REENTRY HEATING EXPERIMENT
LAUNCHED ON SCOUT VEHICLE

A NASA flight experiment to find out how well a spacecraft heat shield material will perform during reentry was successfully launched on a Scout vehicle at 2:06 a.m. EDT August 18 from Wallops Island.

The reentry experiment, devised by scientists of Langley Research Center, was conducted to learn how low-density charring ablator materials withstand the intense heat generated by a spacecraft during reentry.

The experiment had two objectives. In the first, NASA researchers wanted to further the understanding of such materials for future manned and unmanned space flight by comparing flight with ground test data. The selected material is one being considered for use as the Apollo heat shield.

The second objective was to provide a basis for assessment of the material even though the Scout reentry environment will be different and in some important technical respects more severe than the Apollo reentry environment.

The low-density charring ablator material test was the fourth flight in NASA's Scout reentry heating project sponsored by the Office of Advanced Research and Technology.

Information received from radar and telemetry stations will permit determining how well the material withstood the heating when the spacecraft sped through the atmosphere at about 19,000 miles per hour. A tape recorder in the spacecraft stored temperature readings and ablation measurements gathered by thermocouples and sensors during a one minute period of communications blackout caused by ionization. After the spacecraft passed through the reentry portion of the flight, the tape recorder relayed the data to ground stations at Wallops Island, Langley Research Center, Bermuda, and ships.

Aircraft in the reentry area recorded the flight on cameras.

The Scout launch vehicle carried the 320-pound spacecraft to an altitude of about 130 miles before the two upper stages and a 17-inch spherical rocket motor propelled the payload down into the atmosphere. Total flight time was 11 minutes. The spacecraft landed in the Atlantic Ocean about 12 miles from the predicted impact point about 1,200 miles down range. There was no attempt at recovery.

NASA scientists will begin immediately to assess the information received from telemetry.

The term "ablation" has come into engineering use during the past ten years. It describes a complex process which takes place on the forward face of a heat shield during the very high energy conditions of atmosphere entry.

Charring ablator heat shields are composed of plastic resin materials reinforced with various added organic or inorganic substances.

Heat shields of charring ablation material protect a spacecraft in several ways. At the beginning of reentry heating they begin to decompose chemically, absorbing some heat in the process. During decomposition, gases are evolved and act as an insulating blanket as they pass over the heat shield surface. Finally, at the surface, a charred layer of coke-like material develops, capable of operating at very high temperatures to radiate heat away from the spacecraft. The uncharred lower layers provide an insulating effect throughout the reentry.