



# EXHIBIT 2

## GPS SIGNAL LEVEL CALCULATIONS

LOCKHEED MARTIN AERONAUTICS  
COMPANY  
Palmdale, CA.



SYSTEM 9  
LMAC PLANT 10  
BUILDING 602  
ADP AVIONICS LAB  
IDENTIFIERS: 602T1

The following calculations are for System 9 transmit identifier 602T1. 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:

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

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:  $FSL = -37.87 + 20 \cdot \text{LOG}(185.2) + 20 \cdot \text{LOG}(1575.42) = 71.4 \text{ dB}$

2. For L2:  $FSL = -37.87 + 20 \cdot \text{LOG}(185.2) + 20 \cdot \text{LOG}(1227.6) = 69.3 \text{ dB}$

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

1. L1 Transmitted Power = 13.2 picowatts EIRP = -78.8 dBm/24 MHz

At 100 feet =  $-78.8 - 71.4 = \mathbf{-150.2 \text{ dBm/24 MHz}}$

2. L2 Transmitted Power = 10.1 picowatts EIRP = -80.0 dBm/24 MHz

At 100 feet =  $-80.0 - 69.3 = \mathbf{-149.3 \text{ dBm/24 MHz}}$

2 NOV 06

System 9



SYSTEM 9  
LMAC PLANT 10  
BUILDING 602 NORTH  
ADP HANGAR AREA  
IDENTIFIERS: 602T2/T3

The following calculations are for System 9 transmit identifiers 602T2 & 602T3. All transmitter locations are equal distance from the nearest exterior wall. 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:

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

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:  $\text{FSL} = -37.87 + 20 \cdot \text{LOG}(198.3) + 20 \cdot \text{LOG}(1575.42) = 72.0 \text{ dB}$

2. For L2:  $\text{FSL} = -37.87 + 20 \cdot \text{LOG}(198.3) + 20 \cdot \text{LOG}(1227.6) = 69.9 \text{ dB}$

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

1. L1 Transmitted Power = 29.8 picowatts EIRP = -75.3 dBm/24 MHz

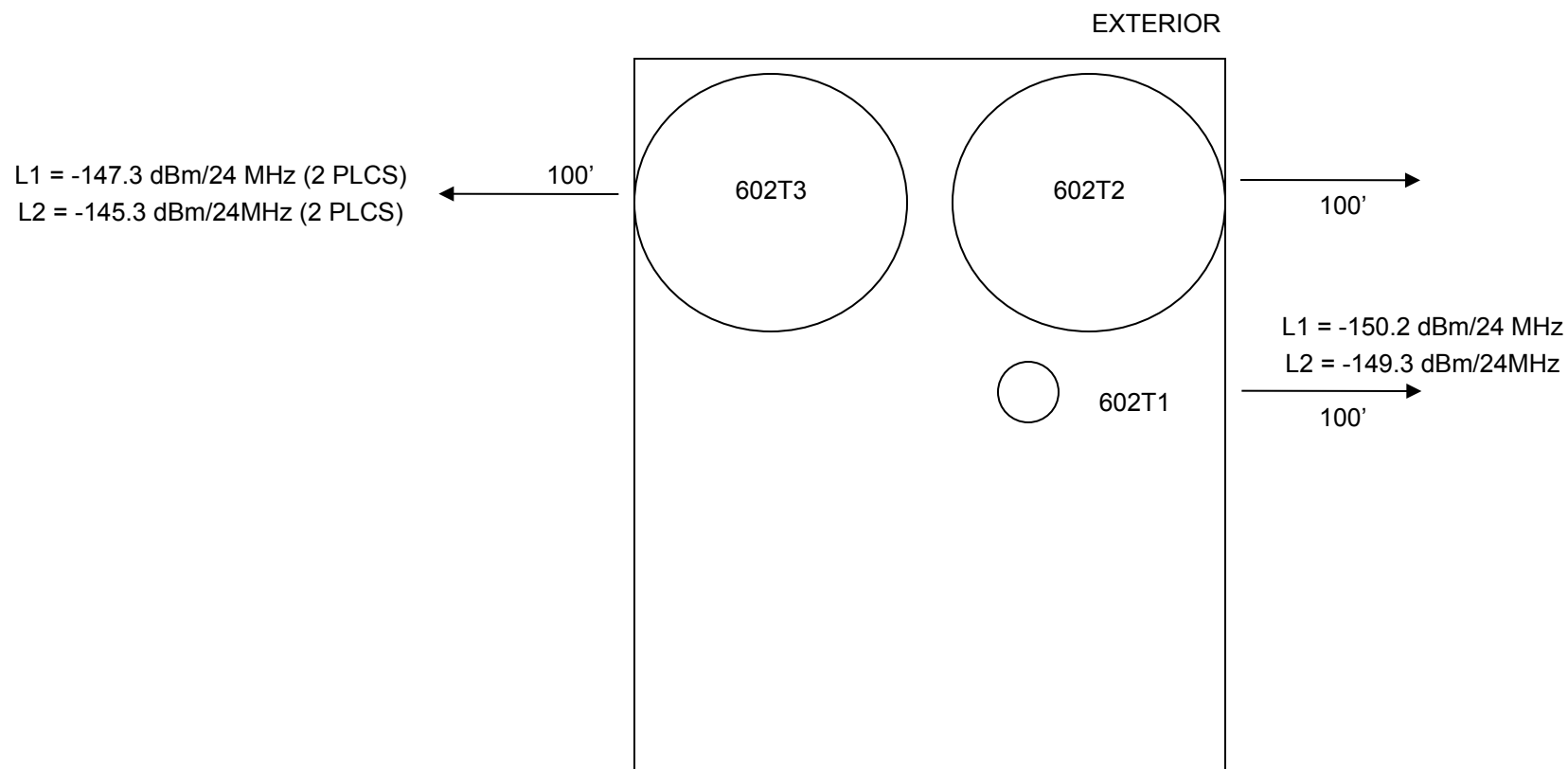
At 100 feet =  $-75.3 - 72.0 = -147.3 \text{ dBm/24 MHz}$

2. L2 Transmitted Power = 28.9 picowatts EIRP = -75.4 dBm/24 MHz

At 100 feet =  $-75.4 - 69.9 = -145.3 \text{ dBm/24 MHz}$



SYSTEM 9  
LMAC PLANT 10  
BUILDING 602 NORTH  
ADP HANGAR AREA & LAB  
IDENTIFIERS: 602T1/T2/T3  
BUILDING DIMENSION: 475' X 354'



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System 9