





The strait between the Persian Gulf and the Gulf of Oman is directly above the antenna in this photo, taken from an altitude of about 300 miles. Near the horizon the folded mountain systems forming the Zagros-Makran Ranges of Iran and West Pakistan can be seen, as well as the great depression containing the Baluchistan Des-

ert, Siah Reg, of northern Pakistan and southern Afghanistan. Over the Empty Quarter in the foreground, cumuliform clouds were widely dispersed. Along the shore of the Gulf of Oman they were more prevalent in a sea-breeze circulation. Beyond the Arabian Sea, India is faintly visible at the far right.

GEMINI XI SEPTEMBER 14, 1966 S66-54669

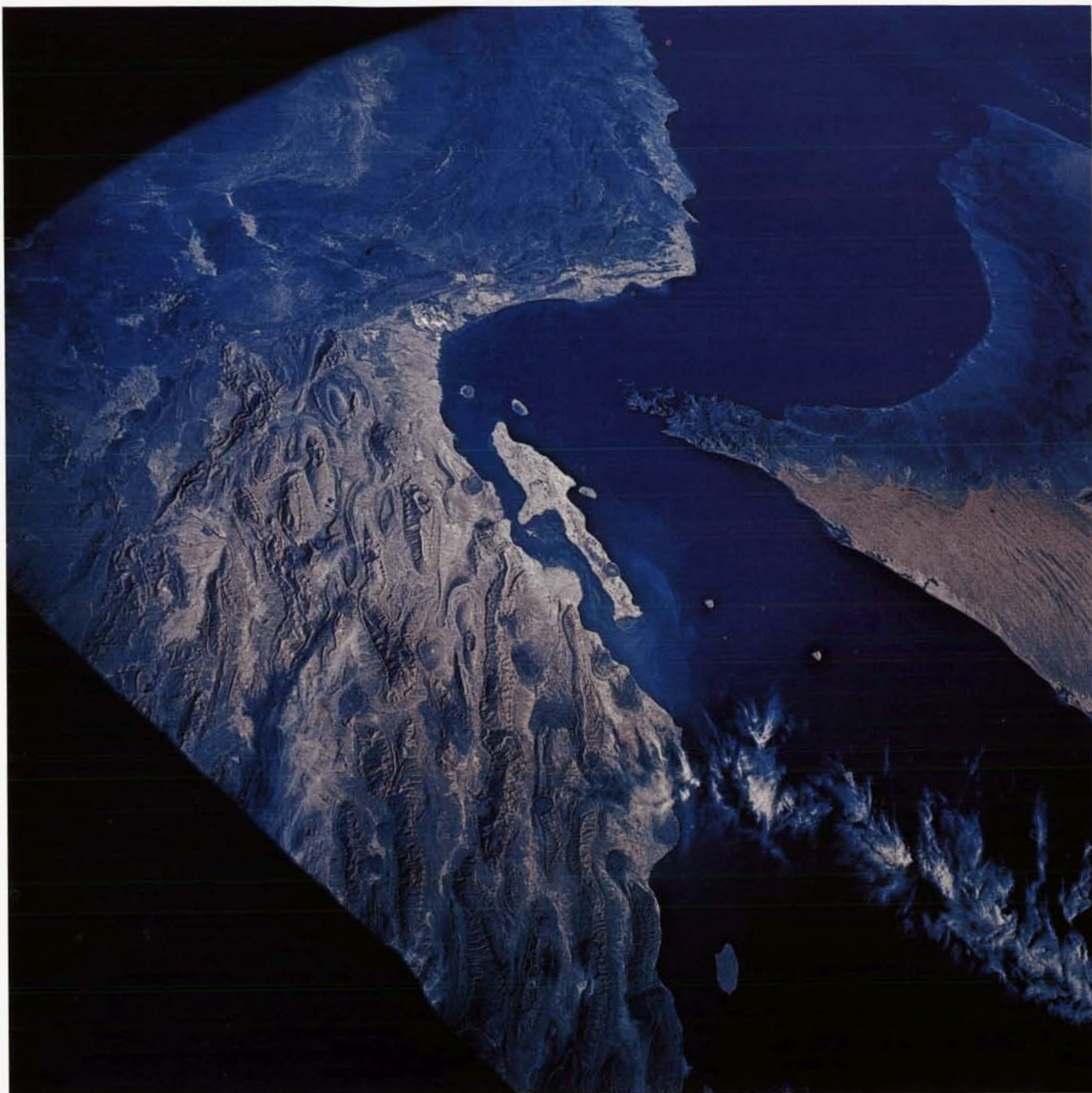


This photo shows the whole Gulf of Oman. The southeastern end of the Persian Gulf is in the foreground and the Arabian Sea can be seen at the top. The large island at the lower left is called Qeshm, and the light area above the spacecraft nose is the Trucial Coast. In the distance, northeasterly winds can be seen carrying dust

out over the Gulf of Oman for 150 miles near the border between Iran and West Pakistan. This and the next photo are of considerable geological interest because of the clarity with which they show the Strait of Hormuz. In a geological sense, this strait separates Africa from Asia.

GEMINI XII NOVEMBER 13, 1966 S66-63486





In this view to the east, Iran is at the left and Saudi Arabia at the right. The peninsula that juts into the Strait of Hormuz is the northern end of the Oman Range on the Arabian Peninsula. It points to a sharp discordance, called the Oman line, at the left, in the Makran Ranges in Iran. These ranges seem to have

been moved to the south by an immense thrust fault. There are reasons to doubt this, but a considerable dislocation of fold axes is certainly apparent, and the concept is of interest because of the insight regarding the nature of the Oman line that geologists may gain from high-altitude photography.

GEMINI XII NOVEMBER 15, 1966 S66-63082

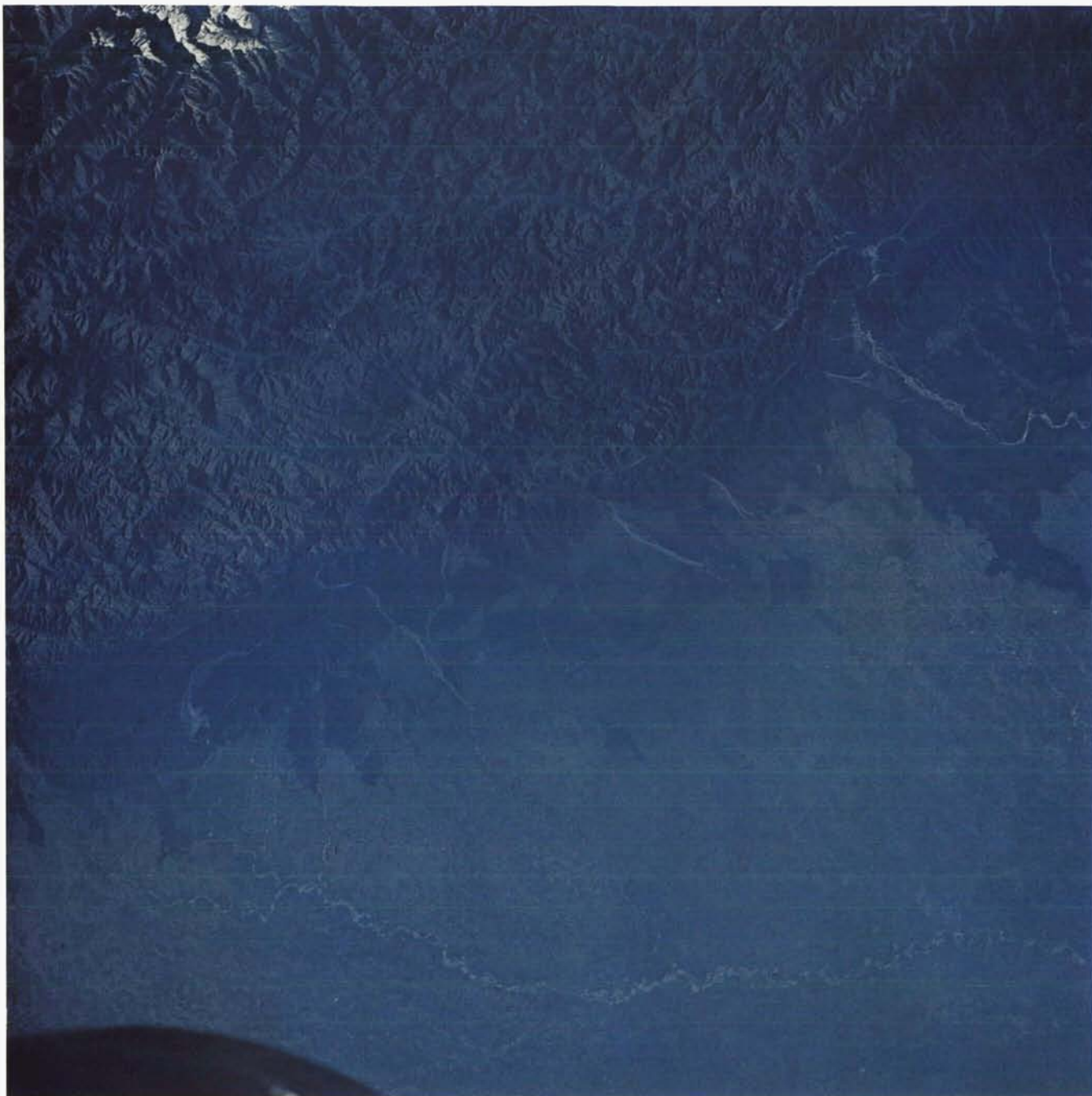


This view of the Zagros Mountains in Iran and the Persian Gulf shows anticlines generally composed of Cretaceous or Tertiary sedimentary rock cores, surrounded by upturned younger strata. The uplift of these mountains began in the Pliocene era and has outstripped erosion thus far. Salt beds have figured in their history

by forming plugs and flowing upward as rheids in many places. Some have penetrated thousands of feet of rock to reach the surface. The dark circular or elliptical masses near the coast at the upper left are salt plugs that are exposed at the surface. They would dissolve soon in a wet climate, but here they survive.

GEMINI XII NOVEMBER 13, 1966 S66-63483



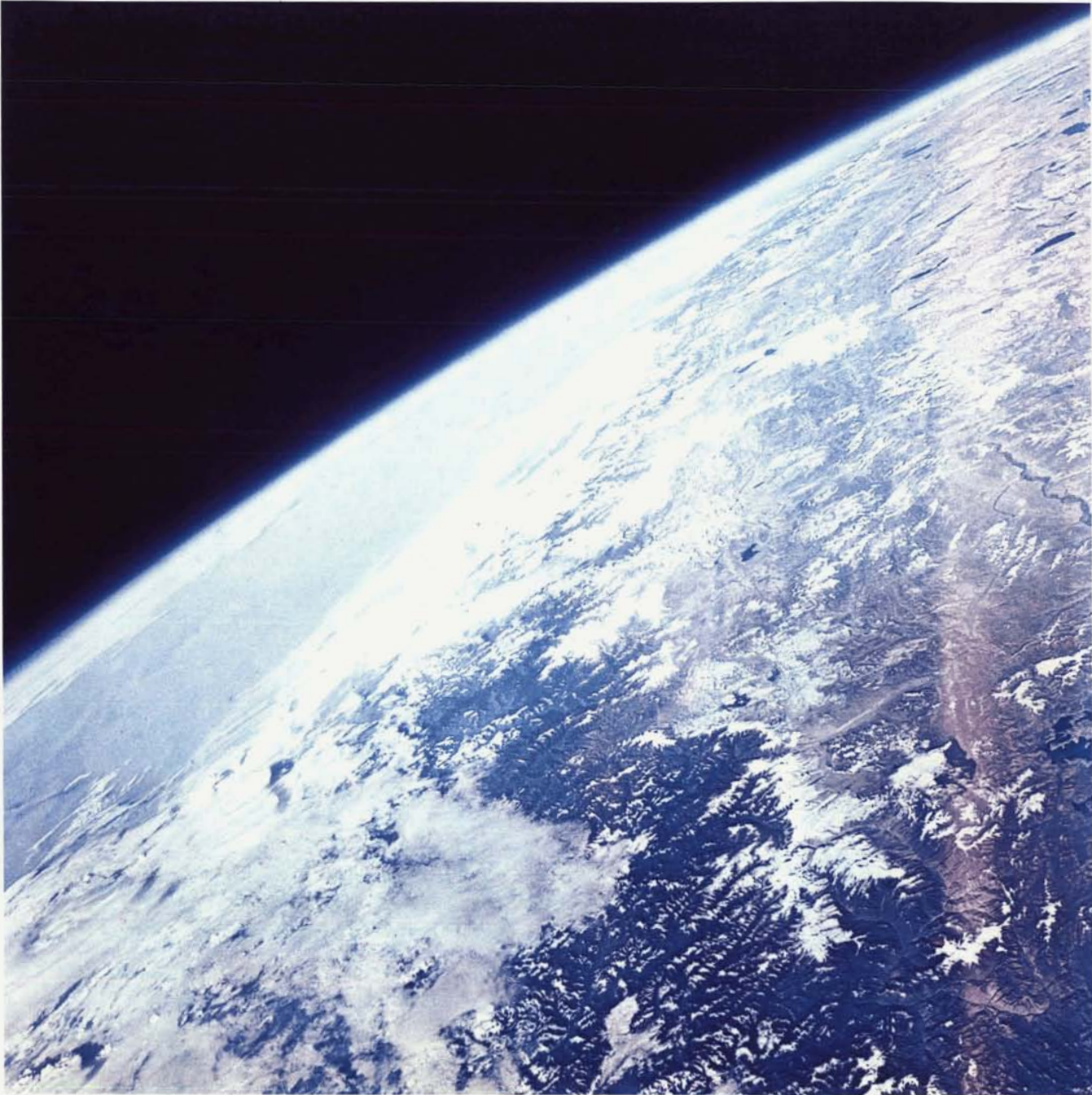


This is the front of the Himalaya Mountains in India and Nepal. This is a fascinating area geologically because the Himalayas here are an extremely complex assortment of igneous, sedimentary, and metamorphic rocks, ranging in age from Precambrian to Recent, that have been thrust southward where the Indian Peninsula

begins. The city of Rampur, India, lies near the lower center of this view, and the mountains at the upper right are in Nepal. The rivers, including the Sard at the upper right, are tributaries of the Ganges, which flows into the Bay of Bengal east of Calcutta. The next photo shows the Himalayas from another vantage point.

GEMINI VI DECEMBER 16, 1965 S65-63128





Mount Everest is about an inch to the right of the center of the view of the Himalayas from west of Nepal to Bhutan, and 8 more of the world's 12 highest peaks are visible. Over India at the left the air is hazy, and thunderstorms catch early-morning sunlight south of the mountains. In the clear area at the right edge is the

Brahmaputra River. The central peak of the forked range in the right foreground is Kula Gangri. The Himalayas were formed by thrust faulting along the margin of the central Asia tableland. As they were thrust southward, the crust folded to form the sub-Himalaya chain in front of the main mountains.

GEMINI XI SEPTEMBER 15, 1966 S66-54840





Notice the great **U**-shaped cloudline around India in this photo. Subsiding air in a sea-breeze circulation resulted in the suppression of convective clouds off the peninsula's coast for 30 to 50 miles on the west and 120 to 150 miles on the east. The occurrence of polygonal

convection cells of cumulus clouds indicates heating of the air by the water and a lack of winds. Vegetation darkens the mountainous regions of Western and Eastern Ghats, but the reddish soil of southern India can be seen between these ranges.

GEMINI XI SEPTEMBER 14, 1966 S66-54677





The Coleroon River and other topographic features of the tip of India can be seen here, as well as typical daytime cumulus-cloud activity, with many cloud elements in long lines parallel to the winds. Southern India was included in the synoptic terrain photography experiment because the Indian Upper Mantle Project is focused on

it, and photos such as this show more than mosaics. Between India and Ceylon, at the far right, the sea is so shallow that a small drop in its level would rejoin the two areas. The islands and shoals there are known both as Adam's Bridge and as Rama's Bridge. The next two pictures show more details of Ceylon.

GEMINI XI SEPTEMBER 14, 1966 S66-54904



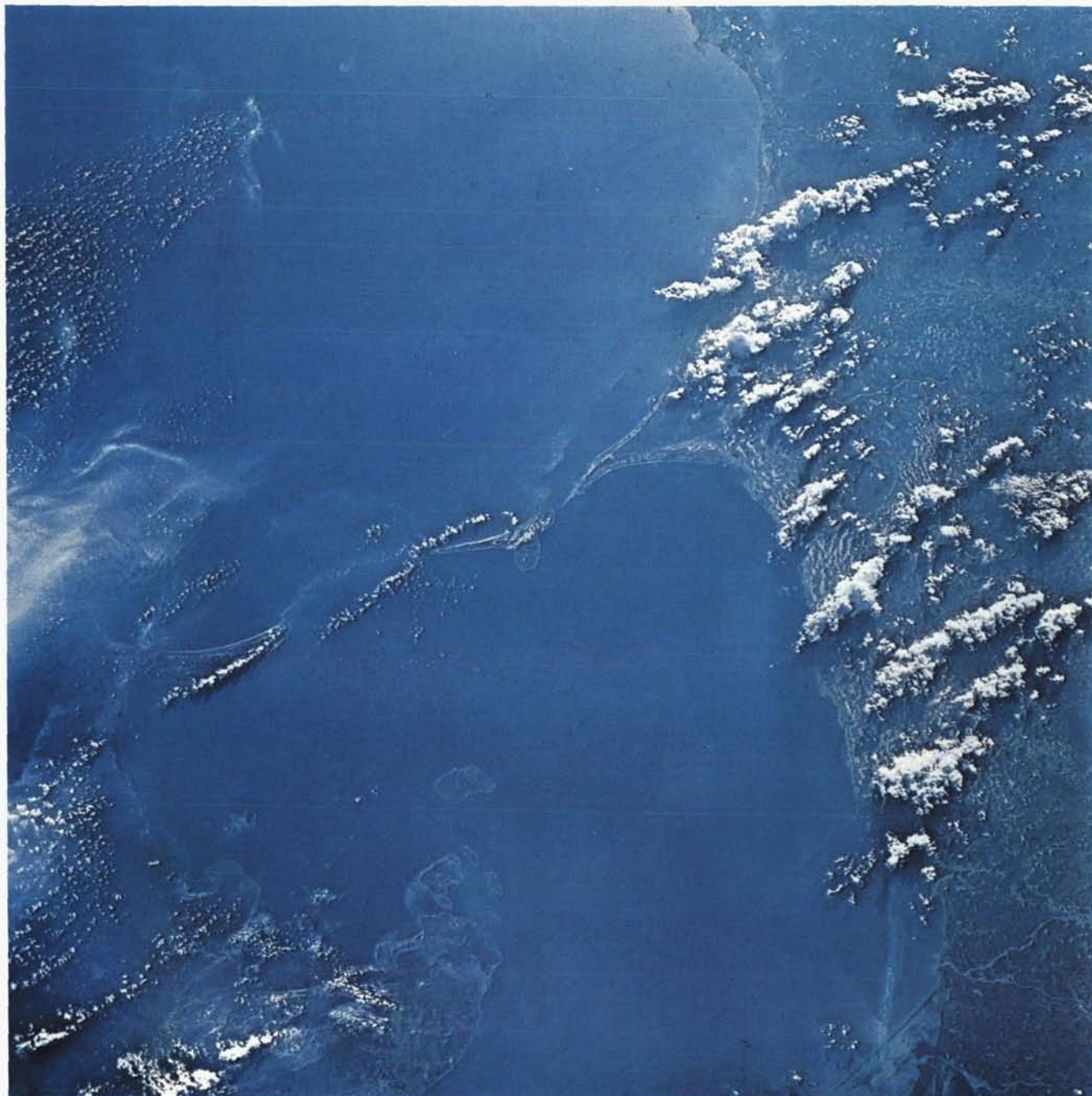


This picture overlaps the previous one. It includes all of Ceylon, yet the Himalayas, roughly 2300 miles away, are faintly visible on the horizon. Ceylon is 270 miles long. Its people are clustered on the moist southwestern third of the island. Dry areas elsewhere were irrigated and productive 2000 years ago, but later were neglected

until recent times. At the upper right, cirrus clouds can be seen streaming westward toward Ceylon from a convective area in the Bay of Bengal. At top center there is another region of cloudiness near Calcutta. It is associated with a weak depression.

GEMINI XI SEPTEMBER 14, 1966 S66-54678





You are looking south now at the shallow water between Ceylon, on the left, and India, at the right. Palk Bay and Palk Strait are in the center and the Gulf of Mannar at the top of the picture. Rama, the hero of Ramayana, is said to have built a bridge here to take his army from India to Ceylon. A road-railway-ferry

system now crosses this shallow area. The high thin clouds over Ceylon are probably associated with a tropical storm in the Bay of Bengal. Ceylon is within 450 miles of the Equator, but oceanic winds temper its hot, humid climate. At the lower right, the Coleroon River at Thanjavúr is visible.

GEMINI VII DECEMBER 11, 1965 S65-63743





About 90 minutes after the Gemini XI photos on preceding pages were taken, the spacecraft crossed the Indian Ocean again and obtained this view. In it one can see how the clouds developed and changed in the brief time it took the spacecraft to circle the world. India and Ceylon are near the horizon at the left. Cumulus con-

gestus over Ceylon had become cumulonimbi, with elongated, anvil-like tops extending nearly 100 miles to the Indian coast, by the time this photo was taken. Over the equatorial Indian Ocean in the foreground, dense cirrus and cirrostratus clouds hid many of the low-level convective clouds.

GEMINI XI SEPTEMBER 14, 1966 S66-54544



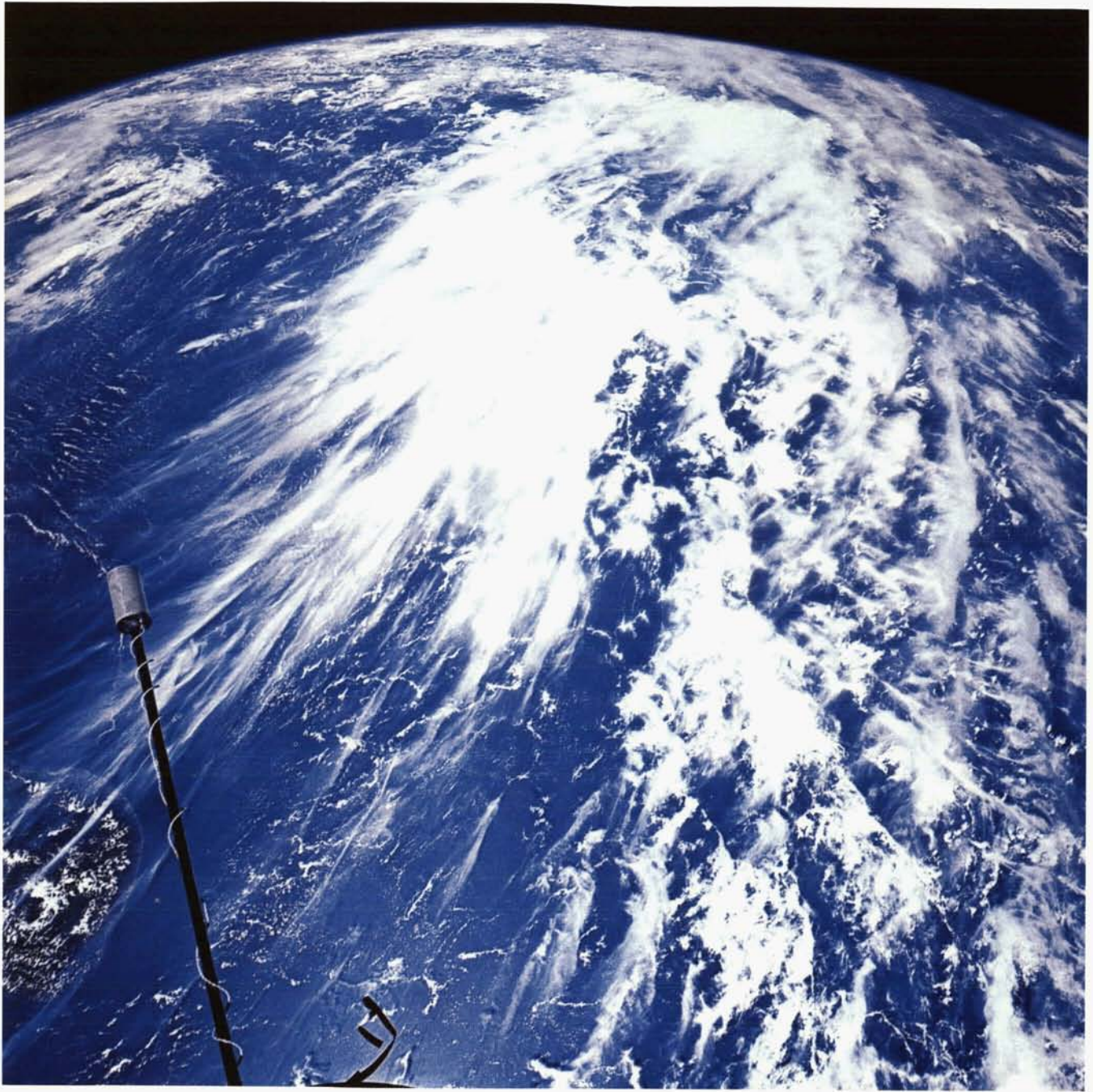


This picture was taken through an 80-mm lens at about the same time that the preceding one was taken through a 38-mm wide-angle lens. India and Ceylon are at the upper left, and meteorological features that were visible in previous pictures can be seen in greater detail in this one. Easterly winds were carrying cirrus streamers

great distances at the time of this photo, and the thunderstorms over Ceylon had grown considerably since the astronauts first saw them. In the foreground, cirrus and cirrostratus obscure much of the lower convective cloudiness typical of this equatorial ocean area.

GEMINI XI SEPTEMBER 14, 1966 S66-54793





Southeastern Ceylon is in the lower left corner of this picture of long fingers of cirrus clouds reaching west across the Bay of Bengal. The thick cirrus near the top of this northeasterly view is emanating from convective storms over the Malay Peninsula. The cloudiness near

the upper center is west of the Nicobar Islands, and is typical of that seen in tropical Southeast Asia. Details discernible in Gemini color pictures such as this have helped the meteorologists who interpret the photographs televised to Earth from unmanned satellites.

GEMINI XI SEPTEMBER 14, 1966 S66-54681





This view eastward across Sumatra shows the great quantities of cirrus produced by cumulonimbus clouds in this equatorial monsoon climate. The intense convective activity, which produces more than 100 inches of rain a year in much of this area, is particularly evident over northern Sumatra in the upper left, and along a

line which cuts across the lower right corner of the picture. In the lower levels the undeveloped cumuli show open cellular patterns in some areas, as well as a suggestion of a vortex in the right center of the photo. Monthly mean temperatures average about 80° F at sea level in this part of Indonesia.

GEMINI XI SEPTEMBER 14, 1966 S66-54686



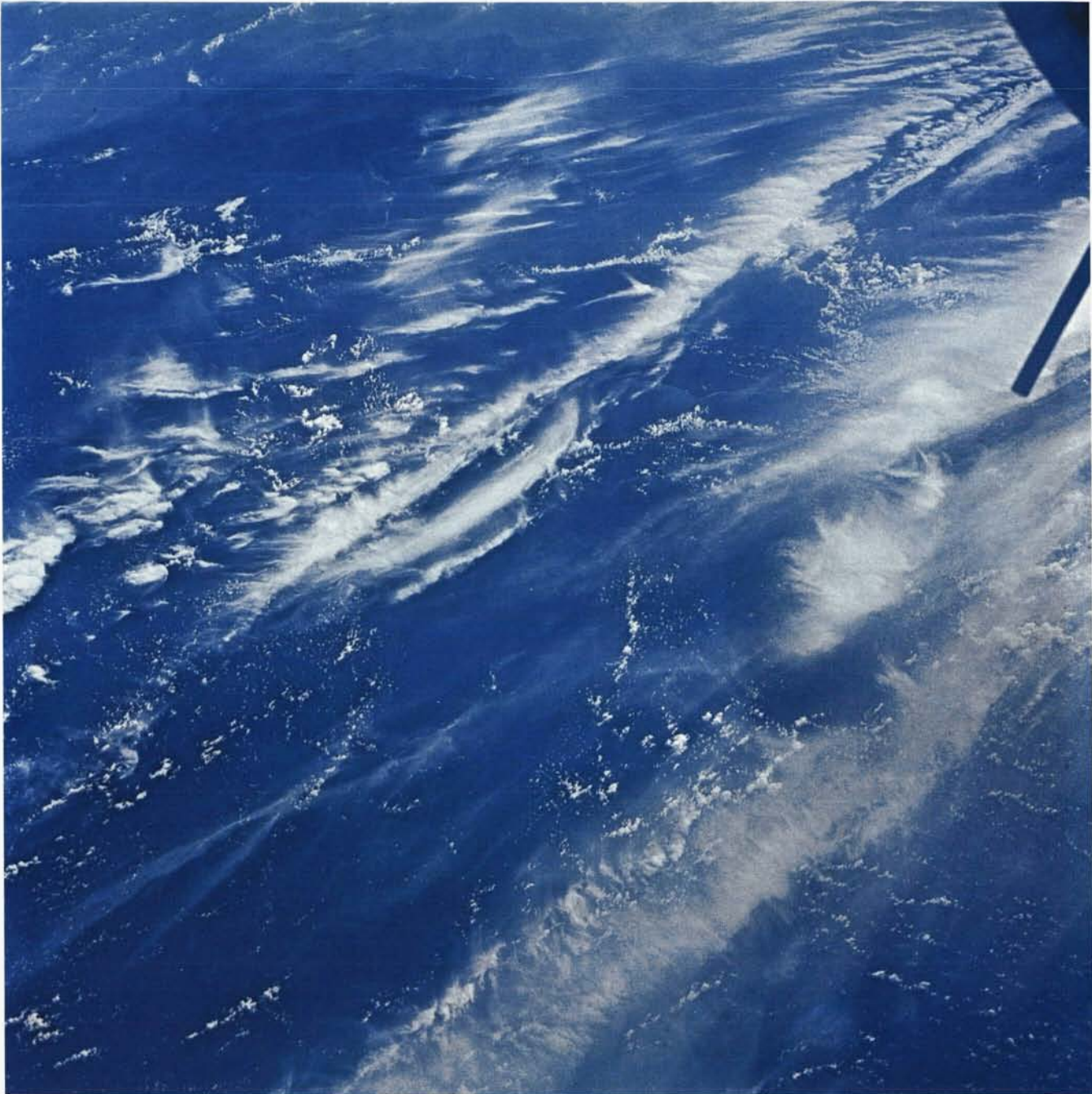


The long shafts of cirrus clouds at the left here trended southwest from northern Borneo. The view is to the northeast and includes many of the Indonesian islands. They are the spice islands that Columbus sought. The clouds above them in this photo were predominantly convective in a moist, unstable atmosphere. Southern

Sumatra is at the left behind the antenna; Java is the long, narrow island in the center, and the Sunda Islands stretch toward the horizon. Borneo is in the upper left corner. Celebes, across the Makassar Strait, is to the right of Borneo and well cloaked in clouds.

GEMINI XI SEPTEMBER 14, 1966 S66-54691



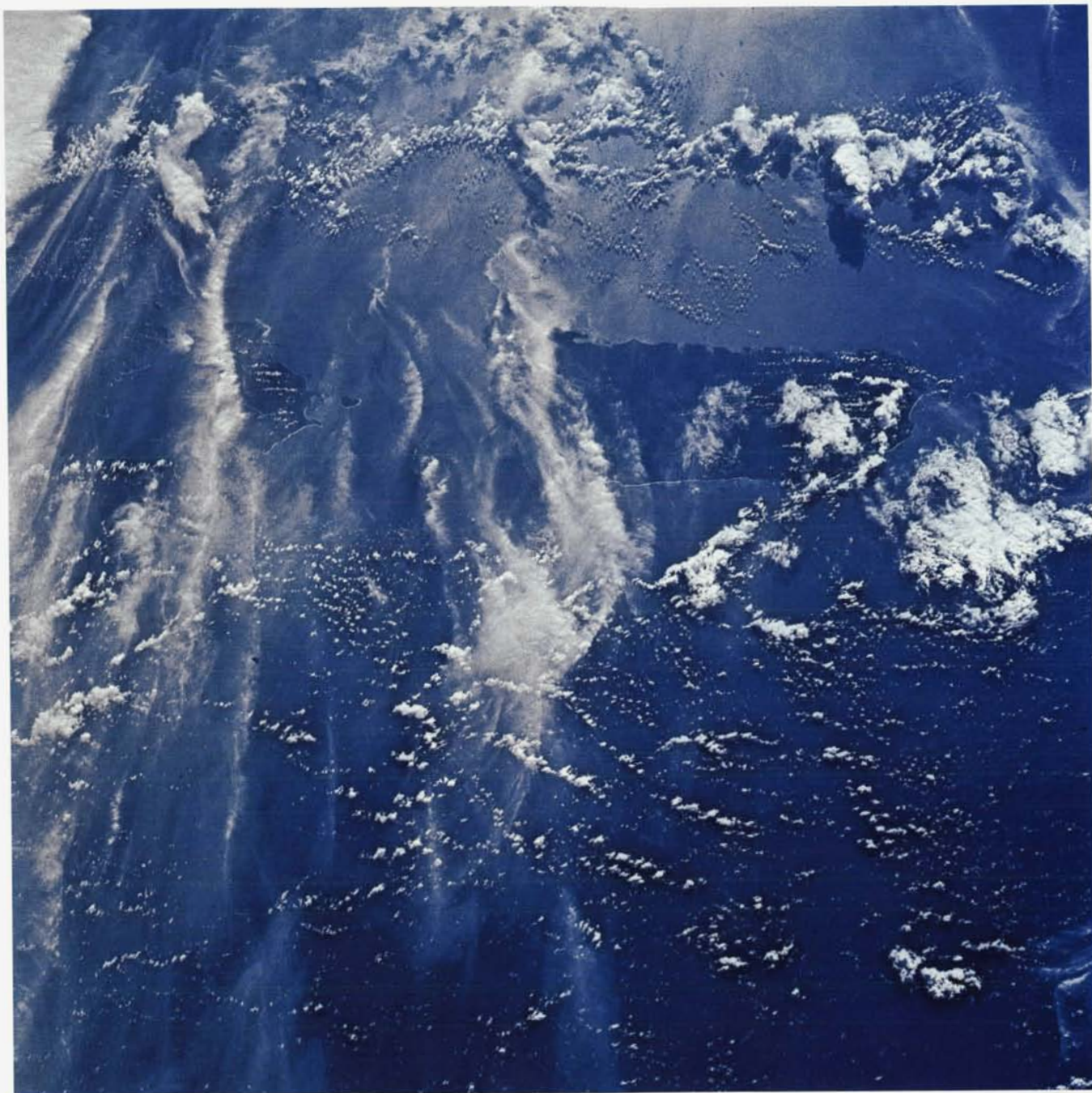


This is a view to the northeast from over the Indian Ocean near the Equator. The photo shows several extremely long bands of cirrus clouds lined up northeast-southwest at a time when cumulus clouds were sparse in the lower atmosphere. The dark mass discernible through the thin clouds at the upper left is northern

Sumatra. The islands off its west coast here are Simeulue, at the left; Banjak, in the upper center; and Nias, in the right center. Notice how the moist equatorial atmosphere obscures the eastern lowlands of Sumatra bordering the Strait of Malacca more than it does the central highlands.

GEMINI X JULY 21, 1966 S66-45782



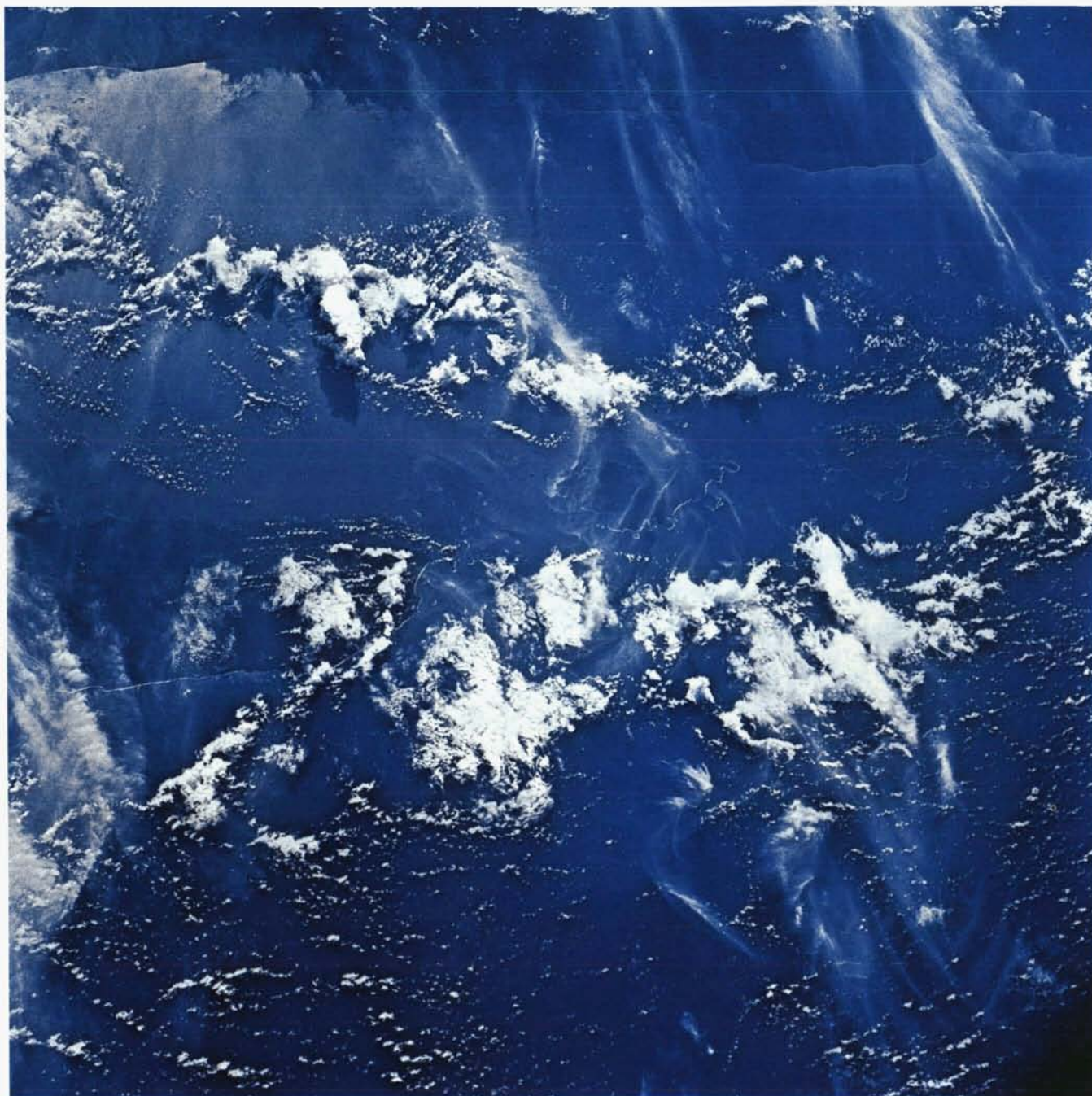


Off Sumatra's southwestern coast many large volcanic islands, with small ones scattered among them, rise from a submarine platform in the Indian Ocean. They are part of a chain that extends on toward Java and Australia. Thin cirrus clouds veil the upper part of this view, but Tanahbala, the southernmost of the Batu

group, can be seen at the left, and Siberut, the largest of the Mentawai Group, is near the center. Some of Siberut's peaks rise more than 1000 feet. The cumulus-cloud streets at the lower right trend north-south, west of Siberut. Thick forests cloak many of the islands in this chain and coral reefs have risen around them.

GEMINI X JULY 21, 1966 S66-45785



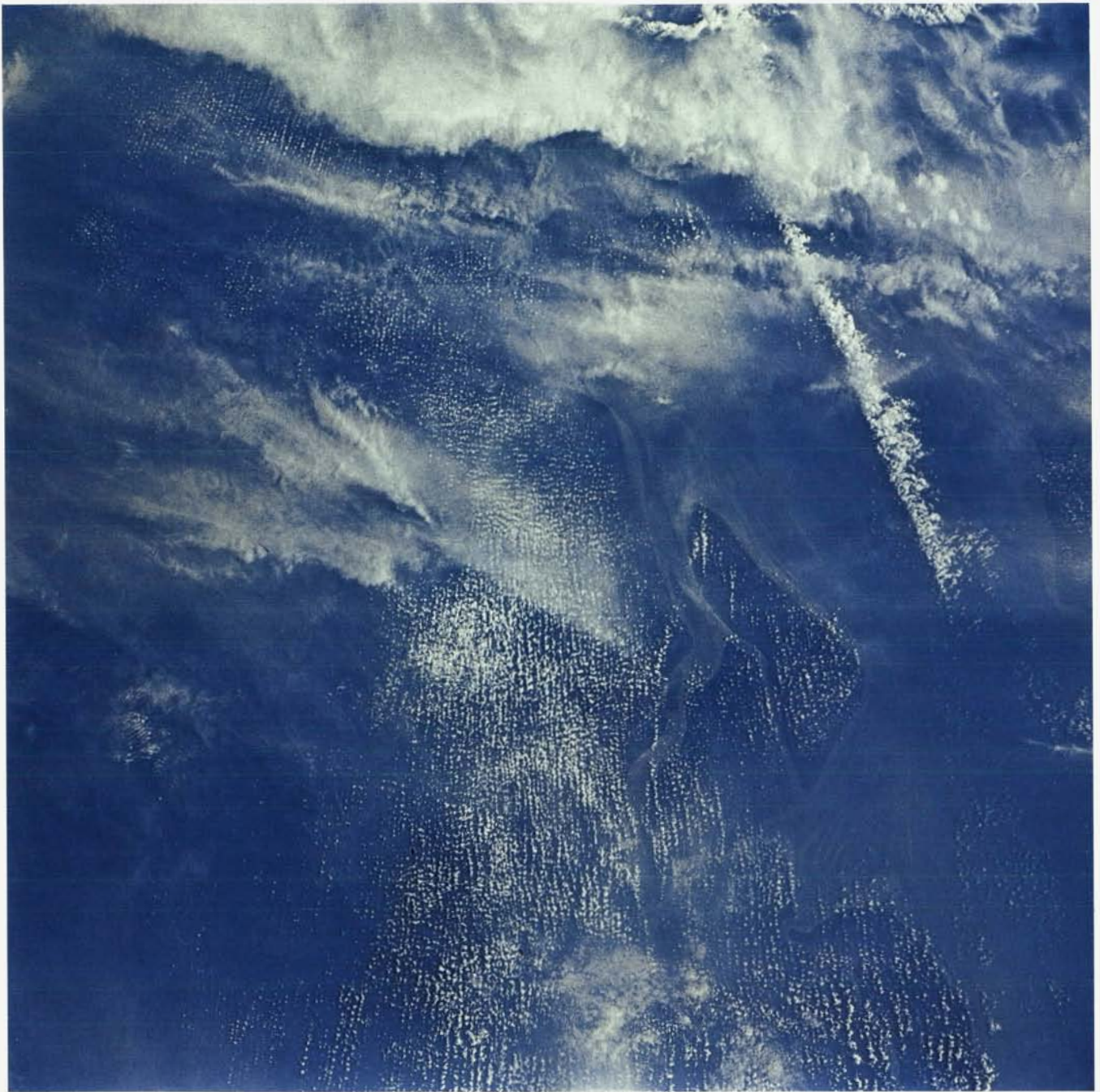


This photo of the Mentawai Archipelago overlaps the preceding one. Siberut Island is at the left, Sipora Island in the center, Utara and Selatan Islands are at the right, and numerous other small islands are included. Sumatra's west coast along the southern slope of the Barisan Mountains is at the top. The surf was creating

bright lines along the western and southern shores of the islands when this picture was taken, suggesting that an onshore wind was blowing. Cumulus clouds were lined up in a southwest wind over the islands, while cirrus plumes were blowing from the northeast at a higher level.

GEMINI X JULY 21, 1966 S66-45787





Sumatra sprawls across the Equator south of Burma and Malaysia. In the middle of this photo, cumulus clouds alined with southeasterly winds rib its central lowlands. The Strait of Malacca is at the right of boomerang-shaped Bengkalis Island. The narrower Pandjung Strait in the upper center separates several large islands from

the mainland. The Siak and Kampar Rivers, flowing north and east from Sumatra's mountains, fill this strait with mud and silt. Thin cirrus clouds shroud forests and jungles on the hot, humid islands. A denser band of cirrus partly conceals a cumulus-cloud line that extends upward at the right.

GEMINI X JULY 21, 1966 S66-45791





This view northward over the Bay of Bengal shows the Irrawaddy River delta in Burma. The Gulf of Martaban in the lower right is 150 miles wide, and some of the river's several mouths are visible left of it. Rice is grown on the alluvial lowlands of this fertile delta. The brown, silt-laden water being discharged into the Andaman

Sea is evidence of denudation upstream that has been estimated to be 1 foot in 400 years. At the left the northern part of the Andaman Islands can be seen. Cumulus streets prevail over the bay and sea, but there are also a few scattered cirrus clouds.

GEMINI XII NOVEMBER 14, 1966 S66-62976



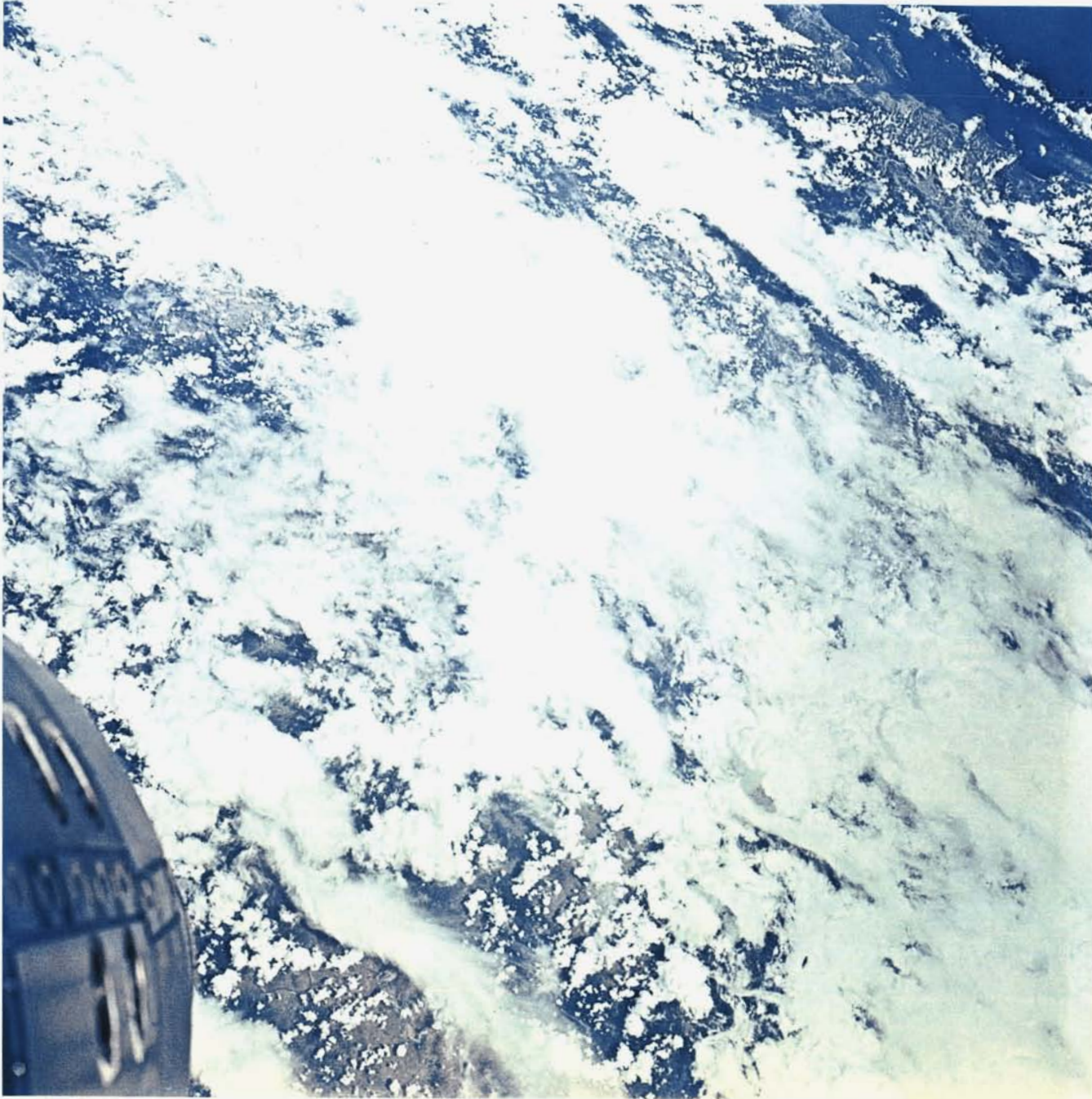


The Gulf of Martaban is in the center and Thailand is at the right here. The Irrawaddy River delta is at the left, and from it a valley runs north to a dry, light-colored region near Mandalay that is sometimes called the Purple Plain. The river to the right of the Irrawaddy is the Sittang, and the Pegu Yoma separates the

two valleys. The view is up the strike of the Arakan Yoma and other mountains in Burma. Geologically these mountains are continuous with the island arcs of Indonesia. Many geologists consider such arcs peripheral to growing continents. The accretion underway here, however, is occurring along the strike of the arc.

GEMINI XII NOVEMBER 14, 1966 S66-62979





Cumulus clouds have grown to extensive heights here, pumping heat and moisture into the high levels of the atmosphere, where cirrus plumes are beginning to obscure the lower clouds. The many stages of cumulus development depicted here were producing summertime showers over Kwangtung Province in China when this

photograph was taken. East is at the top of the picture. Nearly 75 miles of coastal southeastern China can be glimpsed in the upper right corner. Offshore, a line of cumulus clouds parallels the bay-indented, island-studded coast of the Asiatic mainland.

GEMINI X JULY 21, 1966 S66-45945





The camera was pointed northeast along the Formosa Strait to obtain this picture of Taiwan and the coast of China. The Pescadores Islands are slightly above and left of its center. Hot, humid air hangs over southeastern China in the summer, and an unstable southwesterly current of maritime air had converged with the North

Pacific trade winds to produce the clouds and showery weather shown here. The cloudiness on the left preceded a weak cold front near the mouth of the Yellow River. The muddy water from river mouths is faintly visible at the upper left.

GEMINI X JULY 21, 1966 S66-45860



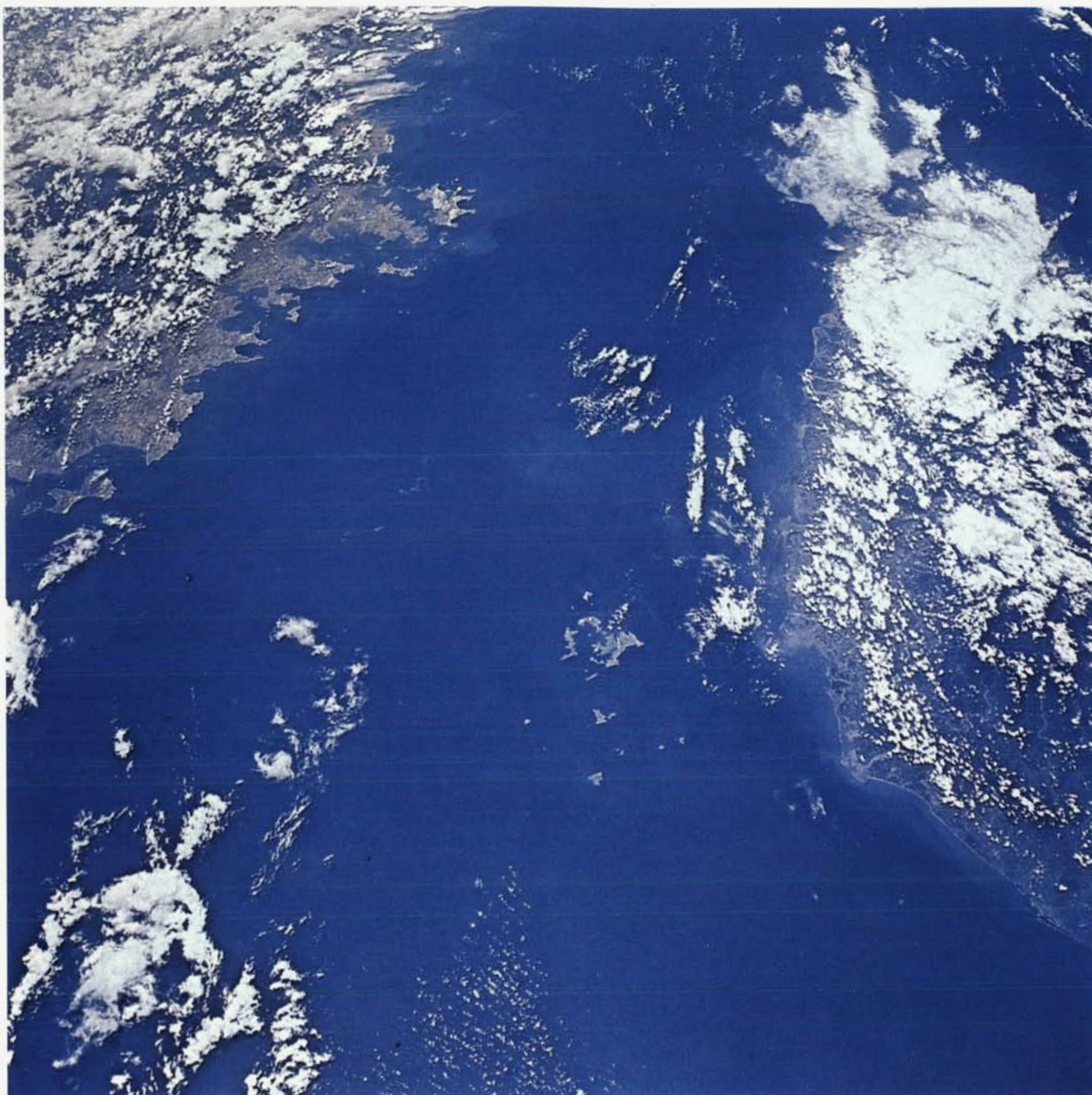


This view toward the west of northeastern China includes the 70-mile-wide Hangchou Bay, at the right, into which the Fuchun River empties. The larger clouds are thunderstorms which are effective generators of precipitation over this region during the summer. The cumulus clouds at the upper right are in a northeast-

southwest alinement. The area shown is largely in Chekiang Province, and includes the large cities of Hangchou, Shaohsing, and Ningpo. They are not resolved because of the range and atmospheric scattering, but the distinctive sediment patterns off the Fuchun and other rivers can be seen clearly.

GEMINI X JULY 21, 1966 S66-45960





China is at the left, the Pescadores Islands in the center, and Taiwan at the right here. The mainland's coast is in a youthful stage of development, and jagged because erosion has not yet produced offshore bars or extensive coastal plains along it. The convective cloudiness at the right is in air coming from the southeast

over Taiwan's 12 000-foot Chungyang mountain range. Tides complicate the currents in the Formosa Strait here. Astronaut John W. Young called this a "lucky" photo because it was made while the spacecraft was drifting in a random attitude over the strait.

GEMINI X JULY 21, 1966 S66-45866





Looking back toward Asia from over the Pacific, 180 miles of China's coast, from Fuchow at the left to Wenling at the right, were photographed. The river in the foreground, with an island in its mouth, is the Ou Chang. Sediments discolor the coastal waters near it. Along the right edge, sections of the Yangtze River be-

tween Kiukang and Siangfu can be glimpsed. The convective-type clouds, from some of which rain was falling, were over mountainous terrain that rises 5000 feet in places. The region at the left, where the clouds are thickest, is a climatic wind convergence zone during the summer.

GEMINI X JULY 21, 1966 S66-45958



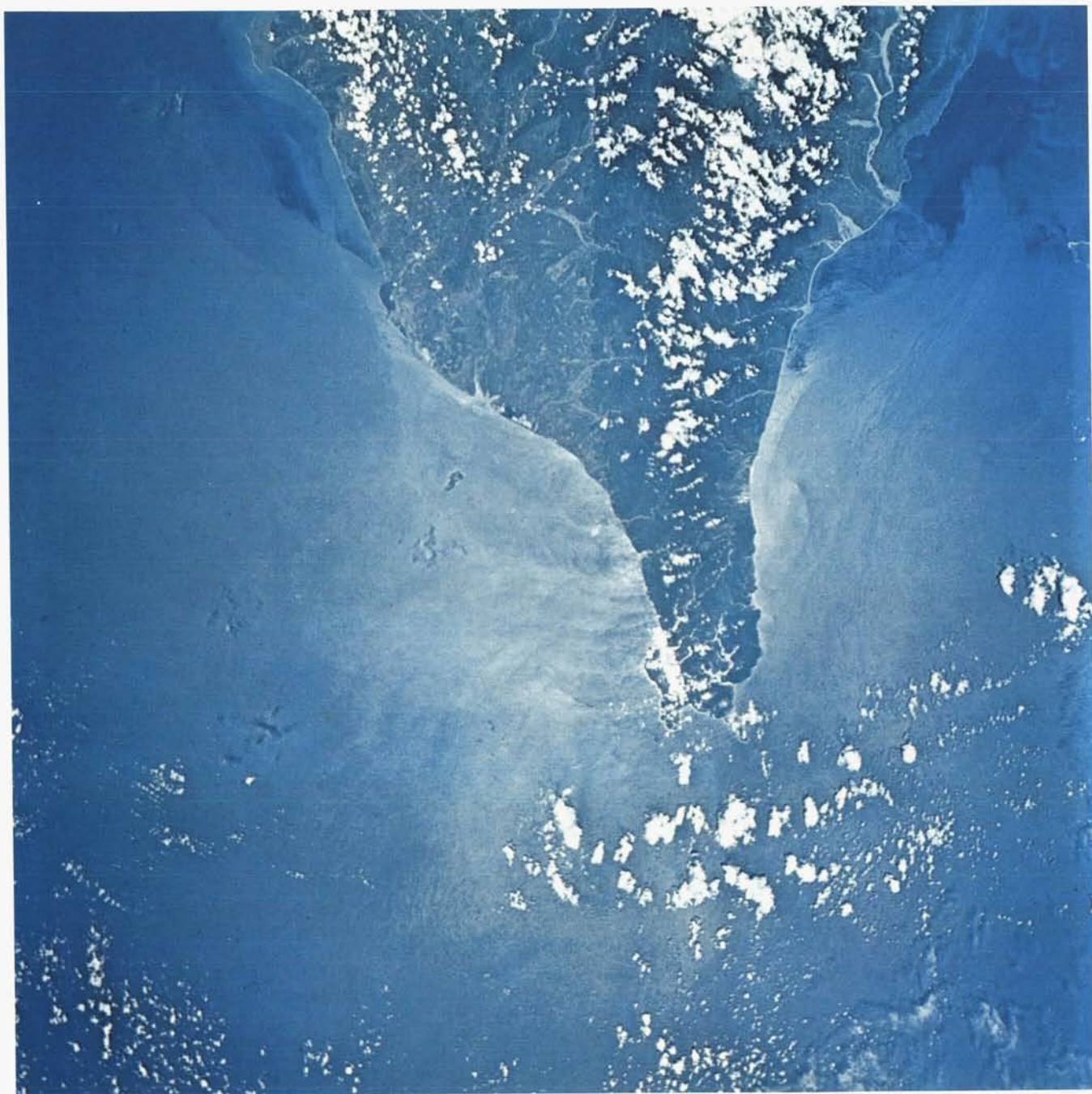


Convective clouds cover much of Taiwan in this southerly view, but its shorelines are visible. Taipei is at the lower center. A tropical storm was dissipated east of the island the previous day. The cloud streets beyond the southern tip are aligned now in an easterly wind near the surface. Cumulonimbi are in scattered groups elsewhere.

Left of the big island, the tops of thunderstorms are directed toward the east, indicating that there is a west wind at their level, and an open cellular formation of cumulus clouds also can be seen. The cirriform undercast near the horizon conceals the northernmost of the Philippine Islands.

GEMINI X JULY 21, 1966 S66-45956





Taiwan is a rugged, forested island 250 miles long that parts the major current in the sea the way a ship does. As the "bow wave" spreads, the upwelling near the shore makes the sea darker blue above the island's southern tip, and lighter blue where an evenly roughened surface reflects the sunlight. More lowland shows

west of the mountains than to the east. The braided patterns of the rivers are typical of streams issuing from steep mountainous areas. One of several wrench faults that ring the Pacific underlies the narrow eastern valley. "This picture," the astronaut noted, "shows many of the major features that we look for in Earth photography."

GEMINI X JULY 21, 1966 S66-45868







## Part VII. Across the Pacific

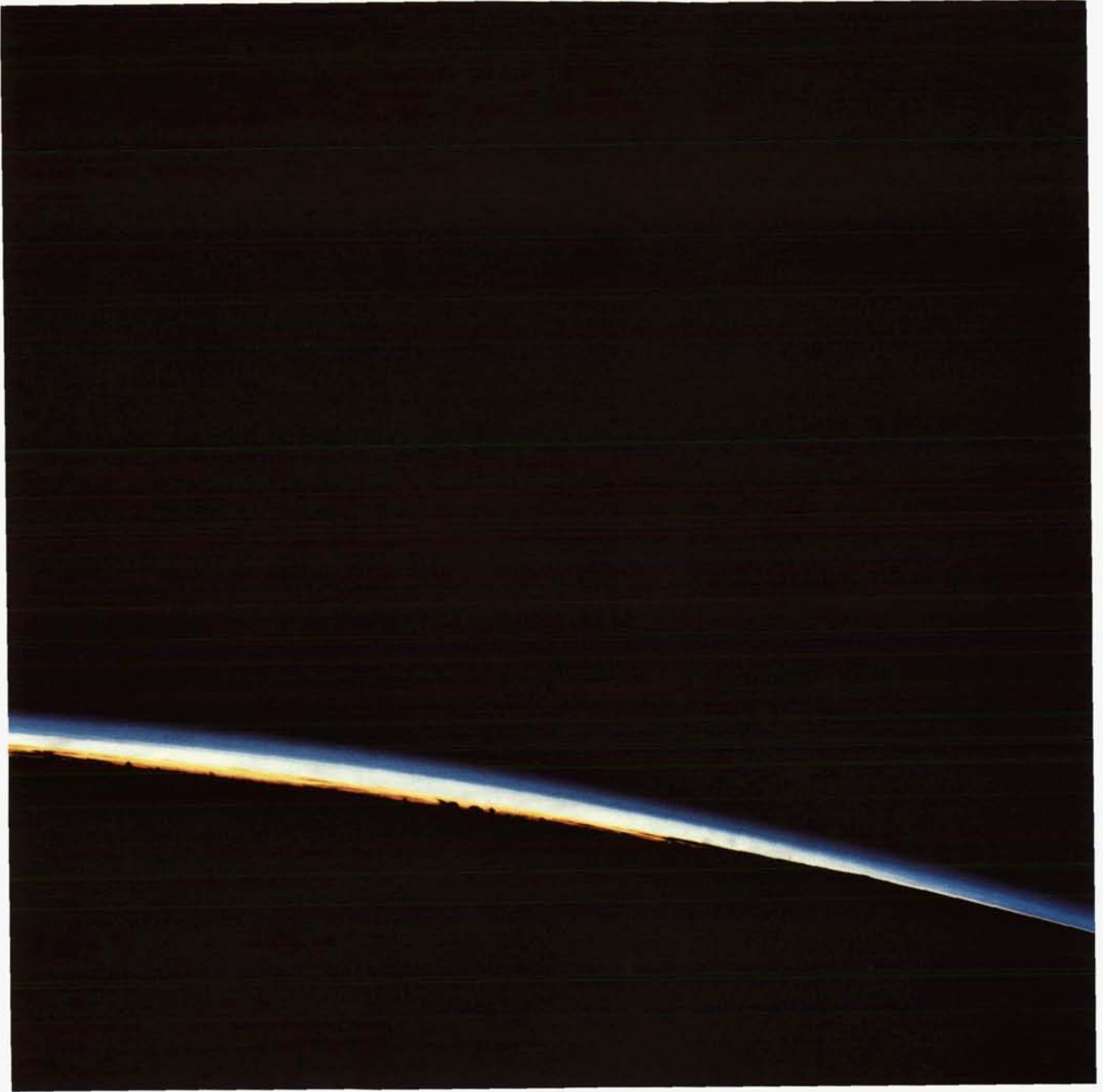
IT was God's pleasure," Marco Polo wrote after his travels seven centuries ago, "that we should get back in order that people might learn of the things that the world contains." After crossing the lands that were on the frontier of knowledge in Marco Polo's day, the world's largest ocean still lay ahead of the Gemini astronauts.

The Pacific covers nearly a third of the Earth's surface. It has deeper waters than any other ocean, yet it is studded with volcanic island chains which primitive people, looking at the stars, reached centuries ago in crude boats. Several of these beautiful bits of land are shown in the photos that follow.

Here, too, you will find a sunrise and a full Moon as photographed from above the clouds that sweep over the Pacific. The astronauts saw the Sun rising and setting far more often during their revolutions of the Earth than people on the Earth's surface. They were given general astronomical briefings on phenomena to observe and the reporting procedure to follow so that maximum scientific use could be made of their observations. In addition to the pictures reproduced here, they obtained color photographs of the airglow, the zodiacal light, and the solar eclipse that occurred November 12, 1966.

Thus the Gemini science program began what well may be called the extension of the scientific laboratory into space. It demonstrated the usefulness on many occasions of having men aboard spacecraft. More sophisticated and challenging experiments are being designed now, because men have found new ways of learning about things that the Earth and the solar system contain.





"The photo [above] was taken," said Astronaut David R. Scott, "during the second sunrise for Gemini VIII. I had hastily unstowed the camera and was anxious to make sure it functioned properly. . . . I was in hopes of capturing the magnificence of the scene, particularly the airglow and thunderheads. Unfortunately, the true

fidelity of the view was not recorded by the camera." (More sensitive emulsion or longer exposure, or both, would be required to bring out the dim light features.) Study of twilight or dawn bands is of considerable interest to scientists. The spacecraft was near Guam when this photo was taken.

GEMINI VIII MARCH 16, 1966 S66-25771



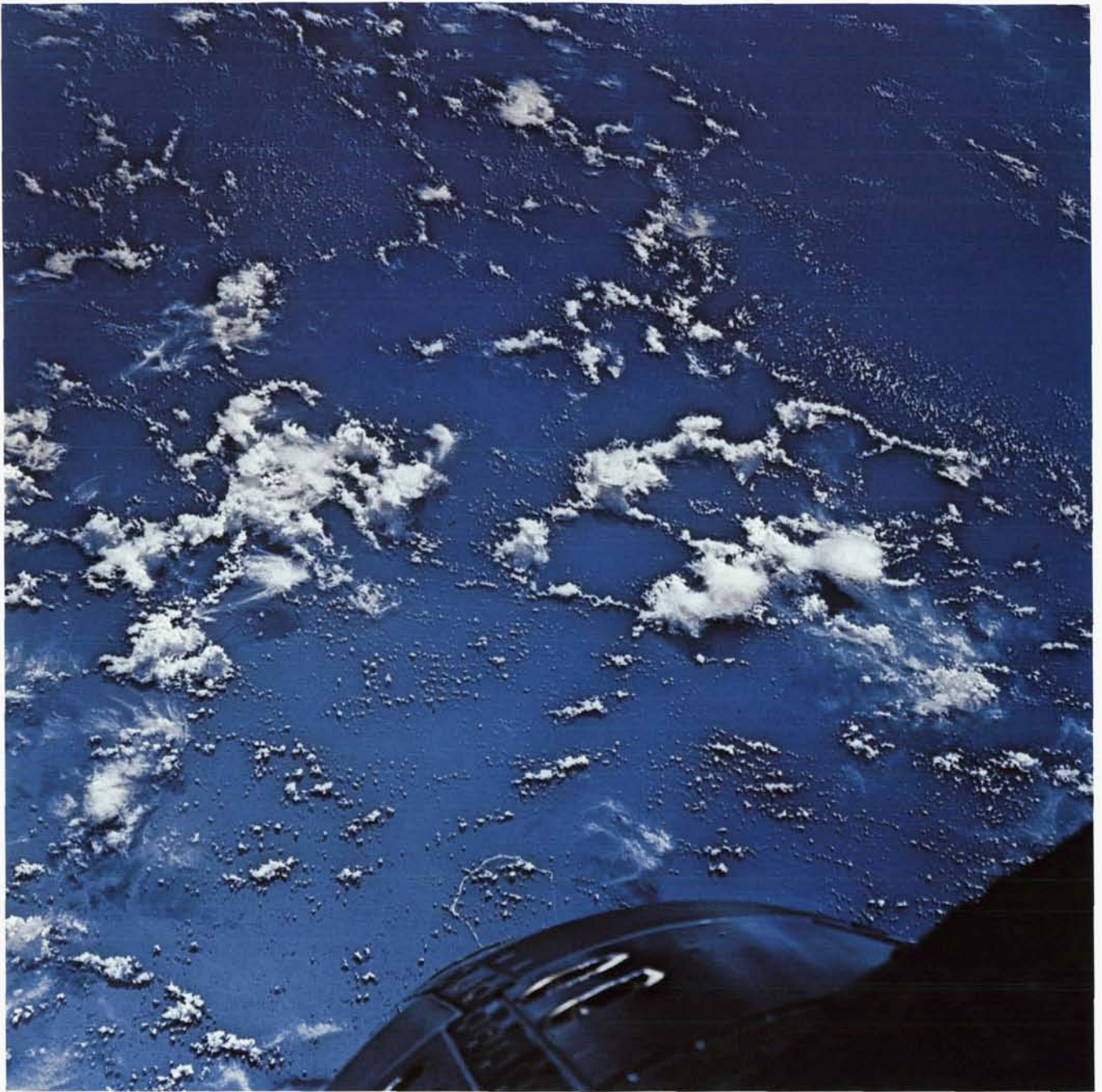


"The Moon varied greatly during the 2 weeks of flight," Gemini VII's Command Pilot Frank Borman wrote afterward. "Jim [Lovell] took this picture of the full Moon as a symbol of our next goal in manned space flight, the lunar landing. I think it also dramatizes the difference between mere orbital flight and the future

adventures that will take man a quarter of a million miles into the ocean of space." The two astronauts were over the Pacific on their 63d orbit. Trade-wind cumuli lay over that great body of water and extensive areas of cirrostratus were penetrated by the more active cumulonimbi.

GEMINI VII DECEMBER 8, 1965 S65-63872



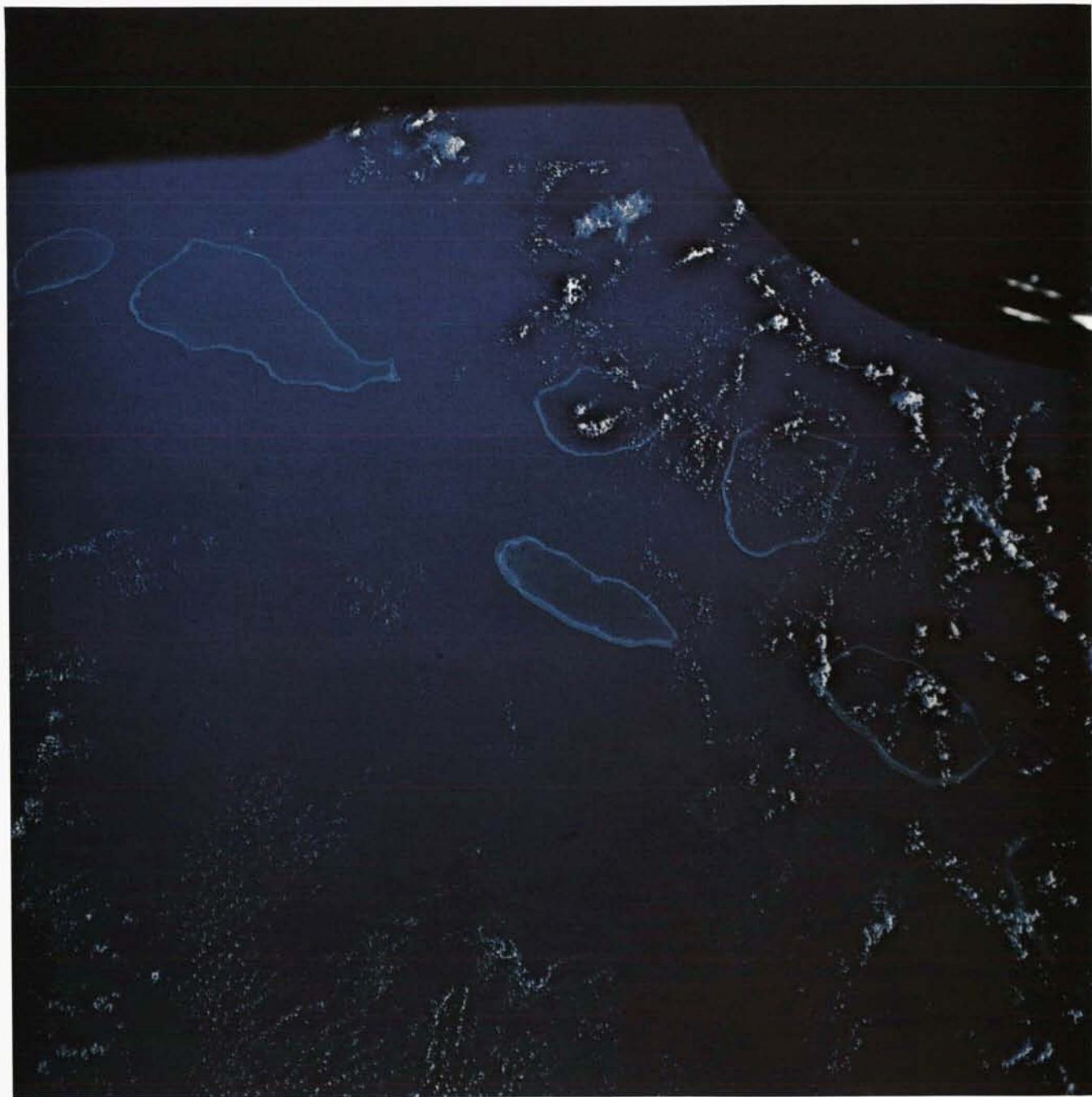


These clouds came into view over the East Caroline Basin where seamen encounter northeast trade winds north of New Guinea in the western Pacific Ocean. A variety of convective clouds is shown here, some of which are forming open polygon-shaped cells with larger cumuli and cumulonimbi at the cell corners. Air gen-

erally sinks within the open region in a cell and rises near the edges where the clouds are found. The northern half of Murilo Atoll is just above the spacecraft nose. It is near Truk Island, and about 9° north of the Equator. The lagoon enclosed by this atoll is about 10 miles wide.

GEMINI X JULY 19, 1966 S66-45653



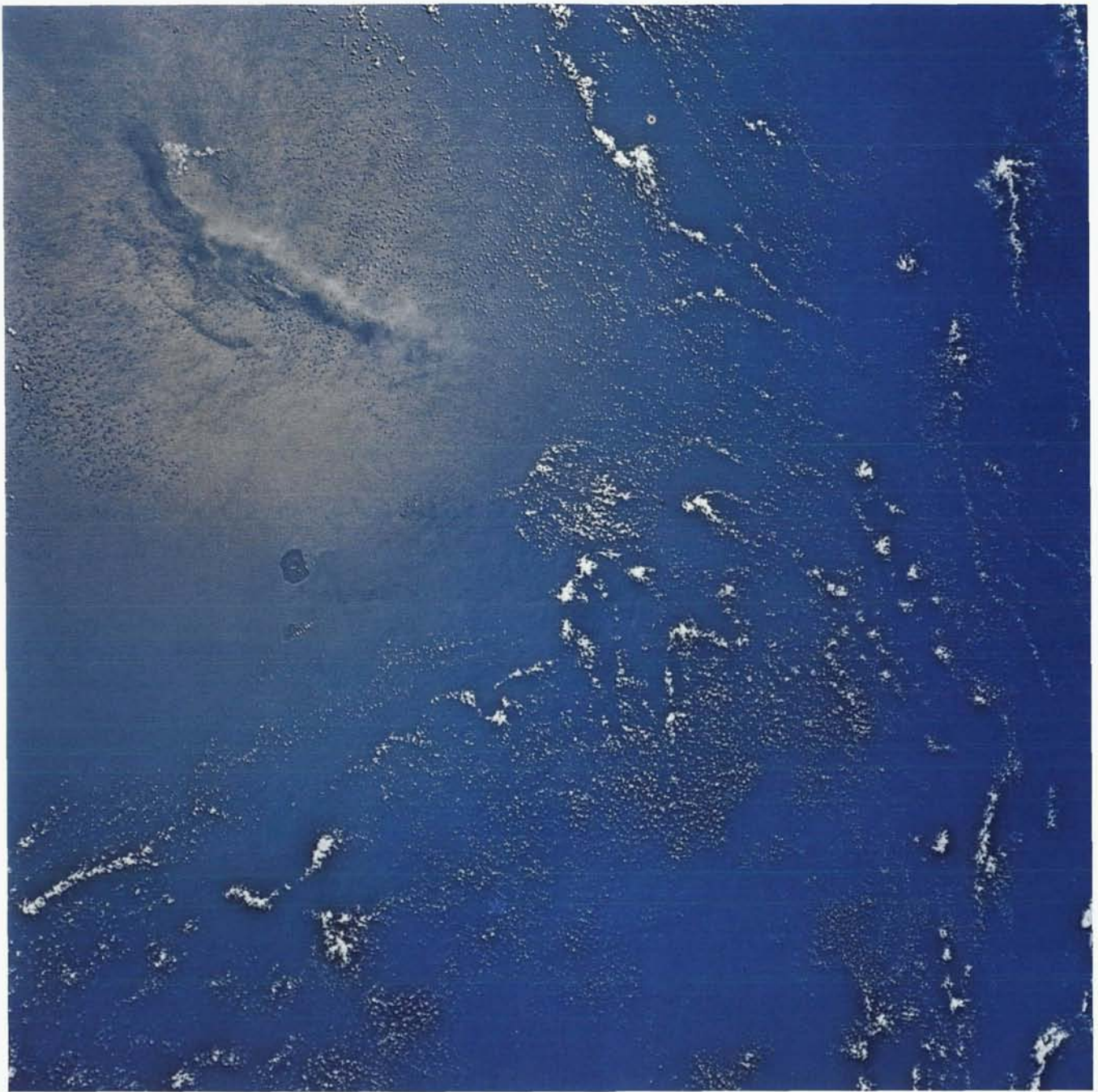


Here are 8 of the 80 coral islands in the 1300-mile chain of the Tuamoto Archipelago, a part of French Polynesia, about  $16^{\circ}$  S and  $145^{\circ}$  W in the South Pacific. The seven most prominent atolls are, from left to right, Tikehau, Rangiroa, Arutua, Kaukura, Apataki, Toau, and Fakarava. A thin line of clouds in the center points

downward to Niau. The poorly organized cumulus activity is typical of the fair weather in this area. Coconut, breadfruit, and pandanus trees grow on these remote islands and the limpid waters of their lagoons yield pearl oysters. The islands shown in the next few pictures are far north of this archipelago.

GEMINI VII DECEMBER 5, 1965 S65-63827





This is a nearly vertical view of two of the western Pacific's many volcanic islands, and shows both the motion of the clouds and the waters around them. These are the Daito Islands, about 200 miles east of Okinawa and 400 miles south of Kyushu, Japan. The larger one is Kita Daito Jima. The turbulence in the deep channel

between it and the one below it in the photo and the cross-swell pattern behind them can be seen. In the original transparency of this picture, a typical wind slick, or "tadpole tail," behind the islands can be seen. It is mainly behind the larger island and indicates the wave action and water motion.

GEMINI X JULY 21, 1966 S66-45871





The most western part of the United States photographed on the Gemini flights was Kure Island, at the lower left here. The Midway Islands are in the center of the picture, and Pearl and Hermes Reef is at the upper right. Coral colonies built these gemlike dots in the sea on the summits of eroded submarine volcanoes

that scientific studies indicate were active at this western end of the long Hawaiian chain before others erupted farther east. Test drillings have shown that the basaltic volcano base of the Midways subsided before the middle Miocene epoch.

GEMINI VII DECEMBER 9, 1965 S65-63726





More details of Pearl and Hermes Reef and the lagoon that encloses its dozen islets can be seen in this photo than in the preceding one. Pearl fishermen once inhabited these beautiful protuberances from the Pacific, but these islands are now part of a national wildlife refuge. The islands from Nihoa to Pearl and Hermes Reef are

often referred to as the "bird islands." Mark Twain called the Hawaiian chain "the loveliest fleet of islands that lies anchored in any ocean." Virtually all of the habitable islands of the Pacific were populated before the arrival of Europeans.

GEMINI VII DECEMBER 9, 1965 S65-63727





This cloud system was photographed over the Pacific Ocean about 400 miles west of Midway Island. The view was northeasterly along curving cloud lines that marked a cold front which extended into the cloud shield of a cyclonic disturbance at the upper right. The cool air behind the front was being heated by the sur-

face of the sea, and cumulus clouds had formed a cellular pattern near the center of the photograph. Cirriform and cumuliform clouds can be seen preceding the cold front at the right. This picture was taken in November and the same cold front and cyclonic disturbance were photographed again the next day.

GEMINI XII NOVEMBER 13, 1966 S66-62951,



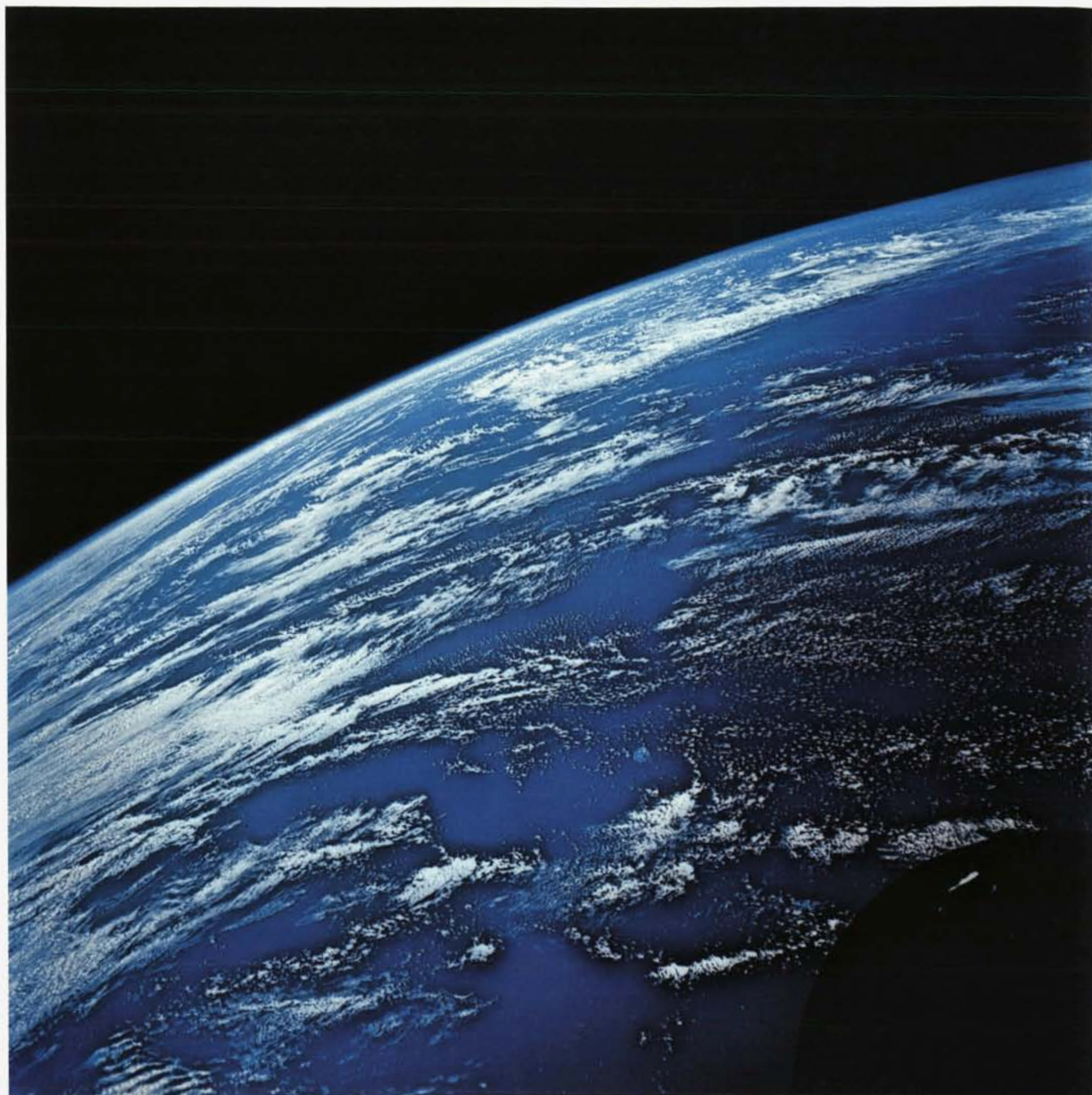


After taking the picture on the preceding page, the astronauts circled the Earth 15 times before taking this one north of Midway Islands. This is a view to the northeast along the same cold front that they had noted the day before. This front was part of a cyclonic disturbance, the center of which can be seen at the far

end of the clearing. The more dense cloudiness near the center of the picture probably had thunderstorms embedded in it along the boundary between the warm and the cool air. Cirrus clouds are shown over the frontal clouds, stratus clouds are to the right of them, and cumuliform clouds to the left.

GEMINI XII NOVEMBER 14, 1966 S66-63076



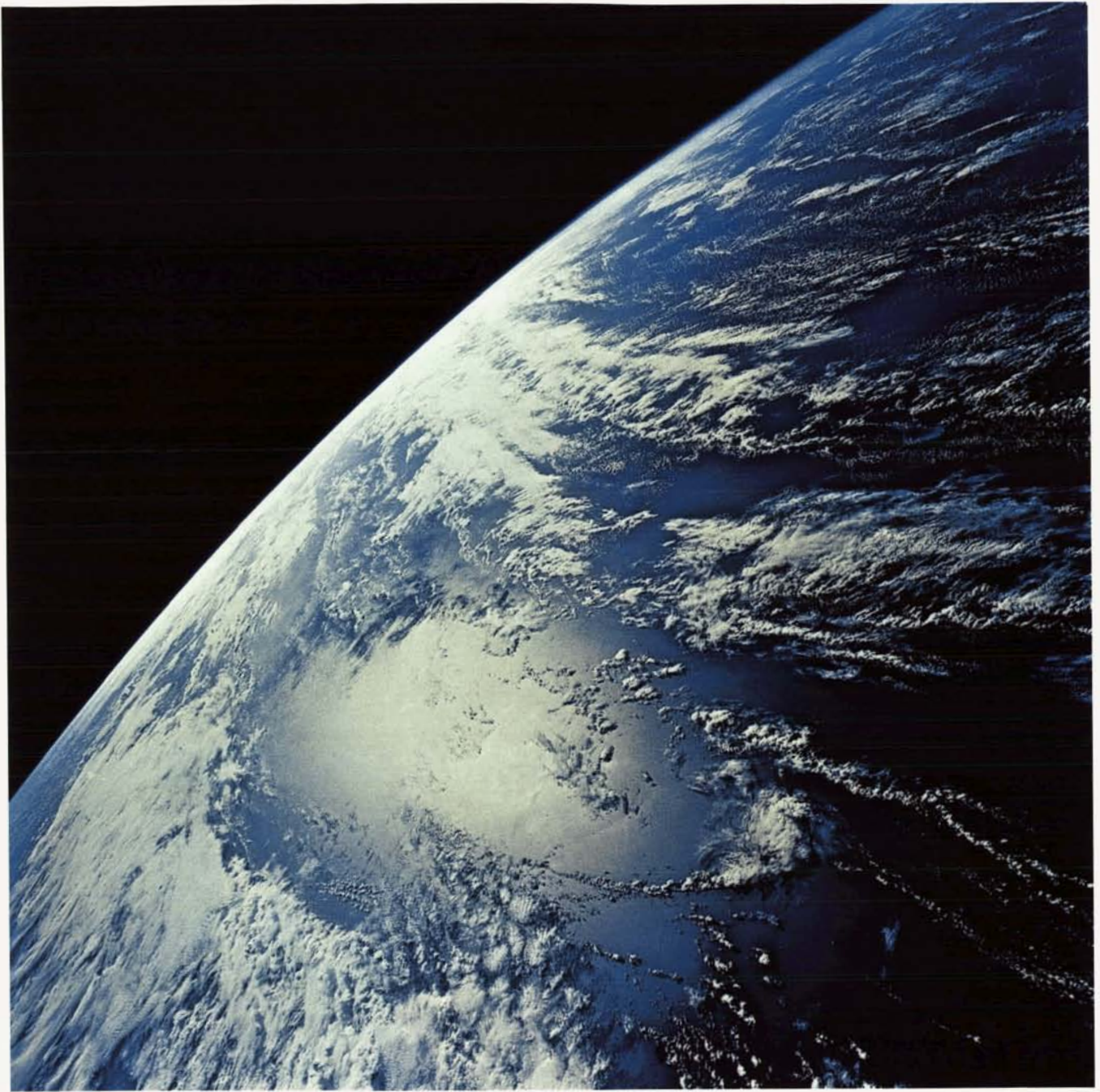


This and the next photo were taken very soon after the one that immediately precedes them was taken. From the foreground to the center of this picture are Kure Island, Midway Islands, and Pearl and Hermes Reef, surrounded by blue-green lagoonal waters. The same low-pressure system over the Pacific that was shown in

the preceding picture is shown here in different light. The cold front crosses the center of this picture from left to right in an arc of cumuliiform clouds that touches Pearl and Hermes Reef. The cooler air in the foreground lay behind the cold front. Ahead of it, toward the horizon, the air was warmer.

GEMINI XII NOVEMBER 14, 1966 S66-63077





This is a southwesterly view along the same cold front near the Midway Islands in the Pacific that you saw in the three photos that have preceded this one. This shows the cold front from another vantage point. The blue-greenish spots, barely discernible, are, from the right center to the upper center, the images of Pearl

and Hermes Reef, Midway Islands, and Kure Island. The surface winds at Midway Island were westerly at 10 knots when this picture was recorded. The bright region is Sun glitter from the surface of the Pacific. Several series of meteorological pictures such as these were obtained during the Gemini program.

GEMINI XII NOVEMBER 14, 1966 S66-63080



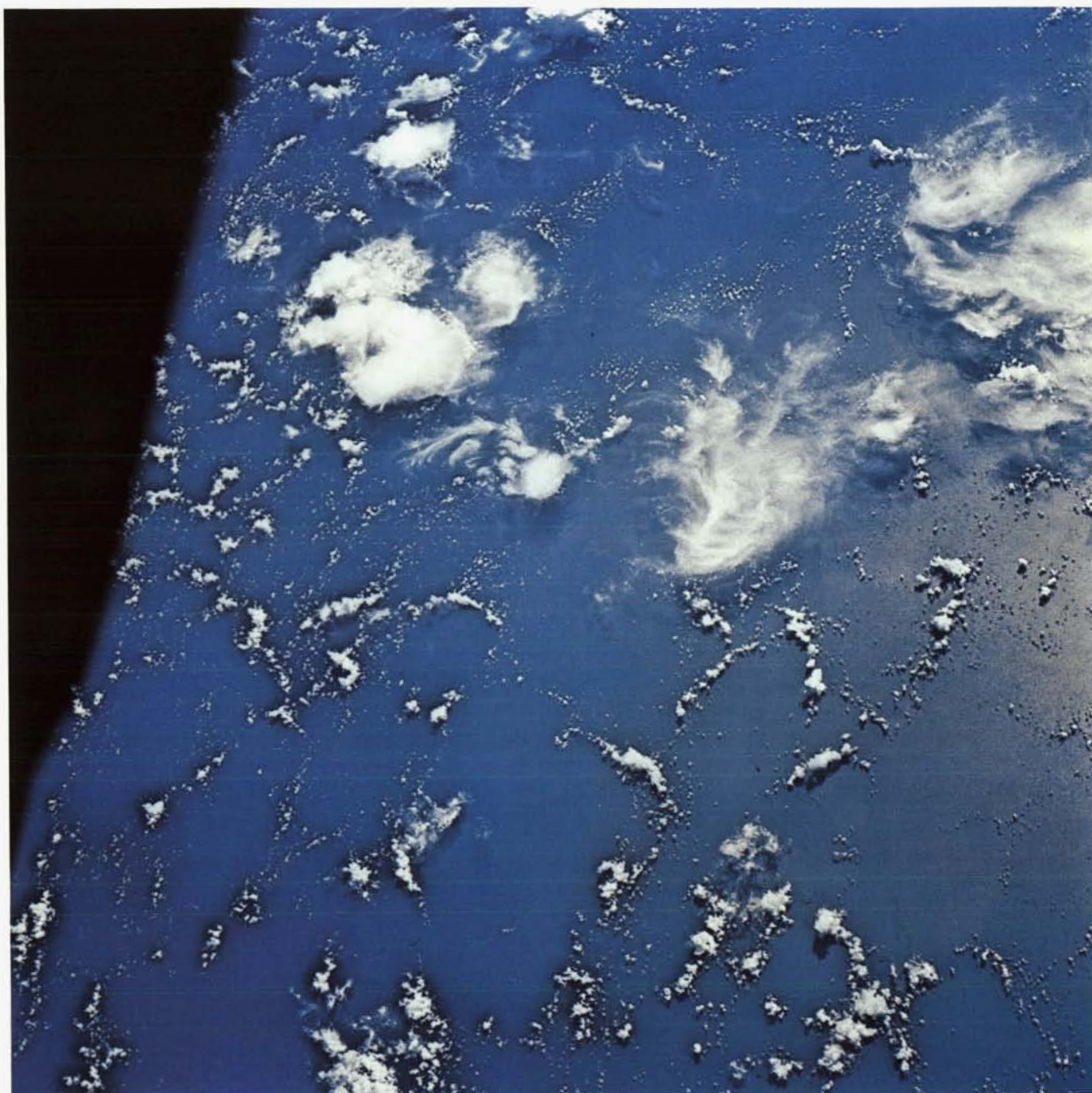


Few large areas of the marine atmosphere in and near the Tropics ever seem completely devoid of clouds. There is about one cloud for every 2 square miles of ocean surface in this picture, even though the total cover seems small. The blue-green outline of Pearl and Hermes Reef is detectable near the right edge of this

photo under a few scattered cumulus and cirrus clouds. These reefs are near the western end of the chain of inlets and reefs that extends for approximately 1250 miles northwest from the main islands of the Hawaiian group. Most of these bits of the State of Hawaii are uninhabited.

GEMINI X JULY 21, 1966 S66-45844



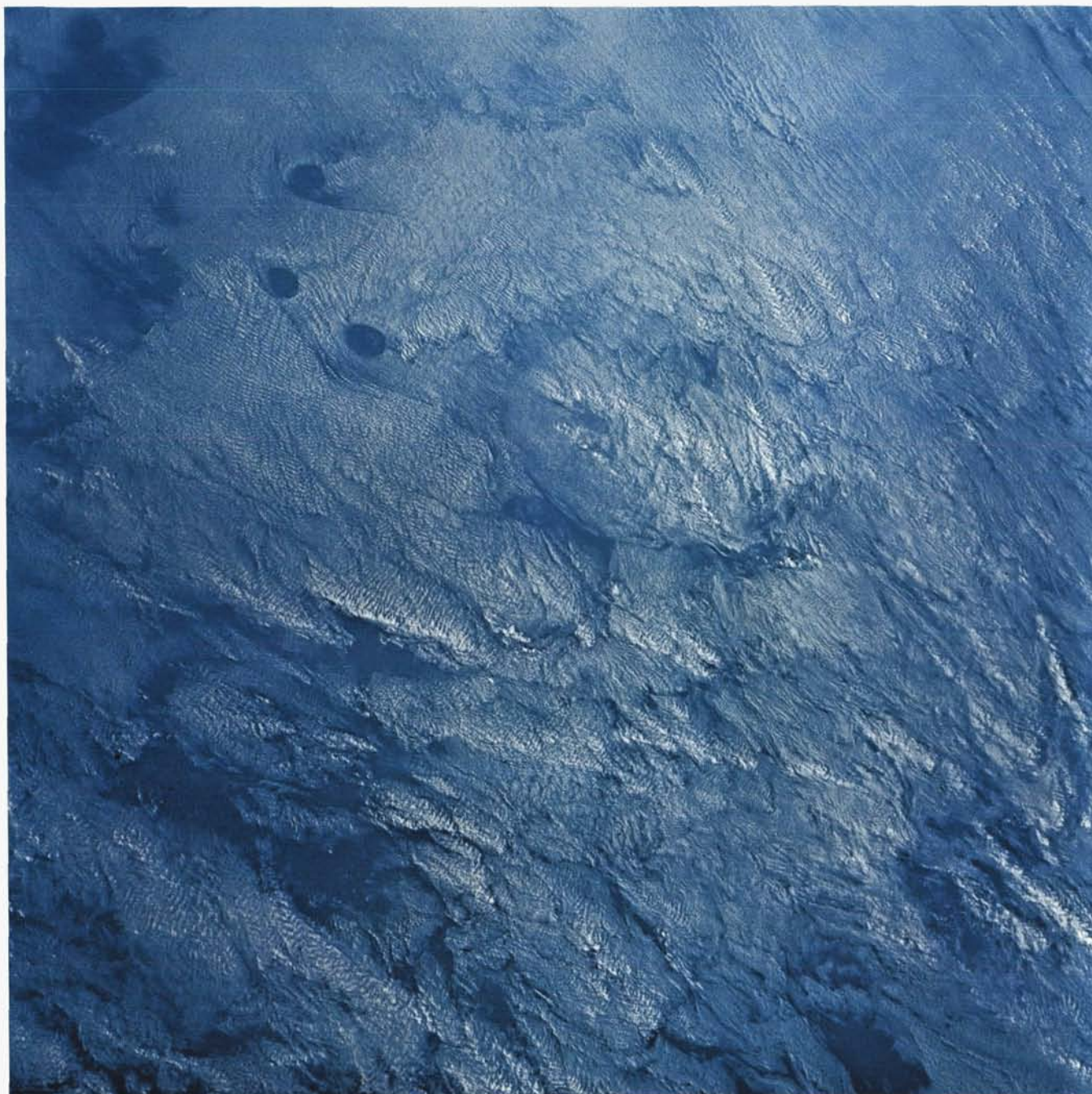


The sky west of Midway Islands offered the viewer another lesson in meteorology the morning that this photo was taken. Small cumulus clouds were growing into polygonal, cell-like structures. This occurs when the surface water is warmer than the air, the temperature is evenly distributed, and there is little or no wind. The

cells in this view were not fully developed. Whether they would become well-formed Bénard-type cells depended on the time available for formation, the difference in temperature between the sea and the atmosphere, and the height through which the convection was occurring.

GEMINI X JULY 21, 1966 S66-45841





These stratocumulus clouds lay over the Pacific west of Ecuador, South America. The three prominent holes in them, at the upper left, were over the volcanic cones of the Galapagos Islands' mountains. The upper one is above Isla Fernandina's 5075-foot peak; the middle and lower ones are above Isla Isabela's two northernmost

peaks. The lines resembling bow waves near each hole were caused by air moving past the mountains from the east. Although the Galapagos Islands are on the Equator, their climate is temperate throughout the year because they are in the path of the cool Peru Current.

GEMINI VII DECEMBER 8, 1965 S65-63854





Victor Hugo called clouds "the only birds that never sleep." This restless flock of them was photographed in the late afternoon over the eastern Pacific about 1000 miles southwest of Baja California. Vigorous convection in the cloud mass at the left was producing a cirrus cloud of ice crystals in the tropical sky, and thin

cirrus was spread over wide areas elsewhere. Polygon-shaped open cells of cumulus clouds can be seen at the lower right, and there are a few cloud streets in the center of the photo. The camera was pointed toward the southeast.

GEMINI XII NOVEMBER 12, 1966 S66-63464



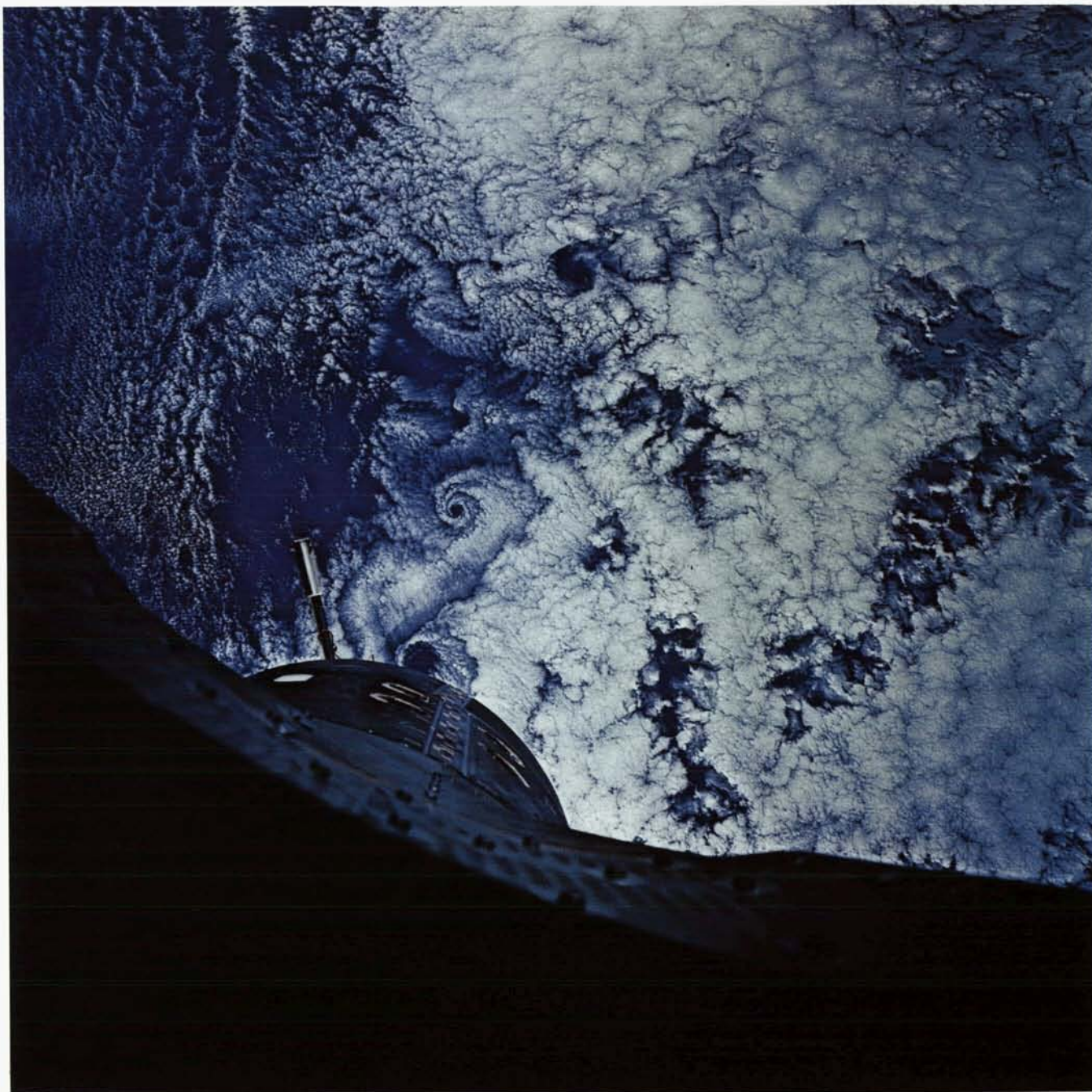


This is a southeasterly view of the eastern Pacific Ocean that includes the Baja California Peninsula and Mexico at the upper left separated by the Gulf of California. Guadalupe Island, in the left center, is surrounded by stratocumulus clouds. Downwind from the island, a chain of vortices has formed similar to eddy patterns

found near the Canary Islands in the Atlantic. The patterns in the foreground indicate cellular convection was occurring in the air near the sea surface. The closed-cell type predominates here, but there are open cells in several areas in the foreground and the upper center.

GEMINI XII NOVEMBER 13, 1966 S66-63493



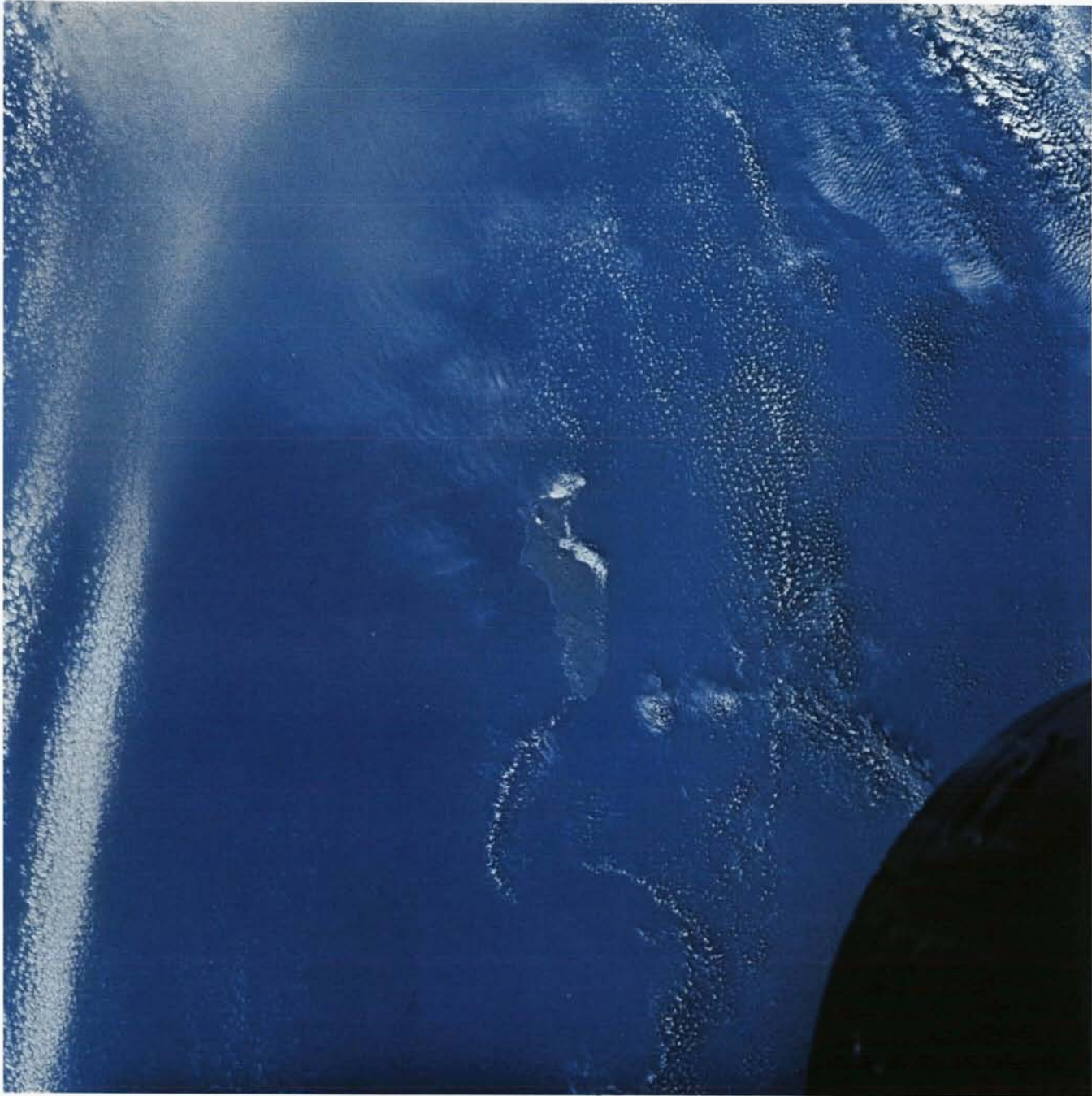


This more nearly vertical view of the Von Kármán vortices downwind from Guadalupe Island was obtained a minute after the preceding one, when the island was behind the spacecraft nose. These eddies over the eastern Pacific Ocean are disturbances caused in air flowing past its mountainous islands. Weak convective currents

in the lower atmosphere give the stratocumulus clouds their cellular appearance. In a closed cell, the air ascends near the center and descends at its edges. The circulation is the opposite of this in an open cell, which has clouds for walls and a clear center. Both types of cells are represented here.

GEMINI XII NOVEMBER 13, 1966 S66-63494



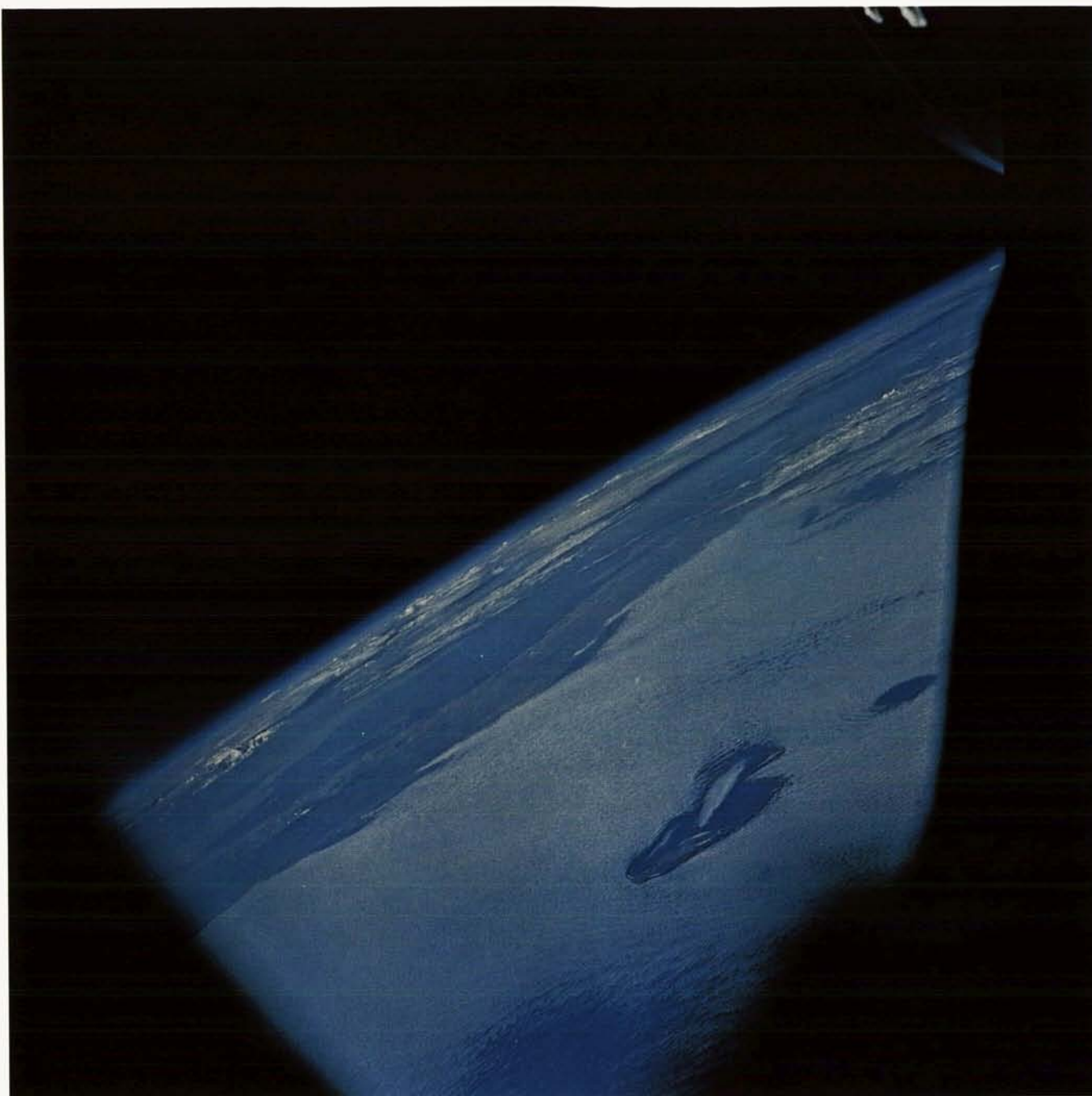


Guadalupe Island is in the center of this photo, taken on a clearer day than the other pictures of it in this group. It is a game preserve for elephant seals, and is about 25 miles long. The winds on this day were northerly and aided in the formation of low stratus clouds over the island's northern coast and the development

of counterrotating eddies downwind. The curved, poorly developed cumulus lines evident here follow, in part, the eddy system in the marine layer. Long, open waves approaching the island from the open Pacific developed the white surf on the island's western shore. The spacecraft window blurred an upper corner of this view.

GEMINI VII DECEMBER 8, 1965 S65-63870





Guadalupe Island is in the opening in the clouds at the lower right. It is about 180 miles west of Baja California, the long peninsula visible in the center of the photo, beyond the clouds. The island is an extinct volcano that rises from a great depth to an altitude of more than 4900 feet. The large openings in these stratocumulus clouds

are Von Kármán vortices that have formed downwind of the island. The cool California current produces a marine climate in this offshore part of Mexico. The Mexican mainland is visible along the horizon beyond the Gulf of California.

GEMINI X JULY 19, 1966 S66-45656



## Part VIII. South America

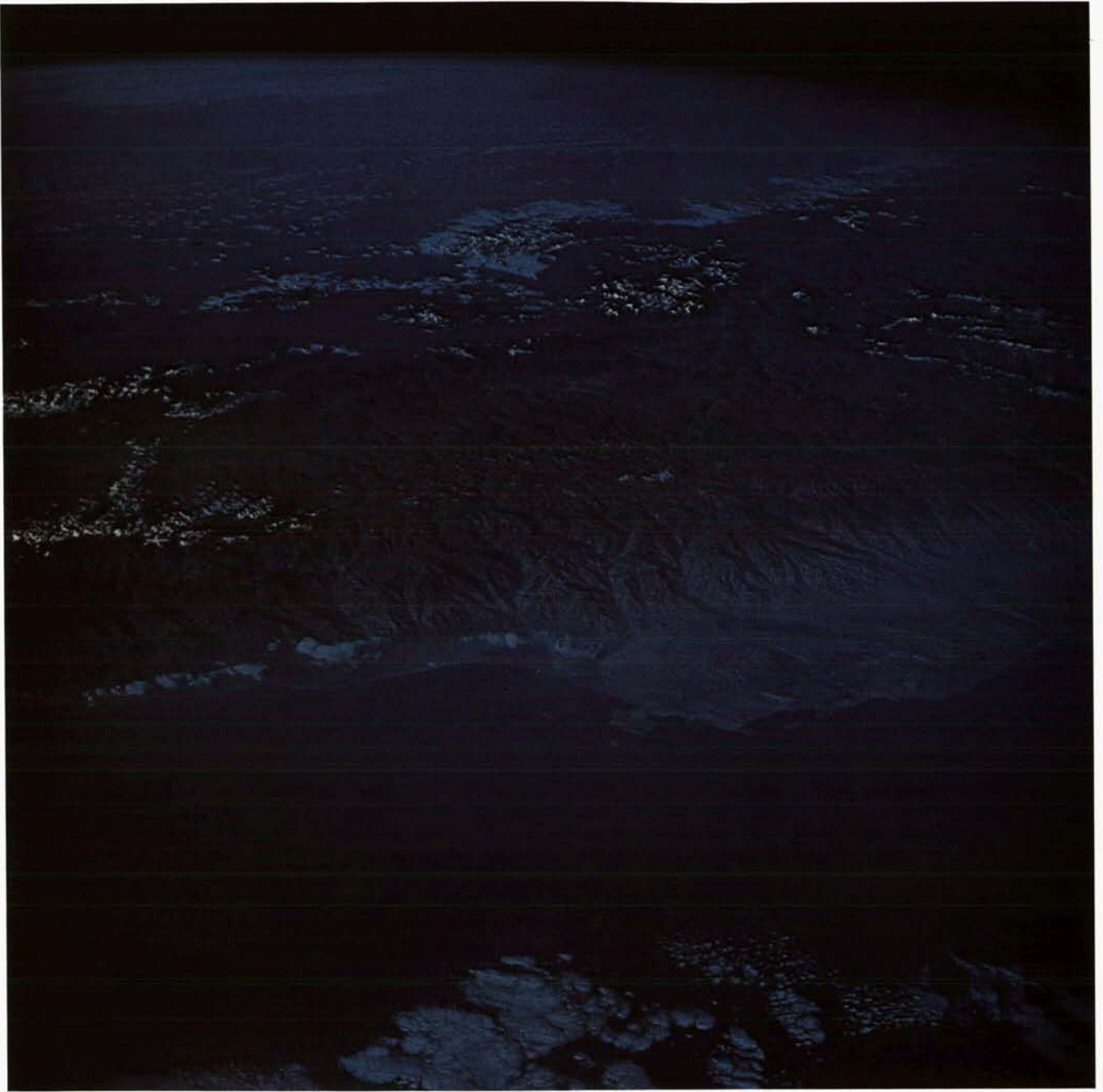
ASTRONAUT Eugene A. Cernan took many of the photographs in this section on what he thinks was “the most fascinating and beautiful trip a man ever made across South America.” The spacecraft carried him over the continent on a southeastward course that it would be arduous to follow on foot, and the weather was clear when he looked across Peru, Bolivia, Chile, and Argentina.

“Without blinking an eye,” he wrote afterward, “I could see the high Andes, the Pacific Ocean, the great Altiplano with a jewellike Titicaca, the rain forests of the Amazon Basin, and the Chaco plains on down our orbital path.” In addition to what he saw, this section contains pictures taken on three other Gemini flights.

These include some examples of photos taken on color infrared film. The camera has enabled men to use parts of the spectrum to which their own eyes do not respond, and this increases the information obtainable from afar about conditions on the Earth’s surface. By combining the observations made in different spectral bands, scientists obtain still more information. This enables them to survey and study developments in parts of the Earth that are difficult and sometimes perilous to enter.

South America has been generous to bygone civilizations as well as to our own (e.g., the potato originated there), but our knowledge of many parts of it is still shamefully meager and can be enhanced by photographs such as these.



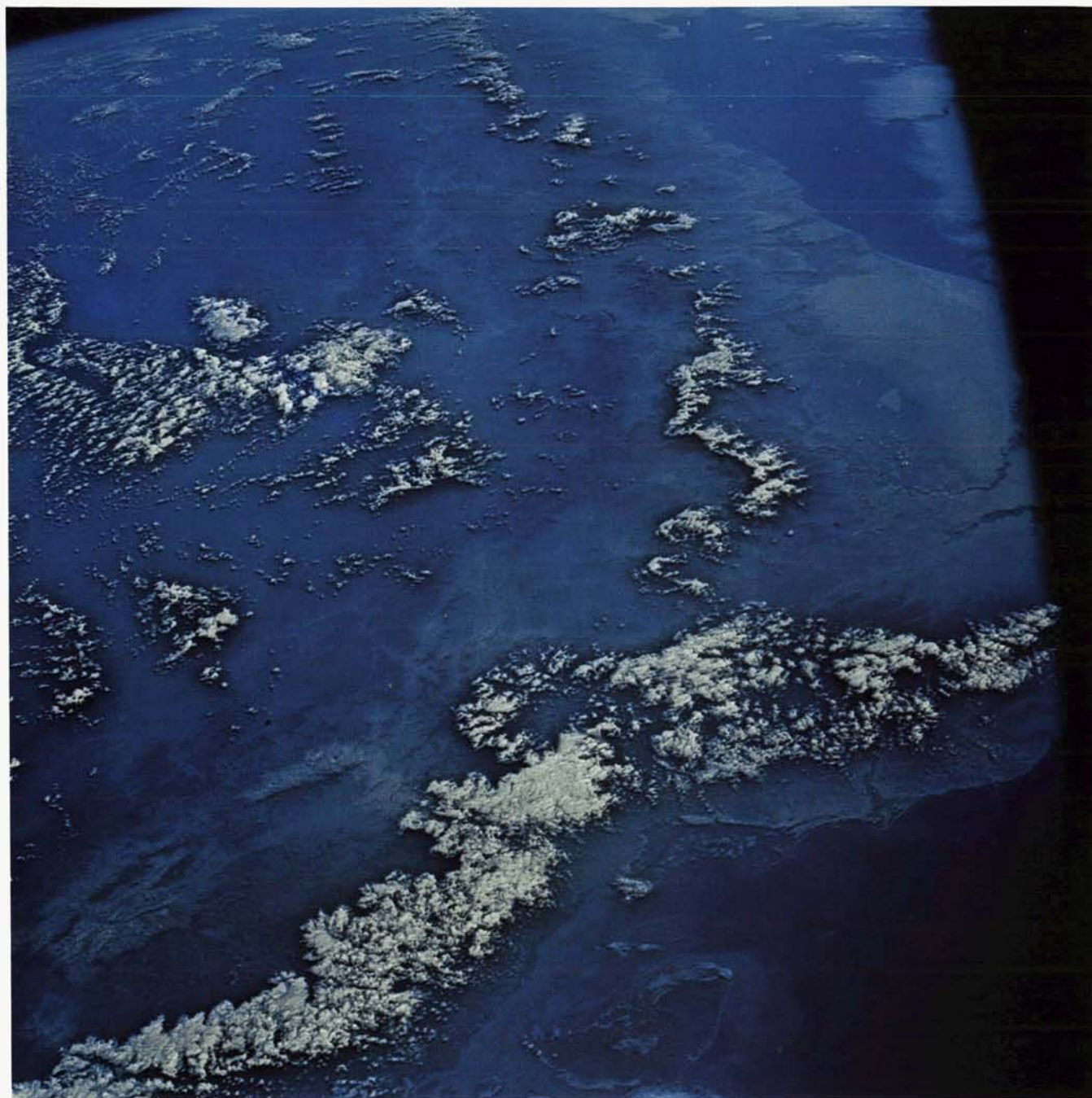


This is the towering Andean cordillera in Peru as seen from over the Pacific Ocean. The narrow coastal plain in the foreground is between Lima and San Juan. Península Paracus is nearly in its center. Beyond the peaks above it, the Río Uçayali, and the Vilcabamba Mountains, the view extends into the Amazon Basin. The

snow and ice on many peaks are difficult to distinguish from cumulus clouds reflecting the setting Sun's light. The Peru Current brings relatively cool water to this part of South America's western coast and stabilizes the lower atmosphere. Stratus and stratocumulus clouds hover offshore here throughout much of the year.

GEMINI IX JUNE 4, 1966 S66-38281



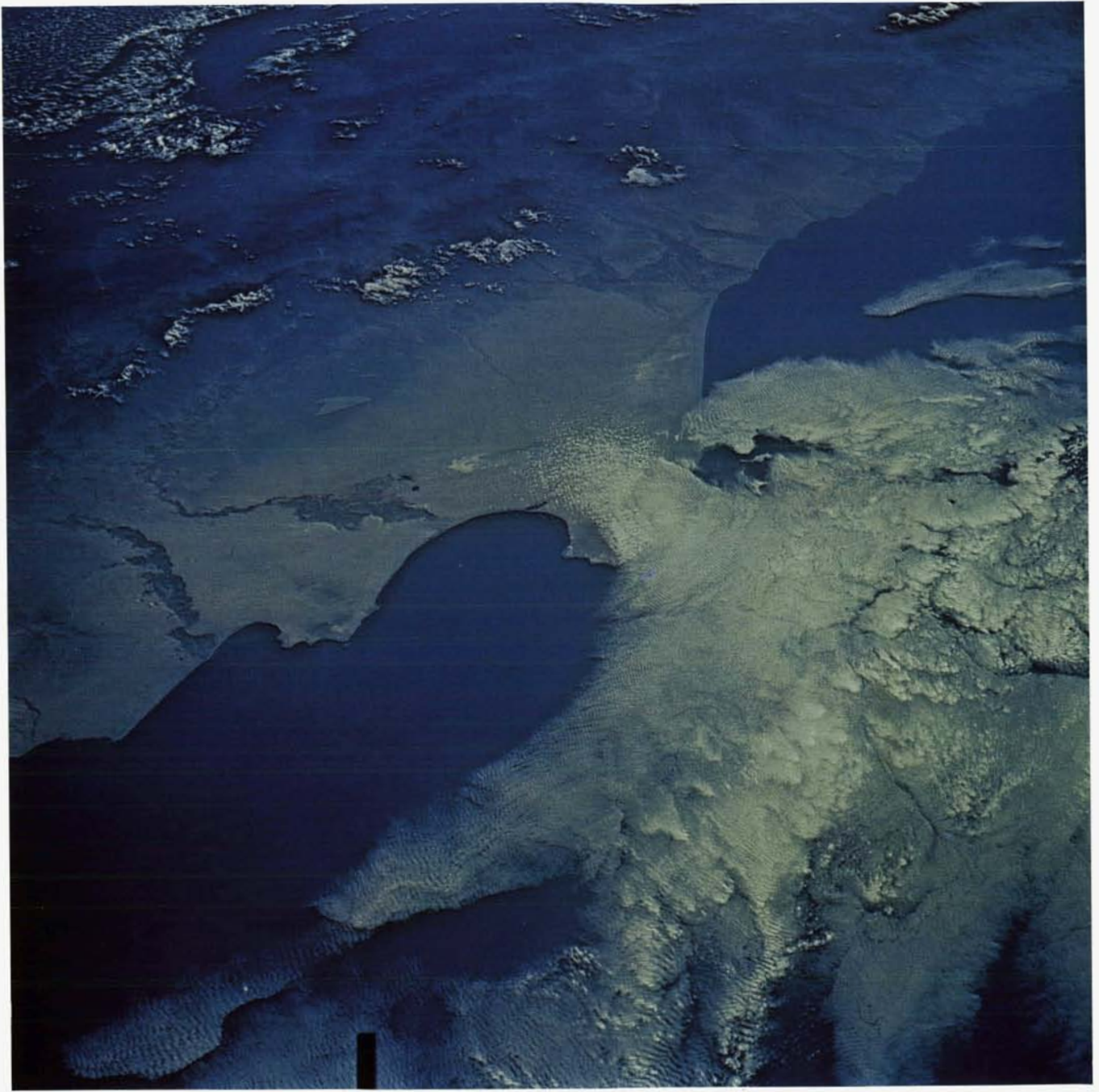


This photo was taken from above the main ridges of the Andes. An irregular band of stratocumulus follows the Western slopes of the mountains a few degrees south of the Equator in Ecuador and Peru. The Amazon Basin begins at the far left, where cumuliform clouds cover the Marañón river's course. The Golfo de Guayaquil is

in the foreground, with the Isla de Puna below it. Early in the 1500's, Pizarro began his search for South America's gold near a point of land formed by a river delta at the lower right. It is now Tumbes, the most northern port of Peru. Another, more southerly, strip of the Peruvian coast is in the upper right corner.

GEMINI IX JUNE 4, 1966 S66-38273



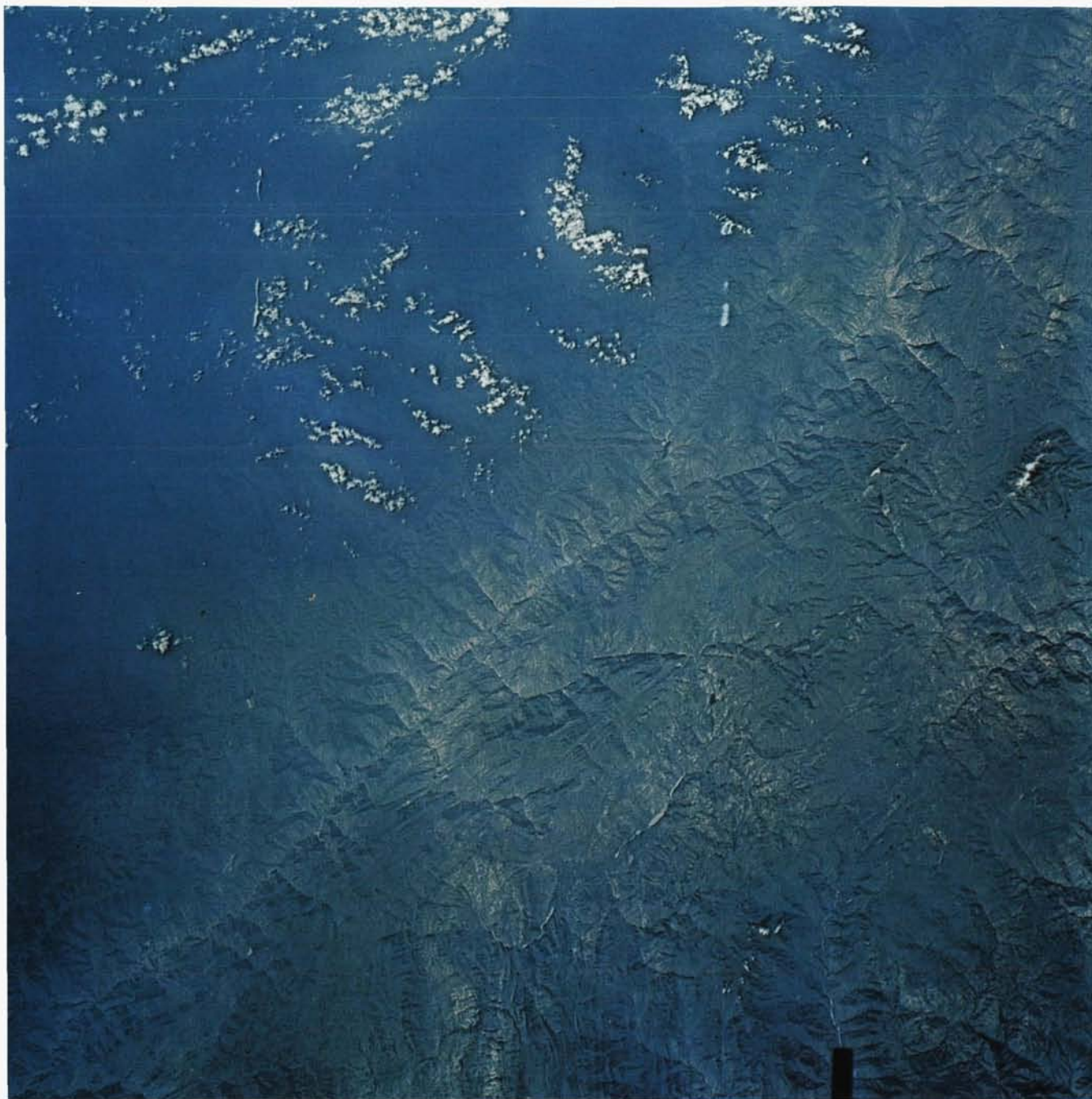


The large curving embayment near the center of this view of western Peru is the Bahía de Sechura, and the narrow coastal plain around it is called the Desierto de Sechura. The results of irrigation along the rivers that cross it are quite apparent. The shoreline shown extends south from Talara about 375 miles to Chimbote. The

Pacific waters off the cape at the far left are famous for big-game fishing; black marlin weighing more than half a ton are caught there. The high Andean chain cuts across the upper part of the photo, and snow can be seen on its peaks. South America's enormous Amazon drainage system begins in the upper left corner.

GEMINI IX JUNE 5, 1966 S66-38291





Some parts of the canyon that crosses this picture diagonally are 2 miles deep. These are the mountains of Peru east of the coastal plain shown in the preceding picture. The Rio Marañón, which carries water from them to the Amazon, flows through this canyon. Tropical forests cover the Cordillera Central and the Cordillera

Oriental below the scattered cumuliform clouds at the left. Near the right edge, a snow-covered peak of the Cordillera Blanca is quite distinct. This photo includes parts of five northern departments of Peru: Ancash, La Libertad, San Martín, Amazonas, and Cajamarca. This is still a poorly mapped part of the world.

GEMINI IX JUNE 5, 1966 S66-38525



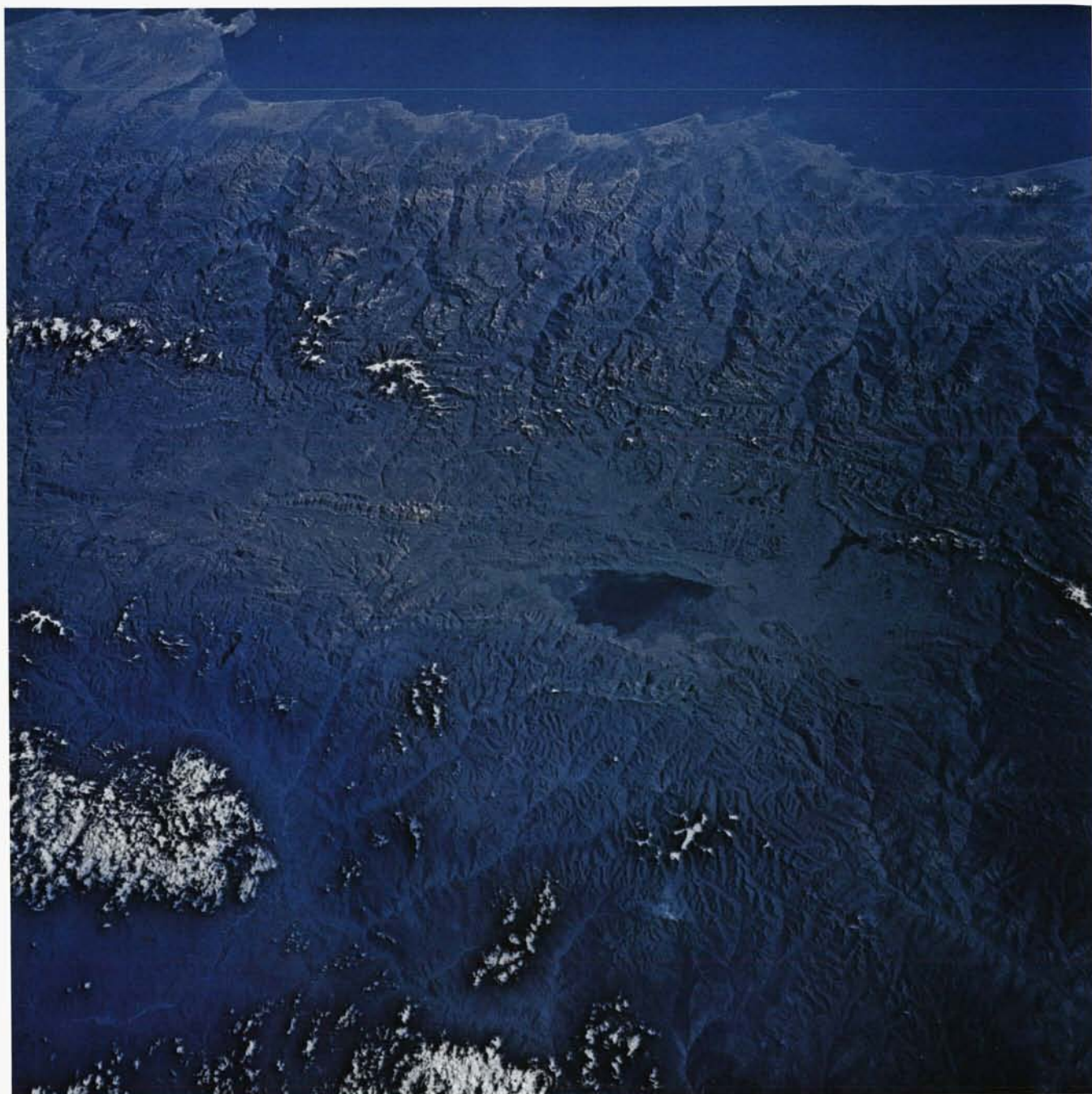


This photograph of nearly 250 miles of Peru's coast suggests how helpful spacecraft may be to surveyors. In the middle of the shoreline shown, a narrow strip of land connects Ferral Peninsula to the mainland near Chimbote. The snowline toward the upper left is more than 16 000 feet above the sea. The Continental Divide fol-

lows the Cordillera Blanca across the country there. One of the most prominent snow-covered peaks is the 22 505-foot Huascarán volcano. A thin white line can be seen running down its western slope toward the sea. This is the scar left in 1962 by an avalanche that killed several thousand persons in the Rio Santo Valley.

GEMINI IX JUNE 5, 1966 S66-38298



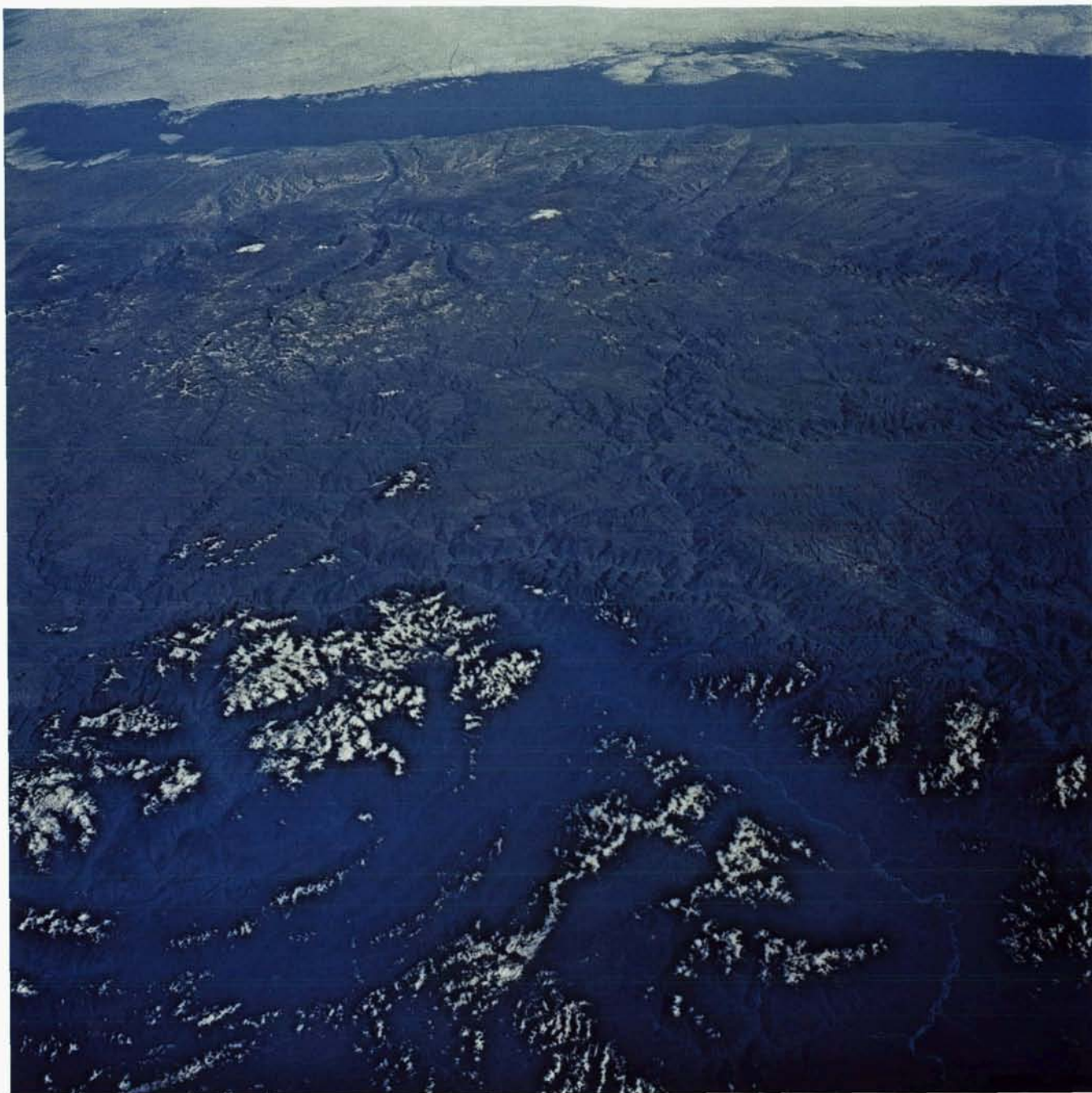


Another strip of the coast of Peru, south of the area shown on the preceding page, is at the top of this picture of the Andes as they appeared when photographed from the east. The large dark lake in the center here is Lago de Junín. Cerro de Pasco is to the right of it, at an altitude of 17 572 feet. The Cordillera Huayhuash ranges,

an important source of minerals, are between the lake and the sea. Snow whitens many of the peaks. The island in the upper right is San Lorenzo. Callao, the port which serves Lima, Peru's capital, is on a small peninsula near that island, over which smoke was floating when this picture was taken.

GEMINI IX JUNE 5, 1966 S66-38300





Rivers visible between the cumulus clouds at the bottom of this picture flow nearly 4000 miles to mouths on the Atlantic. The Pacific continental shelf is at the top of the photo. The Peruvian coastline shown extends south-eastward from Bahia de Caballa to Nevada Coropuna. Inland toward the left one can see the great snowfields

on Nevada Coropuna, 21 079 feet high, and Nevada Ampato's twin peaks, 20 702 feet high. The clear zone in the sky may have resulted from the upwelling of cold water and divergence in the atmosphere's friction layer. This divergence is produced when a southeast wind blows over the water adjacent to the arid shoreland.

GEMINI IX JUNE 5, 1966 S66-38303





Cusco, once the Inca empire's capital, is nearly in the center of this photo of the towering mountains south-east of Lima, Peru. At the left, where the Cordillera Vilcanota rises 22 000 feet, fields of snow form a white cup around the Laguna Sibnacochas. Below that cup, cumulus clouds and blue haze darken the flat tropical

rain forests of the Madre de Dios drainage system. Mile-deep canyons abound along the eastern front of the Andes. The clouds at the right in this view follow the mountains' curving ridges. At the very top of the picture, streaked by snow, is Flor del Mundo. Its northern flank is the source of the Amazon River.

GEMINI IX JUNE 5, 1966 S66-38306





This is the world's highest navigable lake: Titicaca is 12 500 feet above the sea, 700 feet deep, and covers 3200 square miles. La Paz, Bolivia's capital, is tucked against the Cordillera Real southeast of it. Peru shares the shores of Titicaca with Bolivia and in the distance you can see the Chilean-Peruvian desert along the Pacific.

The land is arid there despite its nearness to the sea and offshore cloudiness. Two salt flats, Salar de Uyuni and Salar de Coipasa, are near the left edge of the photo. Many volcanoes in the snowcapped Andes exceed 20 000 feet. The snow at the lower right is on the Cordillera Vilcanota.

GEMINI IX JUNE 5, 1966 S66-38312





The bleak, windswept plateau in the lower center of this photo is the Altiplano between Lake Poopo, at the left, and Lake Titicaca, at the right. Lake Poopo is smaller and a few hundred feet lower than Titicaca. West of it enormous salt flats whiten the landscape nearly as much as do the clouds over the Pacific at the upper

right. The warm, dry, upper-level air of the trade winds reaches the high elevations of Bolivia and gives this region a desert or steppe climate. Much of the shoreline here is in Chile. The stratus cloudiness over the Pacific is often a persistent feature of the weather along this part of the coast.

GEMINI IX JUNE 5, 1966 S66-38313



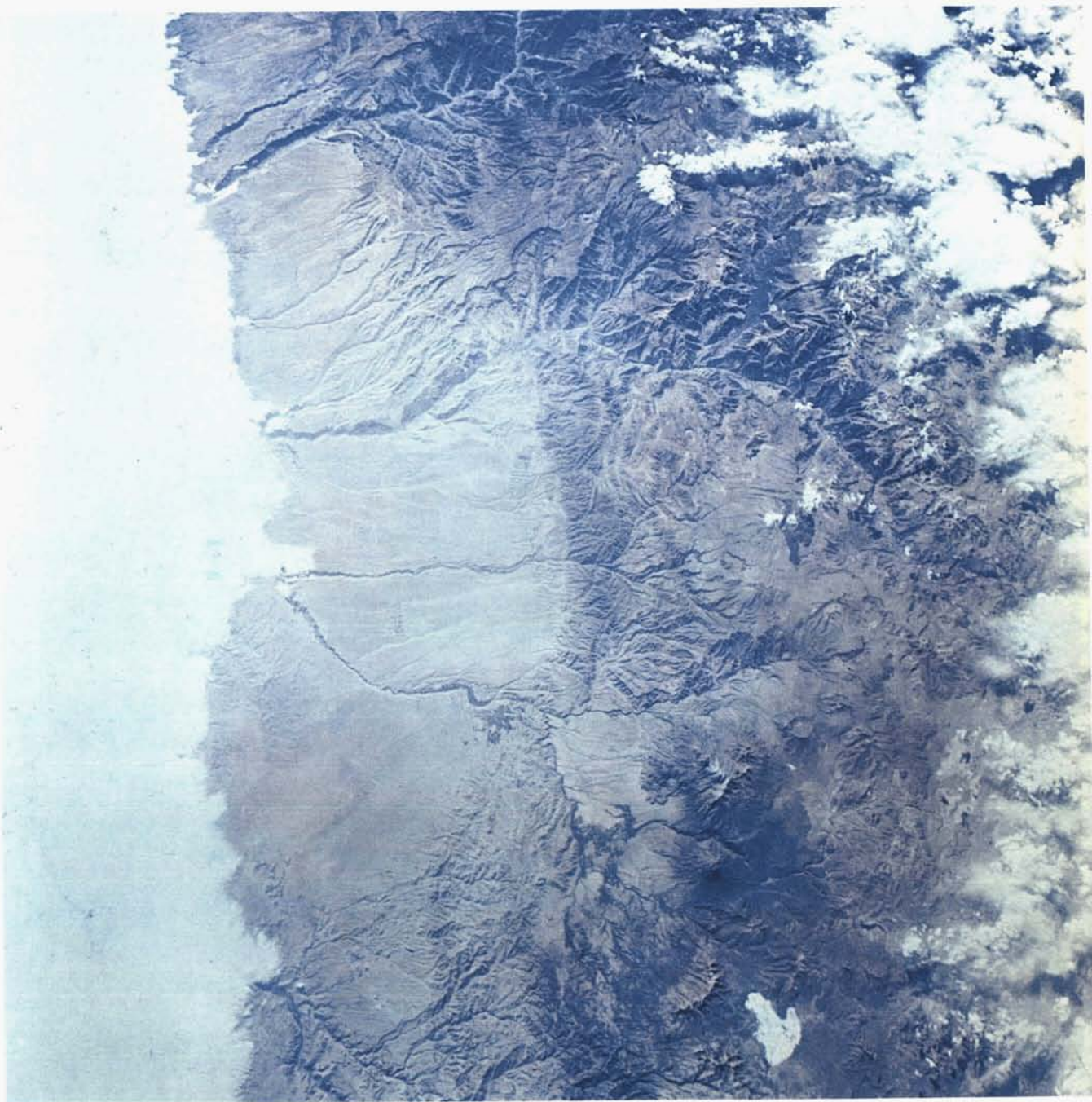


The Andean uplift extends along the west coast of South America for 5000 miles. This was the view to the south when the spacecraft crossed it north of Lake Poopo, in the foreground, and the salt flats shown in two previous pictures. Beyond them are the mountains of southern Bolivia, and the volcanoes, lakes, and salt beds of the

Puna de Atacama. The view includes northern parts of both Argentina and Chile. At the left the easterly ranges of the Andes drop to the rolling forested region of the Gran Chaco. At the right near the horizon is a deck of stratus clouds that extends far down the long Pacific coast of Chile.

GEMINI IX JUNE 5, 1966 S66-38315





Low stratus clouds extended inland possibly 5 miles and cumuliform clouds covered the Andes 100 miles from the sea when this photo was taken of the mountains around Arequipa, Peru's second largest city. The Río Majes canyon in the center is a mile deep. The city is in the lower part of this view's center, at an altitude of 7500

feet. Northeast of it, three volcanos, Misti, Chachani, and Ampato rise, respectively, 19 098, 19 931, and 20 702 feet. Snow is found on the high peaks, but Arequipa is famous for its flower gardens. Ruins of a civilization believed to have preceded that of the Incas have been found near it.

GEMINI XI SEPTEMBER 14, 1966 S66-54832





The setting Sun's rays gave a golden tint to the thick edges of cirrostratus clouds, and the Cordillera de Los Andes threw long shadows eastward, when the astronauts obtained this picture of southwestern Brazil, northern Argentina, and Chile. Two salt flats and two small lakes, the Laguna Pastos Grandes and the Salina Olaroz,

can be distinguished in the foreground when one studies this photo with a map of the area in hand. South America's Andean spine includes many of the Western Hemisphere's highest peaks. Here, however, the convective towers protruding upward in the clouds are more prominent than the mountains for which the area is noted.

GEMINI VII DECEMBER 12, 1965 S65-63780



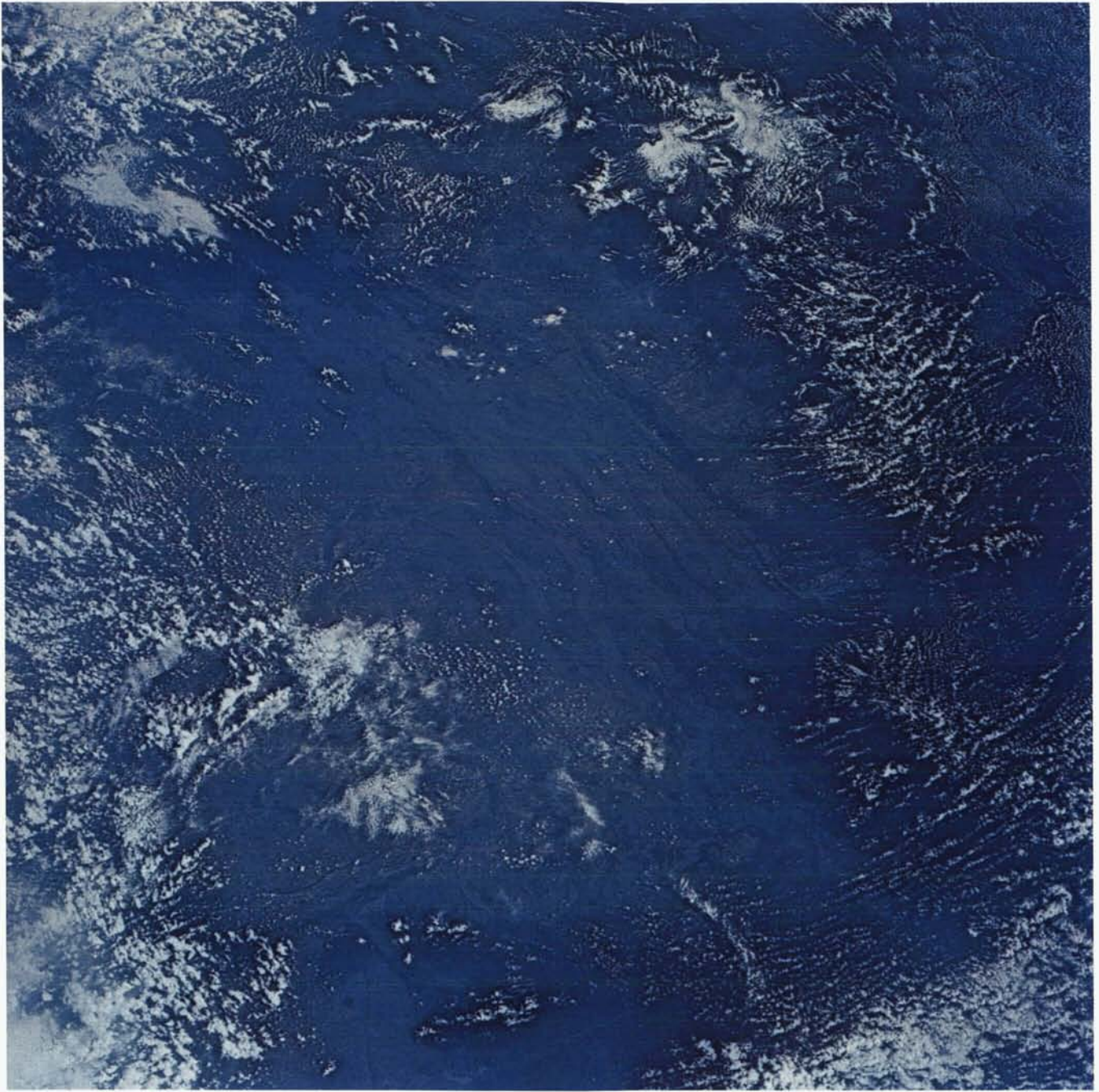


There were four layers of clouds below the spacecraft the day this picture was taken over equatorial northwest Brazil. When viewed stereoscopically, by using this and an adjacent frame (not reproduced here), each layer is distinct. Two are high-level layers of cirrus, beneath which there is a middle layer of altocumulus, and a lower

layer of cumulus. The cumulus-cloud pattern reflects the underlying cool surface of a large river containing islands. It probably is the Río Negro near Barcelos, a town in the State of Amazonas. The Río Negro is a broad stream that crosses the Equator to flow southeast into the Amazon River.

GEMINI X JULY 21, 1966 S66-46047





Brazil's northernmost State, R o Branco, is in the foreground, Venezuela in the left, and Guyana in the right of this photo. The dark, forested areas under cumulus-cloud patterns around the basin in the center are plateaus of sandstones and lava flows, resting on the Precambrian granites and gneisses that constitute the cloud-

free basin. The rain forest yields valuable wood and wood products, and the crystalline rocks contain much mineral wealth, including gold and diamonds, but the vegetation has hampered exploration. The large looping river in the lower center is the R o Tacutu, which joins another stream to form the R o Branco.

GEMINI X JULY 21, 1966 S66-46050



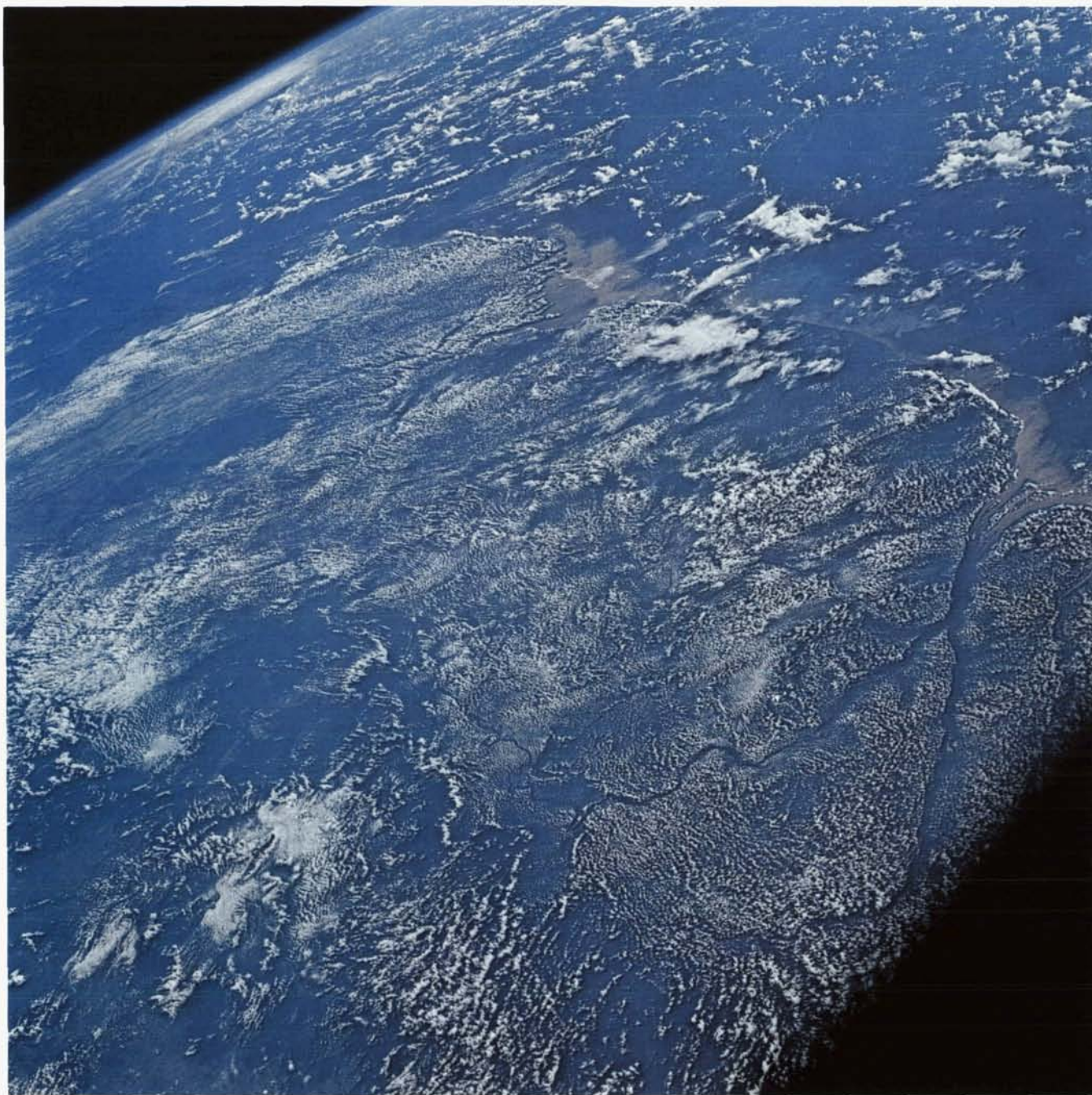


The Pakarima Mountains are in the lower right here, and Brazil, Venezuela, and Guyana meet beneath a heavy cloud patch over Mount Roraima near the center. Beyond Mount Roraima is the Gran Sabana, Venezuela's portion of the Guyana highlands. Although these high, flat-topped mesas occupy nearly half of Venezuela,

less than 3 percent of the people live on them. The complex pattern of cumulus clouds here is shaped by the topography and by light winds of a weak pressure gradient. Near the coastal region in the upper part of the picture, these clouds trend east-west. There is some cirrus cloudiness in the lower left.

GEMINI X JULY 21, 1966 S66-46051



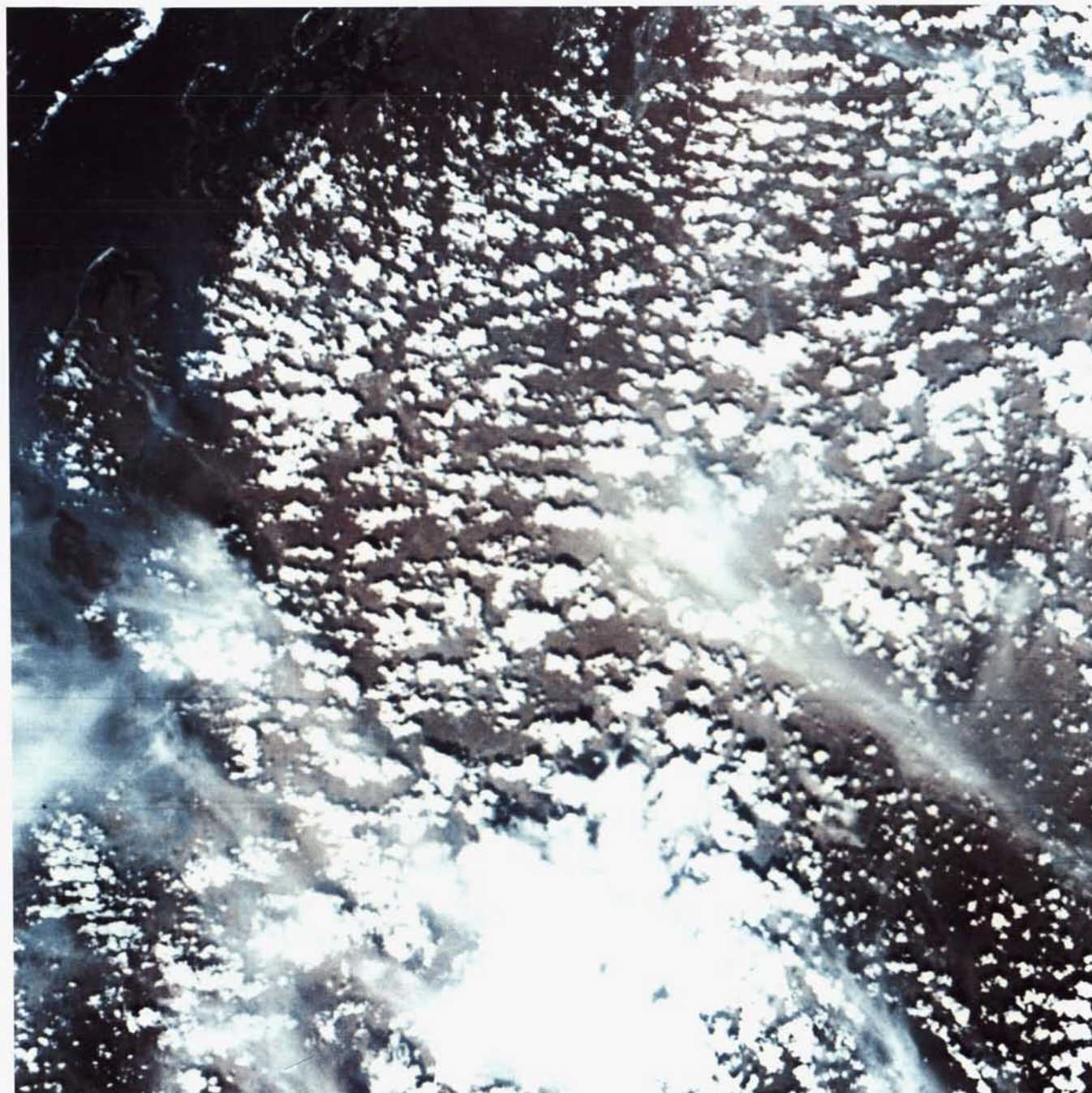


This picture overlaps the preceding one and includes the northern coast of South America from Caracas, Venezuela, at the left, to Georgetown, Guyana, at the right. Landward, a narrow coastal plane separates the great Guyana plateau from the sea. The massive delta of the Orinoco River is in the upper center and the mouth of

the Essequibo River is at the right. The larger tributaries of the Essequibo River system are remarkably outlined in the cumulus-cloud pattern. Sedimentation has discolored the Atlantic waters at the river mouths and along the shore. Scattered over the sea offshore are trade-wind cumuli.

GEMINI X JULY 21, 1966 S66-46052



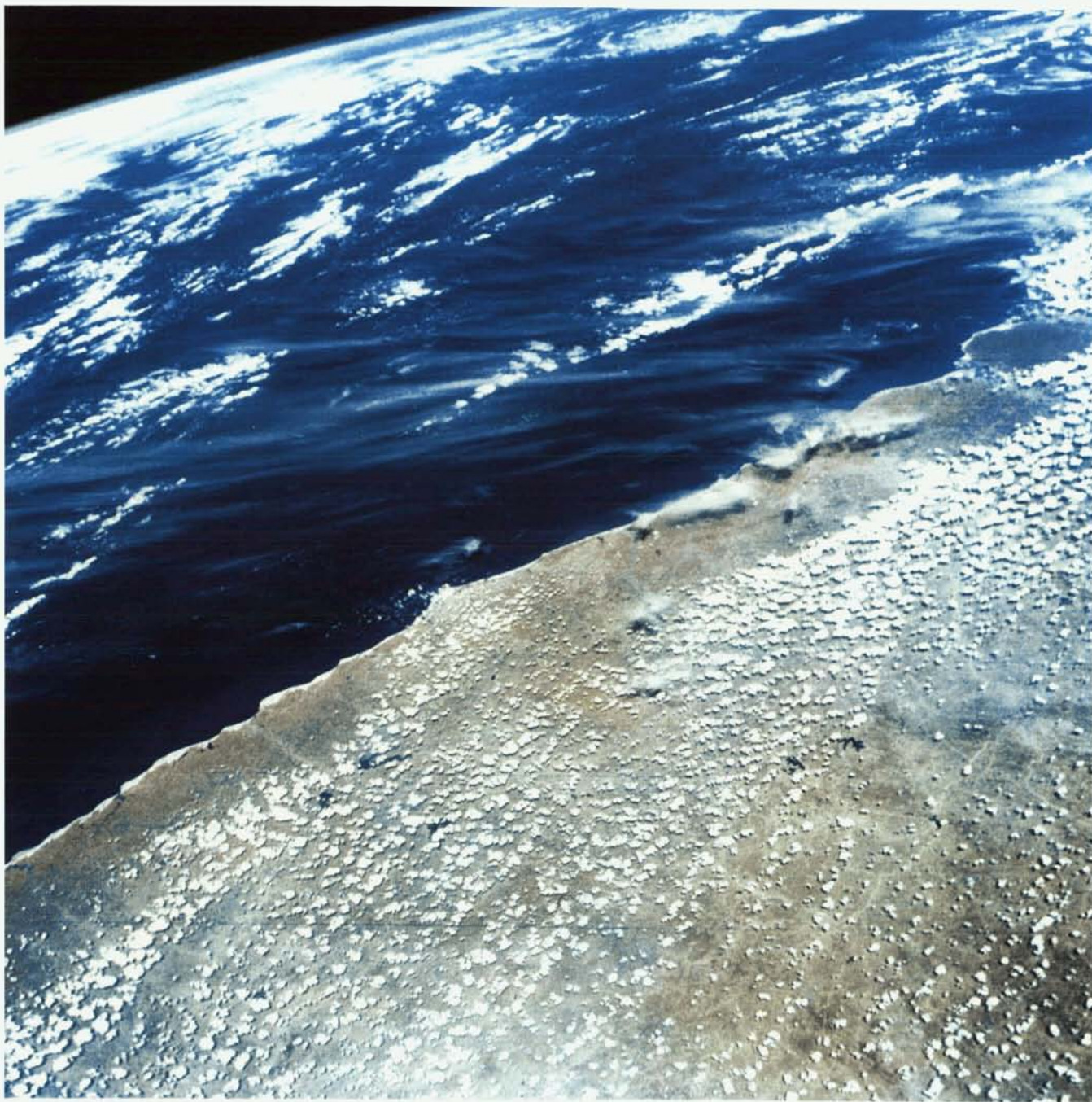


This and the next two photos were taken on color infrared film. They show Brazil's Atlantic coast from the Baía de São Marcos, in the upper left here, eastward around the Natal corner and south to João Pessoa. Varying tones of red indicate changes in the green vegetation. Dense growth on coastal lowlands deepens the red

near the Baía de São Marcos. Only a few major streams, draining a small part of Brazil's highlands, feed this bay. From it the land rises gradually to more than 400 feet above sea level at the right edge of the photo. The cloud pattern here consists of cumuli in rows, cumuli congesti, and a few wisps of cirrus.

GEMINI VII DECEMBER 17, 1965 S65-64069



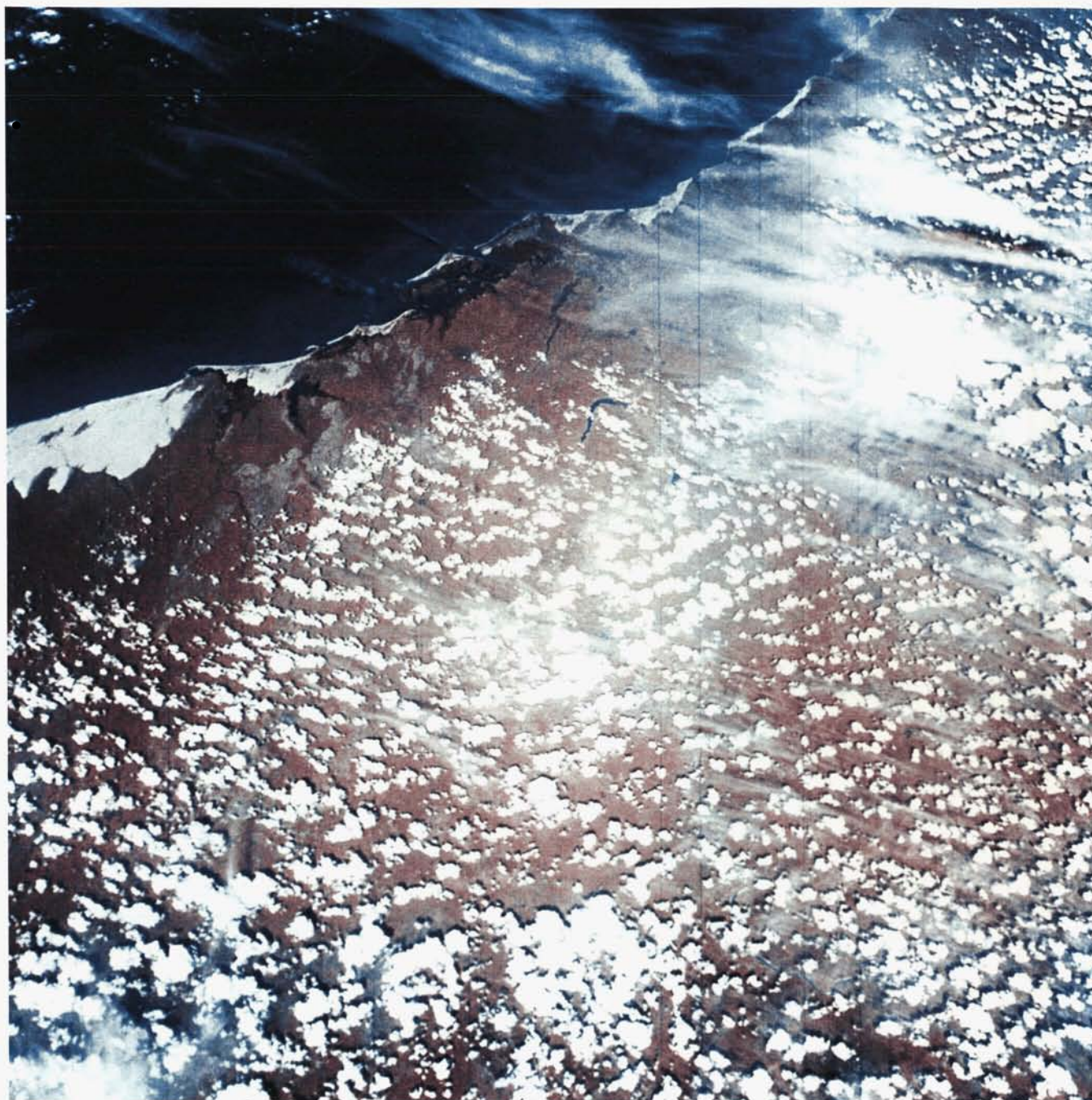


One can trace rivers in the foreground of this infrared photo of the Brazilian coastline from Ponta Redonda east nearly to Natal. The city of Fortaleza is under the clouds over the prominent cape in the center. The shore on both sides of it and inland, where there are mountains, is tinted by dense vegetation. Lowlands surround

the Serra da Uruburetama in the lower center. A sea breeze had kept miles of the sandy beach free from clouds. Near the horizon the clouds are distinct because the intervening atmosphere does not scatter as much light at near-infrared wavelengths as it does at the shorter wavelengths used in most photography.

GEMINI VII DECEMBER 17, 1965 S65-64073



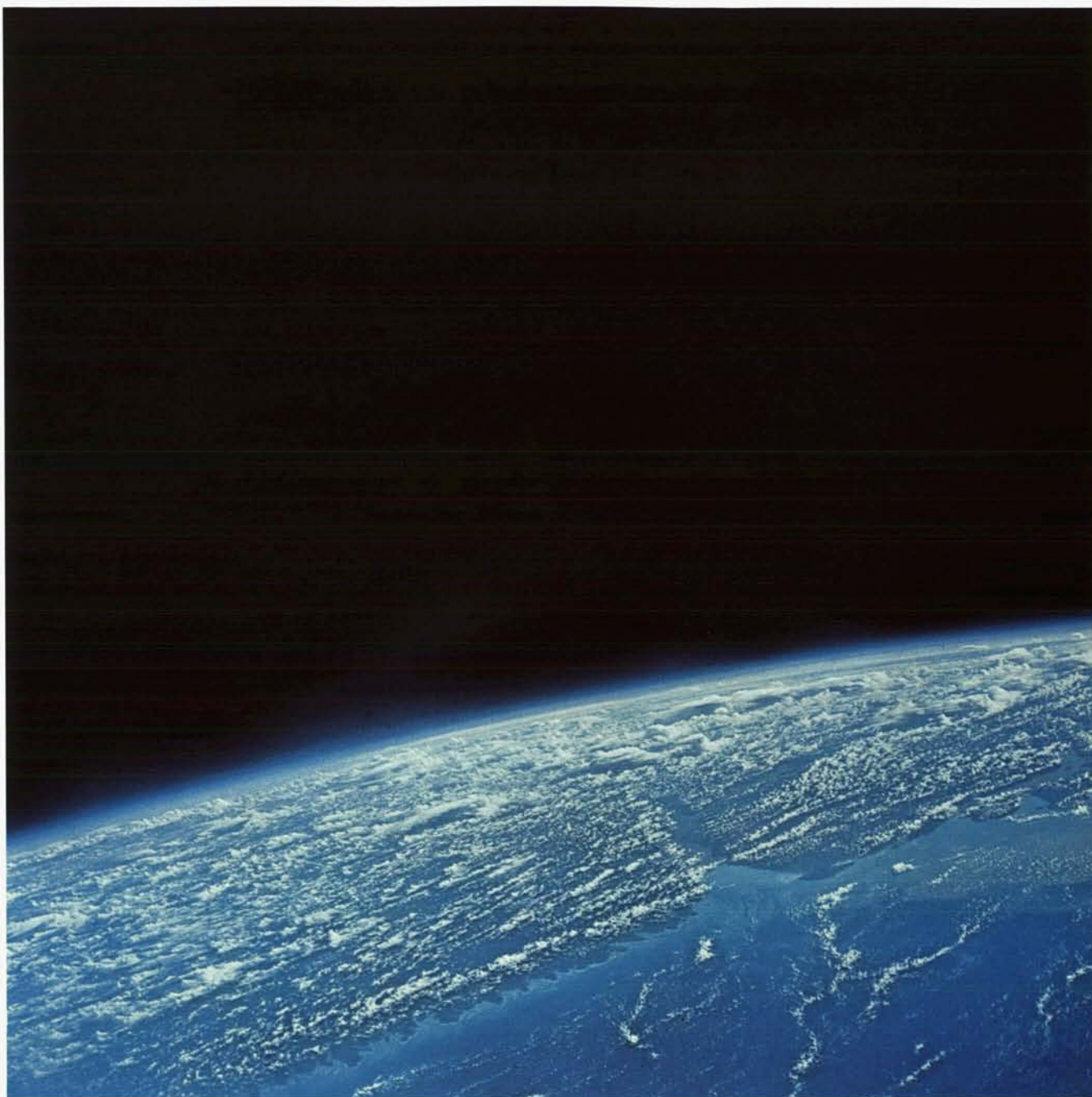


This photo partly overlaps the preceding one. It shows Brazil's coast as far east as Ponta Jericoacoara, the cape at the very top. Parnaíba is several miles inland from the cape in the center, and Camocim is in a small bay above it. The white splashes are quartz sand, carried down from highlands by rivers, strewn by coastal cur-

rents, and whipped into dunes by offshore winds. Cumulus clouds laced above by cirrus begin inland, beyond the cooling effect of the sea breeze. The terrain's redness shows how heavily it is cloaked by vegetation. The land rises to more than 2500 feet at the upper right, where the Serra da Ibiapaba ends.

GEMINI VII DECEMBER 17, 1965 S65-64070



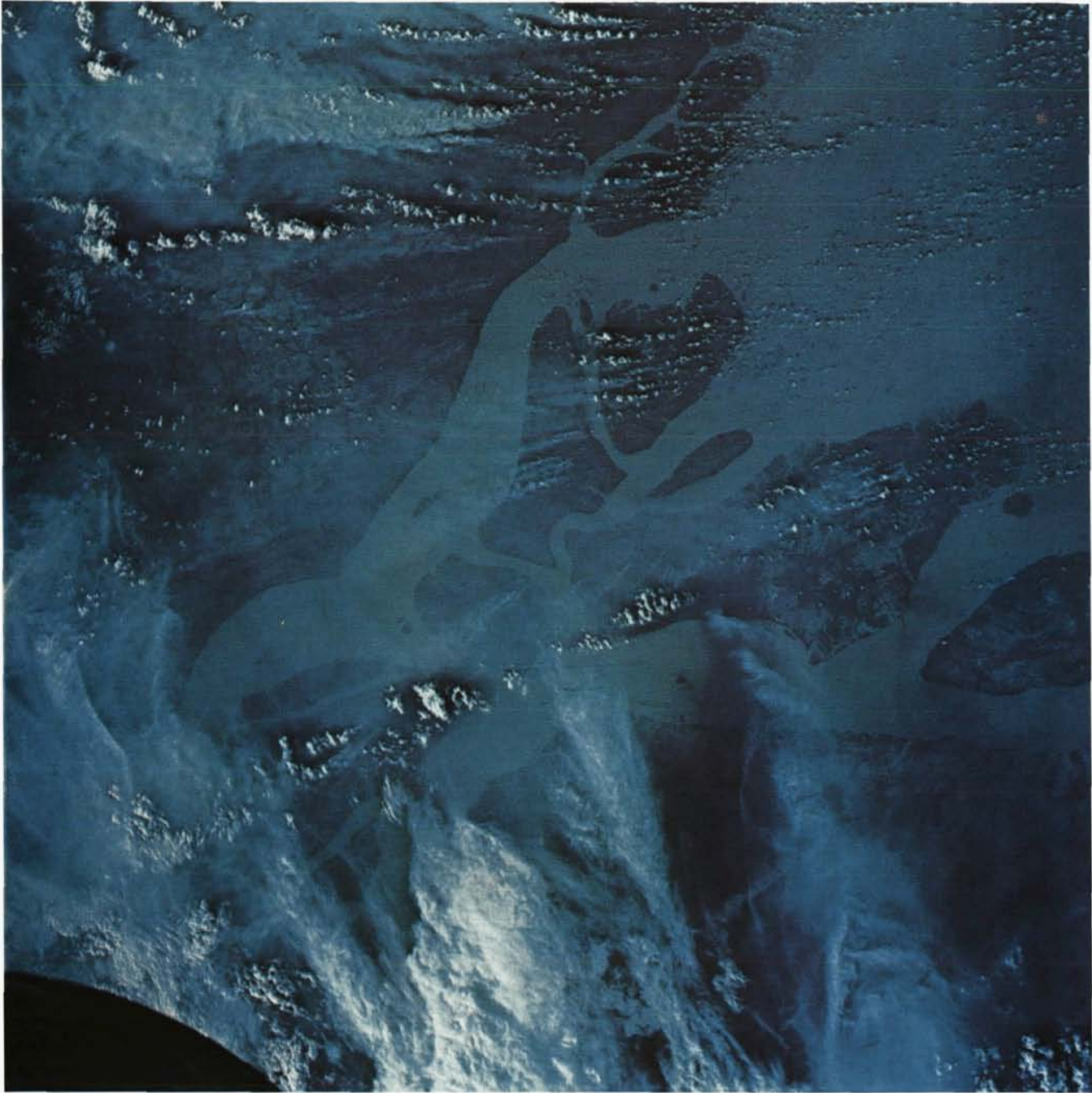


The strip of Brazil's northeast coast in the foreground here begins near Carutapera and continues to the Amazon River's mouth at the right. The many rows of convective clouds, ranging from tiny cumuli to towering cumulonimbi, extend far inland. Near the center they part over the long Baía de Marajó by which ships ap-

proach Belém. The Ilha de Marajó is to the right, separated from two other islands, Ilha Mexiana and Cavi-ana (at the right edge), by the Canal do Sul, one of the Amazon's main channels. The sea is discolored beyond them by suspended sediments for distances up to 50 miles.

GEMINI IX JUNE 4, 1966 S66-38191





A late-afternoon Sun penetrated the parallel rows of cumulus clouds in the foreground of this nearly vertical picture enough to expose the large islands in the broad, brown Amazon River's mouth. Alongside the cirrus clouds at the top of the photo, thick smoke from burning forests obscured the view. The Amazon's main channels

are Canal do Sul, below center, and Canal do Norte, above it. The great river's mouth is dirtied by the vast quantities of mud and silt that it carries far into the Atlantic currents off Brazil's northern shore. Here the water flows through a low, swampy, thinly populated tidewater area covered by forests.

GEMINI VII DECEMBER 12, 1965 S65-64001



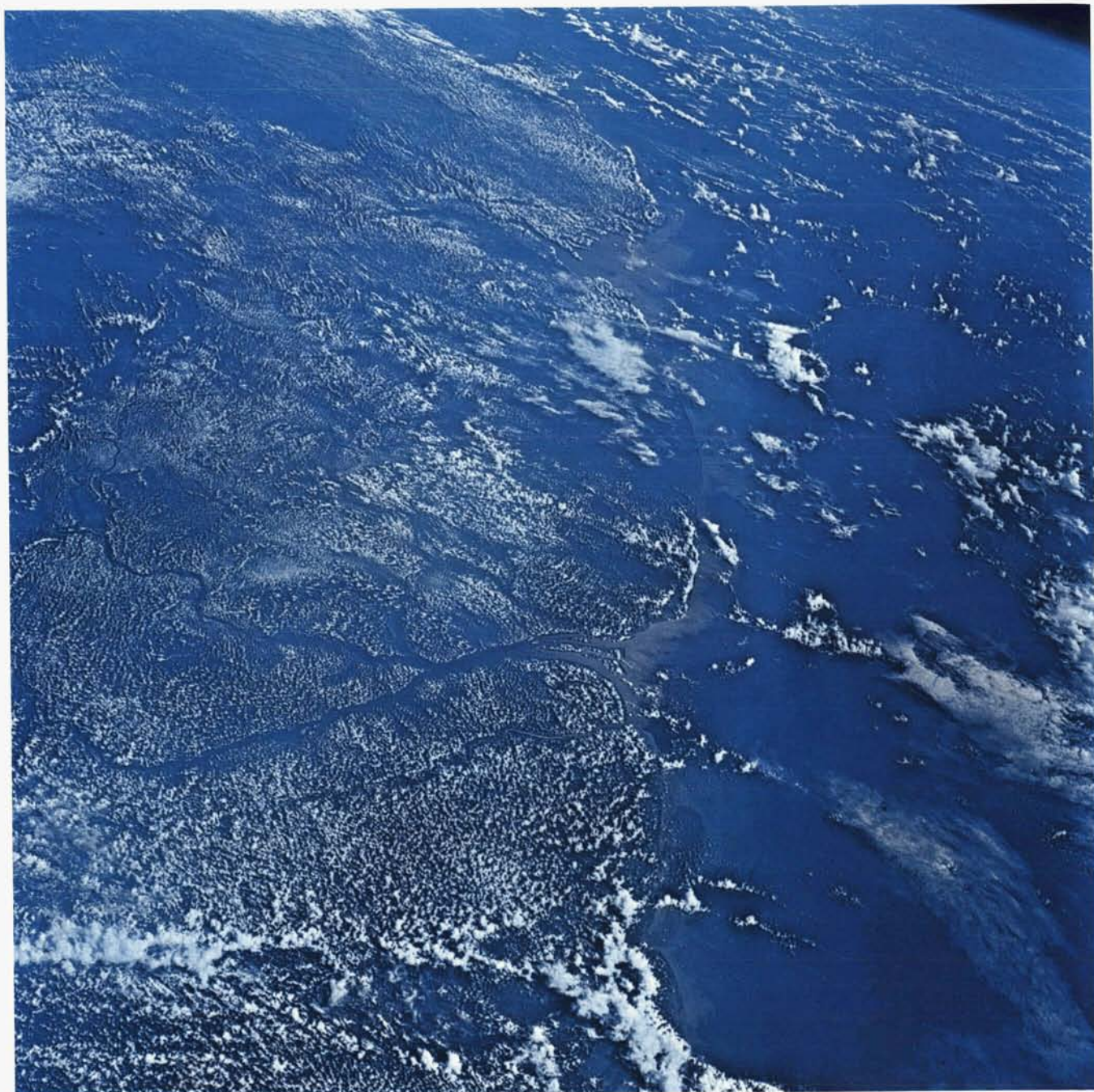


When one looks closely at South America's coast here, one sees four rivers adding silt to the coastal currents off Guyana and Surinam. From the left they are the Courantyne, Berbice, Demerara, and Essequibo. Dikes have converted areas slightly below sea level into valuable plantation land along this Atlantic coast. Its sedimentary

strata are shales, clays, sands, and lignites, built up largely from the muds brought northward from the Amazon's mouth. Georgetown, Guyana's capital, is at the Demerara's mouth. Convective cloudiness dominates this region throughout the year, and in this photo thunderstorms are also visible inland.

GEMINI VII DECEMBER 13, 1965 S65-64029



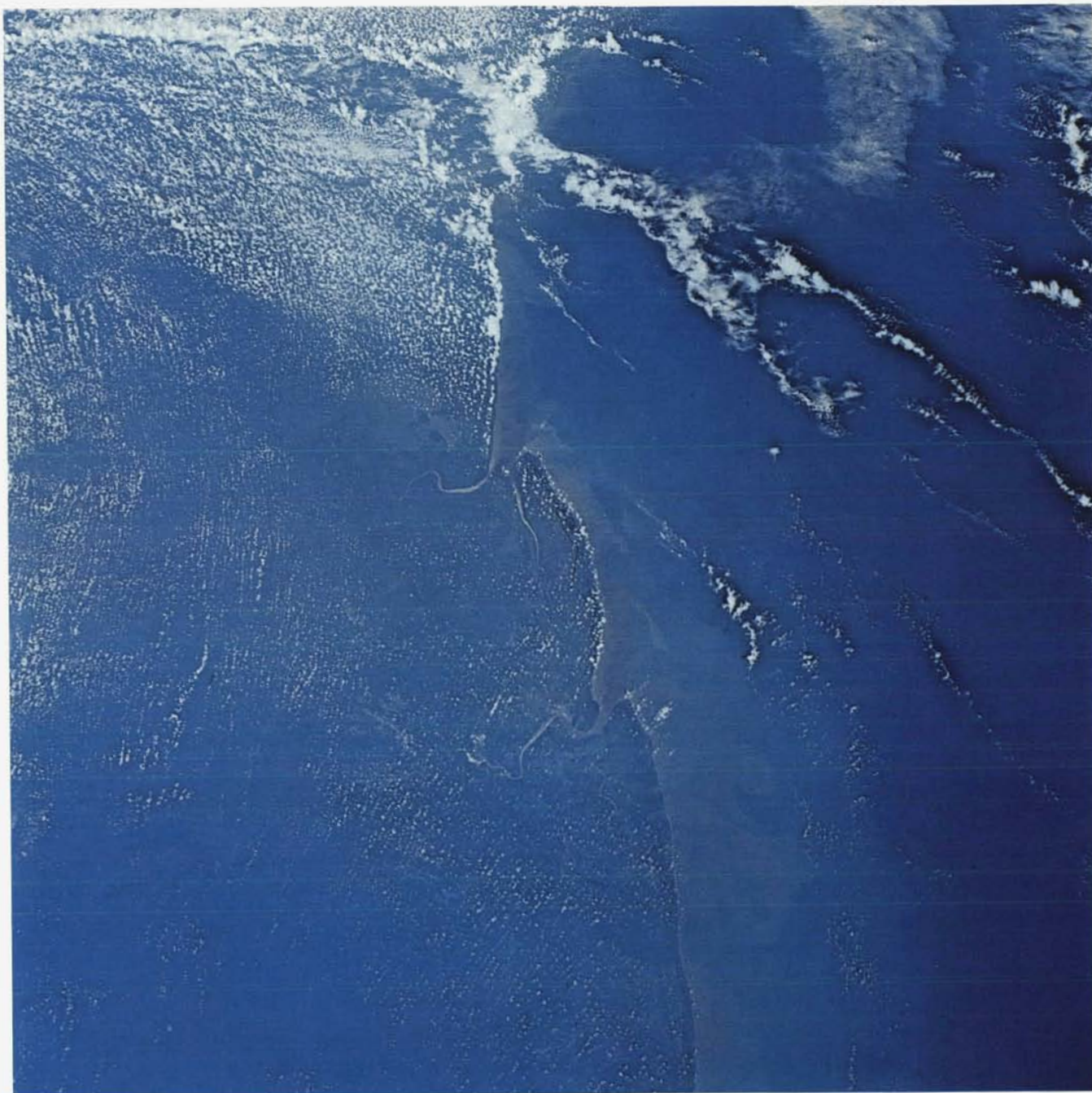


"We stole some time from our sleep period to get this picture," Astronaut Michael Collins recalls. "Even from space it appeared as some of the most forbidding jungle territory in the world. This is as close as I ever hope to get to it." The Orinoco River mouth is at the left, and the Essequibo's mouth is near the center of this view.

Both rivers were pouring silt and mud into the Atlantic for coastal currents to carry along and build up deposits of shale, clay, and lignites. The morning Sun was heating the land, and complex patterns of cumulus clouds were being built up over it. Broad parts of this coastal land are a few feet below sea level.

GEMINI X JULY 21, 1966 S66-46054



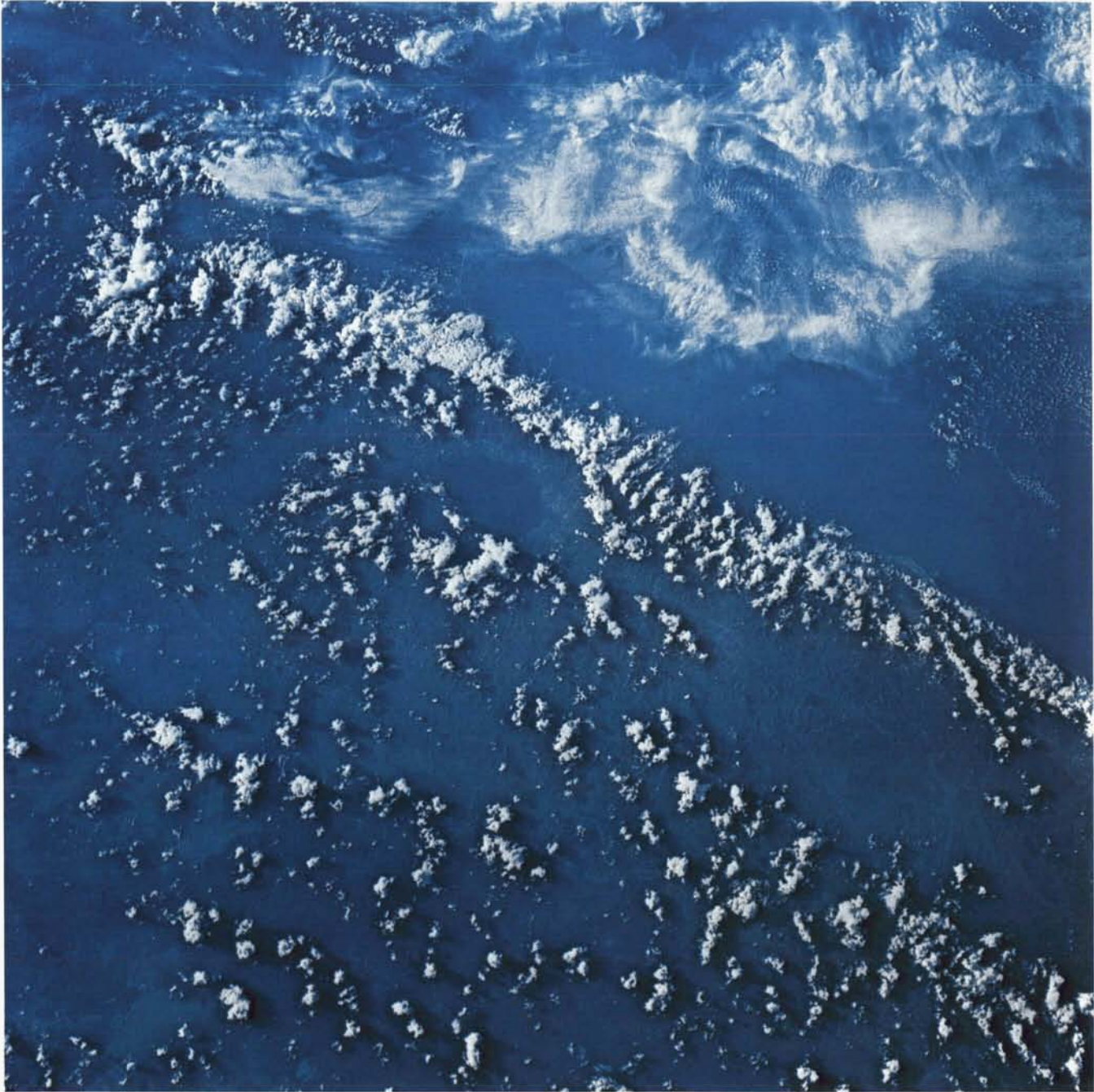


This photograph of the northern coast of Surinam shows low-level cloud convergences that do not appear on the usual synoptic weather map. The cloud lines are readily associated with the boundaries of turbid water. Seeing the distribution of suspended sediment, and the variations in the resulting turbidity of the water, as one can

here, is extremely helpful in oceanographic research. The current shears were parallel to the coast on the day this picture was taken, and tons of sediment brought from the continent's interior by the rivers were being spread far to the west. There is no cool season in the Guyanas.

GEMINI X JULY 21, 1966 S66-46056



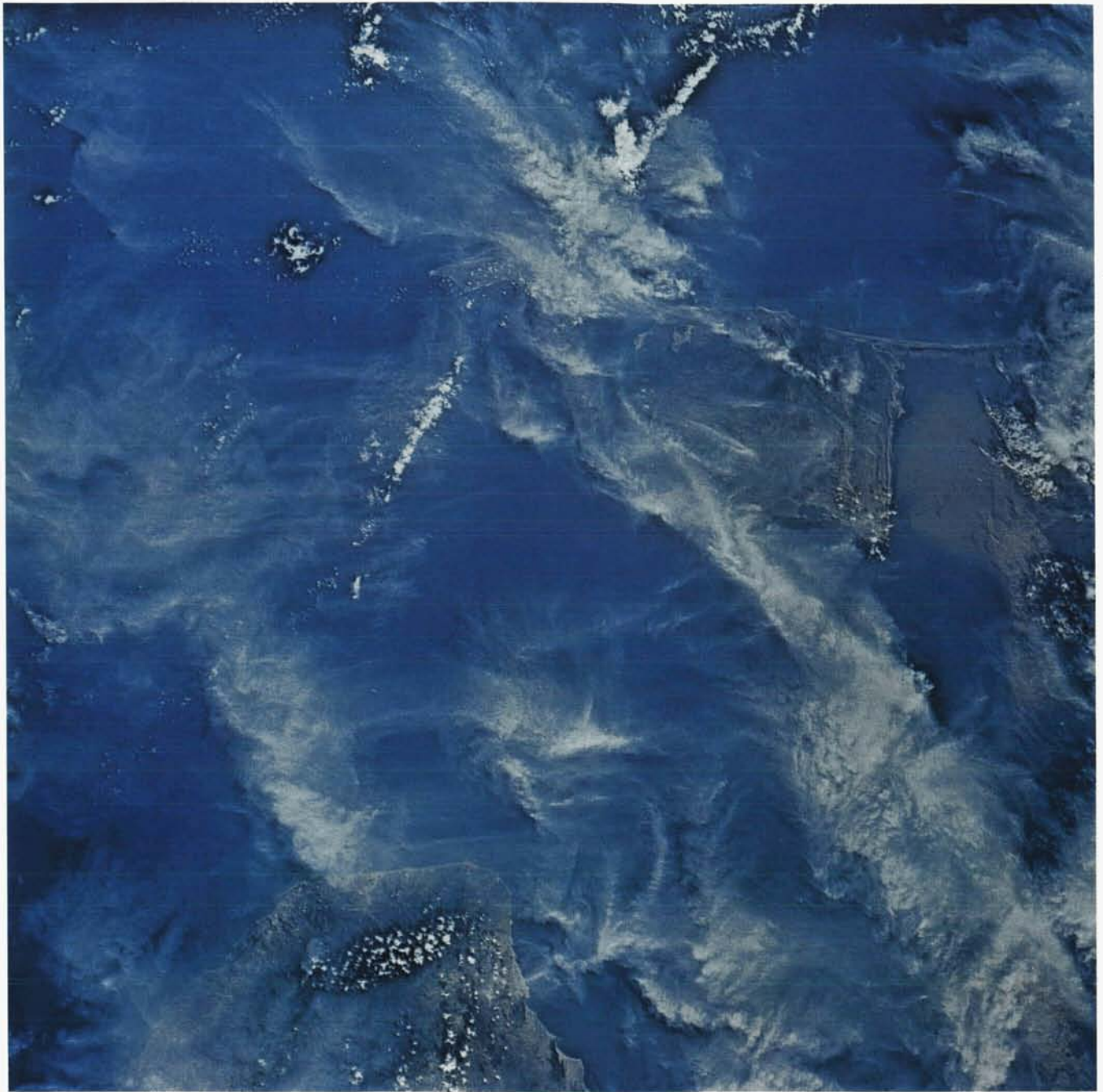


In this view of Venezuela, cumulus clouds dot the land and cirrus veils the Caribbean Sea. The coastline included runs from Tocuyo de la Costa, near the center at the top, to Naiguatá. Lago de Valencia is in the cloud-free area in the center, and the Río Tuy is to the right of it. Caracas, the capital, is about halfway be-

tween the river and the coast. The Andes in this area are composed of Mesozoic igneous and metamorphic strata. The vast featureless plain at the lower left is the Orinoco basin. A large reservoir on the Río Guarico is barely discernible there, but the Río Tuy's tributaries stand out clearly in the lower right of the photo.

GEMINI VII DECEMBER 12, 1965 S65-63995



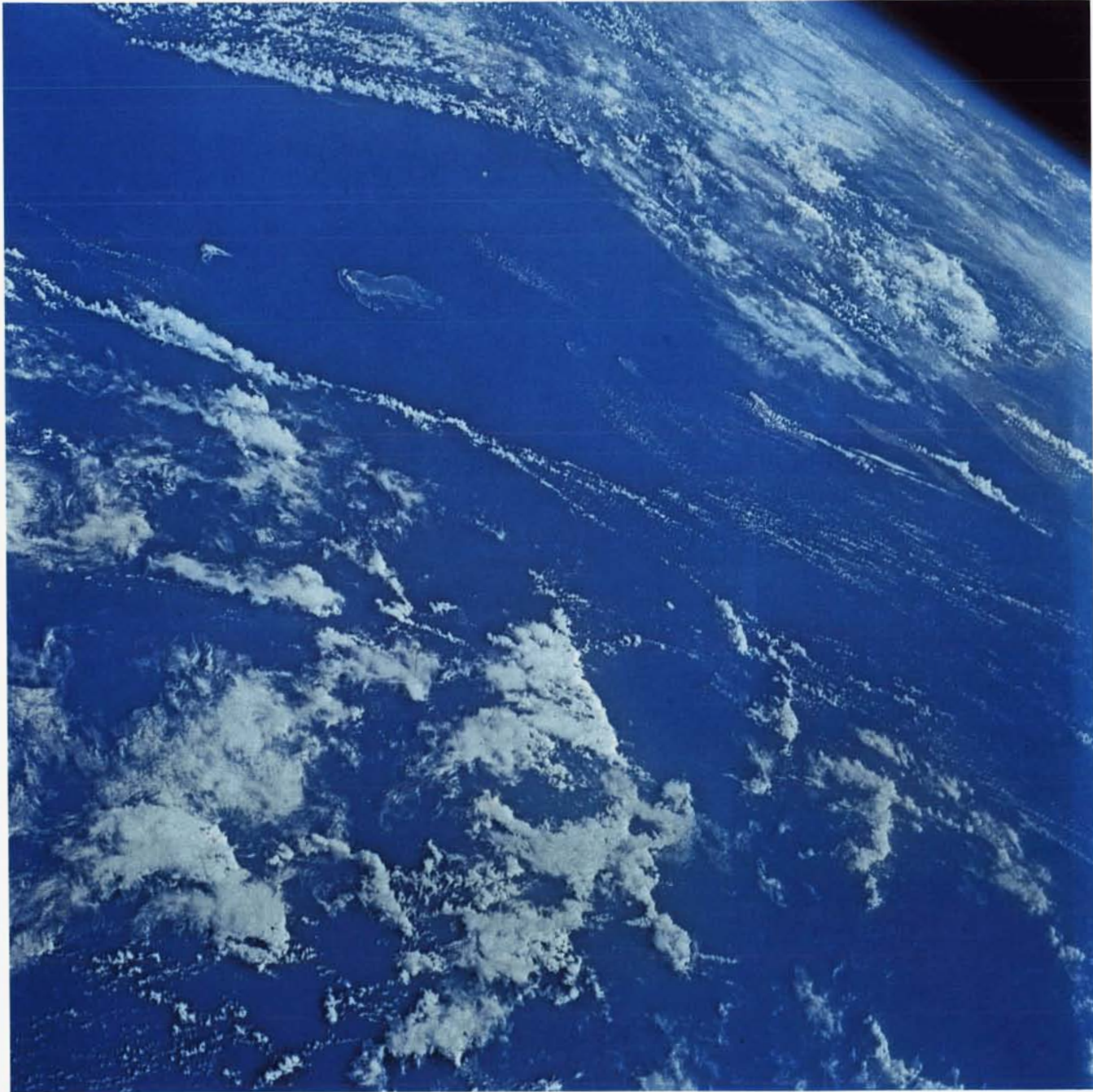


The bright line of cumulus clouds in the upper center runs downward from Curaçao to Aruba. A peninsula of Colombia and the 60-mile-wide entry to the Golfo de Venezuela are under the cirrus clouds in the foreground. At the right, below a narrow strip of land between the Península de Paraguana and the mainland, is the rect-

angular Golfete de Coro, darkened by the sediment carried seaward by South American streams. Faults between the Andean spurs outline the Golfo de Venezuela, and a surface deposit of Quaternary alluvium is found on the Cretaceous and Tertiary beds in this fault basin.

GEMINI VII DECEMBER 12, 1965 S65-63993





From over the Caribbean Sea, the camera was pointed southwest toward South America to obtain this picture. The semiarid islands of the Lesser Antilles cross it near the center. From the left they are the Isla Orchila, Islas Los Roques, Ilas de Aves, Bonaire, Curaçao, and Aruba. The Venezuelan shore above them extends from Barce-

lona at the left to the country's reddish, northernmost tip, the Península de Paraguana, at the right. This part of the world has been photographed from several spacecraft, but clouds usually have obscured the surface. Even here convective and cirriform cloudiness conceals much of the landscape.

GEMINI IX JUNE 4, 1966 S66-38189







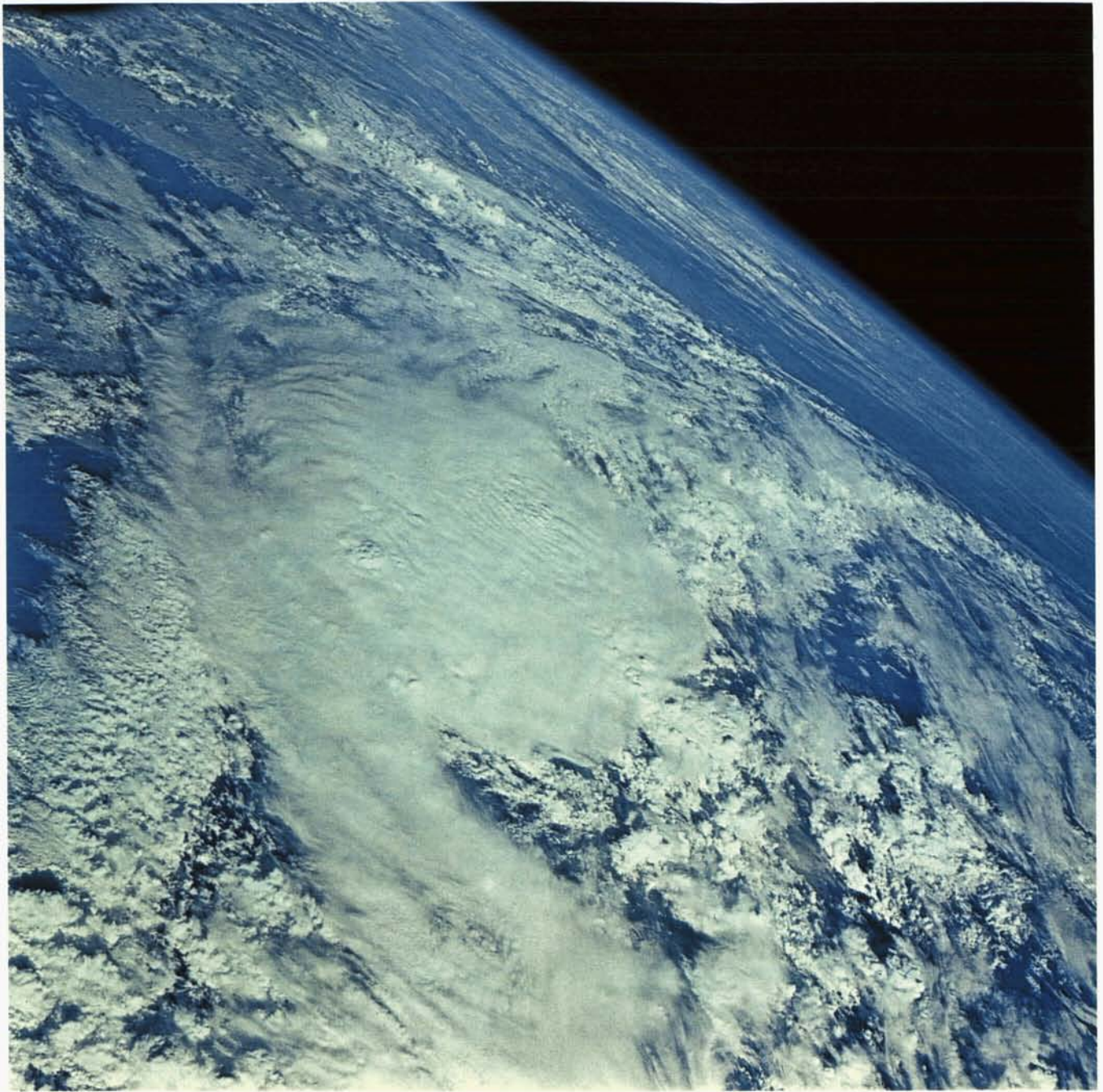
## Part IX. Mexico

MEXICO is between  $14^{\circ}$  and  $33^{\circ}$  north of the Equator and the orbits of the Gemini flights gave the astronauts many opportunities to photograph it. The central plateau is bounded on the west by the Sierra Madre Occidental, and on the east by the Sierra Madre Oriental. Between these high ranges, other mountains partition the land into a maze bedecked by volcanoes, lakes, and deserts. These photos show the land through which the Spaniards advanced into the southwestern part of the United States.

The Gemini astronauts approached it from the Pacific rather than from the Atlantic and often crossed Baja California, which extends down the western coast of North America for 800 miles, before they soared over the mainland. Joseph Wood Krutch has called Baja California "the forgotten peninsula" for reasons quite apparent in these photos.

Below the long Gulf of California, the continent curves east around the Gulf of Mexico. The Yucatan Peninsula extends to the north from this part of Mexico nearly to Cuba's western tip. When one recalls the known history of this land, and the civilizations that flourished there before the Spaniards arrived, the pictures in this section become especially fascinating. Some of the views here extend northward into the United States for many miles.





This and the next few photos, taken from spacecraft as they approached Mexico, show how greatly its appearance varied on different occasions. The thick, high, cirrostratus cloud here concealed all but a few bits of Baja California, at the left and toward the lower right corner. A number of thunderstorms formed this great circular

body. Several convective cells appeared to have gained sufficient momentum to penetrate its thick layer, and the rippled surface of the cirrostratus suggests that diverging updrafts from other convective cells have reached their maximum stage of development and begun to dissipate.

GEMINI VII DECEMBER 7, 1965 S65-63834



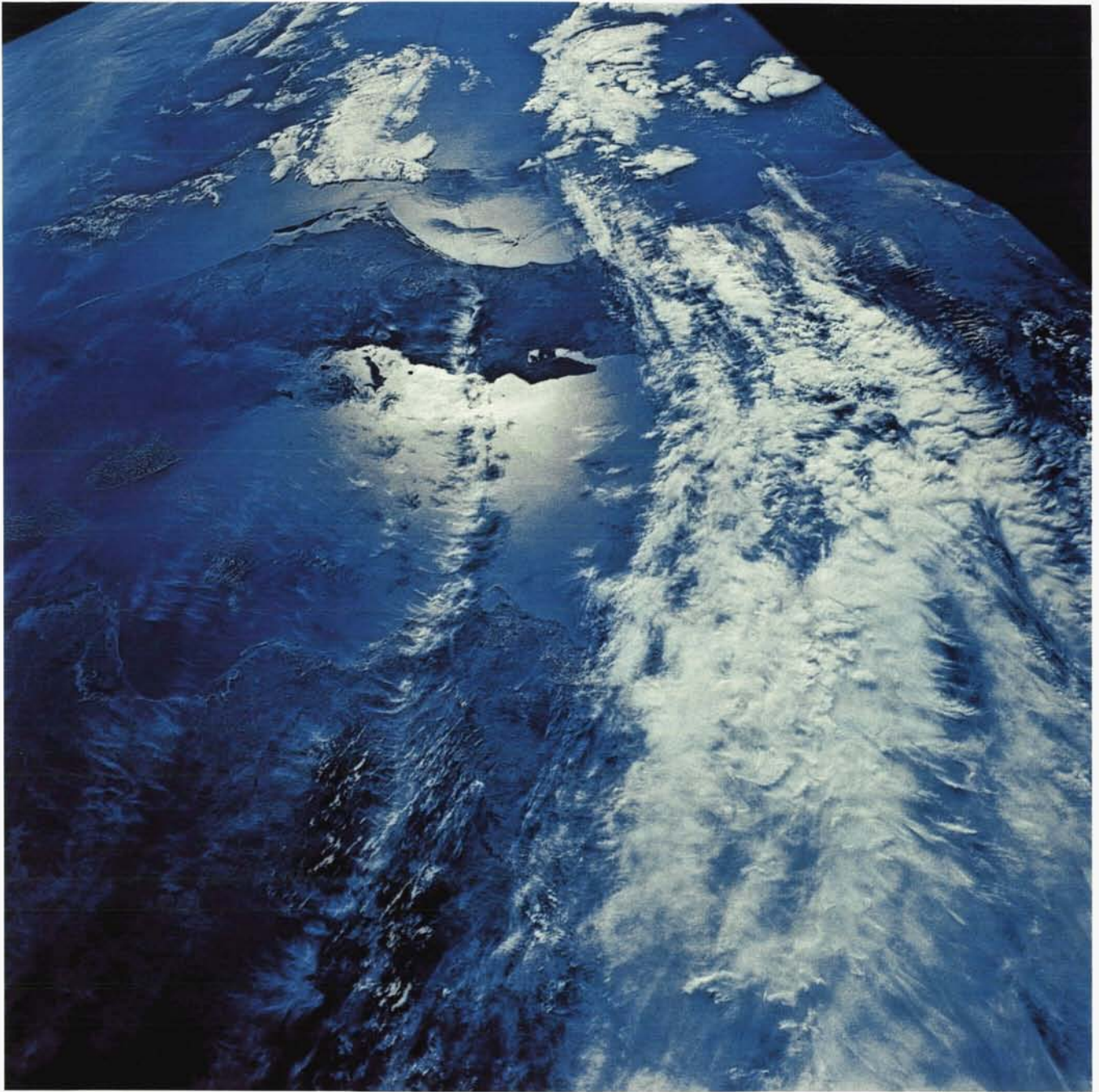


On one occasion the camera recorded bands of cirrus clouds that extended for 300 miles in southwesterly winds between the mountains in Sonora and Baja California. This photo includes the Pinacate volcanic field at the left, on the border between the United States and

Mexico. Baja California has changed less than most parts of the New World since the Spanish built missions there in the 17th century. Here the birds and other native creatures have gone their way virtually undisturbed. So, too, have many of this peninsula's distinctive plants.

GEMINI XII NOVEMBER 14, 1966 S66-63015





This picture, taken on the next revolution after the one on which the previous photo was taken, shows some of Baja California and the North American mainland under different lighting. Dark patches in the Sun glitter on the Pacific are regions of smooth water. Patches of stratocumulus clouds are near the top of the photo.

Clouds such as that long, conspicuous band of cirrus that arcs along the right side of the picture usually indicate the existence of a subtropical jetstream nearby. The jetstream winds are encountered in this region when an upper air trough is located over the eastern Pacific Ocean.

GEMINI XII NOVEMBER 14, 1966 S66-63054





From over the Pacific, you are looking southeast now at Baja California. In the foreground long fingers of cirrus reach toward Punta Eugenia. The large oval at the left is Bahía Sebastián Vizcaíno, and the lagoon is Ojo de Liebre, where gray whales breed. The dry air evaporates sea water to form white salt flats south of

this lagoon. The mountains in the center of the cape are underlain by Cretaceous metamorphic, igneous, and sedimentary rock. This part of North America's shore is characterized by abundant Tertiary and Quaternary vulcanism. Beyond the Gulf of California, which extends across the upper half of the photo, is Sonora.

GEMINI VII DECEMBER 5, 1965 S65-63822



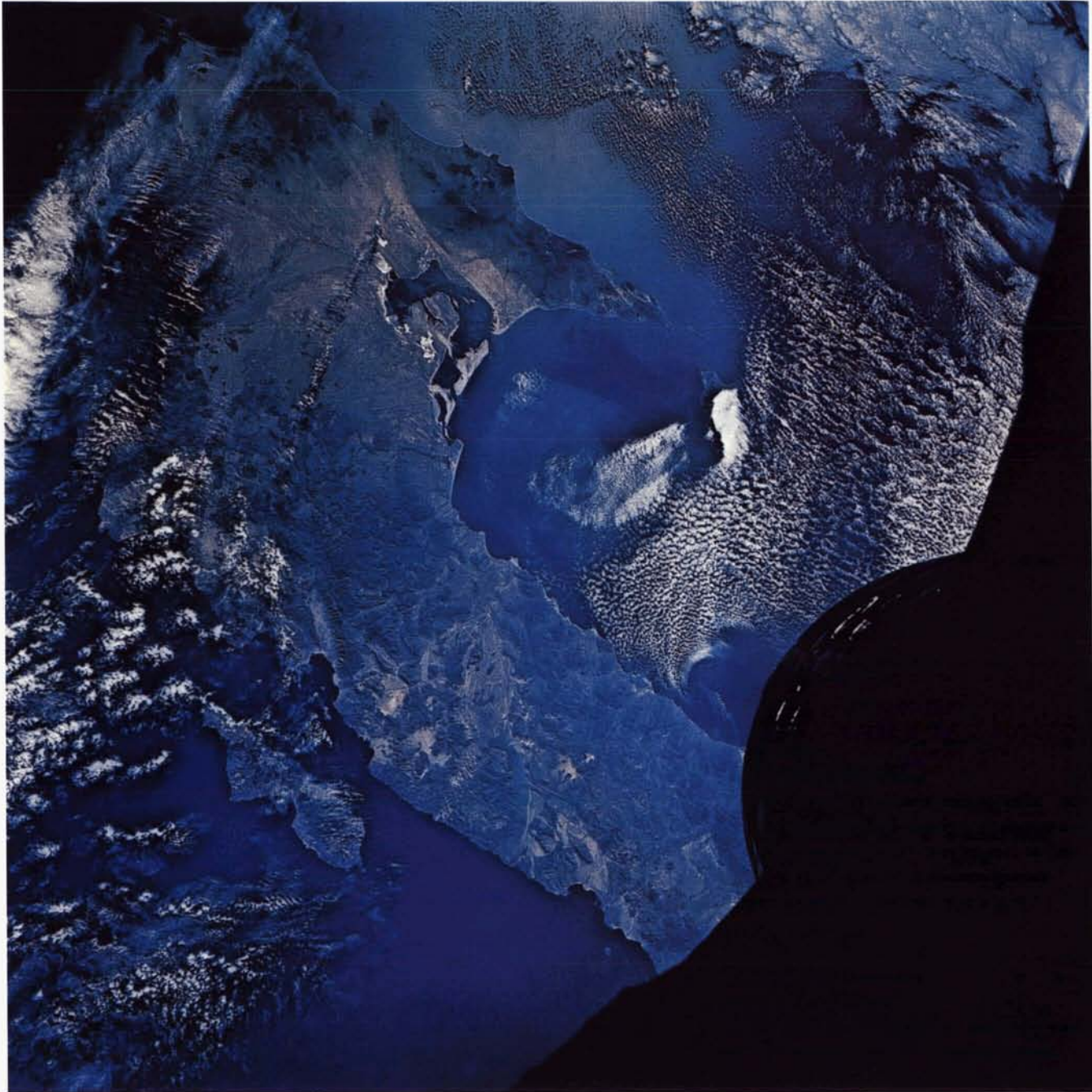


Astronaut Eugene A. Cernan took this maplike picture of the Pacific coast of Mexico alongside Gemini IX's nose while the hatch was open. The Sierra Madre Occidental extends along the left shore of the Gulf of California in the center. The Sierra La Giganta is in the foreground, and the southern end of Baja California is

spread before you at the right. The State capital, La Paz, is at the far end of the large bay in the narrow neck near the long peninsula's tip. The irregular dark topography is typical of a surface underlain mainly by igneous and metamorphic rock. The clouds on the horizon are south of the Tropic of Cancer.

GEMINI IX JUNE 5, 1966 S66-38070





The spacecraft's nose was pointed at the central part of Baja California when this photo was taken. Angel de La Guarda Island in the Gulf of California was visible at the lower left below the cloud system over the gulf. Bahía Sebastián Vizcaíno is in the upper center of this view and beyond it to the south are Punta Abreojos,

Laguna San Ignacio, and Bahía Ballenas. The current in the Pacific was sweeping strongly from north to south and relatively cool. Punta Abreojos projected into the main stream of this current, and caused the series of turbulent eddies visible in the slick pattern of the Sun's reflection in the upper center of the picture.

GEMINI XII NOVEMBER 14, 1966 S66-63044



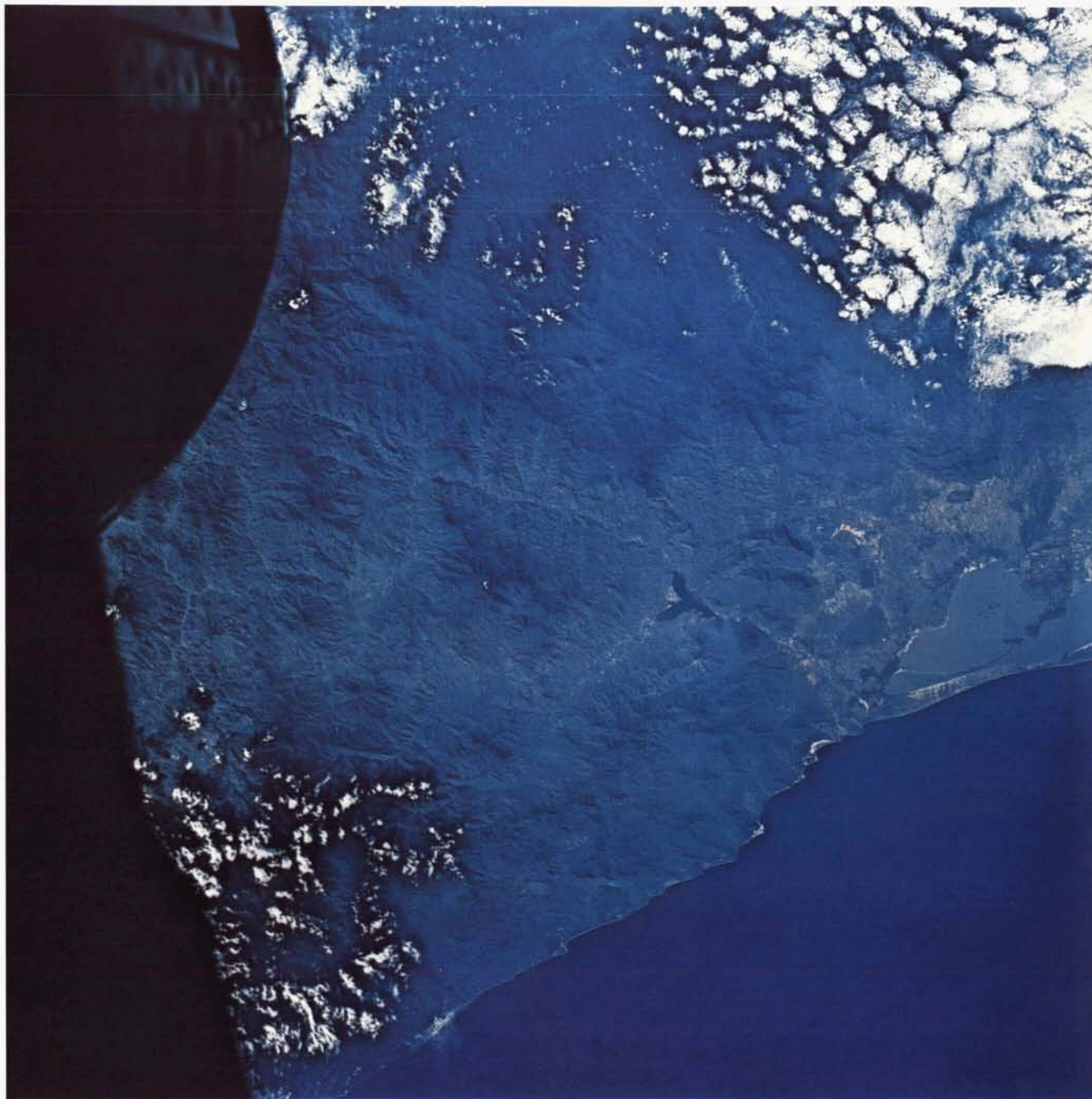


Cabo Corrientes is above Gemini XII's nose in this open-hatch photo, taken by Astronaut Edwin E. Aldrin, Jr., south of Baja California. At the left are dark, dissected ranges of the Sierra Madre Occidental, an extensive plateau of Tertiary volcanics. Beyond the cape, around Lago de Chapala, is the Neo-Volcanic plateau, a band

of Tertiary, Quaternary, and Recent volcanics that extends eastward to the Gulf of Mexico. To the south is the Sierra Madre del Sur, a complex mountainous area of older rocks. A spiral is visible in the cumulus-cloud streets near the cape where the coastal configuration induced an eddy in the northerly airflow.

GEMINI XII NOVEMBER 12, 1966 S66-62883



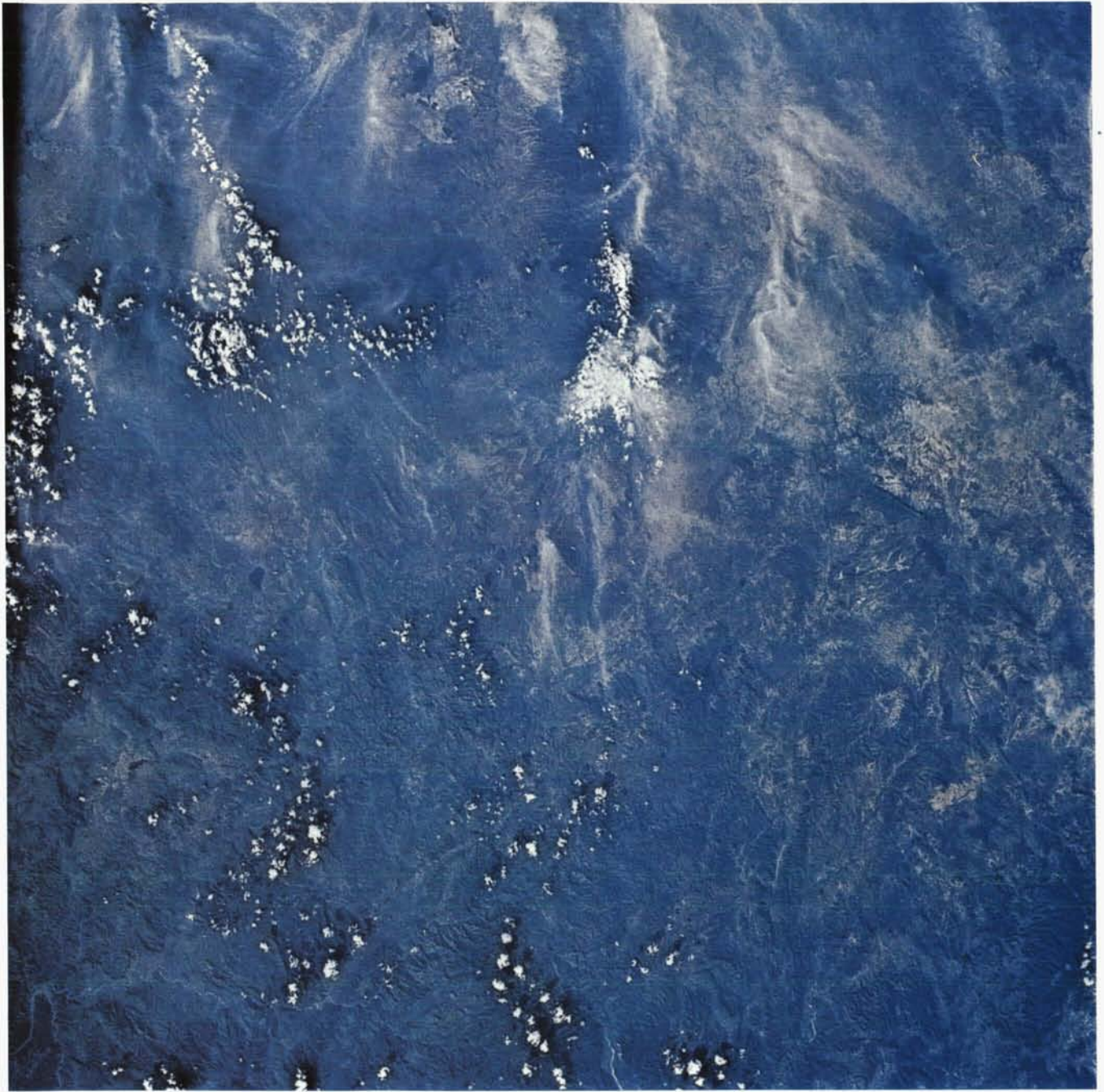


The Gulf of Tehuantepec is in the right foreground now. It is about 1000 miles south at the same longitude as Houston. The Y-shaped reservoir is near the Pacific Coastal Plain of Mexico. From it the Río Tehuantepec flows past the city of Tehuantepec. At Laguna Superior, you see a long sand bar. Laguna Inferior is farther

right. The Sierra Madre del Sur's southern and eastern edges are in the upper left of this photo. The Gulf Coastal Plain begins below the cellular strato-cumulus clouds in the upper right corner. The Sierra Travesada, marking the edge of the Chiapas-Guatemala Uplands, begins just above the lagoons.

GEMINI VII DECEMBER 11, 1965 S65-63760



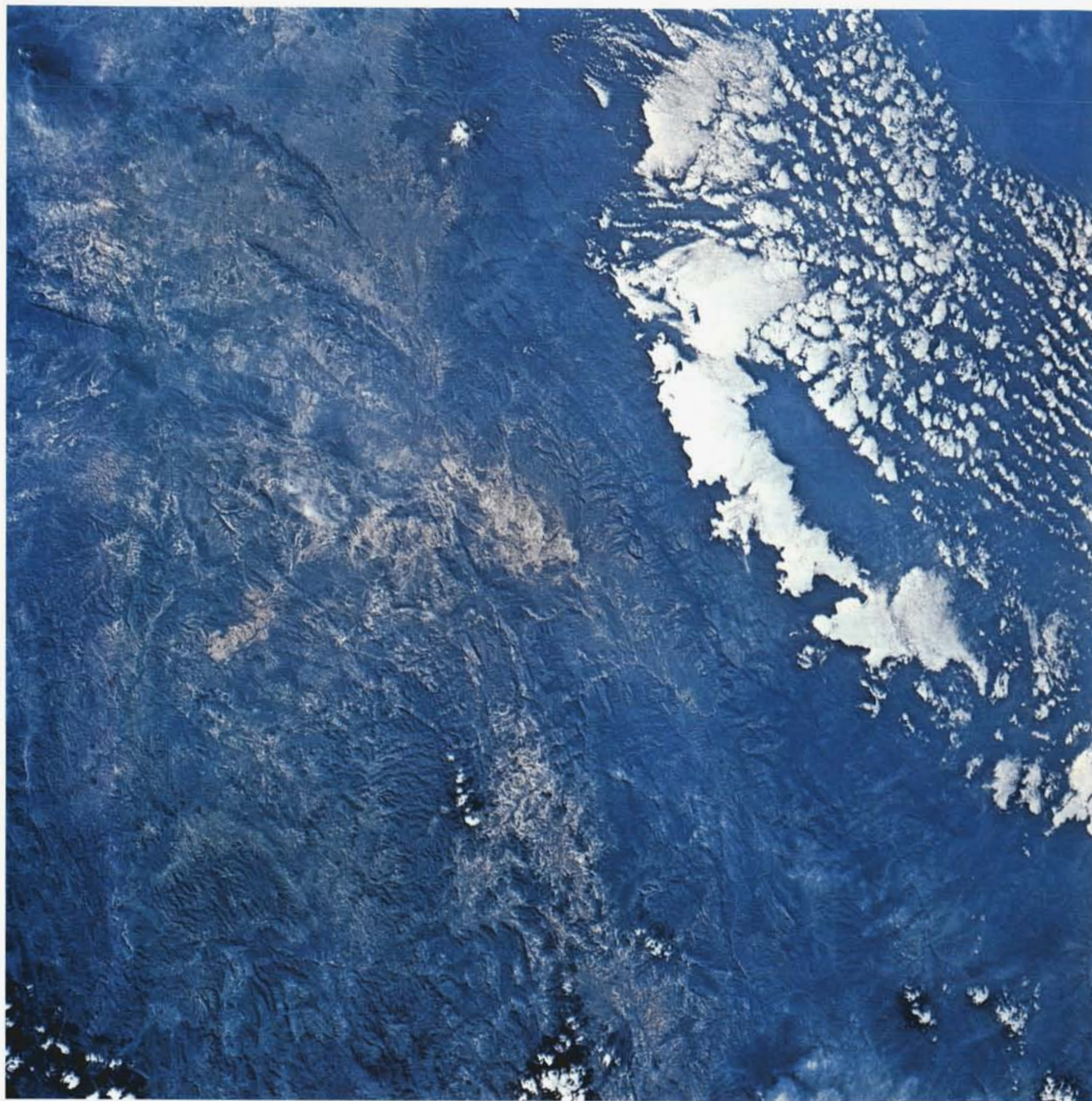


Mexico City is a white patch distinct from the cirrus clouds at the top here. You are looking north and the city of Puebla is in the broad valley toward the upper right. The Neo-Volcanic Plateau in the top half of the photo averages 8000 feet in height. Three volcanic cones—Serro Tlálloc, Iztaccíhuatl, and Popocatépetl—

extend south from the top center. The latter rises 17887 feet. In the foreground is part of the Sierra Madre del Sur system. This complex area of Paleozoic metasediments has fewer volcanoes, but pyroclastics cover large areas. The rivers that drain this lower region flow into the Pacific.

GEMINI VII DECEMBER 11, 1965 S65-63757



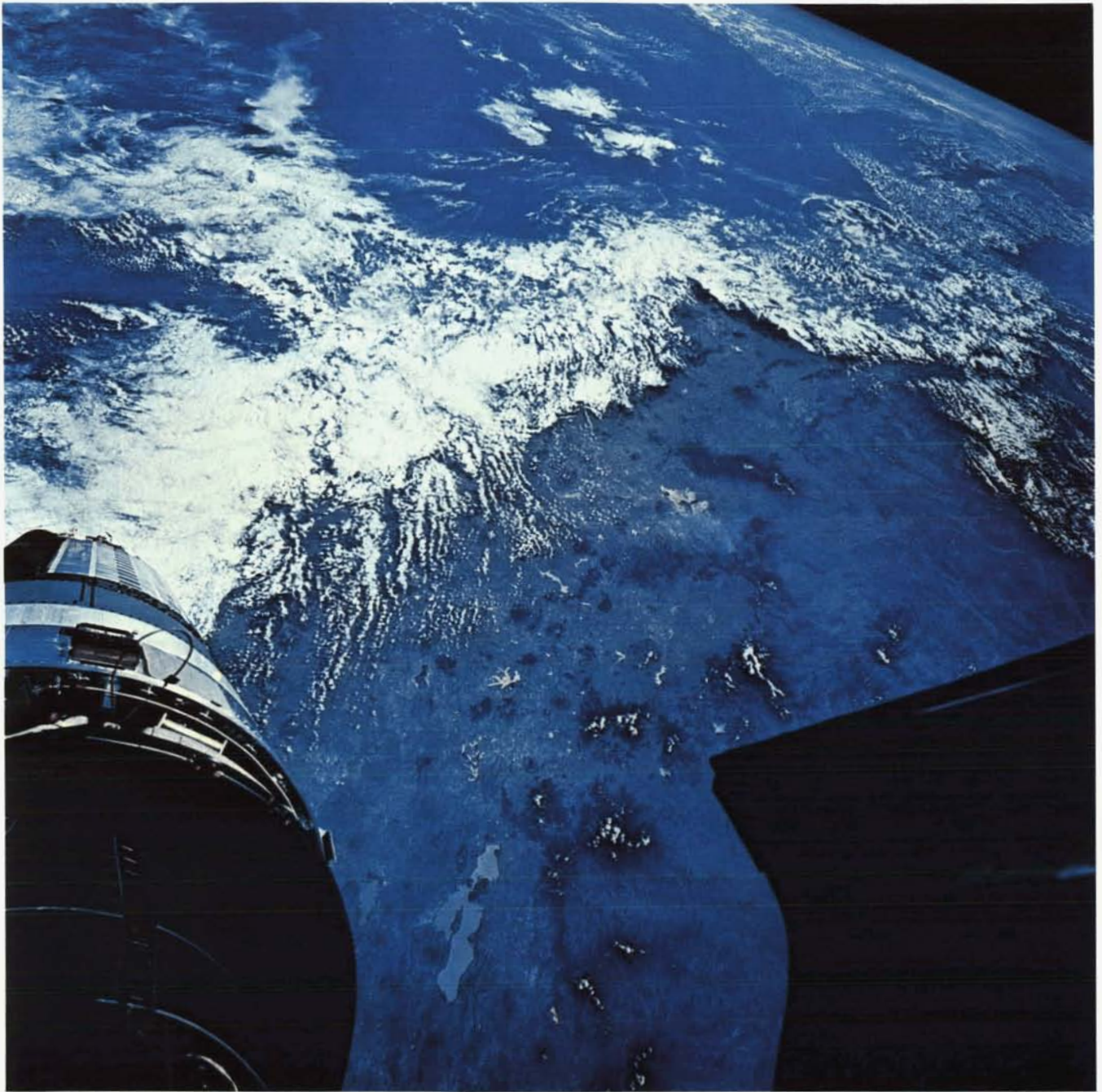


The mountains here are east of those in the preceding picture and the Gulf of Mexico south of Veracruz is in the upper right. An upland of the Madre del Sur system is at the lower left, and the Valle de Oaxaca, bordered by sharply dissected rims on the north and east, is in the foreground. The snow-covered volcano in the

upper center is Citlaltépec, 18 701 feet high. Strato-cumulus clouds were pushed toward it from the gulf. Through the largest gap in them, Miguel Alemán, a large reservoir, is visible. Radiosonde data at Veracruz showed that the cloud tops were about 3500 feet high when the photo was taken.

GEMINI VII DECEMBER 11, 1965 S65-63758



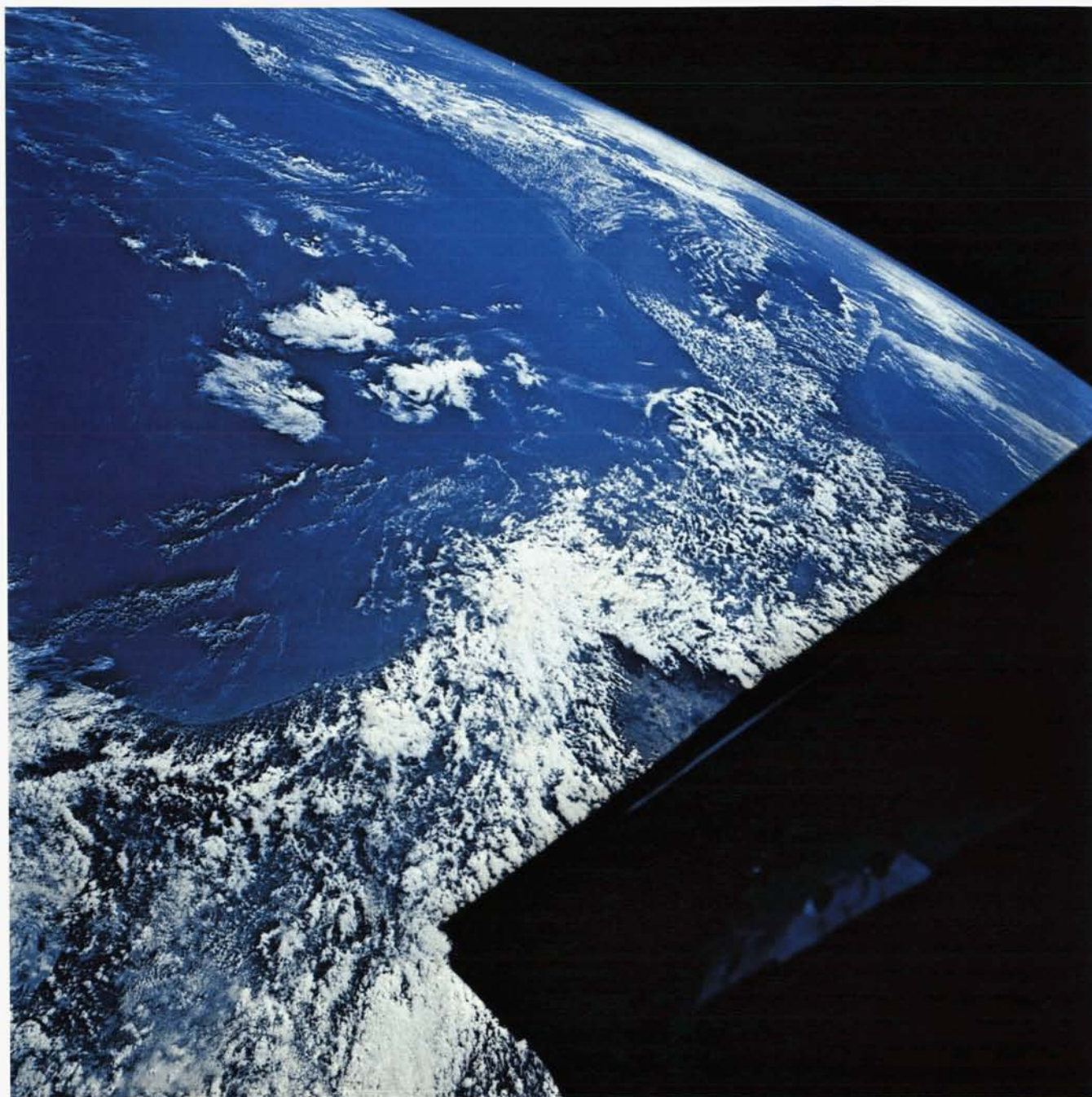


This view to the southeast over Mexico extends to the Yucatan Peninsula. Mexico City is just north of a forested region from which smoke is rising near the center. The large brown lake in the foreground is Lago de Cuitzeo. The dark spots are areas of volcanic rock. This plateau's thousands of volcanoes are mostly Quaternary

and Tertiary. Rocks that span the geologic column from Precambrian to Quaternary time are found in the Madre del Sur Mountains at the right. The rows of cumuli in the foreground are in a light easterly wind. The clouds over Mexico's eastern coast and Central America in the distance are mostly cumuliform.

GEMINI XII NOVEMBER 12, 1966 S66-62887



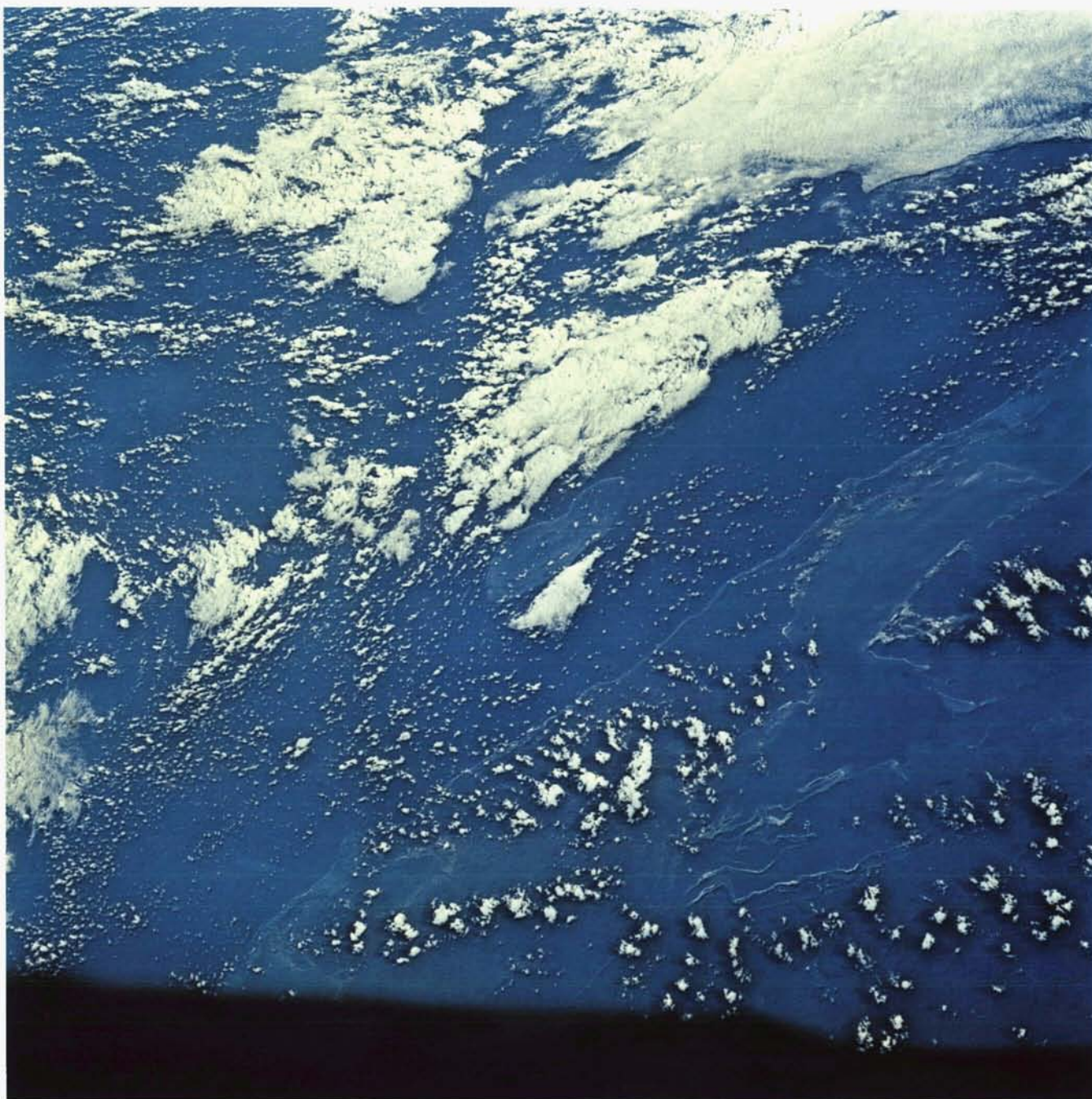


The tiny, cloud-free area above the spacecraft's open hatch in this view of southern Mexico is a basin near Puebla. Cumulus clouds have formed lines with the wind at many places, and high cirriform clouds are scattered over the Gulf of Mexico and the Yucatan Peninsula at the upper left. The indentation in the clouds on Yuca-

tan's north shore is west of Laguna de Terminos. Surface temperatures are likely to be lower in the marshy land there. Mexico's part of the Yucatan Peninsula is mostly a coastal plain, but south of it in Guatemala there are many complex mountains, bordered by older ranges near the Pacific.

GEMINI XII NOVEMBER 12, 1966 S66-62891



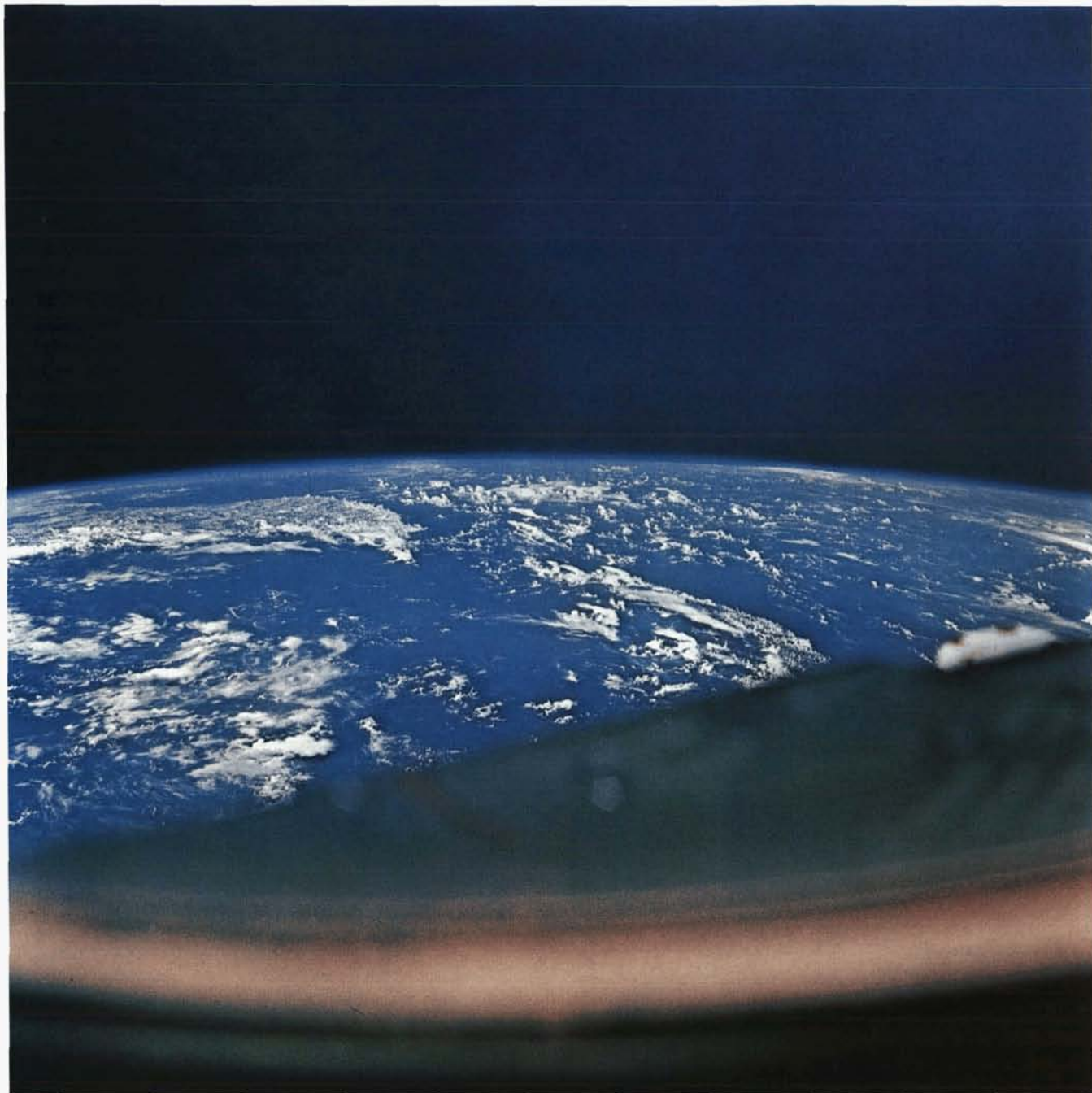


The eastern coast of the Yucatan Peninsula is in the foreground of this photo. Trade-wind cumuli lie beneath a higher stratiform cloud layer. Bahía de la Ascensión on the Caribbean Sea at the lower left is in Quintana Roo, Mexico, and Ambergris Cay, at the right edge, is in British Honduras. Offshore there are numerous cays

and reefs, amidst which Banco Chinchorro stands out near the center. Around Bahía de Chetumal at the lower right, the land is low, flat, and swampy. Dense vegetation obscures its topography. This part of Central America is still emerging geologically and is composed mostly of Tertiary limestones.

GEMINI VII DECEMBER 10, 1965 S65-63741





All three shores of the Yucatan Peninsula can be seen at the left in this northwesterly view from over the Caribbean. This is where Spanish explorers found the remnants of the Mayan civilization. Western Cuba projects from the foreground into the center of this picture. White towers of cumuli reached upward into the moist

atmosphere over the Gulf of Mexico the day this photo was taken, and small cumuli dotted Yucatan except where cumulonimbi had developed at its eastern end. Cirrus cloudiness generated by thunderstorms is prevalent in the Caribbean region in the lower left quadrant of the photo.

GEMINI X JULY 19, 1966 S66-45688



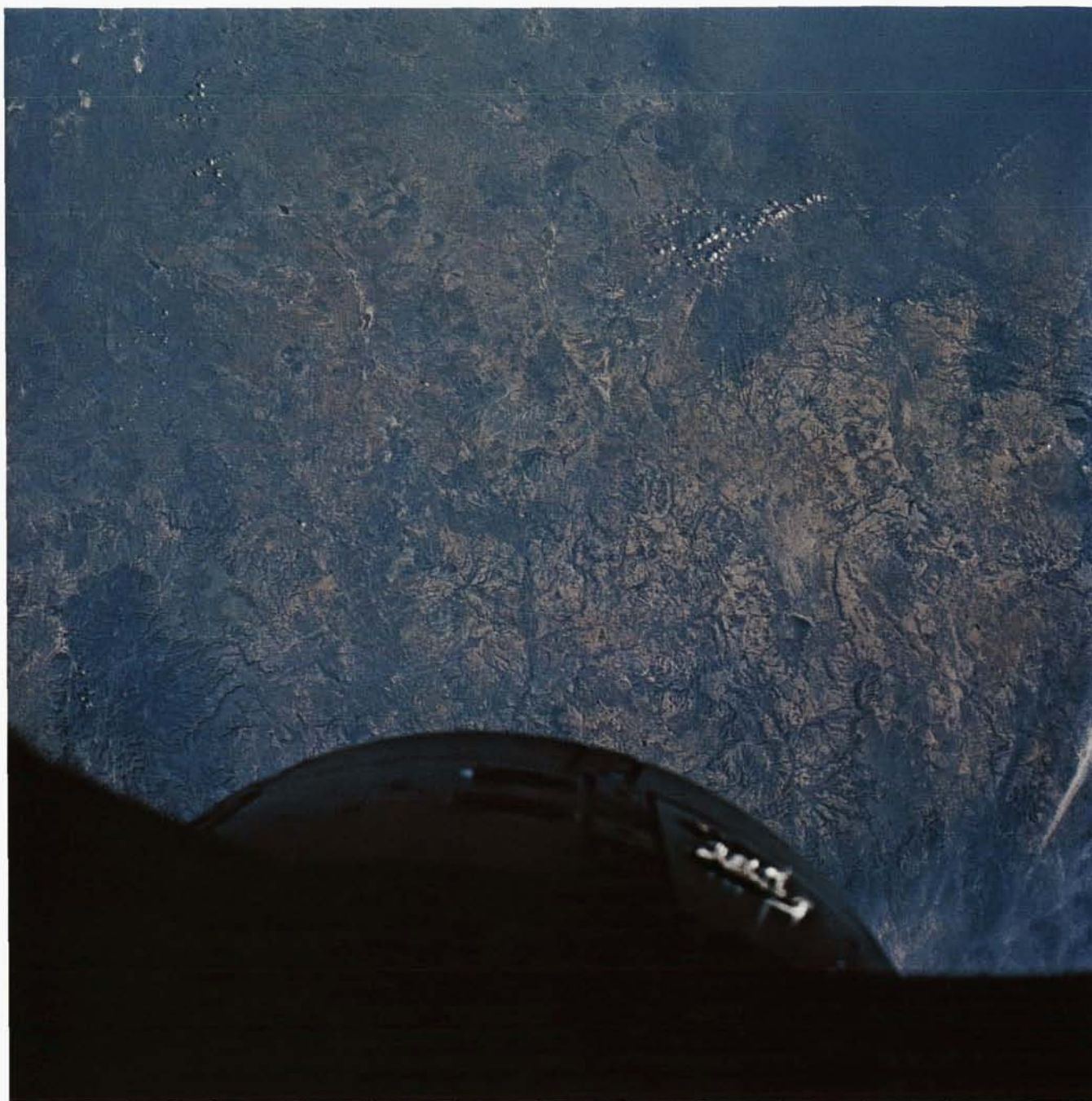


Now the view is to the north through central Mexico. The Sierra Madre Occidental is in the lower left and the Sierra Madre Oriental's dark ridges cross this photo above its center. Composed of folded Cretaceous sediments, these mountains form a long chain from the Big Bend country to the Neo-Volcanic plateau. Left of the

center, the light-colored, sandy Bolson de Coahuila separates the mountainous Coahuila upland and the westward swing of the cross ranges. Several layers of cumuliform and cirriform clouds are along Mexico's east coast. The cloud deck near the horizon is connected with a cold front moving south from Texas.

GEMINI XII NOVEMBER 12, 1966 S66-62889



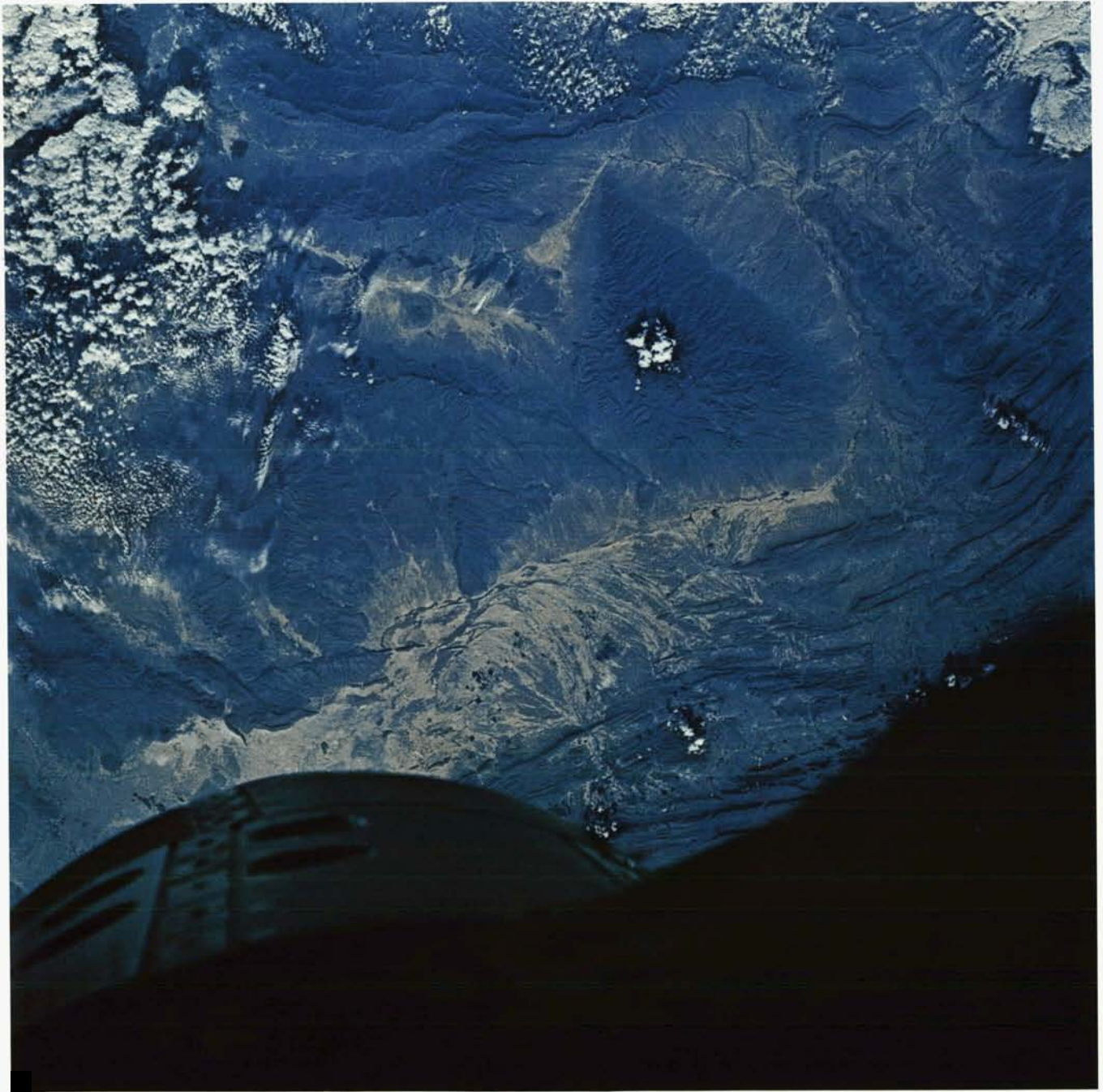


North of Mexico City, the Mexican plateau is actually a basin surrounded by higher terrain. This picture of it was obtained with the camera pointed northeast, and includes parts of four States: Aguascalientes, Zacatecas, San Luis Potosí, and Guanajuato. This is a hilly area, composed mostly of dissected volcanics, and the drainage

is into shallow lakes. These are usually salty and sometimes dry. The top of this photo is blurred because of a residue on the window of Gemini VII, but a few widely scattered cumulus clouds and some cirrus can be seen. The dark patch at lower left is an area of volcanic rock.

GEMINI VII DECEMBER 6, 1965 S65-63814



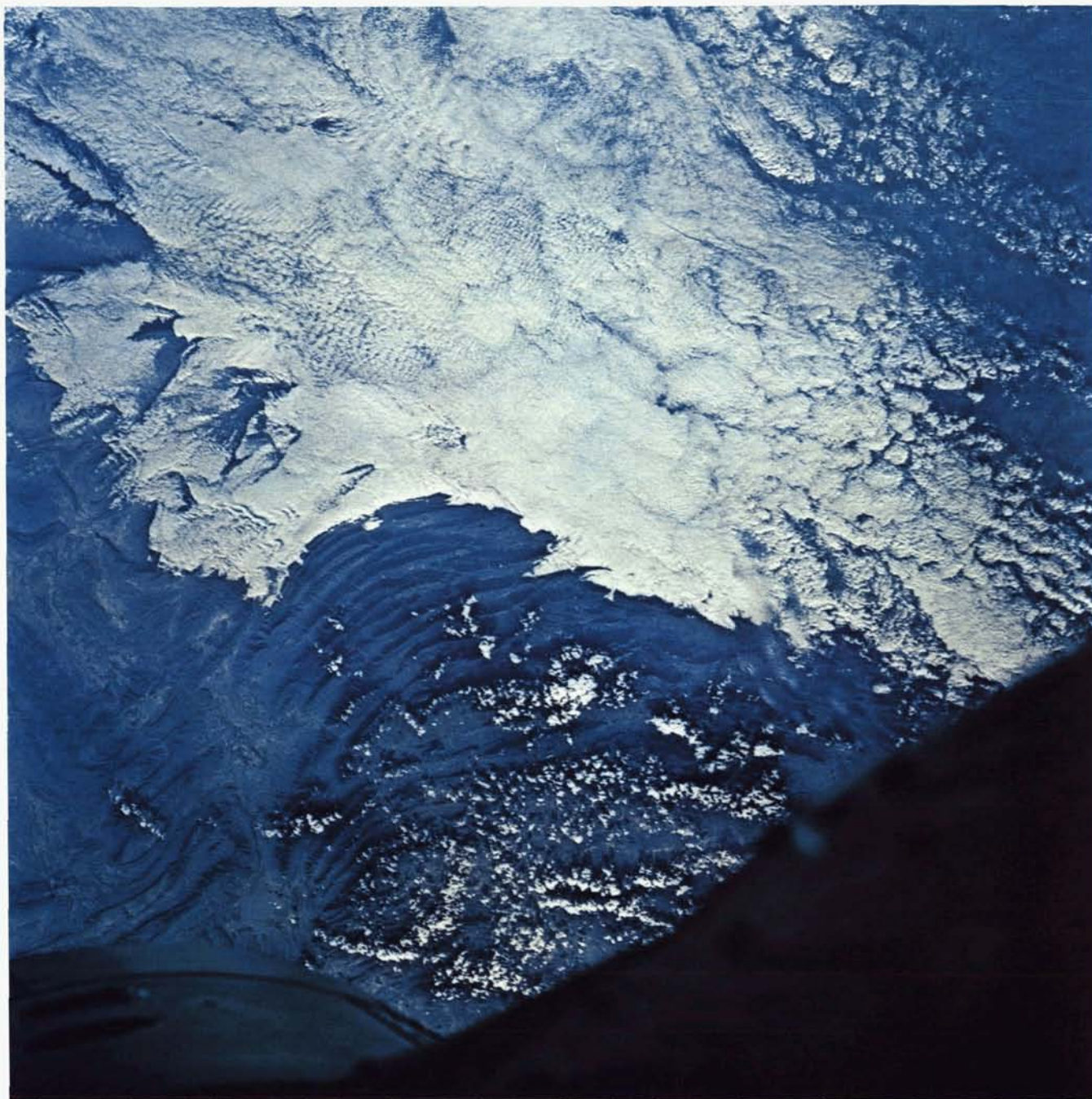


Small cumulus clouds hung like a tiny crown atop the Sierra de la Palma, in the upper center, to adorn this photo of the mainland's eastern mountains. The Sierra de la Palma is a roughly triangular, isolated mass of uplifted Cretaceous rocks at the eastern end of Antefosa de Parras in the Sierra Madre Oriental. Erosion of

folded sedimentary rocks formed the zigzag pattern to the right of this peak; these folds plunge eastward so that the uplift is essentially across the direction of the main folds. When Hernán Cortes was asked for a relief map of Mexico after his conquest of it, he simply crumpled a piece of parchment.

GEMINI VII DECEMBER 9, 1965 S65-63888





The stratocumulus cloud deck with cells and billows shown here stretched across eastern Mexico. The high ranges in the foreground are south of Monterrey. These intensely folded Cretaceous sedimentary rocks mark both the front of the Sierra Madre Oriental and a bend in the mountain range. No one knows why the range bends

about 60° toward the west here, but some geologists suspect that a major wrench fault going through the Antefosa de Parras dragged the mountains around in this way. The city of Saltillo is in the valley just above the nose of the spacecraft, and parts of two States, Coahuila and Nuevo León, are visible.

GEMINI VII DECEMBER 9, 1965 S65-63889



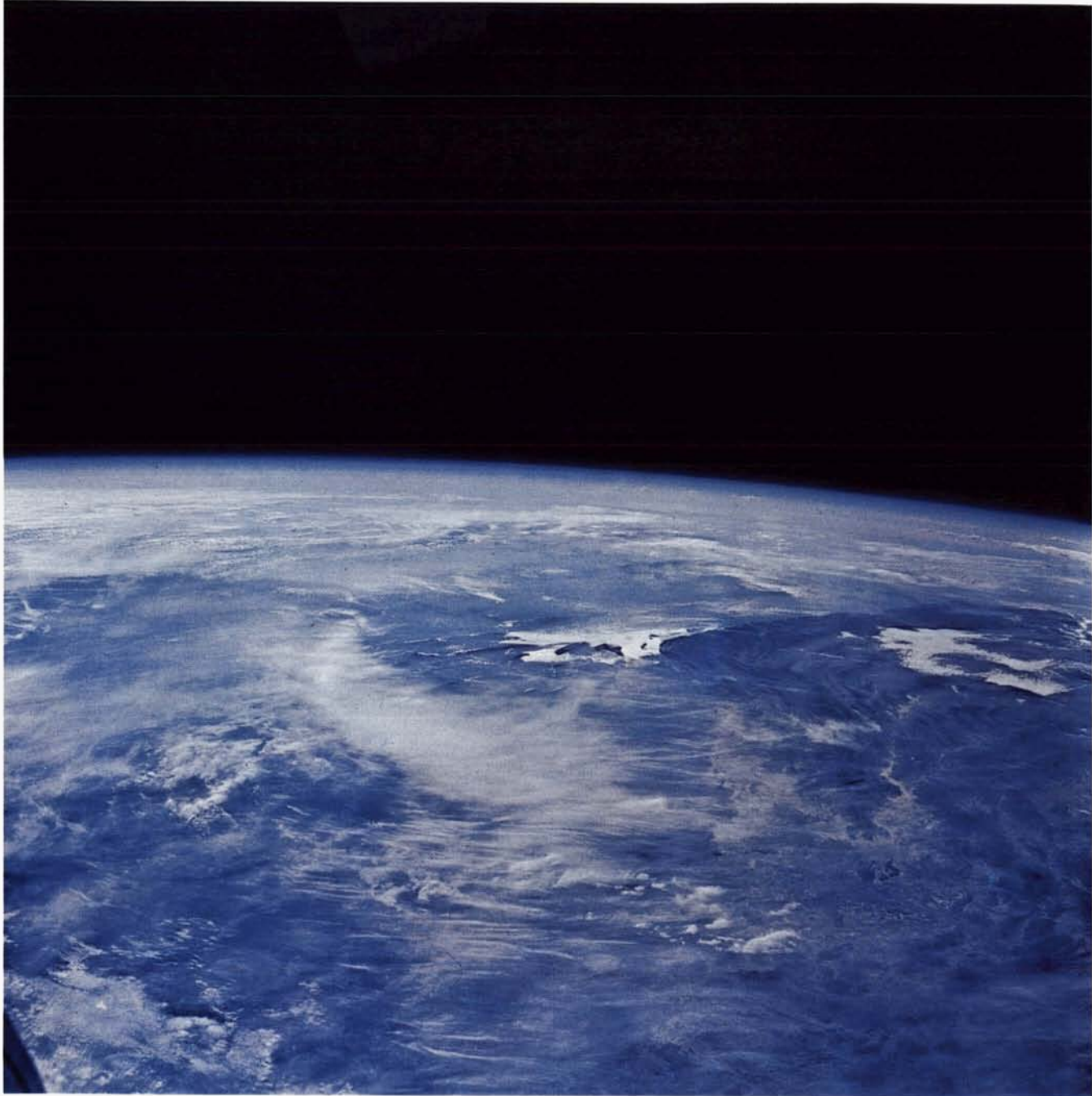


The waters off Tamaulipas, south of Brownsville, Tex., are usually clear, but the high surf the day this photo was taken stirred sediment into suspension, and tidal movements caused the swirls you see in the sediment pattern. The coastal strip shown extends south for 150

miles from Boca de Sandoval to the Tropic of Cancer. Behind the offshore bar is Laguna Madre. At the lower left the Río Purificación meanders out of the Sierra de Tamaulipas and across the narrow plain to the gulf.

GEMINI VII DECEMBER 6, 1965 S65-63810



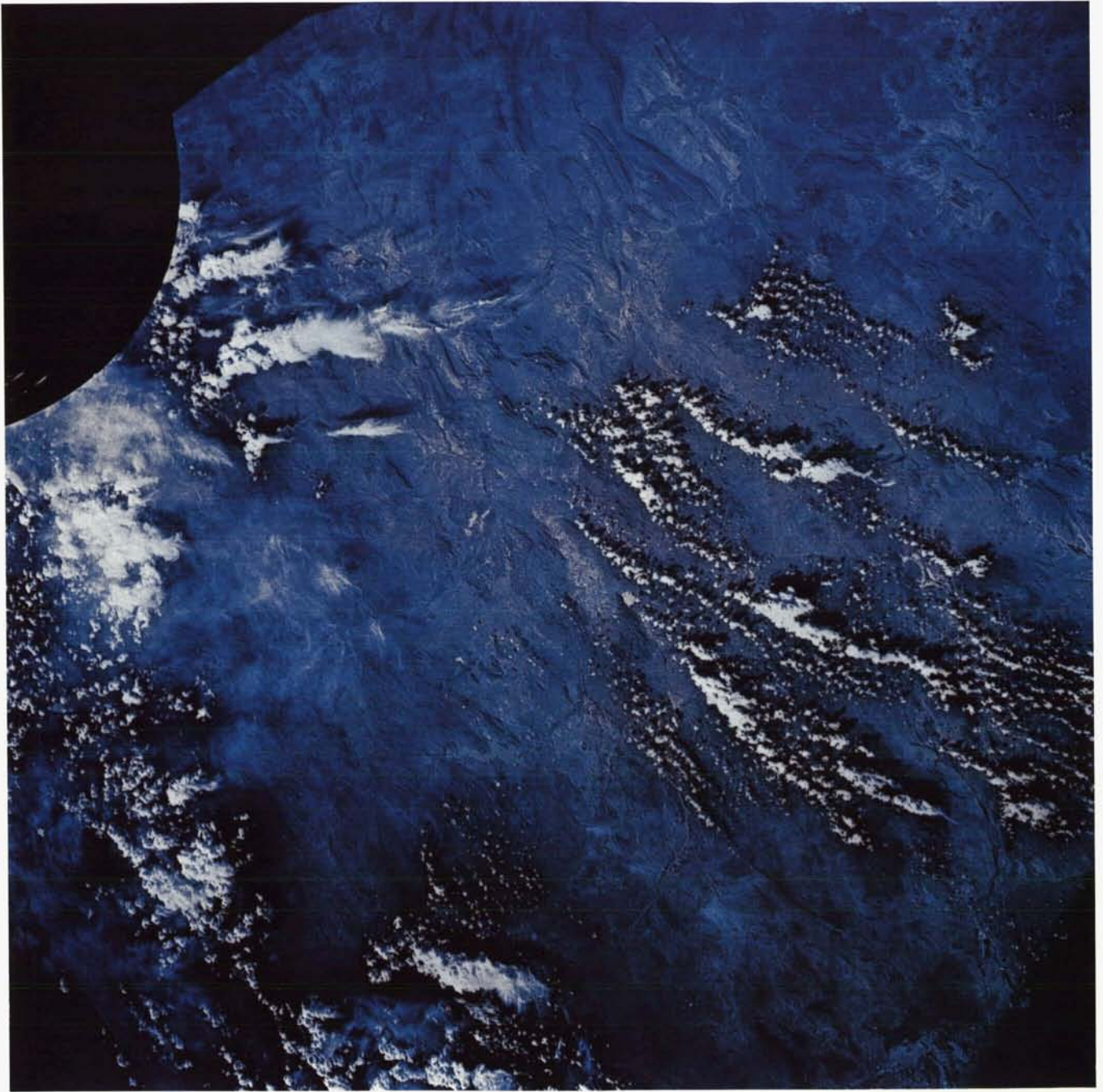


For this picture the camera was pointed east over the Sierra Madre Oriental toward the Gulf of Mexico. Some of the interior highland can be seen in the foreground. Those long dark ridges, visible despite the cirrus-cloud cover, are in the vicinity of Monterrey. The largest de-

flection in the trend of the Sierra Madre Oriental is found there. In the background, heavy, moist air from the gulf veils the view. The high mountains along the coast barricade the interior land from such humid air.

GEMINI IX JUNE 3, 1966 S66-37907



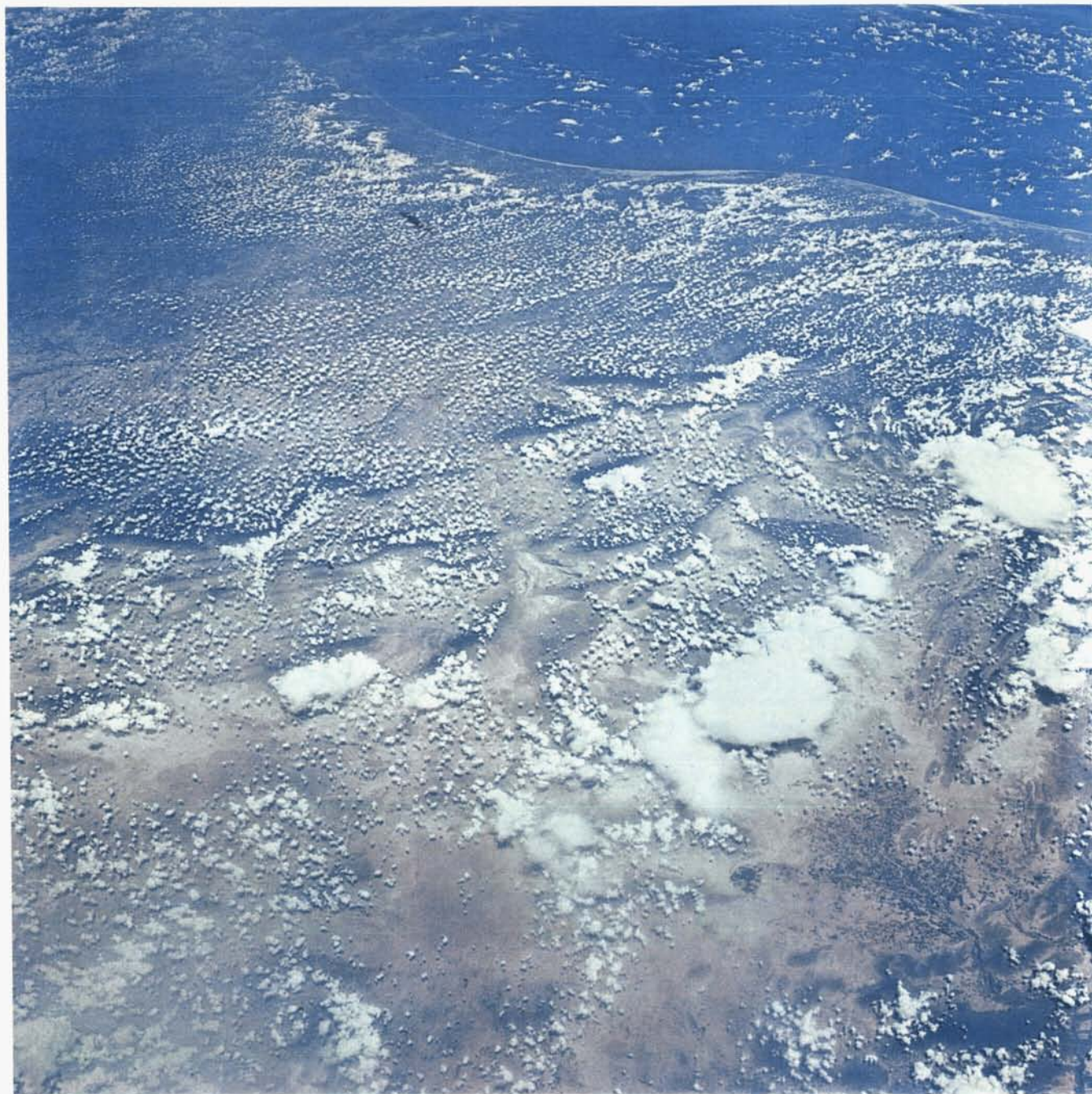


The Sierra Madre Occidental is in the lower left corner of this view and the city of Chihuahua is just below a featherlike cirrus cloud in the upper left center. Rows of cumuli at the right are over a part of the Sierra Madre Oriental. This is an area of relatively low relief but high elevation. Mountain ranges are widely spaced

here and intermontane basins are filled with Quaternary alluvium. The Rio Grande flows through the region at the upper right. North of it is El Solitario, a 3-mile-wide dome over a laccolith that brings lower Paleozoic and Cretaceous sediments to the surface along with Tertiary rocks.

GEMINI XII NOVEMBER 14, 1966 S66-63055



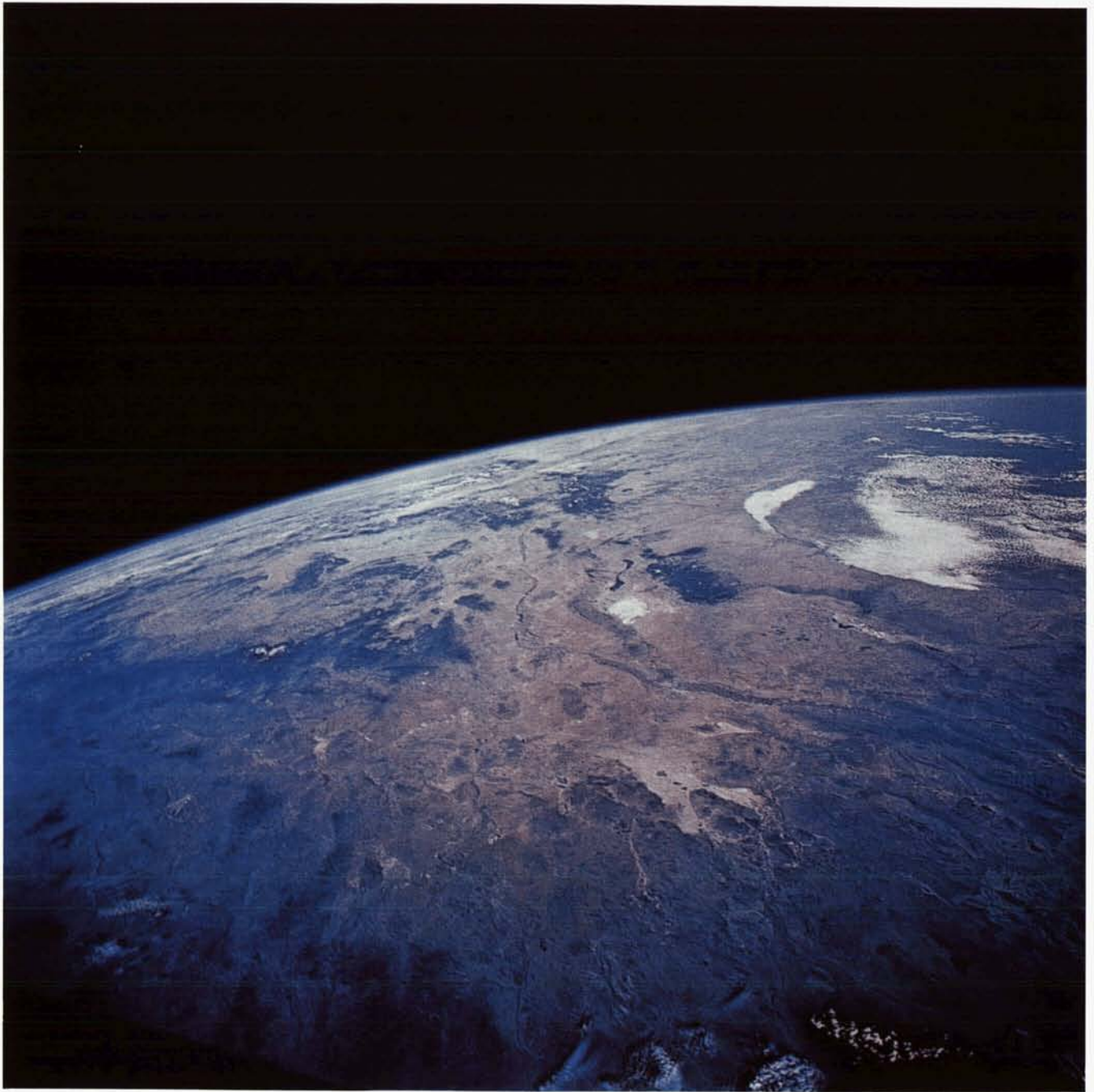


This view of northeastern Mexico extends into Texas. The mouth of the Rio Grande is in the upper right, and Nuevo León and Coahuila are in the foreground. The color reveals these States' desertlike climate. The cloud lines over the coastal lowlands show that the airflow in the lower troposphere is from the east. The leeward,

western slopes of some ranges of the Sierra Madre Oriental are free of clouds. Notice, too, how the cloud lines conform to the curvature of the ranges near Monterrey at the right. The immense folded mountain chain in the foreground runs southeast from Chihuahua nearly to the gulf.

GEMINI X JULY 20, 1966 S56-45762





The horizon here is more than 1000 miles away. Part of Chihuahua, Mexico, is in the foreground. The Sierra Madre Occidental is at the left and the Sierra Madre Oriental is at the right. The view is directly north up the Rio Grande valley and includes most of the southern Rocky Mountains. Eastern Arizona is on the horizon at

the far left, and central Oklahoma and Kansas at the right. Near the center of the picture, the white patch to the right of the Rio Grande is the White Sands National Monument. North of it is the distinct, black, ribbonlike shape of the Malpais, a recent lava flow north of Alamogordo, N. Mex.

GEMINI XII NOVEMBER 14, 1966 S66-63018



## Part X. The United States

SOME parts of the United States were shown in pictures that precede this group. Since the girdle that the Gemini program threw around the world did not extend as far north as south of Cape Kennedy, the photographs that follow are predominantly views of the southern coast of the United States around the Gulf of Mexico.

This is not a "forgotten" area such as Baja California. Nor is it a barren land. It differs markedly from many of the regions shown previously. This is a region in which people have been quick to develop the resources available to them, and parts of it are now highly industrialized. Even so, when seen from space its beauty still rivals that of many undeveloped regions.

By enabling us to see the scheme of things entire, space photography can help men both exploit an undeveloped region's natural resources and monitor the skies, seashores, and forests to prevent pollution and degradation of them.

This was the astronauts' homeland and they photographed the city of Houston many times. Along the gulf shore they used infrared along with other color film to obtain more information than one can with the naked eye. Above Florida's east coast they saw their starting point again, and sped east again and again to see more of the world.

"We have achieved the ability to see and contemplate ourselves from afar," Dr. Floyd L. Thompson wrote shortly before he retired as Director of the Langley Research Center, "and thus in a measure to accomplish the wish expressed by Robert Burns: 'To see oursels as ithers see us.'"





North America's Pacific coast, from Los Angeles, near the left edge, to Baja California is slightly above the stratocumulus clouds in the foreground. San Diego is nearly in the center. The massive mountain range at the extreme left is the south end of the Sierra Nevada. Above Los Angeles is the large, bare Mojave Desert.

The San Andreas fault runs southeast from it between mountain ranges to the Salton Sea, right of center. The clouds on the horizon hide most of the Colorado Plateau. In the clouds at the lower right, the photo shows a remarkable set of waves, probably induced by irregularity in the terrain along the coast.

GEMINI X JULY 19, 1966 S66-45658



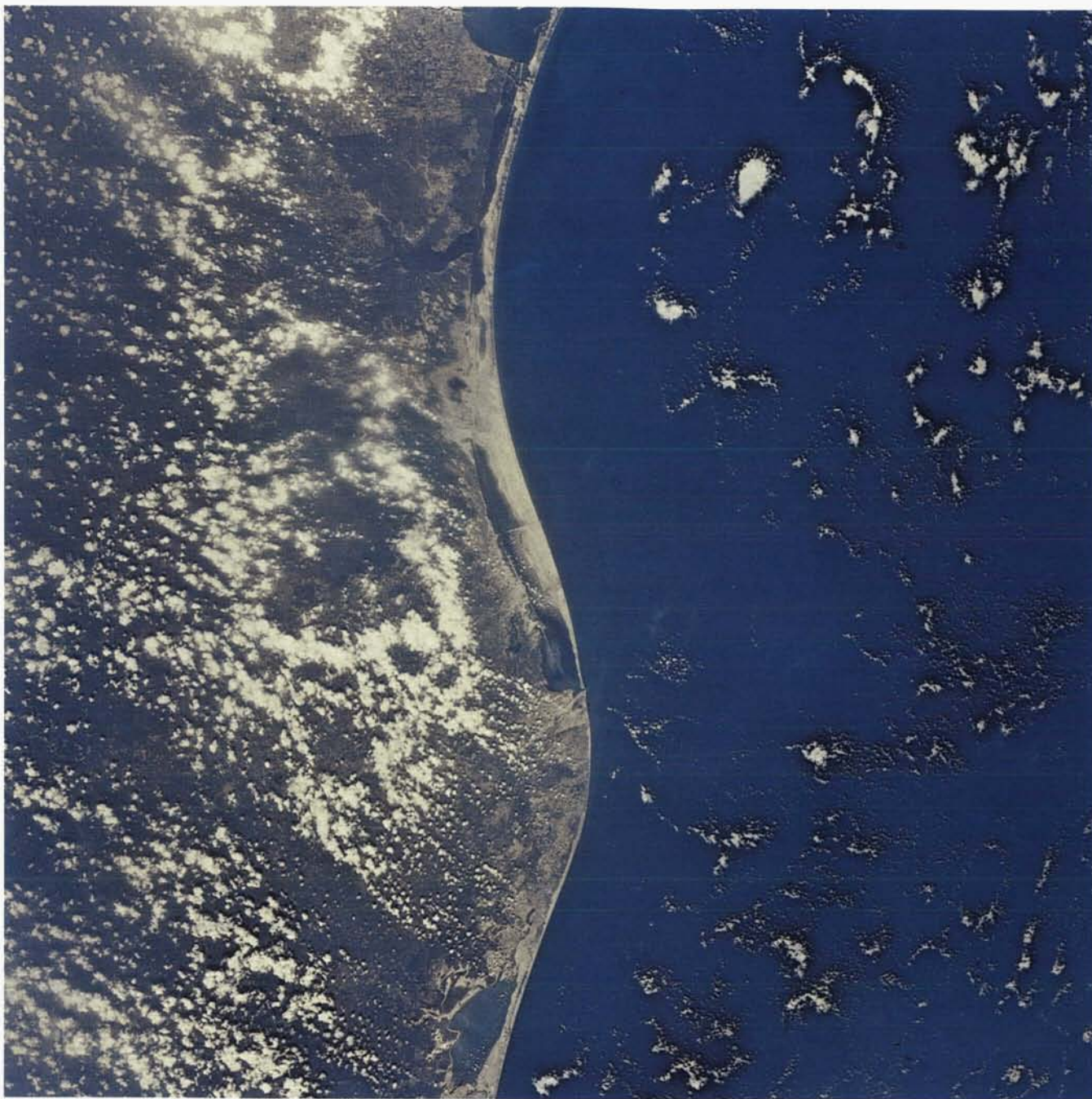


A wide-angle lens used during extravehicular activity produced this colorful view of the United States from the Gulf of California, at lower right, to the Colorado Plateau. The Salton Sea is above the red dot on the spacecraft. Farms outline California's Imperial Valley and the Colorado River's delta in northern Mexico. This

part of the Great Basin shows typical basin-and-range topography. The distant clouds were scattered over California and western Arizona. The dark elliptical area above the gulf is the Pinacate volcanic field, and the light smoke plume above it was rising from the forested region northeast of Phoenix, Ariz.

GEMINI IX JUNE 5, 1966 S66-38068





Corpus Christi Bay is at the top and Mexico's Laguna Madre at the bottom of this nearly vertical view of the Rio Grande's deltaic plain. The international boundary is in the lower half of the photo. The long curving beach is Padre Island. It is typical of barriers that rim the Gulf of Mexico on the west, and has been studied as a pos-

sible clue to the formation of oil traps. The Intracoastal Waterway can be seen in the shallow Laguna Madre and a belt of grassland begins inland from the sand bars. Cumuli had formed inland while a cool sea breeze restricted cloud development along the coast.

GEMINI X JULY 20, 1966 S66-45764



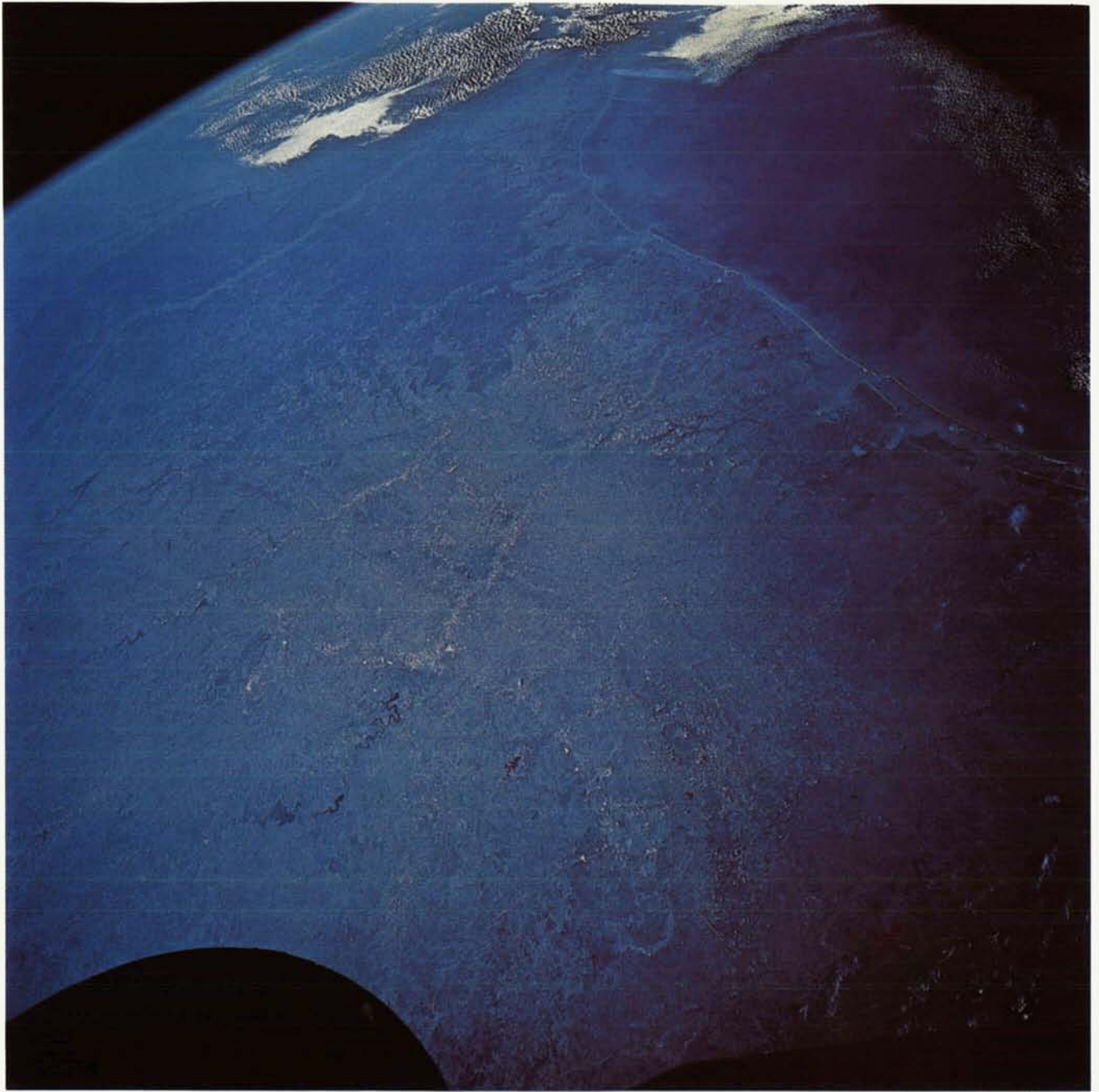


San Antonio is in the light area left of the center. Austin is above and to the right of it on the Texas Colorado River. The cities are along the fault-controlled Balcones Escarpment that is the east edge of the Edwards Plateau. Differences in the shale and sand content of the Tertiary units cause variations in soil color, topographic expres-

sion, and vegetation. In the upper left, the Llano Uplift brings a complex dome of Precambrian rocks to the surface. Lower Paleozoic carbonates and sandstone surround it. The stratocumulus clouds at the right are on the north side of a cold front.

GEMINI XII NOVEMBER 12, 1966 S66-63428





Austin is now above Gemini XII's nose and San Antonio is in the lower center. Near Austin one can see Buchanan, Lyndon B. Johnson, Travis, and Canyon Lakes. The curving Balcones Escarpment is above these cities, and cuestas on the coastal plain are visible from north of San Antonio to the vicinity of Waco. In the upper

left, the Red River flood plain crosses dense pine forests of Louisiana. The Mississippi River's mouth is between the stratocumulus and cirrus clouds near the horizon. Suspended alluvial sediments show the currents off the Texas shore in the Gulf of Mexico between the Mississippi and Aransas Pass at the right.

GEMINI XII NOVEMBER 14, 1966 S66-63024





Taken only seconds after the previous photo, this one has Houston's metropolitan area in the center. The Balcones Escarpment is now just above the spacecraft nose. The Houston ship channel and spoil banks in Galveston Bay can be seen at the right, where the ancient Pleistocene shoreline stands out as the present northwest

shore of Matagorda and Espirito Santo Bays. Matagorda, Galveston, and other islands are raised offshore bars. Such bars extend along the Texas coast eastward to Sabine Pass. Northerly winds along the Louisiana coast were carrying smoke plumes toward the stratocumulus-cloud field over the Gulf of Mexico.

GEMINI XII NOVEMBER 14, 1966 S66-63025





This picture overlaps the two photos that have preceded it in this volume, and shows the dense pine forest in east Texas that is known as "The Big Thicket" more clearly. The Sam Rayburn Reservoir can be seen in that thicket. Along the shore, suspended sediments can be traced as they are carried out into the Gulf of Mexico.

Note especially the upper part of this photo, where wavy patterns in the clouds are quite distinct, and smoke from fires near oil and gas wells in the Vermillion Bay area is being blown out over the gulf. The next picture in this sequence was taken about 90 minutes later and shows interesting changes in the sky.

GEMINI XII NOVEMBER 14, 1966 S66-63031





After circling the Earth, the Gemini astronauts took this picture of the same area shown in the preceding one. The patch of stratiform clouds over Louisiana, in the upper part of the photo, had shrunk in size, and some dissipation of the stratocumulus clouds over the water along the coast had occurred. Smoke from the

shoreline still drifted southward, and sediment patterns still discolored the water. The Red River Valley cuts a swath across the dark forest lands in the left center. North of the Red River are ridges of the Ouachita and Wichita Mountains of Oklahoma.

GEMINI XII NOVEMBER 14, 1966 S66-63062



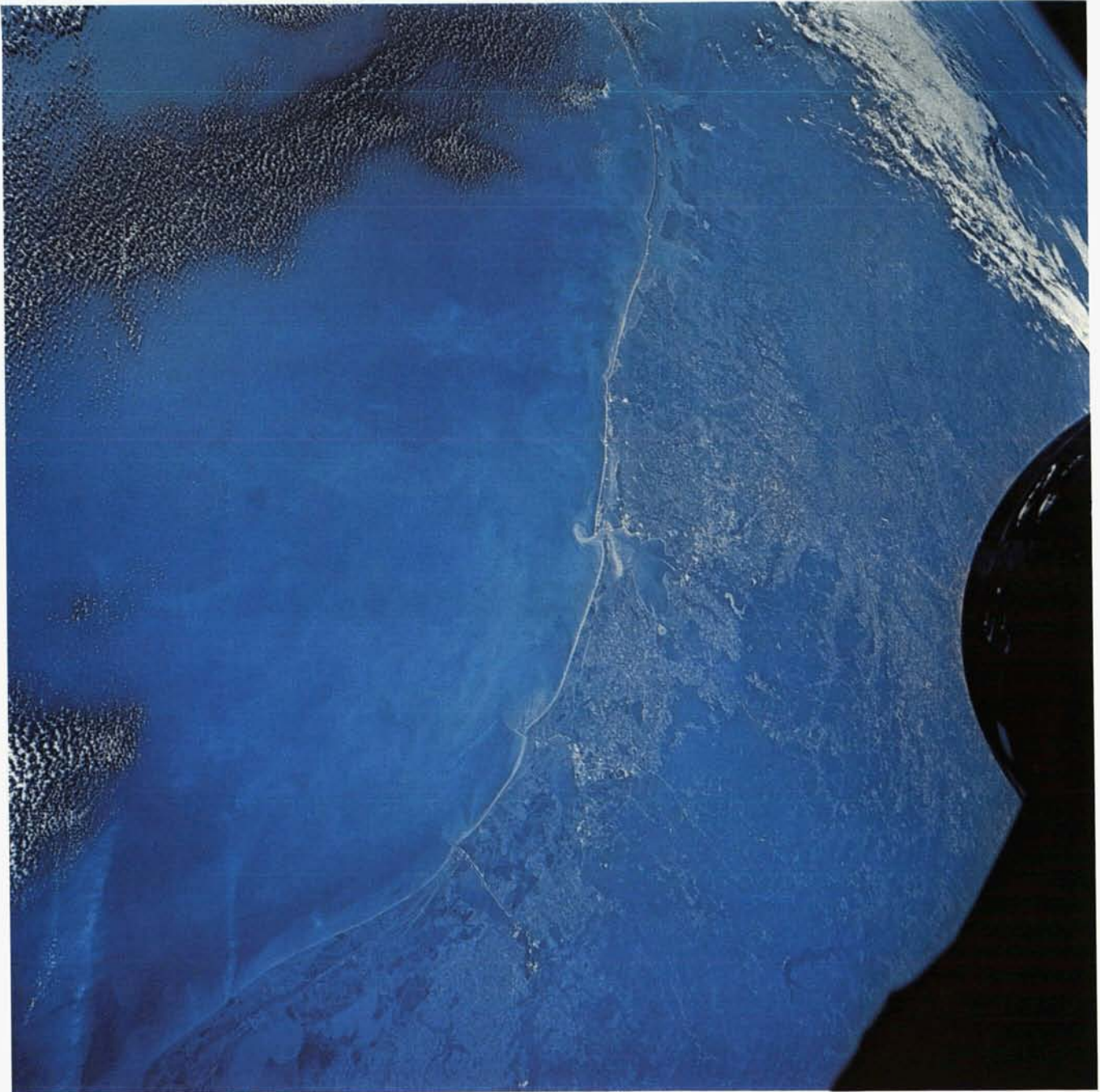


Here is the city of Houston as seen from an altitude of about 175 miles. The city is directly below "The Big Thicket" in this photo. The big Harris County domed stadium in the southwest part of the city is only a white dot. The dark-blue line across Galveston Bay is the Hous-

ton ship channel. Turbid waters extend into the Gulf of Mexico from several outlets. A marsh fire sent up the stream of smoke in the upper right. NASA's Manned Spacecraft Center is 20 miles southeast of Houston.

GEMINI XII NOVEMBER 14, 1966 S66-63034



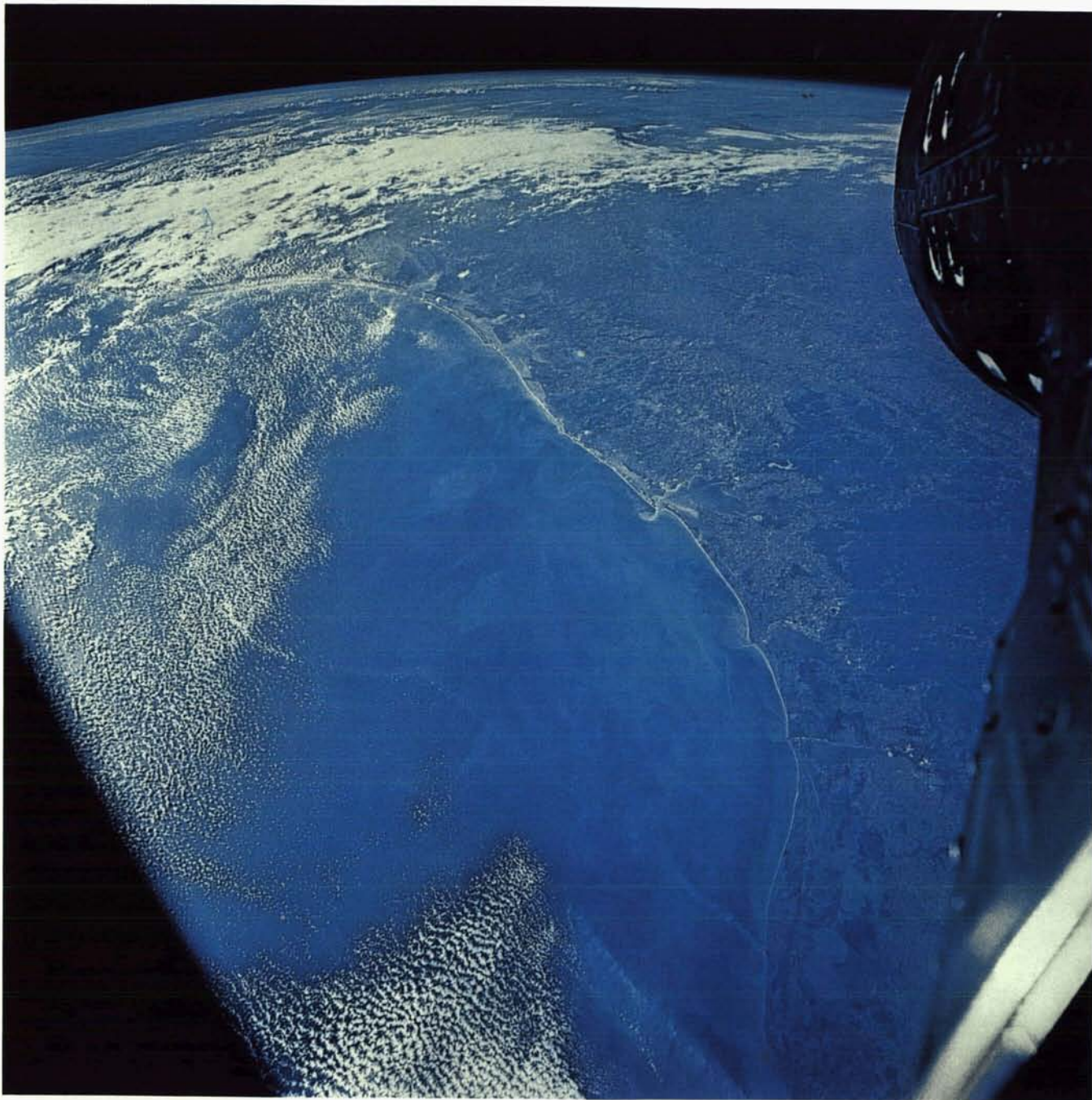


From east of Galveston Bay, Astronaut James A. Lovell, Jr., looked back to photograph it again. To the right is the Beaumont-Port Arthur and Lake Charles industrial complex. The coastal sky was clear from Vermillion Bay to Baffin Bay, and the Intracoastal Waterway can be traced from Orange on the Sabine River east to Grand

Lake in this photo. A cold front had crossed the coast 2 days earlier and the winds still were from the north-east. They were thrusting water into the gulf from the lagoons and estuaries. An interference eddy had formed west of the Galveston jetties, and frictional eddies were visible farther seaward.

GEMINI XII NOVEMBER 14, 1966 S66-63035



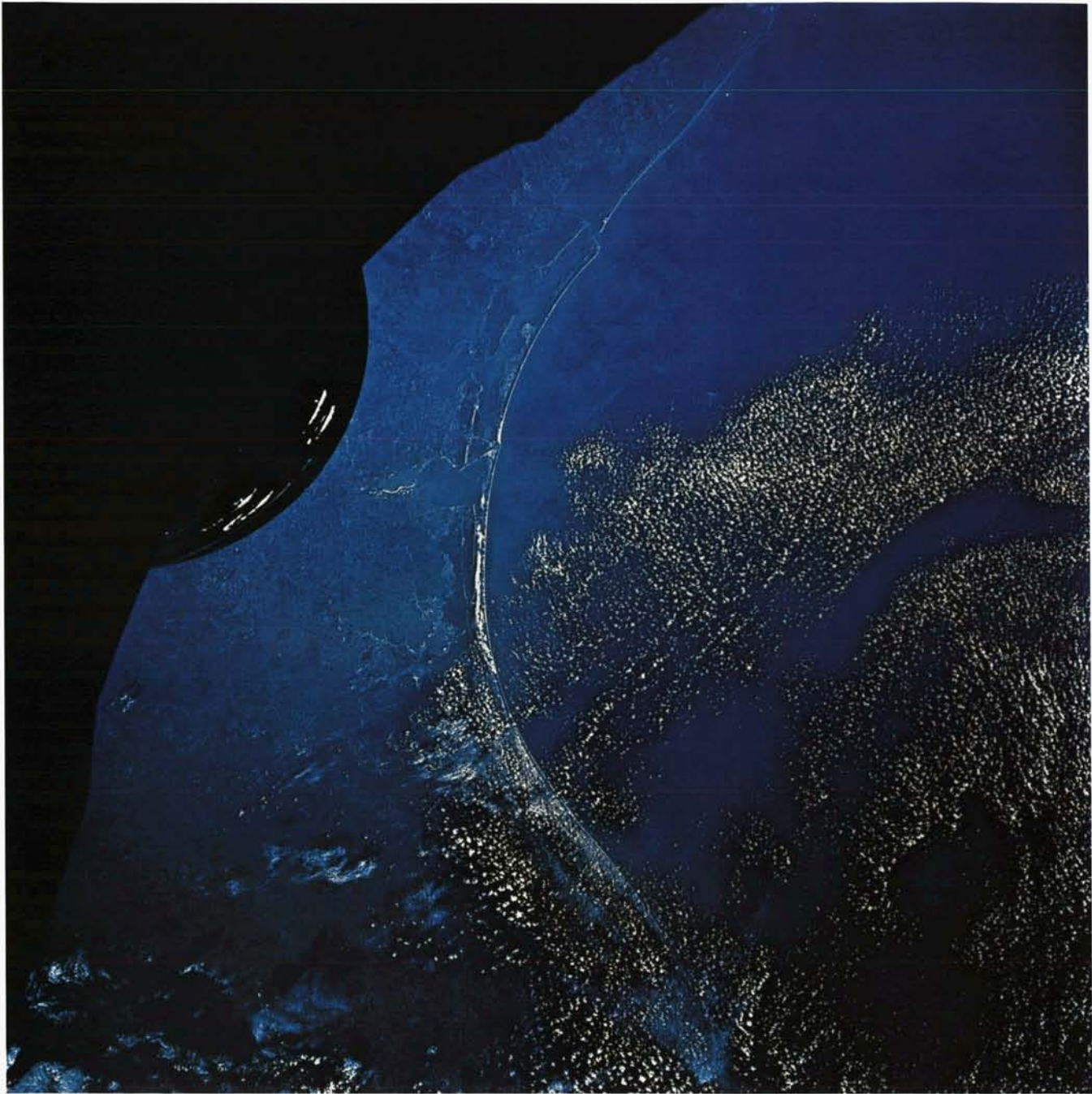


This southwesterly view of the gulf coast includes many of the same features as the preceding pictures, but extends from Marsh Island in the foreground to south of Brownsville. The cell-like patterns in the stratocumulus clouds over the gulf appear when water warms the lower part of the atmosphere. Drizzle was reported in north-

eastern Mexico from the clouds near the top center here. Below them one can see the Balcones Escarpment. Some of the world's most important shrimp fisheries are in the coastal waters shown, and photos such as this can be used to improve predictions of currents that affect shrimp migration paths and rates.

GEMINI XII NOVEMBER 14, 1966 S66-63038



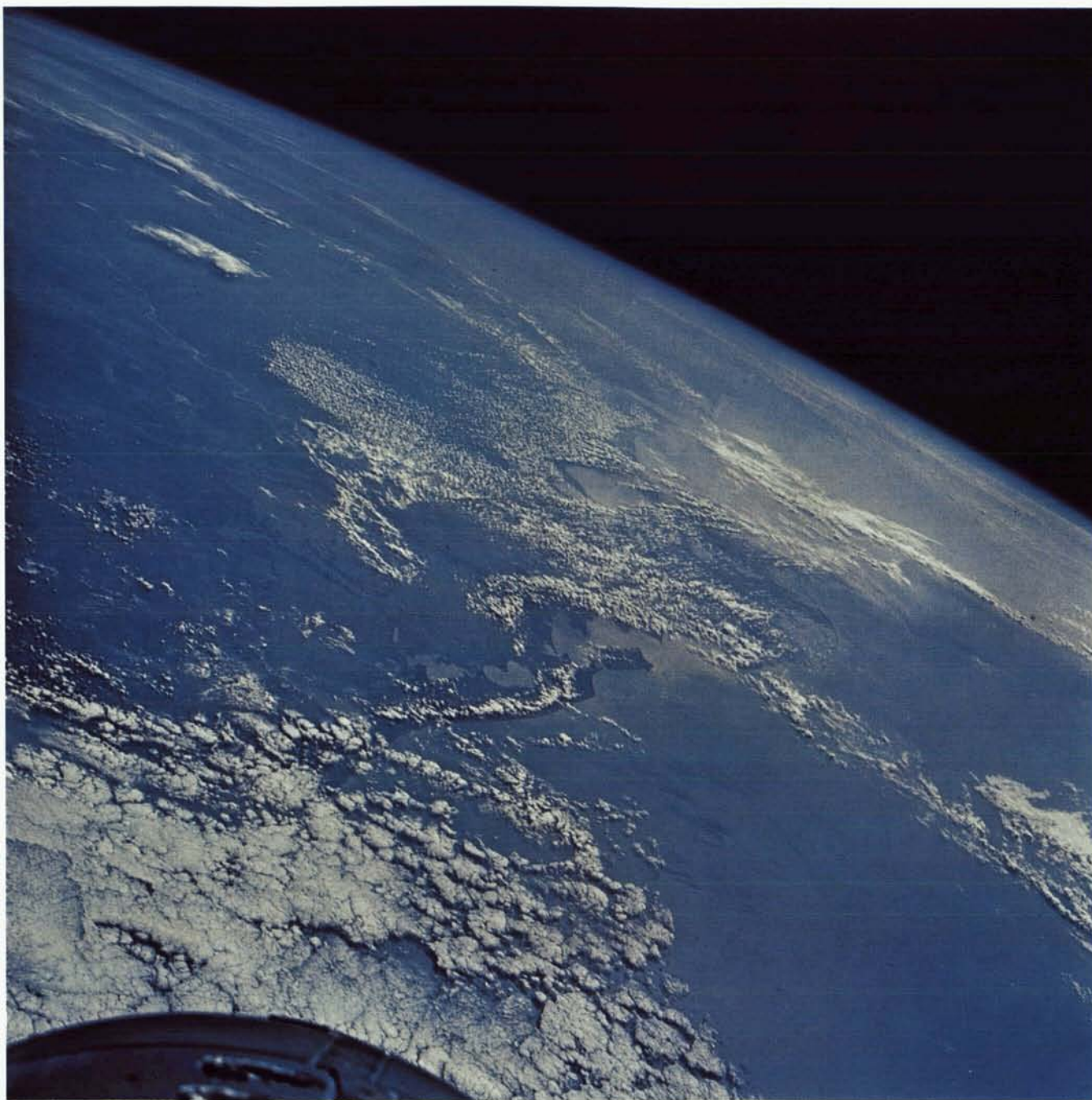


Here one sees again some of the same area shown in pictures that have preceded this one. Nueces Bay and Corpus Christi are now above the vehicle's nose, and the rivers flowing into the gulf and the ship channel from Aransas Pass are distinctly shown. Small cumulus clouds dot the area of the mouth and valley of the Rio Grande,

and the cumuli ranging inland can be seen to have increased somewhat since the photo that immediately preceded this one was taken, about 90 minutes earlier. From an orbiting spacecraft, a given area can be observed repeatedly at regular intervals, as well as seen from a variety of angles helpful to students.

GEMINI XII NOVEMBER 14, 1966 S66-63060



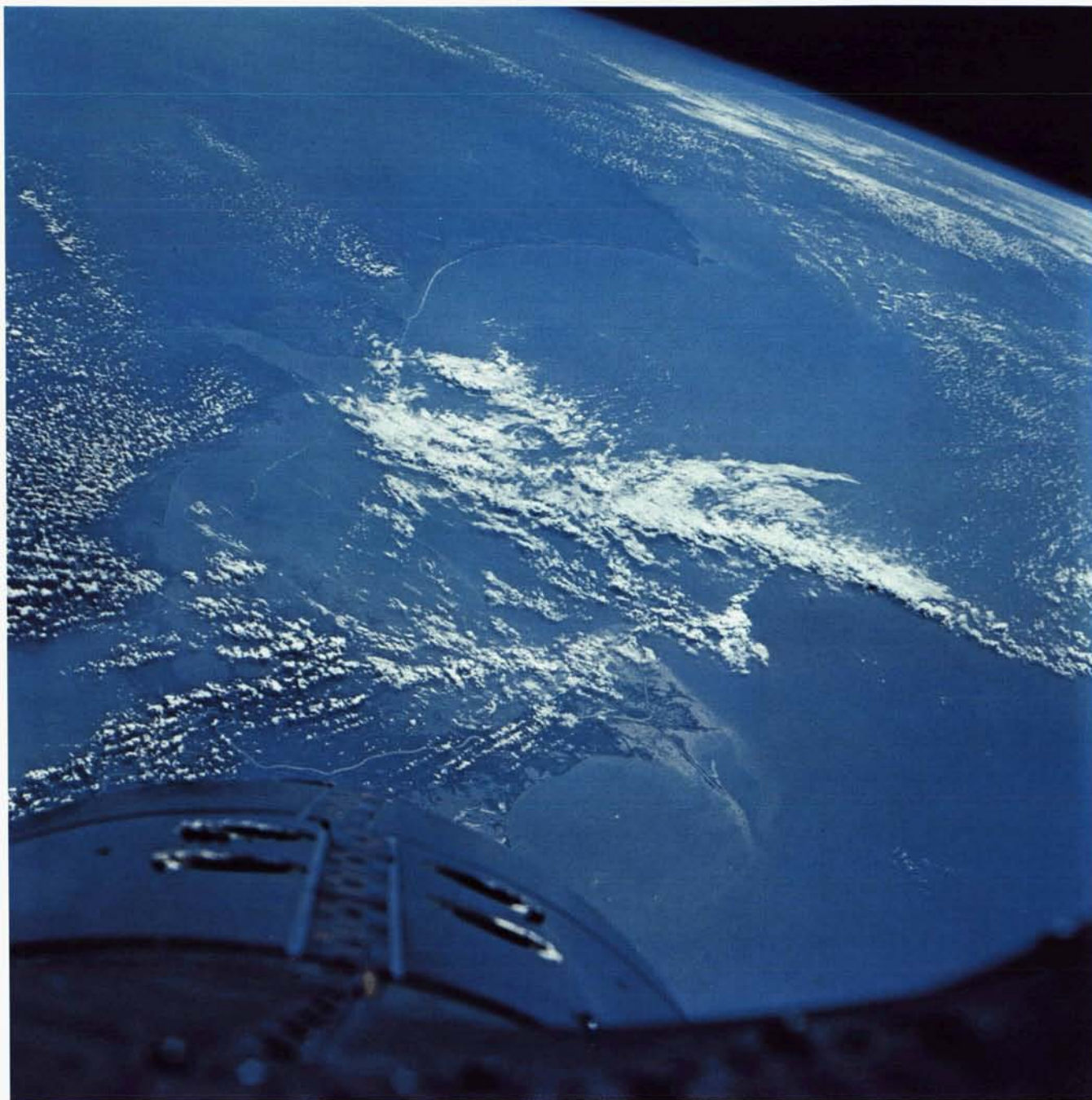


The gulf coast from Port Arthur, Tex., at the lower left, to Florida, on the horizon, is shown here. From Vicksburg, Miss., near the upper left edge, to the Gulf, the Mississippi River is visible. Between the altostratus clouds in the foreground and rows of cumulus over Louisiana and Mississippi, you see Atchafalaya Bay and the con-

tinental shelf offshore that has been tapped for oil. An anticyclone was centered over North Carolina and an upper air trough was over the Mississippi Valley the day of this photo. West of the river, the winds at an altitude of 18 000 feet were from the northwest; east of it, they were from the southwest.

GEMINI IX JUNE 3, 1966 S66-37909



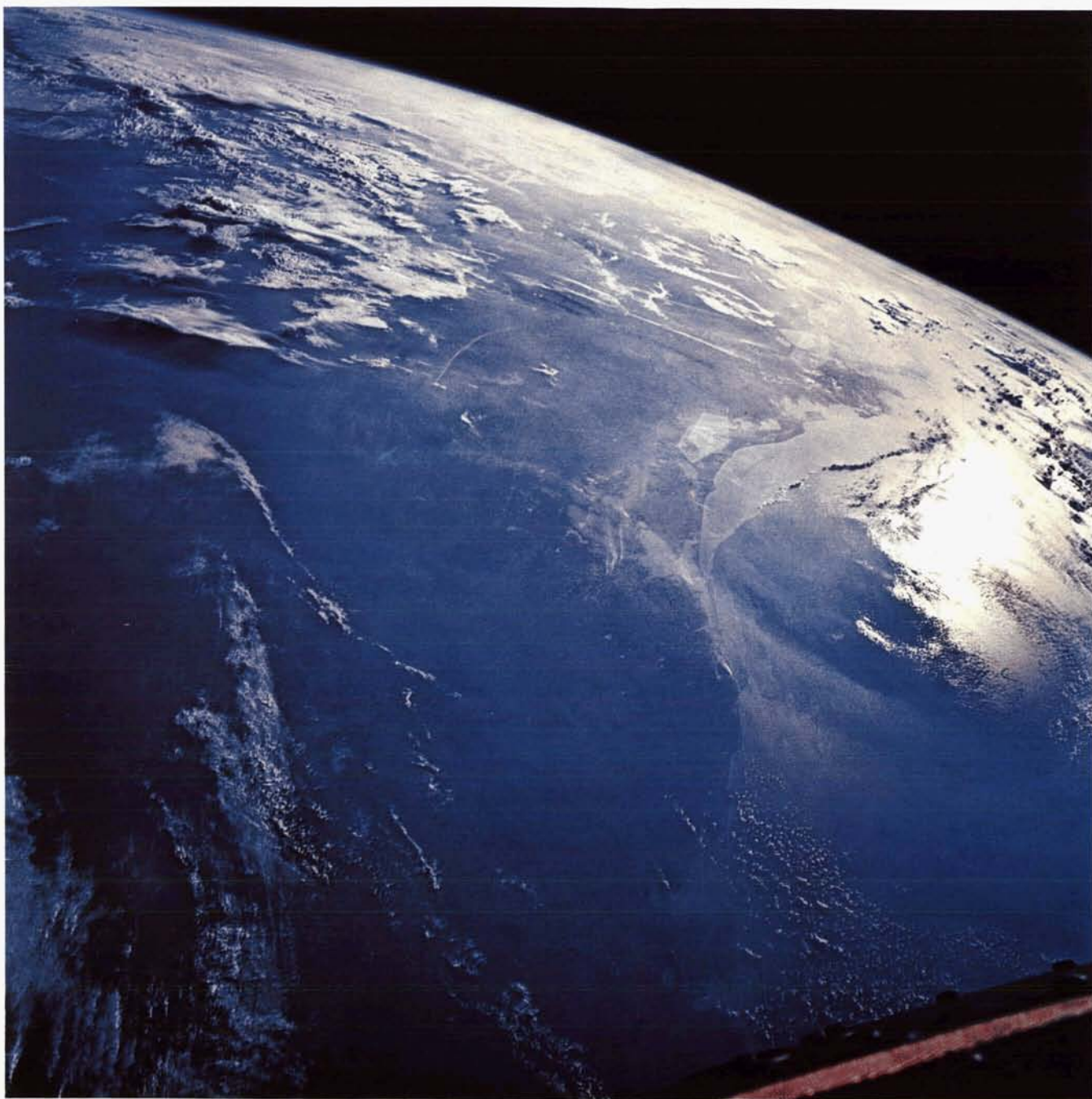


The "bird's foot" in the lower center here is the Mississippi River delta. Lake Pontchartrain is left of it. Rows of cumulus clouds obscure New Orleans and much of southern Mississippi. The long embayment is Mobile Bay, and the Florida peninsula is near the horizon. Off-shore bars from Gulfport, Miss., to Apalachicola, Fla.,

are prominent depositional features. The Mississippi pours great quantities of fine sediment into the gulf. Changes in the color of sediment-laden water off the delta show that the longshore currents were westerly, and light spots reveal the wakes formed around offshore drilling rigs.

GEMINI IX JUNE 3, 1966 S66-37910





Thunderstorms were imbedded in the cloudiness over northern Texas at the upper left in this photo ahead of a cold front advancing southward. The gulf south of Louisiana reflected early-morning sunlight. The contrail from a jetliner near Shreveport left a thin line near the center, and ground fog in valleys of eastern Louisi-

ana and Mississippi produced other bright, irregular lines. A line of cumulus clouds lay parallel to the shore, and smoke plumes showed that winds north of it were northerly. This picture shows how vividly pollution can be seen in photos taken from high altitudes.

GEMINI XI SEPTEMBER 14, 1966 S66-54560



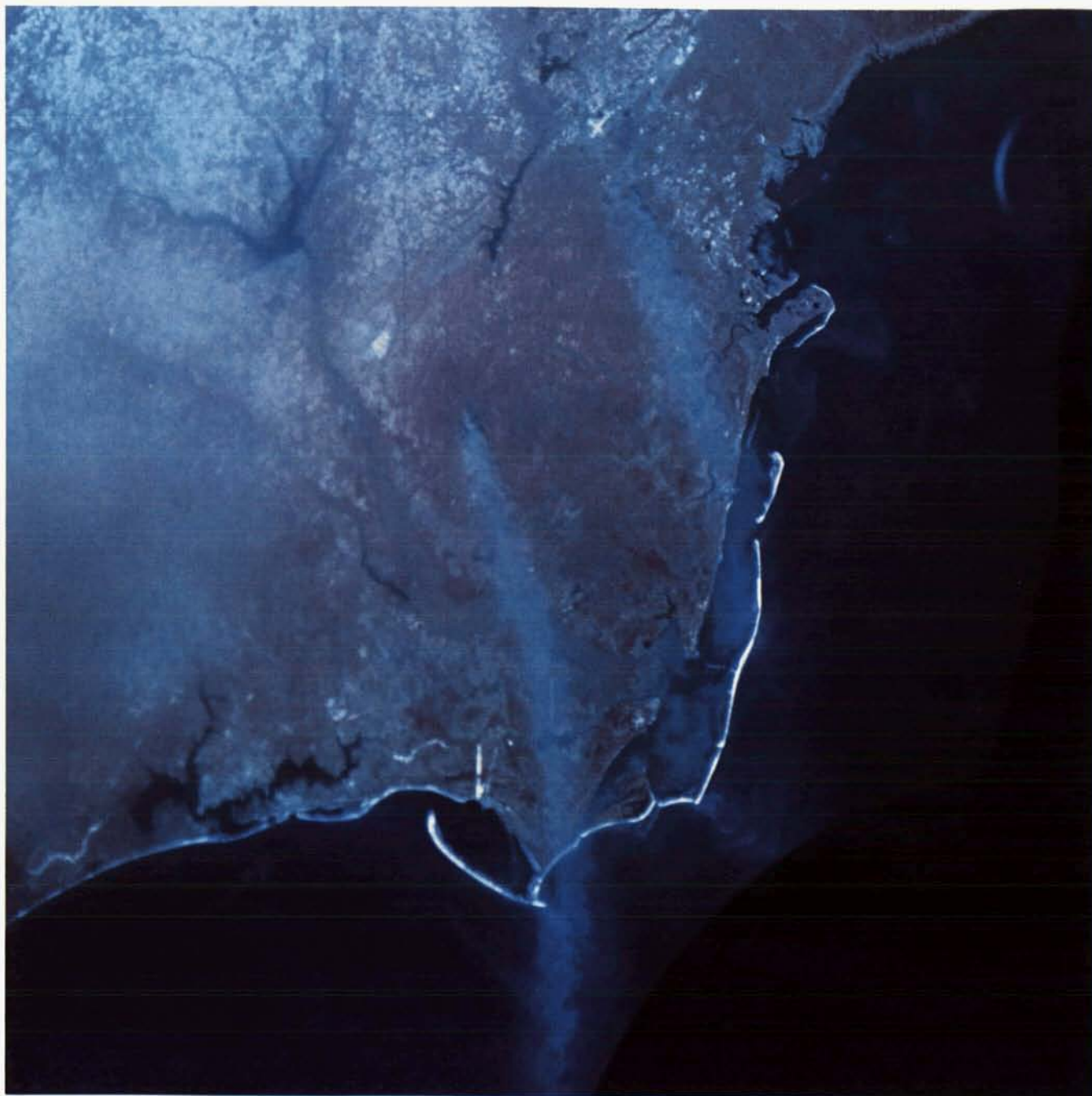


Color infrared film was used for this and the next photo, and coastal sands brighten the shoreline. Pensacola is at the lower left here, Birmingham near the top, the Chattahoochee River in the upper right, and St. Andrew's Bay in the lower right. Tyndall Air Force Base is a light rectangle on the peninsula below the bay. A residue on

the spacecraft window degraded this photo's center. Light bands in the upper left are Upper Cretaceous coastal plain clastic sediments overlapping the edge of the Appalachians north of Selma and Montgomery. Sinkholes north of St. Andrew's Bay mark the location of Miocene and Pliocene limestones.

GEMINI VII DECEMBER 7, 1965 S65-64052



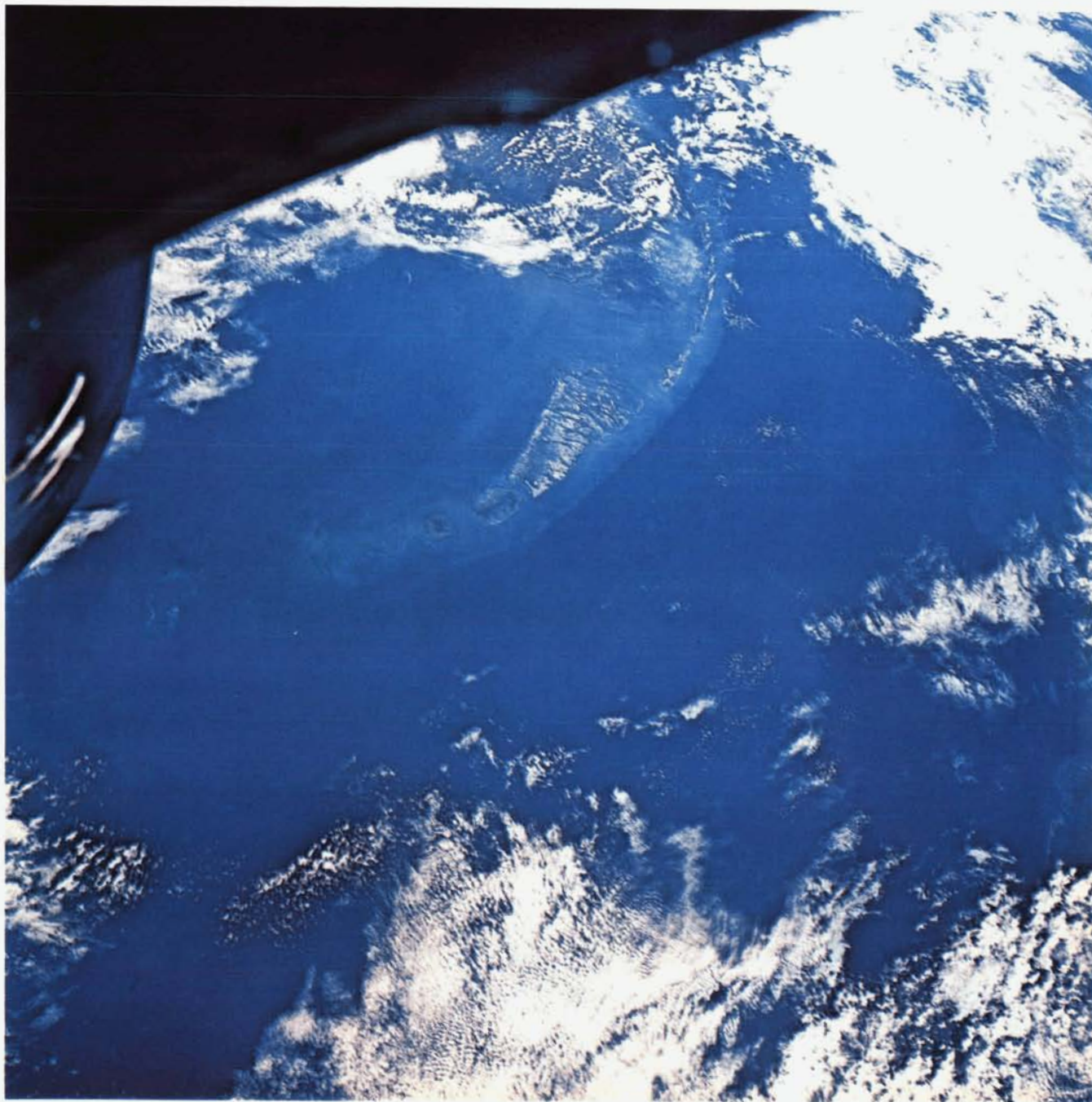


Those long blue plumes in this infrared photo are the smoke from forest fires southwest of Tallahassee, Fla. They are drifting over the Gulf of Mexico. The hook-shaped sand bar in the foreground encloses St. Joseph Bay. Panama City is to the left. From Lake Seminole in the upper left, the Apalachicola River flows south to the

bay above the hook. The long blue line to the right of the reservoir is Lake Talquin and you can see the Tallahassee airport runways near its upper end. The vegetation on the swampy tidal flats is reddish in this picture and a narrow band of gray marks the extent of this coastal land.

GEMINI VII DECEMBER 7, 1965 S65-64053





Cumuliform clouds frame Florida's tip and 150 miles of the keys off it in this picture. The Dry Tortugas are at the far left, Key West near the center, and Key Largo near the top. Sediment-laden water is streaming across the bays and a turbid tongue is visible in the channel that separates the Dry Tortugas from the calcareous

platform of the Florida and Marquesas Keys. Islands dot the reef between the Marquesas and Key West. Southeast of Key Largo, part of the long, submerged coral reef has been reserved as an underwater park. Sediments formed the southern edge of the mainland, and there is a band of mangrove swamps between it and the Everglades.

GEMINI VII DECEMBER 13, 1965 S65-64024



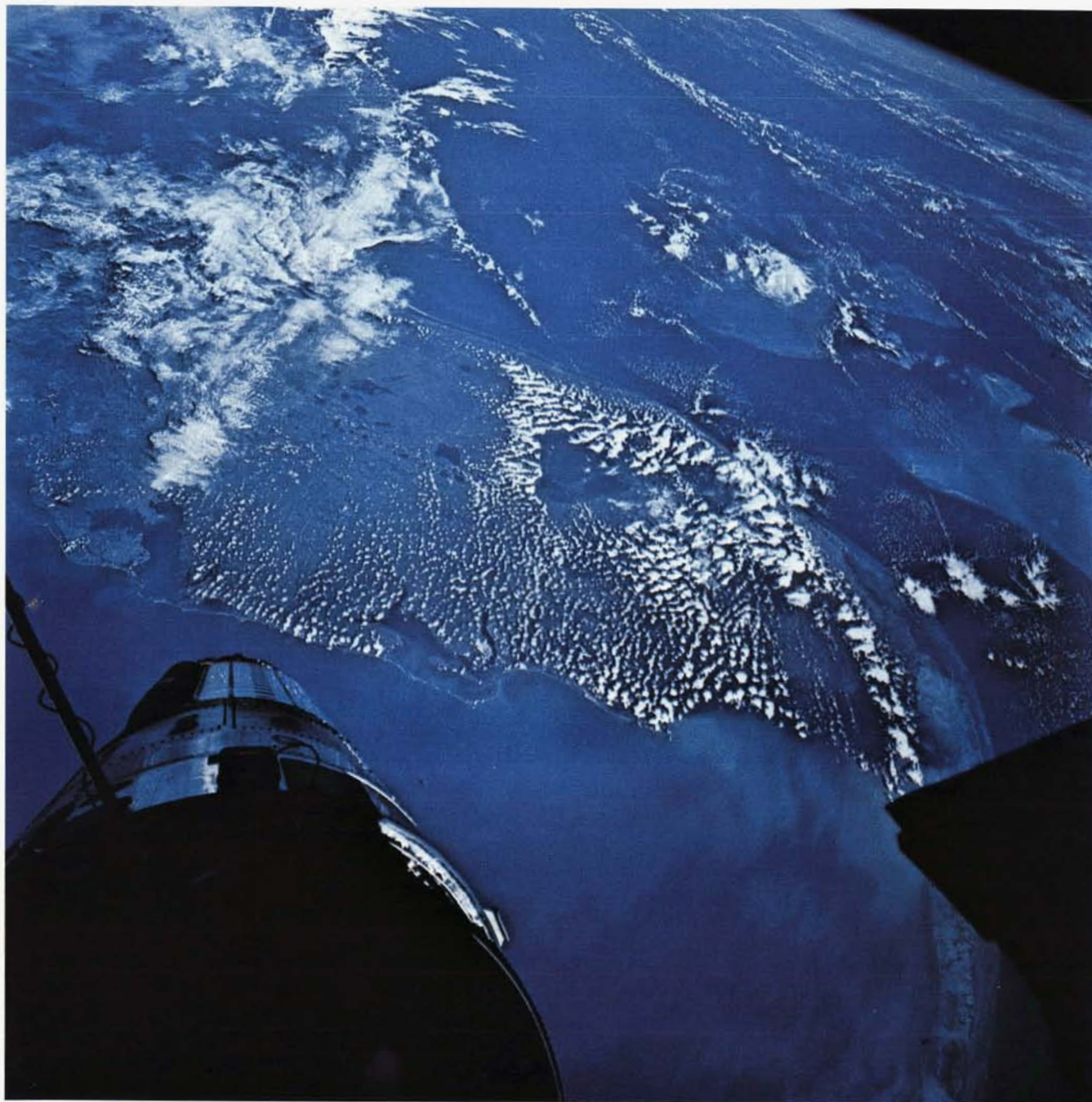


The day the astronauts took this and the next four pictures, cumulus clouds covered the southern half of Florida in an organized manner and a cold front was along the U.S. Atlantic coast on the horizon here. There were openings in the cumulus over Lake Okeechobee, Tampa Bay, and Charlotte Harbor, because such clouds usually

form over land. Tampa was reporting southwest winds at 10 knots and Miami had southeast winds at 5 knots. A long, narrow band of cirrus clouds near the jetstream lay over the frontal zone in the distance. The spacecraft was docked with its Agena target vehicle and approaching Florida from the west.

GEMINI XII NOVEMBER 12, 1966 S66-62897



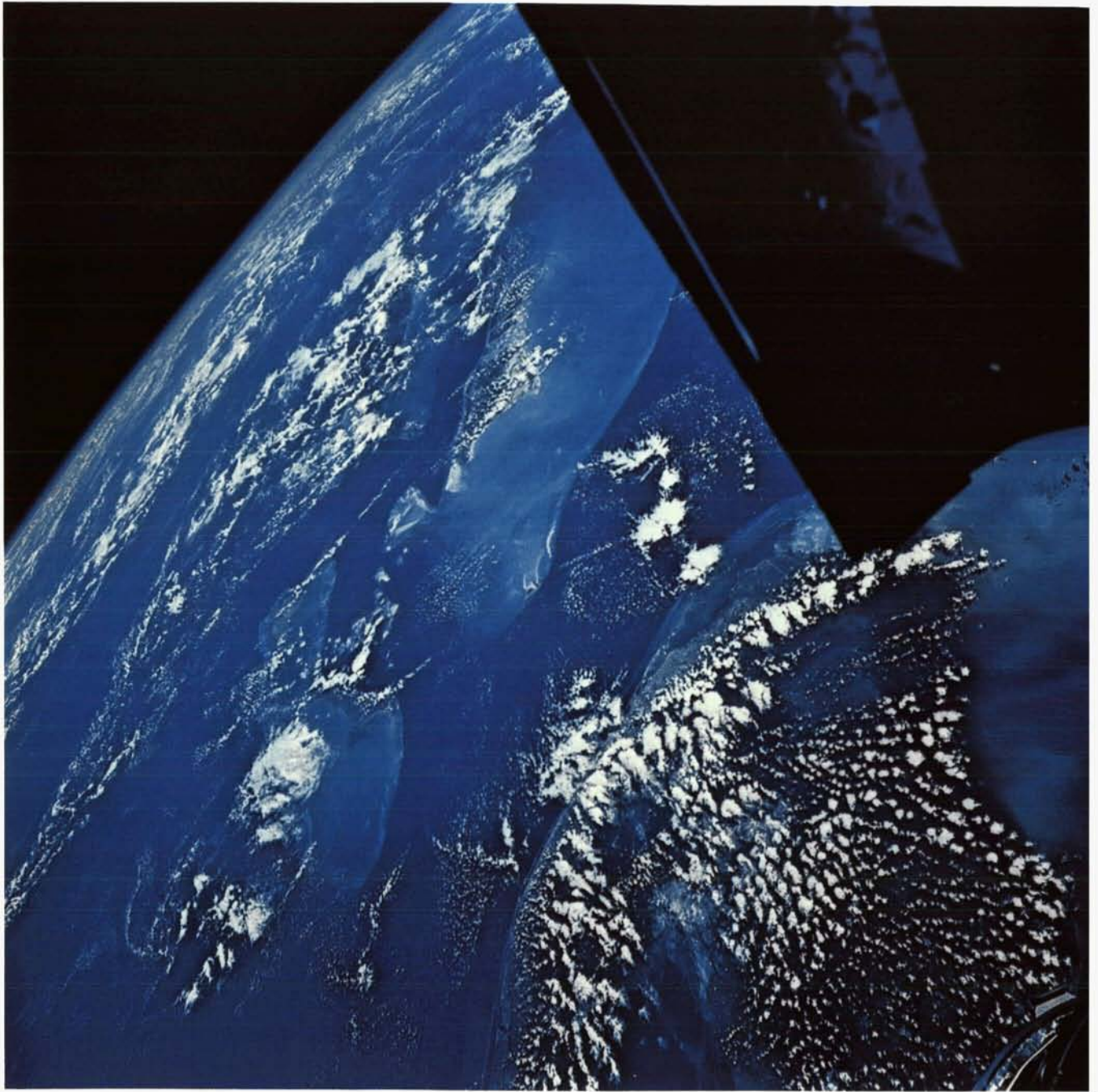


Strong surface winds were creating turbulence in the shallow waters off southwest Florida as the spacecraft neared the peninsula and the astronauts recorded the view eastward toward the Little Bahama Bank. Tampa Bay is at the left and the Florida Keys are in the lower right. The turbulence was bringing fine, white, calcar-

eous muds into suspension, and muddy water from the coast spread across the western Florida shelf. Layers of stratocumulus covered Cape Kennedy on the eastern coast, and a cloud line bordering the edge of the Gulf Stream extended northeast over the Atlantic. Such a cloud line is frequently seen in this area.

GEMINI XII NOVEMBER 12, 1966 S66-62900



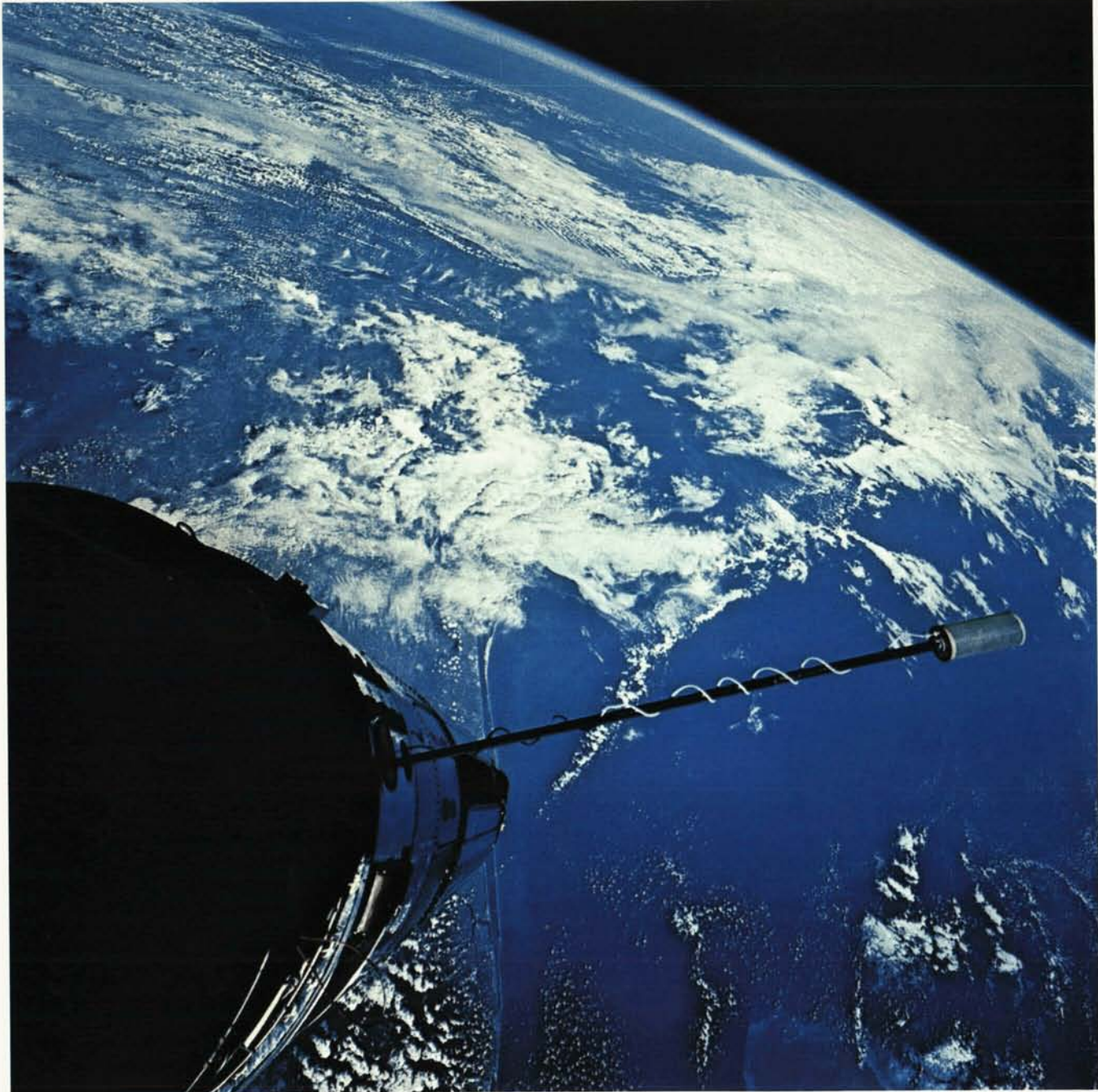


In this photo the puffy cumuliform clouds to which the spacecraft door points are over southern Florida, and the clouds to the left overlay the Gulf Stream. There the northern portion of the Great Bahama Bank and the Little Bahama Bank off the east coast of Florida are clearly defined. This and the next photo are especially

interesting to the marine geologist and the cartographer because of the clarity with which they show the relationship of shallow calcareous sandbars in the Bahama Banks. Andros Island is in the upper center here. Bimini Island is on the near edge of a light-blue area below Andros Island, and other islands are left of it.

GEMINI XII NOVEMBER 12, 1966 S66-62903





This and the next picture are additional views of the cold-front cloudiness along the eastern coast of the United States that was first photographed while Gemini XII was over the Gulf of Mexico. The hatch was open and Astronaut Edwin E. Aldrin, Jr., was engaged in extravehicular activity when this one was taken. Florida's

Atlantic coast from Cape Kennedy to Fort Pierce is visible. So, too, at the right edge is the northeast part of the Little Bahama Bank. Offshore the line of cumulus is near the Gulf Stream. In the frontal zone the low-level cumulus streets are parallel to the winds. Note how a ropelike band of cirrus follows the cold front.

GEMINI XII NOVEMBER 12, 1966 S66-62905





The astronauts had crossed Florida and were out over the Atlantic again when they looked northward at the southeastern coast of the United States and photographed the cold front there again. This front was a boundary region between the cool, dry air near the left horizon and the warm, moist air located to the right of

the large cloudy zone. Stratiform and cumuliform clouds in layers are likely to produce rain showers in the neighborhood of such a front. The Gemini flights ended in 1966, but weather satellites have continued to assist meteorologists studying the global movements of clouds such as these.

GEMINI XII NOVEMBER 12, 1966 S66-62911



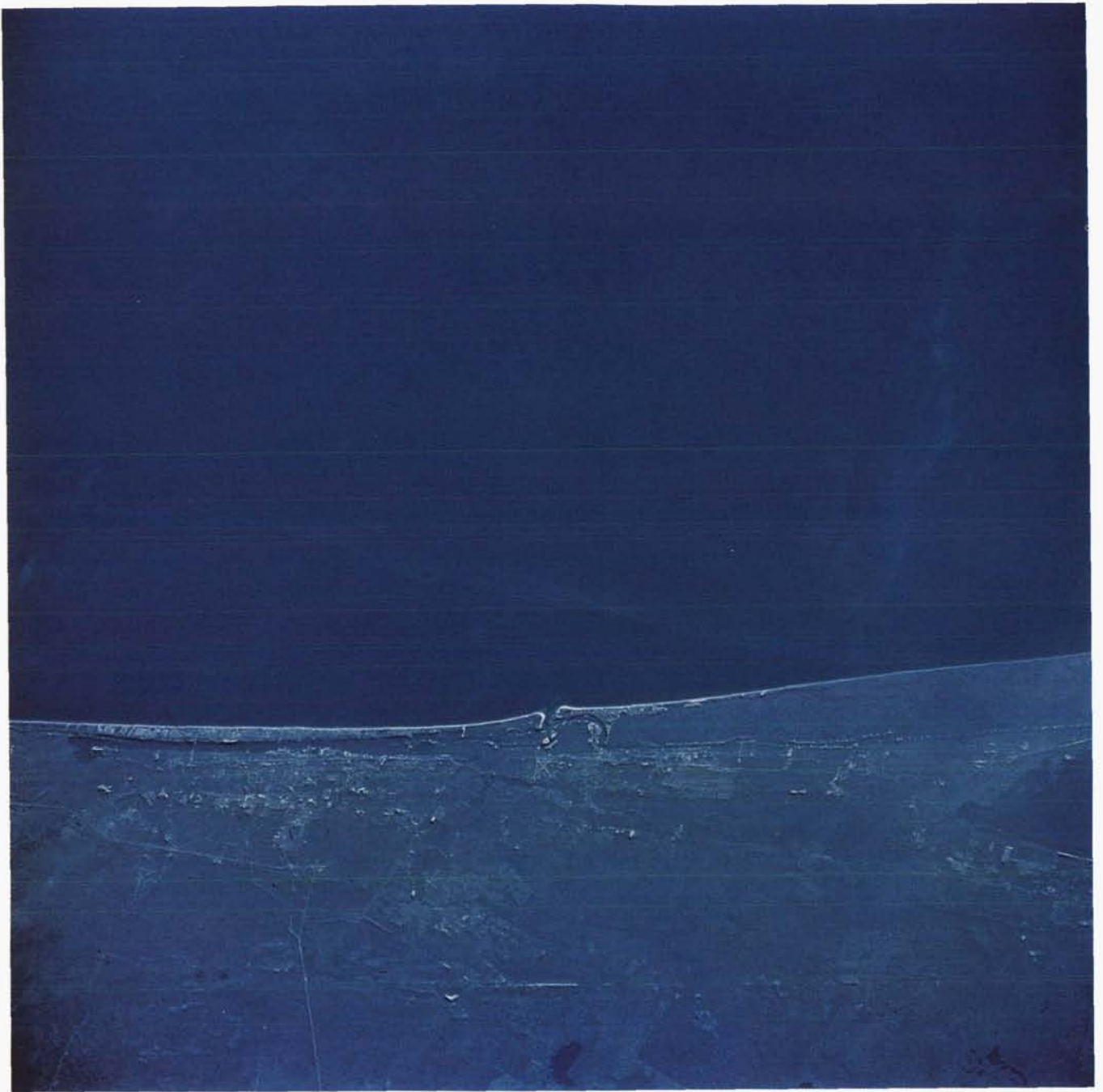


Many details of the Atlantic coast of northern Florida and southern Georgia can be seen and related in the left half of this photo. The broad, dark, sinuous line starting at the lower left and continuing northward is the St. John River, which turns toward the sea at Jacksonville. Above this prominent stream is the St. Marys, the

boundary between the two States. Below the mouth of the St. John is the inlet to St. Augustine. Many small lakes are clearly visible inland just above the nose of the spacecraft. Photographs such as this can help students understand the patterns of land use, highways, and the water resources available to the increasing population.

GEMINI VII DECEMBER 5, 1965 S65-63824





This picture, taken with a Zeiss Sonnar 250-mm lens from an altitude of 140 miles, shows about 55 miles of the Atlantic coast of Florida, from Flagler Beach south to Allenhurst. The Intracoastal Waterway can be traced in it by small white dots. They are spoil heaps left by its dredgers. The break in the barrier beach, in the center

of the picture, is Ponce de Leon inlet. The city of Daytona Beach is on the mainland to the left of it, and New Smyrna Beach is at the right. Thin cirrus clouds make parts of this photo look foggy, but highways, lakes, and other features familiar to Floridians are conspicuous.

GEMINI VII DECEMBER 6, 1965 S65-63808



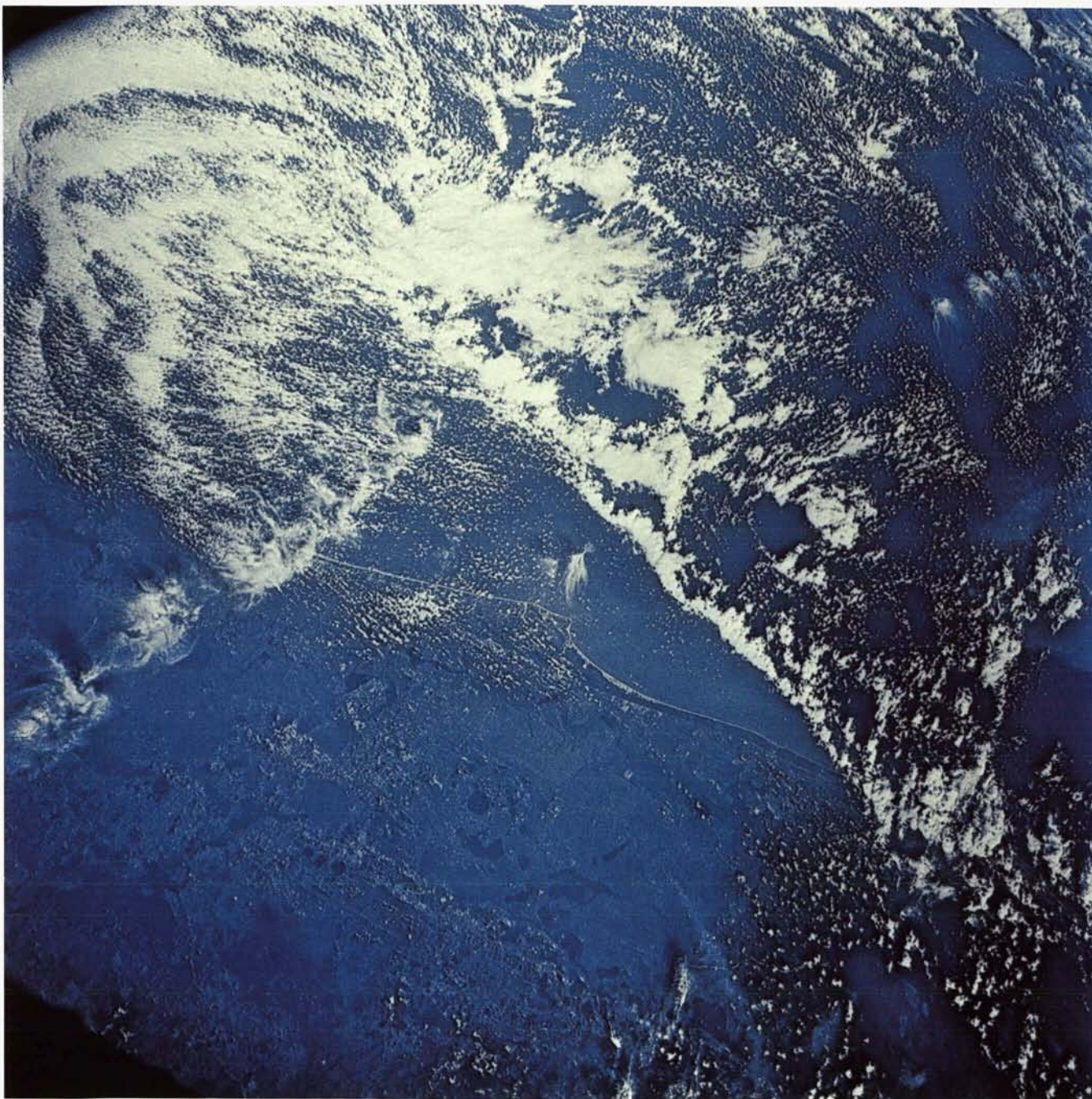


Cape Kennedy is on the tip of land slightly above the center here. The Florida Keys are a thin curving line at the lower left; Lake Okeechobee is below an oblong hole in fine clouds. The light bands in the center of the State apparently follow outcrops of Bone Valley and Alachua formations. They are Pliocene alluvial formations. Hues

are similar to the west where Miocene Tampa limestone is found. A weak cold front extended across Florida when this photo was taken. Cumulus clouds hung between it and the Great Bahama Bank at the right, and were photographed again from the same spacecraft about 90 minutes later.

GEMINI XII NOVEMBER 14, 1966 S66-63013





When this picture was taken, on the next revolution after the preceding photo, cumulus clouds had begun to form rows over Cape Kennedy in a northwesterly wind. Offshore the cumulus in a diagonal line through the center of this view had grown. Open cellular patterns persisted in the cloud field seaward of that line,

and tufts of cirrus crossed Florida's eastern coast north of Cape Kennedy. The bands of stratocumulus in the upper left were in the cooler air behind the cold front that lay across the peninsula's southern tip. Cape Kennedy was the starting point of the Gemini flights but not the terminus.

GEMINI XII NOVEMBER 14, 1966 S66-63040





It was late afternoon when this photo was taken, about 90 minutes after the preceding one, and the spacecraft was again near its starting point but proceeding around the world again. The Florida Keys are visible in the lower center. The wide zone of cumuliform clouds passing diagonally through this picture marked the location

of the weak cold front that had been photographed during the two preceding revolutions. It was moving off the mainland. The Gemini astronauts obtained many more photos of the Earth than it was possible to include in this volume. All of them are now available for scientific use.

GEMINI XII NOVEMBER 14, 1966 S66-63063







# APPENDIX A

## The Gemini Flight Crews

THE photography presented in this volume and its companion volume, *Earth Photographs from Gemini III, IV, and V*, was made possible by the men who flew the spacecraft. These men were not professional photographers, but they were professional observers, recorders, and interpreters of scientific phenomena, as well as human beings appreciative of natural beauty. Thus, these photographs represent a combination of scientific and esthetic interests. Each of the flight crews was selected for a particular mission several months before the flight and underwent rigorous specific-mission training during the period between selection and launch. The training included not only instruction and practice in the use of the cameras and film but also briefings on the scientific background and purpose of the photographic experiments planned for that particular flight, in addition to the engineering and pilot training required for the mission.

The photographic coverage obtained on each flight was determined by a combination of flight objectives and flight duration, and, to a large degree, by the weather conditions and cloud coverage. On nearly all of the flights, excellent coverage was obtained of various desert areas. Only once or twice, however, was the weather suitable for photography of the surface of some areas such as the Texas gulf coast region. Nearly all of the flights were at altitudes ranging from 100 to 200 statute miles. The exceptions were those of Gemini X and XI, during which excursions were made to 475 and 850 miles (741.5 nautical miles), respectively, using the Agena propulsion system. The higher altitudes reached permitted increased coverage of some areas; and the views obtained of India and Ceylon, in particular, were among the most startling examples of photography that I have seen.

The photography obtained in the Gemini program will stand as a lasting tribute to the flight crews' abilities and interest. The names of these men and the duration of their flights were:

*Gemini III:* Maj. Virgil I. (Gus) Grissom, USAF, and Lt. Comdr. John W. Young, USN; 3 revolutions; 4 hours 53 minutes. Orbit approximately 100 miles by 140 miles.

*Gemini IV:* Maj. James A. (Jim) McDivitt, USAF, and Maj. Edward H. (Ed) White II, USAF; 62 revolutions; 97 hours 56 minutes. Orbit approximately 100 miles by 175 miles.

*Gemini V:* Lt. Col. L. Gordon (Gordo) Cooper, Jr., USAF, and Lt. Comdr. Charles (Pete) Conrad, Jr., USN; 120 revolutions; 190 hours 56 minutes. Orbit approximately 100 miles by 217 miles.

*Gemini VII:* Lt. Col. Frank Borman, USAF, and Comdr. James A. (Jim) Lovell, Jr., USN; 206 revolutions; 330 hours 35 minutes. Orbit approximately 100 miles by 204 miles.

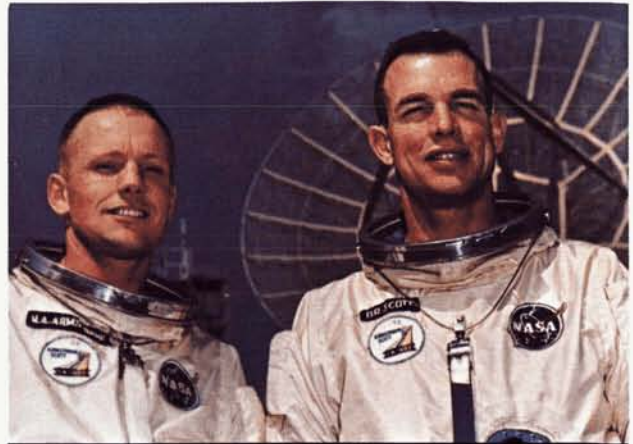








James A. Lovell      GEMINI VII      Frank Borman



Neil A. Armstrong      GEMINI VIII      David R. Scott



Thomas P. Stafford      GEMINI IX      Eugene Cernan



John W. Young      GEMINI X      Michael Collins



Richard F. Gordon, Jr.      GEMINI XI      Charles Conrad, Jr.



Edward E. Aldrin, Jr.      GEMINI XII      James A. Lovell



*Gemini VI*: Capt. Walter M. (Wally) Schirra, Jr., USN, and Maj. Thomas P. (Tom) Stafford, USAF; 16 revolutions; 25 hours 51 minutes. Orbit approximately 100 miles by 161 miles.

*Gemini VIII*: Neil A. Armstrong and Maj. David R. (Dave) Scott, USAF; 7 revolutions; 10 hours 42 minutes. Orbit approximately 100 miles by 169 miles.

*Gemini IX*: Lt. Col. Thomas P. (Tom) Stafford, USAF, and Lt. Comdr. Eugene A. (Gene) Cernan, USN; 45 revolutions; 72 hours 21 minutes. Orbit approximately 99 miles by 166 miles.

*Gemini X*: Comdr. John W. Young, USN, and Maj. Michael (Mike) Collins, USAF; 44 revolutions; 70 hours 46 minutes. Orbit approximately 100 miles by 167 miles, with one excursion to 475 miles.

*Gemini XI*: Comdr. Charles (Pete) Conrad, Jr., USN, and Lt. Comdr. Richard F. (Dick) Gordon, Jr., USN; 44 revolutions; 71 hours 17 minutes. Orbit approximately 100 miles by 177 miles, with two excursions to 850 miles.

*Gemini XII*: Capt. James A. (Jim) Lovell, Jr., USN, and Maj. Edwin E. (Buzz) Aldrin, Jr., USAF; 59 revolutions; 94 hours 34 minutes. Orbit approximately 100 miles by 175 miles.

ROBERT E. GILRUTH, *Director,*  
*Manned Spacecraft Center, NASA*



# APPENDIX B

Listings printed in *italics* appear in this volume. Identifications marked with an asterisk (\*) are partially degraded.

Photos marked with two asterisks (\*\*) are sufficiently degraded to be considered useless, or nearly so.

## GEMINI VI MAGAZINE A

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63163	S65-63544	5	Dec. 15, 1965	21:26	163	Rendezvous with Gemini VII, oblique view, pilot side, nose down, range 48 ft.
2	S65-63164	S65-63545	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 40 ft.
3	S65-63165	S65-63546	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 43 ft.
4	S65-63166	S65-63547	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 37 ft.
5	S65-63167	S65-63548	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 36 ft.
6	S65-63168	S65-63549	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 40 ft.
7	S65-63169	S65-63550	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 43 ft.
8	S65-63170	S65-63551	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 45 ft.
9	S65-63171	S65-63552	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 55 ft.
10	S65-63172	S65-63553	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 45 ft.
11	S65-63173	S65-63554	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 53 ft.
12	S65-63174	S65-63555	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 62 ft.
13	S65-63175	S65-63556	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose toward camera, range 63 ft.
14	S65-63176	S65-63557	5	Dec. 15, 1965	..	.....	Earth limb, clouds over ocean.
15	S65-63177	S65-63558	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 52 ft; clouds.
16	S65-63178	S65-63559	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 58 ft; clouds.
17	S65-63179	S65-63560	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 68 ft; clouds.
18	S65-63180	S65-63561	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter section toward camera, range 87 ft.
19	S65-63181	S65-63562	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter section toward camera, range 110 ft.
20	S65-63182	S65-63563	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter section toward camera, range 120 ft.
21	S65-63183	S65-63564	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter section toward camera, range 120 ft.
22	S65-63184	S65-63565	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter section toward camera, range 150 ft.
23	S65-63185	S65-63566	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 210 ft; sky background.



## MAGAZINE A Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
24	S65-63186	S65-63567	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 220 ft; sky background.
25	S65-63187	S65-63568	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 275 ft; sky background.
26	<i>S65-63188</i>	<i>S65-63569</i>	5	<i>Dec. 15, 1965</i>	.....	.....	<i>Rendezvous with Gemini VII, oblique nose view, range 50 ft.</i>
27	S65-63189	S65-63570	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique nose view, range 35 ft; perfect stereo with No. 28.
28	S65-63190	S65-63571	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique nose view, range 35 ft; perfect stereo with No. 27.
29	S65-63191	S65-63572	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique nose view, range 33 ft.
30	S65-63192	S65-63573	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, nose hidden by Gemini VI nose, range 24 ft.
31	S65-63193	S65-63574	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, part of adapter hidden by nose of Gemini VI, range 22 ft.
32	S65-63194	S65-63575	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, part of adapter hidden by nose of Gemini VI, range 35 ft.
33	S65-63195	S65-63576	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view turning nose away from camera, range 38 ft.
34	S65-63196	S65-63577	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, turning nose away from camera, range 40 ft.
35	S65-63197	S65-63578	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, dark shadows on adapter section, range 42 ft.
36	S65-63198	S65-63579	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, adapter section in deep shadow, range 47 ft.
37	S65-63199	S65-63580	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, adapter side, range 25 ft; Sun in lens, ruins picture quality.
38	S65-63200	S65-63581	5	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 30 ft; Sun in lens, ruins picture quality.
39	S65-63201	S65-63582	5	Dec. 15, 1965	21:47	163	Rendezvous with Gemini VII, side view, range 65 ft; Sun in lens, ruins picture quality.
40	S65-63202	S65-63583	6	Dec. 15, 1965	22:46	161	Rendezvous with Gemini VII, side-view adapter section, range 30 ft.
41	S65-63203	S65-63584	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side-view adapter section, range 32 ft.
42	<i>S65-63204</i>	<i>S65-63585</i>	6	<i>Dec. 15, 1965</i>	.....	.....	<i>Rendezvous with Gemini VII, side view, turning adapter section toward camera, range 40 ft.</i>
43	S65-63205	S65-63586	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, turning adapter section toward camera, range 45 ft.
44	S65-63206	S65-63587	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, turning adapter section toward camera, range 50 ft.
45	S65-63207	S65-63588	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, turning adapter section toward camera, range 65 ft.
46	S65-63208	S65-63589	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, turning adapter section toward camera, range 75 ft.
47	S65-63209	S65-63590	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 130 ft; clouds, sea background.
48	S65-63210	S65-63591	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 130 ft; clouds, sea background.
49	S65-63211	S65-63592	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 125 ft; clouds, sea background.



## MAGAZINE A Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
50	S65-63212	S65-63593	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter toward camera, range 100 ft; clouds, ocean.
51	S65-63213	S65-63594	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter toward camera, range 90 ft.
52	S65-63214	S65-63595	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter toward camera, range 75 ft.
53	S65-63215	S65-63596	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, adapter toward camera, range 65 ft.
54	S65-63216	S65-63597	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 50 ft; clouds, sea background.
55	S65-63217	S65-63598	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 48 ft; clouds, sea background.
56	S65-63218	S65-63599	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 45 ft; clouds, sea background.
57	S65-63219	S65-63600	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, turning adapter toward camera, range 40 ft.
58	S65-63220	S65-63601	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, turning adapter toward camera, range 37 ft.
59	S65-63221	S65-63602	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, oblique view, turning adapter toward camera, range 37 ft.
60	S65-63222	S65-63603	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, adapter end, range 42 ft.
61	S65-63223	S65-63604	6	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, adapter end, range 42 ft.
62	S65-63224	S65-63605	6	Dec. 15, 1965	23:14	166	Rendezvous with Gemini VII, adapter end, range 42 ft; partial frame.

## MAGAZINE B

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63101	S65-64887	7	Dec. 15, 1965	23:54	157	Rendezvous with Gemini VII, side view, range 50 ft; off west coast of India.
2	S65-63102	S65-64888	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 58 ft; off west coast of India.
3	S65-63103	S65-64889	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 60 ft; off west coast of India.
4	S65-63104	S65-64890	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view; double exposure.
5	S65-63105	S65-64891	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 150 ft; rotation sequence.
6	S65-63106	S65-64892	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 150 ft.
7	S65-63107	S65-64893	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 150 ft.
8	S65-63108	S65-64894	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 160 ft.
9	S65-63109	S65-64895	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 180 ft.
10	S65-63110	S65-64896	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 160 ft.
11	S65-63111	S65-64897	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 170 ft.
12	S65-63112	S65-64898	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 180 ft.
13	S65-63113	S65-64899	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 150 ft.



## MAGAZINE B Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
14	S65-63114	S65-64900	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 150 ft.
15	S65-63115	S65-64901	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 140 ft.
16	S65-63116	S65-64902	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 125 ft.
17	S65-63117	S65-64903	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 125 ft.
18	S65-63118	S65-64904	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 90 ft.
19	S65-63119	S65-64905	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 120 ft.
20	S65-63120	S65-64906	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 100 ft.
21	S65-63121	S65-64907	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 70 ft.
22	S65-63122	S65-64908	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 37 ft.
23	S65-63123	S65-64909	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 45 ft.
24	S65-63124	S65-64910	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 47 ft.
25	S65-63125	S65-64911	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, side view, range 50 ft.
26	S65-63126	S65-64912	7	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VII, nose view, range 75 ft; stereo with No. 27.
27	S65-63127	S65-64913	7	Dec. 16, 1965	00:07	159	Rendezvous with Gemini VII, nose view, range 75 ft; stereo with No. 26.
28	S65-63128	S65-64914	9	Dec. 16, 1965	03:10	155	India, Nepal: Bareilly, Rampur; Ganges plain, Himalaya front, east of Delhi.
29	S65-63129	S65-64915	.....	Dec. 16, 1965	.....	.....	Urine drops in sunlight.
30	S65-63130	S65-64916	13	Dec. 16, 1965	09:28	159	Somali Republic: Ras Hafun, Wadi Giae.
31	S65-63131	S65-64917	13	Dec. 16, 1965	09:28	159	Somali Republic: Ras Hafun, Wadi Giae.
32	S65-63132	S65-64918	13	Dec. 16, 1965	09:28	159	Somali Republic: Ras Hafun, Wadi Giae.
33	S65-63133	S65-64919	13	Dec. 16, 1965	09:28	159	Somali Republic: Wadi Giae.
34	S65-63134	S65-64920	13	Dec. 16, 1965	09:30	160	Socotra Island, extreme east tip, Arabian Sea.
35	S65-63135	S65-64921	13	Dec. 16, 1965	09:45	167	Western Australia: Lake McLeod.
36	S65-63136	S65-64922	13	Dec. 16, 1965	09:45	167	Western Australia: Shark Bay, Denham Sound, Carnarvon Tracking Station.
37	S65-63137	S65-64923	13	Dec. 16, 1965	09:45	167	Western Australia: Kennedy Range and plateau to the southeast.
38	S65-63138	S65-64924	14	Dec. 16, 1965	10:34	154	Cumulus clouds over western Atlantic.
39	S65-63139	S65-64925	14	Dec. 16, 1965	10:34	154	Cumulus clouds over western Atlantic.
40	S65-63140	S65-64926	14	Dec. 16, 1965	10:34	154	Cumulus clouds over western Atlantic.
41	S65-63141	S65-64927	14	Dec. 16, 1965	10:42	155	Large disturbance over central Atlantic, 1000 miles west of Canary Islands.
42	S65-63142	S65-64928	14	Dec. 16, 1965	10:42	155	Large disturbance over central Atlantic, 1000 miles west of Canary Islands.
43	S65-63143	S65-64929	14	Dec. 16, 1965	10:43	155	Large disturbance over central Atlantic, 1000 miles west of Canary Islands.
44	S65-63144	S65-64930	14	Dec. 16, 1965	10:43	155	Large disturbance over central Atlantic, 1000 miles west of Canary Islands.
45	S65-63145	S65-64931	14	Dec. 16, 1965	10:43	155	Large disturbance over central Atlantic, 1000 miles west of Canary Islands.
46	S65-63146	S65-64932	14	Dec. 16, 1965	10:45	156	Cellular cloud formations west of Canary Islands.
47	S65-63147	S65-64933	14	Dec. 16, 1965	10:45	156	Cellular cloud formations west of Canary Islands.

## MAGAZINE B Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt. N. Mi.	Area description
	Color No.	B&W No.					
48	S65-63148	S65-64934	14	Dec. 16, 1965	10:45	156	Eddies in stratocumulus near Gomera, La Palma, and Hierro Islands.
49	S65-63149	S65-64935	14	Dec. 16, 1965	10:46	156	Eddies in stratocumulus near Tenerife and Gomera Islands.
50	S65-63150	S65-64936	14	Dec. 16, 1965	10:46	156	Eddies in stratocumulus near Tenerife, Gomera, and Gran Canaria Islands.
51	S65-63151	S65-64937	14	Dec. 16, 1965	10:46	156	Eddies in stratocumulus near Tenerife and Gran Canaria Islands.
52	S65-63152	S65-64938	14	Dec. 16, 1965	10:46	156	Eddies in stratocumulus near Gran Canaria and Fuerteventura Islands.
53	S65-63153	S65-64939	14	Dec. 16, 1965	10:47	157	Morocco, Algeria, Mauritania, Spanish Sahara: Hamada du Dra area.
54	S65-63154	S65-64940	14	Dec. 16, 1965	10:48	157	Algeria, Mauritania: Erg Iguidi.
55	S65-63155	S65-64941	14	Dec. 16, 1965	10:48	157	Algeria, Mauritania: Erg Iguidi.
56	S65-63156	S65-64942	14	Dec. 16, 1965	10:49	157	Southern Algeria: Tanezrouft Desert of Sahara.
57	S65-63157	S65-64943	14	Dec. 16, 1965	10:51	158	Southeast Algeria: Fort Lapperine; Ahaggar Mountains.
58	S65-63158	S65-64944	14	Dec. 16, 1965	10:52	158	Niger Republic: Air ou Azbine.
59	S65-63159	S65-64945	14	Dec. 16, 1965	10:56	159	Sudan: Darfur Province; Jebel Gurgei.
60	S65-63160	S65-64946	14	Dec. 16, 1965	10:56	159	Sudan: Darfur Province; Jebel Marva.
61	S65-63161	S65-64947	14	Dec. 16, 1965	10:58	160	Sudan: Upper Nile Province; the Sudd, large swamp in White Nile.
62	S65-63162	S65-64948	14	Dec. 16, 1965	11:00	161	Ethiopia: Lakes Z'wai, Langana, and Shala; Koka Dam south of Addis Ababa—partial frame.

## MAGAZINE C

Frame	NASA/MSC		Revolution	Date	GMT	Alt. N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63280	S65-63293	14	Dec. 16, 1965	11:12	166	Clouds over southeast Indian Ocean.
2	S65-63279	S65-63294	14	Dec. 16, 1965	11:12	166	Clouds over southeast Indian Ocean.
3	S65-63278	S65-63295	14	Dec. 16, 1965	11:13	166	Clouds over southeast Indian Ocean.
4	S65-63277	S65-63296	14	Dec. 16, 1965	11:13	166	Clouds over southeast Indian Ocean.
5	S65-63276	S65-63297	14	Dec. 16, 1965	11:14	167	Clouds over southeast Indian Ocean.
6	S65-63275	S65-63298	14	Dec. 16, 1965	11:14	167	Clouds over southeast Indian Ocean.
7	S65-63274	S65-63299	14	Dec. 16, 1965	11:14	167	Clouds over southeast Indian Ocean.
8	S65-63273	S65-63300	14	Dec. 16, 1965	11:14	167	Clouds over southeast Indian Ocean.
9	S65-63272	S65-63301	14	Dec. 16, 1965	11:14	167	Clouds over southeast Indian Ocean.
10	S65-63271	S65-63302	14	Dec. 16, 1965	11:15	167	Clouds over southeast Indian Ocean.
11	S65-63270	S65-63303	14	Dec. 16, 1965	11:15	167	Clouds over southeast Indian Ocean.
12	S65-63269	S65-63304	14	Dec. 16, 1965	11:47	156	Sunset.
13	S65-63268	S65-63305	14	Dec. 16, 1965	11:47	156	Sunset.
14	S65-63267	S65-63306	14	Dec. 16, 1965	11:47	156	Sunset.
15	S65-63266	S65-63307	14	Dec. 16, 1965	11:47	156	Sunset.
16	S65-63265	S65-63308	14	Dec. 16, 1965	11:47	156	Sunset.
17							Blank.
18	S65-63264	S65-63309	15	Dec. 16, 1965	12:21	158	Lines of cumulus clouds southwest of Canary Islands.
19	S65-63263	S65-63310	15	Dec. 16, 1965	12:21	158	Lines of cumulus clouds southwest of Canary Islands.
20	S65-63262	S65-63311	15	Dec. 16, 1965	12:21	158	Lines of cumulus clouds southwest of Canary Islands.
21	S65-63261	S65-63312	15	Dec. 16, 1965	12:21	158	Lines of cumulus clouds southwest of Canary Islands.
22	S65-63260	S65-63313	15	Dec. 16, 1965	12:22	158	Lines of cumulus clouds southwest of Canary Islands.
23	S65-63259	S65-63314	15	Dec. 16, 1965	12:22	158	Lines of cumulus clouds southwest of Canary Islands.
24	S65-63258	S65-63315	15	Dec. 16, 1965	12:22	158	Lines of cumulus clouds southwest of Canary Islands.



## MAGAZINE C Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
25	S65-63257	S65-63316	15	Dec. 16, 1965	12:23	158	Spanish Sahara, Mauritania: Port Etienne; Cap Blanc, Levrier Bay.
26	S65-63256	S65-63317	15	Dec. 16, 1965	12:23	158	Spanish Sahara, Mauritania: Cap Blanc, Levrier Bay.
27	<i>S65-63255</i>	<i>S65-63318</i>	<i>15</i>	<i>Dec. 16, 1965</i>	<i>12:24</i>	<i>158</i>	<i>Spanish Sahara, Mauritania: Cap Blanc, Levrier Bay.</i>
28	S65-63254	S65-63319	15	Dec. 16, 1965	12:24	159	Mauritania, Senegal: Dakar, Noaukchott; Senegal River.
29	S65-63253	S65-63320	15	Dec. 16, 1965	12:24	159	Mauritania, Senegal: Gambia, Guinea, Portuguese Guinea: Aouker Basin.
30	S65-63252	S65-63321	15	Dec. 16, 1965	12:24	159	Mauritania, Senegal: Gambia, Guinea, Portuguese Guinea: Aouker Basin.
31	<i>S65-63251</i>	<i>S65-63322</i>	<i>15</i>	<i>Dec. 16, 1965</i>	<i>12:24</i>	<i>159</i>	<i>Mauritania, Senegal: Gambia, Guinea, Portuguese Guinea: Aouker Basin.</i>
32	S65-63250	S65-63323	15	Dec. 16, 1965	12:24	159	Mauritania, Senegal: Gambia, Guinea, Portuguese Guinea.
33	S65-63249	S65-63324	15	Dec. 16, 1965	12:24	159	Mauritania, Senegal, Mali: Aouker Basin.
34	S65-63248	S65-63325	15	Dec. 16, 1965	12:25	159	Mauritania, Senegal, Spanish Sahara.
35	<i>S65-63247</i>	<i>S65-63326</i>	<i>15</i>	<i>Dec. 16, 1965</i>	<i>12:26</i>	<i>159</i>	<i>Mauritania, Mali: Timbuktu; Niger River marshes.</i>
36	S65-63246	S65-63327	15	Dec. 16, 1965	12:26	159	Mauritania, Mali: Timbuktu; Niger River marshes.
37	S65-63245	S65-63328	15	Dec. 16, 1965	12:26	159	Mauritania, Mali, Upper Volta: Timbuktu, Niger River marshes.
38	S65-63244	S65-63329	15	Dec. 16, 1965	12:27	159	Mali, Upper Volta, Niger: Niger River Basin, Sahara.
39	S65-63243	S65-63330	15	Dec. 16, 1965	12:29	160	Cirrus puff over Nigeria, Niger, Mali.
40	S65-63242	S65-63331	15	Dec. 16, 1965	12:29	160	Cirrus puffs over Nigeria, Niger, Mali, Upper Volta, Dahomey.
41	S65-63241	S65-63332	15	Dec. 16, 1965	12:29	160	Cirrus puffs over Nigeria, Niger, Mali, Upper Volta, Dahomey.
42	<i>S65-63240</i>	<i>S65-63333</i>	<i>15</i>	<i>Dec. 16, 1965</i>	<i>12:30</i>	<i>160</i>	<i>Cirrus puffs over Nigeria, Niger, Mali, Upper Volta, Dahomey.</i>
43	S65-63239	S65-63334	15	Dec. 16, 1965	12:30	160	Cirrus puffs over Nigeria, Niger, Mali, Upper Volta, Dahomey.
44	S65-63238	S65-63335	15	Dec. 16, 1965	12:30	160	Cirrus puffs over Nigeria, Niger, Mali, Upper Volta, Dahomey.
45	S65-63237	S65-63336	15	Dec. 16, 1965	.....	.....	Sky, horizon.
46	<i>S65-63236</i>	<i>S65-63337</i>	<i>15</i>	<i>Dec. 16, 1965</i>	.....	.....	<i>Heavy haze, cellular cumulus clouds over Cameroon, Central African Republic.</i>
47	S65-63235	S65-63338	15	Dec. 16, 1965	.....	.....	Heavy haze, cellular cumulus clouds over Cameroon, Central African Republic.
48	S65-63234	S65-63339	15	Dec. 16, 1965	.....	.....	Very heavy haze, clouds over Republic of the Congo.
49	S65-63233	S65-63340	15	Dec. 16, 1965	12:36	163	Uganda: Lake Victoria, Sese Islands; cumulus clouds.
50	<i>S65-63232</i>	<i>S65-63341</i>	<i>15</i>	<i>Dec. 16, 1965</i>	<i>12:37</i>	<i>163</i>	<i>Tanzania: Lake Victoria, Speke Gulf; cumulus clouds.</i>
51	S65-63231	S65-63342	15	Dec. 16, 1965	12:37	163	Tanzania: Lake Victoria, Speke Gulf; cumulus clouds.
52	S65-63230	S65-63343	15	Dec. 16, 1965	12:38	164	Tanzania coast, islands of Zanzibar and Pemba; cumulus clouds.
53	S65-63229	S65-63344	15	Dec. 16, 1965	12:38	164	Tanzania coast, south of Dar es Salaam.
54	<i>S65-63228</i>	<i>S65-63345</i>	<i>15</i>	<i>Dec. 16, 1965</i>	<i>12:40</i>	<i>165</i>	<i>Tanzania, Mozambique coast: Indian Ocean; clouds.</i>
55	<i>S65-63227</i>	<i>S65-63346</i>	<i>15</i>	<i>Dec. 16, 1965</i>	<i>12:41</i>	<i>165</i>	<i>Comoro Islands: Ile Moheli, Ile d'Anjouan, Gran Comore Island, Ile de Mayotte.</i>
56	S65-63226	S65-63347	15	Dec. 16, 1965	12:41	165	Comoro Islands: Ile Moheli, Ile d'Anjouan, Gran Comore Island, Ile de Mayotte.
57	S65-63225	S65-63348	15	Dec. 16, 1965	12:41	165	Comoro Islands: Ile de Mayotte.

## MAGAZINE D

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63281	S65-63700	15	Dec. 16, 1965	12:43	167	Northeast of Madagascar Island, Malagasy Republic in background.
2	S65-63282	S65-63701	15	Dec. 16, 1965	12:43	167	Northeast of Madagascar Island, Malagasy Republic in background.
3	S65-63283	S65-63702	15	Dec. 16, 1965	12:44	167	Mascarene Islands: La Réunion, Madagascar in background.
4	S65-63284	S65-63703	15	Dec. 16, 1965	12:44	167	Mascarene Islands: La Reunion and Mauritius.
5	S65-63285	S65-63704	15	Dec. 16, 1965	12:44	167	Mascarene Islands: La Réunion and Mauritius.
6	S65-63286	S65-63705	15	Dec. 16, 1965	13:39	154	Cumulus puffs over Gulf of Mexico.
7	S65-63287	S65-63706	15	Dec. 16, 1965	13:39	154	Cumulus puffs over Gulf of Mexico.
8	S65-63288	S65-63707	15	Dec. 16, 1965	13:40	154	Cumulus puffs over Gulf of Mexico.
9	S65-63289	S65-63708	15	Dec. 16, 1965	13:40	154	Cumulus puffs over Gulf of Mexico.
10	S65-63290	S65-63709	16	Dec. 16, 1965	.....	.....	Nose of Gemini VI showing insulation extrusion on thruster ports.
11	S65-63291	S65-63710	16	Dec. 16, 1965	.....	.....	Nose of Gemini VI showing insulation extrusion on thruster ports.
12	S65-63292	S65-63711	16	Dec. 16, 1965	.....	.....	Nose of Gemini VI out of focus.

## GEMINI VII

## MAGAZINE 22

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63832	S65-64949	11	Dec. 5, 1965	16:33	120	Saudi Arabia: Ar Riyad; Jabal Tuwayiq
2	S65-63831	S65-64950	.....	Dec. 5, 1965	.....	.....	Algeria: Erg Iquidi, good display of sand dunes (250-mm lens).
3	S65-63830	S65-64951	13	Dec. 5, 1965	19:32	121	Algeria: Oued Saoura, south of Bechar, rain runoff in normally dry lake bed (250-mm); see frames 46, 47.
4	S65-63829	S65-64952	13	Dec. 5, 1965	19:34	121	Algeria: south of Fort Flatters, Tifernine dunes, 1000 ft. high (250-mm lens).
5	S65-63828	S65-64953	13	Dec. 5, 1965	19:36	121	Algeria, Libya: Looking across Idehan Marzuq, toward Tibesti Mountains.
6	S65-63827	S65-64954	13	Dec. 5, 1965	20:38	164	Tuamotu Archipelago: atolls of Tikehua, Rangiroa, Arutua, Apataki, Kaukura, Toau, Niau, Fakarava.
7	S65-63826	S65-64955	14	Dec. 5, 1965	20:50	129	Cuba: Oriente Province, Guantanamo Bay, Santiago de Cuba.
8	S65-63825	S65-64956	15	Dec. 5, 1965	17:54	124	Bahama Islands: Andros, New Providence, Berry Islands.
9	S65-63824	S65-64957	15	Dec. 5, 1965	19:28	121	Florida-Georgia; Atlantic Coast, Jacksonville; St. Johns River.
10	S65-63823	S65-64958	16	Dec. 5, 1965	20:54	124	Mexico, California, Arizona: Baja California, Sonora area.
11	S65-63822	S65-64959	16	Dec. 5, 1965	20:55	123	Mexico: Baja California, Punta Eugenia.
12	S65-63821	S65-64960	17	Dec. 5, 1965	22:01	159	Australia: Northern Territory, east coast of Joseph Bonaparte Gulf, west of Darwin.
13	S65-63820	S65-64961	17	Dec. 5, 1965	22:30	120	Mexico, California, Arizona; Baja California; Moon near full.
14	S65-63819	S65-64962	19	Dec. 6, 1965	.....	.....	Double exposure over Mexico.
15	S65-63818	S65-64963	19	Dec. 6, 1965	01:10	146	Stratocumulus cells over Indian Ocean.
16	S65-63817	S65-64964	19	Dec. 6, 1965	01:10	146	Stratocumulus cells over Indian Ocean.
17	S65-63816	S65-64965	19	Dec. 6, 1965	.....	.....	Clouds, Moon near full.
18	S65-63815	S65-64966	29	Dec. 6, 1965	17:46	131	*Central Mexico: Aguascalientes-Zacatecas area.
19	S65-63814	S65-64967	29	Dec. 6, 1965	17:47	131	*Central Mexico: San Luis Potosí area.
20	S65-63813	S65-64968	29	Dec. 6, 1965	17:47	130	*Eastern Mexico: San Luis Potosí-Matchucla area.
21	S65-63812	S65-64969	29	Dec. 6, 1965	17:47	129	*Eastern Mexico: Ciudad Victoria area.



## MAGAZINE 22 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt. N. Mi.	Area description
	Color No.	B&W No.					
22	S65-63811	S65-64970	29	Dec. 6, 1965	17:48	129	*Eastern Mexico: Ciudad Victoria-gulf coast.
23	S65-63810	S65-64971	29	Dec. 6, 1965	17:48	129	Eastern Mexico: Gulf coast at La Pesca.
24	S65-63809	S65-64972	30	Dec. 6, 1965	19:25	121	Florida: east coast, St. Augustine to Fort Pierce, Kennedy Space Center.
25	S65-63808	S65-64973	30	Dec. 6, 1965	19:25	121	Florida: east coast, Titusville to north of Daytona Beach (250-mm lens).
26	S65-63807	S65-64974	30	Dec. 6, 1965	19:25	121	Florida: east coast, Kennedy Space Center, Merritt Island Complex (250-mm lens).
27	S65-63806	S65-64975	31	Dec. 6, 1965	19:25	121	Florida: Kennedy Space Center, Merritt Island to Daytona Beach (250-mm lens).
28	S65-63805	S65-64976	31	Dec. 6, 1965	.....	.....	Moonrise out of focus.
29	S65-63804	S65-64977	31	Dec. 6, 1965	20:57	120	Gulf coast: Texas, Galveston Bay to central Louisiana, very hazy.
30	S65-63803	S65-64978	31	Dec. 6, 1965	20:57	120	Gulf coast: Texas, Galveston Bay to central Louisiana, very hazy.
31	S65-63802	S65-64979	31	Dec. 6, 1965	20:57	120	Texas; Houston, Beaumont; Jetero Airport, very hazy.
32	S65-63801	S65-64980	31	Dec. 6, 1965	20:57	120	East Texas, west Louisiana: Sam Rayburn Reservoir, very hazy.
33	S65-63800	S65-64981	32	Dec. 6, 1965	21:01	120	Ocean off Florida.
34	S65-63799	S65-64982	32	Dec. 6, 1965	21:01	120	Ocean off Florida.
35	S65-63798	S65-64983	32	Dec. 6, 1965	21:01	120	Polaris underwater launch, missile and trail off Florida.
36	S65-63797	S65-64984	32	Dec. 6, 1965	21:01	120	Polaris underwater launch, missile and trail off Florida.
37	S65-63796	S65-64985	32	Dec. 6, 1965	21:01	120	Polaris underwater launch, missile and trail off Florida.
38	S65-63795	S65-64986	.....	.....	.....	.....	*Clouds, underexposed.
39	S65-63794	S65-64987	32	Dec. 6, 1965	21:02	120	*Bahama Islands: south end of Andros Island.
40	S65-63793	S65-64988	32	Dec. 6, 1965	21:02	120	*Bahama Islands: Great Exuma Island, Long Island.
41	S65-63792	S65-64989	32	Dec. 6, 1965	21:02	120	*Bahama Islands: Crooked Island, Acklins Island.
42	S65-63791	S65-64990	.....	.....	.....	.....	Double exposure, limb plus sunset or sunrise.
43	S65-63790	S65-64991	32	Dec. 6, 1965	22:31	120	Mexico: Tamaulipas, Tampico; gulf coast, Cape Rojo.
44	S65-63789	S65-64992	33	Dec. 6, 1965	22:43	129	Limb at sunset.
45	S65-63788	S65-64993	33	Dec. 6, 1965	22:45	131	Sunset, note cloud layers in red.
46	S65-63787	S65-64994	43	Dec. 7, 1965	14:55	121	Algeria: Oued Saoura, south of Bechar, rain runoff in normally dry lake bed (see frame 3 for telephoto view).
47	S65-63786	S65-64995	43	Dec. 7, 1965	14:55	121	Algeria: Oued Saoura, south of Bechar, rain runoff in normally dry lake bed, good display of sand dunes (see frame 3 for telephoto view).
48	S65-63785	S65-64996	43	Dec. 7, 1965	14:56	121	Algeria: Tidikelt, Ahnet regions, Ahaggar Mountains.
49	S65-63784	S65-64997	43	Dec. 7, 1965	14:56	121	Algeria: Tidikelt, Ahnet regions, (good dome structure), Ahaggar Mountains.
50	S65-63783	S65-64998	.....	.....	.....	.....	Underexposed.
51	S65-63782	S65-64999	46	Dec. 7, 1965	20:30	155	Marshall Islands: Namorik Atoll.
52	S65-63781	S65-64500	.....	.....	.....	.....	Partial frame.

## MAGAZINE 17

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63833	S65-65337	47	Dec. 7, 1965	22:24	126	Clouds, tropical storm off Baja California.
2	<i>S65-63834</i>	<i>S65-65338</i>	47	<i>Dec. 7, 1965</i>	22:25	126	<i>Clouds, tropical storm off Baja California.</i>
3	S65-63835	S65-65339	47	Dec. 7, 1965	22:26	126	Clouds, tropical storm off Baja California.
4	S65-63836	S65-65340	47	Dec. 7, 1965	22:27	126	*Western Mexico: east of Culiacan.
5	S65-63837	S65-65341	47	Dec. 7, 1965	22:27	126	*Western Mexico: Laguna de Santiaguillo.
6	S65-63838	S65-65342	47	Dec. 7, 1965	22:28	126	*Western Mexico: Durango.
7	S65-63839	S65-65343	47	Dec. 7, 1965	22:28	126	*Western Mexico: Durango.
8	S65-63840	S65-65344	47	Dec. 7, 1965	22:28	126	*Western Mexico: Sombrerete, Rio Grande, Valparaiso.
9	S65-63841	S65-65345	47	Dec. 7, 1965	22:28	126	*Central Mexico: Fresnillo Zacatecas.
10	S65-63842	S65-65346	47	Dec. 7, 1965	22:28	126	*Central Mexico: Zacatecas, Salinas.
11	S65-63843	S65-65347	47	Dec. 7, 1965	22:28	126	*Central Mexico: Salinas, San Luis Potosí.
12	S65-63844	S65-65348	47	Dec. 7, 1965	22:29	126	*Central Mexico: San Luis Potosí.
13	S65-63845	S65-65349	.....	.....	.....	.....	Blank.
14	S65-63846	S65-65350	48	Dec. 7, 1965	23:23	160	Moon, full.
15	S65-63847	S65-65351	48	Dec. 7, 1965	23:23	160	Moon, full (warped picture).
16	.....	.....	.....	.....	.....	.....	Blank.
17	.....	.....	.....	.....	.....	.....	Blank.
18	S65-63848	S65-65352	56	Dec. 8, 1965	11:48	131	*Libya; Gulf of Sirte.
19	<i>S65-63849</i>	<i>S65-65353</i>	56	<i>Dec. 8, 1965</i>	11:52	129	<i>Israel, Syria, Jordan, Lebanon, Turkey, Cyprus, Iraq: Nile Delta, Sinai Peninsula.</i>
20	S65-63850	S65-65354	56	Dec. 8, 1965	11:52	128	*Israel, Jordan, Lebanon, United Arab Republic: Dead Sea.
21	S65-63851	S65-65355	56	Dec. 8, 1965	11:55	127	Muscat and Oman: Ra's al Hadd.
22	S65-63852	S65-65356	56	Dec. 8, 1965	12:00	130	Full Moon, cirrus clouds over Indian Ocean, note patterns (see frame 49).
23	S65-63853	S65-65357	56	Dec. 8, 1965	12:00	130	Clouds, Indian Ocean, note patterns (see frame 49).
24	<i>S65-63854</i>	<i>S65-65358</i>	56	<i>Dec. 8, 1965</i>	12:56	160	<i>Galapagos Islands; openings in clouds.</i>
25	<i>S65-63855</i>	<i>S65-65359</i>	57	<i>Dec. 8, 1965</i>	13:04	149	<i>Leeward Islands: Guadeloupe, Antigua, Maria Galante, Montserrat.</i>
26	S65-63856	S65-65360	57	Dec. 8, 1965	13:23	128	Libya: basalt flows of Black Haruj.
27	<i>S65-63857</i>	<i>S65-65361</i>	58	<i>Dec. 8, 1965</i>	14:37	145	<i>Bahama Islands: Crooked, Acklins, Long and Mayaguana Islands, San Salvador, Plana Cays and Samana Cay.</i>
28	<i>S65-63858</i>	<i>S65-65362</i>	58	<i>Dec. 8, 1965</i>	14:37	145	<i>Bahama Islands: Crooked, Acklins, Mayaguana Islands, Plana Cays, Samana Cay.</i>
29	S65-63859	S65-65363	.....	.....	.....	.....	Blank.
30	S65-63860	S65-65364	58	Dec. 8, 1965	16:10	140	**Florida Keys.
31	S65-63861	S65-65365	58	Dec. 8, 1965	16:10	140	**Florida: Keys, Whitewater Bay.
32	S65-63862	S65-65366	58	Dec. 8, 1965	16:10	140	**Florida: Keys, Florida Bay, Everglades.
33	S65-63863	S65-65367	58	Dec. 8, 1965	16:11	140	**Florida: Keys, Florida Bay, Everglades.
34	S65-63864	S65-65368	59	Dec. 8, 1965	16:12	140	**Edge of Great Bahama Bank, Straits of Florida.
35	S65-63865	S65-65369	59	Dec. 8, 1965	16:12	140	**Edge of Great Bahama Bank, Straits of Florida, Andros Island.
36	S65-63866	S65-65370	59	Dec. 8, 1965	16:12	140	**Bahama Islands: Andros Island area.
37	S65-63867	S65-65371	59	Dec. 8, 1965	16:13	139	**Bahama Islands: Andros Island area.
38	S65-63868	S65-65372	61	Dec. 8, 1965	20:45	135	Clouds over eastern Pacific off Mexico (see frames 50-55).
39	S65-63869	S65-65373	61	Dec. 8, 1965	20:45	135	*Clouds over eastern Pacific off Mexico (see frames 50-55).
40	<i>S65-63870</i>	<i>S65-65372</i>	61	<i>Dec. 8, 1965</i>	20:47	133	<i>*Guadalupe Island, Pacific Ocean off Baja California, Mexico.</i>
41	S65-63871	S65-65375	61	Dec. 8, 1965	20:49	132	*Mexico: Baja California, Punta Eugenia, Cedros Island.
42	<i>S65-63872</i>	<i>S65-65376</i>	63	<i>Dec. 8, 1965</i>	21:30	155	<i>Moon, clouds over western Pacific.</i>
43	S65-63873	S65-65377	63	Dec. 8, 1965	21:30	155	Moon, clouds over western Pacific.
44	S65-63874	S65-65378	.....	.....	.....	.....	Blank.



## MAGAZINE 17 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
45	S65-63875	S65-65379	73	Dec. 9, 1965	14:48	131	*Canary Islands: Tenerife and La Palma Islands.
46	S65-63876	S65-65380	73	Dec. 9, 1965	14:49	130	*Canary Islands: Tenerife, Gomera, Gran Canaria Islands.
47	S65-63877	S65-65381	73	Dec. 9, 1965	14:49	130	*Canary Islands: Tenerife, Gran Canaria Islands.
48	S65-63878	S65-65382	74	Dec. 9, 1965	16:26	126	**Mauritania: Dhar Adrar, Richat Structure.
49	S65-63879	S65-65383	74	Dec. 9, 1965	16:50	161	Clouds, Indian Ocean (see frames 22 and 23)
50	S65-63880	S65-65384	76	Dec. 9, 1965	20:45	161	Clouds over eastern Pacific off Mexico (see frames 39, 38)
51	S65-63881	S65-65385	76	Dec. 9, 1965	20:45	161	Clouds over eastern Pacific off Mexico (see frames 38, 39)
52	S65-63882	S65-65386	76	Dec. 9, 1965	20:46	161	Clouds over eastern Pacific off Mexico (see frames 38, 39)
53	S65-63883	S65-65387	76	Dec. 9, 1965	20:46	161	Clouds over eastern Pacific off Mexico (see frames 38, 39)
54	S65-63884	S65-65388	76	Dec. 9, 1965	20:46	161	Clouds over eastern Pacific off Mexico (see frames 38, 39)
55	S65-63885	S65-65389	76	Dec. 9, 1965	20:47	161	Clouds over Mexico, Sonora.
56	S65-63886	S65-65390	76	Dec. 9, 1965	20:50	161	Mexico: Torreon, Camargo area.
57	S65-63887	S65-65391	76	Dec. 9, 1965	20:50	161	Mexico: Torreon area.
58	S65-63888	S65-65392	76	Dec. 9, 1965	20:50	161	Mexico: Torreon, Saltillo area.
59	S65-63889	S65-65393	76	Dec. 9, 1965	20:51	161	Mexico: Saltillo, Monterrey area.

## MAGAZINE 24

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63722	S65-65120	77	Dec. 9, 1965	21:51	162	*Clouds at twilight.
2	S65-63723	S65-65121	77	Dec. 9, 1965	21:52	162	*Clouds.
3	S65-63724	S65-65122	77	Dec. 9, 1965	21:52	162	*Clouds, western Pacific.
4	S65-63725	S65-65123	77	Dec. 9, 1965	21:55	162	Clouds, western Pacific.
5	S65-63726	S65-65124	77	Dec. 9, 1965	22:09	162	Hawaiian Islands: Pearl and Hermes Reef, Kure Island, Midway Island.
6	S65-63727	S65-65125	77	Dec. 9, 1965	22:09	162	Hawaiian Islands: Pearl and Hermes Reef.
7	S65-63728	S65-65126	79	Dec. 10, 1965	01:03	161	China: Kwangtung Province, Hong Kong.
8	S65-63729	S65-65127	79	Dec. 10, 1965	01:03	161	China: Kwangtung Province, Hong Kong.
9	S65-63730	S65-65128	79	Dec. 10, 1965	01:08	161	Daito Islands: Kita and Minami.
10	S65-63731	S65-65129	88	Dec. 10, 1965	15:02	160	*Niger, Nigeria, Chad: Lake Chad.
11	S65-63732	S65-65130	88	Dec. 10, 1965	15:02	160	*Niger, Nigeria, Chad: Lake Chad.
12	S65-63733	S65-65131	88	Dec. 10, 1965	15:03	160	*Niger, Nigeria, Chad: Lake Chad.
13	S65-63734	S65-65132	89	Dec. 10, 1965	16:29	161	**Mauritania, Spanish Sahara; Cap Blanc
14	S65-63735	S65-65133	89	Dec. 10, 1965	16:31	160	**Mauritania, Spanish Sahara; Cap Blanc
15	S65-63736	S65-65134	91	Dec. 10, 1965	20:54	161	Clouds, Pacific Ocean off Mexico.
16	S65-63737	S65-65135	91	Dec. 10, 1965	20:56	161	**West-central Mexico.
17	S65-63738	S65-65136	91	Dec. 10, 1965	20:57	161	**West-central Mexico.
18	S65-63739	S65-65137	91	Dec. 10, 1965	20:57	161	**West-central Mexico.
19	S65-63740	S65-65138	91	Dec. 10, 1965	20:58	161	*Mexico: north of San Luis Potosí.
20	S65-63741	S65-65139	91	Dec. 10, 1965	21:01	161	Mexico, British Honduras: Yucatan Peninsula, Quintana Roo.
21	S65-63742	S65-65140	91	Dec. 10, 1965	21:01	161	British Honduras: city of Belize, Gulf of Honduras.
22	.....	.....	.....	.....	.....	.....	Blank.
23	S65-63743	S65-65141	100	Dec. 11, 1965	10:37	160	India, Ceylon: Palk Strait, Adam's Bridge.
24	S65-63744	S65-65142	100	Dec. 11, 1965	10:38	160	India, Ceylon: Palk Strait, Adam's Bridge.
25	S65-63745	S65-65143	100	Dec. 11, 1965	10:38	160	India, Ceylon: Palk Strait, Adam's Bridge.
26	S65-63746	S65-65144	101	Dec. 11, 1965	11:58	162	Libya, Chad, Niger: Tibesti Mountains.
27	S65-63747	S65-65145	101	Dec. 11, 1965	11:58	162	**Libya, Chad, Nigeria: Tibesti Mountains.
28	S65-63748	S65-65146	101	Dec. 11, 1965	11:59	162	Eastern Libya: Al Kufrah, Libyan Desert.
29	S65-63749	S65-65147	101	Dec. 11, 1965	12:01	162	United Arab Republic, Libya: Western and Libyan Deserts

## MAGAZINE 24 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
30	S65-63750	S65-65148	101	Dec. 11, 1965	12:07	161	Somali Republic: Ras Asir, Ras Hafun, Abd al Kuri Island.
31	S65-63751	S65-65149	.....	Dec. 11, 1965	.....	.....	Clouds, sunlit cumulus tops.
32	S65-63752	S65-65150	102	Dec. 11, 1965	14:46	163	*Florida: Keys and Miami area.
33	S65-63753	S65-65151	103	Dec. 11, 1965	14:47	163	Bahama Islands: Andros, New Providence, Abaco, Eleuthera Islands.
34	S65-63754	S65-65152	104	Dec. 11, 1965	16:37	160	Senegal, Gambia, Portuguese Guinea: Dakar, Cape Vert.
35	S65-63755	S65-65153	106	Dec. 11, 1965	19:38	160	*Venezuela: Peninsula de Araya, Isla de Margarita.
36	S65-63756	S65-65154	106	Dec. 11, 1965	21:05	161	Mexico: Federal District, Morelos, Puebla, Tlaxcala, Guerrero.
37	S65-63757	S65-65155	106	Dec. 11, 1965	21:05	161	Mexico: Federal District, Morelos, Puebla, Tlaxcala, Guerrero, Oaxaco, Veracruz.
38	S65-63758	S65-65156	106	Dec. 11, 1965	21:05	161	Mexico: Puebla, Veracruz, Tlaxcala, Oaxaco.
39	S65-63759	S65-65157	106	Dec. 11, 1965	21:06	161	Mexico: Veracruz, Oaxaco.
40	S65-63760	S65-65158	106	Dec. 11, 1965	21:06	161	Mexico: Veracruz, Oaxaco; Golfo and Istmo de Tehuantepec.
41	S65-63761	S65-65159	.....	.....	.....	.....	*Clouds.
42	S65-63762	S65-65160	109	Dec. 12, 1965	01:16	161	China: Kweichow-Kwangsi Provinces.
43	S65-63763	S65-65161	109	Dec. 12, 1965	01:17	161	China: Kwangtung Province, looking toward Canton and Hong Kong.
44	S65-63764	S65-65162	109	Dec. 12, 1965	01:17	161	China: coastline of Formosa Strait.
45	S65-63765	S65-65163	116	Dec. 12, 1965	12:12	160	Somali Republic: Ras Asir, Ras Hafun.
46	S65-63766	S65-65164	116	Dec. 12, 1965	12:13	160	Somali Republic: Ras Asir, Ras Hafun, Socotra Island.
47	S65-63767	S65-65165	116	Dec. 12, 1965	12:13	160	Aden, Somali Republic; Gulf of Aden, Ras Asir.
48	S65-63768	S65-65166	.....	.....	.....	.....	*Clouds.
49	S65-63769	S65-65167	117	Dec. 12, 1965	14:52	161	*Florida: Kennedy Space Center, Gemini VI abort.
50	S65-63770	S65-65168	117	Dec. 12, 1965	14:52	161	*Florida: Kennedy Space Center, Gemini VI abort.
51	S65-63771	S65-65169	117	Dec. 12, 1965	14:52	161	*Florida: Kennedy Space Center, Gemini VI abort.
52	S65-63772	S65-65170	118	Dec. 12, 1965	14:53	161	*Florida: Kennedy Space Center, Gemini VI abort.
53	S65-63773	S65-65171	.....	.....	.....	.....	Clouds over ocean.
54	S65-63774	S65-65172	.....	.....	.....	.....	Clouds over ocean.
55	S65-63775	S65-65173	.....	.....	.....	.....	Clouds over ocean.
56	S65-63776	S65-65174	.....	.....	.....	.....	Clouds over ocean, contrails.
57	S65-63777	S65-65175	.....	.....	.....	.....	Clouds over ocean.
58	S65-63778	S65-65176	.....	.....	.....	.....	*Clouds.
59	S65-63779	S65-65177	119	Dec. 12, 1965	16:55	160	Angola: coast, south of Luanda(?).
60	S65-63780	S65-65178	123	Dec. 12, 1965	22:59	161	Bolivia, Chile, Argentina: cloud over Andes, Salar de Uyuni.
61	S65-63781	.....	.....	.....	.....	.....	Partial frame.

## MAGAZINE 25

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63991	S65-65061	120	Dec. 12, 1965	19:39	161	*Honduras, El Salvador, Nicaragua: Caribbean in foreground, Pacific in background.
2	S65-63992	S65-65062	121	Dec. 12, 1965	19:43	160	Colombia, Venezuela: Peninsula de la Guajira, Peninsula de Paraguana.
3	S65-63993	S65-65063	121	Dec. 12, 1965	19:43	160	Colombia, Venezuela: Peninsula de la Guajira, Peninsula de Paraguana.
4	S65-63994	S65-65064	121	Dec. 12, 1965	.....	160	Venezuela: Partial frame.
5	S65-63995	S65-65065	121	Dec. 12, 1965	19:44	160	Venezuela: Caracas, Lago de Valencia.



## MAGAZINE 25 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
6	S65-63996	S65-65066	121	Dec. 12, 1965	.....	160	Clouds off Guyana coast.
7	S65-63997	S65-65067	121	Dec. 12, 1965	19:49	160	Brazil: Mouth of Amazon River.
8	S65-63998	S65-65068	121	Dec. 12, 1965	19:49	160	Brazil: Mouth of Amazon River.
9	S65-63999	S65-65069	121	Dec. 12, 1965	19:50	160	Brazil: Mouth of Amazon River, Baia de Marajo.
10	S65-64000	S65-65070	121	Dec. 12, 1965	19:50	160	Brazil: Mouth of Amazon River, Baia de Marajo.
11	S65-64001	S65-65071	121	Dec. 12, 1965	19:50	160	Brazil: Mouth of Amazon River.
12	S65-64002	S65-65072	121	Dec. 12, 1965	19:50	160	Brazil: Mouth of Amazon River, Baia de Marajo.
13	S65-64003	S65-65073	121	Dec. 12, 1965	19:50	160	Brazil: Mouth of Amazon River, Baia de Marajo.
14	S65-64004	S65-65074	.....	.....	.....	.....	Double exposure.
15	S65-64005	S65-65075	130	Dec. 13, 1965	10:42	161	Saudi Arabia, Sudan, Ethiopia: Red Sea.
16	S65-64006	S65-65076	130	Dec. 13, 1965	10:42	161	Saudi Arabia, Sudan, Ethiopia, United Arab Republic: Red Sea.
17	S65-64007	S65-65077	130	Dec. 13, 1965	10:43	161	Saudi Arabia, Yemen, Ethiopia: Red Sea.
18	S65-64008	S65-65078	130	Dec. 13, 1965	10:43	161	Yemen: Southwest corner of Empty Quarter.
19	S65-64009	S65-65079	130	Dec. 13, 1965	10:43	161	Aden Protectorate: Hadramawt Plateau, Wadi Hadramawt.
20	S65-64010	S65-65080	130	Dec. 13, 1965	10:43	161	Aden Protectorate: Hadramawt Plateau, Wadi Hadramawt, Al Mukalla, Gulf of Aden.
21	S65-64011	S65-65081	130	Dec. 13, 1965	10:44	160	Aden Protectorate: Mouth of Wadi Hadramawt, Gulf of Aden.
22	S65-64012	S65-65082	130	Dec. 13, 1965	10:45	160	Somali Republic: Ras Asir, Ras Hafun.
23	S65-64013	S65-65083	130	Dec. 13, 1965	10:45	160	Socotra Island, Abd al Kuri Island, The Brothers Islands.
24	S65-64014	S65-65084	131	Dec. 13, 1965	12:17	160	Ethiopia: Lake Tana, Blue Nile.
25	S65-64015	S65-65085	131	Dec. 13, 1965	12:17	160	Ethiopia: Harar, Bale Provinces.
26	S65-64016	S65-65086	131	Dec. 13, 1965	12:17	160	Ethiopia: Harar, Bale Provinces.
27	S65-64017	S65-65087	131	Dec. 13, 1965	12:18	160	Ethiopia: Harar, Bale Provinces.
28	S65-64018	S65-65088	131	Dec. 13, 1965	12:18	160	Ethiopia: Harar Province; Somali Republic.
29	S65-64019	S65-65089	131	Dec. 13, 1965	12:18	160	Ethiopia: Harar Province; Somali Republic.
30	S65-64020	S65-65090	131	Dec. 13, 1965	12:18	160	Ethiopia: Harar Province; Somali Republic.
31	S65-64021	S65-65091	131	Dec. 13, 1965	12:18	160	Somali Republic: Coastline north of Mogadishu.
32	S65-64022	S65-65092	133	Dec. 13, 1965	15:25	160	Congo, Brazzaville; Republic of Congo, Leopoldville: Stanley Pool, Congo River.
33	S65-64023	S65-65093	133	Dec. 13, 1965	15:31	161	Mozambique: Mouth of Zambeze River.
34	S65-64024	S65-65094	134	Dec. 13, 1965	18:11	161	Florida: Keys, Florida Bay, Cape Sable, underwater detail clearly shown.
35	S65-64025	S65-65095	135	Dec. 13, 1965	18:11	161	Cuba: Camaguey Province; Great Bahama Bank, Tongue of the Ocean.
36	S65-64026	S65-65096	135	Dec. 13, 1965	18:11	161	Cuba: Golfo de Ana Maria, Jardines de la Reina Islands.
37	S65-64027	S65-65097	135	Dec. 13, 1965	18:13	161	Haiti, western Dominican Republic.
38	S65-64028	S65-65098	135	Dec. 13, 1965	18:13	161	Southeastern Haiti, western Dominican Republic.
39	S65-64029	S65-65099	135	Dec. 13, 1965	18:14	161	Guyana: Coastline at Georgetown.
40	S65-64030	S65-65100	143	Dec. 14, 1965	07:19	158	*Cape Verde Islands: Sao Nicolau, Sao Vicente.
41	S65-64031	S65-65101	143	Dec. 14, 1965	07:19	158	**Cape Verde Islands: underexposed.
42	S65-64032	S65-65102	143	Dec. 14, 1965	07:23	159	*Mauritania: Dhar Adrar, Richat Structure.
43	S65-64033	S65-65103	.....	.....	.....	.....	**Clouds.
44	S65-64034	S65-65104	162	Dec. 15, 1965	13:37	160	Florida: Kennedy Space Center, Gemini VI launch, smoke puff at pad 19, clouds, contrails.
45	S65-64035	S65-65105	.....	.....	.....	.....	**Clouds.
46	.....	.....	.....	.....	.....	.....	Blank.
47	.....	.....	.....	.....	.....	.....	Blank.
48	.....	.....	.....	.....	.....	.....	Blank.

## MAGAZINE 25 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
49	S65-64036	S65-65106	166	Dec. 15, 1965	21:40	161	Rendezvous, with Gemini VI, range 45 ft; underexposed.
50	S65-64037	S65-65107	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 45 ft.
51	S65-64038	S65-65108	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 48 ft.
52	S65-64039	S65-65109	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 38 ft; "Beat Army" sign.
53	S65-64040	S65-65110	166	Dec. 15, 1956	.....	.....	Rendezvous, with Gemini VI, nose view, range 38 ft; "Beat Army" sign.
54	S65-64041	S65-65111	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 55 ft.
55	S65-64042	S65-65112	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 45 ft.
56	S65-64043	S65-65113	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 45 ft.
57	S65-64044	S65-65114	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 270 ft.
58	S65-64045	S65-65115	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view, range 40 ft.
59	S65-64046	S65-65116	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view 35 ft.
60	S65-64047	S65-65117	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, nose view 33 ft.
61	S65-64048	S65-65118	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, oblique view, range 60 ft.
62	S65-64049	S65-65119	166	Dec. 15, 1965	.....	.....	Rendezvous, with Gemini VI, oblique view. range 60 ft.

## MAGAZINE 13

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	.....	.....	.....	.....	.....	.....	Blank.
2	S65-63890	S65-65296	166	Dec. 15, 1965	.....	.....	**Rendezvous with Gemini VI, nose view, range 100 ft.
3	S65-63891	S65-65297	166	Dec. 15, 1965	.....	.....	**Rendezvous with Gemini VI, nose view, range 130 ft.
4	S65-63892	S65-65298	166	Dec. 15, 1965	.....	.....	**Rendezvous with Gemini VI, nose view, range 145 ft.
5	S65-63893	S65-65299	166	Dec. 15, 1965	.....	.....	**Rendezvous with Gemini VI, oblique nose view, range 70 ft.
6	S65-63894	S65-65300	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, oblique nose view, range 43 ft.
7	S65-63895	S65-65301	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, oblique nose view, range 40 ft.
8	S65-63896	S65-65302	166	Dec. 15, 1965	.....	.....	**Rendezvous with Gemini VI, oblique nose view, range 40 ft.
9	S65-63897	S65-65303	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, nose view, range 58 ft.
10	S65-63898	S65-65304	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, nose view, range 43 ft.
11	S65-63899	S65-65305	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, nose view, range 43 ft.
12	S65-63900	S65-65306	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, nose view, range 40 ft.
13	S65-63901	S65-65307	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, nose view, range 32 ft.
14	S65-63902	S65-65308	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, nose view; underexposed.



## MAGAZINE 13 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
15	S65-63903	S65-65309	166	Dec. 15, 1965	.....	.....	Rendezvous with Gemini VI, nose view; underexposed.
16	S65-63904	S65-65310	.....	.....	.....	.....	**Double exposure, clouds.
17	S65-63905	S65-65311	.....	.....	.....	.....	Clouds, reflections on window.
18	S65-63906	S65-65312	178	Dec. 16, 1965	15:45	162	**Southwest Africa: Rocky Point, Cape Fria.
19	S65-63907	S65-65313	178	Dec. 16, 1965	15:45	162	**Southwest Africa: Rocky Point, Cape Fria.
20	S65-63908	S65-65314	178	Dec. 16, 1965	15:45	162	**Southwest Africa: Kaoko Veld.
21	S65-63909	S65-65315	178	Dec. 16, 1965	15:45	162	**Southwest Africa: Kaoko Veld.
22	S65-63910	S65-65316	178	Dec. 16, 1965	15:45	162	**Southwest Africa: Kaoko Veld, Etosha Pan.
23	S65-63911	S65-65317	178	Dec. 16, 1965	15:45	162	**Southwest Africa: Etosha Pan.
24	S65-63912	S65-65318	178	Dec. 16, 1965	15:46	162	**Southwest Africa: Etosha Pan.
25	S65-63913	S65-65319	178	Dec. 16, 1965	15:46	162	**Southwest Africa: Etosha Pan.
26	S65-63914	S65-65320	178	Dec. 16, 1965	15:46	162	**Southwest Africa.
27	S65-63915	S65-65321	178	Dec. 16, 1965	15:46	162	**Southwest Africa.
28	S65-63916	S65-65322	178	Dec. 16, 1965	15:47	162	**Southwest Africa.
29	S65-63917	S65-65323	178	Dec. 16, 1965	15:47	162	**Southwest Africa, Bechuanaland.
30	S65-63918	S65-65324	179	Dec. 16, 1965	16:54	160	**Cuba: Pinar del Rio, La Habana Provinces.
31	S65-63919	S65-65325	179	Dec. 16, 1965	16:54	160	**Cuba: Matanzas, Las Villas Provinces.
32	S65-63920	S65-65326	179	Dec. 16, 1965	16:54	160	**Cuba: Las Villas, Camaguey Provinces.
33	S65-63921	S65-65327	179	Dec. 16, 1965	16:55	160	**Cuba: Camaguey, Oriente Provinces.
34	S65-63922	S65-65328	179	Dec. 16, 1965	16:55	160	**Cuba: Oriente Province.
35	S65-63923	S65-65329	179	Dec. 16, 1965	16:56	160	**Cuba: Oriente Province.
36	S65-63924	S65-65330	179	Dec. 16, 1965	16:56	160	**Cuba: Oriente Province.
37	S65-63925	S65-65331	179	Dec. 16, 1965	16:56	160	*Haiti, western Dominican Republic.
38	S65-63926	S65-65332	179	Dec. 16, 1965	16:57	160	*Dominican Republic.
39	S65-63927	S65-65333	179	Dec. 16, 1965	16:58	160	**Easternmost Dominican Republic, Puerto Rico.
40	S65-63928	S65-65334	179	Dec. 16, 1965	17:01	160	**Guyana: Mouths of Essequibo and Demerara Rivers.
41	S65-63929	S65-65335	179	Dec. 16, 1965	17:02	161	**Surinam, Guyana: Coastline, clouds.
42	S65-63930	S65-65336	179	Dec. 16, 1965	17:03	161	*Brazil: Mouth of Amazon.

## MAGAZINE 23

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S65-63990	S65-65001	190	Dec. 17, 1965	10:54	160	**Mauritania, Mali: Erg Iguidi.
2	S65-63989	S65-65002	190	Dec. 17, 1965	10:55	160	**Mali, Algeria: Erg Chech.
3	S65-63988	S65-65003	190	Dec. 17, 1965	10:55	160	**Mali, Algeria: Erg Chech.
4	S65-63987	S65-65004	190	Dec. 17, 1965	10:55	160	**Mali, Algeria: Tanezrouft region.
5	S65-63986	S65-65005	190	Dec. 17, 1965	10:56	160	**Algeria: Tanezrouft region.
6	S65-63985	S65-65006	190	Dec. 17, 1965	10:56	160	**Algeria: Tanezrouft region.
7	S65-63984	S65-65007	190	Dec. 17, 1965	10:56	160	**Algeria: Tanezrouft region.
8	S65-63983	S65-65008	190	Dec. 17, 1965	10:56	160	**Algeria: Tanezrouft region.
9	S65-63982	S65-65009	190	Dec. 17, 1965	10:56	160	**Algeria: Tanezrouft region, Assedjrad Escarpment.
10	S65-63981	S65-65010	190	Dec. 17, 1965	10:57	160	**Algeria: Tanezrouft region, Assedjrad Escarpment.
11	S65-63980	S65-65011	190	Dec. 17, 1965	10:57	160	**Algeria: Tanezrouft region, Assedjrad Escarpment.
12	S65-63979	S65-65012	190	Dec. 17, 1965	10:57	160	**Algeria: Tanezrouft region, Assedjrad Escarpment.
13	S65-63978	S65-65013	190	Dec. 17, 1965	10:58	160	**Algeria, Mali: Adrar des Iforas.
14	S65-63977	S65-65014	190	Dec. 17, 1965	10:58	160	**Algeria, Mali: Adrar des Iforas.
15	S65-63976	S65-65015	190	Dec. 17, 1965	10:58	160	**Niger: Northwest corner.
16	S65-63975	S65-65016	190	Dec. 17, 1965	10:59	160	**Niger: Air ou Azbine.
17	S65-63974	S65-65017	190	Dec. 17, 1965	10:59	160	**Niger: Air ou Azbine.
18	S65-63973	S65-65018	190	Dec. 17, 1965	10:59	160	**Niger: Air ou Azbine.
19	S65-63972	S65-65019	190	Dec. 17, 1965	10:59	160	**Niger: Northwest of Lake Chad.

## MAGAZINE 23 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
20	S65-63971	S65-65020	190	Dec. 17, 1965	11:00	160	**Niger: Lake Chad.
21	S65-63970	S65-65021	190	Dec. 17, 1965	11:00	160	*Niger, Chad, Nigeria, Cameroon: Lake Chad.
22	S65-63969	S65-65022	190	Dec. 17, 1965	11:00	160	Niger, Chad, Nigeria, Cameroon: Lake Chad.
23	S65-63968	S65-65023	190	Dec. 17, 1965	11:00	160	Chad: East, central, partial frame.
24	S65-63967	S65-65024	190	Dec. 17, 1965	11:01	160	Chad: East, central.
25	S65-63966	S65-65025	190	Dec. 17, 1965	11:01	160	Chad: East, central.
26	S65-63965	S65-65026	190	Dec. 17, 1965	11:01	160	Chad: East, central.
27	S65-63964	S65-65027	190	Dec. 17, 1965	11:02	161	Chad: East, central.
28	S65-63963	S65-65028	190	Dec. 17, 1965	11:02	161	Chad: East, central
29	S65-63962	S65-65029	190	Dec. 17, 1965	11:02	161	Chad: Southeast.
30	S65-63961	S65-65030	190	Dec. 17, 1965	11:02	161	Chad: Southeast.
31	S65-63960	S65-65031	190	Dec. 17, 1965	11:03	161	Chad, Central African Republic.
32	S65-63959	S65-65032	190	Dec. 17, 1965	11:03	161	Chad, Central African Republic, Sudan.
33	S65-63958	S65-65033	190	Dec. 17, 1965	11:03	161	Central African Republic, Sudan: forest fires.
34	S65-63957	S65-65034	190	Dec. 17, 1965	11:04	161	Central African Republic, Sudan: forest fires.
35	S65-63956	S65-65035	190	Dec. 17, 1965	11:04	161	Central African Republic, Sudan: forest fires.
36	S65-63955	S65-65036	190	Dec. 17, 1965	11:04	161	Central African Republic, Sudan: forest fires.
37	S65-63954	S65-65037	190	Dec. 17, 1965	11:04	161	Central African Republic, Sudan, Republic of the Congo: forest fires.
38	S65-63953	S65-65038	190	Dec. 17, 1965	11:05	161	Central African Republic, Sudan, Republic of the Congo: forest fires.
39	S65-63952	S65-65039	190	Dec. 17, 1965	11:09	161	Somali Republic: Coastline south of Mogadishu.
40	S65-63951	S65-65040	.....	.....	.....	.....	Out of focus, overexposed.
41	S65-63950	S65-65041	192	Dec. 17, 1965	14:03	161	Cape Verde Islands: Brava, Fogo, Sao Tiago, Maio, Boa Vista, Sal.
42	S65-63949	S65-65042	193	Dec. 17, 1965	15:27	160	**Bahama Bank area: Andros, Great Exuma Islands, north coast of Cuba.
43	S65-63948	S65-65043	193	Dec. 17, 1965	15:27	160	**Bahama Bank area: Andros Island, Tongue of the Ocean.
44	S65-63947	S65-65044	193	Dec. 17, 1965	15:27	160	**Bahama Bank area: Andros, Great Exuma, Long Islands.
45	S65-63946	S65-65045	193	Dec. 17, 1965	15:27	160	**Cuba: Oriente Province.
46	S65-63945	S65-65046	193	Dec. 17, 1965	15:27	160	**Cuba: Las Villas, Camaguey, Oriente Provinces.
47	S65-63944	S65-65047	193	Dec. 17, 1965	15:27	160	**Cuba: Oriente Province.
48	S65-63943	S65-65048	193	Dec. 17, 1965	15:28	160	**Cuba: Oriente Province, Guantanamo Bay.
49	S65-63942	S65-65049	.....	.....	.....	.....	**Clouds.
50	S65-63941	S65-65050	194	.....	.....	.....	**Clouds, west of Panama.
51	S65-63940	S65-65051	195	Dec. 17, 1965	18:41	161	Peru, Ecuador: Rio Napo, Rio Cururary.
52	S65-63939	S65-65052	195	Dec. 17, 1965	18:42	161	Peru, Brazil: Upper Amazon Basin.
53	S65-63938	S65-65053	195	Dec. 17, 1965	18:43	161	Brazil, Colombia: Upper Amazon Basin.
54	S65-63937	S65-65054	195	Dec. 17, 1965	.....	.....	Brazil: Overexposed.
55	S65-63936	S65-65055	195	Dec. 17, 1965	.....	.....	Brazil: Matto Grosso, clouds.
56	S65-63935	S65-65056	195	Dec. 17, 1965	.....	.....	Brazil: Matto Grosso, clouds.
57	S65-63934	S65-65057	195	Dec. 17, 1965	.....	.....	Brazil: Matto Grosso.
58	S65-63933	S65-65058	195	Dec. 17, 1965	.....	.....	Brazil: Matto Grosso.
59	S65-63932	S65-65059	195	Dec. 17, 1965	18:51	163	Brazil: Coastline north of Vitoria, clouds.
60	S65-63931	S65-65060	195	Dec. 17, 1965	.....	.....	Clouds over Atlantic.

## MAGAZINE 26

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	.....	.....	.....	.....	.....	.....	Blank.
2	S65-64050	.....	45	Dec. 7, 1965	19:21	130	Gulf coast: New Orleans, Baton Rouge, Mobile, Gulfport; f/11, 1/250 sec.
3	S65-64051	.....	45	Dec. 7, 1965	19:21	129	Gulf coast: Mobile, Gulfport, Pensacola; f/11, 1/250 sec.



## MAGAZINE 26 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
4	S65-64052	.....	45	Dec. 7, 1965	19:22	129	Gulf coast: Pensacola, Panama City, Montgomery, Birmingham; f/11, 1/250 sec.
5	S65-64053	.....	45	Dec. 7, 1965	19:22	129	Gulf coast: Apalachicola, Tallahassee; forest fires.
6	S65-64054	.....	.....	.....	.....	.....	Gulf coast: Florida; underexposed, f/16, 1/250 sec.
7	S65-64055	.....	.....	.....	.....	.....	Florida, Georgia coast: Jacksonville; underexposed.
8	S65-64056	.....	45	Dec. 7, 1965	19:22	129	Florida: Jacksonville; highlights underexposed.
9	S65-64057	.....	121	Dec. 12, 1965	19:51	160	Brazil: Para and Maranhao States; Atlantic Ocean; no filter.
10	S65-64058	.....	121	Dec. 12, 1965	19:51	160	Brazil; Maranhao State, Baia de Sao Luis; no filter.
11	S65-64059	.....	121	Dec. 12, 1965	19:51	160	Brazil: Maranhao State, Baia de Sao Luis; no filter.
12	S65-64060	.....	121	Dec. 12, 1965	.....	.....	Clouds along Brazil coast; underexposed.
13	S65-64061	.....	121	Dec. 12, 1965	.....	.....	Clouds along Brazil coast; underexposed.
14	S65-64062	.....	121	Dec. 12, 1965	.....	.....	Clouds along Brazil coast; underexposed.
15	S65-64063	.....	121	Dec. 12, 1965	19:54	160	Brazil: mouth of Sao Francisco River; no filter.
16	S65-64064	.....	194	Dec. 17, 1965	.....	.....	Brazil: Amazon River; bad exposure, trouble with film advance.
17	S65-64065	.....	194	Dec. 17, 1965	.....	.....	Brazil: Amazon and Purus Rivers; bad exposure, trouble with film advance.
18	S65-64066	.....	194	Dec. 17, 1965	.....	.....	Overexposed.
19	S65-64067	.....	194	Dec. 17, 1965	.....	.....	Brazil: Maranhao State; clouds.
20	S65-64068	.....	194	Dec. 17, 1965	17:11	161	Brazil: Maranhao State; clouds.
21	S65-64069	.....	194	Dec. 17, 1965	17:11	161	Brazil: Maranhao State Sao Luis; Atlantic Ocean; clouds.
22	S65-64070	.....	194	Dec. 17, 1965	17:12	161	Brazil: Maranhao, Piaui, Ceara States; Atlantic Ocean, clouds.
23	S65-64071	.....	194	Dec. 17, 1965	17:12	161	Brazil: Paiui and Ceara States; clouds.
24	S65-64072	.....	194	Dec. 17, 1965	17:12	161	Brazil: Ceara State, south of Fortaleza; clouds.
25	S65-64073	.....	194	Dec. 17, 1965	17:13	161	Brazil: Ceara and Rio Grande do Norte States, Fortaleza; Atlantic coast; clouds.
26	S65-64074	.....	194	Dec. 17, 1965	17:13	162	Brazil: Ceara and Rio Grande do Norte States; clouds.
27	S65-64075	.....	194	Dec. 17, 1965	17:13	162	Brazil: Ceara, Rio Grande do Norte and Paraiba States, Natal; clouds.
28	S65-64076	.....	194	Dec. 17, 1965	17:13	162	Brazil: Rio Grande do Norte, Paraiba and Pernambuco States, Natal; clouds.
29	S65-64077	.....	194	Dec. 17, 1965	17:13	162	Brazil: Ceara, Rio Grande do Norte and Paraiba States, Fortaleza; clouds.
30	S65-64078	.....	194	Dec. 17, 1965	17:13	162	Brazil: Ceara, Rio Grande do Norte and Paraiba States, Natal; clouds.
31	S65-64079	.....	194	Dec. 17, 1965	17:15	161	Brazil: Atlantic coast, mouth of Sao Francisco River.

## GEMINI VIII

## MAGAZINE 20

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-25771	S66-25752	3	Mar. 16, 1966	20:56	.. .. .	Earth limb with cloud layers in silhouette, sunrise over Guam.
2	S66-25772	S66-25753	3	Mar. 16, 1966	21:05	.. .. .	Agna at approximately 1000 ft; overexposed; near Midway Island.
3	S66-25773	S66-25754	3	Mar. 16, 1966	21:05	.. .. .	Agna at approximately 1000 ft; overexposed; near Midway Island.
4	S66-25774	S66-25755	3	Mar. 16, 1966	21:06	.. .. .	Agna at approximately 1000 ft; dark sky background; near Midway Island.

## MAGAZINE 20 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
5	S66-25775	S66-25756	3	Mar. 16, 1966	21:06	.. .. .	Agena at approximately 1000 ft; dark sky background; near Midway Island.
6	S66-25776	S66-25757	3	Mar. 16, 1966	21:07	.. .. .	Agena at approximately 750 ft; dark sky background; north of Hawaii.
7	S66-25777	S66-25758	3	Mar. 16, 1966	21:08	.. .. .	Agena at approximately 450 ft; dark sky background; north of Hawaii.
8	S66-25778	S66-25759	3	Mar. 16, 1966	21:09	.. .. .	Agena at 250 ft, motor end turned 45° toward Gemini VIII; sky background; north of Hawaii.
9	S66-25779	S66-25760	3	Mar. 16, 1966	21:09	147	Agena at 210 ft; motor end turned 45° toward Gemini VIII; sea, clouds, sky in background.
10	S66-25780	S66-25761	3	Mar. 16, 1966	21:10	147	Agena at 190 ft, motor end turned 45° toward Gemini VIII; sea, clouds, sky in background.
11	S66-25781	S66-25762	3	Mar. 16, 1966	21:14	.. .. .	Agena at 55 ft, docking adapter end turned partially toward Gemini VIII; clouds, sky in background.
12	S66-25782	S66-25763	3	Mar. 16, 1966	21:21	.....	Agena at 45 ft, side view of entire Agena; good stereo with frame 13; off west coast of Mexico.
13	S66-25783	S66-25764	3	Mar. 16, 1966	21:21	.....	Agena at 44 ft, side view of entire Agena; good stereo with frame 12; off west coast of Mexico.
14	S66-25784	S66-25765	4	Mar. 16, 1966	21:38	.....	Agena at 24 in. from nose of Gemini VIII, docking adapter end and instrument panel of Agena visible; over coast of Brazil near Rio de Janeiro.
15	S66-25785	S66-25766	4	Mar. 16, 1966	21:57	.....	Docking, instrument panel and L-band antenna of Agena, slightly out of focus; over South Africa.
16	S66-25786	S66-25767	4	Mar. 16, 1966	21:57	.....	Agena instrument panel while docked; out of focus.
17	S66-25787	S66-25768	4	Mar. 16, 1966	22:21	.....	Docked with Agena; clouds, sea, sky, solar backlighting, near Philippine Islands.
18	S66-25788	S66-25769	4	Mar. 16, 1966	22:21	.....	Docked with Agena; shadow side of Agena; clouds, sea, sky, near Philippine Islands.
19	S66-25789	S66-25770	4	Mar. 16, 1966	.....	.....	Sunlight in lens, no photo.

GEMINI IX  
MAGAZINE A

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-37906	S66-37806	1	June 3, 1966	15:11	130	Mexico: Torreon, Monterrey; looking over cloudy Coahuila Basin to folded mountains of Sierra Madre Oriental.
2	S66-37907	S66-37807	1	June 3, 1966	15:11	130	Mexico: Torreon, Monterrey; looking over cloudy Coahuila Basin to folded mountains of Sierra Madre Oriental.
3	S66-37908	S66-37808	1	June 3, 1966	15:11	130	Mexico: Coahuila, Nuevo Leon States; Serranias del Burro, northern Sierra Madre Oriental.
4	S66-37909	S66-37809	1	June 3, 1966	15:14	129	Louisiana, gulf coast: Cameron to Mobile; Mississippi River and delta; cloudy.
5	S66-37910	S66-37810	1	June 3, 1966	15:15	128	Louisiana, Alabama, Florida: gulf coast, Grand Isle to Apalachicola; Mississippi Delta, Mobile Bay.
6	S66-37911	S66-37811	3	June 3, 1966	18:27	.....	ATDA, backlit, range 65 ft; sky background.
7	S66-37912	S66-37812	3	June 3, 1966	18:27	.....	ATDA, backlit, range 65 ft; sky background.
8	S66-37913	S66-37813	3	June 3, 1966	18:27	.....	ATDA, backlit, range 70 ft; sky background.
9	S66-37914	S66-37814	3	June 3, 1966	18:28	.....	ATDA, backlit, range 65 ft; sky background.
10	S66-37915	S66-37815	3	June 3, 1966	18:29	.....	ATDA, backlit, range 45 ft; sky background.



## MAGAZINE A Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
11	S66-37916	S66-37816	3	June 3, 1966	18:29	.....	ATDA, backlit, range 38 ft; sky background.
12	S66-37917	S66-37817	3	June 3, 1966	18:29	.....	ATDA, side view, range 45 ft; off coast of Honduras.
13	S66-37918	S66-37818	4	June 3, 1966	18:30	.....	ATDA, back end view, range 75 ft; sky background.
14	S66-37919	S66-37819	4	June 3, 1966	18:31	.....	ATDA, side view, range 30 ft; sky background.
15	S66-37920	S66-37820	4	June 3, 1966	18:31	.....	ATDA, side view, range 25 ft; sky background.
16	S66-37921	S66-37821	4	June 3, 1966	18:31	.....	ATDA, side view, range 25 ft; sky background.
17	S66-37922	S66-37822	4	June 3, 1966	18:32	157	ATDA, side view, range 70 ft; Venezuela coast, Isla Los Roques.
18	S66-37923	S66-37823	4	June 3, 1966	18:32	157	ATDA, side view, range 75 ft; Venezuela coast, Isla Los Roques, Isla La Orchila.
19	S66-37924	S66-37824	4	June 3, 1966	18:32	157	ATDA, side view, range 85 ft; Venezuela coast, Isla La Tortuga.
20	S66-37925	S66-37825	4	June 3, 1966	18:32	157	ATDA, side view, range 105 ft; Venezuela coast, Isla La Tortuga.
21	S66-37926	S66-37826	4	June 3, 1966	18:32	157	ATDA, side view, range, 110 ft; Venezuela coast, Isla La Tortuga, Peninsula de Araya.
22	S66-37927	S66-37827	4	June 3, 1966	18:33	157	ATDA, shroud, range 45 ft; Venezuelan jungles, clouds in background.
23	S66-37928	S66-37828	4	June 3, 1966	18:33	157	ATDA, shroud, range 40 ft; Venezuelan jungles, clouds in background.
24	S66-37929	S66-37829	4	June 3, 1966	19:13	.....	Moon, full; ATDA, range approximately 750 ft.
25	S66-37930	S66-37830	4	June 3, 1966	19:13	.....	Moon, full; ATDA, range approximately 750 ft.
26	S66-37931	S66-37831	4	June 3, 1966	19:13	.....	Moon, full.
27	S66-37932	S66-37832	15	June 4, 1966	12:16	.....	ATDA, fore side view, range 125 ft; sky background.
28	S66-37933	S66-37833	15	June 4, 1966	12:16	.....	ATDA, side view, range 140 ft; sky background.
29	S66-37934	S66-37834	15	June 4, 1966	12:16	.....	ATDA, rear quarter view, range 140 ft; sky background.
30	S66-37935	S66-37835	15	June 4, 1966	12:17	.....	ATDA, side view, range 150 ft; sky background.
31	S66-37936	S66-37836	15	June 4, 1966	12:17	.....	ATDA, nose view, range 150 ft; sky background.
32	S66-37937	S66-37837	15	June 4, 1966	12:17	.....	ATDA, view of shroud, range 150 ft; sky background.
33	S66-37938	S66-37838	15	June 4, 1966	12:17	.....	ATDA, nose view, range 170 ft; sky background.
34	S66-37939	S66-37839	15	June 4, 1966	12:18	.....	ATDA, rear and side view, range 150 ft; sky background.
35	S66-37940	S66-37840	15	June 4, 1966	12:18	.....	ATDA, side view, range 140 ft; sky background.
36	S66-37941	S66-37841	15	June 4, 1966	12:18	.....	ATDA, side view, range 100 ft; sky background.
37	S66-37942	S66-37842	15	June 4, 1966	12:18	.....	ATDA, side view, range 100 ft; sky background.
38	S66-37943	S66-37843	15	June 4, 1966	12:19	.....	ATDA, forward quarter view, range 80 ft; sky background.
39	S66-37944	S66-37844	15	June 4, 1966	12:19	.....	ATDA, side rear half view, range 135 ft; sky background.
40	S66-37945	S66-37845	15	June 4, 1966	12:19	.....	ATDA, side rear half view, range 130 ft; sky background.
41	S66-37946	S66-37846	15	June 4, 1966	12:19	.....	ATDA, side rear half view, range 145 ft; sky background.
42	S66-37947	S66-37847	15	June 4, 1966	12:19	.....	ATDA, side rear half view, range 120 ft; sky background.
43	S66-37948	S66-37848	15	June 4, 1966	12:20	.....	ATDA, side view, range 110 ft; sky background.
44	S66-37949	S66-37849	15	June 4, 1966	12:20	.....	ATDA, side view, range 120 ft; sky-horizon-ocean.
45	S66-37950	S66-37850	15	June 4, 1966	12:20	.....	ATDA, side view, range 80 ft; sky-horizon-ocean.
46	S66-37951	S66-37851	15	June 4, 1966	12:20	.....	ATDA, fore quarter view, range 75 ft; sky-horizon-ocean.
47	S66-37952	S66-37852	15	June 4, 1966	12:21	.....	ATDA, side rear half view, range 65 ft; sky-horizon-ocean.

## MAGAZINE A Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
48	S66-37953	S66-37853	15	June 4, 1966	12:21	.....	ATDA, side rear half view, range 55 ft; sky-horizon-ocean.
49	S66-37954	S66-37854	15	June 4, 1966	12:21	.....	ATDA, shroud side view, range 25 ft; sky-horizon-ocean.
50	S66-37955	S66-37855	15	June 4, 1966	12:21	.....	ATDA, shroud side view, range 25 ft; sky-horizon-ocean.
51	S66-37956	S66-37856	15	June 4, 1966	12:21	.....	ATDA, partial shroud and side view, range 25 ft; sky-horizon-ocean.
52	S66-37957	S66-37857	15	June 4, 1966	12:22	.....	ATDA, shroud side view, range 25 ft; sky background.
53	S66-37958	S66-37858	15	June 4, 1966	12:22	.....	ATDA, partial shroud view, range 22 ft; sky background.
54	S66-37959	S66-37859	15	June 4, 1966	12:22	.....	ATDA, shroud view, range 22 ft; sky background.
55	S66-37960	S66-37860	15	June 4, 1966	12:22	.....	ATDA, partial shroud view, range 26 ft; sky background.
56	S66-37961	S66-37861	15	June 4, 1966	12:22	.....	ATDA, partial shroud view, range 28 ft; sky background.
57	S66-37962	S66-37862	15	June 4, 1966	12:22	.....	ATDA, partial longitudinal view, range 25 ft; sky background.
58	S66-37963	S66-37863	15	June 4, 1966	12:23	.....	ATDA, partial longitudinal view, range 27 ft; ocean, clouds west of Africa.
59	S66-37964	S66-37864	15	June 4, 1966	12:23	.....	ATDA, side rear half view, range 30 ft; oceans, clouds west of Africa.
60	S66-37965	S66-37865	15	June 4, 1966	12:23	.....	ATDA, side view, range 33 ft; ocean, clouds west of Africa.
61	S66-37966	S66-37866	15	June 4, 1966	12:23	.....	ATDA, side view, range 38 ft; ocean, clouds west of Africa.
62	S66-37967	S66-37867	15	June 4, 1966	12:23	.....	ATDA, rear quarter view, range 40 ft; ocean, clouds west of Africa.
63	S66-37968	S66-37868	15	June 4, 1966	12:24	.....	ATDA, rear view, range 44 ft; ocean, clouds, Mauritania coastline.
64	S66-37969	S66-37869	15	June 4, 1966	12:24	.....	ATDA, rear view, range 47 ft; ocean, clouds, Mauritania coastline.
65	S66-37970	S66-37870	15	June 4, 1966	12:24	.....	ATDA, rear quarter view, range 47 ft; ocean, clouds, Mauritania coastline.
66	S66-37971	S66-37871	15	June 4, 1966	12:24	.....	ATDA, side view, range 47 ft; ocean, clouds, Mauritania coastline.
67	S66-37972	S66-37872	15	June 4, 1966	12:24	.....	ATDA, side view, range 44 ft; ocean, clouds, Mauritania coastline.

## MAGAZINE F

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-38141	S66-38089	12	June 4, 1966	07:55	157	Iran, West Pakistan: Arabian Sea coast, Makran Mountains.
2	S66-38142	S66-38090	15	June 4, 1966	12:14	.....	ATDA, side view, range 125 ft; sky background.
3	S66-38143	S66-38091	15	June 4, 1966	12:15	.....	ATDA, nose view, range 120 ft; sky background.
4	S66-38144	S66-38092	15	June 4, 1966	12:15	.....	ATDA, side view, range 115 ft; sky background.
5	S66-38145	S66-38093	15	June 4, 1966	12:15	.....	ATDA, end view, range 130 ft; sky background.
6	S66-38146	S66-38094	15	June 4, 1966	12:16	.....	ATDA, side view, range 140 ft; sky background.
7	S66-38147	S66-38095	15	June 4, 1966	12:16	.....	ATDA, side view, range 140 ft; sky-horizon-ocean.
8	S66-38148	S66-38096	15	June 4, 1966	12:16	.....	ATDA, side view, range 75 ft; sky-horizon-ocean.
9	S66-38149	S66-38097	15	June 4, 1966	12:17	.....	ATDA, side view, range 60 ft; sky-horizon-ocean.
10	S66-38150	S66-38098	15	June 4, 1966	12:18	.....	ATDA, side view, range 50 ft; sky-horizon-ocean.
11	S66-38151	S66-38099	15	June 4, 1966	12:18	.....	ATDA, side rear half view, range 37 ft; sky-horizon-ocean.



## MAGAZINE F Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
12	S66-38152	S66-38100	15	June 4, 1966	12:18	.....	ATDA, side rear half view, range 37 ft; sky-horizon-ocean.
13	S66-38153	S66-38101	15	June 4, 1966	12:19	.....	ATDA, side view, range 30 ft; sky background, image blurred.
14	S66-38154	S66-38102	15	June 4, 1966	12:19	.....	ATDA, side view, range 27 ft; sky background.
15	S66-38155	S66-38103	15	June 4, 1966	12:20	.....	ATDA, rear quarter view, range 27 ft; sky background.
16	S66-38156	S66-38104	15	June 4, 1966	12:20	.....	ATDA, rear quarter view, range 27 ft; sky background.
17	S66-38157	S66-38105	15	June 4, 1966	12:20	.....	ATDA, shroud view, range 24 ft; sky-horizon-ocean.
18	S66-38158	S66-38106	15	June 4, 1966	12:20	.....	ATDA, shroud view, range 22 ft; sky-horizon-ocean.
19	S66-38159	S66-38107	15	June 4, 1966	12:21	.....	ATDA, shroud view, range 23 ft; sky-horizon-ocean.
20	S66-38160	S66-38108	15	June 4, 1966	12:21	.....	ATDA, shroud view, range 24 ft; sky-horizon-ocean.
21	S66-38161	S66-38109	15	June 4, 1966	12:21	.....	ATDA, shroud view, range 25 ft; sky-horizon-ocean.
22	S66-38162	S66-38110	15	June 4, 1966	12:21	.....	ATDA, shroud view, range 20 ft; sky-horizon-ocean.
23	S66-38163	S66-38111	15	June 4, 1966	12:21	.....	ATDA, shroud view, range 17 ft; sky-horizon-ocean.
24	S66-38164	S66-38112	15	June 4, 1966	12:22	.....	ATDA, shroud view, range 16 ft; sky-horizon-ocean.
25	S66-38165	S66-38113	15	June 4, 1966	12:22	.....	ATDA, shroud view, range 21 ft; sky-horizon-ocean; image blurred.
26	S66-38166	S66-38114	15	June 4, 1966	12:22	.....	ATDA, side view, range 33 ft; sky-horizon-ocean.
27	S66-38167	S66-38115	15	June 4, 1966	12:22	.....	ATDA, side view, range 36 ft; sky-horizon-ocean.
28	S66-38168	S66-38116	15	June 4, 1966	12:23	.....	ATDA, rear quarter view, range 37 ft; sky-horizon-ocean.
29	S66-38169	S66-38117	15	June 4, 1966	12:23	.....	ATDA, rear quarter view, range 40 ft; Mauritania coast in background.
30	S66-38170	S66-38118	15	June 4, 1966	12:23	.....	ATDA, rear quarter view, range 40 ft.; Mauritania coast in background.
31	S66-38171	S66-38119	15	June 4, 1966	12:24	.....	ATDA, rear quarter view, range 40 ft; Mauritania coast in background.
32	S66-38172	S66-38120	15	June 4, 1966	12:24	.....	ATDA, side view, range 40 ft; Mauritania coast in background.
33	S66-38173	S66-38121	15	June 4, 1966	12:24	.....	ATDA, side view, range 38 ft; Mauritania coast in background.
34	S66-38174	S66-38122	15	June 4, 1966	12:28	159	Mauritania, Mali; Aouker Basin, Irrigi Plain: ATDA, partial view, range 60 ft.
35	S66-38175	S66-38123	15	June 4, 1966	12:28	159	Mauritania, Mali: Aouker Basin, Irrigi Plain, Niger River; ATDA, partial view, range 60 ft.
36	S66-38176	S66-38124	15	June 4, 1966	12:28	159	Mauritania, Mali: Aouker Basin, Niger River, Lake Faguibine; ATDA, nose view, range 60 ft.
37	S66-38177	S66-38125	15	June 4, 1966	12:28	159	Mauritania, Mali: Niger River, Lake Faguibine; ATDA, nose view, range 65 ft.
38	S66-38178	S66-38126	15	June 4, 1966	12:29	159	Mauritania, Mali: Timbuktu; Niger River, Lake Faguibine; ATDA, nose view, range 60 ft.
39	S66-38179	S66-38127	15	June 4, 1966	12:29	159	Mauritania, Mali: Timbuktu; Niger River, Lake Faguibine; ATDA, nose view, range 60 ft.
40	S66-38180	S66-38128	15	June 4, 1966	12:29	159	Mali, Upper Volta: Timbuktu; false delta of Niger River; ATDA, side view, range 60 ft.
41	S66-38181	S66-38129	15	June 4, 1966	12:30	159	Mali, Upper Volta: Niger River; ATDA, side view, range 60 ft.

## MAGAZINE F Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
42	S66-38182	S66-38130	15	June 4, 1966	12:31	159	Mali, Upper Volta: Hombori Mountains; ATDA, side view, range 65 ft.
43	S66-38183	S66-38131	15	June 4, 1966	12:31	159	Mali, Upper Volta, Niger: Hombori Mountains; ATDA, side view, range 70 ft.
44	S66-38184	S66-38132	15	June 4, 1966	12:31	159	Mali, Upper Volta, Niger: Niger River; ATDA, rear view, range 75 ft.
45	S66-38185	S66-38133	15	June 4, 1966	12:32	159	Upper Volta, Niger, Dahomey, Nigeria: Niger River; ATDA, side view, range 75 ft.
46	S66-38186	S66-38134	15	June 4, 1966	12:32	159	Upper Volta, Niger, Dahomey, Nigeria: Niger River; ATDA, side view, range 80 ft.
47	S66-38187	S66-38135	15	June 4, 1966	12:33	159	ATDA, side view, range 42 ft; sky background.
48	S66-38188	S66-38136	15	June 4, 1966	12:33	159	ATDA, side view, range 46 ft; sky background.
49	S66-38189	S66-38137	15	June 4, 1966	17:01	159	Venezuela: Caribbean coast, islands of Aruba, Curaçao, Bonaire, Roques, Tortugas.
50	S66-38190	S66-38138	15	June 4, 1966	17:01	159	Venezuela: Caribbean coast, islands of Aruba, Curaçao, Bonaire, Roques, Tortugas, Margarita.
51	S66-38191	S66-38139	15	June 4, 1966	17:08	158	Brazil: Atlantic coast, mouth of Amazon and Para Rivers.
52	S66-38192	S66-38140	15	June 4, 1966	17:09	158	Brazil: Atlantic coast, Baia de Sao Marcos.

## MAGAZINE C

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-38263	S66-38193	19	June 4, 1966	19:18	155	Clouds over water.
2	S66-38264	S66-38194	19	June 4, 1966	19:18	155	Clouds over water.
3	S66-38265	S66-38195	19	June 4, 1966	19:22	156	Clouds over water.
4	S66-38266	S66-38196	19	June 4, 1966	19:22	156	Clouds over water.
5	S66-38267	S66-38197	19	June 4, 1966	20:01	159	Mexico: Pacific coast, Baja California, Sonora, Sinaloa.
6	S66-38268	S66-38198	19	June 4, 1966	20:01	159	Mexico: Pacific coast, Baja California,, Sonora, Sinaloa.
7	S66-38269	S66-38199	19	June 4, 1966	20:01	159	Mexico: Pacific coast near Mazatlan, entire gulf coast.
8	S66-38270	S66-38200	19	June 4, 1966	20:02	159	Mexico, Central America: Istmo de Tehuantepec, Yucatan.
9	S66-38271	S66-38201	19	June 4, 1966	20:11	158	Ecuador, Columbia, Peru: Andes, cloud-filled upper Amazon Basin.
10	S66-38272	S66-38202	19	June 4, 1966	20:11	158	Ecuador: Guayaquil, beneath clouds; Chimborazo (20 561 ft).
11	S66-38273	S66-38203	20	June 4, 1966	20:11	158	Ecuador, Peru: Gulf of Guayaquil, Andes, Pacific coast south of Punta Negra.
12	S66-38274	S66-38204	20	June 4, 1966	20:50	156	Limb, sunrise.
13	S66-38275	S66-38205	20	June 4, 1966	20:50	156	Limb, sunrise.
14	S66-38276	S66-38206	20	June 4, 1966	21:22	159	Clouds over water.
15	S66-38277	S66-38207	20	June 4, 1966	21:43	159	Galapagos Islands: clouds over water.
16	S66-38278	S66-38208	20	June 4, 1966	21:44	159	Galapagos Islands: clouds over water.
17	S66-38279	S66-38209	20	June 4, 1966	21:45	159	Galapagos Islands: clouds over water.
18	S66-38280	S66-38210	20	June 4, 1966	21:47	159	Clouds over Pacific Ocean, east of Galapagos Islands, cell structure.
19	S66-38281	S66-38211	20	June 4, 1966	21:48	159	Peru: Pacific coast at Peninsula Paracas, Andes, Amazon Basin; twilight.
20	S66-38282	S66-38212	21	June 4, 1966	21:50	159	Peru: Andes; underexposed.
21	S66-38283	S66-38213	21	June 4, 1966	21:50	159	Peru, Bolivia: Lake Titicaca, sunlit Cordillera Real peaks; twilight.
22	S66-38284	S66-38214	21	June 4, 1966	21:51	159	Peru, Bolivia: Lake Titicaca, sunlit Cordillera Real peaks; twilight.



## MAGAZINE C Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
23	S66-38285	S66-38215	21	June 4, 1966	21:51	159	Peru, Bolivia: sunlit Illimani volcano (21 300 ft); underexposed.
24	S66-38286	S66-38216	21	June 4, 1966	21:51	159	Peru, Bolivia: La Paz; Lake Titicaca, sunlit Illimani volcano (21 300 ft); twilight.
25	S66-38287	S66-38217	21	June 4, 1966	21:55	160	At sunset, long shadows from cumulus buildups.
26	S66-38288	S66-38218	21	June 4, 1966	21:55	160	At sunset, long shadows from cumulus buildups.
27	S66-38289	S66-38219	21	June 4, 1966	22:19	160	Nearly full Moon.
28	S66-38290	S66-38220	34	June 5, 1966	20:15	146	Peru, Ecuador: Bay and Desert of Sechura, Andes Mountains, Amazon Basin.
29	<i>S66-38291</i>	<i>S66-38221</i>	34	<i>June 5, 1966</i>	<i>20:16</i>	<i>146</i>	<i>Peru, Ecuador: Bay and Desert of Sechura, Andes Mountains.</i>
30	S66-38292	S66-38222	34	June 5, 1966	20:16	146	Peru, Ecuador: Bay and Desert of Sechura, Andes Mountains.
31	S66-38293	S66-38223	34	June 5, 1966	20:16	146	Peru: Bay and Desert of Sechura, Andes Mountains.
32	S66-38294	S66-38224	35	June 5, 1966	20:16	146	Peru: North coastal area, Chiclayo to Trujillo; Andes Mountains.
33	S66-38295	S66-38225	35	June 5, 1966	20:17	146	Peru: North coastal area, Chiclayo to Trujillo; Andes Mountains.
34	S66-38296	S66-38226	35	June 5, 1966	20:17	146	Peru: North coastal area, Chiclayo to Trujillo; Andes Mountains.
35	S66-38297	S66-38227	35	June 5, 1966	20:17	146	Peru: North coastal area, Trujillo to Casma; Andes Mountains.
36	<i>S66-38298</i>	<i>S66-38228</i>	35	<i>June 5, 1966</i>	<i>20:17</i>	<i>146</i>	<i>Peru: Central coastal area, Chimbote to Paramonga; Andes Mountains, Cordillera Blanca, Huascaran (22 205 ft.)—path of disastrous avalanche of 1962 clearly visible.</i>
37	S66-38299	S66-38229	35	June 5, 1966	20:18	146	Peru: Cerro de Pasco; Andes Mountains, branches of Ucayali River.
38	<i>S66-38300</i>	<i>S66-38230</i>	35	<i>June 5, 1966</i>	<i>20:18</i>	<i>147</i>	<i>Peru: Coastline, Lima to Peninsula Paracas; Andes Mountains, Lago de Junin.</i>
39	S66-38301	S66-38231	35	June 5, 1966	20:18	147	Peru: Andes Mountains, Ucayali River, Upper Amazon Basin.
40	S66-38302	S66-38232	35	June 5, 1966	20:18	147	Peru: Eastern edge of Andes Mountains, Ucayali River, Upper Amazon Basin.
41	<i>S66-38303</i>	<i>S66-38233</i>	35	<i>June 5, 1966</i>	<i>20:19</i>	<i>147</i>	<i>Peru: Cusco-Ayacucho area; Andes Mountains, Rio Apurimac, Rio Urubamba.</i>
42	S66-38304	S66-38234	35	June 5, 1966	20:19	147	Peru: Cusco-Ayacucho area; Andes Mountains, Rio Apurimac, Rio Urubamba.
43	S66-38305	S66-38235	35	June 5, 1966	20:19	147	Peru: Cusco-Ayacucho area; Andes Mountains, Rio Apurimac, Rio Urubamba, Nevado Ampato.
44	<i>S66-38306</i>	<i>S66-38236</i>	35	<i>June 5, 1966</i>	<i>20:19</i>	<i>147</i>	<i>Peru: Cusco area; Andes Mountains, Apurimac-Urubamba-Madre de Dios Rivers.</i>
45	S66-38307	S66-38237	35	June 5, 1966	20:19	147	Peru, Chile: Arequipa, coastline from Chala south; Andes Mountains, Volcan Misti.
46	S66-38308	S66-38238	35	June 5, 1966	20:19	147	Peru, Bolivia, Chile: Arequipa, coastline from Mollendo south; Andes Mountains, Volcan Misti.
47	S66-38309	S66-38239	35	June 5, 1966	20:20	148	Peru, Bolivia, Chile: Arequipa, Lake Titicaca, Andes Mountains, salt basins, coastline.
48	S66-38310	S66-38240	35	June 5, 1966	20:20	148	Peru, Bolivia, Chile: Arequipa, Lake Titicaca, Andes Mountains, salt basins, coastline.
49	S66-38311	S66-38241	35	June 5, 1966	20:20	148	Peru, Bolivia, Chile: La Paz; Lake Titicaca, Andes Mountains, salt basins, coastline.
50	<i>S66-38312</i>	<i>S66-38242</i>	35	<i>June 5, 1966</i>	<i>20:20</i>	<i>148</i>	<i>Peru, Bolivia, Chile: La Paz; Lake Titicaca, Andes Mountains, salt basins, coastline.</i>

## MAGAZINE C Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
51	S66-38313	S66-38243	35	June 5, 1966	20:20	148	Peru, Bolivia, Chile: La Paz; Lake Titicaca, Lake Poopo, Salar de Uyuni, Andes Mountains.
52	S66-38314	S66-38244	35	June 5, 1966	20:21	148	Peru, Bolivia, Chile: La Paz; Lake Titicaca, Lake Poopo, Salar de Uyuni, Andes Mountains.
53	S66-38315	S66-38245	35	June 5, 1966	20:21	148	Bolivia, Chile, Argentina: Sucre; Lake Poopo, Salar de Uyuni, Andes Mountains, Gran Chaco.
54	S66-38316	S66-38246	35	June 5, 1966	20:21	148	Bolivia, Argentina, Paraguay: Sucre; Cordillera Central, Cordillera Oriental, Gran Chaco, Rio Grande.
55	S66-38317	S66-38247	35	June 5, 1966	20:21	148	Bolivia, Argentina, Paraguay: Cordillera Oriental, Gran Chaco, Rio Grande, Rio Parapeti.
56	S66-38318	S66-38248	35	June 5, 1966	20:22	149	Bolivia, Paraguay: Cordillera Oriental, Gran Chaco, Rio Grande, Rio Parapeti, Serrania de San Jose.
57	S66-38319	S66-38249	35	June 5, 1966	20:22	149	Bolivia, Paraguay: Gran Chaco, Rio Parapeti, Serra de San Jose, Serrania de Santiago.
58	S66-38320	S66-38250	35	June 5, 1966	20:22	149	Bolivia, Paraguay: Chaco Boreal, Serrania de Santiago, Serrania de Sunsas.
59	S66-38321	S66-38251	35	June 5, 1966	20:22	149	Bolivia, Paraguay: Chaco Boreal, Serrania de Santiago.
60	S66-38322	S66-38252	35	June 5, 1966	.....	.....	Blank.
61	S66-38323	S66-38253	35	June 5, 1966	.....	.....	Light spot, probably Moon time exposure.
62	S66-38324	S66-38254	35	June 5, 1966	20:28	.....	Earth terminator at sunset, South America.
63	S66-38325	S66-38255	35	June 5, 1966	20:28	.....	Earth terminator at sunset, South America.
64	S66-38326	S66-38256	35	June 5, 1966	20:28	.....	Earth terminator at sunset, South America.
65	S66-38327	S66-38257	.....	.....	.....	.....	Cirriiform clouds.
66	S66-38328	S66-38258	.....	.....	.....	.....	Cirriiform clouds.
67	S66-38329	S66-38259	.....	.....	.....	.....	Cirriiform clouds.
68	S66-38330	S66-38260	.....	.....	.....	.....	Cirriiform clouds.
69	S66-38331	S66-38261	.....	.....	.....	.....	Blank.
70	S66-38332	S66-38262	.....	.....	.....	.....	Blank.

## MAGAZINE D

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-38031	S66-37973	.....	.....	.....	.....	Blank.
2	S66-38032	S66-37974	31	June 5, 1966	15:10	156	Comdr. Cernan's EVA camera; standing in hatch over Pacific Ocean.
3	S66-38033	S66-37975	31	June 5, 1966	15:11	156	Comdr. Cernan's EVA camera; standing in hatch over Pacific Ocean.
4	S66-38034	S66-37976	31	June 5, 1966	15:12	157	Comdr. Cernan's EVA camera; clouds over Pacific Ocean.
5	S66-38035	S66-37977	31	June 5, 1966	15:14	157	Comdr. Cernan's EVA camera; clouds over Pacific Ocean.
6	S66-38036	S66-37978	31	June 5, 1966	15:14	157	Comdr. Cernan's EVA camera; clouds over Pacific Ocean.
7	S66-38037	S66-37979	31	June 5, 1966	15:15	157	Comdr. Cernan's EVA camera; clouds over Pacific Ocean.
8	S66-38038	S66-37980	31	June 5, 1966	15:16	158	Comdr. Cernan's EVA camera; California/Arizona/Mexico: Baja California, Sonora.
9	S66-38039	S66-37981	31	June 5, 1966	15:16	158	Comdr. Cernan's EVA camera; California/Arizona/Mexico: Baja California, Sonora.
10	S66-38040	S66-37982	31	June 5, 1966	15:16	158	Comdr. Cernan's EVA camera; California/Arizona/Mexico: Baja California, Sonora.
11	S66-38041	S66-37983	31	June 5, 1966	15:16	158	Comdr. Cernan's EVA camera; California/Arizona/Mexico: Baja California, Sonora.



## MAGAZINE D Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
12	S66-38042	S66-37984	31	June 5, 1966	15:19	158	Comdr. Cernan's EVA camera; open hatch, gear deployment.
13	S66-38043	S66-37985	31	June 5, 1966	15:19	158	Comdr. Cernan's EVA camera; open hatch, gear deployment; Arizona/New Mexico background.
14	S66-38044	S66-37986	31	June 5, 1966	15:20	158	Comdr. Cernan's EVA camera; open hatch, gear deployment; Arizona/New Mexico background.
15	S66-38045	S66-37987	31	June 5, 1966	15:21	158	Comdr. Cernan's EVA camera; command pilot side spacecraft; Arizona/New Mexico/Texas/Mexico background.
16	S66-38046	S66-37988	31	June 5, 1966	15:21	158	Comdr. Cernan's EVA camera; open hatch, gear deployment; Mexico background.
17	S66-38047	S66-37989	31	June 5, 1966	15:23	158	Comdr. Cernan's EVA camera; side of spacecraft.
18	S66-38048	S66-37990	31	June 5, 1966	15:24	159	Comdr. Cernan's EVA camera; nose view of spacecraft.
19	S66-38049	S66-37991	31	June 5, 1966	15:24	159	Comdr. Cernan's EVA camera; side view, open hatch, umbilical cord.
20	S66-38050	S66-37992	31	June 5, 1966	15:25	159	Comdr. Cernan's EVA camera; side view of Gemini IX.
21	S66-38051	S66-37993	32	June 5, 1966	15:28	159	Comdr. Cernan's EVA camera; view of Gemini IX.
22	S66-38052	S66-37994	32	June 5, 1966	15:29	159	Comdr. Cernan's EVA camera; umbilical cord, sea background.
23	S66-38053	S66-37995	32	June 5, 1966	15:29	159	Comdr. Cernan's EVA camera; nose of Gemini IX.
24	S66-38054	S66-37996	32	June 5, 1966	15:30	159	Comdr. Cernan's EVA camera; sea, umbilical cord, hatch.
25	S66-38055	S66-37997	32	June 5, 1966	15:30	159	Comdr. Cernan's EVA camera; side of Gemini IX adapter section.
26	S66-38056	S66-37998	32	June 5, 1966	15:31	159	Comdr. Cernan's EVA camera; out of focus.
27	S66-38057	S66-37999	32	June 5, 1966	.....	.....	Blank.
28	S66-38058	S66-38000	32	June 5, 1966	.....	.....	Blank.
29	S66-38059	S66-38001	32	June 5, 1966	.....	.....	Blank.
30	S66-38060	S66-38002	32	June 5, 1966	.....	.....	Blank.
31	S66-38061	S66-38003	32	June 5, 1966	.....	.....	Comdr. Cernan's EVA camera; out of focus.
32	S66-38062	S66-38004	32	June 5, 1966	16:40	156	Comdr. Cernan's EVA camera; adapter section.
33	S66-38063	S66-38005	32	June 5, 1966	16:49	157	Comdr. Cernan's EVA camera; nose of Gemini IX, umbilical cord.
34	S66-38064	S66-38006	32	June 5, 1966	16:49	158	Comdr. Cernan's EVA camera; nose of Gemini IX, umbilical cord.
35	S66-38065	S66-38007	32	June 5, 1966	16:50	158	Comdr. Cernan's EVA camera; nose of Gemini IX, umbilical cord.
36	S66-38066	S66-38008	32	June 5, 1966	16:50	158	Comdr. Cernan's EVA camera; nose of Gemini IX, umbilical cord, California.
37	S66-38067	S66-38009	32	June 5, 1966	16:51	158	Comdr. Cernan's EVA camera; umbilical cord; California, Los Angeles area.
38	S66-38068	S66-38070	32	June 5, 1966	16:53	158	Comdr. Cernan's EVA camera; umbilical cord; California/Arizona/Sonora.
39	S66-38069	S66-38011	32	June 5, 1966	16:53	158	Comdr. Cernan's EVA camera; umbilical cord; Arizona/New Mexico/Sonora.
40	S66-38070	S66-38012	32	June 5, 1966	16:54	158	Comdr. Cernan's EVA camera; nose of Gemini IX, Baja California/Sonora.
41	S66-38071	S66-38013	33	June 5, 1966	17:12	.....	Comdr. Cernan's EVA camera; underexposed.
42	S66-38072	S66-38014	33	June 5, 1966	17:12	.....	Comdr. Cernan's EVA camera; underexposed.
43	S66-38073	S66-38015	33	June 5, 1966	17:13	.....	Comdr. Cernan's EVA camera; underexposed.
44	S66-38074	S66-38016	33	June 5, 1966	17:13	.....	Comdr. Cernan's EVA camera; underexposed.
45	S66-38075	S66-38017	33	June 5, 1966	17:13	.....	Comdr. Cernan's EVA camera; underexposed.

## MAGAZINE D Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
46	S66-38076	S66-38018	34	June 5, 1966	18:40	.....	Inside Gemini IX, Lt. Col. Stafford.
47	S66-38077	S66-38019	34	June 5, 1966	18:40	.....	Inside Gemini IX, Lt. Col. Stafford.
48	S66-38078	S66-38020	34	June 5, 1966	18:41	.....	Inside Gemini IX, Lt. Col. Stafford; image blurred.
49	S66-38079	S66-38021	34	June 5, 1966	18:41	.....	Inside Gemini IX, Lt. Col. Stafford; image blurred.
50	S66-38080	S66-38022	34	June 5, 1966	18:41	.....	Inside Gemini IX, Lt. Col. Stafford.
51	S66-38081	S66-38023	34	June 5, 1966	18:42	.....	Inside Gemini IX, Lt. Comdr. Cernan; image blurred.
52	S66-38082	S66-38024	34	June 5, 1966	18:42	.....	Inside Gemini IX, Lt. Comdr. Cernan; image blurred.
53	S66-38083	S66-38025	34	June 5, 1966	18:55	.....	Inside Gemini IX, Lt. Comdr. Cernan; image blurred.
54	S66-38084	S66-38026	34	June 5, 1966	18:55	.....	Limb; sunset.
55	S66-38085	S66-38027	34	June 5, 1966	18:56	.....	Limb; sunset.
56	S66-38086	S66-38028	34	June 5, 1966	18:56	.....	Clouds; out of focus.
57	S66-38087	S66-38029	34	June 5, 1966	18:57	.....	Clouds; out of focus
58	S66-38088	S66-38030	34	June 5, 1966	18:58	.....	Red light streak.

## MAGAZINE G

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-38510	S66-38459	31	June 5, 1966	15:23	.....	EVA, Lt. Comdr. Cernan outside; solar reflection degrades photo.
2	S66-38511	S66-38460	31	June 5, 1966	15:24	.....	EVA, Lt. Comdr. Cernan outside; solar reflection degrades photo.
3	S66-38512	S66-38461	31	June 5, 1966	15:24	.....	EVA Lt. Comdr. Cernan outside; solar reflection degrades photo.
4	S66-38513	S66-38462	31	June 5, 1966	15:24	.....	EVA, umbilical cord; out of focus, light reflection.
5	S66-38514	S66-38463	31	June 5, 1966	15:24	.....	EVA, partial view of Lt. Comdr. Cernan outside.
6	S66-38515	S66-38464	31	June 5, 1966	15:25	.....	EVA, partial view of Lt. Comdr. Cernan outside.
7	S66-38516	S66-38465	31	June 5, 1966	15:25	.....	EVA, partial view of Lt. Comdr. Cernan outside, image blurred.
8	S66-38517	S66-38466	31	June 5, 1966	15:25	.....	EVA, closeup of Lt. Comdr. Cernan outside, out of focus.
9	S66-38518	S66-38467	31	June 5, 1966	15:26	.....	EVA, umbilical cord.
10	S66-38519	S66-38468	34	June 5, 1966	19:48	.....	Limb, red-yellow-blue; focus not sharp.
11	S66-38520	S66-38469	34	June 5, 1966	19:48	.....	Limb, red-yellow-blue; focus not sharp.
12	S66-38521	S66-38470	34	June 5, 1966	19:49	.....	Limb, red-yellow-blue; focus not sharp.
13	S66-38522	S66-38471	34	June 5, 1966	20:16	146	Peru, Ecuador: Bay and Desert of Sechura, Andes Mountains, Amazon Basin.
14	S66-38523	S66-38472	34	June 5, 1966	20:16	146	Peru: Desert of Sechura, Andes Mountains, Amazon Basin.
15	S66-38524	S66-38473	35	June 5, 1966	20:17	146	Peru: Andes Mountains, Rio Maranon, east of Trujillo.
16	<i>S66-38525</i>	<i>S66-38474</i>	35	<i>June 5, 1966</i>	20:17	146	<i>Peru: Andes Mountains, Rio Maranon, Rio Huallaga, east of Trujillo.</i>
17	S66-38526	S66-38475	35	June 5, 1966	20:17	146	Peru: Andes Mountains, Rio Maranon, Rio Huallaga, east of Trujillo.
18	S66-38527	S66-38476	35	June 5, 1966	20:18	147	Peru: Andes Mountains, Amazon Basin, Rio Ucayali.
19	S66-38528	S66-38477	35	June 5, 1966	20:18	147	Peru: Andes Mountains, Amazon Basin, Rio Ucayali.
20	S66-38529	S66-38478	35	June 5, 1966	20:19	147	Peru: Andes Mountains, Amazon Basin, Rio Madre de Dios, Rio Urubamba.
21	S66-38530	S66-38479	35	June 5, 1966	20:19	147	Peru, Bolivia: Andes Mountains, Lake Titicaca, Rio Madre de Dios, Amazon Basin.



## MAGAZINE G Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
22	S66-38531	S66-38480	35	June 5, 1966	20:20	147	Peru, Bolivia: Andes Mountains, Lake Titicaca, Rio Madre de Dios, Amazon Basin.
23	S66-38532	S66-38481	35	June 5, 1966	20:20	148	Peru, Bolivia: Andes Mountains, Rio Madre de Dios, Amazon Basin.
24	S66-38533	S66-38482	35	June 5, 1966	20:20	148	Peru, Bolivia: Andes Mountains, Lake Titicaca, Lake Poopo, Salar de Uyuni, Rio Beni, Amazon Basin.
25	S66-38534	S66-38483	35	June 5, 1966	20:20	148	Bolivia: Andes Mountains, Rio Beni, Amazon Basin.
26	S66-38535	S66-38484	35	June 5, 1966	20:21	148	Bolivia: Eastern slope of Andes, Amazon Basin, Rio Mamore, Rio Grande.
27	S66-38536	S66-38485	35	June 5, 1966	20:21	148	Bolivia: Amazon Basin, Rio Mamore, Rio Grande.
28	S66-38537	S66-38486	35	June 5, 1966	20:21	148	Bolivia: San Javier; Amazon Basin, Rio Grande.
29	S66-38538	S66-38487	35	June 5, 1966	20:22	149	Bolivia: San Javier; Amazon Basin.
30	S66-38539	S66-38488	35	June 5, 1966	20:22	149	Bolivia, Brazil: Serra Aguapei, Mato Grosso, headwaters of Rio Paraguay.
31	S66-38540	S66-38489	35	June 5, 1966	20:23	149	Bolivia, Brazil: Serrana de Sunsas, Mato Grosso, headwaters of Rio Paraguay at Lago Mandiore.
32	S66-38541	S66-38490	35	June 5, 1966	20:23	149	Bolivia, Brazil: Mato Grosso, Serra Azul, headwaters of Rio Paraguay.
33	S66-38542	S66-38491	43	June 6, 1966	09:19	148	Canary Islands near horizon.
34	S66-38543	S66-38492	43	June 6, 1966	09:20	148	Canary Islands; image degraded because of window obscuration.
35	S66-38544	S66-38493	43	June 6, 1966	09:20	148	Canary Islands; image degraded because of window obscuration.
36	S66-38545	S66-38494	43	June 6, 1966	09:22	147	Spanish Sahara, Morocco: Hamada du Dra, Tindouf Basin.
37	S66-38546	S66-38495	43	June 6, 1966	09:23	147	Spanish Sahara, Morocco, Mauritania, Algeria: Tindouf Basin, Yetti Plains.
38	S66-38547	S66-38496	43	June 6, 1966	09:23	147	Spanish Sahara, Morocco, Mauritania, Algeria: Hamada du Dra, Tindouf Basin.
39	S66-38548	S66-38497	43	June 6, 1966	09:23	147	Algeria: Erg Iguidi, Erg Chech; image degraded because of window obscuration.
40	S66-38549	S66-38498	43	June 6, 1966	09:24	147	Algeria: Erg Iguidi, Erg Chech; image degraded because of window obscuration.
41	S66-38550	S66-38499	43	June 6, 1966	09:25	146	Algeria: Grand Erg Oriental, Ajjer Plateau; image degraded because of window obscuration.
42	S66-38551	S66-38500	43	June 6, 1966	09:26	146	Algeria, Libya: Ajjer Plateau, Marzuq Sand Plain.
43	S66-38552	S66-38501	43	June 6, 1966	09:27	146	Algeria, Libya: Ajjer Plateau, Marzuq Sand Plain.
44	S66-38553	S66-38502	43	June 6, 1966	09:28	145	Libya, Chad, Niger: Tibesti Mountains and Gravel Desert.
45	S66-38554	S66-38503	43	June 6, 1966	09:29	145	Libya, Chad: Northern Tibesti Mountains; cloudy.
46	S66-38555	S66-38504	43	June 6, 1966	09:29	145	Libya: Northern Tibesti Mountains, Kufra Oasis, Sarra Gravel Desert.
47	S66-38556	S66-38505	43	June 6, 1966	09:31	144	Sudan: Great Bend of Nile River, Ethiopia, Red Sea, Saudi Arabia in background.
48	S66-38557	S66-38506	43	June 6, 1966	09:32	144	Sudan: Great Bend of Nile River, Ethiopia, Red Sea, Saudi Arabia in background.
49	S66-38558	S66-38507	43	June 6, 1966	09:33	144	Sudan, Ethiopia, Saudi Arabia: Red Sea.
50	S66-38559	S66-38508	43	June 6, 1966	09:34	144	Ethiopia, Yemen, Saudi Arabia: Danakil Depression, Red Sea, Gulf of Aden.
51	S66-38560	S66-38509	43	June 6, 1966	09:35	144	Ethiopia, French Somaliland, Somali Republic: Gulf of Aden; partial frame.

## MAGAZINE B

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1							Blank.
2	S66-38396	S66-38333					Blank.
3	S66-38397	S66-38334					Blank.
4	S66-38398	S66-38335	43	June 6, 1966			Limb, blue.
5	S66-38399	S66-38336	43	June 6, 1966			Limb, blue.
6	S66-38400	S66-38337	43	June 6, 1966	09:18	148	Canary Islands.
7	S66-38401	S66-38338	43	June 6, 1966	09:19	148	Canary Islands.
8	S66-38402	S66-38339	43	June 6, 1966	09:19	148	Canary Islands.
9	S66-38403	S66-38340	43	June 6, 1966	09:19	148	Canary Islands, coast of Africa.
10	S66-38404	S66-38341	43	June 6, 1966	09:20	148	Canary Islands, coast of Africa.
11	S66-38405	S66-38342	43	June 6, 1966	09:20	148	Canary Islands, coast of Morocco and Spanish Sahara.
12	S66-38406	S66-38343	43	June 6, 1966	09:20	148	Canary Islands, coast of Morocco and Spanish Sahara.
13	S66-38407	S66-38344	43	June 6, 1966	09:21	148	Canary Islands, coast of Morocco and Spanish Sahara.
14	S66-38408	S66-38345	43	June 6, 1966	09:21	147	Fuerteventura Islands, coast of Morocco and Spanish Sahara.
15	S66-38409	S66-38346	43	June 6, 1966	09:22	147	Morocco, Spanish Sahara, Mauritania, Algeria: Hamada du Dra, Tindouf Basin, Yetti Plain.
16	S66-38410	S66-38347	43	June 6, 1966			Blank.
17	S66-38411	S66-38348	43		09:22	147	Spanish Sahara, Mauritania: South edge of Tindouf Basin, Yetti Plain.
18	S66-38412	S66-38349	43	June 6, 1966	09:23	147	Algeria: Erg Iguidi, Erg Chech.
19	S66-38413	S66-38350	43	June 6, 1966	09:23	147	Algeria: Erg Iguidi, Erg Chech.
20	S66-38414	S66-38351	43	June 6, 1966	09:24	147	Algeria: Erg Chech, Tademait Plateau.
21	S66-38415	S66-38352	43	June 6, 1966	09:24	146	Algeria: Erg Chech, Tanezrouft area.
22	S66-38416	S66-38353	43	June 6, 1966	09:25	146	Algeria: Tademait Plateau, Ahellakane Escarpment.
23	S66-38417	S66-38354	43	June 6, 1966	09:26	146	Algeria: Iraquene and Ahellakane Escarpments.
24	S66-38418	S66-38355	43	June 6, 1966	09:27	146	Algeria, Libya: Ajjer Plateau, Ahaggar Mountains.
25	S66-38419	S66-38356	43	June 6, 1966	09:28	145	Libya, Niger, Chad: Tibesti Mountains and Gravel Desert.
26	S66-38420	S66-38357	43	June 6, 1966	09:29	145	Niger, Chad: Tibesti Mountains, volcanoes, lava.
27	S66-38421	S66-38358	43	June 6, 1966	09:31	145	Libya, Chad, Sudan: featureless desert.
28	S66-38422	S66-38359	43	June 6, 1966	09:33	144	Sudan: Great Bend of Nile River.
29	S66-38423	S66-38360	43	June 6, 1966	09:35	144	Ethiopia, French Somaliland, Yemen, South Arabia: Red Sea, Gulf of Aden, Danakil Depression.
30	S66-38424	S66-38361	43	June 6, 1966	09:35	144	Ethiopia, Somali Republic: Berbera; Gulf of Aden.
31	S66-38425	S66-38362	43	June 6, 1966	09:36	144	Ethiopia, Somali Republic; Heavy cloud cover.
32	S66-38426	S66-38363	43	June 6, 1966	09:37	144	Somali Republic: Ras Azir, Ras Hafun, Indian Ocean, Socotra Island.
33	S66-38427	S66-38364	43	June 6, 1966	09:38	144	Somali Republic: Ras Azir, Ras Hafun, Indian Ocean, Socotra Island.
34	S66-38428	S66-38365	43	June 6, 1966	09:50	148	Clouds over water.
35	S66-38429	S66-38366	43	June 6, 1966	09:51	148	Clouds over water.
36	S66-38430	S66-38367	44	June 6, 1966	10:46	149	Clouds, underexposed.
37	S66-38431	S66-38368	44	June 6, 1966	10:46	149	Clouds, underexposed.
38	S66-38432	S66-38369	44	June 6, 1966	10:47	149	Clouds, near terminator.
39	S66-38433	S66-38370	44	June 6, 1966	10:47	149	Clouds, near terminator.
40	S66-38434	S66-38371	44	June 6, 1966	10:47	149	Clouds, near terminator.
41	S66-38435	S66-38372	44	June 6, 1966	10:48	148	Clouds, near terminator.
42	S66-38436	S66-38373	44	June 6, 1966	10:48	148	Clouds, near terminator.
43	S66-38437	S66-38374	44	June 6, 1966	10:48	148	Clouds.
44	S66-38438	S66-38375	44	June 6, 1966	10:49	148	Clouds.
45	S66-38439	S66-38376	44	June 6, 1966	10:49	148	Clouds.
46	S66-38440	S66-38377	44	June 6, 1966	10:55	146	Clouds.



## MAGAZINE B Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
47	S66-38441	S66-38378	44	June 6, 1966	10:56	145	Canary Islands.
48	S66-38442	S66-38379	44	June 6, 1966	10:57	145	Canary Islands.
49	S66-38443	S66-38380	44	June 6, 1966	11:04	144	Chad, Niger, Nigeria: Lake Chad, inundated dunes.
50	S66-38444	S66-38381	44	June 6, 1966	11:05	144	Chad, Niger, Nigeria, Cameroun: Lake Chad, inundated dunes.
51	S66-38445	S66-38382	44	June 6, 1966	11:08	144	Central African Republic: cloudy.
52	S66-38446	S66-38383	44	June 6, 1966	11:09	144	Central African Republic, Republic of the Congo: hazy.
53	S66-38447	S66-38384	44	June 6, 1966	11:10	144	Republic of the Congo, Uganda: Lake Albert, Lake Edward; hazy.
54	S66-38448	S66-38385	44	June 6, 1966	11:11	144	Republic of the Congo, Uganda: Lake Albert, Lake Edward, Lake Kyoga; hazy.
55	S66-38449	S66-38386	44	June 6, 1966	11:11	144	Kenya, Tanzania, Uganda: Lake Victoria, Kavirondo Gulf; hazy.
56	S66-38450	S66-38387	44	June 6, 1966	11:11	144	Kenya, Tanzania, Uganda: Lake Victoria, Kavirondo Gulf; hazy.
57	S66-38451	S66-38388	44	June 6, 1966	11:13	144	Kenya, Tanzania: Indian Ocean coast; hazy.
58	S66-38452	S66-38389	44	June 6, 1966	11:13	145	Kenya, Somali Republic: Indian Ocean coast; hazy.
59	S66-38453	S66-38390	44	June 6, 1966	11:14	145	Kenya, Somali Republic; Tanzania: Indian Ocean coast; hazy.
60	S66-38454	S66-38391	44	June 6, 1966	11:14	145	Somali Republic, Kenya: Indian Ocean coast; hazy.
61	S66-38455	S66-38392	44	June 6, 1966	11:15	145	Somali Republic, Kenya: Indian Ocean coast; hazy.
62	S66-38456	S66-38393	44	June 6, 1966	11:15	145	Partial frame, Somali coast.
63	S66-38457	S66-38394	.....	.....	.....	.....	Blank.
64	S66-38458	S66-38395	.....	.....	.....	.....	Blank.

GEMINI X  
MAGAZINE 5

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	.....	.....	.....	.....	.....	.....	Blank.
2	S66-46111	S66-46171	4	July 19, 1966	04:00	161	Agna No. 5005, side view, range 98 ft; ocean, clouds.
3	S66-46112	S66-46172	4	July 19, 1966	04:00	161	Agna No. 5005, side view, range 98 ft; ocean, clouds.
4	S66-46113	S66-46173	4	July 19, 1966	04:01	161	Agna No. 5005, side view, range 85 ft; ocean, clouds.
5	S66-46114	S66-46174	4	July 19, 1966	04:01	161	Agna No. 5005, side view, range 85 ft; ocean, clouds.
6	S66-46115	S66-46175	4	July 19, 1966	04:02	161	Agna No. 5005, side view, range 65 ft; ocean, clouds.
7	S66-46116	S66-46176	4	July 19, 1966	04:02	161	Agna No. 5005, side view, range 65 ft; ocean, clouds.
8	S66-46117	S66-46177	4	July 19, 1966	04:03	161	Agna No. 5005, side view, range 62 ft; ocean, clouds.
9	S66-46118	S66-46178	4	July 19, 1966	04:03	161	Agna No. 5005, side view, range 62 ft; ocean, clouds.
10	S66-46119	S66-46179	4	July 19, 1966	04:03	161	Agna No. 5005, side view, range 52 ft; ocean, clouds.
11	S66-46120	S66-46180	4	July 19, 1966	04:03	161	Agna No. 5005, side view, range 52 ft; ocean, clouds.
12	S66-46121	S66-46181	4	July 19, 1966	04:03	161	Agna No. 5005, side view, range 46 ft; ocean, clouds.

## MAGAZINE 5 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
13	S66-46122	S66-46182	4	July 19, 1966	04:04	161	Agna No. 5005, side view, range 46 ft; ocean, clouds.
14	S66-46123	S66-46183	4	July 19, 1966	04:04	161	Agna No. 5005, side view, range 51 ft; ocean, clouds.
15	S66-46124	S66-46184	4	July 19, 1966	04:04	162	Agna No. 5005, side view, range 49 ft; ocean, clouds.
16	S66-46125	S66-46185	4	July 19, 1966	04:04	162	Agna No. 5005, side view, range 51 ft; ocean, clouds.
17	S66-46126	S66-46186	4	July 19, 1966	04:04	162	Agna No. 5005, side view, range 28 ft; ocean, clouds.
18	S66-46127	S66-46187	4	July 19, 1966	04:05	162	Agna No. 5005, side view, range 27 ft; ocean, clouds.
19	S66-46128	S66-46188	4	July 19, 1966	04:05	162	Agna No. 5005, docking adapter turning toward spacecraft, range 24 ft; ocean, clouds.
20	S66-46129	S66-46189	4	July 19, 1966	04:05	162	Agna No. 5005, docking adapter turning toward spacecraft, range 23 ft; ocean, clouds.
21	S66-46130	S66-46190	4	July 19, 1966	04:05	162	Agna No. 5005, docking adapter turning toward spacecraft, range 23 ft; ocean, clouds.
22	S66-46131	S66-46191	4	July 19, 1966	04:06	162	Agna No. 5005, docking adapter turning toward spacecraft, range 26 ft; ocean, clouds.
23	S66-46132	S66-46192	4	July 19, 1966	04:06	162	Agna No. 5005, docking adapter turning toward spacecraft, range 25 ft; ocean, clouds.
24	S66-46133	S66-46193	4	July 19, 1966	04:06	162	Agna No. 5005, docking adapter turning toward spacecraft, range 25 ft; ocean, clouds.
25	S66-46134	S66-46194	4	July 19, 1966	04:08	161	Blank.
26	S66-46135	S66-46195	4	July 19, 1966	04:09	161	Agna No. 5005, docked.
27	S66-46136	S66-46196	4	July 19, 1966	04:25	160	Agna No. 5005, docked.
28	S66-46137	S66-46197	4	July 19, 1966	04:25	160	Agna No. 5005, docked, Agna display panel clearly seen.
29	S66-46138	S66-46198	4	July 19, 1966	04:25	160	Agna No. 5005, docked, Agna display panel clearly seen.
30	S66-46139	S66-46199	4	July 19, 1966	04:26	159	Agna No. 5005, docked, Agna display panel clearly seen.
31	S66-46140	S66-46200	4	July 19, 1966	04:26	159	Agna No. 5005, docked, Agna display panel clearly seen.
32	S66-46141	S66-46201	4	July 19, 1966	04:26	159	Agna No. 5005, docked, Agna display panel clearly seen.
33	S66-46142	S66-46202	4	July 19, 1966	04:26	159	Agna No. 5005, docked, Agna display panel clearly seen.
34	S66-46143	S66-46203	4	July 19, 1966	04:26	159	Agna No. 5005, docked, Agna display panel clearly seen.
35	S66-46144	S66-46204	4	July 19, 1966	04:27	159	Agna No. 5005, docked, Agna display panel clearly seen.
36	S66-46145	S66-46205	4	July 19, 1966	04:27	159	Agna No. 5005, docked, Agna display panel clearly seen.
37	S66-46146	S66-46206	4	July 19, 1966	04:27	159	Agna No. 5005, docked.
38	S66-46147	S66-46207	4	July 19, 1966	04:28	159	Agna No. 5005, docked.
39	S66-46148	S66-46208	4	July 19, 1966	04:28	159	Agna No. 5005, docked.
40	S66-46149	S66-46209	4	July 19, 1966	04:28	159	Agna No. 5005, docked.
41	S66-46150	S66-46210	4	July 19, 1966	04:29	159	Agna No. 5005, docked.
42	S66-46151	S66-46211	6	July 19, 1966	07:00	371	Small portion docked Agna No. 5005; Africa, Arabia, Red Sea, Gulf of Aden.
43	S66-46152	S66-46212	6	July 19, 1966	07:01	369	Small portion docked Agna No. 5005; Africa, Arabia, Red Sea, Gulf of Aden.
44	S66-46153	S66-46213	6	July 19, 1966	07:01	367	Small portion docked Agna No. 5005; Africa, Arabia, Red Sea, Gulf of Aden.



## MAGAZINE 5 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt. N. Mi.	Area description
	Color No.	B&W No.					
45	S66-46154	S66-46214	6	July 19, 1966	07:01	365	Small portion docked Agena No. 5005; Africa, Arabia, Red Sea, Gulf of Aden.
46	.....	.....	.....	.....	.....	.....	Blank.
47	S66-46155	S66-46215	10	July 19, 1966	13:25	346	Window, mostly sky, Earth limb; off west coast of Africa.
48	S66-46156	S66-46216	10	July 19, 1966	13:26	344	Window, mostly sky, Earth limb; off west coast of Africa.
49	S66-46157	S66-46217	10	July 19, 1966	13:26	342	Window, mostly sky, Earth limb; off west coast of Africa.
50	S66-46158	S66-46218	10	July 19, 1966	13:26	340	Window, mostly sky, Earth limb; off west coast of Africa.
51	S66-46159	S66-46219	10	July 19, 1966	13:27	338	Window, mostly sky, Earth limb; off west coast of Africa.
52	S66-46160	S66-46220	10	July 19, 1966	13:27	336	Window, mostly sky, Earth limb; off west coast of Africa.
53	S66-46161	S66-46221	10	July 19, 1966	13:41	220	Window, mostly sky, Earth limb; Mediterranean coast—Libya to Turkey.
54	S66-46162	S66-46222	10	July 19, 1966	13:42	216	Window, mostly sky, Earth limb; Mediterranean coast—Libya to Turkey.
55	S66-46163	S66-46223	11	July 19, 1966	16:28	389	Window, mostly sky, Earth limb; Mexico (Yucatan), Guatemala, British Honduras; Gulf of Mexico.
56	S66-46164	S66-46224	11	July 19, 1966	16:29	388	Window, mostly sky, Earth limb; Mexico (Yucatan), Guatemala, British Honduras; Gulf of Mexico.
57	S66-46165	S66-46225	11	July 19, 1966	16:29	387	Window, mostly sky, Earth limb; Mexico (Yucatan), Guatemala, British Honduras; Gulf of Mexico.
58	S66-46166	S66-46226	.....	.....	.....	.....	Agena No. 5005, docked.
59	S66-46167	S66-46227	.....	.....	.....	.....	Agena No. 5005, docked.
60	S66-46168	S66-46228	.....	.....	.....	.....	Agena No. 5005, docked, L-band antenna only.
61	S66-46169	S66-46229	.....	.....	.....	.....	Agena No. 5005, docked; sky and horizon.
62	S66-46170	S66-46230	.....	.....	.....	.....	Agena No. 5005, docked; sky and horizon.

## MAGAZINE 10

Frame	NASA/MSC		Revolution	Date	GMT	Alt. N. Mi.	Area description
	Color No.	B&W No.					
1	S66-45651	S66-45701	2	July 19, 1966	00:03	91	Clouds near terminator, sunlit tops.
2	S66-45652	S66-45702	2	July 19, 1966	00:03	91	Clouds near terminator, sunlit tops.
3	<i>S66-45653</i>	<i>S66-45703</i>	2	<i>July 19, 1966</i>	<i>01:08</i>	<i>131</i>	<i>Murilo Atoll, Pacific Ocean.</i>
4	S66-45654	S66-45704	2	July 19, 1966	01:09	131	Clouds over Pacific Ocean, northeast of Murilo Atoll.
5	S66-45655	S66-45705	2	July 19, 1966	01:22	178	Guadalupe Island (in hole in clouds); Baja California, Gulf of California in background.
6	<i>S66-45656</i>	<i>S66-45706</i>	2	<i>July 19, 1966</i>	<i>01:23</i>	<i>178</i>	<i>Guadalupe Island (in hole in clouds); Baja California, Gulf of California in background.</i>
7	S66-45657	S66-45707	2	July 19, 1966	01:23	178	Guadalupe Island (in hole in clouds); Southern California, Baja California area.
8	<i>S66-45658</i>	<i>S66-45708</i>	2	<i>July 19, 1966</i>	<i>01:23</i>	<i>178</i>	<i>California, Mexico: Los Angeles to Cabo Colnett.</i>
9	S66-45659	S66-45709	5	July 19, 1966	05:27	160	Maldiv Islands: Haddummati, Suvadiva Atolls.
10	S66-45660	S66-45710	.....	July 19, 1966	.....	.....	Docked, partial view of Agena; sky-ocean-clouds.
11	S66-45661	S66-45711	.....	July 19, 1966	.....	.....	Docked; sky-ocean-clouds.
12	S66-45662	S66-45712	.....	July 19, 1966	.....	.....	Docked; sky-ocean-clouds.
13	S66-45663	S66-45713	.....	July 19, 1966	.....	.....	Docked; sky-ocean-clouds.
14	S66-45664	S66-45714	.....	July 19, 1966	.....	.....	Docked; sky-ocean-clouds.
15	S66-45665	S66-45715	.....	July 19, 1966	.....	.....	Docked; sky-ocean-clouds.
16	S66-45666	S66-45716	.....	July 19, 1966	.....	.....	Docked; partial view of Agena; sky-ocean-clouds.

## MAGAZINE 10 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
17	S66-45667	S66-45717	.....	July 19, 1966	.....	.....	Docked; partial view of Agena; sky-ocean-clouds.
18	S66-45668	S66-45718	.....	July 19, 1966	.....	.....	Docked; sky-ocean-clouds.
19	S66-45669	S66-45719	.....	July 19, 1966	.....	.....	Docked; sky-ocean-clouds.
20	S66-45670	S66-45720	.....	July 19, 1966	13:34	.....	Mali, Mauritania: Upper Niger Basin.
21	S66-45671	S66-45721	10	July 19, 1966	13:35	267	Mali, Niger, Upper Volta: Timbuktu; Niger River, Lake Faguibine.
22	S66-45672	S66-45722	10	July 19, 1966	13:37	247	Mali, Niger, Algeria: Iforas Mountains, Niger Basin.
23	S66-45673	S66-45723	10	July 19, 1966	13:39	235	Mali, Niger, Algeria: Ahaggar Mountains, Air ou Azbine.
24	S66-45674	S66-45724	10	July 19, 1966	13:39	231	Niger, Algeria: Ahaggar Mountains, Air ou Azbine, northern Tenere.
25	S66-45675	S66-45725	10	July 19, 1966	13:40	227	Niger, Algeria, Libya, Chad: Air ou Azbine, Tenere region.
26	S66-45676	S66-45726	10	July 19, 1966	13:41	220	Niger, Algeria Libya, Chad: Tibesti Mountains, Tenere region.
27	S66-45677	S66-45727	10	July 19, 1966	13:41	216	Niger, Libya, Chad: Tibesti Mountains, Bodele Basin.
28	S66-45678	S66-45728	10	July 19, 1966	13:42	210	Libya, United Arab Republic, Sudan: Great Sand Sea, Jebel Uweinat.
29	S66-45679	S66-45729	10	July 19, 1966	13:45	194	United Arab Republic, Sudan, Saudi Arabia: Eastern Desert, Foul Bay, Hejaz area, Red Sea.
30	S66-45680	S66-45730	10	July 19, 1966	13:46	188	United Arab Republic, Sudan, Saudi Arabia: Eastern Desert, Foul Bay, Hejaz area, Red Sea.
31	S66-45681	S66-45731	10	July 19, 1966	13:46	185	United Arab Republic, Sudan, Saudi Arabia: Hejaz Area, Red Sea.
32	S66-45682	S66-45732	11	July 19, 1966	16:22	405	Clouds over eastern Pacific; stereo with 33.
33	S66-45683	S66-45733	11	July 19, 1966	16:23	405	Clouds over eastern Pacific; stereo with 32.
34	S66-45684	S66-45734	11	July 19, 1966	16:23	404	Clouds over eastern Pacific; stereo with 35.
35	S66-45685	S66-45735	11	July 19, 1966	16:24	404	Clouds over eastern Pacific; stereo with 34.
36	S66-45686	S66-45736	11	July 19, 1966	16:36	342	Mexico, Central America: Yucatan, Gulf of Mexico.
37	S66-45687	S66-45737	11	July 19, 1966	16:36	342	Mexico, Central America: Yucatan, Gulf of Mexico.
38	<i>S66-45688</i>	<i>S66-45738</i>	12	<i>July 19, 1966</i>	<i>16:37</i>	334	<i>Mexico, Cuba, Florida: Yucatan Channel, Gulf of Mexico, Caribbean Sea.</i>
39	S66-45689	S66-45739	12	July 19, 1966	16:38	326	Cuba, Florida: Straits of Florida, Gulf of Mexico.
40	S66-45690	S66-45740	12	July 19, 1966	16:38	324	Cuba, Florida: Straits of Florida, Gulf of Mexico.
41	S66-45691	S66-45741	12	July 19, 1966	16:38	322	Cuba: Gulf of Mexico, Caribbean Sea; Yucatan in background.
42	<i>S66-45692</i>	<i>S66-45742</i>	12	<i>July 19, 1966</i>	<i>16:39</i>	315	<i>Hurricane Celia; Cuba, Florida in background.</i>
43	S66-45693	S66-45743	12	July 19, 1966	16:39	313	Hurricane Celia; Cuba, Florida in background.
44	S66-45694	S66-45744	12	July 19, 1966	16:55	193	Morocco: Straits of Gibraltar, Spain, Portugal in background.
45	S66-45695	S66-45745	12	July 19, 1966	16:56	192	Morocco: Straits of Gibraltar, Spain, Portugal in background.
46	S66-45696	S66-45746	12	July 19, 1966	16:56	191	Morocco: Straits of Gibraltar, Spain, Portugal in background.
47	S66-45697	S66-45747	12	July 19, 1966	16:56	186	Morocco, Algeria: Straits of Gibraltar, Spain, Portugal in background.
48	S66-45698	S66-45748	12	July 19, 1966	16:56	183	Morocco, Algeria: Straits of Gibraltar, Spain in background.
49	S66-45699	S66-45749	12	July 19, 1966	16:57	181	Morocco, Algeria: Straits of Gibraltar, Spain in background.
50	S66-45700	S66-45750	12	July 19, 1966	16:57	180	Morocco, Algeria: Straits of Gibraltar, Spain in background.



## MAGAZINE 28

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1							Blank.
2	S66-46231	S66-46288	12	July 19, 1966	16:54	205	Docked with Agena No. 5005; looking toward Spain, Portugal, Morocco, Straits of Gibraltar.
3	S66-46232	S66-46289	12	July 19, 1966	16:54	202	Docked with Agena No. 5005; looking toward Spain, Portugal, Morocco, Straits of Gibraltar.
4	S66-46233	S66-46290	12	July 19, 1966	16:55	199	Docked with Agena No. 5005; looking toward Spain, Portugal, Morocco, Straits of Gibraltar.
5	S66-46234	S66-46291	12	July 19, 1966	16:55	196	Docked with Agena No. 5005, Agena No. 5003 in distance; Spain, Portugal, Morocco, Straits of Gibraltar.
6	S66-46235	S66-46292	12	July 19, 1966	16:56	193	Docked with Agena No. 5005, Agena No. 5003 in distance; Spain, Portugal, Morocco, Straits of Gibraltar.
7	S66-46236	S66-46293	12	July 19, 1966	16:56	189	Docked with Agena No. 5005, Agena No. 5003 in distance; Algeria, Mediterranean Sea.
8	S66-46237	S66-46294	12	July 19, 1966	16:57	186	Docked with Agena No. 5005, Agena No. 5003 in distance; Algeria, Mediterranean Sea.
9	S66-46238	S66-46295	12	July 19, 1966	16:57	184	Docked with Agena No. 5005; Algeria, Mediterranean Sea.
10	S66-46239	S66-46296	12	July 19, 1966	17:00	171	Docked with Agena No. 5005, Agena No. 5003 in distance; Tunisia, Libya, Mediterranean Sea.
11	S66-46240	S66-46297	12	July 19, 1966	17:01	169	Docked with Agena No. 5005; Libya, Mediterranean Sea.
12	S66-46241	S66-46298	12	July 19, 1966	.....	.....	Docked with Agena No. 5005; Spacecraft window showing debris on glass.
13	S66-46242	S66-46299	12	July 19, 1966	.....	.....	Docked with Agena No. 5005; spacecraft window showing debris on glass.
14	S66-46243	S66-46300	12	July 19, 1966	.....	.....	Docked with Agena No. 5005; spacecraft window showing debris on glass.
15	S66-46244	S66-46301	12	July 19, 1966	.....	.....	Docked with Agena No. 5005; spacecraft window showing debris on glass.
16	S66-46245	S66-46302	12	July 19, 1966	.....	.....	Docked with Agena No. 5005; limb near terminator.
17	S66-46246	S66-46303	12	July 19, 1966	.....	.....	Docked with Agena No. 5005; underexposed.
18	S66-46247	S66-46304	12	July 19, 1966	.....	.....	Docked with Agena No. 5005; excellent view of Agena display panel and L-band antenna.
19							Blank.
20							Blank.
21							Blank.
22							Blank.
23							Blank.
24							Blank.
25							Blank.
26							Blank.
27			12	July 19, 1966	17:48	.....	Green lights on display panel of Agena No. 5005.
28	S66-46248	S66-46305	12	July 19, 1966	17:48	.....	Docked to Agena No. 5005; excellent view of Agena display panel and L-band antenna.
29	S66-46249	S66-46306	12	July 19, 1966	17:48	.....	Docked to Agena No. 5005; excellent view of Agena display panel, glow from Agena PPS.
30	S66-46250	S66-46307	12	July 19, 1966	17:49	.....	Docked to Agena No. 5005; excellent view of Agena display panel.
31	S66-46251	S66-46308	12	July 19, 1966	17:49	.....	Docked to Agena No. 5005; excellent view of Agena display panel.
32	S66-46252	S66-46309	12	July 19, 1966	17:49	.....	Docked to Agena No. 5005; excellent view of Agena display panel.
33	S66-46253	S66-46310	12	July 19, 1966	17:49	.....	Docked to Agena No. 5005; excellent view of Agena display panel.

## MAGAZINE 28 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt. N. Mi.	Area description
	Color No.	B&W No.					
34	S66-46254	S66-46311	12	July 19, 1966	17:49	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
35	S66-46255	S66-46312	12	July 19, 1966	17:50	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
36	S66-46256	S66-46313	12	July 19, 1966	17:50	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
37	S66-46257	S66-46314	12	July 19, 1966	17:50	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
38	S66-46258	S66-46315	12	July 19, 1966	17:50	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
39	S66-46259	S66-46316	12	July 19, 1966	17:50	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
40	S66-46260	S66-46317	12	July 19, 1966	17:50	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
41	S66-46261	S66-46318	12	July 19, 1966	17:51	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
42	S66-46262	S66-46319	12	July 19, 1966	17:51	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
43	S66-46263	S66-46320	12	July 19, 1966	17:51	.....	Docked to Agena No. 5005; excellent view of Agena display panel, particles of Agena fuel.
44	S66-46264	S66-46321	12	July 19, 1966	17:51	.....	Docked to Agena No. 5005; underexposed.
45	S66-46265	S66-46322	12	July 19, 1966	17:52	.....	Docked to Agena No. 5005; underexposed.
46	S66-46266	S66-46323	12	July 19, 1966	18:00	.....	Inside Gemini X, Comdr. J. W. Young; underexposed.
47	S66-46267	S66-46324	12	July 19, 1966	18:01	.....	Inside Gemini X, Comdr. J. W. Young; underexposed.
48	S66-46268	S66-46325	12	July 19, 1966	18:01	.....	Inside Gemini X, Maj. M. Collins.
49	S66-46269	S66-46326	12	July 19, 1966	18:02	.....	Inside Gemini X, Maj. M. Collins.
50	S66-46270	S66-46327	12	July 19, 1966	18:02	.....	Inside Gemini X, Comdr. J. W. Young.
51	S66-46271	S66-46328	12	July 19, 1966	18:03	.....	Inside Gemini X, underexposed.
52	S66-46272	S66-46329	12	July 19, 1966	18:03	.....	Inside Gemini X, Maj. M. Collins.
53	S66-46273	S66-46330	12	July 19, 1966	18:03	.....	Skin of Gemini X, sharp focus.
54	S66-46274	S66-46331	12	July 19, 1966	18:04	.....	Skin of Gemini X, sharp focus.
55	S66-46275	S66-46332	12	July 19, 1966	18:04	.....	Skin of Gemini X, sharp focus.
56	S66-46276	S66-46333	.....	.....	.....	.....	Docked to Agena No. 5005; underexposed, out of focus.
57	S66-46277	S66-46334	.....	.....	.....	.....	Docked to Agena No. 5005; excellent view of Agena display panel.
58	S66-46278	S66-46335	14	July 19, 1966	20:20	168	Docked to Agena No. 5005; clouds over water.
59	S66-46279	S66-46336	14	July 19, 1966	20:20	168	Docked to Agena No. 5005; clouds over water.
60	S66-46280	S66-46337	14	July 19, 1966	.....	.....	Blank.
61	S66-46281	S66-46338	14	July 19, 1966	20:06	159	Docked to Agena No. 5005; west coast of Africa in background.
62	S66-46282	S66-46339	14	July 19, 1966	20:06	159	Docked to Agena No. 5005; west coast of Africa in background.
63	S66-46283	S66-46340	14	July 19, 1966	20:07	159	Docked to Agena No. 5005; west coast of Africa in background.
64	S66-46284	S66-46341	14	July 19, 1966	20:08	159	Docked to Agena No. 5005; west coast of Africa in background.
65	S66-46285	S66-46342	14	July 19, 1966	20:09	159	Docked to Agena No. 5005; Atlantic coast, Mauritania, Spanish Sahara, Algeria.
66	S66-46286	S66-46343	14	July 19, 1966	20:11	159	Docked to Agena No. 5005; Atlantic coast, Mauritania, Spanish Sahara, Algeria.
67	S66-46287	S66-46344	14	July 19, 1966	20:11	159	Docked to Agena No. 5005; Atlantic coast Mauritania, Spanish Sahara, Algeria.
68	S66-46288	S66-46345	14	July 19, 1966	20:12	159	Docked to Agena No. 5005; Atlantic coast, Mauritania, Spanish Sahara, Algeria.



## MAGAZINE 13

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-46017	S66-46064	.....	.....	.....	.....	Color patch, exposed in laboratory.
2	S66-46018	S66-46065	.....	.....	.....	.....	Color patch, exposed in laboratory.
3	S66-46019	S66-46066	.....	.....	.....	.....	Color patch, exposed in laboratory.
4	S66-46020	S66-46067	.....	.....	.....	.....	Color patch, exposed in laboratory.
5	S66-46021	S66-46068	.....	.....	.....	.....	Color patch, exposed in laboratory.
6	S66-46022	S66-46069	.....	.....	.....	.....	Color patch, exposed in laboratory.
7	S66-46023	S66-46070	14	July 19, 1966	21:49	.....	Color patch, exposed during EVA, in its own shadow; f/8, 1/250 sec.
8	S66-46024	S66-46071	14	July 19, 1966	21:50	.....	Color patch, exposed during EVA; f/8, 1/250 sec.
9	S66-46025	S66-46072	14	July 19, 1966	21:50	.....	Color patch, exposed during EVA; f/8, 1/250 sec.
10	S66-46026	S66-46073	14	July 19, 1966	21:50	.....	Color patch, exposed during EVA; f/8, 1/250 sec.
11	S66-46027	S66-46074	.....	July 19, 1966	.....	.....	Out of focus.
12	S66-46028	S66-46075	.....	July 19, 1966	.....	.....	Out of focus.
13	S66-46029	S66-46076	.....	July 19, 1966	.....	.....	Ocean, clouds.
14	S66-46030	S66-46077	18	July 20, 1966	02:28	210	Peru, Brazil: Amazon Basin, Ucayali River, Andes with Huascarán Volcano (22 205 ft) in background.
15	S66-46031	S66-46078	18	July 20, 1966	02:28	210	Peru, Brazil: Amazon Basin, Ucayali River, Andes with Huascarán Volcano (22 205 ft) in background.
16	S66-46032	S66-46079	18	July 20, 1966	02:29	210	Peru, Brazil: Amazon Basin, Ucayali River, Andes with Huascarán Volcano. (22 205 ft) in background.
17	S66-46033	S66-46080	18	July 20, 1966	02:29	210	Peru, Brazil: Amazon Basin, Ucayali River, Andes with Huascarán Volcano. (22 205 ft) in background.
18	S66-46034	S66-46081	25	July 20, 1966	15:36	206	Costa Rica, Nicaragua, Panama: Pacific Ocean foreground, Caribbean Sea background.
19	S66-46035	S66-46082	25	July 20, 1966	15:36	206	Costa Rica, Nicaragua, Panama: Pacific Ocean foreground, Caribbean Sea background.
20	S66-46036	S66-46083	25	July 20, 1966	15:36	206	Costa Rica, Nicaragua, Panama: Pacific Ocean foreground, Caribbean Sea background, stereo with No. 21.
21	S66-46037	S66-46084	25	July 20, 1966	15:36	206	Costa Rica, Nicaragua, Panama: Pacific Ocean foreground, Caribbean Sea background, stereo with No. 20.
22	S66-46038	S66-46085	26	July 20, 1966	15:51	208	Vortex clouds over ocean, Canary Island area.
23	S66-46039	S66-46086	26	July 20, 1966	15:52	208	Vortex clouds over ocean, Canary Island area.
24	S66-46040	S66-46087	26	July 20, 1966	15:52	208	Vortex clouds over ocean, Canary Island area.
25	S66-46041	S66-46088	26	July 20, 1966	15:54	208	Vortex clouds near Straits of Gibraltar; Spain, Portugal in background, Morocco on right.
26	S66-46042	S66-46089	26	July 20, 1966	15:54	208	Vortex clouds near Straits of Gibraltar; Spain, Portugal in background, Morocco on right.
27	S66-46043	S66-46090	26	July 20, 1966	15:54	208	Vortex clouds near Straits of Gibraltar; Spain, Portugal in background, Morocco on right.
28	S66-46044	S66-46091	26	July 20, 1966	15:54	208	Vortex clouds near Straits of Gibraltar; Spain, Portugal in background, Morocco on right.
29	S66-46045	S66-46092	39	July 21, 1966	12:55	199	Brazil: Amazonas State; cloud-covered Amazon Basin.
30	S66-46046	S66-46093	39	July 21, 1966	12:55	199	Brazil: Amazonas State; cloud-covered Amazon Basin.
31	S66-46047	S66-46094	39	July 21, 1966	12:56	198	Brazil: Amazonas State; cloud-covered Amazon Basin.
32	S66-46048	S66-46095	39	July 21, 1966	12:56	198	Brazil: Amazonas State; cloud-covered Amazon Basin.
33	S66-46049	S66-46096	39	July 21, 1966	12:56	196	Brazil, Guyana, Venezuela: Rio Branco, Serra Pacaraima.

## MAGAZINE 13 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
34	S66-46050	S66-46097	39	July 21, 1966	12:56	196	Brazil, Guyana, Venezuela: Rio Branco, Serra Pacaraima.
35	S66-46051	S66-46098	39	July 21, 1966	12:57	196	Brazil, Guyana, Venezuela: La Gran Sabana, Orinoco Basin.
36	S66-46052	S66-46099	39	July 21, 1966	12:57	196	Guyana, Venezuela: Orinoco, Essequibo Rivers, La Gran Sabana.
37	S66-46053	S66-46100	39	July 21, 1966	12:57	196	Guyana, Venezuela: Orinoco, Essequibo Rivers, La Gran Sabana.
38	S66-46054	S66-46101	39	July 21, 1966	12:57	196	Surinam, Guyana, Venezuela: Orinoco, Essequibo Rivers.
39	S66-46055	S66-46102	39	July 21, 1966	12:58	195	Surinam, Guyana: Paramaribo; Atlantic coast.
40	S66-46056	S66-46103	39	July 21, 1966	12:58	194	Surinam, Guyana: Paramaribo; Atlantic coast.
41	S66-46057	S66-46104	39	July 21, 1966	12:58	194	Surinam, Guyana, French Guiana: Paramaribo, Georgetown; Atlantic coast.
42	S66-46058	S66-46105	39	July 21, 1966	12:58	193	Surinam, Guyana, French Guiana: Paramaribo, Atlantic coast.
43	S66-46059	S66-46106	39	July 21, 1966	12:58	193	Surinam, Guyana, French Guiana: Atlantic coast.
44	S66-46060	S66-46107	39	July 21, 1966	13:07	178	Spanish Sahara, Mauritania: Port Etienne; Cap Blanc, Dhar Adrar.
45	S66-46061	S66-46108	39	July 21, 1966	13:07	178	Spanish Sahara, Mauritania: Villa Cisneros; Erg Iguidi, Tindouf Basin.
46	S66-46062	S66-46109	39	July 21, 1966	13:09	174	Spanish Sahara, Mauritania, Morocco, Algeria: Erg Iguidi, Tindouf Basin.
47	S66-46063	S66-46110	39	July 21, 1966	13:11	171	Spanish Sahara, Mauritania, Morocco, Algeria: Erg Iguidi, Tindouf Basin, Hamada du Dra, Anti-Atlas Mountains.

## MAGAZINE 14

Frame	NASA/MSC.		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	.....	.....	.....	.....	.....	.....	Blank.
2	.....	.....	.....	.....	.....	.....	Blank.
3	.....	.....	.....	.....	.....	.....	L-band antenna of Agena No. 5005; underexposed.
4	.....	.....	.....	.....	.....	.....	Blank.
5	.....	.....	.....	.....	.....	.....	Blank.
6	.....	.....	.....	.....	.....	.....	Blank.
7	S66-45751	S66-45794	.....	.....	.....	.....	Docked with Agena No. 5005; clouds, ocean; slightly overexposed.
8	S66-45752	S66-45795	.....	.....	.....	.....	Docked with Agena No. 5005; clouds, ocean; slightly overexposed.
9	S66-45753	S66-45796	.....	.....	.....	.....	Docked with Agena No. 5005; clouds, ocean; slightly overexposed.
10	S66-45754	S66-45797	.....	.....	.....	.....	Docked with Agena No. 5005; clouds, ocean; slightly overexposed.
11	S66-45755	S66-45798	.....	.....	.....	.....	Docked with Agena No. 5005; clouds, ocean; slightly overexposed.
12	S66-45756	S66-45799	.....	.....	.....	.....	Docked with Agena No. 5005; clouds, ocean; slightly overexposed.
13	S66-45757	S66-45800	.....	.....	.....	.....	Docked with Agena No. 5005, clear view of docking adapter.
14	S66-45758	S66-45801	.....	.....	.....	.....	Docked with Agena No. 5005, clear view of docking adapter.
15	S66-45759	S66-45802	.....	.....	.....	.....	Docked with Agena No. 5005, clear view of docking adapter.
16	S66-45760	S66-45803	28	July 20, 1966	20:20	207	Clouds, overexposed.



## MAGAZINE 14 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
17	S66-45761	S66-45804	28	July 20, 1966	20:24	208	Mexico, Texas: Tamaulipas, gulf coast; overexposed.
18	S66-45762	S66-45805	28	July 20, 1966	20:24	208	Mexico, Texas: Torreón; Coahuila Basin, Serranía del Burro, Rio Grande, gulf coast.
19	S66-45763	S66-45806	28	July 20, 1966	20:25	208	Mexico, Texas: Coahuila; Sierra Madre Oriental, Sierra de los Alamitos, Don Martin Reservoir.
20	S66-45764	S66-45807	28	July 20, 1966	20:27	208	Mexico, Texas: Gulf coast from Corpus Christi Bay to Boca San Rafael.
21	S66-45765	S66-45808	28	July 20, 1966	20:27	208	Texas: Gulf coast, Matagordo Bay, mouth of Colorado River.
22	S66-45766	S66-45809	28	July 20, 1966	20:28	208	Texas, Louisiana: Gulf coast from Freeport to Vermilion Bay.
23	S66-45767	S66-45810	28	July 20, 1966	20:28	209	Clouds over Gulf of Mexico.
24	S66-45768	S66-45811	31	July 21, 1966	00:55	.....	Umbilical cord bag discarded; ocean, clouds.
25	S66-45769	S66-45812	31	July 21, 1966	00:55	.....	Umbilical cord bag discarded; ocean, clouds.
26	S66-45770	S66-45813	31	July 21, 1966	00:57	215	Clouds over ocean, door open.
27	S66-45771	S66-45814	31	July 21, 1966	00:58	.....	Discarded debris, chest pack.
28	S66-45772	S66-45815	31	July 21, 1966	00:59	.....	Open hatch, out of focus.
29	S66-45773	S66-45816	31	July 21, 1966	00:59	.....	Open hatch, out of focus.
30	S66-45774	S66-45817	31	July 21, 1966	01:20	214	Clouds, ocean; Agena No. 5005 in distance.
31	S66-45775	S66-45818	31	July 21, 1966	01:20	214	Clouds, ocean.
32	S66-45776	S66-45819	31	July 21, 1966	01:20	214	Clouds, ocean.
33	S66-45777	S66-45820	31	July 21, 1966	01:20	214	Clouds, ocean.
34	S66-45778	S66-45821	31	July 21, 1966	01:21	214	Clouds, ocean; Agena No. 5005 in distance.
35	S66-45779	S66-45822	31	July 21, 1966	01:21	214	Clouds, ocean; Agena No. 5005 in distance.
36	S66-45780	S66-45823	31	July 21, 1966	01:21	214	Clouds, ocean; Agena No. 5005 in distance.
37	S66-45781	S66-45824	31	July 21, 1966	01:21	214	Docking bar against sky.
38	S66-45782	S66-45825	32	July 21, 1966	02:14	200	Indonesia: Sumatra, Simeulue, Nias Islands.
39	S66-45783	S66-45826	32	July 21, 1966	02:15	200	Indonesia: Sumatra, Simeulue Islands.
40	S66-45784	S66-45827	32	July 21, 1966	02:15	200	Indonesia: Sumatra, Nias, Batu Islands, Mentawai Archipelago.
41	S66-45785	S66-45828	32	July 21, 1966	02:15	199	Indonesia: Sumatra (Padang), Mentawai Archipelago.
42	S66-45786	S66-45829	32	July 21, 1966	02:15	199	Indonesia: Nias Island, Mentawai Archipelago.
43	S66-45787	S66-45830	32	July 21, 1966	02:16	198	Indonesia: Sumatra, Mentawai Archipelago.
44	S66-45788	S66-45831	32	July 21, 1966	02:16	198	Indonesia: Sumatra, Nias Island, Mentawai Archipelago.
45	S66-45789	S66-45832	32	July 21, 1966	02:16	197	Indonesia: Sumatra (Padang), Mentawai Archipelago.
46	S66-45790	S66-45833	32	July 21, 1966	02:16	197	Indonesia: Sumatra, Mentawai Archipelago.
47	S66-45791	S66-45834	32	July 21, 1966	02:17	196	Indonesia, Malaysia: Sumatra, Malaya (Malacca): Strait of Malacca.
48	S66-45792	S66-45835	32	July 21, 1966	02:18	195	Malaysia: Kuala Lumpur; Strait of Malacca; southernmost Thailand beneath clouds in background.
49	S66-45793	S66-45836	32	July 21, 1966	02:18	193	Anambas Islands, South China Sea.

## MAGAZINE 11

Frame	NASA/MSC.		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1							Clouds-horizon-sky; overexposed.
2	S66-45837	S66-45883	32	July 21, 1966			Spacecraft nose; underexposed.
3	S66-45838	S66-45884	32	July 21, 1966			Spacecraft nose; underexposed.
4	S66-45839	S66-45885	32	July 21, 1966			Clouds, ocean.
5	S66-45840	S66-45886	32	July 21, 1966			Clouds, ocean.
6	<i>S66-45841</i>	<i>S66-45887</i>	32	<i>July 21, 1966</i>	<i>02:38</i>	<i>161</i>	<i>Clouds, ocean, west of Midway Island.</i>
7	S66-45842	S66-45888	32	July 21, 1966	02:39	161	Midway Island, Kure Island.
8	S66-45843	S66-45889	32	July 21, 1966	02:39	161	Midway Island, Kure Island.
9	<i>S66-45844</i>	<i>S66-45890</i>	32	<i>July 21, 1966</i>	<i>02:39</i>	<i>161</i>	<i>Pearl and Hermes Reef.</i>
10	S66-45845	S66-45891	32	July 21, 1966	02:39	161	Pearl and Hermes Reef.
11	<i>S66-45846</i>	<i>S66-45892</i>	33	<i>July 21, 1966</i>	<i>03:44</i>	<i>202</i>	<i>Chagos Archipelago: Egmont Islands, Three Brothers; Indian Ocean, clouds.</i>
12	S66-45847	S66-45893	33	July 21, 1966	03:46	201	Chagos Archipelago: Egmont Islands, Three Brothers; Diego Garcia; Indian Ocean, clouds.
13	<i>S66-45848</i>	<i>S66-45894</i>	33	<i>July 21, 1966</i>	<i>03:47</i>	<i>200</i>	<i>Chagos Archipelago: Egmont Islands, Three Brothers, Diego Garcia; Indian Ocean, clouds.</i>
14	S66-45849	S66-45895	33	July 21, 1966	03:47	200	Chagos Archipelago: Diego Garcia, Blenheim Reef; Indian Ocean, clouds.
15	S66-45850	S66-45896	33	July 21, 1966	03:47	198	Maldiv Islands: Suvadiva and Addu Atolls; Indian Ocean, clouds.
16	<i>S66-45851</i>	<i>S66-45897</i>	33	<i>July 21, 1966</i>	<i>03:48</i>	<i>198</i>	<i>Maldiv Islands: Suvadiva and Addu Atolls; Indian Ocean, clouds.</i>
17	S66-45852	S66-45898	33	July 21, 1966	03:48	196	Maldiv Islands: Nilandu, Kolamadulu, Haddummati, Suvadiva, Addu Atolls; Indian Ocean, clouds.
18	<i>S66-45853</i>	<i>S66-45899</i>	33	<i>July 21, 1966</i>	<i>03:49</i>	<i>196</i>	<i>Maldiv Islands: Kolamadulu, Haddummati, Nilandu, Suvadiva, Addu Atolls; Indian Ocean, clouds.</i>
19	S66-45854	S66-45900	33	July 21, 1966	03:49	195	Maldiv Islands: Kolamadulu, Haddummati, Suvadiva, Addu Atolls; Indian Ocean, clouds.
20	S66-45855	S66-45901	33	July 21, 1966	03:49	195	Maldiv Islands: Kolamadulu, Haddummati, Suvadiva, Addu Atolls; Indian Ocean, clouds.
21	S66-45856	S66-45902	33	July 21, 1966	03:49	193	Cloud streaks over Indian Ocean.
22	S66-45857	S66-45903	33	July 21, 1966	03:50	192	Clouds streaks over Indian Ocean, Maldiv Islands in background.
23	S66-45858	S66-45904	33	July 21, 1966	03:50	191	Cloud streaks over Indian Ocean.
24	<i>S66-45859</i>	<i>S66-45905</i>	33	<i>July 21, 1966</i>	<i>03:51</i>	<i>190</i>	<i>Cloud streaks over Indian Ocean, Maldiv Islands in background.</i>
25	<i>S66-45860</i>	<i>S66-45906</i>	33	<i>July 21, 1966</i>	<i>03:57</i>	<i>178</i>	<i>China, Taiwan: Formosa Strait.</i>
26	S66-45861	S66-45907	33	July 21, 1966	03:57	178	China, Taiwan: Formosa Strait.
27	S66-45862	S66-45908	33	July 21, 1966	03:57	177	China: Fukien, Chekiang, Kwangtung Provinces.
28	S66-45863	S66-45909	33	July 21, 1966	03:58	177	China: Fukien, Kwangtung, Hunan, Kiangsi, Hupeh Provinces; lakes on Yangtze River.
29	S66-45864	S66-45910	33	July 21, 1966	03:58	177	China, Taiwan: Fukien Province; Formosa Strait, Pescadores Islands.
30	S66-45865	S66-45911	33	July 21, 1966	03:58	176	China: Fukien, Chekiang Provinces; Formosa Strait, Pescadores Islands.
31	<i>S66-45866</i>	<i>S66-45912</i>	33	<i>July 21, 1966</i>	<i>03:59</i>	<i>176</i>	<i>China (Fukien Province), Taiwan: Formosa Strait, Pescadores Islands.</i>
32	S66-45867	S66-45913	33	July 21, 1966	03:59	176	China (Fukien Province), Taiwan: Formosa Strait, Pescadores Islands.
33	<i>S66-45868</i>	<i>S66-45914</i>	33	<i>July 21, 1966</i>	<i>04:00</i>	<i>176</i>	<i>Taiwan: Kaohsiung, south half of island.</i>
34	S66-45869	S66-45915	33	July 21, 1966	04:03	170	Ryukya Islands: Sakishima Gunto group.
35	S66-45870	S66-45916	33	July 21, 1966	04:03	170	Daito Islands: Kita Daito Jima.
36	<i>S66-45871</i>	<i>S66-45917</i>	33	<i>July 21, 1966</i>	<i>04:04</i>	<i>169</i>	<i>Daito Islands: Kita Daito Jima.</i>
37	S66-45872	S66-45918	33	July 21, 1966	04:04	168	Ocean, clouds.
38	S66-45873	S66-45919	33	July 21, 1966	04:04	168	Parece Vela (Douglas) Reef: ocean, clouds.
39	S66-45874	S66-45920	33	July 21, 1966	04:04	167	Ocean, clouds, sea mount.



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Frame	NASA/MSC.		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
40	S66-45875	S66-45921	33	July 21, 1966	04:05	167	Ocean, clouds.
41	S66-45876	S66-45922	33	July 21, 1966	04:05	166	Ocean, clouds.
42	S66-45877	S66-45923	34	July 21, 1966	05:16	200	East Africa coastline; Indian Ocean, cloud layers of several types.
43	S66-45878	S66-45924	34	July 21, 1966	05:17	200	East Africa coastline; Indian Ocean, cloud layers of several types.
44	S66-45879	S66-45925	34	July 21, 1966	05:17	199	Indian Ocean, cloud layers of several types.
45	S66-45880	S66-45926	34	July 21, 1966	05:18	199	Indian Ocean, cloud layers of several types.
46	S66-45881	S66-45927	34	July 21, 1966	05:18	198	Indian Ocean, cloud layers of several types.
47	S66-45882	S66-45928	34	July 21, 1966	05:19	198	Indian Ocean, cloud layers of several types.

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Frame	NASA/MSC.		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-45929	S66-45973	34	July 21, 1966	05:30	176	China, North Vietnam, cloudy.
2							Blank.
3	S66-45930	S66-45974	34	July 21, 1966	05:30	176	China, North Vietnam: Gulf of Tonkin, cloudy.
4	S66-45931	S66-45975	34	July 21, 1966	05:32	175	China, North Vietnam: Gulf of Tonkin, cloudy.
5	S66-45932	S66-45976	34	July 21, 1966	05:32	174	North Vietnam: Gulf of Tonkin, cloudy.
6	S66-45933	S66-45977	34	July 21, 1966	05:32	174	China (Kwangsi Province), North Vietnam: Hanoi, Haiphong; Red River, Gulf of Tonkin.
7	S66-45934	S66-45978	34	July 21, 1966	05:33	173	China (Kwangsi Province), North Vietnam: Red River.
8	S66-45935	S66-45979	34	July 21, 1966	05:33	173	China (Kwangsi Province), North Vietnam: Hanoi, Haiphong; Red River, Gulf of Tonkin, South Vietnam on horizon.
9	S66-45936	S66-45980	34	July 21, 1966	05:33	172	China (Kwangsi Province), North Vietnam: Gulf of Tonkin.
10	S66-45937	S66-45981	34	July 21, 1966	05:33	172	China (Kwangsi Province), North Vietnam: Song Gam River.
11	S66-45938	S66-45982	34	July 21, 1966	05:34	172	China (Kwangsi Province), North Vietnam: Song Gam River.
12	S66-45939	S66-45983	34	July 21, 1966	05:34	171	China (Kwangsi Province), North Vietnam: Siang River.
13	S66-45940	S66-45984	34	July 21, 1966	05:34	171	China (Kwangsi Province), North Vietnam, South Vietnam (background): Hanoi, Haiphong; Red River, Gulf of Tonkin.
14	S66-45941	S66-45985	34	July 21, 1966	05:35	170	China (Kwangsi Province), North Vietnam: Siang River, Gulf of Tonkin.
15	S66-45942	S66-45986	34	July 21, 1966	05:35	169	China: Kwangsi Province, Nan-ning; Yu River.
16	S66-45943	S66-45987	34	July 21, 1966	05:36	168	China: Kwangtung, Kiangsi Provinces: South China Sea coast.
17	S66-45944	S66-45988	34	July 21, 1966	05:36	168	China: Kwangtung, Kiangsi Provinces; South China Sea coast.
18	S66-45945	S66-45989	34	July 21, 1966	05:36	167	China: Kwangtung, Kiangsi Provinces; South China Sea coast.
19	S66-45946	S66-45990	34	July 21, 1966	05:36	167	China: Kwangtung, Kiangsi Provinces; South China Sea coast.
20	S66-45947	S66-45991	34	July 21, 1966	05:36	167	China: Kwangtung, Kiangsi, Fukien Provinces; South China Sea coast.
21	S66-45948	S66-45992	34	July 21, 1966	05:37	167	China: Kwangtung, Kwangsi Provinces; Hsi River.
22							Blank.
23	S66-45949	S66-45993	34	July 21, 1966	05:37	167	China: Kwangtung, Kiangsi, Fukien Provinces, South China Sea coast.
24	S66-45950	S66-45994	34	July 21, 1966	05:37	167	China: Kwangtung, Kiangsi, Fukien Provinces; Quemoy, South China Sea coast.

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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
25	S66-45951	S66-45995	34	July 21, 1966	05:37	167	China: Kwangtung, Kiangsi, Fukien Provinces; Quemoy, South China Sea coast.
26	S66-45952	S66-45996	34	July 21, 1966	05:37	166	China (Kwangtung, Fukien Provinces), Taiwan; Quemoy, Formosa Strait, Pescadores Islands.
27	S66-45953	S66-45997	34	July 21, 1966	05:37	166	China: Fukien Province: Quemoy, South China Sea coast.
28	S66-45954	S66-45998	34	July 21, 1966	05:38	166	Taiwan: Formosa Strait, Pescadores Islands, Pacific Ocean, clouds.
29	S66-45955	S66-45999	34	July 21, 1966	05:38	166	Taiwan, China (Fukien Province): Formosa Strait, Quemoy, Pescadores Islands.
30	<i>S66-45956</i>	<i>S66-46000</i>	<i>34</i>	<i>July 21, 1966</i>	<i>05:38</i>	<i>165</i>	<i>Taiwan: Formosa Strait, Pescadores Islands, Pacific Ocean, clouds.</i>
31	S66-45957	S66-46001	34	July 21, 1966	05:38	165	China: Fukien, Kiangsi, Chekiang Provinces; P'oyang and Tung'ing Lakes on Yangtze River.
32	<i>S66-45958</i>	<i>S66-46002</i>	<i>34</i>	<i>July 21, 1966</i>	<i>05:38</i>	<i>165</i>	<i>China: Fukien, Kiangsi, Chekiang Provinces; P'oyang and Tung'ing Lakes on Yangtze River.</i>
33	S66-45959	S66-46003	34	July 21, 1966	05:39	164	Taiwan, China coast (Fukien Province): Formosa Strait.
34	.....	.....	.....	.....	.....	.....	Blank.
35	<i>S66-45960</i>	<i>S66-46004</i>	<i>34</i>	<i>July 21, 1966</i>	<i>05:39</i>	<i>164</i>	<i>China: Chekiang Province; mouth of Yangtze River, Hangchow Bay.</i>
36	S66-45961	S66-46005	34	July 21, 1966	05:39	164	China: Chekiang Province; mouth of Yangtze River, Hangchow Bay.
37	S66-45962	S66-46006	34	July 21, 1966	05:39	164	China: Chekiang, Kiangsu Provinces, Shanghai; Hangchow Bay.
38	S66-45963	S66-46007	.....	July 21, 1966	.....	.....	Double exposure.
39	S66-45964	S66-46008	.....	July 21, 1966	.....	.....	Ocean, clouds.
40	S66-45965	S66-46009	.....	July 21, 1966	.....	.....	Ocean, clouds.
41	S66-45966	S66-46010	.....	July 21, 1966	.....	.....	Ocean, clouds.
42	S66-45967	S66-46011	.....	July 21, 1966	.....	.....	Ocean, clouds.
43	.....	.....	.....	.....	.....	.....	Blank.
44	S66-45968	S66-46012	.....	July 21, 1966	.....	.....	Ocean, clouds near terminator.
45	S66-45969	S66-46013	.....	July 21, 1966	.....	.....	Ocean, clouds, near terminator.
46	S66-45970	S66-46014	.....	July 21, 1966	.....	.....	Ocean, clouds, near terminator.
47	S66-45971	S66-46015	.....	July 21, 1966	.....	.....	Ocean, clouds, near terminator.
48	S66-45972	S66-46016	39	July 21, 1966	12:52	204	Peru, Brazil: Rio Ucayali, Cordillera Oriental; road to Pucallpas visible.

GEMINI XI  
MAGAZINE 11

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-54888	S66-54845	1	Sept. 12, 1966	16:02	.....	Agana, docking end and side; range, 60 ft.
2	S66-54889	S66-54846	1	Sept. 12, 1966	16:02	.....	Agana, docking end; range, 60 ft.
3	S66-54890	S66-54847	1	Sept. 12, 1966	16:05	.....	Agana, side view; range, 25 ft.
4	S66-54891	S66-54848	1	Sept. 12, 1966	16:08	.....	Agana, side view; range, 35 ft.
5	S66-54892	S66-54849	1	Sept. 12, 1966	16:10	.....	Agana, side view; range, 75 ft.
6	S66-54893	S66-54850	26	Sept. 14, 1966	07:24	225	United Arab Republic, Israel, Saudi Arabia, Jordan, Lebanon, Syria, Iraq: fire on Trans-Arabian pipeline.
7	S66-54894	S66-54851	26	Sept. 14, 1966	.....	.....	Blank.
8	<i>S66-54895</i>	<i>S66-54852</i>	<i>26</i>	<i>Sept. 14 1966</i>	<i>07:26</i>	<i>249</i>	<i>United Arab Republic, Saudi Arabia: Lunayyir lava field, northern Red Sea.</i>
9	S66-54896	S66-54853	26	Sept. 14, 1966	07:28	290	Saudi Arabia: Near Ar Riyad.
10	S66-54897	S66-54854	26	Sept. 14, 1966	07:29	298	Saudi Arabia, Trucial States, Oman and Muscat: Empty Quarter, Iran, West Pakistan in background.



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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
11	S66-54898	S66-54855	26	Sept. 14, 1966	07:29	306	Arabian Sea: West Pakistan, India in background.
12	S66-54899	S66-54856	26	Sept. 14, 1966	07:29	.....	Image degraded because of window obscuration.
13	S66-54900	S66-54857	26	Sept. 14, 1966	07:33	365	India: Gulf of Kutch, Gulf of Cambay.
14	S66-54901	S66-54858	26	Sept. 14, 1966	07:35	396	India, Ceylon: Laccadive Islands, Arabian Sea.
15	S66-54902	S66-54859	26	Sept. 14, 1966	07:36	420	India: Mysore, Pradesh, Madras and Kerala States.
16	S66-54903	S66-54860	26	Sept. 14, 1966	07:37	435	India: central and northern portions; Tibet on horizon.
17	S66-54904	S66-54861	26	Sept. 14, 1966	07:37	438	India, south from Hyderabad, part of Ceylon: Bay of Bengal.
18	S66-54905	S66-54862	26	Sept. 14, 1966	07:37	440	India, South from Hyderabad, part of Ceylon: Bay of Bengal.
19	S66-54906	S66-54863	26	Sept. 14, 1966	07:37	444	India, southern and eastern portion, part of Ceylon: Bay of Bengal, Himalayas, Tibet on horizon.
20	S66-54907	S66-54864	26	Sept. 14, 1966	07:39	485	Indian Ocean: Clouds.
21	S66-54908	S66-54865	26	Sept. 14, 1966	07:39	492	Indian Ocean: Clouds.
22	S66-54909	S66-54866	26	Sept. 14, 1966	07:44	553	Sumatra, Malaya: Clouds.
23	S66-54910	S66-54867	26	Sept. 14, 1966	07:44	563	Sumatra, Malaya: Clouds.
24	S66-54911	S66-54868	26	Sept. 14, 1966	07:46	596	Sumatra, Java, Borneo: Clouds.
25	S66-54912	S66-54869	26	Sept. 14, 1966	07:47	607	Sumatra, Java, Borneo, Celebes: Clouds.
26	S66-54913	S66-54870	26	Sept. 14, 1966	07:47	612	Sumatra, Java, Borneo: Clouds.
27	S66-54914	S66-54871	26	Sept. 14, 1966	07:48	620	Sumatra, Java, Borneo, Celebes: clouds.
28	S66-54915	S66-54872	26	Sept. 14, 1966	07:48	628	Java, Bali, Lombok.
29	S66-54916	S66-54873	26	Sept. 14, 1966	07:49	638	Java, Bali, Lombok.
30	S66-54917	S66-54874	26	Sept. 14, 1966	07:49	648	Java, Bali, Lombok, Sumbawa.
31	S66-54918	S66-54875	26	Sept. 14, 1966	07:53	682	Western Australia: Eighty Mile Beach to Admiralty Gulf; Great Sandy Desert.
32	S66-54919	S66-54876	26	Sept. 14, 1966	07:53	684	Western Australia: Eighty Mile Beach to Joseph Bonaparte Gulf; Kimberley Plateau, Great Sandy Desert.
33	S66-54920	S66-54877	26	Sept. 14, 1966	07:53	686	Western Australia: Eighty Mile Beach to Joseph Bonaparte Gulf; Kimberley Plateau, Great Sandy Desert.
34	S66-54921	S66-54878	26	Sept. 14, 1966	07:53	688	Western Australia: Eighty Mile Beach to Joseph Bonaparte Gulf; Kimberley Plateau, Great Sandy Desert.
35	S66-54922	S66-54879	26	Sept. 14, 1966	.....	.....	Blank.
36	S66-54923	S66-54880	26	Sept. 14, 1966	07:53	690	Western Australia: Eighty Mile Beach to Joseph Bonaparte Gulf; Kimberley Plateau, Great Sandy Desert.
37	S66-54924	S66-54881	26	Sept. 14, 1966	07:54	691	Western Australia: Eighty Mile Beach to Joseph Bonaparte Gulf; Kimberley Plateau, Great Sandy Desert.
38	S66-54925	S66-54882	26	Sept. 14, 1966	07:54	694	Western Australia, Northern Territory: King Sound to Gulf of Carpentaria.
39	S66-54926	S66-54883	26	Sept. 14, 1966	07:54	697	Timor Sea, Indonesian Islands, Timor to Java, Borneo and Celebes: Scott Reef, Bonaparte Archipelago; clouds.
40	S66-54927	S66-54884	26	Sept. 14, 1966	07:55	699	Western Australia, Northern Territory: Roebuck Bay to Darwin; Kimberley Plateau.
41	S66-54928	S66-54885	26	Sept. 14, 1966	07:55	701	Western Australia, Northern Territory: Roebuck Bay to Darwin; Kimberley Plateau.
42	S66-54929	S66-54886	26	Sept. 14, 1966	07:55	703	Western Australia, Northern Territory: Roebuck Bay to Darwin; Kimberley Plateau.
43	S66-54930	S66-54887	26	Sept. 14, 1966	07:55	704	Western Australia, Northern Territory: King Sound to Van Diemen Gulf; Kimberley Plateau.

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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-54652	S66-54589	16	Sept. 13, 1966	16:27	.....	Inside spacecraft, Lt. Comdr. Gordon's hand, helmet; hatch open preparing for used equipment jettison.
2	S66-54653	S66-54590	16	Sept. 13, 1966	16:27	.....	Inside spacecraft, hatch open; Lt. Comdr. Gordon prepares for used equipment jettison.
3	S66-54654	S66-54591	16	Sept. 13, 1966	16:27	.....	Inside spacecraft, hatch open; Lt. Comdr. Gordon prepares for used equipment jettison.
4	S66-54655	S66-54592	.....	Sept. 13, 1966	.....	.....	Blank.
5	S66-54656	S66-54593	16	Sept. 13, 1966	16:29	.....	Agena, nose of Gemini through open hatch.
6	S66-54657	S66-54594	16	Sept. 13, 1966	16:29	.....	Tether line, patch on Lt. Comdr. Gordon's shoulder, through open hatch.
7	S66-54658	S66-54595	.....	Sept. 13, 1966	.....	.....	Blank.
8	S66-54659	S66-54596	18	Sept. 13, 1966	18:25	.....	L-band antenna, overexposed.
9	S66-54660	S66-54597	18	Sept. 13, 1966	18:25	.....	L-band antenna, overexposed.
10	S66-54661	S66-54598	18	Sept. 13, 1966	18:25	.....	L-band antenna, overexposed.
11	S66-54662	S66-54599	26	Sept. 14, 1966	07:24	231	United Arab Republic, Israel, Jordan: Nile Valley, Sinai Peninsula; image degraded because of window obscuration.
12	S66-54663	S66-54600	26	Sept. 14, 1966	07:25	237	United Arab Republic, Saudi Arabia, Israel, Jordan: Nile Valley, Red Sea; image degraded because of window obscuration.
13	S66-54664	S66-54601	26	Sept. 14, 1966	07:26	251	United Arab Republic, Saudi Arabia, Israel, Jordan: Foul Bay, Al Hijaz area.
14	S66-54665	S66-54602	26	Sept. 14, 1966	07:28	288	Saudi Arabia: Mecca, Medina; Nafud Desert, fire on Trans-Arabian pipeline.
15	S66-54666	S66-54603	26	Sept. 14, 1966	07:29	296	Saudi Arabia, Qatar, Bahrain, Kuwait, Iraq, Iran: Empty Quarter; image degraded because of window obscuration.
16	S66-54667	S66-54604	26	Sept. 14, 1966	07:29	307	Saudi Arabia, Trucial States, Muscat and Oman: Iran and West Pakistan in background; image degraded because of window obscuration.
17	S66-54668	S66-54605	26	Sept. 14, 1966	07:30	315	Saudi Arabia, Muscat and Oman: Iran, West Pakistan in background.
18	S66-54669	S66-54606	26	Sept. 14, 1966	07:30	318	Saudi Arabia, Muscat and Oman: Iran, West Pakistan, India in background.
19	S66-54670	S66-54607	26	Sept. 14, 1966	07:32	343	Muscat and Oman: Arabian Sea; Iran, West Pakistan, India in background.
20	S66-54671	S66-54608	26	Sept. 14, 1966	07:33	370	Arabian Sea, West Pakistan, India: Indus valley, Gulf of Kutch, Gulf of Cambay.
21	S66-54672	S66-54609	26	Sept. 14, 1966	07:34	387	Arabian Sea, Laccadive Islands, India, Ceylon.
22	S66-54673	S66-54610	26	Sept. 14, 1966	07:35	405	Arabian Sea, Laccadive Islands, India, Ceylon.
23	S66-54674	S66-54611	26	Sept. 14, 1966	07:36	417	Arabian Sea, Laccadive Islands, India, Ceylon, Bay of Bengal.
24	S66-54675	S66-54612	26	Sept. 14, 1966	07:36	423	India, Ceylon, Arabian Sea, Bay of Bengal.
25	S66-54676	S66-54613	26	Sept. 14, 1966	07:36	429	India, Ceylon, Arabian Sea, Bay of Bengal.
26	S66-54677	S66-54614	26	Sept. 14, 1966	07:37	441	India, Ceylon, Arabian Sea, Bay of Bengal.
27	S66-54678	S66-54615	26	Sept. 14, 1966	07:37	448	India, Ceylon, Bay of Bengal.
28	S66-54679	S66-54616	26	Sept. 14, 1966	07:38	454	India, Ceylon: Image degraded because of window obscuration.
29	S66-54680	S66-54617	26	Sept. 14, 1966	07:38	460	India, Ceylon, Arabian Sea, Bay of Bengal: Image degraded because of window obscuration.
30	S66-54681	S66-54618	26	Sept. 14, 1966	07:39	480	Ceylon, Indian Ocean, Sumatra: Southeast Asia on horizon.
31	S66-54682	S66-54619	26	Sept. 14, 1966	07:40	489	Southwest tip of Ceylon, Indian Ocean, Sumatra: Southeast Asia on horizon.
32	S66-54683	S66-54620	26	Sept. 14, 1966	07:41	502	Indian Ocean, Sumatra.
33	S66-54684	S66-54621	26	Sept. 14, 1966	07:42	520	Indian Ocean, Sumatra.



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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
34	S66-54685	S66-54622	26	Sept. 14, 1966	07:43	537	Sumatra, Java: Borneo on horizon.
35	<i>S66-54686</i>	<i>S66-54623</i>	26	<i>Sept. 14, 1966</i>	<i>07:44</i>	<i>553</i>	<i>Sumatra, Java: Borneo on horizon.</i>
36	S66-54687	S66-54624	26	Sept. 14, 1966	07:45	569	Sumatra, Java, Borneo.
37	S66-54688	S66-54625	26	Sept. 14, 1966	07:46	585	Sumatra, Java, Borneo.
38	S66-54689	S66-54626	26	Sept. 14, 1966	07:47	600	Sumatra, Java, Borneo.
39	S66-54690	S66-54627	26	Sept. 14, 1966	07:48	614	Sumatra, Java-to-Timor chain, Borneo, Celebes.
40	<i>S66-54691</i>	<i>S66-54628</i>	26	<i>Sept. 14, 1966</i>	<i>07:48</i>	<i>623</i>	<i>Sumatra, Java-to-Timor chain, Borneo, Celebes.</i>
41	S66-54692	S66-54629	26	Sept. 14, 1966	07:49	633	Java-to-Timor chain, Borneo, Celebes, Sumatra, tip of Western Australia, Northern Territory.
42	S66-54693	S66-54630	26	Sept. 14, 1966	07:50	641	Java-to-Timor chain, Borneo, Celebes, Sumatra, tip of Western Australia, Northern Territory.
43	S66-54694	S66-54631	26	Sept. 14, 1966	07:51	657	Java-to-Timor chain, Borneo, Celebes, Sumatra, tip of Western Australia, Northern Territory.
44	S66-54695	S66-54632	26	Sept. 14, 1966	07:52	669	Java-to-Timor chain, Borneo, Celebes, Western Australia, Northern Territory.
45	S66-54696	S66-54633	26	Sept. 14, 1966	07:52	674	Java-to-Timor chain, Borneo, Celebes, Western Australia, Northern Territory.
46	S66-54697	S66-54634	26	Sept. 14, 1966	07:52	678	Western Australia, Northern Territory: Eighty Mile Beach to Darwin; Celebes, Bali-to-Timor chain in background.
47	S66-54698	S66-54635	26	Sept. 14, 1966	07:53	681	Western Australia, Northern Territory: Eighty Mile Beach to Darwin; Celebes, Bali-to-Timor chain in background.
48	S66-54699	S66-54636	26	Sept. 14, 1966	07:53	685	Western Australia, Northern Territory: Eighty Mile Beach to Darwin; Celebes, Bali-to-Timor chain in background.
49	<i>S66-54700</i>	<i>S66-54637</i>	26	<i>Sept. 14, 1966</i>	<i>07:54</i>	<i>693</i>	<i>Western Australia, Northern Territory: Eighty Mile Beach to Darwin; Celebes, Sumba-to-Timor chain in background.</i>
50	S66-54701	S66-54638	26	Sept. 14, 1966	07:54	696	Western Australia, Northern Territory, Eighty Mile Beach to Darwin; Celebes, Sumba-to-Timor chain in background.
51	S66-54702	S66-54639	26	Sept. 14, 1966	07:57	720	Out of focus because of window obscuration.
52	S66-54703	S66-54640	26	Sept. 14, 1966	07:58	722	Australia: western half, Perth to Darwin.
53	S66-54704	S66-54641	26	Sept. 14, 1966	07:58	724	Australia: western half, Perth to Darwin.
54	S66-54705	S66-54642	26	Sept. 14, 1966	07:58	726	Australia: northwest quarter, Broome to Gulf of Carpentaria.
55	S66-54706	S66-54643	26	Sept. 14, 1966	07:59	728	Australia: western half, Perth to Gulf of Carpentaria.
56	S66-54707	S66-54644	26	Sept. 14, 1966	08:04	740	Terminator at sunset, seen from east coast of Australia.
57	S66-54708	S66-54645	26	Sept. 14, 1966	08:04	740	Terminator at sunset, seen from east coast of Australia.
58	S66-54709	S66-54646	26	Sept. 14, 1966	08:05	740	Terminator at sunset, seen from east coast of Australia.
59	S66-54710	S66-54647	26	Sept. 14, 1966	08:05	741	Terminator at sunset, seen from east coast of Australia.
60	S66-54711	S66-54648	26	Sept. 14, 1966	08:06	741	Terminator at sunset, seen from east coast of Australia.
61	S66-54712	S66-54649	26	Sept. 14, 1966	08:06	741.5	Terminator at sunset, seen from east coast of Australia; record high apogee.
62	S66-54713	S66-54650	26	Sept. 14, 1966	08:06	741	Terminator at sunset, seen from east coast of Australia.
63	S66-54714	S66-54651	26	Sept. 14, 1966	08:07	741	Terminator at sunset, seen from east coast of Australia.

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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-54764	S66-54715	27	Sept. 14, 1966	09:02	186	Morocco, Ifni: Agadir, Cape Rhir, Atlas and Anti-Atlas Mountains.
2	S66-54765	S66-54716	27	Sept. 14, 1966	09:02	190	Morocco, Ifni, Algeria: Agadir, Cape Rhir, Atlas and Anti-Atlas Mountains.
3	S66-54766	S66-54717	27	Sept. 14, 1966	09:03	195	Morocco, Algeria: Hamada du Dra, Erg Iguidi, Anti-Atlas Mountains.
4	S66-54767	S66-54718	27	Sept. 14, 1966	09:03	202	Algeria: Erg Iguidi, Erg er Raoui, Oued Saoura.
5	S66-54768	S66-54719	27	Sept. 14, 1966	09:04	206	Algeria: Erg Chech, Oued Saoura, Tademait Plateau.
6	S66-54769	S66-54720	27	Sept. 14, 1966	09:04	212	Algeria: Ain Salah; Erg Chech, Tademait Plateau, Tidikelt region.
7	S66-54770	S66-54721	27	Sept. 14, 1966	09:05	219	Algeria: Ain Salah; Tademait Plateau, Tidikelt region.
8	S66-54771	S66-54722	27	Sept. 14, 1966	09:05	223	Algeria; Tidikelt region, Ajjer Plateau, Irrarene Dunes.
9	S66-54772	S66-54723	27	Sept. 14, 1966	09:05	231	Algeria, Libya: Ajjer Plateau, Irrarene Dunes, Telu Basalt.
10	S66-54773	S66-54724	27	Sept. 14, 1966	09:06	237	Algeria, Libya: Ghat; Ajjer Plateau, Mellet Plateau.
11	S66-54774	S66-54725	27	Sept. 14, 1966	09:06	246	Algeria, Libya: Ghat; Ajjer Plateau, Mellet Plateau, Marzuq Sand Plain.
12	S66-54775	S66-54726	27	Sept. 14, 1966	09:09	274	Libya: Northern Tibesti Mountains, Rebiana Sand Sea, Jebel Tarhuni.
13	S66-54776	S66-54727	27	Sept. 14, 1966	09:11	302	Libya, United Arab Republic, Sudan: Libyan Desert, Jebel Arkenu, Jebel Uweinat, Gilf Kebir Plateau.
14	S66-54777	S66-54728	27	Sept. 14, 1966	09:12	321	United Arab Republic, Sudan: Dongola, Wadi Halfa; Great Bend of the Nile River, Nubian Desert.
15	S66-54778	S66-54729	27	Sept. 14, 1966	09:13	331	United Arab Republic, Sudan: Dongola, Wadi Halfa, Merowe; Great Bend of the Nile River, Nubian Desert, Dungunab Bay on Red Sea.
16	S66-54779	S66-54730	27	Sept. 14, 1966	09:13	347	Sudan, Ethiopia, Saudi Arabia: Atbara, Port Sudan, Kassala; Nile and Atbara Rivers, Red Sea.
17	S66-54780	S66-54731	27	Sept. 14, 1966	09:14	355	Sudan, Ethiopia, Saudi Arabia: Kassala, Asmara; Atbara River, Red Sea, Dahlak Archipelago, Farasan Islands.
18	S66-54781	S66-54732	27	Sept. 14, 1966	09:15	362	Sudan, Ethiopia, Saudi Arabia, Yemen: Kassala, Asmara; Red Sea, Dahlak Archipelago, Farasan Islands.
19	S66-54782	S66-54733	27	Sept. 14, 1966	09:15	374	Ethiopia, Saudi Arabia, Yemen: Asmara, Assab; Red Sea, Dahlak Archipelago, Farasan Islands.
20	S66-54783	S66-54734	27	Sept. 14, 1966	09:16	392	Ethiopia, French Somaliland, Somali Republic, Yemen, South Arabia: Assab, Djibouti, Aden; Lake Abbe, Red Sea, Gulf of Aden, Mandab Gate.
21	S66-54784	S66-54735	27	Sept. 14, 1966	09:17	403	Ethiopia, French Somaliland, Somali Republic, Yemen, South Arabia: Djibouti, Berbera, Aden; Mandab Gate, Gulf of Aden.
22	S66-54785	S66-54736	27	Sept. 14, 1966	09:17	418	Ethiopia, Somali Republic, South Arabia: Gulf of Aden, Ras Hafun, Indian Ocean.
23	S66-54786	S66-54737	27	Sept. 14, 1966	09:18	433	Ethiopia, Somali Republic: Gulf of Aden, Ras Hafun, Indian Ocean.
24	S66-54787	S66-54738	27	Sept. 14, 1966	09:19	455	Indian Ocean, clouds.
25	S66-54788	S66-54739	27	Sept. 14, 1966	09:20	470	Indian Ocean, clouds.
26	S66-54789	S66-54740	27	Sept. 14, 1966	09:22	502	Maldives Islands, Indian Ocean; clouds.
27	S66-54790	S66-54741	27	Sept. 14, 1966	09:22	510	Maldives Islands, Indian Ocean; clouds.
28	S66-54791	S66-54742	27	Sept. 14, 1966	09:23	521	Maldives Islands, Indian Ocean; clouds.



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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
29	S66-54792	S66-54743	27	Sept. 14, 1966	09:23	530	Maldiv Islands, Indian Ocean, coast of India; clouds.
30	<i>S66-54793</i>	<i>S66-54744</i>	27	<i>Sept. 14, 1966</i>	<i>09:24</i>	538	<i>Maldiv Islands, India, Ceylon, Indian Ocean; clouds.</i>
31	S66-54794	S66-54745	27	Sept. 14, 1966	09:24	547	Maldiv Islands, India, Ceylon, Indian Ocean; clouds.
32	S66-54795	S66-54746	27	Sept. 14, 1966	09:33	670	Clouds over Indian Ocean.
33	S66-54796	S66-54747	27	Sept. 14, 1966	09:34	678	Clouds over Indian Ocean.
34	S66-54797	S66-54748	27	Sept. 14, 1966	09:35	690	Clouds over Indian Ocean.
35	S66-54798	S66-54749	27	Sept. 14, 1966	09:36	696	Clouds over Indian Ocean.
36	S66-54799	S66-54750	27	Sept. 14, 1966	09:37	705	Clouds over Indian Ocean; west coast of Australia on horizon.
37	S66-54800	S66-54751	27	Sept. 14, 1966	09:40	725	Australia: west coast, North West Cape and Shark Bay; clouds over Indian Ocean.
38	S66-54801	S66-54752	27	Sept. 14, 1966	09:42	734	Terminator in eastern Australia.
39	S66-54802	S66-54753	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini; sky background.
40	S66-54803	S66-54754	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini; sky background.
41	S66-54804	S66-54755	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini; sky background.
42	S66-54805	S66-54756	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini; sunlit cloud tops, background.
43	S66-54806	S66-54757	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini, TDA down; Pacific Ocean off Mexico, clouds.
44	S66-54807	S66-54758	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini, TDA down; Pacific Ocean off Mexico, clouds.
45	S66-54808	S66-54759	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini, TDA down; Pacific Ocean off Mexico, clouds.
46	S66-54809	S66-54760	31	Sept. 14, 1966	.....	.....	Agena tethered to Gemini, TDA down; Pacific Ocean off Mexico, clouds.
47	S66-54810	S66-54761	31	Sept. 14, 1966	16:48	157	Agena tethered to Gemini, over Mexico: Gulf of California, Baja California at La Paz, Sinaloa near Los Mochis.
48	S66-54811	S66-54762	31	Sept. 14, 1966	16:50	157	Agena tethered to Gemini, over Mexico; Fresno, Zacatecas area.
49	S66-54812	S66-54763	31	Sept. 14, 1966	16:50	157	Agena tethered to Gemini, over Mexico; Fresno, Zacatecas, Aguascalientes area.

## MAGAZINE 9

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	.....	.....	.....	.....	.....	.....	Blank.
2	S66-54523	S66-54457	27	Sept. 14, 1966	09:03	201	Algeria, Morocco, Mauritania: Erg Iguidi, Atlas Mountains; image degraded because of window obscuration.
3	S66-54524	S66-54458	27	Sept. 14, 1966	09:05	218	Algeria: Tidikelt region, Tademaït Plateau, Grand Erg Occidental; image degraded because of window obscuration.
4	<i>S66-54525</i>	<i>S66-54459</i>	27	<i>Sept. 14, 1966</i>	<i>09:06</i>	236	<i>Algeria, Libya, Niger, Chad: Ajjer Plateau, Marzuq Sand Plain, the Black Haruj; Gulf of Sirte in background.</i>
5	S66-54526	S66-54460	27	Sept. 14, 1966	09:06	239	Libya, Niger, Chad: Ajjer Plateau, Marzuq Sand Plain, The Black Haruj, Gulf of Sirte in background.
6	S66-54527	S66-54461	27	Sept. 14, 1966	09:07	250	Libya, Niger, Chad: Marzuq Sand Plain, The Black Haruj, Tibesti Mountains, Mediterranean coast in background.
7	S66-54528	S66-54462	27	Sept. 14, 1966	09:09	272	Libya, Chad, United Arab Republic, Sudan: Northern Tibesti Mountains, sand seas and gravel plains of eastern Sahara.

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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
8	S66-54529	S66-54463	27	Sept. 14, 1966	09:10	285	Libya, United Arab Republic, Sudan: sand seas and gravel plains of eastern Sahara.
9	S66-54530	S66-54464	27	Sept. 14, 1966	09:11	307	United Arab Republic, Sudan: Western Desert, Nile River, Red Sea; Saudi Arabia in background.
10	S66-54531	S66-54465	27	Sept. 14, 1966	09:12	327	United Arab Republic, Sudan: Nile River, Nubian Desert, Red Sea; Saudi Arabia in background.
11	S66-54532	S66-54466	27	Sept. 14, 1966	09:13	341	Sudan, Ethiopia, French Somaliland, Somali Republic, Saudi Arabia, Yemen, South Arabia: Lake Tana, Red Sea, Gulf of Aden.
12	S66-54533	S66-54467	27	Sept. 14, 1966	09:14	353	Sudan, Ethiopia, French Somaliland, Somali Republic, Saudi Arabia, Yemen, South Arabia: Lake Tana, Red Sea, Gulf of Aden.
13	S66-54534	S66-54468	27	Sept. 14, 1966	09:14	357	Sudan, Ethiopia, French Somaliland, Somali Republic, Saudi Arabia, Yemen, South Arabia: Lake Tana, Red Sea, Gulf of Aden.
14	S66-54535	S66-54469	27	Sept. 14, 1966	09:15	368	Ethiopia, French Somaliland, Somali Republic, Saudi Arabia, Yemen, South Arabia: Red Sea, Gulf of Aden.
15	S66-54536	S66-54470	27	Sept. 14, 1966	09:15	379	Ethiopia, French Somaliland, Somali Republic, Saudi Arabia, Yemen, South Arabia: Red Sea, Gulf of Aden.
16	S66-54537	S66-54471	27	Sept. 14, 1966	09:16	385	Ethiopia, French Somaliland, Somali Republic, Saudi Arabia, Yemen, South Arabia: Red Sea, Gulf of Aden.
17	S66-54538	S66-54472	27	Sept. 14, 1966	09:17	408	Ethiopia, Somali Republic, Saudi Arabia, South Arabia: Gulf of Aden, Arabian Sea, Indian Ocean.
18	S66-54539	S66-54473	27	Sept. 14, 1966	09:18	421	Ethiopia, Somali Republic, South Arabia: Gulf of Aden, Arabian Sea, Indian Ocean.
19	S66-54540	S66-54474	27	Sept. 14, 1966	09:21	473	Arabian Sea, Indian Ocean, tip of India and Ceylon on horizon.
20	S66-54541	S66-54475	27	Sept. 14, 1966	09:22	487	Indian Ocean, southern India, Ceylon, Maldives Islands.
21	S66-54542	S66-54476	27	Sept. 14, 1966	09:22	495	Indian Ocean, southern India, Ceylon, Maldives Islands.
22	S66-54543	S66-54477	27	Sept. 14, 1966	09:23	504	Indian Ocean, southern India, Ceylon, Maldives Islands.
23	S66-54544	S66-54478	27	Sept. 14, 1966	09:23	512	Indian Ocean, southern India, Ceylon, Maldives Islands.
24	S66-54545	S66-54479	27	Sept. 14, 1966	09:24	516	Indian Ocean, Ceylon.
25	S66-54546	S66-54480	27	Sept. 14, 1966	09:35	681	Indian Ocean, west of Australia.
26	S66-54547	S66-54481	27	Sept. 14, 1966	09:36	688	Indian Ocean, west of Australia.
27	S66-54548	S66-54482	27	Sept. 14, 1966	09:37	693	Indian Ocean, west of Australia.
28	S66-54549	S66-54483	27	Sept. 14, 1966	09:38	699	Indian Ocean, western Australia on horizon.
29	S66-54550	S66-54484	27	Sept. 14, 1966	09:38	707	Indian Ocean, western Australia; Northwest Cape on horizon.
30	S66-54551	S66-54485	27	Sept. 14, 1966	09:39	715	Indian Ocean, western Australia; Northwest Cape on horizon.
31	S66-54552	S66-54486	27	Sept. 14, 1966	09:40	726	Indian Ocean, Western Australia; Shark Bay in background.
32	S66-54553	S66-54487	27	Sept. 14, 1966	09:40	730	Indian Ocean, Western Australia; Shark Bay in background.
33	S66-54554	S66-54488	29	Sept. 14, 1966	12:57	.....	Standup EVA, hatch open; L-band antenna, hatch door, 70-mm (Blue) Maurer, UV camera.
34	S66-54555	S66-54489	29	Sept. 14, 1966	13:02	.....	Standup EVA, hatch open; docked Agena clearly seen.
35	S66-54556	S66-54490	29	Sept. 14, 1966	13:38	156	Clouds over Mexico at sunrise.
36	S66-54557	S66-54491	29	Sept. 14, 1966	13:38	156	Clouds over Mexico at sunrise.



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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
37	S66-54558	S66-54492	29	Sept. 14, 1966	13:38	156	Texas, Mexico: Rio Grande, Big Bend area, Del Rio, Eagle Pass, gulf coast; near sunrise, dark.
38	S66-54559	S66-54493	29	Sept. 14, 1966	13:39	156	Texas, Mexico: Del Rio to Corpus Christi, gulf coast to New Orleans; near sunrise, dark.
39	<i>S66-54560</i>	<i>S66-54494</i>	29	<i>Sept. 14, 1966</i>	<i>13:40</i>	<i>156</i>	<i>Texas, gulf coast: San Antonio Bay to Mobile, Galveston Bay, Houston; industrial smoke, contrails.</i>
40	S66-54561	S66-54495	29	Sept. 14, 1966	13:40	156	Texas, Louisiana, gulf coast: Galveston to Mobile, Houston, Beaumont, Mississippi Delta.
41	S66-54562	S66-54496	29	Sept. 14, 1966	13:41	156	Louisiana, Alabama: gulf coast, White Lake to Mobile, New Orleans, mouth of Mississippi.
42	S66-54563	S66-54497	29	Sept. 14, 1966	13:42	156	Louisiana, Alabama, Florida: gulf coast, Grand Isle to Apalachicola, New Orleans, mouth of Mississippi.
43	S66-54564	S66-54498	29	Sept. 14, 1966	13:42	157	Florida: Gulf coast and Atlantic coast, north of Tampa; image blurred.
44	S66-54565	S66-54499	29	Sept. 14, 1966	13:43	157	Florida, Georgia: Gulf and Atlantic coasts, from Sarasota-Fort Pierce to north of Jacksonville; clouds, dark.
45	S66-54566	S66-54500	29	Sept. 14, 1966	13:43	157	Florida, Georgia: Gulf and Atlantic coasts, from Sarasota-Fort Pierce to north of Jacksonville; clouds, dark.
46	S66-54567	S66-54501	29	Sept. 14, 1966	13:43	157	Florida, Georgia: Gulf and Atlantic coasts from Tampa-Fort Pierce to north of Jacksonville; clouds, dark.
47	S66-54568	S66-54502	29	Sept. 14, 1966	13:43	157	Florida: Tampa-Fort Pierce-Jacksonville; clouds, dark.
48	S66-54569	S66-54503	29	Sept. 14, 1966	13:44	157	Florida: Cape Kennedy; very dark, last photo taken during standup EVA.
49	S66-54570	S66-54504	32	Sept. 14, 1966	18:12	.....	Agna tethered to Gemini XI; ocean, clouds, atolls.
50	<i>S66-54571</i>	<i>S66-54505</i>	32	<i>Sept. 14, 1966</i>	<i>18:12</i>	.....	<i>Agna tethered to Gemini XI; ocean, clouds, atolls.</i>
51	S66-54572	S66-54506	32	Sept. 14, 1966	18:22	.....	Agna tethered to Gemini XI; black sky background.
52	S66-54573	S66-54507	32	Sept. 14, 1966	18:22	.....	Agna tethered to Gemini XI; black sky background.
53	S66-54574	S66-54508	32	Sept. 14, 1966	18:23	.....	Agna tethered to Gemini XI; black sky background.
54	S66-54575	S66-54509	32	Sept. 14, 1966	18:23	.....	Agna tethered to Gemini XI; black sky background.
55	S66-54576	S66-54510	32	Sept. 14, 1966	18:24	.....	Agna tethered to Gemini XI; black sky background.
56	S66-54577	S66-54511	32	Sept. 14, 1966	18:24	.....	Agna tethered to Gemini XI; black sky background.
57	S66-54578	S66-54512	32	Sept. 14, 1966	18:25	.....	Agna tethered to Gemini XI; black sky background.
58	S66-54579	S66-54513	33	Sept. 14, 1966	19:52	.....	Agna (side view), tether line loose; range, 65 ft.
59	S66-54580	S66-54514	33	Sept. 14, 1966	19:53	.....	Agna (side view), tether line loose; range, 75 ft.
60	S66-54581	S66-54515	34	Sept. 14, 1966	21:12	156	Typhoon Elsie, southeast of Japan.
61	S66-54582	S66-54516	42	Sept. 15, 1966	09:13	.....	Agna, sky background; range, 250 ft; rendezvous sequence.
62	S66-54583	S66-54517	42	Sept. 15, 1966	09:14	.....	Agna, sky background; range, 300 ft; out of focus.
63	S66-54584	S66-54518	42	Sept. 15, 1966	09:17	.....	Agna, docking cone end, tether line loose; range, 90 ft; Lake Chad, Chari River in background.
64	S66-54585	S66-54519	42	Sept. 15, 1966	09:20	.....	Agna, side view, tether line loose; range, 80 ft; over East Africa.

## MAGAZINE 9 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
65	S66-54586	S66-54520	42	Sept. 15, 1966	09:21	.....	Agena, side view, tether line loose; range, 90 ft; over East Africa.
66	S66-54587	S66-54521	42	Sept. 15, 1966	09:22	.....	Agena, side view, tether line loose; range, 95 ft; over East Africa.
67	S66-54588	S66-54522	42	Sept. 15, 1966	09:22	.....	Agena, side view, tether line loose; range, 100 ft; over East Africa.

## MAGAZINE 12

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-54829	S66-54813	33	Sept. 14, 1966	19:51	.....	Agena on tether line.
2	S66-54830	S66-54814	33	Sept. 14, 1966	19:53	.....	Agena at time of tether drop; range, 50 ft.
3	S66-54831	S66-54815	34	Sept. 14, 1966	20:14	165	Peru: Fog-shrouded coastline from Punta Chala to Rio Ocona, western slope of Andes.
4	<i>S66-54832</i>	<i>S66-54816</i>	<i>34</i>	<i>Sept. 14, 1966</i>	<i>20:15</i>	<i>165</i>	<i>Peru: Arequipa; fog-shrouded coastline from Rio Atico to Rio Tambo; Laguna Salinas, Volcano Misti, Nevado Chachani.</i>
5	S66-54833	S66-54817	34	Sept. 14, 1966	20:15	165	Peru: Arequipa; fog-shrouded coastline from Punta Chala to Rio Tambo; Laguna Salinas, Volcano Misti, Nevado Chachani.
6	S66-54834	S66-54818	34	Sept. 14, 1966	20:16	165	Peru, Chile, Bolivia: La Paz beneath clouds; Lake Titicaca, Rio Desaguadero, Cordillera Real.
7	S66-54835	S66-54819	34	Sept. 14, 1966	20:17	165	Bolivia: Sucre, Santa Cruz; Cordillera Oriental, Rio Grande, Rio Parapeti.
8	S66-54836	S66-54820	34	Sept. 14, 1966	20:17	165	Bolivia, Paraguay: Gran Chaco, edge of Cordillera Oriental, Rio Grande, Rio Parapeti; hazy.
9	S66-54837	S66-54821	35	Sept. 14, 1966	22:48	155	Typhoon Elsie, southeast of Japan; out of focus.
10	S66-54838	S66-54822	35	Sept. 14, 1966	22:48	155	Typhoon Elsie, southeast of Japan; out of focus.
11	S66-54839	S66-54823	37	Sept. 15, 1966	01:44	156	West Pakistan, India, China: Himalayas, Hindu Kush, Karakoram Range, Sinkiang Desert, Indus River.
12	<i>S66-54840</i>	<i>S66-54824</i>	<i>37</i>	<i>Sept. 15, 1966</i>	<i>01:49</i>	<i>156</i>	<i>East Pakistan, India, Bhutan, Sikkim: Himalayas, Mount Everest, Brahmaputra River, Tibetan Highlands, Ganges Plain in background.</i>
13	S66-54841	S66-54825	40	Sept. 15, 1966	06:45	162	Western Australia: Eighty Mile Beach, Great Sandy Desert, Percival Lakes and Lake Disappointment, Fitzroy River.
14	S66-54842	S66-54826	.....	.....	.....	.....	Agena, side view, range, 70 ft.
15	S66-54843	S66-54827	.....	.....	.....	.....	Blank.
16	S66-54844	S66-54828	.....	.....	.....	.....	Agena, side view; range, 200 ft.



GEMINI XII  
MAGAZINE 8

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-63386	S66-63236	1	Nov. 11, 1966	22:19	124	Mexico: Monterrey-Salttillo-Torreón area; Sierra Madre Oriental Gulf coastal plain.
2	S66-63387	S66-63237	3	Nov. 12, 1966	.....	.....	Agena station keeping; range, 15 ft.
3	S66-63388	S66-63238	3	Nov. 12, 1966	.....	.....	Agena station keeping; range, 15 ft.
4	S66-63389	S66-63239	3	Nov. 12, 1966	.....	.....	Agena station keeping; range, 15 ft.
5	S66-63390	S66-63240	3	Nov. 12, 1966	00:55	156	Agena station keeping; range, 50 ft; Borneo, Philippine Islands; Sulu Archipelago.
6	S66-63391	S66-63241	3	Nov. 12, 1966	00:55	156	Agena station keeping; range, 50 ft; Borneo, Philippine Islands; Sulu Archipelago.
7	S66-63392	S66-63242	3	Nov. 12, 1966	00:55	156	Agena station keeping; range, 50 ft; Borneo, Philippine Islands; Sulu Archipelago.
8	S66-63393	S66-63243	3	Nov. 12, 1966	00:55	156	Agena station keeping; range, 50 ft; Borneo, Philippine Islands; Sulu Archipelago.
9	S66-63394	S66-63244	3	Nov. 12, 1966	00:55	156	Agena station keeping; range, 50 ft; Borneo, Philippine Islands; Sulu Archipelago.
10	S66-63395	S66-63245	3	Nov. 12, 1966	00:56	156	Agena station keeping; range, 50 ft; Borneo, Philippine Islands; Sulu Archipelago.
11	S66-63396	S66-63246	3	Nov. 12, 1966	00:56	156	Agena station keeping; range, 50 ft; Borneo, Philippine Islands; Sulu Archipelago.
12	S66-63397	S66-63247	3	Nov. 12, 1966	01:06	159	Docked to Agena.
13	S66-63398	S66-63248	3	Nov. 12, 1966	01:07	159	Docked to Agena.
14	S66-63399	S66-63249	3	Nov. 12, 1966	01:07	159	Docked to Agena.
15	S66-63400	S66-63250	3	Nov. 12, 1966	01:08	159	Docked to Agena.
16	S66-63401	S66-63251	3	Nov. 12, 1966	01:10	159	Docked to Agena.
17	S66-63402	S66-63252	3	Nov. 12, 1966	01:31	.....	Agena station keeping; range, 25 ft.
18	S66-63403	S66-63253	3	Nov. 12, 1966	01:32	.....	Agena station keeping; range, 25 ft.
19	S66-63404	S66-63254	3	Nov. 12, 1966	01:32	.....	Agena station keeping; range, 27 ft.
20	S66-63405	S66-63255	3	Nov. 12, 1966	01:33	.....	Agena station keeping; range, 34 ft.
21	S66-63406	S66-63256	3	Nov. 12, 1966	01:33	.....	Agena station keeping; range, 37 ft.
22	S66-63407	S66-63257	3	Nov. 12, 1966	01:33	.....	Agena station keeping; range, 42 ft.
23	S66-63408	S66-63258	3	Nov. 12, 1966	01:34	.....	Agena station keeping; range, 45 ft.
24	S66-63409	S66-63259	3	Nov. 12, 1966	01:34	.....	Agena station keeping; range, 50 ft.
25	S66-63410	S66-63260	3	Nov. 12, 1966	01:35	.....	Agena station keeping; range, 55 ft.
26	S66-63411	S66-63261	3	Nov. 12, 1966	01:35	.....	Agena station keeping; range, 60 ft.
27	S66-63412	S66-63262	3	Nov. 12, 1966	01:36	.....	Agena station keeping; range, 45 ft.
28	S66-63413	S66-63263	3	Nov. 12, 1966	01:36	.....	Agena station keeping; range, 45 ft.
29	S66-63414	S66-63264	3	Nov. 12, 1966	12:47	.....	Solar eclipse, partial.
30	S66-63415	S66-63265	3	Nov. 12, 1966	12:48	.....	Solar eclipse, total.
31	S66-63416	S66-63266	.....	Nov. 12, 1966	.....	.....	Blank.
32	S66-63417	S66-63267	15	Nov. 12, 1966	19:13	150	Southern Florida, Bahama Islands, Cuba.
33	<del>S66-63418</del>	<del>S66-63268</del>	15	<del>Nov. 12, 1966</del>	<del>19:13</del>	150	<del>Southern Florida, Bahama Islands, Cuba.</del>
34	S66-63419	S66-63269	15	Nov. 12, 1966	19:13	150	Southern Florida, Bahama Islands, Cuba.
35	S66-63420	S66-63270	15	Nov. 12, 1966	19:13	150	Southern Florida, Bahama Islands, Cuba.
36	S66-63421	S66-63271	15	Nov. 12, 1966	19:14	150	Southern Florida, Bahama Islands, Cuba.
37	S66-63422	S66-63272	15	Nov. 12, 1966	19:14	150	Southern Florida, Bahama Islands, Cuba.
38	<del>S66-63423</del>	<del>S66-63273</del>	15	<del>Nov. 12, 1966</del>	<del>19:14</del>	149	<del>Southern Florida, Bahama Islands, Cuba.</del>
39	S66-63424	S66-63274	15	Nov. 12, 1966	19:14	149	Southern Florida, Bahama Islands, Cuba.
40	S66-63425	S66-63275	15	Nov. 12, 1966	19:14	149	Southern Florida, Bahama Islands, Cuba.
41	S66-63426	S66-63276	15	Nov. 12, 1966	20:43	150	Texas, Mexico: Del Rio, Eagle Pass; Edwards Plateau, Big Bend, Rio Grande, Serrania del Burro, Sierra Madre Oriental.
42	S66-63427	S66-63277	15	Nov. 12, 1966	20:43	150	Texas, Mexico: Del Rio, Eagle Pass; Laredo; Edwards Plateau, Big Bend, Rio Grande, Serrania del Burro, Sierra Madre Oriental.

## MAGAZINE 8 Continued

Frame	NASA/MS		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
43	S66-63428	S66-63278	15	Nov. 12, 1966	20:44	149	Texas: San Antonio, Austin, Corpus Christi; Edwards Plateau, Balcones Escarpment, gulf coast, Matagorda Bay.
44	S66-63429	S66-63279	15	Nov. 12, 1966	20:44	149	Texas: Corpus Christi; gulf coast from Baffin Bay to Matagorda Bay, Interstate 10 at Columbus.
45	S66-63430	S66-63280	15	Nov. 12, 1966	20:44	149	Texas: Gulf coast at Matagorda Bay, Interstate 10 at Columbus.
46	S66-63431	S66-63281	15	Nov. 12, 1966	20:47	146	Florida: Tampa, St. Petersburg, Fort Myers, Palm Beach; Cape Kennedy, Lake Okeechobee.
47	S66-63432	S66-63282	15	Nov. 12, 1966	20:48	146	Florida: Tampa, St. Petersburg, Fort Myers, Palm Beach, Miami; Keys, Lake Okeechobee, Everglades.
48	S66-63433	S66-63283	15	Nov. 12, 1966	20:48	146	Florida: Cape Kennedy, Palm Beach, Orlando.
49	S66-63434	S66-63284	15	Nov. 12, 1966	20:48	146	Florida: Cape Kennedy, Orlando.
50	S66-63435	S66-63285	16	Nov. 12, 1966	20:48	146	Florida: Cape Kennedy; underexposed.
51	S66-63436	S66-63286	16	Nov. 12, 1966	20:48	146	Bahama Islands; underexposed.
52	S66-63437	S66-63287	16	Nov. 12, 1966	.....	.....	Blank.
53	S66-63438	S66-63288	16	Nov. 12, 1966	22:17	147	Mexico: Guaymas; Baja California, Gulf of California.
54	S66-63439	S66-63289	16	Nov. 12, 1966	22:17	147	Mexico: Guaymas; Baja California, Gulf of California.
55	S66-63440	S66-63290	16	Nov. 12, 1966	22:17	146	Mexico: Guaymas; Baja California, Gulf of California.
56	S66-63441	S66-63291	17	Nov. 12, 1966	22:17	146	Mexico: Guaymas; Baja California, Gulf of California.
57	S66-63442	S66-63292	17	Nov. 12, 1966	.....	.....	Blank.
58	S66-63443	S66-63293	17	Nov. 12, 1966	.....	.....	Cellular cloud formations.
59	S66-63444	S66-63294	17	Nov. 12, 1966	23:18	160	Indonesia: Islands of Alor, Wetar, Timor, Babar, Jamdena; Bandar Sea.
60	S66-63445	S66-63295	17	Nov. 12, 1966	23:19	160	Indonesia: Islands of Alor, Wetar, Timor, Babar, Jamdena; Bandar Sea.
61	S66-63446	S66-63296	17	Nov. 12, 1966	23:19	160	Indonesia: Islands of Alor, Wetar, Timor, Babar, Jamdena; Bandar Sea.
62	S66-63447	S66-63297	17	Nov. 12, 1966	23:33	156	Clouds over Pacific Ocean.
63	S66-63448	S66-63298	17	Nov. 12, 1966	23:34	156	Clouds over Pacific Ocean.
64	S66-63449	S66-63299	17	Nov. 12, 1966	23:34	156	Clouds over Pacific Ocean.
65	S66-63450	S66-63300	17	Nov. 12, 1966	23:35	156	Clouds over Pacific Ocean.
66	S66-63451	S66-63301	17	Nov. 12, 1966	.....	.....	Inside spacecraft; underexposed.
67	S66-63452	S66-63302	17	Nov. 12, 1966	23:35	155	Clouds over Pacific Ocean.
68	S66-63453	S66-63303	17	Nov. 12, 1966	23:36	155	Clouds over Pacific Ocean.
69	S66-63454	S66-63304	17	Nov. 12, 1966	23:36	155	Clouds over Pacific Ocean.
70	S66-63455	S66-63305	17	Nov. 12, 1966	23:37	155	Clouds over Pacific Ocean.
71	S66-63456	S66-63306	17	Nov. 12, 1966	23:37	155	Clouds over Pacific Ocean.
72	S66-63457	S66-63307	17	Nov. 12, 1966	.....	.....	Blank.
73	S66-63458	S66-63308	17	Nov. 12, 1966	23:38	153	Clouds over Pacific Ocean.
74	S66-63459	S66-63309	17	Nov. 12, 1966	.....	.....	Blank.
75	S66-63460	S66-63310	17	Nov. 12, 1966	23:39	153	Clouds over Pacific Ocean.
76	S66-63461	S66-63311	17	Nov. 12, 1966	23:40	153	Clouds over Pacific Ocean.
77	S66-63462	S66-63312	17	Nov. 12, 1966	23:40	152	Clouds over Pacific Ocean.
78	S66-63463	S66-63313	17	Nov. 12, 1966	23:41	152	Clouds over Pacific Ocean.
79	S66-63464	S66-63314	17	Nov. 12, 1966	23:42	151	Clouds over Pacific Ocean.
80	S66-63465	S66-63315	17	Nov. 12, 1966	23:43	150	Clouds over Pacific Ocean.
81	S66-63466	S66-63316	17	Nov. 12, 1966	23:44	150	Clouds over Pacific Ocean.
82	S66-63467	S66-63317	25	Nov. 13, 1966	11:31	158	Mauritania, Mali: Dhar Adrar, Richat Structure, Aouker Basin, El Djouf Desert.
83	S66-63468	S66-63318	25	Nov. 13, 1966	11:31	158	Mauritania, Mali: Dhar Adrar, Richat Structure, Aouker Basin, El Djouf Desert.



## MAGAZINE 8 Continued

Frame	NASA/MSG		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
84	S66-63469	S66-63319	25	Nov. 13, 1966	11:32	157	Mauritania, Mali: Dhar Adrar, Richat Structure, Aouker Basin, El Djouf Desert.
85	S66-63470	S66-63320	25	Nov. 13, 1966	11:32	157	Mauritania, Mali: Dhar Adrar, Richat Structure, Aouker Basin, El Djouf Desert.
86	<i>S66-63471</i>	<i>S66-63321</i>	25	<i>Nov. 13, 1966</i>	<i>11:32</i>	157	<i>Mauritania, Mali: Dhar Adrar, Richat Structure, Aouker Basin, El Djouf Desert.</i>
87	S66-63472	S66-63322	25	Nov. 13, 1966	11:32	157	Mauritania, Mali: Dhar Adrar, Richat Structure, Aouker Basin, El Djouf Desert.
88	S66-63473	S66-63323	25	Nov. 13, 1966	11:34	156	Mauritania, Mali, Spanish Sahara: Dhar Adrar, El Hank Bluffs, Erg Iguidi, Erg Chech, Yetti Plains, south edge Tindouf Basin.
89	S66-63474	S66-63324	25	Nov. 13, 1966	11:36	155	Algeria: Tifernine, Irrarene Dunes, Ajjer Plateau, Ahaggar Mountains.
90	S66-63475	S66-63325	25	Nov. 13, 1966	11:36	155	Algeria, Libya: Tifernine, Irrarene Dunes, Ajjer Plateau, Ahaggar Mountains.
91	S66-63476	S66-63326	25	Nov. 13, 1966	11:42	151	United Arab Republic: Cairo; Gulf of Suez, Nile River, El Faiyum depression, Nile Delta.
92	<i>S66-63477</i>	<i>S66-63327</i>	25	<i>Nov. 13, 1966</i>	<i>11:42</i>	151	<i>United Arab Republic, Saudi Arabia: Nile River, Gulf of Suez, Gulf of Aqaba, Red Sea, Sinai Peninsula.</i>
93	S66-63478	S66-63328	25	Nov. 13, 1966	11:42	151	United Arab Republic, Saudi Arabia: Nile River, Gulf of Suez, Gulf of Aqaba, Red Sea, Sinai Peninsula.
94	S66-63479	S66-63329	25	Nov. 13, 1966	11:42	151	United Arab Republic, Saudi Arabia, Sudan: Nile River, Gulf of Suez, Gulf of Aqaba, Red Sea, Sinai Peninsula.
95	S66-63480	S66-63330	25	Nov. 13, 1966	11:42	151	United Arab Republic, Saudi Arabia, Sudan: Nile River, Gulf of Suez, Gulf of Aqaba, Red Sea, Sinai Peninsula.
96	<i>S66-63481</i>	<i>S66-63331</i>	25	<i>Nov. 13, 1966</i>	<i>11:42</i>	151	<i>United Arab Republic, Saudi Arabia, Sudan: Nile River, Gulf of Suez, Gulf of Aqaba, Red Sea, Sinai Peninsula.</i>
97	S66-63482	S66-63332	25	Nov. 13, 1966	11:44	149	United Arab Republic, Saudi Arabia, Sudan: Red Sea.
98	<i>S66-63483</i>	<i>S66-63333</i>	25	<i>Nov. 13, 1966</i>	<i>11:47</i>	147	<i>Iran: Persian Gulf, Zagros Mountains; excellent display of anticlinal mountains.</i>
99	S66-63484	S66-63334	25	Nov. 13, 1966	11:47	147	Iran: Persian Gulf, Qeshm Island, Zagros Mountains; excellent display of anticlinal mountains.
100	S66-63485	S66-63335	25	Nov. 13, 1966	11:47	147	Iran, Trucial States, Muscat and Oman: Persian Gulf, Strait of Hormuz, Qeshm Island, Zagros Mountains; excellent display of anticlinal mountains.
101	<i>S66-63486</i>	<i>S66-63336</i>	25	<i>Nov. 13, 1966</i>	<i>11:48</i>	146	<i>Iran, Trucial States, Muscat and Oman, Pakistan: Persian Gulf, Strait of Hormuz, Makran Mountains.</i>
102	S66-63487	S66-63337	.....	.....	.....	.....	Blank.
103	S66-63488	S66-63338	30	Nov. 13, 1966	20:20	159	Agana on tether; Makin Island, Gilbert Group; underexposed.
104	S66-63489	S66-63339	30	Nov. 13, 1966	20:20	159	Agana on tether; Makin Island, Gilbert Group; underexposed.
105	S66-63490	S66-63340	30	Nov. 13, 1966	20:20	159	Agana on tether; Makin Island, Gilbert Group; underexposed.
106	S66-63491	S66-63341	30	Nov. 13, 1966	20:21	159	Agana on tether; clouds over Pacific Ocean; underexposed.
107	S66-63492	S66-63342	30	Nov. 13, 1966	20:39	153	Guadalupe Island: von Kármán eddies in lee of island, Baja California, Mexico in background; underexposed.

## MAGAZINE 8 Continued

Frame	NASA/MSG		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
108	S66-63493	S66-63343	30	Nov. 13, 1966	20:39	153	Guadalupe Island: Von Kármán eddies in lee of island, Baja California, Mexico in background; underexposed.
109	S66-63494	S66-63344	30	Nov. 13, 1966	20:39	153	Von Kármán eddies in lee of Guadalupe Island.
110	S66-63495	S66-63345	30	Nov. 13, 1966	20:39	153	Von Kármán eddies in lee of Guadalupe Island.
111	S66-63496	S66-63346	30	Nov. 13, 1966	20:42	151	Texas, Mexico: Gulf Coastal Plain from Padre Island east.
112	S66-63497	S66-63347	30	Nov. 13, 1966	20:43	150	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas; San Antonio, Austin, Waco, Houston.
113	S66-63498	S66-63348	30	Nov. 13, 1966	20:43	150	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas; San Antonio, Austin, Waco, Houston; gulf coast, Matagorda Bay.
114	S66-63499	S66-63349	30	Nov. 13, 1966	20:43	150	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas; San Antonio, Austin, Waco, Houston; gulf coast, Matagorda Bay.
115	S66-63500	S66-63350	30	Nov. 13, 1966	20:43	150	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas: Austin, Waco, Houston; gulf coast, Matagorda Bay.
116	S66-63501	S66-63351	30	Nov. 13, 1966	20:44	150	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas: Austin, Waco, Houston; gulf coast, Matagorda Bay.
117	S66-63502	S66-63352	30	Nov. 13, 1966	20:44	149	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas; Waco, Houston, gulf coast, Matagorda Bay, Red River, Mississippi Valley.
118	S66-63503	S66-63353	30	Nov. 13, 1966	20:44	149	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas; Houston, gulf coast, Matagorda Bay, Red River, Mississippi Valley.
119	S66-63504	S66-63354	30	Nov. 13, 1966	20:44	149	Agna on tether; Texas, Louisiana, Oklahoma, Arkansas; Houston, gulf coast, Matagorda Bay, Red River, Mississippi Valley.
120	S66-63505	S66-63355	30	Nov. 13, 1966	20:44	149	Agna on tether; Texas, Louisiana; San Antonio, Austin, Houston, Beaumont; gulf coast, Matagorda Bay, Edwards Plateau.
121	S66-63506	S66-63356	30	Nov. 13, 1966	20:44	149	Agna on tether; Texas, Louisiana; San Antonio, Austin, Houston, Beaumont; gulf coast, Matagorda Bay, Edwards Plateau.
122	S66-63507	S66-63357	.....	Nov. 13, 1966	20:44	.....	Agna on tether.
123	S66-63508	S66-63358	.....	Nov. 13, 1966	.....	.....	Agna on tether.
124	S66-63509	S66-63359	.....	Nov. 13, 1966	.....	.....	Agna on tether.
125	S66-63510	S66-63360	.....	Nov. 13, 1966	.....	.....	Agna on tether.
126	S66-63511	S66-63361	.....	Nov. 13, 1966	.....	.....	Blank.
127	S66-63512	S66-63362	.....	Nov. 13, 1966	.....	.....	Agna on tether; clouds, ocean.
128	S66-63513	S66-63363	.....	Nov. 13, 1966	.....	.....	Agna on tether; clouds, ocean.
129	S66-63514	S66-63364	.....	Nov. 13, 1966	.....	.....	Agna on tether; clouds, ocean.
130	S66-63515	S66-63365	.....	Nov. 13, 1966	.....	.....	Agna on tether; clouds, ocean.
131	S66-63516	S66-63366	.....	Nov. 13, 1966	.....	.....	Agna on tether; clouds, ocean.
132	S66-63517	S66-63367	31	Nov. 13, 1966	22:15	149	Agna on tether; Mexico: Baja California Sur, Sinaloa.
133	S66-63518	S66-63368	31	Nov. 13, 1966	22:16	148	Agna on tether; Mexico: Baja California Sur, Sinaloa.
134	S66-63519	S66-63369	31	Nov. 13, 1966	22:16	148	Agna on tether; Mexico: Baja California Sur, Sinaloa.
135	S66-63520	S66-63370	31	Nov. 13, 1966	22:16	148	Agna on tether; Mexico: Baja California Sur, Sinaloa.
136	S66-63521	S66-63371	31	Nov. 13, 1966	22:18	146	Agna on tether; Mexico: Durango-San Luis Potosí-Guadalajara area.
137	S66-63522	S66-63372	31	Nov. 13, 1966	22:18	146	Agna on tether; Mexico: Durango-San Luis Potosí-Guadalajara area.



## MAGAZINE 8 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
138	S66-63523	S66-63373	31	Nov. 13, 1966	22:18	146	Agena on tether; Mexico: Durango-San Luis Potosi-Guadalajara area.
139	S66-63524	S66-63374	31	Nov. 13, 1966	.....	.....	Docking bar; terminator, limb.
140	S66-63525	S66-63375	31	Nov. 13, 1966	.....	.....	Docking bar; terminator, limb.
141	S66-63526	S66-63376	31	Nov. 13, 1966	.....	.....	Agena on tether; limb, sunset.
142	S66-63527	S66-63377	31	Nov. 13, 1966	.....	.....	Agena on tether; limb, sunset.
143	S66-63528	S66-63378	.....	.....	.....	.....	Blank.
144	S66-63529	S66-63379	54	Nov. 15, 1966	10:05	154	United Arab Republic, Saudi Arabia, Sudan: Nile River, Red Sea, jetstream clouds.
145	S66-63530	S66-63380	54	Nov. 15, 1966	10:06	153	United Arab Republic, Saudi Arabia, Sudan: Nile River, Red Sea, jetstream clouds.
146	S66-63531	S66-63381	54	Nov. 15, 1966	10:06	153	United Arab Republic, Saudi Arabia, Sudan: Nile River, Red Sea, jetstream clouds.
147	S66-63532	S66-63382	54	Nov. 15, 1966	10:06	153	United Arab Republic, Saudi Arabia, Sudan: Nile River, Red Sea, jetstream clouds.
148	S66-63533	S66-63383	54	Nov. 15, 1966	10:06	153	United Arab Republic, Saudi Arabia, Sudan: Nile River, Red Sea, jetstream clouds.
149	S66-63534	S66-63384	54	Nov. 15, 1966	10:06	153	United Arab Republic, Saudi Arabia, Sudan: Nile River, Red Sea, jetstream clouds.
150	S66-63535	S66-63385	54	Nov. 15, 1966	10:06	153	United Arab Republic, Saudi Arabia, Sudan: Nile River, Red Sea, jetstream clouds.

## MAGAZINE 10

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-62749	S66-62701	3	Nov. 12, 1966	00:47	.....	Agena; range, 50 ft.
2	S66-62750	S66-62702	3	Nov. 12, 1966	00:48	.....	Agena; range, 50 ft.
3	S66-62751	S66-62703	3	Nov. 12, 1966	00:48	.....	Agena; range, 50 ft.
4	S66-62752	S66-62704	3	Nov. 12, 1966	00:51	.....	Agena; range, 12 ft.
5	S66-62753	S66-62705	3	Nov. 12, 1966	00:52	.....	Agena; range, 12 ft.
6	S66-62754	S66-62706	3	Nov. 12, 1966	00:52	.....	Agena; range, 14 ft.
7	S66-62755	S66-62707	3	Nov. 12, 1966	00:55	.....	Agena; range, 50 ft; excellent side view, stereo.
8	S66-62756	S66-62708	3	Nov. 12, 1966	00:56	.....	Agena; range, 53 ft; excellent side view, stereo.
9	S66-62757	S66-62709	3	Nov. 12, 1966	00:56	.....	Agena; range, 55 ft; excellent side view, stereo.
10	S66-62758	S66-62710	.....	.....	.....	.....	Blank.
11	S66-62759	S66-62711	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
12	S66-62760	S66-62712	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
13	S66-62761	S66-62713	.....	.....	.....	.....	Blank.
14	S66-62762	S66-62714	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
15	S66-62763	S66-62715	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
16	S66-62764	S66-62716	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
17	S66-62765	S66-62717	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
18	S66-62766	S66-62718	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity; Florida and Bahamas in background.
19	S66-62767	S66-62719	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
20	S66-62768	S66-62720	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
21	S66-62769	S66-62721	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
22	S66-62770	S66-62722	.....	.....	.....	.....	Blank.
23	S66-62771	S66-62723	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
24	S66-62772	S66-62724	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
25	S66-62773	S66-62725	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
26	S66-62774	S66-62726	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
27	S66-62775	S66-62727	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
28	S66-62776	S66-62728	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
29	S66-62777	S66-62729	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
30	S66-62778	S66-62730	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
31	S66-62779	S66-62731	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.

## MAGAZINE 10 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
32	S66-62780	S66-62732	.....	Nov. 13, 1966	.....	.....	Blank.
33	S66-62781	S66-62733	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
34	S66-62782	S66-62734	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity; best view of series.
35	S66-62783	S66-62735	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
36	S66-62784	S66-62736	28	Nov. 13, 1966	.....	.....	Major Aldrin, extravehicular activity.
37	S66-62785	S66-62737	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
38	S66-62786	S66-62738	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
39	S66-62787	S66-62739	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
40	S66-62788	S66-62740	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
41	S66-62789	S66-62741	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
42	S66-62790	S66-62742	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
43	S66-62791	S66-62743	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
44	S66-62792	S66-62744	30	Nov. 13, 1966	.....	.....	Agena on tether; clouds, ocean.
45	S66-62793	S66-62745	30	Nov. 13, 1966	20:40	153	California, Arizona, New Mexico, Nevada, Utah, Colorado: Grand Canyon, Colorado River, Death Valley, Lake Mead.
46	S66-62794	S66-62746	30	Nov. 13, 1966	20:40	152	Arizona, New Mexico, Mexico: Tucson, Phoenix; Sonoran Desert, Mogollon Rim, Painted Desert.
47	S66-62795	S66-62747	30	Nov. 13, 1966	20:41	152	Arizona, New Mexico, Mexico: Chihuahuan Desert, Rio Grande, Sierra Madre Occidental, Painted Desert.
48	S66-62796	S66-62748	30	Nov. 13, 1966	20:41	152	Arizona, New Mexico, Texas, Mexico: Chihuahuan Desert, Rio Grande, White Sands, Painted Desert, Rocky Mountains.

## MAGAZINE 11

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-62940	S66-63088	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
2	S66-62941	S66-63089	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
3	S66-62942	S66-63090	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
4	S66-62943	S66-63091	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
5	S66-62944	S66-63092	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
6	S66-62945	S66-63093	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
7	S66-62946	S66-63094	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
8	S66-62947	S66-63095	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
9	S66-62948	S66-63096	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
10	S66-62949	S66-63097	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
11	S66-62950	S66-63098	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
12	<del>S66-62951</del>	<del>S66-63099</del>	32	<del>Nov. 13, 1966</del>	.....	.....	<del>Agena on tether; clouds over Pacific Ocean.</del>
13	S66-62952	S66-63100	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
14	S66-62953	S66-63101	32	Nov. 13, 1966	.....	.....	Agena on tether; clouds over Pacific Ocean.
15	S66-62954	S66-63102	32	Nov. 13, 1966	23:51	144	Agena on tether; Mexico: Baja California Sur.
16	S66-62955	S66-63103	32	Nov. 13, 1966	23:53	142	Agena on tether; Mexico: Pacific coast at Manzanillo; note long cloud shadows.
17	S66-62956	S66-63104	32	Nov. 13, 1966	23:53	142	Agena on tether; Mexico: Pacific coast at Manzanillo; note long cloud shadows.
18	S66-62957	S66-63105	32	Nov. 13, 1966	23:53	142	Agena on tether; Mexico: Pacific coast at Manzanillo; note long cloud shadows.
19	S66-62958	S66-63106	32	Nov. 13, 1966	23:54	.....	Agena on tether, at sunset.
20	S66-62959	S66-63107	32	Nov. 13, 1966	23:55	.....	Earth limb at sunset.
21	S66-62960	S66-63108	32	Nov. 13, 1966	23:55	.....	Earth limb at sunset.
22	S66-62961	S66-63109	32	Nov. 13, 1966	23:55	.....	Earth limb at sunset.
23	S66-62962	S66-63110	32	Nov. 13, 1966	23:56	.....	Earth limb at sunset.
24	S66-62963	S66-63111	32	Nov. 13, 1966	23:56	.....	Earth limb at sunset.



## MAGAZINE 11 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt. N. Mi.	Area description
	Color No.	B&W No.					
25	S66-62964	S66-63112	32	Nov. 13, 1966	23:56	.....	Earth limb at sunset.
26	S66-62965	S66-63113	32	Nov. 13, 1966	23:56	.....	Earth limb at sunset.
27	S66-62966	S66-63114	32	Nov. 13, 1966	23:56	.....	Earth limb at sunset.
28	S66-62967	S66-63115	32	Nov. 13, 1966	23:56	.....	Earth limb at sunset.
29	S66-62968	S66-63116	32	Nov. 13, 1966	23:57	.....	Earth limb at sunset.
30	S66-62969	S66-63117	32	Nov. 13, 1966	23:57	.....	Earth limb at sunset.
31	S66-62970	S66-63118	32	Nov. 13, 1966	23:57	.....	Earth limb at sunset.
32	S66-62971	S66-63119	32	Nov. 13, 1966	23:57	.....	Earth limb at sunset.
33	S66-62972	S66-63120	32	Nov. 13, 1966	23:58	.....	Earth limb at sunset.
34	S66-62973	S66-63121	32	Nov. 13, 1966	23:59	.....	Earth limb at sunset.
35	S66-62974	S66-63122	34	Nov. 14, 1966	02:17	160	Southern end of Maldiv Islands.
36	S66-62975	S66-63123	34	Nov. 14, 1966	02:23	160	Andaman Islands, Bay of Bengal.
37	S66-62976	S66-63124	34	Nov. 14, 1966	02:24	160	Burma: Mouths of Irrawaddy and Salween Rivers.
38	S66-62977	S66-63125	34	Nov. 14, 1966	02:24	160	Burma: Mouths of Irrawaddy and Salween Rivers.
39	S66-62978	S66-63126	34	Nov. 14, 1966	02:24	160	Burma: Mouths of Irrawaddy and Salween Rivers.
40	S66-62979	S66-63127	34	Nov. 14, 1966	02:25	160	Burma: Mouths of Irrawaddy and Salween Rivers.
41	S66-62980	S66-63128	.....	Nov. 14, 1966	.....	.....	Blank.
42	S66-62981	S66-63129	.....	Nov. 14, 1966	.....	.....	Major Aldrin inside spacecraft; underexposed.
43	S66-62982	S66-63130	.....	Nov. 14, 1966	.....	.....	Major Aldrin inside spacecraft; underexposed.
44	S66-62983	S66-63131	.....	Nov. 14, 1966	.....	.....	Major Aldrin inside spacecraft; underexposed.
45	S66-62984	S66-63132	.....	Nov. 14, 1966	.....	.....	Major Aldrin inside spacecraft; underexposed.
46	S66-62985	S66-63133	.....	Nov. 14, 1966	.....	.....	Blank.
47	S66-62986	S66-63134	39	Nov. 14, 1966	10:06	156	United Arab Republic, Libya: Mediterranean coast from Bengazi to El Alamein, Libyan Plateau; slightly out of focus.
48	S66-62987	S66-63135	39	Nov. 14, 1966	10:06	156	United Arab Republic: Mediterranean coast from Sidi Barrani to Nile Delta, El Faiyum and Qattara Depressions; slightly out of focus.
49	S66-62988	S66-63136	39	Nov. 14, 1966	10:13	152	Iran, Saudi Arabia, Qatar, Bahrain: Persian Gulf, Zagros Mountains; slightly out of focus.
50	S66-62989	S66-63137	39	Nov. 14, 1966	10:13	151	Iran, Trucial States: Persian Gulf, Qeshm Island, Zagros Mountains; slightly out of focus.
51	S66-62990	S66-63138	39	Nov. 14, 1966	10:14	151	Iran: Gulf of Oman, Makran Ranges; slightly out of focus.
52	S66-62991	S66-63139	39	Nov. 14, 1966	10:14	151	Iran, Pakistan, Afghanistan: Makran Ranges; slightly out of focus.
53	S66-62992	S66-63140	39	Nov. 14, 1966	10:15	150	Pakistan; Makran and Kirthar Ranges, Arabian Sea coast; slightly out of focus.
54	S66-62993	S66-63141	39	Nov. 14, 1966	10:16	149	Pakistan, India: Makran and Kirthar Ranges, Indus River, Thar Desert, Arabian Sea coast; slightly out of focus.
55	S66-62994	S66-63142	39	Nov. 14, 1966	10:17	149	Pakistan, India: Thar Desert, Aravalli Range; slightly out of focus.
56	S66-62995	S66-63143	.....	Nov. 14, 1966	.....	.....	Light in spacecraft.
57	S66-62996	S66-63144	.....	Nov. 14, 1966	.....	.....	Blank.
58	S66-62997	S66-63145	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
59	S66-62998	S66-63146	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
60	S66-62999	S66-63147	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
61	S66-63000	S66-63148	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
62	S66-63001	S66-63149	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
63	S66-63002	S66-63150	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
64	S66-63003	S66-63151	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
65	S66-63004	S66-63152	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
66	S66-63006	S66-63154	.....	Nov. 14, 1966	.....	.....	Equipment jettison, ELSS, other gear.
67	S66-63007	S66-63155	.....	Nov. 14, 1966	.....	.....	Standup EVA, nose of spacecraft.
68	S66-63008	S66-63156	.....	Nov. 14, 1966	.....	.....	Standup EVA, rear view, adapter section.
69	S66-63009	S66-63157	.....	Nov. 14, 1966	.....	.....	Standup EVA, nose of spacecraft.

## MAGAZINE 11 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
70	S66-63010	S66-63158	44	Nov. 14, 1966	.....	.....	Standup EVA, nose of spacecraft.
71	S66-63011	S66-63159	44	Nov. 14, 1966	.....	.....	Standup EVA, nose of spacecraft.
72	S66-63012	S66-63160	44	Nov. 14, 1966	.....	.....	Standup EVA, nose of spacecraft.
73	<i>S66-63013</i>	<i>S66-63161</i>	44	<i>Nov. 14, 1966</i>	<i>17:37</i>	<i>150</i>	<i>Florida, Bahama Islands, north coast of Cuba.</i>
74	S66-63014	S66-63162	44	Nov. 14, 1966			Out of focus.
75	<i>S66-63015</i>	<i>S66-63163</i>	44	<i>Nov. 14, 1966</i>	<i>19:04</i>	<i>154</i>	<i>Arizona, New Mexico, Mexico: Gulf of California, Baja California, Sonora, Chihuahua.</i>
76	S66-63016	S66-63164	44	Nov. 14, 1966	19:04	154	Arizona, New Mexico, Mexico: Gulf of California, Baja California, Sonora, Chihuahua; contrail and shadow along coast.
77	S66-63017	S66-63165	44	Nov. 14, 1966	19:05	154	Arizona, New Mexico, Mexico, Texas: Phoenix-El Paso-Presidio Panorama.
78	<i>S66-63018</i>	<i>S66-63166</i>	44	<i>Nov. 14, 1966</i>	<i>19:05</i>	<i>153</i>	<i>Arizona, New Mexico, Mexico, Texas: Phoenix-El Paso-Carlsbad Panorama.</i>
79	S66-63019	S66-63167	44	Nov. 14, 1966	19:06	153	Mexico, Texas: Big Bend, Northern Sierra Madre Oriental, Glass Mountains, El Solitario, Marathon Uplift, Rio Grande.
80	S66-63020	S66-63168	44	Nov. 14, 1966	19:06	153	Mexico, Texas: Big Bend, Northern Sierra Madre Oriental, Glass Mountains, El Solitario, Marathon Uplift, Rio Grande.
81	S66-63021	S66-63169	44	Nov. 14, 1966	19:07	153	Texas, Louisiana, Oklahoma, Arkansas: San Antonio, Corpus Christi, Houston, Fort Worth-Dallas; Edwards Plateau, Gulf Coastal Plain.
82	S66-63022	S66-63170	44	Nov. 14, 1966	19:07	152	Texas, Louisiana, Oklahoma, Arkansas: San Antonio, Corpus Christi, Houston, Fort Worth-Dallas; Edwards Plateau, Gulf Coastal Plain.
83	S66-63023	S66-63171	44	Nov. 14, 1966	19:07	152	Texas, Louisiana, Oklahoma, Arkansas: San Antonio, Corpus Christi, Houston, Fort Worth-Dallas; Edwards Plateau, Gulf Coastal Plain.
84	<i>S66-63024</i>	<i>S66-63172</i>	44	<i>Nov. 14, 1966</i>	<i>19:07</i>	<i>152</i>	<i>Texas, Louisiana, Oklahoma, Arkansas: San Antonio, Corpus Christi, Houston, Fort Worth-Dallas; Edwards Plateau, Gulf Coastal Plain.</i>
85	<i>S66-63025</i>	<i>S66-63173</i>	44	<i>Nov. 14, 1966</i>	<i>19:08</i>	<i>152</i>	<i>Texas, Louisiana, Oklahoma, Arkansas: Austin, Waco, Shreveport, Beaumont, Houston; Edwards Plateau, Gulf Coastal Plain, Red River.</i>
86	S66-63026	S66-63174	44	Nov. 14, 1966	19:08	152	Texas, Louisiana, Oklahoma, Arkansas: Austin, Waco, Shreveport, Beaumont, Houston; Edwards Plateau, Gulf Coastal Plain, Red River.
87	S66-63027	S66-63175	44	Nov. 14, 1966	19:08	152	Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.
88	S66-63028	S66-63176	44	Nov. 14, 1966	19:08	152	Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.
89	S66-63029	S66-63177	44	Nov. 14, 1966	19:08	152	Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.
90	S66-63030	S66-63178	44	Nov. 14, 1966	19:08	152	Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.
91	<i>S66-63031</i>	<i>S66-63179</i>	44	<i>Nov. 14, 1966</i>	<i>19:08</i>	<i>152</i>	<i>Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.</i>
92	S66-63032	S66-63180	44	Nov. 14, 1966	19:08	152	Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.



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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
93	S66-63033	S66-63181	44	Nov. 14, 1966	19:09	152	Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.
94	<i>S66-63034</i>	<i>S66-63182</i>	44	<i>Nov. 14, 1966</i>	<i>19:09</i>	152	<i>Texas, Louisiana, Arkansas: Houston, Beaumont; Gulf Coastal Plain from Matagorda Bay to Mississippi Delta; MSC area astrodome.</i>
95	<i>S66-63035</i>	<i>S66-63183</i>	44	<i>Nov. 14, 1966</i>	<i>19:09</i>	152	<i>Texas, Louisiana: Houston, Beaumont; Gulf Coastal Plain from White Lake to Corpus Christi.</i>
96	S66-63036	S66-63184	44	Nov. 14, 1966	19:09	152	Texas, Louisiana: Houston, Beaumont; Gulf Coastal Plain from Cameron to Brownsville.
97	S66-63037	S66-63185	44	Nov. 14, 1966	19:09	152	Texas, Louisiana: Houston, Beaumont; Gulf Coastal Plain from Cameron to Brownsville.
98	<i>S66-63038</i>	<i>S66-63186</i>	44	<i>Nov. 14, 1966</i>	<i>19:09</i>	151	<i>Texas, Louisiana: Houston, Beaumont; Gulf Coastal Plain from Cameron to Brownsville.</i>
99	S66-63039	S66-63187	44	Nov. 14, 1966	19:10	151	Texas, Louisiana: Houston, Beaumont; Gulf Coastal Plain from Cameron to Brownsville.
100	<i>S66-63040</i>	<i>S66-63188</i>	44	<i>Nov. 14, 1966</i>	<i>19:11</i>	150	<i>Florida: Orlando, Cape Kennedy.</i>
101	S66-63041	S66-63189	44	Nov. 14, 1966	19:12	150	Florida: Orlando, Cape Kennedy.
102	S66-63042	S66-63190	44	Nov. 14, 1966	19:12	150	Florida: Orlando, Cape Kennedy.
103	S66-63043	S66-63191	.....	Nov. 14, 1966	.....	.....	Blank.
104	<i>S66-63044</i>	<i>S66-63192</i>	45	<i>Nov. 14, 1966</i>	<i>20:40</i>	152	<i>Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.</i>
105	S66-63045	S66-63193	45	Nov. 14, 1966	20:40	152	Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.
106	S66-63046	S66-63194	45	Nov. 14, 1966	20:40	151	Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.
107	S66-63047	S66-63195	45	Nov. 14, 1966	20:40	151	Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.
108	S66-63048	S66-63196	45	Nov. 14, 1966	20:40	151	Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.
109	S66-63049	S66-63197	45	Nov. 14, 1966	20:40	151	Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.
110	S66-63050	S66-63198	45	Nov. 14, 1966	20:40	151	Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.
111	S66-63051	S66-63199	45	Nov. 14, 1966	20:41	151	Mexico: Baja California, from Angel de la Guarda to Santa Rosalia, cloud-covered mainland; Sun glint.
112	S66-63052	S66-63200	45	Nov. 14, 1966	20:41	151	Mexico: Baja California, from Punta Eugenia to La Paz, cloud-covered mainland; Sun glint.
113	S66-63053	S66-63201	45	Nov. 14, 1966	20:41	151	Mexico: Baja California, from Punta Eugenia to La Paz, cloud-covered mainland; Sun glint.
114	<i>S66-63054</i>	<i>S66-63202</i>	45	<i>Nov. 14, 1966</i>	<i>20:41</i>	151	<i>Mexico: Baja California, from Punta Eugenia to La Paz, cloud-covered mainland; Sun glint.</i>
115	<i>S66-63055</i>	<i>S66-63203</i>	45	<i>Nov. 14, 1966</i>	<i>20:41</i>	151	<i>Mexico, Texas: Chihuahua, Presidio; Sierra Madre Occidental, Big Bend, El Solitario, Rio Grande, Southern Basin and Range.</i>
116	S66-63056	S66-63204	45	Nov. 14, 1966	20:43	150	Mexico, Texas: Valleys of Nueces and Frio Rivers, Rio Grande, Falcon Reservoir.
117	S66-63057	S66-63205	45	Nov. 14, 1966	20:43	150	Mexico, Texas: Gulf coast, Laguna Madre-Corpus Christi-Matagorda Bay.

## MAGAZINE 11 Continued

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
118	S66-63058	S66-63206	45	Nov. 14, 1966	20:43	150	Mexico, Texas: Gulf coast, Laguna Madre-Corpus Christi-Matagorda Bay.
119	S66-63059	S66-63207	45	Nov. 14, 1966	20:43	149	Mexico, Texas: Gulf coast, Laguna Madre-Corpus Christi-Matagorda Bay.
120	<i>S66-63060</i>	<i>S66-63208</i>	45	<i>Nov. 14, 1966</i>	<i>20:43</i>	<i>149</i>	<i>Mexico, Texas: Gulf coast, Laguna Madre-Corpus Christi-Matagorda Bay.</i>
121	S66-63061	S66-63209	45	Nov. 14, 1966	20:43	149	Texas, Louisiana, Oklahoma, Arkansas: gulf coast from Matagorda Bay to Mississippi Delta.
122	<i>S66-63062</i>	<i>S66-63210</i>	45	<i>Nov. 14, 1966</i>	<i>20:44</i>	<i>149</i>	<i>Texas, Louisiana, Oklahoma, Arkansas: gulf coast from Matagorda Bay to Mississippi Delta.</i>
123	<i>S66-63063</i>	<i>S66-63211</i>	45	<i>Nov. 14, 1966</i>	<i>20:46</i>	<i>147</i>	<i>Florida: Keys, Cay Sal Bank, Florida Straits.</i>
124	S66-63064	S66-63212	45	Nov. 14, 1966	20:46	147	Cuba: La Habana, Piñar del Rio, Matanzas, Las Villas, Provinces.
125	S66-63065	S66-63213	45	Nov. 14, 1966	20:47	147	Cuba: La Habana, Piñar del Rio, Matanzas, Las Villas Provinces.
126	S66-63066	S66-63214	46	Nov. 14, 1966	20:47	146	Central Cuba; Bahama Bank.
127	S66-63067	S66-63215	46	Nov. 14, 1966	20:49	146	Cuba: Oriente, Camaguey Provinces.
128	S66-63068	S66-63216	46	Nov. 14, 1966	20:49	146	Cuba: Oriente, Camaguey Provinces; Jamaica.
129	S66-63069	S66-63217	46	Nov. 14, 1966	20:49	145	Cuba: Oriente, Camaguey Provinces; Jamaica.
130	S66-63070	S66-63218	46	Nov. 14, 1966	20:49	145	Bahama Islands: Great Inagua, Acklins, Mayaguana, The Caicos.
131	S66-63071	S66-63219	46	Nov. 14, 1966	20:50	145	Bahama Islands: Great Inagua, Acklins, Mayaguana, The Caicos.
132	S66-63072	S66-63220	46	Nov. 14, 1966	20:50	.....	Bahama Islands: Great Inagua, Grand Turk, Mayaguana, The Caicos.
133	S66-63073	S66-63221	46	Nov. 14, 1966	.....	.....	Limb, sunset.
134	S66-63074	S66-63222	47	Nov. 14, 1966	.....	.....	Clouds over Pacific Ocean.
135	S66-63075	S66-63223	47	Nov. 14, 1966	.....	.....	Clouds over Pacific Ocean.
136	<i>S66-63076</i>	<i>S66-63224</i>	47	<i>Nov. 14, 1966</i>	.....	.....	<i>Clouds over Pacific Ocean.</i>
137	<i>S66-63077</i>	<i>S66-63225</i>	47	<i>Nov. 14, 1966</i>	<i>23:34</i>	<i>154</i>	<i>Hawaiian Islands: Midway, Kure, Pearl and Hermes Reef.</i>
138	S66-63078	S66-63226	47	Nov. 14, 1966	23:34	154	Hawaiian Islands: Midway, Kure, Pearl and Hermes Reef.
139	S66-63079	S66-63227	47	Nov. 14, 1966	23:35	154	Hawaiian Islands: Pearl and Hermes Reef, Salmon Bank.
140	<i>S66-63080</i>	<i>S66-63228</i>	47	<i>Nov. 14, 1966</i>	<i>23:36</i>	<i>153</i>	<i>Hawaiian Islands: Pearl and Hermes Reef, Salmon Bank, Midway, Kure.</i>
141	<i>S66-63081</i>	<i>S66-63229</i>	53	<i>Nov. 15, 1966</i>	<i>08:32</i>	<i>154</i>	<i>United Arab Republic, Saudi Arabia, Sudan: Red Sea; jetstream clouds.</i>
142	<i>S66-63082</i>	<i>S66-63230</i>	53	<i>Nov. 15, 1966</i>	<i>08:36</i>	<i>153</i>	<i>Iran, Trucial States, Muscat and Oman: Qeshm Island, Gulf of Oman, Persian Gulf, Zagros Mountains, Makran Ranges.</i>
143	<i>S66-63083</i>	<i>S66-63231</i>	55	<i>Nov. 15, 1966</i>	<i>11:31</i>	<i>155</i>	<i>Mauritania, Spanish Sahara, Algeria: Erg Iguidi, Yetti Plains, south edge of Tindouf Basin.</i>
144	S66-63084	S66-63232	.....	Nov. 15, 1966	.....	.....	Blank.
145	S66-63085	S66-63233	55	Nov. 15, 1966	.....	.....	Bénard cells over Pacific Ocean.
146	S66-63086	S66-63234	55	Nov. 15, 1966	.....	.....	Bénard cells over Pacific Ocean.
147	S66-63087	S66-63235	56	Nov. 15, 1966	13:12	150	Libya, Algeria: Hamada el Hamra, Tiririne Dunes, Grand Erg Oriental; note contrail and shadow.



## MAGAZINE 17

Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
1	S66-62867	S66-62797	.....	.....	.....	.....	Blank.
2	S66-62868	S66-62798	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open.
3	S66-62869	S66-62799	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open.
4	S66-62870	S66-62800	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open.
5	S66-62871	S66-62801	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open.
6	S66-62872	S66-62802	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open.
7	S66-62873	S66-62803	13	Nov. 12, 1966	.....	.....	Spacecraft skin, looking aft, hatch open; Maurer 16-mm movie camera.
8	S66-62874	S66-62804	13	Nov. 12, 1966	.....	.....	Spacecraft skin, looking aft, hatch open; Maurer 16-mm movie camera.
9	S66-62875	S66-62805	13	Nov. 12, 1966	.....	.....	Spacecraft skin, hatch open.
10	S66-62876	S66-62806	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; clouds, ocean.
11	S66-62877	S66-62807	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; clouds, ocean.
12	S66-62878	S66-62808	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; clouds, ocean.
13	S66-62879	S66-62809	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; clouds, ocean.
14	S66-62880	S66-62810	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; Mexico: Baja California.
15	S66-62881	S66-62811	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; Mexico: Baja California.
16	S66-62882	S66-62812	13	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; Mexico: Baja California.
17	<i>S66-62883</i>	<i>S66-62813</i>	13	<i>Nov. 12, 1966</i>	17:30	158	<i>Docked to Agena, hatch open; Mexico: West coast from Culiacan to Manzanillo.</i>
18	S66-62884	S66-62814	13	Nov. 12, 1966	17:30	158	Docked to Agena, hatch open; Mexico; West coast from Culiacan to Manzanillo.
19	S66-62885	S66-62815	13	Nov. 12, 1966	17:31	158	Docked to Agena, hatch open; Mexico: West coast from Culiacan to Manzanillo.
20	S66-62886	S66-62816	13	Nov. 12, 1966	17:31	158	Docked to Agena, hatch open; Mexico: West coast north of Manzanillo.
21	<i>S66-62887</i>	<i>S66-62817</i>	13	<i>Nov. 12, 1966</i>	17:32	158	<i>Docked to Agena, hatch open; Mexico: Mexico City, Puebla; Neo-Volcanic plateau, Lago de Chapala.</i>
22	S66-62888	S66-62818	13	Nov. 12, 1966	17:32	157	Docked to Agena, hatch open; Mexico: Mexico City, Puebla; Neo-Volcanic plateau, Lago de Chapala.
23	<i>S66-62889</i>	<i>S66-62819</i>	13	<i>Nov. 12, 1966</i>	17:32	157	<i>Docked to Agena, hatch open; Mexico: Central and eastern Mexico, north of Leon, Coahuila Basin, Sierra Madre Occidental and Oriental.</i>
24	S66-62890	S66-62820	13	Nov. 12, 1966	17:32	157	Docked to Agena, hatch open; Mexico: Mexico City, Pueblo; Neo-Volcanic plateau.
25	<i>S66-62891</i>	<i>S66-62821</i>	13	<i>Nov. 12, 1966</i>	17:33	157	<i>Docked to Agena, hatch open; Mexico: Isthmus of Tehuantepec, Yucatan Peninsula.</i>
26	S66-62892	S66-62822	13	Nov. 12, 1966	17:34	156	Docked to Agena, hatch open; Mexico: Yucatan Peninsula, Yucatan Channel.
27	S66-62893	S66-62823	13	Nov. 12, 1966	17:34	156	Docked to Agena, hatch open; Gulf of Mexico, U.S. gulf coast.
28	S66-62894	S66-62824	13	Nov. 12, 1966	17:35	156	Docked to Agena, hatch open; Gulf of Mexico, U.S. gulf coast.
29	S66-62895	S66-62825	13	Nov. 12, 1966	17:35	156	Docked to Agena, hatch open; Gulf of Mexico, U.S. gulf coast.
30	S66-62896	S66-62826	13	Nov. 12, 1966	17:35	155	Docked to Agena, hatch open; Gulf of Mexico, U.S. gulf coast.
31	<i>S66-62897</i>	<i>S66-62827</i>	13	<i>Nov. 12, 1966</i>	17:36	155	<i>Docked to Agena, hatch open; Florida.</i>
32	S66-62898	S66-62828	13	Nov. 12, 1966	17:37	155	Docked to Agena, hatch open; Florida.
33	S66-62899	S66-62829	13	Nov. 12, 1966	17:37	155	Docked to Agena, hatch open; Florida.
34	<i>S66-62900</i>	<i>S66-62830</i>	13	<i>Nov. 12, 1966</i>	17:37	155	<i>Docked to Agena, hatch open; Florida, Bahama Islands.</i>
35	S66-62901	S66-62831	13	Nov. 12, 1966	17:37	155	Docked to Agena, hatch open; Florida, Bahama Islands.

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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
36	S66-62902	S66-62832	13	Nov. 12, 1966	17:37	155	Docked to Agena, hatch open; Florida, Bahama Islands.
37	<i>S66-62903</i>	<i>S66-62833</i>	<i>13</i>	<i>Nov. 12, 1966</i>	<i>17:37</i>	<i>155</i>	<i>Docked to Agena, hatch open; Florida, Bahama Islands.</i>
38	S66-62904	S66-62834	13	Nov. 12, 1966	17:37	154	Docked to Agena, hatch open; Florida, Bahama Islands.
39	<i>S66-62905</i>	<i>S66-62835</i>	<i>13</i>	<i>Nov. 12, 1966</i>	<i>17:37</i>	<i>154</i>	<i>Docked to Agena, hatch open; Florida, Bahama Islands.</i>
40	S66-62906	S66-62836	14	Nov. 12, 1966	17:38	154	Docked to Agena, hatch open; Florida.
41	S66-62907	S66-62837	14	Nov. 12, 1966	17:38	154	Docked to Agena, hatch open; Florida.
42	<i>S66-62908</i>	<i>S66-62838</i>	<i>14</i>	<i>Nov. 12, 1966</i>	<i>17:38</i>	<i>154</i>	<i>Docked to Agena, hatch open; Florida, Bahama Islands: Miami Keys.</i>
43	S66-62909	S66-62839	14	Nov. 12, 1966	17:38	154	Docked to Agena, hatch open; Bahama Islands.
44	S66-62910	S66-62840	14	Nov. 12, 1966	17:38	154	Docked to Agena, hatch open; Bahama Islands.
45	<i>S66-62911</i>	<i>S66-62841</i>	<i>14</i>	<i>Nov. 12, 1966</i>	.....	.....	<i>Docked to Agena, hatch open; clouds, ocean.</i>
46	S66-62912	S66-62842	14	Nov. 12, 1966	.....	.....	Docked to Agena, hatch open; clouds, ocean.
47	<i>S66-62913</i>	<i>S66-62843</i>	<i>14</i>	<i>Nov. 12, 1966</i>	.....	.....	<i>Docked to Agena, hatch open; clouds, ocean.</i>
48	<i>S66-62914</i>	<i>S66-62844</i>	<i>14</i>	<i>Nov. 12, 1966</i>	.....	.....	<i>Docked to Agena, hatch open; clouds, ocean.</i>
49	S66-62915	S66-62845	14	Nov. 12, 1966	.....	.....	Inside spacecraft, out of focus.
50	S66-62916	S66-62846	14	Nov. 12, 1966	.....	.....	Inside spacecraft, out of focus.
51	S66-62917	S66-62847	14	Nov. 12, 1966	.....	.....	Hatch open, looking aft; Maurer 16-mm movie camera.
52	S66-62918	S66-62848	14	Nov. 12, 1966	.....	.....	Hatch open, looking aft; Maurer 16-mm movie camera.
53	S66-62919	S66-62849	14	Nov. 12, 1966	.....	.....	Hatch open, looking aft; Maurer 16-mm movie camera.
54	S66-62920	S66-62850	14	Nov. 12, 1966	.....	.....	Hatch open, looking aft; Maurer 16-mm movie camera.
55	S66-62921	S66-62851	14	Nov. 12, 1966	.....	.....	Major Aldrin's helmet; out of focus.
56	S66-62922	S66-62852	14	Nov. 12, 1966	.....	.....	Major Aldrin's helmet.
57	S66-62923	S66-62853	14	Nov. 12, 1966	.....	.....	Major Aldrin's helmet.
58	S66-62924	S66-62854	14	Nov. 12, 1966	.....	.....	Major Aldrin's helmet, open hatch.
59	S66-62925	S66-62855	14	Nov. 12, 1966	.....	.....	Major Aldrin's helmet, open hatch.
60	S66-62926	S66-62856	14	Nov. 12, 1966	.....	.....	Major Aldrin's helmet, open hatch; Blue Maurer camera.
61	S66-62927	S66-62857	14	Nov. 12, 1966	.....	.....	Major Aldrin's helmet, open hatch; Blue Maurer camera.
62	S66-62928	S66-62858	14	Nov. 12, 1966	17:52	143	Docked to Agena, hatch open; Spanish Sahara, Mauritania: Atlantic coast at Cap Blanc and Cap Barbas.
63	S66-62929	S66-62859	14	Nov. 12, 1966	17:52	143	Docked to Agena, hatch open; Spanish Sahara, Mauritania: Atlantic coast at Cap Blanc and Cap Barbas.
64	S66-62930	S66-62860	14	Nov. 12, 1966	17:52	143	Docked to Agena, hatch open; Spanish Sahara, Mauritania: Atlantic coast at Cap Blanc and Cap Barbas.
65	S66-62931	S66-62861	14	Nov. 12, 1966	17:52	142	Docked to Agena, hatch open; Spanish Sahara, Mauritania: Atlantic coast at Cap Blanc and Cap Barbas.
66	S66-62932	S66-62862	14	Nov. 12, 1966	17:52	142	Docked to Agena, hatch open; Spanish Sahara, Mauritania: Atlantic coast at Cap Blanc and Cap Barbas.
67	S66-62933	S66-62863	14	Nov. 12, 1966	19:07	155	Docked to Agena, hatch open; Mexico: West coast north of Culiacan; Sierra Madre Oriental, Baja California.
68	S66-62934	S66-62864	14	Nov. 12, 1966	19:07	155	Docked to Agena, hatch open; Mexico: West coast north of Mazatlan; Sierra Madre Oriental, Baja California.



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Frame	NASA/MSC		Revolution	Date	GMT	Alt, N. Mi.	Area description
	Color No.	B&W No.					
69	S66-62935	S66-62865	14	Nov. 12, 1966	19:07	154	Docked to Agena, hatch open; Mexico: West coast north of Cabo Corrientes; Sierra Madre Oriental, Baja California.
70	S66-62936	S66-62866	14	Nov. 12, 1966	19:08	154	Docked to Agena, hatch open; Mexico: West coast from Culiacan to head of Gulf of California, Sierra Madre Oriental, Baja California.

# GLOSSARY

- airglow** Broadly defined as the nonthermal radiation emitted by the Earth's atmosphere with the exception of auroral emission (northern lights) and radiation of cataclysmic origin such as lightning and meteor trains. Airglow at night, also called nightglow, is always present and is readily observed by the naked eye on a clear night away from city lights. The peak of the night-glow layer occurs at approximately 90 kilometers, the emission being the result, for example, of excited molecular oxygen, atomic oxygen, and sodium.
- alluvium** A general term for all detrital deposits resulting from the operations of modern rivers; this includes the sediments laid down in river beds, flood plains, lakes, and estuaries.
- altocumulus** A cloud path or layer composed of laminae, rounded masses, or rolls which are sometimes partly diffused and may or may not merge. The cloud elements usually are smaller than stratocumulus and larger than cirrocumulus. They may occur at more than one level and are made up largely of small liquid water droplets.
- anticline** A fold or arch of rock strata, usually dipping in opposite directions away from an axis.
- anticyclone** A region of relatively high atmospheric pressure whose circulation is clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere. The region may be 3000 kilometers or more wide.
- island arc** Islands or mountains arranged in a great curve. A curved belt of islands, partly volcanic, in or near ocean basins, such as the Aleutian Islands.
- Archean** The term is generally applied to the oldest rocks of the Precambrian. However, usage is changing and the new term, *Early Precambrian*, is preferred. It means the same as *Archeozoic* also.
- atoll** A ringlike "coral or calcareous algae" island or islands encircling, or nearly encircling, a lagoon.
- basalt** A fine-grained, dark-colored, igneous rock containing about 50 percent  $\text{SiO}_2$  and characteristic minerals.
- basin-and-swell structure** Geologic term for areas such as the central United States in which the dominant structures are very large domes, arches, and troughs with very shallow dips; characteristic of tectonically stable areas.
- bedrock** Any solid rock, in place, exposed at the surface of the Earth or overlain by unconsolidated material.
- Bénard cell** A form of cellular convection, studied in the laboratory by the French physicist, H. Bénard, in which the vertical circulation may be upward in the core of the cell and downward on the edges, or it may be reversed.
- carbonate** A compound containing the radical  $\text{CO}_3$ , used geologically as a short term for calcium or magnesium carbonate rocks such as limestone or dolomite.
- cay** A flat mound of sand built up on a reef flat slightly above high-tide level.
- Cenozoic** The latest of the four eras into which geologic time is divided, beginning about 70 million years ago. Also, the whole group of stratified rocks deposited during the Cenozoic era. The era includes Tertiary and Quaternary.
- cellular convection** An organized air motion in distinct convection cells, having either upward or downward motion in the central portions of the cell, and having the opposite either sinking or rising flow in the cell's outer regions. The phenomenon is similar to that often referred to as Bénard cells displayed in fluids on laboratory scale.
- cirrostratus** A whitish cloud veil of fibrous or smooth appearance occurring at altitudes of 6 to 18 kilometers, composed largely of ice crystals. It is frequently thin enough to be transparent.
- cirrus** White, delicate filaments, patches, or bands of cloud which have a fibrous appearance and often a silky sheen. The cloud is composed mainly of ice crystals and in the Tropics it is found at 6 to 18 kilometers in altitude.
- clastic** Consisting of fragments of rocks or of organic structures that have been moved from their places of origin.
- cloud street** A line or row of cumulus clouds usually aligned nearly parallel to the wind direction.
- coesite** A high-pressure polymorph of  $\text{SiO}_2$ ; first created artificially by L. Coes and later found in rock from Meteor Crater, Ariz., by E. Chao. It is believed to be indicative of meteoritic impact.
- cold front** A boundary zone between an advancing mass of cold air and a warmer air mass.
- color infrared film** A color film sensitive to infrared radiation as well as visible light; used chiefly to photograph vegetation. Colors are rendered differently from the colors seen by the eye; e.g., greens are reproduced as reds.
- continental drift** The supposed horizontal movement of entire continents for hundreds or thousands of miles over geologic time; indicated by similarities in geologic structure, lithology, and fossil affinities on opposite sides of oceans such as the South Atlantic. It is still a disputed concept.
- convection** Atmospheric motions that are predominantly vertical, resulting in the vertical transport and mixing of atmospheric properties, normally caused by heating from the land or water surface below (meteorological).
- convergence** An inflow of air on a horizontal plane. Near the Earth's surface the converging air may rise and produce convective clouds (meteorological). Situation whereby waters of different origins come together at a point or, more commonly, along a line known as a convergence line (oceanographic).



**coral** A calcareous skeleton of a coral or group of corals which are bottom-dwelling marine animals.

**Cretaceous period** The third and latest of the periods included in the Mesozoic era, beginning about 135 million years ago and lasting about 65 million years, also the system of strata deposited in the Cretaceous period.

**cuesta** Ridge with one steep and one gently sloping side.

**cumulonimbus cloud** A heavy and dense cloud of convective origin. It may develop to 10 or 20 kilometers in height. The top is nearly always flattened and often spreads out in an anvil or plume containing predominantly ice crystals; a thundercloud accompanied by lightning, thunder, rain, and sometimes hail.

**cumulus cloud** Individual detached cloud elements, generally dense and with sharp outlines, developing vertically in the form of rising mounds, domes, or towers. The cloud has a high density of small water droplets which frequently are supercooled.

**cumulus congestus cloud** A large cumulus cloud with sharp outlines and great vertical development. It may be producing rain, but not yet have reached the thunderstorm stage.

**current** Horizontal movement of a fluid.

**cyclone** An atmospheric circulation rotating counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere; a storm.

**dendritic drainage pattern** This phenomenon is characterized by treelike branching of streams in all directions, with the tributaries joining the main stream at all angles.

**Devonian** The fourth, in order of age, of the periods comprising the Paleozoic era, following the Silurian period, beginning about 400 million years ago and lasting about 50 million years. Also the system of strata deposited during that time. Sometimes called the "Age of Fishes."

**dike** A tabular body of rock (usually igneous) that cuts across the structure of adjacent rocks or cuts massive rocks. Most dikes result from intrusion of magma; some are formed by injection of sand or mud.

**dip** The maximum angle at which a stratum or any planar feature is inclined from the horizontal. The dip is at a right angle to the strike.

**divergence** A horizontal flow of water in different directions, from a common center or zone; often associated with upwelling.

**ebb tide, falling tide** The portion of the tide cycle between high water and the following low water.

**eddy** A circulation drawing its energy from a flow of much larger scale and brought about by flow irregularities (meteorological). A circular movement of water usually formed where currents pass obstructions, where two adjacent currents flow counter to each other, or along the edge of a permanent current (oceanographic).

**embayment** An embayment is similar to a basin of sedimentation and may be one flank of a larger subsiding feature. Used in a structural sense to designate a reentrant of sedimentary rocks into a crystalline massif.

**ephemeral stream** A stream or portion of a stream which flows only in direct response to precipitation. It receives little or no water from springs and no long-continued supply from melting snow or other sources. Its channel is at all times above the water table.

**epoch** Geologic time unit corresponding to a series; a subdivision of a period.

**equatorial counter current** An oceanic current flowing eastward in a narrow band in an equatorial region; usually imbedded in an equatorial current that is flowing westward.

**era** A large division of geologic time of the highest order, comprising one or more periods. The eras now generally recognized are the Archeozoic, Proterozoic, Paleozoic, Mesozoic, and Cenozoic. In some cases, Early Precambrian is substituted for Archeozoic and Late Precambrian for Proterozoic.

**erosion** The group of processes whereby earthy or rock material is loosened or dissolved and removed from any part of the Earth's surface. It includes the processes of weathering, solution, corrosion, and transportation. The mechanical wear and transportation are affected by running water, moving ice, or winds, which use rock fragments to pound or grind other rocks to powder or sand.

**escarpment** A cliff or relatively steep slope separating level or gently sloping tracts.

**estuary** Drainage channel adjacent to the sea in which the tide ebbs and flows. Some estuaries are the lower courses of rivers or smaller streams, others are no more than drainage ways that lead sea water into and out of coastal swamps.

**fault** A fracture or fracture zone along which there has been displacement of the two sides relative to one another parallel to the fracture. The displacement may be a few inches or many miles.

**fold** A bend in strata or any planar structures.

**friction layer** The layer of atmosphere from the surface to about 0.5 to 2 kilometers that is influenced by frictional and diurnal phenomena.

**gabbro** Loosely used for any coarse-grained dark igneous rock, chemically similar to basalt, and considered the plutonic (formed by solidification of molten magma deep within the Earth) equivalent of basalt.

**geosyncline** A large, generally linear trough that subsided deeply throughout a long period of geologic time and in which a thick secession of stratified sediments and possibly extrusive volcanic rocks has commonly accumulated. The strata of many geosynclines have been folded into mountains. Many types have been differentiated and named.

**glaciation** Alteration of the Earth's solid surface through erosion and deposition by glacial ice.

**glitter pattern** The specular reflectance of the Sun's rays off the ocean's surface.

**gneiss** A coarse-grained rock in which bands rich in granular minerals alternate with bands in which schistose minerals predominate.

**graben** Large blocks of the crust that have been downdropped along fractures.

**graben faulting** A block, generally long compared to its width, that has been downthrown along faults relative to the rocks on either side.

**gradient** The rate of decrease of one quantity with respect to another.

**granite** Light-colored, coarse to medium-grained, plutonic rock containing alkali feldspars, quartz, and accessory minerals such as mica; of igneous or metamorphic origin.

- granodiorite** An intrusive igneous rock, similar to granite but with a higher plagioclase content.
- greenstone** An old field term applied to altered basic igneous rocks which owe their color to the presence of chlorite, hornblende, and epidote.
- Greenwich mean time** The local mean time of the Greenwich (prime) meridian. Now called Universal Time (astronomical); sometimes, Zulu or Z-time (U.S. Navy).
- ground elapsed time (GET)** Time elapsed from launch of spacecraft.
- homocline** A general name for any block of bedded rocks all dipping in the same direction.
- igneous rock** Rocks formed by solidification from a molten or partially molten state. One of three principal classes into which all rocks are divided. The others are sedimentary and metamorphic.
- intrusive (igneous) rock** One formed by consolidation of magma beneath the surface of the Earth, as opposed to extrusive rock formed from erupted magma (lava).
- island wake** A wake resulting from the division of an ocean current by an island producing an elongated area of upwelling on the lee side.
- jebel** Arabic for mountain.
- jetstream** Relatively strong winds concentrated within a narrow stream in the atmosphere. It may be thousands of kilometers long, hundreds of kilometers wide, and some kilometers in depth. A subtropical jetstream is found, at some longitudes, between 20° and 30° latitude.
- Jurassic** The middle of the three geological periods comprising the Mesozoic era. Also the system of strata deposited during that period, beginning about 180 million years ago and lasting about 45 million years.
- laccolith** A concordant, intrusive body that has domed up the overlying rocks and has a floor that is generally horizontal, but may be convex downward.
- lagoon** A body of shallow water, particularly one possessing a restricted connection with the sea. A water body within an atoll or behind barrier reefs or islands.
- lignite** A brownish-black coal in which the alteration of vegetal material has proceeded further than in peat but not so far as subbituminous coal.
- limb** Geologically, one of the two parts of an anticline or syncline on either side of the axis. Astronomically, the edge of a celestial object as viewed.
- limestone** A general term for that class of sedimentary rocks which contain at least 80 percent of the carbonates of calcium or magnesium.
- lineament** A structurally controlled topographic line, generally of regional extent.
- lithographic texture** A term used to denote grain size in calcareous sedimentary rocks. The grain size corresponds to that of clay, or less than 1/256 millimeter.
- low-pressure system** An area of minimum atmospheric pressure associated with cyclonic circulation.
- marl** Usually defined as a calcareous clay, or an intimate mixture of clay and particles of calcite or dolomite, usually fragments of shells.
- massif** A body of plutonic igneous or metamorphic rock, at least 10 to 20 miles in diameter, occurring as a structurally resistant mass in an uplifted area that may have been a mountain core.
- mesoscale** Small-scale weather patterns that may occur over distances of perhaps 15 to 1500 kilometers.
- Mesozoic** One of the eras of geologic time. It comprises the Triassic, Jurassic, and Cretaceous periods beginning about 225 million years ago and lasting 255 million years. Also the group of strata formed during the era.
- metamorphic** Rocks which have formed in the solid state in response to pronounced changes of temperature, pressure, and chemical environments, usually at depth.
- metasediments** Metamorphosed sedimentary rocks.
- microgranite** A fine-grained granite, usually a marginal phase of a granite intrusion.
- micrometeoroid** A very small solid body, generally less than a millimeter in diameter, moving in interplanetary space.
- minaret** A towerlike rock form.
- Miocene** The fourth of the five epochs into which the Tertiary period is divided. Also the series of strata deposited during that epoch.
- monsoons** Seasonal winds caused primarily by the much greater annual variation of temperature over large land areas compared with neighboring ocean surfaces. An excess of pressure occurs over land in winter and a deficit in summer. Monsoons are strongest on the southern and eastern sides of Asia.
- mosaic** A composite picture formed by assembling overlapping vertical aerial photographs taken from different camera positions.
- Neogene** The later of the two periods into which the Cenozoic era is divided in the classification adopted by the International Geological Congress and used by many European geologists. Also the system of strata deposited during that period.
- Neo-Volcanic** Of or pertaining to volcanic rocks or volcanic phenomena formed or taking place during the Cenozoic era.
- orogeny** The process of forming mountains, particularly by folding and thrusting.
- orographic cloud** A cloud, the existence, form, and extent of which are determined by the upslope flow of air over hills or mountains.
- outcrop** Bedrock exposed at the surface of the Earth.
- Paleogene** The earlier of the two periods comprised in the Cenozoic era, and used by many European geologists. Not in wide use in the United States.
- Paleozoic** One of the eras of geologic time, between the Late Precambrian and Mesozoic eras, that comprises the Cambrian, Ordovician, Silurian, Devonian, Mississippian, Pennsylvanian, and Permian systems. Also the group of rocks deposited during this era.
- pegmatite** Igneous rocks of coarse grain that are usually found as dikes associated with a large mass of igneous rock of finer grain size. The name usually refers to granite pegmatites. Some pegmatites contain rare minerals.
- pelagic** Pertaining to communities of marine organisms which live free from direct dependence on bottom or shore; the two types are free-swimming (nektonic) and floating forms (planktonic).
- Permian** Last period of the Paleozoic era. Also the system of rocks formed during the period.



**pillow lavas** Lavas that exhibit a peculiar structure consisting of an agglomeration of rounded masses that resemble pillows. The pillow structure is generally believed to be the result of subaqueous deposition.

**Pleistocene** The earlier of the two epochs comprised in the Quaternary period. Also called Glacial epoch and formally called ice age. Also the series of sediments deposited during that period.

**Pliocene** The latest of epochs comprised in the Tertiary period in the classification generally used. Also the series of strata deposited during the epoch.

**Precambrian** An era of geologic time. All rocks formed before Cambrian time. The oldest and longest period of geologic time.

**Quaternary** The younger of the two geologic periods in the Cenozoic era. It is subdivided into Pleistocene and Recent epochs or series. It comprises all geologic time and deposits from the end of the Tertiary until and including the present.

**radiosonde** A balloon-borne instrument for simultaneous measurement and transmission of meteorological data.

**reef** A chain or range of rock or coral, elevated above the surrounding bottom of the sea, generally submerged and dangerous to surface navigation.

**reverse faults** A fault along which the hanging wall has been raised relative to the foot wall. A normal fault is just the opposite.

**rheid** A body of rock showing flow structure; also used for masses of rock which have flowed over geologic time while below the melting point.

**rhyolite** An extrusive igneous rock chemically equivalent to granite.

**rift** A topographic depression formed along major faults.

**rift valley** A large valley produced by subsidence along two parallel faults. (See *graben*.)

**ring dike** An arcuate, rarely circular, dike with steep dip. Larger ring dikes may be many miles long, hundreds or thousands of feet thick; the radius or arc is generally from 1 to 10 miles; although some dikes may form a nearly complete circle or ellipse, more commonly they encompass one-third to three-fourths of the circle or ellipse.

**rip tide** A seaward flowing current brought about when waves elevate the water level along a coast. These currents are confined to the surf zone and are usually no longer than a few tens of meters. They are not associated with diurnal tides.

**salt plug/salt dome** A structure resulting from the upward movement of a salt mass, and with which oil and gas fields are frequently associated. In the gulf coast area of the United States, the salt is in the form of a roughly circular plug of relatively narrow diameter but often several thousand feet in depth.

**sandstone** A cemented or otherwise compacted detrital sediment, usually composed predominantly of quartz grains; some varieties are composed partly of other minerals such as feldspar.

**savanna** A tropical or subtropical region of grassland and other drought-resistant vegetation. This type of growth occurs in warm regions having a long, dry season alternating with a rainy season.

**scarp** An escarpment, cliff, or steep slope of some extent along the margin of a plateau, mesa, terrace, or bench.

**schist** A medium or coarse-grained metamorphic rock, with subparallel orientation of the micaceous minerals which dominate its composition.

**sea breeze** A local coastal wind that blows from sea to land caused by the temperature difference when the sea surface is colder than the adjacent land.

**sea-surface structure** Features of the sea surface created by wind (waves), currents, differences in density of adjacent waters, and the shape of the ocean basin. Only the surface expressions of the features and their horizontal extent are visible from space.

**sedimentary rocks** Rocks formed by the accumulation of sediment. The sediment may consist of rock fragments or particles of various sizes (conglomerate, sandstone, shale); of the remains or products of animals or plants (certain limestones and coal); of the product of chemical action or evaporation (salt, gypsum, etc.); or of mixtures of these materials. A characteristic feature of sedimentary deposits is a layered structure known as bedding or stratification.

**shale** A laminated sediment in which the constituent particles are predominantly of the clay grade.

**shield** A continental block of the Earth's crust that has been relatively stable over a long period of time and has undergone only gentle warping (basin and swell structure) in contrast to the strong folding of bordering geosynclinal belts. Mostly composed of Precambrian rocks.

**sill** An intrusive body of igneous rock of approximately uniform thickness, relatively thin compared with its lateral extent, usually emplaced parallel to the bedding or schistosity of the intruded rocks.

**sinkhole** A funnelshaped depression in the land surface, generally in a limestone region, communicating with a subterranean passage developed by solution.

**stability** A condition in the atmosphere in which vertical motions are absent or definitely restricted.

**steppe** An area of grass-covered and generally treeless plains with a semiarid climate. They occupy large portions of eastern Europe and Asia.

**stratocumulus cloud** A patch, layer, or sheet of cloud composed of numerous elements which appear as rounded masses or rolls. They are nonfibrous and may or may not merge. They are composed of small water droplets and occur at altitudes up to 2 kilometers.

**stratum** A section of a formation that consists throughout of approximately the same kind of rock material. A single sedimentary bed or layer (plural, strata).

**stratus cloud** A cloud layer having a uniform base and top with widely dispersed water droplets. It occurs between the surface and 2 kilometers in the Tropics.

**stream piracy** The diversion of the upper part of a stream by the headward erosion of another stream.

**strike** The course or bearing of the outcrop of an inclined bed or structure on a level surface; the direction or bearing of a horizontal line in the plane of an inclined stratum, joint, fault, cleavage plane, or other structural plane; it is perpendicular to the direction of the dip.

**structure** The sum total of the structural features of an area. Petrology: one of the larger features of a rock mass, like

- bedding, jointing, cleavage; also the sum total of such features.
- subsidence** A descending motion in the atmosphere, usually over a rather broad area (meteorological). Gradual depression of an area, as in a geosyncline (geological).
- Sun glitter** A pattern of sunlight being reflected from water; also called Sun glint.
- syenite** An intrusive igneous rock consisting principally of alkalic feldspar and usually one or more mafic (dark) minerals.
- syncline** A fold in rocks in which the strata dip inward from both sides toward the axis. The opposite of *anticline*.
- tableland** A flat or undulating elevated area, a plateau or mesa.
- tectonic** Pertaining to the rock structure and external forms resulting from the deformation of the Earth's crust. As applied to earthquakes, it is used to describe shocks not caused by volcanic action or by collapse of caverns or landslides.
- terminator** The line separating the illuminated and dark portions of a celestial body which shines by reflected sunlight, as the Moon or the Earth.
- Tertiary** The earlier of the two geologic periods comprised in the Cenozoic era. Also the system of stratum deposited during that period.
- Tethys geosyncline** Elongated east-west geosyncline that separated Europe and Africa and extended across southern Asia in pre-Tertiary time.
- trachyte** An extrusive rock composed essentially of alkalic feldspar and minor biotite, hornblende, or pyroxene.
- trade winds** The wind system which occupies the lowest few kilometers in the atmosphere of most of the Tropics. It blows with consistency of direction from the subtropical highs toward the equatorial trough. The winds are predominantly northeasterly in the Northern Hemisphere and southerly in the Southern Hemisphere.
- trellis drainage** A drainage system in which the main streams are generally parallel, with smaller tributaries flowing at right angles to them.
- troposphere** That portion of the Earth's atmosphere from the surface to the tropopause which is the lower 10 to 20 kilometers of the atmosphere. Here the temperature normally decreases with height.
- tuff** A rock formed of compacted volcanic fragments, which are generally smaller than 4 millimeters in diameter.
- typhoon** A severe tropical storm in the western Pacific Ocean.
- uplift** Elevation of any extensive part of the Earth's surface relative to some other part; opposite to *subsidence*.
- upper-level trough** An elongated area of relatively low atmospheric pressure existing in the upper air.
- upwelling** The process by which water rises from a lower to a higher depth, usually as a result of divergence and offshore currents.
- von Kármán eddy** Vortices especially visible in cloud formations, resulting from frictional drag of air over and/or around raised obstacles such as islands. Named after Theodor von Kármán, the aerodynamicist.
- vortex** A whirl or eddy.
- vortex street** Two parallel rows of alternately placed, counterrotating vortices along the wake of an obstacle in a fluid or air; also called a von Kármán vortex street.
- wadi** A ravine or watercourse, dry except in the rainy season.
- watershed** The area contained within a drainage divide above a specified point on a stream. Also called drainage area, drainage basin, or catchment area.
- wind shear** The local variation of the wind vector in a horizontal or vertical direction.
- wave diffraction** The bending of waves around obstacles or over a shoal sea floor.
- wave length** The distance between corresponding points of two successive periodic waves in the direction of propagation, for which the oscillation has the same phase.
- wrench fault** A nearly vertical strike-slip fault.
- zodiacal light** A faint, diffuse light, triangular or cone shaped, seen on either side of the Sun along the zodiac or ecliptic plane. It is seen in middle northern latitudes in the spring after sunset in the western sky, or in the fall before sunrise (dawn) in the eastern sky (astronomical).





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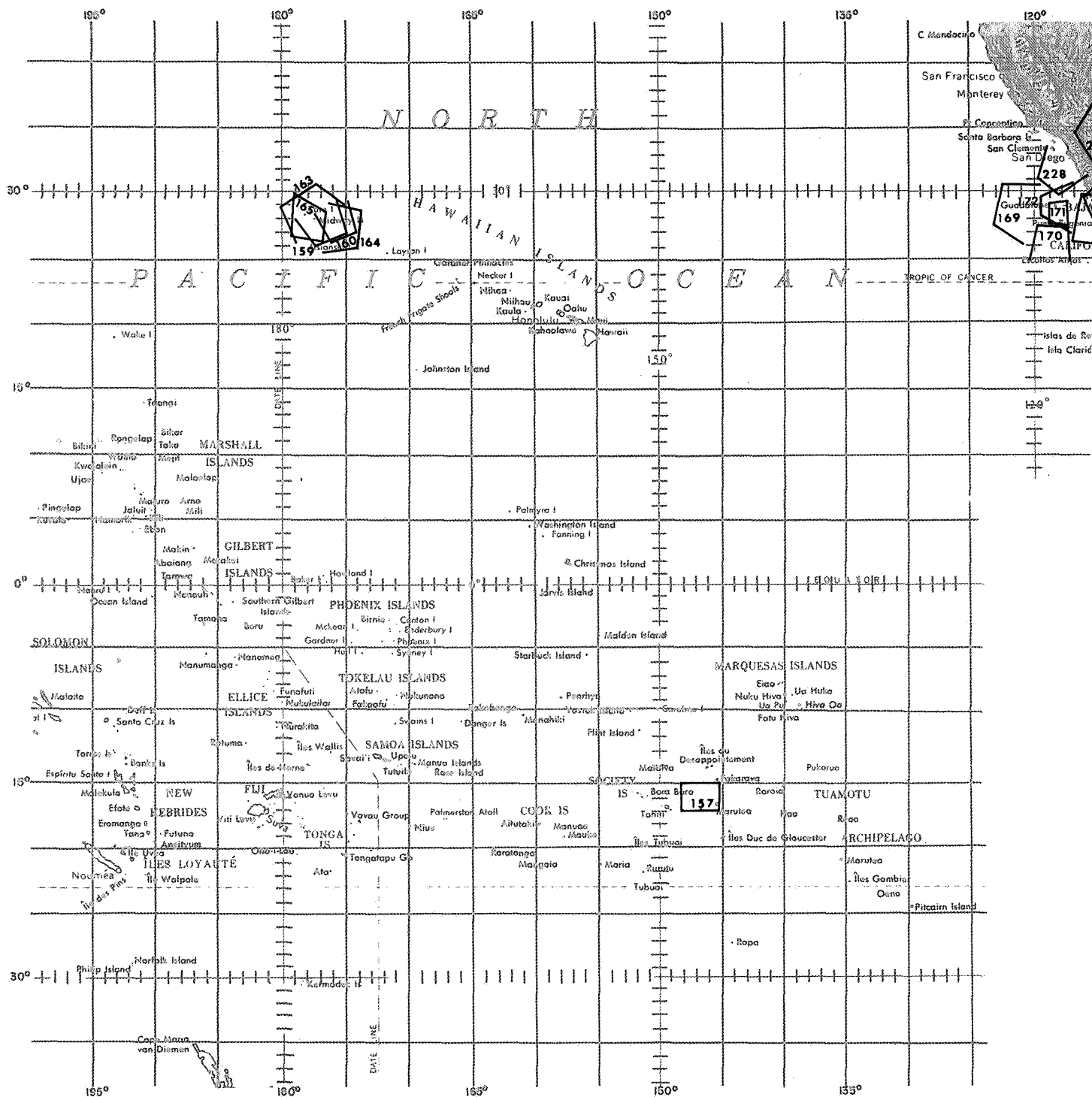
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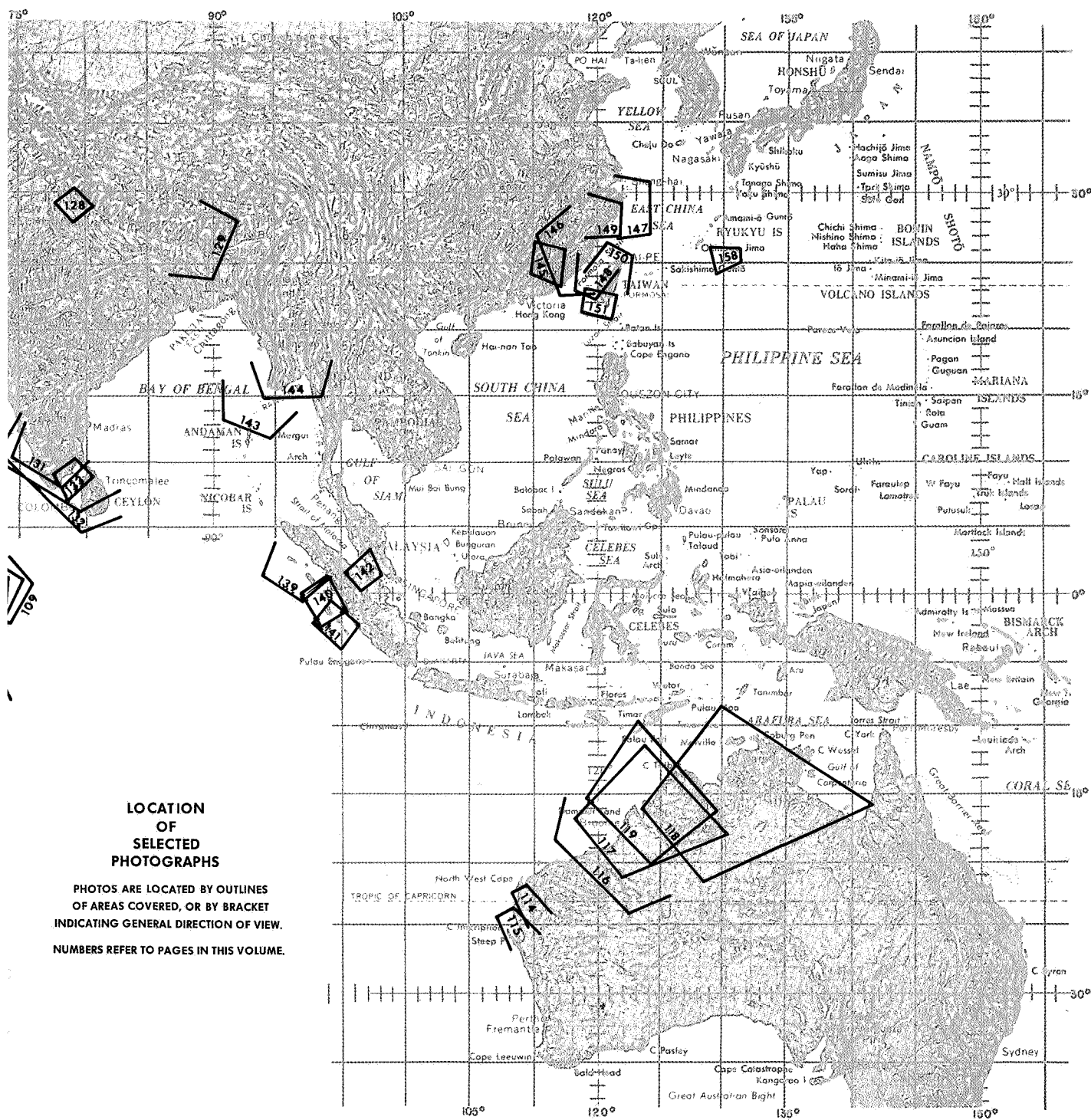
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