

Saturn V Rocket Booster Test Stand at
MSFC

SATURN HISTORY DOCUMENT

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HUNTSVILLE, Ala. -- The massive Saturn V rocket booster test stand is the center of a new testing complex at the NASA-Marshall Space Flight Center.

Several short duration tests have been conducted here leading to today's scheduled 2-1/2 minute full duration test of the S-IC-T -- static test version of the Saturn V rocket.

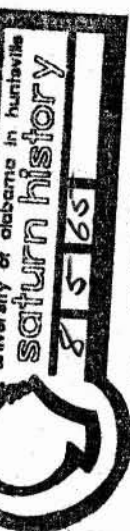
The non-flight S-IC booster is a cluster of five powerful rocket engines developing 7.5 million pounds thrust. The booster was assembled in Marshall Center shops from components supplied by The Boeing Company.

Early flight versions of the S-IC -- two of which are being assembled here -- will also be captive tested here before being shipped to the NASA-Kennedy Space Center for launch.

Construction for the gigantic test stand was begun in November of 1962 by Ets-Hokin and Galvan, Inc., of San Francisco, Calif.

Foundations for the stand are set in bedrock some 40 feet below the ground. The stand has four 144 feet high concrete legs. The hollow legs, having walls four feet thick, are 47 feet square at the base and 30 feet at the top. Shops and instrumentation rooms are located in the legs.

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The steel superstructure extends 122 feet above the concrete portion, to the 266 foot level. A 135-foot boom of a 200 ton crane atop the superstructure makes the stand's height reach more than 400 feet.

The S-IC-T stage is held in the stand by a thrust load platform during static tests. This platform has four strain gauges which measure the performance of the booster.

The stand has been designed to take up to 12 million pounds thrust. Boosters 410 inches in diameter and 170 feet long can be fired on this stand. The Saturn V booster is 33 feet in diameter and 138 feet long.

One of the "larger" features of the stand is its 1,900 ton flame deflector. The large steel "flame bucket" was constructed outside the stand and then moved on wheels to its position beneath the thrust load platform.

Some 320,000 gallons of water is forced through the deflector's more than 38,000 holes each minute during a test. Water is pumped from the Tennessee River by a high pressure industrial water system. This system has 13 huge diesel driven pumps and two three-million gallon water storage tanks.

The booster is equipped with sensitive measuring devices -- strain gauges and accelerometers -- during tests. Some 1,200 channels of measurements will be transmitted to recording instruments in the blockhouse 750 feet east of the test stand.

The \$37 million complex includes an F-1 engine test stand, a high pressure industrial water system, a three-story blockhouse and extensive propellant storage and handling facilities.

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Ets, Hokin and Galvan held the major construction contract -- totaling \$5.2 million -- for building the main structural portion of the test stand.

The company's main subcontractors included:

John Beasley Co., Dallas, Texas, erection of structural steel; Inscho's Mechanical Contractors, Birmingham, Ala., mechanical work; Dave L. Brown Ready-Mixed Concrete, Huntsville, Ala., concrete; H. K. Porter Co., Birmingham, reinforcing steel; R. Mohon Co., Detroit, Mich., structural steel;

Valley Steel Construction Co., Inc., Decatur, Ala., placing reinforcing steel and structural steel inside legs; Decatur Iron and Steel Co., Decatur, Ala., furnishing light structural steel for steel decks and stairways and other uses in towers.

Aetron, Covina, Calif., performed the design work under the supervision of the MSFC Facilities and Design Office. Aetron also procured and fabricated the technical systems and instrumentation for the test complex.

Sullivan, Long and Hagerty, Birmingham, Ala., completed the site development and foundation work, and the Pearce and Gresham Co., Decatur, Ala., held the contract for building the control center.

The Mobile District of the Corps of Engineers supervised construction of the giant stand.

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