

The ground control will consist of a laptop used for processing and displaying the data that is received from the atmospheric payload and the rocket body. The information is passed to the computer using an Arduino board connected to one of the XTend 900 1 watt radios and a SainSmart GSM Module. The radio will receive scientific and location data from the atmospheric payload. The GSM Module will receive location data from the rocket body and the atmospheric payload as a backup to the radio.

When the data is transmitted to the ground from the atmospheric payload, the radio receiver will send the data over serial to the Arduino board. SMS messages will be transmitted from the GSM Module on a second serial port on the Arduino. The Arduino will send this data to the computer via USB, where the computer will decode the encoded data, process the data and display it in a graphical user interface.

Messages can and will be sent from the ground to both the rocket body via SMS messaging and to the atmospheric payload via radio and SMS messaging as a backup. The messages will contain instructions on power settings to apply to the components based on the battery status. The higher power components such as the radio and GPS can be put into a power saving sleep mode, and the radios transmit power can be adjusted via software as well.



The atmospheric payload will consist of an Arduino microcontroller with a series of atmospheric sensors and communication devices attached. The atmospheric sensors will consist of a camera, temperature and humidity sensor, a barometer, UV Sensor, solar irradiance sensor and accelerometer. A GPS receiver will be included as well for location tracking. Communication devices include an XTend 900 1 watt radio and a SainSmart GSM Module. The scientific and location data will be transmitted in real time to the ground control via the XTend 900 1 watt radio. A backup of location data will be transmitted to the ground control via SMS messaging as well.



The rocket body electronics will consist of an Arduino microcontroller as well as a GPS receiver and the SainSmart GSM Module. This will allow the rocket body to transmit its location data to the ground control via SMS messaging.