

# GPS LINK BUDGET Room 3033

	L1		L2	
<b>Satellite Transmitter</b>				
Satellite Transmitter Power (25 Watts)	14	dBW	14	dBW
RF Losses in transmitter path	-1.25	dB	-1.25	dB
Antenna Gain (with respect to isotrope)	13.5	dB	13.5	dB
<b>Satellite ERP</b>	26.25	<b>dBW</b>	26.25	<b>dBW</b>
<b>Propagation</b>				
Atmospheric and Polarization Losses	-0.5	dB	-0.5	dB
Free Space Path Loss	-1.84E+02	dB	-1.82E+02	dB
<b>Received Power on Earth dBW</b>	-1.59E+02	<b>dBW</b>	-1.57E+02	<b>dBW</b>
<b>Received Power on Earth dBm</b>	-1.29E+02	<b>dBm</b>	-1.27E+02	<b>dBm</b>
<b>Facility Re-radiation System</b>				
Gain of Receive Antenna	36.5	dB	36.5	dB
RF Losses in Cable & Connectors (min.) (from Receive Antenna to Amplifier)	-7.16	dB	-6.19	dB
Gain of Line Amplifier (measured)	18.4	dB	17.8	dB
RF Losses in Cable & Connectors (from Amplifier to Passive Antenna)	-0.95	dB	-0.82	dB
Gain of Passive Radiating Antenna	3.5	dB	3.5	dB
Free Space Path Loss (100ft)	-6.61E+01	dB	-6.39E+01	dB
<b>RF Power Level at 100ft Distance</b>	<b>-1.44E+02</b>	<b>dBm</b>	<b>-1.40E+02</b>	<b>dBm</b>

## Free Space Path Loss Calculations

### Satellite to Earth

where d = distance	2.52E+07	m	2.52E+07	m
lambda = wavelength = c/f	1.91E-01		2.44E-01	
c = speed of light	3.00E+08	m/sec	3.00E+08	m/sec
f = frequency	1.57E+09	Hz	1.23E+09	Hz
Free Space Path Loss	-1.84E+02	dB	-1.82E+02	dB

### 100ft from Passive Antenna

where d = distance	3.05E+01	m	3.05E+01	m
lambda = wavelength = c/f	1.91E-01		2.44E-01	
c = speed of light	3.00E+08	m/sec	3.00E+08	m/sec
f = frequency	1.57E+09	Hz	1.23E+09	Hz
Free Space Path Loss	-6.61E+01	dB	-6.39E+01	dB