

Landover Wireless Corp.
FCC Registration (FRN): 0021560925
EXPERIMENTAL LICENSE APPLICATION

NARRATIVE STATEMENT

Landover Wireless Corp. (“Landover” or “Applicant”) will seek a 12-month experimental license beginning **September 1, 2012**, to evaluate and demonstrate LTE based wireless broadband communications equipment in the mid to upper portions of the 600 MHz RF Spectrum band. There are currently no existing Long Term Evolution (LTE) based wireless broadband equipment operating in this spectrum. Landover seeks to test whether LTE equipment can be constructed to operate in this new band and whether such equipment can co-exist with nearby operating UHF television networks utilizing the ATSC standard.

A. Introduction and Specific Proposed License Request:

Landover seeks a 12-month experimental license to accommodate demonstrations and testing of an LTE based eNodeB transmission equipment that operates within the mid to upper 600MHz RF Spectrum band in order to test whether it can peacefully co-exist, both in adjacent channel and co-channel environments of operational UHF television broadcasters utilizing the ATSC standard. Additional testing will be done to evaluate specific propagation characteristics of equipment operating in this band. Prior to the deployment of any LTE transmission equipment, a full analysis will be performed using RF Spectrum analysis gear to create baseline radio frequency data. This project will be segmented into two phases, the first using Rohde & Schwarz LTE Signal Generation Equipment, and the final segment using modified LTE eNodeB equipment originally designed to operate in the lower 700MHz RF Spectrum but operating on the specific 600MHz channels specified in this document. Landover believes it can complete it’s technical objectives and the evaluation within such 12 month experimental license period.

B. Purpose of Operation:

The proposed operation will allow Landover to test and demonstrate new data infrastructure equipment designed in accordance with the 3GPP specifications of LTE standards but that will operate in a new spectrum location – namely the 600MHz RF band. The testing will determine potential interference issues with existing Digital Television broadcast stations both adjacent (Adjacent Channel Interference) and on the same channels but some distance away (Co-Channel Interference).

Landover does not seek authority to conduct market studies nor provide communications services under the requested experimental authority. Landover does not propose to market, sell, or lease prototype equipment to end users in conjunction with this test. All non-Landover participants such as suppliers, tower owners and/or contractors working with Landover in this test will be advised that: (1) the test is being conducted under an experimental authority issued to Landover, (2) Landover is the party responsible for the operations, (3) all operations must be conducted on a non-interference basis, and (4) after the test is completed, Landover will retrieve and recover all devices that do not comply with FCC regulations. In addition, no fees will be charged to any entity using the equipment during this test. Landover understands that the FCC may specify these as well as other conditions on its authorization.

C. Technical Specifications:

Signal Generator Specifications:

Rohde & Schwarz SMU200A Vector Signal Generator

Power: 0.25 Watts Peak

Modulation: Internal Baseband Generator for generation of LTE Signals

Rohde & Schwarz CMW500 Mobile Communications Signal Generator and Spectrum Analyzer

Power: 0.25 Watts Peak

Modulation: Internal Baseband Generator for generation of LTE Signals

Broadband Power Amplifier Specifications:

Rohde & Schwarz BBA100 Broadband Power Amplifier

Power: 40 Watts Peak*

Note that this unit is capable of up to 70 Watts of output power, but will be used at 5, 10, 20, and 40 Watts maximum.

LTE Signal & Spectrum Analysis Equipment

Rohde & Schwarz FSW Signal and Spectrum Analyzer

Additional Software Modules for LTE FDD / TDD & MIMO performance analysis.

Rohde & Schwarz TSMW Mobile Drive Test Signal and Spectrum Analyzer

Rohde & Schwarz CMW500 Mobile Communications Signal Generator and Spectrum Analyzer

LTE eNodeB Equipment:

LTE Macro Base Station

Ericsson RBS 6000 Base Station, modified as experimental equipment

Power: 40W Peak TPO

Effective Radiated Power: 500W Peak

Necessary Bandwidth: 2 X 10 MHz per channel TV Channels 42/43 and 49/50

LTE UE Device

Ericsson prototype testing device, modified as experimental equipment

Power: 23 dBm, 200m Peak TPO

Effective Radiated Power: 26 dBm, 400m Peak

Necessary Bandwidth: 2 X 10 MHz per channel TV Channels 42/43 and 49/50

Frequency Division Duplexing (FDD) Modulation: BPSK, QPSK, 16QAM Emissions: D7D Antenna: Tri Sector 63° HBW 13.5dBi antennas.	Frequency Division Duplexing (FDD) Modulation: BPSK, QPSK, 16QAM Emissions: D7D Antenna: Omni, 3dBi
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Other emission modes may be utilized, but in no event will the emissions extend beyond the frequency bands and/or power levels requested. All power levels will comply with the limits set forth in the FCC's rules, including those relating to human exposure to radiation.

2. Antenna Information:

The antenna that would be deployed under this license will be installed at a height of approximately 70 meters above the ground on an existing tower structure and will be installed in accordance with FAA and FCC rules and regulations. Proposed antenna is the Kathrein 700MHz Panel Antenna and would be arranged in a tri-sector format to provide 360 degree coverage. No increases in the existing tower height will be made nor any modifications to the tower that would require modifications to its existing licenses and certifications.

Proposed Antenna Specifications:

Kathrein 8400-21240 Broadband Sector Antenna

Width of the beam in degrees at the half power point, orientation in horizontal plane: 63°

Orientation in the Horizontal Plane: 0°, 120°, 240°

Orientation in the vertical plane: 0°

Mounting Height: 70m above ground level

3. Proposed Location:

Landover seeks authority to conduct its experimental operations in a specific location chosen in central Missouri just outside the city of Columbia. The proposed testing will determine signal strength and identify potential interference issues at varying distances from this single site location up to a maximum of 20 miles. The right to conduct mobile transmission is also requested in this application and will be performed within this radius. The primary transmission site will be located on a fixed antenna structure already registered with the FCC antenna structures database. Additionally, a low power (23dbm or less) LTE-UE device will be used within a 20 mile radius surrounding this site. Precise evaluation and verification will also be done by specialized spectrum analysis equipment set up throughout the proposed operational area to evaluate the effects of co-channel and adjacent channel television station interference on the LTE network and UHF TV transmissions as well as LTE interference with the ATSC network. The proposed site is listed below. A tech box from Form 346 is attached for this site, giving geographic coordinates in NAD27, specifying effective radiated power and antenna height above sea level,

and providing directional antenna pattern information as proposed.

Proposed Site Location and Structure:

Site Location: 38-57-18.0 N 92-16-20.0 W (NAD 27)	
Site Location: 38-57-18.1 N 92-16-20.7 W (Converted to NAD 83)	
FCC Structure Registration Number: 1006896	
File Number: A0704318	Structure Height: 130.5m.
Structure Type: Structure Type: TOWER	Height Overall: 133.2m.
Registered To: American Towers, Inc	Overall Height AMSL: 363.9m.
Structure Address: 405 Tower Drive, Columbia, MO	FAA Determination: 11/16/2009
ASR Issued: 11/25/2009	FAA Study #: 2009-ACE-1941-OE
Date Built: 02/23/1988	FAA Circular #: 70/7460-1K
Site Elevation: 230.7m.	Paint & Light FAA Chapters: 4, 8, 12

4.0 Spectrum Requirements:

The experiment will be conducted on two blocks of 12MHz each of RF Spectrum located in the mid and upper portions in the 600MHz UHF band. Specifically, each block corresponds to two adjacent 6MHz UHF TV channels 42 & 43 and channels 49 & 50 respectively. Landover Wireless has permission to access the construction permits held by another company for two contiguous 6MHz channels corresponding to one of the required blocks. Special permission is sought under this application for the additional 12 Mhz of spectrum corresponding to UHF TV channels 49 & 50 which are currently un-owned and unoccupied.

These 4 channels define the RF bandwidth of 12MHz each to support the proposed testing as an FDD communications system using 3GPP LTE technology in an FDD configuration of 10MHz X 10MHz.

Spectrum Requirements Summary:

Construction Permits already attained:

TV Channel 42: 638-644 MHz, Construction Permit Granted to K42KE-D, Facility ID 185772

TV Channel 43: 644-650 MHz, Construction Permit Granted to K43ND-D, Facility ID 185767

Special Permission Required for:

TV Channel 49: 680-686 MHz, Request Temporary Permit: No Current Licenses within 100 miles

TV Channel 50: 686-692 MHz, Request Temporary Permit: No Current Licenses within 100 miles

5.0 Interference

The transmissions will be on channels already authorized to Landover by permission except for the noted additional spectrum indicated in the previous section. Attached are maps showing how the proposed service contours will remain within the authorized service areas of the existing stations. Further, to ensure that the experimental digital

operation does not have any greater impact on other stations than the facilities already authorized to Landover, Longley-Rice studies were conducted to predict the impact of the proposed operations on other stations. In addition, prior to the commencement of installing and making operational the eNodeB base station, a spectrum analysis will be done to record the present UHF TV ATSC signal strength and propagation of any broadcast stations transmissions. Additional analysis will also include RF analysis with any existing broadcasting in the lower 700MHz band. Power, height, and antenna pattern have been set for the specific site indicated to ensure that operating digitally, new interference to any co-channel or adjacent-channel LPTV station will not exceed 2%, nor will interference to any Class A or full power TV station exceed 0.5%.

While Longley-Rice interference studies are based on an ATSC signal format, the type of transmission used in this project is LTE, thus an OFDM signal. OFDM being digital, is managed in a more sophisticated manner than ATSC thus more precise in its spectrum use. In LTE, the RF signal is made up of multiple subcarriers, and the carrier management system is designed to refrain from emitting in any band segment where interference potential is detected. Therefore, the proposed LTE OFDM based signals should have the same or less impact on co-channel stations.

Additionally, the proposed LTE-OFDM signal will occupy only 10 MHz of the existing 12MHz UHF TV Channels, thus a full 1.0 MHz guard-band would be utilized at the upper and lower edges in the 10MHz X 10MHz tests, providing further protection to adjacent-channel TV stations in the area.

Landover will also ensure to take immediate steps to resolve any interference complaints that may be received by Landover or the Commission. Landover will re-orient its antennas, install filters, or taking other remedial actions and reduce the power and/or height of the proposed testing facilities if necessary including the immediate suspension of testing should the foregoing not resolve the interference issues. All interference issues will be recorded and provided to the FCC along with a thoroughly explanation as to the resolution of the problem.

Attached to this document are details regarding the existing construction permits as well as Longley -Rice studies indicating potential interference limits with existing television stations operating in the area are within legal limits.

6.0 Testing Scope:

The primary objective in testing once deployment of the eNodeB is complete is to determine the signal strength at varying distances from the site as well as to determine potential interference issues in both adjacent channel and co-channel TV stations in the area. Utilizing the baseline spectrum studies performed in the initial stages of this project, Landover will compare these to the experimental interference studies to show any discrepancies. This experimental application will incorporate specialized LTE spectrum generation equipment in the first phase and an additional low power (Maximum 23dbm) LTE UE device in later phases in order to properly evaluate two way communications using standard 3GPP LTE broadcast specifications. In addition to the signal generation and

simulation equipment, mobile spectrum analyzers will also be used for analysis of potential interference to the LTE communications for data capture and reporting, as well as interference to UHF TV signal. Testing with this spectrum analyzer will also gather any co-channel radiation at N, N+1, N+2 and N+3 channels adjacent to ensure that any possible interference will be identified and mapped accordingly.

Notes will be taken as to whether potential sources of interference in the adjacent and co-channel RF spectrum are digital or analog, their locations, and their respective power levels. Potential designs and filter recommendations for RF spectrum masks may be evaluated in addition to other LTE specific technologies.

7.0 Protections and Certifications

7.1 Airspace Protection:

The proposed site is a registered structure with the FCC Antenna Structures Database file # A0704318. Landover does not propose to modify or increase the overall height of this structure and thus will not increase their existing airspace impact.

7.2 Environmental Protection:

None of the facilities will place more than 5% of the uncontrolled exposure limit for radio frequency energy within two meters above the ground, and therefore the proposed operation is a minor environmental action at the proposed transmitter site.

7.3 Anti-Drug Abuse Certification:

Applicant certifies that neither Applicant nor any party to this application is subject to denial of federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862.

7.4 Restrictions on Operation:

Landover understands that the FCC permits (1) companies to enter into agreements and contracts to manufacture new products and (2) manufacturers to sell—but not deliver—products on a conditional basis to wholesalers and retailers. Landover also understands that the FCC permits the operation of equipment for, among other things, compliance testing, demonstration at trade shows and other exhibitions with appropriate notices displayed, and evaluation of product performance and customer acceptability at the manufacturer's facilities or at certain non-residential sites during the developmental, design and pre-production stages. *See* Marketing Rule Revisions, § 2.803; Part 15 Revisions, 6 FCC Rcd 1683, 1685 (1991).

Notwithstanding these general rules, the FCC requires parties to seek authorization to use devices that normally require a license to operate or that will be operated at residential locations. Such authority may be granted under the FCC's experimental rules set forth in Part 5 of the Code of Federal Regulations, 47 C.F.R. Part 5 (2010). Accordingly, Landover seeks an experimental license to conduct experimental operations permitted under Part 5 of the Commission's rules.

Landover does not seek authority to conduct market studies nor provide communications services under the requested experimental authority. Landover does not propose to market, sell, or lease prototype equipment to end users in conjunction with this test. After the test is completed, Landover will retrieve and recover all devices that do not comply with FCC regulations. If any different treatment becomes necessary during the course of its experimentation, Landover will seek separate and additional authority from the agency.

Landover also recognizes that the operation of any unapproved or unlicensed devices under experimentation must not cause harmful interference to authorized facilities. Should interference occur, Landover will immediately take reasonable steps to resolve the interference, including if necessary discontinuing operation. To that end, Landover would advise entities using the equipment that permission to operate the equipment has been granted under experimental authority issued to Landover, is strictly temporary and may be canceled at any time. It will also advise entities that operation is subject to the condition that the equipment may not cause harmful interference. Specifically, Landover proposes to label the equipment conspicuously as follows:

FCC STATEMENT

Permission to operate this device has been granted under experimental authority issued by the Federal Communications Commission (FCC) to Landover Wireless Corp., is strictly temporary, and may be canceled at any time. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received including interference that may cause undesired operation.

This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or sold until the approval of the FCC has been obtained. Thus, the user does not hold a property right in the device and may be required to return the device.

Moreover, Landover submits that its experimental operations are unlikely to cause interference. First, Landover plans to coordinate its operations with existing licensees of UHF Television broadcasters in the proposed area both adjacent and co-channel up to 100 miles distant. Second, Landover intends to monitor use of the relevant frequencies before commencing transmissions, and it will not operate if the frequencies are in use or interference is expected to be observed.

7.5 Public Interest:

Landover submits that issuance of a license is in the public interest, convenience, and necessity. Grant of a license will permit Landover to test whether LTE equipment deployed for broadband service in the mid to upper portions of

the 600 MHz of RF spectrum can co-exist alongside existing UHF Television broadcast systems utilizing the ATSC standard if engineered with these considerations in mind. The results of this testing will provide valuable data to the FCC in the development of policy and rules in this band.

8.0 Contact Information:

The following people may be contacted for further information regarding this application.

8.1 Landover Wireless Corp, Contact:

Mr. Laurence Zimmerman – Chairman / Founder: Ph (212) 551-1170 Email: lsz@landoverllc.com

Mr. Leonard Z. Sotomayor – EVP Strategic Planning: Ph Ph (212) 551-1170 Email: lsotomayor@landoverllc.com

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9.0 Signatures:

Landover Wireless Corp.

Date: July 3, 2012



Leonard Z. Sotomayor

EVP Strategic Planning