



Item 7, Narrative Statement:

*i) The complete program of research and experimentation proposed including description of equipment and theory of operation.*

The program of experimentation will be to investigate the feasibility of using bidirectional repeater technology to extend the reach of 5G New Radio in the FR2 band (greater than 6 GHz). The bidirectional amplifier will use the existing gNB as the donor and will be located near the gNB's service edge. The bidirectional repeater will extend coverage into un-covered areas outside of the gNB's coverage service area.

The program will be operating in the Verizon's licensed 28 GHz spectrum with prior coordination, cooperation, and consent Verizon.

*ii) The specific objectives sought to be accomplished.*

1) Demonstrate that a bi-directional repeater can extended a gNB's coverage area.

2) Understand what, if any, impact to the signal quality the bi-directional repeater will have on the gNB's signal.

3) Understand the design options for bidirectional repeater amplifiers and associated antennas and measure the performance of the design options in a field setting.

4) Measure that the performance metrics of subscriber devices in the weak coverage are improved and that the usable coverage area of the gNB has been extended.

*iii) 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.*

Using bi-directional repeater technology has the advantages of lower initial cost, quick deployment and low operating costs over the deployment of adding traditional gNB's that require fixed connectivity and have increased power consumption. Bidirectional repeater technology can provide network operators with a cost effective, quickly deployable solution to expanding 5G technology to underserved areas.

