Experiment Name	Description	Subteam(s)	Mission Requirement(s)	Results
System Low Temperature Test	Test balloon flight computer, comprised of (1) Raspberry Pi 3B+, (1) MPU9250+MS5611 sensor, (1) NEO 7M GPS sensor, and (1) Arduino Nano with external connections to power, display, and keyboard. Computer was placed inside an insulated payload box and, using dry ice, subjected to temperatures of -52 C external. Internal temperatures reached -16 C after 106 minutes at temperature and computer / sensor package remained fully functional.	Avionics, Payload	AVS-302	Flight system can operate within an insulated payload box down to environmental temperatures of -52 C at sea level.
QDM Logic Test	With the implementation of a safety switch to the QDM circuit board, the logic of the switch needed to be tested. The safety switch completes the circuit of the actual QDM process, allowing the launch structure to detach from the balloon. When off, the safety switch should prevent QDM from ever occuring, even if there is no signal from Ground Station (GS). To test this new system, multiple variables were used to determine if the safety switch was behaving correctly. The first variable was which power source, MCU or Battery, was plugged in first, this is important because of the different voltage draws from either system. The second was whether the MCU was on or off, as this is the primary variable that determines whether QDM needs to be activated or not. The last variable was whether the switch was on or off, to ensure that QDM would never activated with the switch off. A LED light was used in place of the QDM system to determine if the circuit was being completed or not.	Avionics, Launch Structure	AVS-303, AVS-202	Out of the 8 tests conditions, 6 were successful. This meant QDM deployed in cases it should've and QDM was delayed in cases it should've. QDM was deployed in the two tests that were incorrect when both the switch and the QDM were on, regardless of which system was plugged in first. Later research found that this was due to the common ground use that was conducted during the experiment and corrections were made.
Radio Range Test	Balloon flight computer, comprised of (1) Raspberry Pi 3B+, (1) MPU9250+MS5611 sensor, (1) NEO 7M GPS sensor, and a radio module supplied by Ground Station will be loaded into an airplane. Ground Station will set up a receiver in a field with no obstructions while the plane carrying the flight computer will be flown to a distance comparable to the maximum range expected from balloon drift models. During flight, data will be collected by the computer and transmitted to the receiver. The purpose of this test is to determine a maximum range for the radio system, as well as confirming data logging and transmission capabilities.	Avionics, Ground Station	AVS-101, AVS-103, AVS-201, AVS-301	TBD
Raspberry Pi Power and Battery Charging Test	Test the powering of the Raspberry Pi and the charging of the internal 5V Lithium-Ion battery through the 12 V battery that will be located on the launch platform. A LED in place of the Raspberry Pi to test whether the 12 V would power the Raspberry Pi while charging the 5V battery.	Avionics	AVS-401, AVS-503	System works as described.
Tether Separation Test	Balloon flight computer, comprised of (1) Raspberry Pi 3B+, (1) MPU9250+MS5611 sensor, (1) NEO 7M GPS sensor, and a radio module supplied by Ground Station will be tethered via data and power lines to the rocket flight computer, comprised of (1) Raspberry Pi 3B+, (1) MPU9250+MS5611 sensor, and (1) NEO 7M GPS sensor. A radio receiver will be set up within range while the rocket computer connection is severed from the balloon computer. Desired results are to confirm ability of balloon computer to recognize severance, transmit this state change to Ground Station, and to safely continue data logging.	Avionics, Commercial Rocket	AVS-502, AVS-504	TBD
Data Collection Test	Balloon flight computer, comprised of (1) Raspberry Pi 3B+, (1) MPU9250+MS5611 sensor, (1) NEO 7M GPS sensor, and a radio module supplied by Ground Station will be tethered via data and power lines to the rocket flight computer, comprised of (1) Raspberry Pi 3B+, (1) MPU9250+MS5611 sensor, and (1) NEO 7M GPS sensor. The data from the balloon computer will be checked against go no-go condition tests. The data from the flight computer will be compared with the data from the balloon computer and will be checked against go no-go condition tests.	Avionics	AVS-102, AVS-104	Systems works as described. Data is collected and organized by sensor of origin.
Remote Ignition Test	Balloon flight computer, comprised of (1) Raspberry Pi 3B+, (1) MPU9250+MS5611 sensor, (1) NEO 7M GPS sensor, and a radio module supplied by Ground Station will be connected to the ignition circuit for the Level 2 rocket motor. An ignition charge will be wired in (without a motor). Ground station will send an ignition command over radio to the balloon flight computer, which will output an ignition signal to the charge -- provided platform rotation is within specification. The desired result from this test is to achieve charge ignition over radio when platform rotation is within bounds, and none when platform rotation exceeds maximum specification.	Avionics, Ground Station, Commercial Rocket	AVS-203	Tested in dry run.