



EXHIBIT 2

GPS SIGNAL LEVEL CALCULATIONS

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SYSTEM 12
LMAC PLANT 10
BUILDING 601 WEST
F-22 MOD LINE HANGAR
IDENTIFIERS: 601T1

The following calculations are for System 12 transmit identifier 601T1. Calculations are based upon an average re-transmitted receive power for L1 and L2 of -130 dBm at the unit under test.

The attenuation of the GPS signal while traveling through free space is calculated with the following formula:

$$FSL = K1 + 20 \cdot \log(D) + 20 \cdot \log(F)$$

Where:

K1 = the constant factor (-37.87) for the desired units (feet),

F = the frequency in MHz; and

D = the slant range distance from the transmitter antenna to 100 feet beyond the nearest exterior wall in feet.

The GPS Re-radiation device transmits at two frequencies: 1575.42 MHz for L1 and 1227.6 MHz for L2.

Therefore, the Free Space Path Loss (FSL) equals:

1. For L1: $FSL = -37.87 + 20 \cdot \log(235.8) + 20 \cdot \log(1575.42) = 73.5 \text{ dB}$

2. For L2: $FSL = -37.87 + 20 \cdot \log(235.8) + 20 \cdot \log(1227.6) = 71.4 \text{ dB}$

The calculated signal at 100 feet beyond the nearest exterior wall from the transmit antenna is as follows:

1. L1 Transmitted Power = 33.5 picowatts EIRP = -74.8 dBm/24 MHz
At 100 feet = $-74.8 - 73.5 = \mathbf{-148.3 \text{ dBm/24 MHz}}$

2. L2 Transmitted Power = 32.0 picowatts EIRP = -75.0 dBm/24 MHz
At 100 feet = $-75.0 - 71.4 = \mathbf{-146.4 \text{ dBm/24 MHz}}$



SYSTEM 12
LMAC PLANT 10
BUILDING 601 WEST
F-22 MOD LINE HANGAR
IDENTIFIERS: 601T2

The following calculations are for System 12 transmit identifier 601T2. Calculations are based upon an average receive power for L1 and L2 of -130 dBm at the unit under test.

The attenuation of the GPS signal while traveling through free space is calculated with the following formula:

$$FSL = K1 + 20 \cdot \text{LOG}(D) + 20 \cdot \text{LOG}(F)$$

Where:

K1 = the constant factor (-37.87) for the desired units (feet),

F = the frequency in MHz; and

D = the slant range distance from the transmitter antenna to 100 feet beyond the nearest exterior wall in feet.

The GPS Re-radiation device transmits at two frequencies: 1575.42 MHz for L1 and 1227.6 MHz for L2.

Therefore, the Free Space Path Loss (FSL) equals:

1. For L1: $FSL = -37.87 + 20 \cdot \text{LOG}(350.5) + 20 \cdot \text{LOG}(1575.42) = 76.99 \text{ dB}$

2. For L2: $FSL = -37.87 + 20 \cdot \text{LOG}(350.5) + 20 \cdot \text{LOG}(1227.6) = 74.80 \text{ dB}$

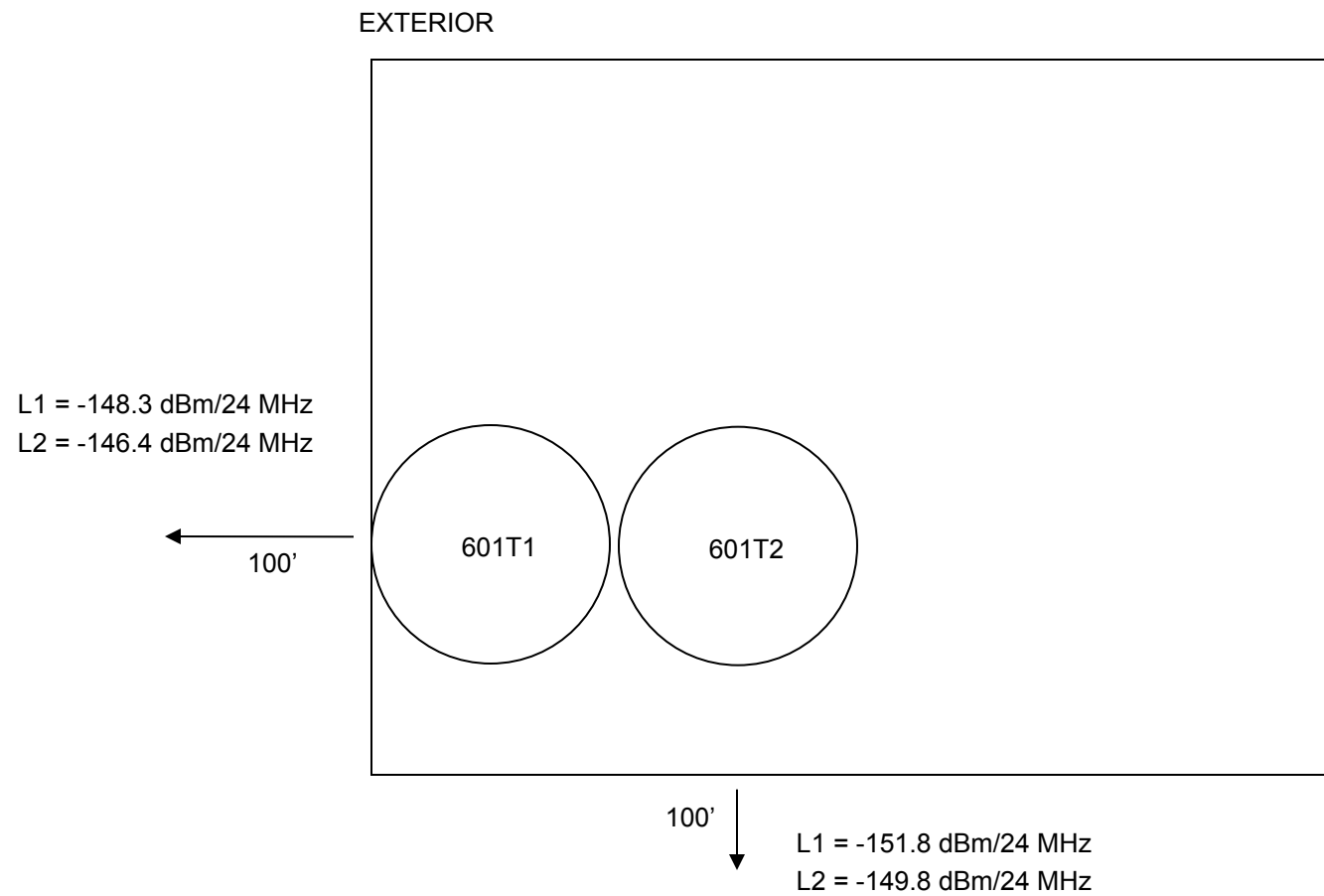
The calculated signal at 100 feet beyond the nearest exterior wall from the transmit antenna is as follows:

1. L1 Transmitted Power = 33.5 picowatts EIRP = -74.8 dBm/24 MHz
At 100 feet = $-74.8 - 77.0 = \mathbf{-151.8 \text{ dBm/24 MHz}}$

2. L2 Transmitted Power = 32.0 picowatts EIRP = -75.0 dBm/24 MHz
At 100 feet = $-75.0 - 74.8 = \mathbf{-149.8 \text{ dBm/24 MHz}}$



SYSTEM 12
LMAC PLANT 10
BUILDING 601
F-22 MOD LINE
IDENTIFIERS: 601T1/T2
BUILDING DIMENSION: 940' X 590'



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System 12