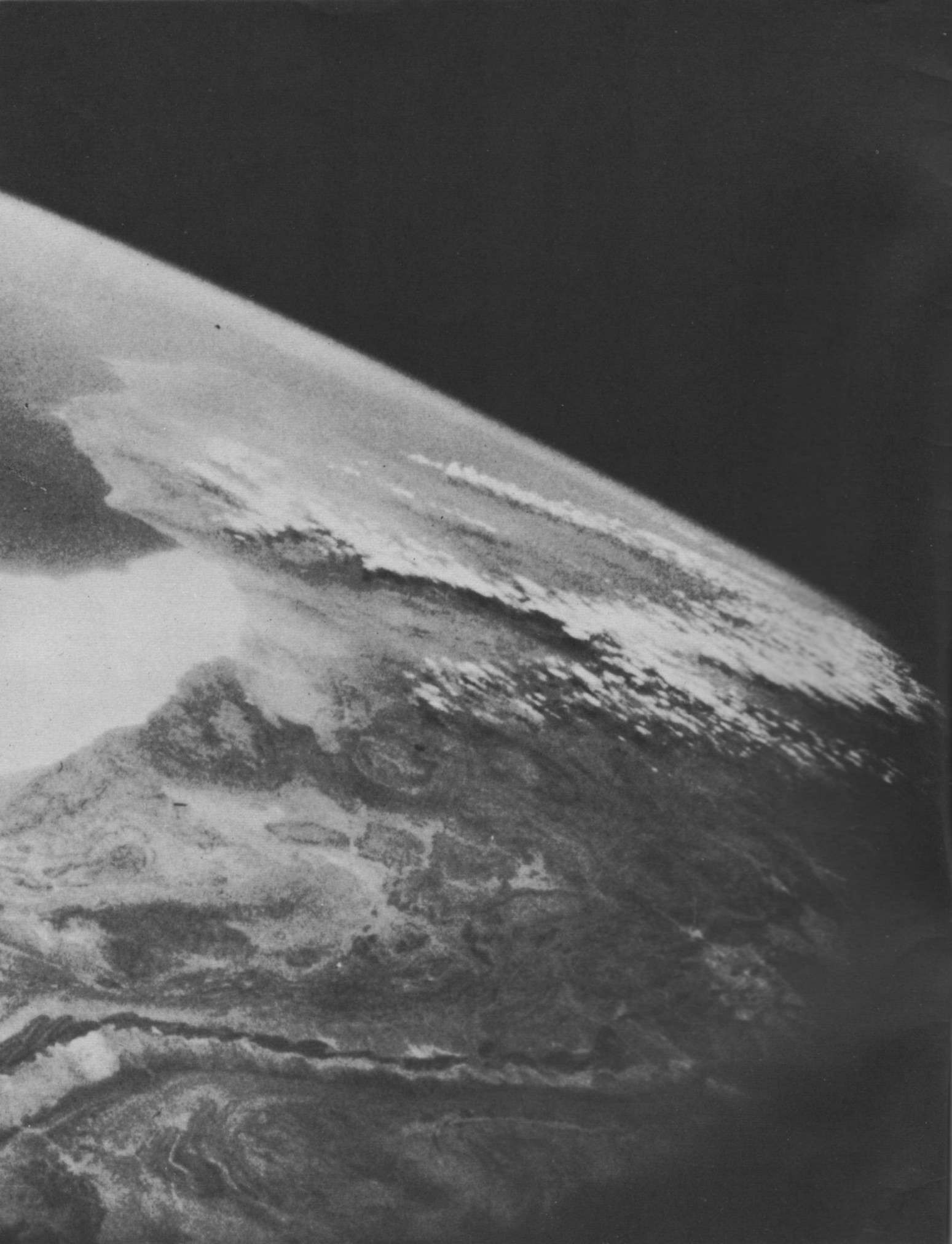
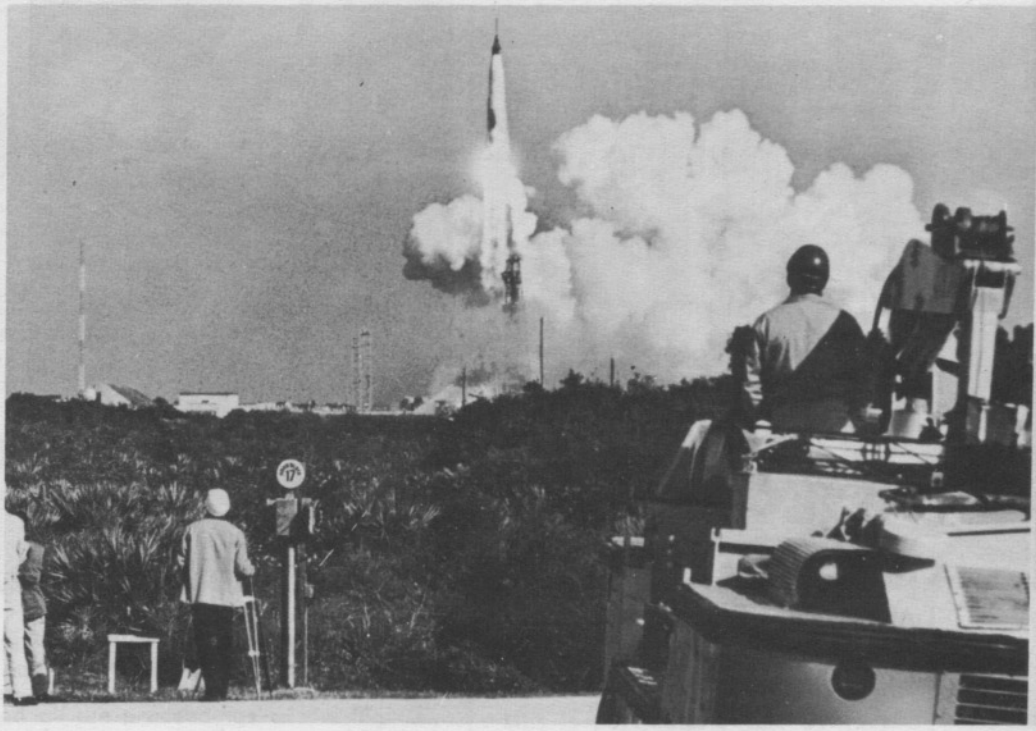
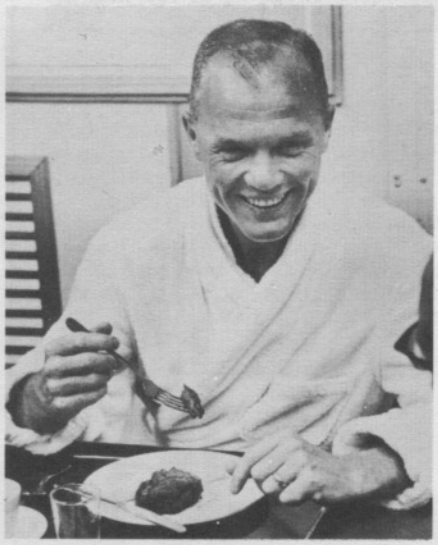

AMERICA'S
MAN
IN
ORBIT



AMERICA'S ASTRONAUT ROCKETS INTO ORBIT



At 9:47 A.M., belching smoke and fire, the Atlas rocket rose slowly from the pad and levelled off toward the East, and Glenn began his historic flight.



At 2:20 A.M., east coast U.S. time, February 20, astronaut Glenn was awakened. He was in good spirits and ate a large breakfast.

Next, technicians checked Glenn's suit for air leaks and faulty connections.

At 4:00 A.M. he donned heavy socks before putting on his space suit.

February 20, 1962, marked another advance in the space age!

At 3:01 P.M., a helicopter from the aircraft carrier U.S.S. Randolph retrieved from the waters of the Atlantic Ocean off Puerto Rico, the spacecraft "Friendship 7" and its pilot, Marine Corps Lieutenant Colonel John H. Glenn Jr., after they had completed three complete orbits of the earth in 4 hours, 56 minutes and 26 seconds at a speed of 28,072 kilometers per hour and landed safely in the designated recovery area.

"My condition is excellent," the 40-year-old space pilot told his rescuers immediately upon climbing from the Mercury spacecraft to the deck of the destroyer U.S.S. Noa, which dashed six miles from its stationed point to make the pickup.

At times during his flight, astronaut Glenn was a busy man. During his first orbit and at various periods thereafter, he had partial

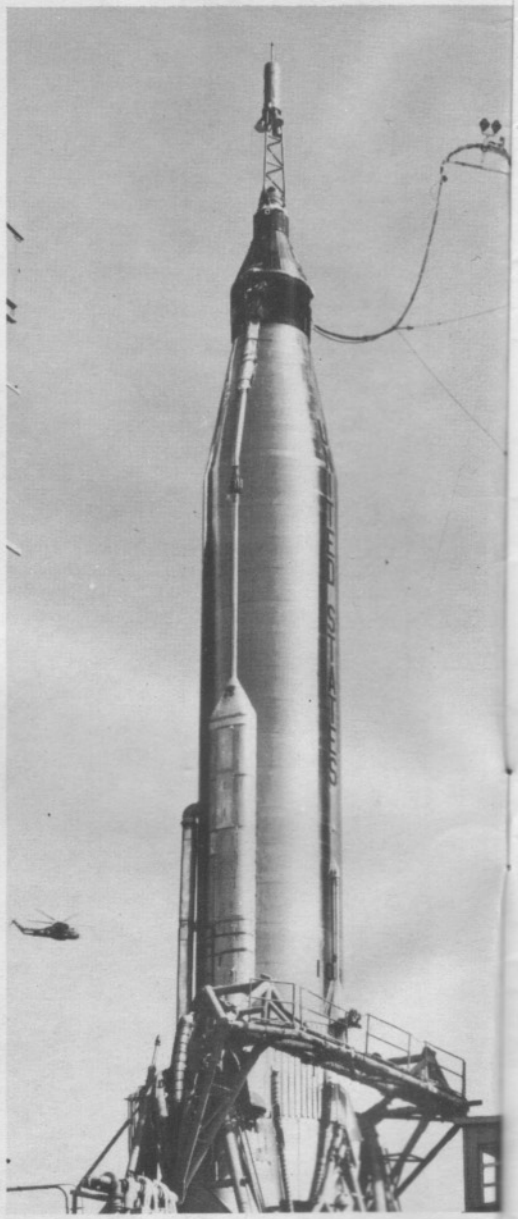
At 5:02 A.M., he left Hangar S for the ride to Complex 14, the launch site.

Glenn took the elevator to the top of the Atlas rocket and entered his "Friendship 7" spacecraft at 6:03 A.M.

Glenn completed his first orbit in 88.29 minutes. He reported that upon beginning his second trip around the world he put his "Friendship 7" spacecraft on automatic control.

He reported continually on the workings of his craft system, and the view from his periscope.

At 8:25 A.M., the gantry moved back on the rails – the rocket stood alone as liquid oxygen was fed into it.



control of his craft, manouvering it into positions to give him different views of the earth he was circling.

After ten postponements, most of which had been caused by bad weather, either at the launching site at Cape Canaveral, Florida, or in the recovery area, Glenn blasted off atop a powerful Atlas rocket at 9:47 A.M. (Florida time). Within four minutes of take-off, the Bermuda tracking station was in radio contact with Glenn.

He talked repeatedly to tracking stations in the first few minutes of flight, describing the falling off of the burned-out Atlas, "A beautiful sight to see."

Glenn entered orbit at a speed of 28,072 kilometers per hour. His first orbital path carried him over the Atlantic, across the African coast near Kano, Nigeria, over the Indian Ocean near Zanzibar, across the southern part of Australia, the Pacific Ocean—crossing the equator in the vicinity of Canton Island, and the continental United States. At no time did he fly over Europe or any part of Asia or South America.

After the initial shock and vibration of take-off, Glenn reported the flight as "very smooth." He went into darkness midway across the Indian Ocean, and re-entered daylight after recrossing the equator in the Pacific Ocean south of Hawaii.

As he passed over the Kano, Nigeria, tracking station at 10:09 A.M., he reported he had eaten beef and vegetables from a squeeze tube. At one point he said, "The horizon is a brilliant blue."

Astronaut Glenn went into orbit 604.6 kilometers from the launch site The low point in his orbital flight was 160 kilometers, the high point 256 kilometers. Glenn carried on a conversation with his colleagues at the various tracking stations.

At one point in his flight, when coming from darkness into sunlight, Glenn said he saw small particles outside his window traveling at the same speed he was, and glowing in the sun. "Luminous particles, thousands of them, right at sunrise," he said.

A TREMENDOUS NOTE OF JOY – At their home in Arlington, Virginia, only a few kilometers from the U.S. capital – Washington, D.C. – Mrs. John Glenn and the Glenn's two teen-age children, David and Lyn, with several friends and neighbors watched all the proceedings of the flight on television. A family friend said there was "a tremendous note of joy" as the reports showed full success as the astronaut soared into space. Reporters, photographers and television crewmen gathered at the Glenn home to catch the family's reaction. During the tense moments of the flight, Reverend Frank A. Erwin, Pastor of the church which the Glenns attend, was asked if there were any prayers. "There were some prayers I am sure. No verbal ones," he said.

"I am having no ill effects at all; no discomfort whatsoever," Glenn said as he swept around the earth in a weightless state. His voice, heard by millions of people around the world via a radio hook-up, was cool and showed no apparent tension.

For Glenn, during the flight, night and day — darkness and sunlight — were less than 45 minutes apart.

Supplementing his navigational devices, Glenn used the stars during his "nights" and the horizon "by day" as navigational checks.

On his second pass over Australia, Glenn said that the yaw (side-to-side movement) was worsening and that the warning light was on. He quickly adjusted the craft.

At the conclusion of the second orbit, Glenn talking with astronaut Alan Shepard at Cape Canaveral, worked out final plans for firing the retro rockets to bring him back to earth. At 2:20 P.M., the rockets were fired. Three minutes later Glenn said he could see the coast of California and a cloud cover extending toward Mexico.

Glenn's spacecraft came down at 2:43 P.M., as planned, and was picked up and deposited on the deck of the U.S.S. Noa.

Glenn was transferred to the aircraft carrier U.S.S. Randolph where he underwent a two-hour physical examination. Then he was taken on a 90-minute plane ride to a special hospital set up on Grand Turk Island in the Bahama Islands. There he underwent two full days of post-flight examination.

A PROUD PRESIDENT and Nation

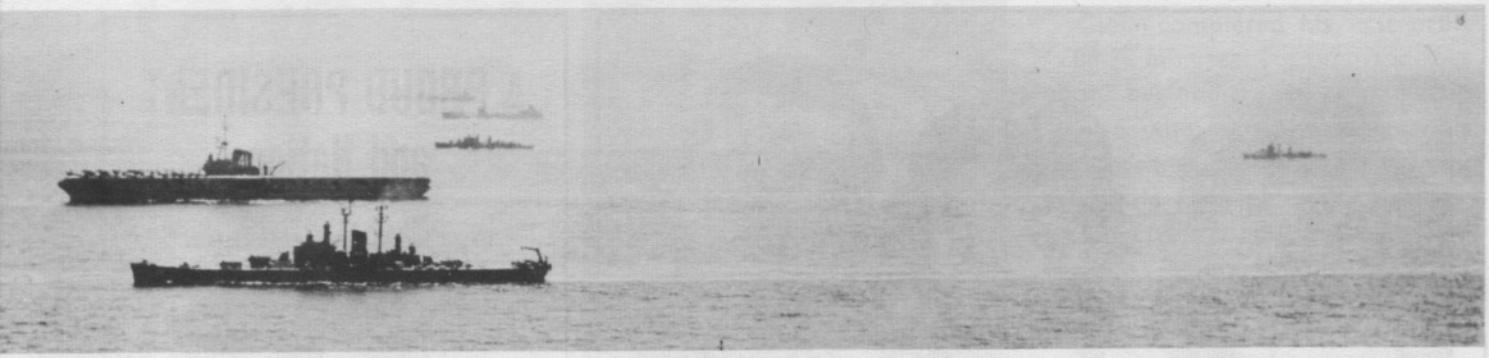
In a radio and television address to the nation immediately following Glenn's successful orbital flight, President John F. Kennedy said the astronaut is "the kind of American of whom we are proud."

Speaking from the White House, the President declared, "We all express our thanks to him . . . I know the great happiness and thanks-giving of all of us that Colonel Glenn has completed his trip and I know that this is particularly felt by Mrs. Glenn and his two children."

He also spoke of the significance of the flight: "We have a long way to go in the space race and we started late. This is the new ocean and we must sail on it and be in a position second to none."

Earlier, President Kennedy, Vice President Lyndon Johnson and leading members of the U.S. Congress met at the White House, had breakfast and watched the launching proceedings on television.

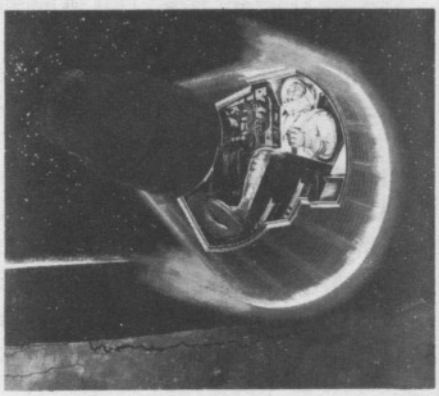
Two weeks prior to his flight, Glenn had a private chat with President Kennedy at the White House.



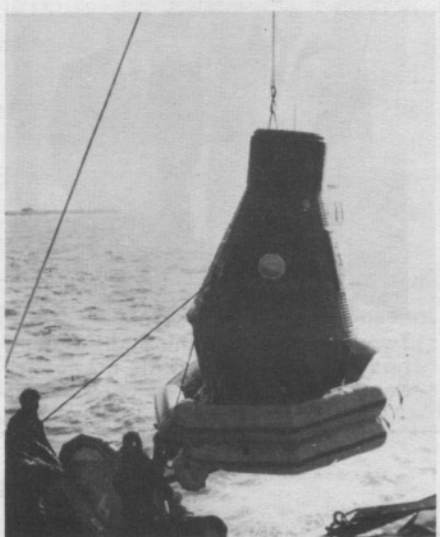
In each area – an aircraft carrier and accompanying destroyers.

OPERATION PICKUP

Sixty aircraft and a fleet of 24 ships manned by more than 15,000 men were at action stations to help recover Astronaut Glenn and his spacecraft after the orbital flight. Extreme care was taken in planning and effecting his safe recovery.



As it plunged down through the earth's atmosphere, "Friendship 7" glowed red with heat from the friction.



The spacecraft is retrieved from the Atlantic by the recovery ship.

Advance plans were made to retrieve the spacecraft at the end of any of three complete orbits. In addition, contingency plans called for picking up Glenn at any point along his path around the earth. Stationed in each of the possible landing areas were one large aircraft carrier with accompanying smaller vessels.

Each of the ships was staffed with a medical team, including a surgeon. Twenty top medical specialists of the U.S. Air Force, Navy and Army were poised at Cape Canaveral and in the Azores ready to rush to Glenn if needed. They were part of a total team of 167 physicians, nurses, technicians and other experts in the pickup operation.

Glenn had memorized the locations of the planned recovery areas. During his flight he received continuous information about possible landing areas lying ahead.

At the end of the third orbit, Glenn fired the retro-rockets slowing down the craft slightly. As soon as his craft began to lose altitude, all recovery aircraft and ships in the area began to converge on the anticipated landing spot. Crews in the other areas relaxed and returned to their former stations.

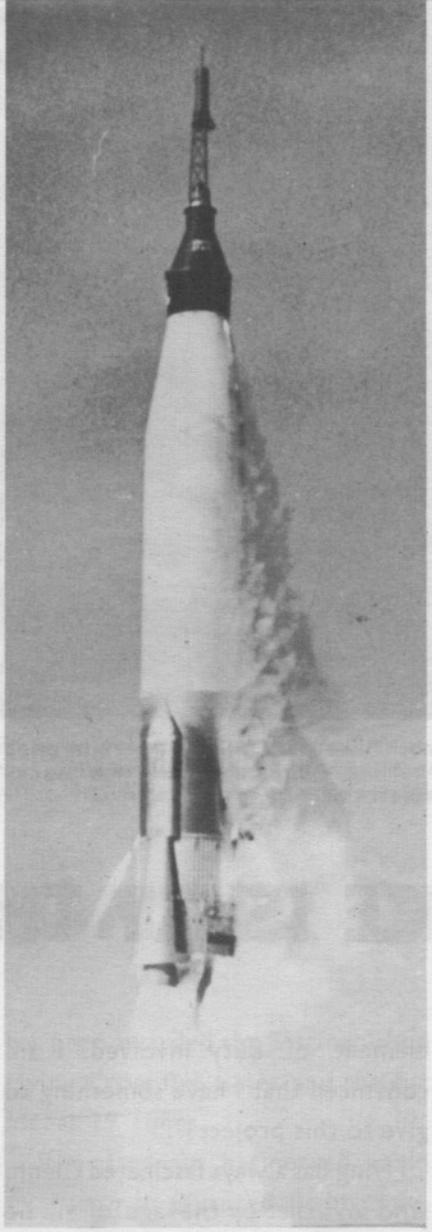
It took 30 minutes for "Friendship 7" to travel the 5,000-kilometer re-entry course in a steepening arc. Despite the discomfort of heavy gravity forces pressing against his body while his speed was slowing, Glenn was able to talk to the recovery team by radio.

When he dropped farther into the atmosphere, his radio waves were blocked temporarily by the intense heat on the surface of the spacecraft. Howevever, metal "chaff" was automatically released from the craft to aid radar trackers. At about 3,000 meters, Glenn's descent was slowed by a large parachute. He then resumed radio contact with the recovery team.

The instant his craft splashed into the Atlantic Ocean, his radio beacon went on automatically and a bright light began flashing atop the craft. A smoke bomb was ejected which poured brightly colored smoke downwind. A dye was released that stained the water. Finally, a sonar depth charge exploded and set off shock waves that were detected by listeners aboard the nearby Navy vessels.

Glenn then radioed that he was awaiting pickup.

FRONT ROW SEAT



Atlas rocket with manned Mercury capsule in its nose lifts off from Cape Canaveral, Florida – launching site for the Space Administration's earth satellite, space probe and Mercury programs.

Through the media of radio, television, motion pictures, newspapers and magazines, hundreds of millions of people in the United States and in most of the other countries of the world were given the opportunity of having a front row seat at the launching and recovery of the space capsule that carried John H. Glenn on his orbital flight around the earth.

Approximately 600 seasoned newsmen — scores of whom were foreign correspondents — with pads, pencils, microphones and an assortment of television, motion picture and still picture cameras covered the start and finish of the historic event.

As the events unfolded on the launching pad at Cape Canaveral, Florida, they immediately became public knowledge. Americans, and others within radio and television range were able to follow the launching as it occurred — or "live" as it is termed in communication jargon.

The on-the-spot news coverage of Glenn's flight was but a continuation of the U. S. Government's policy of making available to the world information on the Project Mercury tests and flights. The sub-orbital flights of Alan B. Shepard last May, and Virgil I. Grissom last July, were also covered by the international and U.S. press.

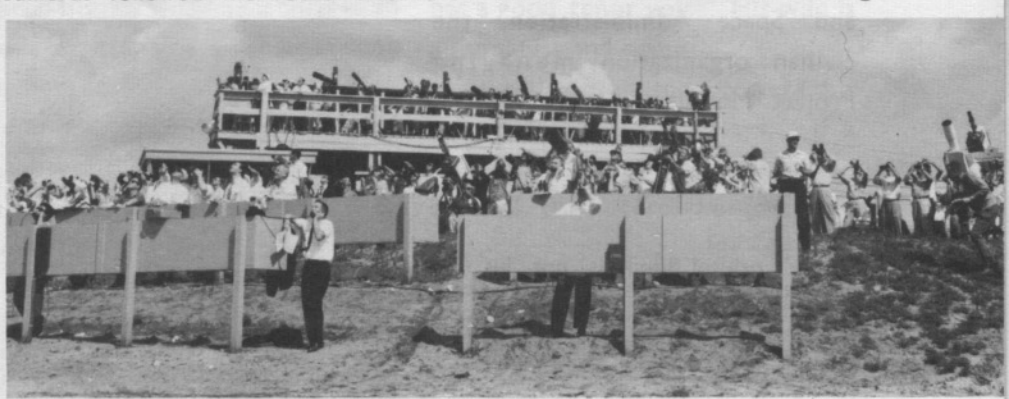
Prior to previous tests and sub-orbital flights, several American as well as foreign newsmen questioned the advisability of the U.S. Government telling the world public in advance that Mercury shots were to be made on particular dates.

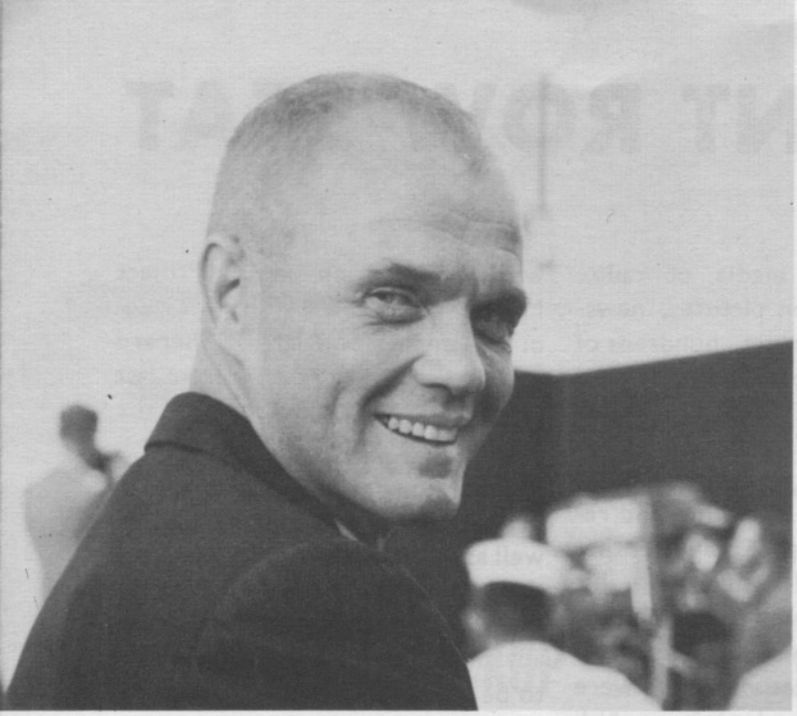
This small group of newsmen contended that in the event of a failure of one of the space flights the publicity would be turned into a disadvantage, and be directed against the United States itself.

The U.S. Government chose to ignore the warnings — holding that the public has a right to know, to criticize, and maintaining that freedom of information involves obligations and risks. Moreover, that freedom to know is only curbed as far as matters are involved whose knowledge by an enemy would decidedly impair America's own national security, or in time of war.

A front row seat at the launching of Glenn's flight was available to the residents of the more than 54,000,000 American homes equipped with either television or radio sets – or both.

Scores of motion picture, television and still picture cameras were trained on the Atlas missile as it sat ready for take-off on the launching pad. The cameras followed the rocket after liftoff until it was out of camera range.





John H. Glenn Jr., as he receives the news that he was chosen to be the first man to orbit the earth in the Mercury spacecraft.

David Glenn is much like his father -- interested in boating, water skiing, airplanes and the space achievements of Project Mercury.

'SPACE IS AT THE

"I wouldn't trade places with any man in the world, and it's an understatement to say that I am happy," John H. Glenn Jr., said when he was chosen for specialized final training for Project Mercury. Now that he has become the first American to orbit the earth in a space capsule, he has more reason to feel that way.

Glenn, at age 40 is the oldest of the seven U.S. astronauts. A Marine Corps lieutenant colonel, he is on loan to the National Aeronautics and Space Administration, the civilian organization managing Project Mercury.

In explaining why he volunteered as a candidate for Project Mercury, Glenn said: "Space is at the frontier of my profession. There is also an element of duty involved. I am convinced that I have something to give to this project..."

Glenn's orbital flight is not his first historic flight. In 1957 he set a new U. S. transcontinental speed record, flying from California to New York -- a distance of 4,800 kilometers -- in three hours and 23 minutes.

Flying has always fascinated Glenn, who says that by the age of six he had decided he wanted to work with airplanes. He recalls reading science fiction as a youth, but admits that he didn't take space travel seriously then.

After graduating from public schools in New Concord, Ohio, he spent three years at Muskingum College but left to enter the Navy cadet flying program. He was commissioned in the Marine Corps in 1943.

In World War II he flew 59 combat missions and during the Korean conflict, 63 missions. For his accomplishments in battle and in developing advanced types of aircraft, Glenn

Fourteen-year-old Lyn Glenn is a typical American teenage girl but different in one respect -- her father is the first American to orbit the earth.

At home he had the backing of his wife, Anna Castor Glenn.

FRONTIER OF MY PROFESSION'

has been awarded the Distinguished Flying Cross five times and the Air Medal 19 times.

The astronaut has served as an instructor in advanced flight training, aircraft projects officer and other Navy assignments. His flying time totals 5,100 hours including 1,600 hours in jet aircraft.

Like his six space team mates Glenn has the distinction of being as nearly physically perfect a man as Project Mercury officials could find.

A man of more than medium height, Glenn has close-cropped, thinning red hair, green eyes and an engaging smile. His charming and jovial manner belie the bedrock sternness of purpose with which he has approached his space-flight training, driving himself even beyond the requirements of that rigorous program.

Glenn is married to his childhood sweetheart, the former Anna Castor. They have two children, David 15, and Carolyn 14.

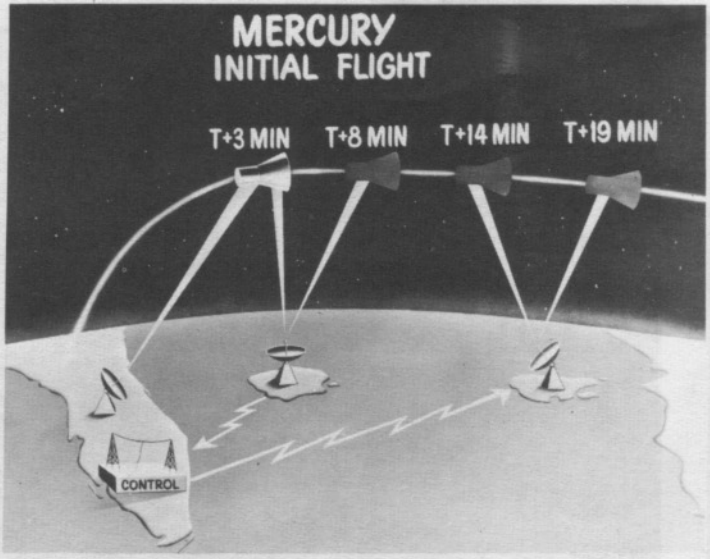
He has the complete backing of his family in his career as a space man. "I don't think any of us could really go on with something like this if we didn't have pretty good backing at home," he has said.

As his training progressed, Glenn shared his job with his family. In an article written for a U.S. magazine during the training period Mrs. Glenn said, "John brings home for us most of the things he has to read, unless they are too technical, so the children and I understand a great deal more than just the goals of Project Mercury."

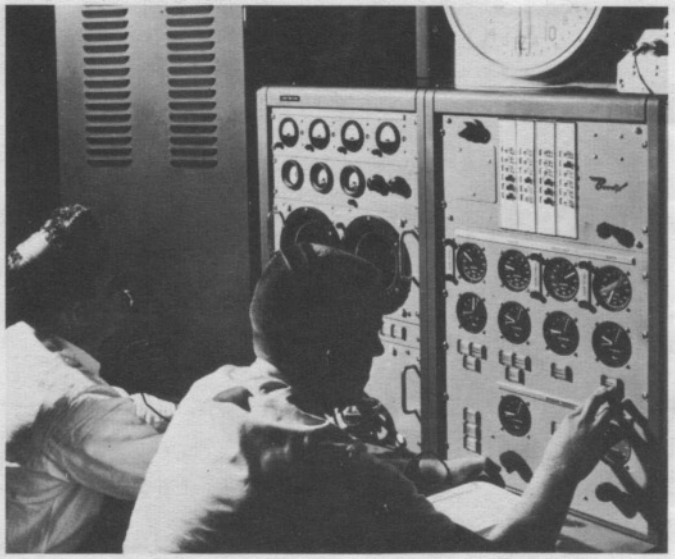
She also explained that "Religion plays an extremely important role in our lives. We try to live it every day, to be consistent in it and not, as John says, use it to pull us out in tight spots." Glenn has taught Sunday school and been a church trustee and choir singer.

The Glenns enjoy boating and water-skiing, and pursue these together whenever possible. Music is another favorite relaxation. Glenn plays the guitar and trumpet and has a good tenor voice. His wife is an organist and pianist.

Of his own attitude toward his career in space, Glenn says, "If a man faces up to it and takes the dare of the future, he can have some control over his destiny. That's an exciting idea to me, better than waiting with everybody else to see what's going to happen."



FIRST FEW MINUTES – An artist's conception of the first 19 minutes of Glenn's flight into an earth orbit. As the capsule headed east after launching from Florida, communications stations in the Atlantic Ocean established radar and radio lifeline contacts. Glenn conversed with them by two-way radio.



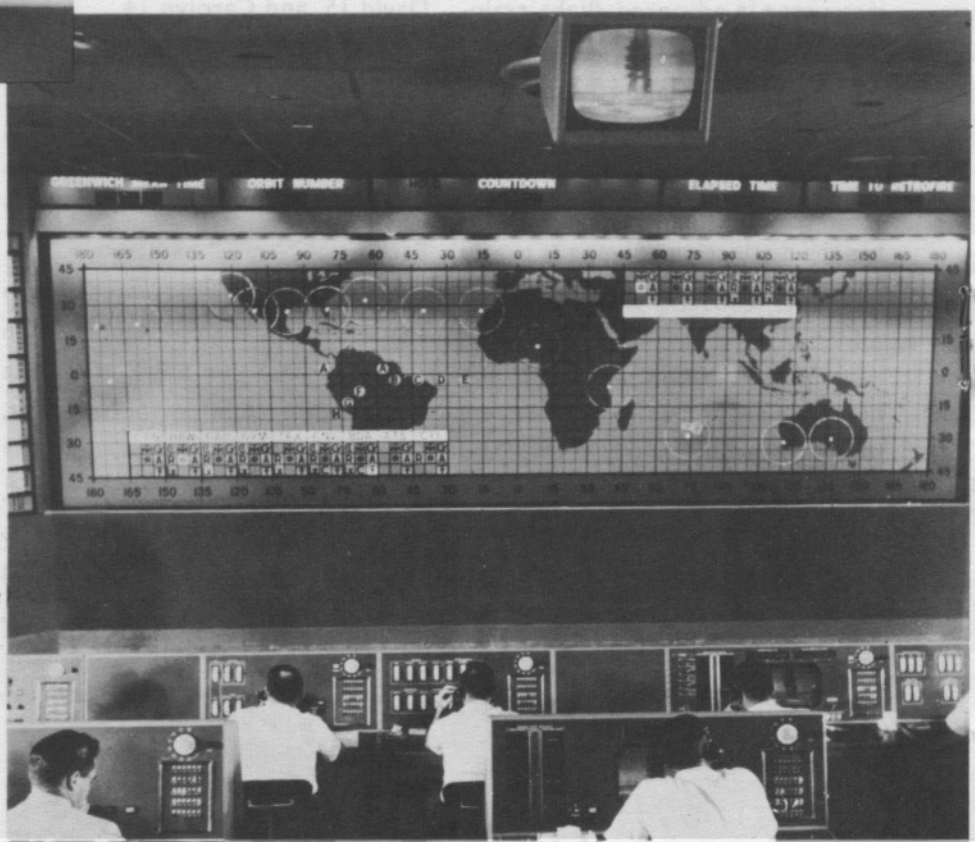
CONTINUOUS CONTACT – Glenn's flight was guarded and guided by means of a worldwide communications and tracking network. The technicians in this typical installation maintained contact with Glenn while he was over their area.

INTERNATIONAL COOPERATION AI

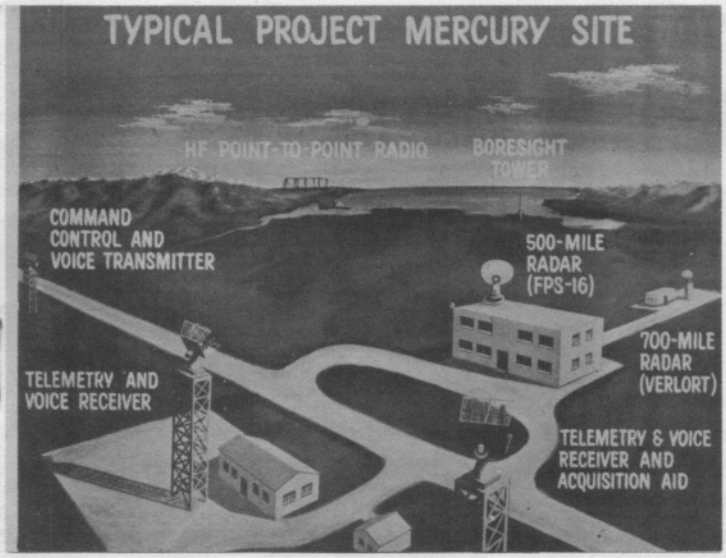
International cooperation was significant in the flight of the first U. S. man in orbit.

The well-being of John H. Glenn depended on communications and tracking stations in various parts of the world. Governments in eight widely separated areas around the earth contributed their aid in this scientific project.

THREE SPACE PILOTS: Prior to his orbital flight, John H. Glenn was briefed on space travel by astronauts Alan B. Shepard (right) and Virgil I. Grissom (left) who made sub-orbital flights in Mercury capsules in 1961.



CAPE CANAVERAL CONTROL CENTER – Into this center came data from the Mercury capsule relayed from the world-wide data stations, and high speed computers. The large world map shows Glenn's path in orbit.



MEASUREMENTS BY RADIO – Artists drawing shows the various transmitting and receiving devices at a typical tracking site. Automatic instruments in each station recorded by radio (telemetry) 90-odd measurements, including Glenn's handling of the many controls.

IDED GLENN'S ORBITAL FLIGHT

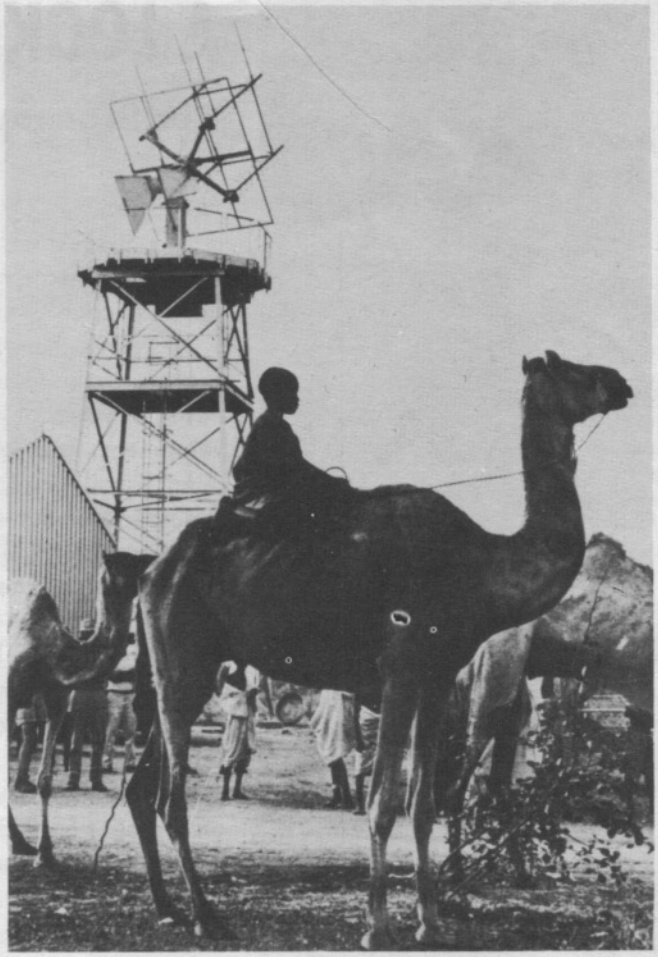
Mutually-beneficial agreements between the United States and the governments in these regions led to establishment of the stations. Nothing is secret about the stations or their equipment. All are open to the public. Citizens of the participating countries helped build and staff the stations, in cooperation with United States personnel.

The stations contain equipment used in direct conversation with astronaut Glenn and receipt of scientific information by radio from the spacecraft. The stations are located at St. David's Island, Bermuda; Maspalomas, Grand Canary Island; Kano, Nigeria; Zanzibar, East Africa; Muchea, West Australia; Woomera, South Australia; Canton Island, Pacific Ocean; and Guaymas, Mexico.

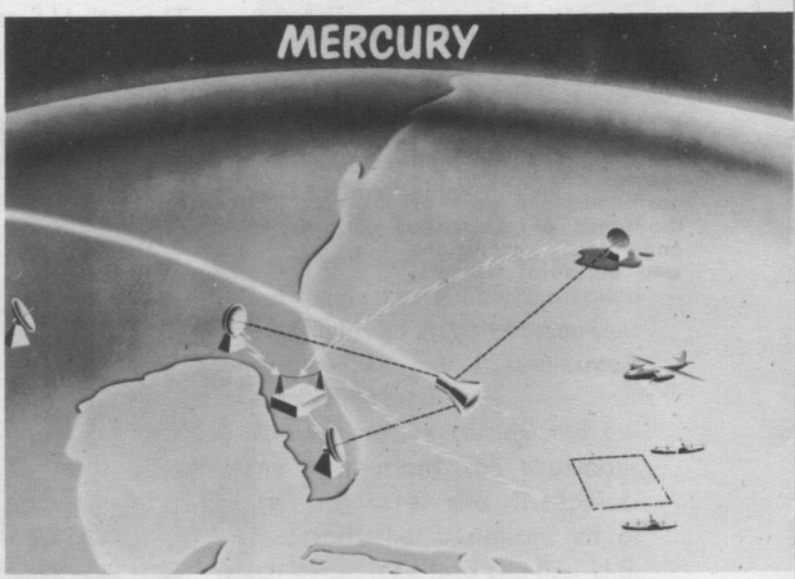
There are also special tracking stations for the Mercury Project on two U.S. ships at sea — one in the Atlantic and the other in the Indian Ocean — and at six points within the United States.

The main control station is at Cape Canaveral, Florida, where Glenn was launched. During his flight, information from all stations was transmitted instantly to computers at the Goddard Space Flight Center, Maryland, near Washington — the U. S. capital. All the stations are linked by an around-the-world chain of communications.

Each station played a role in the space drama as Glenn circled the earth. Some citizens of the various countries heard Glenn's voice by radio as he whizzed through space far over their heads.



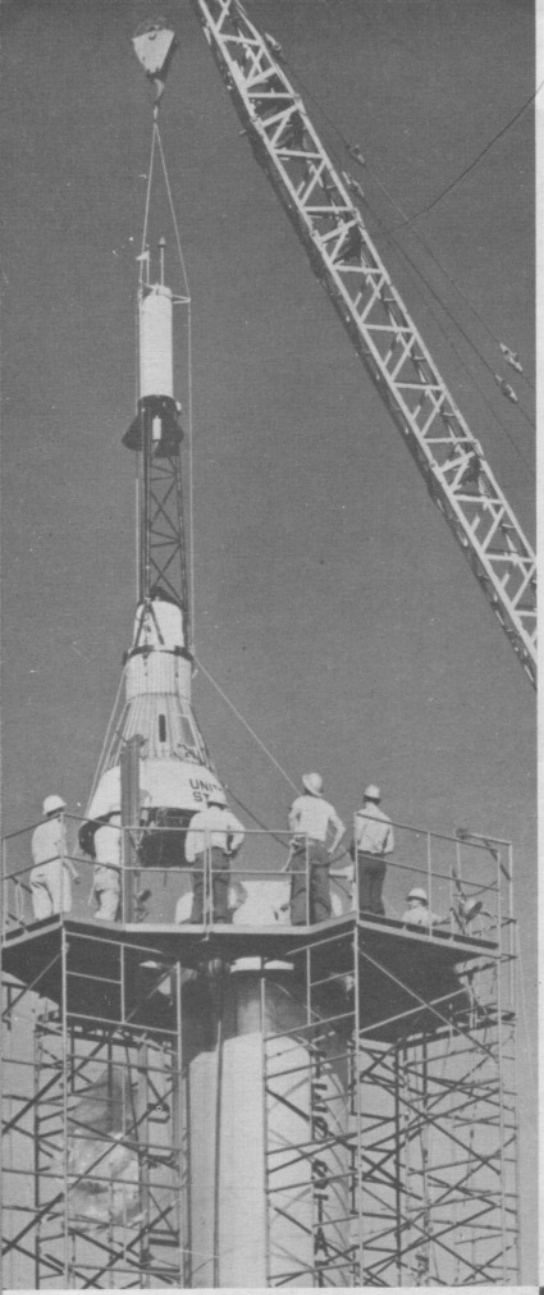
COMMUNICATIONS STATION – Camels pause in front of the Mercury station at Kano, Nigeria.



FINAL MINUTES – An artist depicts the final moments of Glenn's flight. Aircraft and ships patroled the Atlantic area where Glenn was scheduled to land. A radio transmitter in the capsule continued working even after the capsule landed in the ocean.

A LOOK BEHIND THE SCENES

The Structure That Made Glenn's Flight A Success



Behind the success of America's first manned space flight around the earth was the work of thousands of scientists, engineers, technicians and industrial workers.

The first American to orbit the earth rode into space on more than the nose cone of a rocket.

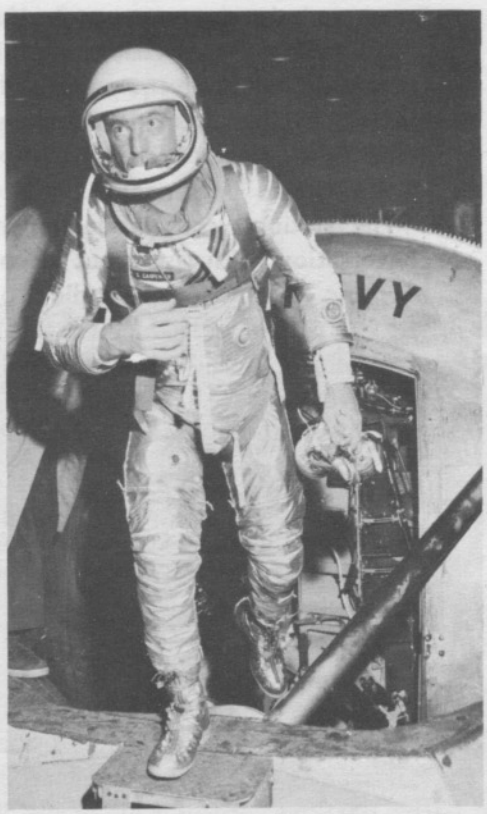
In a sense, he was propelled atop a giant pyramid, a structure composed of years of research and development, into which poured the talent, toil, and imagination of thousands of scientists, engineers, and technicians. Dozens of private companies pitched in, working together with the Project Mercury staff. And not to be forgotten are the young monkeys and chimpanzees that pioneered the way into space for man.

Project Mercury was established on October 5, 1958. Many questions faced the staff. Questions such as: What is space? What kind of spacecraft should be constructed for the first space flights? What safety measures should be built in? Which rockets should be used in the first launchings?

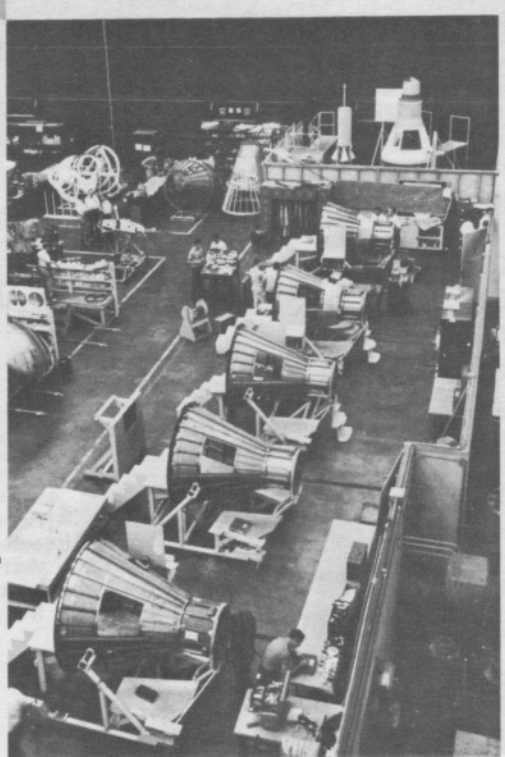
The early U.S. satellites and space probes filled in a lot of blanks about the nature of space and the problems of rocket launchings. But a great deal remained to be learned.

The choice for the first spacecraft was made — a bell-shaped vehicle which would ride out of the atmosphere narrow end first and return at extremely high speed with its heavy blunt end leading the way down and protecting it against the fierce heat generated by the air friction of the atmosphere.

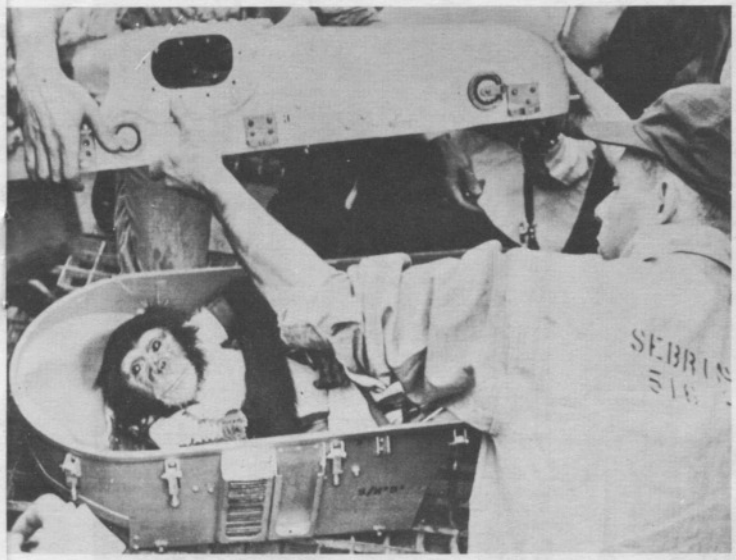
Three rockets — Atlas, Redstone, and Little Joe — were picked for



The astronauts as well as the components of the space vehicles were put under stress and strain. M. Scott Carpenter, selected as the alternate in the event that Glenn had been unable to make the flight, emerges from the gondola of a human centifuge at a pre-flight test center.



Scores of the bell-shaped Mercury space capsules were manufactured by private industry for use in Project Mercury tests and the main event – Glenn's orbit of the earth.



Among the primates used in the pre-manned space capsule tests were tiny monkeys and chimpanzees such as "Ham" shown being removed from his flight couch after a sub-orbital flight on January 31, 1961.

To determine the space capsule's lift, drag and other characteristics in flight, tests were made in a wind tunnel which simulated an airspeed of 28,000 kilometers per hour.

reliability and availability. They had to undergo modifications and tests in preparation for their Project Mercury functions. Each was to have special jobs in qualifying the spacecraft, beginning with the Redstone manned suborbital flights of Astronauts Alan B. Shepard and Virgil I. Grissom, and culminating in the Atlas orbital flight of John H. Glenn Jr.

Next came the astronauts. Sixty-nine aircraft test pilots, chosen on the basis of education, age, physical size, and flying experience, were called to Washington — the U.S. Capital — to hear about the Mercury program. Eighty percent volunteered. Seven were selected for training after a series of interviews and discussions.

With these and other decisions made, the project moved into high gear.

Small-scale models of the spacecraft were tested in 28,000 kilometer-an-hour wind tunnels to see how they stood up to violent pressures, vibrations, and heating.

As components of the spacecraft were made, they were tested to destruction. Then their weak points were determined, and they were re-tested. They were attached to other components and tested again. The testing went on and on, until each sub-system was completed. The sub-systems were made to operate as units for the first time, but hardly under serene conditions. They were subjected to extreme heat and cold and furious shaking.

Sub-systems were joined and put through similar tests. Ultimately, the entire spacecraft, with its dozens of sub-systems, 11 kilometers of wiring, and 10,000 components, was assembled.

During all this time, tracking stations were constructed around the world (for the orbital flights). Ground crews underwent training for their critical jobs. The rockets, themselves, were punished as unmercifully as were the spacecraft.

And the astronauts! They, too, were treated roughly to prepare for space flight conditions. They were spun in centrifuges and squeezed back into their foam-rubber couches with more force than might be expected during acceleration and deceleration in space flight.

Aircraft carried them aloft and went through maneuvers producing about 45 seconds of weightlessness. In their protective space suits, the men were exposed to extremes of heat and cold.

Ground testing and experimentation was not enough. Development models of the spacecraft were rocketed aloft bearing instruments for checking their performance, several primates were sent aloft, then came the sub-orbital flights of Shepard and Grissom, and then in one of the final tests before manned orbital flight, an Atlas booster sent a chimpanzee on a two-circuit tour of the earth.

The exhaustive testing and extreme precautions, the enormous effort, the care, the disappointments, and the optimism, all of which pyramided into the first U.S. manned orbital space flight, gave astronaut Glenn more support and greater confidence than any pioneering test pilot of the past.

SEVEN ASTRONAUTS

Seven Important Jobs

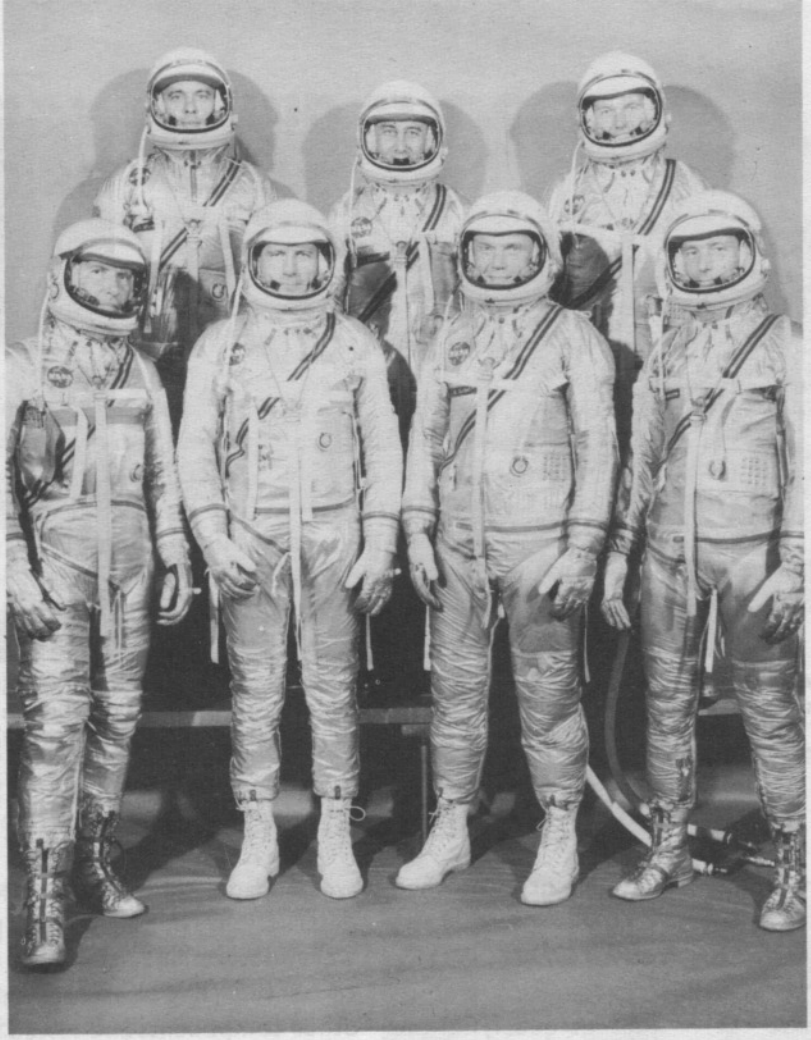
All eyes were on John H. Glenn Jr., as the long countdown neared its final moments. He eased into the close confines of the Mercury spacecraft, adjusted the restraining straps on the contour couch, and watched as the hatch was bolted shut.

Glenn's orbit of the earth was a solitary one, Yet, in one sense, it was also a joint endeavor. In the overall effort, each of the other six astronauts had a task that was vital to the mission.

Next to Glenn's assignment, the most important task had been given to Malcolm Scott Carpenter, the 36-year-old Navy officer who was the "back-up" pilot. Carpenter went through most of the early countdown with Glenn, and would have made the flight had Glenn, the prime pilot, not been able to at the last moment. They had breakfast together, underwent physical examinations, put on their space suits, and rode together in the special van to the launching pad.

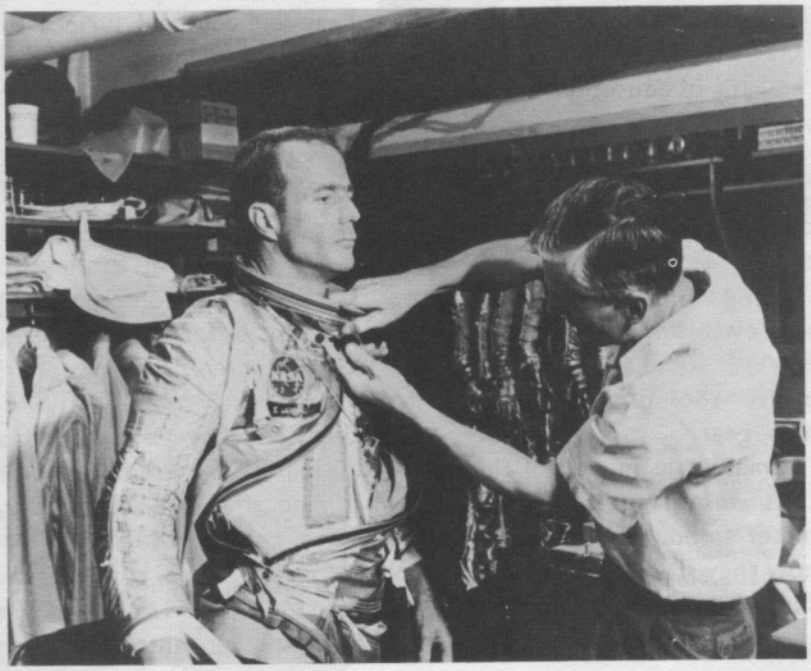
Also accompanying Glenn to the launching pad was Alan B. Shepard, who made the first suborbital flight in the Mercury program. His job was to run through the various phases of the mission with Glenn.

In the Mercury central control room an astronaut was in communication with Glenn while awaiting liftoff, and during the critical first minutes of powered flight. An astronaut in a jet plane flew past the climbing rocket at an altitude of about 11 kilometers to observe the rocket's behavoir. Another astronaut helped man a key tracking station in the communications network, and still another was with the seaborne recovery forces in the Atlantic Ocean off Bermuda.



SEVEN ASTRONAUTS – (Front row, left to right) Walter M. Schirra, Jr., Donald K. Slayton, John H. Glenn Jr., and M. Scott Carpenter. (Back row) Alan B. Shepard, Virgil I. Grissom, and L. Gordon Cooper Jr. All had important jobs to perform in the successful orbital flight.

BACK-UP PILOT – M. Scott Carpenter was "suited-up" and ready to step into the Mercury capsule had Glenn, the prime pilot, become ill or otherwise disqualified.



EFFECTS OF WEIGHTLESSNESS STUDIED

When all the data from John Glenn's orbital flight has been collected, sifted, studied and evaluated, the doctors connected with Project Mercury hope to have much more knowledge of the phenomenon of weightlessness — that feeling of no weight or pull of gravity.

As Glenn circled the earth at about 28,000 kilometers an hour for over four and one half hours, he experienced zero gravity. Although gravity was pulling at the spacecraft and Glenn, their speed offset it and they were literally falling through space in a free fall around the earth.

Glenn was strapped tightly to a form-fitting couch, which prevented him from rattling around inside the craft. Drinking water was available to him, but not from a glass. Instead, it was contained in a plastic squeeze tube to prevent it from floating aimlessly around inside the cabin.

The question for which the doctors seek an answer is — what happens to human beings during long periods of weightlessness, and what happens after prolonged periods of weightlessness when the spacecraft was suddenly braked down re-entering the atmosphere and the suddenly restored gravity is about seven and one-half times greater than its normal force.

NEW WINGS By virtue of his exploits in space, Marine Corps Lt. Colonel John H. Glenn Jr., is entitled to exchange the traditional pilot's badge for a new set of wings.

To differentiate between their pilots who flew conventional aircraft in the atmosphere, and those who had made rocket flights into space, the U.S. Air Force and Navy designed new insignia.

Upon the traditional aviator's wings they superimposed a shooting star device. Last December, the military chiefs of the Air Force and Navy presented the new wings to Air Force Captain Virgil Grissom and Navy Commander Alan Shepard, who made suborbital flights in Mercury spacecraft during that year. Pilot-Astronaut Glenn now will receive his new wings.

As the spacecraft circled the earth, at incredible speed, Glenn felt neither motion nor his weight.

THE FUTURE ROLE OF MAN IN SPACE

Probably no subject has provided so much emotional controversy as that of the proper role of man in space.

The enthusiasts, on one hand, would immediately set up colonies on other planets. Some of them would even move to other star systems, travelling in giant space ships and propagating generation after generation along the way.

Another more cautious group believes there is nothing a man in space can do as well as an instrument. Therefore, they feel, man should be kept on earth, where he belongs.

The latter view is obsolete, for an American astronaut, John H. Glenn, has just returned from a globe-girdling flight in space. The point of view of the enthusiasts, while not necessarily impossible, is out of the question for some time to come.

Man is going to spend more and more time traveling in space, and it behooves us to think about his proper and possible functions. The astronaut today is in a position similar to that of the aviator 58 years ago, following the first flight of the Wright brothers. Because the future is largely unknown, he has no sure way of perceiving the myriad tasks he will be performing. And, while it is presumptuous of me to make predictions, I believe we must use our imaginations, drawing from our present fund of knowledge.

On the Moon man would have to withstand extreme heat and cold.

If I were to stress the major advantage of a man over an instrument it would be his flexibility. A man can perform many more functions than any instrument or device yet conceived, and this is quite natural since the human brain is capable of many more programming situations than any known electronic computer. This is not to say that an instrument may not perform its special function better than a man, but man will always excel in his ability to perform a variety of tasks, in his flexibility, and in his adaptability to the unexpected.

Next in importance, in man's superiority to machine, is his aptness at perceiving what is meaningful and rejecting what is not, at filtering information, at discriminating, and at exercising reason and judgement.

The disadvantages of man are well-known: his general fragility and dependence on oxygen, waste-removal, and pressure systems; his inability to do monotonous work well for long periods; and his inability to perceive a great many things which instruments can detect.

Nevertheless, we may expect that man and instruments will complement each other and that each will find its proper role in space.

In making most scientific observations and explorations machines can definitely do the better job. But one thing man should observe is himself, as a biological system removed from his parent plant. Until recently, we have never studied man in the absence of Earth; he has always been in an Earth-

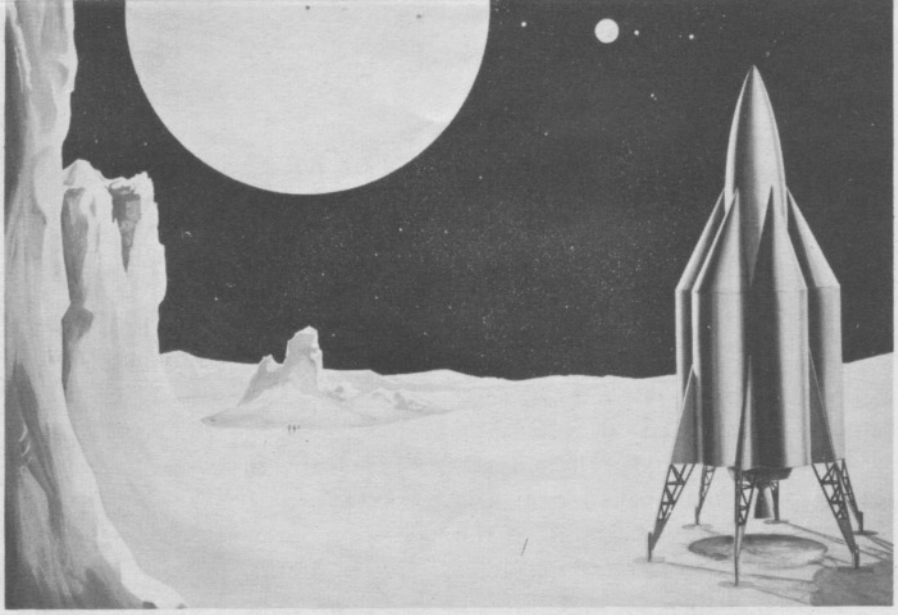
By S. Fred Singer

(One of America's pioneering scientists in rocket and satellite research.)

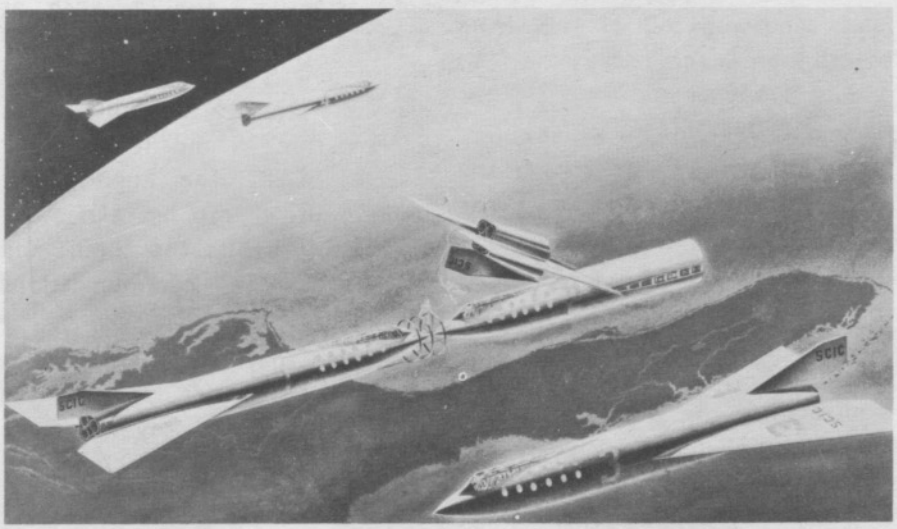
based laboratory, subject to gravity and all of the stimuli associated with living on earth. Now he will examine himself away from his usual surroundings, and it is almost certain we will learn more about ourselves.

One of the really exciting prospects is the discovery of a form of life which has developed apart from those on earth. It may be quite difficult to recognize this form of life. For example, life on Mars would have to exist under slight atmospheric pressure. Moon life would have to withstand an almost complete vacuum and extremes of cold and heat. These conditions would be deadly to life as we know it. One of the chief functions of man might be the employment of his remarkable intelligence to recognize strange life forms which could not be detected by unimagninative instruments.

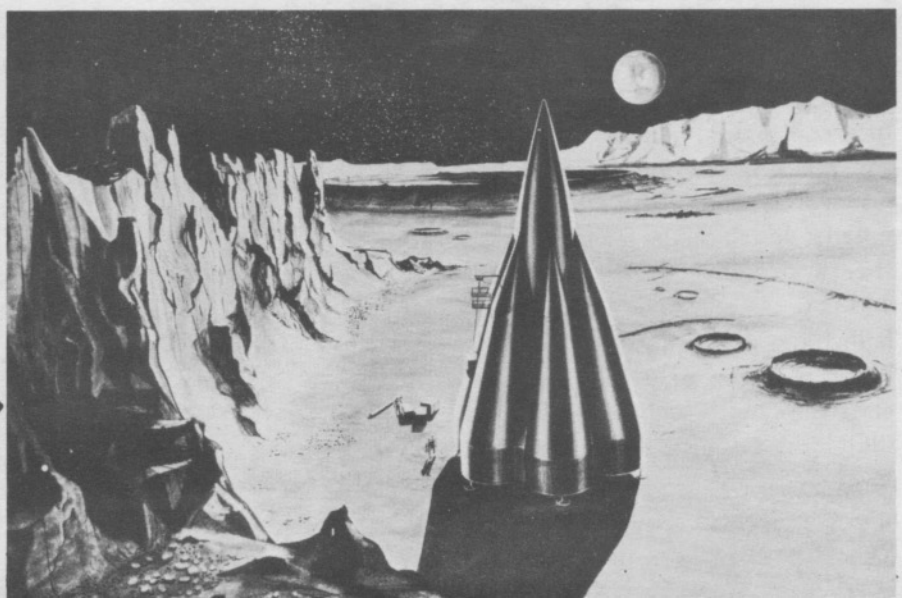
As the exploration of space expands, the instruments making physical observations and measurements will become so complicated and expensive that we will need man in the "secondary" role of repairing and maintaining them. If television satellites or astronomical observatories in space fail to operate properly, then a rocket pilot would have to bring his craft alongside. Here a man would have to make full use of his facilities, his judgement, his reason, his ability to improvise.



From one of the planet Jupiter's 12 moons, Earth astronauts could gaze on this view of the planet which is 318 times the mass of Earth. Traveling at a rate of 300,000 kilometers per second, a space ship would require nearly two months to make the voyage from Earth to Jupiter.



Man's role in future space travel and exploration may be that of repair and maintenance man for space ships and terminals. An artist's conception of astronauts joining space ships to form a space station.



Nuclear-powered vehicles are envisioned by American space engineers for efficient, low-cost space travel in the future. An artist's drawing of a space ship and crew on the Moon.

CAPE CANAVERAL
U.S. Space Capital

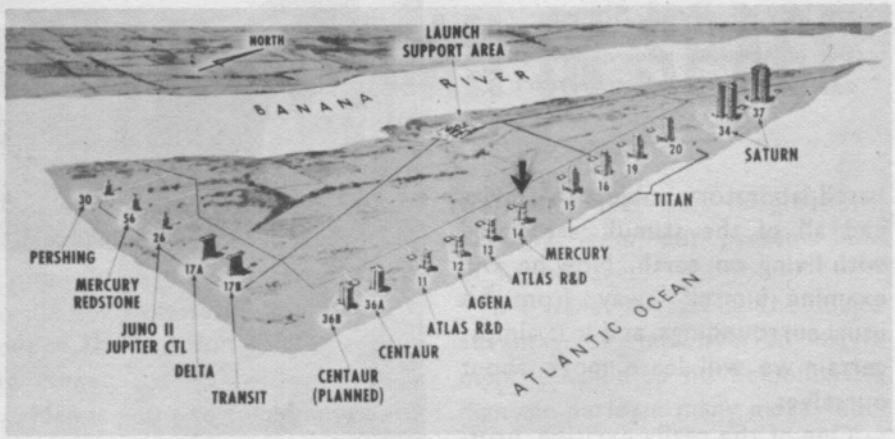
About half-way down the Atlantic coastline of the State of Florida, on a small (66 square kilometers), sandy, triangular-shaped peninsula is situated Cape Canaveral — the United States' "space capital."

Rows of enormous missile gantries (towers) line the beaches, huge radar and radio antenna, and dozens of block houses, control centers and supply buildings dot this windswept bit of land from which John Glenn rocketed to his orbit of the earth.

Project Mercury — which culminated in Glenn's flight — is not the only space project going at the Cape. Two to five rockets are launched from there every week by the U.S. Air Force and the National Aeronautics Administration in cooperation with private industry contractors. The base operates 24 hours a day, 365 days a year, and employs more than 21,000 persons.

Since 1950, more than 1,000 missiles and rockets have started their skyward journeys from the Cape. Most have been Air Force products. NASA has fired about 100, while others have been sent aloft by the U.S. Army and Navy.

The United States' first successful intercontinental missile (ICBM), the ATLAS, was fired from Cape Canaveral. The Navy's POLARIS missile, which can be launched from the surface or beneath the ocean, was first tested at the Cape. Other launchings from there include EXPLORER I, the first U.S. satellite, and the first VANGUARD and PIONEER satellites — all launched in 1958.



CAPE CANAVERAL – Drawing shows launch complexes for U.S. earth satellite and space probe programs. Glenn's orbital flight was launched from complex 14 with an Atlas booster rocket.

Among the 1960 launchings at Cape Canaveral were the remarkable scientific satellites such as TIROS I, the picture-taking weather instrument; TRANSIT I used to aid sea and air navigation; MIDAS, an early-warning missile launching device; ECHO, the huge plastic balloon, which can be seen every night as it orbits the earth; and COURIER, the communications relaying satellite.

Cape Canaveral in 1962 is not the cape that Ponce De Leon, the Spanish explorer, discovered in the year 1512. The former uninhabited wasteland of scrub brush and swamps is now the busy, noisy "space capital" of the United States.

METAL FOREST – Scores of gantries hold the rockets firmly on the pads until they are launched.

DAY AND NIGHT – Work goes on around-the-clock to ready rockets and missiles for launching from Cape Canaveral.