

Red Rover on behalf of Parlier Unified  
School District  
STA Exhibit

Date: 01/24/2017

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Subject: Complementary Exhibits  
File Number: 0086-EX-ST-2017

To Whom It May Concern:

Consistent with the standards set forth in Section 5.61 of the Federal Communications Commission's (Commission's) Rules, 47 C.F.R. § 5.61, Red Rover Ltd, on behalf of Parlier Unified School District (USD), requests Special Temporary Authority (STA) to conduct demonstrations of Shared Spectrum experimental 4G LTE Cell Base Stations in Parlier, California. Operations under this STA would be consistent with the Part 96 rules the Commission has adopted to govern use of the 3.5 GHz band. The STA is sought for a period of 180 days beginning on 02/01/2017. Red Rover Ltd outlines below its need for the requested STA and the reasons that the STA should be granted expeditiously.

The STA is needed to execute operation and performance of 4G LTE Cell in the 3.5 GHz band, which the Commission has designated for broader use. The operation of Cell Base Stations will be consistent with the Commission's Part 96 rules and the incumbent operators will be protected from any harmful interference. The School District of Parlier wants to test the capabilities of CBRS in providing Educational broadband Internet services to low income students at home. In support of their chromebook deployments and digital educational material online. This service will enhance the students and families for Parlier USD.

In Parlier California, Red Rover Ltd. and Parlier USD requests authorization to operate on the frequencies between 3650-3670 MHz, part of 3550-3700 MHz which have been opened for innovative small cell spectrum sharing in connection with the new Citizens Broadband Radio Service (CBRS). Operations across the proposed frequencies will be consistent with the rules for Category B CBRS devices (CBSDs) set forth in Part 96 of the Commission's rules. As stated above and described below, Red Rover Ltd and Parlier USD will avoid harmful interference to incumbent operations throughout the band, and to operations in adjacent bands.

#### **Planned Operations**

Red Rover anticipates performing the following tests under the requested STA. The proposed experimental operations in the 3.5 GHz band will be conducted without harmful interference to other authorized users.

- 4G LTE outdoor coverage and performance: Red Rover Ltd in collaboration with its Air Span radio equipment, model Air Symphony 4200 will test:
  - The operation of the Cell base station to understand the coverage and performance of indoor base stations in the 3.5 GHz band in rural environments.
    - The frequency of operation will be limited to 3650 to 3670 MHz
    - A single antenna site will be established on existing outdoor stadium light poles
    - The existing light poles will broadcast, “filter content” to students at home. The desire outcome is the ability to provide educational Internet services to low income students at home.
    - While traditional the FCC Educational Broadband Spectrum (EBS) is used for these deployments, Parlier USD does not have, nor can receive new EBS allocation. The application of CBRS would open the door for other Educational Institutions to consider this new spectrum in support of their students needs.
  - The performance and operation of a CBSD when instructed by SAS to switch frequency.
  - The impact on an end user when a CBSD has switched its frequency
- SAS Management of Shared Spectrum: Red Rover, in collaboration with its SAS Administrator (Federated Wireless) and radio partner Air Span, will test spectrum sharing, including General Authorized Access (GAA) registration, CBSD spectrum grant request and SAS response, spectrum grant revocation, and simulated protection scenarios in an operation environment.

#### **Non-Interference Analysis**

Operation under the STA will not adversely impact any authorized user of RF Spectrum.

**Morphology of Test Site:** The city of Parlier is located in Central California. The location is rural and geography is flat with low buildings. The test site is remote and surrounded by agricultural fields. Being remote the possibility of interference from other incumbents is minimized, as the next closest development is 4Km from the planned site. Parlier city proper is 2 miles by 1.6 miles and the district has 3000 students.

- The test site located at the Parlier USD main campus. The site has existing Stadium field lights that will be used as the radio towers. These existing structures assure no aircraft flight pattern issues.
- A single eNodeB (antenna site) will be tested providing 360 degree broadcast of the 4G LTE signal using the TDD protocol. The network will provide broadband wireless Internet service to a test bed of students.
- With the higher frequency and low transmit power, reduces the conflict to adjoining areas.

CBSD power will be limited to 47dBm/10MHz (EIRP) in alignment with CBSD's Category B specifications

**Radar Protection (Shoreline):** Parlier is outside of the protected zone, regardless, we select the use of the 3650-3670MHz frequency to avoid any possible contention with ship born radar. Red Rover Ltd does not expect any interference to Radars that operate on the shorelines.

**Federal Government Radiolocation Facilities:** The Parlier test bed is approximately 200 km away from Military Installation, meeting the 80 km distance requirement of the Part 96 rules.

**Ground Based Radar:** The City test bed is located outside of any ground-based radar Exclusion Zone. The STA desired frequency is 3650-3670MHz frequencies to avoid any possible contention with ground-based radar.

**International Border:** Parlier is more than 850 km from the nearest Canadian border and over 330 km from the Mexican border. Therefore, no interference to incumbent operations is expected for international operation.

**In-Band FSS Protection:** The Commission has identified in-band fixed satellite service (FSS) operations in 3600-3700 MHz that require protection under Part 96. Part 96 further requires coordination with any in-band FSS operations within a 150 km coordination contour, operating within the 3650-3700 MHz band. The closest FSS is 230KM from the center of the proposed antenna site. This exceeds the 150KM protection zone for FSS operations assuring no conflict of spectrum space.

**Adjacent Band FSS Protection:** The Commission has identified adjacent band FSS operations in the 3700-4200 MHz that require protection under Part 96. Part 96 requires adjacent band FSS protection within 40km of the FSS site. The closest FSS is 230KM from the center of the proposed antenna site. This exceeds the 40KM protection zone for FSS operations assuring no conflict of spectrum space.

Part 96 requires a blocking level of -60 dBm. Assuming Free Space path loss between a CBSD in Parlier and FSS sites in Livermore (150KM distance) the blocking level of -60 dBm will not be an issue due to free space distance between the sites.

**Part 90 (GWBL):** A search in the FCC ULS for any GWBL license holders within 18KM of the proposed STA site indicated there are no current GWBL within the area. Based on no incumbents, there will not be any interference with any part 90 GWBL operations in the Parlier, California area.

**Exhibit B – Technical Information:**

Applicant Name: Red Rover Ltd

Applicant FRN: 0024036667

**Technical Contact Details:**

<b>Name of Contact</b>	Steve Rovarino – President Red Rover Ltd
<b>Contact Address</b>	748 South Meadows Parkway Suite A9-52 Reno, NV 89521 408-921-8945 Steve@redroverltd.com

**Base Station General Information**

<b>Equipment</b>	<u>Air Span Air Symphony 4200 (Undergoing SAS certification process)</u>
<b>Quantity</b>	<u>2</u>
<b>Address of Operation</b>	Parlier Unified School District 900 S Newmark Ave Parlier CA 93648
<b>Area of Operation</b>	Operation not to exceed 3 km radius from the following geographic center points: 36 36 56 N and 119 31 41 W


**Amplifier Detail**

<b>Antenna</b>	External
<b>Type</b>	Omnidirectional
<b>Quantity</b>	Qty 3 120° coverage from each Antenna
<b>Frequency</b>	3650-3700 MHz
<b>Gain</b>	17 dB
<b>Height</b>	24M
<b>Tower/Structure</b>	Antenna’s will be mounted on existing Stadium Field Lights

<b>Beamwidth at Half-Power Point</b>	60° Horizontal
<b>Orientation in Horizontal Plane</b>	0°
<b>Orientation in Vertical Plane</b>	Various (0° to -10°)

**Radio Equipment**

Radio	Modulation	Emission Designator	Bandwidth	Maximum Output Power	Maximum EIRP
<u>Air Symphony 4200 Cat B CBRS</u>	Digital 64QAM	20M0D1D	20 MHz	<u>2.5W</u>	<u>47 dBm/10MHz</u>
<u>Air Symphony 4200 Cat B CBRS</u>	Digital 64QAM	20M0D1D	20 MHz	<u>2.5W</u>	<u>47 dBm/10MHz</u>

<b>AirHarmony 4000</b>	
Tx power	4 x 40 dBm (4 x 10W)
LTE Band	Band 42 , CBRS
Tx and Rx Paths	4 X 4
(per) Channel size	Up to 20 MHz LTE
Users	1024
Throughputs	TDD: 2x 120 Mbps * HW ready for 600 Mbps
Backhaul	2x Fiber (SFP) + 2x Copper Ethernet (int. iRelay, iBridge option)
Synchronization	GPS IEEE1588-2008 SyncE
Antenna Spec	1x Quad 2x X-Polar antenna



Red Rover Ltd. is submitting an application for Special Temporary Authority to test certain aspects of prospective wireless operations of Experimental Category B CBRS Radios in the 3.5 GHz band.

Parlier USD CBRS STA Request

Respectfully submitted,  
Steve Rovarino  
Red Rover Ltd  
President

Red Rover Ltd.