Question 7: Purpose of Experiment

The purpose of this experiment is to determine the feasibility of utilizing the UHF channels to provide long range, non line of sight communications to rural areas of the state, not serviced by any other means. The goal is to understand the potential of utilization of TV white space, and to design system architectures to achieve optimal performance and efficient spectrum utilization.
Fixed point to point back-hauling as well as mobile networking applications will be explored.
By utilizing available radio cards (Xagyl, Carlson) along with mini motherboards, and embedded systems, programming and design will produce an experimental wireless networking product capable of providing inter-connectivity to rural as well as very remote areas of the state.

By using a combination of "off the shelf" radio boards, GPS receiver boards, mini computer mother boards such as the mini itx frame, as well as proprietary control circuits, customized stations will be assembled to perform fixed station to fixed station network connectivity, fixed station to mobile connectivity, and other applications. Software and firmware development will be the key to realizing this experiments goals. Software algorithms and protocols will be developed to facilitate weak signal reception, as well as to reduce or eliminate any interference. The system software will ultimately be embedded into the operating system to provide a seamless value added product, capable of being expanded upon, and upgraded.

The experiment will also explore the feasibility of other applications, which may include a mobile remote environmental monitoring station, capable of acting as a network repeater, and a remote station control link, capable of cycling or controlling power and other requirements to remote stations.

Interference to other stations and services will be eliminated by utilizing database look up services at regular intervals, as well as active spectrum analysis on the fly. Radio parameters under software control, will modify as necessary, to eliminate interference, and maximize performance, and efficiency, while operating at the lowest power levels necessary to maintain connectivity. Provisions will be made within the software to perform proper station ID at intervals, and in the manor prescribed by rule.

Data collection of operating parameters, operating conditions, operation times, frequency, spectrum usage, and propagation, will be maintained, analyzed and studied, throughout the experiment, to better understand the potential capabilities of utilizing the TV white space UHF spectrum.