File Number: **0017-EX-PL-2006**
Confirmation Number **EL981555**

Exhibit #1 Text and Diagram

The exact equipment in use for field-testing varies from test to tests. In all cases, power amplifiers of less than or equal to 6 watts peak power and antenna with 20dBi or less gain will be used. All work in this frequency band will be between 2.418 GHz and 2.4835 GHz. Orinoco (a.k.a Wavelan) is a common test radio platform and is often used as a radio with a replacement MAC layer. Commercial off the shelf antennas are proposed for many tests, in all cases with less than or equal to 20dBi of gain. Other radios and antennas are being developed under DARPA funding by OEMs and will be used during the conduct of testing. In all cases peak effective radiated power (ERP) will be less than or equal to 27.8dBw (7.8dBW peak for power amplifies + 20dB max. antenna gain).

CenGen Inc. requests permission to use power amplifiers, directional antennas, fixed ground, mobile ground, unattended autonomous vehicles, fixed wing aircraft and rotary wing aircraft assets in the conduct of experimental efforts to address the above objectives. Power amplifiers up to 6 watts peak are desired to support testing in locations where propagation is difficult due to foliage or comparable line-of-sight limitations. Directional antenna, including advanced electronically scanned arrays, with beam width of 5 degrees or greater, effectively 20dBi gain or less are planned and permission for their use requested. All ground vehicle antenna placements will be below 6 meters in height or attached to pre-existing structures so no adverse impact to aviation is possible.

Permission is requested to use the above components in testing in the vicinity of Piedmont, TN (35 deg 16 min 03 sec North / 085 deg 51 min 22 sec West) and a radius of 250 km.
Figure 1 is a pictorial representation of the testing environment.

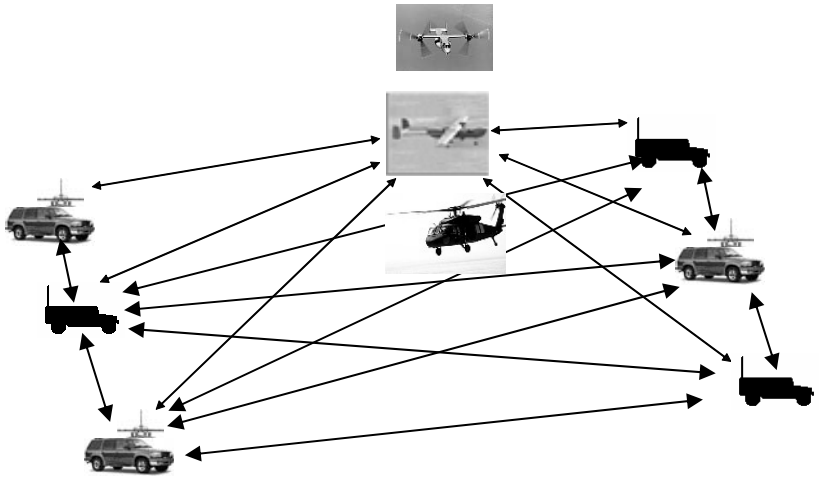

Figure 1: Pictorial representation of the testing environment

Background Information Related the Activities of CenGen, Inc.

Consulting & Engineering Next Generation Networks (CenGen) Inc. is engaged in several government sponsored (e.g. Office of Naval Research (ONR), Defense Advanced Research Projects Agency (DARPA), etc.) and Internal Research and Development (IRAD) efforts to advance wireless communications. Objectives under investigation by CenGen Inc. include:

1) advances to support highly mobile users of wireless connectivity,
2) advanced usage of spectrum to improve spectral efficiency,
3) use of all layers of the protocol stack to improve efficiency and mobile user connectivity, and
4) advances in electronic scanned arrays (ESA, phased arrays, etc.) in particular to improve spectral reuse through directional antenna approaches.

CenGen Inc. has and anticipates contracts as well as IRAD funding to support data collection and measurement activities to substantiate, augment, and support modeling and simulation efforts and laboratory type efforts typically undertaken by the Original Equipment Manufacturer (OEM) of particular components of RF technology (i.e. Radios, transceivers, modems, antenna, ESA, protocol stacks, applications, etc.). Due to the commercial aspects, success, and the relative ease in acquiring 2.4GHz components, this frequency band is often utilized by the OEM for development of hardware. The ability to conduct testing which includes this frequency band as a component of the testing is very important to the advancement of the objectives stated previously. Testing at any particular location or experiment site is typically a few weeks in duration; however locations change frequently to accommodate a variety of environmental, terrain, propagation, and experimental objectives.

The research and experimentation efforts support data collection in field environments. Advances in modulation techniques to counter multipath, jamming, and interference are being addressed as components of ongoing DARPA sponsored efforts. Advanced ESA to improve spectral efficiency via the use of directional antennas are being developed. Physical layer advances (i.e. modulation techniques and directional antennas) require advances in high layer protocols to enable effective network communication. Recent efforts have indicated that the use of higher layers to form networks consisting of directional antennas may enable significant spectral reuse. A simple example would be a three node network where the middle node can seamlessly relay for nodes on either side of it, allowing all nodes to transmit at lower power than if the end nodes would attempt to communicate directly (i.e. without the relay in the middle). The result of the lower power transmission could result in the frequency being available for reuse by other nodes at shorter distances than are in standard use today. Another example relevant to the FCC would be the more effective use of spectrum by enabling effective use of highly directional antennas to mitigate interference and/or increase range, potentially allowing spectral reuse to a significantly higher degree than is presently implemented. The impact of such a configuration is that higher layer protocols need to be advanced along with the physical layer changes and the impact on the applications (i.e. likely longer latency in the simple example above) need to be addressed, including advances to make the applications more tolerant to mobile wireless networks. If approval, this request will advance physical layer (e.g. radios, ESA), media access control layer, network layer, and application layer efforts presently being address in isolation by enabling them to be tested in a variety of field environments.