The Space Environment Simulation Laboratory is located in Building 32, a complex structure containing the two chambers, administration and control offices, a refrigeration room, pump room, and a support laydown yard.

The chamber portion of the building is a high-bay structure of approximately 26,000 square feet which houses two large man-rated Space Environment Simulation Chambers, related services and work areas. The two chambers are designed for the simulation of a space environment. The larger of the two chambers provides simulated space and lunar surface environments and is primarily intended for combined tests involving man and operating spacecraft. It became operational in early 1966. The small space chamber is utilized for life systems and astronaut training studies, and for tests of single modules of the Apollo spacecraft. It became operational in late 1965.

The larger chamber, designated Chamber "A" is a 65-foot diameter stainless steel vessel having an overall height of 120 feet. The chamber will handle a spacecraft of up to approximately 75 feet in height and 25 feet in diameter. There are four individually operated 25-ton hoists located above the top head of the vessel. The lifting hooks may be lowered through the removable sections in the top head.

Chamber "A" supports spacecraft weight of 150,000 pounds in a vertical position on a rotating platform (lunar plane) 45 feet in diameter. The lunar plane rotation (±180°) can be controlled, manually or automatically, to a maximum rotation speed of 1-2/3 rpm. The lunar plane surface temperature can be controlled from 80 K to 400 K.

A side-hinged door for vehicle loading is located in the cylindrical section of the vessel with the bottom of the opening approximately four feet above the lunar plane level. The door provides a 40-foot diameter clear opening. The door is hydraulically opened, closed, and clamped from a remote control panel.
The chamber interior is equipped with guarded walkways around the perimeter at the mid-manlock level and the upper manlock levels. Chamber penetrations (12 inches in diameter) for utility servicing of the spacecraft are located at each manlock level. Instrumentation penetrations are located through the hollow shaft of the lunar plane assembly. There are two manlocks, one double lock at the lunar plane and one single lock at the mid-chamber level. Provisions are made for the future additions of a single lock at the upper level. All manlock doors are side-hinged and provided with quick action clamp devices on all doors for initial seal. The clamp devices on all doors, except those leading from the manlock into the chamber, can be operated from one side only and will fall away or disengage when the doors become pressure sealed.

The chamber vacuum system consists of a combination of mechanical and diffusion pumps and a 20 K cryopump using gaseous helium. The chamber pumps down to a $1 \times 10^{-5}$ torr in nineteen hours with a gas leak load of 27.6 torr liters per second.

The interior of the chamber is lined with black, nitrogen cooled heat sink panels which will operate at approximately 80 K. To the maximum practical extent, all surfaces in the chamber viewed by the vehicle consists of heat sink panels. Cryopump surfaces, cooled by gaseous helium, are shielded from the test vehicle by heat sink panels.

Solar simulators of modular design are mounted external to the chamber walls on its die and tip. The simulators irradiate the vehicle through penetrations in the wall with an intensity which can be controlled in the range from 60 to 140 watts/sq. ft. The solar simulators have a wavelength range from approximately 0.25 to 3.0 microns. The target area of the side sun is 13 feet wide by 33 feet high, expandable to 20 feet wide by 65 feet high. The target area of the top sun is 23 feet in diameter.

The smaller chamber, designated Chamber "B", is a 35-foot diameter stainless steel vessel having an overall height of 43 feet. The chamber handles a maximum sized vehicle of 13 feet in diameter and 27 feet in length. Vehicle access is provided by a removable top head. A rolling bridge crane with a capacity of 50 tons is utilized to remove the chamber head or insert spacecraft into the test chamber.
Chamber "B" supports a spacecraft weight of 75,000 pounds on a fixed lunar plane 20 feet in diameter. The lunar plane surface temperature can be controlled from 80 K to 400 K.

There is one double manlock at the lunar plane level with the same provisions established for Chamber "A" manlocks. The chamber vacuum system will consist of a combination of mechanical and diffusion pumps. The chamber will pump down to $1 \times 10^{-2}$ torr in 3-1/2 hours with a gas load of 25.6 torr liters per second.

The heat sink description for Chamber "A" is applicable to Chamber "B". The Chamber "B" solar simulators are the same type as for Chamber "A" except that Chamber "B" has a top sun only. The target area for the top sun is 5.6 feet in diameter, expandable to 20 feet in diameter.

Lunar Module Test Article-8 (LTA-8), now on display in the Visitor Center at Johnson Space Center, is identified to the Apollo 11 "Eagle" flown to the surface of the moon by Astronauts Neil Armstrong and Buzz Aldrin in July 1969. LTA-8 was subjected to thermal vacuum tests in both the chambers located in the Space Environment Simulation Laboratory.