

DESCRIPTION OF RESEARCH PROJECT

Pursuant to Sections 5.3(j) and Section 5.61 of the Federal Communications Commission’s rules, 47 C.F.R. §§ 5.3(j) and 5.61, CCO Fiberlink, LLC (“Charter”), a limited liability company and subsidiary of Charter Communications, Inc., seeks Special Temporary Authority (“STA”) for 180 days, beginning September 20, 2017, to test and evaluate coverage, capacity, and propagation characteristics in the 3550-3700 MHz band. The proposed operations will occur only in the 3650-3700 MHz portion of the band, where Charter is an existing Wireless Broadband Licensee (call sign WQVB849), to avoid Naval radar interference. The testing will advance Charter’s understanding of technology and network potential in the full 3550-3700 MHz band and will advance the potential deployment of fixed wireless services.

Location of Testing

Charter will conduct outdoor fixed testing within a radius of 8 km from the 9 specified fixed locations in Florida.

Description of Testing

Charter will deploy the experimental fixed antennas on existing structures or portable masts, and will test the radio link between each base station antenna and another end user antenna sequentially on a portable mast placed at fixed locations within the test area.

Charter will evaluate propagation characteristics, conduct connectivity and throughput testing in the vicinity of each device, and assess individual performance of each vendor’s equipment.

Radio Equipment Description

For the testing, Charter will use 17 different models of fixed equipment. The technical information below provides the greatest bandwidth and power levels that will be used for each piece of prototype equipment.

Equipment	Category¹	Fixed or mobile	Tx Power (mW)	EIRP (dBm)	ERP (watts)	Mean or Peak Power	Frequency Tolerance +/- (%)	Emission Designator	Signal Modulation Format(s)
Prototype 1	B	Fixed	4000	53	50.9	Peak	0.0005	40M0W9W	Digital, 256 QAM
Prototype 2	B	Fixed	25119	53	50.9	Peak	0.0005	40M0W9W	Digital, 256 QAM
Prototype 3	B	Fixed	251	40.0	6.1	Peak	0.0005	10M0W8W	OTFS ²
Prototype 4	B	Fixed	1000	43.0	12.2	Mean	0.000001	20M0D7D	256 QAM, 64 QAM, 16 QAM

¹ Category A and B radios are defined in Sections 96.3 and 96.41 of the FCC’s rules. See 47 C.F.R. §§ 96.3 and 96.41.

² “Orthogonal Time Frequency and Space” is a proprietary vendor signal modulation format.

Prototype 5	B	Fixed	1000	43.0	12.2	Mean	0.000001	20M0D7D	256 QAM, 64 QAM, 16 QAM
Prototype 6	B	Fixed	1000	43.0	12.2	Mean	0.000001	20M0D7D	256 QAM, 64 QAM, 16 QAM
Prototype 7	B	Fixed	1000	37.0	3.1	Mean	0.000005	20M0W7W	64 QAM, 16 QAM, QPSK, BPSK
Prototype 8	B	Fixed	2000	47.0	30.6	Mean	0.000005	20M0W9W	256QAM, 64QAM, 16QAM, QPSK
Prototype 9	B	Fixed	2000	47.0	30.6	Mean	0.000005	20M0W9W	256QAM, 64QAM, 16QAM, QPSK
Prototype 10	B	Fixed	2000	50.0	61.0	Mean	0.000005	20M0F9W	256QAM, 64QAM, 16QAM, QPSK
Prototype 11	B	Fixed	251	33.0	1.2	Mean	0.000001	20M0W7W	64QAM, 16QAM, QPSK
Prototype 12	B	Fixed	199	35.0	1.9	Peak	0.000001	20M0W7W	64QAM, 16QAM, QPSK
Prototype 13	A	Fixed	199	25.5	0.2	Peak	0.000001	20M0W7W	64QAM, 16QAM, QPSK
Prototype 14	B	Fixed	316	47	30.6	Mean	0.000001	20M0W7D	64QAM, 16QAM
Prototype 15	B	Fixed	200	38	3.9	Mean	0.000001	20M0W7D	64QAM, 16QAM
Prototype 16	B	Fixed	200	30	0.60	Mean	0.000005	40M0W9W	256QAM, 64QAM
Prototype 17	B	Fixed	200	23	0.12	Mean	0.000005	40M0W9W	64 QAM

Protection Against Interference

Charter has taken a number of steps to protect against interference. In particular, the base station locations were chosen specifically to avoid risk of physical interference. All base station sites are collocated with existing towers (44%) or utility poles (55%), and the equipment will not extend more than 6 meters above those structures. Individual “end user device” test locations were also selected specifically to avoid physical interference, which will be further lessened due to the limited duration and continuous presence of test engineers at each location under test.

Charter also understands that it must accept interference from any federal and non-federal incumbent users of the 3650-3700 MHz band and that all Charter operations will be on a secondary basis. Charter has confirmed there are no Fixed Satellite Service (FSS) earth stations operating in the 3650-3700 MHz band in the areas in which Charter seeks to conduct testing. Charter has identified all grandfathered 3650-3700 MHz “NN” Wireless Broadband Licensees with registered locations within 30 km of the requested test locations, has intentionally chosen sites a minimum of 15 km from any registered “NN” location, and will coordinate individually to avoid impacting their existing operations.

Finally, as transmit levels of the proposed radios comply with approved CBRS band operations, and will be operated sequentially, Charter expects limited RF propagation distances as well as limited and localized aggregative contribution to the RF noise floor.

Restrictions on Operation

Charter does not seek authority to perform a market study under the requested license and will retain control over the equipment in the testing at all times.

Contact Information

Point of contact for FCC licensing issues:

Colleen King
Vice President, Regulatory Affairs
(202) 621-1921
colleen.king@charter.com

Point of contact for questions about testing operations:

Greg McLaughlin
Sr. Director of Wireless Operations, R&D
(720) 482-4290
greg.mclaughlin@charter.com

The following individual will be available 24/7 during all testing, and has authority and ability to immediately cease all operations:

PJ Dhillon
Principal Engineer
(631) 374-0748
parmjit.dhillon@charter.com