AST&Science LLC
0208-EX-CM-2022

Application for Conventional Experimental License
(Modification of Call Sign WL2XRE)

Pursuant to Part 5 of the Commission's rules,[1] AST&Science LLC ("AST SpaceMobile") seeks to modify experimental authority granted under Call Sign WL2XRE (File No. 1059-EX-CN-2020) to perform testing from earth stations located in the United States with a non-geostationary orbit ("NGSO") satellite, the BlueWalker 3 ("BW3"), operating from Low-Earth Orbit ("LEO"). The purpose of the modification is to add an additional Station Location in Hana, Hawaii, to the experimental authorization. Ultimately, test results will inform the technical refinement and management of the planned AST SpaceMobile constellation, which will provide 4G and 5G broadband connectivity to unserved and underserved areas.[2] All other information set forth in the narrative filed in File No. 1059-EX-CN-2020, as last amended and filed on September 1, 2021, remains accurate

Hana, HI, Handset Testing

AST SpaceMobile plans to perform testing for space-based cellular broadband service utilizing the recently launched BW3 satellite. As noted in the application, testing of the handsets will involve commercially available 2G/4G/LTE/5G phones.

Testing of handset communications will take place up to three times per day, at each location. The BW3 will first connect to the V-band fixed location antennas pursuant to the authority already granted under Call Sign WL2XRE and then to the off-the-shelf handsets, including those in Hana, HI, during the same pass. Testing at the Hana location will occur within a 24 km geographic radius around the following center point coordinates:

- Hana, HI Location[3]
    - LAT: 20°45'15" North
    - LONG: 155°50'55" West
    - GROUND ELEVATION: Mobile

Handset Specifications

- Frequencies
    - Hana Downlink (Space to Earth) 875-880 MHz
    - Hana Uplink (Earth to Space) 830-835 MHz
- Bandwidth: 180 kHz or 1.4 MHz
- Power: 0.2 W (uplink); *see* complementary Schedule S to application for Call Sign WL2XRE (File No. 1059-EX-CN-2020) for downlink information
- ERP: 0.12 W (uplink); 130572.6 W (downlink) (*Note: The EIRP for the user beam downlinks listed on the attached Schedule S is the maximum aggregated EIRP for the satellite, assuming all available RF power from the phased array antenna is used by one*

[1] 47 C.F.R. Part 5.
[2] AST is seeking FCC authority to operate the SpaceMobile system through a Petition for Declaratory ruling filed in 2020. *See* IBFS File Nos. SAT-PDR-20200413-00034, SAT-APL-20200727-00088 and SAT-APL-20201028-00126.
[3] AST appreciates that the center point coordinates for the instant application are nominally positioned off the eastern shore of Maui. The proposed experiment will occur within the 24 km geographic radius of this center point.

beam. Therefore, that information differs from the power levels listed here, which represent the power levels used for testing between handsets and the satellite in one selected beam over five beams in operation.)

- Frequency tolerance: 10 ppm
- Emission designators: 180KDXD for uplink and 1M40DXD for downlink
- Modulating signal: OFDM
- Antenna location: Mobile

Protection of Other Users

AST SpaceMobile's use of the requested frequencies for handset testing will be with the permission of the license holder. AST SpaceMobile understands that conditions may be placed on its license in this regard. In the highly unlikely event that harmful interference is created to another user, AST SpaceMobile will cease transmission on the frequency and will work with the FCC and affected party to resolve the interference.[4]

A point of contact for this testing will be physically located at the Lanham, MD site and will ensure that operations will cease in the event that any licensed users experience interference or as otherwise directed by the FCC. AST SpaceMobile's "stop buzzer" contact will be:

Mariano Boragano
4200 Parlament PL Suite 500
Lanham, MD 20706
240-319-4773
frequencycoordinator@ast-science.com

Finally, the equipment will be located at ground level. The installation and operation of the equipment will not have a significant environmental impact. Therefore, no Section 1.311 environmental assessment is necessary.[5] And, FAA notification of the antenna height is not required.[6]

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Grant of this application will serve the public interest because it will allow AST SpaceMobile to test a number of features related to its planned SpaceMobile system, ensuring that mobile broadband service can be brought to Americans in underserved and unserved markets. Questions should be directed to Timothy Bransford at timothy.bransford@morganlewis.com or 202.373.6140.

[4] AST addresses potential for interference in its Technical Annex Call Sign WL2XRE (File No. 1059-EX-CN-2020).
[5] 47 C.F.R. § 1.311.
[6] *See* 47 C.F.R. § 17.7.