

Narrative Statement

Gigabit Wireless Inc. (GWI) is a manufacturer of communications equipment currently developing hardware to be used in the MMDS/MDS/ITFS bands and other frequencies in the 2-5 GHz spectrum for two-way broadband wireless access.

The "base station" prototype under development and the two "subscriber units" under development are all capable of transmitting and receiving.

A novel aspect of GWI's research and development is the use of multiple-antenna space-time processing to improve the capacity, coverage and quality of broadband wireless access by exploiting the spatial dimension. Our experiments will show that multiple antennas at both the base station and the subscriber units can be processed using signal canceling, spatial diversity, and spatial multiplexing to provide nearly tenfold increase in bits/Hz/cell.

A characteristic of the space-time technology is its ability to operate at low power. In addition, owing to the technology's ability to automatically orient the transmitted signal toward the base station, the processing maximizes gain of the subscriber unit in the desired direction and minimizes interference to others.

The specific objectives sought to be accomplished with the experimental authorization are:

1. GWI desires to refine its equipment as a prelude to type acceptance and marketing
2. GWI also wishes to test the feasibility of a wireless system to operate two communications links simultaneously on the same frequency between the base station and the two subscriber units, separating the communication by space-time processing the output of multiple antennas
3. GWI wishes to test the limits of its equipment's ability to promote spectrum re-use and efficiency by space-time processing

GWI's unique program of experimentation will contribute substantially to the development of the radio art. GWI's technology and equipment will make it possible for its customers to simultaneously access a variety of digital services, including telephony, internet and digital video multicasting among others. This will result not only in better, more efficient use for the wireless cable spectrum, but will also serve to enhance the competitive position of wireless cable in the marketplace. Grant of an experimental license to GWI is therefore clearly in the public interest.

Narrative Statement 2: Statement on Power

1. Please see Figure 1 for the proposed experiment. The proposed EIRP of the experiment is extremely low, less than a milliwatt EIRP with full antenna gain, and is quite unlikely to cause interference.
2. The field strength that Gigabit Wireless, Inc. will emit is no greater than that permitted by Part 15, section 249 in the 2400-2483.5 band, i.e. 50 millivolts per meter at a distance of 3 meters. A calculation of the EIRP is shown on the next page.
3. The strongest proposed transmitter power is -3.3 dBm, less than half a milliwatt, which is unlikely to cause interference.
4. The occupied bandwidth of the signal is approximately 800 kHz, and the resulting power spectral density in a 3 kHz band is less than -20 dBm, which is 28 dB less than the maximum power spectral density of 8 dBm per 3 kHz permitted by Part 15, section 247 for direct sequence spread spectrum signals in the 2400-2483.5 MHz band. Our randomized QPSK test signal is very similar to a direct sequence spread-spectrum signal, and is therefore very unlikely to cause interference to anyone in the band.

Figure 1: Experimental License Use

