REDACTED — PUBLIC VERSION

Description of Proposed Experimental Operations

Pursuant to Sections 5.3(j) and 5.54(a)(1) of the Federal Communications Commission's ("Commission's) rules, 47 C.F.R. §§ 5.3(j) and 5.54(a)(2), Comcast CBRS, LLC ("Comcast"), an indirect subsidiary of Comcast Cable Communications, LLC, requests authorization to conduct experimental operations under a special temporary authorization ("STA") issued by the Commission for a term of six months commencing on October 28, 2020.

Comcast seeks authorization to conduct pre-commercial outdoor field trials in the 3700–3800 MHz, a subset of the recently expanded flexible use C-Band available to mobile and fixed operations in the ranges of 3.7 to 3.98 GHz, which the Commission intends to auction at the end of the year. The proposed field test will evaluate coverage, throughput, and mobility of equipment and facilities that operate in the C-Band to obtain data and advance the company's understanding of the full potential of technology and equipment operational in this band.

Summary of Proposed Field Tests

As described in more detail below, Comcast will be testing on traditional mobile handsets that will send and receive signals via **[[BEGIN CONFIDENTIAL]]** [redacted] **[[END CONFIDENTIAL]]**. Testing will be conducted Monday through Friday from 9 AM to 5 PM, using only Comcast's approved employees and vendors.

Location of Testing

Comcast will conduct outdoor fixed and mobile testing in a small targeted portion of the area surrounding Philadelphia, Pennsylvania market within its service territory. Specifically, testing will be conducted within a 15 km radius of the following location:

Locality	Latitude	Longitude
Philadelphia, PA	39.9549°N	75.1699°W

Description of Test Bed Framework

The experimental operations will field test transmitters in various configurations that will be deployed within the 15 km radius of the location set forth above. The transmitters will consist of **[[BEGIN CONFIDENTIAL]]** [redacted] **[[END CONFIDENTIAL]]**.

Through the use of mobile test devices and commercial handsets (i.e., "End User Equipment"), Comcast will evaluate propagation characteristics for model verification, data throughput performance, inter-cell interference. Authorization to conduct this testing will also allow Comcast to test and evaluate certain network trial objectives include validating RF design parameters, technical performance and end user experience characterization, and evaluation of operating characteristics under different channel types. All testing will be conducted within **[[BEGIN CONFIDENTIAL]]** [redacted] **[[END CONFIDENTIAL]]**.

Radio Equipment Description

The radio equipment that will be used in the proposed experiment will perform pursuant to the technical characteristics shown below. Each type of the proposed radio equipment has been certified by the Commission pursuant to the equipment authorization rules. Comcast may also use prototype radio equipment with the same or similar technical characteristics as the authorized radio equipment. Comcast will utilize traditional mobile handsets to receive signals from the transmitters in order to evaluate performance of the equipment described above.

Fixed Equipment

Transmitter	Category	Tx Power (W)	EIRP (dBm)	ERP (Watts)	Mean or Peak	Emissions Designator	Frequency Tolerance	Modulation
Type 1[1]	B	200W	2x66 dBm	61	Mean	20M0W7W	0.00000005	256QAM/64 QAM/ 16QAM/QPS K

End User Equipment (3 Types)

Transmitter Type	Category	Tx Power (mW)	EIRP (dBm)	ERP (Watts)	Mean or Peak	Emissions Designator	Frequency Tolerance	Modulation
Mobile smartphone or equivalent	EUD	200	23	0.2	Mean	20M0W7W	0.0000001	64QAM/ 16QAM/QPSK

Protection Against Interference

Pursuant to the Commission's experimental licensing rules,[2] Comcast understands that, for purposes of the experimental operations described in this application, it must accept interference from any incumbent users of the 3700–3800 MHz band and that Comcast's experimental operation will be conducted on a secondary basis. To ensure the proposed field testing does not unduly interfere with incumbent operations in the area during this time prior to the C-Band transition, Comcast will undertake the following steps to identify potentially affected incumbent operators and mitigate any potential harmful interference relevant to such operators.

First, Comcast will identify all current registered C-band earth station operators by extracting data from the Commission's list of registered C-band earth stations in the IBFS database. That data will then be used to identify the geographic location of all earth station locations within a 40 km radius of the proposed tests, and to identify the operators of such earth stations.

[1] This transmitter is a directional antenna. The width of the beam at the half-power point is 65.00 degrees. When installed in the testing location described above, three separate antennas will be oriented in the horizontal plane at 0 degrees, 120 degrees, and 240 degrees. All three antennas will be oriented in the vertical plane at 6.80 degrees from horizontal.

[2] *See* 47 C.F.R Part 5.

Second, the company will establish protection criteria for the testing based upon the out of band emissions protections articulated by the Commission in the C-band Order,[3] including by establishing a Power Flux Density (PFD) limit of -124 dBW/m^2/MHz. Because Comcast proposes to use the spectrum prior to the C-Band transition, its operation will be in-band (co-channel) with the incumbent earth stations, and the same PFD limit (-124 dBW/m2/MHz) can be applied as a protection threshold for the proposed temporary, experimental operations.[4]

Third, Comcast will use a well-established, calibrated radio network planning tool to predict signal propagation and evaluate interference risk at each registered earth station. This approach will utilize the Aster ray tracing model together with high-resolution terrain and clutter data (2.5-meter resolution) in order to create a representation of the desired base station configuration in the network planning tool. Once configured, a Comcast engineer will run a propagation prediction; visually inspect all areas where the signal level exceeds the RSS / RSRP threshold; and, identify any incumbent C-Band earth station that falls within this signal level contour. The company also will review and utilize variations on network configuration (e.g. antenna location, azimuth, tilt, transmit power) to attempt to reduce any potential earth station exposure.

Fourth, Comcast will contact potentially affected earth station operators to coordinate use and establish mechanisms for addressing potential harmful interference. This process will include a letter of introduction to each unique entity associated with registered earth stations deemed potentially at-risk by the interference predictions. The correspondence will include an overview of the planned network configuration and operating parameters, a description of network operations management capabilities, and the name and contact information of Comcast personnel who will be available to receive and handle interference inquiries. It will also solicit feedback and include a commitment to address any credible concerns that may be raised.

Fifth, and finally, Comcast will establish a network operations plan that minimizes potential harmful interference risk by enabling transmitter(s) only when needed for active testing, and by operating base stations and mobile stations at the minimum power levels needed to satisfy test objectives. The company will also maintain 24x7 remote network management capability, that is able to promptly disable transmission if interference concerns arise, and allocate technical operational personnel able to perform network configuration and troubleshooting tasks.

Restrictions on Operation

Comcast does not seek authority to perform a commercial market study under the requested experimental license. Comcast will retain control over any prototype equipment utilized in the testing at all times.

Contact Information

FCC licensing issues:
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[3] *In the Matter of Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Report and Order and Order of Proposed Modification, FCC 20-22 (Mar. 3, 2020).

[4] Although this rule anticipates new terrestrial operations in spectrum *adjacent* to the re-banded earth stations, the stipulated PFD limit represents the highest level of *in-band* energy that will be allowed at the receive antenna of a registered earth station.

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