

Softcom Internet Communications, Inc. Supporting Statement

Pursuant to Section 5.63(c)(1) of the Commission's Rules, Softcom Internet Communications, Inc. ("Softcom") hereby provides this statement in support of its application for an experimental license to conduct a market trial, as defined in Sections 5.5 and 5.602, using spectrum in the 3550-3650 MHz band in Sacramento and San Joaquin counties in California. Softcom requests a license term of the shorter of (a) two (2) years from grant of the application, or (b) Softcom's grant of authority from a Spectrum Access System ("SAS") and Environmental Sensing Capability ("ESC") to operate the authorized equipment and facilities at the designated locations on a General Authorized Access ("GAA") basis.

Overview

Softcom is a fixed wireless broadband provider that holds a nationwide non-exclusive 3650-3700 MHz service license (Call Sign WQIG223). Softcom delivers service to approximately 3,500 residential and business subscribers in the northern Central Valley of California, including portions of Sacramento and San Joaquin counties, with a focus on rural and previously underserved locations. Softcom uses a wide array of unlicensed spectrum and "lightly licensed" spectrum in the 3650-3700 MHz band and has deployed WiMAX technology in portions of its network. Under its 3650-3700 MHz license, Softcom has registered in ULS more than 800 base and fixed locations. Over time, Softcom has determined that, in many areas, LTE technology in the 3650-3700 MHz band offers the best combination of throughput, propagation, cost and equipment solutions to deliver high-quality broadband service to its subscribers and others in the target markets that lack access to competitive broadband services.

Softcom, through its membership in the Wireless Internet Service Providers Association, has supported the creation of the Citizens Broadband Radio Service ("CBRS"). Softcom believes that the *CBRS Order*,¹ along with the ongoing development of the SAS and ESC, represents a positive change in spectrum management policy, and will eventually result in extremely efficient and widespread use of this 150 megahertz of spectrum for both small cell technologies for mobile wireless broadband and low power macro cell technologies for fixed wireless broadband in rural and underserved locations.

In addition, the equipment market is evolving to a standards-based LTE platform that relies on software-defined base station radios and encompasses a large, rapidly developing global equipment and technology ecosystem. Because of these attributes and the future ability to operate within the 150 megahertz between 3550-3700 MHz, Softcom intends to deploy in the 3650-3700 MHz band for new areas and to upgrade existing unlicensed operations to the 3650-3700 MHz band to improve customer experience and better compete. In the future, Softcom expects to utilize a combination of Priority Access Licenses ("PAL") and GAA "license by rule" spectrum across the entire 150 megahertz of spectrum. However, to date, there is no Part 90

¹ See *Amendment of the Commission's Rules with Regard to the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) ("*CBRS Order*").

certified equipment that incorporates the functionality needed to comply with new Part 96 requirements, partially due to the fact that there is no certified SAS and ESC, and the technical specifications for the SAS and ESC, are still under development.²

In order to determine the financial and technical viability of the CBRs band and assess consumer acceptance at various speeds and price points, Softcom seeks an experimental license to use spectrum in the 3550-3650 MHz band in Sacramento and San Joaquin counties in California. These counties include significant rural areas where consumers lack choice in broadband access. Softcom is using all available 3650-3700 MHz spectrum in these areas such that further deployment in that band would result in harmful self-interference. Softcom plans to use Telrad LTE equipment on an experimental basis to determine whether and to what extent such deployment in the 3550-3650 MHz band can resolve its capacity and congestion issues. In sum, this experiment will inform Softcom's business, investment, technology and deployment decisions as it plans for expansion and densification of its broadband network.

Description of Program

Because the Commission has not yet certified equipment for use with the SAS or the ESC in the CBRs band, Softcom plans to use Telrad LTE equipment certified by the FCC for use in the 3650-3700 MHz band that is re-tuned to the 3550-3650 MHz band. Power limits and out-of-band emission limits will conform to the Part 96 rules for Category B CBSDs that the Commission adopted in the *CBRS Order* and the Order on Reconsideration and Second Report and Order.³

Softcom has identified Sacramento and San Joaquin counties in California as the optimum place to conduct the market trial experiment. Softcom has access to and is transmitting on other frequencies from existing towers and operation in these counties with personnel on site to monitor construction and operation, to ensure that there will be no harmful interference to Incumbent Access users, and to remedy harmful interference in the unlikely event it occurs. Softcom has designed the trial to ensure that the edge of the trial area will be more than 33 miles from the closest earth station.⁴

There appear to be no ground-based radar in or near the planned trial area that would require ESC or coordination with incumbents. Softcom notes that its proposed operations lie near the boundary of the coastal exclusion zone identified by NTIA.⁵ To mitigate the potential for harmful interference to seaborne radar, as shown in the technical information in this

² See <http://www.wirelessinnovation.org/spectrum-sharing-committee> (last visited Feb. 11, 2016).

³ See *Amendment of the Commission's Rules with Regard to the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, GN Docket No. 12-354, FCC 16-55 (rel. May 2, 2016).

⁴ See *Amendment of the Commission's Rules with Regard to the 3550-3650 MHz Band*, Notice of Proposed Rulemaking and Order, GB Docket No. 12-354, 27 FCC Rcd 15594 (2012), at Appendix A.

⁵ See Letter dated from Paige R. Atkins, NTIA, to Julius P. Knapp, FCC, GN Docket No. 12-354 (dated March 24, 2015), at Enclosure 1. The resolution of the map is not sufficiently clear to determine the location of the boundary relative to the planned tower locations.

application, Softcom will transmit directionally away from the coastal boundary using downtilt from tower heights of no more than 115 feet above ground level and have the downtilt of all devices installed on towers set so that the outer cell radius does not exceed 6.5 miles. As part of the experiment, Softcom plans to test with one or more ESCs to determine operating parameters that may be permissible once GAA and PAL use is authorized. To the extent there is any harmful interference to Navy vessels, Softcom will immediately cease operations or remedy the interference through technical adjustments to its experimental authorization.

Under the market trial aspect of the experiment, Softcom plans to test different broadband speeds and price points to determine the utility and value of the CBRS as it relates to consumer take rates and network performance. Over time, Softcom may test with different equipment as it becomes available. Consistent with the market trial requirements of Section 5.602(d), Softcom will own the CBSD and End User Device equipment, and will not transfer ownership to trial participants. Softcom seeks authority to deploy up to 11 base stations consisting of four CBSD sectors each and up to 1000 End User Devices, which it believes is the minimum quantity necessary to conduct the two-year trial proposed in this application due to the need to measure performance and the integration of the Telrad equipment with the SAS and ESC.

As required by Section 5.602(e), all end users will be advised at the commencement of the trial that service is being provided on a trial basis, that any non-approved devices are for testing only and that all equipment must be returned at the end of the trial period. Softcom further acknowledges that it will retrieve the end user devices from the users at the end of the trial. In particular, all end users will be notified that the service they will be receiving is being provided in part or in whole under experimental authority, and that as a condition of the experimental license, Softcom may be required at any time, without prior notice, to cease operations in the 3550-3650 MHz band. In addition, Softcom acknowledges and will notify users that all customer premise equipment authorized under the experimental license remains the property of Softcom, and must be collected or rendered inoperable at the conclusion of the trial. At the end of the trial, Softcom will either: (1) shut off the service immediately, stop billing users for the service and post a public notice at <https://www.softcom.net> and collect or render all customer premise equipment inoperable, or (2) change the frequency and operating parameters of some or all of the customer premise equipment that is part of the trial to parameters authorized under Part 90, Subpart Z of the FCC rules (which may materially impact network capacity, performance, and quality of service), post a public notice to <https://www.softcom.net>, and allow users to opt out of the modified service offering with no further obligation to pay for the service.

Softcom plans to conduct its trial in two phases. In the first phase, Softcom will deploy with equipment certified for use in the 3650-3700 MHz band in accordance with the technical showing of this application. In the second phase, which will begin when SAS and ESC testing is viable with at least one party, Softcom will incorporate experimental SAS/ESC integration of equipment into the trial.

Objectives of Experimental Program

During the trial, and prior to the certification of a SAS and ESC, Softcom will comply with the power levels in Section 96.41 as they apply to End User Devices and Category B CBSDs. Softcom has also carefully designed its experimental system to minimize signal that could extend across the boundary of the coastal exclusion zone and into areas where earth stations might be expected to experience harmful interference. At the conclusion of the requested experimental license term, Softcom will either transition to Part 96 GAA if equipment is certified and authorized under GAA rules or, if not, cease operation in 3550-3650 MHz. Softcom hopes that the equipment and SAS/ESC development can be accelerated through the information generated by the market trial.

In addition to the technical objectives, Softcom will test to determine the value and utility of PALs, which necessitates charging for the service at varying price points and performance levels. The trial will also provide Softcom with information that may be useful in bidding on PALs.

The experiment will examine the impact of the following rules on potential future commercial deployments.

Section 96.15 - Validate ability to comply through dynamic frequency changes across a geographically clustered collection of CBSDs, planned and executed within 300 seconds of a simulated command to vacate an occupied channel.

Section 96.17 – Validate propagation models ability to predict co-channel interference, blocking, and OOBE to comply with protections of existing Incumbent Access users.

Section 96.21 - Validate propagation models ability to predict co-channel interference, blocking, and OOBE to comply with protections of Grandfathered Wireless Broadband Licensees.

Section 96.25 – Validate propagation model's ability to predict compliance with PAL Protection Areas.

Section 96.39(d), (e) – Develop methods for collecting Signal Level and Frequency information from the CBSD so it can be reported to the SAS.

Section 96.41 – Determine the appropriate power levels for CBSD and End User Devices to both comply with this section and achieve desired coverage and performance. The aggregate RMS power level RSS and PAPR requires measurement validations in a real world environment where CBSD and End User Device density is consistent with intended long term use of the band. Propagation models must be tuned and validated to accurately predict compliance. Power level control of the equipment must be tuned so that the CBSD and End User Device transmit at the lowest power levels possible to meet performance objectives, while complying with the prescribed limits.

Section 96.53 – Develop methods to detect interference at the CBDS and End User Device from other GAA and PAL users so it can be reported to the SAS and ESC.

Contribution to the Radio Art

In accordance with Section 5.63(c)(1), Softcom expects that its market trial will contribute greatly to the radio art. The CBRS is a new service in which commercial and Federal users will share a spectrum band, with use governed by an SAS and ESC. It has been characterized as a test-bed for innovation and as a paradigm shift in spectrum management. In connection with its market trial, Softcom expects to learn a significant amount of information about equipment capabilities and limitations, interference protection and mitigation, customer acceptance at various speeds and price points, and integration of its service and equipment with the SAS and ESC. Because the equipment manufacturer, Telrad, will have access to Softcom's network, Telrad also will gain important information that will improve equipment performance and development. To the extent permitted by SAS and ESC administrators and equipment providers, Softcom will share the results of its market trial with the Commission.