Reason for Modification Application

Modifying Experimental License 0391-EX-CN-2020

The current license 0391-EX-CN-2020, is for operation of a prototype Earth endpoint transceiver, communicating with the separately licensed Totum 1L experiment aboard the LOFT Orbital YAM-3 satellite, which is licensed and operated by LOFT Orbital. The following changes are requested in this modification application.

1. This modification expands the number of endpoints to 100 mobile stations located throughout the US.

2. The endpoint antenna is changed to provide 3 dB gain instead of the 1.5 dB in the original design. The resulting EIRP increase is the only change to the endpoint emissions. The design uses a second generation custom DMSS SoC ASIC with the same radio characteristics.

3. Based on the results of tests that have been conducted under the current license, the number of downlink channels is reduced from 26 to 16, and the number of uplink channels is reduced from 101 to 20.

4. For the satellite, the antenna gain is changed to 7 dBi instead of 7.3 dBi in the current license. This reflects more accurate data and is consistent with the satellite filing.

5. Similarly, the satellite beam width is changed to 70 degrees to reflect measurements taken after the current license was awarded.

The endpoints will communicate the Totum 1L experiment aboard the LOFT Orbital YAM-3 satellite, as was done in the original license for one endpoint. The satellite operator, Loft Orbital Inc., has licensed the satellite along with the Totum1L experiment.

An endpoint will only transmit when in line of sight of the satellite. The maximum duration of the transmit portion of a satellite-endpoint connection session will be less than 4 minutes, and for any device the cumulative transmit time in a 24 hour period will be less than 20 minutes.

The endpoints will be incrementally activated over the period from June 1, 2022 to December 31, 2022.

The intent of this expanded experiment is to validate coverage and mobility of the DMSS OTA protocol, test the tracking application with many geographically diverse endpoints, and complete performance testing on the DMSS ASIC in preparation for a device production release and certification.