Vanderbilt's Contributions to the Eclipse Ballooning Project
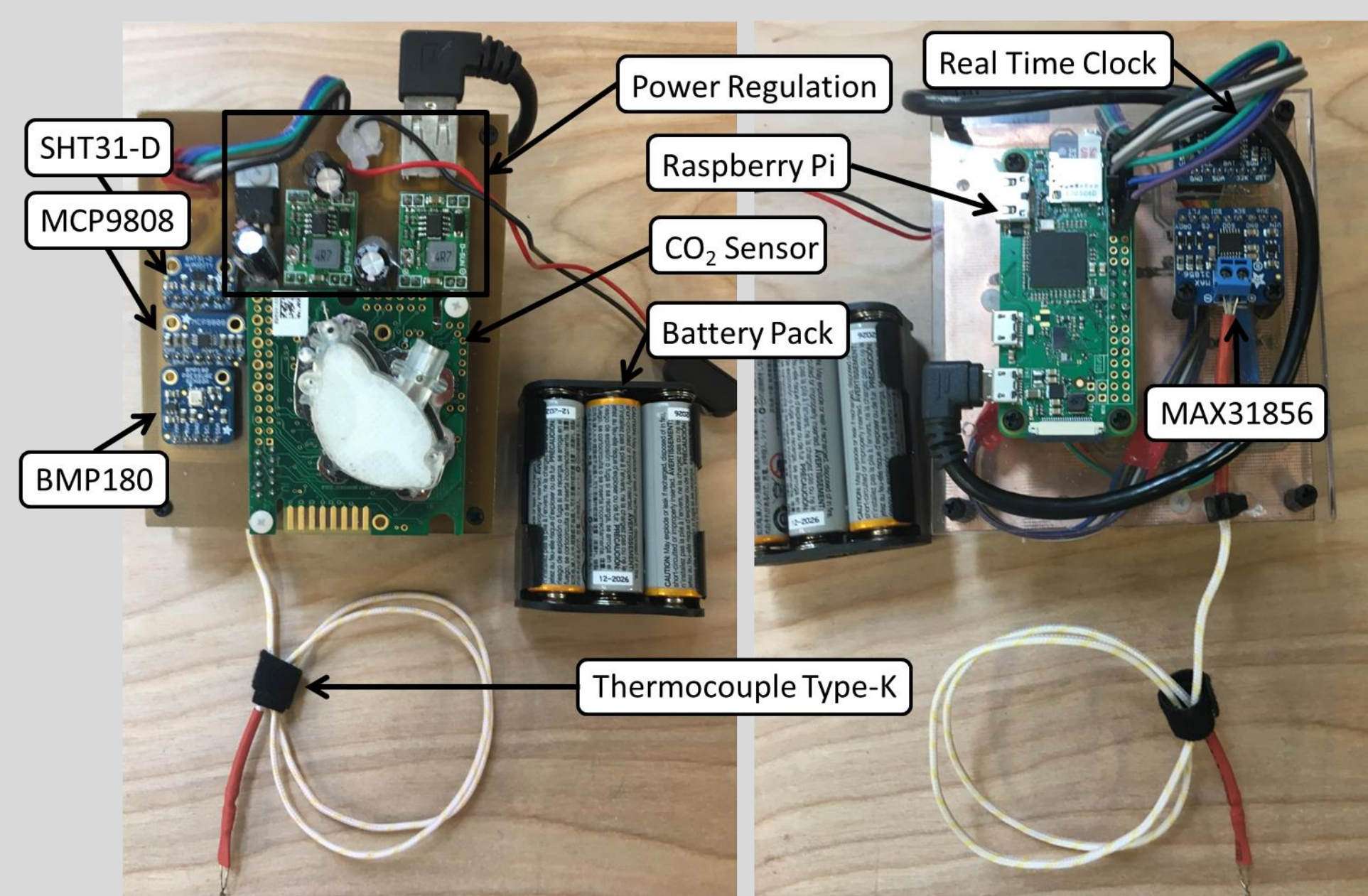## Supported by the Tennessee Space Grant Consortium
## Adam Jarrell

Environmental Package

An environmental logger was included in the eclipse payload. The goal was to detect any differences in the environment due to the sudden lack of solar heating.


The environmental package utilized a Raspberry Pi Zero W to access and log the sensor data. The Pi ran a python script to iteratively access all the sensors on each of the digital buses.
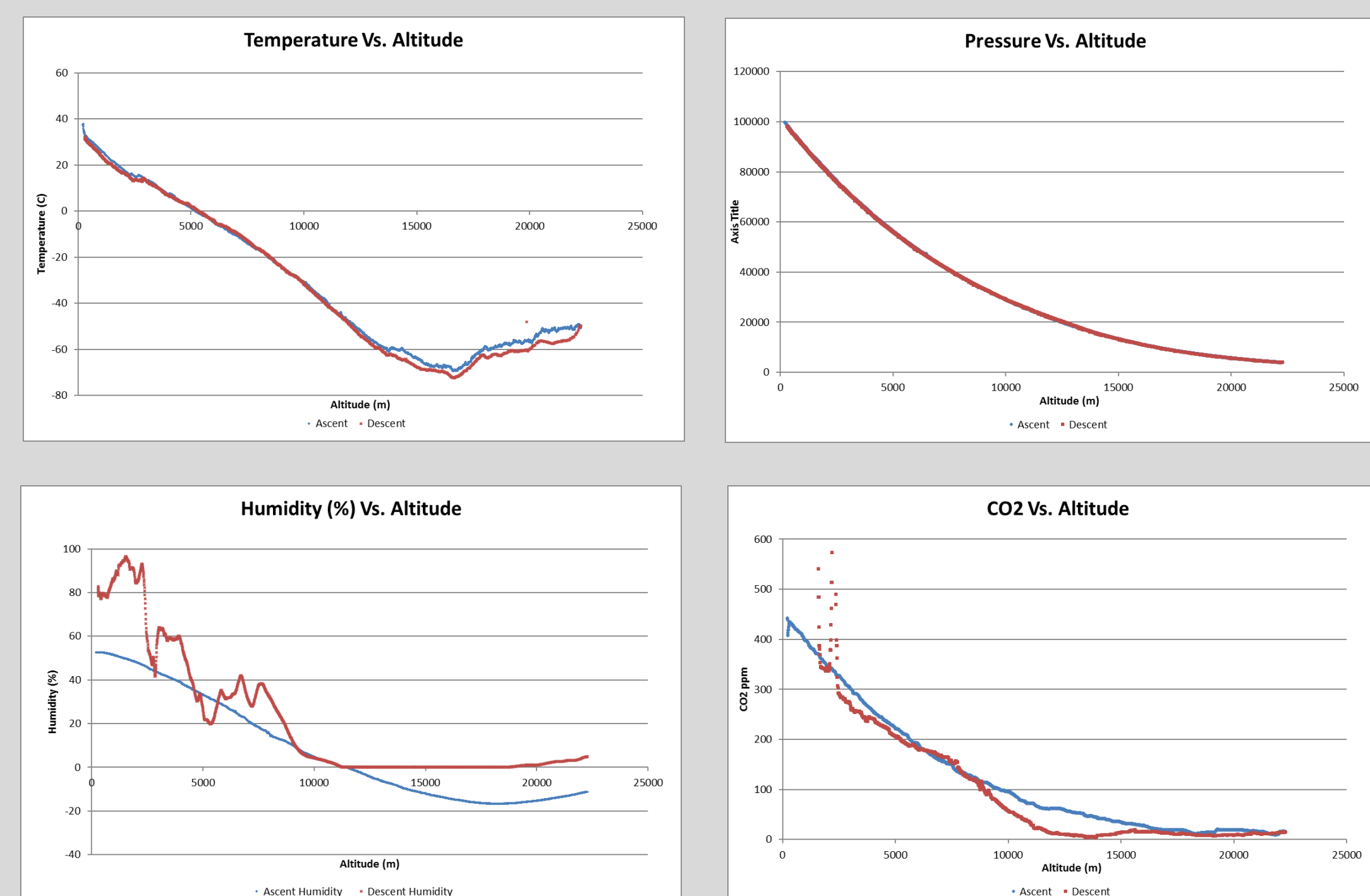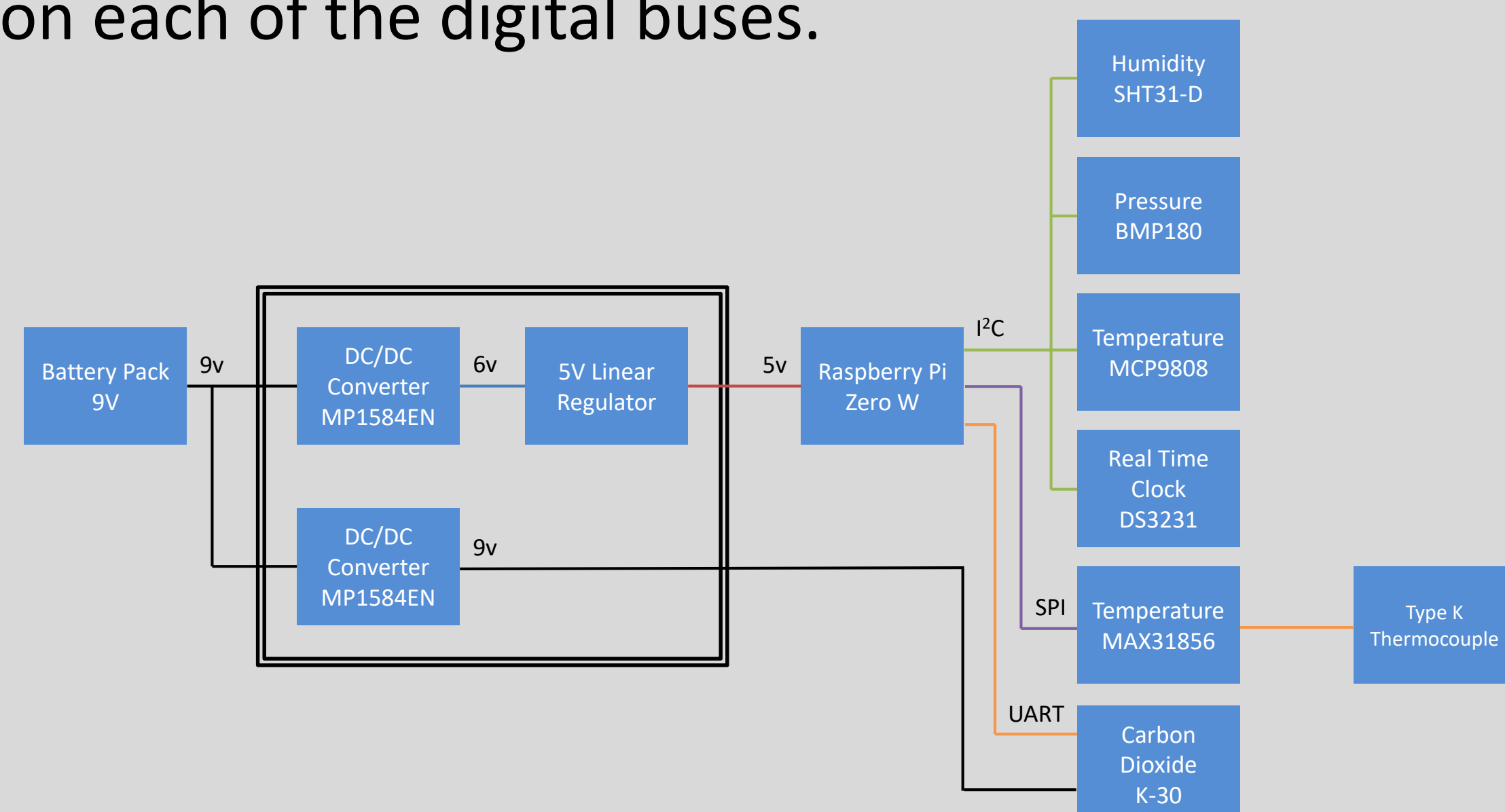

Amateur Radio Repeater
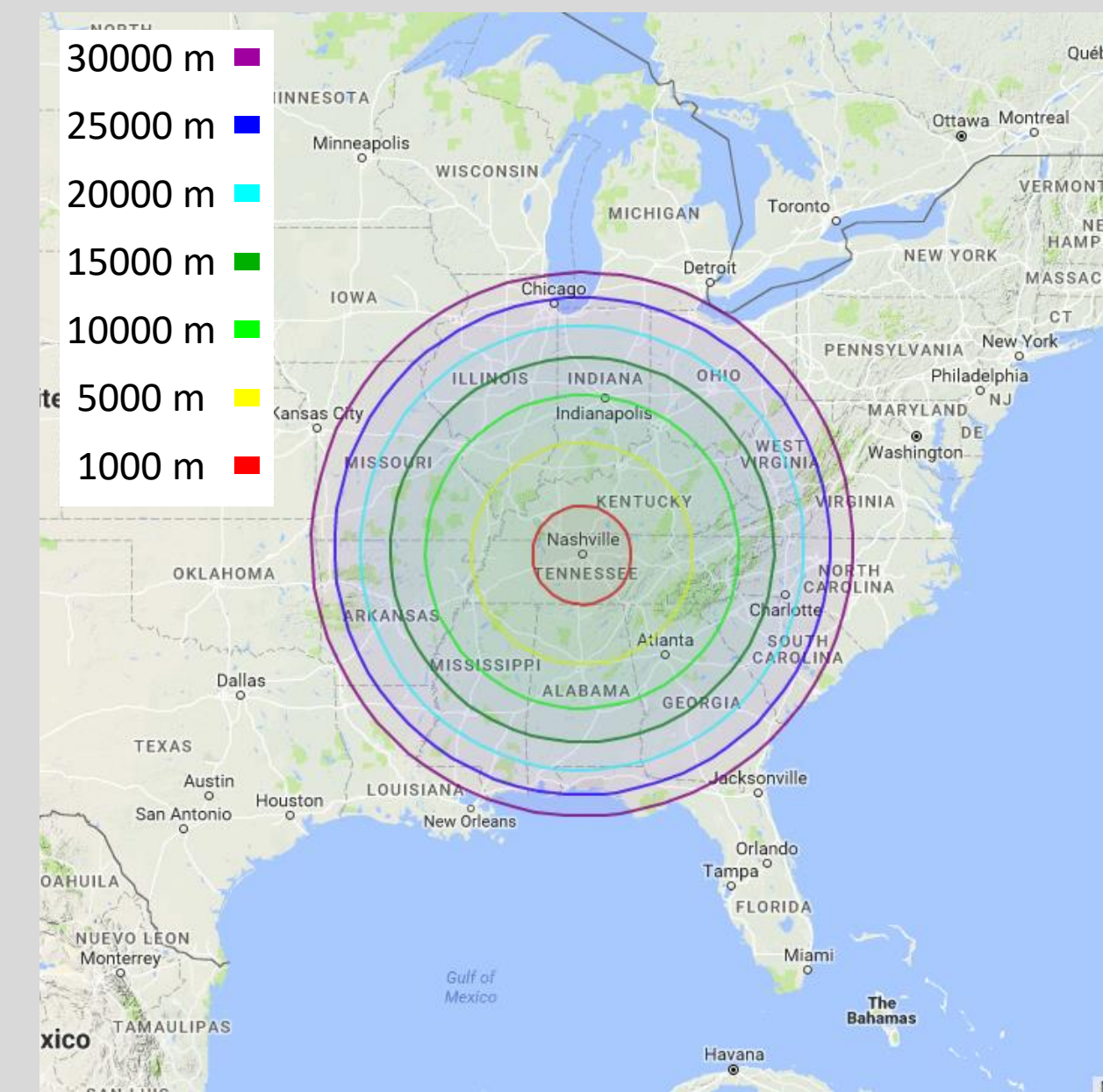
An amateur radio repeater was included in the balloon payload. The repeater was through to be a fun and engage tool to reach out to the surrounding community about the Eclipse Project. At altitude, the repeater would have a radio horizon sufficient to relay messages across the southeast. The furthest contact made during flights was in Cincinnati, OH.
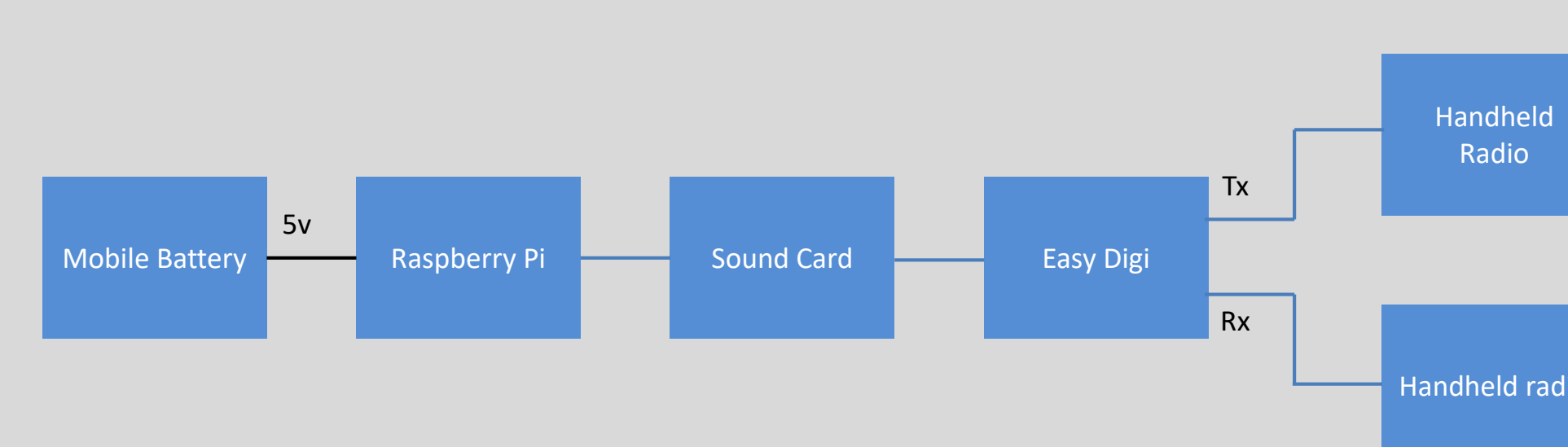

The repeater used a Raspberry Pi with the OpenRepeater package to manage transmission. Two Baofeng radios were used to receive and transmit.
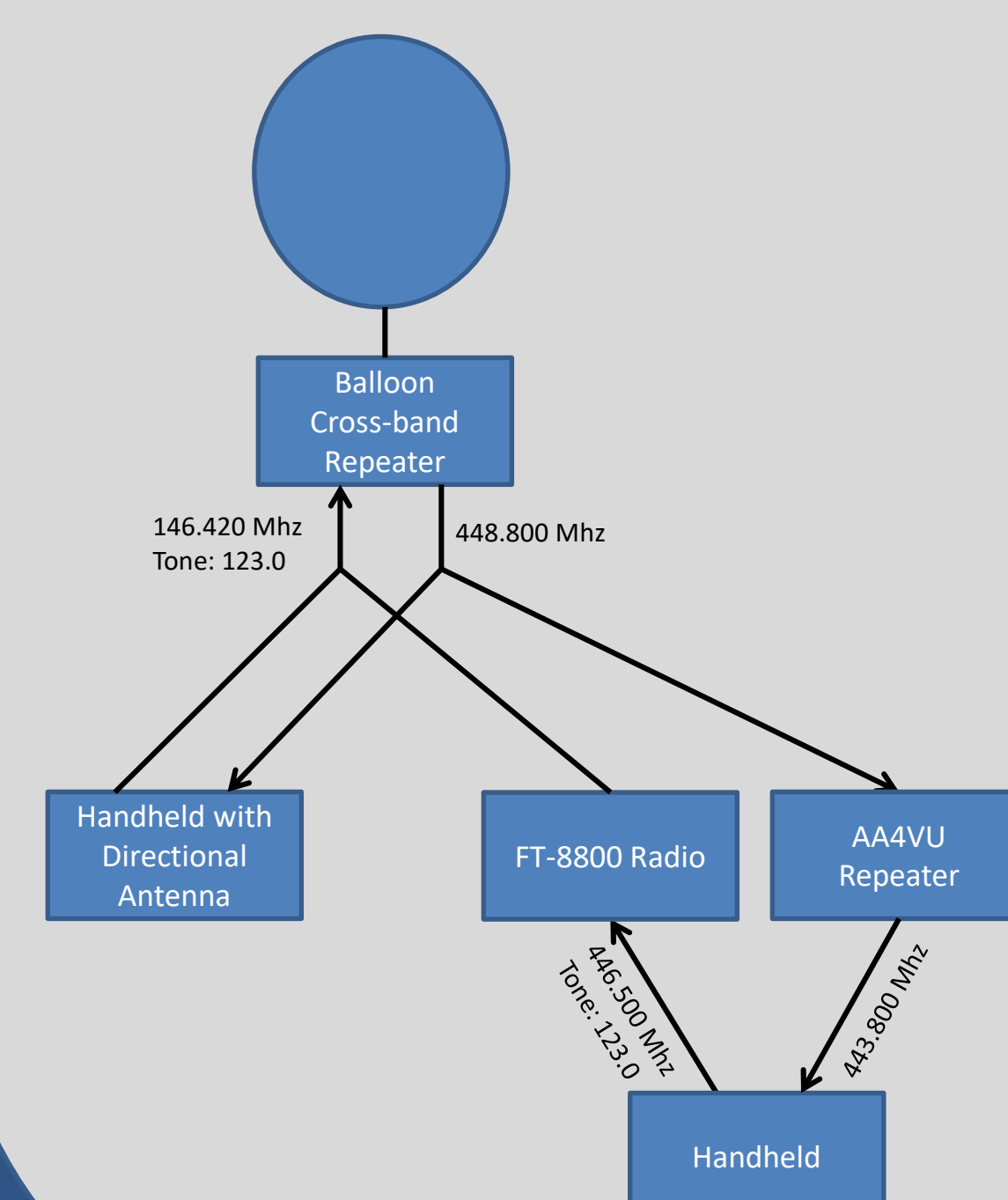

The balloon package operated as a cross band repeater. Any operator with a radio that could be programmed to operate in a cross band mode and an appropriate antenna could communicate through the repeater. In the Nashville area, a repeater relay was set up for better reception. Using the higher power and sensitivity of the repeaters to boost reception.
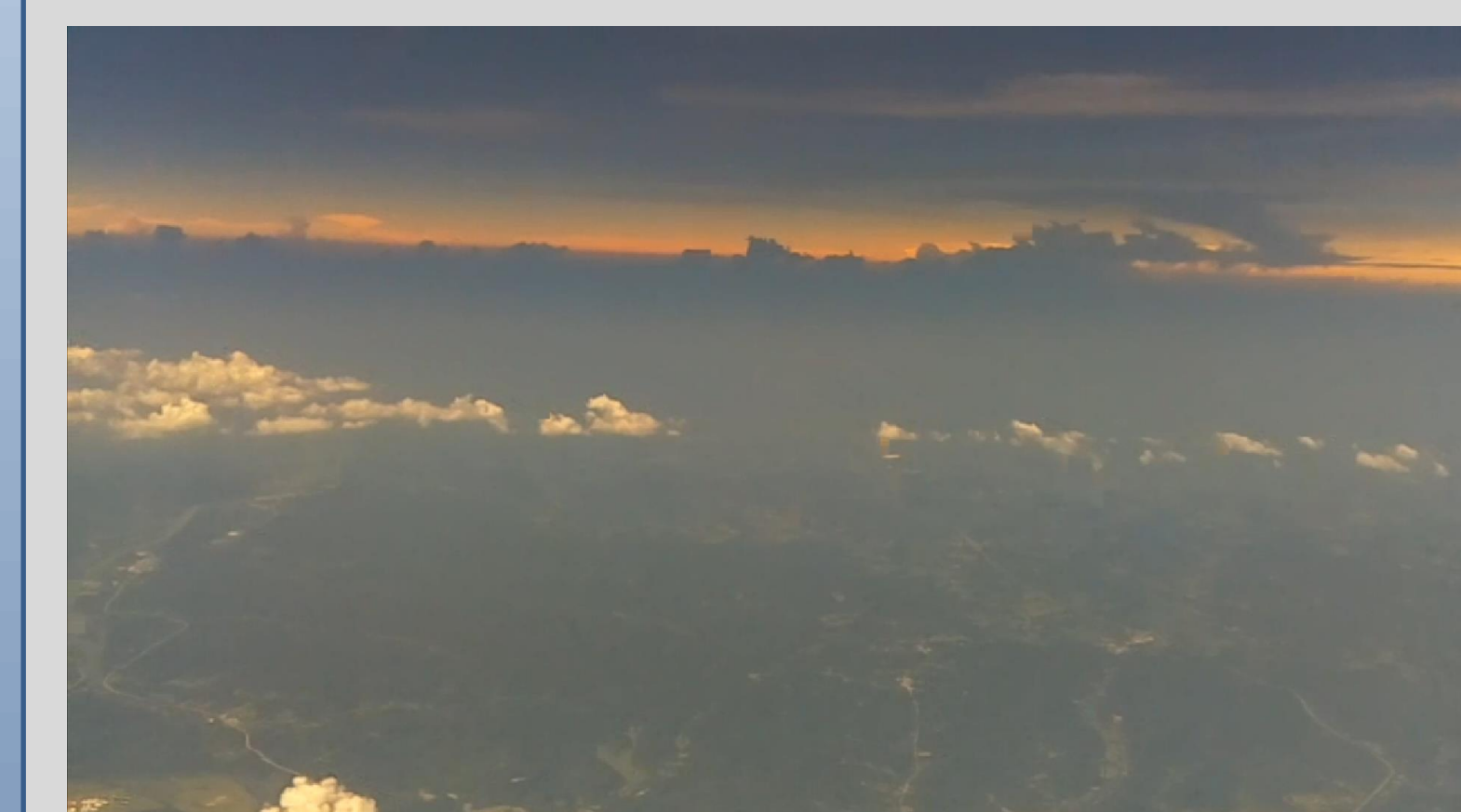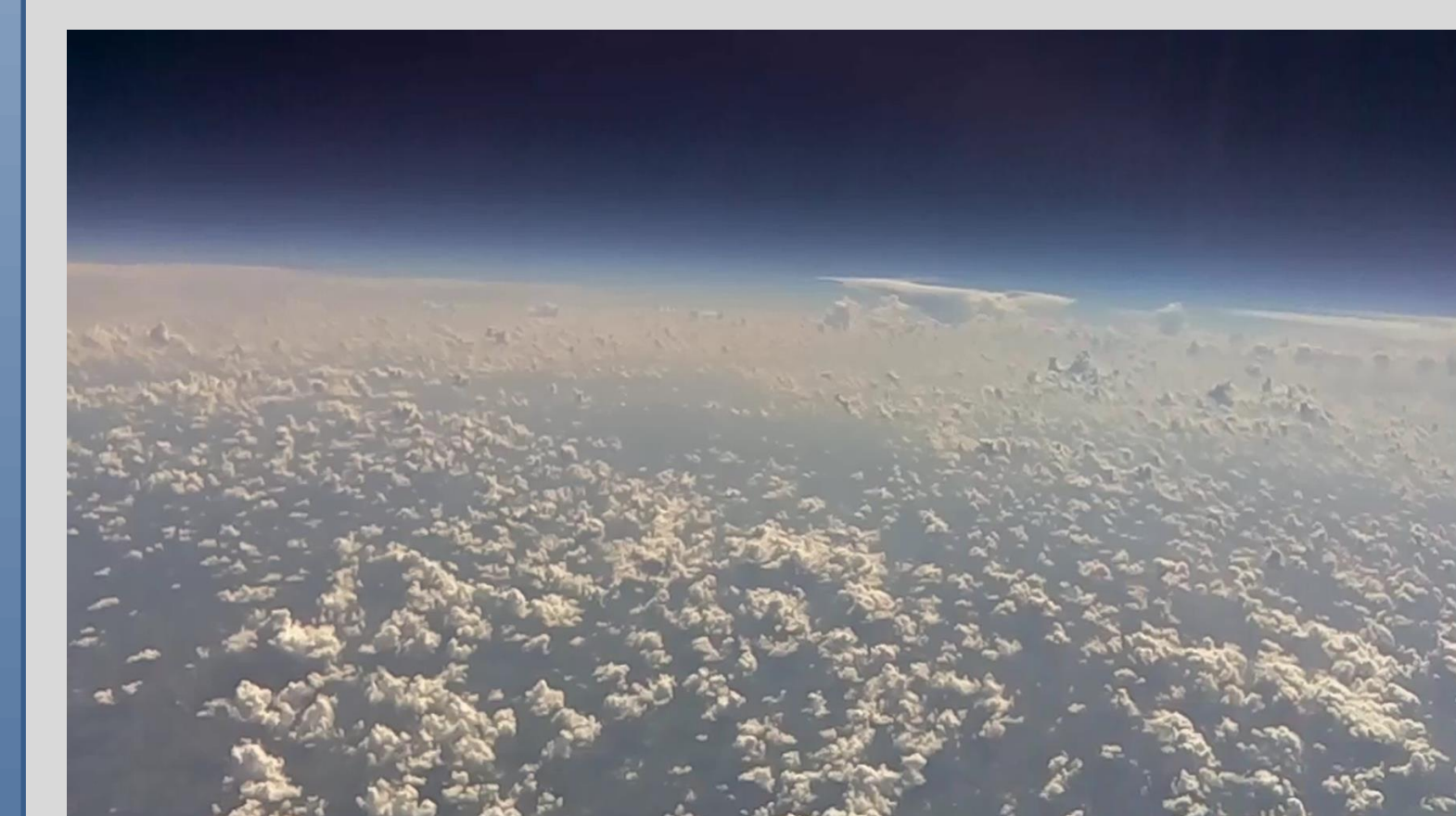
Balloon Flight
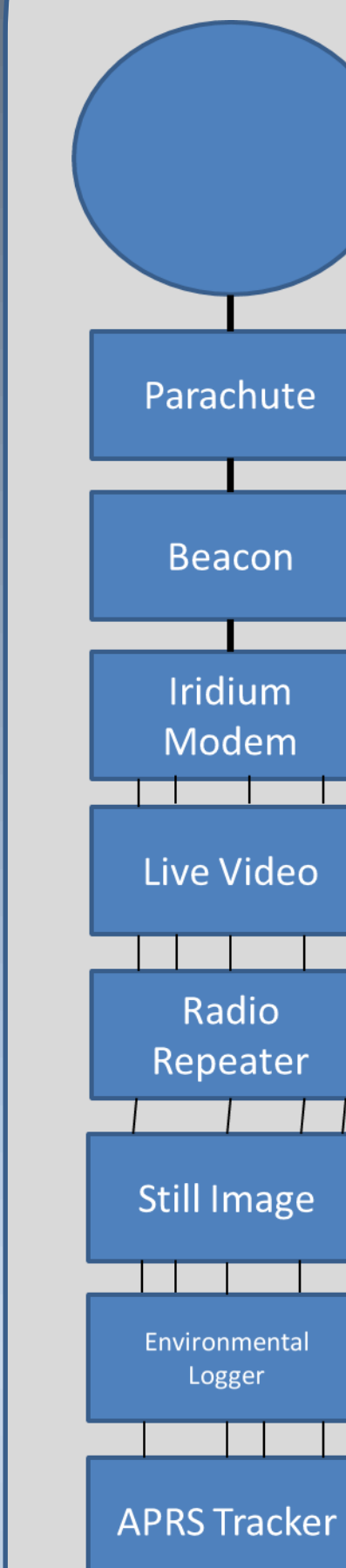
The balloon was flown with a large number of payloads with wireless communication capability. The order was selected to attempt to separate packages with the possibility of crosstalk. A tracker was placed at either end of the balloon to prepare in the eventuality of fragmentation.
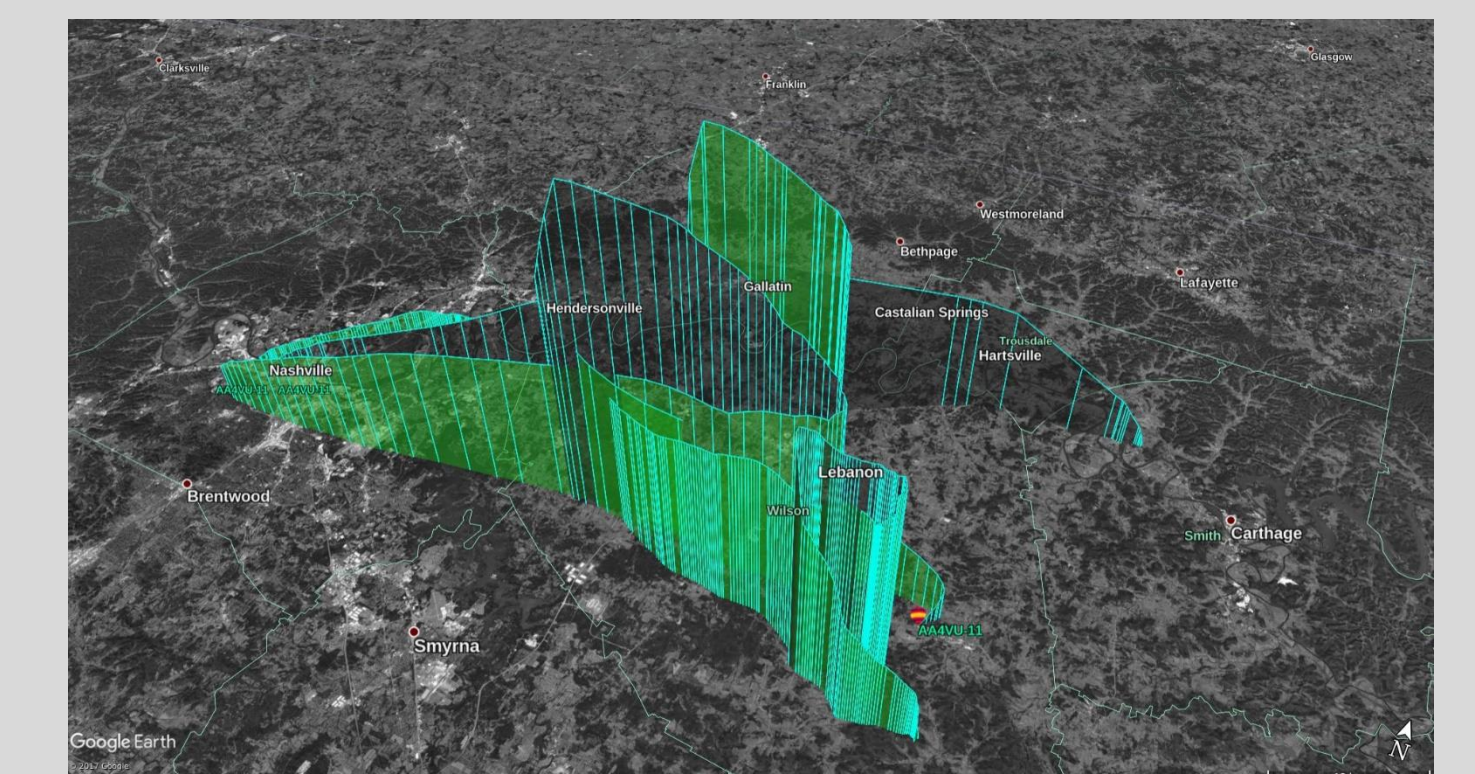
Three flights were launched from the selected launch location on campus. Two test flights and one launch the day of the eclipse. All three followed an eastern flight path and in to the projected eclipse path.

Video was taken through the duration of the flight. Due to an issue with the balloon the balloon filmed the eclipse at an estimated altitude of 7600 meters. The eclipse flight reached an estimated altitude of 22,276 meters.

For all three test flights ended with a tree based recovery