

Outland Wireless, LLC
FCC Form 442
Exhibit 1
File No. 0223-EX-PL-2005

QUESTION 7: Experimentation Description

On May 14, 2004 the FCC issued a Notice of Proposed Rulemaking (NPRM) Docket No. 04-186, "Unlicensed Operation in the TV Broadcast Bands" stating that it recognizes the economic impact of unlicensed wireless spectrum and its potential for improved broadband access. By this application, Outland Wireless LLC seeks an experimental license to test and demonstrate prototype equipment for unlicensed use operating between 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-698 MHz, excluding 608-614 MHz which is reserved for radio astronomy. Experimental activities will be conducted at various locations throughout the Melbourne, Florida area, as described below. The following information is provided in support of this request:

- a. **The complete program of research and experimentation proposed including description of equipment and theory of operation.**

Purpose of Operation:

Outland Wireless is developing a wireless network system with radio base station and customer premises equipment that will employ algorithms and procedures to ensure compliance with proposed FCC non-interference regulations. Of primary concern to the FCC and to the TV broadcasting industry is the issue of interference of unlicensed devices with incumbent licensed services. Any wireless system sharing these bands must ensure it is not interfering with a TV channel that is in use.

Outland Wireless intends to establish an outdoor test range whereby it can perform experiments and take measurements of two-way data communications equipment operating in the VHF and UHF frequency range. It seeks to test and demonstrate this equipment during various stages of its research and design to evaluate functionality and acceptability prior to seeking equipment authorization. Grant of an experimental license will serve the public interest, convenience, and necessity, as it will allow Outland Wireless over the course of the license period to improve upon equipment performance and to mitigate interference to licensed users of the band.

Proposed Location:

Outland Wireless proposes to conduct its experimental activities within 24 kilometers of its primary research and development site in Viera, Florida. Radio Base Station and Customer Premises Equipment transmitters would be operated within 24 km of the site listed below.

Viera, Florida

North Latitude 28° 16' 04"
West Longitude 80° 43' 01"
Datum: NAD83

Equipment to be Used:

The radio equipment under investigation is relatively low power and is similar to other unlicensed equipment used for similar purposes in the 2.4 GHz and 5.8 GHz unlicensed bands. Therefore, each transmitter has a relatively small range. Outland Wireless will need to use up to two different channels in the above mentioned bands simultaneously.

To obtain accurate data regarding real-world operations, Outland Wireless must employ a sufficient number of units during its studies to simulate actual usage. It expects that it will be able to complete its experimentation and demonstration with not more than 3 radio base station units and 15 customer premises units at any given test location. In other words, 3 low power radio base stations and 15 low power customer premises units reflect the maximum number of unlicensed units that would be in operation at any given time at the location under the experimental license it requests. Moreover, Outland Wireless will limit the power, area of operation, and transmitting times to the minimum necessary to evaluate the equipment.

Technical Specifications:

Frequency: 76-88 MHz, 174-216 MHz, 470-608 MHz, 614-698 MHz

Effective Radiated Power: Radio Base Stations: 4 Watts Peak ERP
Customer Premises Equipment: 4 Watts Peak ERP

Necessary Bandwidth: Not greater than 6 MHz

Modulation: QAM Modulation, Phase Modulation

Emissions: 6M0D7D, 6M0G7D

In no event will the emissions extend beyond the frequency bands requested. All power levels will comply with the limits set forth in the FCC's rules, including those relating to human exposure to radiation.

Antenna Information:

The antennas, when mounted on an existing building, will not extend more than 6 meters above the building. If the antennas are mounted on an existing structure other than a building, or at ground level, they will be installed in accordance with FAA and FCC rules and regulations.

Theory of Operation

Radio Base Station (RBS) and Customer Premises Equipment (CPE) will employ functionality to continually monitor channel utilization throughout the band and dynamically change operating frequency to avoid interference. This will allow the base station to continually seek optimum channels for wireless services resulting in higher average data rates and lower interference levels. Safeguards will be incorporated so that the equipment will not be able to operate outside the restrictions of the requested experimental license.

Restrictions on Operation:

Outland Wireless recognizes that the operation of any equipment under experimental authority must not cause harmful interference to authorized facilities. It therefore will coordinate its activities with any licensees in the proposed bands in accordance with FCC requirements. Should interference occur, Outland Wireless will take immediate steps to resolve the interference, including if necessary arranging for the discontinuance of operation.

Outland Wireless does not propose to market, sell, or lease any prototype equipment to end users. After the experimentation ceases, Outland Wireless would recall and recover all devices that are not in compliance with FCC regulations. If any different treatment becomes necessary during the course of its experimentation, Outland Wireless will seek separate and additional authority from the agency.

In addition, Outland Wireless will advise entities using the equipment that permission to operate has been granted under experimental authority issued to Outland Wireless, that such operation is strictly temporary, and that the equipment may not cause harmful interference. Outland Wireless proposes to label the equipment or associated written information as follows:

FCC STATEMENT

Permission to operate this device has been granted under experimental authority issued by the Federal Communications Commission to Outland Wireless LLC, is strictly temporary and may be cancelled at any time. Operation is subject to the condition that it not cause harmful interference. 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.

b. The specific objectives sought to be accomplished.

Objectives of Experimentation:

The overall objective of experimentation is to develop methods and procedures that will ensure compliance with proposed FCC rules. In addition to detection of licensed emissions, other transmission objectives include:

Measurement of propagation characteristics of various waveforms used for broadband wireless access in the VHF/UHF bands.

Experimentation of various modulation methods for the purpose of determining performance characteristics as it relates to long dispersion times that will be found at VHF/UHF frequencies.

Measurement of data throughput and user capacity in a 6 MHz channel using various modulation methods.

- c. **How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion or utilization of the radio art, or is along line not already investigated.**

Public Interest:

This experimentation relates directly to efforts by the FCC to increase broadband access in rural areas. Specifically, this relates to FCC Notice of Proposed Rulemaking (NPRM) Docket No. 04-186, "Unlicensed Operation in the TV Broadcast Bands", issued 14 May 2004. By using "white space" in the VHF/UHF bands, that is, frequencies that are unused due to geographic distance between licensee towers, the FCC hopes to provide low-cost, unlicensed access to Americans in sparsely populated areas. Because radio waves propagate much further in the VHF/UHF bands, less capital equipment is required to provide coverage to these areas. This makes it more affordable for a network operator (Wireless Internet Service Provider—WISP) to establish a competitively priced service to consumers.

Outland Wireless submits that issuance of a license is in the public interest, convenience, and necessity. Grant of a license will permit Outland Wireless to develop innovative equipment that will accommodate the broadband access communications needs of users.

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