

As space launches become more common, more payloads and satellites need testing to ensure their survival in space. When an object is only under the influence of gravity, it experiences microgravity, or freefall. This occurs when an object falls toward the surface of the Earth or while in orbit around the Earth. Current methods of achieving microgravity on Earth are expensive. Florida Space Grant Consortium assigned us to create a new and cheaper method to test 300x100x100mm sized payload in freefall conditions. A drone lifts our rocket shaped air vehicle to a height of 900ft, then the vehicle falls toward the Earth to experience freefall. To combat the forces of air drag that interfere with freefall, we propel the device toward the surface using a ducted fan. We use a sensor to measure the acceleration caused by drag during descent. A computer controls the speed of the ducted fan to maintain freefall. After 4 seconds of descent, a parachute releases from the tail of the vehicle to slow the vehicle for safe recovery. Making a new, cheap method for testing microgravity will expand research opportunities and aid in space exploration.