NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-1	Astronaut geological field training Hawaii	1-4-65
65-2	Modification of Titan launch complex at Cape at saving of $5 million	1-10-65 Cape Dateline
65-3	Additional parasail tests scheduled this month	1-11-65
65-4	MSC open house for employee families on 1-16	1-11-65
65-5	Speech in Big Spring, Texas	1-13-65 (AP4)
65-6	CSD using x-rays to take "inside look" at pressure suit mobility and comfort	1-20-65
65-7	Lectures planned under sponsorship of Gulf Coast Science Foundation	1-15-65 (AP4)
65-8	Wardell to speak Nat'l Electrical Manf. Assoc.	1-15-65 (AP4)
65-9	35 members of Flight Acceleration Branch of CSD moving into Bldg. #29 on 1-19-65	1-18-65
65-10	Results on GT-2 attempt on December 9, 1964 (Cape dateline)	1-18-65
65-12	GLV-3 shipped to Cape Kennedy today from Martin Co. at Baltimore (Cape dateline)	1-21-65
65-14	Results on Mission Control Center operation during GT-2 mission	1-19-65
65-15	Results on 3 tests of Gemini spacecraft escape & recovery systems at El Centro, Calif.	1-28-65
	NOTE TO EDITORS-GT-3 crews available for interviews 2-1 through 2-5-65.	1-28-65
65-16	3 Gemini astronaut's personal parachute tests completed successfully at El Centro, Calif.	2-2-65
65-17	MSC ask for proposals on head-and-shoulders dummy capable of hearing & speaking electronically	2-11-65

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-18	Shakedown test at WSO of 1st major piece of of Apollo flight type hardware -Las Cruces	2-5-65
65-19	Gemini spacecraft 3 being prepared for series of tests before being mated to launch vehicle	2-5-65
65-20	Eighth test of gemini spacecraft recovery system conducted successfully at El Centro, Calif.	2-5-65
65-21 (DC)	Foreign scientist invited to conference on Apollo experiments	2-8-65
65-22	Average Astronaut	2-10-65
65-23	Transfer of 41 engineers and matehematicians from KSC to MSC	2-12-65
65-24	Astronauts continue series of geological field trips in AEC's Nevada Test Site begin 2-16	2-12-65
65-25	Two men from MSC winners of 1965 Arthur S. Fleming award	2-12-65
(China Lake) 65-26	Qualification seat ejection escape system test successful	2-12-65
65-27	Astronauts assignments	2-16-65
65-28	"In the barrel" Astronauts	2-16-65
65-29	Dr. Reynolds named Asst. Mgr. of ASPO	2-16-65
65-30	Shea to speak Gulf Coast Science Lecture Series	2-16-65
65-31	Gemini Spacecraft No. 3 joined to launch vehicle	2-18-65
65-32	Parasail system land test as water drop in galveston bay on 2-24	2-23-65
65-33	AC Spark Plug signed 5 yr contract for guidance and navigation systems ($235 million contract)	3-3-65
65-34	William Lee named Asst Apollo Program Mgr.	2-26-65
65-35	Problems	3-1-65
65-36	Gemini Mission Profile	no date
65-37	Landing rocket system test scheduled EAFB 3-5	3-4-65
65-38	Pressure suit qualification test program comp.	3-5-65

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-39	Solar telescope to be installed at MSC	3-8-65
65-40	Mission Control Center-Houston	3-12-65
65-41	Dr. Walter C. Randall, Chairman of Dept. of Physiology, Loyola University, to speak	3-8-65
65-42	Simulated landings on lunar surface made	3-11-65
65-43	Bad weather could delay GT-3	3-15-65
65-44	Flight controllers	
65-45	Dr. Lewis F. Hatch, Graduate Professor of Chemistry, Univeristy of Texas, to speak	3-31-65
65-46	Summer Faculty Fellowship Program	3-31-65
65-47	Regional finals of a science congress at MSC	4-6-65
HQS. REL.	GT-4 to be controlled from MCC-H	4-9-65
65-48	Art exhibit in auditorium	4-9-65
Editors Note	Announcement of parasail-landing rocket developmental system at Fort Hood	4-12-65
65-49	Announcement of parasail-landing rocket at Fort Hood	4-13-65
65-50	Chamber "A" passes structural integrity test	4-15-65
65-51	Press conference with McDivitt & White sched.	4-21-65
Memo to press	Series of briefings and demonstrations showing astronaut training devices and facilities	4-21-65
65-52	Operation on Aldrin's right knee successful	4-23-65
65-53	Ast. Aldrin to undergo surgery tomorrow.	4-22-65
65-54	MSC/U of H Graduate Education Center	4-29-65
65-55	C. W. Mathews' Notes for Press Briefing - Preflight activities	no date
65-56	Transcript of Mathews' press briefing on GT-3	5-3-65
65-57	Development of landing rocket system for Apollo test to take place Tues., May 11, 1965	5-7-65

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-58	Dr. Piccard to be principal speker at awards ceremony at High School Sciences Seminar 5-8	5-8-65
65-59	Apollo space suit	5-12-65
65-60	SPARC PAOE Release	5-24-65
65-61	LSEp proposals being sought	6-10-65
65-62	Piland named manager of Experiments Program Office	6-10-65
65-63	Six scientist-astronauts named w/pix	~~6-29-65~~ Released 2pm 6-28
Hqs. Release	Thompson appointed mission director	6-26-65
65-64	~~Rendezvous attempt to be made by Guidance~~ and Control	7-1-65
65-65	NASA to negotiate with Federal Electric Corp for MSC support services	7-1-65
65-66	Gemini VII group named	7-1-65
Hqs. 65-228	NASA Equips Pegasus C with detachable panels	
65-67	MSC presents vaudeville Revisited	7-8-65
65-68	PLSS delivered to the Crew Systems Division	8-2-65
65-69	Contract to Dynalectron maintenance support for aircraft	8-2-65
65-70	Helicopter damaged during training	7-21-65
65-71	Three story office & lab for CSD under construction	8-4-65
Hqs. 260	Three firms selected to design Apollo lunar surface package	8-4-65
65-72	200 personnel to be transferred from MSFC	8-4-65
MSC/HQS. 65-73	128 AF Officers assigned to NASA's MSC	8-13-65
74	NASA slects Lockheed for support svcs at Hou.	8-13-65
75	Gemini 5 crew to undergo 11 days of debriefing	8-13-65

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-76	Science fair winners to view Gemini 5 from MSC	8-16-65
65-77	Manned paraglider testing at Edwards AFB resumed	9-2-65
65-78	Retrieval of lost Mercury boilerplate, lost since 5-31-62	9-15-65
65-79 HQS& MSC	NASA to select additional pilot astronauts	9-10-65
65-80	Westinghouse engineers begin tests on centrifuge facility	9-13-65

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-81	Flight hardware for Apollo	9-17-65
65-82	Gemini 7 spacecraft successfully completes altitude chamber tests	9-20-65
65-83	Ling Timco Vought selected as contractor for engineering support services at White Sands Test Facility	9-22-65
65-84	Radiation contract signed with Tracerlab	9-24-65
65-85	GT-6 launch date announced	9-25-65
65-86	Three contracts awarded foranalytical studies of parasail	10-7-65
65-87	Photography in space flight	10-8-65
65-88	Chop to address officials in San Antonio	10-8-65
65-89	Lightweight Gemini space suit undergoing tests	10-11-65
65-90	Schultse and members of Bureau of Budged to visit MSC	10-11-65
65-91	NATO college to visit MSC	10-12-65
65-92	Remote flight controllers on way to tracking stations	10-14-65
65-93	NASA TO negotiate with Lockheed for computer programming support	10-15-65
65-94	Test series on extravehicular activity completed by engineers of Crew Systems	10-18-65
65-95	Berry to receive exception service medal	~~10-19-65~~

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-96	New bubble helmet	10-21-65
65-97	Contract extension for support of Real-time	10-21-65
	Computer Complex	
65-98	Meteorite finds in Texas increasing	10-28-65
65-99	Agena Review Bpard NAMED	10-27-65
65-100	Test scheduled of paraglider recovery system	10-28-65
65-101	LCU undergoes face lifting (Retriever)	11-5-65
65-102	International Latex and Ham Standard to engage	
	in research & development work on Apollo space suits and	
	portable life support system.	11-5-65
65-103	NASA announces launch of Gemini 7 on Dec. 4	11-9-65
65-104	Qualification test scheduled for Chamber B	11-12-65
65-105	Extravehicular/Life Support System & Extravehicular	
	Support Pack qualification tests scheduled	11-18-65
65-106	Solar Particle Alert Network to study radiation	
	coming from sun	11-22-65
65-107	FY 65 procurements at MSC totals $1,487.4 million	11-22-65
65-108	Four companies, Lockheed, McDonnell, Martin and	
	Northrop, to perform 4-month design studies on	
	Experiments pallet for Apollo	11-22-65
64-109	Flight Controllers deploy for locations for GT 7/6 missions	11-24-65
65-110	Ice cream being studied as space food	11-23-65

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
65-111	Medical report on results of medical tests of Gemini 7 astronauts.	12-21-65

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HU 3-4231

MSC 65-1
January 4, 1965

HOUSTON, TEXAS -- U.S. astronauts will continue their geology field training in January when they go to the Hawaiian Islands for a close-up look at active volcanoes.

The geology sessions will be held starting January 11 on the island of Hawaii. The astronauts will ascend the twin peaks of Mauna Loa and Mauna Kea, and also examine the Kilauea Crater. The astronauts will go to Hawaii in two groups. Each group will spend five days in geological exploration of the island.

On Mauna Loa, the astronaut groups will be given field problems dealing with mapping and relative age of the lava flows. They will also study problems of rock sample collection.

On one of the days, the astronauts will be flown by charter plane around the island to get an overall view of its geological features. Later in the day, they will go to the Volcano Observatory for a lecture on geophysics and a look at the seismographs which record the tremblings of the volcanic island.

The island of Hawaii is one of the world's best examples of shield volcanoes. Geologists believe some of the features on the moon may be caused by shield volcanoes. The astronauts will also

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study olivine basalt, a dark lava which may also be found on the maria or "seas", dark areas on the moon. They will also examine cinder cones and other volcanic features which may be similar on the lunar surface.

The Hawaiian names for the lava flows which the astronauts will study are more exotic. The blocky, rough basalt is known as a a (ah-ah) and the ropey-surfaced lava is called phoehoe (pahoyhoy).

Dr. Howard Powers, director of the Volcano Observatory, will be chief lecturer for the astronauts on this field trip. He will be assisted by Dr. Al Chidester of the U.S. Geological Survey, and Dr. Ted Foss, head of MSC's Geology and Geochemistry Section.

"We hope there may be a volcanic eruption while we are on the field trip," Dr. Foss stated, "Hawaiian eruptions are not violent, and it would give the astronauts valuable first hand information on the behavior of shield volcanoes in action."

The astronauts day by day schedule is:

First day -- Arrive at Hilo Airport and travel to Volcano House, base of operations for the field trip.

Second day -- Field trip begins. Examine rim of Kilauea crater and lava flow from Kilauea south of Hilo.

Third day -- Visit Kilauea Iki crater. Walk down to floor of Kilauea crater to Halemaumau (Smoking Pit) then take automobiles down Chain of Craters Road.

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Fourth day -- Air tour of the island by chartered plane. Second part of the day will be spent at Volcano Observatory for geophysics lecture.

Fifth day -- Ascend Mauna Kea, Hawaii's highest volcano. Observe cinder cones on volcano's peak. Spend night at Pahaka Loa State Park.

Sixth day -- Ascend Mauna Loa, Hawaii's second highest volcano. Descend to Kailua on West Coast, where trip ends.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas
HU 3-4231

MSC 65-2
January 10, 1965

CAPE KENNEDY, FLA. -- The National Aeronautics and Space Administration will modify a Titan launch complex at Cape Kennedy this month, and put it to use for preflight testing of Apollo spacecraft, saving NASA $5 million.

The $2 million modification of an existing launch complex replaces a proposed $7 million static test facility originally planned for construction at the Cape's Merritt Island Launch Area (MILA).

First tests of the Apollo service module are expected to begin in mid-1965. Later, in 1966, static tests of the lunar excursion module (LEM) will begin at the modified Launch Complex 16. Work to convert the launch pad will begin January 20, and is expected to be completed in May.

Titan launch complexes are designed to test separately the first and second stages of Titan I and II missiles. First stage positions will be converted to test service modules; second stage positions will be used to test the LEMs.

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Spacecraft modules will undergo complete preflight checkout, including leak tests, systems tests, hot firings and gimballing. Static tests will also be useful to checkout ground servicing equipment and to familiarize personnel with pad procedures.

Since Titan launch vehicles use the same hypergolic propellants as the two Apollo modules, propellant storage, transfer and loading facilities at Pad 16 will be retained. The modification will be mechanical, electrical and structural.

Three Titan launch complexes will remain operational at the Cape.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-3
January 11, 1965

HOUSTON, TEXAS -- Additional parasail tests have been scheduled in Trinity Bay this month by the Manned Spacecraft Center engineers and technicians.

Two water drops are scheduled to precede the first earth landing test at Fort Hood, Texas. The parasail will be the smaller version, 69.7 feet in diameter, and it will not carry landing rockets in the water drops. In previous tests, an 80-foot parasail was used.

Project engineers want to re-evaluate the turn motor rigging lines on the new chute and gain more experience in remote control guidance of the smaller parasail.

The boilerplate spacecraft will be dropped from a C-119 aircraft at 11,200 feet. It will be radio-controlled by a project engineer aboard the motor vessel Retriever, and will be recovered after the drop.

In another phase of preparation for the land tests, landing gear deployment is being qualified on a boilerplate vehicle at a test rig at Ellington AFB. The first test in a series of three was conducted January 5.

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The landing gear will be identical to that originally proposed for use with the paraglider on Gemini. Both the parasail and the paraglider are developmental programs and are not scheduled for use as landing equipment for any Gemini flights. A standard 84 ft. ring-sail parachute will be used for all Gemini recoveries.

The parasail landing gear consists of tricycle, skid-type landing struts. The nose gear is a telescoping type and is deployed by the thrust of compressed nitrogen gas. The two main gear are positioned beneath the cabin of the spacecraft. They are deployed by small solid propellant actuators, and lock into place by means of angle braces. The skids, metal shoes on the end of the gear, are automatically trimmed by cable mechanism at full gear extension.

The pyrotechnic actuators which deploy the gear have been tested with simulated laods by the McDonnell Aircraft Corp. The MSC tests combine the actuators and the landing gear for the first time.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-4231

MSC 65-4
January 11, 1965

HOUSTON, TEXAS -- Manned Spacecraft Center will hold an open house for employee and on-site contractor families only from 8 a.m. to 5 p.m. Saturday, January 16.

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Information from the

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS 77058

January 13, 1965
Don J. Green
HUnter 3-4432
Area Code 713

65-5 (4)

Local mailing
Big Spring
Texas
area

HOUSTON, TEXAS -- Don J. Green, a spaceflight information specialist at the Manned Spacecraft Center, will address prominent civic leaders and students in Big Spring during a community services program January 18 and 19.

He will speak to the Air Force Association and to members of the high school during the two day visit.

In a speech describing the impact of the space program, Mr. Green will discuss current progress and planned activities of the manned space flight program. His speeches are entitled, "Gemini: Twins in Space," and "Footprints on the Moon."

-more-

Both the opportunities and dangers of these American space projects will occupy the speaker in his talks. Man will launch his greatest voyage of discovery before 1970, Green will tell the audience. The pitfalls of space flight will be navigated and there will be footprints in the lunar dust.

The speaker's background includes many years as a newsman. Prior to joining the space agency, Green served nine years as an aerospace writer for a news service in Chicago. His articles on related subjects have appeared in technical journals and national magazines.

Green covered space probes fr m Cape Canaveral as early as 1958, including the flights made by John Glenn, Jr. and other astronauts. The speaker is a member of the Aviation/Space Writers Association, a professional organization of newsmen who cover the space program.

Green holds a Reserve commission in the United States Air Force. His current assisnment in the event of mobilization is as the Information Staff Officer with the 12th Air Force, Tactical Air Command, Waco, Texas. He has previously held a staff position as Intelligence Officer with the Air Defense Command, Madison, Wisconsin, and is a veteran of World War II.

The speaker received a Bachelor of Arts degree from Hasting College in Nebraska and worked on a Master of Science degree in Journalism at Northwestern University, Evanston, Illinois.

In his present position with the National Aeronautics and Space Administration in Houston, Green works in a speakers bureau in the Public Affairs Office. Previously his speciality was covering the fields of flight operations and training. He joined NASA in January, 1963.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-6
January 20, 1965

HOUSTON, TEXAS -- Manned Spacecraft engineers and medical personnel in Crew Systems Division are using x-rays to take an "inside look" at pressure suit mobility and comfort.

Through the use of x-ray still photographs and 16mm motion pictures, suit engineers, and design and medical personnel are able to determine what parts of the suits may be hampering mobility and how the situation can be corrected.

Since the astronaut must be able to move outside his vehicle in later Gemini flights, and walk and work on the surface of the moon after the Apollo lunar landing, the pressure suit must allow the subject to move as freely as possible.

The x-ray studies are carried out at the Baylor University School of Medicine in Houston under the direction of Dr. V. P. Collins and Dr. Zoltan Petrany. Test subjects are filmed both unsuited and suited for mobility comparisons, and Atomic Energy Commission standards are followed for x-ray exposure of all subjects. Subjects are volunteer NASA employees who fit the suit being tested and Army officers from a local reserve unit.

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Such factors as determination of the eye-heart angle are important in controlling the effects of acceleration. Also, the angular ranges of joint mobility, the suit restrictions on mobility and comparisons between Gemini and Apollo suit mobility are being studied.

Movements which the subjects perform include head nodding and rotation, movements of shoulder, elbow, wrist, hand and thumb-finger opposition. Leg movements concentrate on the hip, knee and ankle.

"A valuable feature of the tests is the immediate feedback it provides to the suit contractor and NASA suit engineers," said Dr. Robert Jones, MSC project director. "We can x-ray the suit in the morning, examine the results, modify the suit, and x-ray it again on the same day to evaluate the modification."

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NASA
C-65-10587

Information from the

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS 77058

January 15, 1965
Don J. Green
HUnter 3-4432
Area Code

65-7 (5)

Local

HOUSTON, TEXAS -- A series of lectures by distinguished scientists are planned for high school students and science teachers in the Gulf Coast area. The talks are under the sponsorship of the Gulf Coast Science Foundation with assistance from the NASA Manned Spacecraft Center.

A total of four Saturday evening programs are planned. They will begin in January and continue through April. The first and fourth lectures will be held at Clear Creek High School with the other two scheduled for MSC.

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Colonel John E. Pickering, USAF, Deputy for Research and Development, Aerospace Medical Division, Brooks Air Force Base, Texas, will open the series on January 30.

His subject will be "The Biological Effect of Atomic Radiation."

Purpose of the series is to stimulate interest in the fields of science among students, teachers and adults of the area.

MSC personnel associated with the Gulf Coast Science Foundation include Dr. Robert R. Gilruth, Director; Max Faget, Assistant Director for Engineering and Development; Charles A. Berry, M.D., Chief of Center Medical Programs; Edward L. Hays, Assistant Chief for Engineering in the Crew Systems Division, and Dr. Donald E. Stullken, Head of the Recovery Operations Branch of the Landing and Recovery Division.

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Information from the

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS 77058

January 15, 1965
Don J. Green
HUnter 3-4432
Area Code 713

65-8 (6)

new orleans area

HOUSTON, TEXAS -- Anthony W. Wardell, of the Reliability and Quality Office at the Manned Spacecraft Center, will be the principal speaker at a two day meeting of the National Electrical Manufacturers Association in New Orleans, Louisiana on January 18 and 19.

Representing the National Aeronautics and Space Administration, Wardell will summarize performance requirements established in the spacecraft's electrical system. His audience will consist of approximately 60 presidents and top executives of wire manufacturing firms.

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"The National goal of a lunar landing and safe return to earth demands ultra-high reliability," Wardell will tell the electrical manufacturers.

There is no room for error, according to Wardell. Electrical wiring could make the difference between success and failure.

The speaker's background includes many years as a mechanical engineer with industrial firms. He was an aircraft hydraulic and flight controls systems reliability engineer with Lockheed Corporation, Marietta, Georgia for three years, and has also been employed with an engineering firm in Huntsville, Alabama and with the Chrysler Corporation, Detroit.

Wardell received a Bachelor of Mechanical Engineering degree from Georgia Tech and a Master of Automotive Engineering degree from the Chrysler Institute of Engineering.

His research efforts have been limited to the fields of metallic materials and how they affect crew safety in space flight.

In his present position with NASA in Houston, Wardell works as a flight safety specialist on environmental control systems. He joined NASA in January, 1963.

He is a member of the following honorary engineering fraternities: Tau Beta Pi, and Pi Tau Sigma.

Wardell was born in Brooklyn, New York on January 11, 1932.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-9
January 18, 1965

HOUSTON, TEXAS -- Thirty five members of the Flight Acceleration Branch of Crew Systems Division will be moving into their new quarters in Bldg. #29 Tuesday.

The administrative wing of the two storey building, containing 17,000 square feet, has been accepted for occupancy by the Manned Spacecraft Center. The centrifuge, which is housed in the circular portion of the building, is 75 per cent complete. Acceptance tests on the centrifuge arm, gondola, and motor assembly are scheduled to begin in several months.

The centrifuge is designed to produce the effects of high acceleration on test subjects, who ride in the gondola on the end of a 50 ft. rotating arm. The forces which build up during launch and reentry of a spacecraft can be simulated inside the facility. The MSC centrifuge gondola can carry three men, effectively simulating the environment of an Apollo lunar mission.

The Flight Acceleration Branch has been located on the 2nd floor of Bldg. #4, prior to the move. The General Accounting Office, now located at Ellington AFB, are scheduled to move into the vacated office space in Bldg. # 4.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas
HUnter 3-4231

MSC 65-10
January 18, 1965

CAPE KENNEDY, FLORIDA -- On December 9, 1964, an attempt to launch GT-2 was aborted when a hydraulic system failure caused the launch vehicle's first stage engines to shut down automatically 1.0021 seconds after ignition.

At that time, indications were that the hydraulic failure initiated a series of events which included abrupt engine gimbaling and switchover to the backup guidance and control system, which caused engine shutdown. In a case like that, the circuitry is such that the booster automatically shuts down and lift off can not occur on backup guidance.

Investigation showed that the failure resulted from high back pressure in a hydraulic line which broke the aluminum housing of a servovalve. The valve is part of an actuator which regulates the movement of an engine thrust chamber. The actuator is part of the booster's steering devices.

Engineering film revealed that the engine did not gimbal. However, such a signal was produced. The thrust chamber position sensor, which transmits thrust chamber movement signals, is located in a cavity near a tapered extension of the actuator piston rod, which controls thrust chamber movement. When the rod moves, a plunger is depressed,

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and thrust chamber movement is recorded.

When the servovalve failed, hydraulic fluid filled the cavity, creating high pressure which depressed the plunger and created an erroneous signal that the thrust chambers had moved. The loss of hydraulic pressure caused the switchover to backup guidance and the resultant automatic engine shutdown. The backup guidance system has a completely independent hydraulic system.

Modifications to prevent a recurrence of such a failure include increasing the thickness of the servovalve housing from 3/16 to 3/8 of an inch and changing part of the hydraulic system.

To insure against the creation of high back pressure, a force limiter in the hydraulic line has been modified to permit increased fluid flow. The hydraulic line has been rerouted to bypass another device which limits flow for other functions, but is not required for servovalve operation during engine starting. The force limiter serves as a shock absorber.

The modifications are being included in all Gemini launch vehicles.

A small leak in one of the regenerative fuel coolant tubes in the thrust chamber of the booster's No. 2 engine has been repaired and the tube has been tested successfully. The tube was damaged slightly by rapid heating, then cooling during ignition and shutdown.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

NASA

Houston 1, Texas

HUnter 3-4231

MSC 65-11
January 30, 1965

HOUSTON, TEXAS -- A new device for simulating some of the motion problems experienced in zero and lunar gravity is undergoing checkout in the Manned Spacecraft Center's Crew Systems Division.

Called the six degree of operational freedom simulator, the device consists of two 12 ft. booms with ballast buckets, and a personnel cradle. Through the use of ball bearing joints and a gimbal system, a test subject can achieve 360 degrees rotation in roll pitch and yaw. He can move nine feet vertically, and has a horizontal range 24 feet in diameter.

The feeling of weightlessness comes from balancing the man's weight exactly with lead weights in the ballast bucket. Since his body has no "weight", he has full freedom of motion. However, it is a suspended type of weightlessness rather than the free fall weightlessness of outer space. The test subject will only have total body weightlessness.

The simulator will be used for evaluating such items as space tool concepts and spacecraft tethering lines. It can give a

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continuous and long term weightless simulation. An aircraft only attains 20-30 seconds flying gravity cancelling parabolas. Special problems arising from simulator work can be validated by the Air Force C-135 aircraft.

In zero "g" simulations, the subject is strapped firmly in the personnel cradle. He cannot move his legs or torso. His arms are free to provide torque by pushing away from a spacecraft, pulling a tethering line, or using a tool.

When the device is balanced to provide one sixth gravity, a bicycle seat is substituted for the lower half of the personnel cradle. The suited man is then able to practice walking under the reduced gravity conditions.

A ventilation and breathing line runs through the simulator to the personnel cradle, where it can be attached to the man's pressure suit.

Project engineer for the simulator is Earl LaFevers and Jack Slight is principal test subject for the device.

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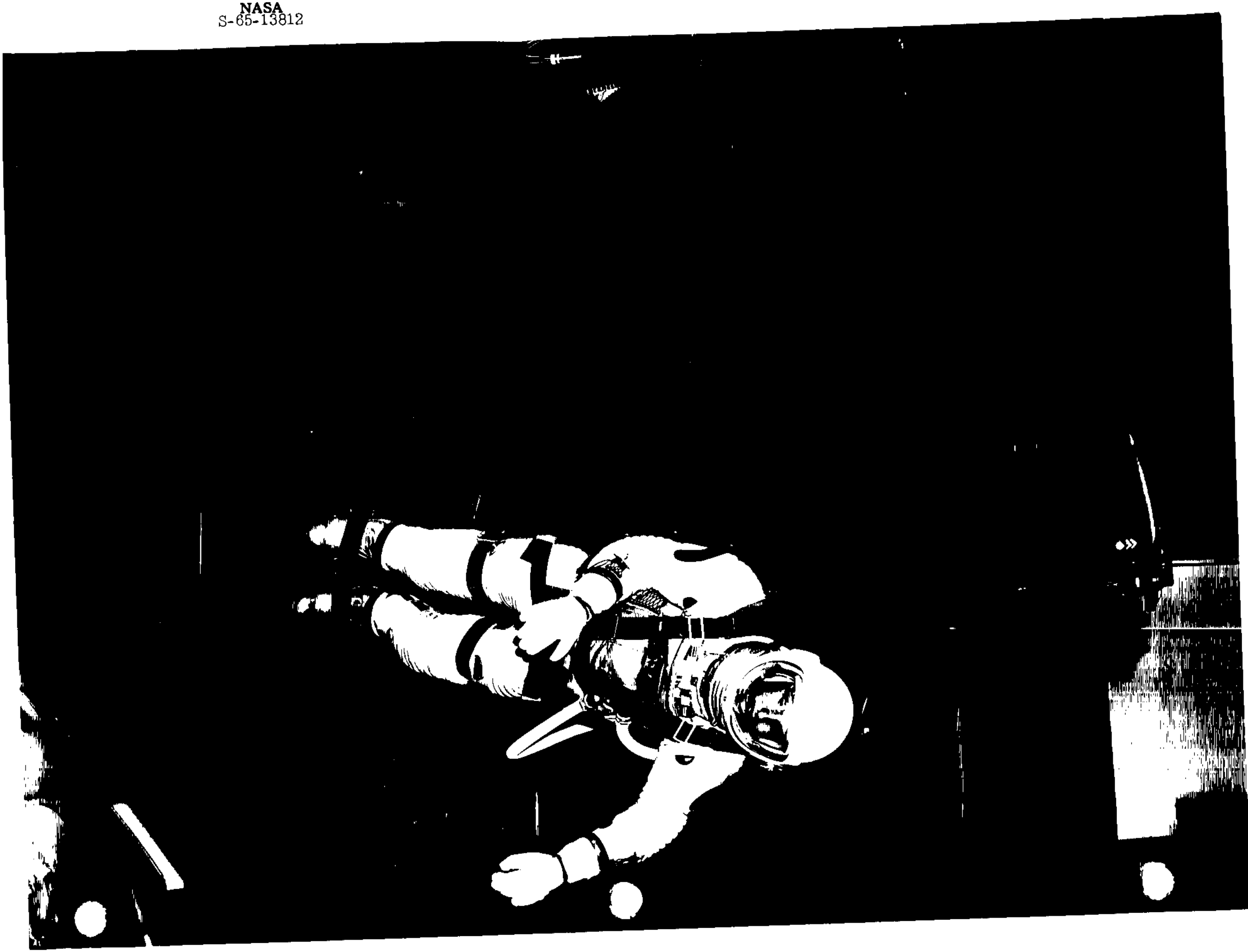
NASA
S-65-13812



NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas
HUnter 3-4231

MSC 65-12
January 21, 1965

CAPE KENNEDY, FLORIDA -- The second stage of Gemini Launch Vehicle No. 3, scheduled to place two men into orbit this spring was shipped to Cape Kennedy today from the Martin Company plant at Baltimore.

The first stage of the vehicle, a modified Air Force Titan II, is scheduled to be shipped Saturday.

Erection of GLV-3 on Pad 19 is expected to be completed sometime Monday. This is the pad from which an unmanned, suborbital Gemini flight was conducted successfully January 19.

Normally both stages are transported together in a C-133 aircraft. However, this type aircraft was grounded recently by the Air Force, and GLV-3 is being flown to the Cape aboard the Pregnant Guppy, a modified Boeing Stratocruiser which is not capable of handling both stages together.

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A detailed evaluation of GT-2 flight data will not be completed for several weeks. If it substantiates preliminary data on the success of the mission, the Gemini Program Office expects GLV-3 and Spacecraft 3 to be mated on the pad the latter part of February.

In the meantime, both the launch vehicle and the spacecraft will undergo a series of system checkouts and other tests. Spacecraft 3 arrived at the Cape on January 4.

The modified hydraulic actuators for GLV-3 are available and will be installed immediately after the launch vehicle is erected on the pad. Installation will be completed in conjunction with activities normally performed at that time. The actuators were modified following the unsuccessful attempt to launch GT-2 on December 9.

GT-3 will be the first manned Gemini Flight. Objectives of the 3-orbit mission are to evaluate operation of spacecraft systems, astronaut procedures, and the operation of the world-wide tracking network. The flight crew consists of Astronauts Virgil I. Grissom and John W. Young.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-13
January 29, 1965

HOUSTON, TEXAS -- The seventh test of the Gemini spacecraft recovery system was completed successfully today at El Centro, Calif.

A minor malfunction was encountered in another test of the Gemini astronauts' personal parachute, although the chute itself worked perfectly and the jumper landed safely.

In the recovery system test, a Gemini spacecraft was again dropped from an altitude of 33,000 feet. The drogue and main parachutes functioned as planned.

In the personal chute test, a pyrotechnic device designed to cut away the astronaut's backboard and egress kit after his parachute has opened failed to fire.

The equipment, necessary during ejection and high altitude freefall only, presented no problem to the jumper and he landed safely with it still attached. It contains oxygen for use during ejection at high altitudes. A failure analysis will be performed before the jumps are continued next week.

The jump was from 6,000 feet by a member of the Air Forces' 6511th Test Group, which conducts the tests for the NASA Manned Spacecraft Center.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-14
January 19, 1965

HOUSTON, TEXAS -- A team of flight controllers in the Mission Control Center-Houston electronically looked over the shoulders of the primary flight control team at Cape Kennedy during Tuesday's highly-successful Gemini-Titan 2 mission. Nearing completion of equipment installation and checkout, the Houston Control Center monitored flight data relayed from Cape Kennedy to displays and consoles in the Center.

Flight controllers manning the Houston Control Center received familiarization in the operation of consoles, data displays and other flight control equipment. A major objectives was the Center's initial checkout of Real-Time Computer Complex programs for converting telemetered flight information into visual displays using live spacecraft and booster pre-launch and flight data. These displays, large rear-projection screens in the front portion of the control room and individual console television monitors, received extensive checkout during the two days of simulated flights and through the actual launch.

Mid-way through the two-man Gemini earth orbital space flight program, all flight control for the nation's manned space flights will shift to the Houston Control Center. Launch operations will remain at Cape Kennedy.

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Flight Director for the GT-2 launch monitoring by Houston Control Center was John D. Hodge, chief of the Flight Control Division. Acting as test conductor was Lynwood C. Dunseith of Mission Planning and Analysis Division.

"It is most gratifying to see the MCC-Houston participating in a live test, even though we were only passively monitoring," Hodge said. "The flight control team gained invaluable experience. We are well satisfied with the progress of the Control Center to date, and look forward with confidence to the final checkout phase."

Despite "looking over the shoulders" of the flight control Team at Cape Kennedy, the Houston Control Center had an atmosphere of operational seriousness as all flight controllers closely followed the mission through countdown, launch and recovery of the spacecraft.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-15
January 28, 1965

HOUSTON, TEXAS--Three tests involving Gemini spacecraft escape and recovery systems were completed successfully today at El Centro, Calif., although an Air Force jumper testing astronauts' personal parachutes landed with two chutes open instead of one.

If an astronaut ejects from the spacecraft, the action of his ejection seat separating from his body will activate his parachute. In today's test, however, the jumper, CWO Mitch Kanowski of the Air Force's 6511th Test Group had to manually pull a lanyard after jumping from a plane at 6,000 feet. By the time he activated the chute, he had fallen to 4,000 feet, and his reserve parachute, which was preset to that altitude, opened automatically, also.

Kanowski said he was stable during the 2,000-foot free fall and that the personal parachute system "worked beautifully." Two more jumps are scheduled for tomorrow.

In a test of the Gemini ejection seat, a dummy was ejected from an Air Force F-106 aircraft at an altitude of 14,500 feet and at a speed of Mach .71. NASA Manned Spacecraft Center engineers conducting the test said all objectives were met successfully.

The third test demonstrated the complete Gemini spacecraft recovery system. A spacecraft was dropped from an altitude of 33,000 feet. At

27,000 feet, a drogue chute deployed to stabilize the spacecraft, and at 10,600 feet the drogue was cut loose and the main parachute opened. This was the sixth successful test of the complete recovery system. The seventh test is scheduled tomorrow.

The tests are conducted at the Joint Parachute Test Facility at El Centro for the Manned Spacecraft Center, Houston, Texas.

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NOTE TO EDITORS - January 28, 1965

Manned Spacecraft Center of Houston, Texas, will have available for interviews next week GT-3 prime and backup crews to be scheduled as follows:

Monday, beginning at 8:00 a.m., the backup crew, Commander Walter Schirra and Major Thomas Stafford, in Tank Egress Training at Ellington Air Force Base, Hangar 135.

Tuesday, beginning at 8:00 a.m., Schirra and Stafford will engage in parachute training in space suits in Galveston Bay.

Both events can be covered by the press.

In the afternoon of Monday and Tuesday, Schirra and Stafford will be available at Manned Spacecraft Center for interviews.

Thursday at 8:00 a.m., the primary crew, Major Virgil Grissom and Lt. Commander John Young, will engage in parachute training in Galveston Bay and Friday, at 8:00 a.m., in Tank Egress Training in Hangar 135, at Ellington Air Force Base. On Thursday and Friday, the primary crew will be available in the afternoon for interviews at Manned Spacecraft Center.

Please make known to Manned Spacecraft Center Press Office, HUnter 3-4231, any specific interview requests, situations or times desired for interviews. These will be the last open press dates with the GT-3 crews prior to the mission.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-16
February 2, 1965

HOUSTON, TEXAS -- Three more jump tests of the Gemini astronauts' personal parachutes were completed successfully at El Centro, California.

Today's jumps were from an altitude of 7,500 feet. The jumpers reported all systems functioned as planned.

Up to three additional jumps are scheduled Friday. The jumpers are from the Air Forces' 6511th Test Group at the Joint Parachute Test Facility in El Centro.

Also scheduled for Friday at El Centro is the eighth test of the complete Gemini spacecraft recovery system. In this test, a spacecraft is dropped from an altitude of 33,000 feet. All of the previous tests have been successful.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-17
February 11, 1965

HOUSTON, TEXAS -- Manned Spacecraft Center engineers have asked industry for proposals on a head-and-shoulders dummy capable of hearing and speaking electronically.

The dummy would be used to obtain objective evaluations of the effect of noise levels upon communications and communications equipment, particularly during the launch phase of a space flight.

The "ears" of the dummy would be simulated by microphones lanted in the side of the head. These devices would be capable of "hearing" the same range of sounds audible to the average human. "Speaking" would be simulated by a tape recording played upon command.

The dummy will wear a pressure suit helmet which will be sealed at the base to prevent any acoustical leaks. Sound levels will be recorded in an acoustical chamber. They will not be heard by human ears but the results placed on tape for evaluation by engineers.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-18
February 5, 1965

LAS CRUCES, N. M. -- The first major piece of actual flight-type hardware for America's manned lunar exploration program, Apollo, today underwent its shakedown test at the NASA Manned Spacecraft Center's White Sands Operations.

The flight-weight Service Module segment of the Apollo spacecraft was fired for 10 seconds in the Propulsion Systems Development Facility (PSDF) at White Sands.

The static firing of the Service Propulsion Subsystem (SPS) engine began a test series designed to help determine the flight readiness of a similar Service Module programmed for the first tests of flight-type Apollo hardware from Cape Kennedy next year.

The tests at PSDF will ultimately verify flight profiles for each subsequent Service Module flight, including the trip to the moon. The SPS engine's 22,000 pounds of thrust will slow Apollo down for entry into lunar orbit, and speed the spacecraft up for escape from lunar orbit, and the return trip to earth.

Future tests will include the reaction control system or small guidance engines used to maneuver the spacecraft, and the electrical power system with its energy-converting fuel cells.

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The airframe is a lightweight structure, including flight-weight propellant tanks, as contrasted to the thick-walled tanks and plumbing of the boilerplate system on which engine development tests have been conducted at the PSDF since September.

It also will include the reaction control and electrical power subsystems not found on the boilerplate. The engine is an updated version of one used in developmental tests.

Static firings in the developmental series will continue with the boilerplate system on Service Module Test Stand One. The air-frame tests will be conducted on SM Test Stand Two. Three other static test stands at the facility, two of them capable of simulating altitudes to 250,000 feet, will handle Lunar Excursion Modules engine firings beginning this spring.

Continuation of the Service Module airframe testing will integrate the service propulsion and reaction control systems prior to the flights from Cape Kennedy. Mission profiles verified at PSDF for later flight tests of the spacecraft will include intentional deviations from normal operation to establish tolerance to and corrective actions for such incidents.

Prime contractor for the Apollo command and service modules is North American Aviation, Inc., Space and Information Systems Division, at Downey, California. The Aerojet-General Corp., of Sacramento, Calif., builds the SPS engine.

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The service module weighs about 10,000 pounds without fuel, and just under 50,000 pounds when fueled. Its multiple-restart propulsion engine burns a half-and-half blend of hydrazine and unsymmetrical di-methyl hydrazine fuels with nitrogen tetroxide as an oxidizer. The propellant combination is hypergolic -- ignites spontaneously when mixed.

Dimensions of the service module, to be located directly behind the three-man command module in the Apollo spacecraft stack, are 13 feet diameter and 13 feet height, not including the engine nozzle extension.

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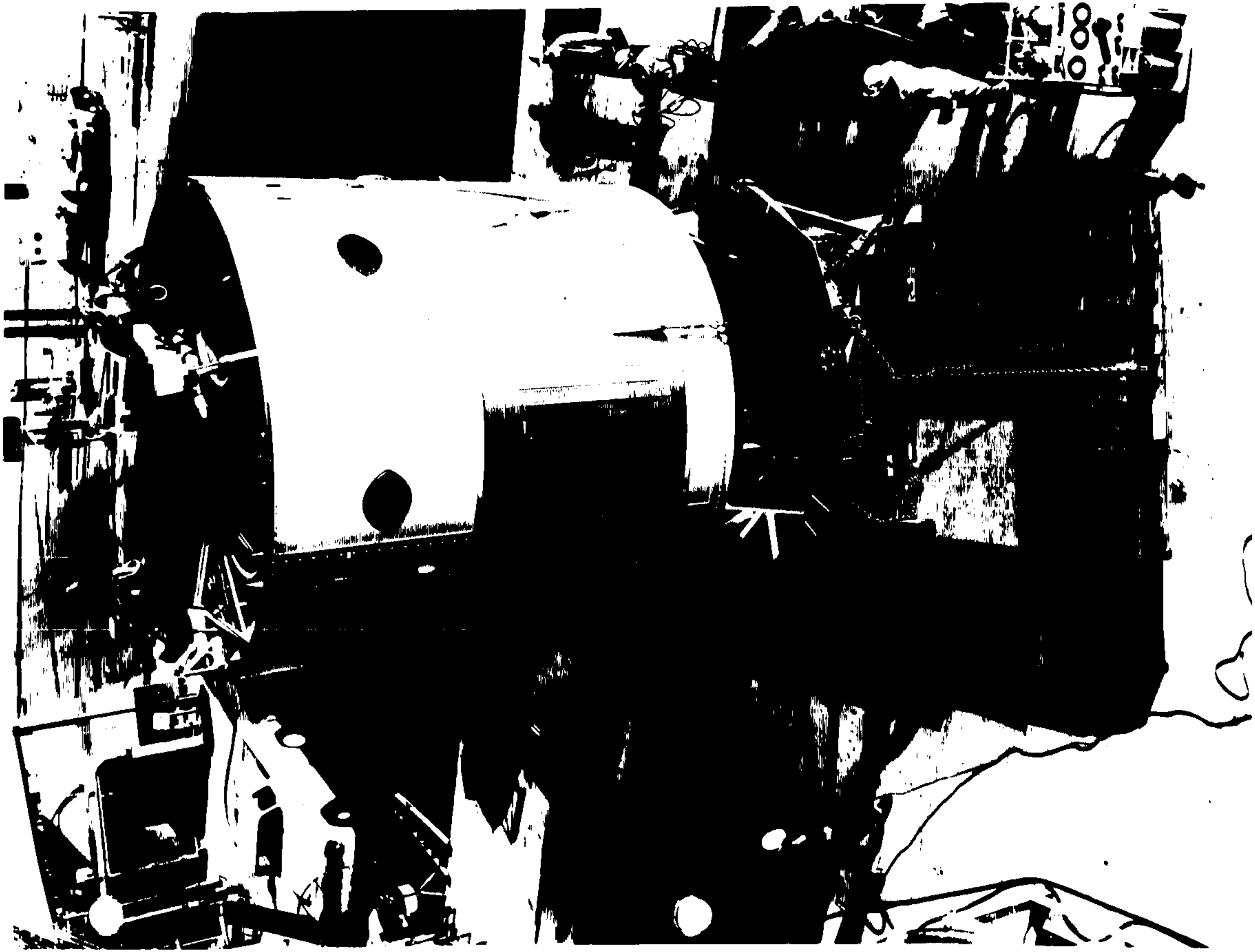
NASA



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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-19
February 5, 1965

HOUSTON, TEXAS -- Gemini spacecraft No. 3, in which two men will orbit the earth, is at Cape Kennedy's launch complex 19 today being prepared for a series of tests before being mated to the launch vehicle.

The spacecraft was delivered to the pad from the pyrotechnic facility on Merritt Island at 9 p.m. cst yesterday. It has been hoisted to the super-clean "white room" and placed on a tripod adjacent to the top of the launch vehicle.

It will remain on the tripod during a series of pre-mate verification and interface tests. The spacecraft is expected to be mated to the launch vehicle the latter part of this month.

Astronauts Virgil I. Grissom and John W. Young will pilot the spacecraft on its 3-orbit journey this spring.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-20
February 5, 1965

HOUSTON, TEXAS -- The eighth successful test of the Gemini spacecraft recovery system was conducted today at El Centro, Calif. The test spacecraft was dropped from an altitude of 33,000 feet.

In addition, one more jump test of the Gemini astronauts' personal parachute was completed successfully. Three jumps from 7,500 feet were scheduled, but high winds cancelled the other two jumps. They have been rescheduled for Monday.

The jumpers are from the Air Forces' 6511th Test Group at the Joint Parachute Test Facility at El Centro, where the tests are being conducted for the NASA Manned Spacecraft Center.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-21
February 8, 1965

FOREIGN SCIENTSIST INVITED TO CONFERENCE ON APOLLO EXPERIMENTS

WASHINGTON, D. C. -- The National Aeronautics and Space Administration has announced more than 130 foreign scientists to a conference to aid them in proposing biomedical experiments on U.S. manned space flights.

The conference, to be held at the Manned Spacecraft Center, in Houston April 22, 23, will be devoted to a briefing of the Gemini and Apollo missions as they relate to the identification and design of appropriate biomedical experiments.

Both of NASA's manned flight programs, Projects Gemini and Apollo, have been opened to proposed experiments by the world scientific community. Proposals will be considered on the basis of their scientific merit in competition with other proposals. The conference will be under the direction of Dr. W. Randolph Lovelace, II, Director of Space Medicine for NASA.

Letters of invitation have been sent by NASA's Office of International Affairs to 113 scientists and 23 national space organizations overseas.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-22
February 10, 1965

HOUSTON, TEXAS -- If there is such a thing as an "average astronuat," he's approaching 35 years of age, weighs 161 pounds, is just under 5 feet 10 inches tall, has brown hair and blue eyes and is crew-cut.

But from there on, a composite picture of NASA's 28 astronauts at the Manned Spacecraft Center show him to be anything but average.

He's a test pilot with more than 3,000 flying hours, 2,500 in jets and some in rocket ships and spacecraft. He's flown about 20 combat missions in Korea and during World War II.

He holds a bachelor of science degree and a master's degree, and has done some work on his doctorate. He graduated in the top five from a major American university, and attended a military test pilot school. He is still in the military service.

Actually, five of the 28 are civilians, though all have served in the military service as pilots. More than a fourth of them have flown in combat, and some have shot down enemy planes. None were aces.

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As a group, the astronauts hold 39 academic degrees and have flown more than 83,000 hours.

The youngest is 29; the oldest, 41. The tallest is 6 feet; the shortest, 5 feet, 6½ inches.

Four were born in Ohio; 4 in Texas; 3, New Jersey; 2, Illinois; 2, Indiana; 2, Oklahoma; and one each in Alabama, California, Colorado, Iowa, Michigan, New Hampshire, Pennsylvania, Washington, and Wisconsin. One was born in Italy and another in Hong Kong.

Twelve are Air Force officers, ten are Naval officers, one's a Marine officer, and five are civilians.

Seventeen have blue eyes; 7, brown eyes; 2, green; 2 hazel. Eighteen have brown hair; 7, blond; 1, auburn, and one is a redhead.

All are married and have a total of 74 children, 41 boys and 33 girls.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-23
February 12, 1965

HOUSTON, TEXAS -- Implementation of an adjustment in the personnel strength between the Manned Spacecraft Center and the John F. Kennedy Space Center, Cape Kennedy, Florida has begun with the transfer of 41 engineers and mathematicians here.

The personnel change is in line with an Office of Manned Space Flight directive which transferred the MSC Florida Operations Office to the Kennedy Space Center. Twenty five members of the Electronic Ground Support Equipment Division at Kennedy are relocating with the Information Systems Division, Engineering and Development Directorate here.

Another sixteen engineers from various divisions of Florida Operations will work in the Apollo Project Office in spacecraft checkout duties.

A third group of 52 personnel are being recruited from Florida Operations by the Apollo Office for spacecraft factory checkout at the North American Aviation Co. plant in Downey, California, and the Grumman Aircraft Engineering Co. plant in Bethpage, N. Y.

Family moves are being coordinated by the MSC Personnel Office and the transfer is expected to be completed by early April.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-24
February 12, 1965

HOUSTON, TEXAS -- Craters in surface depressions created by nuclear explosions and the volcanic geology of a portion of Southern Nevada will be studied by United States astronauts as they continue their series of geological field trips.

The studies will be conducted at the Atomic Energy Commission's Nevada Test Site and will begin Tuesday, February 16. The test site contains a number of craters created by nuclear and chemical high explosive blasts. The nuclear explosion sites now have very low levels of radioactivity. The craters resemble meteoritic impact craters that may be found on the moon.

On the test site also are calderas, or crater areas from ancient volcanic activity, which also may be found on the moon surface. The astronauts will study both explosive and volcanic craters during their visits to Nevada.

Three trips to the test site are scheduled about a week apart. The first will start Tuesday in Yucca Flats, where nuclear explosive tests have been conducted since the early 1950's. The astronauts will inspect a number of explosion produced craters, including the large Sedan Crater created in a 1962 experiment in the Plowshare Program to develop peaceful uses for nuclear explosives.

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Small dynamite blasts will be set off in a forward area of the test site Tuesday afternoon. Using seismic equipment, the astronauts will practice geophysical observations and will attempt to locate a buried ridge in the area.

Air Force helicopters will be used on the second day of each trip to cover a wide area of rough Nevada desert country near the western edge of the test site. The field trip members will make stops at several calderas to study the geology of these ancient volcanic formations. If bad weather grounds the helicopters, a similar trip will be made by ground transportation to more acceptable volcanic areas on the site.

On the final day, the astronauts are scheduled to visit the nuclear rocket development station at the southwest corner of the test site, where testing is performed on nuclear reactors for future space nuclear engine development.

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NEWS
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-25
February 12, 1965

HOUSTON, TEXAS -- Two men from the Manned Spacecraft Center were among the ten winners of the 1965 Arthur S. Fleming Award that is given to outstanding young men in the federal Government each year.

The awards are presented by the U.S. Junior Chamber of Commerce. Five awards were presented to men in scientific and technical fields and five in administrative or executive fields.

Dr. Joseph F. Shea, 38, Manager, Apollo Spacecraft Program Office, and Wesley L. Hjornevik, 38, assistant director for Administration, were presented the awards last Thursday at an awards luncheon at the Statler Hilton Hotel in Washington, D. C., along with eight other Government employees.

Three others receiving the award were also connected with the space program. They were Leonard Jaffe, NASA director of Communications and Navigation Programs; Dr. Robert Jastrow of the Goddard Institute for Space Studies; and Dr. George W. Sutton, scientific advisor to the USAF Directorate of Development Plans.

Principal speaker for the occasion was Secretary of Labor W. Willard Wirtz.

Dr. Shea's participation as head of the study group to decide which of three possible approaches should be used for the U.S. manned

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lunar landing and to examine management considerations for each approach, earned him the award.

Hjornevik was presented the award for his part in construction of the Manned Spacecraft laboratory facilities for space environment simulation.

Three past winners of the Arthur S. Fleming Award are here at the Manned Spacecraft Center.

In 1960 Maxime A. Faget, assistant director for Engineering and Development received the Arthur S. Fleming Award.

Recipients in 1963 included George M. Low, deputy director, MSC, who was at that time deputy director, Office of Manned Space Flight (Programs), NASA Hq.; and Christopher C. Kraft, Jr., assistant director for Flight Operations.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-26
February 12, 1965

CHINA LAKE, CALIF. -- One of the final series of qualification tests of the two man Gemini spacecraft's seat ejection escape system was successfully accomplished by the National Aeronautics and Space Administration today at the U.S. Naval Ordnance Test Station.

Conducted under the management of NASA's Manned Spacecraft Center, these final tests will qualify the system for Gemini space flights, the first of which will be piloted by Astronauts Gus Grissom and John Young. The test simulated a pad abort condition. The boiler-plate engineering test vehicle was mounted atop a 150 foot tower equal in height to the Titan 2 launch vehicle.

The side by side ejection seats were thrust out and away from the test vehicle to an altitude of about 350 feet and the mannequins landed by parachutes approximately 850 feet downrange.

Witnessing today's test were Hilary Ray, Systems Engineer for MSC and Astronaut Alan Bean. Ray who was in charge of today's test said, "From visual observation everything looked to be 100% perfect. We expect evaluation of films and other data will confirm this visual observation."

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Production models of the escape system are now at Cape Kennedy and will be installed in the Gemini spacecraft which will orbit Astronauts Grissom and Young. Prior to today's test, the twin ejection seat system was subjected to more than 100 qualifying tests which included high speed track runs, high altitude ejections and other pad abort tower tests.

The Gemini escape system is designed and built for NASA by Weber Aircraft Co., of Burbank Calif., under subcontract to McDonnell Aircraft Corp., the prime contractor for the Gemini spacecraft.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-27
February 16, 1965

HOUSTON, TEXAS -- Nearly half of NASA's 28 astronauts at the Manned Spacecraft Center here are training for the next three flights of two-man Gemini spacecraft, all scheduled to fly this year.

Astronauts Virgil I. Grissom and John W. Young are command pilot and pilot, respectively, for Gemini-Titan 3 (GT-3), due for a three-orbit trip from Cape Kennedy in a few weeks.

Astronauts Walter M. Schirra and Thomas P. Stafford are doing identical training as back-up pilots for GT-3.

The second manned Gemini flight, GT-4, will have Astronauts James A. McDivitt and Edward H. White II at the controls for up to four days in orbit. Astronauts Frank Borman and James A. Lovell are their back-up crew.

Astronauts Leroy Gordon Cooper and Charles Conrad are the GT-5 crew, scheduled to orbit a Gemini spacecraft for up to seven days. Back-up crew for this mission is Neil A. Armstrong and Elliot M. See.

Other assignments recently announced for the remainder of the NASA astronaut team include:

Donald K. Slayton, Assistant Director at MSC for Flight Crew Operations.

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Alan B. Shepard, Chief of the Astronaut Office.

M. Scott Carpenter, U.S. Navy Project Liaison for special projects.

Seven astronauts are assigned to Project Apollo in these areas:

Richard F. Gordon, branch chief, responsible for overall astronaut activities in the Apollo area, and for liaison in connection with development of the Apollo command and service modules.

Donn F. Eisele, command and service modules and lunar excursion module (LEM).

William A. Anders, environmental control systems, radiation and thermal systems.

Eugene A. Cernan, boosters, spacecraft propulsion and the Agena stage.

Roger B. Chaffee, communications, flight controls and docking.

R. Walter Cunningham, electrical, sequential and non-flight experiments.

Russell L. Schweickart, in-flight experiments and future programs.

Six astronauts are assigned to Operations and Training:

Edwin E. Aldrin is branch chief, responsible also for mission planning.

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Charles A. Bassett, training and simulators, operations handbooks.

Alan L. Bean, recovery systems.

Michael Collins, pressure suits and extra-vehicular activities.

David R. Scott, guidance and navigation, mission planning.

Clifton C. Williams, range operations, deep space instrumentation and crew safety.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER NASA Houston 1, Texas

HUnter 3-4231

MSC 65-28
February 16, 1965

HOUSTON, TEXAS -- Astronaut Gus Grissom glanced nervously at the clock, then at his fellow space pilot, John Young.

"Three minutes to go, John."

"Yeah, I know . . ."

"Ready, John?"

"Ready, Gus."

Then both men began what was, for them, one of the more demanding xperiences of their lives as astronauts.

It was their "week in the barrel" with the American Press -- a solid week of granting interviews with scores of reporters and cameramen at the NASA Manned Spacecraft Center.

It's all part of the job, lumped in with hour upon hour of classroom work, week after week of simulations in space chambers, centrifuges, and trainers, day after day of engineering meetings, night after night in high performance jet fighters.

Astronauts, who are also highly qualified engineers, spend most of their time away from the space center here, either training for space flight or evaluating complex spacecraft and systems at ocations all over the country.

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Besides this, the 28 NASA astroanuts granted more than 500 press interviews and made more than 200 personal appearances at serious scientific, engineering and educational gatherings throughout the United States last year -- usually sandwiched into a tremendously tight training schedule.

Grissom and Young are the prime crew for the first manned Gemini flight, scheduled to take them on a three-orbit, five-hour journey from Cape Kennedy within a few weeks. Astronauts Walter M. Schirra and Tom Stafford are the back-up crew, pursuing the identical schedules as Grissom and Young until launch time.

Grissom and Schirra had both been in space during Project Mercury, and both had been "in the barrel" with reporters before.

But for Young and Stafford, tension mounted as reporters began to fill the halls at the MSC Public Affairs Office this month.

"I'm ready for the flight," Young mused, "but somehow I just can't get used to this press business."

Stafford had to bow out the second day with laryngitis.

And no wonder -- the week had begun with egress training in a 20-foot deep water tank surrounded by newsmen. The astronauts were

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submerged inside a dummy spacecraft to practice escaping from it underwater in the event of an emergency after returning from space flight.

"How's the water?" reporters would ask as the men bobbed to the surface after a dunking.

"Cold," the men replied.

Again they were submerged.

And again they were interviewed.

Parachute training took place in the chilly waters of Galveston Bay, with two yachtloads of newsmen awaiting as the astronauts landed in the choppy recovery area.

"How's the water, Wally?" newsmen hollered.

"Cold."

Afternoons were spent scurrying from hastily vacated offices to prepared soundrooms, where the astronauts talked individually with radio, TV, magazine, newspaper and wire service reporters.

"Gus, how does it feel to be the first American to make a second space flight?"

"John, what do you think of Gus?"

"Gus, what do you think of John?"

--more--

Add 3
65-28

"Wally, do you think you have a chance to go to the moon?"

And so it went, with photographers hollering, "Just one more," as photographers have hollered since Matthew Brady hollered at Abe Lincoln.

Some reporters were tough, hammering for a reaction.

A few forgot their questions and settled for conversation.

Most were sympathetic to the uncomfortable spacemen.

There's an unspoken bond of mutual respect between NASA's astronauts and newsmen who regularly cover the space beat. They call each other by first names, and joke together freely.

But somehow the formal press interview ranks high among the more awesome aspects of space flight.

"We accepted hazards when we signed on," Young declared, "and we certainly understand the importance of keeping the public informed . . .

"But this is rough . . . really rough."

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HUnter 3-4231

MSC 65-29
February 16, 1965

HOUSTON, TEXAS -- Dr. Harry L. Reynolds, former head of the Nuclear Propulsion and Experimental Physics divisions at Lawrence Radiation Laboratory, Livermore, California, has been named Assistant Manager of the Apollo Spacecraft Program Office at the NASA Manned Spacecraft Center.

Reynolds, 39, will work closely with Dr. Joseph F. Shea, Manager, and Robert O. Piland, Deputy Manager of ASPO in the overall management of the spacecraft program.

He had been director of the Pluto nuclear ramjet program at the Lawrence Laboratory of the University of California where he was employed for nine years. The Pluto program was cancelled last July after successful ground operation of flight-type reactors at Jackass Flats, Nev. The joint Air Force-Atomic Energy Commission program was halted for lack of a clear military need for the nuclear ramjet.

While at Livermore, Dr. Reynolds was also involved in advanced nuclear propulsion and electrical power systems for spacecraft.

A native of Port Chester, N. Y., Reynolds was graduated from Central High School at Purdy Station, N. Y., in 1942. He served

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two years in the U.S. Navy during World War II, including duty aboard a destroyer escort. He was an electronics technician.

He received his Bachelor of Science degree in physics from Rensselaer Polytechnic Institute, Troy, N. Y., in 1947, and won his Ph.D in physics from the University of Rochester, N. Y., in 1951. His thesis dealt with cosmic radiation.

He did studies in nuclear reactions at Oak Ridge National Laboratories in Tennessee before joining Lawrence Radiation Laboratory in 1955. His first assignment at Lawrence Labs was on the Rover nuclear rocket program. He moved to the Pluto program in 1957.

Dr. Reynolds has written more than 30 technical and scientific papers, including about 20 published in the Physical Review, the journal of the American Physical Society.

He presented a paper in 1958 at the Second Geneva Conference on peaceful uses of atomic energy in Switzerland on "Critical Experiments on Propulsion Systems," and another on the Pluto program before the Australian Atomic Energy Commission conference in Sydney in 1963.

Reynolds and his wife, the former Katherine Haile of Savannah, Ga., live at 315 Biscayne, El Lago, with their two daughters, Patricia, 10, and Margaret, 7.

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An outdoorsman, Reynolds is a member of the Sierra Club of California, and is devoted to skiing and mountain climbing, hobbies he admits are challenging to pursue in snowless, mountainless Southeast Texas.

He is also a Fellow of the American Physical Society, a member of the American Nuclear Society, and a member of Sigma Xi, an honorary scientific society.

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NASA
S-65-10178

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-30
February 16, 1965

HOUSTON, TEXAS -- A glimpse into the demands placed on scientists and engineers by today's complex space program will be offered February 20 to Bay area high school students, their parents and faculty at the Distinguished Lecture Series sponsored by the Gulf Coast Science Foundation.

Featured speaker will be Dr. Joseph F. Shea, Manager of the Apollo Spacecraft Program Office. His talk, "The Role of Science in Today's World," will be presented at the NASA Manned Spacecraft Center at 8 p.m.

Dr. Shea will emphasize the preparation and training required to achieve proficiency in scientific fields, and will offer specific examples of education needed to understand the systems of a spacecraft.

Shea, who last week was named as one of the top ten outstanding young men in government by the United States Junior Chamber of Commerce, has been in charge of the Apollo program since October, 1963. He has been with the National Aeronautics and Space Administration since early 1962.

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Add 1
65-30

Prior to his present position, Dr. Shea was Deputy Director for Systems in the Office of Manned Space Flight at NASA Headquarters.

His career also includes service with the A.C. Spark Plug Division of General Motors and with Space Technology Laboratories.

Dr. Shea attended the University of Michigan where he received a Bachelor of Science degree in Mathematics. He also was awarded a Master of Science degree in Engineering Mathematics and a Doctor of Philosophy degree in Engineering Mathematics from the same university.

The Saturday evening program is the second of four lectures sponsored by the science foundation. A third lecture will be held March 13 at MSC with a speaker yet to be named. The final program is scheduled for Clear Creek High School.

Purpose of the series is to stimulate interest in the fields of science among the students, teachers and adults of this area.

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NASA
S-63-20339

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HUnter 3-4231

MSC 65-31
February 18, 1965

HOUSTON, TEXAS -- Gemini spacecraft No. 3, scheduled for a manned 3-orbit flight this spring, was joined to its launch vehicle at Cape Kennedy late yesterday.

A series of tests of the combined vehicles, including simulated launches and flights, will be conducted to insure flight readiness.

Astronauts Virgil I. Grissom and John W. Young, Jr., are the prime crew for the mission. The backup crew consists of Walter M. Schirra and Thomas W. Stafford.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-32
February 23, 1965

HOUSTON, TEXAS -- The final rehearsal for the land test of the parasail system is scheduled as a water drop in Galveston Bay on February 24, weather permitting.

The drop is a final checkout of test procedures before the land test of the parasail-landing rocket combination begins at Fort Hood. Test objectives include validation of the turn lines and accurate control of the boilerplate to effect a landing within one-sixteenth of a mile from the target. The control point is aboard the motor vessel Retriever. Such accuracies will be necessary when land tests begin, due to smaller land drop target areas available.

Static attitude change tests of the rigging lines at Ellington AFB last week validated the riser and turn line stowage. In addition, a static landing gear deployment test series was conducted to insure reliability. The final water drop will be made from a C-119 aircraft at 11,200 ft. Landing rockets will not be tested.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER NASA Houston 1, Texas
HUnter 3-4231

MSC 65-33
March 3, 1965

HOUSTON, TEXAS -- The National Aeronautics and Space Administration has signed a five-year contract with the AC Spark Plug Division of General Motors Corporation for the guidance and navigation systems slated to guide American astronauts safely to the surface of the moon and back before 1970.

The $235 million contract is the second major incentive agreement entered into by NASA's Manned Spacecraft Center in Houston this year. A Gemini spacecraft contract of $712 million with McDonnell Aircraft Corporation, St. Louis, Missouri, was signed recently.

AC Spark Plug Division in Milwaukee, Wisconsin is responsible for the manufacture, testing and delivery of primary navigation and guidance systems for Apollo's three-man command module and the two-man lunar excursion module. The systems are being designed by the Massachusetts Institute of Technology.

Most of the money to be spent by AC will go to vendors and subcontracts for system components, such as the computer, manufactured by Raytheon Company, Sudbury, Mass., and the optical subsystem,

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built by Kollsman Instrument Corporation, Long Island, New York. AC provides the inertial platform for the system, called the IMU, or inertial measurement unit.

AC had formerly been on a cost plus fixed fee contract with MSC, and had spent $43 million since 1962. The new contract will be completed in December, 1969.

The transition to incentive contracts by NASA is a major step in improving performance, meeting schedules and controlling costs of manned space programs. It provides for rewards when contractors keep costs down and meet early schedules. The contractor can only get the full contract value if his performance is above average, delivery schedules are met and costs are minimized.

The AC guidance and navigation systems in the command and lunar excursion modules are backups to ground-based systems, and are used to make frequent cross-checks on the ground systems' performance.

In the command module, for instance, the guidance system operates throughout the launch phase to back up the Saturn launch vehicle's guidance system. It also operates during translunar flight for mid-course corrections, guides the spacecraft into lunar orbit, back into transearth trajectory, and throughout the transearth portion of flight.

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The LEM guidance and navigation unit must provide information for the transfer of the LEM from lunar orbit to the moon's surface, for the descent phase of flight until lunar touchdown, back into lunar orbit and throughout the linking-up portion of rendezvous with the command module.

In all, the onboard systems must perform as many as 15 intricate maneuvers during the lunar round trip.

The optical system, a sextant-like device, allows astronauts to make navigational sightings to update the inertial platform and correct the platform's minor drifting tendencies.

The guidance system, operating from information fed to it from the platform, operates during engine burns to make corrections required to keep the spacecraft on the proper trajectory.

Most of Apollo's navigation information will be fed to the inertial platform directly from Apollo ground stations, but onboard navigation will be conducted as a cross-reference by the crew, and in the event the spacecraft loses communications with the ground.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-34
February 26, 1965

HOUSTON, TEXAS -- Dr. Joseph F. Shea, manager of the Apollo Spacecraft Program Office at the NASA Manned Spacecraft Center here, has named Dr. William A. Lee as Assistant Program Manager.

Lee, formerly head of the Operations Planning Division under Shea, joins Dr. Harry L. Reynolds who was appointed last week as an Assistant Program Manager.

Lee's former division has been merged with the Systems Engineering Division under Owen E. Maynard. Branches of the former Operations Planning Division will remain intact.

Dr. Lee's primary area of responsibility will be the operational aspects of the Apollo program for both the nominal lunar mission and the flight test program.

Dr. Reynolds will be primarily concerned with development of the Lunar Excursion Module, the portion of the Apollo spacecraft destined to land two Americans on the moon in this decade.

Robert O. Piland, Deputy Manager of ASPO, will continue to be involved primarily with Command and Service Module development, and ıth overall program management with Dr. Shea.

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Before joining Manned Spacecraft Center in December, 1963, Dr. Lee was Director of Advanced Studies for the Office of Manned Space Flight at NASA Headquarters. Dr. Reynolds recently joined NASA from the Lawrence Radiation Laboratory in California where he was Director of the Nuclear Ramjet Division.

Dr. Lee was born May 2, 1927, in New York City. Upon graduating from the Peekskill Military Academy, Peekskill, New York, in 1945, he served in Europe with the U.S. Army Air Force until 1947.

He was graduated from Williams College, Williamstown, Mass., with a B.A. degree in psychology in 1950. In 1954 he obtained an M.A. degree in experimental psychology, and in 1956 he was awarded a Ph.D. in experimental psychology, both from the University of Virginia.

From 1955 to 1962, Dr. Lee was a supervisor and member of the staff of the Bell Telephone Laboratories. He joined NASA on March 1, 1962, and became Director of Advanced Studies in October, 1962.

Dr. Lee has specialized in the research field of experimental and physiological psychology and is a member of Sigma Xi, the American Psychological Association, the American Association for the Advancement of Science, and the Psychonomic Society.

He is married to the former Ruth Fuhrer of Gloversville, New York. They have four children and live in Seabrook, Texas.

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NASA
S-64-11213

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-35
March 1, 1965

HOUSTON, TEXAS -- When the United States set its sights on the moon, some of the toughest problems popped up right here on earth.

Right here in Texas, in fact.

How do you build the world's largest vacuum chamber?

How do you construct the world's most powerful centrifuge?

How can you duplicate the surface of the moon?

How do you eliminate gravity?

These are just a few of the down-to-earth questions facing ordinary men who must build the extraordinary tools astronauts need before they can set foot on the moon.

Before 1965 is over, engineers at the NASA Manned Spacecraft Center here will have built the world's largest vacuum chamber.

And the world's most powerful centrifuge.

They've already duplicated a 328-foot circle of lunar landscape.

They've even gotten rid of some gravity.

These jobs are not being done by space men. They're being accomplished by imaginative designers, patient engineers and hard-working construction gangs who also build bridges, tunnels and skyscrapers.

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It's tough work.

The lunar landscape, for instance, is made mostly of blast furnace slag from steel mills to simulate the roughness and light-absorbing qualities of the moon. Its "crater".are fashioned after those discovered in photographs taken by NASA's camera-carrying Ranger moon probes.

Unlike real lunar craters, those built by earthmen in Texas sometimes collect rain water -- a problem unlikely on the weatherless moon.

The world's largest vacuum chamber -- 120 feet tall -- presented a different problem. It had to be built like a giant steel football. Instead of pumping air into it, scientists have to pump air out of it to simulate the airless vacuum of space.

During a test last year the chamber crinkled under severe pressure applied by atmosphere outside on a vacuum inside. A reinforced chamber will be ready for use this fall.

A similar problem was encountered by men building the largest, most powerful centrifuge ever constructed. Not only does the three-man gondola have to withstand an airless environment of space, but it must perform while spinning at 150 miles an hour under forces 30 times that imposed by normal gravity.

The first 12-foot spherical gondola built for the job failed during tests in California. The 6,000-pound gimbal ring, an 18-foot support which allows the gondola to pivot on two axes, cracked during similar tests in Maryland.

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But even these problems are being solved, and the new gondola is ready for installation at the Manned Spacecraft Center. The facility, the only centrifuge capable of exerting 30 Gs on a three-man, airless spacecraft simulator, will be ready in October.

Eliminating gravity is impossible.

Pilots can fly maneuvers in high-performance aircraft and counteract gravity for as long as 30 seconds at a time. Even motorists can outwit gravity for fractions of seconds by speeding over bumps in the highway.

But engineers want to give astronauts longer periods of weightlessness so spacemen can practice working in space, where there is no noticeable gravity, or on the moon, where gravity is only one-sixth that of earth.

So far they've had to settle for weird contraptions with bulky counterweights on one end and an astronaut on the other, or on cables which hang from the ceiling to relieve the astronaut of his weight and provide the illusion of weightlessness.

The impossible is more challenging.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER NASA Houston 1, Texas

HUnter 3-4231

MSC 65-36
March 4, 1965

GEMINI MISSION PROFILE

Following is a profile and sequence of the forthcoming first manned Gemini space flight: All data, times and figures are based upon a nominal mission.

Launch azimuth: 72°.

Gemini Launch Vehicle second stage separation by use of 100 lb aft-firing thrusters of Orbit Attitude and Maneuvering System (OAMS).

Insertion into 87/130 nautical mile orbit.

At end of first orbit, at Ground Elapsed Time 1 hr 33 min., over Texas, 85-lb forward firing OAMS thrusters will be fired in an in-plane retrograde maneuver to achieve an 87/93 nautical mile orbit. Velocity change: 66 feet per second.

During second orbit, 2 hrs 20 min, over Indian Ocean, north and south out-of-plane maneuvers will be made using both aft and forward firing OAMS thrusters for total velocity changes (out-of-plane) of 14 feet per second.

Near end of third orbit, 4 hrs, 21 min, 30 sec, 12 minutes before retrofire and west of Hawaii, aft-firing OAMS thrusters will be fired

--more--

for a 93-feet-per-second retrograde maneuver to achieve a 45/85 nautical mile reentry elliptical orbit. Objective: To gain experience in orbital maneuvering (circularizing from an elliptical orbit, etc.) in preparation for later rendezvous missions.

Retrofire will occur at 4 hrs, 33 min, 30 sec over Los Angeles. The spacecraft will reenter and land 60 nautical miles northeast of Grand Turk Island.

LAUNCH SEQUENCE:

Event	Time from Lift-off Min:Sec	Altitude, feet
Lift-off	00:00	69.7
Roll program begins	00:09.92	467.3
Roll program ends	00:20.4	1,903
Pitch program, Rate No. 1 begins	00:23.04	2,458.2
Maximum dynamic pressure	01:19	42,445
Pitch program, Rate No. 1 ends; Rate No. 2 begins	01:28.32	54,000
Pitch program, Rate No. 2 ends; Rate No. 3 begins	01:59.04	110,000
First stage cut-off	02:35.65	205,718
Pitch program, Rate No. 3 ends	02:42.56	227,348

--more--

Event	Time from Lift-off Min:Sec	Altitude, feet
Initiate radio guidance	02:47.5	242,797
Second stage cut-off	05:40.72	530,740

LAUNCH COUNTDOWN:

T minus one day	Spacecraft and launch vehicle pre-launch servicing and checks
T minus 420 minutes	Begin countdown
T minus 400 minutes	Spacecraft power on
T minus 380 minutes	GLV and spacecraft systems check
T minus 330 minutes	Spacecraft command checks with Mission Control Center
T minus 258 minutes	Awaken crew
T minus 220 minutes	Spacecraft/computer memory loading
T minus 190 minutes	Pad clear for GLV ordnance and range command checks
T minus 173 minutes	Begin sensor placement and suiting of crew
T minus 160 minutes	GLV tanks to launch pressure
T minus 145 minutes	Ground test of launch program
T minus 100 minutes	Crew enters spacecraft
T minus 75 minutes	Spacecraft hatch closure. Dismantle White Room

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T minus 35 minutes	Erector lowering
T minus 30 minutes	Activate all spacecraft communication links
T minus 20 minutes	Spacecraft to internal power
T minus 6 minutes	GLV-spacecraft final status check
T minus 3 minutes	Update GLV launch azimuth and space-craft computer
T minus 0	Engine start signal
T plus 1.8 seconds	Thrust chamber pressure switch -- calibrated for 77 percent of rated engine thrust -- is activated, starting a two-second timer
T plus 3.8 seconds	Spacecraft umbilicals release -- GLV tiedown bolts fire
T plus 4 seconds	Lift-off
Lift-off plus 153 seconds	Staging
Lift-off plus 198 seconds	Fairing jettison
Lift-off plus 338 seconds	SECO - Second stage engine cutoff
Lift-off plus 358 seconds	Separation maneuver. Confirm orbit.

GEMINI 3 SEQUENCE OF EVENTS:

F-3 day	Start precount
F-2 day and F-1 day	GLV propellant loading and GLV, space-craft, and pad pyrotechnic readiness

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T-480 minutes	Complete propellant loading
T-420 minutes	Begin terminal countdown
T-210 minutes	MCC Operations Room fully manned
T-200 minutes	Begin pad clearance for destruct initiate connection
T-100 minutes	Proceed with crew insertion. Begin suit purge and leak checks.
T-90 minutes	Spacecraft hatch closure status check
T-75 minutes	Close spacecraft hatches
T-50 minutes	Start white room evacuation
T-35 minutes	Begin erector lowering
T-13 minutes	Final systems status checks
T-150 seconds	Range clearance to proceed with launch
T-90 seconds	GLV on internal power
T-15 seconds	GLV destruct initiators armed
T-0 seconds	Start Stage I engines, spacecraft upper umbilical release

<u>Elapsed Time</u>

<u>Hr</u>	<u>Min</u>	<u>Sec</u>	
00	00	04	Lift-off
00	02	36	Booster engine cutoff (BECO). Start second stage engine
00	05	41	Second stage engine cutoff

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Hr	Min	Sec	
00	06	01	Spacecraft launch vehicle separation
00	06	12	Orbital insertion
			Orbit
04	32	03	Equipment section separation
04	33	30	Retrograde rockets fired
04	34	15	Retrograde pack jettisoned
04	40	31	Beginning of blackout (308,000 feet)
04	40	35	.01g (306,495 feet). Start reentry roll
04	45	20	End of blackout (137,000 feet)
04	47	06	Drogue parachute deployment (50,000 feet)
04	48	45	Release rendezvous and recovery section and deploy main parachute (10,600 feet)
04	52	00	Spacecraft landing

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-37
March 4, 1965

HOUSTON, TEXAS -- Another test of the landing rocket system is scheduled to take place at Ellington AFB, Friday.

In preparation for a parasail-landing rocket test series at Fort Hood, Texas, Manned Spacecraft Center engineers are making a boilerplate drop from a crane to determine the cratering effects of the landing rockets on soil.

The first landing rocket test was made in August, 1964 on a cement surface. Its main prupose was the evaluation of the integration of the rockets into the landing system. The second crane drop test will be on a sod surface to determine soil erosion characteristics of the rockets under vertical descent conditions. Engineers must know if there is any chance of the landing gear being damaged if it should slide into craters or tracks caused by the landing rockets.

The two rockets, located on the lower equipment bay on the underside of the boilerplate, generate more than 10,000 pounds of thrust in their 1.5 second firing time. They slow the spacecraft from 25 feet per second to seven feet per second.

The landing rockets have also been tested twice with the parasail in water drops in Galveston Bay in October and December, 1964.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston, Texas

HUnter 3-4231

MSC 65-38
March 5, 1965

HOUSTON, TEXAS -- Crew Systems Division Engineers at Manned Spacecraft Center have completed final phases of the pressure suit qualification test program, and the flight suits have been declared "ready to go" for the first manned Gemini launch.

Major tests on the suits were completed in December 1964, and the final tests run have provided added insurance for the suit's reliability as a back-up for the cabin pressurization system.

In addition to the qualification tests, a series of manned decompressions were performed with a suited subject in the 20 foot vacuum chamber in the Crew Systems laboratory at the Manned Spacecraft Center. The decompressions were run to demonstrate confidence in suit performance under worst emergency conditions.

In this test, the subject is placed in a parasite chamber 3 feet wide, 5 feet high and 4 feet deep. The chamber pressure is maintained at 5.1 psi, approximately the same as Gemini cabin pressure. The main 20 foot diameter chamber is then evacuated to a high vacuum such as exists 240,000 feet above the earth.

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When a decompression valve is opened between the two chambers, the air rushes into the vacuum in the large chamber in two tenths of a second, and the Gemini suit pressurizes to 3.9 psi to protect the subject from the hard vacuum.

The test demonstrates the back-up role of the suit to protect the astronauts if they should lose cabin pressure while orbiting in space.

Earlier in the week, engineers had tested the visor of the helmet under conditions which might cause it to fog and restrict the astronaut's visibility. These tests were preceded by a series in the thermal chamber which tested the suit cooling system under reentry, orbital, and pad abort excessive heating conditions.

At the same time, in El Centro, California, the suit successfully passed tests in Gemini ejection seats and in parachute jump tests.

More than 47 tests were performed in the qualification program for the suit. They include such tests as life cycling, comfort tests, mobility tests, and suit component testing.

The final nod was given for the Gemini suit only after it had met the exacting standards for each of these tests, and the results were analyzed by MSC engineers and management.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-39
March 8, 1965

HOUSTON, TEXAS -- A telescope to scan the surface of the sun for solar flares and warn lunar bound astronauts of their approach will be installed at the Manned Spacecraft Center according to space radiation scientists here.

The solar telescope and its instrumentation has already been produced under contract with the Razdow Laboratories, Newark, N. J. It consists of a 4-inch lens with a special solar filter.

An invitation for bid on the solar telescope facility was issued to industry by MSC procurement officials recently. It calls for a 65 ft. tower and an instrumentation building to be located at the northeast edge of the MSC site.

The MSC telescope is the first of a series of seven such solar flare detectors which will be erected at manned network tracking stations around the world.

An 8-foot diameter parabolic dish will also be installed at MSC and two other sites to measure the radio noise associated with

--more--

a flare. The solar telescope at the same time will look at the sun's light in the neutral hydrogen range. By receiving this picture of the total intensity of the event, scientists hope to be able to determine the radiation environment in space..

The space radiation warning network will be tied into the Mission Control Center. During a lunar voyage, the spacecraft crew can be warned instantly of dangerous solar events.

If they are in space, they will be able to turn their spacecraft to place its bulk between them and the solar flare. If they are on the surface of the moon, they can reenter the lunar excursion module, which will shield them from radiation.

The other solar telescope sites will be at Hawaii; Carnarvon, Australia; Canberra, Australia; Guaymas, Mexico; Tananarive, Madagascar; and Grand Canary Island. Radio telescope sites are located at Houston, Carnarvon and Grand Canary.

The cost of the space radiation network will be approximately $2 million. Physicists at the MSC site will begin using the solar telescope as soon as installation is completed. They will train monitoring crews and begin observations of the sun to gather background on the behavior of solar flares. However, the solar radiation network has been designed as a warning rather than a predicting system.

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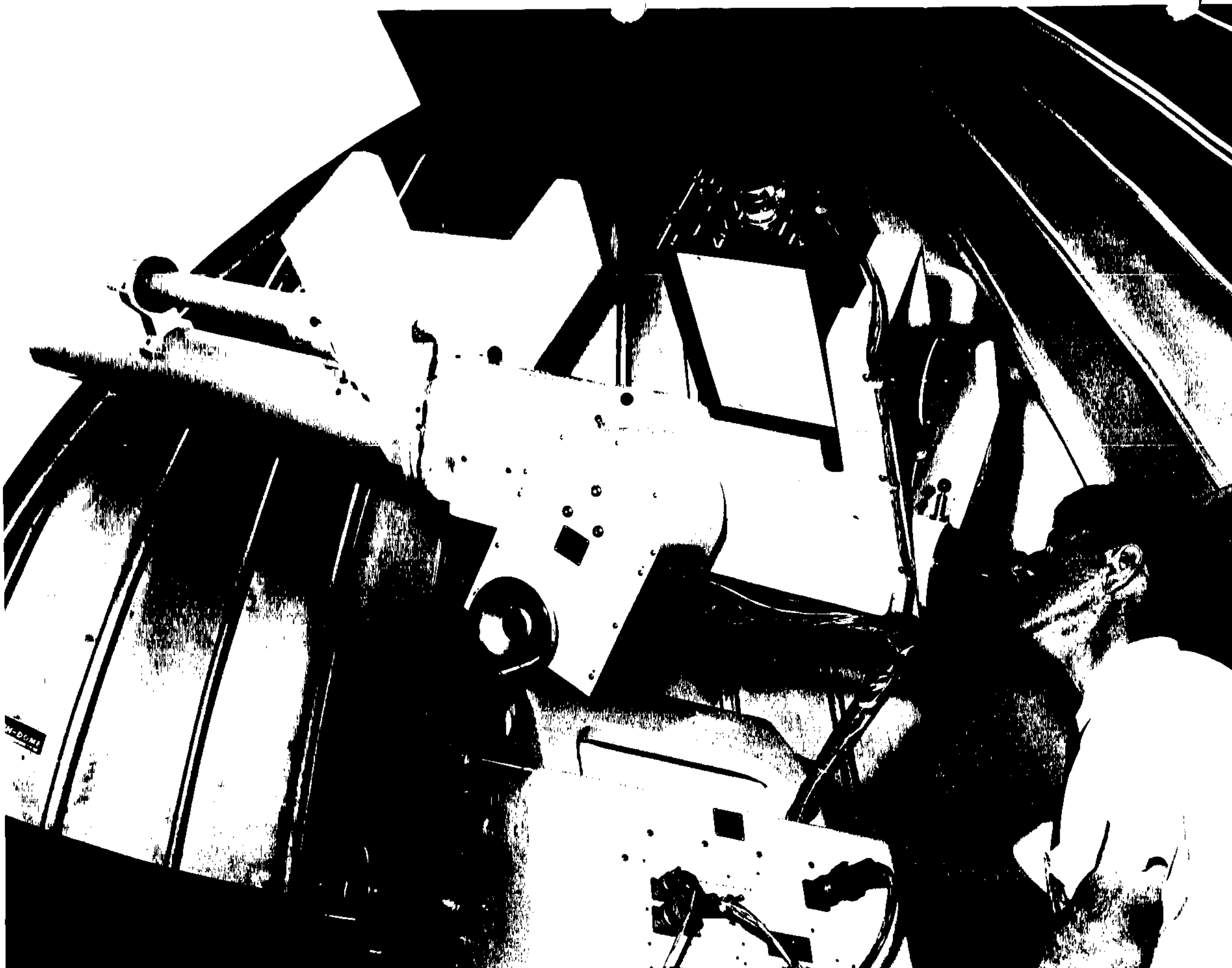
NASA
S-65-44266



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER NASA Houston 1, Texas

HUnter 3-4231

MSC 65-40
March 12, 1965

HOUSTON, TEXAS -- There is a school at the NASA Manned Spacecraft Center here from which no one ever graduates and where there is no summer vacation.

The school house is the Mission Control Center-Houston from which the nation's manned space flights will be controlled starting in mid-1965. The massive three-story Control Center houses the communications, computer and flight control facilities for monitoring and controlling earth-orbital two-man Gemini space flights, developmental earth-orbital three-man Apollo flights and the Apollo lunar landing mission set for late in this decade.

School begins when a prospective flight controller joins the flight operations organization at the Manned Spacecraft Center and continues throughout his tenure. As booster and spacecraft systems evolve, flight controllers' knowledge must keep pace with these systems from a functional standpoint.

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The first phase in the education of a flight controller is some 140 hours of rather straightforward classroom instruction and general orientation in spacecraft and ground support systems and operation of flight control equipment and consoles.

Included in the classroom work are 30 hours of spaceflight trajectory instruction by instructors from the Mission Planning and Analysis Division and instruction in the functions of the world-wide spaceflight tracking network by the Network Controller staff from Flight Support Division. In most instances, the instructors are flight controllers who work the same positions during a mission.

Through on-the-job training, neophyte flight controllers develop an extensive knowledge of spaceflight operational details which allows them to make use of spacecraft systems and flight manuals, engineering drawings, and other highly-detailed documentation. This phase brings the flight controller student to the second level of training -- to a sort of sophomore status.

The third level of training -- continuing all the while with refresher courses in spacecraft systems -- is directed toward developing in the flight controller the capability for developing and writing operational handbooks and procedures.

When the flight controller reaches the fourth, or "senior" level of training, his own initiative is his best teacher, for here he must

--more--

be a "self-starter" capable of polishing and improving his knowledge of the flight operations business to a degree that cannot be learned by lecture or group briefing. Again, refresher courses covering spacecraft systems, supplemented by visits to spacecraft manufacturers' plants, keep the flight controller in pace with late developments and changes in design.

Training does not end with the fourth level self-learning and classroom work; training, in fact, never ends for the flight controller. But, instead of getting more instruction and on-the-job training as an individual, he begins now to become a part of a flight controller team. He takes part in monitoring actual spaceflight missions and in realistic computer-generated mission simulations in which flight crews also take part.

Astronauts assigned to the flight crew for a specific mission actively participate in mission simulations by means of spacecraft simulators in another building at the Manned Spacecraft Center. The simulators are linked to the Control Center so that the flight crew's control actions and the status of spacecraft systems are transmitted to Control Center console meters and displays in the same way they would be relayed by telemetry during an actual flight.

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Simulated systems malfunctions and other abnormalities can also be injected into the training, both for crew training purposes and for flight controller training.

The mission simulation business is a profession in itself. Simulation specialists first prepare a computer program for a specific mission which, when recorded on computer tapes, produces realistic responses in flight control equipment in the Control Center and in tracking stations located around the belt of the earth covered by orbital space flights. In addition to the straightforward computer programs representing nominal or ideal flight conditions and performance, the simulation specialists act as "devil's advocates" by writing simulation scripts that provide for introducing the abnormal into the simulation of a flight.

Special consoles allow simulation specialists to inject indications of systems failures, loss of communications and other malfunctions into control room flight displays and flight controller consoles -- a purposeful harrassment intended to develop a keen sense of judgment that could mean the difference between a successful and an unsuccessful future real mission. "Never give a flight controller an even break," is the motto voiced by the mission simulation group.

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Another device used for flight controller training is the Simulated Remote Site -- an exact duplicate of the Flight controller consoles located in the worldwide Manned Spaceflight Network stations. Two simulated remote sites are located on the second floor of the Mission Control Center-Houston. Network station flight controllers receive training in a realistic setting without having to travel half-way around the world to their station until just before the actual mission.

Each team of remote site flight controllers waits its turn to man the simulated remote sites as the imaginary spacecraft and flight crew approach the range of radar and voice communications coverage of its tation. Thus, the two simulated remote sites may in the same flight simulation play the role of network stations at Guaymas, Mexico or Carnarvon, Australia.

Not only are simulation tapes used to generate displays for flight controller training, but data recorded from previous flights is played back through the Control Center's computer equipment and displays for critiques of the missions -- sort of like watching re-runs on television.

A visitor putting on a headset and listening to the conversations on various communications loops in the Mission Control Center would

--more--

hear regional inflections ranging from crisp British and Tidewater Virginia accents to soft southern drawls and "standard American" mid-West accents.

But regardless of the backgrounds of the flight controllers, their judgment and technical knowledge are essential to the success of a spaceflight mission and to the safety of the astronauts aboard. Such judgment and knowledge is not gained by accident. It is the result of living a career as a flight controller, and a continuous process of learning performance and technical details of new boosters and new spacecraft from conception to flight status.

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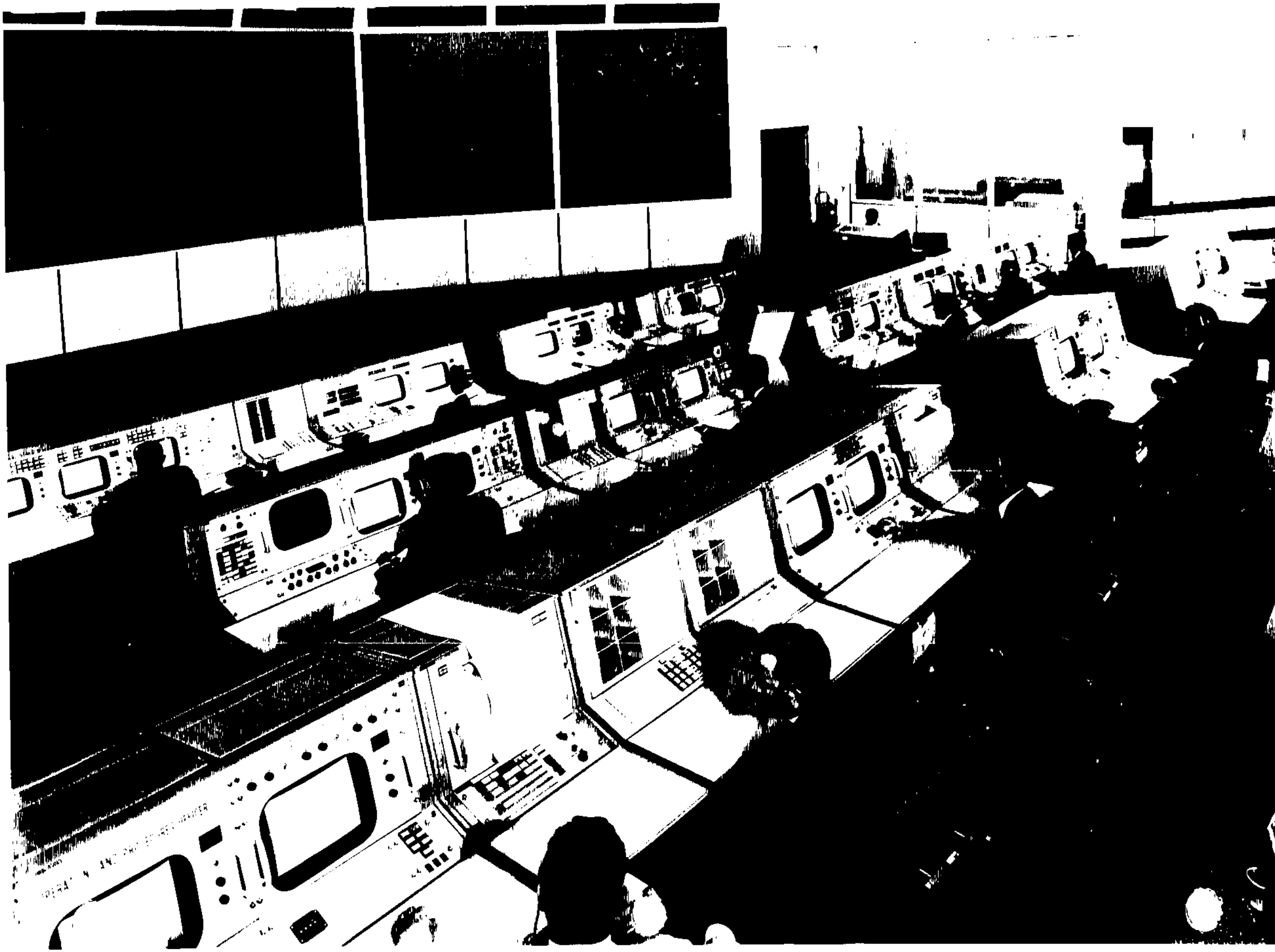
NASA
S-65-12501

NASA
C-65-12507

NASA
S-65-11572



NASA
S-64-29769

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-41
March 8, 1965

HOUSTON, TEXAS -- Dr. Walter C. Randall, Chairman of the Department of Physiology, Loyola University, Chicago, will be the guest speaker March 13 at the next Distinguished Lecture Series sponsored by the Gulf Coast Science Foundation.

His presentation will include a discussion of diseases of the nervous system and heart, and will be presented at the NASA Manned Spacecraft Center at 8 p.m.

A recognized medical authority, Dr. Randall has published more than 150 technical papers over the past 26 years relating to the diagnosis and treatment of disorder of the heart and nervous system.

He is a Fellow of the American Association for the Advancement of Science; chairman of a scientific section of the American Physiological Society; past president of the Illinois Section of the Society of Experimental Biology and Medicine; and now holds membership in several other scientific societies.

He was awarded a Doctorate in Physiology from Purdue; a Master of Science in Physiology from the same school, and a bachelor's degree from Taylor University, Upland, Indiana.

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The Saturday evening program is the third of four lectures sponsored by the science foundation. The final program will be held in April at the Clear Creek High School Auditorium.

Purpose of the series is to stimulate interest in the fields of science among the students, teachers and adults of this area.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HUnter 3-4231

MSC 65-42
March 11, 1965

HOUSTON, TEXAS -- Landings on the rugged and unknown surface of the moon are being made here daily by Manned Spacecraft Center engineers.

Although two astronauts are not scheduled to make that landing until later in the decade, the lunar surfaces at MSC are simulated by computer. Scale models and animated drawings of the lunar excursion module are used to study stability and impact problems which could occur on a lunar landing.

Two parallel studies are being run by Structures and Mechanics Division engineers to cover a variety of landing conditions. Another study by Advanced Spacecraft Technology Division has been completed.

Dave Brown, an engineer in Landing Technology Branch is conducting one study which uses a computer to draw three dimensional animated pictures of a LEM landing on the lunar surface.

The description of the surface on which the LEM landing will take place is reduced to mathematical terms. The same process is followed for the LEM, its descent velocity and the physical properties of its landing gear and engine skirt. This information is given to personnel of the Computation and Analysis Division to program into a computer.

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"There are a million possibilities for lunar landing conditions," Brown said, "our problems stay within the landing criteria that has been established for the first lunar landings."

Using the mathematical data, the computer draws a three dimensional image on a video screen every one thousandth of a second. A high speed 35 mm motion picture camera captures the action. The engineers can then review the hypothetical landing in slow motion.

"Using an animated image allows us to see many things we could never figure out from just looking at computer data," Brown said.

On some landings, the LEM tips over.

"On a bad landing, we can see the conditions and speeds which ause the LEM to become unstable," Brown said, "then we must determine if the landing gear can be modified to make the landing safe, or if these types of landings should be avoided.

While Brown is evaluating landings by computer, his colleague, Frank Stafford, uses a one sixth scale model of LEM landing gear to make actual drops.

Using a large heavy-duty platform which can be adjusted to represent different slopes, Stafford drops the model from several feet to test the ability of the crushable honeycomb shock absorbers to stabilize the vehicle.

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Impact data, gross stability, acceleration, and stroke of the landing gear are recorded as the 60 lb. model lands on the masonite table top.

The table landings do not provide the rugged terrain and crater holes which can be duplicated by the computer. However, the actual drop verifies the data developed in the computer program.

Before the LEM has made its first test flight, animated drawings and scale models are being flown by MSC engineers to lay down the ground rules for a safe landing on the surface of the moon.

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NASA
S-65-14561

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HUnter 3-4231

MSC 65-43
March 15, 1965

HOUSTON, TEXAS -- If Project Mercury is any indication, the odds are 50-50 that weather could delay the launching of America's first two-manned Gemini spacecraft late this month.

Half of the six manned Mercury flights were postponed because of bad weather: Astronaut Alan B. Shepard, Jr.'s flight was held up once for weather in the Atlantic recovery area; Virgil I. Grissom's flight was halted once because of clouds over Cape Kennedy, and John H. Glenn, Jr.'s orbital flight was delayed four times because of weather.

Grissom, who made his suborbital, 15-minute space flight on July 21, 1961, is command pilot for the first Gemini flight of as many as three orbits. With him will be fellow NASA astronaut, Naval Lt. Cmdr. John W. Young.

Weather plays a large role in the National Aeronautics and Space Administration's manned space programs, Gemini and Apollo. One of the last things an astronaut does before a flight is attend a weather briefing, usually at the launch pad just an hour or so before the mission.

And the job of providing up-to-the-minute weather data from all over the world for NASA's manned space operations is accomplished by a group

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of 17 men from the Spaceflight Meteorology Group, a unit of the National Weather Satellite Center of the U.S. Weather Bureau.

Four of these men are stationed here at the NASA Manned Spacecraft Center; two are at Cape Kennedy; six are in Miami, Fla., and five are at the Group's headquarters in Suitland, Md., six miles from the nation's capitol.

But 17 men can't forecast the world's weather without help. They get information from other weathermen in North and South America, Europe, Russia, China and other countries around the globe -- members of the World Meteorological Organization. They also get data from Air Force and Navy airborne and shipboard weathermen.

And just before and during manned space flights, additional efforts are made by countries along the flight path, like Australia, which funnel detailed information to the group -- information not normally sent in the four daily international weather reports.

Information also comes in from weather satellites, like Tiros 9, NASA's high-orbiting camera carrier, identifying large storms and frontal areas in such isolated places as the Indian, Atlantic and South Pacific Oceans.

The chances of finding good weather all over the world at any one time are "minute," according to Kenneth M. Nagler, the Weather Bureau's head of the Spaceflight Meteorology Group. "There's always bound to be bad weather at certain portions of the track," he says.

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Glenn, for instance, flew over vast dust storms in Africa; M. Scott Carpenter's three-orbit trip took him over some of the worst winter storms in the Southern Hemisphere; Walter M. Schirra, Jr.'s six orbits covered about seven severe tropical storms, including Hurricane Daisy.

Weather beneath the 22 orbits of L. Gordon Cooper, Jr., was mostly good. Cooper's spacecraft landed in the Pacific Ocean after piercing several layers of clouds, and the astronaut was retrieved five-foot seas -- an acceptable recovery condition if not the most desireable.

Nagler says some months are better than others for world-wide weather. February, he says, is the worst weather month of the year.

March is nearly as bad.

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NASA
-65-14659

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231
MSC 65-44

HOUSTON, TEXAS -- A team of flight controllers girdling the earth provides the human link between the ground and space-borne crew during a Gemini mission.

These controllers, and their counterparts and the Flight Director who will be stationed at Mission Control Center, Cape Kennedy, Florida, for the GT-3 mission, are charged with analyzing a vast quantity of data - a second-by-second basis in order to advise the pilots on a continuing basis regarding mission performance. They stand ready to assist the pilots in any eventuality.

The controllers spend hundreds of hours in preparation for a particular mission, as does the flight crew. Pre-mission work includes development of a detailed flight plan, flight simulations, and establishment of mission rules.

Heading GT-3 overall operations is Christopher Columbus Kraft, Jr., Manned Spacecraft Center's Assistant Director for Flight Operations. For this mission, he serves both as the Mission Director and Flight Director. Kraft served as Flight Director on all the Project Mercury missions.

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Kraft, 41, was born in Phoebus, Virginia. He was graduated from Virginia Polytechnic Institute with a bachelor of science degree in aeronautical engineering and has been with the National Aeronautics and Space Administration and its predecessor, the National Advisory Committee for Aeronautics, since January 1945. He started his government service at NACA's Langley Research Center.

As Mission Director for GT-3, Kraft is responsible for overall conduct of the mission. He is supported during the mission period by Department of Defense, contractor, and other NASA personnel in addition the flight controllers and two doctors from the Royal Australian Air Force. In this role he conducts a mission readiness review several days prior to the launch. After receiving reports from key personnel on the status of the crew, the spacecraft and launch vehicle systems, the Manned Space Flight Network, and the weather, he must make a Go/No Go decision. If he decides the mission is Go, he then sets the date and time of the launch.

Heading Department of Defense support for this mission are Air Force Lt. Gen. Leighton I. Davis, Manager of the National Range Division and DOD Manager for Manned Flight Support Operations; and Air Force Maj. Gen. Vincent G. Huston, Commander of the Air Force Eastern

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Test Range. DOD support embraces launch services at the Cape, remote tracking facilities, and spacecraft recovery forces.

Other members of Kraft's command staff include Ernest Amman, 47, U.S. Weather representative who keeps Kraft advised of weather conditions in the Cape area as well as the various landing areas, and a NASA Assistant Information Director for Mission Commentary. The Manned Spacecraft Center Public Affairs Officer, Paul Haney, 36, serves in the latter capacity. He is responsible for relaying to news media representatives all vital information concerning the flight.

As Flight Director, Kraft is responsible for detailed control of the mission. In this capacity, he is also responsible for the implementation of mission objectives and for making decisions which might change the flight plan and mission rules on an as-necessary basis.

A 31-year-old native of Toledo, Ohio, Eugene F. Kranz, will serve as Assistant Flight Director during the GT-3 mission. He was graduated from St. Louis University with a bachelor of science degree in aeronautical engineering and has been with NASA since October 1960. During the flight he will assist Kraft in the detailed control of the mission and will assume full responsibility during the absence of the Flight Director.

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Manfred von Ehrenfried and Lawrence L. Armstrong will serve at Mission Control Center as Operations and Procedures Officers for the mission. von Ehrenfried, 29, was born in Dayton, Ohio, and was graduated from the University of Richmond with a bachelor of science degree in physics. He has been with NASA since July 1961. Armstrong, 26, is a native of Pocatello, Idaho, and has been with NASA since August 1962. The Operations and Procedures Officers are responsible to the Flight Director for detailed implementation of the MCC/GOSS (ground operational support systems); implementation of remote site flight controller scheduling and operation, flight controller communication network discipline, and monitoring all mission control teletype traffic.

There are three Network Controllers assigned to the mission. All three are Air Force captains, assigned to the Air Force Systems Command. They are R. B. Sheridan, 32, a native of Detroit, Michigan; A. Piske, 31, a native of Metairie, Louisiana; and W. E. Arellano, 35, a native of Fort Collins, Colorado. Sheridan was graduated from the U. S. Military Academy and Piske from the U.S. Naval Academy. Both received a master of science degree in astronautical engineering from the Air Force Institute of Technology at Wright-Patterson Air Force Base, Ohio.

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Arellano attended Rollins College at Orlando, Florida. They are responsible to the Flight Director during the mission for the capability of the instrumentation network required to support the flight. Their specific duties include advising the Flight Director of network status, issuing network instrumentation changes and instructions, and taking appropriate actions to insure the network is capable of providing the support required for the mission.

Flight Dynamics Officers for the GT-3 mission are Clifford E. Charlesworth, Jr. and Glynn S. Lunney. Charlesworth, 33, a native of Redwing, Minnesota, was graduated from Mississippi College, Clinton, Mississippi, with a bachelor of science degree in physics. He joined NASA in September 1961. Lunney, 28, was born in Old Forge, Pennsylvania, and received a bachelor of science degree from the University of Scranton. He has been with NACA and NASA since August 1955, starting his service at the Lewis Flight Propulsion Laboratory in Cleveland, Ohio. The Flight Dynamics Officers are responsible to the Flight Director for monitoring the powered flight phase of the mission, orbital events, and trajectories from the standpoint of mission success. They also transmit radio frequency commands to the spacecraft and launch vehicle, monitor reentry trajectories and update landing point estimates.

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The Guidance and Navigation System Engineers for the mission are Arnold D. Aldrich and Gerald D. Griffin. Aldrich, 28, was born in Arlington, Massachusetts, and received a bachelor of science degree in electrical engineering from Northeastern University at Boston. He joined NASA in July 1959. Griffin, 30, is a native of Athens, Texas. He was graduated from Texas A&M with a bachelor of science degree in aeronautical engineering, and joined NASA in June 1964. The Guidance and Navigation Systems Engineers are responsible to the Flight Director for detecting slow-rate deviations in the first stage of the launch vehicle and verification of the performance of the radio guidance system; detecting any launch vehicle second stage radio guidance system malfunctions; and making recommendations to the Flight Director as to whether a switchover to the secondary guidance system should be made, depending on the nature of any malfunction noted.

Retrofire Controllers for the GT-3 mission will be John S. Llewellyn, Jr. and Jerry C. Bostwick. Llwellyn, 33, is a native of Newport News, Virginia, and received a bachelor of science degree in physics from Randolph-Macon at Ashland, Virginia. He has been with NACA and NASA since June 1957 at which time he started at Langley Research Center. Bostwick, 25, was born in Golden, Mississippi, and was graduated from Mississippi State College with a bachelor of science degree in civil

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engineering. He joined NASA in January 1962. The Retrofire Controllers are responsible to the Flight Director for determination and transmission of retrofire times, either in the event of an abort, a contingency landing situation, a landing at the end of an orbit, or the landing at the end of the nominal mission. Their responsibilities include a constant check on retrofire parameters and landing point estimates. They also maintain current data for updating the onboard computer for orbital navigation and reentry guidance and consult with the Flight Director, other flight controllers and the astronauts concerning reentry planning. They receive frequent reports as to weather conditions in planned landing areas and in the event weather conditions in those areas should become not acceptable, coordinate with the Flight Director and recovery personnel in making required changes. One of their prime responsibilities is insuring that the correct information as to retrofire time has been received and acknowledged by the flight crew.

Switchover Monitors for GT-3 will be Charlie B. Parker and Thomas F. Carter, Jr. Parker, 30, is a native of Concord, Texas, and was graduated from Lamar State College with a bachelor of science degree in electrical engineering. Carter, 26, is a native of Quitman, Mississippi, and was graduated from Mississippi State College with a

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degree in civil engineering. The switchover monitors are responsible to the Flight Director for informing him of any apparent malfunctions and making recommendations concerning switching over from the primary radio guidance system to the secondary inertial guidance system.

The Electrical, Environmental, and Communications System Engineers for GT-3 will be Richard D. Glover, John W. Aaron and Larry Bell. Glover, 30, was born in Chicago, Illinois, and received a bachelor of science degree in electrical engineering from the University of Texas and a master of science degree in electrical engineering from Stanford University. He has been with NASA since November 1963. Aaron, 22, is a native of Wellington, Texas. He was graduated from Southwestern State College, Weatherford, Oklahoma, with a bachelor of science degree in physics and has been with NASA since June 1964. Bell, 23, was born in Texas City, Texas, and was graduated from Lamar State College with a bachelor of science degree. He has been with NASA since February 1965. The EECOM Engineers monitor various activities in order to stay abreast of the spacecraft status and to correlate MCC display readouts with those appearing in the spacecraft. Significant readout discrepancies will be resolved with the MCC Telemetry supervisor. They are responsible to the Flight Director for all information concerning the spacecraft systems.

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The Booster Systems Engineer for this mission will be William E. Platt, 29, a native of Wink, Texas. He was graduated from Southwestern Louisiana Institute with a bachelor of science degree in mechanical engineering. He is responsible to the Flight Director and Flight Dynamics Officer for all booster systems degradations observed and is responsible for monitoring booster sequential, electrical, hydraulic, propulsion, and malfunction detection system displays.

The Spacecraft Communicator for this flight will be Astronaut L. Gordon Cooper, Jr., 38, who was born in Shawnee, Oklahoma. Cooper made the final flight in the Mercury program - 22 orbits in his "Faith 7" spacecraft. As spacecraft communicator he is responsible to the Flight Director for voice contact with the flight crew in connection with details concerning the mission flight plan, flight procedures, mission rules, and the spacecraft systems.

Another astronaut, Eugene A. Cernan, 31-year-old native of Chicago, Illinois, will serve as Booster Tank Monitor for GT-3. In this position, he is responsible for monitoring and operating launch vehicle propellant tank pressure displays. He will advise the flight crew and the Flight Director of all tank pressure degradations observed and will recommend an abort by means of the spacecraft abort light and/or voice radio if a tank pressure structural problem is indicated.

Flight Surgeons in MCC for the flight will be Charles A. Berry, Chief of Center Medical Programs for Manned Spacecraft Center, and Air Force Maj. J. R. Wamsley. Berry, 41, is a native of Rogers, Arkansas. He received a bachelor of arts degree from the University of California in 1945 and his MD degree from that same university in 1947. He was graduated from the Harvard School of Public Health in 1955 with a master of Public Health degree. He has been with NASA since June 1963. The flight surgeons are responsible to the Flight Director for advising him of astronaut status during the mission as pertains to blood pressure, pulse rates, respiratory rates, and electrocardiograms. They will also advise the Flight Director of any obvious physical abnormalities noted.

The NASA Recovery Coordinator, located at MCC, will be Robert F. Thompson. Thompson, 39, is a native of Bluefield, Virginia, and received a bachelor of science degree in aeronautical engineering from Virginia Polytechnic Institute. He joined NACA/NASA in March 1947 at Langley Research Center. He is responsible to the Flight Director for coordination of all recovery activities and is physically stationed at MCC in the Recovery Room, located adjacent to the Operations Room. Others assisting in this phase of the operation include an assistant NASA Recovery Coordinator, a senior Department of Defense Representative, and the Department of Defense Operational Control Staff.

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Due to the fact that future Gemini missions will be of longer duration, there is a continuing requirement for training personnel for the various flight controller positions. While the GT-3 flight is in progress a complete team of flight controllers will be monitoring the flight from the Mission Control Center at Houston, Texas, in addition to the flight controllers on duty in MCC at Cape Kennedy. Key personnel on this team will be: J. D. Hodge, Flight Director; J. W. Roadh, Assistant Flight Director; J. H. Temple, Operations and Procedures Officer; Dr. D. O. Coons, Flight Surgeon; Astronaut Roger B. Chaffee, Spacecraft Communicator; D. T. Lockard, Guidance and Navigation Engineer; T. R. Loe, Electrical, Environmental and Communications Systems Engineer; Astronaut C. C. Williams, Jr., Tank Monitor; S. M. Present, Booster Monitor; K. W. Russell and W. E. Fenner, Guidance Officers; D. V. Massaro, Retrofire Officer; and Air Force Maj. H. E. Nichols, Network Controller.

The flight controller at remote sites will perform duties during the simulations and the flight as command communicators, systems engineers, flight surgeons and astronaut simulators. The astronaut simulators will only be used during network simulations and will provide information to the command communicators at their particular site similar to that they will receive from the astronauts during the actual mission.

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Following is a list of remote sites which will be manned for GT-3, the positions, the personnel who will man those positions and the organization to which they are assigned:

Canary Island: Command Communicators - A. J. Roy, Jr., Flight Control Division, MSC; and A. S. Davis, Philco. Systems Engineers - Gary E. Coen, Flight Control Division, MSC; and A. W. Barker, Philco. Astronaut Simulator - J. E. Saultz, Flight Control Division, MSC. Flight Surgeons - Navy Captain E. L. Beckman and Army Lieutenant Colonel R. H. Shamburek.

Carnarvon, Australia: Command Communicators - D. S. Hunter and J. P. Vick; Systems Engineers - T. A. White and W. M. Merritt; and Astronaut Simulator - B. H. Walton, all assigned to Flight Control Division, MSC. Flight Surgeons - Air Force Maj. R. A. Pollard, MSC; and Wing Commander A. J. Bishop and Squadron Leader Dr. Murray Alston, both of the Royal Australian Air Force. Astronaut Charles Conrad, Jr. will be an observer at Carnarvon.

Kauai, Hawaii: Command Communicators - J. L. Tomberlin and P. L. Ealick, both assigned to Flight Control Division, MSC. System Engineers - J. F. Moser and C. A. Link, both Philco employees. Astronaut Simulator - J. R. Fucci, Philco. Flight Surgeons - Dr. D. E. Catterson, MSC, and Air Force Lieutenant Colonel H. R. Unger. Astronaut Neil Armstrong will be an observer.

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Corpus Christi, Texas: Command Communicators -- K. K. Kundel, Flight Operations Division, MSC; and R. F. Robertson, Philco. Systems Engineers - D. L. Klingbeil, Philco; and G. M. Bliss, Flight Operations Division, MSC. Astronaut Simulator - W. E. Emerson, Philco. Flight Surgeons - Air Force Major R. M. Chubb and Navy Lieutenant G. A. Humbert.

Guaymas, Mexico: Command Communicators - C. R. Lewis and G. B. Scott; and Systems Engineers - G. F. Muse and H. B. Stephenson, all of Flight Control Division, MSC. Astronaut Simulator - E. L. Dunbar, Philco. Flight Surgeons - Air Force Major R. R. Burwell and Army Major J. E. Hertzog.

ROSE KNOT VICTOR Tracking Ship (East of Hawaii): Command Communicators - E. I. Fendell and L. E. Mercier, both of Flight Operations Division, MSC. Systems Engineers - H. Smith, Philco; and J. Fuller, Flight Operations Division, MSC. Astronaut Simulator - H. V. Berlin, Philco. Flight Surgeons - Dr. G. F. Kelly, MSC; and Air Force Major D. E. Graveline.

COASTAL SENTRY QUEBEC Tracking Ship (Indian Ocean): Command Communicators - W. D. Garvin and H. E. Porter; System Engineers - J. E. Walsh and F. E. Claunch; and Astronaut Simulator - H. R. Perkins, all of Philco. Flight Surgeons - Dr. C. A. Jernigan, MSC; and Air Force Major G. D. Young, Jr.

Also assisting the Flight Director in the conduct of the mission is a Mission Control Center support group. This group performs a number of functions which include necessary operations to provide information concerning telemetry, etc.

The telemetry room is shared jointly by the Air Force Eastern Test Range and NASA. The equipment used in the Gemini program include a Pulse Command Modulation System in addition to other telemetry equipment.

Two digital command systems and a tone command are housed in the command room. Command signals are transmitted by land lines to the command destruct building at Cape Kennedy where 10 kilowatt command transmitters and antennas are located.

In the air-to-ground equipment room, a received and communications console allows simultaneous conversations with astronauts on the high-frequency and ultra-high frequency radio lengths. Direct air-to-ground communications between Mission Control Center and the astronauts in the Gemini spacecraft are possible through the facilities of the world-wide tracking network.

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The data select room is a focal point of the launch monitor subsystem which drives the flight dynamics officer's plotboard and displays. In addition, raw radar data is received from the range tracking network converted to teletype format and transmitted to Goddard Space Flight Center for orbital computation.

In addition to these areas at MCC, other facilities there which provide necessary support requirements are a network room, a data analysis and flight control briefing room, and communications center.

A Gemini simulator is also located in MCC. The crew station in this facility is identical to the spacecraft in which the astronauts make the flight and provides a capability for simulating all phases of a mission with the exception of liftoff and reentry g-forces and weightlessness. This training facility is controlled from a three-man instructor console and a two-man telemetry monitor console. In addition to providing flight crew training it is used extensively during network simulations.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-45
March 31, 1965

HOUSTON, TEXAS -- Dr. Lewis F. Hatch, Graduate Professor of Chemistry at the University of Texas, will be the guest speaker Arpil 3 at the final presentation of the Distinguished Lecture Series sponsored by the Gulf Coast Science Foundation.

His lecture is entitled "The Petrochemical Industry." It will be given at the Clear Creek High School at 8 p.m., Saturday evening.

A specialist in the petrochemicals fields, Dr. Hatch has spent several years in the Middle East as a consultant to the chemical and petroleum fields. He is the author of over 100 technical articles, has ten patents and has authored or co-authored seven books.

Recently he presented a paper in Teheran, Iran at the United Nations Conference on Petrochemical Industries for Developing Countries.

Dr. Hatch was awarded a Doctorate in Chemistry from Purdue University; and a bachelor's degree from the State College of Washington (now Washington State University).

Purpose of the lecture series is to stimulate interest in the fields of science among the students, teachers and adults of this area.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-46
March 31, 1965

HOUSTON, TEXAS -- Engineering courses and research opportunities in space science fields will be offered to fifteen college professors from throughout the nation under a Summer Faculty Fellowship Program this summer. The program will be conducted jointly by the National Aeronautics and Space Administration, the University of Houston and Texas A&M University.

Scheduled to run from June 14 through August 20, the project will be directed by Astronaut M. Scott Carpenter, executive assistant to the director of the NASA Manned Spacecraft Center, and Dr. C. J. Huang, chairman of the department of chemical engineering at the University of Houston. Serving as a member of the project's advisory committee is Dr. A. E. Cronk, chairman of the department of aeronautical engineering at Texas A&M University.

Astronaut Carpenter is responsible for appointing the fellowships and for selecting their research assignments during the program.

Professors taking part in the Summer Fellowship Program will gain actual research and development experience by spending 30 hours

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each week attending lectures at the University of Houston by professors from U of H and from Texas A&M University. Additional lecturers will come from the Manned Spacecraft Center, the American Society of Engineering Educators, other universities and from industry.

Among the research and development fields at the Manned Spacecraft Center are spacecraft technology, space environment, crew systems and systems evaluation and development.

Following a survey of faculty fellows, the University of Houston and Texas A&M University will each conduct three courses of the following six: electrical engineering aspects of manned spacecraft design, space environment and materials, rocket flight dyanmics, fundamental concepts in aerodynamic heating, continuum mechanics and aerospace structural mechanics.

One of six summer programs to be carried out simultaneously throughout the nation, the project is being financed under a $60,000 contract from NASA to the University of Houston for providing to engineering professors knowledge and experience in the fields of space technology which will be of benefit to their colleges.

Similar programs will be jointly provided by NASA Ames Research Center and Stanford University; NASA Lewis Research Center and Case Institute of Technology; NASA Langley Research Center and the University of Virginia, William and Mary College and Virginia Polytechnic Institute; NASA Marshall Space Flight Center, Auburn University and the University of Alabama and the NASA Goddard Space Flight Center and University of Maryland and Catholic University.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-47
April 6, 1965

HOUSTON, TEXAS -- Five mid- and southwestern states will send a total of 17 gifted high school students to the NASA Manned Spacecraft Center April 15 and 16 to participate in the regional finals of a science congress which will be hosted by the space agency.

The students were chosen from hundreds who participated in a nationwide Youth Science Congress sponsored by the National Science Teachers Association (NSTA) and the National Aeronautics and Space Administration.

Nine of the participants come from Texas; Kansas is next with five, and Colorado, Nebraska, and Oklahoma each are sending one.

One of the Texas group, two come from Houston; two from Longview; two from Pampa; two from San Antonio, and one comes from Austin. Texas finalists are Edward Osborne, 8110 Lawler Street, Houston; William A. Voelkle, 735 Eubanks Street, Houston; Donnis D. Koons, Route 2, Longview; Jame Smith, 144 Houston Street, Longivew; Avril Doucette, 2424 Mary Ellen Avenue, Pampa; Cynthia Plaster, 1010 Charles Street, Pampa; Mary A. Geyne, 727 East Hildebrand Avenue, San Antonio; Elizabeth Switzer, 530 Wheaton Road, San Antonio; and Arthur Frankel, 1110 Gaston Avenue, Austin.

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Regional finalists from Kansas include Sarah Hall, 2121 Browning Avenue, and Robert Weltsch, 714 Poyntz Street, both of Manhatten; James Haug, Route 2, Seneca; Margaret MacDougall, 5315 West 79th Terrace, Shawnee Mission; and Edward Aten, 7109 Hardy Street, Overland Park.

Others are Robert Vadnal, 930 Box Elder Avenue, Pueblo, Colorado; Margaret Wilkie, Marsland, Nebraska; and Paul Patten, 823½ West Apache Street, Purcell, Oklahoma.

While at the Center, the students will present their scientific papers to a panel of judges who will select three regional winners. The winners will advance to a national competition to be held at NASA Headquarters, Washington, D. C., in May.

In addition to the professional meetings at which they will be reading their own research reports, the science-talented students will visit with NASA engineering personnel in the MSC laboratories, and will tour the Houston area.

Two luncheons are scheduled. An astronaut will be the principal speaker at one, and a member of the aerospace industry will speak at the other. Climax of the two days of meetings will come at an awards dinner at which time the winners will be announced.

The winners' research papers covered the scientific fields of botany, earth and space, chemistry, and biology.

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This is the second year NSTA sponsored congresses. They were initiated in order that senior high school students may more thoroughly understand professional requirements in the fields of science and technology. The program consists of eight regional events with the winners moving to a national competition.

NSTA coordinator for the region is Mrs. Elaine Ledbetter, head of the science department at Pampa Senior High School, Pampa, Texas. The program is under the direction of Eugene E. Horton, MSC's Chief of Educational Programs and Services.

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FOR Release 2:00 CST, April 9, 1965 jointly with NASA Hqs.

MIT GETS NEW CONTRACT FOR APOLLO GUIDANCE, NAVIGATION SYSTEM

The National Aeronautics and Space Administration awarded a separate contact today to the Massachusetts Institute of Technology, Cambridge, Massachusetts for continued direction of overall design of the Apollo guidance and navigation systems.

The cost reimbursement contract, with no fee, will cover further work on guidance and navigation of the Apollo command and lunar excursion modules. MIT was selected in August 1961 to design the system. The new contract runs from March 1 through November 30, 1965 and totals $15,529,000, including $1.4 million for supporting research activities to maintain an advanced technology in the guidance and navigation fields.

MIT is an associate contractor in the Apollo guidance and navigation systems program. AC Spark Plug, Division of General Motors, Corp., Milwaukee, Wis., is prime contractor to NASA to build the system. Kollsman Instrument Corp., Elmhurst, N. Y., and Raytheon Co.'s Missile and Space Division, Lexington, Mass. have subcontracts with AC to build prototypes, test articles, and flight hardware.

Washington, April 9 -- Control of manned flight missions from the new Mission Control Center at the Manned Spacecraft Center in Houston will begin with the forthcoming Gemini Titan 4 flight.

Dr. George E. Mueller, NASA Associate Administrator for Manned Space Flight, announced the change of primary flight control from the Mission Control Center at Cape Kennedy to the Mission Control Center of Houston.

The GT-4 flight is scheduled for the third quarter of this year.

Dr. Mueller said Christopher C. Kraft will serve as mission director for the four-day orbital mission. He was mission and flight director for GT-3, a successful 3-orbit mission completed March 23.

The Houston Mission Control Center will be operated on a three shift basis with an approximate two-hour overlap between the shifts to insure smooth transition.

Kraft will also serve as one of the three flight directors, the other two being John Hodge and Gene Kranz. Because of his dual role, Kraft will divide his time before launch between Cape Kennedy and the Control Center at Manned Spacecraft Center. He will return to Houston on the afternoon prior to launch and control the final hours of the countdown from MSC.

Add 1

During the launch phase of the count the Cape Kennedy Control Center will provide backup in trajectory and launch vehicle telemetry areas. NASA's Goddard Computer Center will follow control of the flight on a backup basis and will provide information directly to Cape Kennedy during the launch phase.

Mueller said he was very pleased with perfromance from the Houston Control Center during the GT-3 mission. The Houston Center served as backup to Cape Kennedy for this flight.

Mueller said there are no major problems remaining in the transition from Cape Kennedy control. The last remaining major task involves linking the mission simulator at Cape Kennedy and the Houston Control Center. This will permit the crew to fly simulated missions at Cape Kennedy while being controlled from Houston - as would be done in a normal flight situation.

The Mission Control Center-Houston has four major functional systems -- Display and Control; Communications; Simulations, Checkout and Training (SCATS); and the Real Time Computer Complex (RTCC).

The MCC-H provides centralized control of manned spaceflight programs - including full mission control from launch through recovery. Technical management is provided in areas of vehicle systems, flight crew activities, recovery support and ground network support operations.

Add 2

In addition to 384 high-resolution TV monitors in 140 control consoles, the center features an expanse of rear projection screens on which are flashed TV images, maps, trajectories and other information vital to mission controllers. The screens are 10 feet high and total 60 feet in width.

Ringing the top of the large-screen displays and the operating consoles are computer-driven time and data displays serving to report instantly the status of astronauts, spacecraft and supporting operations to the mission/flight director.

Most of the information to be displayed will reach the Mission Control Center over land lines.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-48
April 9, 1965

HOUSTON, TEXAS -- Works of art done by Manned Spacecraft Center employees will be on exhibit at the Center Auditorium on April 11 and 18 from 1 to 5 p.m.

The art show is being held in conjunction with the regular Sunday Open House, in which exhibits and motion pictures on the manned spaceflight program are presented to the public.

Four categories of original art will be on display. They include oil paintings, water colors, prints, and ceramics.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

April 12, 1965

EDITORS NOTE

The first full scale test of the parasail-landing rocket developmental system at Fort Hood, Texas is scheduled to take place Wednesday, April 21. If you wish to have a representative at this test, please submit his or her name to the Public Affairs Office. An indication of press interest is necessary in order to coordinate on-site service with Army officials. A pre-flight press briefing will be held at the Officers Club, Fort Hood, on April 20 at 8 p.m. If possible, press should attend this briefing for important background information on the test.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HISTORY OF FULL SCALE PARASAIL AND LANDING ROCKET DROP TESTS

ALL TESTS CONDUCTED ON TRINITY BAY

Feb. 2, 1964 -- Drop with parasail only to verify drop method. The boilerplate was dropped from an altitude of 6,000 ft., parasail deployed satisfactorily, and vehicle harness changed from vertical to horizontal attitude.

April 8, 1964 -- First drop to test flight maneuvering with parasail turn system. Dropped from 11,400 ft., the reefing line on parasail failed structurally just prior to full reefed inflation. Parasail was separated and boilerplate descended on 84 ft. ringsail chute.

April 29, 1964 -- Scheduled as a repeat of April 8 test. Dropped from 11,100 ft., all systems functioned correctly. Turn system was activated and several turns executed in flight. Boilerplate was maneuvered to within approximately 50 yds. of target.

May 14, 1964 -- First incorporation of interim altitude sensor into parasail system. Dropped from 11,000 ft. Although forward Y bridle leg load cell failed structurally, several turns were made in flight. Vehicle was maneuvered 40 yds. from target area and altitude sensors were actuated, firing flash bulbs which simulated rocket firing.

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May 26, 1964 -- Further test of turn system and interim altitude sensor performance. Right turn motor failed, and vehicle was landed within 90 yards of target using left turn motor only. Altitude sensors functioned properly.

July 31, 1964 -- A crane drop was conducted at Ellington AFB to evaluate the landing rockets and landing gear. The impacting surface was one half inch steel plate over concrete. Rockets fired and decelerated the vehicle to approximately 7 feet per second at impact.

Oct. 16, 1964 -- First test of rocket attentuation system with parasail over water. Boilerplate was dropped from 11,200 ft., parasail deployed but turn motors did not operate. Landing rockets fired at altitude sensor impact closure, but vehicle landed two miles from target area.

Dec. 11, 1964 -- First incorporation of deHaviland altitude sensor and 70 ft. parasail with landing rocket system. Boilerplate was dropped from 7,000 ft. but turn motors did not operate. New sensors operated and landing rockets fired as boilerplate impacted 200 yards from target area.

Jan. 14, 1965 -- Modified turn line stowage was evaluated and further flight control experience with 70 ft. parasail was obtained. All systems functioned correctly. Turns systems responded to turns systems commands. Several turns were executed in flight and vehicle was maneuvered within 1/4 mile of the target area.

Feb. 25, 1965 -- Evaluated effect of increased turn line length and served as final rehearsal for land landing tests. All systems functioned normally. Landing rockets were not used. With strong head winds, the parasail managed to bring the boilerplate to within 1000 yds. of the target.

March 12, 1965 -- A second static test of landing rockets was conducted at Ellington AFB. The test was conducted over a sod surface to verify thrust alinement and to determine impact and post impact acceleration. Rocket exhaust dug a crater 11 ft. wide, 2½ ft. deep, and eight ft. long. Boilerplate remained in stable position under worst possible landing conditions.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-49
April 13, 1965

HOUSTON, TEXAS -- The U.S. will explore the land landing capability of its spacecraft with the first test of the parasail-landing rocket at Fort Hood, Texas on April 21.

A series of four tests are scheduled for the Tank Assault Range at Fort Hood. The boilerplate spacecraft will be dropped by C-119 aircraft from 11,500 feet. Depending on wind conditions at the time of the drop, test conductors will attempt to land the boilerplate in one of the five prepared landing areas on the range.

The parasail is a steerable parachute which has already undergone nine drop tests over water on Galveston Bay. On two of these tests, landing rockets were used to slow the descent speed of the boilerplate.

In the test sequence, when the parasail is fully opened the test conductor will steer the vehicle by radio command system which operates turn motors onboard the boilerplate. The turn motors control flap angles on the parachute which in turn controls chute direction of drift.

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Add 1
MSC 65-49

Two altitude sensors are suspended below the spacecraft. They are tubular metal probes 12 ft. long. When they impact with the ground, they ignite two 6,000 thrust rockets in the lower equipment bay of the boilerplate.

The rocket thrust reduces the vertical landing speed from 30 to less than ten feet per second. Tricycle landing gear will be used to provide a stable landing after the rockets have fired.

The parasail-landing rocket tests are being conducted by the Landing Technology Branch of Structures and Mechanics Division and the Operational Evaluation and Test Branch of the Landing and Recovery Division.

Landing rocket design was engineered by the Power and Propulsion Division and contracted to the Thiokol Corporation of Elkton, Md. for production. Technical support was provided by Technical Services Division.

The parasail was manufactured by the Pioneer Parachute Co., Manchester, Conn. Altitude sensors were produced by the deHaviland Aircraft Co. of Canada.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-4231

MSC 65-50
April 15, 1965

HOUSTON, TEXAS -- Chamber "A", the 120 ft. high by 65 ft. diameter vacuum chamber under construction at the Manned Spacecraft Center, has successfully passed a structural integrity test here yesterday.

The chamber was pumped down to an altitude of approximately 130,000 feet and a battery of 225 instruments placed on its steel skin measured the stress as the air on the outside pushed against the chamber.

The pumpdown of the chamber began at 9 a.m. Tuesday and terminated at 6:30 p.m. Wednesday. Normal pumpdown time would be less, but frequent holds were called to check data obtained from the instruments.

Engineers from Manned Spacecraft Center, the Army Corps of Engineers, and the prime construction contractor for the chamber, Chicago Bridge and Iron, conducted the test. Test conductors were Tom Milton, Lou Vosteen and Phil Glynn, all MSC engineers.

A vacuum integrity test is scheduled to start later this week. During this test, the chamber will be pumped down to an equivalent of 70 miles in altitude and the leak rate of air into the chamber will be checked.

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Chamber "A" will be used by the MSC for checking full Apollo lunar spacecraft under vacuum and thermal conditions. The tests this week are part of a series designed to qualify the large chamber for operational use.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-4231

MSC 65-51
April 21, 1965

HOUSTON, TEXAS -- A general press conference with Astronauts James McDivitt and Edward White, the GT-4 flight crew, has been scheduled for April 30 in FOB 6, Washington, D. C., beginning at 9 a.m., it was announced today by Paul Haney, Public Affairs Officer for MSC. This meeting had tentatively been set for Chapel Hill, North Carolina.

Haney said that additional, individual interviews with the GT-4 flight crew will be arranged for a later date in Houston, Texas.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

MEMO TO PRESS - April 21, 1965

A series of briefings and demonstrations showing varied astronaut training devices and facilities at the Manned Spacecraft Center will be conducted for interested members of the press starting at 9:00 a.m., Saturday, April 24.

A tentative schedule of activities follows:

9:00 am - 9:30 am	Demonstration at the lunar landscape involving MSC engineer in prototype space suit performing tasks with working tools
9:30 am - 10:30 am	Briefing and demonstration of the translation and docking trainer (bldg 260) with an MSC engineer 'flying' the vehicle.
10:30 am - 11:00 am	Briefing by an MSC engineer beside the Gemini Mission Simulator.
11:00 am - 11:30 am	Briefing by an MSC engineer beside the Dynamic Systems Trainer.
11:30 am - 12:30 am	Tour of the Astronauts' gym with briefing by gym manager.
12:30 pm - 1:30 pm	Lunch break
1:30 pm - 2:00 pm	Tour and briefing of the centrifuge conducted by an MSC engineer.

MEMO TO PRESS
April 21, 1965
Add 1

2:00 pm - 2:45 pm Tour and briefing of the space environmental facility (both chambers) conducted by an MSC engineer.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER — Houston 1, Texas

HUnter 3-4231

MSC 65-52
April 23, 1965

HOUSTON, TEXAS -- An operation to remove an injured cartilage from the right knee of Astronaut Edwin E. Aldrin, Jr., was successfully performed at Wilford Hall U.S. Air Force Hospital, San Antonio, this morning. Col. George H. Chambers, who performed the 53-minute operation, reported the patient in excellent condition, awake and comfortable. The operation began at 7:57 a.m. and was completed at 8:50 a.m.

Aldrin is expected to be in the hospital for about a week after ich time he will return to limited duty for 6 to 8 weeks.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-4231

MSC 65-53
April 22, 1965

HOUSTON, TEXAS -- Astronaut Edwin E. Aldrin, Jr., 35, will undergo surgery tomorrow for removal of an injured cartilage in his right knee.

Aldrin, an Air Force Major, on duty at NASA's Manned Spacecraft Center, entered Wilford Hall Hospital, Lackalnd AFB, San Antonio, Texas, today. The cartilage, medically identified as a medial meniscus, apparently was injured and aggravated in the course of his astronaut training, which includes strenuous physical conditioning, competitive athletics, parachute landing exercises, geology field trips and contingency survival training. Doctors have been watching the condition for about a year and have recommended surgery to avoid any permanent impairment.

He is expected to spend about a week in the hospital, to be followed by about 6 to 8 weeks of limited duty. Aldrin was selected for astronaut training in October, 1963.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65- 54
April 29, 1965

HOUSTON, TEXAS -- A graduate education center will be established at the NASA Manned Spacecraft Center under a plan recently approved by the Texas Commission on Higher Education. The Graduate Education Center will be operated by the University of Houston at the Manned Spacecraft Center site, 22 miles southeast of Houston.

Dr. Robert Gilruth, director of the NASA Center, and Dr. Philip Hoffman, president of the University of Houston, jointly requested approval of the Graduate Center by the Commission.

Graduate study opportunities in engineering, physical sciences, public administration and management will be provided to employees of the Manned Spacecraft Center and to other persons living in the vicinity of the Center. Dr. Gilruth has repeatedly emphasized the need for a high-quality graduate study program easily available to NASA employees.

Courses offered by the Graduate Center will permit Manned Spacecraft Center employees to complete most degree requirements at their place of work, and for the first time, employees will be awarded "resident" graduate credits for courses taken at the Center.

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All courses will be taught in conference rooms at Manned Spacecraft Center in early morning and late afternoon hours.

As an aid to orderly planning of graduate study for MSC employees, Dr. Lawrence R. Daniel, head of the Mechanical Engineering Department at Louisiana State University, counsels three times a year with employees.

The MSC Graduate Study Program began in 1962 with 162 employees enrolled in graduate courses, growing to 328 in 1963 and 567 in 1964. Through the program, seven MSC employees have earned master's degrees. By the end of the current academic year, required graduate work will be completed by 25 master's candidates and six doctoral candidates.

Substantial enrollment growth is expected with the establishment of the University of Houston Graduate Education Center at the NASA Manned Spacecraft Center.

The Training Section of the MSC Personnel Division administers the MSC Graduate Study Program with guidance from the Graduate Study Steering Committee headed by Paul E. Purser, special assistant to Dr. Gilruth.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

Hunter 3-4231 MSC 65-55

C. W. MATHEWS' NOTES FOR PRESS BRIEFING

PREFLIGHT ACTIVITIES

Count initiated at 2:00 a.m. EST and proceeded ahead of schedule until hold was called. A nut seal on oxidizer discharge pressure transducer in the launch vehicle leaked slightly. Nut was backed off and retorqued to specification value and leak stopped. Hold called at T-35 for 24 minutes to observe and insure no leak.

No spacecraft problems during count. No Control Center or network problems. Crews ingressed 20 minutes ahead of schedule.

No problems in ingress procedures. Communications were good, and crew was aware of status at all times. Crew had some discomfort during waiting period but no noticeable pressure points. Only new event was noise and vibration when fuel prevalves were opened.

POWERED FLIGHT

Lift off at 7:24 am EST. Crew could hear engines start but actual lift off undetectable (called out by cap com, also event timer start is cue).

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Pad damage minimal and less than on GT-2.

Shortly after lift off crew could see motion against sky background (including initiation of pitch and roll programs). High engine performance (thrust) resulted in slightly lofted Stage I trajectory but never out of bounds.

Stage I flight very smooth with little vibration and lower noise levels than expected. POGO oscillation hardly detectable. Staging was readily detectable by noise change, abrupt but smooth acceleration reduction and a momentary flash of flame around spacecraft as a result of "fire in hole" engine start.

At initiation of radio guidance, vehicle pitched down rapidly to point nose slightly below horizon and then nose gradually rose to slightly above level attitude.

Stage II flight also smooth, but slight throbbing noise apparent. Backup guidance system showed moderate pitch error during last half of Stage II flight but would have given satisfactory orbit.

Insertion conditions accurately achieved. Velocity was about 12 mph low. Lowest altitude of orbit (Perigee) was correct (100 miles); highest altitude of orbit was 140 miles.

ORBIT

SECO readily apparent from loss in thrust and entry into weightless flight. Crew at no time experienced any disorientation, nausea

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The command pilot had been instructed to fly a fixed bank angle during reentry. This bank angle would have been correct to achieve the desired landing point had the expected spacecraft lift been obtained based on both GT-2 and wind tunnel results.

Actually significant lift was obtained because the peak acceleration encountered was 4g as compared to 8g if the lift was zero. Nevertheless, the lift was only two-thirds that expected and the spacecraft landed about 60 miles short. The onboard guidance system did pick up the discrepant condition throughout the reentry, and if its display had been used early in the reentry, the landing desired point would have been more closely achieved.

The command pilot, however, did as he was instructed and held the fixed bank angle. At the same time he did believe the display and late in the reentry did roll to full lift. It was too late to correct the error and he then informed the ground that he was landing short.

Now that the onboard reentry guidance has been verified and the lift capability of the spacecraft is more precisely known no future problems are anticipated and no spacecraft modifications are envisioned.

The landing system operated precisely as planned. There was a surprise in that when the spacecraft went from a heat shield down

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position to its landing attitude while on the parachute the sudden rotation caused both crewmen to bump their visors against the spacecraft windows. Because the acceleration on the pilots heads in this maneuver is about that experienced in aircraft carrier landings it is felt that the crew could handle the condition if they are prepared. Tests are underway to confirm this assumption. The actual landing in the water was relatively soft and there was no evidence of spacecraft leaks.

RECOVERY

The crew became quite warm while waiting on the water and ultimately doffed their pressure suits. Both encountered conditions of sea sickness -- one to a somewhat less extent than the other.

The aircraft carrier in the prime landing area tracked the spacecraft during the final stages of the flight and knew rather precisely the landing location prior to the actual landing. It dispatched its helicopters the same minute that the spacecraft touched down.

Several recovery aircraft obtained voice communications with or DF fixes on the spacecraft prior to landing. The DF fix was reported one minute after landing. An aircraft was "on top" 13 minutes after landing and immediately proceeded with deployment of its pararescue team.

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Twenty-five minutes after landing the prime recovery helicopter arrived on scene. It dispatched its swimmers who attached a flotation collar to the spacecraft. Fifty minutes after landing the trasnfer of the flight crew to the helicopter was commenced and about 20 minutes later they were on the carrier deck.

The aircraft carrier proceeded to the spacecraft, had a line attached slightly over an hour and one half after the landing and the spacecraft was on deck about 10 minutes later.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-56
May 3, 1965

PRESS BRIEFING - C. W. MATHEWS

I guess we'll hit GT-3 first. I don't have any real surprises for you. I thought that I'd just phase on to the mission and indicate the various things that happened during the mission and what our evaluation of these happenings are. As far as preflight activities are concerned, we initiated the count at 2:00, as you know, and we actually were running ahead of the count, both on the launch vehicle and the spacecraft. Most of this count was running about 20 to 30 minutes ahead of time, and we will do some modifications to the count on 4, to take advantage of our experience here, that indicates here that you can probably shorten a few things up. As a result of this being ahead of the count, we actually put the crew on board early, about 20 minutes early, and this did not seem to produce any really detrimental effects. I think both the crew felt a little uncomfortable, sitting there, but, in talking to them about it, they didn't seem to have any pressure point problems, or anything like that. This is more or less just being generally a little bit cramped, having, I guess, spent over two and a half hours in the spacecraft before lift-off. And they also felt that there was nothing that occurred at that time, in the way of tiredness or anything else, that affected their performance at all, during the mission.

The spacecraft, of course, had essentially no problems during the count. The launch vehicle did have one problem, which was a leak in an oxidizer discharge pressure transducer seal. This was fixed simply by backing off the nut on this seal and then going back to the spec torque, and the leak stopped. Actually that was done while the count was in progress, but it was decided to call a hold at T-35, so that there could be additional time for observing this, to make sure the leak was indeed stopped.

Communications were very good, according to the crew, at this time. They were aware of the status at all times, and the only event that occurred that they hadn't really experienced before in the simulations was the noise and some of the vibrations when the fuel prevalves were opened - the gush of fuel down into the engine compartment essentially does create some noise and vibration. They had been briefed on that, so they knew what it was.

So, the lift-off occurred at 9:24 and, although the crew could hear the engines start all right, they had essentially no idea of when the lift-off actually occurred, lift-off being very smooth. Of course, the lift-off is called out by the CapCom and also the event timer in the spacecraft starts. So both of these things were called out and they were aware of lift-off from these sources. But it is an interesting fact that they couldn't determine the exact lift-off point. Of course, we do want to make sure they are adequately informed of this, in that one of the more critical abort situations does occur right at that time.

As far as pad damage is concerned, it was very minimal, and actually less than on GT-2, which we thought was very good. We were able to again turn this pad around pretty rapidly.

Just a few seconds after lift-off, however, they could see the motion of the vehicle as it rose. As I recall there was essentially no clouds in the sky but apparently there was enough granularity in the sky so they can actually detect motion. And, of course, you can generally see this in movies, too. And they could, in fact, out the window see the roll program on the vehicle initiate, and the pitch program initiate.

The only thing slightly off nominal in first-stage flight was again these engines on the launch vehicle operated hotter than normal. By hotter, I mean there was more performance than we normally had expected them to - and this, in combination with the normal pitch program - we actually went to a higher altitude before we staged than we had expected to. Our trajectory was never out of bounds but it was higher - generally higher - than normal. This has been a consistant situation on all the Gemini flights, indicating that the engine model that we're using is not adequate for the Gemini engines and it is being revised and also a slight revision to the pitch program to account for these hotter than nominal engines. Again, when I say hotter I'm not talking about temperature. This will actually give us some increased payload, because when we go into a lofted trajectory, we actually - it's a less efficient trajectory.

The stage one flight was very smooth. The crew actually noticed very little vibration and the noise levels were actually lower than they had expected them to be. We had had various simulations, for example the launch simulations for abort studies that were made up at Ling-Temco-Vought, it turns out the noise simulation there was considerably - the noise level there was considerably higher than they experienced in flight.

Staging was, of course, readily detectable, noise change, but smooth - reduction in acceleration from the order of magnitude of 5 to 6 g down to less than one g. There was a momentary flash of flame around the spacecraft, which is a result of the light-off of the second stage engine, which is a "fire-in-the-hole" light-off - that is, the engine is lit-off while it is still attached to the first stage and the baffling effect of the first stage and the low pressure at this altitude is such as to cause the whole vehicle to momentarily get enveloped in the flame.

Question: Did it blow back, Chuck?

Yes. We had already taken movies of Titan II operations in flight and had - were aware of this effect and they had been, again, briefed on this so that they didn't regard it as anything unusual.

Then being in this relatively high trajectory, at the initiation of the radio guidance during the first stage, we're just on a programed flight. The radio guidance then takes over and steers out any errors and it made a smooth, rapid pitch-down to where the nose of the vehicle was actually pointed below the horizon and then gradually came up to about on the horizon. The vehicle essentially just rested that way for the entire second stage. In other words, the trajectory was flown on the first stage resulted in essentially very little maneuvering, other than this initial pitch-down of the vehicle during second stage flight. It stayed in essentially a level attitude. As far as stage two flight is concerned, there was a little bit more of a throbbing noise apparent, possibly because it's just a single engine operation.

The back-up guidance system did show some moderate errors during the last half of the second stage flight. This has been established as the result of a gyro-drift problem - the magnitude of the errors actually would have given us a satisfactory orbit had we switched over on to the back-up guidance system. Of course, that wasn't necessary on this flight, and, in fact, the insertion conditions were accurately achieved - the velocity was about 12 miles an hour ow - and I think you know the figures - the lowest altitude of the orbit was about 100 miles high - statute miles - and the highest altitude of the orbit was about 140 statute miles high.

Again the cut-off of the second stage of SECO was readily apparent from the loss of thrust and the entry into weightless flight. I should point out here that at no time during the flight did the crew experience any abnormal physiological conditions - there was no disorientation, nor nausea, nor any similar effects. We haven't experienced that sort of thing in our flights to date and, on a three-orbit mission, we hadn't expected to experience it.

The Command Pilot then took over control of the spacecraft at SECO and oriented the spacecraft for a short separation burn of about ten feet a second. He not only does that but, of course, he - the spacecraft enters orbit on its side and then he rolls about 90 degrees at that time and he had no trouble making the roll. And actually holding the attitude for this insertion burn and got the correct velocity increment.

Then the crew started going through the insertion checklist and I guess the only comment here is that they were busy - busier than we thought they were going to be - that is, it took them a bit longer to go through everything we wanted done at that time - that we had allocated to them. But they just took longer. However, just after leaving the Canary Islands, this dc converter exhibited intermittent operation. Actually, it had shown some intermittency for a period of about 12 minutes before the more-or-less permanent failure occurred. What happened here is that a substantial number of the crew's cockpit displays did go out at that time. This type of thing had been simulated on the mission simulator and it does give you an idea of what the human crew does for a flight, because you could look at one instrument and you would wonder what the trouble was. But by knowing that this combination of instruments has gone out, they were able to diagnose rapidly that it was, in fact, the dc converter, and they simply switched the back-up one on the line and got their displays back and proceeded throughout the rest of the flight on that basis. Actually, what the failure analysis shows on that converter - of course, it's also nice to get these things back and this is in the reentry module - it proved that a nut that was holding a filter down backed out and was floating around in the converter and shorted out some lines. The problem here is really a faulty application of the locking device that was used and a new locking device has been incorporated in all of the converters that we're now flying.

Also during the first orbit, the Command Pilot noticed this slight tendency to yaw to the left - or to continually swing if he didn't control it. Actually, this is a very slight tendency but if you let it go awhile it could build up where it was reasonably noticeable and really was primarily a nuisance factor. However, the question immediately arose as to whether we had some leaky propellant out of one of the thrusters. This proved not to be the case; looking at the fuel utilization around the first orbit, we established that there was no unusual amount of fuel being utilized other than what we had expected. So we had a fairly high degree of confidence that it wasn't a propellant leak. At that time we began thinking that this water boiler, or this launch cooler, that is used in the initial phase of our orbital operation, might be producing the thrust and that in the process of boiling this water, it dumps it overboard and actually the direction of the dump would produce this yaw left tendency. Subsequently, in the postlaunch thing, we correlated this very well, both in terms of the magnitude of the thrust produced and the times at which this was apparent, with the dumping of this water. So the fix on that, again is fairly straightforward. It's just a matter of putting some diverters on the outlets and guidemains so that we actually dump it - so that its line of action, or thrust, goes through the c.g. and we don't get a rotation out of it.

Over the Indian Ocean, the crew switched this cooling system over to the space radiators. What we do is we take off and initially we boil water for cooling. We wait for the space radiator to cool down and then switch over to it. This means we don't have to carry beaucoups amount of water on the flight. The space radiator worked exceedingly well. The environmental control was good throughout the flight - the crew was comfortable at all times, although they did comment that they noticed some tendency for heat to build up during very active periods. However, this is - I don't regard this as unusual because any time you're active you usually - there is some tendency for heat to build up here on the ground, even if you're in a very comfortable room. Of course, as soon as they stopped, they immediately became cool again.

I emphasize the environmental control because, on Mercury, as you know, we did have various troubles, particularly on the first orbit, in getting things all set up. It looks like we don't have that kind of trouble with this spacecraft, and this is the first time we have had to find out. It looks like we learned some things from Mercury. The control system, itself, the crews were very high in the praise of it. This is the hand controller and the autopilot - and the thruster part of it. Every mode, they liked very well. They liked certain modes for certain purposes - the pulse mode for tracking and the rate command mode was the - obviously the easiest one to fly, etc. But they thought they had very good flying qualities throughout. The mission simulator had almost exactly duplicated the characteristics that they experienced in flight.

Then, at the end of the first orbit, the pilot, of course, did make this Texas burn maneuver. This was accomplished quite accurately, in that the resulting orbit - we essentially circularized the orbit - was within two miles of the orbit that we had planned before the flight. And I might point out that, because the initial orbit was slightly different than we had planned, the actual adjustment that was made was different than the nominal value.

Then, during the second orbit, the Command Pilot did notice some discrepancies between his cockpit display of attitude and what he was seeing outside the window. You know, he has this eight-ball - which essentially gives him roll, pitch, and yaw attitudes and a number of other functions. And, particularly in roll, he noticed the tendency of the eight-ball to slowly drift with respect to the horizon. It turns out that this problem is a procedural one. Early in the first orbit, he went into a mode in which he alined his inertial platform. And it turned out that we did not give him enough time in his preflight briefing to get the yaw axis of this platform perfectly alined. The way it works is that the - I don't know how much detail I should get into here - but, essentially the horizon sensors sense pitch and roll attitude and this is what enables you to level the platform in pitch and roll and then you aline it in yaw after you've got the pitch and roll all lined up, by sensing whether there's any rate of going around the earth. If there's a component of that in roll, then you know you're not in line properly, because it should only be in pitch. I don't know whether you can follow that or not. Anyway, it does take a longer time to aline it in yaw and we've subsequently got back and looked at the alinement procedure and realized that we did not give him enough time. I might mention that we, just to check out this mode, deliberately created some rather large errors. We had a maneuver off, and then caged the platform, and then uncaged it and let everything go to work. Even in the process, when he had it caged, he rolled further than he planned to by something like 7 degrees, because the eight-ball no longer was serving as a reference to him; it was locked up at that time. So he started out with bigger errors than he thought. So it's just a matter of saying that we're going to have to give him, instead of about five minutes' time, about ten minutes' time to get this alinement. And the reason that it drifted in roll, and again this may be a little hard to follow, but as you go 90 degrees around the earth, and you're torqueing the platform at orbit rate, the yaw error becomes a roll error. You'll have to probably do a little thinking about that, but that's why he saw this thing gradually drifting around in roll.

Question: What reference does he use for yaw in this alinement?

Actually, you see up here - if you're going around the orbit, if you've got it lined up in pitch and roll, then you're going around the orbit, of course, making one revolution per hour and a half of your spacecraft, as compared to an inertially stabilized spacecraft. Now, if he's off in yaw, then you see a roll rate as a component of that. For instance, if you're pointing off the orbit like this, it's not a pure pitch rate - it's partly a roll rate. So you sense that, and then you say, "Well, I've got so much roll rate, due to this orbit rate. I'll swing and kill it off. And you keep alining the platform until you've killed it off and you have just a pure pitch rate, you see.

Then, let's see. Also during the second orbit, Young did evaluate the food and waste management aspects of the spacecraft. I guess, to sum that up, you'd say that, "Yes, the operations are somewhat more cumbersome than they are here on earth in your own bathroom or your own kitchen." But they were felt to be adequate for the subsequent flights. Really, the most difficult part about it is the fact that the food and certain other things require certain packaging and unpackaging and repackaging, etc., and, with the pressure suit on, this is not quite as convenient as in, as I said, your own kitchen. We did find that we again didn't give them enough time. This, unfortunately, with a three orbit flight - it is true that there's a lot of things to do and you rush the fellow along pretty well and he didn't have really enough time to make as complete an evaluation as he would like to make. I think, however, there's no indication that we have any problems here.

Near the end of the second orbit, there was a break in the clouds. As you know, the land areas, particularly associated with the - well, pretty much all of the land areas around the world were cloud-covered that day - but there was a break as he come up on the west coast of the United States and they did acquire a small town - Mexicali - in Mexico, and tracked it and took some pictures of it. They did get some excellent color photographs of that general area. I don't know if these . . . .

The final orbit, of course, was mostly occupied with the systems checks that we do in preparation for retrofire. We look at the various modes of the ECS system, for example, and ultimately go through our complete retrofire checklist. Of course, I forgot to mention that on, and you're aware of it, that we did make some out of plane burns over the Indian Ocean on the second orbit. Again these were accurately - and the postlaunch analysis shows that these were actually accurately made down to the exact mile an hour. But the last thrusting maneuver was this larger maneuver of the order of magnitude of about 70 miles an hour. And this was the maneuver that put the spacecraft on a gradually reentering trajectory. People quoted a perigee altitude of 45 nautical miles - I forget what that is in statute miles - a little bit more than that. But it did put it on this gradually reentering trajectory. In other words we quote a perigee there, but really the atmosphere will catch the spacecraft there and bring it on in under those conditions. You did reduce the speed about 68 miles an hour at this time, which was within about 2 miles an hour of the desired value. This is the maneuver, though, that you desire to do rather accurately because there is a rather high sensitivity to the magnitude of this velocity to the touchdown air. And he was actually somewhat high on this velocity, which contributed to the requirement to stretch the glide so-to-speak. Similarly on the actual retrofire, the velocity was two or three miles an hour slow and this added further to the requirements to stretch the glide a little bit. During the actual retrofire operation, the Command Pilot was able to hold the spacecraft within just a few degrees - I'm quoting here the actual measured values and not his opinion - but it does show that he was able to control the retrothrust quite accurately. And during the actual reentry, the Command Pilot, of course, was flying under essentially a manual mode, a direct mode where his control stick was directly providing the thruster firings. And, as you know, we had him set up a particular bank angle to fly during the atmospheric part of the reentry. And the results in these show that his average excursion from that bank angle was only about 3 degrees. The spacecraft was very stable, just like GT-2 was. He had to spend very little time damping any oscillations. I think he only provided control of that type four or five times during the reentry, each time they would allow the oscillation to build up to nine degrees a second and he would just hit the controls very briefly with the properly phased thrust and immediately go on back down again.

As I said, the pilot had been instructed to fly fixed bank angle. This bank angle that was given him would have been the correct bank angle if the spacecraft had achieved the lift that we had expected out of it. That lift that we had expected was based both on our GT-2 results, as well as on wind tunnel results, the wind tunnel results correlating very well with the GT-2 data. Actually, we did get very significant lift out of this spacecraft. As I indicated the retrofire operations put a requirement for an increased glide on the spacecraft. We certainly made up that discrepancy and more, but more significantly the acceleration that was felt on the crew during reentry was only about four g, whereas if we came in at zero lift it would have been about eight g. Nevertheless, this lift was only about 2/3 of what we had expected it to be. And as a result of that the spacecraft did land about 60 miles short. The onboard guidance system did pick up this discrepant condition throughout the reentry, and if its display had been used earlier in the reentry, the desired landing point would have been more closely achieved. We still wouldn't have made it but it would have been considerably lower in error. The Command Pilot, however, did as he was told, and he held the fixed bank angle. I might just point out why we did that. This is the first time we had ever reentered under automatic control. We thought it might be more desirable to set this thing up as programed reentry and this time follow the needles and see whether they were operating right. However, apparently the Command Pilot - Gus - did have confidence in what the displays were telling him, because ultimately he did roll out and attempt to stretch his glide; unfortunately, that was too late. He did, of course, come on back in at that time with the indication that he was landing short, while he was still at fairly high altitude.

Now that we've verified this onboard guidance system and we know what the lift capability of the spacecraft is under these particular conditions - and I might mention the reason for the difference between GT-2 and GT-3, as far as lift capabilities are concerned - aerodynamics are frequently greatly affected by the path you're flying through the atmosphere - if you fly high at a so-called lower Reynolds number, you may have one set of aerodynamics and if you fly lower altitude at a higher Reynolds number, you may have another set of aerodynamics. This is a parameter that is always looked at before you do any aerodynamic testing. However, testing at these extremely high mach numbers on the order of 20 is more difficult and it is more difficult to obtain the amount of data that you normally have in, say, testing a subsonic or supersonic airplane. So for our actual orbital reentry conditions the flight data has given us the best fix we probably will have on what the actual aerodynamics are and now that we know them we don't anticipate having any more problems. The footprint we feel is still big enough to take care of our errors. It is just a question of getting more precise information on what these numbers were.

The landing system operated precisely as planned. There was a surprise there, which you've heard about, where normally we are coming down with the blunt heat shield facing down and then to get to our landing attitude on the spacecraft we flip the spacecraft over about 45 degrees - or 55 degrees - and during this time the crew is a bit surprised at the jerk that they got when this happened. Their heads actually went forward and bumped the windshield area rather hard. We looked at the GT-3 results and the accelerations on the pilots' heads are no greater than we had in any of our drop tests. We had in our 50 to 60 drop tests about 2 to 2-1/2 g. And this is not unusual in terms of the accelerations that are experienced in the carrier landings, something like this. So that, although we've got tests under way to verify this, we think, if they're prepared, they can cope with the problem. We are actually running some of these inversion tests on a spacecraft presently and one of the problems we run into is the usual thing of trying to really simulate that good because the flexibility of the parachute risers, etc., have to be simulated fairly well on the ground tests where we're hanging a spacecraft up from the rafters and we don't have the complete answers on this yet.

The actual landing on the water was relatively soft. There was no evidence of any leaks in the spacecraft. During recovery the crew became quite warm as we had expected while waiting on the water. We normally would have had them doff their suits a lot earlier than they did. They did wait a considerable length of time before they took their suits off, and they ultimately did. But by that time they were pretty warm. Of course, both of them encountered seasickness to some degree - one somewhat more than the other.

As far as the recovery is concerned, it was a very straightforward recovery operation. I'll go into that in a little detail because perhaps some confusion exists on this. Actually, in the first place, the aircraft carrier in the prime recovery area tracked the spacecraft pretty well all the way in. In other words, not only during the high altitude part, but down to earth. The radar's elevation angle went to zero, so it knew exactly where the spacecraft was, relative to the location of the carrier. And just about the time it lost track, then it immediately dispatched the helicopters. That happened to be the same minute the helicopters were airborne - the same minute the spacecraft touched down - and sent them downrange to the - I'm sorry - uprange to the location they knew the spacecraft to be. Several recovery aircraft had communications before the spacecraft had even landed - one was in voice communication and another was receiving DF - UHF-DF fixes on the spacecraft. Several others immediately after landing also had these fixes. Actually the DF fixes on the aircraft were first reported only one minute after the spacecraft had landed. There was an aircraft over the top about 13 minutes after the landing and they immediately proceeded with the deployment of their pararescue men. Then 25 minutes after the landing the prime recovery helicopter got there - the one dispatched from the carrier. It put its swimmers in the water to attach the usual flotation collar on the spacecraft. Then 50 minutes after landing, the transfer of the crew up to the helicopter took place. And 20 minutes after that, they were on the deck of the carrier. So it was about an hour and ten minutes between the time that they landed and the time that they were on the deck of the carrier. Of course, the carrier then proceeded to the spacecraft - it was chugging up there all the while - and it had a line attached to the spacecraft in about an hour and a half after the landing and it was on deck about ten minutes later.

Looking at the recovered spacecraft, it really looks very good. There was nothing that came out of the postflight inspection that was unusual. The external surfaces of the spacecraft are quite clean and no great evidence of - no unusual evidence of high temperature - no particular hot spots. The heat shield has a much whiter appearance than on GT-2, and this is primarily related to the different ablation process that occurs during this kind of reentry - which more heat is put in but at a slower rate than in the GT-2 reentry which was a much steeper one. In GT-2 there was more external evidence of charring and I'll say we have a very considerable margin in this heat shield.

Question: What kind of temperatures are you talking about, Chuck?

Well, it depends on what you're talking about but the temperatures, say, in the back end of the heat shield are only about 200 to 300 degrees. That's the one that's most significant.

Question: The outer edge?

This is at the bondline structure between the structural honeycomb and the heat protection material, itself. So there's very little temperature that soaked through at all.

As far as experiments are concerned, two of them were successful, and one of them wasn't. The sea urchin egg experiment - we weren't able to produce on that one, largely because of a failure of the handle that activated the experiment. As a result of this thing we're taking a much harder look at our subsequent experiments to make sure that they are satisfactory for the experiment's own sake. In a program like this, we have paid a lot of attention to make sure that these are satisfactory from a flight safety standpoint. We will put more emphasis on making sure that they really work.

Haney: In this one I think it's worth making the point that Grissom is not just a Charles Atlas. A guy broke a similar piece of equipment on the ground at the Cape with one twist, so it really was the equipment, huh?

That's right. On experiments, naturally, we have a large class of people working on this all the way from scientists down to even non-scientific people but many of them don't, of course, know all the things that are done in terms of qualification. We have worked very hard with them on this; but, at the same time, it's something that sort of has to grow a little bit with the program.

The other two experiments worked out well, I guess. This blood cell experiment - well to the extent that they got a negative result - that is they did not find any unusual aberrations associated with the space environment or the subjecting of the white blood cells to the space environment and radiation at the same time. As you know, they were running a base-line case here on the ground at the same time, timed right along with the one going on in flight and there was no significant difference in these aberrations. As far as the reentry communications experiment is concerned, I personally haven't heard all the data but they did have data from three of the downrange stations, all of which correlated the fact that there was considerable improvement - well, in some cases, it was a case where they were getting no indications of a carrier at all without the water injection and with the water injection, in all cases, there was either considerable improvement, or a case of going from a non-communicating condition to a communicating condition. So it appears that, for future space programs, I don't know that we'll really do anything with it in Gemini or not, but in future space programs where you want to have communications throughout the blackout period, this is a good possibility.

Question: Chuck, you don't intend to repeat it on any of the Gemini flights?

Answer: Not at the present time, Warren. I think that's all I have, Paul.

Haney: Any questions on 3?

Question: Will you use this onboard guidance system for the next flight?

Answer: Yes, we plan to - I'll explain that a little bit. We'll always call up a backup bank angle, simply because if, for some reason or another, the platform, or something like that, obviously is not working, then you want to have information on which to come on in. And, of course, under those conditions you would have a somewhat greater dispersed trajectory. But, if the guidance system is indicated to be operating properly we will use it.

Question: In Washington last week, Dr. Mueller added another element to this undershoot. He said that they began by taking out the cross-range errors, with the idea of taking the downrange errors out later, but by the time they got around to taking the downrange errors out, they ran out of lift, and therefore couldn't do anything about that. Could you explain that a little more?

Answer: I think what happened there was the crossrange error did come out first - in fact, the crossrange error was practically zero; in terms of where he landed, the crossrange error was zero. The bank angle he flew was intended to take out the cross and downrange errors more or less simultaneously but, with the lower amount of lift he should have been flying at a steeper bank angle which would have traded off the downrange and crossrange better for the actual case. And this is why he got the crossrange out before he got the downrange out.

Question: Then an attempt was made to take them both out at the same time?

Answer: They would have gone out at the same time on this flight if the lift had been proper.

Question: Chuck, what does this cut your footprint or control area down to?

Answer: It cuts it about in half, Warren, but it still is several hundred miles, so that's quite a bit of maneuvering.

Question: About how many, can you give a rough figure on how many cross and down you will have now?

Answer: The length of the footprint is about, under the present conditions, is about 200 miles and the crossrange area is about 17 miles.

Question: On either side of the target?

Answer: Yes. Now actually we could up it about any time we felt like it by just reballasting the spacecraft to go to a higher angle of attack. We don't think that's necessary at the present time. We're still looking into it.

Question: 200 miles total length would that be, Chuck? Or 200 either way?

Answer: 200 miles total - the 17 is plus or minus.

Question: On this hot engine - do you plan to make any changes in the engine itself, or just in the pitch angle?

Answer: No. We don't have any objections to the engine having a higher specific impulse and higher thrust. It gives us better performance actually. It's just a matter of accounting for the fact that it's the condition that exists.

Question: What will you do to offset this? Can you describe that again?

Answer: In the first place, you use an analytical model of the engine in figuring out which trajectory you fly. So you first set up this analytical model that represents your engine and, as I say, this is adjusted to now represent the Gemini engines better, based on our experience. And the ultimate result is that we pitch the - because it operates with higher thrust, you pitch it over a little faster and you really end up flying the same trajectory as you had intended to if you were operating at lower thrust.

Question: Because of this, you can carry a little more payload?

Answer: That's correct.

Question: What will that translate into - 50 or 100 pounds before you start getting a mass problem?

Answer: Actually, there is no structural problem there at all, Warren. We could go up to a lot higher thrust - but it should amount to 100 pounds a payload, something like that.

Question: Chuck, what did you say you have to go through to prepare the crew so that their heads wouldn't snap forward upon landing as they did on this flight?

Answer: Our present thinking is that it was primarily just the surprise element. We had not briefed them that this was going to be so severe. We looked at this and said 2-1/2 g and this isn't too unusual. Obviously, for example, when a fellow is making a carrier approach and hooks the arresting system with his airplane, he's aware that he's going to stop fairly shortly. And this was not the case. We think that probably just telling them about it and the knowledge of this is good enough. But this is yet to be proved, as I point out here. There are other things we can do, if we have to, which would - I mean rather than just use a simple disconnect and going through this bridal condition in a nylon strap - put some shock absorbers in it, or something like this. But we don't think we have to do that at the moment.

Haney: You want to say a word on GT-4, Chuck?

Well, GT-4 is still going along very well. I don't have too much to say about it. We really haven't run into anything worth talking about. We went into joint combined systems test with the launch vehicle in the last week. Next major operation we have, of course, is the wet mock simulated flight - we have G&C testing, etc., to do in between those tests, but we're moving along in the planned program and nothing has come up to deviate from our plans. I think you can see here that we really haven't come up with anything on GT-3 that impacts strongly on GT-4.

Question: When is the wet mock?

Answer: It'll be around the middle of this month.

Question: How are the checks with the Mission Control Center here coming along? Dr. Mueller indicated last week that possibly you're not quite ready yet and that this is going to be - that launch date will depend a lot on how you come along with the Mission Control Center here.

Answer: The last time I talked to Chris, he indicated it was coming along per plan. The hardware part of it has shaped up very well, and it's really the software, which you are doing more or less continuous checking on all the way along here now and in which something could come out of the woods on you. But nothing like that's happened. It's moving along in accordance with the plan.

Haney: I believe they have had that simulator program running.

Question: That's correct.

Haney: Which was the big worry. They actually tied the Cape simulator in very successfully and will be able to participate, then, in all the prelaunch sims.

Question: They have been using it?

Haney: Yes. It tested out well.

Question: Will you keep a control capability at the Cape on standby for the first orbit or so?

Answer: There will be a launch control capability at the Cape and, in addition to this, the Goddard computers will be programed, and on standby, for orbital trajectory operations. So there'll be a reasonable capability backing up the MCC here.

Question: Chuck, you will have the crew in tempo there, too?

Answer: There'll be a crew there because it is a normal network station. Of course, it's an augmented crew for launch, anyway. But we are really to that primarily as a launch backup. The Goddard thing I alluded to really amounts to sending the information down here.

Question: If something went wrong here, could Goddard control the flight or would you have to terminate it fairly quickly?

Answer: No, the way it looks to us, we would not control the flight from Goddard, but with the Goddard backup information it would be possible to continue on with the flight.

Question: Anything new over the weekend on the EVA experiment?

Answer: No. We're still moving along with our work.

Question: Still hoping?

Question: What exactly is the work?

Answer: We have, of course, had an EVA program going on for a substantial length of time and the work is involved in the qualification of various equipments - even the EVA suit, although you may have heard that it's completely qualified, this is not true. There's still some testing going on on it. That's typical.

Question: What remains in the suit work and the hatch, your spacecraft pressure work to still be worked out? Is it considerable?

Answer: No. We've progressed to the point where I do feel that it's very unlikely that we'll come up with a suit problem.

Question: That we would not?

Answer: That we would not - it's very unlikely that we would come up with a suit problem.

Question: So that means that the major problems are with the spacecraft?

Answer: No. We have a number of areas where we are actually still continuing to conduct tests. The test program has generally moved along so things look pretty good, but we never can tell what might crop up. Everything is in the mill.

Question: What are the nature of the hatch tests?

Answer: We have, of course, done many, many hatch tests, some starting a year and a half ago, etc. But the ones that are of significance that we have completed recently are the hatch cold-temperature tests, demonstrating that you can open and close the hatch, for example, under extremely low temperatures. If the hatch is opened, for example, and is radiating to space from both sides it can get quite cold - say, minus 50 degrees or something like that. You want to make sure that, with the differences in temperature of the hatch as compared to the temperature of the frame, it will open and close satisfactorily. It would be this type of thing.

Question: If everything goes smoothly in this type of testing, it still won't make any difference with the extent to which the man will emerge, will it?

Answer: That is correct.

Question: It's pretty well settled that he'll just stand up?

Answer: That is correct.

Question: What is the temperature at, say, a hundred miles above the earth?

Answer: You can't really quote a temperature because, you see, you'd almost have to catch a single molecule or something and measure its excitation - I really can't quote one because it has no significance. You have to have molecules in order to - and temperature is related to activities of molecules and there's just not hardly any up there, you see, and your temperature, say, on the surface of the spacecraft is primarily related to what it's radiating to and not determined by any external heat source. There's no conduction of something outside into the spacecraft. And, of course, in space, except for the heat that's reradiated from the earth or the heat that's radiated from the sun, the spacecraft sees essentially absolute zero. And the temperatures - equilibrium temperatures are a function of the surface condition on the spacecraft - the color of the paint and all that sort of thing determines how much heat is taken in by this reradiation from the earth and the sun, as compared to how much is radiated back out.

Question: Well, tell me would a man feel cold or would he feel hot if he were up there without any protection?

Answer: Well, again, it's the same business. You can put protective cover layers on him of certain colors and balance the radiation out as compared to the heat absorption from the radiation sources that you have, the sun and the earth, and get a temperature balance. And, of course, in an unmanned spacecraft that's all they do - they just paint stripes or particular colors on a spacecraft and they maintain it right at 70 degrees on the inside.

Question: If a man's outside, Chuck, he will feel cold at a 100 miles altitude. In fact, he'll be dead cold, would he not?

Answer: Not for some period of time - and it is even theoretically possible just to hold his temperature rather accurately at a comfortable temperature by . . .

Question: Rotating him evenly? . . . . balancing him at 6 rpm or 8 rpm?

Answer: That's right.

Question: Has anyone thought of putting a molecular thermometer, or whatever you might want to call it, aboard on the exterior of the spacecraft?

Answer: No. We've never - at least, not to my knowledge, Jules.

Question: Do you think, Mr. Mathews, do you think that's what Colonel Leonov was doing when he was tumbling - he was rotating himself?

Answer: No. He certainly wouldn't have been out there for the length of time that would require any action of that type. I'm sure his garment was fairly well insulated and he did have a fairly reasonable temperature balance to start with so that I don't think he would have had to do anything.

Question: The time that our spacemen is emerged or partially emerged - will that be comparable to the time the Russians - or Russian - emerged or shorter?

Answer: I really can't answer that. We really haven't completed that study yet.

Question: Mr. Mathews, Ed White said that they were going to perform extra vehicular activity both directly to the sun and in the shadow of the spacecraft. Is this true - that it's going to be performed more than once?

Answer: No. I don't know what - I don't know. You'll have to ask him.

Question: You won't operate the thrusters while he's extra vehicular, will you?

Answer: In the standup maneuver, I don't see any problems with operating the thrusters.

Question: Will they be operating . . ..

Answer: We haven't gotten that far yet. I don't know what he's talking about.

Haney: He means that forward firing thruster - will that come over the hatch?

Answer: It's off center.

Haney: I think it's past the time that you have here.

Chop: Okay.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-57
May 7, 1965

HOUSTON, TEXAS -- The first development test of a possible landing rocket system for the Apollo spacecraft is scheduled to take place here Tuesday with the drop of boilerplate spacecraft from a crane into a 700,000 gallon water tank.

The 15-foot deep tank is located on the northwestern edge of the Manned Spacecraft Center. It is 130 feet on a side, with 3-foot high retaining walls, and is lined with a plastic material.

The boilerplate is fitted with two pair of rockets and an 8-foot long altitude sensor. The rockets are mounted outside the pressure vessel in the outer rim of the heat shield and the thrust vector of the rockets is alined with the gravity vector of the spacecraft.

The rockets are identical to those used with the parasail boilerplate, each one producing 6,000 pounds of thrust. They are being tested as a possible method of attenuating landing loads for Apollo.

Structural reinforcement of the heat shield area of Apollo is the present solution for preventing damage to the spacecraft in a rough water landing. If the landing rocket system proves desirable,

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it would cut several hundred pounds from the weight of the Apollo command module, in addition to providing an improved emergency and landing capability.

One more test will be conducted. Only three of the four motors will be fired in the second test to determine the amount of attenuation with a partial failure of the rocket system.

In both tests, the boilerplate will be instrumented with 14 pressure transducers on the bottom of the heat shield and accelerometers and rate gyros inside the spacecraft. Lead weight will ballast the boilerplate to 10,000 pounds to give the vehicle a drop rate of 30 feet a second. It will be dropped from 22 feet at a 27 degree angle which is the same angle at which the Apollo command module is suspended from its parachutes.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-58
May 8, 1965

HOUSTON, TEXAS -- Dr. Jeannette Piccard, educational consultant for the Manned Spacecraft Center and unofficial holder of the American altitude record for women balloonists since 1934, will be the principal speaker at the awards ceremony of the Houston Seminar of High School Sciences, Saturday, May 8, at Memorial High School, Houston, Texas.

The Seminar is sponsored annually by the Houston Council of Science Clubs and the Engineers Council of Houston in cooperation with the Baylor University College of Medicine.

The program will afford approximately 100 outstanding students from the Houston area an opportunity to make both oral and written presentations of their research projects. Students in grades 10, 11, and 12 will compete in the senior division, and those in grades 7, 8, and 9 in the junior division. Both divisions will include categories for research projects in Earth science, life science, mathematics, and physical science.

First place trophies and second place medals will be awarded to the winners in each category for both divisions, in addition to

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special awards by the Houston Heart Association and the American Institute of Chemical Engineers.

The Manned Spacecraft Center will sponsor a special competition for the National Aeronautics and Space Administration awards which will be made to the winners of technical and editorial papers. Eight winners, four each from the junior and senior divisions will receive NASA plaques and certificates. Presentation will be made by Eugene E. Horton, Chief of Educational Programs and Services, Public Affairs Office, Manned Spacecraft Center.

Dr. Piccard, who will speak on the subject, "Trials and Tribulations of Pioneering," is the widow of the world-renowned balloonist, Dr. Jean Felix Piccard. In 1934, Dr. Piccard and her husband rode a balloon to an altitude of 57,579 feet, an exploit for which she was awarded the Clifford B. Harmon International Trophy. She was also the first American woman to hold a spherical balloon pilot's license. This was granted by the Federation Aeronautique International, an organization that maintains all international aviation and spaceflight records.

Dr. Piccard has earned a doctorate in Philosophy from the University of Minnesota; a Master of Science degree in chemistry from the University of Chicago, and a Bachelor of Arts degree from Bryn Mawr College, Byrn Mawr, Pennsylvania.

The presentations are open to the general public.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas
HUnter 3-4231

MSC 65-59
May 12, 1965

HOUSTON, TEXAS -- The space suit for the lunar landing mission is the only operational equipment which must be designed to go all the way to the surface of the moon and return to earth.

The Apollo suit, being developed by Crew Systems Division of the Manned Spacecraft Center, for use on the lunar surface is not a single garment, but an integrated series of garments. It is designed to provide the astronaut the best possible protection against the environment he will encounter on the lunar surface.

The entire suit is called the Extravehicular Mobility Unit and it must shield its occupant against extremes of temperature from minus 250 degrees Fahrenheit to plus 250 degrees Fahrenheit. Micrometeoroids and the complete vacuum of space are two other hazards it must withstand.

The well-dressed astronaut would wear the following assembly when he steps onto the lunar surface.

The first layer is a liquid cooled undergarment. Through earthbound tests, scientists have determined the heat load an astronaut would generate while working on the lunar surface. The

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best method of cooling the astronaut under these conditions is by circulating cool water through small tubes which are in direct contact with the skin.

The second layer of the astronaut's attire is the pressure garment or the actual suit assembly. It must be pressurized while the astronaut is on the lunar surface to protect him against vacuum. The soft pressure garment tends to take a spherical shape when pressurized, so joints must be built into the suit to provide mobility.

Mobility can vary in different joints of the suit, and engineers must design each suit joint to give the greatest mobility for its corresponding human joint. For example, a knee joint needs only a flexure or bending movement. It would not be acceptable as a shoulder joint, which must make many complex motions.

Covering the pressure suit is micrometeoroid protection garment. It is composed of lightweight materials arranged to provide as much protection from meteoroids as a thin sheet of aluminum.

The astronaut's attire is completed with a thermal overgarment composed of many thin layers of superinsulation with a white synthetic fabric as an outer layer. Thermal mittens protect the hands and are provided with slit openings in the palms to permit egress of

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specially insulated gloves when tasks requiring finger dexterity must be performed.

The suit, including the thermal and micrometeoroid garment, weighs less than 50 pounds. The backpack which supplies oxygen and ventilation to the astronaut on the lunar surface weighs 60 pounds, and emergency oxygen and communications weigh ten pounds.

While wearing all this equipment, the astronaut must be able to walk over the surface and perform many tasks

The suit unit was taken to Bend, Oregon, recently to be tested in terrain similar to conditions expected to be found on the moon. The tests indicated that some joint areas, particularly in the thigh and ankle, need improvement to allow the man to move and perform assigned tasks more easily.

MSC engineers are pursuing a development program to cut down weight and bulk of the outer layers to provide more mobility and several alternate approaches have been suggested.

In one concept, micrometeoroid and thermal protection would be integrated as additional layers to the basic Apollo suit, as the Gemini extravehicular suit is constructed. A second approach combines the two types of protection into the basic suit below the waist, and the astronaut wears a separate covering on the upper part of the body.

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Protection for the astronaut's eyes must also be considered as part of the pressure garment assembly. Without any atmosphere to scatter and cut down the power of the sun's rays on the lunar surface, the astronaut is exposed to visible, infrared, and ultraviolet rays. Solar reflection from the space suit, the lunar excursion module, or scientific equipment can produce a blinding glare. Dark adaption problems will be created by the transition from light to shadow in sunlit areas.

As a solution to these visual problems, an adjustable visor has been designed on the helmet. It operates similar to a sun visor in an automobile, and can reflect 80 to 90 per cent of visible light, 60 to 80 per cent of infrared rays, and nearly all of the ultraviolet rays. An inner and outer visor arrangement prevents fogging due to temperature extremes.

While the Apollo suit is undergoing its development period, the Gemini suit is being qualified for early earth orbital flights.

With small modifications, Gemini suits will also be used for early Apollo earth orbital missions to allow design engineers to concentrate on development of the Apollo suit for lunar trips.

The major development effort remaining for the Gemini program is the extravehicular suit. In later Gemini missions, the astronaut

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will step outside his spacecraft for the first time, protected only by his pressure suit.

For micrometeoroid protection, a cloth material which will stop penetrating particles has been developed for Gemini. The Gemini suit will be qualified for vacuum and extreme temperature operation in the 35-foot diameter vacuum chamber at the Manned Spacecraft Center.

Since the beginning of manned spaceflight programs by the U.S the development work in suits has had two goals. First, to protect the man inside the spacecraft cabin in case of a loss of pressure. Second, to provide protection for the man venturing outside into space. An investment of $12 million in developing pressure suits for Gemini and Apollo has already been made by the U.S.

Without the space suit to protect man, the national goal of walking on the surface of the moon and gathering the scientific information cannot be met.

Ever since the late President Kennedy expressed our national purpose in reaching the moon, MSC has been working on suits which can support man in true space as found on the lunar surface.

The suits developed in reaching this goal add to our knowledge and insure the safety of the astronaut. In the meantime

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the suit provides back-up insurance should the spacecraft lose pressure during earth orbital flights.

The U.S. space suit is being designed as a mobile, lightweight item which will enable man to make space another environment in which he can work and live.

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NASA
S-65-17252

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-4231

MSC 65-60

May 24, 1965

HOUSTON, TEXAS -- The Manned Spacecraft Center was host last week to 18 honor students representing the nationally-acclaimed Project SPARC group of Northeast High School in Philadelphia.

The SPARC Project was started in October 1962 by the then 25-year old Northeast High School physics teacher, Robert Montgomery, Jr., with full enthusiastic support of other faculty members and school administrators. Mr. Montgomery has remained coordinator of the Project since its inception. A total of 91 students now participate in the project on an active, continuous basis, with another 123 students giving backup support to project work.

When the project was first started, according to Mr. Montgomery, an effort was made to simply organize "some sort of space club." Student response was so tremendous that the result was a full-fledged space research project named SPARC (for space research capsule) which had as its goals the construction of a space capsule simulator (equipment and ground control system), the preparation of student astronauts, and the testing of equipment and men in a simulated space flight.

The original SPARC members formed six committees to accomplish their objectives. These activities have expanded with time, but the project has kept essentially the same general organization, with the following committees: (1) Medical/Psychology; (2) Flight Plan; (3) Astrionics and Communications; (4) Design Engineering; (5) Life Support; and (6) Advanced Projects.

As SPARC gained momentum, interest was generated throughout the city, state, and nation. In May of 1963 the SPARC group presented three assembly programs at their high school. These were simulated launch programs, which included the display of a full-pressure Mercury suit, a test seat, instrument panel, and a ground control unit complete with flashing lights.

Then in August of 1963 the 15 highest honor students of SPARC were given a tour of NASA Centers. They visited Manned Spacecraft Center at that time also. That tour inspired even more ambitious efforts upon their return to Philadelphia and by May 1964, they had constructed a Systems Evaluation Facility (SEF). This is a 20' x 11' x 8' superstructure, completely heated and air-conditioned, which now houses a completed 3-man capsule mock-up and supporting ground control equipment. SEF, however, is only the first part of SPARC'S objective, which is to have a fully equipped capsule ready for complete circumlunar flight simulations.

This explains why the interest of the SPARC group, which just completed its visit to Manned Spacecraft Center on its second tour of NASA centers, was primarily focused on flight control simulation work.

Other areas of interest were details on the Apollo program (especially the command module and lunar excursion module), navigation instruments, rendezvous and docking, environmental control, water cooled suits, suit construction and operation, astronaut training and activities, and medical and psychological studies.

NASA has cooperated in every way possible to encourage the SPARC group, whose work parallels in many respects the government's research program on manned space flight. SPARC is a wonderful example of what the minds and energies of teenagers can accomplish when channeled in constructive directions.

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NASA
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NASA
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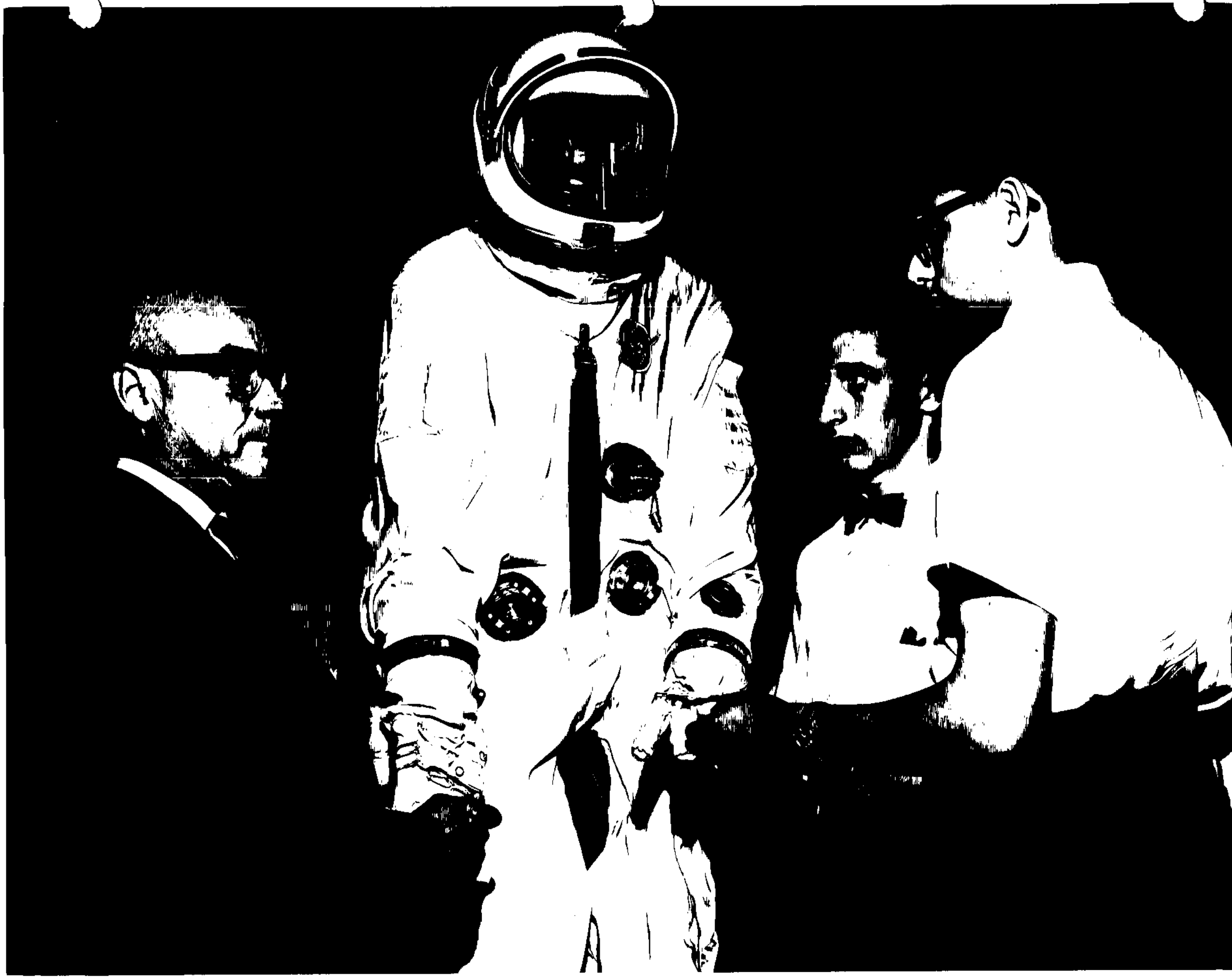

NASA
S-65-19479

GEMINI NEWS CENTER

MSC 65-61
June 10, 1965

HOUSTON, TEXAS -- The NASA Manned Spacecraft Center here is seeking proposals for an experiments package to leave on the moon when American explorers depart on their return trip to earth.

The package, called the Lunar Surface Experiments Package (LSEP), will contain a combination of instruments to measure the moon's gravity and atmosphere, heat flow and solar wind, proton activity and micrometeorite impacts for as long as a year.

The package will also contain a data subsystem, including telemetry transmitters, controls and antenna; electrical, thermal and power generation subsystems.

The experiments to be left behind are separate from the lunar geological equipment to be used by the astronauts during their periods of exploration. They will use such items as hand tools, coring devices, cameras and containers.

The Apollo lunar landing program is NASA's effort to land two men on the moon and return them safely by 1970.

The experiments package will insure that a flow of information about the moon will continue long after the astronauts have returned home.

The first step in this program will be taken June 16 when interested firms will attend a bidders conference at MSC.

Up to three firms of those responding to NASA's request for proposals will be selected for awards of separate $500,000 research and development contracts. The six-month contracts would be fixed price.

- more -

One of the three, after a review of his proposals and mock-ups, will receive a cost-plus-incentive fee contract to develop hardware to do the long-time lunar exploration.

Mock-ups coming out of the first contracts will be delivered to the Manned Spacecraft Center and to Grumman Aircraft Engineering Corporation, Bethpage, New York, manufacturers of the Apollo lunar excursion module.

The experiments packages will be delivered to the moon aboard the Apollo spacecraft, and landed on the surface by the lunar excursion module (LEM), that section of the spacecraft designed to land men on the moon and return them to the command module in lunar orbit.

Several identical packages ultimately will be left on the moon, one aboard each man-carrying LEM. The packages will operate for about a year, possibly using a nuclear power source.

As many as eight experiments are candidates for inclusion aboard the LSEP:

ACTIVE LUNAR SEISMIC EXPERIMENT to ascertain the elastic properties of the lunar surface and interior to a depth of 500 feet. This experiment involves explosive charges for seismic measurements, with the explosives set to detonate long after the astronauts have left the moon.

PASSIVE LUNAR SEISMIC EXPERIMENT to detect seismic waves from natural sources, using a three-axis, long-period seismograph and a one-axis short period seismograph.

LUNAR GRAVITY EXPERIMENT to measure the acceleration of gravity over a period of several months, using expected "tidal" effects and changes in the moon's gravity caused by seismic activity and free oscillations, possibly caused by "gravitational waves" from stellar activity.

LUNAR METEOROID MEASUREMENT to measure the flux, velocity, radiant, momentum and depth of penetration of meteoroids into an aluminum collector.

HEAT FLOW EXPERIMENT, a study of the thermal regime near the lunar surface using temperature probes "stabbed" into the surface by the flight crew, and left to transmit temperature changes.

LUNAR ATMOSPHERIC EXPERIMENTS, using a lunar atmosphere analyzer, a lunar ionosphere analyzer and a total pressure measuring gauge. These instruments will determine the degree of lunar atmosphere, if any.

LUNAR RADIATION EXPERIMENTS to measure electron and proton activity, and to measure the hydrogen/helium ratio of solar wind as it strikes the lunar surface.

LUNAR SURFACE MAGNETOMETER to determine, with well-defined accuracy, the moon's magnetic field at one or two locations.

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GEMINI NEWS CENTER

MSC 65-62
June 10, 1965

HOUSTON, TEXAS -- Robert O. Piland has been appointed manager of the newly formed Experiments Program Office at the NASA Manned Spacecraft Center here.

The new office will be responsible for developing, implementing and integrating all experiments to be flown on manned space missions, and is a part of the Engineering and Development Directorate at MSC.

Piland was formerly deputy manager of the Apollo Spacecraft Program Office, an assignment he was given in January, 1962. He joined MSC in 1959 when it was called Space Task Group.

With Piland in the Experiments Program Office will be Robert E. Vale, formerly assistant chief of Structures and Mechanics Division at MSC; John W. Small, formerly resident Apollo manager at Grumman Aircraft Engineering Corp., Bethpage, N. Y.; Norman Foster, whose entire Gemini Experiments Branch has transferred from Gemini Program Office into EPO, and William Armstrong, experiments coordinator from Advanced Spacecraft Technology Division.

Besides being manager of EPO, Piland has been named experiments manager for Maxime Faget, Assistant Director for Engineering and Development at MSC.

Piland joined the science staff of the NASA Langley Research Center located at Langley Field, Virginia in 1947. As a research

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scientist he became engaged in the development and flight testing at Wallops Island, Virginia, of rocket-propelled research test vehicles. Under Piland's supervision, three-, four-, and five-stage test vehicles were successfully developed and used to obtain unique test data in aerodynamic heating, which substantiated theories which could be reliably used for the design of hypersonic vehicles such as ballistic missile nose cones, the X-15, the Mercury Spacecraft, etc.

During 1958, Piland served as a technical assistant to the President's Advisor in the space and missile fields. At the termination of his duty in 1959, Piland was asked to take the assignment of Assistant Chief of the Flight Systems Division, Manned Spacecraft Center. Within the Flight Systems Division were organized approximately 150 technical and scientific personnel responsible for overseeing the proper development of the Mercury capsule and its various systems.

In early 1960 Piland was assigned to manage the early planning and study efforts which led to the present Apollo spacecraft program.

In 1962 Piland received the Institute of Aeronautical Sciences' Lawrence Sperry Award for notable contributions made for the advancement of the Aerospace Sciences.

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Piland attended secondary schools in Portsmouth, Virginia. He graduated from the College of William and Mary, Williamsburg, Virginia, with a BS degree in mathematics in 1947.

Piland is married to the former Myra Stanton of Brooklyn, New York. They have three children and reside in Dickinson, Texas.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER NASA Houston 1, Texas

HU 3-5111

MSC 65-63
June 29, 1965

HOUSTON, TEXAS -- One geologist, two physicians and three physicists were named today by the National Aeronautics and Space Administration to join the 28-man team of astronauts in training at the NASA Manned Spacecraft Center here.

The new scientist-astronauts will train as highly specialized scientific crewmen for the Apollo program.

They are:

Owen K. Garriott, 34, of 825 Cedro Way, Stanford, Calif., an associate professor of physics at Stanford University.

Edward G. Gibson, 29, of 2907 Via Corbina, San Clemente, Calif., a senior research scientist at Applied Research Laboratories, Aeronutronic Division, Philco Corp., Newport Beach, Calif.

Duane E. Graveline, 34, of 705 Windrock Drive, San Antonio, Tex., a flight surgeon at the NASA Manned Spacecraft Center.

Lt. Cdr. Joseph P. Kerwin, 33, of 3056 Lakeshore Blvd., Jacksonville, Fla., staff flight surgeon for Air Wing Four, Cecil Field Naval Air Station, Fla.

Frank Curtis Michel, 31, of 6415 Mercer St., Houston, Tex., an assistant professor of space sciences, Rice University.

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Harrison H. Schmitt, 29, of 709 W. Grand Canyon Ave., Flagstaff, Arizona, an astrogeologist for U.S. Geological Survey.

They were chosen from a group of 16 nominees submitted to NASA by the National Academy of Sciences, Washington, D. C. The Academy screened about 400 applications forwarded by NASA earlier this year.

Two of the six selectees are qualified jet pilots. Kerwin has been a Naval Aviator since 1962; Michel has about 500 hours in Air Force jets. They will report to the Houston space center to begin training in late July.

The others will report July 29 to Williams AFB, Arizona, to join an Air Force class of cadets for a year of pilot training, then will continue training at Manned Spacecraft Center.

Garriott and Graveline are private pilots.

The new astronauts were judged by the Academy mainly on their scientific backgrounds, regardless of jet pilot experience, unlike previous astronaut selection programs. They underwent strenuous physical examinations, were given jet indoctrination flights by MSC, and took extensive tests. Age limit was 34.

Of the other 28 astronauts on board at MSC, all hold bachelor degrees, ten have master's and one has his doctorate. All are qualified in jet aircraft and have flown a combined 85,000 hours.

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Beginning in April, 1964, the NASA Office of Space Science and Applications and the National Academy of Sciences cooperated in developing the scientific criteria for the selection process. The Academy conducted the screening for scientific qualification of the applicants. The NASA Office of Manned Space Flight and the Manned Spacecraft Center were responsible for all other aspects of selection criteria and screening.

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BIOGRAPHIES ATTACHED

OWEN K. GARRIOTT

Owen K. Garriott was born at Enid, Okla., Nov. 22, 1930. He is five feet, nine inches tall and weighs 145 pounds. His wife is the former Helen Mary Walker of Enid. They have three sons: Randall, 10; Robert, 9; Richard, 4. His parents, Mr. and Mrs. Owen Garriott, live at Enid.

Garriott has been teaching electronics, electromagnetic theory and ionospheric physics at Stanford University since 1961, and has performed research in ionospheric physics since obtaining his doctorate at Stanford in 1960. He is a 1948 graduate of Enid High School, received his Bachelor of Science degree from the University of Oklahoma in 1953, and got his Master of Science degree from Stanford in 1957.

He spent a year in England on a National Science Foundation fellowship at Cambridge University and at the Radio Research Station at Slough in 1960-61. He was a consultant to the Manned Space Science Division of NASA's Office of Space Sciences and Applications, and to Lockheed Corporation's Space Physics branch. He was secretary to the U.S. Commission, International Scientific Radio Union, was regional editor of Planetary and Space Sciences, is a member of the American Geophysical Union, Tau Beta Pi, Sigma Xi, and the Institute of Electrical and Electronic Engineers. He was an electronics officer in the Navy for three years, serving on destroyers.

EDWARD G. GIBSON

Edward G. Gibson was born in Buffalo, N. Y., Nov. 8, 1936. He is five feet, nine inches tall and weighs 160 pounds. He is married to the former Julia Ann Volk of Alden, N. Y., and they have a son, John, 1, and a daughter, Jannet, 5. His parents, Mr. and Mrs. Calder A. Gibson, live at Kenmore, N. Y.

Gibson has been in aerospace research with Applied Research Laboratories, Newport Beach, Calif., since June 1964 when he received his doctorate in engineering physics from the California Institute of Technology. He received his Master of Science degree in 1960 at Caltech, and his Bachelor of Science in 1959 at the University of Rochester, N. Y. He is a 1955 graduate of Kenmore High School at Kenmore, N. Y.

While studying at Caltech in Pasadena, Calif., Gibson was a research assistant specializing in jet propulsion and atmospheric physics, and later wrote several technical papers, including some on his work with LASER. He is a member of Tau Beta Pi, Sigma Xi, American Institute of Aeronautics and Astronautics, is an R. C. Baker Fellow and a Fellow of the National Science Foundation.

Add 5
MSC 65-63

DUANE E. GRAVELINE

Duane E. Graveline was born at Newport, Vt., Mar. 2, 1931. He is six feet tall and weighs 165 pounds. His wife is the former Carole Jane Tollerton of Newport, and they have four daughters: Jill, 13, Joan and Jean, 12; Jane, 10. His parents, Mr. and Mrs. Edgar Graveline, live at Newport.

Graveline left the U.S. Air Force earlier this month to join the staff of the Medical Operations Office at Manned Spacecraft Center. He was a military flight surgeon at the Aerospace Medical Division, Brooks AFB. He formerly was a scientific researcher in the field of bioastronautics at Wright-Patterson AFB, Ohio, and served as Chief of Aviation Medicine at Kelly AFB in 1956-57. He has written more than a dozen technical and scientific papers, including many on the effects of prolonged weightless in space flights. He also participated during Project Mercury as a medical monitor for NASA.

He attended public schools in Vermont, received his Bachelor of Science degree from the University of Vermont and won his Doctor of Medicine degree in 1955 from the Vermont Medical School. He interned at Walter Reed Army Medical Center in Washington, D.C., in 1955-56, then earned his Master of Public Health degree from John Hopkins School of Hygiene in 1958. While in the Air Force he attended Nuclear Medicine School, the Air Force School of Aviation Medicine, Missile Medicine School at Cape Kennedy, Fla., and Advanced Aerospace Medicine School at Brooks AFB.

Add 6
MSC 65-63

LT. CDR. JOSEPH P. KERWIN, USN

Joseph P. Kerwin was born in Oak Park, Ill,, Feb. 19, 1932. He is married to the former Shirley Ann Good of Danville, Pa., and they have a daughter, Sharon, 2. His parents, Mr. and Mrs. Edward M. Kerwin, live in Chicago. He is six feet tall and weighs 174 pounds.

Kerwin has been in the Navy since July, 1958, and won his pilot's wings at Pensacola NAS in 1962. He was named the outstanding officer student in his cadet class. Prior to becoming a Naval aviator, he was two years flight surgeon with Marine Air Group 14 at Cherry Point, N. C. Later, he served as flight surgeon for Fighter Squadron 101 at Oceana Naval Air Station, Virginia Beach, Va., then became staff flight surgeon for Air Wing Four, Cecil Field, NAS, Fla.

He is a 1949 graduate of Fenwick High School at Oak Park, Ill. He received his Bachelor of Arts degree in 1953 from the College of Holy Cross, Worcester, Mass., and his Doctor of Medicine degree from Northwestern University Medical School, Chicago. He was intern at District of Columbia General Hospital, Washington, D. C., during 1957-58. He also attended the U.S. Navy School of Aviation Medicine at Pensacola, in 1958.

Add 7
MSC 65-63

F. CURTIS MICHEL

F. Curtis Michel was born at LaCrosse, Wis., June 5, 1934. He is five feet, eleven inches tall and weighs 160 pounds. His wife is the former Beverly Muriel Kaminsky of Sacramento, Calif., and they have one son, Jeffrey, 2. Michel's mother, Mrs. Viola Bloom, lives in San Francisco.

Michel has been at Rice University, Houston, Since July, 1963. He researches and teaches space sciences, such as the interaction of solar winds and the lunar atmosphere. He formerly was a research fellow at the California Institute of Technology, Pasadena, doing experimental and theoretical work in nuclear physics. He received his doctorate in physics at Caltech in 1962 and had earned his Bachelor of Science degree there "with honors" in 1955. He is a 1951 graduate of McClatchy High School, Sacramento.

Prior to joining the Air Force in 1955, Michel was a junior engineer working on the Corporal Missile Program at the Guided Missile Division of Firestone Tire and Rubber Co., Southgate, Calif. An Air Force ROTC graduate, Michel received flight training at Marana AFB, Tucson, Ariz., and at Laredo and Perrin Air Force Bases in Texas. He flew F86 interceptors in the U.S. and Europe during his three years in military service.

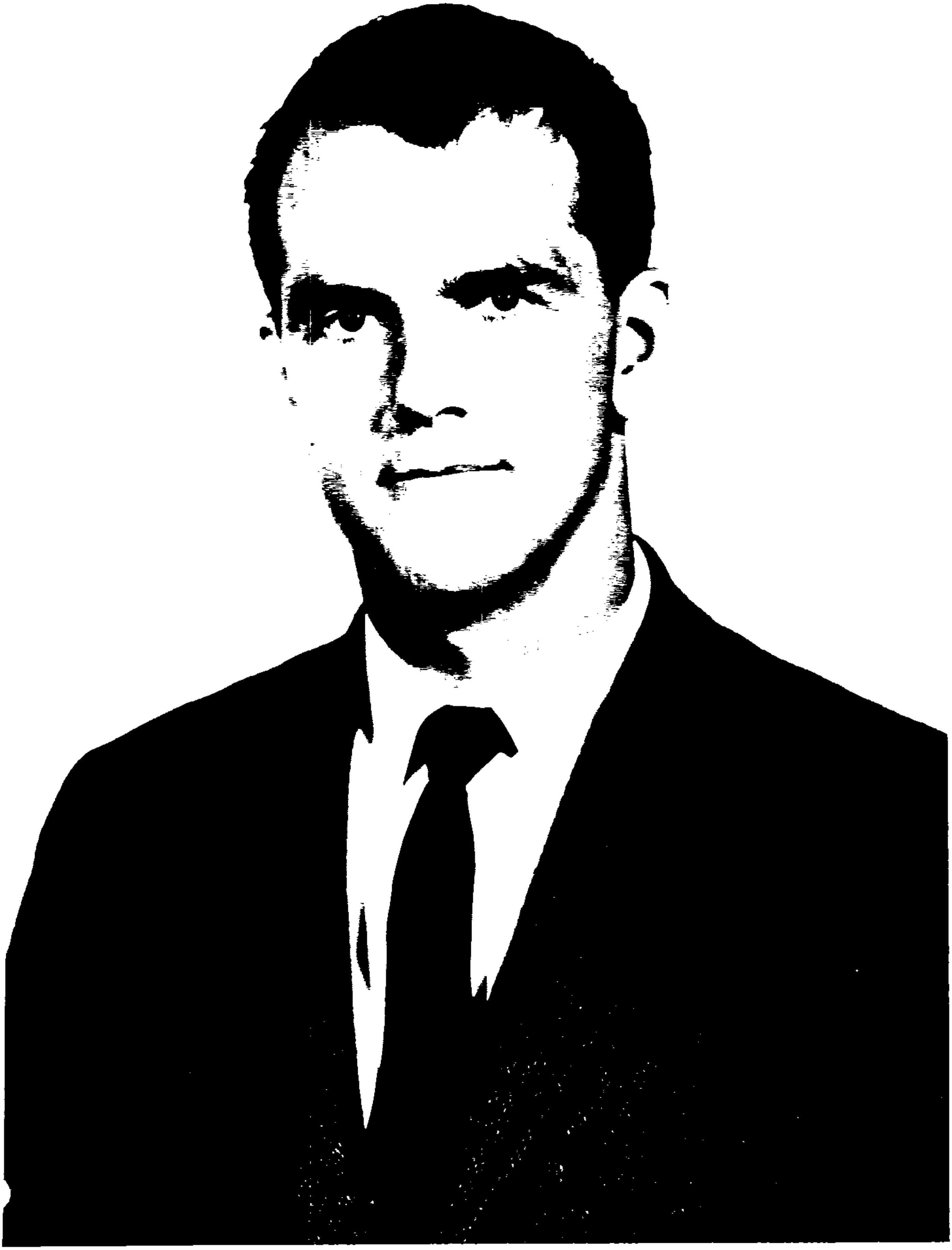
Add 8
MSC 65-63

HARRISON H. SCHMITT

Harrison H. Schmitt was born at Santa Rita, N.M., on July 3, 1935. He is five feet, nine inches tall and weighs 165 pounds. A bachelor, his parents, Mr. and Mrs. Harrison A. Schmitt, live in Silver City, N. M.

Schmitt has been with the U.S. Geological Survey's Astrogeology Department at Flagstaff, Ariz., for the past year. He was project chief on photo and telescopic mapping of the moon and planets, and was among the USGS astrogeologists instructing NASA astronauts during their geological field trips. From June 1963 to June 1964 Schmitt was on a National Science Foundation post-doctoral fellowship at Harvard's Department of Geological Sciences. Prior to that fellowship, Schmitt had received a Fulbright Fellowship to Norway (1957-58), a Kennecot Fellowship in Geology (1958-59), a Harvard Fellowship (1959-60), a Parker Traveling Fellowship (1961-62), and a Harvard Traveling Fellowship (1960).

He graduated from Western High School, Silver City, N.M., in 1953, and from the California Institute of Technology, Pasadena, in 1957. He studied at the University of Oslo in Norway during 1957-58, and received his doctorate in Geology from Harvard last year. He was a teaching fellow at Harvard in 1961 where he taught geological sciences. Earlier, he had done geological work for the Norwegian Geological Survey in Oslo, and for the U.S. Geological Survey in New Mexico and Montana, including some undergraduate work. He is a member of Sigma Xi and the American Geophysical Union.



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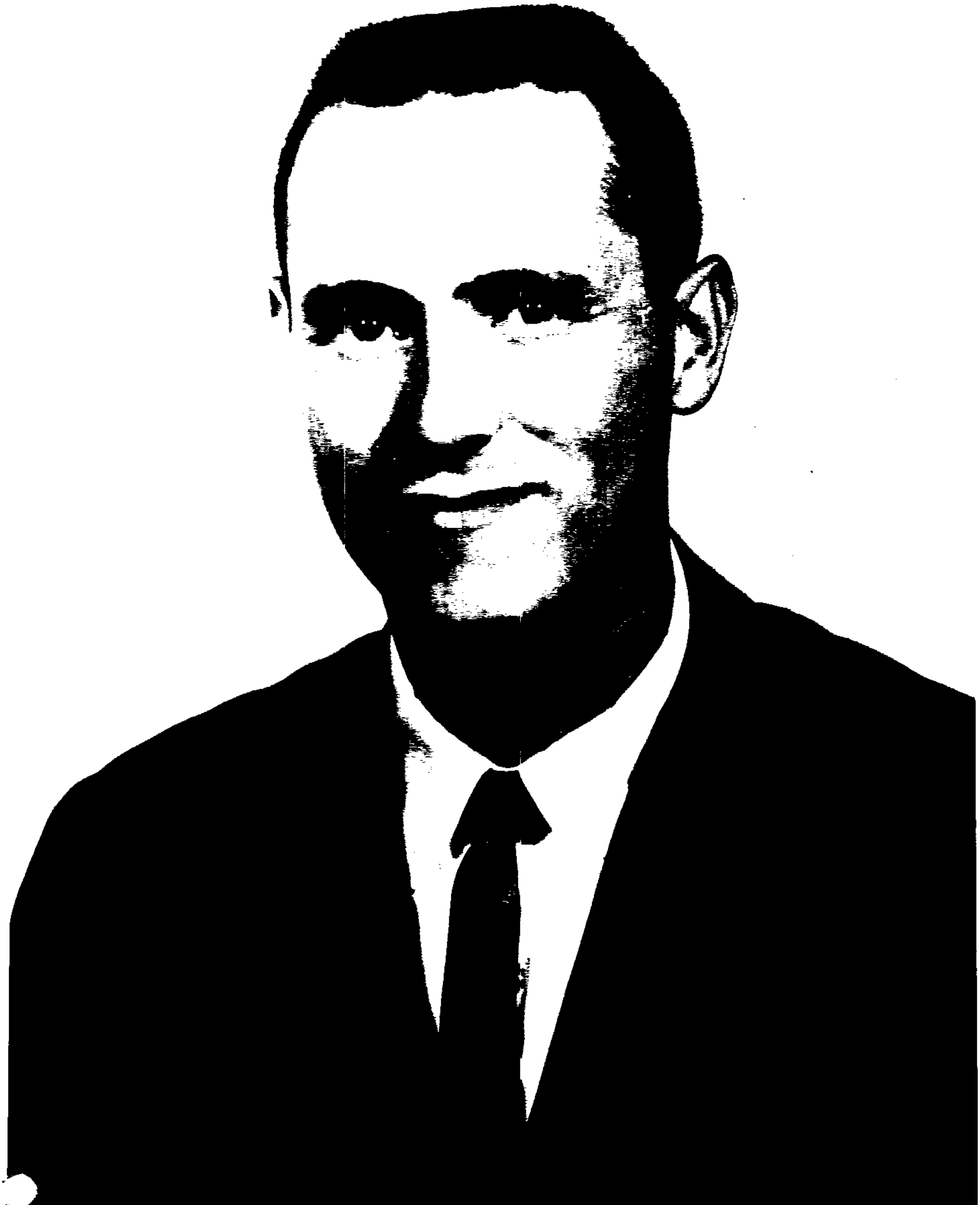

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NASA NAMES GEMINI AND APOLLO MISSION DIRECTORS

The National Aeronautics and Space Administration today announced the appointment of Robert F. Thompson as Mission Director for future Gemini missions and Colonel C. H. (Rit) Bolender, USAF, as Mission Director for the first and second Apollo/Saturn IB flights.

Thompson and Bolender are assigned to the Mission Operation Organization in the Office of Manned Spaceflight, NASA Headquarters, Washington. They will have overall responsibility for directing assigned missions.

Thompson, was Chief Landing and Recovery Division, NASA Manned Spacecraft Center, Houston, before receiving the Headquarters assignment. He will direct the Gemini 5 mission and all remaining Project Gemini flights.

Christopher C. Kraft, who served temporarily as both mission and flight director for Gemini missions 2, 3, and 4 will continue in his regular assignment as Flight Director for future Gemini missions. In addition, to his regular assignment as Mission Flight Director, he is Assistant Director for Flight Operations at the Manned Spacecraft Center, Houston.

Thompson, 40, joined the NACA Langley Research Laboratory in 1947. He is a native of Bluefield, Virginia and received a B. S. degree in aeronautical engineering from Virginia Polytechnic Institute in 1944. During World War II he served as a line officer in the U. S. Navy.

Before assignment to the Mission Operations Office, Washington, in January of this year, Colonel Bolender directed a studies group in the Office of the Chief of Staff, USAF. His previous assignments include extensive guided missiles and aeronautical systems work and attendance at the Air War College. During World War II he served as a night fighter pilot in the North African and Meterannean theaters. Bolender was born November 2, 1919. He holds a B. S. degree from Wilmington College, Ohio and an M. D. A. from Ohio State University.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER NASA Houston 1, Texas

HUnter 3-5111

MSC 65-64
July 1, 1965

HOUSTON, TEXAS -- A "repeat performance" of Astronaut Jim McDivitt's attempt to rendezvous with the Titan booster during the GT-4 mission will take place in the Manned Spacecraft Center's Guidance and Control Laboratory next week.

Although McDivitt may not be present to act as pilot, G & C engineers are planning to duplicate the rendezvous maneuvers using the Virtual Image Simulator and a series of three computers.

The Simulator has been used to give a three dimensional representation of a lunar landing, and rendezvous to train pilots and work out the problems connected with a lunar touchdown and rendezvous with the command module in lunar orbit.

In the Gemini rendezvous simulation, the Titan booster will be represented by a 30 x 10 ft. rectangle against a black background.

Several pilots including some of the astronauts will make the flights. Each run will take about 70 minutes. The command pilot will be seated in a mock-up Gemini cabin for the simulation and will have the same field of view as the Gemini spacecraft. He will have his attitude and translational controllers for varying direction and speed.

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In addition to the "out of the window" view, he will use the "eight ball" attitude indicator to determine his direction of travel and the incremental velocity indicator or spacecraft speedometer to register increases or decreases in speed.

Each run will start after spacecraft separation when the Gemini and its booster are 400 feet apart. The pilot will try to perform the station keeping maneuver by coasting to 3000 feet from the booster, turning around, and thrusting close to the target.

"We want to try to duplicate what was done during Gemini," Ron Simpson said, "then we will try to find procedures that will be more conservative in fuel consumption." Simpson is project engineer for the simulation.

The entire planned rendezvous maneuver will also be run. After the first rendezvous, Gemini 4 was scheduled to separate 21.8 miles from the booster and then perform a terminal rendezvous. Since McDivitt used nearly half his fuel attempting the station keeping maneuver, both rendezvous attempts were cancelled.

Several other computer studies of the Gemini 4 rendezvous orbital mechanics are being conducted by the Mission Planning and Analysis Division of Flight Operations, and by Theoretic Mechanics Branch of Guidance and Control Division. The Engineering Simulation Branch is the only section of MSC attempting to refly the mission.

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"We expect to receive double benefit from these simulations," Simpson said, "not only do we hope to obtain information for future Gemini rendezvous, but we hope it will benefit in planning the Apollo lunar rendezvous.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-5111

MSC 65-65
July 1, 1965

NASA TO NEGOTIATE WITH FEDERAL ELECTRIC CORPORATION FOR MSC SUPPORT SERVICES

The National Aeronautics and Space Administration today selected Federal Electric Corporation of Paramus, N. J.---a subsidiary of International Telephone and Telegraph Corporation---for negotiation of a contract to provide logistical and technical information support services to its Manned Spacecraft Center, Houston.

An award-fee type contract will be negotiated for a one-year period :h renewal provisions for 2 additional years, if performance is acceptable. Estimated cost for the first year of services is 1.5 million.

The services to be provided the Center include technical writing and editing, technical documentation retrieval, microfilming, and graphic arts. It is anticipated that approximately 200 persons will be required to perform these services.

Under an award fee type agreement the contractor can earn additional profit by improving performance and reducing cost.

Federal Electric was one of 11 firms which responded to request for proposals issued by the Center.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-5111

MSC 65-66
July 1, 1965

HOUSTON, TEXAS -- Astronauts Frank Borman and James A. Lovell, Jr., have been assigned as the prime flight crew for the Gemini VII mission scheduled for the first quarter of 1966.

The backup crew for the flight of up to 14 days consists of Astronauts Edward H. White, II and Michael Collins.

Borman and Lovell were the backup crew and White was the pilot for the Gemini IV mission. The command pilot on that flight, Astronaut James A. McDivitt, has been assigned as a spacecraft communicator for the Gemini V flight.

Borman is command pilot for the Gemini VII mission, and White is command pilot in the backup crew. Collins is the first of the third group of astronauts named in October, 1963, to be assigned to a flight crew.

Actual flight duration of the Gemini VII mission will depend on experience from earlier flights and the progress of the mission itself. Extravehicular activity may be conducted.

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NASA Headquarters Release 65-228
July 8, 1965

NASA EQUIPS PEGASUS C WITH DETACHABLE PANELS

An engineering experiment with the ultimate aim of possibly returning to earth meteoroid punctured metal samples from long exposure in space has been added to the Pegasus C/Saturn 10 project of the National Aeronautics and Space Administration.

Small "coupons" or sub-panels of aluminum have been fastened to the Pegasus spacecraft with simple quick-detach fittings. The scheme is designed so that at some future date, if the experiment is deemed feasible, an astronaut could detach the panels and carry them back to earth.

NASA officials emphasize that no decision has been made for an astronaut to rendezvous and retrieve such samples. If the sub-panels are recovered from the space environment for laboratory study and analysis, they could provide actual samples of meteoroid hits. Knowing the nature and thickness of the material, and length of time exposed, scientists could learn much about the meteoroids, their effects and other factors of the space environment.

Although numerous experiments have been conducted in space, no materials punctured by meteoroids have been returned thus far. Meteoroids are believed to be small particles of matter

--more--

flying in space at great speeds. When they enter the earth's atmosphere, they burn -- as meteors -- and those that reach the ground are known as meteorites.

The Pegasus experiment, managed by NASA's Marshall Space Flight Center, is designed to gather knowledge of the frequency and type of hits experienced in space, and radio the information back to earth. So far, Pegasus I and II have recorded numerous hits, while other smaller satellites have added to the record.

In addition to installing the detachable sub-panels, the Pegasus C flight plan has been changed to a circular orbit about 332 miles above the earth at 28.9° inclination rather than an elliptical orbit at 31° inclination. The change is to orbit Pegasus C closer to a nominal manned flight path.

The Marshall Center made up eight panels for the special purpose on Pegasus C, and then positioned them at comparable locations on each of the two wings of the spacecraft, four to each side. The frame of the spacecraft was coated with luminous paint to make it easier to recognize in orbit.

Luminous paint was also coated on the frames of the eight individual panels holding the detachable sub-panels.

There are six "coupons" on each panel, three to each side, for a total of 48 "coupons". They are made of aluminum in three thicknesses, as follows: 16 of them at .008 inch or 8 mils thick; 24 at 16 mils or .016 inch; and 8 at 32 mils or .032 inches.

The sub-panels are attached at two relay points to the main panels and could be removed quickly. The 11 x 16 inch size is easy to carry and can be stored in compartments within the Gemini or Apollo spacecraft.

Two major program divisions of NASA have worked cooperatively on the Pegasus/Saturn project. The Pegasus project is the responsibility of the Office of Advanced Research and Technology, while the Saturn is a major project of the Office of Manned Space Flight.

The Pegasus C Launch is scheduled for July 30 at Cape Kennedy.

July 1965

Glenn McAvoy of the NASA Inspections Division is leaving the South Central regional office located at the Marshall Space Flight Center this month to head the new southwestern regional office to be located at the Manned Spacecraft Center.

He has been at the Huntsville office for more than two years.

A native of Clayton, N. Y., McAvoy was graduated from Cornell University in 1949 and served 10 years as an FBI agent.

He is also a World War II verteran and former semi-pro baseball player.

The NASA Inspections Division is assigned the responsibility of establishing and conducting a program to prevent and detect unethical or illegal conduct on the part of NASA employees and NASA contractors

This will be the fourth field office and will open August 2.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER HOUSTON 1, TEXAS

HU 3-5111

MSC 65-67
July 8, 1965

HOUSTON, TEXAS -- Nearly 100 employees -- or members of their families -- from the Manned Spacecraft Center and its contractors will set aside problems of the space age for three evenings next week and temporarily enter the theatrical world.

The group will stage a variety show valled "Vaudeville Revisited '65."

The show, sponsored by the MSC Employees Activities Association, will be held in the MSC auditorium on July 16, 17 and 18 at 8 p.m.

According to Phil Hamburger, president of the MSC Employees Activities Association, MSC employees and "guests from the Houston-Galveston areas" are invited. A one dollar donation is required for admission.

All proceeds will go to benefit the Theodore C. Freeman Memorial Libraries at Houston Baptist College and Clear Lake City, which were formed after Astronaut Freeman lost his life in a T-38 crash last October.

Twenty-five separate acts are featured in "Vaudeville Revisited '65" which musically carries the audience from the days of vaudeville to man's endeavors in outer space.

--more--

Add 1
MSC 66-67

Entertainment will include vocal numbers in the popular, folk, classical and operatic areas, a harpist solo, a comedy monologue, a pantomimist performance, two barbershop quartets, tahitian hula dancers and a ten-girl chorus line.

Serving as master of ceremonies is Jim Gorman of MSC's Personnel Division. Prior to joining MSC, Gorman had worked as an announcer and sports director for an El Paso television station.

Invited to attend opening night are Mrs. Faith Freeman, widow of Astronaut Freeman; Dr. W. H. Hinton, president of Houston Baptist College; and Richard Allen, president of the Ted Freeman Memorial Library in Clear Lake City.

The MSC Charm Club will serve as usherettes for the three performances.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-68
August 2, 1965

HOUSTON, TEXAS -- The first prototype of a liquid model of a portable life support system (PLSS) has been delivered to the Crew Systems Division at the Manned Spacecraft Center.

The unit, which weighs approximately 60 pounds, is designed for use with the water-cooled undergarment which the astronauts will wear beneath the Extravehicular Mobility Unit or space suit on the lunar surface.

The water-cooled undergarment cools the astronaut by conduting the metabolic heat generated by his motions into water which is circulating through a network of plastic tubing in contact with the skin. The water carries the heat into the PLSS, which recools and recirculates the water.

Interface testing with the undergarment will be conducted here, followed by performance testing on a treadmill and control and display checkout. A total of 52 units, including flight hardware, are scheduled for delivery by Hamilton Standard, Windsor Locks, Connecticut, prime contractor for the PLSS.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas

HU 3-5111

MSC 65-69
August 2, 1965

HOUSTON, TEXAS -- NASA Manned Spacecraft Center has selected the Dynalectron Corporation of Fort Worth, Texas, for negotiation of a contract to provide maintenance support for aircraft assigned to MSC.

The contract will cover field-level aircraft maintenance, modification and repair support for MSC aircraft, as well as supply support and flight-line servicing of MSC and transient aircraft-oriented research and development programs.

Dynalectron was selected for this negotiation in competition with 12 other companies.

The proposed contract, which will be a cost-plus-award-fee type, will be for a one-year period and will include provisions for negotiations of two one-year renewals. The government's estimate for the first year's contract cost is in excess of $500,000.

Aircraft assigned to MSC, exclusive of transient aircraft, include five T-38A and eleven T-33A astronaut flight-readiness training aircraft, one Convair 240 used as an electronics research and development test bed and three helicopters -- two H-13's used in astronaut training and one H-34 used in research and development activities.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HU 3-5111

MSC 65-70
July 21, 1965

HOUSTON, TEXAS -- A helicopter used in astronaut training was damaged slightly today during a practice autorotation landing by Astronaut Russell Schweickart. Schweickart was not injured.

Joseph Algranti, Chief of the MSC Aircraft Operations Office, said the tail rotor system received minor damage when it struck the ground during the flare-out for a landing at Clover Field near Frinedswood. Algranti said such incidents are common during simulated power-off landings.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HU 3-5111

MSC 65-71
August 4, 1965

HOUSTON, TEXAS -- Construction is underway at the Manned Spacecraft Center on a new three-story office and laboratory building for the Crew Systems Division.

The Division, responsible for space suits and the spacecraft environmental system, currently co-occupies Building 4 with the Flight Crew Operations Division.

The new $1,764 million building will be located adjacent to Building 7, the Crew Systems High Bay Laboratory area. The two buildings will be connected by a first floor passageway.

The building will cover approximately 54,000 feet in area and be 207 feet long by 76 feet wide. The long axis of the building will be parallel to the existing Building 7. It is expected to be ready for occupancy by March 1966.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER Houston 1, Texas

August 4, 1965
NASA Headquarters Release No. 65-260

News Release File

THREE FIRMS SELECTED TO DESIGN APOLLO LUNAR SURFACE PACKAGE

The National Aeronautics and Space Administration selected three firms today to design the Apollo Lunar Surface Experiments Packages (ALSEP) under separate and concurrent $500,000 six-month, fixed-price contract. The firms are Bendix, Houston Division, Bendix Corporation, Ann Arbor, Michigan; Space-General Corporation, El Monte, California; and TRW Systems Corporation, Thompson, Ramo, Wooldridge, Redondo Beach, California.

The packages will contain scientific instruments to measure the moon's structure and surface characteristics, atmosphere, heat flow, solar winds, radiation and micrometeorite impacts.

They will be carried to the moon in the Lunar Excursion Module on the initial Apollo flight and placed on the surface by astronauts. The instruments will transmit data back to earth for six months to one year. Weight of each package will be less than 150 pounds.

Contracts call for the firms to deliver mockups of the experiments package to the NASA Manned Spacecraft Center, Houston, and to Grumman Aircraft Engineering Corporation, Bethpage, New York, manufacturer of the Apollo Lunar Excursion Module, about March 1, 1966.

--more--

August 4, 1965
NASA Hqs. Release No. 65-260

Add 1....

After a review and evaluation of contractor performance, NASA plans to select one of the firms to develop the ALSEP flight hardware under a cost-plus-incentive-fee contract.

The three companies were among nine firms which responded to requests for proposals issued by the Manned Spacecraft Center in June 1965.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 35111

MSC 65-72
August 4, 1965

HOUSTON, TEXAS -- Personnel of the Manned Spacecraft Center, Houston, Texas will be augmented to meet the increasing tempo of Gemini and Apollo manned spaceflight operations.

In the first of these actions, approximately 200 personnel will be transferred from the Marshall Space Flight Center, Huntsville, Alabama, to the Manned Spacecraft Center over the next ten months.

Dr. George E. Mueller, Associate Administrator for Manned Space Flight said the completion of the first phase of the Saturn program with the successful launch of SA-10 had made it possible for the Marshall Space Flight Center to make personnel available for Saturn Apollo operational activities at the Manned Spacecraft Center.

The total number of personnel to be provided from other NASA activities has not yet been determined.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston, Texas

HU 3-5111

MSC 65-73
August 13, 1965

128 AIR FORCE OFFICERS ASSIGNED TO NASA'S MANNED SPACECRAFT CENTER

HOUSTON, TEXAS -- The National Aeronautics and Space Administration and the Air Force have signed an agreement whereby 128 Air Force Officers will be detailed to NASA's Manned Spacecraft Center, Houston, for 2 years.

Their assignments in Flight Operations at the Center will augment NASA Flight Operations organization while providing the officers with on-the-job training and experience in the operational control of manned space flight.

The first group of officers arrived for duty at the Center earlier this month. Others will follow each month until March 1966 for a total of 128 officers -- 6 majors, 38 captains, and 84 lieutenants.

They will be staffed into the Flight Crew Operations Directorate on the same basis as NASA employees.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas
HU 3-5111

MSC 65-74
August 13, 1965

NASA SELECTS LOCKHEED FOR SUPPORT SERVICES AT HOUSTON CENTER

HOUSTON, TEXAS -- The National Aeronautics and Space Administration today announced the selection of Lockheed Electronics Company, Clark, N. J., for a contract covering operational support services for laboratories and test facilities at the NASA MSC, Houston.

The contract is a cost-plus-award-fee with cost-incentive features. It contains options for four additional one-year periods, each to be negotiated. First year costs are expected to be about 3.8 million dollars.

The contract will provide for support services at the instrumentation and electronic laboratory, information systems laboratory, guidance and control laboratory and space environmental laboratory.

Contractor responsibility will include test preparation, procedures and operation, test data recording, analysis and reporting, instrument calibration, design and fabrication of test gear and experimental breadboard, circuits and computer programming, maintenance and operation.

NASA solicited 128 firms, December 3, 1964. Of these, 48 attended a pre-proposal conference December 16, 1964.

Ling-Temco-Vought, Inc., Dallas, and Lockheed were selected last April for final competitive negotiations.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

HUnter 3-5111

MSC 65-75
August 13, 1965

HOUSTON, TEXAS -- Gemini 5 Astronauts L. Gordon Cooper and Charles Conrad will undergo intensive debriefing and medical tests for 11 days following their mission, NASA said today.

This unbroken period of medical tests and pilots reporting in seclusion is necessary to extract the maximum scientific and technical information from the eight day flight.

"Producing scientific and technical information is the purpose of the flight," said Dr. George E. Mueller, Associate Administrator for Manned Space Flight, "this information is vital in determining the effects of long duration flight on the human systems and in proving out flight systems for future flights."

News media will be permitted to photograph the astronauts on the Lake Champlain on their departure from the ship and arrival at Cape Kennedy and on their departure from Cape Kennedy and arrival at Ellington Air Force Base near the Manned Spacecraft Center.

Following the 11-day debriefing period, the Gemini 5 crew will be made available for a press conference and other public activities.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER Houston 1, Texas

HUnter 3-5111

MSC 65-76
August 16, 1965

HOUSTON, TEXAS -- While the United States watches the progress of Gemini V from their homes, over 100 outstanding science students will view the mission from the Manned Spacecraft Center Auditorium as part of the program for the MSC Conference for Science Fair Winners on August 26 and 27, 1965.

The students are winners of NASA awards at regional and state science fairs in the states of Texas, Oklahoma, New Mexico, Colorado, Nebraska, Kansas, North Dakota, and South Dakota. Each student prepared an exhibit to display his investigations into a particular branch of the space sciences. Awards were presented in five categories: space life sciences; space physical sciences; space vehicles, propulsion systems, and aerodynamics; communications, navigation and instrumentation; and astronomy and planetary studies.

Also attending will be the winners of NASA awards at the Houston Seminar of High School Science. Each student competing in the seminar presented an original paper relating to his studies in a particular scientific area.

MSC management and engineering personnel will discuss various aspects of the Center's activities during the first day of the Conference. Following opening remarks by Paul Haney, Public Affairs Officer, talks will be presented by Paul Purser, Special Assistant to the Director; Dr. Joseph Shea, Manager of the Apollo Spacecraft Program; Andre J. Meyer, Senior Assistant to the Manager of the Gemini Program; Captain Charles Bassett, NASA Astronaut; William Stoney, Chief of the Advanced Spacecraft Technology Division; and Burney Goodwin, Chief of the Recruiting Branch, Personnel Division.

Astronauts Gordon Cooper and Charles Conrad this afternoon began a detailed assessment of their eight day flight after their first meal ashore, a hearty luncheon of macaroni and ham.

Dr. Charles A. Berry, MSC medical operations officer, said he was pleased with the weight gain both pilots showed in the first day after their flight. Weight statistics today showed that Cooper had gained back six of the seven and a half pounds he lost during the flight. Conrad showed a similar gain by recapturing four of the eight and a half pounds he lost.

Cooper's preflight weight was 152 pounds. Two and a half hours after recovery his weight was 144-5/8 pounds. At 3 p.m. today he weighed 150-3/4. He weighed 145-1/2 pounds at his first post flight weigh-in abo rd the carrier and by this afternoon he was back to 149-3/8.

Dr. Berry says that while the heart rate and blood pressures of both pilots were not quiet back to pre-flight normals, they seemed to correlate very closely to the experience of the Gemini 4 crew. It took Gemini 4 astronauts McDivitt and White about two days before they returned to their pre-flight rates.

Neither Gemini 5 crewmen reported any symptoms of seasickness during the 40-odd minutes they spent in their spacecraft awaiting pickup. They said the sea was like a mill pond and they were comfortable in their spacecraft and their suits with the hatches closed.

After lunch, Conrad left the third floor crew quarters in the Manned Space Flight Operations Building on Merritt Island and went to the opposite end of the building for a 50 minutes blood pressure evaluation tilt-table exercise. While Conrad was on the table, Cooper spent about one hour with two MSC physicians discussing medical aspects of the flight. At 2:30 Cooper underwent the tilt exercise and Conrad had a medicalinterview.

By 3:30 p.m. the two pilots began making technical assessments of the flight, talking into tape recorders and responding to questions about the flight put to them by Donal K. Slayton, Assistant Director for Flight Crew Operations and B. J. Thomas, an MSC flight crew operations staff officer. Discussions this afternoon covered the countdown, powered flight, and insertion into orbit.

Tomorrow morning the crew will start the day with a quick medical check, following a 45 minute tilt examination for each man, before resuming the technical de-briefing at 9:30. At some point Tuesday, both men plan to work out in the small gym in the crew quarters. Items to be covered in Tuesday's technical discussion include, orbital flight, retro-fire, reentry, landing and recovery.

Tonight the astronauts will dine on steaks, baked potatoes, string beans and blueberry pie.

Slayton said the men planned to get another good night's rest before resuming the detailed technical discussions.

After Tuesday, their schedule goes like this:

Wednesday -- Technical de-briefing covering system operations, visual sightings and experiments.

Thursday -- premission planning, mission control, training and, hopefully, return to Houston.

Friday -- A day-long discussion of overall mission with Gemini project and NASA management officials at the Manned Spacecraft Center in Houston.

Saturday -- Day-long discussion with Gemini VI and VII crews.

Sunday -- The crew will spend the day identifying the several hundred pictures they took during their journey. They will do this by comparing flight log entries with exposed film.

Monday -- Detailed systems de-briefing will begin with small groups from project office and various systems specialities. The system specialists will have read in detail the report of the first four days of technical de-briefings. They will cover the radar evaluation pod, communications, instrumentation, electrical pyro techni and landing systems.

Tuesday -- Systems de-briefings on guidance and control propulsion, the Gemini launch vehicle, environmental control.

Wednesday -- The crew will review each experiment with the planned experimenters to develop a general session on the effectiveness of Gemini V experiments program.

Thursday -- A general news conference at a time yet to be determined.

File

FOR IMMEDIATE RELEASE August 31, 1965

Office of the White House Press Secretary

The White House

The President today approved the following policy on the promotion and decoration of astronauts.

1. Each military astronaut will receive a one grade promotion as a direct result of the first successful space flight, but not beyond the grade of colonel in the Air Force and Marine Corps or Captain in the Navy. Promotions to general officer rank will be accomplished through usual military selection board processes.

2. Each Gemini astronaut will be awarded the NASA medal for exceptional service (or cluster) after completion of a successful space flight. The NASA medal for distinguished service, the highest award which can be given by that agency, will be awarded for exceptional accomplishments in the Gemini program, including but not limited to accomplishments in the Gemini program.

3. Military decorations associated with space flights, such as awards for exception herosim or other distinguished service, will be determined on an individual basis consistent with general policy governing the award of traditional military decorations.

8-31-65

THE FIRST STATUS REPORT ON THE DEBRIEFING OF THE GEMINI-5 PRIME CREW WILL BE PIPED INTO THE MSC NEWS CENTER AUDITORIUM OF NASSAU BAY BUILDING 6 AT 12:00 NOON TODAY FROM CAPE KENNEDY. PRINCIPALS INVOLVED IN THE BRIEFING INCLUDE DONALD K. SLAYTON, ASST. DIRECTOR FOR FLIGHT CREW OPERATIONS AND DR. CHARLES BERRY, CHIEF OF CENTER MEDICAL PROGRAMS.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas
HUnter 3-5111

MSC 65-77
September 2, 1965

HOUSTON, TEXAS -- Manned testing of the paraglider landing system was resumed at Edwards AFB, California today as North American test pilot Donald F. McCusker flew the delta glider wing from the crew station of a boilerplate Gemini spacecraft.

There have been two previous manned flights, with the last flight taking place in December 1964. The new series of manned flights is designed to obtain quantitative aerodynamic data, develop navigational techniques, and develop operational procedures for ..ling various wind conditions. The program is being conducted by North American Aviation S&ID for the NASA Manned Spacecraft Center.

In each manned test, the vehicle will be towed to 8,000 feet by a Sikorsky S-61 helicopter and released. The pilot will glide back to the landing point using visual pilotage and radio navigation techniques.

Warren North, Chief of the Flight Crew Support Division, described todays flight as "excellent, with a good flare and a good landing".

The paraglider is a steerable wing with a lift-to-drag ratio of three which was originally conceived to provide a land landing capability for the Gemini spacecraft. However, the wing could not

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be developed in time to be included in Gemini flights and has been continued as an operational research project.

A series of unmanned tests, using radio-controlled vehicles, were performed before the start of manned testing.

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NOTE TO EDITORS SEPTEMBER 9, 1965

A Super Guppy will be on display for news media representatives at Ellington AFB from 2 to 4 p.m. today. The airplane, designed with the capability of transporting large launch vehicle stages, is undergoing test flights. John M. Conroy, President of Aero Spacelines, which owns the airplane, will be available to newsmen for questions. The Super Guppy is at Ellington for a "showing" to MSC officials.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-5111

MSC 65-78
September 15, 1965

HOUSTON, TEXAS -- A rusty, collapsed and twisted piece of metal with a packed parachute attached was found in Galveston Bay recently by a shrimp boat crew, solving the whereabouts of a long lost NASA test spacecraft.

The spacecraft, a Mercury Boilerplate, was lost May 31, 1962 during the first drop test made by NASA in Galveston Bay. The t[illegible] was conducted in the bay area by the landing and recovery division of NASA's Manned Spacecraft Center.

The drop test was one of the first outward signs of activity by the newly-arrived NASA organization in Houston. The drop was supported by elements of the 446th Troop Carrier Wing, USAF Reserve.

The purpose of the test was to qualify a new method for deploying a spacecraft in preparation for conducting tests of a gliding parachute system.

A lanyard was to have pulled the parachute out of the cannister in the spacecraft, as it left the aircraft. The line broke and the 2,150 pound Mercury boilerplate fell 1500 feet into Galveston B[illegible]

A search was conducted but proved futile when the hulk was apparently buried in the mud.

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Apparently the parachute was forced from the cannister upon impacting the water, but was still intact when the craft was recovered.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-79
September 10, 1965

NASA TO SELECT ADDITIONAL PILOT-ASTRONAUTS

HOUSTON, TEXAS -- The NASA will begin immediately recruiting to select additional pilot-astronauts for manned spaceflight missions.

To be eligible for selection applicants must: 1. Be a citizen of the United States; be no taller than 6 feet; and have been born on or after December 1, 1929. 2. Have a Bachelor's Degree in Engineering, Physical, or Biological Science. 3. Have acquired 1000 hours jet pilot time or have graduated from an armed forces test pilot school.

Military applicants must apply through their respective services. Others should send applications, postmarked no later than midnight December 1, 1965 directly to: Pilot-Astronaut, P. O. Box 2201, Houston, Texas.

All applicants must be able to pass a class-1 flight physical examination, which requires 20-20 uncorrected vision. Civilian applicants and military reservists should submit a standard Civil Service form 57, application for Federal Employment, available at all U.S. Post Offices, or a resume of their employment experience and academic training. Civilian applicants also should send a statement of their total jet flying time.

The selection process will be completed next spring and the new pilot-astronauts will report for duty at the NASA Manned Spacecraft Center in the summer of 1966.

The criteria are the same as those used in selecting 14 pilot-astronauts in 1963, with the exception of birthdate.

There are presently 28 pilot-astronauts and 5 scientist-astronauts participating in the NASA manned space flight program. Recruitment of additional pilot-astronauts is necessary to insure availability of an adequate number of flight crews for Project Apollo and future manned missions. Within the next year NASA plans to recruit additional scientist-astronauts.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

HU 3-5111

MSC 65-80
September 13, 1965

HOUSTON, TEXAS -- The Manned Spacecraft centrifuge facility was whirled for the first time last week, as Westinghouse Electric Co. engineers began tests on the large direct current motor which is the hub of the system.

The 50 foot arm of the centrifuge, which is designed to reproduce the gravity forces of launch or reentry, was spun at three revolutions per minute for a period of approximately one hour.

The 6,700 horsepower motor drove the weight of the arm, gimbel ring, and gondola ring. It will be tested at its maximum rate of 42 rpm by the Westinghouse team. Beginning in October, MSC engineers will begin using the facility to conduct acceptance tests, check the safety features, and train operators for the facility.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HU 3-5111

MSC 65-81
September 17, 1965

HOUSTON, TEXAS -- Long-duration Apollo flights will carry more than 5,000 pounds of scientific experimentation aboard an experiments pallet scheduled to fly for the first time in 1968.

Thirty-six prospective bidders met at the NASA Manned Spacecraft Center Wednesday for briefings at a pre-proposal conference, and may compete for two research and development contracts of $375,000 each.

The one or two industrial contractors selected for four-month study contracts will develop a design concept, detailed specifications, mock-ups and a firm cost proposal for the second phase of the program involving a cost plus incentive contract to develop flight hardware.

Flight hardware in this case will be an experiments pallet which will occupy one of the six pie-shaped segments of the Apollo service module. The other sections contain electrical power, environmental systems, fuel tanks and propulsion to sustain the three-man command module in space.

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The pallet consists of a basic structure to support scientific experiments, interconnectors to make use of other Apollo subsystems, plus supplementary subsystems designed to support specific experiments.

It is intended to operate for periods of up to two weeks in space, and to be monitored and controlled by the Apollo crew. Since the service module does not re-enter the atmosphere with the crew, some of the experimentation will be retrieved by extravehicular astronauts -- "space walkers" -- and returned aboard the command module.

Space in the pallet will be divided and shelved to allow installation of various experimental equipment, with enough flexibility to provide special installations for particular missions. Other sections of the pallet will be devoted to subsystems, such as batteries, which will provide the power for a variety of experiments.

Experiments to be carried in long-duration Apollo flights include some which may require extension "booms" to drive experimental equipment to positions as far from the spacecraft as 25 feet. Others involve removable sections that can be retrieved by an astronaut who would leave the command module during orbital flight. Still others would record data and transmit it to the ground tracking network via VHF and S-Band radio.

A list of the characteristic type of experiments which would be mounted on the pallet is given below:

TITLE:

Radar Scattering Cross-section Measurements of Terrain

OBJECTIVE:

To determine the radar scattering across sections of different kinds of terrain from orbital attitude. This information will be of great value to geoscientists. Such measurements offer the opportunity to provide gross aerial averages of such quantities as terrain geometry, ground cover conditions, amount of forest land and other earth properties. The correlation of these data with maps, photographs, etc. will be of value to the designers of imaging radars.

TITLE:

Temperature Sounding of the Atmosphere from a Manned Earth Orbiting Spacecraft

OBJECTIVE:

The primary objective of this experiment is the temperature sounding of the earth's atmosphere from a spacecraft. Knowledge of

--more--

the temperature structure of the atmosphere extended to high altitudes and over wide geographical area is of great significance to the understanding of the earth's meteorology. This experiment will also be of interest for planetary studies.

TITLE:

Ultraviolet Mapping of the Celestial Sphere in the 1230 to 1700 Angstrom Band

OBJECTIVE:

To map the sky in the 1230 to 1700 A band, thereby determining the far ultraviolet brightness of a large number of early type stars. Further, to use these data to determine how accurately the far ultraviolet brightness of a star can be predicted from its special classification and visual magnitude, and to extend the law governing interstellar absorption into the far ultraviolet.

Expected results:

a. Maps of the sky in the 1230-1700 A band.

b. The luminosity of the ultraviolet emissions from regions of emission nebulosity.

c. Data on peculiar objects of unusual far ultraviolet luminosity.

--more--

d. Data on extragalactic far ultraviolet objects.

e. Observations of far ultraviolet zodical light and gegenschein.

f. Dispersion stellar spectra of selected starfields.

TITLE:

X-ray Astronomy

OBJECTIVE:

The purpose of the experiment shall be to continue the study of X-ray sources outside the solar system. These sources cannot be studied from the Earth due to absorption of the X-rays in the atmosphere. The scientific objectives of the proposed experiment are:

a. To determine the positions of the known X-ray sources to better than a tenth of a degree.

b. To measure the X-ray spectrum from the stronger sources.

c. To observe certain objects of astronomical interest for evidence of X-ray emission. These objects would include strong radio emission centers, the galactic center, the ecliptic and certain extra-galactic objects such as super-nova remnants.

d. To scan the galactic equator for X-ray sources.

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e. To measure the relative and absolute strengths of X-ray emission from the sources.

f. To monitor the solar X-ray flux.

g. To observe the setting of X-ray sources below the Earth's horizon.

h. To perform a random scan of the sky in order to acquire information about the X-ray background.

<u>TITLE</u>:

Spark Chamber for Galactic Gamma Ray

<u>OBJECTIVE</u>:

To detect and map galactic gamma ray sources.

<u>TITLE</u>:

Nuclear Emulsion

<u>OBJECTIVE</u>:

Nuclear emulsion allows the detection and identification of particles over a greater range of energies than is possible with any other single detection system. A study of heavy primary cosmic ray nuclei (HPN) yields information on the origin of primary cosmic radiation and on the interstellar materials and fields they have traversed. If such studies can be made at several times during the 11-year solar cycle, one can also learn something about the solar modulation process.

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TITLE:

Measurement of Atmospheric Iodine from Orbit

OBJECTIVE:

To provide new evidence on the geochemical cycle of iodine and its possible relationship to marine life at the oceans surface and the application of this method to other geochemical relationships.

TITLE:

Zero Gravity Studies of Physical Properties

OBJECTIVE:

At zero gravity certain basic physical properties of solids and liquids have not been established. Among these are:

a. Thermal conductivity

b. Capillary flow

c. Liquid drop behavior

A controlled environment chamber in orbital flight would offer an opportunity to measure the special properties at zero gravity.

TITLE:

Frog Otolith Functions during Zero Gravity

OBJECTIVE:

To record the bioelectric action potentials of the vestibular nerve in the bull frog during weightlessness and repeated

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accelerations (obtained by spinning the animals on a small rotator) and to determine the adaptability of the otolith system to weightlessness and acceleration during extended periods of flight. Information to be obtained on stimulus-response relationships in the vestibular system under zero-gravity conditions and on the adaptability of the animal are an important step forward in the investigation of biodynamic factors and their effects on living systems.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-82
September 20, 1965

HOUSTON, TEXAS -- The Gemini 7 spacecraft has successfully completed altitude chamber tests, with the prime and backup flight crews having spent about 4 hours each in the spacecraft in an environment equivalent to 150,000 feet altitude.

Conducted at the McDonnell Aircraft Corp., St. Louis, prime contractor for the Gemini spacecraft, the tests constituted the final acceptance check of the environmental control system. In addition, all crew equipment was checked out at altitude.

The prime crew, Astronauts Frank Borman and James Lovell, wore the lightweight suit which is under consideration for the mission. The backup crew, Edward H. White, II and Michael Collins, wore regular Gemini space suits.

Spacecraft cabin pressure was maintained at 5 psi throughout the tests except for a 45-minute period when the spacecraft was depressurized and the hatch opened by the backup crew to check the reaction of various items in the cabin in a near vacuum.

At Cape Kennedy, Fla., the Gemini 6 spacecraft has been mechanically mated to its launch vehicle on launch complex 19. The operation clears the way for combined testing of both vehicles. Electrical interface verification testing is now underway.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HUnter 3-5111

MSC 65-83
September 22, 1965

HOUSTON, TEXAS -- The National Aeronautics and Space Administration today selected Ling Timco Vought, Inc., of Dallas, Texas for negotiation of a contract to provide engineering support services at White Sands Test Facility, White Sands Missile Range, New Mexico. The facility is under the direction of the NASA Manned Spacecraft Center, Houston.

A one-year-cost-plus-award-fee-contract is to be negotiated. It will contain provisions for two additional one year renewals. Estimated cost for the three year period is in excess of $5 million.

The contractor will operate five engineering laboratories in the facility to support NASA in testing the propulsion systems of the Apollo command, service and lunar excursion modules. The laboratories are data processing, materials and processes, electrical measurements and standards, physical measurements and standards, and systems design and testing. The work will require approximately 200 persons.

Ling Timco Vought was one of 17 firms which responded to request for proposal issued in June 1965 by the Manned Spacecraft Center.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER Houston 1, Texas

HUnter 3-5111

MSC 65-84
September 24, 1965

HOUSTON, TEXAS -- A support contract for control of radiation sources, in space and on the ground, for manned spacecraft has been signed with Tracerlab, a Division of the Laboratory for Electronics.

The $132,000 contract provides for health physics and radiation protection services. Health physics covers the hazard analyses, monitoring, waste disposal, and decontamination of radiation sources used at the Manned Spacecraft Center in experimental work, checkout, and testing.

Radiation protection services includes studies performed on spacecraft hardware and experiments which use radiation sources. Safety standards and environmental tests will be determined and must be met by each itme before it can be flown.

The handling and use of radioactive materials at MSC is coordinated by the Radiological Control Committee, chaired by the MSC Radiation Control Officer. Safety standards and procedures for all radiation sources in use on site or in space are set up by this committee.

Tracerlab will also assist in determining whether there would be any interaction between radiation sources onboard a spacecraft.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HU 3-5111

MSC 65-85
September 25, 1965

The National Aeronautics and Space Administration today announced that Gemini VI will be launched on a two-day mission from Cape Kennedy, Florida, no earlier than Oct. 25. It will be man's first attempt to rendezvous and dock with an orbiting space vehicle.

Pilots for Gemini 6 are astronauts Walter M. Schirra and Thomas P. Stafford. Backup pilots are Virgil I. Grissom and John W. Young. This will be Schirra's second space flight. His first was October 3, 1962 aboard Mercury spacecraft Sigma 7.

Prime objective of Gemini 6 is to prove out the ability of Gemini to rendezvous and dock with an orbiting Agena vehicle. Secondary objectives of the flight include evaluating maneuverability of the two undocked vehicles.

Two launches are required for the mission. The Gemini-Titan and the 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.

Following successful launches of both vehicles the first opportunity for the Gemini launch will be one revolution or approximately 101 minutes after the Atlas Agena launch.

When the Agena has obtained proper orbit, Gemini VI will be launched into an orbit of about 100 miles perigee and 168 miles apogee. During the first three revolutions of Gemini VI the astronauts will maneuver their spacecraft into a circular orbit of about 168 miles, approximately 17 miles below the Agena.

On the fourth revolution, as the Gemini spacecraft passes over the Atlantic Ocean, the astronauts will begin terminal rendezvous maneuvers for a planned docking with the Agena between Australia and Hawaii.

Only attitude maneuvers are translations maneuvers using Gemini Orbital Altitude And Maneuvering System (OAMS) will be attempted while the two spacecraft are docked.

It is planned to dock and separate spacecraft several times to provide experience with docking procedures. Each astronaut will 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 altitudes and distances.

About 10 hours of flight time have been planned for rendezvous and docking activities. However, based on experience in previous flights, the Gemini VI flight plan will be flexible to provide whatever time is needed to accomplish these activities.

Scientific and medical experiments for Gemini VI are presently under consideration.

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

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

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

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

HU 3-5111

MSC 65-86
October 7, 1965

HOUSTON, TEXAS -- The technology developed in the steerable parachute program using a Gemini boilerplate is now planned for application to Apollo-type spacecraft, it was announced here today.

"The identical method used in the first parasail test series will be applied to demonstrate the technology for vehicles of the weight and size of Apollo," said Maxime Faget, Assistant Director for Engineering and Development, "We are using the knowhow acquired in the parasail program in the development of a new system."

The last test drop using the Gemini boilerplate was conducted successfully at Fort Hood, Texas, on July 30. The vehicle landed within forty feet of the target point, using two small braking rockets to cushion its descent.

In the new test series, two most promising types of gliding parachutes will be developed. Northrop Ventura of Van Nuys, California, has been awarded a contract for $302,797 to develop a cloverleaf gliding chute and Pioneer Parachute Co., Manchester, Connecticut has been awarded a $186,997 contract for design and development of a large controllable parachute.

Initial flight testing will be done with a half scale model of an Apollo boilerplate. The results of these tests will determine which type of parachute will be used with a full scale Apollo boilerplate.

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Add 1......

The half scale model will use only the chutes and turn motors. The full scale models will test all the components of the gliding parachute-landing rocket system.

Three contracts for analytical studies have already been awarded. Bendix Aerospace, South Bend, Indiana, has received a $116,000 contract for a computer study on landing dynamics of the Apollo command module. North American Aviation, Downey, California, has been awarded $67,000 for a study on mechanical system impact design, and Hayes International, Birmingham, Alabama, has received a study contract for $88,987 for soil erosion characteristics caused by landing rocket firings.

The Landing Technology Branch of Structures and Mechanics Division, Engineering and Development Directorate, is responsible for technical supervision of the program.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-87
October 8, 1965

HOUSTON, TEXAS -- U.S. astronauts aren't just the world's most experienced space travelers.

The NASA Manned Spacecraft Center pilots are 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.

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.

Mexico's Agua Blanca fault zone, so obvious in photos taken from space, was only recognized by geologists in 1956, and even then it took aerial reconnaissance to find it.

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Add 1......

The Pinacate volcanic field in Mexico has been known for centuries, yet its boundaries are not shown on maps as recent as 1960. Gemini photos taken this year identify the field clearly.

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.

But more than just photographs are involved. On-the-spot reports by astronauts, such as those provided by L. Gordon Cooper and Charles Conrad from Gemini V, are equally valuable.

Cooper and Conrad reported Typhoon Doreen in mid-Pacific during their 65th revolution of the earth when nobody knew where the storm was. Their information was transmitted to the ground, and the weather bureau in San Francisco published an advisory to sea and air traffic the same day.

Astronomers have known about a mysterious glow in the sky for years, and they call it gegenschein -- "counter glow." It has baffled them, and defied every attempt at photography from the earth.

Cooper and Conrad photographed it for the first time during their eight-day flight in August. Milky haze on their film indicates that gegenschein is reflections from back-lighted particles in space, particles of comets or asteroids, but not particles from earth.

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Add 2......

Zodiacal light, a tinge of light near the horizons at sunset and sunrise, has also been photographed by American astronauts. This phenomenon is caused by reflected sunlight from dust particles.

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.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-88
October 8, 1965

HOUSTON, TEXAS -- Albert M. Chop, Deputy Public Affairs Officer at NASA's Manned Spacecraft Center, will address officials of the San Antonio Chamber of Commerce October 19.

Chop will speak at 7:30 a.m. at the Saint Anthony Hotel's Pereaux Room in San Antonio to the Chamber's board of directors, executive committee, Alamo Roundup Club and the chairmen of about 30 chamber committees.

His talk, status of NASA's manned space flight programs, Gemini and Apollo, will be supported by films and slides from the Gemini V mission, and animation showing how rendezvous and docking will be performed by Gemini VI pilots later this month.

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(biography available upon request)

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-8111

MSC 65-89
October 11, 1965

HOUSTON, TEXAS -- First details of a lightweight Gemini suit proposed for use in Gemini VII flight were announced today at the NASA Manned Spacecraft Center.

The suit, currently undergoing qualification tests, has not yet been approved for use by Gemini VI pilots. It weighs 16 pounds, including an aviator's crash helmet which is worn under the soft helmet. The Gemini suit currently in use weighs 23.5 pounds and uses a fiberglass shell helmet.

The suit can be completely taken off during flight. It can also be worn in the partially doffed mode, in which the gloves and boots are removed and the helmet is unzipped at the neck and rolled back to form a headrest behind the neck.

The new suit has two layers of material. The inner layer is the pressure retaining neoprene-coated nylon bladder and outer layer is 6 ounce HT-1 nylon. Small sections of link net are used in the shoulders for improved mobility. The Gemini suit for the Gemini VI flight has four layers of material.

Other weight savings were effected in eliminating the large rotating neck bearing and the helmet tie-down system. The ventilation system for the suit is external, with ducting travelling down the outside of legs and arms to enter the pressure bladder at the extremities.

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Add 1......

Due to the proven reliability of the Gemini environmental control system on previous flights, even shirt sleeve operation would be possible in the spacecraft. However, other considerations such as blast protection, ventilation, and emergency pressurization were the basis for the lightweight suit approach which is being considered.

Dick Johnston, chief of Crew Systems Division, will present a paper at the American Institute of Aeronautics and Astronautics in St. Louis on October 13 which deals in part with the lightweight suit. He will also discuss basic and extravehicular Gemini suits, the Apollo extravehicular mobility unit for lunar use, and the concepts of post Apollo suits, such as the all metal space suit.

The suit was developed by the Gemini Support Office of Crew Systems Division, and was built by the David Clark Co., Worchester, Mass., present contractor for the basic and extravehicular Gemini suits.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-90
October 11, 1965

HOUSTON, TEXAS -- Charles L. Schultse, director of the Bureau of the Budget, and members of his staff visited Manned Spacecraft Center Sunday for a general orientation briefing and tour of MSC facilities.

The Bureau of the Budget group was the guest of NASA Administrator James E. Webb and Dr. Robert R. Gilruth, MSC Director, for the visit. The group, accompanied by Mr. Webb and members of his staff, arrived at 2 p.m. Sunday and remained overnight, departing for Cape Kennedy early Monday morning.

The group toured astronaut training facilities in Building 5, crew systems development areas in Building 7, large pressure chambers in Building 32 and the Mission Operations Control Wing of Building 30.

MSC officials were hosts to the visitors at dinner in the MSC cafeteria Sunday night.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-91
October 12, 1965

HOUSTON, TEXAS -- The 55-member faculty and student body of the NATO Defense College will visit the Manned Spacecraft Center October 15 as part of a nation-wide tour of government departments, military headquarters and installations.

In addition to the Manned Spacecraft Center, the College is scheduled to visit the State Department and Pentagon in Washington, D.C.; United Nations; Strategic Air Command, Omaha, Neb.; a U.S. Minuteman installation at Cheyenne, Wyo.; Headquarters of the North American Air Defense Command, Colorado Springs; New Orleans; a fire power demonstration by the U.S. Strike Command at Ft. Bragg, N.C.; and Quebec and Ottawa, Canada where members will receive briefings by top Canadian political and military leaders.

The college was established in Paris in 1951 at the initiative of General Eisenhower...at the time Supreme Allied Commander in Europe. The objective of the college was training of key senior personnel to fill high military and civilian posts in NATO or in positions with their own national governments dealing with the NATO alliance.

Members of the college are drawn from the military and civilian departments of NATO nations on an agreed quota. The commandant is Lt. Gen. Duilio S. Fanali of the Italian Air Force. Thirteen of the 15 NATO countries are represented at the college. Only Iceland and

--more--

Add 1......

Luxembourg are not represented on the present course. There are six U.S. Military officers and one foreign service officer from the State Department in this particular course. Canada has two military representatives.

More than 1,500 persons have been graduated from the college since its beginning in 1951. Courses are of six months duration. The studies of the college cover the broad spectrum of political, military and social problems of the world...in particular their relationships to the Alliance and its member nations.

Tours made by the college, such as the one which brings it to the Manned Spacecraft Center, are of particular importance to the curriculum. They afford the members the opportunity to view at first hand the countries of the Alliance and to receive on the spot briefings on political, economic and military problems by national authorities. Visits to industrial plants and places of cultural interest are also featured on the college tours.

The United States and Canada have only recently been added to the tour program. The current visit is the second to North America. The European NATO countries are visited on a regular basis.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-92
October 14, 1965

HOUSTON, TEXAS -- Remote-site flight controllers deployed from Houston this week to their tracking stations at Guaymas, Hawaii, Carnarvon, Canary Islands and aboard the ships Coastal Sentry and Rose Knot.

Their departure followed many hours of drill in the Mission Control Center-Houston in the simulated remote site training facilities -- Simulated Network Simulations (Sim Net Sims), as they are called to differentiate between in-house simulations and full network simulations with the actual tracking stations manned.

The three teams of flight controllers in Mission Control continue their Gemini 6 training with launch abort and reentry simulations as the October 25 launch date draws near.

Flight Directors for the three teams of flight controllers in Mission Control are Christopher C. Kraft, Jr., Red Team; Eugene F. Kranz, White Team; and John D. Hodge, Blue Team.

Console positions in Mission Control follow, listed by Red, White, and Blue teams, respectively:

Assistant Flight Director: Charles S. Harlan, Manfred H. "Dutch" von Ehrenfried, and William E. Platt. Operations and Procedures Officer: Jones W. Roach, Lawrence L.D. Armstrong, and William Molnar, Jr. Flight Surgeon: Dr. Charles A. Berry, Dr. A. D. Catterson, and Dr. D.

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Owen Coons. Spacecraft Communicator: Elliott M. See and John Young, Red team; Eugene A. Cernan, White team; and Charles A. Bassett, II, and Virgil I. "Gus" Grissom, Blue team. Booster Systems Engineer: Charles S. Harlan. Tank Monitor: Clifton C. Williams. Guidance, Navigation and Control Engineer: Arnold D. Aldrich, Gerald D. Griffon, Gary E. Coen. Electrical, Environmental and Communications Engineer: Richard D. Glover, Thomas R. Loe, and John W. Aaron.

Agena Systems: (two teams only) Milvin F. Brooks and Robert C. Carlton; James E. Saultz and Bruce H. Walton. Flight Dynamics: Clifford E. Charlesworth, Edward L. Pavelka, and Jerry C. Bostick. Retrofire Officer: John S. Llewellyn, David V. Massaro and Thomas F. Carter. Guidance Officer: Charley B. Parker, William E. Fenner, and Kenneth W. Russell. Network Controller: Capt. Walter J. Arellane, Lloyd White; Ernest L. Randall, Lt. Richard G. Ayers; Capt. Andreus A. Piske, Capt. George D. Ojalehto. Support Control Coordinator: Ledrieu L. Linson, James E. Mager and Philip N. Barnes. Maintenance and Operations Supervisor: John W. Hatcher, Earl V. Carr and Bobby B. Dye. Public Affairs Officer: Paul Haney, Al Chop and Terry White.

Tracking station flight controller assignments are listed for each station by Spacecraft Communicator, Gemini Systems, Agena Systems and Aeromed console positions respectively:

Canary Islands: Arda J. Roy, Jr., Joseph Fuller, Jr.; Charles L. Gruby and George P. Contois; Lt. Col. Roland Shamburek, MC/USA, Lt. Clyde G. Jeffrey, MC/USN.

Carnarvon: William D. Garvin, Harold M. Draughon, Ted A. White;

Add 2......

Harry Smith and Thomas E. Weichel; Lt. Cdr. George F. Humbert, MC/USN, Wing Commander W. J. Bishop, RAAF.

Hawaii: Charles R. Lewis, Ambers S. Davis, Dale L. Klingbeil; Hershel R. Perkins and Paul D. Nering; Capt. Charles H. Sawyer, MC/USAF, Maj. O'Neill Barrett, MC/USA.

Guyamas: Keith Kundel, Gene F. Muse; Willard D. Robinson; Capt. William A. Walter, MC/USAF, Cdr. Andrew W. Stephenson, Jr., MC/USN.

Coastal Sentry: Edward I. Fendell, James F. Moser; Harold V. Berlin, and George W. Emerson; Maj. James R. Wamsley, MC/USAF, John J. Droescher, MD.

Rose Knot: James R. Fucci, Floyd E. Claunch; Robert D. Legler and Luis J. Espinoza; Maj. Gerald D. Young, Jr., MC/USAF, and Cdr. Clarence E. Gossett, MC/USN.

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HUnter 3-5111

MSC 65-93
October 15, 1965

NASA to Negotiate with Lockheed Electronics Co. for Computer Programming Support

HOUSTON, TEXAS -- The National Aeronautics and Space Administration today selected Lockheed Electronics Co. of Houston, Texas for negotiation of a contract to provide computer, programming and operational support services for the Manned Spacecraft Center, Houston, Texas.

A cost-plus-award-fee contract will be negotiated for a one-year period with provisions for two additional one-year renewals. Estimated cost for the first year is in excess of three million dollars.

The contractor will support the Center in all work requiring computer programming and data reduction, and equipment operations, exclusive of Mission Control Center operations. Work will include supporting astronauts' centrifuge training operations, data processing and support of tests of spacecraft and spacecraft components, trajectory computations, spacecraft engineering simulations, and reduction of bio-medical data obtained during Gemini and Apollo

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missions. Support of the Center's business office and payroll and cost accounting work also is included. Approximately 400 personnel will be required to perform the services.

Lockheed Electronics Company was one of nine firms which responded to requests for proposals issued in June, 1965 by the Manned Spacecraft Center.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-94
October 18, 1965

HOUSTON, TEXAS -- A test series on extravehicular activity has been completed by the engineers of Space Medicine Branch of Crew Systems Division.

Test subject Jack Slight, wearing a Gemini spacesuit and strapped into a six-degree of freedom zero gravity simulator, "walked" through space from a mockup of the Gemini spacecraft and Agena target vehicle as they were docked together on the laboratory floor at the Manned Spacecraft Center.

Slight opened a panel on the side of the Agena which represented a micrometeoroid collection experiment which will be flown on a later Gemini mission. In a second set of maneuvers, he retrieved the trap and carried it back to the spacecraft.

The purpose of the tests is to determine the procedures necessary for performing the task in space, to define the handholds necessary for the astronaut to perform the experiment, and design verification of the experiment.

The tests will be performed again next month in a true weightless condition in the cabin of an Air Force KC-135 aircraft flying a trajectory which produces weightlessness for a period of 30 seconds.

Martin DeBrovner, Space Medicine Branch, is test conductor for the series.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

MSC 65-95
October 19, 1965

HU 3-5111

HOUSTON, TEXAS -- Dr. Charles A. Berry, Chief of Center Medical Programs at the Manned Spacecraft Center, is the nation's first medical doctor in the aerospace field to receive the Exceptional Service Medal. He was presented the award by President Lyndon B. Johnson at the White House on September 14.

As chief physician for NASA astronauts, Dr. Berry heads an organization of 100 medical doctors and technicians stationed throughout the world monitoring the health of the astronauts before, during, and after a space flight.

The Exceptional Service Medal was given for "his outstanding contributions to space medicine through his direction of and personal participation in the medical planning and control of the Gemini manned space flights."

A graduate of the University of California medical school, Dr. Berry began his medical career in private practice at Indio and Coachella, California. He entered the Air Force in July 1951, and was assigned to the Canal Zone, Panama. He was assigned to NASA in 1959 as a medical monitor on the Mercury program, and became Chief of Center Medical Programs of MSC in 1963.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

MSC 65-96
October 21, 1965

[illegible] 3-5111

HOUSTON, TEXAS -- The familiar white space helmets are on the way out, due to the efforts of a psychologist and a mechanical engineer in Crew Systems Division of the Manned Spacecraft Center.

Dr. Robert L. Jones and James O'Kane have developed a "bubble" helmet which is smaller and lighter than previous helmets, and yet is more comfortable and provides more visibility.

The helmet, which is made from a plastic material called polycarbonate, is transparent except for a small section at the back of the head. Hence the name, "bubble" helmet.

The Apollo suits which will be used for the moon landing will have this new type of helmet design.

The helmet started as a development project, but its design offered so many advantages over the other helmets that it was incorporated into the Apollo suit, and will be worn by astronauts exploring the surface of the moon.

The first consideration in designing a new helmet was the fit, or headspace inside the helmet. If the helmet did not rotate, it was necessary to find out just how much room a man needed to move his head freely inside the helmet. The results of head motion studies revealed that a smaller and lighter helmet could be designed and the viewing area of the astronaut actually increased.

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Add 1......

A pattern for the new helmet was cut and a mold made by personnel of the Technical Services Division. The first helmet was almost round, but in later designs, the sides were flattened to give an even better shape and fit.

Other features were added to the helmet. A new design of the neckring where the helmet connects to the torso of the suit permitted donning or removing the helmet in a few seconds.

Protection pads made of a foam material were molded to fit on the inside and outside of the back of the helmet to protect the head against buffeting, vibration and impact during launch and reentry. They are removable during flight.

Three adjustable visors on the outside of the helmet will provide protection from heat, radiation and glare. The visors move independently.

After assembly, the helmet was tested by mounting it in a drop rig and subjecting it to various g forces caused by impact. The helmet received as many as 34 g's without damage in these tests.

Other evaluation tests included visual field measurements, carbon dioxide build-up, and ease of operation.

The features of the helmet were reviewed by members of the astronaut group and Center management, and adopted. The "bubble" helmet has taken its place as the latest development on the Apollo suit for the lunar landing.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-97
October 21, 1965

HOUSTON, TEXAS -- The National Aeronautics and Space Administration will negotiate a contract extension with Federal Systems Division, International Business Machines Corporation, Rockville, Md., for continued support of the Real-Time Computer Complex at the Manned Spacecraft Center.

Extension is expected to cost about $80,000,000, and will contain provisions for converting to an incentive agreement. Details are under discussion.

The work calls for conversion to new generation IBM systems 360 computers and use of advanced multi-program techniques to increase capabilities required for Apollo missions.

The Real-Time Computer Complex in the Mission Control Center provides the computing capability required for mission monitoring, inflight mission planning, and simulation activities.

In the mission monitoring and planning functions, raw data is converted and displayed in formats easily interpreted by the mission team.

Flight plan recommendations are computed and displayed for mission controller analysis and selection. Rapid detection and

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notification of the existence of marginal spacecraft conditions are provided. The RTCC also generates simulated raw data required for preflight testing and training.

As part of the program to increase the capability of the operational computer complex for the Apollo moon mission, orders have been placed with Univac Division of Sperry Rand Corporation, to provide the new 494 unit. The Univac 494's will be used in the communication, command telemetry areas.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-5111

MSC 65-98
October 28, 1965

HOUSTON, TEXAS -- Meteorite finds in Texas are increasing, according to Dr. Elbert King of the Manned Spacecraft Center here.

King, an expert in the composition and origin of extraterrestrial objects who works in the Geology and Geochemistry Section at MSC, said that he has received four meteorites from various areas in Texas during the current year. All the specimens were either donated or loaned to MSC for analysis.

"Normally, four or five new meteorites are the total find for the world in one year," King said.

The largest meteorite was a 30-pound stoney variety from Collingsworth County, Texas. Two meteorites of three and four pounds were found near Conroe by a lady who observed the fall in 1955. The fourth meteorite was a seven-pound iron specimen found near Del Rio and received about a month ago through the efforts of Dr. George Edwards of the Shell Research Company.

Although meteorites are comparatively rare, they are valuable mainly for scientific information they contain rather than any monetary worth. If meteorites can be examined soon after they

--more--

fall, much can be learned about cosmic radiation in space.

MSC geologists are also interested in the space rocks as a key to determining the composition of lunar rocks and possibly the evolution of the solar system. Meteorites are accepted here for examination in cooperation with the U.S. National Museum. All meteorites donated here will eventually go to the National Museum.

King said that most meteorites are discovered because they are heavier than rocks of a comparable size and have an unusual shape due to entry heating. Meteorites are also commonly found in areas which are free from other rocks. Anyone who suspects he has discovered a meteorite should first send only a small sample of the rock for analysis. If the sample is meteoritic, the entire specimen can then be sent.

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NASA
S-65-55167

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HU 3-5111

MSC 65-99
October 27, 1965

HOUSTON, TEXAS--The National Aeronautics and Space Administration today named an Agena Review Board. The board will be headed by co-chairman, Dr. Robert R. Gilruth, Director of NASA Manned Spacecraft Center and Major General O. J. Ritland, USAF Deputy Commander for Space Air Force Systems Command.

Members are to try to identify the causes of the failure which prevent Agena stage from fulfilling its mission in Gemini VI flight Monaay.

Members are Cyrus Himmel, Lewis Research Center; Robert Gray, Kennedy Space Center; F. John Bailey, Manned Spacecraft Center; Col. William Neilsen, USAF Director Agena Directorate Air Force Space Systems Division; Col. Quenten Riete, USAF Vice Commander, 6595 Aerospace Test Wing Vandenberg, Calif; Mort Goldman, Aerospace Corp., Los Angeles, Calif.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-5111

MSC 65-100

October 28, 1965

HOUSTON, TEXAS-- The first two-man flight of North American Aviation's Space and Information Systems Division paraglider recovery system is scheduled for Saturday morning at Edwards Air Force Base following completion of four successful manned flights in the past 10 days, and a total of eight in the past two months.

S&ID test pilots Don McCusker and Jack Swigert will be at the controls of the Gemini-type spacecraft used in tests of the bat-shaped paraglider wing.

Bert Witte, director of S&ID's Flexible Wing Systems, said the test plan calls for the paraglider to be inflated on the ground and then towed to an altitude of approximately 10,000 feet by helicopter. During the first two minutes of the scheduled six-minute free flight following release, McCusker and Swigert plan to make a series of navigational checks, and then guide the system to a spot landing.

McCusker was the pilot of three of the earlier flights, and Swigert manned the craft in today's flight. In the initial two flights, McCusker put the vehicle through a series of turns to determine its characteristics under maximum bank angles, and practiced spot landings.

On Tuesday, McCusker made the first flight in which the system was ballasted to simulate the weight of the second pilot. Swigert's flight today was to obtain further aerodynamic data and spot landing practice to pave the way for Saturday's two-man test.

A successful flight today will make a consecutive string of eight successes in the program during the past two months. The tests are designed to demonstrate pilot capability to land the system in a pre-selected area, and the ability of a pilot to make heading corrections during spacecraft recovery.

--MORE--

ADD 1........

Paraglider test

Witte said at least three more one and two-man flights are scheduled for next week in which the spot-landing capabilities of the system will be further proved out.

S&ID is conducting the paraglider development program for NASA's Manned Spacecraft Center to study the operational feasibility of a controlled earth landing system.

Warren J. North, chief, Flight Crew Support Division, MSC's Flight Crew Operations, is the NASA technical director for the paraglider program.

For the test program, the paraglider is inflated on the ground and towed aloft by helicopter. Is is released at altitude and put through a series of maneuvers by the pilot to accomplish test objectives enroute to a landing in a pre-designated area.

In actual operation, the paraglider would be stored in a 10-cubic foot cannister onboard a spacecraft until after the vehicle is slowed by the Earth's atmosphere on re-entry. Then an onboard nitrogen supply similar to that used to inflate a life raft, is utilized to deploy the paraglider to its full 31-foot length and 31-foot wing span.

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER Houston 1, Texas

HUnter 3-5111

MSC 68-101
November 5, 1965

HOUSTON, TEXAS--The Manned Spacecraft Center's "navy", a converted Army landing craft utility (LCU), recently underwent a face-lifting which included relocating the bridge to better adapt the vessel to perform its space oriented duties.

NASA Motor Vessel Retriever, as the 115-foot long and 34-foot wide ship is called, has been in use of the MSC Landing and Recovery Division since June 1963, in support of operational tests that require large and sometimes rough water areas.

These exercises have included Gemini postlanding water suitability tests, water egress training for flight crews, spacecraft drop tests from aircraft, spacecraft uprighting sea tests, Gemini and Apollo sea-dye tests, flotation collar tests, qualification of shipboard recovery equipment, and other qualification testing programs.

The old bridge has been replaced with a newly elevated structure that contains all the controls from the old bridge plus some additional equipment. The new bridge is about two and one-half feet higher than the old one, and measures 20 by nine feet. It is enclosed all around by opening-type tinted glass windows, and the bridge area is heated and air conditioned for crew comfort.

Controls moved from the old bridge, include the air controlled clutches for the diesel engines which propell the ship, the electric steering controls, the ship's wheel, gyro repeater compass, and the radar.

In addition to these controls, another set of air controlled clutches for the engines, along with another electric steering control have been installed to provide two crew stations so that the ship can be operated from either side of the bridge. Another portable electric steering control on an extension cord, which allows the ship operator to move about on the bridge, has also been installed.

The new bridge which is more than twice as large as the old one also contains a ship-to-shore radio, radar, water depth recorder, wind velocity and wind direction indicators, a chart table, a magnetic compass, auto-pilot, and an additional gyro repeating compass.

Origionally built for the Army in 1954, the Retriever was acquired by NASA in early 1963 at Ft. Eustis, Va. It was sailed by an Army crew to Charleston, S. C., where its present skipper Frank M. Gammon, assumed control of the vessel for NASA, and the Army crew sailed the LCU on to New Orleans. It was then sailed to Mobile, Ala. shipyard for modifications and was brought to Houston in June, where it was pressed into duty within a week.

One of the Retriever's first tests was performed in Galveston Bay with a group of local newsmen on board to witness the exercise. A boiler-plate spacecraft was placed in the water and retrieved to demonstrate the ship's capabilities.

Presently a telemetry instrumentation station for the Apollo post-landing qualification program is in the process of being installed on the Retriever by the MSC Information Systems Division.

Equipment onboard for handling of spacecraft include a 10-ton lift capacity boom with a 50-foot mast and a 10-to 12-ton davit retrieval crane. Both the boom and the crane will swing over the side for retrieval of space-craft from the water.

The Retriever is manned by a permanent crew of three men who perform routine maintenance as time permits in the busy schedule of the vessel. The ship is utilized for MSC test and qualification exercises on an average of four working days each week. Major repairs such as the recent relocating of the bridge, or the once-a-year dry dock maintenance, is contracted out.

The shallow draft of the vessel, four and one-half feet, makes it ideal for working in the Galveston Bay area. The Retriever's large deck area provides adequate working space and a lift capability in excess of 20,000 pounds, which is sufficient to do all testing for Apollo and the extended Apollo programs. The LCU was originally designed to carry six 30-ton tanks or 200 battle equipped soldiers. It has a 350-ton water displacement.

A limitation of the Retriever is its slow speed. A maximum speed of seven knots is provided by the three 165hp diesel engines, and when the vessel is bucking a running tide, four knots is about all the speed that can be mustered. From the Retriever's permanent berth at Seabrook Shipyard to

Galveston takes an average of four hours. So as a rule when tests are to be conducted in the Gulf, the vessel is docked at the Corps of Engineers' or Coast Guard Dock at the Galveston Coast Guard Station.

The crew: Gammon, ship's captain; Frank J. Janoch, chief engineer; and William C. Lyons, deck hand; are all members of the Operational Evaluation and Test Branch of the Landing and Recovery Division.

During tests, the crew of three receives assistance in the operation of winches, spacecraft handling and shipboard duties from the Technical Services Division and others onboard to support the tests.

A complete galley and sleeping quarters for 17 people are onboard the Retriever. These facilities are utilized on tests that require more than one day to complete. The old bridge area was converted to bunk space to provide three of the 17 sleeping spaces.

Another recent addition to the Retriever is the davit retrieval crane which has interchangeable rings to accomodate either the Gemini or the Apollo spacecraft. During the remodeling of the vessel, provisions were made for mounting the crane on either the main or poop deck.

The new crane was first operationally used for the egress training of the Gemini VII backup crew in the Gulf of Mexico, on October 29.

The recent addition of the new bridge to the Retriever and other modifications were performed by Todd's Shipyards Corporation in Houston at a cost of $150,000. This was followed by the annual drydock maintenance which was performed by Bludworth Shipyard Incorporated, Brady Island.

NASA
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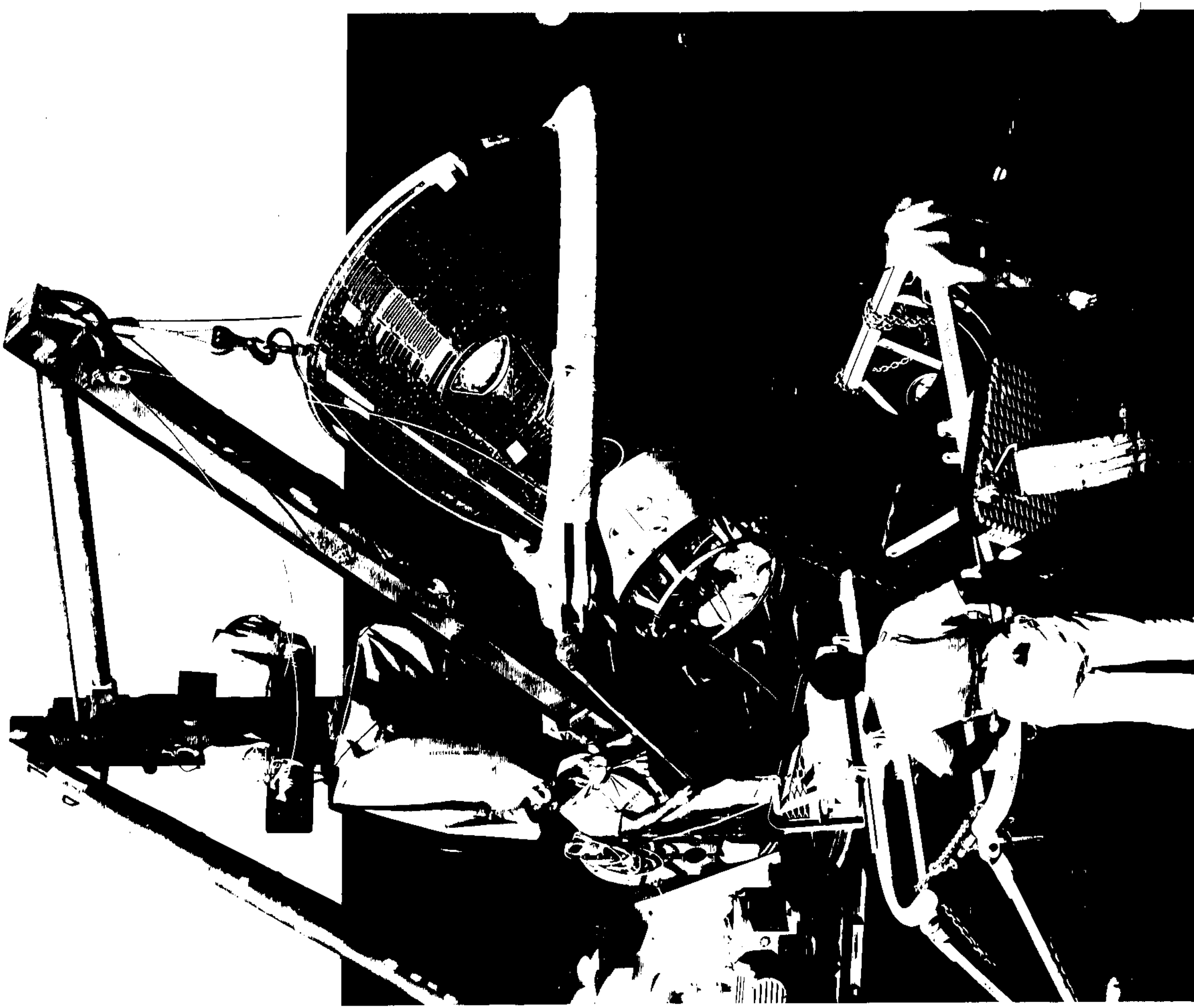
NASA
S-65-57229



NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HU 3-5111

MSC 65-102
November 5, 1965

HOUSTON, TEXAS -- The National Aeronautics and Space Administration today announced it will negotiate with International Latex Co., Dover, Delaware, and Hamilton Standard Division of United Aircraft Corp., Windsor Locks, Conn., for development and production of Project Apollo astronaut flight suits and a portable life support system for operations in space and on the lunar surface.

Subject to negotiations, International Latex will produce the ight suit, which consists of a liquid-cooled undergarment, constant-wear garment, pressure garment assembly and thermo-micrometeoroid protective overgarment. Cost of the work is estimated at $10 million.

Under a separate contract to be negotiated, Hamilton Standard will produce the life support system. It will be a back pack weighing about 65 pounds which will contain an oxygen system, thermo control system and communications equipment. This system will be used for extravehicular activities during earth orbital flights and on the lunar surface. Estimated cost is approximately $20 million.

Present plans call for the pressure suit to be worn during the later phase of the Apollo/Saturn 1B earth orbital mission series and ıring Apollo/Saturn 5 missions, including lunar landings. Astronauts will use Gemini pressure suits on the initial Saturn 1B missions.

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The Crew Systems Division of the NASA Manned Spacecraft Center, Houston, will manage the work and be responsible for integration of the pressure suit and life support system.

The companies have been engaged in research and development work on suits and life support equipment for NASA since 1963.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
HUnter 3-5111

MSC 65-103
November 9, 1965

HOUSTON, TEXAS -- The National Aeronautics and Space Administration today announced the launch of Gemini 7 -- the first of two launches in a combination long duration mission and rendezvous of two manned Gemini spacecraft -- is scheduled no earlier than December 4.

If preparation of launch facilities and checkout of launch vehicle and spacecraft proceed as presently planned, the launch of Gemini 6 will follow nine days later on December 13.

Astronauts Frank Borman and James A. Lovell, Jr. are command pilot and pilot respectively for the Gemini 7 mission. It will be the first space flight for each. Astronauts Edward H. White, II and Michael Collins are the backup crewmen.

Walter M. Schirra is the command pilot of Gemini 6 and Thomas P. Stafford is the pilot. It will be the second space flight for Schirra. Astronauts Virgil I. Grissom and John W. Young are the backup pilots.

The Gemini 7 mission is scheduled for up to 14 days. The purpose of this flight is to further determine the effects of long duration flight on man. Twenty scientific, medical and technological experiments are scheduled to be carried out on the Gemini 7 mission.

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The mission planned for Gemini 6 is nearly identical to that of the original rendezvous flight which was postponed on October 25 when the Agena target failed to achieve orbit. (An intensive study is now underway to determine the cause of the Agena failure).

Gemini 6 will rendezvous with the Gemini 7 target spacecraft during the fourth revolution and station-keep with the Gemini 7 spacecraft for a period of time. Maximum duration of the Gemini 6 mission is two days. While the Gemini 6 spacecraft will approach within close proximity of the Gemini 7 spacecraft it will not dock with it.

No major changes have been made in the Gemini 7 mission. The Gemini 6 mission will have no major impact on the accomplishment of Gemini 7 objectives. The Gemini 7 flight trajectory has been modified to provide support as a target for the Gemini 6 mission.

The purpose of proceeding with the attempt to launch Gemini 6 is to demonstrate as early as possible a rendezvous of two vehicles in space.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER NASA Houston 1, Texas
HUnter 3-5111

MSC 65-104
November 12, 1965

HOUSTON, TEXAS -- A 35-foot vacuum chamber at the NASA Manned Space Center, will receive its baptism of manned activity when a space-suited technician is scheduled to enter its frigid and airless interior for the first time.

The test will be the final act in a series of unmanned shakedown tests which are aimed at qualifying chamber B for use in testing Gemini and Apollo equipment in the space environment.

Test crewman Bob Piljay, a space chamber technician from Brown and Root/Northrop, (BRN) will be wearing a modified Gemini suit as he steps into a vacuum equal to approximately 60 miles above the earth. BRN is operations support contractor for the Space Environment Simulation Laboratory. Twenty-two thousand gallons of liquid nitrogen pumped into panels in the wall will lower temperatures to a minus 250 degrees Fahrenheit.

He will spend ten minutes inside the chamber checking the environmental control system module which supplies air to test crewmen inside the chamber. Then the solar lamps and earth albedo lamps will be turned on to add the effects of solar heating to the chamber. After five more minutes, Piljay will return to the manlock and the test will be completed.

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In preparation for the full vacuum manned test, a partial vacuum test will be run to verify rescue procedures for the chamber.

The chamber will be pumped down to the 60-miles altitude. Two lock observors in insulated thermal suits will be inside the manlocks leading to the chamber. The manlocks will be at 18,000 feet.

An emergency repressurization will be conducted, lowering the chamber to an altitude of 22,000 feet. The lock observors will enter the chamber and "rescue" a space suited dummy inside the chamber. When he has been retrieved from the chamber, they will give him simulated emergency first aid and take him to the emergency medical room.

The test is being conducted by personnel of the Space Environment simulation Laboratory. James H. Chappee is the test director.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-5111

MSC 65-105
November 18, 1965

HOUSTON, TEXAS -- Extravehicular equipment for Gemini VIII is scheduled for two qualification tests in the 20-foot vacuum chamber in Crew Systems Division at the Manned Spacecraft Center Friday.

The Extravehicular Life Support System, which finished its thermal qualification a week ago, will be combined with the Extravehicular Support Pack (ESP), a 92-pound backpack in which the astronaut will carry his oxygen and maneuvering gas supply.

The first test of the combined system will evaluate the capability of the oxygen bottle in the pack to supply the extravehicular astronaut with air at a high rate of flow. The switchover to the emergency oxygen supply in the ELSS will occur automatically after the ESP bottle is exhausted. The test subject will also fire the space gun 40 bursts of five-second duration with a 15-second interval between them.

The second test is a propellant blowdown qualification in which the space gun will be fired in 30-second bursts to exhaust the freon supply. The subject will use the left tank air supply at medium flow during this test. Brown and Root-Northrop technicians and MSC engineers will serve as test subjects.

A vacuum equal to 150,000 feet altitude will exist in the chamber, and the walls of the thermal box will be cooled to a minus 300 degrees Fahrenheit to simulate the conditions of orbital night for both tests.

Test conductor is Kenneth Snyder, Systems Test Branch of Crew Systems Division.

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FACT SHEET

EXTRAVEHICULAR GEMINI MOBILITY UNIT (EGMU) COMPONENTS

Extravehicular Life Support System (ELSS)

Use: To provide electrical, life support, and mechanical connections between the spacecraft and the astronaut and to provide circulation and cooling inside the suit.

Major Components: Ejector pump for circulation, heat exchanger for cooling, 30 minute emergency oxygen supply, controls and warning system, umbilical for spacecraft oxygen supply.

Weight: Approximately 42 pounds.

Size: Rectangular box, 18" tall by 10" wide by 6" thick.

Position: Worn on astronaut's chest during extravehicular activities.

Extravehicular Support Pack (ESP)

Use: To provide extended oxygen supply for extravehicular activities and fuel supply for the hand held maneuvering unit.

Major Components: Two oxygen bottles containing seven pounds oxygen and 17 pounds freon under 5,000 pounds pressure. Oxygen supply is sufficient for 83 minutes normal usage. A 28 volt battery for instrumentation and communications equipment. Outlet connections for suit and gun, and inlet connections for servicing. UHF transceiver.

Weight: Approximately 92 pounds.

Size: Rectangular cradle, 26" tall by 21" wide by 17" deep, with connections for mounting in the center of the adapter section. Shape will be the same as the Astronaut Maneuvering Unit, experiment D-12. ESP will be held in adapter by explosive bolts, which will be fired from spacecraft by command pilot after pilot has secured himself to ESP by fastening a web belt attached to the sides of ESP to the front of the ELSS chest pack.

Umbilical Tether: Nylon cord, 1000 pound test, with 13 electrical leads for communication. Length 75 feet.

Hand Held Maneuvering Unit

Use: To provide the extravehicular astronaut with positive control of his attitude and to propel him from point to point in zero gravity environment.

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Major Components: Handle, two spring loaded poppet valves, foldable tubes, two one-pound nozzles, and one two-pound nozzle.

Weight: 3.4 pounds.

Size: 12" long by $4\frac{1}{2}$" high. Distance between tractor nozzles -- 28" (extended), 15" (retracted).

Position: Stowed on top of ESP during launch.

Capability: Tractor thrust - 0 to 2 pounds.
Braking thrust - 0 to 2 pounds.
Total impulse - 800 pounds per second.
Total V - 75 feet per second.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HU 3-5111

MSC 65-106
November 22, 1965

HOUSTON, TEXAS -- There's a new dome in Houston, but it hasn't been built for sporting events or entertainment.

Housed under a silvery dome at the northeast corner of the NASA Manned Spacecraft Center is the SPAN, Solar Particle Alert Network, the first in a series of three telescopes to study radiation coming from the sun.

The Houston station will be joined early next year by monitoring points at Grand Canary Island in the Atlantic and Canarvon, Australia, to keep a constant watch on the sun's fiery surface for flares and spots.

The network will be used to develop a warning system for radiation events on the sun which could endanger astronauts on a lunar mission. If a dangerous flare was observed, it would be several hours before the radiation would reach the vicinity of the moon, which would enable the astronauts to return to the safety of the command module if they were on the surface of the moon.

The Houston facility is mounted on a 75 foot tower in a wooded area. The combination of altitude and trees keeps the effects of heat shimmer at a minimum.

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Add 1
MSC 65-106

There are two monitoring telescopes at the MSC station. One is a hydrogen alpha solar patrol instrument fitted with special filters which can provide an optical image of the sun's surface. The lens is four inches in diameter and has three magnifications from 20 to 80 power. A 35mm camera is mounted in the telescope to allow scientists to take time lapse photography of the development of a solar flare.

The instrument is also equipped with an occulting cone. This device creates an artifical eclipse of the sun for the observer, blocking out the sun's disc to enable him to see the corona or halo on the sun's rim. An alternate lens also has a raster or grid to enable observers at different stations to correlate their findings.

Directly under the telescope, a small darkroom has been installed which can be used to hand process film strips from the telescope camera. In this way, engineers can check on a fine focus of the telescope.

The Houston site has a second mirror and objective lens system which carries an 8-inch diameter white light image of the sun to a spectrograph to analyze individual colors or spectra.

The spectrograph can make such measurements as the temperatures of the sun in active regions and the force of the solar magnetic field.

The total cost of the facility is $171,000. The solar telescope, was assembled by Razdow Inc., Newark, N. J. The building and tower was constructed by Evans Construction Co., Houston, Texas. The heliostat was built by Geotech Inc., of Dallas, Texas. The spectrograph and instrumentation was furnished by Jarrell Ash Co. of Waltham, Mass.

Peter Higgins, Radiation and Fields Branch of Advanced Spacecraft Technology Division, is project engineer for the facility.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas
HUnter 3-5111

MSC 65-107
November 22, 1965

HOUSTON, TEXAS -- Fiscal year 1965 procurements at the Manned Spacecraft Center totalled approximately $1,487.4 million, or three per cent higher than during fiscal year 1964, according to Dave Lang, chief of the procurement and contracts division.

Lang said approximately 86 per cent was placed with business firms, 1.4 per cent with educational and other nonprofit institutions and 12.5 per cent with, or through, other Government agencies.

MSC's dollars awarded to business through competitive procedures increased from 69 per cent of the total business in FY 1964 to 78 per cent in FY 1965. An additional 13 per cent represented awards on follow-on contracts placed with companies that had previously been selected on a competitive basis. In these instances, selection of another source would have resulted in additional cost to the Government by reason of duplicate preparation and investment.

Small business firms received about two per cent of the total dollar value awarded to business. Excluding the 10 largest awards which were for major systems and hardware requiring resources not generally within the capability of small business on a prime contract basis small business received about 15 per cent of the remaining business dollar.

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Nearly 73 per cent of the awards to business in excess of $25,000 resulted in cost-plus-fixed-fee contracts, a reflection of the fact that MSC's procurements are primarily for research and development.

Of the total dollars awarded during fiscal year 1965, $1,290 million or 87 per cent was negotiated. Over 95 per cent of the negotiated amount represented R&D efforts.

Business firms in 45 states and educational and other non-profit institutions in 26 states participated in MSC procurement during FY 1965. California, New York, Missouri, Wisconsin, Texas, Massachusetts, Florida, Maryland, Washington, D. C., and Connecticut received the largest cumulative awards.

Lang said there was continued emphasis on incentive contracting with the conversion of two major contracts from cost-plus-fixed- fee. The Gemini spacecraft contract with McDonnell Aircraft Corporation was converted to a CPIF with FY 1965 awards totaling $166.8 million.

Also converted was the contract for the guidance computer sub-system for the Apoolo Command & Service Module with AC Electronics. The FY 1965 award totaled $64.5 million.

Eleven CPIF and three fixed price incentive contracts were in effect for a combined total of $250.9 million or approximately 19 per cent of the business awards in FY 1965 in excess of $25,000.

The ten largest contracts with business in terms of aggregate value of awards during fiscal year 1965 are as follows:

North American Aviation, Inc., Downey,Calif. Design, develop and test three-man earth-to-moon-and-return Apollo spacecraft. FY 1965 obligations $581,6 million; cumulative obligations $1,452.0 million.

Grumman Aircraft Engineering Corporation, Bethpage, New York. Lunar Excursion Module development. FY 1965 obligation $242.6 million; cumulative obligations $392.1 million.

McDonnell Aircraft Corporation, St. Louis, Mo. Design and develop Gemini Spacecraft. FY 1965 obligations $166.8 million; cumulative obligations $657.6 million.

General Motors Corp., AC Electronics Division, Milwaukee. Guidance computer subystem for Apollo Command Module. FY 1965 obligations $64.5 million; cumulative obligations $112.4 million.

Philco Corporation, Palo Alto, Calif. Implementation of the Mission Control Center. FY 1965 obligations $21.2 million; cumulative obligations $63.7 million.

International Business Machines, Corp., Bethesda, Maryland. Real Time Computer Complex. FY 1965 obligations $14.0 million; cumulative obligations $36.1 million.

TRW Systems Group, Redondo Beach, Calif. Mission Trajectory control program. FY 1965 obligations, $6.4 million (new contract).

Add 3
MSC 65-107

General Dynamics Corp., San Diego, Calif. Solid suborbital vehicle. FY 1965 obligations $5.7 million; cumulative obligations $18.0 million.

United Aircraft Corp., Hamilton Standard Division, Windsor Locks, Conn. Development of Apollo prototype space suits and portable life support systems. FY 1965 obligations $5.2 million (new contract).

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-5111

MSC 65-108
November 22, 1965

HOUSTON, TEXAS -- The National Aeronautics and Space Administration today selected four companies to perform 4-month design studies on an experiments pallet to fly aboard Project Apollo missions. They are Lockheed Missiles and Space Division, of Sunnyvale, Calif.; McDonnell Corp., of St. Louis, Mo.; Martin Company of Denver, Colorado; and Northrop Space Laboratories of Hawthorne, Calif.

The firms, under separate and concurrent fixed price contracts valued at approximately 375 thousand dollars, will design and develop detailed specifications and produce mockups of a pallet to be placed in the Apollo spacecraft service modules.

The pallet will house scientific, technological and engineering experiments to be carried on Apollo missions of up to two weeks duration beginning in 1968.

After review and evaluation of the design studies, NASA plans to select one of the firms to develop the experiments pallet flight hardware under a cost-plus-incentive-fee contract.

The pallet will occupy one of the six pie-shaped segments in the service module. It will be 146 inches high, 50 inches deep and 63 inches wide on the outer surface. Total volume will be 170 cubic feet. Other segments of the service modules contain fuel tanks and electrical, environmental and propulsion systems.

Space in the pallet will be arranged in shelved compartments for installation of the instrumentation required for specific experiments. Some of the experiments being studied for Apollo flights will require astronauts to retrieve instrumentation from the pallet and place it aboard the command module for return to earth. Other experiments will transmit data to earth during the mission and will be left in the pallet.

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Lockheed, McDonnell, Martin and Northrop were among 9 firms which responded to request for proposal issued by the NASA Manned Spacecraft Center, Houston in September 1965.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

HUnter 3-5111

MSC 65-109
November 2-, 1965

HOUSTON, TEXAS -- The MSC remote site flight controller teams for the Gemini 7/6 mission began deploying this week to the seven locations around the world where they will exercise detailed real time mission control during the upcoming flights of the two Gemini spacecraft.

In addition to the six remote sites: Canary Islands (CYI); Canarvon, W. Australia (CRO); Kauai, Hawaii (HAW); Guaymas, Mexico (GYM); tracking ship Rose Knot (RK); and tracking ship Coastal Sentry (CS); a crew from Houston will also man the Corpus Christi Tex., (TEX) site.

The teams, each composed of from four to seven men, are scheduled to be on station by noon Thanksgiving Day to begin preparing the sites and crews for the network simulations prior to the Gemini 7/6 mission.

A pre-mission preparation phase will be the first order of business at each remote site. The first day, briefings will be given the local maintenance and operations (M&O) people by the flight controllers.

This will consist of briefings on the general mission flight plan, and a discussion of procedural changes that have been instituted since the previous mission. The senior flight controller who is the Command Communicator at each site will give the briefing.

The Gemini systems engineer will brief the M&O group on the Gemini spacecraft and their unique aspects for the current mission and any specialized "backroom" monitoring procedures deemed appropriate for a given spacecraft pass or the entire mission.

A briefing by the aeromedical monitor will be held to provide the M&O staff with the medical aspects of the mission and biomedical or other research experiments to be performed.

Another member of the team at the remote sites is the astronaut simulator. His duties prior to the actual mission is to man the astronaut

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simulator console at the remote site and play the part of the astronauts in the spacecraft. He also controls the pre-mission remote site simulations. During the mission he will perform duties as backup command communicator or spacecraft systems engineer at the site.

On the second day a network test simulation will be held at the remote site to confidence test the equipment. This will be followed by network tests to integrate the remote site into the network operation. Local confidence tests are run to integrate the remote site flight controllers and the M&O people and at the same time develop confidence in the remote site systems. A state of readiness is maintained at each site until liftoff on mission day.

Prior to deployment, the remote site crews study the standard operating procedures for the remote sites such as the use of the command system and telemetry, the air-to-ground communications, network tests and other necessary procedures. Each man gets at least three hours in the Gemini procedures trainer for cockpit familiarization. They also attend systems and procedural briefings.

In the days before deploying to the remote sites the crews take part in simulated network simulations in the Mission Control Center. From a back room in the MCC, the remote site flight controllers conduct simulated missions as though they were on station at the various sites.

The command communicator at the remote site, in addition to supervising the preparation of the site for the mission, is the delegated representative of the Mission Control Center Flight Director and serves as the operations manager of the site and its supporting crew throughout the mission phase. He is responsible for the air to ground communications with the spacecraft and for operation of the ground to spacecraft command system. Any decision from a site that affects the mission is made by the command communicator.

Two Gemini systems engineers will be at each site and their area of responsibility is to monitor, analyze and report any spacecraft systems anomalies noted on the telemetry displays. They in turn will make recommendations for corrective action to the command communicator and/or the MCC-H.

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Each site will have two surgeons (aeromedical monitors) whose primary responsibility is to monitor the physical and physiological well being of the astronauts via telemetry. The information is reported by the doctors to the command communicator who relays the information to the MCC-H.

During the course of the mission the command communicator normally relays all information to the MCC-H and the spacecraft crew. The exception being when a discussion with the flight controller's counterpart at the MCC-H is necessary to resolve a point.

The normal work day for the remote site flight controllers is 14 to 15 hours. The hours worked during each 24-hour period are determined by lift-off time of the spacecraft from Cape Kennedy, which in turn sets the ground track passes over each station. An average of seven passes are over each remote site daily.

During periods when the spacecraft is not over the site the operation goes on standby. Then about two and one-half hours before acquisition time on the first pass of a series of passes by the spacecraft, all equipment at the site is confidence tested and all mission teletype messages are reviewed in preparation for support of the mission.

Flight controllers at the remote sites stay in commercial facilities as near the sites as possible. Limited food facilities are available at all remote stations and the crews usually get in a little cooking experience also.

Team member assignments vary from mission to mission and a flight controller may be assigned to any one of the seven sites for a Gemini flight. With the present schedule of Gemini flights, many of the flight controllers are on travel nearly half of the time. Most of the men are married and would like to spend more time with their families but the fact that they do enjoy their work helps in some small way to help compensate for the time away from home.

After the mission is completed and the crews return to Houston, they conduct a complete evaluation of the operation of equipment and procedures used at the remote site and make necessary recommendations for hardware changes that are deemed necessary to improve operations. They also evaluate all documentation used and try to make improvements for the next mission.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston
1, Texas

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MSC 65-110
November 23, 1965

HOUSTON, TEXAS -- Astronauts on future space missions may become space gourmets through the efforts of food technologists at the Manned Spacecraft Center here and the U.S. Army Natick Laboratories in Massachusetts.

A compressed ice cream is high on the list of items under evaluation. Tablets are prepared like other dehydrated foods now carried by astronuts. Ice cream is frozen and the water content is drawn out. Then the mixture is made into a powder, and compressed into a tablet.

Comments on its flavor by a taste panel at MSC have been favorable. The majority compare it in taste with a malted milk tablet. It comes in two flavors, chocolate and vanilla.

Barbecued meats are also being evaluated for future menus. They include beef and pork barbecue bites and veal with barbecue sauce. The first two are bite-sized, the third is rehydrateable, and water must be added before eating.

Space food experts say that if the new foods prove feasible for spaceflight, they could appear as entrees sometime during the Apollo program.

Other bite-size items considered include bacon, pork sausage, scrapple, lobster, oyster, shrimp, salmon, and fish chowder.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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MSC 65-111
December 21, 1965

HOUSTON, TEXAS -- The Gemini 7 flight crew, astronauts Frank Borman and James Lovell, completed the medical phase of their post-flight debriefing this afternoon at the Merritt Island medical facility.

According to Dr. Charles Berry, Chief of MSC's Medical Programs, medical aspects of Borman's debriefing were finished about noon today, while Lovell completed his this afternoon.

Both crew members will continue on their regulated calcium balanced diet through noon tomorrow. Their diet will be changed by the time they board the NASA aircraft for their return to the Manned Spacecraft Center in Houston.

Tilt table results for both crew members have returned to normal with the final tests being accomplished today.

Other than routine checks and blood studies, due to be accomplished January 3, the gathering of the post flight medical data is mostly completed, Dr. Berry indicated.

Dr. Berry said, "A quick look at the data available to us from Gemini 7 indicates that man has fared extremely well in two-weeks of space environment."

However, because of the tremendous amount of data and samples acquired, medical analysis of the data will not be detailed until sometime later, Dr. Berry stressed.