

NEWS

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PROJECT: APOLLO 6
(To be launched on
or after Apr. 3)

SATURN HISTORY DOCUMENT
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History of Science & Technology Group

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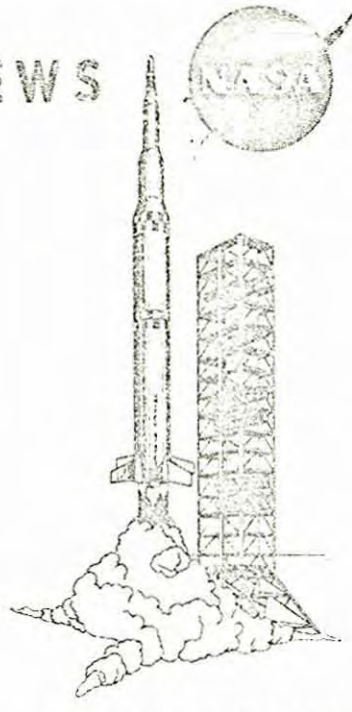
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APOLLO 6 SCHEDULED

The second flight of the Apollo/Saturn V space vehicle is scheduled for launch from the John F. Kennedy Space Center, Fla., on or after April 3. The mission is designated Apollo 6.

Primary purpose of this second flight of the Saturn V is to qualify the launch vehicle for future manned flights.

The successful first flight of Saturn V in Apollo 4, last Nov. 9, verified spacecraft systems and tested the command module under heat conditions expected on a lunar return. Therefore, spacecraft objectives, including recovery, are secondary in the Apollo 6 flight.

The majority of primary objectives will be met in the boost phase of flight. Events leading through the parking orbit stage and reignition of the launch vehicle's third stage S-IVB engine will satisfactorily complete primary mission objectives.

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These include:

- . Demonstration of structural, thermal, propulsion and separation characteristics of the first, second and third stages of the Saturn V in powered flight.
- . Qualification of the third-stage continuous vent system, its auxiliary propulsion system and the J-2 engine restart capability while in orbit.

For this mission, the emergency detection system will be flown closed-loop (designed to operate without ground command) for the first time. It was not operational during the Apollo 4 flight.

A new crew hatch will be flown aboard the spacecraft for the first time.

In Apollo 6, a different method will be used in shutting down the engines of the first stage from that used in Apollo 4.

The Apollo spacecraft and Saturn third stage will be placed in a 100 nautical (115 statute) mile orbit.

Reignition of the third stage will occur about three hours, 10 minutes into the flight over the Eastern Test Range. The burn will last some five minutes 10 seconds and will place the vehicle on a simulated translunar coast ellipse with a 279,000 nautical (320,000 statute) mile apogee. The actual apogee is dependent upon the day of launch.

Following third-stage shutdown, the Apollo 6 third stage-spacecraft combination will be maneuvered 180 degrees by the stage's auxiliary propulsion system in preparation for separation of the third stage from the command and service module.

Three minutes after third-stage engine cutoff, the command and service module will separate from the third stage which will continue on its path to lunar distance moving at more than 20,750 nautical (23,850 statute) mph.

Meanwhile the first spacecraft service-propulsion-system engine burn will slow Apollo 6 to about 16,700 nautical (19,200 statute) mph and lower its apogee to 12,000 nautical (13,820 statute) miles which will be achieved at six hours 22 minutes after liftoff.

The second firing of the SPS engine -- 3 minutes 8 seconds duration -- will occur 9 hours 22 minutes into the flight. This burn is intended to increase entry velocity to 21,600 nautical (24,900 statute) mph.

Entry will be less steep than on Apollo 4, giving a greater heat load to the command module heat shield. The command module will travel 2,500 nautical (2,880 statute) miles after reentering the atmosphere.

Following separation from the service module and deployment of the Earth-landing system, the Apollo 6 command module is scheduled to land 340 nautical (391 statute) miles north-northwest of Kauai, Hawaii, 9 hours 49 minutes after liftoff.

The Saturn V launch vehicle consists of three propulsive stages and an instrument unit (IU).

The first stage (S-IC) is 138 feet tall, 33 feet in diameter and weighs 306,140 pounds dry. Its fuel and oxidizer tanks hold 4,400,000 pounds (214,200 gallons of RP-1 kerosene, and 346,400 gallons of liquid oxygen). Its five F-1 engines develop a combined 7.5 million pounds thrust at liftoff and burn almost 15 tons of propellant per second.

The second stage (S-II), 81.5 feet tall and 33 feet in diameter, weighs 88,200 pounds dry. Fully loaded it weighs 1.033 million pounds including 267,700 gallons of liquid hydrogen fuel and 87,400 gallons of liquid oxygen. Its five J-2 engines provide 1 million pounds of thrust.

