

## Why is the antenna important?

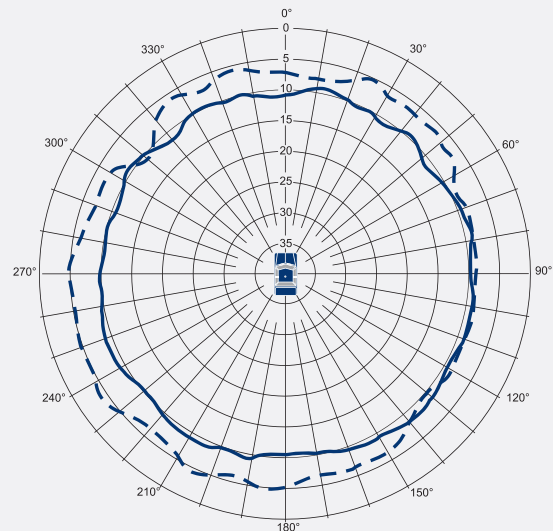
An antenna is a device for transmitting and/or receiving signals – the ‘ears’ of your communication system. A good antenna is designed to be ‘in-tune’ to the signal you are seeking – your phone or radio ‘hears the signal, and you hear a clear signal. Use a poor antenna and you simply cannot communicate effectively.

## Antenna radiation patterns

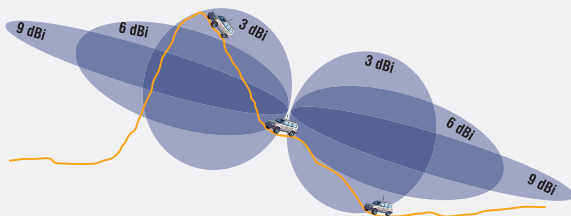
In a perfect world, mobile antennas should radiate in a symmetrical pattern 360-degrees around the antenna/vehicle, however this can only be achieved by mounting the antenna high in the middle of the vehicle’s roof.

The next and most popular alternative is the purchase of a ground independent antenna. While these will still affect the pattern depending on where they are mounted (i.e. side of roof rack, guard or bull bar), they will minimise the pattern distortion.

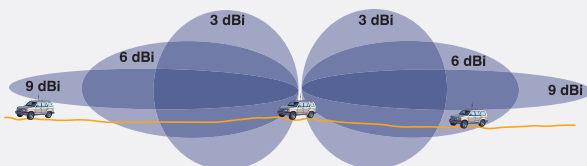
So, look at purchasing a ground independent antenna and mounting it as high as possible on your vehicle.



## Antenna gain



- Lower gain in hilly terrain areas will produce greater coverage



- Higher gain in flat terrain will give better coverage

Antenna gain is the ability of the antenna to radiate more or less in a direction compared to a theoretical antenna (isotropic) or known antenna (dipole or quarter wave).

The design of the antenna controls the antenna gain and pattern. In a mobile situation, the gain you want may depend on the terrain you are driving in. The problem is as gain is increased, the radiation gets compressed into a thinner pattern and reaches out further to the sides. The more gain an antenna has, the thinner the pattern becomes and the further the signal can travel or reach. However, a thinner radiation pattern may prevent strong signal reception when driving through hills and valleys, or amongst built-up areas such as city centre’s where base station antennas tend to be located on top of buildings.

In summary, the ideal gain for each situation is as follows:

- Low gain antennas (2-3 dBi) are good for hilly terrain but can lack range in flat terrain.
- Medium gain antennas (5-6.5 dBi) are good all-round antenna which works well in hilly and flat terrain.
- High gain antennas (8+ dBi) are good in flat terrain but poor in hilly terrain.