AKASH SYSTEMS

July 18, 2018

Exhibit 1: Akash Mission Description

1. Introduction

Akash Systems Inc. (referred to as "Akash") is on a mission to improve the spectral efficiency of satellite communications systems with its patented GaN-on-Diamond technology. Founded in January 2016, Akash is composed of a veteran team of GaN and satellite innovators, and is headquartered in San Francisco, CA with an additional office in Dallas, TX.

Akash has incorporated its GaN-on-Diamond technology with a flight-proven software defined radio (SDR) into a compact form factor, and seeks authority to test its GaN Transmitter technology on a 12U CubeSat called "MCNAIR".

2. Technical System Description

On October 1, 2019, MCNAIR will be launched from New Zealand's Mahia Peninsula on a Rocketlab Electron rocket to a sun-synchronous orbit targeted for an altitude of 500 km, and an inclination of 97.8 degrees. The demonstration is intended to begin on October 1, 2019 and end on April 1, 2020, but with CubeSat missions the launch window could slip in time. All emissions will cease after the six-month demonstration is complete

MCNAIR is a 12U CubeSat that measures 23.9 cm by 22.9 cm by 36.6 cm stowed and has a mass of 19.9 kg. MCNAIR consists of an Akash GaN Transmitter (parabolic antenna), a S-band SDR (patch antenna) for telemetry and telecommand (TT&C), a spacecraft flight computer, avionics and GNC equipment, power system components, and 2 solar panels (one per side), each measuring 30 cm x 40 cm. There is no propulsion on-board, and based off NASA's Orbital Debris Assessment (ODA) software the orbital lifetime is 2.075 years for a 500 km 97.8 degree orbit. As previously mentioned, with CubeSat missions, there is often a chance that a launch window can shift, and that the ultimate altitude can vary slightly. The range of possible sun-synchronous altitudes for MCNAIR varies from 400 km – 600 km (inclination of 97.8 +/- 1.5 degrees). Orbital debris analyses have been run for the feasible altitudes, and in each scenario all requirements are met. See the ODA Report (ODAR), provided in Exhibit 6, for more information.

The Akash GaN Transmitter will downlink pre-configured test data over a single 1.2 GHz bandwidth channel in Ka-band (19.0 - 20.2 GHz) to a 13.2 meter ES in Dongara, Western Australia. Ka-band transmissions will occur in both RHCP and LHCP to maximize spectral efficiency. A summary of the frequencies and bandwidths used in this demonstration is provided in Table 1.

Akash will operate on a non-protected and non-interference basis. Akash is aware of the MSS allocation in Ka-band, and has conducted preliminary, informal coordination with Iridium. Akash is also aware of the US334 footnote and has initiated discussions with NTIA to ensure that the demonstration does not interfere with existing operations.

There will be no corresponding uplink to MCNAIR in Ka-band, and MCNAIR will be telecommanded to cease all emissions when it is not in view of the Dongara ES. Passes will occur between 3-5 times a day and each pass will have a duration of approximately 8 minutes. The Ka-band parabolic antenna has a 3 dB beamwidth of 2.2 degrees and a gain of 36.2 dBi. As shown in the figure below, the Ka-band downlink transmissions will comply with the relevant FCC and ITU power-flux density (PFD) regulations.

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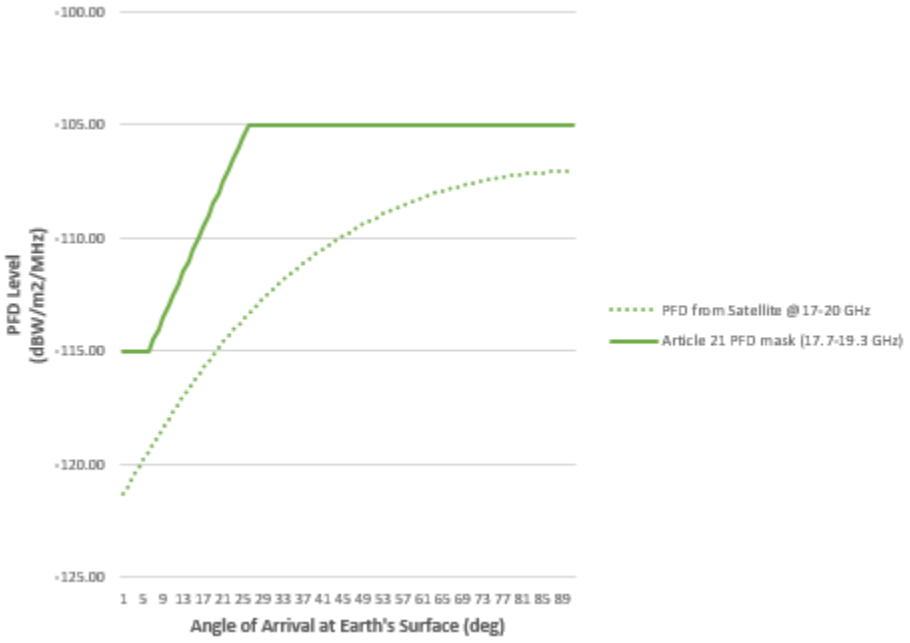

Figure 1. PFD Compliance

MCNAIR's S-band TT&C SDR will receive telecommands from and transmit telemetry to a 3.7 m KSAT ES located in Svalbard. A total of 0.2 MHz of uplink bandwidth in the 2025 - 2110 MHz band is required for telecommand, and a total of 2 MHz of downlink bandwidth in the 2200 - 2290 MHz band is required for telemetry. Akash has identified the 2109.5-2109.7 MHz frequency range for uplink telecommand transmissions and the 2286 – 2288 MHz frequency range for downlink transmissions.

Table 1: MCNAIR Frequency Information

	Min. Freq. (MHz)	**Max. Freq. (MHz)**	**Direction**	**Bandwidth**
Ka-band downlink	19000	20200	space-to-Earth	1.2 GHz
S-band telemetry	2286	2288	space-to-Earth	2 MHz
S-band telcommand	2109.5	2109.7	Earth-to-Space	0.2 MHz

3. Objectives

Simulation and ground-based lab tests have proven that the Akash GaN Transmitter is capable of transmitting data rates as high as 14 Gbps. The primary objective of the MCNAIR is to demonstrate record-breaking downlink spectral efficiency and data rates from low earth orbit using Akash's GaN Transmitter, and to qualify the transmitter in a space environment.