

MEASUREMENT/TECHNICAL REPORT



**Intermec Technologies Corporation
RM915L Legacy Radio
915 MHz Spread Spectrum Transmitter**

REPORT NO: 040525-1

DATE: May 25, 2004

Appendix G

RF EXPOSURE, MPE CALCULATION

Page 2 RM60 and RM70 Antenna Calculation

Page 3 RT5960 Antenna Calculation

MPE Calculator

$\text{dBd} + 2.17 = \text{dBi}$

TX Frequency (MHz) **900** Watts **0.325** Antenna Gain dBi **0.00**
Antenna Gain dBd **-2.17**

Cable Losses dB **0** dBm **25.118834** radiated dBm **25.118834**

Calculated EIRP (mW) **325.000000**

Occupational Limit
3 mW/cm²

General Public Limit
0.6 mW/cm²

$$\text{EIRP} = \frac{\text{mW}}{4 \pi d^2} = \text{mW/cm}^2$$

d = cm ERP=mW

wavelength
meters **0.33333333** cm **33.333**
1/2 wavelength **16.667**
1/5 wavelength **6.667**
1/10 wavelength **3.333**

Freq. MHz	occ.limit		public limit
300-1,500	f/300		f/1500
1,500-10,000	5		1

Note:

Far field calculations remains linear to 1/2 wavelength.

0.325 watt EIRP 915 MHz Spread Spectrum RM60 and RM70 Antenna

EIRP (milliwatts)	Distance (cm)	Distance (Meters)	mW/cm ²	Distance (inches)	near field corrected
325	100	1.00	0.00259	39.37	
325	80	0.80	0.00404	31.50	
325	60	0.60	0.00718	23.62	
325	40	0.40	0.01616	15.75	
325	35	0.35	0.02111	13.78	
325	30	0.30	0.02874	11.81	
325	29	0.29	0.03075	11.42	
325	28	0.28	0.03299	11.02	
325	27	0.27	0.03548	10.63	
325	26	0.26	0.03826	10.24	
325	25	0.25	0.04138	9.84	
325	24	0.24	0.04490	9.45	
325	23	0.23	0.04889	9.06	
325	22.0	0.22	0.05344	8.66	
325	21.0	0.21	0.05865	8.27	
325	20.0	0.20	0.06466	7.87	
325	19.0	0.19	0.07164	7.48	
325	18.0	0.18	0.07982	7.09	
325	17.0	0.17	0.08949	6.69	
325	16.0	0.16	0.10103	6.30	1/2 wavelength
325	15.0	0.15	0.11495	5.91	
325	14.0	0.14	0.13195	5.51	
325	13.0	0.13	0.15303	5.12	
325	12.0	0.12	0.17960	4.72	
325	11.0	0.11	0.21374	4.33	
325	10.0	0.10	0.25863	3.94	
325	9.0	0.09	0.31929	3.54	
325	8.0	0.08	0.40410	3.15	
325	7.0	0.07	0.52781	2.76	
325	6.0	0.06	0.71841	2.36	
325	5.0	0.05	1.03451	1.97	

MPE Calculator

$\text{dBd} + 2.17 = \text{dBi}$

TX Frequency (MHz) **900** Watts **0.325** Antenna Gain dBi **5.00**
Antenna Gain dBd **2.83**

Cable Losses dB **0** dBm **25.118834** radiated dBm **30.118834**

Calculated EIRP (mW) **1027.740240**

Occupational Limit
3 mW/cm²

General Public Limit
0.6 mW/cm²

$$\text{EIRP} = \frac{\text{mW}}{4 \pi d^2} = \text{mW/cm}^2$$

d = cm ERP=mW

wavelength
meters **0.33333333** cm **33.333**
1/2 wavelength **16.667**
1/5 wavelength **6.667**
1/10 wavelength **3.333**

Freq. MHz	occ.limit		public limit
300-1,500	f/300		f/1500
1,500-10,000	5		1

Note:

Far field calculations remains linear to 1/2 wavelength.

0.325 watt EIRP 915 MHz Spread Spectrum RT5960 Antenna

EIRP (milliwatts)	Distance (cm)	Distance (Meters)	mW/cm ²	Distance (inches)	near field corrected
1027.74	100	1.00	0.00818	39.37	
1027.74	80	0.80	0.01278	31.50	
1027.74	60	0.60	0.02272	23.62	
1027.74	40	0.40	0.05112	15.75	
1027.74	35	0.35	0.06676	13.78	
1027.74	30	0.30	0.09087	11.81	
1027.74	29	0.29	0.09725	11.42	
1027.74	28	0.28	0.10432	11.02	
1027.74	27	0.27	0.11219	10.63	
1027.74	26	0.26	0.12098	10.24	
1027.74	25	0.25	0.13086	9.84	
1027.74	24	0.24	0.14199	9.45	
1027.74	23	0.23	0.15460	9.06	
1027.74	22.0	0.22	0.16898	8.66	
1027.74	21.0	0.21	0.18545	8.27	
1027.74	20.0	0.20	0.20446	7.87	
1027.74	19.0	0.19	0.22655	7.48	
1027.74	18.0	0.18	0.25242	7.09	
1027.74	17.0	0.17	0.28299	6.69	
1027.74	16.0	0.16	0.31947	6.30	1/2 wavelength
1027.74	15.0	0.15	0.36349	5.91	
1027.74	14.0	0.14	0.41727	5.51	
1027.74	13.0	0.13	0.48393	5.12	
1027.74	12.0	0.12	0.56795	4.72	
1027.74	11.0	0.11	0.67591	4.33	
1027.74	10.0	0.10	0.81785	3.94	
1027.74	9.0	0.09	1.00969	3.54	
1027.74	8.0	0.08	1.27789	3.15	
1027.74	7.0	0.07	1.66908	2.76	
1027.74	6.0	0.06	2.27180	2.36	
1027.74	5.0	0.05	3.27140	1.97	