REL 63-35

MERCURY/ATLAS LAUNCH CHRONOLOGY

MERCURY DESIGNATION	MERCURY/ATLAS BOOSTER NUMBER	DATE	TYPE OF LAUNCH	TYPE OF PAYLOAD	PLACE OF LAUNCH
Big Joe I	10-D	Sep 9, 1959	Suborbital (Ballistic trajectory)	NASA "boiler plate" capsule	All boosters launched from Complex 14, Air Force Missile Test Center, Cape Canaveral, Florida
Mercury/Atlas-1	50-D	Jul 29, 1960	Suborbital(Destroyed)	McDonnell Instrumented Capsule	
Mercury/Atlas-2	67-D	Feb 21, 1961	Suborbital	McDonnell Instrumented Capsule	
Mercury/Atlas-3	100-D	Apr 25, 1961	Orbital(Destroyed)	Crewman simulator	
Mercury/Atlas-4	88-D	Sep 13, 1961	One orbit	Crewman simulator	
Mercury/Atlas-5	93-D	Nov 29, 1961	One orbit	Enos (Chimpanzee)	
Mercury/Atlas-6	106-D	Feb 20, 1962	Three orbits	John Glenn	
Mercury/Atlas-7	107-D	May 24, 1962	Three orbits	M. Scott Carpenter	
Mercury/Atlas-8	113-D	Oct 3, 1962	Six orbits	Walter M. Schirra	
Mercury/Atlas-9	130-D		Twenty-two orbits planned	Gordon Cooper	

Mercury Program Management - National Aeronautics and Space Administration
Booster and Launch Responsibility - United States Air Force Space Systems Division
Mercury/Atlas Construction - General Dynamics/Astronautics
Mercury Capsule Construction - McDonnell Aircraft Corporation

[Enclosure, n.d. CPI Turner]

NEWS RELEASE

SPACE SYSTEMS DIVISION
AIR FORCE UNIT POST OFFICE
LOS ANGELES 45 CALIFORNIA

OFFICE OF INFORMATION
TEL. ORCHARD 0-1444
EXT. 1149 - 2261 - 2269

REL 63-33

FACT SHEET

AIR FORCE MERCURY ATLAS LAUNCH VEHICLE

PROPULSION: Five liquid propellant rocket engines; two boosters, two verniers and one sustainer engine. All five engines ignited on the ground.

THRUST: More than 360,000 pounds at liftoff.

GUIDANCE: Radio Inertial.

SIZE: Approximately 68 feet high. Diameter across booster section is 16 feet; at tank section - 10 feet.

WEIGHT: About 260,000 pounds at liftoff.

CONTRACTORS: Program Management - Air Force Space Systems Division (AFSC).
General Systems Engineering and Technical Direction - Aerospace Corporation.
Airframe, assembly, test and systems integration - General Dynamics/Astronautics.
Guidance - General Electric and Burroughs Corporation.
Propulsion - Rocketdyne Division of North American Aviation.

GENERAL: It takes a combination of over 300,000 parts to produce one Mercury Atlas. The Air Force produces these launch vehicles in support of the National Aeronautics and Space Administration's Project Mercury. In late 1958, NASA requested the Air Force to provide the launch vehicle that would boost the Mercury Astronauts into orbit around the earth. At this time the Atlas ICBM had achieved a record of performance and reliability that with slight modifications would qualify it for this program.

(more)

NEWS RELEASE

The requirement for adapting the Atlas for its new role was placed with Space Systems Division in Los Angeles. SSD began a Pilot Safety Program which contained the guidelines and procedures for modifications on the Atlas. The Pilot Safety Program was begun under Major General O. J. Ritland and has been continued by Space Systems Division's present Commander, Major General Ben I. Funk.

The safety of the Astronaut is the primary interest of the Air Force officers who compose the Mercury Directorate, headed by Major Charles L. Gandy, Jr.. These officers keep a continuing record of all work that is performed by General Dynamics/Astronautics on the Mercury/Atlas. These reports form the basis of the Air Force's decision on whether the Mercury/Atlas is "man-ready".

The Abort Sensing and Implementation System is an important addition to the Mercury/Atlas. This mechanism can sense an impending malfunction and cause the Mercury capsule to be ejected away from the Atlas prior to any destruction of the launch vehicle.

The Mercury/Atlas will perform the following sequence of events after its lift-off from Cape Canaveral.

For approximately 130 seconds the three main Atlas engines plus the two small verniers will accelerate Astronaut Cooper to a point about 200,000 feet above the Atlantic ocean and approximately 50 miles down range.

Having reached this position the two booster engines will shut down. Three seconds later the astronaut will hear the pair of engines as they roll down their tracks, separating from the Atlas. This is done to lighten the load carried by the sustainer and vernier engines which continue to burn.

At about 155 seconds the capsule's escape tower will separate from the capsule as it is no longer required to insure the safety of the astronaut. The Abort Sensing and Implementation System will continue to monitor the Atlas. Approximately 300 seconds after lift-off the sustainer and vernier engines will shut down. As the thrust deminishes, the vehicle's acceleration will rapidly drop from a peak of 7 "G's". When the "G" force nears zero, the capsule's posigrade rockets will fire and the capsule will be in orbit. Cooper's altitude and distance down range at this point will be about 500,000 feet and 500 miles.

It is at this same point that the Air Force will have successfully completed its objective--a safe and accurate launch of the ninth Mercury/ Atlas.

[Enclosure, n.d. CPT Turner]

SPACE SYSTEMS DIVISION
AIR FORCE UNIT POST OFFICE
LOS ANGELES 45 CALIFORNIA
OFFICE OF INFORMATION
TEL. ORCHARD 0-1444
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FACT SHEET

AIR FORCE MERCURY ATLAS

LAUNCH VEHICLE

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(OVER)

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HEADQUARTERS
SPACE SYSTEMS DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
LOS ANGELES AIR FORCE STATION
Air Force Unit Post Office, Los Angeles, California 90045

REPLY TO ATTN OF: Office of Information — 4 October 1965

SUBJECT: 2nd Titan III-C Launch

TO: Editors and News Directors

The second flight test of the Air Force Titan III-C Standard Space Launch Vehicle is scheduled for 9:00 AM EST Friday, October 8th, 1965, from Pad No. 40 at Cape Kennedy, Florida.

We hope the inclosed material will help you in reporting this significant test. For confirmation of launch and for flight data you may call any of the following numbers:

Space Systems Division Office of Information Los Angeles Air Force Station Los Angeles, California	Area Code: 213 Number: 643-0254
Titan III News Center Cape Colony Inn Cocoa Beach, Florida	Area Code: 305 Number: 783-2252
Air Force Eastern Test Range Office of Information Patrick Air Force Base, Florida	Area Code: 305 Number: 494-1110 Ext 7733

Launch photographs may be obtained from this office or from the Air Force Eastern Test Range, Office of Information.

Sincerely

John Barbato

JOHN BARBATO
Major, USAF
Director of Information

NEWS RELEASE

UNITED STATES AIR FORCE

OFFICE OF INFORMATION, AIR FORCE SPACE SYSTEMS DIVISION, LOS ANGELES AIR FORCE STATION, CALIFORNIA, TEL (213) 64-30254

4 OCT 1965

NO: 65-153
FOR RELEASE: Upon Receipt

AIR FORCE TO LAUNCH
SECOND TITAN III-C

The U. S. Air Force plans to send the nation's most powerful rocket -- the Titan III-C -- into space from Cape Kennedy, Fla. this week for its second flight test.

One of the objectives of the flight will be an "unprecedented ten starts in space of the booster's third stage, the Transtage," according to Maj. Gen. Ben I. Funk, Commander of the Air Force Systems Command's Space Systems Division, Los Angeles AFS, Calif.

Following the deposit in space of two "bonus" research satellites, each in a different orbit, the Transtage will attempt a series of start-stop-starts to demonstrate capability to perform as a "space switch engine."

Accomplishment of this feat will verify Air Force and industry space experts' beliefs that the Titan III Standard Space Launch system can supply the versatility demanded of a military space launch vehicle.

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The 124-foot tall rocket's two payloads are a radar calibration sphere and a biological hazards experiment satellite designated OV2-1. (See accompanying releases for payload details.)

They are the first "live" payloads to be carried aboard a Titan III-C.

In the first, highly successful Titan III-C flight test on June 18, 1965, a total of 21,000 pounds of lead ballast was lifted into a 100 nautical mile orbit. Weight of the burned-out Transtage and payload truss brought this total to 29,300 pounds.

Weight of the payloads on board the second flight, including truss and ballast, is only 1270 pounds. However, in a demonstration of its versatility, the Titan III will send part of its payload 40 times deeper into space in this flight than in the first, according to Col. David V. Miller, Titan III System Program Director.

The Transtage will carry the OV2-1 satellite to an elliptical orbit of 4,000 by 400 nautical miles," he said. "The radar calibration sphere will be injected into a 400 nautical mile orbit."

Both the Transtage and payloads will be injected initally into an elliptical orbit ranging from 100 to 400 nautical miles. At the 400 nautical mile apogee, over Carnarvon, Australia, the Transtage will be started a second time to circularize the orbit with an inclination of about 32 degrees to the equator.

-more-

At that time, the radar calibration sphere -- designed to give radar operators a precise target for radar system calibration and evaluation -- will be separated downward from the Transtage.

Near Vandenberg AFB, Calif., the Transtage will be ignited a third time to put it and the remaining OV2-1 payload into the 4,000 - 400 nmi elliptical orbit. After completion of this burn, a depitch maneuver or "space somersault" will be started -- but interrupted when the vehicle has rotated through 180 degrees.

Then the OV2-1 satellite will be separated opposite the direction the Transtage is traveling. After a short wait to allow the satellite and Transtage to move apart, the depitch will be completed.

Following the third Transtage burn, a series of seven engine start-stop-starts will be conducted.

"We will begin the restart series when the vehicle reaches approximately 33 degrees east longitude, off the eastern tip of Afrida," according to Col. Miller. "The burns will last about 12 seconds each and are scheduled to occur at intervals of 78 seconds. This series of burns will roughly circularize the orbit at 4,000 nautical miles."

Following the final burn, the payload truss and ballast will be separated from the Transtage by means of the helium retrovent system. Vehicle telemetry, attitude control and guidance subsystem will then remain operative to gain additional coast data for at least four hours. Total mission time is expected to be about seven hours.

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Assembly of the Titan III-C for this flight test was conducted for the first time in the Air Force's new Vertical Integration Building (VIB) and Solid Motor Assembly Building (SMAB) -- both part of a launch complex called the Integrate-Transfer-Launch (ITL) facility.

The liquid propellant core vehicle was assembled in the VIB. Then the 85-foot tall, 120-inch diameter booster motors were attached in the SMAB.

The assembled vehicle was then pushed by twin diesel-electric locomotives along the ITL's railway system to Pad 40 where pre-launch checkout was completed, and the payload was mated to the booster.

"Full assembly and checkout of future Titan III vehicles will be conducted in the VIB and SMAB to further speed and standardize prelaunch procedures," according to Col. Miller.

Both assembly and checkout of future Titan III vehicles will be conducted in the VIB and SMAB to further speed and standardize prelaunch procedures," according to Col. Miller.

Both assembly and checkout of the first Titan III-C were conducted on the pad in traditional fashion.

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PHOTOS AVAILABLE

NEWS RELEASE
UNITED STATES AIR FORCE
OFFICE of AEROSPACE RESEARCH
WASHINGTON, D. C. OX 63751

THE OV2-1 RESEARCH SATELLITE

The OV2-1 research satellite is designed to explore, monitor, and assess the biological hazards of the charged particle environment in the near earth regions of space. Information obtained will be used in the planning and design of both manned and unmanned space systems.

The satellite is one of two developed for the Office of Aerospace Research, Washington, D. C., by Northrop Space Laboratories, Hawthorne, Calif.

The Office of Aerospace Research, commanded by Maj. Gen. Don R. Ostrander, is responsible for research within the Air Force.

On-board experimentation is provided by the Air Force Cambridge Research Laboratories, Bedford, Mass.; Air Force Weapons Laboratory, Kirtland AFB, N. Mex; the Aerospace Corporation, El Segundo, Calif. on behalf of Air Force Systems Command Space Systems Division, Los Angeles AFS, Calif.

The OV2-1, which stands for Orbiting Vehicle 2 Payload Configuration 1, will measure energetic particles; electromagnetic field strength; very low frequencies; and radiation effects on tissue equivalents. A total of 14 separate experiments are carried on board the 360 pound satellite.

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In addition, the satellite will provide the first space test of a subliming solid spin system developed by Rocket Research Corporation for the Goddard Space Flight Center of the National Aeronautics and Space Administration.

The satellite was purchased under the Aerospace Research Support Program (ARSP), a joint Air Force Systems Command-Office of Aerospace Research venture. Managed by OAR, the program is designed to provide the scientist/engineer with the necessary hardware and services to get his experiment into the space environment.

The OV-2 is box-shaped -- 23" by 23" by 24" -- with four solar panels extending from its sides. The solar panels can provide electrical energy which will power the 14 experiments for a minimum of one year.

Titles of the experiments and the sponsoring agencies are as follows:

Directional Particle Detectors	SSD/Aerospace
Omnidirectional Proton Spectrometer	SSD/Aerospace
Faraday Cup	SSD/Aerospace
Cerenkov Detector	SSD/Aerospace
VLF Receiver	SSD/Aerospace
Magnetometer	SSD/Aerospace
Plasma Probe	AFCRL
Electrostatic Analyzer	AFCRL
Proton Detector	AFCRL
Tissue Equivalent Phantom	AFWL
Proton Spectrometer	AFWL
Solar Aspect Indicator	SSD/Aerospace
Low Energy Magnetic Electron Spectrometer	SSD/Aerospace
de/dx - E Telescope	SSD/Aerospace

Following is a description of the purposes of the various experiments:

SSD/Aerospace Experiments

The Aerospace (Space Physics Laboratory) group of experiments is a closely-correlated group of instruments intended to:

(1) Monitor the radiation belts and measure their time variations;

(2) Identify and measure the fluxes and energies of the particles in the radiation belts;

(3) Measure the particle pitch, angle distribution and correlate these with electromagnetic and hydromagnetic waves.

The particle injection mechanisms, lifetimes and loss mechanisms can be determined from these detailed measurements. While all experiments noted are active scientific instruments, the magnetometer and solar aspect indicator are primarily included to provide orientation information to the experimenters.

AFWL Experiments

The primary objective of this group of experiments is to make biologically-significant measurements in conjunction with detailed spectral measurements of space radiation environment which cannot be reproduced in a laboratory. These measurements will be used with other space data to assess the personnel hazards associated with space radiation and to compile a synoptic map of space radiation (trapped) hazards. Of particular interest is the Phantom, which is a simulated human torso made of plexiglass and containing ion chambers capable of measuring total absorbed dose rates from 10-milli-rads/hr to 500 rads/hr. The quantities to be measured in detail, by the AFWL experiments, are the electron flux energy spectra, the proton flux energy spectra, the Bremsstrahlung intensity, the total energy deposition rates (dose) at different depths in a tissue equivalent medium under various shielding conditions, and the linear energy transfer spectra at different depths in a tissue equivalent medium under various shielding conditions.

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AFCRL Experiments

Plasma Probe

Principal objective is to obtain basic data on electrical phenomena of the upper atmosphere and interplanetary plasma. This experiment is designed to determine the flux and energy distribution of protons and electrons in the energy range 0.1 to 20 kev entering the earth's upper atmosphere. This determination of charged particle flux is necessary to ascertain their influence on upper atmosphere heating.

Electrostatic Analyzer

The principal objective is to obtain basic data concerning the electrical processes of the D and lower E regions. The effect on the D region ionization of solar x-rays, cosmic radiation and a variety of man-made disturbances will be studied. The ESA is used to obtain positive ion, negative ion and electron densities and energies.

Proton Spectrometer

The objective of this experiment is to measure the energy spectrum and angular distribution of electrons from 0-5 Mev and protons from 0-250 Mev, both of trapped (naturally-caused or due to man-made injection) and of incoming radiation as a function of latitude, altitude and time. The mass and energy spectra of heavy primaries and the intensity, energy and direction of albedo neutrons may also be measured.