IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
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OUTLAST-1: INTERNATIONAL COLLABORATION AND DISRUPTIVE EDUCATION VIA POCKETQUBES

Abstract

While attending the SmallSat conference in the summer of 2019, the concept of easy to launch, collaborative nanosatellites was introduced in the form of PocketQubes. Alba Orbital, a company based in Scotland, specializes in these small satellites, which a range in size from five by five by five cubic centimeters (known as 1p) to five by five by twenty cubic centimeters (4p). There are many factors which make these satellites a viable option as a disruptive educational tool, particularly for schools working together within a district, a state, or around the world.

An attractive factor of PocketQubes is their accessibility. First, the cost is comparably less than their larger and more commonly used counterparts, which potentially makes them more accessible for public and smaller schools in the States as well as to schools abroad. Additionally, because they are made in Scotland, there are no ITAR restrictions. Often, a struggle for schools in America are restrictions that make it difficult to collaborate internationally, so the PocketQube could be a way to work with students and colleagues from around the world who have not yet experienced what it is like to build, test, and fly a Nanosatellite into space. When people work collaboratively and cross-culturally, best practices are learned that can have far-reaching implications.

An example of a PocketQube mission could be Outlast-1. Outlast-1 is an even smaller version (5 by 5 by 15) that plans to utilize watchdog timers and redundancy methods to prevent bitflips in COTS hardware. This research is important as any nation's hardware in orbit is subject to the harsh conditions of space, and bitflips can lead to a failure of hardware, and ultimately, the mission. The Outlast-1 aims to prove and validate watchdog timers and redundancy as a way to protect data efficiently. Overall, the Outlast will bring students and colleagues of all different nations together and help today's world with finding a secure way to protect data.