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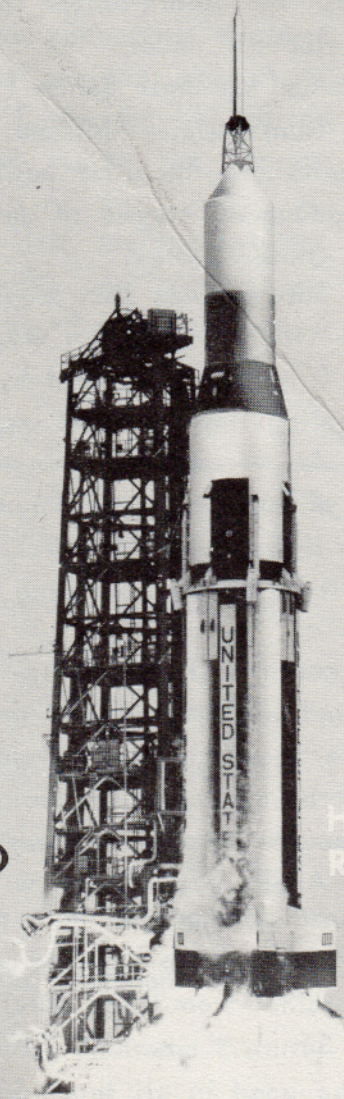
SATU

THE FIRST GENERATION

OF HEAVY LAUNCH VEHICLES DESIGNED FOR PEACEFUL EXPLORATION OF SPACE



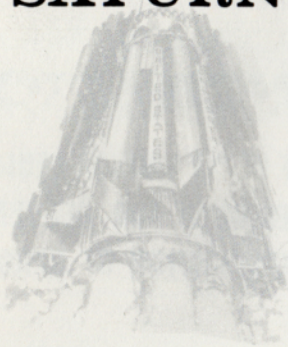
NASA

HOLDS THE RECORD FOR ROCKET RELIABILITY

GEORGE C. MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA

SATURN MISSIONS

SATURN LAUNCHES



Saturn I is the first of three generations of Saturn-class rockets being developed under the direction of NASA's Marshall Space Flight Center at Huntsville, Alabama. The three Saturns are the most powerful rockets in advanced stages of development in the United States.

Saturn I was first launched October 27, 1961, at Cape Kennedy, with only the first stage (S-I) live. The completely successful firing was followed by three additional successful flights testing the clustered engine concept of the first stage.

On the fifth flight test of Saturn I, made January 29, 1964, the second (S-IV) stage was flown live for the first time, placing itself and a payload into orbit for a record-breaking total tonnage of 37,700 pounds.

Saturn I flights will continue through mid-1965. Manned flights will not be attempted in Saturn I, but the final three launches of the 10-vehicle research and development flight test program will place in orbit Meteoroid Technology Satellites. These satellites are designed to measure and report the meteoroid hazard with which Apollo astronauts will be faced. Decisions on the structural design of the parts of the Saturn/Apollo Spacecraft which will be exposed in space will be made from information obtained from these satellites.

Most important of the Saturn I missions is the testing of systems and concepts to be used in all three Saturn rockets. Test launchings of the smaller and less costly Saturn I make possible fewer research and development launchings of the two larger and more expensive Saturns to be used in manned space flights.

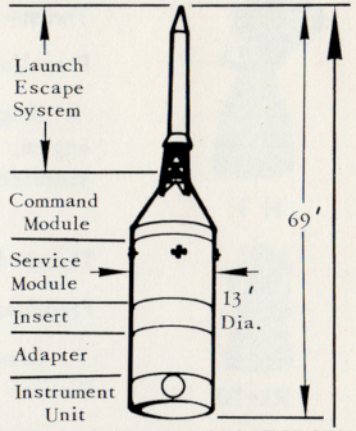
Saturn I has pioneered the clustered-engine concept, path-adaptive guidance system, and other systems essential in development of a heavy duty rocket capability.

PHYSICAL DESCRIPTION

Unmanned "boilerplate" Apollo Spacecraft tests spacecraft systems to be used in manned moon trip.

Meteoroid Technology Satellites will be housed inside the service module.

Instrument Unit, located between the Apollo model and S-IV stage, contains guidance and control system for the vehicle.



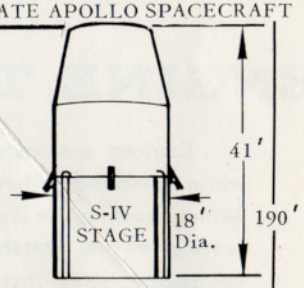
BOILERPLATE APOLLO SPACECRAFT

Total Thrust--90,000 pounds.

Propellants--Liquid oxygen/liquid hydrogen

Liftoff Weight--113,500 pounds.

Burning Time--About 8 minutes.



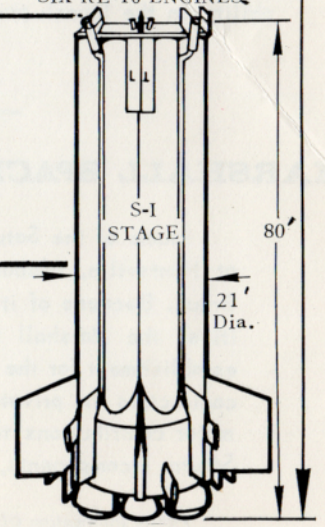
SIX RL-10 ENGINES

Total Thrust--1.5 million pounds.

Propellants--Liquid oxygen/kerosene.

Liftoff Weight--960,000 pounds.

Burning Time--About 2 1/2 minutes.



Vehicle Stages--Two

Total Vehicle Liftoff Weight--1.1 million pounds

Note: Dimensions and figures are approximate and will vary slightly with individual vehicles.

EIGHT H-1 ENGINES

SATURN I ENGINES

H 1

Thrust--188,000 pounds.

Propellants--Liquid oxygen/kerosene.

Engine is offspring of Jupiter and Thor engine, selected because of its relative simplicity and proven reliability.

RL-10

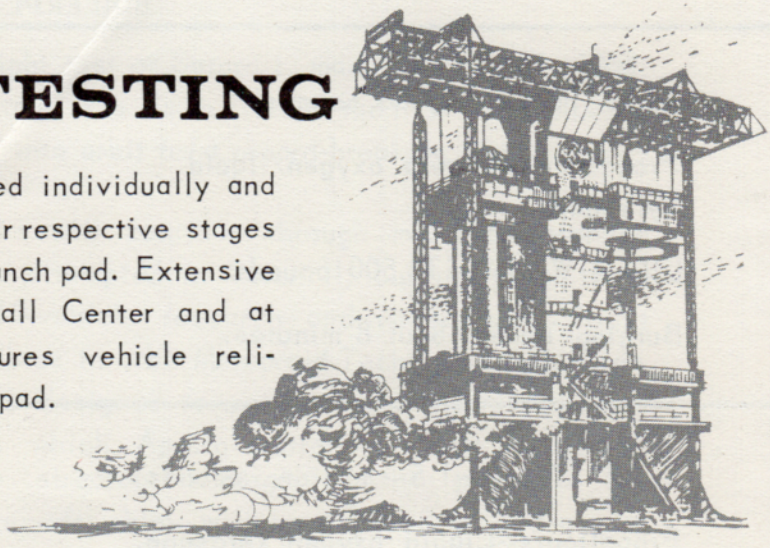
Thrust--15,000 pounds.

Propellants--Liquid oxygen/liquid hydrogen.

Same engine as used in the Centaur. Pioneer engine using hydrogen as fuel.

ENGINE TESTING

Engines are tested individually and while clustered in their respective stages before reaching the launch pad. Extensive testing at the Marshall Center and at contractor sites insures vehicle reliability on the launch pad.



MARSHALL SPACE FLIGHT CENTER

Home of the Saturn is the Marshall Space Flight Center at Huntsville, Alabama. It is directed by Dr. Wernher von Braun. Because of its unique laboratories and testing facilities, the Marshall Center is the nation's most complete establishment for the development of large rockets. Numerous contractors in private industry throughout the nation made major contributions to design, development, and testing of Saturn I components, engines and stages.

Public Information Office, Marshall Space Flight Center, 1964