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.

Receiving Antenna Gain	*Antenna Cable Insertion Loss*	*System Gain*	*Nominal Antenna Gain Best Case*	*Distance to Nearest External Wall (FT)*	*Signal Power at Nearest External Wall Building*	*Signal Power at 100' Outside of Nearest External Wall In dBm*
38	**-7.60**	**6.5**	**-1**	**3**	**-129.74**	-160.45

GPS Carrier Frequency MHz	**Total System Gain**	**Range in Miles**	**Total Signal Power @ Range in Watts**
L1: 1575.42	35.9	0.00	106.2E-18
Avg Receive Power dBm North America		**Range in Meters**	**Radiated Power dBm**
-130		0.91	-94.1
Free Space loss with Isotropic Antennas		**Range in Kilometers**	**Power (pW)**
-35.64		0.00	0.19
Helpful Links:			**Effective Radiated Power (pW)**
Get an FCC Registration Number			0.39
FCC Experimental Broadcast Form 442			
Cable Loss Calculator			**Effective Radiated Power (dBW)**
GPS Networking Store			-124.1
Email Tim Waite for help			

REVG 4/3/2024

Distance to External Wall (FT): 3 ft

System Receive Antenna

Part Number	Gain/Loss (dB)
Panasonic VIC 100 (L1) Part Number CCAH32T04	38

Passive Components (Cause Loss)

Part Number	Gain/Loss (dB)

Amplified Components (Cause Gain)

Part Number	Gain/Loss (dB)
GPS Networking **NHIALDCBS1X2N/5.0/110**	6.5

Repeating Antennas

Part Number	Gain/Loss (dB)
Sensor Systems Inc. **S67-1575-20**	-1

Cable Runs

Cable Type	Loss Per 100 Feet (LMR400 = -6)	Length of Cable	O M	Cable Losses
LMR-400	-6	60	ft	-3.60
			ft	0.00
UFB293B	-10	40	ft	-4.00
			ft	0.00
			ft	0.00
			ft	0.00
			ft	0.00
			ft	0.00
			ft	0.00
			ft	0.00
			ft	0.00
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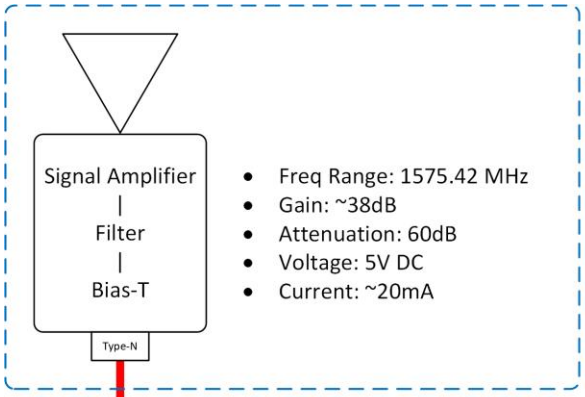
			ft	0.00
			ft	0.00
			ft	0.00
			ft	0.00

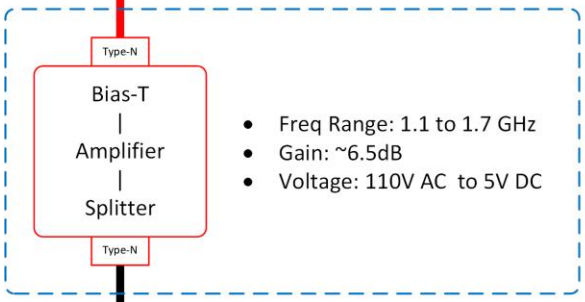
System Diagram



- Freq Range: 1575.42 MHz
- Gain: ~38dB
- Attenuation: 60dB
- Voltage: 5V DC
- Current: ~20mA

Panasonic VIC100 (L1)
Part# CCAH32ST04

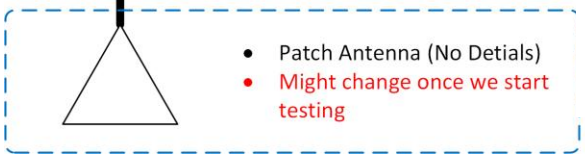
- Coax: Times Microwave LMR 400
- Length: ~60ft
- Loss: ~5.1 dB/100ft @ 1.5GHz



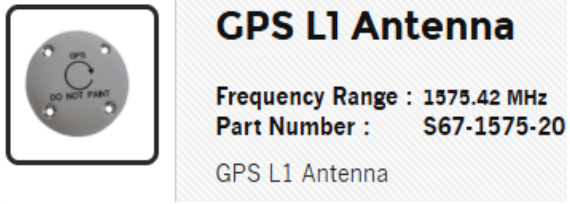
- Freq Range: 1.1 to 1.7 GHz
- Gain: ~6.5dB
- Voltage: 110V AC to 5V DC

GPS Networking
Part# NHIALDCBS1X2N/5.0/110

- Coax: Micro-Coax UFB293B
- Length: ~40ft
- Loss: 0.1 dB/ft @ 1.5 GHz (4dB)



- Patch Antenna (No Detials)
- Might change once we start testing



Location:
Millennium Space Systems
2265 East El Segundo Blvd
El Segundo CA 90245
33.916712 lat -118.383949 long

Stop Buzzer Contact:
John Wirth Director of ATLO 424-367-9532
Tim Barrett Principal Engineer RF & Avionics 310-739-760

-1 dBic' on bore site
Best Case gain

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