

January 11, 2011

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STA File Number: 0019-EX-ST-2011  
STA Confirmation Number: EL624528

Battelle is seeking a Special Temporary Authority to operate an experimental point-to-point communications link operating at millimeter-wave frequencies. The link uses optical components to generate and modulate millimeter waves and has the capability of transmitting 10 Gb/s on a 100 GHz carrier.

The system uses high gain Cassegrain antennas (53 dBi) at both the transmitter and receiver site. Transmitter power would be less than 10 mW. Experience with this system has shown that the highly directional antennas will generate a very narrow beam (0.6 degrees) which is nearly impossible to detect, unless the receiving antenna (with 53 dBi gain) is perfectly aligned. Therefore it is unlikely that the experimental system will interfere with existing millimeter-wave systems.

Test Site 1: Battelle's Columbus Campus, Roof of Building 4, Columbus, OH  
We plan to operate the signal constantly for several months to study the impact of weather and temperature.

Test Site 2: Battelle's West Jefferson Facility, West Jefferson, OH  
The tests would be conducted on Battelle-owned land in West Jefferson Ohio. Figure 2 shows two configurations for the field test.

Test Site 3: Darby Dan Airport, Galloway, OH  
Figure 3 shows the proposed test configuration for the Darby Dan Airport. This is a small, privately-owned airport with very little traffic. The airport would be rented and shut down for the day. Additional information on the airport can be obtained at:

**Scope:**

The scope of project is an investigation of photonic approaches to provide high data rate wireless transmission on a millimeter-wave carrier. The proposed study includes: investigation of candidate modulation formats at distances up to 1 km.

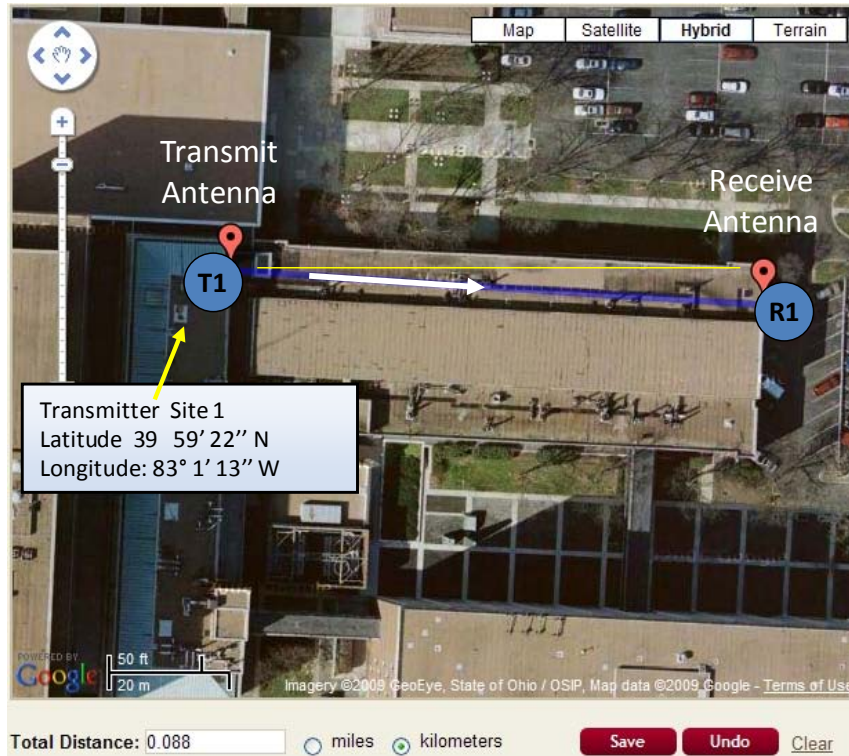


Figure 1. Map of Field Test Site 1. Left Marker: Transmitter Site; Right Marker: Receive Site. Both locations are located on Battelle-owned Building 4. The antennas will be placed 0.088 km apart.

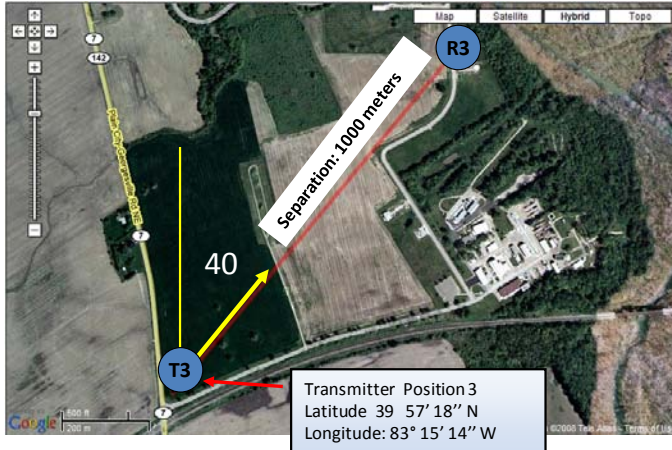


Figure 2. Map of Field Test Site 2. T3: Transmitter Site; R3: Receiver Site. All sites are located on Battelle-owned land.

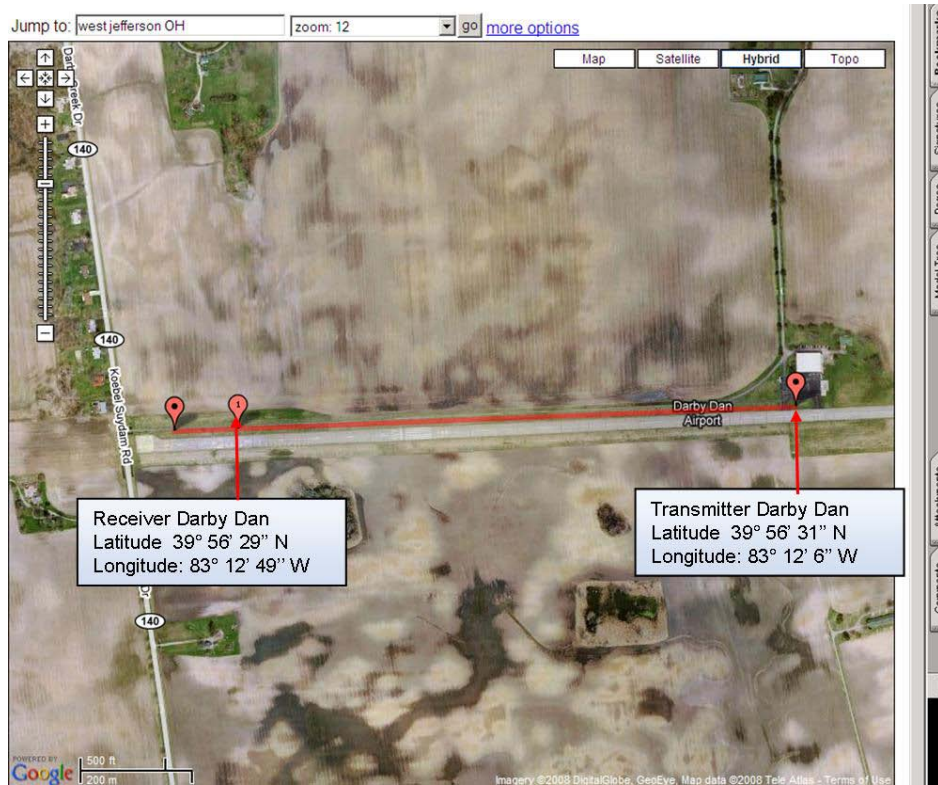


Figure 3. Map of Field Test Site 2. Darby Dan Airport. Battelle has made arrangements with the private authority to have access to the unused airport during testing. Flights will not occur during testing.