Space News

ROUNDUP!

NASA

VOL. 1, NO. 5 MANNED SPACECRAFT CENTER, LANGLEY AFB, VA. DECEMBER 27, 1961

SEASON'S GREETINGS

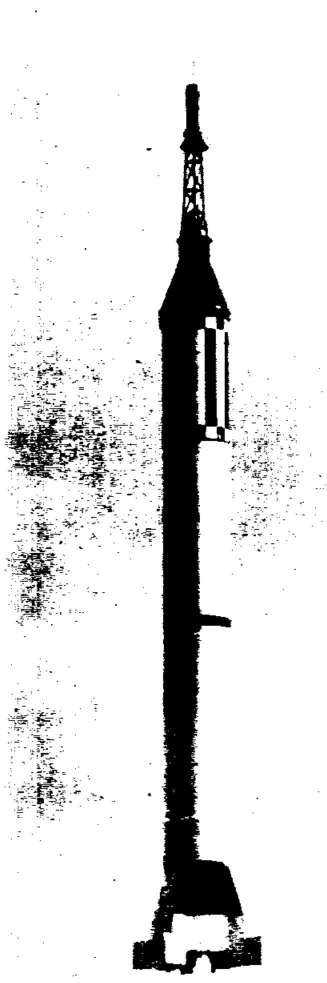
I wish the entire staff of Manned Spacecraft Center and their families a Happy Holiday Season and a prosperous New Year.

During the past year this wonderful team we have put together has achieved many notable successes in the effort to attain our ultimate goals. I trust that during the coming year these successes will be even greater as we strive to continue making history through additional knowledge learned about space and man's capabilities in the space environment.

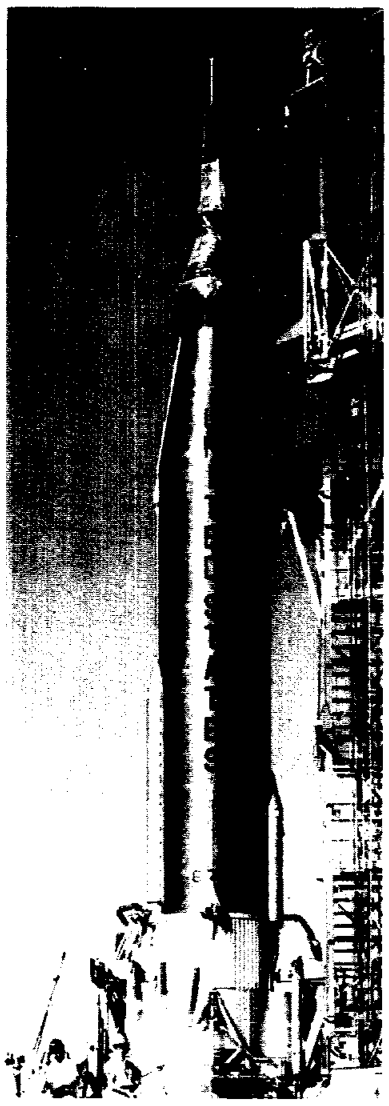
Again, I wish you all a Happy Holiday Season!

Robert R. Gilruth

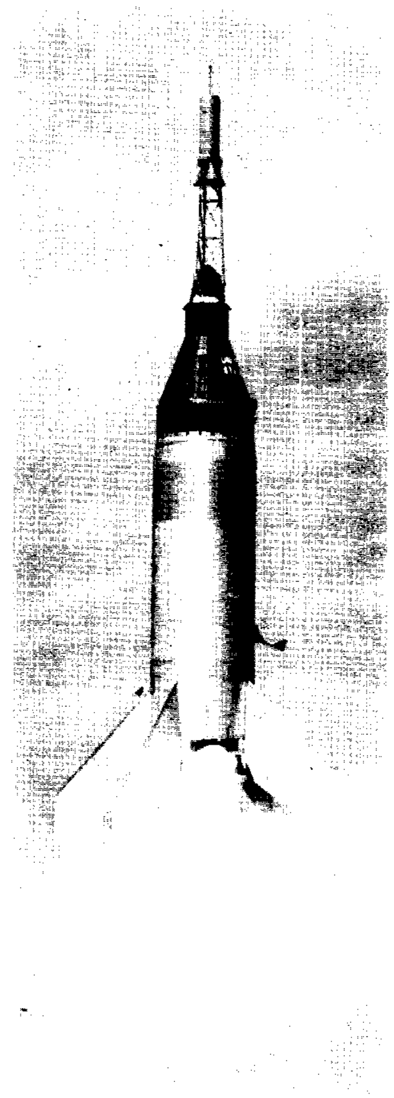
ROBERT R. GILRUTH
Director



MERCURY REDSTONE 4



MERCURY ATLAS 2



LITTLE JOE 5A

Mercury Flight Chronology From Inception Listed

Following is a chronology of Project Mercury flight tests to date. It is reprinted here in order that all MSC personnel might have a condensed record of the program from its inception through 1961.

August 21, 1959—LITTLE JOE 1. The first Little Joe firing was cancelled when a faulty wiring circuit prematurely actuated the escape system and carried the spacecraft out over the water. The main chute did not deploy and the spacecraft was destroyed at impact.

September 9, 1959—BIG JOE 1. Purpose of the flight was to investigate re-entry problems and a boiler-plate spacecraft on an Atlas launch vehicle was used. The flight accomplished all technical objectives and the spacecraft was recovered. Because of this success a second scheduled similar mission (BJ-2) was cancelled.

October 4, 1959—LITTLE JOE 6. This test, conducted at Wallops Island, Va., checked the Little Joe booster performance. Eight solid-propellant rockets were used which developed 250,000 pounds of thrust at lift-off. The mission validated the aerodynamic and structural integrity of the booster and the use of the command destruct system. No effort was made to recover the boiler-plate spacecraft.

November 4, 1959—LITTLE JOE 1-A. Also tested at Wallops Island to execute a planned abort under high aerodynamic load conditions. The boiler-plate spacecraft was recovered.

December 4, 1959—LITTLE JOE 2. Test flight at Wallops Island to check high-altitude performance of the escape system. A rhesus monkey, "Sam", was used as a test subject. All test objectives were met and the spacecraft with occupant was recovered.

January 21, 1960—LITTLE JOE 1-B. Another Wallops Island test to evaluate the escape system under high aerodynamic load. Rhesus monkey, "Miss Sam", was a test subject and the spacecraft and occupant were recovered with the test rated as a success.

(*Continued to page 4*)

Mercury - Redstone Missions And Test Objectives

Mission	Launch date	Objectives
MR-1A Unmanned	December 19, 1960	(a) Qualify the spacecraft-booster combination for the Mercury-Redstone mission which includes attaining a Mach number of approximately 6.0 during powered flight, a period of weightlessness of about 5 minutes, and a deceleration of approximately 11g on reentry. (b) Qualify the posigrade rockets (c) Qualify the recovery system (d) Qualify the launch, tracking, and recovery phases of operation (e) Qualify the Automatic Stabilization and Control System, including the Reaction Control System
MR-2 Primate aboard	January 31, 1961	(a) Obtain physiological and performance data on a primate in ballistic space flight (b) Qualify the Environmental Control System and aeromedical instrumentation (c) Qualify the landing bag system (d) Partially qualify the voice communication system (e) Qualify the mechanically-actuated side hatch (f) Obtain a closed-loop evaluation of the booster automatic abort system
MR-BD Booster Development Flight	March 24, 1961	(a) Investigate corrections to booster problems as a result of the MR-2 flight. These problems were as follows: (1) Structural feedback to control system producing vane "chatter" (2) Instrument compartment vibration (3) Thrust control malfunction
MR-3 Manned	May 5, 1961	(a) Familiarize man with a brief but complete space flight experience including the lift-off, powered flight, weightless flight (for a period of approximately 5 minutes), reentry, and landing phases of the flight. (b) Evaluate man's ability to perform as a functional unit during space flight by: (1) Demonstrating manual control of spacecraft attitude before, during, and after retrofire (2) Use of voice communications during flight (c) Study man's physiological reactions during space flight (d) Recover the astronaut and spacecraft
MR-4 Manned	July 21, 1961	(a) Familiarize man with a brief but complete space flight experience including the lift-off, powered, weightless (for a period of approximately 5 minutes), atmospheric reentry, and landing phases of the flight. (b) Evaluate man's ability to perform as a functional unit during space flight by: (1) Demonstrating manual control of spacecraft during weightless periods (2) Using the spacecraft window and periscope for attitude reference and recognition of ground check points (c) Study man's physiological reactions during space flights (d) Qualify the explosively-actuated side egress hatch

Mercury Beach Abort Test Objectives

Mission	Launch date	Objectives
Beach Abort (Boilerplate spacecraft)	May 9, 1960	(a) Demonstrate capability of escape system, landing system, and postlanding equipment during an off-the-pad abort. (b) Demonstrate structural integrity of escape configuration during an off-the-pad abort. (c) Provide time history data for the following parameters: (1) altitude, (2) range, (3) velocity, (4) pitch, roll and yaw angles, (5) pitch, roll and yaw rates, (6) pitch, roll and yaw accelerations, (7) impact accelerations, and (8) sequence of events. (d) Obtain operational experience for check-out, launch and recovery teams. (e) Determine the effects of off-the-pad escape and landing conditions upon the spacecraft telemetry, instrumentation and communication system. (f) Provide time history data for the following parameters: (1) indicated pressure altitude, (2) outside skin temperature, (3) inside skin temperature, (4) cabin air temperature, (5) noise level, and (6) vibration.

Project Mercury Flight Data Summary

Flight	Launch date	Maximum altitude			Maximum range		Maximum velocity			Flight duration: lift-off to impact hr:min:sec
		Feet	Statute miles	Nautical miles	Statute miles	Nautical miles	Ft/sec earth-fixed	Ft/sec space-fixed	Mph space-fixed	
Big Joe 1	9-9-59	501,600	95.00	82.60	1,496.00	1,300.00	20,442	21,790	14,856.8	13:00
LJ-6	10-4-59	196,000	37.10	32.20	79.40	69.00	3,600	4,510	3,075.0	5:10
LJ-1A	11-4-59	47,520	9.00	7.80	11.50	10.00	2,040	2,965	2,021.6	8:11
LJ-2	12-4-59	280,000	53.00	46.10	194.40	169.00	5,720	6,550	4,465.9	11:06
LJ-1B	1-21-60	49,104	9.30	8.10	11.70	10.20	2,040	2,965	2,021.6	8:35
Beach abort	5-9-60	2,465	0.47	0.41	0.60	0.50	475	1,431	976.2	1:16
MA-1	7-29-60	42,768	8.10	7.00	5.59	4.85	1,560	2,495	1,701.1	3:18
LJ-5	11-8-60	53,328	10.10	8.80	13.60	11.80	1,690	2,618	1,785.0	2:22
MR-1A	12-19-60	690,000	130.80	113.40	234.80	204.00	6,350	7,200	4,909.1	15:45
MR-2	1-31-61	828,960	157.00	136.20	418.00	363.00	7,540	8,590	5,856.8	16:39
MA-2	2-21-61	602,140	114.00	99.00	1,431.60	1,244.00	18,100	19,400	13,227.3	17:56
LJ-5A	3-18-61	40,800	7.70	6.70	19.80	17.20	1,680	2,615	1,783.0	23:48
MR-BD	3-24-61	599,280	113.80	98.80	307.40	267.10	6,560	7,514	5,123.2	8:23
MA-3	4-25-61	23,760	4.50	3.90	0.29	0.25	1,135	1,726	1,176.8	7:19
LJ-5B	4-28-61	14,600	2.80	2.40	9.00	7.80	1,675	2,611	1,780.2	5:25
MR-3	5-5-61	615,120	116.50	101.20	302.80	263.10	6,550	7,530	5,134.1	15:22
MR-4	7-21-61	624,400	118.30	102.80	302.10	262.50	6,618	7,580	5,168.2	15:37
MA-4	9-13-61	750,300	142.10	123.30	26,047	22,630	24,389	25,705	17,526.0	1:49:20
MA-5	11-29-61	778,272	147.40	128.10	50,892	44,104	24,393	25,710	17,529.6	3:20:59

Mercury Flight Chronology

(*Continued from page 2*)

May 9, 1960—Beach Abort Test. McDonnell's first production spacecraft and its escape rocket system were flight tested in an off-the-pad (Beach Abort) test at Wallops Island to evaluate the escape rocket system. No booster was used. The test was successful and the spacecraft No. 1 was recovered.

July 29, 1960—MERCURY-ATLAS 1 (MA-1). This was the first Atlas-boosted flight with a production spacecraft (No. 4). The objectives were to qualify the spacecraft under maximum air loads and afterbody heating rate during re-entry conditions. The spacecraft contained only a minimum number of systems and no escape tower. The test was unsuccessful and the spacecraft lost due to a structural failure in the region of the spacecraft-booster interface.

November 8, 1960—LITTLE JOE 5. This was another of the series of Little Joe tests at Wallops Island with a specific purpose of checking the spacecraft (No. 3) in an abort simulating the most severe conditions during an Atlas launch. Due to a premature firing of the escape rocket, the spacecraft did not separate from the booster and was lost. The test was unsuccessful.

November 21, 1960—MERCURY-REDSTONE 1. This was the first unmanned Mercury-Redstone suborbital flight. An unscheduled engine cutoff resulted in premature jettisoning of the escape rocket when the booster was only about one inch off the pad. The booster settled back on the pad and was damaged slightly. The spacecraft (No. 2) remained on the booster undamaged and was suitable for further use on MR-1A.

December 19, 1960—MERCURY-REDSTONE 1A. This was a repeat test of the MR-1 attempt and was completely successful. The spacecraft (No. 2) reached a peak altitude of 130 statute miles, travelled 235 statute miles down-range, and was recovered.

January 31, 1961—MERCURY-REDSTONE 2. This test carried Ham, a 37-pound chimpanzee, in his spacecraft (No. 5) to a height of 157 statute miles, covered 418 statute miles down-range, and the recovery was effected. During the landing phase, the heat shield made contact with the lower pressure bulkhead of the spacecraft driving two bolts through and resulting in a leak. Recovery of the spacecraft and its occupant was effected before much water had been taken aboard.

February 21, 1961—MERCURY-ATLAS 2. This test was held to check maximum heating rates during worst re-entry and to evaluate the modification resulting from the MA-1 flight. All test objectives were met and the spacecraft (No. 6) was recovered.

March 18, 1961—LITTLE JOE 5A. This was a repeat test of the unsuccessful LJ-5 test. Premature firing of the escape rocket before spacecraft (No. 14) release precluded the accomplishment of most of the test objectives. The spacecraft did not have structural damage, therefore was refurbished for another flight (LJ-5B).

March 24, 1961—MERCURY-REDSTONE BD. This was a booster development test which was successful. The boiler-plate spacecraft used was one previously test flown on LJ-1B which provided the proper configuration and weight. No attempt was made to separate or recover the spacecraft. All booster test objectives were met.

April 25, 1961—MERCURY-ATLAS 3. This was the first attempt to orbit a Mercury spacecraft, which contained special instrumentation and a "mechanical astronaut." Due to booster guidance malfunction, the booster was destroyed by the Range Safety Officer approximately 40 seconds after lift-off. The spacecraft (No. 8) performed a successful escape maneuver, was recovered and refurbished for the MA-4 test.

April 28, 1961—LITTLE JOE 5B. This was the third test of the escape system under maximum exit dynamic presure conditions. The test objectives were met and the spacecraft (No. 14) recovered.

May 5, 1961—"FREEDOM 7" - MERCURY-REDSTONE 3. This was the first manned suborbital flight with Astronaut Alan B. Shepard, Jr., as pilot. The spacecraft (No. 7) achieved an altitude of 116.5 statute miles and a range of 302.8 nautical miles. The mission was completely successful.

July 21, 1961—"LIBERTY BELL 7"—MERCURY-REDSTONE 4. This was the second and final manned suborbital flight of the Mercury program. Astronaut Virgil I. Grissom was the pilot. The flight path was approximately the same as in the MR-3 misison. The spacecraft (No. 11) attained a height of 118.3 statute miles and travelled down-range 302 statute miles. The mission was a success except for the recovery phase. Due to premature actuation of the side hatch, water shipped into the spacecraft and made it so heavy the helicopter could not recover it and it sank in 2,800 fathoms of water. Grissom was in the water about four minutes before being rescued but was found to be in excellent condition.

September 13, 1961—MERCRUY-ATLAS 4. The unmanned spacecraft (No. 8A) successfully made one earth orbit, reaching an apogee of 142.1 statute miles and perigee of 98.9 statute miles. All test objectives were met and the spacecraft was recovered.

November 1, 1961—MERCURY-SCOUT 1. The purpose of this test was to orbit a communications package in order to additionally evaluate the radar tracking capability of the Mercury Tracking Network. The test was terminated shortly after lift-off due to erratic booster oscillations which continued to increase in magnitude until the missile apparently broke up.

November 29, 1961—MERCURY-ATLAS 5. This flight, spacecraft No. 9, with chimpanzee ENOS aboard, successfully orbited the earth twice before the command to return it to earth was given, due to increasing inverter temperature and other than nominal attitude control. Enos was in excellent condition. Apogee of 147.4 statute miles and perigee of 99.5 statute miles was attained.

Mercury - Little Joe Missions And Test Obje

Mission	Launch date	Objectives
LJ-6	October 4, 1959	(a) To qualify the aerodynamic and structural integrity c mechanical performance of the launcher. (b) To check the performance of the system for transmitti from the ground station, receiving it in the booste setting off an explosive system at the head-end of motor in the booster.
LJ-1A	November 4, 1959	(a) To carry out a planned abort of the spacecraft from t maximum dynamic pressure anticipated during Mercur (b) To obtain added reliability data on the Mercury drogu operation. (c) To study spacecraft impact behavior. (d) To gain further operational experience in recovery o utilizing a surface vessel. (e) To obtain further experience and confidence in the o command thrust termination system. (f) To recover escape motor and tower.
LJ-2 Primate aboard	December 4, 1959	(a) To carry out a planned escape of the spacecraft from altitude (96,000 ft) just prior to main booster ro (b) To ascertain spacecraft entry dynamics for an uncont (c) To check spacecraft dynamic stability on descent thr without a drogue parachute. (d) To determine the physiological and psychological eff and weightlessness on a small primate (rhesus monk (e) To obtain additional reliability data on the operati parachutes. (f) To obtain more data on Mercury spacecraft flotation sea areas typical of those planned for use as reco (g) To obtain additional operational experience of space surface vessel.
LJ-1B Primate aboard	January 21, 1960	(a) To check out the Mercury escape system concept and h dynamic pressure anticipated during a Mercury-Atla (b) To determine the effects of simulated Atlas abort ac primate (female rhesus monkey). (c) To obtain further reliability data on the Mercury sp main chute operations. (d) To check out the operational effectiveness of spacec helicopter. (e) To recover the escape-system assembly (escape motor postflight examination in order to establish wheth component malfunction or structure failure.
LJ-5A	March 18, 1961	(a) Demonstrate the structural integrity of the Mercury system during an escape initiated at the highest d can be anticipated during an Atlas launch for orbi (b) Demonstrate the performance of the spacecraft escape system, and the recovery system. (c) Determine the flight dynamic characteristics of the escape maneuver. (d) Demonstrate the performance of a particular landing- (e) Establish the adequacy of the spacecraft recovery pr (f) Establish prelaunch check-out procedures for the fun systems. (g) Determine the effects of the flight profile on the s systems not otherwise required for the first-order
LJ-5B	April 28, 1961	(a) Demonstrate the structural integrity of the Mercury system during an escape initiated at the highest d be anticipated during an Atlas launch for orbital (b) Demonstrate the performance of the spacecraft escape system, landing system, and the recovery system. (c) Determine the flight dynamic characteristics of the an escape maneuver. (d) Establish the adequacy of the spacecraft recovery pr (e) Establish prelaunch check-out procedures for the fun systems. (f) Determine the effects of the flight profile on the s systems not otherwise required for first-order tes

AT THE CLOSE OF EACH YEAR, A RESUME OF ALL ME
AND APOLLO MISSIONS FLOWN DURING THE PERIOD
BE CARRIED IN THE LAST ISSUE OF THE YEAR.

ves

e booster and the
command signal
ring flight, and
main rocket
ooster at the
as exit flight.
d main parachute
loating spacecraft,
ion of the booster
booster at high
motor burnout.
d entry.
the atmosphere
of acceleration
the Mercury
cteristics in
areas.
recovery by a
re at the maximum
t flight.
ations on a small
aft drogue and
recovery by
ower) for a
ere had been any
craft and escape
c pressure that
light.
em, the sequential
ry spacecraft in an
onfiguration.
res.
ing spacecraft
raft equipment and
objectives.
craft and escape
c pressure that can
t.
em, the sequential
ry spacecraft in
res.
ing spacecraft
raft equipment and
jectives.

JRY

ILL

Mercury - Atlas Missions And Test Objectives

Mission	Launch date	Objectives
Big Joe 1	September 9, 1959	(a) To recover the spacecraft. (b) To determine the performance of the ablation shield and measure afterbody heating. (c) To determine the flight dynamic characteristics of the spacecraft during reentry. (d) To establish the adequacy of the spacecraft recovery system and procedures. (e) To establish the adequacy of recovery aids in assisting the recovery of the spacecraft. (f) To conduct familiarization of NASA operating personnel with Atlas launch procedures. (g) To evaluate the loads on the spacecraft during the actual flight environment. (h) To evaluate operation of the spacecraft control system.
MA-2	February 21, 1961	(a) To determine the integrity of the spacecraft structure, ablation shield, and afterbody shingles for a reentry from a critical abort. (b) To evaluate the performance of the operating spacecraft systems during the entire flight. (c) To determine the spacecraft full-scale motions and afterbody heating rates during reentry from a critical abort. (d) To evaluate the compatibility of the spacecraft escape system with the Mercury-Atlas system. (e) To establish the adequacy of the location and recovery procedures. (f) To determine the closed-loop performance of the Abort Sensing and Implementation System. (g) To determine the ability of the Atlas booster to release the Mercury spacecraft at the position, altitude, and velocity defined by the guidance equations. (h) To evaluate the aerodynamic loading vibrational characteristics and structural integrity of the LO_2 boiloff valve, tank dome, spacecraft adapter and associated structures.
MA-4	September 13, 1961	(a) To demonstrate the integrity of the Mercury spacecraft structure, ablation shield, and afterbody shingles for a normal reentry from orbital conditions. (b) To evaluate the performance of the Mercury spacecraft systems for the entire flight. (c) To determine the spacecraft motions during a normal reentry from orbital conditions. (d) To determine the Mercury spacecraft vibration environment during flight. (e) To demonstrate the compatibility of the Mercury spacecraft escape system with the Mercury-Atlas system. (f) To determine the ability of the Atlas booster to release the Mercury spacecraft at the prescribed orbital insertion conditions. (g) To demonstrate the proper operation of the network ground command control equipment. (h) To evaluate the performance of the network equipment and the operational procedures used in establishing the launch trajectory and booster cutoff conditions and in predicting landing points. (i) To evaluate the applicable ground communications network and procedures. (j) To evaluate the performance of the network acquisition aids, the radar tracking system, and the associated operational procedures. (k) To evaluate the telemetry receiving system performance and the telemetry displays. (l) To evaluate the spacecraft recovery operations, as to the equipment and procedures used for communications and for locating and recovering the spacecraft, for a landing in the Atlantic Ocean along the Mercury Network. (m) To obtain data on the repeatability of the booster performance of all Atlas missile and ground systems. (n) To determine the magnitude of the booster sustainer/vernier residual thrust after cutoff. (o) To evaluate the performance of the Abort Sensing and Implementation System. (p) To evaluate and develop applicable Mercury Network countdown and operational procedures. (q) To evaluate the Atlas booster with regard to engine start and potential causes for combustion instability.
MA-5 Primate aboard	November ~~19~~ 29, 1961	(a) To demonstrate the performance of the Environmental Control System by utilizing a primate during an orbital mission. (b) To demonstrate satisfactory performance of the spacecraft systems throughout a Mercury orbital mission. (c) To determine by detail measurements, the heating rate and the thermal effects throughout the Mercury spacecraft for all phases of an orbital mission. (d) To exercise the satellite clock. (e) To determine the ability of the Atlas booster to release the Mercury spacecraft at the prescribed orbital insertion condition. (f) To demonstrate satisfactory performance of the Mercury Network in supporting an orbital mission. (g) To demonstrate the ability of the Flight Controllers to satisfactorily monitor and control an orbital mission. (h) To demonstrate the adequacy of the recovery plans for an orbital mission; particular emphasis is required for the spacecraft occupant. (i) To evaluate the performance of the Abort Sensing and Implementation System. (j) To determine the magnitude of the booster sustainer/vernier residual thrust or impulse after cutoff. (k) To obtain data on the repeatability of the booster performance of all Atlas missile and ground systems. (l) To evaluate the Mercury Network countdown and operational procedures. (m) To evaluate the Atlas booster with regard to engine start and potential causes for combustion instability.

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

Director . . . . **Robert R. Gilruth**
Public Affairs Officer . . . . . . **John A. Powers**
Editor . . . . **Ivan D. Ertel**
Staff Photographer . . . . **Bill Taub**

On The Lighter Side

Add to the saga of MA-5 and Enos.

The following telegram was received by Manned Spacecraft Center's Associate Director:

San Antonio, Texas, Nov. 29, 1961

Walter C. Williams
Cape Canaveral

Congratulations to every one. Pleased and happy for you. Am buying stock in inverter research corporation.

Carault B. Jackson

(*Dr. Jackson was formerly with Life Systems Division*)

* * *

And messages for Enos continue to arrive daily at the Public Affairs Office. They are apparently from both young and old, from individuals and from groups, from the United States and from abroad.

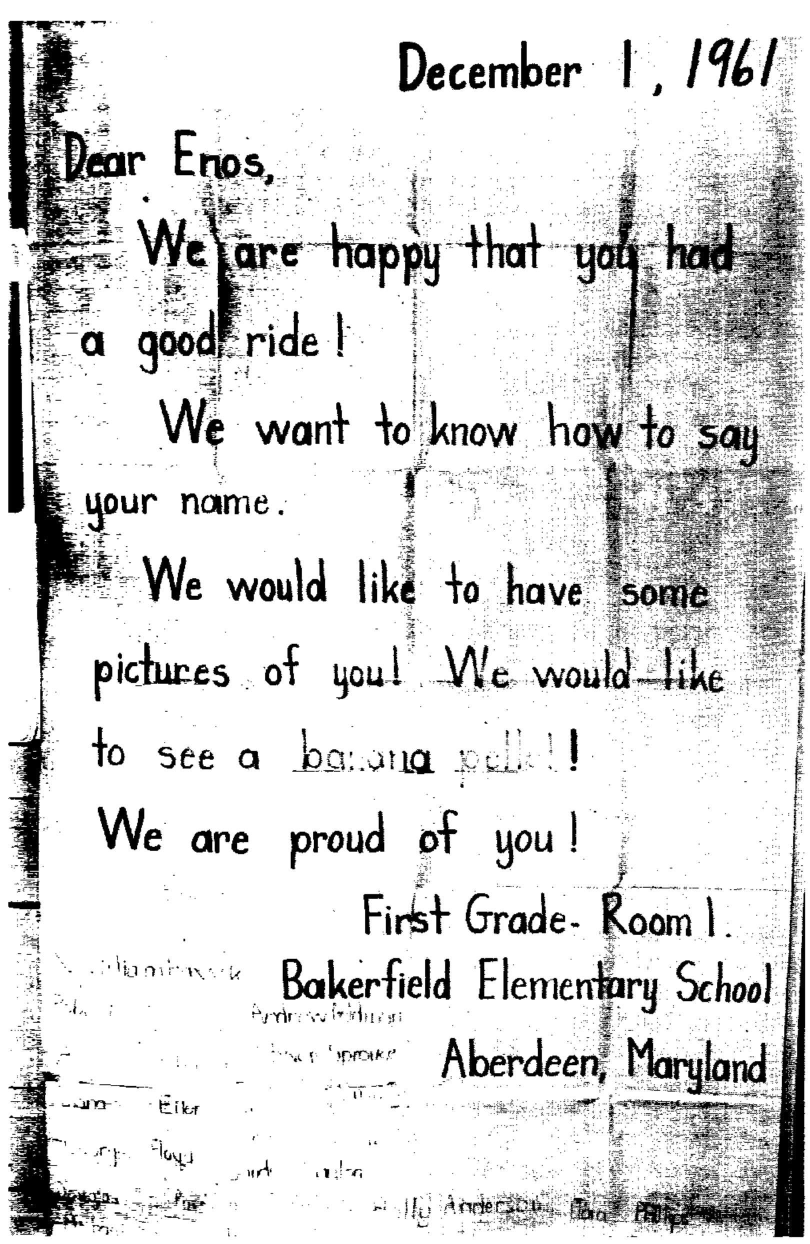
* * *

To cap it all, newsmen using their ingenuity in trying to come up with a different angle, really reached into left field for headlines such as the following:

(Great Falls, Mont., *Tribune*) High IQ Chimp Readies For Earth Circling Hop; and (Ahoskie, N. C., *News*) Native African Going Into Space.

* * *

And from the First Grade, Room 1, of Bakerfield Elementary School, Aberdeen, Maryland, came a letter which measured four feet by six feet (pictured below) signed by the 21 members of the class.



December 1, 1961

Dear Enos,

We are happy that you had a good ride!

We want to know how to say your name.

We would like to have some pictures of you! We would like to see a banana [illegible]!

We are proud of you!

First Grade- Room 1.
Bakerfield Elementary School
Aberdeen, Maryland

EDITORIAL EXCERPTS

HOUSTON PRESS
November 27, 1961

Although much has been published about the $60 million government space laboratory at Clear Lake which will project Houston into a prominent role in man's efforts to reach the moon, very little of the project's impact on the community has been known. In a question-and-answer session between the City Planning Commission and Martin A. Byrnes, site manager of what the government knows as the National Aeronautics and Space Administration Manned Spacecraft Center, the details of this social-economic impact on Houston developed. It is significant that Mr. Byrnes "plans to retire here"—pointing up the permanence of the fantastic space lab. The vastness of the overall project to construct and develop the space lab is emphasized by the hint that more than 200 subcontractors will be needed for the job, and that many heretofore "outside" concerns have or plan to open Houston branch offices. Mr. Byrnes discusses the types of people who will be employed on the project, what they will do, what money they will earn, where they will come from, where they will live and in what types of homes. The Press believes this report, developed by Staff Writer Garvin Berry, to be the most informative yet presented to the people of Houston as to the importance and impact of the space lab which will be constructed on a 1000-acre plot near Clear Lake—THE EDITOR.

Q. How much noise will the lab make?

A. The loudest noise will be similar to that of a jet plane when its afterburner comes on during a takeoff. Much of the time it wouldn't be that loud.

Q. Is there any danger of explosion?

A. No. All we are doing is the design of the vehicle and the training of the crew. Fuel research and testing is conducted in other parts of the country.

Q. Will rockets be launched from the lab?

A. No. No launchings but there will be small scale tests of rocket motors.

The small steering motors will be tested here and the large primary motors probably on Matagorda Island. The actual launchings will be from Cape Canaveral.

Q. Are you already working on the project?

A. In other parts of the country. We have 24 men here now, but they are working only on setting up the lab.

Q. What is the schedule on the lab?

A. We will have 80 men here by Christmas, 600 by next June, and about 3000 by June, 1963, when the lab begins full working schedules. All of the basic office housing will be built by then, although several environmental labs will take longer.

Q. Will any people be hired from this area?

A. Yes. About 500 people already with the project will be moved in. All the rest will come from technically qualified people wherever we can find them.

MSC PERSONALITY

MSC's Flight Systems Division Chief Is Maxime A. Faget

Maxime A. Faget, Chief of the Flight Systems Division, NASA Manned Spacecraft Center, was appointed to his present position position November 5, 1958. He has contributed many of the original design concepts embodied in the Project Mercury manned spacecraft. He is responsible for spacecraft systems and systems integration.

Faget attended secondary schools in San Francisco, then San Francisco Junior College. He received his Bachelor of Science Degree in mechanical engineering from Louisana State University in 1943.

Entering the U. S. Navy following graduation, Faget served as an officer in the submarine service during the remainder of World War II. In addition to campaign and theater medals, he was awarded the Submarine Combat Patrol Pin with star, and the Navy Letter of Commendation.

Faget joined the science staff of the NACA Langley Research Center in 1946 after separation from the Navy. As a research scientist, he was assigned to Langley's Applied Materials and Physics Division (AMPD) - then the Pilotless Aircraft Research Divisioin. He was named head of the performance aerodynamics branch of that division, a position he held until accepting his present appointment soon after creation of the NASA Manned Spacecraft Center (then the Space Task Group) in late 1958. While a member of AMPD, he conducted research on the blunted leading face (heat shield area) of the Mercury spacecraft.

Faget has conceived many flight systems and aerodynamis configurations—most important of which is the Mercury spacecraft flight system. Other flight systems include Scout, Little Joe, a wingless/hypersonic glider, and a four-engine supersonic bomber equivalent to the B-58. In addition, as a propulsion and performance expert, he was a member of the X-15 preliminary design team which determined weight, size, and performance of that aircraft.

During earlier research, he worked out a method of measuring inlet performance using choking orifices that were adopted by Langley's AMPD and other research facilities. He holds a patent on a flight Mach number meter based on essentially this same principle.

Other earlier research included the design of a complete ramjet flight test vehicle, which at one time held the speed, altitude and acceleration record for air breathing engines. He designed and developed ramjet burner systems for this and other vehicles. In addition, he developed a performance analysis scheme, ground testing techniques, and fuel control system for the ramjet research program.

During transonic drag research, he developed the "sine-cosine" method for determining body and wing tip store shape for sweptwing aircraft. The resulting configuration produced the lowest drag values (both analytically and experimentally) of other schemes evaluated on a comparable configuration.

Faget is married to the former Nancy Carastro of Philadelphia. The couple have three children—Ann Lee, Carol Jean and Guy—and live at 1200 Riverside Drive, Newport News, Virginia. Faget's mother resides in New Orleans.

MAXIME A. FAGET

WELCOME ABOARD

A total of 61 new personnel have entered the employ of Manned Spacecraft Center during the past two weeks. They are:

PUBLIC AFFAIRS OFFICE: Gene T. Brown.

TECHNICAL SERVICES: Davis R. Dalby, Jr., James T. Hefferson.

PROCUREMENT AND SUPPLY: Charles A. Kinman, Ace C. Wilder, Jr.

BUDGET AND FINANCE: Z. Vance Jones, Jr., James J. Cavanaugh, Jr., Sylvia H. Harris, Lynn C. McMillion, Vivian G. Walker, Woodrow W. Rasco.

SECURITY OFFICE: Sue H. Craig.

SUPPLY OFFICE: Howard B. Graves, Jose P. Olivares, Walter C. Brewer, Betty B. Walker, Joyce A. Priode.

PERSONNEL OFFICE: Virginia H. Martin, Janet S. Roth, Judy K. Sonier, Elizabeth D. Turner.

STENOGRAPHIC SERVICES: Ida S. Vogel, Carolyn L. Long, Carolyn K. Snead, Edna J. Ramsey, Sharon P. Lay, Mildred L. Wilkes, Joyce A. Wheeler, Frances S. Berkman.

TRANSPORTATION OFFICE: Evelyn C. Allison, Sharon S. Townsend, Gwendolyn V. Hadley, Billy J. Ball, Amie F. Chandler, Emma L. Bookhart, Ernest Boyd, Lolita M. Currie, Betty J. Sustana, Chester H. Jenkins, Jr., Adolphus B. Postell, Frank Mathews, Wallace O. Rogers, Janet K. Potchernick.

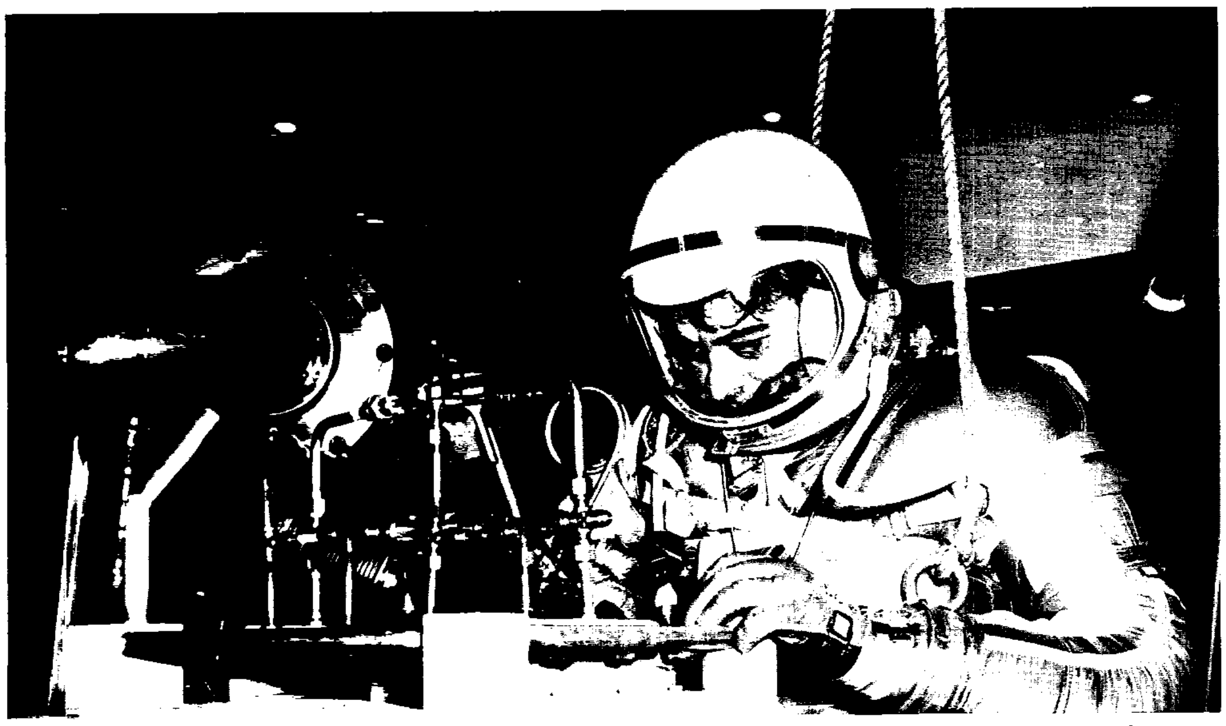
FLIGHT SYSTEMS DIVISION: Arnold N. Levine, Paul G. Thomas, Gerald P. Kenney, George P. Burrill, III, Curtis J. LeBlanc, Jimmy W. Usry, Paul R. Spencer, Marie M. Seals, George A. Zupp, Jr.

APOLLO PROJECTS OFFICE: Ausley B. Carraway, Jr., Florence C. Ferrese, Robert A. Newlander.

LIFE SYSTEMS DIVISION: James C. Shows.

ENGINEERING DIVISION: Rachel B. Hutchens, Mary L. Beach, Robert Cohen.

FLIGHT OPERATIONS DIVISION: Wililam L. Davidson, Edward C. Bullock.



STRAIN SHOWS ON THE FACE of John Leshko as he work on equipment outside a rocket engine. He found it impossible to use tools in the normal manner in the pressurized suit and was required to use the wrench gripped between fingers rather than in the palm of his hand.

Space Maintenance Study Made Recently at Huntsville

A joint study concerning capabilities and limitations of existing suit, engine, and tool design for corrective maintenance functions in space operations was recently held by personnel of Manned Spacecraft Center and Marshall Space Flight Center at the latter installation.

Representing MSC were John Leshko and James McBarron II of the Crew Equipment Branch of Life Systems Division and Alan Rochford of Technical Service Division.

The purpose of the study was to investigate problem areas in connection with future space activities requiring a crew member to perform work outside his vehicle.

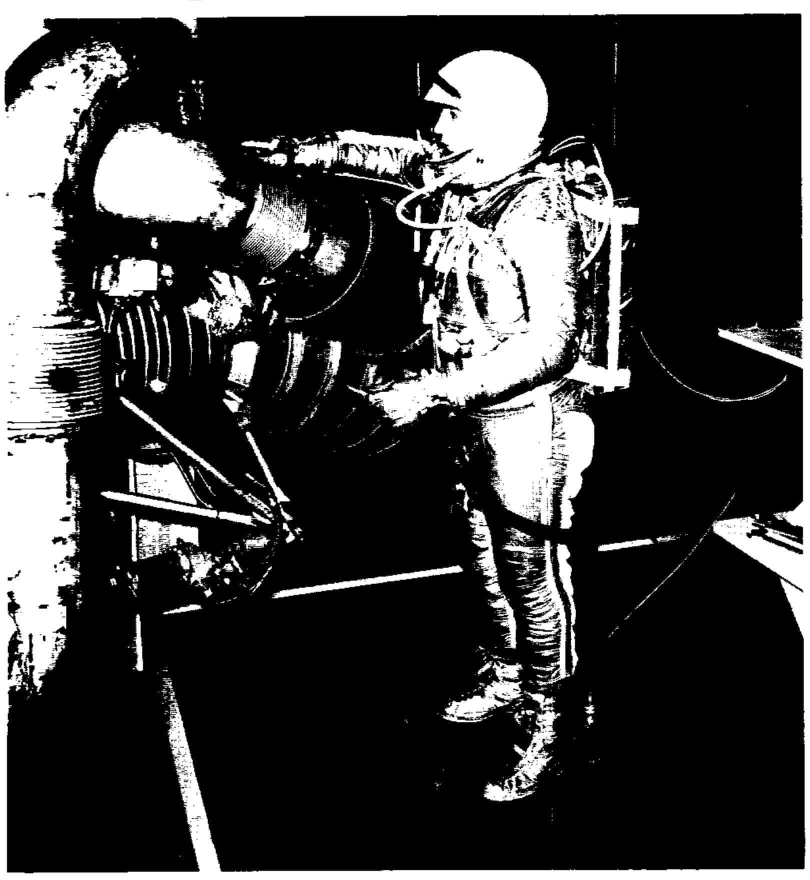
The team members wore presently available full pressure suits and performed various corrective maintenance tasks on rocket engines in anticipation of those which might be necessary during orbital missions. In order to simulate the human factor conditions of near zero gravity, a frictionless air bearing platform was used.

Supported by this low-friction device, mechanical tasks were performed by the team members to determine the degree of difficulty involved in accomplishing such work with standard hand tools.

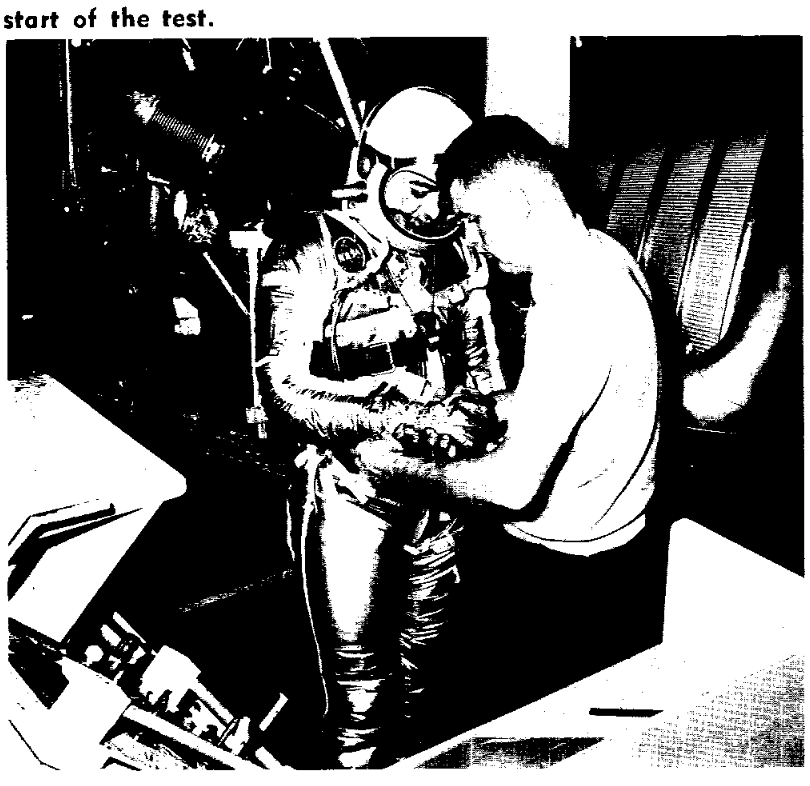
Tasks were evaluated with the suit pressurized and un-pressurized. Included in the test were such tasks as tightening and loosening of joints and other hardware typical to fuel line and component assembly and the removal an insertion of radio tubes, lights and other components associated with intrumentation packages.

Another phase of the study was to evaluate the effectiveness of special "space tools", designed to increase the task performance capability of the investigator. The tools were designed to eliminate the necessity for a space crewman to apply torque against his body.

The results of this preliminary study indicate many complex problem areas exist and will require resolution before extra-vehicular work can be performed by space vehicle crewmen.



JAMES MC BARRON II is shown above working on the outside of a rocket engine while standing on a frictionless air-bearing platform to simulate conditions of near zero gravity. Below Alan Rochford assists Leshko with suit preparation prior to the start of the test.



Future MSC Goals Listed By Williams

Walter C. Williams, Associate Director of Manned Spacecraft Center, outlined future MSC goals to the Houston Chapter of Sigma Delta Chi, national journalistic fraternity, and charged them with the responsibility of becoming familiar with the space program and terminology. The meeting was held at the University of Houston December 14.

Williams pointed out to about 100 journalists present that by the end of the fiscal year approximately $1.7 billion will have been spent on the lunar program and emphasized the fact that these are tax dollars and that the public has a right to know what is being done with their money.

He set forth a chronology of six major projects which will lead to the accomplishment of the ultimate goal of Projects Mercury and Apollo.

1. One astronaut to orbit around the earth three times.

2. Orbit the earth 18 times in a Mercury flight that will last about 24 hours. This is a new step in the NASA project to the moon.

3. Two astronauts to orbit the earth for about a week. NASA hopes to accomplish this is 1963 or 1964.

4. Three astronauts to orbit the earth in the Apollo spacecraft, the ultimate lunar ship, and demonstrate docking and working together in weightless space.

5. An Apollo flight to the moon, around it, and return to earth.

6. America's first astronaut lands on the moon.

Williams explained to the group that America's flight to the moon will be made only when conditions are exactly right and told why some U. S. space flights have been postponed.

He said "These are scientific events. We are not operating a circus.

"We must take every step, although sometimes after a flight, it appears the step could have been skipped . . . Small steps have paid off . . . Walk slow and get where you are going.

"The Russians have accomplished certain projects, but then they go off and do something else. I like to think our program is better founded . . . We are pursuing sound technical goals in a logical manner."

In speaking further about the responsibility of newsmen he pointed out that "Last May 25, President Kennedy stressed that it would not be a man we would be sending to the moon but a whole nation . . . Seven months later, few citizens understand the scope and complexity of an undertaking of this size."

Fraternity president Ed Ray, managing editor of the Houston Press, said that Houston reporters must soon become familiar with space terminology because Houston is to be the center of the lunar project.

While in Houston, Williams and Public Affairs Officer John A. Powers, who accompanied him, attended a reception at the Ben Milam Hotel for Vice President Lyndon B. Johnson. One of the Vice President's tops tasks is serving as chairman of the National Space Advisory Committee.

Webb Asks Aid In Recruitment

We in NASA have been given the assignment which calls for one of the greatest single technological efforts our country has thus far undertaken.

Of critical importance in achieving success in this effort is the staff who will perform and direct the varied and difficult tasks such a mission requires. In the past few days we have launched an intensive nationwide recruiting drive to employ nearly 4000 highly qualified persons including 2000 scientists and engineers.

Each one of you is needed to assist in this effort. Studies of our hiring in the past show that our own employees are the most important single source of contact with prospective new employees. Surveys show that more than one-third of our new employees were motivated to seek and accept employment because of information and encouragement received from a NASA staff member whom they knew and whose judgment they respected. Whatever your field of of work, I hope that you will consider the building of the NASA staff is a personal responsibility.

I welcome this opportunity of working with all of you in this most important undertaking.

JAMES E. WEBB
Administrator

Abbott

(*Continued from page 8*)

he was appointed Assistant Director of Research (Aerodynamics), a position he held until the NASA was established in 1958. He was promoted to Director of Advanced Research Programs in 1959, and to his present post last November 1.

Mr. Abbott made his early contributions in aerodynamics research. He wrote a large number of technical reports on wind tunnels, airship dynamics, airship aerodynamics, laminar flow, and theory of wing sections. He was intrumental in establishing programs for high-speed research airplanes, for the creation of many unique research facilities of the NACA and NASA, and for the scientific efforts leading to success in supersonic flight.

Transfers to Houston

A total of 14 personnel were transferred to the Houston site during the period December 6-18.

They were Leo T. Chauvin of the Apollo Project Office; Luther Bishop, Transportation Office; Harold D. Toy, Wiliam H. Hamby, David D. Ewart, Raymond H. Bradley, David M. Hammock, Burton G. Cour-Palais, Harold R. Largent, Gerald H. Launey, and Lovick O. Hayman, Jr., all of the Flight Systems Division; and Raoul P. Lopez, Leo T. Zbanek, and Thomas D. Conger, all of the Contruction Office.

Space News ROUNDUP!

SECOND FRONT PAGE

Seasons Greetings

Over the past year this agency has been engaged in a tremendous effort to accelerate the space program to meet the challenging objectives established by the President. The dedicated and tireless response to this task by every member of NASA has been particularly gratifying to us. As we pause at this time of the year to observe the Christmas Holiday we want to commend this effort and to extend to all of you our warmest wishes for a pleasant and rewarding Holiday Season.

JAMES E. WEBB
Administrator

HUGH L. DRYDEN
Deputy Administrator

ROBERT C. SEAMANS
Associate Administrator

Four Additional Companies Named To Work On Apollo

Four companies were named last week by North American Aviation's Space and Information Systems Division to help build the Apollo spacecraft for Manned Spacecraft Center. Selected to design and build four of the major systems of the spacecraft which will carry the first Americans to the moon were the Collins Radio Company, Cedar Rapids, Iowa, telecommunications; Minneapolis Honeywell Regulator Company, Minneapolis, Minn., stabilization and control; Airesearch Manufacturing Company, Division of the Garrett Corporation, Los Angeles, Calif., environmental control; and Radioplane Division of Northrop Corporation, Van Nuys, Calif., parachute landing system.

"These companies are outstanding in their respective fields and were selected because of their related experience, technical capability and program management ability," stated Harrison Storms, Space Division president.

Storms said additional sub-contractors will be named in the near future following negotiations with NASA's Manned Spacecraft Center at Langley Air Force Base, Va., technical directors of the program.

Approximate value of the four systems is expected to be in excess of $81 million with Collins Radio Co. to receive more than $40 million for the telecommunications system; Minneapolis Honeywell, $30 million for the stabilization and control systems; Airesearch, $10 for the environmental control system; and Radioplane, more than $1 million for the recovery system.

North American's Space Division was selected as NASA's principal contractor in November following intensive competition among five industrial teams. NASA estimated North America's share may exceed $400 mililon for the initial phase. The intrumentation Laboratory of Massachusetts Institute of Technology had previously been named as an associate contractor for development of the Apollo Guidance System.

NASA said the program, called one of the Nation's most important for the long range exploration of space by President Kennedy, will start with earth orbital flights and be extended to flights to the moon and manned exploration of the moon by 1970.

Apollo spacecraft will be launched by various boosters. The craft will consist of a command center to house the three-man crew, a service component for fuel, electrical power and propulsion units needed for takeoff from the moon, and a third section which will contain decelerating rockets for a lunar landing.

Ira H. Abbott To Be Retired Jan. 2, 1962

Ira H. Abbott, Director of Advanced Research and Technology, NASA, will retire January 2, 1962, after more than 32 years of Government service. He plans to devote his full time to personal affairs.

James E. Webb, NASA Administrator, expressed regret over Mr. Abbott's decision to retire. "His achievements and his leadership in reasearch have served in very important ways to advance our country from the forefront of aeronautics to the forefront of space." Webb said. "All of us in NASA are proud of his long, untiring and selfless service to our nation's good."

No successor has been named. Thomas F. Dixon, Deputy Associate Administrator, will serve as Acting Director of Advanced Research and Technology in addition to his present duties.

Mr. Abbott has been engaged in scientific research for the Government since his graduation from the Massachusetts Institute of Technology in 1929. He is internationally known for his leadership in aeronautical research and his career has paralleled the rapid development of airplanes and space vehicles over the past several decades.

He began his career at the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics, predecessor of NASA, as a junior aeronautical engineer. He advanced to positions of increased responsibility at the laboratory, becoming Assistant Chief of Research in 1945.

After transferring to the NACA Washington Headquarters in 1948,

(*Continued to page 7*)

Graduate Study Committee Is Announced

Robert R. Gilruth recently appointed a Graduate Study Steering Committee to assist in formulating policies and administering a program of graduate study at Manned Spacecraft Center.

Acting Chairman of the committee will be Paul E. Purser, Special Assistant to the Director. Other committeemen were selected from various offices and divisions and include: Phillip Whitbeck, Dr. Robert Voas, Robert Chilton, Stanley Cohn, Richard Johnston, John Mayer and Andre Meyer.

Additional members of the committee will be Jack Lister, Secretary-Recorder, and Pinckney McGathy, Contract Advisor.

The definition and extent of the graduate study need of the Center are presently being determined. Surveys and inquiries from all major offices and divisions will be used as a basis for negotiation with the universities near the Houston site. Provisions are to be made for personnel of MSC to attend classes during both duty hours and in the evenings. Further information will be made available when plans are completed.

The Training Branch of Personnel will continue to answer any specific questions and consider any suggestions during the transfer of employees to the new area. Mervin Hughes will be located in the Dresser Building shortly after the first of the year and Jack Lister, Branch Head, will be here until the offices are moved.

Hampton Streets And Bridges To Be Re-Named January 1

The Hampton City Council in a recent action took steps to honor Projects Mercury and Apollo and the Mercury Astronauts by re-naming roads and bridges. The changes will be effective January 1, 1962. Military Highway will be redesignated Mercury Boulevard and Tide Mill Road will be changed to Apollo Road. The West Gate access road (to be constructed) will be named Shepard Boulevard in honor of astronaut Alan B. Shepard, Jr.

Bridges will be named after the other six astronauts. The bridge over the Hampton River at Military Road will be named the Virgil I. Grissom Bridge; the Military Road bridge at Newmarket Creek will become the John H. Glenn, Jr., Bridge; the Armistead Avenue bridge over Newmarket Creek will become the M. Scott Carpenter Bridge.

The Queen Street bridge over Newmarket Creek will become the L. Gordon Cooper, Jr., Bridge; the Aberdeen Road bridge over Newmarket Creek will be re-named the Walter M. Schirra, Jr., Bridge; and the Whealton Road bridge over Newmarket Creek will become the Donald K. Slayton Bridge.

Hampton officials indicated last week that the appropriate signs are being prepared and are expected to be in place by January 1. The Newport News City Council has also taken necessary action to re-name that portion of Military Highway which lies in that city to conform with the rest of the road.

The actions by both bodies were taken at the behest of Radio Station WGH Space Reporter Dick Kidney. He suggested the changes as an appropriate means of honoring the astronauts and the space programs for the world-wide attention which has been focused on the local area as a result of their activities. Kidney proposed that "this action should be taken before Manned Spacecraft Center personnel complete the move to the Houston, Texas, area, in order that all personnel in the program might know that the Peninsula is proud of the part played in its area in this historic program."

Design Work Contract Is Let For Clear Lake

A $1,499,220 contract was awarded recently to Brown and Root of Houston, Tex., for architect-engineer design work on a major portion of the Manned Spacecraft Center to be constructed near Houston for the National Aeronautics and Space Administration by the Army Corps of Engineers.

Award of the contract was made by Colonel R. P. West, Ft. Worth District engineer, who will supervise design of the facility based on criteria to be supplied by NASA. The contractor was selected from more than 150 firms which submitted proposals for different phases of the design, engineering for the Manned Spacecraft Center.

Completion of the initial engineering will take about 6 months, but the first construction contract covering certain utilities is expected to be let in February.

Besides general site development, this initial architect-engineer contract will include master planning for the complete installation as well as the design of the flight project facility, the engineering evaluation laboratory, the flight operations facility and various utility. Design engineering for the environmental testing laboratory will not be included in this contract.

The Manned Spacecraft Center, which will direct NASA's manned space flight program, including the landing of men on the moon, will be constructed in the Clear Lake Area, 20 miles southeast of Houston.

THE AMERICAN ROCKET SOCIETY'S astronautics award was recently presented to Alan B. Shepard, Jr., by Andrew G. Haley, left, general counsel of the society at Langley AFB Officers' Club. The citation praised Shepard for his activities as a member of "the U. S. first team of astronauts". Shepard has also received the NASA Distinguished Service Award and the Theodore Roosevelt Distinguished Service Medal.

—Photo by Chuck Coler