Form 442 Confirmation number: EL454526
Form 442 File Number: 0302-EX-PL-2012
Date of Submission: 2012-06-13

– ELS Attachments
Question 7: Experimentation Description
If all the answers to Items 4, 5, 6 are "NO", include as an exhibit a narrative statement describing in detail the following items:

a. The complete program of research and experimentation proposed including description of equipment and theory of operation,
b. The specific objectives sought to be accomplished,
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 a line not already investigated.

One function of this Goodrich office is the design and development of highly accurate GPS based flight guidance electronics systems for use in precision munitions with application to future military contracts. To that end, numerous specific location, timing and navigation tests must be performed on demonstration hardware as well as actual deliverable guidance hardware units to prove out their functionality and capabilities. In addition, the GPS receiving antennas and tracking algorithms of these guidance systems must be proven with live GPS data. Typically, the available time for such 'live sky' testing is limited by numerous conditions. Unfortunately, difficult RF and environmental conditions inevitably lead to wasted time and potential damage to delicate systems. We seek to construct a consistent and reliable GPS repeater system within our controlled lab and testing/development space to eliminate the environmental variability and provide far greater test control. This will also greatly increase the amount of testing time available and allow GPS system development to proceed at a far greater pace.

The GPS repeater system we propose has the following hardware:

- an active L1/L2 receiving antenna placed on the roof of our 2 story building,
- an in-line RF amplifier in close proximity to the receiving antenna,
- continuous cabling (200 feet total) into the building's vertical roof access conduit to the second floor and into the lab and testing area,
- a GPS Source, Inc. GPSRKL12-V-P110/5-NF Repeater Kit (L1/L2, Variable Gain - 30dB) located in our lab which is about 45 feet into the building from the West side. The repeater will also provide the DC power for the active antenna and in-line amplifier on the roof.

Previous testing on the roof utilizing hand-held GPS devices has shown that the number of detectable satellites and the signal strength is average for the location. We feel that having indoor controlled access to this GPS 'view' will facilitate expanded testing capability and allow us to detect and solve design anomalies that might not have been evident before. The result of this increased capability means a more robust and dependable 'real world' product to support future military requirements and goals.