

Statement of the Problem

Background:

In the radio frequency communications realm there is a bureaucratic authority known as the Federal Communications Commission (FCC). The FCC has many regulations and standards on how communications are made. For example, they regulate the amount of power transmitted and what frequencies are allocated for communications use. A way to get around the FCC's regulation would be to implement a radio which runs at a wide 'band' of frequencies. By designing a radio that operates in this manor, the transmitted power can be spread out along a large number of frequencies, and the sum of all of the transmitted power is still a large number. Thus the total power transmitted, which would be greater than the FCC's minimum allowable on one particular frequency, can be transmitted on a number of frequencies with power below the FCC minimum that sum to enough power to make a significant transmission.

The Product:

- The product must be completed and the prototype delivered within eight months
- The product will be used for one way digital wireless communications
- The prototype will consist of two main designs, a transmitter and a receiver
- This project will be a 1/5 scale of the ideal solution

The Transmitter:

- The transmitter will take a digital input through a serial peripheral interface
- The transmitter can take a supply voltage of 2 – 5 volts
- The transmitter will consume less than 100mW of power
- The data rate of the transmitter will be 100kb/s
- Data will be transmitted to the receiver at a minimum range of 1m
- The transmitter will have transmitted power density below FCC regulations on the channel

The Receiver:

- The receiver will receive a signal and output it through a serial peripheral interface
- The receiver will run on a supply voltage of 2 – 5 volts
- The receiver will consume less than 100mW of power
- The receiver can receive digital data at 100kb/s
- The receiver will be able to make receptions from the transmitter at a minimum range of 1m