

From: Rob Rainhart

To: Doug Young

Date: July 24, 2017

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

Message:

In response to your email, the following information is provided:

1. The main sensor on the satellite is a passive RF receiver and is limited in its ability to processing signals. The payload includes COTS Antennas, RF System on a Chip (SOC) technology combined with a reprogrammable Field Programmable Gate Array (FPGA). The satellite and the FPGA payload function is a receive-only and contains no transmit function on the satellite. An individual HE360 sensor receives information corresponding to the observable, environmental characteristics associated with transmission of different types of signals. The raw data collected by the Spacecraft is simply recorded information regarding the RF signals that are present in a particular RF spectrum. Downlinked data will generally be limited to metadata that contains time of arrival (TOA), frequency of arrival (FOA), bandwidth, power and modulation type. Raw data may occasionally be downlinked but this will be limited due to bandwidth constraints. There are broadcast signals which will be processed beyond signal metadata and geolocation. Those specific signals are called out in the table below.

The following list outlines the antenna types and center frequency:

VHF Dipole - Center at 162 MHz, intended for AIS processing and signal geolocation, BW +/- 20 MHz

UHF Dipole - Center at 402 MHz, intended for EPIRB processing and geolocation, BW +/- 20 MHz

LBand Patch - Covers 1.6 GHz - 1.7 GHz, intended for Lband signal geolocation

SBand Patch - Covers 2.9 GHz - 3.1 GHz, intended for Sband signal geolocation

Molded Button Antenna - Covers 1.4 GHz - 6GHz, intended for broadband spectrum scanning and monitoring, signal occupation and ID,

Horn Antenna - Covers 9 - 15 GHz, intended for Marine X-Band RADAR and KuBand SATCOM geolocation and signal metadata.

2. Orbital Debris Assessment Report (ODAR): When dispersed in space, the water will evaporate.

3. US Table of Frequency Allocation Footnotes US397, US347, US258, 5.279A: We acknowledge the allocations tables and requirements. We are in the process of reaching out for pre-coordination.

4. In the 2025-2110 MHz frequency band and the 8025-8400 MHz frequency band we have reached out to each of the named FCC licensed satellite operators.

5. API File (updated with the information below and sent to you via email at Douglas.Young@fcc.gov):

(a) The max peak power for the 2200-2290 MHz band is revised to read -4.56

(b) The power spectral density for each band is revised as follows:

STX PSD = -7.0 dBw / Hz

URX PSD = -16.44 DBW / Hz

SRX PSD = -78.08 dBw / Hz

XTX PSD = -71.28 dBw / Hz

(c) The minimum elevation angle for all downlink beams is 5 degrees.

6. Exhibit 2, page 7: The power flux density on page 7 is amended to read: "The maximum X-Band and S-Band FPD on the ground are -160.45 and -159.26 dBW/m²/4kHz, respectively.

Regards,
Rob Rainhart
VP, Engineering
HawEye 360, Inc.
719-649-0243
rob@HE360.com