Calculator:

https://www.bobatkins.com/radio/offset_fed_dish.html

North Texas NTMS Microwave Society

Wifi Calculations for Parabolic Dish with Offset Feedhorn

Inputs

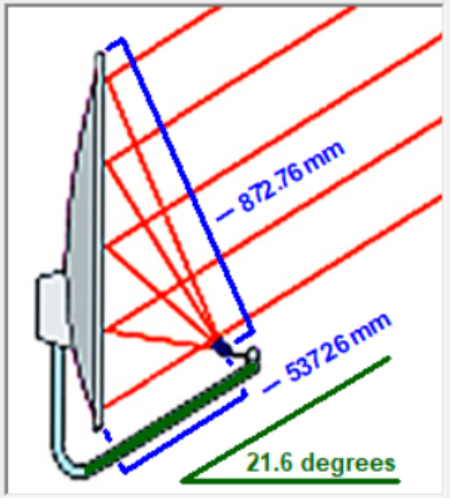
Enter Frequency	10386	MHz
Diameter of large axis of dish	913	mm
Diameter of small axis of dish	850	mm
Depth of dish at deepest pt	78	mm
Distance of deepest pt from bottom edge along large axis	430	mm

Units (all entries) ○ inches ◉ mm

Calculate

Save to File

Exit



The Focal Length is 537.26 mm.

This offset reflector is a section of a full parabola with a diameter of 1698.24 mm whose vertex is at the bottom edge of the offset reflector. The full parabola has an f/D = 0.32, which determines criticality of focal length.

The focal point of the dish is 537.26 mm from the bottom edge of the reflector and 872.76 mm from the top edge of the reflector.

For operation with the main beam on the horizon with the feed at the bottom, the dish must be tilted forward so that the large axis is 68.44 degrees above horizontal.

Illumination angle for feed = 76.63 degrees on the large axis and 78.08 degrees on the small axis. A feedhorn with a 3 dB beamwidth of 45.15 degrees is needed, equivalent to the feed for a conventional dish with f/D = 0.71.

Gain at 50% efficiency = 36.31 dBi.If you do really well, you might get 60% efficiency for a gain = 37.11 dBi.