



Why Height Beats Power

The earth curves, and GMRS signals travel in straight lines

Radio waves travel in straight lines

Line of sight

- GMRS works best when the antennas could almost see each other
- Hills, buildings and the earth's curve block the signal
- Trees and wet leaves soak it up

What that means

- Doubling power adds only a little range
- Raising the antenna adds a lot
- A hilltop beats an extra 5 watts every time

How far each antenna can 'see'

Antenna height	Radio horizon	Example
6 ft	About 3.5 miles	Handheld at head height
15 ft	About 5.5 miles	Second-story window
30 ft	About 7.7 miles	Mast on the ranch house
100 ft	About 14 miles	Tall tower
200 ft	About 20 miles	Repeater on a high tower

Rule of thumb: radio horizon in miles $\approx 1.41 \times \sqrt{\text{height in feet}}$. Add both stations' horizons for the most you could hope for over flat ground.

Putting it together

≈7

miles: two handhelds
on flat ground, at best

≈11

miles: handheld to a
30 ft ranch mast

≈23

miles: handheld to a
200 ft repeater

1-2

miles: real life in hills
and trees

These are best-case figures over flat, open land. Arkansas hills and forest cut them down sharply.

Remember

Before buying more power, get the antenna higher.