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EXPLORER SATELLITES

The Air Density Explorer Satellites, used to study the upper atmosphere, are 12-foot-diameter spheres constructed of alternating layers of aluminum and plastic film. These satellites carry no measuring instruments. The satellite, itself, is the measuring instrument for the determination of atmospheric density. Because it is so large and light in weight, about 17 pounds, it is markedly affected even by the sparse air of the upper atmosphere. White circles painted on the outer surface contribute to temperature balance by absorbing less of the sun's heat than the aluminum skin. The Explorer Satellites shown on Platform B are actual satellites.

At launch the satellite is folded and packed inside a metal cylinder 9" in diameter and 19" long. In orbit, compressed nitrogen gas pushes the sphere from its container and inflates it to a 12 foot diameter.

Three Air Density Explorer Satellites have been launched; Explorer IX, XIX, and XXIV. The Explorer IX Satellite, launched in 1961, was used to measure atmospheric densities from 200 to 500 miles altitude in the equatorial and temperate zone.

Explorer XIX, launched in 1963, and Explorer XXIV, launched in 1964, are still measuring densities between altitudes of 400 and 500 miles in the equatorial, temperate, and polar regions. Using these satellites, a great deal of knowledge about the earth's upper atmosphere is being accumulated. Atmospheric densities decrease with altitude and are found to have systematic daily, monthly, seasonal, semi-annual, and 11-year variations. These studies make it possible to predict the orbital lifetimes of satellites and to better understand how the sun affects the earth's atmosphere.