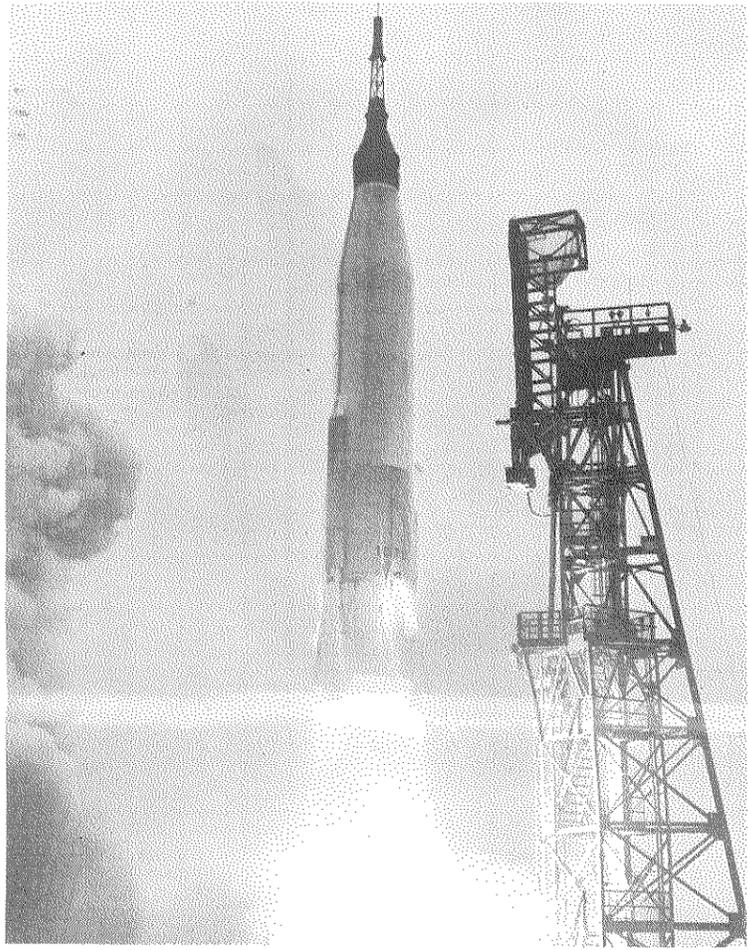


Three More Orbits Added To Record



LIFTOFF! Aurora 7 rides atop the Atlas booster seconds after leaving Pad 14 at Cape Canaveral last Thursday. Aboard is the United States' second man-in-orbit, Astronaut M. Scott Carpenter.

Carpenter 'Feels Fine' After Hours On Raft; Scientific Information Called 'Tremendous'

The smoothest countdown in the history of U. S. manned space flight ended at 7:45 a.m. Thursday morning when Astronaut Scott Carpenter and his "Aurora 7" blasted from Pad 14 at Cape Canaveral on a trajectory which officials said was "good for seven orbits."

And then, as the saying goes, the fun began.

Five hours and three orbits later, after a flight beset by technical difficulties such as suit temperature trouble and an unexpected shortage of peroxide fuel for the attitude control rockets, Carpenter splashed into the Atlantic Ocean some 250 miles down-range from the planned recovery area, struggled through the topside exit of his spacecraft and floated on a rubber life raft for 40 anxious minutes while the world gnawed its knuckles.

"I feel fine," he said later, a tribute to both personal courage and astronaut training.

The only delay in the hours-long split countdown, in which the spacecraft systems are carefully checked out one by one, was a 45-minute hold to allow the rising sun to burn off morning fog surrounding the launch pad.

Visibility was improving steadily and the low, thin cloud cover was lifting nicely when the voice of Lt. Col. John A. Powers announced from Mercury Control:

"T-19 seconds and holding momentarily. T-15 and counting. . . 10, 9, 8, 7, 6, 5, 4, 3" — a fraction ahead of the clock, he caught the "3" again — "3, 2, 1, 0, ignition, liftoff!"

At the word "ignition" fire poured from the bottom of the massive black silhouette poised on the skyline a mile and a half from the press site where hundreds of watchers held their breaths. Mercury-Atlas 7 hung for agonizing seconds, poised on a column of fire, then rose.

She lifted into the low clouds, appeared again above them, flashed into the sunlight and out of sight, her heavy thunder rolling back over the earth she had left behind.

Watchers cheered, pounded each other on the back, or merely grinned and sighed before turning back to the voice of Mercury Control and their only link with the vanished spacecraft.

"My status is good," Carpenter reported at three minutes and 40 seconds. The Atlas booster had shut down and been jettisoned. Minutes later came sustainer engine cutoff and spacecraft separation.

Inserted into orbit, Carpenter began a busy five hours painting a red, white and blue stripe across the roof of the world. The amount of information which he and his equipment gathered in three orbits was, in the words of NASA scientists, "tremendous" and formed a major milestone in man's pioneering venture into space.

It will be weeks before the data is fully analyzed, but already on record are the astronaut's observation that "dayglo" orange and silver are probably the most easily visible colors in space. He saw

them on a balloon which trailed behind the spacecraft, drifting seemingly at random at the end of a tether which was sometimes taut, sometimes so slack that it looped, a study in aerodynamic drag which experts are calling "highly interesting." Also of particular interest is the behavior of a green chemical liquid in zero-gravity and the use of special bite-sized squares of solid food which he ate. (See results story, page 6.)

He performed dozens of other tests and evaluations, reporting at one point that he was "behind in his work schedule." Besides completing a number of attempts to solve the problems facing the U. S. lunar landing program, he demonstrated once again the inevitability of man in future space roles. A black box of electronic wizardry almost certainly could never have completed the mission. It took the hand of an experienced test pilot.

The astronaut became the third man in space to sight glowing flecks which Astronaut John H. Glenn compared to fireflies and the first to photograph them. Soviet Cosmonaut Titov, during his recent visit to the United States, also reported sighting the luminous particles. Both Glenn and Carpenter saw the particles when passing between day-side and night-side.

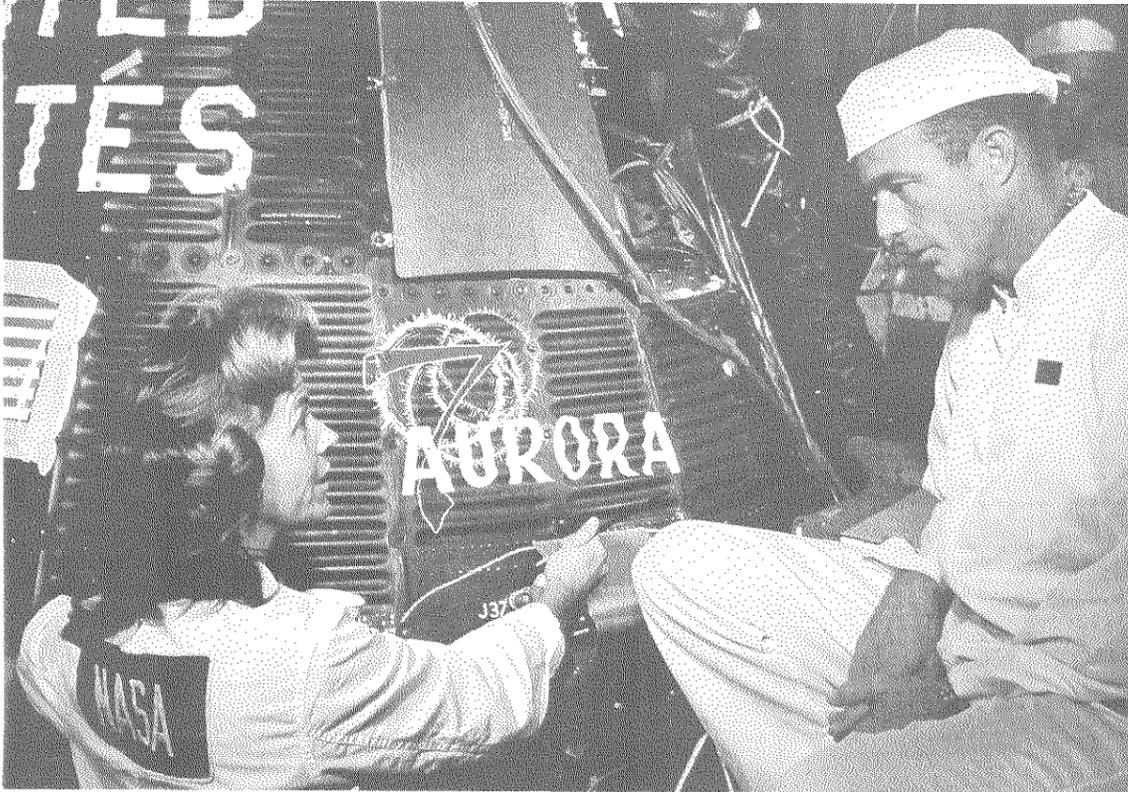
Twice during the three-orbit mission Carpenter reported trouble with overheating of his spacesuit, but later said it seemed to be mostly a problem of coolant setting. Once an erroneous reading of body temperature at 102 degrees caused temporary concern, but Carpenter reported he felt fine and was "sure he would be sweating a lot more than he was" if the reading were correct. Some trouble with blood pressure and pulse readings developed.

Flying by wire much of the time (using manual rather than automatic control) he ran into the problem of fuel shortage as he neared the point where a decision to go for the third orbit or not would have to be

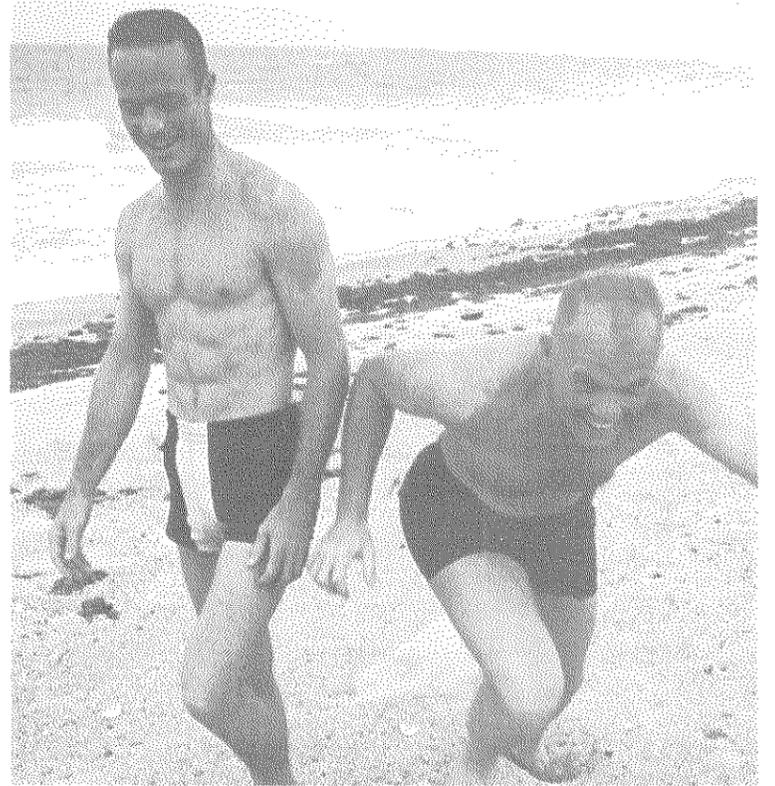


ASTRONAUT CARPENTER leaves the transfer van which carried him from Hangar 5 to Pad 14 just before prelaunch checkout and flight Thursday morning.

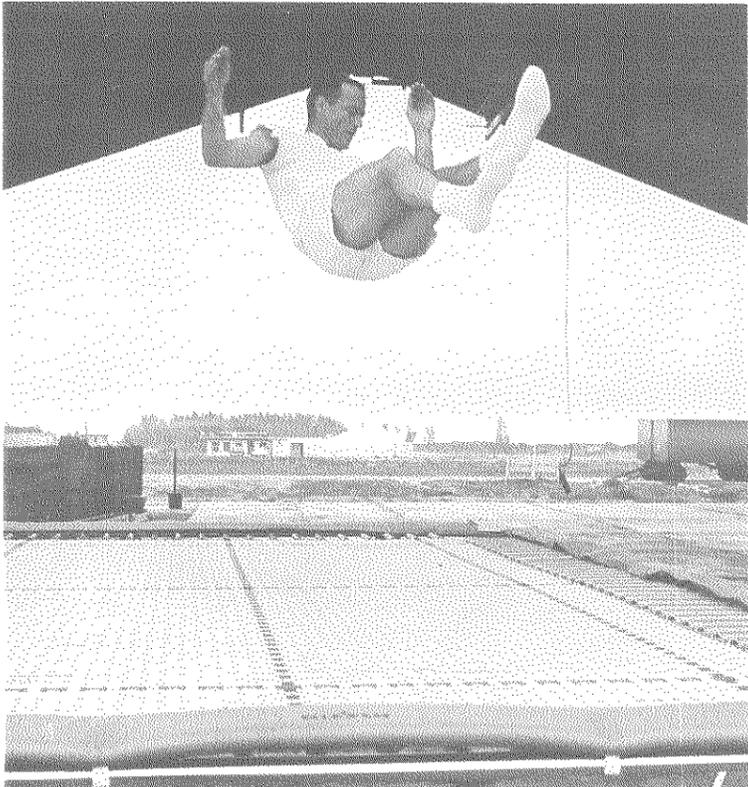
(Continued on page 3)



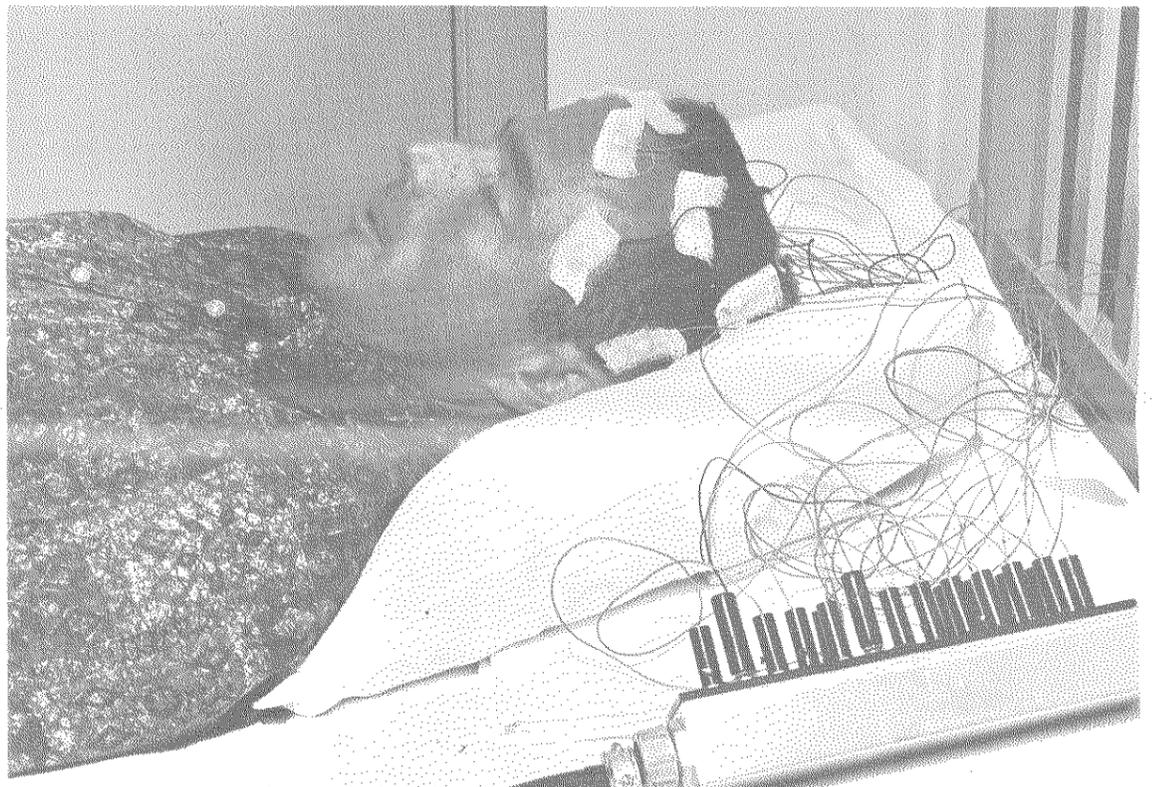
CECE BIBBY PUTS the finishing touches to her artwork as she paints the name Aurora 7 on the spacecraft while Carpenter looks on.



RELAXATION AND PHYSICAL training were combined as Carpenter and John Glenn worked out on the beach.



TRAMPOLINE WORKOUTS WERE a part of Carpenter's physical training program for the MA-7 flight.



ELECTRODES ARE ATTACHED to Carpenter's head during electroencephalograph recording made during a five-hour pre-flight physical examination.



PRESENT AT A MISSION planning conference were, left to right, Kenneth Kleinknecht, Walter C. Williams, Chris Kraft, Carpenter, and Robert Mercer.



CARPENTER LEANS AGAINST the astro-globe, a device used for training in celestial familiarization.

Aerospace Corp. Participates In Project Mercury Launches

The Mercury spacecraft which carried the second American into orbit was launched by an Atlas vehicle supplied to NASA through the Space Systems Division, Air Force Systems Command. Working with the Air Force on the project was Aerospace Corporation, a non-profit organization established to serve the U. S. Air Force in the scientific-engineering planning and technical direction of ballistic missile and space programs.

In the Mercury-Atlas program, NASA has assigned systems management responsibility to the Air Force for the launch vehicle, launch complex modification and launch operations. Aerospace Corporation is providing systems engineering and technical direction to the Air Force contractors.

Aerospace Corporation's participation in Mercury includes technical direction of the following activities: modification of the Atlas booster; modification of the guidance computer program and preparation of trajectory calculations to meet NASA's flight objectives; and the design and test of the abort sensing and implementation system, a special device designed to initiate capsule separation in case of launch vehicle malfunction.

The Atlas, as originally conceived and designed, was not intended as a booster for orbital payloads, much less for a manned spacecraft. Therefore, in conjunction with the Space Systems Division, Aerospace Corporation supervises modification of the Atlas for the Mercury mission, and assures that the Mercury booster is at least as safe as a high-performance, experimental piloted aircraft.

Two major modifications were made to the Atlas. The Mercury booster has a thickened and strengthened superstructure because, in the Mercury launches, the vehicle must bear loads significantly higher than it normally experiences. In addition, the abort sensing system has been designed into the basic Atlas configuration.

Under Air Force and Aerospace Corporation guidance, strict quality controls are maintained by the Mercury booster associate contractors. During fabrication, components are hand-selected and receive special handling.

Before the Mercury-Atlas leaves the factory for Cape Canaveral, it is thoroughly inspected by an Air Force-Aerospace Corporation team. Further inspections are conducted during the flight safety review at Cape Canaveral before launch. These checks are designed to provide a high-performance launch vehicle featuring maximum safety and reliability.

The greatest single contribution to pilot safety in the booster is the abort sensing and implementation system (ASIS) built into the launching vehicle and designed to initiate

capsule separation in case of Mercury-Atlas malfunction. ASIS has had the highest demonstrated reliability rate of all the Mercury-Atlas subsystems. It has never failed on a Mercury flight and has flown on all six previous Mercury-Atlas launches. During the subsystem's development program, it was put through 4,000 simulated flights in laboratory testing.

In addition to its technical direction efforts of associate contractor activities, Aerospace Corporation prepares the launch trajectory for the Mercury-Atlas—charting the course the booster must travel to insert the spacecraft into orbit at a prescribed altitude, position, and velocity, and determining times and places in the trajectory when such booster functions as staging and engine cut-off must occur.

During the last few hours before launch, Aerospace Corporation performs special flight simulations on a computer to determine the effects of upper atmosphere winds on the performance and stability of the launch vehicle in flight. Data from wind-sounding balloons, at altitudes ranging to about 50,000 feet over the Cape, are telephoned to corporate headquarters in El Segundo, California, where computer runs indicate if wind conditions create a hazard to the booster's structure. The computer results are phoned to the blockhouse at the Cape.

Three Orbits

(Continued from page 1)
made.

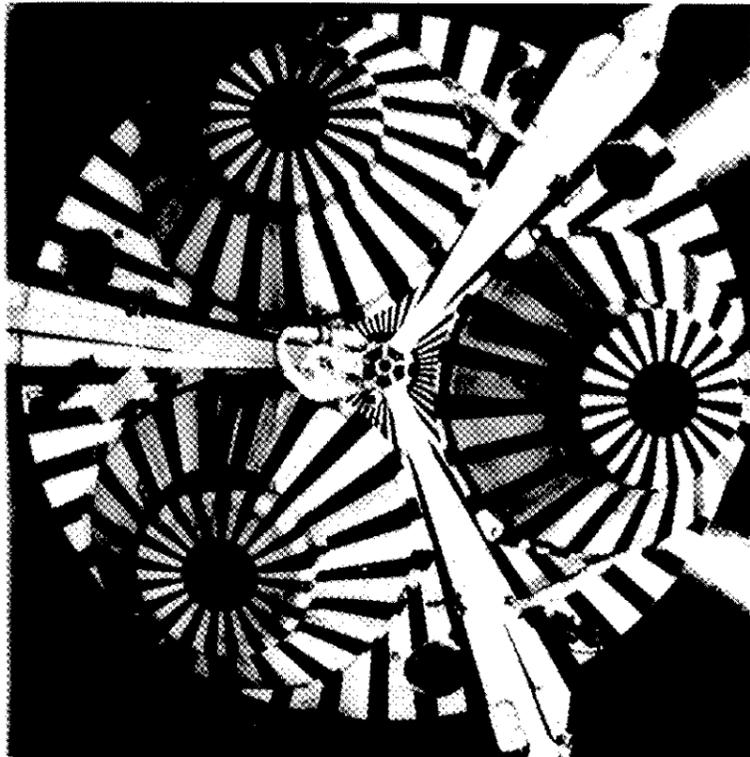
Of the low fuel state, Carpenter later said in a post-flight press conference (see story on page 6): "I was anxious to do all the things we had planned to do; I was impatient with the time it took to point the capsule in various directions necessary. The fuel shortage was not the fault of the capsule, it was the fault of an impatient man."

Since there was, however, no serious problem at this point, officials gave the go-ahead and the flight continued.

It was not until the time neared for re-entry that real trouble developed. The automatic control system did not perform satisfactorily after Hawaii was passed, and the rest of the flight had to be flown manually.

Excessive fuel consumption showed up between Hawaii and California. As a result, Carpenter ran very low on fuel for his attitude controls and had to watch the fuel situation carefully during retro and re-entry stages of the flight.

Then an unexplained difficulty caused an error in positioning



THESE ARE THE rocket "brakes," shown here in Lt. Col. John Glenn's Friendship VII, which brought Lt. Commander Scott Carpenter's Mercury capsule out of orbit. TOP PHOTO: Package of three retro-rockets strapped to the heat shield covering the blunt nose of the capsule. BOTTOM PHOTO: Three of these small bucket-size retro-rockets made up the retro-package for Lt. Commander Carpenter. They are each 12 inches in diameter and 15.5 inches long. Inside is the solid propellant with its star-shaped center which controls the performance of the rocket engine built by Thiokol Chemical Corporation. The engine uses a concave bulkhead to reduce the length of the nozzle extending beyond the casing. Each of the three Thiokol engines burns for about 11 seconds, together they generate enough total impulse to brake the capsule velocity by about 500 feet per second. The engines are covered by candy-striped domes of the retro-package. Astronaut Carpenter's orbital flight brought to 11,267,000 the total number of miles logged by this type rocket in flights conducted by NASA.

the spacecraft for firing the retrograde rockets which brought it out of orbit and back into the earth's atmosphere. The spacecraft was pointed an estimated eight to 10 degrees shallower than the desired 34-degree angle, causing a longer, shallower trajectory which carried it beyond the planned recovery area.

Ionized air piling up around the spacecraft during the 3,000 degree heat of re-entry caused a loss of radio contact, as was expected. But although all tracking stations agreed that the craft splashed into the ocean at 12:41 p.m. and the area in which it struck was accurately plotted, radio and radar contact could not be picked up again.

It was 1:22 p.m. when a Navy P2V patrol plane, following a radio beacon signal from

the spacecraft, spotted the spacecraft. In the words of Col. Powers, "beside it was a life raft, and a gentleman by the name of Carpenter was in it." The world heaved a sign of relief after 41 anxious minutes. Two para-medics, Navy medical technicians landing by parachute, dropped in to give help if needed. None was, but it was more than two hours later before a helicopter from the aircraft carrier Intrepid could pick up the Astronaut at 3:38 p.m.

Watching several aircraft orbiting his position, Carpenter failed to see the two para-medics that dropped into the sea behind him. "The next thing I knew," he said later, "I heard a man calling my name from the water behind the raft."

After the two had joined

Meet Atlas 'D,' Horsepower For Mercury Craft

Propulsion for the Atlas "D," which serves as the launch vehicle for the National Aeronautics and Space Administration's Mercury program, is a system of five liquid propellant rocket engines produced by Rocketdyne, a division of North American Aviation, Inc.

Together, the engines develop approximately 360,000 pounds of thrust at liftoff. During flight, they reach a total force equivalent to 7,500,000 horsepower. By comparison, the four jet engines of a transcontinental airliner produce 68,000 pounds of thrust and modern diesel locomotives develop 2250 to 4000 horsepower.

Propellants for the engines are liquid oxygen and RP-1, a kerosene-type fuel developed specifically for rocket engines.

All engines of the system are ignited on the ground. In Mercury flights, two booster engines each producing 150,000 pounds of thrust operate for approximately 135 seconds before they are shut down and jettisoned. A sustainer engine continues to operate for a total of approximately 300 seconds. Two small vernier engines, which are used for roll control, operate throughout both phases of propulsion.

The basic system of engines used in the Mercury flights was developed by Rocketdyne for the Air Force in 1958 and has been in production for four years.

Produced in both Canoga Park, Calif., and Neosho, Mo., the engines are test fired individually for approximately flight duration prior to their delivery to General Dynamics/Astronautics for installation in Atlas missiles. Normally they are not fired again until a vehicle launching.

their rafts to his and put a flotation collar around the badly listing capsule in order to keep it on the surface until it could be picked up, Carpenter offered them some of his food, "but they'd just had lunch."

The astronaut got a dunking several hours later when the helicopter from the carrier Intrepid picked him up, but managed to keep his 35mm camera and the film in it dry by holding it determinedly over his head until the chopper pilot reeled him in.

At 4:55 p.m. the second American astronaut to orbit the earth stepped out on the deck of the Intrepid, to be taken back to Grand Turk island for debriefing. He returned to Cape Canaveral Sunday.

The Aurora 7 proved seaworthy as well as spaceworthy by remaining afloat until later in the day when the destroyer Pierce picked it up for passage to Roosevelt Roads, Puerto Rico, after which it was flown to Hangar S at the Cape.



A SMILING MRS. CARPENTER greeted the press Thursday afternoon scant hours after her husband's rescue from a watery landing. Left to right are the Carpenters' four children Jay, 10, Kristy, 6, Candy, 5, and Scott, 12.

Czech Newsman 'Understands' Why We Can't See Their Shots

The 35 year old newsman was one among more than 500 crowded into the motels and news centers at Cocoa Beach. Of medium height and build, a balding man with a sharp nose, he ran around in the 85-degree heat dressed like most of his fellows—in Bermuda shorts, white shirt with rolled sleeves, and thong slippers.

He took a tour of the Cape, attended news conferences, asked questions.

There was very little to differentiate the first Communist newsman ever to cover a launching from anybody else, unless it was his name, Karel Kyncl, his Czechoslovakian accent, or the notation on the registration form — "Radio Prague."

Kyncl is presently a resident of the United States, and will be for about three years. He is the official representative of Radio Prague in the United States, stationed in New York City. He and his wife have a boy and a girl, aged 9 and 11, presently in a Russian boarding school, and a small house in Queens. When his tour of duty is up, he will return to Czechoslovakia, and, presumably, his active membership in the Communist party.

Meanwhile, he is here for the same reason we would send a radio reporter to Moscow—to cover news events in another country.

Kyncl was friendly with other newsmen at the Cape, laughing and trading quips but

parrying the deeper probes into his opinion of the Russian space effort versus that of the United States. He was interviewed by TV, radio and other newsmen so much that he finally protested, "But when am I going to get my own work done?"

Returning from what he called a "tourist tour" of Cape Canaveral, he admitted readily that he was "really impressed" with seeing the site of John Glenn's launch and the ship that would lift Astronaut Scott Carpenter into orbit within a few days.

"But" he added in heavily accented, precise English, "I was NOT impressed by the . . . ah . . . other rockets I saw there, the Minuteman, the Polaris—the rockets which are weapons."

Of Czech impressions of the Glenn flight he said, "They thought of it as a great achievement," and added they thought the same thing of Russian Cosmonaut Titov's flight. "In comparison, of course," he said condescendingly, "Titov completed 17 orbits, and Col. Glenn only three."

Asked which nation had the greatest space effort, Kyncl first said that it was a very difficult question, and then answered it this way: "I am a news reporter. I am also a Communist. But I say this not only because I am a Communist but because I know about facts; I think that the Soviet Union is ahead."

Kyncl parried a number of

questions about whether the United States newsmen would ever get a chance to visit a Soviet launch site by saying he was a Czech, not a Russian: that he had never seen one himself, having spent only a week in Moscow; and that he could not say what the Russians would do. He did say, however, that "as a journalist I hope they will be. As a citizen of my country I can understand the rules why you are not allowed. People of Prague," he said, "look upon the Soviet and American space program as competing," but hope that the joint satellite program for unmanned scientific satellites recently proposed will work out. "The Soviet," he said, "sincerely wants such a program."

Czech scientists have no space program of their own, but according to Kyncl, do work with their Russian counterparts on space research methods.

Only one incident occurred during Kyncl's visit to Fla., when a policeman in the town of Cocoa Beach outside Cape Canaveral stopped him for speeding 60 to 65 in a 40 mile zone. "I am covering the space attempt," he said, to newsmen, "and I thought I can in my car speed . . . I was caught . . . caught by a policeman here. But as soon as he saw my driver's license, which is from Czechoslovakia, I explained to him, and he did not give me a ticket."

Family Knew He Would Come Through All Right

The first wife of a U. S. astronaut ever to watch the beginning of her husband's mission in person paid the nation's space program one of its highest compliments Thursday afternoon.

Mrs. Rene Carpenter, wife of America's second orbital pilot, told the public in a press conference that she went through the harrowing hours of the flight without tears or prayers, even when he overshoot the recovery area and was out of contact for more than 40 minutes.

"I gave a little pause when the newscaster said contact . . . had been lost, but I had been thoroughly checked out and was familiar with all the procedures," said the attractive ash blonde.

Asked if she felt, as Carpenter has said that he did, that it would be presumptuous to pray for oneself, she said frankly, "No, I did not pray. I felt the same way. Not once," she said in her opening statement, "in these three years would I have had Scott do any one thing less than he did today. For those of us who also serve, the rewards are very great."

She said she had never been worried during the flight.

For sheer joy, Mrs. Carpenter said the day of the flight "did not match the day three years ago when we first learned Scott had been selected as an astronaut."

Smilingly explaining how she achieved a difficult privacy while the elite of the free world's press sought her for days, she said the Navy had taken her and the four Carpenter children to a private resi-

dence in Cocoa Beach, where they watched the launch from a point on the beach.

Meanwhile, in Boulder, Col., Mrs. Florence Carpenter, mother of the astronaut, watched the event on television in her trailer home a few blocks from the University of Colorado campus.

She later told the press she never doubted he would be picked up safely, and that "she still wanted him to fly to the moon. He was conditioned for it, he was trained for it, and he was capable," she said.

Twelve-year-old Scott Carpenter, appearing with his mother, brother and two sisters at the Cocoa Beach press conference, displayed the only small doubt in the family when he said he thought he wanted to be an astronaut but changed his mind during the minutes between retrorocket firing and the moment his father was sighted floating in the ocean.

His brother Jay, 10, still wants to be an astronaut when he grows up. "Well . . ." he said when asked, "in a way."

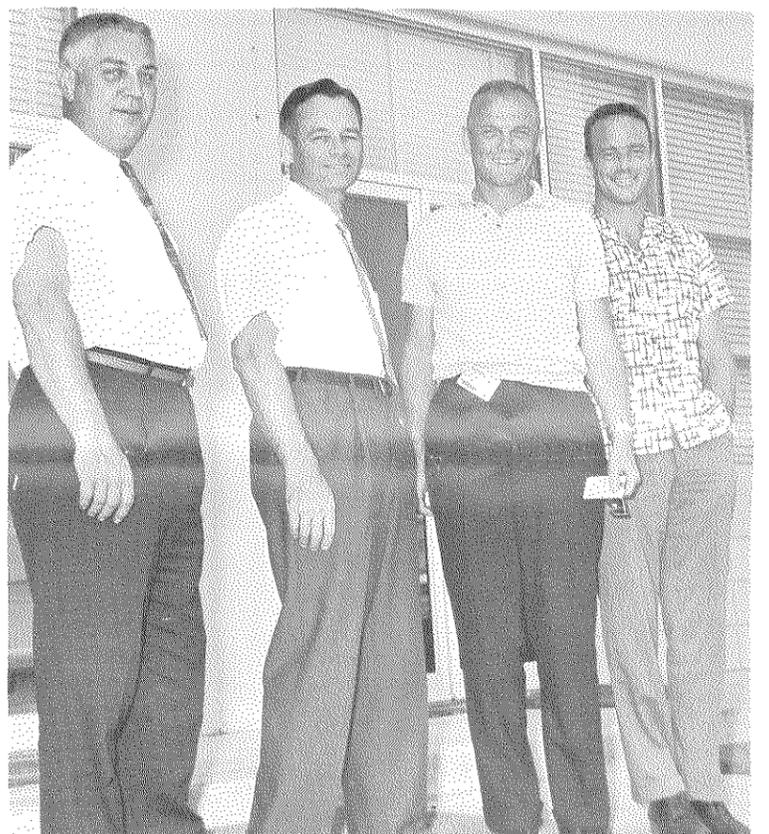
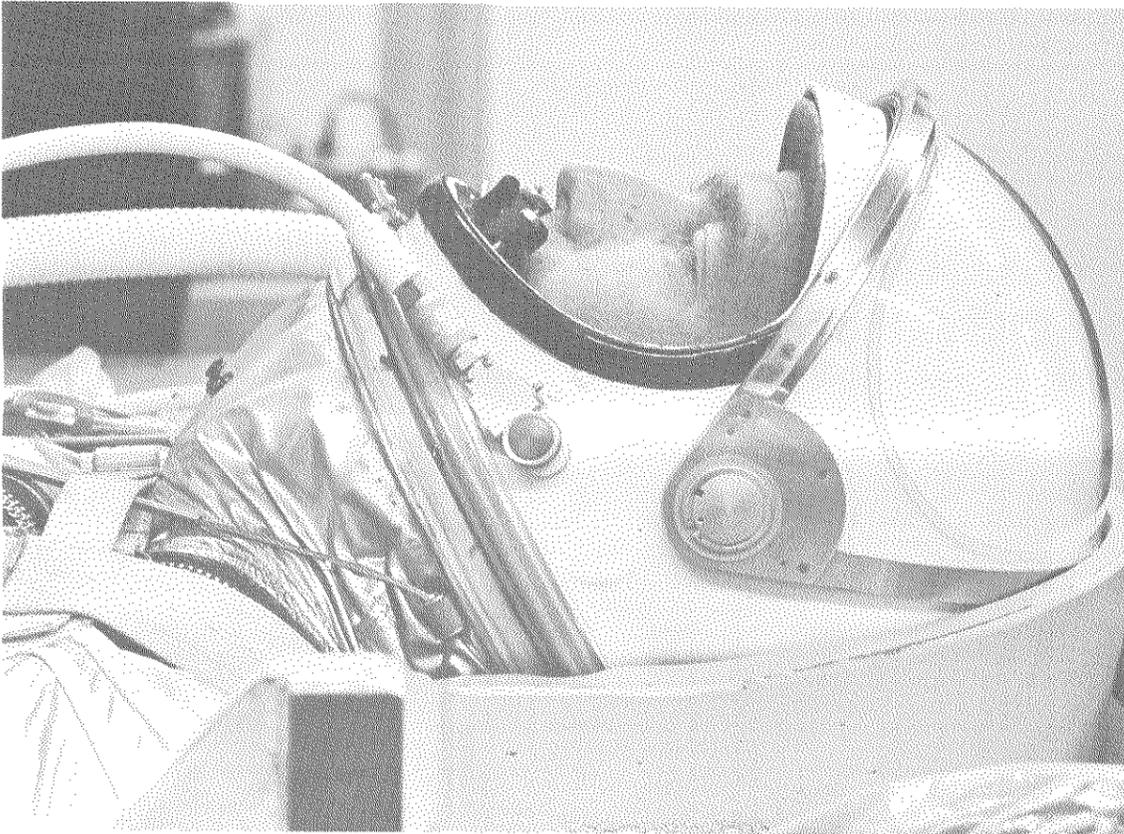
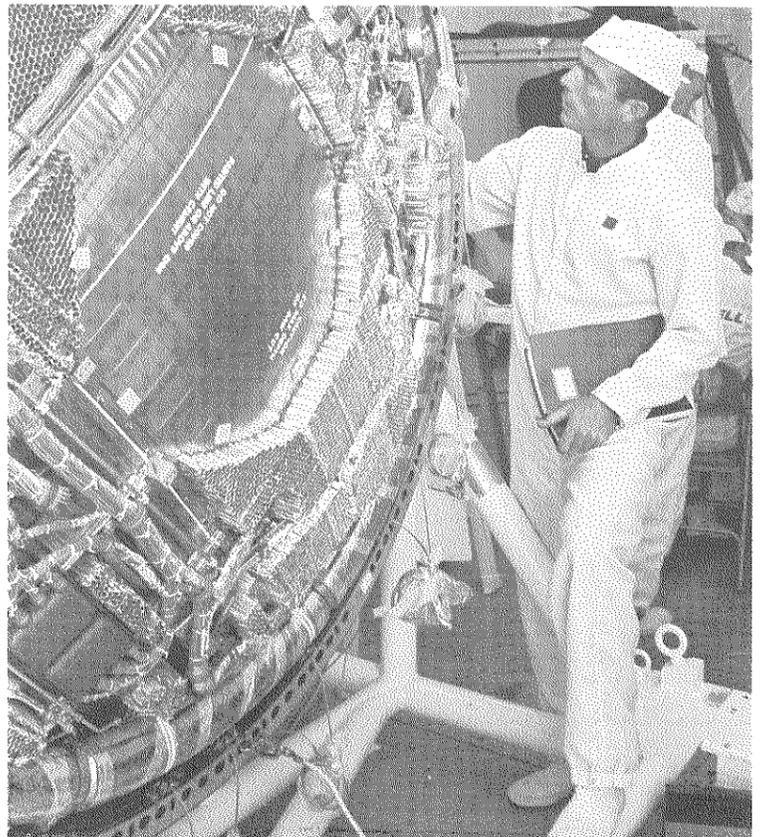
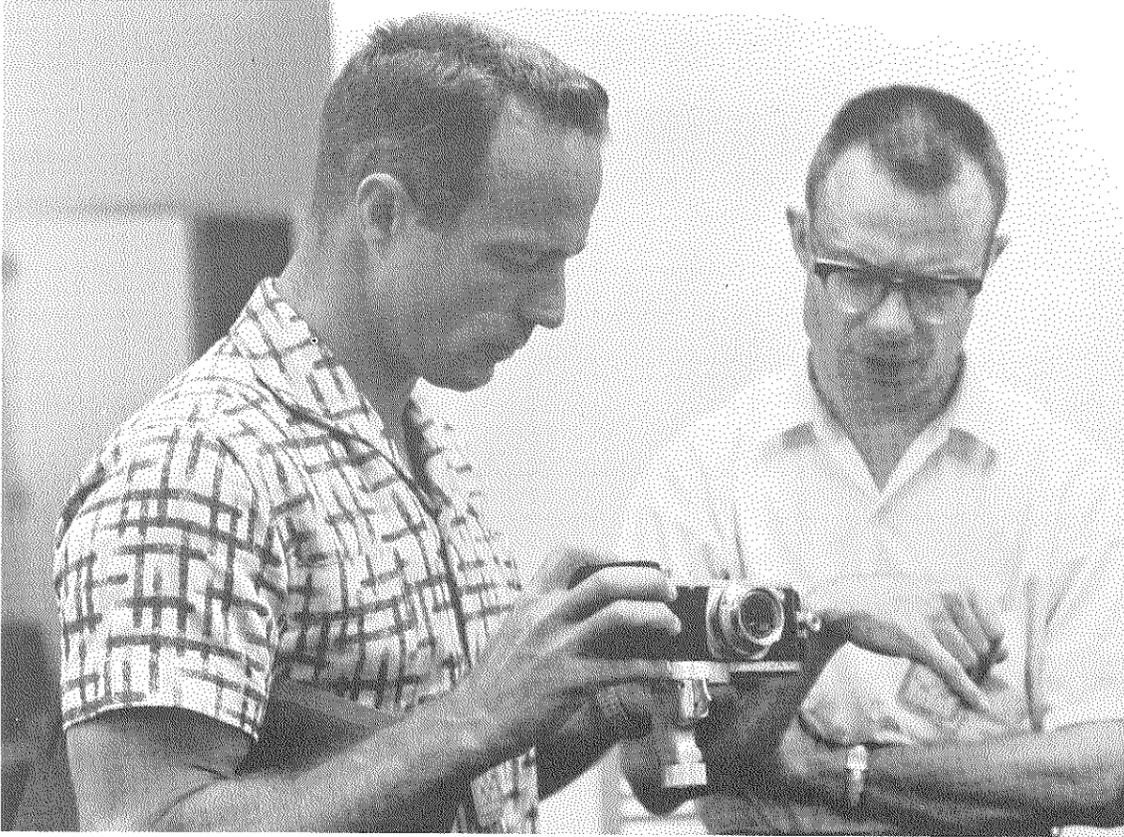
The two Carpenter girls, Kristen, 6, and Candace (Candy), squirmed in their seats during their mother's press conference and occasionally peeped impishly at reporters and photographers.

Carpenter's father, a retired chemist living in Palmer Lake, Col. watched the flight on television and later said, "that was the tensest five hours I've ever spent," but added "I had faith in our technology."

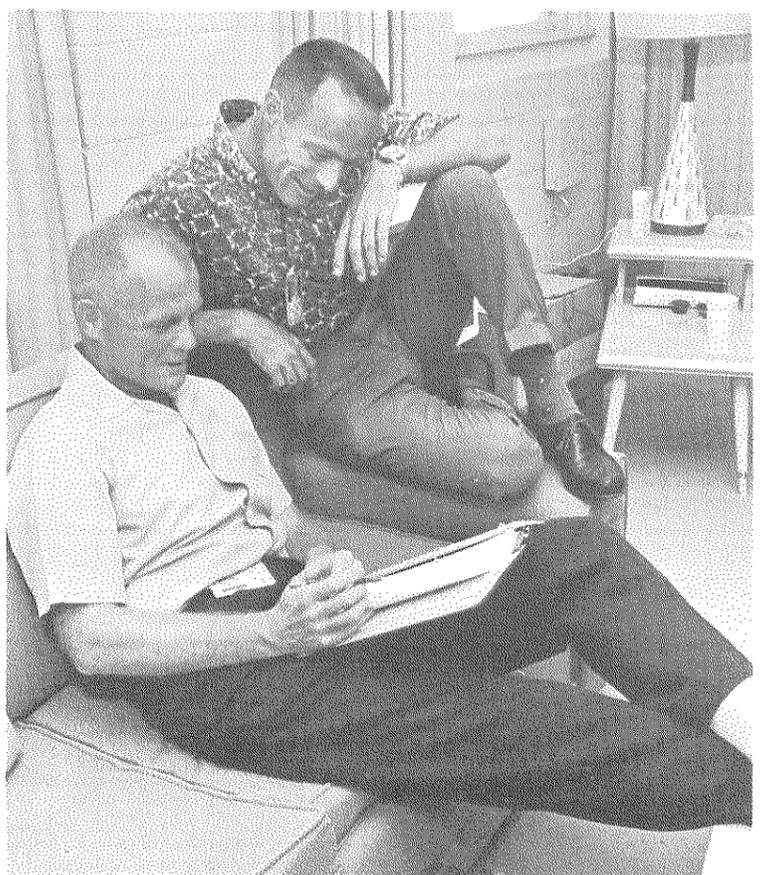
It was a convincing demonstration of confidence in American know-how from those closest to the astronaut.



PRIME MINISTER EINAR GERHARDSEN of Norway and Preflight Operations Chief G. Merritt Preston look over the honeycomb insulation on a bulkhead during the prime minister's recent visit to Cape Canaveral.



PRE-LAUNCH ACTIVITIES for the MA-7 flight found Astronaut M. Scott Carpenter engaged in a variety of activities. At upper left he discusses the operation of the 35mm camera which he carried for recording visual details of his flight. At upper right he examines the honeycomb protective material on the main pressure bulkhead of the spacecraft which he named "Aurora 7." At left center, Carpenter is shown in the astronaut couch in the crew quarters of Hangar 5 at Cape Canaveral during a checkout of his pressure suit. At right center, he talks with Walter C. Williams, Associate Director of Manned Spacecraft Center and operations director for Carpenter's flight, Benjamin Homann, a representative of Aerospace Corp., and John H. Glenn, Jr., pilot for the first manned orbital flight. At left he is pictured outside Mercury Control Center prior to a test in the procedures trainer, and at lower right, Carpenter and Glenn relax in the crew quarters the day before Carpenter's flight.



The **SPACE NEWS ROUNDUP**, an official publication of the Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas, is published for MSC personnel by the Public Affairs Office.

Director Robert R. Gilruth
Public Affairs Officer . . . John A. Powers
Editor Ivan D. Ertel
Staff Writer Anne T. Corey
Staff Photographer Bill Taub

MA-7 Congratulations

A flood of telegrams from friends, organizations and individuals all over the country and abroad began pouring into Cape Canaveral last Thursday as news media informed the public of Astronaut M. Scott Carpenter's successful three-orbit mission.

Dozens of them were from chapters and individual members of Carpenter's college fraternity, Delta Tau Delta.

"Congratulations to the first Delt in space," wired the Baker University (Kan.) chapter.

"Congratulations from Beta Kappa Chapter of Delta Tau Delta on your fine achievement. Hope you can stop by the house while in Boulder. Fraternally yours, Earle and the Brothers," wired the University of Colorado chapter from Carpenter's home town.

"Next time try not to keep us in suspense so long," wired the brothers at Bowling Green State University, Ohio.

Others came from chapters at Kent State University, Ohio; University of Georgia at Athens; Easton, Pa.; Indianapolis, Ind.; Florida State University at Tallahassee, University of Idaho.

Another group of telegrams began coming in from a surprising number of places which have the same name as Carpenters "Aurora 7" spacecraft.

There was one from Aurora, Ontario, Canada and Aurora, Neb.

There's another Aurora in Illinois: "Illinois's Aurora congratulates you and Aurora 7 for the tremendous accomplishments. Will you honor our Aurora with a personal appearance on a date of your own choosing."

Another in Maine: "Congratulations on your successful flight into space."

And from New York State: "The prayers and best wishes of the residents of East Aurora, the town of Aurora, and western New York are with you on your historical flight in the 'Aurora.' You are hereby acclaimed honorary mayor of the village of East Aurora, New York."

VIP telegrams came in from such persons as ex-president of the United States Herbert Hoover who wired, "I want to be one who tenders his unlimited admiration for your skill, devotion and courage. You have lifted our country in the respect of the world."

From Colorado Governor Steve Nichols: "You have pioneered the way into space, you have advanced the frontiers of Science, and you have served your state and your country. We in Colorado are very proud of you."

From Colorado Congressmen Peter H. Dominick: "Congratulations on today's flight. Your courage and achievement reflect honor on the state of Colorado, our nation and free people around the world."

From the Boulder, Col. Chamber of Commerce: "Colorado University students and all the citizens of your home town send sincere congratulations on your wonderful achievement. Boulder is mighty proud of you."

From the City and County of Denver, Col., "We are all very proud of the way you have represented your native state in your successful flight today. All the citizens of Denver want you to know our thoughts and our prayers were with you. Your 160 mile high flight has given our mile high city a new glow of confidence in space."

There was a telegram of congratulations from Governor Ernest F. Hollings of South Carolina, speaking for the citizens of that state, and a long wire from delegates to the National Association of Railway Business Women in session in Cleveland, Ohio.

Of particular note was a wire from the Century 21 World's Fair in Seattle, Wash., "Many congratulations to NASA, Scott Carpenter and all else who made possible the historic flight of the Aurora 7 spacecraft. Today, May 24, 1962, was formally dedicated as M. Scott Carpenter Day at the Century 21 World's Fair."

Other telegrams came from citizens all over the country, ordinary people who felt the urge to express their appreciation and respect. A club of sophomore girls in Bridgeport, Conn. which calls itself "The Aurora's"; a man in London, England, whose wire consists of two words, "Great relief"; a lady from Brussels who said, "Share the happiness of Belgium"; and the Rocky Mountain Section of the American Rocket Society—all wired their happiness and admiration.

And on the lighter side, a high school friend of Carpenter's wired from Longmont, Col.: "A great trip. Glad you're back. Sort of like the rumble seat rides in the old Ford."

EDITORIAL EXCERPTS

Miami Herald, May 18
SAFETY FIRST

A great many people are disappointed that Astronaut Scott Carpenter won't be soaring into orbit today. Saturday would have been an ideal day for his flight from the viewpoint of millions of his fellow Americans. Many are at home today, having finished their five-day work week.

Unselfishly, however, everyone will approve the delay. Nothing should be overlooked to guarantee the safety of the pilot so far as is humanly possible. That is the purpose of the postponement.

Spacemen tend to chide laymen for paying too much attention to the human side of these first footsteps into space. Their own attention is focused sharply on the scientific and technical knowledge to be gained.

The public is right, of course. We never expect to see a day in this country when people will set more store on things, even on ideas, than on a single human life.

WELCOME ABOARD

Cape Canaveral Administration: Anita S. Bell.

Apollo Project Office: Donovan L. Teegarden, Jr., Robert A. Tremant, and Harvey W. Fritz.

Program Analysis and Evaluation: Mary C. Decherd.

Flight Operations: Leslie J. Sullivan, George E. Tadford, Melvin F. Brooks, Charles D. McKinney, Beverly J. R. Koos, James E. Hannigan, Matthew R. Soulant, Jr., Howard H. Neill, and Gordon M. Ferguson.

Flight Crew Operations: Capt. James R. Brickel (USAF) and Margie S. Charles.

Systems Evaluation and Development Division: Jesse C. Jones, Norman H. Chaffee, Henry O. Pohl, Richard W. Bricker and John H. Kimzey.

Life Systems Division: Robert N. Prince.

Spacecraft Research Division: John Betts, Jr., George G. Steinmetz, Terrance M. Carney, and John J. Bertin.

Data Computation and Reduction Division: Robert A. Plunkett.

Administrative Services: Robert J. Reaves.

Steno Services: Jewell J. Norsworthy and Pauline B. Jones.

Technical Services: Raymond E. Darrah.

Procurement and Contracts: James J. McLaughlin, and Patricia H. Curry.

Logistics: Lila A. Calkins.

Personnel: Virginia S. Cook, Erwin F. Rich and Franklin D. Matthews.

Public Affairs: Tallulah T. Monroe.

Security: Carole Ann Howard.

Project Representative To AMR Elmer H. Buller Leaves MSC

A government employee for more than 20 years and a member of Project Mercury since April of 1959 left Cape Canaveral May 11 for Detroit, Mich. and a job in private industry.

Elmer H. Buller, formerly Project Mercury representative to the Atlantic Missile Range, has joined Chrysler Corporation to work with Chrysler's advanced missile programs.

One of the early employees of Space Task Group (now Manned Spacecraft Center), he joined STG April 20, 1959 and after several months at Langley AFB, Va., was one of the first persons sent to Cape Canaveral on Project Mercury. As a project representative, he was then responsible to the chief of operations division.

He organized the Mercury Project Office at Patrick AFB, and was instrumental in officially introducing Project Mercury to the Atlantic Missile Range. Since that time he had been official representative for Project Mercury to AMR.

Buller began his career in government service in 1941 as a civil service employee of the Air Force at Wright Patterson AFB in Ohio. From 1942 to 1946 he spent four years in active duty in the U. S. Navy, returning to his job with the

Department of the Air Force afterward. In 1950 and '51, he worked with the Department of the Navy at the Cluna Lake, Calif. site and from 1952 to '55 at Pt. Magu, Calif.

In 1955 he joined the National Aeronautics and Space Administration at the Cleveland, Ohio office, where he remained until transferring to



Elmer H. Buller

Space Task Group at Langley in 1959.

Since his move to Florida, Buller and his family had been living at 510 B. Avenue in Melbourne Beach. They moved to Detroit following Buller's resignation May 11.

'Supreme Experience Of My Life,' Carpenter Tells Press

"I have had the supreme experience of my life," Astronaut M. Scott Carpenter told newsmen at a press conference in Cocoa Beach, Fla. Sunday afternoon.

The appearance climaxed a parade from Patrick AFB and a reunion with his wife and mother after his return from Grand Turk Island.

Carpenter and Associate Director Walter C. Williams were presented the NASA Distinguished Service Medal by NASA Administrator James Webb, as Astronaut John Glenn and MSC Director Robert Gilruth had been before them.

Said Carpenter, "I am uneasy in this acclaim. I am aware that it is due and merited by at least 1,000 people here. This is the hardest working group of people I have ever seen."

Calling it the "report of a working astronaut to the people who paid for this," Carpenter gave a blow-by-blow account of his historic feat, which he said was much smoother and easier than he had expected, and answered questions of newsmen as to difficulties encountered in overshooting the planned recovery area.

(See flight story, Page 1.)

"I think the most arresting sight I saw during the flight

Facilities: Norman J. Willis.

Photo Services: Frederick J. Southard, and Charles C. Shrimplin.

was the sunset or sunrise. It is the most magnificent sight I have ever seen. But I have the idea that every sunset in space is identical," he added, noting that each one was different as seen through the earth's atmosphere.

Carpenter said he photographed the particles which have been such a question mark since the flight of Astronaut John Glenn. He said, also, that he discovered the origin of those he saw by striking the side of his spacecraft, which made clouds of the particles fly out, supporting the idea that they were "snowflakes" of frost.

He said he had argued with Glenn about this, and added, "He (Glenn) believes his particles were luminous. My particles were not."

The green liquid in a transparent container behind his head behaved much as scientists predicted in zero gravity, he said, climbing the standpipe in the center and the rest clustering around the base of the standpipe.

Of the "space food" he tested in flight, he noted "the cookies crumbled and the candy melted," meaning that there was still a problem with floating crumbs in the weightless state, in spite of a special coating on the bite-sized squares.

"I'm ready for two weeks in orbit any time," he said near the end of the conference.

Mexican Earthquake Quite An Experience, Says Gregory

How does it feel to be in the middle of an earthquake at eight in the morning on the ninth floor of your hotel?

"It's not something I'd want to go through again," says Don Gregory, technical assistant to the director.

Gregory was one of the MSC representatives present in Mexico City May 10 and 11 for a two-day display of the Mercury spacecraft. The morning of the second day he had not yet left his hotel room on the ninth floor of Mexico City's Alameda Hotel when the city was hit by a sharp earth tremor that broke seismographs all over the country. The scientists said it lasted for about nine seconds.

"It was a lot longer than that," declares Gregory. "I think that must have been when their seismographs broke. It seemed to me as if it lasted for minutes. I saw the curtains moving as if the wind were blowing them. The walls cracked a little and some plaster sifted down from the ceiling, but nothing collapsed. I lost my equilibrium. After a minute I ran out of the room and tried to go down the stairs, but the building was still moving. It was quite an experience."

The quake caused no serious damage in Gregory's area, however, and he spent the day, as he had the day before, giving lectures on Projects Mercury, Gemini and Apollo before the huge crowds of Mexican citizens who came to see the display.

"It was surprising, the amount of response we had," he said. "The people are pretty far removed from Project Mercury down there but they have a tremendous interest in it and they are very well informed on the Glenn flight."

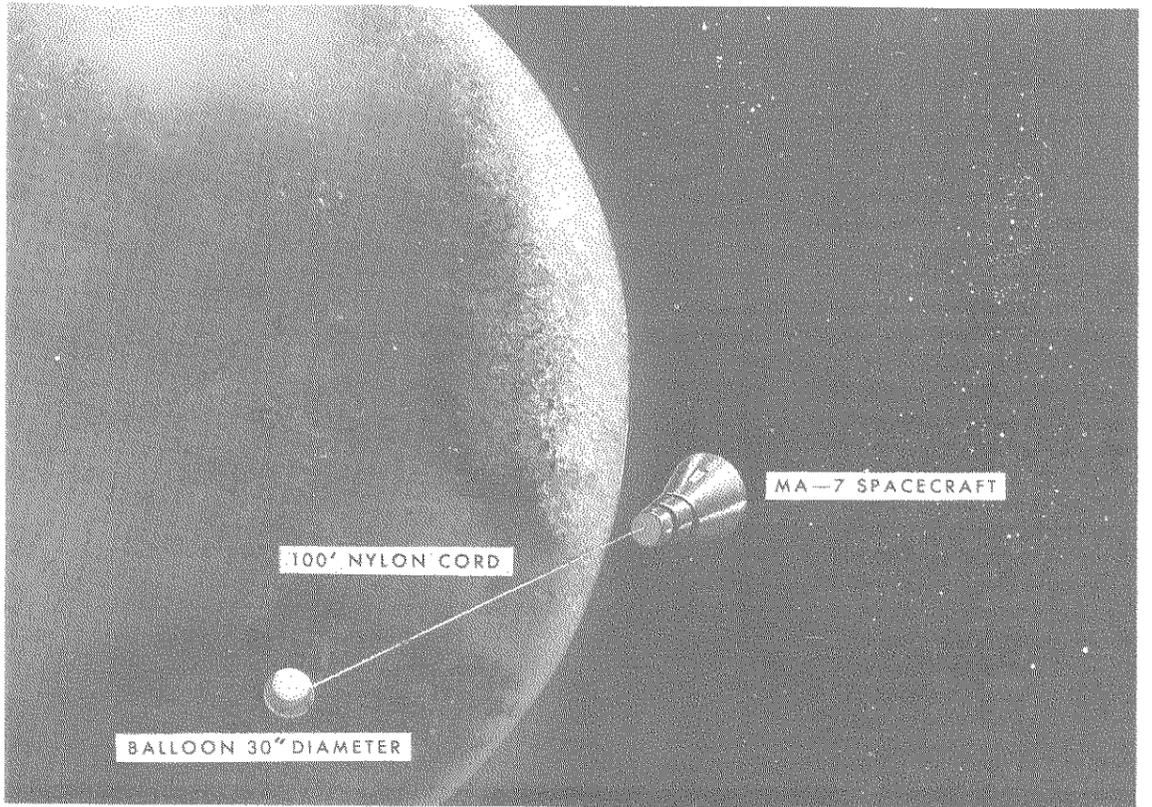
"Some of them stood in line for hours to see the display, and the crowds were so large that they had to be moved through faster than they wanted and complained about not being able to stay long enough. A lot of people had to be turned away at the end of the day without getting in."

At the end of each lecture, which Gregory gave three times each day, he held a question and answer period. Crowd reaction was excellent. Mexicans asked about the weight of the capsule, what materials were used, would women ever fly in space, whether the Russians were really ahead of the U. S., the cost of the capsule, the type of food the astronauts ate, and a hundred other questions.

They were particularly interested in the role the Mexico range station played in the Glenn flight. Some of them wanted to know what fraction of the U. S. budget went to defense and what part to space exploration.

They asked about the colored particles, the G's that Glenn experienced, whether weightlessness bothered him, how he flew the spacecraft, the thickness of the heat shield, the speed of the craft in orbit, and what happens to the booster after launch. They were clearly interested in the mechanics of space flight and Gregory said no political questions were asked.

Commenting on the trip after their return, R. S. Johnston of Life Systems said: "I have been impressed with the interest shown . . . and I have been equally impressed with the need for NASA people to put forth the best efforts, since the people look to you not as an MSC representative but rather a representative of the USA."



AN ARTIST'S CONCEPTION of how the MA-7 spacecraft looked circling the earth with the balloon tethered behind it which was used in an experiment to test visual phenomena in a space environment and measure aerodynamic drag.

Gilruth Speaks About Manned Space Programs At Nat'l Conference on Peaceful Uses of Space

"Manned space flight has come into its own as a major part of our total space flight program" MSC Director Robert R. Gilruth told the Second National Conference on the Peaceful Uses of Space in Seattle, Wash. May 9.

"Project Mercury has provided the initial step upon which our future program is being built. In bringing Mercury to this stage we have acquired a large fund of both general and detailed knowledge that should do much to help advanced manned flight programs."

"Project Gemini is in the design and construction phase. It has been planned to utilize the lessons learned in Mercury and to provide significant increases over Mercury in space flight duration and maneuverability. Gemini will provide flight experience and technical knowledge that will be applied to Apollo and to more advanced space flight missions."

Gilruth thus summarized a review of the concepts of Project Mercury and a discussion of the role of Project Gemini in the same context.

Mercury's basic concepts, Gilruth said, were the Atlas launch vehicle and its guidance, a blunt non-lifting re-entry body with retrorockets for recovery from orbit; a parachute landing on water; an automatic escape system or tower; and a progressive build-up of tests.

Basic problems encountered in Project Mercury included development of the spacecraft and its systems, pilot selection and training, flight control in real time, automatic versus manned control procedures, and booster-spacecraft integration.

Gilruth said the problem of afterbody heating which

cropped up in initial flight tests was solved by replacing original thin refractory metal panels by thicker beryllium panels. Also, a land landing capability, an impact bag to absorb shockloads under certain conditions of abort, had to be devised. The compactness of the Mercury spacecraft and the crowding of its systems were found to slow the preflight checks of each spacecraft, a problem which will have a bearing in the design of the Gemini craft.

Gilruth said the selection of experienced test pilots for the project "we feel has been wise, and I would say that in the future . . . we can come close to predicting lead time."

Flight control problems led to the development of the Canaveral control center and the worldwide tracking network. In addition a completely automatic system had to be developed, in order to fly animals first. "At the same time we wanted to use as much of the same hardware as possible when we got the manned flights and we wanted to give the man as much override as possible. This gave us a problem of complexity we would not have had if we could have gone with a manned vehicle all the way."

Operating procedures, Gilruth said, had to be developed for a whole new area of manned flight, and a serious structural dynamics problem between the spacecraft and the booster developed quite unexpectedly during booster-spacecraft integration.

Gilruth then turned to Project Gemini, which he said was designed to include long-duration missions of days rather than hours and to include studies of our ability to rendezvous in space by locating another vehicle and

maneuvering alongside.

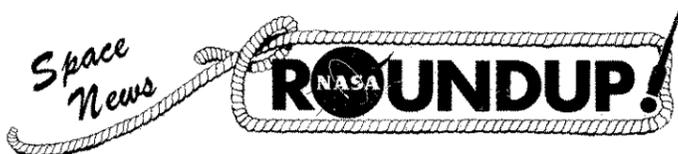
Efforts are being made, he said, to improve systems packaging in order that access and checkout, assembly and maintenance can be facilitated. The problems of flight control should be intermediate between those for Mercury and Apollo as to severity, but because of the two pilots it is anticipated that Gemini will have less automatic sequencing of flight modes than did Mercury. The problems of booster-spacecraft integration between Titan II and Gemini should be less than in the Atlas-Mercury program due to both the experience gained in Project Mercury, and to the absence of a long, heavy escape tower on the front of the spacecraft to change structural vibration modes of the combined spacecraft and booster. On Gemini, escape means will be provided by ejection seats, which are suitable because of much lower explosive yield of Titan II fuels as compared to those used in Atlas.

Gilruth discussed finally the problem of land landing at a preselected point, which will mean that the pilot must be able to control the craft throughout the reentry phase and apply controlled amounts of lift to change course in correcting for navigational errors, wind drift, etc.

In this connection an offset center of gravity will be built into Gemini so that it will tend to trim at some finite value of lift rather than at zero lift as Mercury does. In addition, the much-discussed Rogallo wing or paraglider will be carried folded into the small neck of the spacecraft and deployed after subsonic speeds are reached during landing.



A RECENT WATER EGRESS test near Cape Canaveral shows Carpenter being picked up by a Marine helicopter. Following the flight he spent some three hours on a raft in the Atlantic before being picked up.



SECOND FRONT PAGE

Thirteen Killed in Africa Crash Of Contingency Recovery Plane

A U.S. Air Force C-130 Hercules transport crashed near Nairobi, Kenya, May 17, killing the 13 men aboard. The plane was from the 322nd Air Division, based at Evreux, France, and was en route to the contingency recovery base at Nairobi, one of four such sites employed by the Mercury recovery system in Africa.

The tragedy pointed up the fact that support elements of many governmental agencies play important roles in the overall Project Mercury program. Little publicity has been given to the part played by these contingency forces which would seek out an astronaut's spacecraft in the event that it came down in the plane's area rather than in the planned recovery area.

Mercury officials were shocked by the crash and MSC's Associate Director Walter C. Williams sent a message of condolence to the Commander of the 322nd.

Those aboard the aircraft were listed as Maj. Frank Sabol, commander; Capt. John W. Stuart, Jr., pilot; 1st Lt. Douglas G. White, navigator; T/Sgt Thomas P. Revell, flight engineer; A/IC Frank J. Leonard, loadmaster, T/Sgt Jack S. Hake, T/Sgt James O. Phillips, S/Sgt Russell Jackson, S/Sgt Thomas J. Neal, S/Sgt Richard E. Boyd, Airman Frederick D. Fisher, Airman Louis R. Laslow, and Airman Ervin M. Miller.



MARINE AND WEAPON get together as Astronaut John H. Glenn, Jr. looks over his custom-made gift from the Project Engineer Office. At left is Joe Dodson of the Project Engineer Office, who assembled the gun by hand. Admirers at right are Mercury Project chief Kenneth Kleinknecht and MSC Associate Director Walter C. Williams.

NASA Selects Lockheed For RIFT Negotiations

The Lockheed Missile & Space Company of Sunnyvale, Calif. has been selected by the National Aeronautics & Space Administration for negotiation of a contract for the design, development, fabrication and testing of the RIFT stage (reactor-in-flight-test). It is estimated the total cost of the RIFT stage development will be about \$180,000,000.

Lockheed was one of three firms that participated in the second phase of the RIFT contract competition March 1 when a proposal conference was held at NASA Marshall Space Flight Center, Huntsville, Ala. The other two firms were General Dynamics Astronautics of San Diego, Calif. and Martin-Marietta of Baltimore, Md.

The first phase of the contract will cover a six to nine month period, after which the more advanced development work will be initiated. A total of nine stages will be provided under the RIFT contract. It is expected about 2,000 contractor personnel will ultimately be employed on the project.

The RIFT vehicle is intended to flight test the NERVA (Nuclear Engine For Rocket Vehicles Application). This engine is being developed under the sponsorship of the joint Atomic Energy Commission-NASA Space Nuclear Propulsion Office by Aerojet-General Corp. with the Westinghouse Corp. as the principal subcontractor. Initial flight tests are planned for the 1966-67 period from Cape Canaveral, Fla.

John Glenn Presented Custom-Made Rifle

A red-faced, surprised, and obviously pleased John Glenn accepted an unusual gift from the Mercury Project Engineering Office May 15, and told a room full of admiring viewers that he "just didn't know what to say."

The gift was a custom-made .243 calibre "large varmit" gun, equipped with a telescopic sight and put together from parts ordered from all over the world.

It was the kind of gun you cannot buy in any store, assembled and its stock hand finished in five months of spare-time work by Joe Dodson of the Project Engineering Office.

In making the presentation, Dodson compared Glenn's February 20 orbital flight to the "shot heard 'round the world" in the 18th century. A metal plate set into the special custom case for the gun carries the same inscription as the gift itself. "Lt. Col. John H. Glenn, Jr., USMC, First American in Orbit, Feb. 20, 1962, presented by Project Engineer Office."

Dodson said he began work on the gun in December, and spent a "considerable number" of working hours on it, much of it in the contouring, finishing and checkering of the stock, which came in rough-machined form from Warsaw, Mo.

The FN Mauser action was made in Liege, Belgium, the trigger mechanism in Finland, the barrel in Northaven, Conn., the riflescope in New York state and its mounting in California, the sling swivels in Oregon and the sling itself in California. The vari-colored wood on the pistol grip cap is rosewood from South America and cocoa wood from Africa. The tools used in carving the stock came from England. The

ammunition was made by Western Arms, the same firm that made the explosive bolts for Glenn's spacecraft. The whole thing was put together in Dodson's Hampton, Va. home.

"It's sort of an orbital gun," Dodson said, "which came from all around the world."

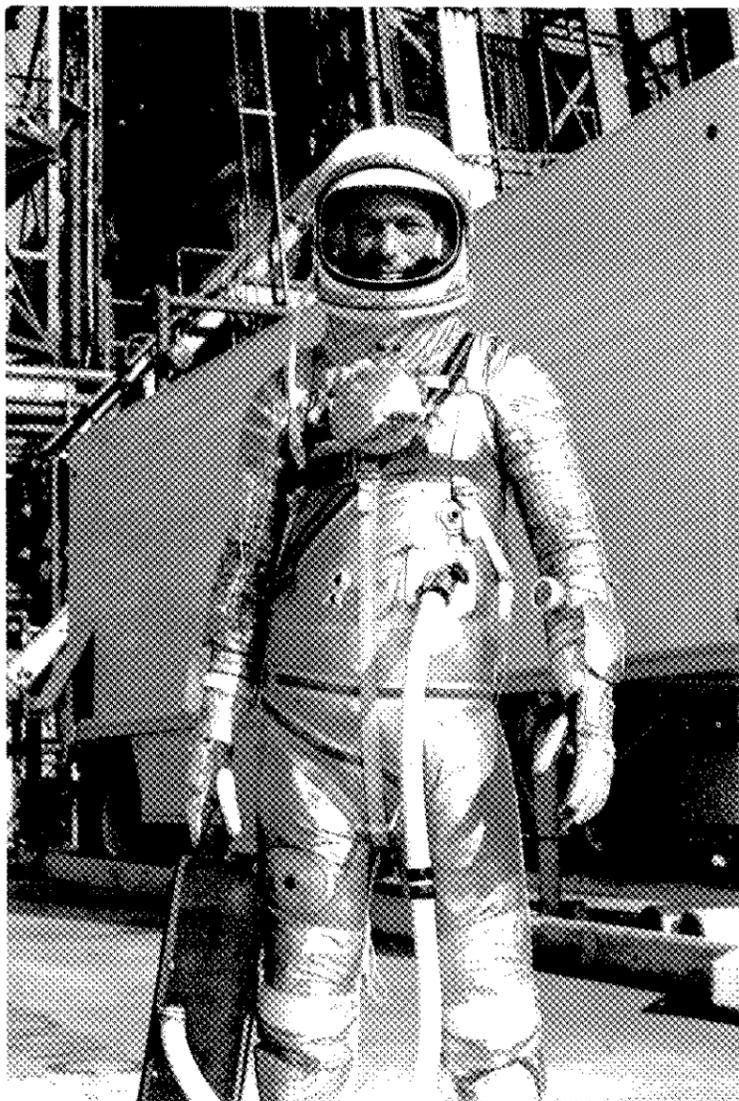
Features of the weapon are a slide action shotgun-type safety, a riflescope which is variable from two and a half to eight-power, and hand-checkering on the stock involving 22 minute grooves to an inch, or 484 tiny diamonds to the square inch, a job which took Dodson hours of careful labor.

"A lot of TLC went into this one," Glenn said admiringly when he received the gift in a brief ceremony in the office of Associate Director Walter C. Williams in the E and O Building at Cape Canaveral.

Primarily a varmit-calibre (.243 Winchester) gun, the weapon can be used for animals as heavy as a white-tailed deer. "We'll have to go deer hunting in Texas now for sure," Glenn promised his audience.

"It's a beautiful thing . . . I really don't know what to say. I hope you can put something in the paper that will thank everyone for me."

The gift came in a wooden case, lined with green foam especially contoured for the gun, and Dodson pointed out that the foam was the same as that used in the early models of the Mercury spacecraft couches.



ASTRONAUT M. SCOTT CARPENTER is shown in front of the gantry which housed the Atlas launch vehicle scheduled to put his Aurora 7 spacecraft into orbit. He carries a portable air conditioning unit for his pressure suit.