



GPS Networking Link Budget Calculator

The following spreadsheet calculates the effective radiated power for a GPS Networking reradiating system as well as the effective signal power at given range in dBm. Enter the components for the strongest repeating path in your system into the section with the **red** border. NTIA regulations require that the repeated signal be weaker than -140 dBm when measured 100 FT outside of the reradiated structure. Please feel free to reach out to GPS Networking if you need assistance.

Receive Ant Gain	Ant Cable Insertion Loss	Repeater Amp Gain	Repeater Ant Gain Best Case	Building Length (Feet)	Signal Power @ End of Building	Signal Power @ 100' Outside of Building In dBm
40	-9.8	30	4	186	-137.12	-140.8557798
GPS Carrier Frequency MHz		Total System Gain		Range in Miles	Total Signal Power @ Range in Watts	
1227.6		64.2		0.04	19.4E-18	
Avg Receive Power L2 dBm North America				Range in Meters	Radiated Power dBm	
-132				57.97	-67.8	
Free Space loss with Isotropic Antennas				Range in Kilometers	Transmitted Power (W)	
-69.32				0.06	83.2E-12	

Helpful Links:

Get an FCC Registration Number: <https://apps.fcc.gov/coresWeb/publicHome.do>
 FCC Experimental Broadcast Form 44 <https://apps.fcc.gov/oetcf/els/forms/442Entry.cfm>
 Cable Loss Calculator <https://www.timesmicrowave.com/Calculator>
 GPS Networking Store <https://www.gpsnetworking.com/store>
 Tim's Email Address (if you need help) <mailto:tim@gpsnetworking.com>

Effective Radiated Power (W)

166.0E-12

Effective Radiated Power (dBW)

-97.8



System Receive Antenna

Part Number	Gain/Loss (dB)
L1/L2GPSA-TNC	40

Passive Components (Cause Loss)

Part Number	Gain/Loss (dB)
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100

Amplified Components (Cause Gain)

Part Number	Gain/Loss (dB)
L1/L2HNRRKAMP	30

Repeating Antennas

Part Number	Gain/Loss (dB)
L1/L2GRRKPA-T	3

Cable Runs

Cable Type	Loss Per 100 Feet (LMR400)	Feet of Cable	Cable Losses
RG58	= -6	-19.6	50 -9.8

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System Diagram

