From: Rob Rainhart

To: Doug Young
Date: July 24, 2017

Subject: Request for Info - File # 0024-EX-CN-2017

Message:

The following information is provided in response to NTIA’s request for information:

1. Specific frequency that will be used by each CubeSat

The satellite fly in a loose formation of three. Each satellite has primary and secondary TT&C links. It is important to note that the secondary links are only backups to the primary links and will not be used for main operations.

Hawk #1 Primary Links
Space to Earth – 8050 MHz
Earth to Space – 2062.7 MHZ

Hawk #1 Secondary Links
Space to Earth – 2240 MHz
Earth to Space – 435.365 MHz

Hawk #2 Primary Links
Space to Earth – 8175 MHz
Earth to Space – 2068.1 MHZ

Hawk#2 Secondary Links
Space to Earth – 2246 MHz
Earth to Space – 435.365 MHZ

Hawk #3 Primary Links
Space to Earth – 8300 MHz
Earth to Space – 2207.4 MHZ

Hawk #3 Secondary Links
Space to Earth – 2256 MHz
Earth to Space – 435.365 MHZ

2. Any spacing of the CubeSats within the indicated orbit

Two of the satellites are co-planer separated by ~250km. the third satellite is in a offset plane from the other two and performs a ~10km cross track maneuver between the two co-planer satellites. This is accomplished with either a change in inclination or RAAN.

3. Antenna gain/power split information for each CubeSat

Hawk #1 Primary Links
Space to Earth Antenna Gain – 7 dBi
Earth to Space Antenna Gain – 7 dBi

Hawk #1 Secondary Links
Space to Earth Antenna Gain – 7 dBi
Earth to Space Antenna Gain – 7 dBi

Hawk #2 Primary Links
Space to Earth Antenna Gain – 7 dBi
Earth to Space Antenna Gain – 7 dBi

Hawk#2 Secondary Links
Space to Earth Antenna Gain – 7 dBi
Earth to Space Antenna Gain – 7 dBi

Hawk #3 Primary Links
Space to Earth Antenna Gain – 7 dBi
Earth to Space Antenna Gain – 7 dBi

Hawk #3 Secondary Links
Space to Earth Antenna Gain – 7 dBi
Earth to Space Antenna Gain – 7 dBi

4. Location of all ground stations supporting these CubeSats (US and international)

As filed we are planning one ground station in Herndon, VA subject to this request. We have begun negotiations on a ground station, supplied by KSAT, in Svalbard as a leased service. We have not completed the contract for this location yet but expect to in the next few weeks at which time we can amend this application with that ground station location.

5. Transmit frequency of each ground station supporting these CubeSats

Herndon, VA Location:

Hawk #1 Primary Links
Space to Earth – 8050 MHz
Earth to Space – 2062.7 MHZ

Hawk #1 Secondary Links
Space to Earth – 2240 MHz
Earth to Space – 435.365 MHz

Hawk #2 Primary Links
Space to Earth – 8175 MHz
Earth to Space – 2068.1 MHZ

Hawk#2 Secondary Links
Space to Earth – 2246 MHz
Earth to Space – 435.365 MHZ

Hawk #3 Primary Links
Space to Earth – 8300 MHz
Earth to Space – 2207.4 MHZ

Hawk #3 Secondary Links
Space to Earth – 2256 MHz
Earth to Space – 435.365 MHZ

6. Transmit power for ground stations supporting these CubeSats

Primary Links (SBand Uplink)
Earth to Space – 100 Watts

Secondary Links (UHF Uplink)
Earth to Space – 100 Watts

7. Antenna gain/power split information for each ground station supporting these CubeSats

Hawk #1 Primary Links
Space to Earth Antenna Gain – 48.18 dBi
Earth to Space Antenna Gain – 36 dBi

Hawk #1 Secondary Links
Space to Earth Antenna Gain –48.18 dBi
Earth to Space Antenna Gain – 12 dBi

Hawk #2 Primary Links
Space to Earth Antenna Gain – 48.18 dBi
Earth to Space Antenna Gain – 36 dBi

Hawk#2 Secondary Links
Space to Earth Antenna Gain –48.18 dBi
Earth to Space Antenna Gain – 12 dBi

Hawk #3 Primary Links
Space to Earth Antenna Gain – 48.18 dBi
Earth to Space Antenna Gain – 36 dBi

Hawk #3 Secondary Links
Space to Earth Antenna Gain –48.18 dBi
Earth to Space Antenna Gain – 12 dBi

Regards,
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