Answers to question 7 EL758294 0766-EX-CN-2021

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 line not already investigated.

a.

This program includes beacon transmissions on the 8-meter band for reception by others and to be reported as quantitative signal strength data to a publicly accessible database. It also includes 2-way communications with others holding similar experimental station licenses for qualitative evaluation of propagation conditions and discussion of equipment and observations. FSK Beacon transmissions is intended to occur at 10 minute intervals continuously. CW beacon transmissions may occur on 1-10 minute intervals. CW transmissions for two-way communication will occur when suitable propagation conditions occur as determined by beacon transmission receptions.

FSK beacon transmissions will utilize a QRP-Labs U3S device, or similar, with filtering to suppress harmonic and other spurious signals generated by the PA stage. Subsequent amplification of the U3S output may be applied with a maximum power output of 100 W or less and will also include filters to ensure clean signal emissions. CW beacon transmissions will utilize circuitry and filtering similar to that in the U3S. CW transmissions that are part of 2-way communications will use the CW beacon's circuitry. More information about the QRP-Labs U3S is available at https://www.qrp-labs.com/ultimate3/u3s.html

Antennas may include 1. half-wave horizontal dipole, 2. horizontally polarized 3-element beam directed towards regions of interest that may change from time to time, and 3. horizontally polarized omnidirectional antenna.

b.

The specific objective is to contribute quantitative and qualitative 8-meter band long-distance propagation information to at least one publicly-searchable database whenever such propagation events occur in regions accessible to this station's location.

c.

The nature of and physics behind long-distance propagation on the 10-meter band are well-known. However, while the nature of long distance propagation on the 6-meter band is different from that on the 10-meter band and is well-known, it is not well-understood. The nature of long-distance propagation changes somewhere between 10 meters and 6 meters. This station's objective is to help gather information about actual long-distance propagation events on the 8-meter band during the sunspot cycle Solar Cycle 25 that began recently. Data from this station's long-distance propagation events, combined and/or aggregated with data from similar stations elsewhere, will improve knowledge of the nature of VHF propagation in order to improve understanding of such propagation and atmospheric propagation generally.