

From: Glenn Lightsey

To: Leann Nguyen

Date: February 11, 2014

Subject: FCC File# 0079-EX-PL-2014

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Message:

- Is the satellite geostationary or non-geostationary?

Non-geostationary

- If satellite is nongeostationary, please submit inclination angle, apogee (km)/perigee (km), orbit period (hours), fractions of hours in decimal and number of satellites in the system.

51.65deg, 426/420, 92.810hours

- Description of the satellite and how it will operate.

The RACE CubeSat contains a radiometer science payload. The system is spin stabilized and will be measuring water vapor in the Earth's atmosphere. Telemetry will be downlinked to the UT-Austin ground station.

- An analysis transmitting between satellites to satellite.

RACE will not communicate to other satellites.

- An analysis transmitting between satellites to ground stations.

The RACE satellite will transmit 2.0 W at a discrete frequency within the amateur UHF band (435-438 MHz) at a data rate of 38400 bits/second throughout the mission life. The satellite antenna is an approximate dipole with an omni-directional radiation pattern. The UT-Austin Ground Station will be the primary control station for the satellite and will communicate using up to 300 W of power on 145.950 MHz at a data rate of 9600 bits/second. The RF Output power will be tuned so that there is sufficient, but not excessive, uplink power. The Ground Station antenna is a Yagi antenna with a gain of 12.25 dBi.

- The orbital debris mitigation plan or replan, uplink/downlink and beacon frequencies.

The satellite's desired orbit will result in a total orbital lifetime of approximately 1 year before reentry. The satellite downlink and beacon frequency is coordinated with the IARU Satellite Transmission Coordinator at 437.525 MHz. The uplink frequency will be 145.950 MHz.

- Information of satellite transmitter antenna including gain, beamwidth, azimuthal range.

Satellite transmitter gain - approximate dipole (~2 dBi)

Half-Power Beamwidth: Approximately 78 degrees.

Azimuthal range: 360 degrees

- Information of earth station receiver antenna including gain, beamwidth, azimuthal range, elevation above mean sea level (m), minimum angle of elevation and antenna height above terrain (m).

Ground Station Receiver gain: 16.8 dBi.

Half-Power Beamwidth: 21 degrees

Azimuthal Range: 360 degrees

Elevation above mean sea level: ~149 m

Minimum angle of elevation: +5 degrees

Antenna height above terrain: 21 m

- Stop Buzzer information including name and telephone number of person who will terminate the system if having interference occurs.

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2) Please submit orbital debris assessment.

The NASA CLI Program Office is responsible for an orbital debris assessment report for RACE and the other CubeSats on its launch.

3) Please also submit Spacecap file.

A SpaceCap file has been uploaded to the application as an attachment.