Team Enlil

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Abstract

On January 31st, 1958 – eight months before the National Aeronautics and Space Administration's first day of operation – the United States' first satellite was put into orbit. Explorer 1's primary scientific instrument was a cosmic ray detector designed to measure the levels of ionizing radiation in earth's orbit. The successful launch of this satellite depended on the teamwork of hundreds of people and millions of dollars. Today, collegiate students have the opportunity to do similar experiments and studies for a fraction of the cost thanks to technological advancement and organizations like the Colorado Space Grant Consortium. However, the viability of replicating past experiments or creating new ones depends entirely on the feasibility of a successful experiment. The D.I.Y. robotics industry can support these experiments, but the variety in price and quality of components bought on an open market are bound to create inconsistencies that could result in experimental failure. By testing components of varying quality under actual experimental conditions, a base level of component price and quality can be identified; both in relation to reliability and data accuracy. To accomplish this, this experiment uses several off-the-shelf components and very basic radiological sensors to measure ionizing radiation in Earth's upper atmosphere. Several different configurations of Geiger counters are connected to necessary command and data handling systems and heating. These components are contained in an insulated capsule, in the shape of a hexagonal prism. The data recorded by the capsule as it ascends to a 30,000 foot altitude will be compared to the data found by other organizations/studies to find a comparative level of accuracy or precision. The data will, ideally be directly comparable and indicate that the level of equipment used is reliable or unreliable. Establishing a baseline of components for student-created experiments will benefit other student-led DemoSat experiments, both for basic experiments and those that specifically pertain to high-energy radiological evaluation.