Parabolic reflector for 2,4 GHz antennas

Reflector mounted on La Fonera router.

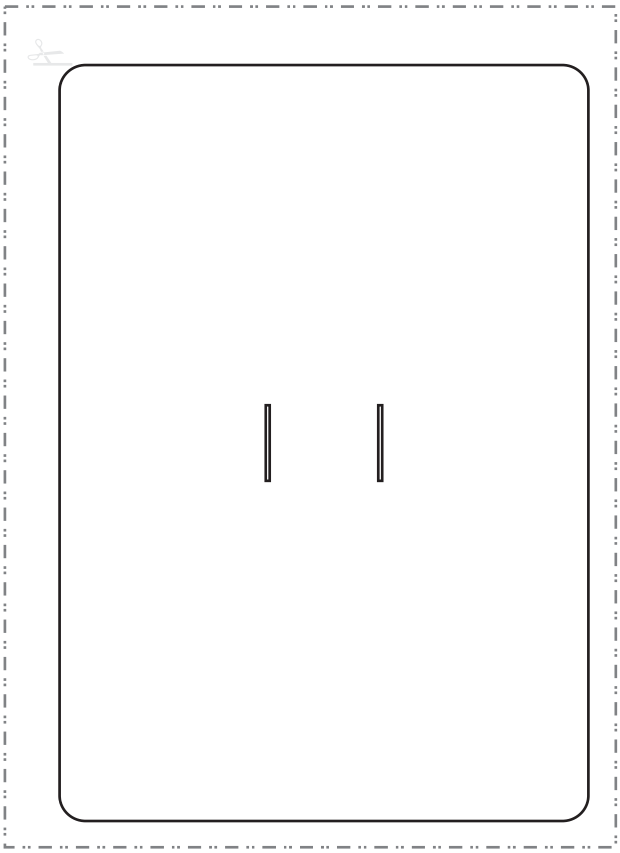
This easy to produce parabolic reflector can be assembled on demand when needed and can be transported disassembled (for instance covered into pages of a book).
Several tests using Network Stumbler (http://www.netstumbler.com/) showed a gain of 6-7 dB using this additional reflector. Please do not zoom the cutting templates because the correct size ot the shape is responsible to reach the gain.

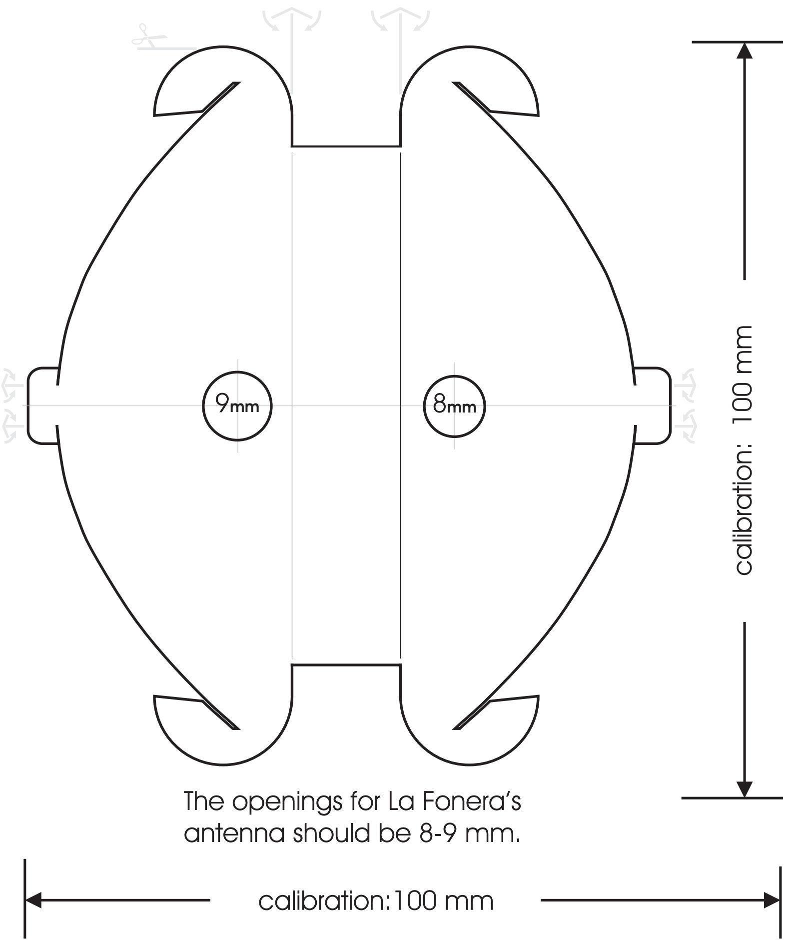
<u>Cutting template to build the reflector</u>
The antenna pictured below was built using the upper templates printed on a overhead film.
The rectangle was pasted up with an aluminium foil on the backside before cutting out the shape.
After cutting out the shapes and enlarging the antenna's openings (for La Fonera's antenna this should be 8-9 mm) the two parts can be assembled without glueing and then attached to the antenna.

A very good alternative solution is to print out this page on plain paper, then to paste up an aluminium foil on the backside so it would cover the rerectangle's backside and then to laminate this page before cutting and assembling.

Print this area on intended paper (100% zoom)
Check the correct size measuring the calibration lengths

Before cutting paste an aluminium foil
in this area on the paper so it
covers the rectangle's backside.

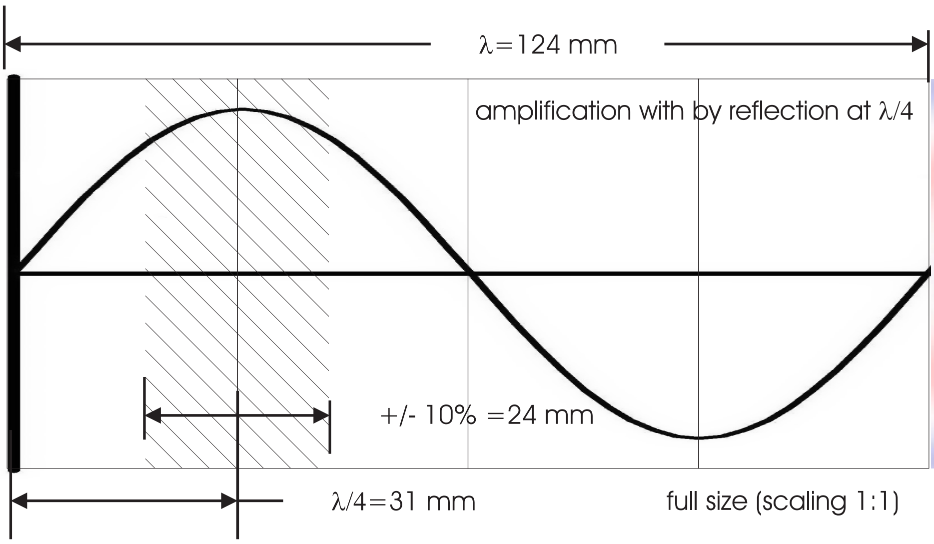


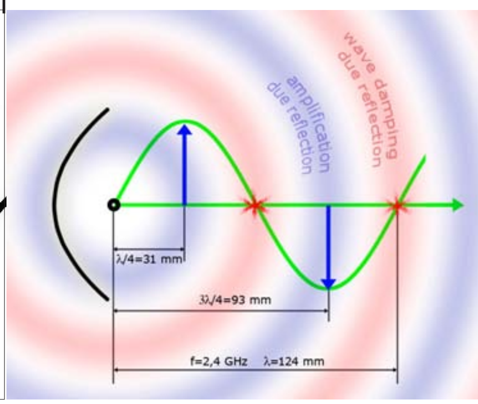


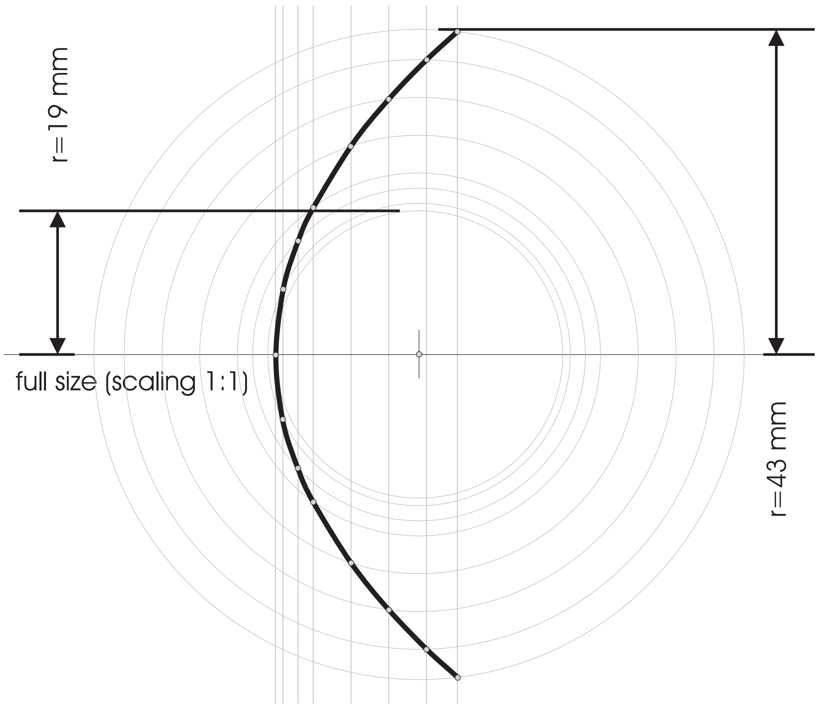
Dimensioning and designing a parabolic reflector for WLAN antennas.

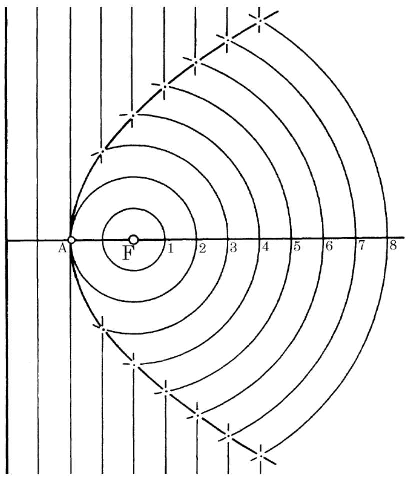
The WLAN frequency of 801.11g is between 2,412 and 2,484 GHz, which is equal to an ectromagnetic wave length λ of 121-124 mm. To achieve amplification by wave reflection the reflecting surface should be positioned to the antenna in a 1/4, 3/4, 5/4, ... distance of the wave length λ. For this reflector 1/4 λ is chosen with a +/- 10% spreading of λ for the distance between antenna and reflector. In this +/- 10% around 1/4 λ the reflection will achieve good amplification.
After dimensioning, this leads to a nearest average distance of appr. 19 mm and a furthest average distance of appr. 43 mm in which the parabolic shape must be designed. Thus the parabolic shape can be designed exactly.

channel no.	Lamda	Lamda=c/f c	f	1/4 Lamda	1/4 Lamda -10%	1/4 Lamda +10%
	cm (10^-3 m)	m/s	GHz (10^9 Hz)	0,25	0,15	0,35
1	124 mm	300.000.000 m/s	2,412 GHz	31 mm	19 mm	44 mm
2	124 mm	300.000.000 m/s	2,417 GHz	31 mm	19 mm	43 mm
3	124 mm	300.000.000 m/s	2,422 GHz	31 mm	19 mm	43 mm
4	124 mm	300.000.000 m/s	2,427 GHz	31 mm	19 mm	43 mm
5	123 mm	300.000.000 m/s	2,432 GHz	31 mm	19 mm	43 mm
6	123 mm	300.000.000 m/s	2,437 GHz	31 mm	18 mm	43 mm
7	123 mm	300.000.000 m/s	2,442 GHz	31 mm	18 mm	43 mm
8	123 mm	300.000.000 m/s	2,447 GHz	31 mm	18 mm	43 mm
9	122 mm	300.000.000 m/s	2,452 GHz	31 mm	18 mm	43 mm
10	122 mm	300.000.000 m/s	2,457 GHz	31 mm	18 mm	43 mm
11	122 mm	300.000.000 m/s	2,462 GHz	30 mm	18 mm	43 mm
12	122 mm	300.000.000 m/s	2,467 GHz	30 mm	18 mm	43 mm
13	121 mm	300.000.000 m/s	2,472 GHz	30 mm	18 mm	42 mm
14	121 mm	300.000.000 m/s	2,484 GHz	30 mm	18 mm	42 mm









design scheme parabola