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Exhibit Detailing Program of Research and Experimentation

This program will conduct research and experimentation at 1750 and 2200 meters. The program is expected to last for 5 years in length and an extension may be sought after this term has expired.

Research will be conducted on local and distant propagation with fixed and mobile receive stations. Changes in local and distant field strength will be researched between vertical and loop antennas during all seasons. The affects of local vegetation surrounding the vertical antenna will be researched at various temperatures and seasons. The affects of various ground conductivity under the loop antenna will be researched at various temperatures and seasons. Loop antenna conductors will be researched to determine suitability based upon visual impact and cost verses performance. Various antenna-matching techniques will be researched.

Automated communications will take place with Morse Code for local propagation research and slow Morse Code rates for distant research. SSB and normal speed Morse Code communications with other Part 5 stations will be researched during different seasons on both antennas.

All station equipment and antennas will be fabricated and operated by myself. There will be two transmitter designs and two receivers used during this research. Only one transmitter will be transmitting at one time on one band. All transmitters will use a crystal reference oscillator and be mixed or divided down to the appropriate frequency bands. Various power outputs will be used up to the 500 watt level or 2 watts ERP depending upon atmospheric conditions and local environmental factors that lower the antennas efficiency.

The specific objectives will be to compare the loop antenna to the vertical antenna in different seasons and local environmental factors. The suitability of different modes of operation at various power output levels and various distances from the transmitter antenna along with different bands of operation will be researched.

This program will contribute to the advancement of the radio art by researching antennas that are optimized for use in heavy foliage and in compact areas. Various antenna designs

no larger than stated in this application will be researched. Propagation effects both locally and distant will be researched with the two different types of antennas and determinations of the feasibility of either antenna will be forthcoming.

Respectfully submitted,

Michael J. Reid