John Kennedy

From: Wye, David [david.wye@lmco.com]
Sent: Friday, March 02, 2007 6:17 AM
To: John Kennedy
Cc: Wells, Claude
Subject: Lockheed Martin 0679-EX-PL-2006
Attachments: M3 Exhibit 2_final.ppt; Bldg 59 Exhibit 2_final.ppt

John—my apologies for taking so long to respond, I'm over here in Geneva at an ITU-R meeting. I've attached the calculations for the 0679-EX-PL-2006 application. I can't check the filing right now, but these should have gone in when the application was filed.

I'll actually be out next week as well, so if you have any questions, the fastest way to get a response will probably be to talk to Claude.

Thanks for all your help,

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LOCKHEED MARTIN

Rocket Assembly Facility
BUILDING 3

The following calculations are for the M3 Bldg. The retransmit antenna is located 30ft from the nearest exterior wall. Calculations are based upon:
1. An average receive power for L1 and L2 of -130 dBm.
2. EIRP at the transmitting antenna = -130dbm - (+20db (amplifier gain)) + (+38 db (receive antenna gain)) + (-10db (75ft cable loss) = -82dbm

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

FSL = K1 + 20*LOG (D) + 20*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) 100ft from the exterior wall equals:

1. For L1: FSL = -37.87 + 20*LOG(130) + 20*LOG(1575.42) = 68.3 dB

2. For L2: FSL = -37.87 + 20*LOG(130) + 20*LOG(1227.6) = 66.1dB

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

1. Transmitted Power = -82.0 dBm/24 MHz
For L1, the EIRP at 100 feet = -82.0 – 68.3 = **-150.3 dBm/24 MHz**

2. Transmitted Power = -82.9 dBm/24 MHz
For L2, the EIRP at 100 feet = -82.0 – 66.1 = **-148.1 dBm/24MHz**

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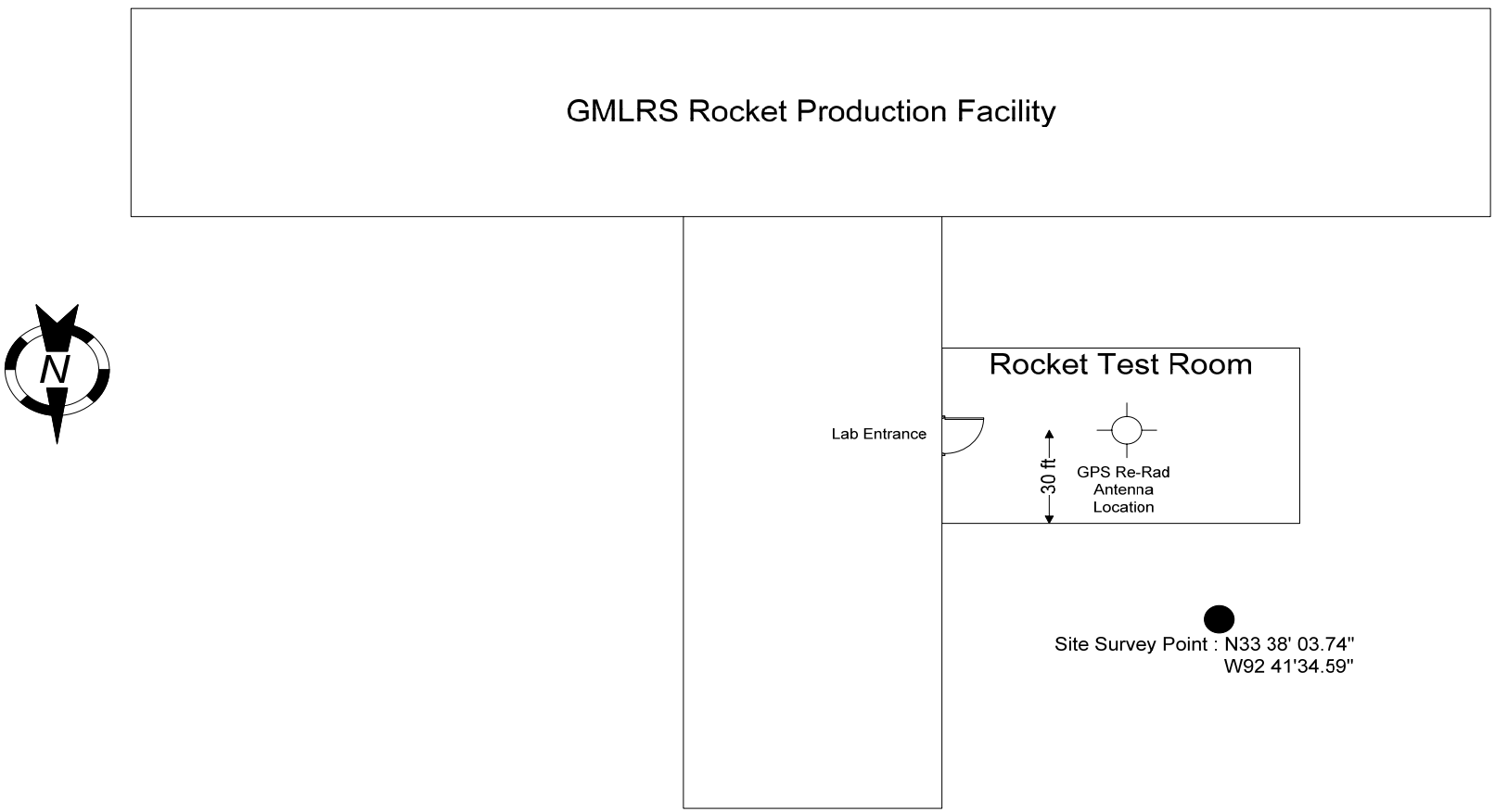
BUILDING 3, Camden, AR.

Building 3



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DTS Lab & MIF Lab
BUILDING 59

The following calculations are for DTS and MIF labs. Both retransmit antennas are located 35ft from the nearest exterior wall. Calculations are based upon:
1. An average receive power for L1 and L2 of -130 dBm.
2. EIRP at the transmitting antenna = -130dbm - (+20db (amplifier gain)) + (+38 db (receive antenna gain)) + (-10db (75ft cable loss) = -82dbm

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

FSL = K1 + 20*LOG (D) + 20*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) 100ft from the exterior wall equals:

1. For L1: FSL = -37.87 + 20*LOG(135) + 20*LOG(1575.42) = 68.7 dB

2. For L2: FSL = -37.87 + 20*LOG(135) + 20*LOG(1227.6) = 66.5dB

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

1. Transmitted Power = -82.0 dBm/24 MHz
For L1, at 100 feet = -82.0 – 68.7 = **-150.7 dBm/24 MHz**

2. Transmitted Power = -82.9 dBm/24 MHz
For L2, at 100 feet = -82.0 – 66.5 = **-148.5 dBm/24 MHz**

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MCTEL Lab
BUILDING 59

The following calculation is for the MCTEL lab. The retransmit antenna is located 44ft from the nearest exterior wall. Calculations are based upon:

1. An average receive power for L1 and L2 of -130 dBm.

2. EIRP at the transmitting antenna = -130dbm - (+20db (amplifier gain)) + (+38 db (receive antenna gain)) + (-10db (75ft cable loss) = -82dbm

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

FSL = K1 + 20*LOG (D) + 20*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) 100ft from the exterior wall equals:

1. For L1: FSL = -37.87 + 20*LOG(144) + 20*LOG(1575.42) = 69.2 dB

2. For L2: FSL = -37.87 + 20*LOG(144) + 20*LOG(1227.6) = 66.5dB

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

1. Transmitted Power = -82.0 dBm
For L1, at 100 feet = -82.0 – 69.2 = **-151.2 dBm/24 MHz**

2. Transmitted Power = -82.9 dBm
For L2, at 100 feet = -82.0 – 67.09 = **-149.09 dBm/24 MHz**

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DTS / MIF / MCTEL Labs
BUILDING 59

Building 59