Abstract Submitted for the TSS18 Meeting of The American Physical Society

Stratospheric Organism and Radiation Analyzer (SORA)¹ STEVEN OLIVER, ANDREW WALKER, KEVIN PORTILLO, REED MASEK. SAMUEL MORELOS, FRE'ETTA BROOKS, DEBORA MROCZEK, DORIAN DE LA PENA, JAIME JUAREZ, ALEJANDRA CRUZ, DIEGO HERNANDEZ, University of Houston — The SORA payload sampled for the existence of microorganisms and bacterial spores in the upper atmosphere. The payload analyzed different aspects of the surrounding environment such as radiation exposure, temperature, pressure and humidity. The payload had three main scientific objectives. First, design and build a novel system that will isolate surrounding air and sample for cells. Second, on-board sensors analyze exposure to solar and cosmic radiation that microorganisms may encounter. Finally, monitor the environmental conditions such as temperature, pressure, and humidity. Furthermore, the design employed additive manufacturing and hobby electronics in its construction to provide an accessible basis for future missions and explore the bounds of the technology available. SORA established a proof of concept for collecting air samples using a low pressure vacuum pump. Onboard sensors gathered a wealth of information regarding surrounding radiation, with a peak dosage rate of about 0.07 μ Gy/min at ascent and about 0.05 $\mu Gy/min$ during float. Finally, SORA monitored the environment for the duration of the flight, successfully testing the prototype flight computer, while keeping the power consumption below 1.5 A at 30 V.

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