SPACEPORT NEWS

Volume 4, Number 42 | Kennedy Space Center, Fla. | October 21, 1965

THUMBS UP--WALLY, TOM

Gemini 6 pilots Tom Stafford and Wally Schirra

Astronauts Wally Schirra and Tom Stafford are continuing final pre-flight preparations today for their orbital rendezvous mission — Gemini 6 — scheduled no earlier than Monday.

Prime objective of this flight — the nation's tenth manned mission — is to prove the ability of Gemini to rendezvous and dock with an orbiting Agena vehicle.

Unlike anything previously attempted in the U.S. manned space program, two launches are required for the mission; the Gemini-Titan II and an Atlas-Agena.

Both launch vehicles will be counted down simultaneously to about T-101 minutes for Gemini. At this time the Atlas will be launched to place the Agena into circular orbit of about 185 miles.

When the Agena has attained its proper orbit, Gemini 6 will be launched, and during its first three revolutions, the astronauts will maneuver their spacecraft into a circular orbit about 17 miles below the Agena.

Rendezvous maneuvers for a planned docking with the Agena will take place on the fourth revolution as the Gemini passes over the Atlantic. Docking is planned somewhere between Australia and Hawaii. It will be the most difficult step ever attempted in the manned space flight program.

It is planned to dock and separate the spacecraft several times to provide experience with docking procedures. Schirra and Stafford will each practice docking under day and night lighting conditions.

Following final separation the astronauts will use the spacecraft radar to transmit commands to the Agena to gather additional data on Agena visibility at different

(See THUMBS, Page 6)

Mars Voyager Considering Saturn V Use

The 7.5 million-pound thrust Saturn V launch vehicle is being considered by NASA for its planned Voyager program of unmanned planetary exploration, beginning with Mars missions in 1971.

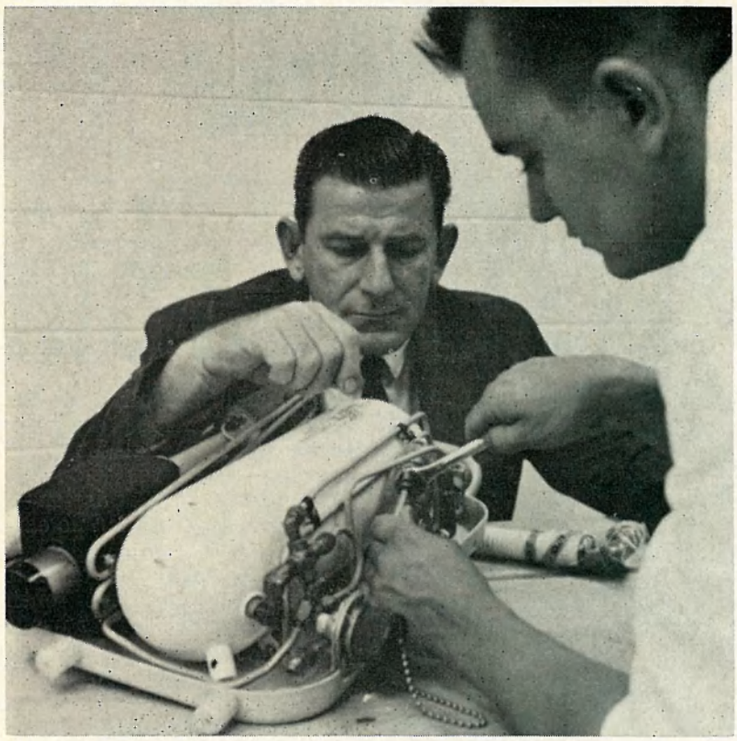
Saturn V is currently under development for the Apollo manned lunar landing program. Voyager is being planned to ultimately carry heavily instrumented landing capsules to the planets to study their surface characteristics and to search for extraterrestrial life.

NASA has considered developing a Saturn I-B/Centaur launch vehicle combination to launch Voyager spacecraft, but with its much greater thrust the three-stage Saturn V would give considerable more flexibility to planning early Voyager missions. It would also provide the launch vehicle capability at the beginning of the Voyager program which would be required by future missions.

Under this concept, a single Saturn V vehicle would launch two spacecraft on missions to orbit Mars in 1971.

The role the 1971 missions will play in the evolution of the landing capsule is under study, with the first capsule missions carrying scientific experiments being contemplated no sooner than 1973.

The findings by Mariner IV of a more rarefied Martian atmosphere than expected will be a major consideration in scheduling entry capsules on early Voyager missions for engineering development and more precise determination of the atmospheric conditions.



PAUL MEYER of Bendix, and technician Thomas Gough inspect a pre-oxygenation ventilator that will be used by the astronauts prior to their flight to purge excessive nitrogen from their systems.

Instrumentation Confab Set

The first annual Instrumentation Conference and Exhibit, sponsored by the Canaveral section of the Instrument Society of America, will be held at the Cape Colony Inn next Wednesday and Thursday.

A total of 19 technical papers will be presented during the two-day session, and 20 exhibits will be on display, showing the latest in instrumentation equipment.

Rube Wilkinson, Chief of KSC's Measurement Systems Division, KSC Information Systems, will be chairman of the opening session next Wednesday — on "Future Space Mission Support."

Richard J. Mazurkiewicz will make a presentation during this session on "Apollo Launch Instrumentation Requirements," and Arthur N. Greene will discuss "Correlation Time Base Generation." Both are with KSC.

Other conferences will be held on "Data Handling and Analysis," "Telemetry and Data Acquisition," and "Sensors and Instrumentation".

Frontiers Of Space

Tomorrow at 9 a.m. KSC employees will have an opportunity to see the NASA Spacemobile lecture - demonstration, "Frontiers of Space."

The one hour presentation will be held in the training auditorium. Lecturer will be Gabriel Cardova. Subject matter will cover the entire scope of NASA's operations, thus affording an opportunity for KSC people to familiarize themselves with this scope.

SPACEPORT NEWS

Published each week by the John F. Kennedy Space Center, National Aeronautics and Space Administration, Kennedy Space Center, Florida, 32899
John W. King, Chief, Public Information Office
L. B. Taylor, Jr., Editor
Russell F. Hopkins, Staff Photographer

Pre-Oxygenation Ventilators Reduce Chances of 'Bends'

Success of the Gemini 6 mission could not be accomplished without the ability of countless contractor agencies to do their specific jobs without error.

Typical of the manner in which this is done is the role played by the Bendix Life Support Facility assisting the KSC Launch Support Operations Division. Among other functions, this group, under supervision of Paul Meyer, is directly responsible for testing, maintenance, repair, filling and providing of pre-oxygenation ventilators for all astronauts prior to launch.

Bendix has fulfilled this requirement since Gemini 4, and with close NASA quality surveillance inspection, Meyer proudly points out, "we have yet to receive out first quality discrepency report."

Pre-oxygenation is a process in which the astronauts purge their system of excessive nitrogen by breathing oxygen that is a minimum of 99.5 percent pure for 45 minutes prior to entering the spacecraft.

If this were not done, the nitrogen would tend to form bubbles in the astronauts' body as the atmospheric pressure decreased at higher altitudes. Atmospheric pressure at 18,000 feet is half what it is at sea level, and above that altitude the chances of the "bends" increase rapidly.

On the day of launch, the pre - oxygenation ventilators first come into play when the astronauts arrive at the Pilots' Ready Room.

After they are fitted into their outfits, each suit is connected to the ventilators and pure oxygen is supplied for both the 45-minute breathing period and for cooling the inner temperature of the space suit.

After completion of the pre-oxygenation period, each astronaut picks up his ventilator and carries it to the launch pad, using it for his oxygen supply during the trip.

The ventilators are carried up the elevators, left in the service structure, and, by use of long hoses, continue to supply oxygen until the spacecraft systems are activated and the astronauts can connect to the spacecraft oxygen supply.

A total of eight ventilators per launch are supplied by the Bendix Life Support Facility. In addition to the two ventilators used by the Gemini 6 astronauts, four more are positioned in the Pilots' Ready Room for reserve.

An additional two ventilators are stored at the 100-foot level on Complex 19. These ventilators will remain there as reserve oxygen for the countdown or for the astronauts' return to the ready room should the mission be cancelled.

The same ventilators are also used to supply astronauts with oxygen during weight and balance operations and for purging the space suits prior to use by the astronauts.

Crawler-Transporter Design Confirmed

Test results have been received by KSC which confirm the design of a new bearing system for the Crawler Transporters.

Tests on bearings were conducted at the Marshall Space Flight Center for KSC to determine wear rates, load capacity, and friction under extreme transporter operating conditions.

The load and endurance tests have confirmed the suitability of a leaded bronze sleeve bearing used with the existing automatic lubrication system.

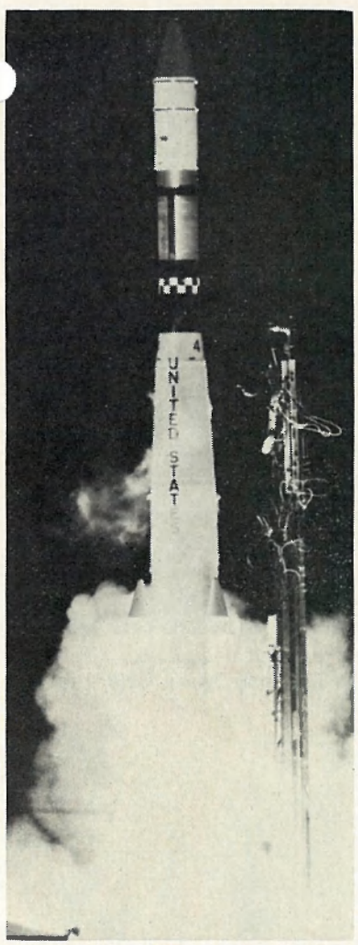
The new bearing system design replaces the original single tapered roller bearings for radial and thrust loads. The new design is a joint effort of engineers of NASA and the prime contractor, Marion Power Shovel Company, with extensive use of prominent consultants.

These new bearings will have load carrying capacities of more than three times that of the original bearings. The new bearings will fit within the space that remains when the old bearings are removed. Field machining is not required with this design.

Gemini 6 Test Cycle Began Here Months Ago

The Gemini 6 spacecraft in which Wally Schirra and Tom Stafford will orbit has undergone extensive pre-flight testing at the Kennedy Space Center.

Work began long before the spacecraft arrived at the Center months ago.



A THRUST - augmented Thor - Agena D rocket lifts off from the Kennedy Space Center, Unmann- d Launch Operations, Western Test Range. The vehicle sent an Orbiting Geophysical Observatory into Earth orbit carrying 20 scientific experiments. The launch was the first directed by Robert H. Gray acting in his new title as Assistant KSC Director for Unmanned Launch Operations.

First stop for the Gemini 6 was the Pyrotechnic Installation Building, where KSC ordnance specialists installed pyrotechnic charge assemblies, switches, retrorocket initators and parachute mortars.

A key test was begun on August 25, when the Gemini 6 and the Agena target vehicle were joined atop the 50-foot timber tower at the Center's Radio Frequency Systems Test Site. Here, RF combatibility tests were conducted in docked and undocked modes, with the astronauts participating.

Two weeks later the spacecraft was erected atop the Gemini launch vehicle at Complex 19. Test crews conducted pre-mate verifications tests, and an overall systems check was completed on September 16, clearing the way for the final, "wet mock" testing of spacecraft and launch vehicle.

More tests followed, including flight configuration mode checks, servicing and a practice launch countdown.

Mechanical mating of the Atlas booster and the integrated Agena target vehicle and target docking adapter occurred in October.

During the next two and a half weeks, both total vehicles ran through simultaneous launch demonstration countdowns and simulated flight tests.

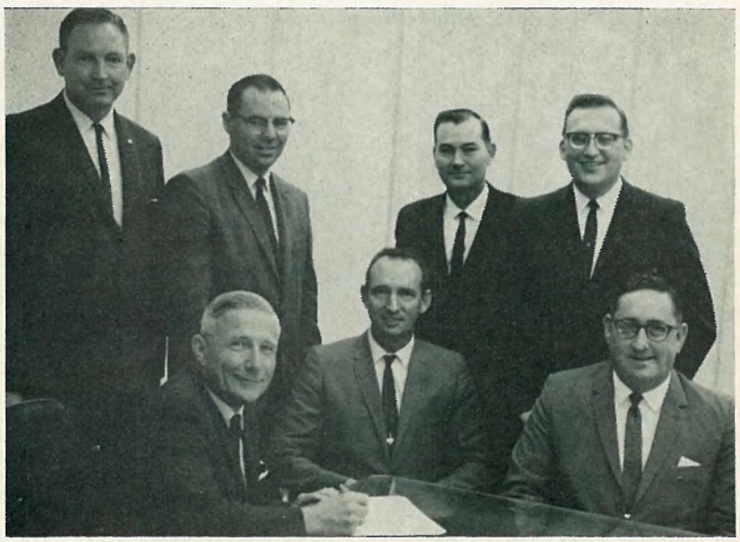
While final checkouts are still going on today, other Kennedy Space Center engineers and technicians are beginning the cycle anew for the Gemini 7 mission. The spacecraft arrived here a few days ago.

Population Percentage

While the U. S. population will have risen at an average yearly rate of 1.7 percent between 1955 and 1965, Federal employment has increased at the rate of only 0.6 percent a ear since 1955.

Schneider Appointed

NASA has announced the appointment of William C. Schneider as Deputy Director of Mission Operations and Gemini Mission Director.



DR. HANS GRUENE, Assistant Director for Launch Vehicle Operations, signs certificates of appreciation for members of his staff whose departments have reached 100 percent participation and fair share in the United Fund drive. Seated with Dr. Gruene are Andy Pickett, Chief, Mechanical and Propulsion Systems Division, and A. D. Lewis, Planning and Technical Support Office. Standing, left to right are, Marvin Williams, LVO drive chairman, Al O'Hara, Manager Saturn IB Operations, E. R. Whisenant, Chief Planning and Technical Support Office, Component Logistics Branch, and Ed Hopton, of the Administrative Branch.

LVO Employees Challenge KSC Personnel In Drive

Personnel in Launch Vehicle Operations have issued a challenge to all other elements at the Kennedy Space Center. They contend they will collect more for the United Fund per employee than any other group.

To back their claim, LVO drive chairman Marvin Williams says his team has already reached more than half their allotted total.

"We pro-rated our share of the Center's overall goal of $25,000," Williams said. Then we had a chart drawn up listing every unit in LVO. When they reach 100 percent participation, and 100 percent fair share, based on this prorating, Dr. Gruene, our Assistant Director, awards them a certificate of appreciation, Williams said.

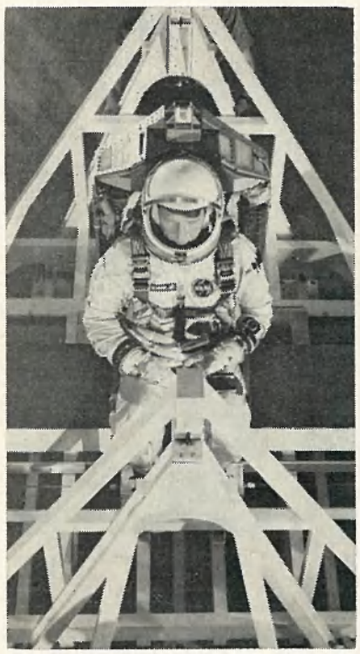
J. B. Russell's Oxidizer section was the first group within LVO to reach the dual 100 percent goals. They did it about two days after the United Fund campaign got underway at the Center.

Russell's group hit 123 percent of their fair share amount, and the ground electrical systems section, under Carroll Rouse, hit 144 percent.

Williams pointed out that LVO had 100 percent participation in last year's drive.

"We have one of the largest single organizations at the Center," he said. "It includes about 350 people scattered at launch complexes 34, 37 and 39. We hoped our system would spur competition among all LVO employees, but things have been happening so fast, we decided to challenge other KSC elements, to get them into the spirit of things."

HOW will the Gemini 6 spacecraft join the Agena target in orbit? Eileen Langan of Lockheed demonstrates better than words can describe.

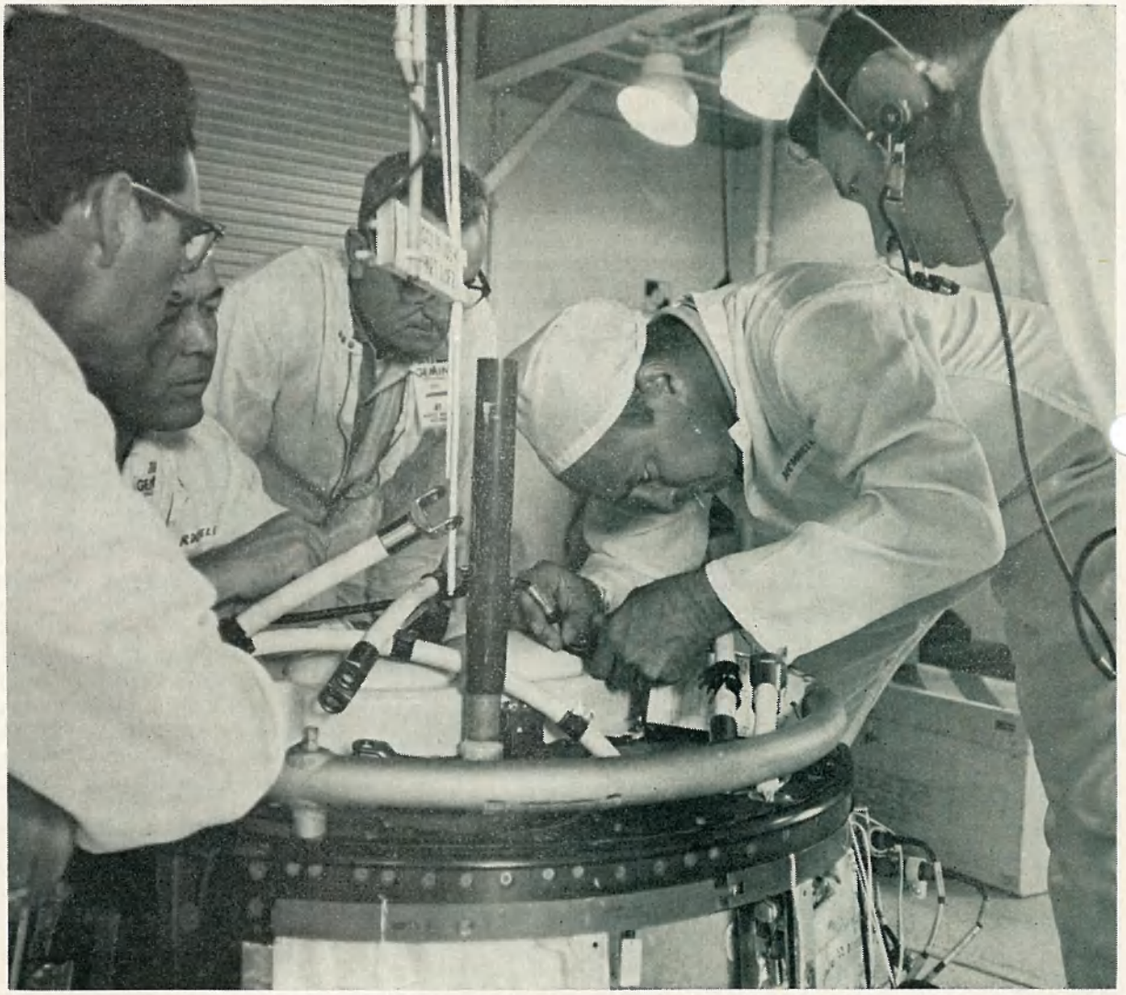


IN FLIGHT configuration, command Gemini 6 pilot Wally Schirra participates in a weight check.

GETTING the feel of the Gemini spacecraft in the mission simulator, astronaut Tom Stafford runs through a series of tests aided by a KSC technician.

Mars, Mars . . . What?

Should NASA attempt some day to place identifying markings on the Planet Mars and be foiled by the mythical god of war, Mars, it might produce this unusual headline: "Mars Mars Mars Mars."

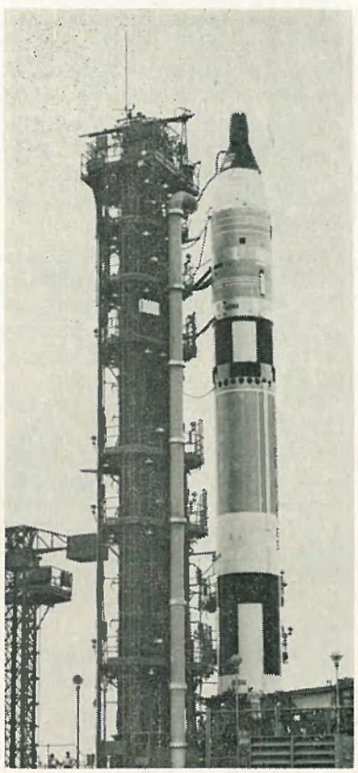


LIKE SKILLED surgeons, McDonnell technicians install test gear in the Gemini 6 nose tip for radar checks. The spacecraft went through weeks of pre-flight checkout at the Kennedy Space Center before being mated to its launch vehicle at Complex 19.

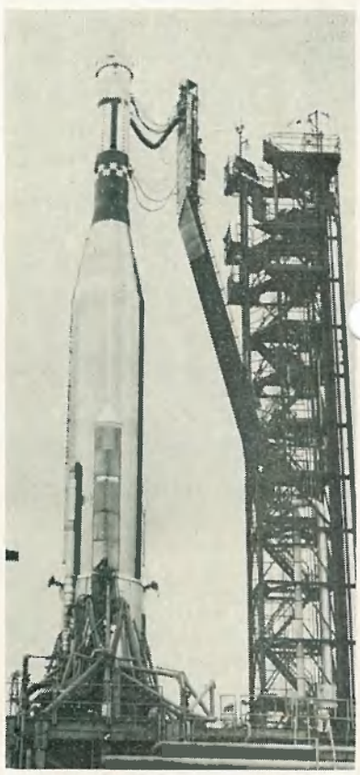
Tier, LaHatte Named

Col. William Teir, USA, has been appointed Deputy Manager, Operations, Saturn I/IB Program Office. He will participate fully with the program manager in managing and coordinating all phases of project planning; engineering design and development, vehicle and mission integration; and testing and evaluation of the Saturn I/IB Program.

Col. William F. LaHatte, USA, has been appointed Deputy Manager, Management, Saturn I/IB Program Office. He will participate in all phases of management of the Saturn I/IB Program including development of technical management systems, plans, policies and procedures; the establishment of program management operating plans and working agreements; and overall program management activities.



Gemini Launch Vehicle



Atlas-Agena Launch Vehicle

Girls Will Squeal; Stomachs Will Flutter

Guaranteed to happen during the Gemini 6 countdown and liftoff:

—The newest young employees at the Kennedy Space Center (female types) will squeal at ignition when the huge cloud of smoke funnels out the rocket's exhaust. They will think the whole thing has caught fire.

—A few office workers will curse aloud as they leave their buildings to view the launch. They are the souls who forgot to bring in the high-powered binoculars they bought specifically for the purpose of watching the rocket!

—At the VIP stands, some dignitary will have to use the bathroom just at liftoff and miss the most exciting part of the operation.

—Regardless of how clear a day it is, there will be at least one small puff of cloud, and the Gemini will pierce it like a thread going through a needle eye, hiding the vehicle from sight for an anxious second.

—At the astronauts' breakfast table Schirra and Stafford will joke and josh and heartily down their filets. Their guests will smile uncomfortably and practically choke on the food; their stomachs full of butterflies.

—A newsman will shout "the erector's stuck" as it is lowered, but it won't be. It just moves that slowly.

—Uninformed tourists will shout encouragement to the astronauts when the Atlas-Agena target vehicle lifts off. Some will even motor off, believing they have actually seen the spacemen on their way. The astronauts won't go for another hour and a half.

—When the F4C chase plants, on a high-flying photographic mission—pop the sound barrier, local newspaper switchboards will be flooded with calls asking: "What was that loud noise?"

—Youngsters in the area's elementary schools will correct their teachers on the Gemini flight operations and objectives. They will recognize every pitch, roll and yaw.

—Dusty Rhodes and John Markovich in the Kennedy Space Center mail room will be completely inundated with thousands of letters to be postmarked on the launch day and affixed with the specially-designed Gemini cachet.

—The hardest workers after liftoff will be the Cape to Cocoa Beach shuttle drivers for GSA. They will have to buck the post-flight traffic jams.

Astronaut-Photographers Provide Valuable Data

U.S. astronauts aren't just the world's most experienced space travelers.

They're also among the world's most accomplished photographers.

And through photography, they have extended their talents into the diverse fields of oceanography, astronomy, meteorology, geology and cartography.

Ever since Col. John Glenn roared into space with a camera aboard the Mercury spacecraft, "Friendship 7," back in 1962, Americans have been treated to extraordinary views of an Earth man is only beginning to understand.

Praise Summed Up

Today, after seeing hundreds of photographs taken by NASA's busy astronaut-photographers, scientists the world over are proclaiming their value. Praise has mostly been summed up in a single word:

More.

Geologists in Mexico, for instance, may discover their country anew through spaceborne photography. Pictures taken by Gemini pilots James McDivitt and Edward H. White have shown geologic faults not identified in more than a century of study.

Oceanographers from the Mediterranean to the Gulf of California have identified bottom topography from photographs taken by Mercury and Gemini astronauts. They have noticed sediment distribution from rivers into gulfs, and are studying the possibility of limited depth mapping through space-taken photos.

Weathermen, too, are interested in tracing patterns defined in orbital altitude pictures.

There is more to space photography than meets the lens. There is the promise of accurate mapping of places on Earth where civilized man has never set foot.

There is potential for determining water temperatures and depths using spaceborne instruments — not simple cameras — and cloud heights, using spectrographs and cameras from space.

And, with man capable of aiming a camera wherever it will do the most good, spaceborne cameras can photograph the moon and stars to get pictures without the distortion ground-based cameras pick up from Earth's atmosphere.

Half Way Home

Gemini 6 marks the halfway point of Project Gemini. Of the remaining six flights five will be rendezvous missions and one, Gemini 7, will be a long duration flight lasting up to 14 days.

DEPUTY KSC Director for Launch Operations, G. Merritt Preston, left, and Walter E. Parsons, Chief of KSC's Checkout Equipment Division, were presented a group achievement award in Washington recently from Associate NASA Administrator, Dr. Robert C. Seamans. The award was for a group now with KSC which developed the Acceptance Checkout Equipment for the Apollo spacecraft while they were with the Manned Spacecraft Center's Florida Operations. In a separate award, Theador A. Poppel, head of the Launch Support Equipment Engineering Division, was cited on behalf of his people for their design, development and checkout of launch support equipment for the Saturn I.

Beach Erosion?

Ocean Currents To Be Studied

Preparations are being made for further study of the flow of ocean currents and beach sediments in the area of Launch Complex 39 pad A.

The study, by the University of Florida's Coastal Engineering Lab, involves tracking fluorescent particles over the ocean floor.

Purpose of the study is to determine the disposition of material in the event of a launching abort near the coastline. A secondary purpose is to provide information on beach erosion and its effect on launch facilities constructed near the shoreline.

Odds and ends on Monday's mission:

After orbiting, both the Gemini 6 spacecraft and the Agena target vehicle will be circling the Earth at better than 17,500 mph — yet their relative speed at the time of docking must be less than one mile per hour!

* * *

Flight experiments include: weather and terrain photography to aid research in the fields of geology, geography and oceanography; photographing celestial bodies and the Agena; determining the mass of an orbiting body, and measuring radiation inside the spacecraft.

* * *

Development of the ability to rendezvous and dock is necessary for the accomplishment of such missions as the Apollo manned Moon landing, resupply of space stations and repair of unmanned satellites.

* * *

The Gemini 6 count will actually be a combination of 11 different countdowns, mostly running simultaneously. The different counts are associated with the two launch vehicles, the two spacecraft, Houston Mission Control and the worldwide tracking network, the Air Force Eastern Test Range and the radio-command guidance system.

* * *

At an elapsed time of 25 and a half hours, the crew will attempt to acquire visually a two-watt argon laser beacon aimed toward them from the ground at the White Sands Missile Range.

* * *

The Gemini spacecraft must be launched within two and a quarter hours after the Agena makes its first revolution to achieve rendezvous. If this cannot be done, the spacecraft launch will be delayed until the next day when the "window" opens again. The Agena's active lifetime in flight is five days.

To The Chief Goblin: We Want . .

Dermot and Heloise Ouinn

The letter came addressed to "The Chief Goblin, Space Station." It was postmarked, Enfield, Middlesex, England.

"Please help us to fly like the XL5," it began, "And please let us have two pair of space clothes and two jars full of oxygen pills and two ray guns and two space bikes and two space radios. We forgot something. With the ray guns, please send electric space bullets, and a Johnny Seven machine gun.

"If you will help us we will do any favor you like. Here is a picture of us so you will know us."

Heloise and Dermot Quinn
Age 6 and 7.

Coordination Keynotes Gemini Flight

As the most complex, demanding mission yet attempted in the U.S. manned space flight program, Gemini 6 calls for more close coordination than ever among an expanded NASA-Air Force-Industry team.

G. Merritt Preston, Deputy KSC Director for Launch Operations, and Deputy Mission Director for the Gemini 6 launch lists six major components that will be conducting simultaneous operations. They are: the Gemini spacecraft; the Agena target vehicle; the Gemini launch vehicle; the Atlas launch vehicle; the mission control center in Houston, including the manned space flight network; and the Air Force Eastern Test Range.

People in each of these components are working a prescribed operational plan, and they must tackle some unique requirements.

—The launch radio guidance system must follow the Agena during its launch, and then it must be reprogrammed to pick up the Gemini launch.

— A reliable communications net had to be installed to connect the two blockhouses at Complexes 19 (Gemini) and 14 (Atlas-Agena), as well as several other key points.

To meet such stringent requirements, all major elements at the Center — the Air Force Eastern Test Range, the four launch vehicle and spacecraft prime contractors — Martin (Gemini launch vehicle), McDonnell, (Gemini spacecraft), General Dynamics (Atlas launch vehicle), and Lockheed, (Agena) — have been working closely with Kennedy Space Center and NASA Manned Spacecraft Center personnel.

TO DOCUMENT, historically, the flight of Gemini 6, this cachet will be affixed to all envelopes mailed from the Center on the day of launch. It features the Gemini spacecraft about to dock with the Agena target vehicle.

KSC Story Being Told In NASA Space Sheet

The Kennedy Space Center is regularly receiving nationwide news coverage as a result of articles and photos appearing in the NASA Space Sheet, published by the Headquarters Public Information Office.

The fact-filled sheet, covering activities at all NASA Centers, is mailed free of charge to more than 700 newspapers across the country.

In the most recent issue photos and a short story on the Gemini 6 and Agena tests at the radio frequency test facility, and an article on the Spaceport tours appeared in the Space Sheet.

Hazards contribute to accidents; correct them.

Thumbs Up Wally, Tom

(Continued from Page 1)

altitudes and distances.

About 10 hours of flight time have been planned for rendezvous and docking activities, but based on experience gained in previous flights, this figure will be flexible.

Total flight time for Gemini 6 will be about 46 hours and 47 minutes. Landing is planned in the Atlantic Ocean about 330 miles south of Bermuda.

Following recovery of the astronauts, ground commands will be used to perform various Agena exercises. These are to test Agena command and control, useful lifetime and maneuver capability.

5,000 COMPANIES

About 5,000 companies had a part in building NASA's Gemini spacecraft, its equipment and the launch vehicle.