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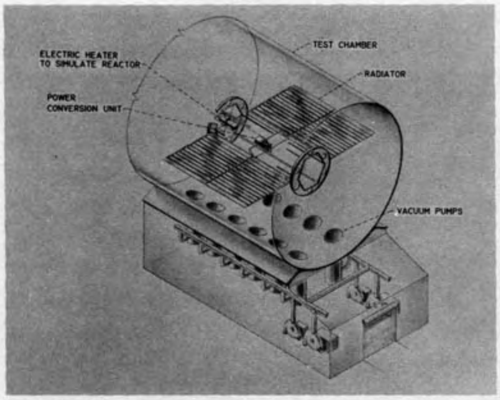
AWT GETS NEW ASSIGNMENT

Since its construction in 1942, the AWT has played a major role in aeronautical and space research. The test section has seen B-29 engines, jet engines, and ramjets mounted in its chamber along with the mercury capsule and escape tower. During these years, the tunnel has been modified from time to time, striving for higher speeds and altitudes. Originally designed to simulate aerial conditions at 50,000 feet and at speeds of 500 miles an hour, modifications resulted in the tunnel's reaching an altitude of 100,000 feet.



Sketch showing the Snap-8 installed in the AWT vacuum chamber. The chamber is about 30 feet in diameter and 100 feet long.

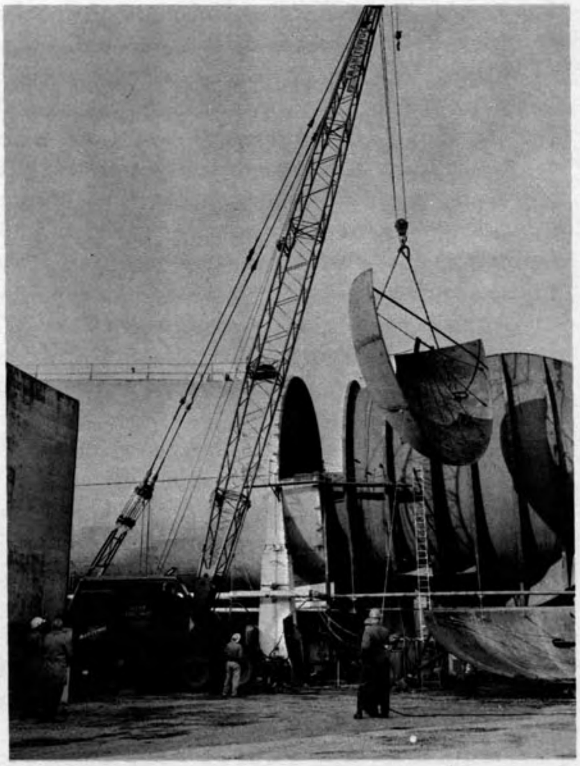
Now the AWT is undergoing a major change -- it is being converted into a large vacuum chamber. Full-scale power conversion systems that take nuclear power will be tested in the chamber, with an electric heater simulating the reactor. As shown in the diagram, the Snap-8 will be able to be mounted in the chamber.

The outer skin and insulation of the tunnel are being removed so a leak check can be made. The tunnel has also been completely stripped of its equipment -- the pumping system, heat exchangers, driving fan, and faring have all been removed.

Two large bulkheads were installed to isolate the small end of the tunnel where the vacuum chamber will be located. In order to install these bulkheads, a section of the top half of the tunnel had to be cut out and removed and the bulkheads lowered into place. The one bulkhead contains a 15-foot diameter door to furnish access to the chamber.

A new pumping system, using oil diffusion pumps, has been installed. This system will reduce the pressure in the vacuum chamber to 10^{-3} mm of mercury.

This is a prime example of how existing facilities at Lewis are being adapted to space research. And the AWT, rather than becoming an obsolete, unused facility, will continue to serve this nation's efforts in the space age.



A section of the tunnel was cut out so the bulkheads could be put in place.

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Since every effort is made to keep the same initials when re-naming a building, there's some speculation that the Altitude Wind Tunnel may be called the "Aerospace Wacuum tank."

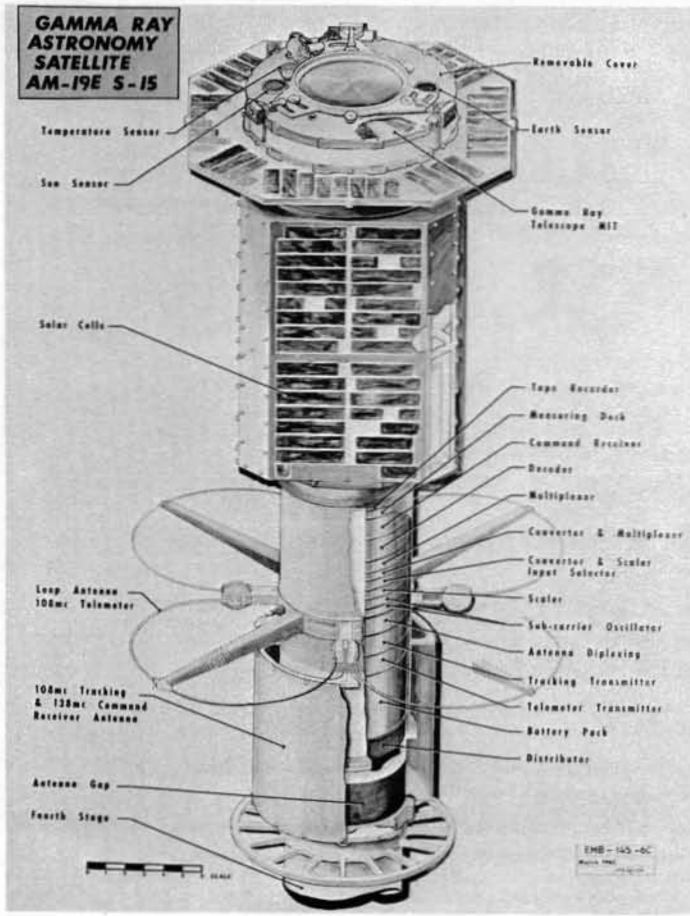
(Editor's note: Written with the technical assistance of J. Elmo Farmer, Advanced Development and Evaluation Division.)

S-15 SATELLITE

In the near future NASA is scheduled to launch a gamma ray astronomy telescope satellite (S-15) to detect and measure cosmic gamma radiation from space. The primary objectives of the experiment will be to detect high-energy gamma rays from cosmic sources, such as our own galaxy and neighboring galaxies, and map their distribution in the sky.

Gamma radiation holds particular interest because it is associated with nuclear activity, which involves energetic processes unmatched elsewhere in nature. Scientists believe gamma rays to be keys to otherwise unattainable information about the elements making up the universe. Another reason for scientific interest is that gamma rays are not deflected by magnetic fields. Therefore, their source in space may be determined by the direction from which they come.

Resembling an old-time street lamp, the 82-pound S-15 satellite will be launched by a four-stage Juno II rocket. The S-15 combines, structurally, a 12-inch-diameter, 23.5-inch-long octagonal aluminum box mounted on a 6-inch-diameter, 20.5-inch-long aluminum instrument column. The box provides both a housing for the gamma ray telescope and four of the external surfaces for the satellite's solar cells. The 44-inch-long fourth-stage rocket will remain with the satellite. This extension will act as a section of a transmitting antenna and provide the additional length and weight needed in attaining tumbling action.



In orbit, the satellite will tumble end-over-end at the rate of about 10 times every minute. This motion will enable the gamma ray telescope, aimed out through the end of the octagonal box, to scan a portion of surrounding space every 6 seconds. Sun and earth sensors, peering out through small apertures in the micrometeorite shield, will permit scientists on the ground to know at all times the exact orientation of the satellite with respect to the earth, sun, stars, thus pinpointing the direction from which the gamma rays are coming.

S-15 will contain two transmitters, one for tracking and transmitting continuous data and one for tape recording readout. Both transmitters will be under ground command control.

The satellite will be launched into a planned elliptical, low-inclination orbit in order that the initial spin axis of the payload will be in such a direction that (1) the telescope will scan the sun during the early part of its lifetime, (2) it will have a lifetime in excess of 6 months, and (3) an appreciable fraction of the time will be spent below the inner Van Allen radiation belt.