CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J0815

Project Title
Easy Access: Using a Parabolic Reflector Antenna to Improve Wireless Internet Signals

Abstract

Objectives/Goals
My objective is to improve a wireless internet signal and access the internet more easily by building a parabolic reflector antenna to extend the range of the signal.

Methods/Materials
Materials:(A)parabolic antenna: cardboard, foil, glue, tape, block to serve as model router for display.(B)For testing signal strength: wireless computer and program to monitor connection quality in detail.
Methods: Download computer program to record and monitor wireless signals on different computers located throughout the house. Measure and map distances of each station, 1 through 4, from the router. Measure and record the wireless signal at the four locations before building the antenna. Build the cylindrical parabolic reflector antenna and attach it to the router. Test and record the signal strength at each different station with the antenna installed. Compare the signal strength measured without the parabolic reflector antenna to the new measurements with the parabolic reflector antenna installed. Make and test other types of antennas (eg. flat reflector & upright antenna)for signal comparison. Take photographs of the different antennas and print out the graphs of the different measured signal strengths.

Results
The parabolic reflector antenna made a drastic impact on the wireless signal at each station. Gains in signal strength ranged from 5 to 11 points. Additional measurements taken with the other experimental antennas showed no change in signal strength. The flat antenna and tall upright antenna did not improve signal strength at all. Continued monitoring of these changes showed the increases in signals to remain constant at the exact same gains throughout the course of the experiment.

Conclusions/Discussion
My experiment worked! The increase in gains of signal strength with the parabolic reflector antenna were measurably significant. The parabolic antenna drastically improved the strength of the wireless signal at all stations and made it possible to connect to the internet at Station 2. Station 2, at over 50 feet, is the most distant station from the router and was not able to maintain a consistent connection to the internet before the installation of the parabolic antenna. Station 2's connection is now strong and consistent and adds greatly to our home wireless network making it possible to work from another room that was unavailable before the installation of the parabolic antenna.

Summary Statement
Building a parabolic reflector antenna is easy to do and can significantly increase the signal strength of the wireless internet signal, providing better connections and allowing longer distances for wireless networks.

Help Received
Dad helped hold tape measurer for calculating distances of computer stations.