



EXHIBIT 2

GPS SIGNAL LEVEL CALCULATIONS

LOCKHEED MARTIN AERONAUTICS
COMPANY
Palmdale, CA.



SYSTEM 13
LMAC PLANT 10
BUILDING 601 NW
FLIGHT TEST LAB
IDENTIFIERS: 601T5

The following calculations are for System 13 transmit identifier 601T5. 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: $FSL = -37.87 + 20 \cdot \log(120.9) + 20 \cdot \log(1575.42) = 67.7 \text{ dB}$

2. For L2: $FSL = -37.87 + 20 \cdot \log(120.9) + 20 \cdot \log(1227.6) = 65.6 \text{ dB}$

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

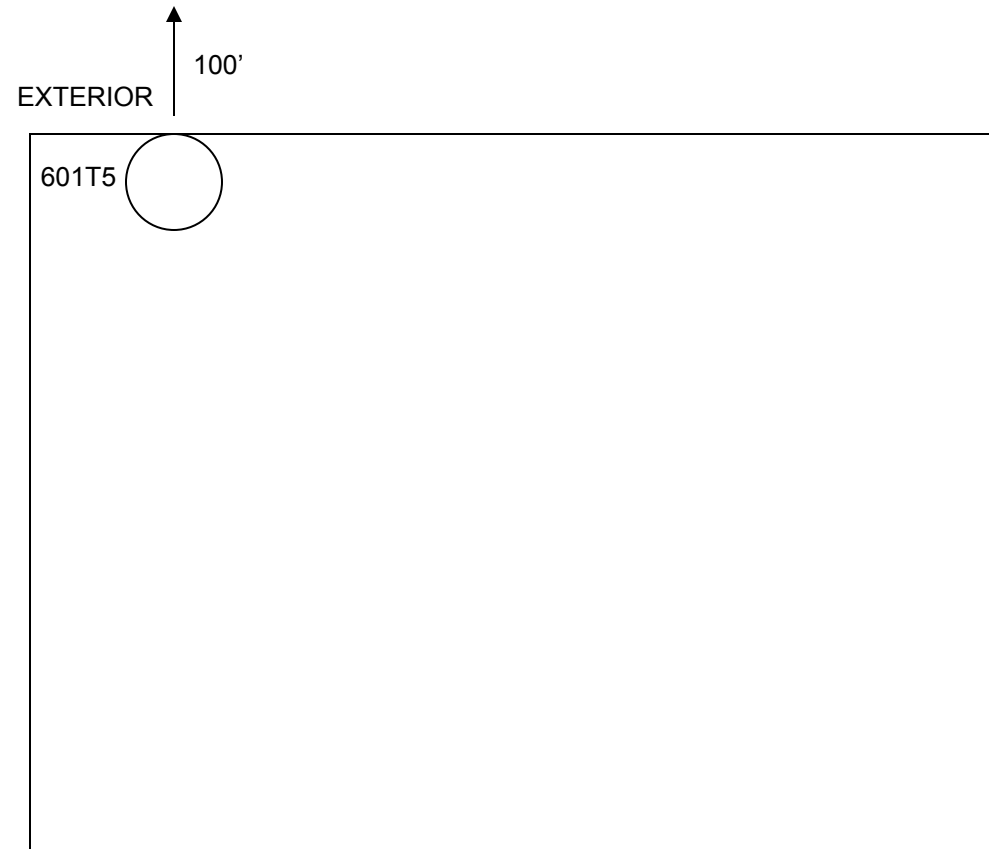
1. L1 Transmitted Power = 3.0 picowatts EIRP = -85.2 dBm/24 MHz
At 100 feet = $-85.2 - 67.7 = \mathbf{-152.9 \text{ dBm/24 MHz}}$

2. L2 Transmitted Power = 2.5 picowatts EIRP = -86.0 dBm/24 MHz
At 100 feet = $-86.0 - 65.6 = \mathbf{-151.6 \text{ dBm/24 MHz}}$



SYSTEM 13
LMAC PLANT 10
BUILDING 601
FLIGHT TEST LAB
IDENTIFIERS: 601T5
BUILDING DIMENSION: 940' X 590'

L1 = -152.9 dBm/24 MHz
L2 = -151.6 dBm/24 MHz



2 NOV 06

System 13