

## Abstract – Design of reflectors to boost signal of a wireless router

Objective: Build a parabolic reflector, corner reflector and flat reflect array antenna to boost the signals of a wireless router's antenna and compare performance.

### Background:

The wireless connection is formed between your device and a wireless router. Your device and the router each have an antenna that can broadcast and receive a Wi-Fi signal. In general, if you get too far away from the router, or if there are certain materials (like metal or concrete) in between you and the router, the signal will get weaker. One way to boost the signal is by using a parabolic reflector. A parabola, shown in the figure below is a special mathematical shape — a curve consisting of the points that are equidistant from both a given fixed point called the focal point or (focus) and a given fixed line (called the directrix).

The reflecting properties of a parabola make parabolic reflectors useful in many practical applications. For example, flashlights use parabolic reflectors to reflect light from the bulb forward in a concentrated beam, and some solar collectors use a parabolic reflector to concentrate the sun's rays to heat water or generate electricity. Similarly, parabolic reflectors can also be used to help broadcast and receive Wi-Fi signals.

### Terms and Concepts:

- Wi-Fi
- Signal Strength
- Router
- Antenna
- Parabola
- Parabolic Reflector, reflectarray, corner reflector
- Decibel-milliwatts (dBm)

### Bibliography

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