

Public Summary Document for DragonSat-1 Drexel University

(1) The name, mailing address and telephone number of the licensee and any affiliates or subsidiaries;

Suk Jin Kang
3141 Chestnut Street
Mechanical Engineering Department, Drexel University
Philadelphia, PA 19104
215-895-3519

(2) A general description of the system, its orbit(s) and the type of data to be acquired; and

a.) Licensed system:

DragonSat-1

b.) System type:

1-U CubeSat-class nano-satellite

c.) Overview/Mission:

The DragonSat-1 Project is Drexel University's iteration of a CubeSat Project. CubeSats are small satellites typically developed by universities for space research missions. As such, the DragonSat-1 Project will follow the established CubeSat standards, developed by California Polytechnic State University and Stanford University. The satellite's mission is to photograph the Earth from its orbit at roughly 350km altitude. In addition, this mission will serve as technology demonstration for many of the components and subsystems flown.

The payload of the DragonSat-1 will consist of a package of various sensors, including one (1) μ Cam camera, one (1) HMC2003 magnetometer, one (1) MMA7260QT accelerometer, and seven (7) LM335 temperature sensors.

d). Operations:

- *Proposed launch schedule;*

TBD

- *Proposed launch source;*

TBD

- *Anticipated operational date;*

TBD

- *The range of orbits and altitudes (nominal apogee and perigee);*

- Values are taken from predictions made by “Satellite Tool Kit (STK)” satellite orbit prediction software.
 - o Altitude: 350 km

Pass	Start Time (UTCG)	Apogee (km)	Time of Apogee (UTCG)	Period (sec)	Lon. Ascen Node (deg)
	End Time (UTCG)	Perigee (km)	Time of Perigee (UTCG)	Right Ascen(deg)	Lon. Descen Node (deg)
74200	27 Oct 2011 13:03:50.295	330.427476	27 Oct 2011 14:12:32.054	5439.064	-44.109
	27 Oct 2011 14:34:29.359	312.161484	27 Oct 2011 13:26:45.444	-172.757	124.385

- *Inclination angle;*

- Values are taken from predictions made by “Satellite Tool Kit (STK)” satellite orbit prediction software.

Time (UTCG)	Semi-major Axis (km)	Eccentricity	Inclination (deg)	RAAN (deg)	Arg of Perigee (deg)	True Anomaly (deg)	Mean Anomaly (deg)
27 Oct 2011 16:00:00.000	6692.637056	0.001082	51.650	186.589	60.555	279.051	279.174

- Orbital Inclination: **51.6 degrees**

- *Orbital period.*
 - DragonSat-1

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	End Time (UTCG)	Perigee (km)	Time of Perigee (UTCG)	Right Ascen (deg)	Lon Descen Node (deg)
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- Orbital Period: ~5439 (sec) → **90.665 (min)**

e.) Mission Data:

- *Anticipated data to be acquired;*

The system shall produce 640x480 pixel JPEG image files to be transmitted to the ground. In addition, various telemetry data will be produced and transmitted to the ground, including temperature measurements, solar panel voltage readings, and accelerometer measurements.

- *Anticipated best theoretical resolution;*

$$R = 0.470\text{km}^2 / \text{pixel}$$

- *Swath width of each sensor (typically at nadir);*

$$SW = 380.07\text{km}$$

- *The various fields of view for each sensor (IFOV, in-track, cross-track);*

$$FOV = 57^\circ$$

- *On-board storage capacity;*

2 GB of storage in the form of an external SD card will be available for the system.

- *Navigation capabilities—GPS, star tracker accuracies;*

The DragonSat-1 will not have any navigation capabilities. The satellite will not hold any GPS devices or a star tracker.

- *Anticipated system lifetime.*

The system is expected to function for approximately 6 months. Shortly after, the satellite will re-enter the Earth's atmosphere and disintegrate.

(3) The name and address upon whom service of all documents may be made

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