

EXHIBIT A – PROPOSED EXPERIMENT & JUSTIFICATION FOR STA

Background and Description of Testing

AST & Science, LLC (“Applicant” or “AST SpaceMobile”), pursuant to Section 5.61 of the Federal Communications Commission’s (“FCC’s” or “Commission’s”) Rules, 47 C.F.R. § 5.61, hereby requests Special Temporary Authority (“STA” or “Authority”) to test off-the-shelf cellular handsets acting as mobile earth stations located in the conterminous United States. Such testing will occur in cooperation with the First Responder Network Authority (“FirstNet”), employing AST SpaceMobile’s initial five (5) commercial non-geostationary orbit (“NGSO”) satellites (“Block 1 Bluebirds” or “BB1s”), operating from Low-Earth Orbit (“LEO”) to communicate with handsets inside FirstNet’s nationwide Band 14 license area.¹ AST SpaceMobile seeks Authority for a period of 180 days beginning not later than March 5, 2025. Consistent with the standards set forth in Part 5 of the Commission’s Rules, AST SpaceMobile outlines below its need for the requested Authority, and how experimentation conducted under the Authority will advance the radio art.

Under existing experimental authority, AST SpaceMobile has been actively testing off-the-shelf terrestrial mobile handsets with its experimental BlueWalker 3 (“BW3”) satellite in collaboration with FirstNet.² For the next phase of testing, AST SpaceMobile hereby requests Authority to evaluate the BB1s’ ability to transmit, process, and receive communications to and from terrestrial mobile handsets inside FirstNet’s Band 14 footprint.³

Such Authority will enable AST SpaceMobile and FirstNet to collect additional real-world inputs to complement AST SpaceMobile’s forthcoming Part 25 modification application that will seek authorization to provide nationwide direct-to-device (“D2D”) communications in Band 14 consistent with the FCC’s recently adopted Supplemental Coverage from Space (“SCS”) service rules and FirstNet’s statutory structure.⁴ The proposed tests will also enable AST SpaceMobile to expeditiously support first responders during the pendency of the Part 25 SCS modification.

AST SpaceMobile and FirstNet will evaluate the performance of the Block 1 Bluebirds with commercially available, off-the-shelf handsets, as further described in Exhibit B (Technical

¹ 47 C.F.R. § 5.61(a)(1). AST SpaceMobile successfully launched its Block 1 Bluebirds on September 12, 2024, pursuant to authority granted by the Commission under ICFS Call Sign S3065.

² See FCC Call Signs WW9XBG, WL2XRE, and pending experimental license application File No. 087-EX-CM-2024 (“OET Licenses”).

³ FirstNet is an independent authority within the National Telecommunications and Information Administration that was created by the 2012 Spectrum Act and tasked with building a dedicated nationwide, interoperable broadband network for first responders. See generally 47 U.S.C. § 1424. It holds a nationwide license in the 758-769/788-799 MHz bands.

⁴ See *Single Network Future: Supplemental Coverage from Space*, GN Docket No. 23-65, IB Docket No. 22-271, Report and Order and Further Notice of Proposed Rulemaking, FCC 24-28 (rel. Mar. 15, 2024) (“SCS Report & Order”) at ¶ 105–09 (explaining that because the Part 1 spectrum leasing framework is inapplicable to FirstNet due to its statutory structure, SCS authorizations will be based on an alternative contractual arrangement between FirstNet and the satellite partner).

Information) and Exhibit C (Interference Analysis). Mobile handsets will be tested under multiple controlled test scenarios in test areas selected in close coordination with FirstNet [REDACTED]

[REDACTED]

Subject to FirstNet's prior consent, mobile handset testing will be conducted across the conterminous United States under ULS Call Sign WQQE234. Consent for the instant experimentation will be provided directly to the Commission from FirstNet as a supplemental exhibit prior to AST SpaceMobile initiating testing.

Interference Analysis

AST SpaceMobile will utilize the proposed testing to provide real-world data demonstrating that SCS services will complement FirstNet's existing network while avoiding harmful interference to cross-border and adjacent spectrum users, as well as FirstNet itself. In addition to carefully coordinating with FirstNet to ensure that the proposed testing occurs solely in approved geographic areas and frequencies, the BB1s under test will employ several interference mitigations, including:

- Protection Zones: BB1s generate hexagonal service link beams or cells on the ground with a 24 km radius. With respect to the international borders with Canada and Mexico, AST SpaceMobile will mute the downlink transmissions in two hexagonal cells, effectively creating a 96 km minimal separation distance. Figure 1 illustrates the implementation of the contemplated protection zones (white cells).

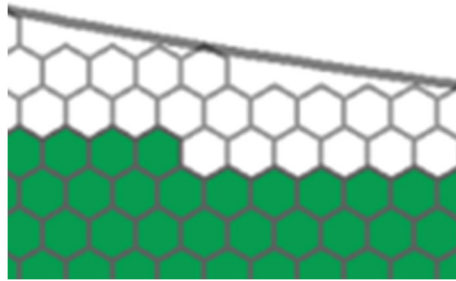


Figure 1.

- Compliance with Aggregate OOB Limits: With respect to protecting adjacent band authorized spectrum uses during the proposed tests, AST SpaceMobile will ensure that its aggregate OOB levels space-to-Earth fall below the -120 dBW/m²/MHz limit (“-120 limit”) adopted by the FCC for SCS operations.⁵ Given that AST SpaceMobile’s constellation is designed to meet the -120 limit when fully deployed with 248 satellites, discrete testing with five (5) Bluebird spacecraft should fall well below the limit. Nevertheless, AST SpaceMobile will carefully monitor aggregate levels of OOB during times when satellite downlink beams might overlap to ensure that real-world OOB levels comply with the rules.
- Off-the-Shelf Handsets & Closed User Group: Uplink operations will not present an interference threat because AST SpaceMobile and FirstNet will only employ off-the-shelf handsets for service link testing, and such handsets will only be given to a closed user group that AST SpaceMobile will carefully supervise. Individual handsets under test will also be configured to operate on FirstNet’s network and frequencies and should not present an interference threat even in the unlikely event that an end user attempts to use one outside of FirstNet’s network footprint.

AST SpaceMobile also attaches as Exhibit C, a supplemental technical analysis of RF interference. The mitigation measures above will provide comprehensive interference protection and no third party will be affected or prejudiced by favorable FCC action on the instant application for STA.

Gateway Earth Station Operations

Gateway earth station operations using V-Band frequencies will be conducted pursuant to separate special temporary authority.⁶

⁵ See 47 C.F.R. §25.202(k)(1).

⁶ See, e.g., ICFS File Nos. SES-STA-20241219-02742 and SES-STA-20241219-02743.

Justification for STA

Consistent with the standards set forth in Section 5.61 of the FCC’s rules, grant of STA is appropriate in the instant circumstances and serves the public interest.

First, the proposed operations are appropriate under STA. The Part 25 SCS rules were only adopted earlier this year, and represent the FCC’s first effort to implement its “single network future” seamlessly blending terrestrial and satellite networks.⁷ Given the complexity of this new class of service and the need to protect incumbent operations that hundreds of millions of Americans rely on daily, the FCC was acutely aware that Part 5 authorizations would serve a critical role in the implementation of SCS networks.⁸

Second, the instant circumstances serve the public interest. In adding FirstNet’s nationwide 700 MHz spectrum to the SCS framework, the Commission concluded that “allowing FirstNet to utilize SCS can serve a critical public safety need by improving access for first responders and public safety entities.”⁹ It likewise recognized that “[i]mproving public safety is an overarching goal of this proceeding, and permitting SCS operations on the 700 MHz public safety spectrum licensed to FirstNet on a nationwide basis is likely to further this goal.”¹⁰

One of AST SpaceMobile’s highest priorities remains providing voice and data services to first responders reacting to natural and manmade disasters that damage or degrade terrestrial infrastructure. In the coming months, with the BB1s nearing operational status, AST SpaceMobile and FirstNet will aggressively look for opportunities to provide such service pursuant to experimental authority. While this testing could provide immediate, critical aid to first responders, it will also provide insight into how the BB1s perform in situations where ground infrastructure may not work or may be seriously impaired and overhead D2D satellites form the principal transmission medium for communications on the ground instead of an auxiliary medium. The Commission has stated that it wants to deliver these benefits “as rapidly as possible,”¹¹ and prompt grant of the proposed Authority will advance this goal.

Third, favorable treatment of the instant request for STA will not prejudice any third-party or create harmful interference to other authorized spectrum users. As explained above, testing will only occur on frequencies and within FirstNet’s nationwide license area pursuant to FirstNet’s express consent. Testing will also continue using mobile handsets under the same technical conditions set

⁷ See generally SCS Report & Order.

⁸ See, e.g., SCS Report & Order at ¶ 13, explaining that Part 5 authorizations played an important role in providing technical inputs and acknowledging that such short-term authorizations would continue to be acted upon.

⁹ SCS Report & Order at ¶ 106.

¹⁰ *Id.* at ¶ 35.

¹¹ SCS Report & Order at ¶ 53. See also *In the Matter of Single Network Future: Supplemental Coverage from Space, Space Innovation*, GN Docket No. 23-65, IB Docket No. 22-271, Notice of Proposed Rulemaking at ¶ 42 (Mar. 16, 2023) (“We strive to realize these public interest benefits as rapidly as possible . . .”).

Justification for Number of Devices Under Test

AST SpaceMobile's proposed test program will simulate such real-world scenarios, which will require the operation of a commensurate number of handsets in diverse geographies.

— * — * — * — *

Grant of Authority will serve the public interest by allowing AST SpaceMobile to continue refining its D2D technology, furthering its mission to bring mobile broadband to Americans in underserved and unserved markets and enhancing communications in the context of emergency and disaster response nationwide through space-based communications infrastructure. In particular, the instant proposed experimentation will support AST SpaceMobile's mission to bring 5G broadband connectivity to first responders and Americans in underserved and unserved markets nationwide. Moreover, grant of this application will not adversely impact other authorized users of spectrum as testing will only occur on FirstNet's licensed frequencies with the consent of FirstNet and comprehensive interference protections will protect other authorized spectrum uses. For these reasons, AST SpaceMobile kindly requests the Commission to grant the Authority.¹³

¹² See OET Licenses.

¹³ AST SpaceMobile acknowledges that experimental radiofrequency testing occurs on a sufferance basis and has provided contact information for personnel with kill switch authority in Exhibit B. AST SpaceMobile will

Please direct any questions to Timothy Bransford at timothy.bransford@gtlaw.com or 202.331.3103.