

March 2024
FM Translator K229DS
Silver City, New Mexico Channel 229D
Allocation Study

Allocation Study

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. There are no cochannel or adjacent channel stations close enough to require detailed allocation study maps, to demonstrate compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

=====

SEARCH PARAMETERS

FM Database Date: 20240228

Channel: 229A 93.7 MHz

Page 1

Latitude: 32 46 21.1 (NAD83)

Longitude: 108 17 46.8

Safety Zone: 50 km

Job Title: K229DS SILVER CITY

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K228DK LIC	DEMING NM	BLFT-19940520TC	228D 93.5	0.010 0.0	32 15 21.3 107 45 28.1	138.5	76.44 0.00	0 TRANS
K229DS LIC	SILVER CITY NM	0000189624	229D 93.7	0.001 0.0	DA 32 50 40.2 108 14 20.1	33.8	9.62 0.00	0 TRANS
KRQQ LIC	TUCSON AZ	BMLH-20130610AAM	229C 93.7	93.000 613.0	32 14 56.8 111 6 59.4	258.3	271.29 45.29	226 CLEAR
ALC	EL PASO TX		230C 93.9	0.000 0.0	31 47 36.4 106 28 52.0	122.1	202.55 37.55	165 CLEAR
KINT-FM LIC	EL PASO TX	BLH-19930127KB	230C 93.9	100.000 433.0	31 47 46.3 106 28 58.9	122.0	202.24 37.24	165 CLEAR
KDEM LIC	DEMING NM	BLH-7744	232A 94.3	3.000 59.0	32 15 5.3 107 45 30.1	138.8	76.77 45.77	31 CLEAR

===== END OF FM SPACING STUDY FOR CHANNEL 229 =====

Compliance with US-Mexico FM Agreement: The proposed facility is located less than 125 kilometers from the common border, and has been carefully designed to comply with the requirements of the US-Mexico FM Agreement.

- a) The power has been limited to no more than 50 watts ERP in the direction of Mexico.
- b) The 60 dBu protected contour has been limited to no more than 8.7 kilometers in the direction of Mexico.
- c) With regard to the interfering contour being limited to no more than 32 kilometers in the direction of Mexico, see discussion below.

“In the direction of Mexico”, for this purpose, has been defined as any direction in which the common border is located 125 kilometers or less from the proposed transmitter site. This corresponds to the span of bearings running clockwise from 152 to 176 degrees True, as depicted on the attached map exhibit.

With respect to compliance with the limitation on the distance to the interfering contour, it should be noted that the closest cochannel Mexican station or allotment is over 460 kilometers distant from the proposed transmitter site,¹ and the nearest first-adjacent is 199 kilometers distant.² This is demonstrated by the following radius search centered on the proposed K229DS site.

¹ Compare to the cochannel Class A to Class C spacing requirement of 210 km, as specified in Section 1.2.1 of the US-Mexico FM Agreement.

² Compare to the first-adjacent channel Class A to Class C spacing requirement of 161 km, as specified in Section 1.2.1 of the US-Mexico FM Agreement.

SEARCH PARAMETERS

FM Database Date: 20240228

Channel Range: 228 to 230

Country: MX

Latitude: N 32 46 21.1 (NAD83)

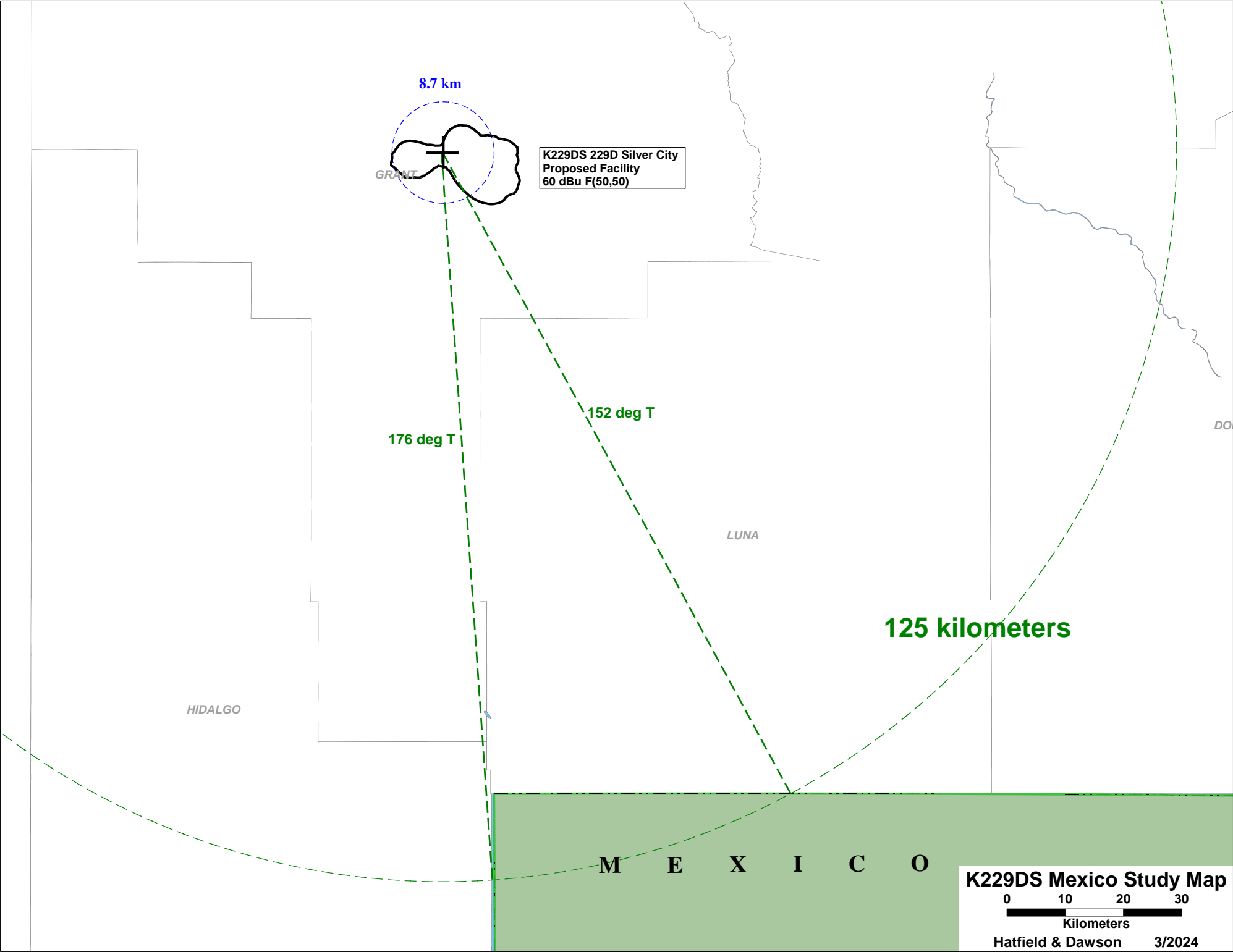
Longitude: W 108 17 46.8

Search Radius: 500 km

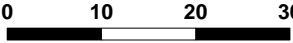
Datum: NAD83

Call Status	City State	FCC File No.	Channel Freq.	ERP (kW) HAAT (m)	Latitude Longitude	Bearing deg-True	Distance kilometers
NEW ALC	EL REAL DEL CATORCE SO		228A 93.5	0.000 0.0	28 57 0.5 111 4 2.1	212.6	500.28
ALC	TECORIPA SO		228B 93.5	0.000 0.0	28 37 0.6 109 57 47.0	199.5	488.52
ALC	VILLA AHUMADA CH		228A 93.5	0.000 0.0	30 36 23.5 106 30 47.9	144.5	293.89
ALC	SAN BUENAVENTURA CH		228B 93.5	0.000 0.0	29 50 47.5 107 29 11.9	166.5	334.14
NEW ALC	GRANJAS EL VENADO CH		229A 93.7	0.000 0.0	28 45 16.6 106 52 51.8	162.8	466.52
XHMFVFM ALC	HERMOSILLO SO		230C 93.9	0.000 0.0	29 4 41.5 110 57 28.1	212.4	482.60
XHMFVFM LIC	HERMOSILLO SO		230C 93.9	9.570 34.0	29 4 41.5 110 57 28.1	212.4	482.60
NEW ALC	AGUA PRIETA SO		230AA 93.9	0.000 0.0	31 19 33.4 109 32 58.2	216.6	199.45
NEW ALC	SAHUARIPA SO		230AA 93.9	0.000 0.0	29 3 19.6 109 13 60.0	192.4	422.65

Neither §74.1235(d)(1) of the Commission's rules, nor Section 2.1.2 of the US-Mexico FM Agreement specify which "interfering contour" must be restricted to no more than 32 km in the direction of the other country. While a conservative reading of the Agreement might suggest that the 34 dBu F(50,10) contour be used (i.e. that being the "worst case" interfering contour specified in the Agreement), prior informal consultation with FCC staff on this particular point has indicated that the interfering contour would be whichever value is relevant to the case at hand. For the instant case, there is no short-spacing to any Mexican station or allotment even if the translator were treated as a Class A station, and therefore there is no relevant interfering contour in this instance.



K229DS Mexico Study Map



Kilometers

Hatfield & Dawson

3/2024

March 2024
FM Translator K229DS Channel 229D
FM Translator K243BH Channel 243D
Silver City, New Mexico
RF Exposure Study

Facilities Proposed

FM translators K229DS and K243BH will both be located on this structure, operating from separate antennas. Each will operate with a maximum lobe effective radiated power of 250 watts.

The proposed antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

DETERMINATION Results							
PASS SLOPE(100:1): NO FAA REQ-RWY MORE THAN 10499 MTRS & 6681.82 MTRS (6.6818 KM) AWAY							
Type	C/R	Latitude	Longitude	Name	Address	Lowest Elevation (m)	Runway Length (m)
AIRP	C	32-45-43.00N	108-12-30.00W	WHISKEY CREEK	GRANT SILVER CITY, NM	1867.2	1645.9000000000001
Your Specifications							
NAD83 Coordinates							
Latitude						32-46-21.1 north	
Longitude						108-17-46.8 west	
Measurements (Meters)							
Overall Structure Height (AGL)						10.7	
Support Structure Height (AGL)						10.7	
Site Elevation (AMSL)						1913.0	
Structure Type							
LTOWER - Lattice Tower							

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed K229DS and K243BH antennas have been made using the manufacturer's elevation pattern for the Scala CA2-CP antenna to be used. Each translator will operate with a single CA2-CP element and so the manufacturer's elevation pattern is considered to be a valid source for data concerning the power to be radiated towards ground level.

The highest calculated ground level power density from K229DS occurs at a point 9 meters from the base of the antenna support structure. At this point the power density is calculated to be 51.3 $\mu W/cm^2$, which is 25.65% of 200 $\mu W/cm^2$ (the FCC MPE for uncontrolled environments).

The highest calculated ground level power density from K243BH occurs at a point 6 meters from the base of the antenna support structure. At this point the power density is calculated to be 125.9 $\mu W/cm^2$, which is 62.95% of 200 $\mu W/cm^2$ (the FCC MPE for uncontrolled environments).

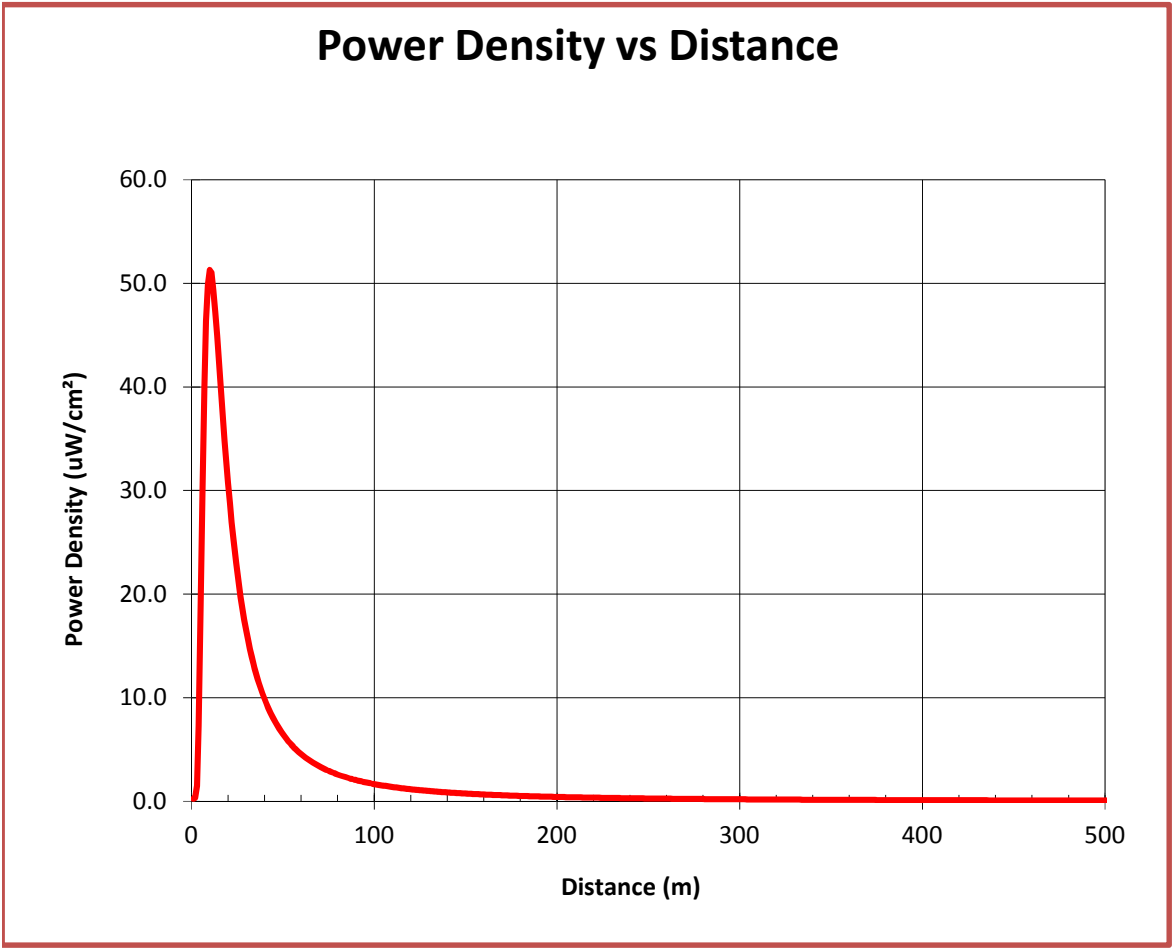
These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operations of K229DS and K243BH (were their maxima to coincide, which they do not) is 177.2 $\mu W/cm^2$, which is 88.6% of 200 $\mu W/cm^2$ (the FCC MPE for uncontrolled environments).

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

K229DS Silver City
Ground-Level Power Density Calculations
Using Manufacturer's Vertical Plane Pattern

Antenna	CA2CP		
ERP	250	Watts H (avg)	
	250	Watts V (avg)	
Antenna AGL	10.3	meters less 2m is	8.3 meters above the reference plane
MBT	0	degrees	

Calculated
Maximum is 51.3 uW/cm² at 9 meters from the tower



K229DS Silver City
Ground-Level Power Density Calculations
Using Manufacturer's Vertical Plane Pattern

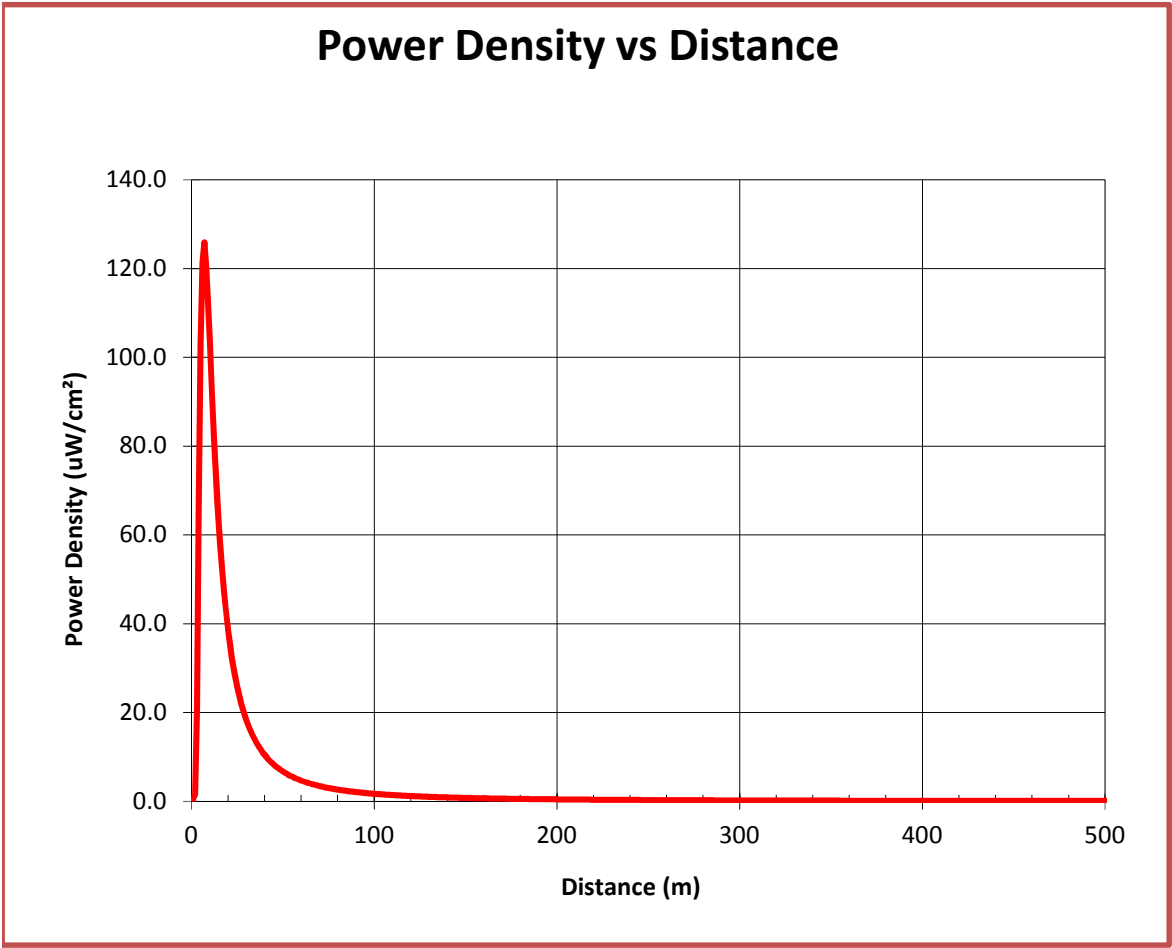
Distance From Tower (meters)	Hypotenuse (meters)	Depression Angle (with MBT adjust) (degrees)	Interpolated Rel Field	Adjusted ERP (watts)	Power Density uW/cm ²
0	8.30	90.00	0.030	0.5	0.22
1	8.36	83.13	0.037	0.7	0.32
2	8.54	76.45	0.080	3.2	1.48
3	8.83	70.13	0.185	17.0	7.31
4	9.21	64.27	0.306	46.8	18.41
5	9.69	58.93	0.409	83.8	29.81
6	10.24	54.14	0.501	125.4	39.94
7	10.86	49.86	0.572	163.7	46.39
8	11.53	46.05	0.630	198.6	49.92
9	12.24	42.68	0.678	230.1	51.30
10	13.00	39.69	0.718	258.0	51.04
11	13.78	37.04	0.749	280.2	49.30
12	14.59	34.67	0.776	300.8	47.21
13	15.42	32.56	0.800	319.9	44.93
14	16.28	30.66	0.822	337.6	42.58
15	17.14	28.96	0.839	352.3	40.05
16	18.02	27.42	0.854	364.5	37.48
17	18.92	26.02	0.867	375.7	35.07
18	19.82	24.75	0.879	386.3	32.85
19	20.73	23.60	0.889	394.8	30.68
20	21.65	22.54	0.898	403.3	28.74
21	22.58	21.57	0.906	410.8	26.92
22	23.51	20.67	0.914	417.7	25.24
23	24.45	19.84	0.921	424.2	23.70
24	25.39	19.08	0.926	429.2	22.23
25	26.34	18.37	0.931	433.2	20.86
26	27.29	17.70	0.935	436.9	19.60
27	28.25	17.09	0.938	440.4	18.44
28	29.20	16.51	0.942	444.1	17.40
29	30.16	15.97	0.946	447.6	16.44
30	31.13	15.46	0.949	450.5	15.53
31	32.09	14.99	0.952	453.2	14.70
32	33.06	14.54	0.955	455.8	13.93
33	34.03	14.12	0.957	458.2	13.22
34	35.00	13.72	0.959	460.2	12.55
35	35.97	13.34	0.961	462.0	11.93
36	36.94	12.98	0.963	463.8	11.35
37	37.92	12.64	0.965	465.7	10.82
38	38.90	12.32	0.967	467.6	10.33
39	39.87	12.01	0.969	469.4	9.86
40	40.85	11.72	0.970	470.8	9.43
41	41.83	11.44	0.972	472.2	9.02
42	42.81	11.18	0.973	473.5	8.63
43	43.79	10.93	0.974	474.7	8.27
44	44.78	10.68	0.976	475.9	7.93

45	45.76	10.45	0.977	477.0	7.61
46	46.74	10.23	0.978	478.1	7.31
47	47.73	10.01	0.979	479.1	7.03
48	48.71	9.81	0.979	479.6	6.75
49	49.70	9.61	0.980	480.0	6.49
50	50.68	9.43	0.980	480.3	6.25
51	51.67	9.24	0.981	480.7	6.02
52	52.66	9.07	0.981	481.0	5.80
53	53.65	8.90	0.981	481.5	5.59
54	54.63	8.74	0.982	482.0	5.39
55	55.62	8.58	0.982	482.4	5.21
56	56.61	8.43	0.983	482.9	5.03
57	57.60	8.28	0.983	483.3	4.87
58	58.59	8.14	0.984	483.7	4.71
59	59.58	8.01	0.984	484.1	4.56
60	60.57	7.88	0.984	484.4	4.41
61	61.56	7.75	0.985	484.6	4.27
62	62.55	7.62	0.985	484.9	4.14
63	63.54	7.51	0.985	485.1	4.01
64	64.54	7.39	0.985	485.3	3.89
65	65.53	7.28	0.985	485.6	3.78
66	66.52	7.17	0.986	485.8	3.67
67	67.51	7.06	0.986	486.0	3.56
68	68.50	6.96	0.986	486.2	3.46
69	69.50	6.86	0.986	486.4	3.36
70	70.49	6.76	0.986	486.6	3.27
71	71.48	6.67	0.987	486.8	3.18
72	72.48	6.58	0.987	486.9	3.10
73	73.47	6.49	0.987	487.1	3.01
74	74.46	6.40	0.987	487.3	2.94
75	75.46	6.32	0.987	487.4	2.86
76	76.45	6.23	0.988	487.6	2.79
77	77.45	6.15	0.988	487.8	2.72
78	78.44	6.07	0.988	487.9	2.65
79	79.43	6.00	0.988	488.1	2.58
80	80.43	5.92	0.988	488.2	2.52
81	81.42	5.85	0.988	488.4	2.46
82	82.42	5.78	0.988	488.5	2.40
83	83.41	5.71	0.989	488.6	2.35
84	84.41	5.64	0.989	488.8	2.29
85	85.40	5.58	0.989	488.9	2.24
86	86.40	5.51	0.989	489.0	2.19
87	87.40	5.45	0.989	489.2	2.14
88	88.39	5.39	0.989	489.3	2.09
89	89.39	5.33	0.989	489.4	2.05
90	90.38	5.27	0.989	489.5	2.00
91	91.38	5.21	0.990	489.6	1.96
92	92.37	5.16	0.990	489.7	1.92
93	93.37	5.10	0.990	489.9	1.88
94	94.37	5.05	0.990	490.0	1.84
95	95.36	4.99	0.990	490.1	1.80
96	96.36	4.94	0.990	490.2	1.76

K243BH Silver City
Ground-Level Power Density Calculations
Using Manufacturer's Vertical Plane Pattern

Antenna	CA2CP		
ERP	250	Watts H (avg)	
	250	Watts V (avg)	
Antenna AGL	7.3	meters less 2m is	5.3 meters above the reference plane
MBT	0	degrees	

Calculated
Maximum is 125.9 $\mu\text{W}/\text{cm}^2$ at 6 meters from the tower



K243BH Silver City
Ground-Level Power Density Calculations
Using Manufacturer's Vertical Plane Pattern

Distance From Tower (meters)	Hypotenuse (meters)	Depression Angle (with MBT adjust) (degrees)	Interpolated Rel Field	Adjusted ERP (watts)	Power Density uW/cm ²
0	5.30	90.00	0.030	0.5	0.54
1	5.39	79.32	0.052	1.3	1.54
2	5.66	69.33	0.201	20.2	21.07
3	6.09	60.49	0.379	71.7	64.60
4	6.64	52.96	0.521	135.6	102.73
5	7.29	46.67	0.621	192.8	121.33
6	8.01	41.46	0.695	241.6	125.93
7	8.78	37.13	0.748	279.4	121.10
8	9.60	33.52	0.789	311.0	112.84
9	10.44	30.49	0.824	339.1	103.86
10	11.32	27.92	0.849	360.2	93.95
11	12.21	25.73	0.870	378.2	84.76
12	13.12	23.83	0.887	393.0	76.29
13	14.04	22.18	0.901	406.2	68.86
14	14.97	20.74	0.913	417.1	62.19
15	15.91	19.46	0.924	426.7	56.33
16	16.85	18.33	0.931	433.4	50.97
17	17.81	17.32	0.937	439.1	46.26
18	18.76	16.41	0.943	444.8	42.20
19	19.73	15.59	0.948	449.8	38.62
20	20.69	14.84	0.953	454.1	35.44
21	21.66	14.16	0.957	457.9	32.62
22	22.63	13.54	0.960	461.1	30.08
23	23.60	12.98	0.963	463.8	27.82
24	24.58	12.45	0.966	466.9	25.82
25	25.56	11.97	0.969	469.6	24.02
26	26.53	11.52	0.971	471.8	22.39
27	27.52	11.11	0.973	473.8	20.91
28	28.50	10.72	0.975	475.7	19.57
29	29.48	10.36	0.977	477.5	18.36
30	30.46	10.02	0.979	479.1	17.25
31	31.45	9.70	0.980	479.8	16.21
32	32.44	9.40	0.980	480.4	15.26
33	33.42	9.12	0.981	480.9	14.38
34	34.41	8.86	0.981	481.6	13.59
35	35.40	8.61	0.982	482.3	12.86
36	36.39	8.38	0.983	483.0	12.19
37	37.38	8.15	0.984	483.7	11.57
38	38.37	7.94	0.984	484.2	10.99
39	39.36	7.74	0.985	484.6	10.45
40	40.35	7.55	0.985	485.0	9.95
41	41.34	7.37	0.985	485.4	9.49
42	42.33	7.19	0.986	485.7	9.06
43	43.33	7.03	0.986	486.0	8.65
44	44.32	6.87	0.986	486.4	8.27

45	45.31	6.72	0.987	486.7	7.92
46	46.30	6.57	0.987	486.9	7.59
47	47.30	6.43	0.987	487.2	7.28
48	48.29	6.30	0.987	487.5	6.98
49	49.29	6.17	0.988	487.7	6.71
50	50.28	6.05	0.988	488.0	6.45
51	51.27	5.93	0.988	488.2	6.20
52	52.27	5.82	0.988	488.4	5.97
53	53.26	5.71	0.989	488.6	5.75
54	54.26	5.61	0.989	488.9	5.55
55	55.25	5.50	0.989	489.1	5.35
56	56.25	5.41	0.989	489.2	5.17
57	57.25	5.31	0.989	489.4	4.99
58	58.24	5.22	0.990	489.6	4.82
59	59.24	5.13	0.990	489.8	4.66
60	60.23	5.05	0.990	490.0	4.51
61	61.23	4.97	0.990	490.1	4.37
62	62.23	4.89	0.990	490.3	4.23
63	63.22	4.81	0.990	490.4	4.10
64	64.22	4.73	0.991	490.6	3.97
65	65.22	4.66	0.991	490.7	3.85
66	66.21	4.59	0.991	490.9	3.74
67	67.21	4.52	0.991	491.0	3.63
68	68.21	4.46	0.991	491.1	3.53
69	69.20	4.39	0.991	491.3	3.43
70	70.20	4.33	0.991	491.4	3.33
71	71.20	4.27	0.991	491.5	3.24
72	72.19	4.21	0.992	491.6	3.15
73	73.19	4.15	0.992	491.7	3.07
74	74.19	4.10	0.992	491.8	2.99
75	75.19	4.04	0.992	491.9	2.91
76	76.18	3.99	0.992	492.1	2.83
77	77.18	3.94	0.992	492.2	2.76
78	78.18	3.89	0.992	492.3	2.69
79	79.18	3.84	0.992	492.4	2.62
80	80.18	3.79	0.992	492.4	2.56
81	81.17	3.74	0.993	492.5	2.50
82	82.17	3.70	0.993	492.6	2.44
83	83.17	3.65	0.993	492.7	2.38
84	84.17	3.61	0.993	492.8	2.32
85	85.17	3.57	0.993	492.9	2.27
86	86.16	3.53	0.993	493.0	2.22
87	87.16	3.49	0.993	493.1	2.17
88	88.16	3.45	0.993	493.1	2.12
89	89.16	3.41	0.993	493.2	2.07
90	90.16	3.37	0.993	493.3	2.03
91	91.15	3.33	0.993	493.4	1.98
92	92.15	3.30	0.993	493.4	1.94
93	93.15	3.26	0.993	493.5	1.90
94	94.15	3.23	0.994	493.6	1.86
95	95.15	3.19	0.994	493.6	1.82
96	96.15	3.16	0.994	493.7	1.78

