

Technical Report W270BK Minor Modification

This technical report is submitted for a minor modification to W270BK, FCC file no. BLFT-20100513ACB. A move to another tower site and change in antenna is submitted for the translator to serve as a fill-in to rebroadcast WQZQ(AM) 830 kHz at Goodlettsville, TN, FCC facility I.D. 72960.

W270BK Modification Analysis:

An overlap study (exhibit E-1) shows the W270BK modification is within the WPRT-FM 273C1 third-adjacent protected contour. Using the vertical elevation pattern of the PSI FML two bay, 0.75 wavelength spaced antenna (exhibit E-2), the 111.7 +40 dBu F(50-10) contour (exhibit E-3) does not reach any buildings, roads or population, as shown in exhibit E-4. A waiver of section 74.1233(a)(1) (*Mattoon Waiver*) is also requested for the W270BK modification. The co-channel 40 dBu F(50-10) contour modification overlaps the current 60 dBu F(50-50) contour (exhibit E-5), and is contained within the WQZQ(AM) 2.0 mV/m daytime contour, as shown in exhibit E-6. The W227DC 60 dBu contour, which also serves as a translator facility for WQZQ(AM), has less than 50 percent overlap to the W270BK modification, also shown in exhibit E-6.

Antenna System:

W270BK is to be relocated to the existing tower, ASR 1000876, at coordinates:

36 25 08N 086 47 18W NAD 27.

A PSI FML two bay, 0.75 wavelength spaced directional antenna (exhibit E-7) will be mounted at a COR AGL of 81 meters, 329 meters AMSL and operate at 0.250 kW ERP.

RF Exposure Calculation:

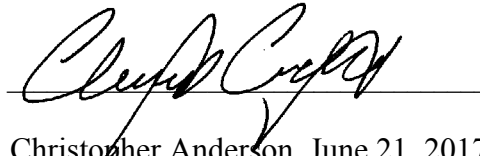
The RF contribution was calculated using the formula from the OET Bulletin 65:

$$S \text{ (RF in microwatts/cm}^2\text{)} = \frac{33.4 \times F^2 \times (H \text{ ERP} + V \text{ ERP in watts})}{R^2 \text{ (height of radiation center in meters}^2\text{)}}$$

Using a worst case vertical (F) factor of 1.0, the RF is calculated to be 2.68 $\mu\text{W/cm}^2$ to the ground, which is 5% of the 200 $\mu\text{W/cm}^2$ maximum permissible for general public exposure allowing exclusion from consideration.

Conclusion:

It is concluded the W270BK modification complies with all Commission rules and policies.



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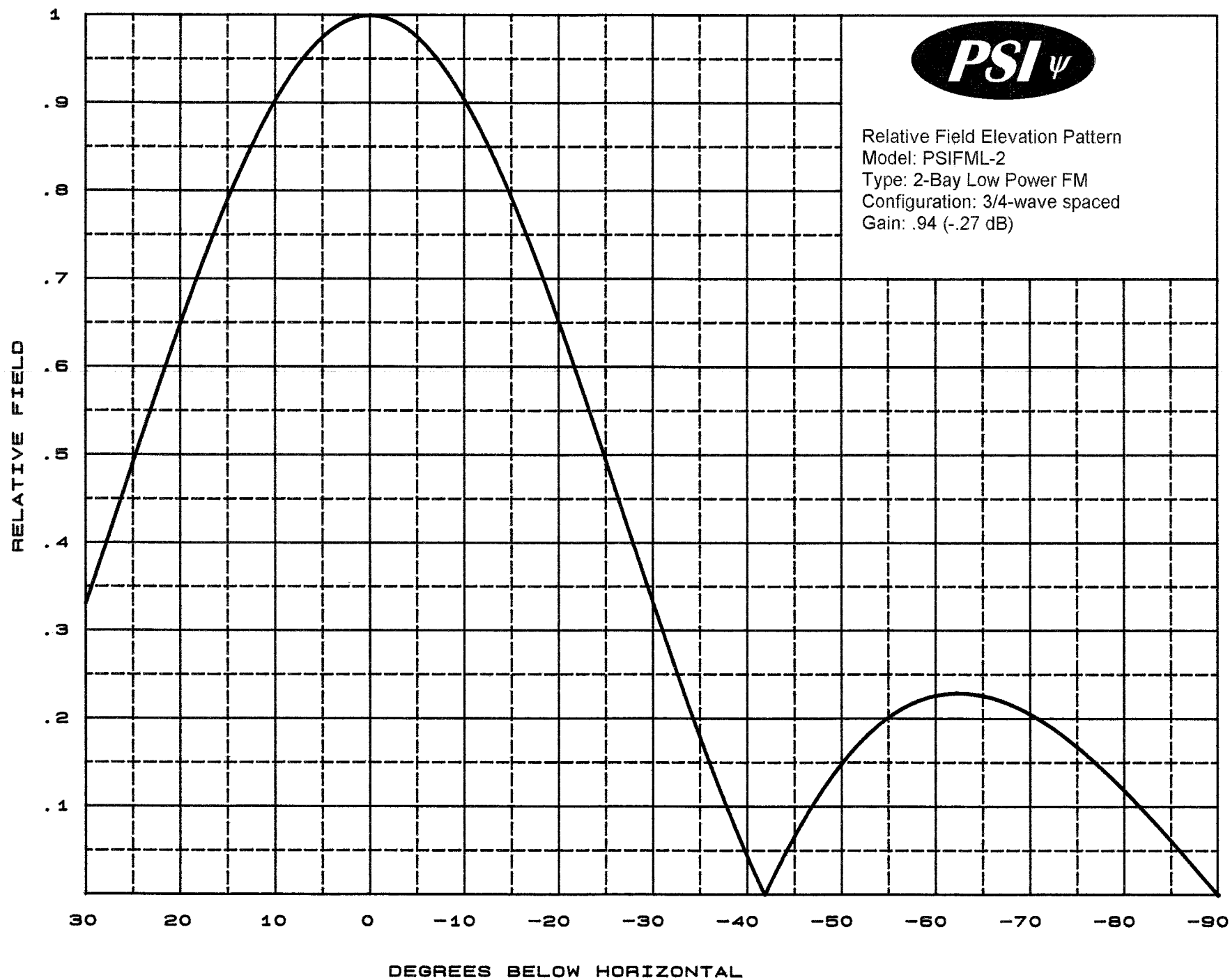
E-1 W270BK Mod. Overlap Study

REFERENCE		CH# 270D - 101.9 MHz, Pwr= 0.25 kW DA, HAAT= 115.0 M, COR= 329 M					DISPLAY DATES			
36 25 08.0 N.		Average Protected F(50-50)= 13.78 km					DATA 06-22-17			
86 47 18.0 W.		Standard Directional					SEARCH 06-22-17			
CH	CALL	TYPE ANT	AZI	DIST	LAT	PWR(kw)	INT(km)	PRO(km)	*IN*	*OUT*
CITY		STATE	<--	FILE #	LNG	HAAT(M)	COR(M)	LICENSEE	(Overlap	in km)
270C1	WQXQ	LIC_CN	352.1	130.80	37 35 03.0	100.000	163.8	65.5	-47.2*	17.3
Central City		KY	172.0	BLH19930826KA	86 59 29.0	204	346	Radio Active Media, Inc.		
273C1	WPRT-FM	LIC NCX	253.4	48.36	36 17 36.0	100.000	10.6	74.5	23.3	-27.3*(1)
Pegram		TN	73.1	BLH20031124ASU	87 18 20.0	297	483	Wycq, Inc.		
271D	W271AB	LIC_C_	192.6	31.67	36 08 27.0	0.145	27.9	18.8	-5.2	0.6
Nashville		TN	12.6	BLFT20091029AAW	86 51 56.0	246	421	Wycq, Inc.		
270D	W270BK	LIC_C_	283.3	52.22	36 31 32.0	0.250	23.8	7.1	14.3	-3.5
Clarksville		TN	103.0	BLFT20100513ACB	87 21 26.0	35	186	Wycq, Inc.		
270D	W270AF	CP_C_	150.8	73.54	35 50 26.0	0.250	46.8	13.8	11.6	13.3
Murfreesboro		TN	331.1	BPFT20170505AAE	86 23 27.0		276	The Rutherford Group, Inc.		
270D	W270AF	LIC_C_	150.8	73.54	35 50 26.0	0.250	41.1	12.0	17.3	15.2
Murfreesboro		TN	331.1	BLFT20151019AAL	86 23 27.0		248	The Rutherford Group, Inc.		
216C2	WFCL	LIC_CX	192.6	31.62	36 08 27.0	10.000	128.8	52.5	14.5R	17.1M
Nashville		TN	12.6	BMLED20030214ABG	86 51 56.0	212	385	Nashville Public Radio		
271A	WLCT	LIC_C_	79.3	70.98	36 32 06.0	6.000	37.1	20.4	24.6	26.9
Lafayette		TN	259.8	BMLH19990624KA	86 00 27.0	99	351	Lafayette Broadcasting Co.		
269A	WKOM	LIC_CN	194.5	91.92	35 37 05.0	4.100	45.1	29.2	37.4	50.6
Columbia		TN	14.3	BLH19970910KF	87 02 33.0	118	332	Middle Tennessee Broadcast		
268D	W268BN	LIC DC_	236.7	62.56	36 06 31.0	0.250	0.7	12.3	48.1	49.2
Dickson		TN	56.4	BLFT20111007ADA	87 22 14.0	105	332	R & F Communications, Inc.		

Terrain database is FCC NGDC 30 Sec , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM										
In & Out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.										
All separation margins (if shown) include rounding.										
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)										
""affixed to 'IN' or 'OUT' values = site inside restricted contour.										

- (1) The +40 111.71 dBu F(50-10) contour within the WPRT-FM 273C1 second adjacent protected contour lowest point = 9.4 meters above the site elevation, which does not reach any population, roads or buildings, as shown in the aerial photo in exhibit E-3.

E-2 W270BK Antenna Vertical Elevation Pattern





Propagation Systems Inc.
 Elevation Pattern Tabulation
 Antenna: PSIFML-2 Special
 Bay spacing: 3/4 wave

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-90.0	0.001	-60.000	-50.0	0.149	-16.513	-10.0	0.903	-0.883
-89.0	0.012	-38.221	-49.0	0.135	-17.364	-9.0	0.921	-0.713
-88.0	0.025	-32.201	-48.0	0.120	-18.405	-8.0	0.937	-0.561
-87.0	0.037	-28.679	-47.0	0.104	-19.677	-7.0	0.952	-0.429
-86.0	0.049	-26.207	-46.0	0.086	-21.289	-6.0	0.964	-0.315
-85.0	0.061	-24.285	-45.0	0.068	-23.404	-5.0	0.975	-0.219
-84.0	0.073	-22.748	-44.0	0.048	-26.425	-4.0	0.984	-0.139
-83.0	0.085	-21.443	-43.0	0.027	-31.481	-3.0	0.991	-0.079
-82.0	0.096	-20.349	-42.0	0.005	-46.848	-2.0	0.996	-0.036
-81.0	0.107	-19.378	-41.0	0.018	-34.664	-1.0	0.999	-0.009
-80.0	0.118	-18.538	-40.0	0.043	-27.417	0.0	1.000	0.000
-79.0	0.129	-17.792	-39.0	0.068	-23.365	1.0	0.999	-0.009
-78.0	0.139	-17.125	-38.0	0.094	-20.529	2.0	0.996	-0.036
-77.0	0.149	-16.522	-37.0	0.121	-18.329	3.0	0.991	-0.079
-76.0	0.159	-15.984	-36.0	0.149	-16.531	4.0	0.984	-0.139
-75.0	0.168	-15.508	-35.0	0.178	-14.998	5.0	0.975	-0.219
-74.0	0.176	-15.072	-34.0	0.207	-13.669	6.0	0.964	-0.315
-73.0	0.184	-14.685	-33.0	0.237	-12.489	7.0	0.952	-0.429
-72.0	0.192	-14.335	-32.0	0.268	-11.431	8.0	0.937	-0.561
-71.0	0.199	-14.026	-31.0	0.299	-10.475	9.0	0.921	-0.713
-70.0	0.205	-13.752	-30.0	0.331	-9.602	10.0	0.903	-0.882
-69.0	0.211	-13.518	-29.0	0.363	-8.801	11.0	0.884	-1.072
-68.0	0.216	-13.315	-28.0	0.395	-8.061	12.0	0.863	-1.279
-67.0	0.220	-13.146	-27.0	0.428	-7.377	13.0	0.841	-1.508
-66.0	0.224	-13.009	-26.0	0.460	-6.742	14.0	0.817	-1.757
-65.0	0.226	-12.904	-25.0	0.493	-6.151	15.0	0.792	-2.029
-64.0	0.228	-12.834	-24.0	0.525	-5.599	16.0	0.765	-2.322
-63.0	0.229	-12.800	-23.0	0.557	-5.083	17.0	0.738	-2.639
-62.0	0.229	-12.794	-22.0	0.589	-4.603	18.0	0.710	-2.979
-61.0	0.228	-12.829	-21.0	0.620	-4.154	19.0	0.680	-3.344
-60.0	0.227	-12.898	-20.0	0.650	-3.736	20.0	0.650	-3.736
-59.0	0.224	-13.009	-19.0	0.680	-3.344	21.0	0.620	-4.154
-58.0	0.220	-13.158	-18.0	0.710	-2.979	22.0	0.589	-4.603
-57.0	0.215	-13.351	-17.0	0.738	-2.639	23.0	0.557	-5.083
-56.0	0.209	-13.600	-16.0	0.765	-2.323	24.0	0.525	-5.599
-55.0	0.202	-13.894	-15.0	0.792	-2.029	25.0	0.493	-6.151
-54.0	0.194	-14.260	-14.0	0.817	-1.759	26.0	0.460	-6.742
-53.0	0.184	-14.685	-13.0	0.840	-1.510	27.0	0.428	-7.377
-52.0	0.174	-15.192	-12.0	0.863	-1.281	28.0	0.395	-8.061
-51.0	0.162	-15.795	-11.0	0.884	-1.072	29.0	0.363	-8.801
						30.0	0.331	-9.602

file: FML 2-bay elevation tabulation

revision: A

Date: 1/28/08

E-3 W270BK Mod. +40 dBu Tabulation Within WPRT-FM 273C1

W270BK Clarksville, TN
74.1204(d) Showing
Translator or LPFM Maximum Licensed ERP = 0.25
Translator or LPFM Antenna Height AG = 81 Meters
W270BK Antenna Model = PSI FML-2-075

Protected Station's Contour = 71.71246 dBu
Translator's or LPFM's full Interference contour 111.71246

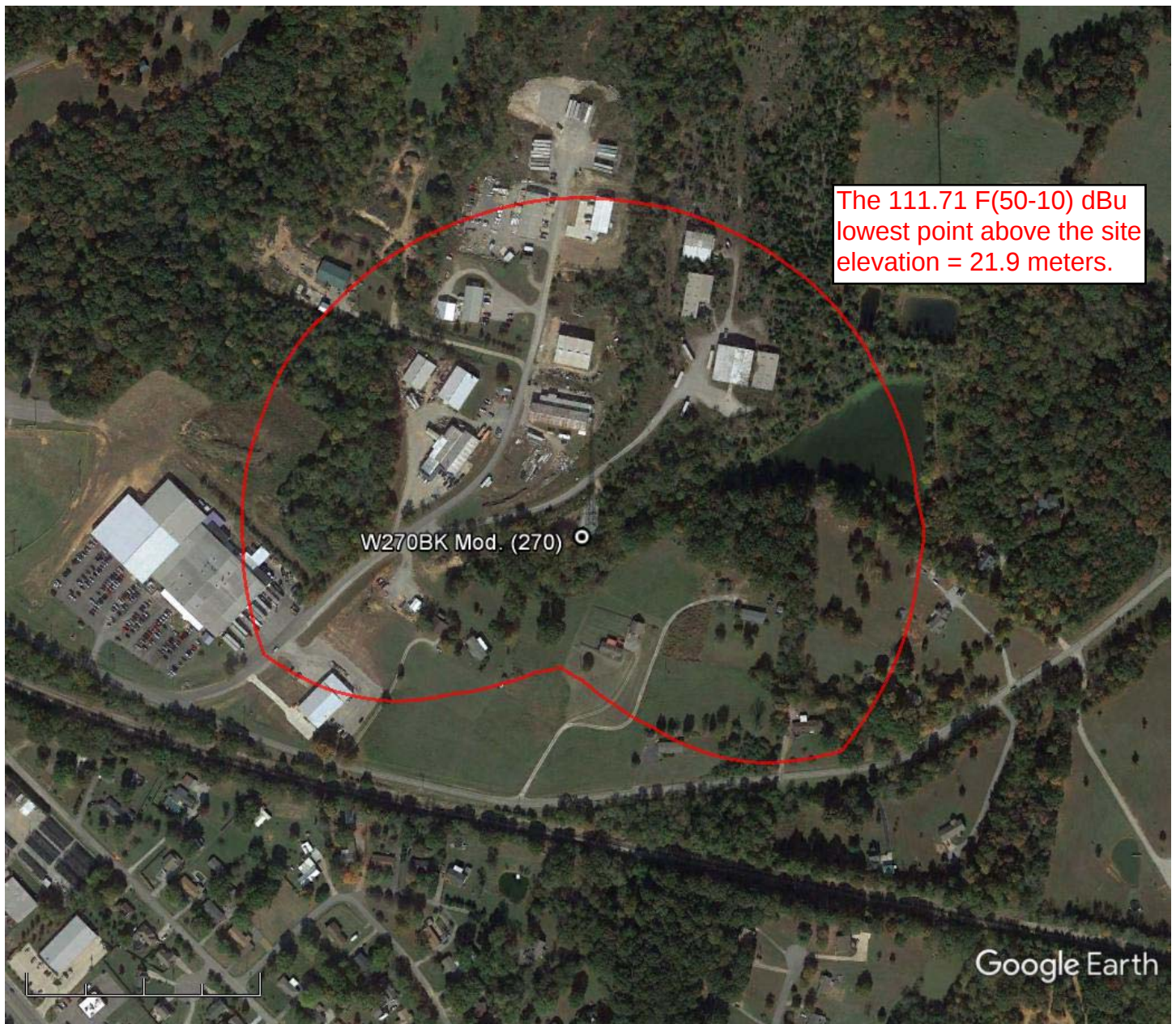
Review Azimuth = 0 Degrees True
Relative Field on the horizon at Review Azimuth = 1.000
Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW
Distance between stations = 48.4 km
Protected Station= WPRT-FM, 100 kW, 483 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle (m)	Dist to IX Contour From Tower Base (m)	Height IX Above Ground (m)
00.00	1.0	1.0	0.2500	287.9698	287.9698	081.000
01.00	0.998	1.0	0.2490	287.3939	287.3501	075.984
02.00	0.996	1.0	0.2480	286.8180	286.6432	070.990
03.00	0.991	1.0	0.2455	285.3781	284.9870	066.064
04.00	0.984	1.0	0.2421	283.3623	282.6721	061.234
05.00	0.975	1.0	0.2377	280.7706	279.7022	056.529
06.00	0.964	1.0	0.2323	277.6029	276.0822	051.983
07.00	0.952	1.0	0.2266	274.1473	272.1038	047.590
08.00	0.937	1.0	0.2195	269.8277	267.2018	043.447
09.00	0.921	1.0	0.2121	265.2202	261.9549	039.510
10.00	0.903	1.0	0.2039	260.0368	256.0862	035.845
11.00	0.884	1.0	0.1954	254.5653	249.8883	032.427
12.00	0.863	1.0	0.1862	248.5180	243.0873	029.330
13.00	0.84	1.0	0.1764	241.8947	235.6949	026.586
14.00	0.817	1.0	0.1669	235.2714	228.2828	024.083
15.00	0.792	1.0	0.1568	228.0721	220.3007	021.971
16.00	0.765	1.0	0.1463	220.2969	211.7630	020.278
17.00	0.738	1.0	0.1362	212.5217	203.2355	018.865
18.00	0.71	1.0	0.1260	204.4586	194.4517	017.819
19.00	0.68	1.0	0.1156	195.8195	185.1510	017.247
20.00	0.65	1.0	0.1056	187.1804	175.8920	016.981
21.00	0.62	1.0	0.0961	178.5413	166.6827	017.017
22.00	0.589	1.0	0.0867	169.6142	157.2636	017.461
23.00	0.557	1.0	0.0776	160.3992	147.6482	018.327
24.00	0.525	1.0	0.0689	151.1842	138.1136	019.508
25.00	0.493	1.0	0.0608	141.9691	128.6677	021.001
26.00	0.46	1.0	0.0529	132.4661	119.0598	022.931
27.00	0.428	1.0	0.0458	123.2511	109.8175	025.045
28.00	0.395	1.0	0.0390	113.7481	100.4336	027.599
29.00	0.363	1.0	0.0329	104.5331	91.4267	030.321
30.00	0.331	1.0	0.0274	95.3180	82.5478	033.341
31.00	0.299	1.0	0.0224	86.1030	73.8047	036.654
32.00	0.268	1.0	0.0180	77.1759	65.4489	040.103
33.00	0.237	1.0	0.0140	68.2489	57.2383	043.829
34.00	0.207	1.0	0.0107	59.6098	49.4187	047.667
35.00	0.178	1.0	0.0079	51.2586	41.9886	051.599
36.00	0.149	1.0	0.0056	42.9075	34.7129	055.780
37.00	0.121	1.0	0.0037	34.8444	27.8279	060.030
38.00	0.094	1.0	0.0022	27.0692	21.3308	064.335
39.00	0.068	1.0	0.0012	19.5820	15.2180	068.677
40.00	0.043	1.0	0.0005	12.3827	9.4857	073.041
41.00	0.018	1.0	0.0001	5.1835	3.9120	077.599
42.00	0.005	1.0	0.0000	1.4398	1.0700	080.037
43.00	0.027	1.0	0.0002	7.7752	5.6864	075.697
44.00	0.048	1.0	0.0006	13.8226	9.9431	071.398
45.00	0.068	1.0	0.0012	19.5820	13.8465	067.153
46.00	0.086	1.0	0.0018	24.7654	17.2035	063.185
47.00	0.104	1.0	0.0027	29.9489	20.4251	059.097
48.00	0.12	1.0	0.0036	34.5564	23.1227	055.320
49.00	0.135	1.0	0.0046	38.8759	25.5049	051.660
50.00	0.149	1.0	0.0056	42.9075	27.5804	048.131
51.00	0.162	1.0	0.0066	46.6511	29.3585	044.745
52.00	0.174	1.0	0.0076	50.1068	30.8488	041.515
53.00	0.184	1.0	0.0085	52.9865	31.8880	038.683
54.00	0.194	1.0	0.0094	55.8662	32.8373	035.803
55.00	0.202	1.0	0.0102	58.1699	33.3649	033.350
56.00	0.209	1.0	0.0109	60.1857	33.6554	031.104
57.00	0.215	1.0	0.0116	61.9135	33.7205	029.075
58.00	0.22	1.0	0.0121	63.3534	33.5722	027.273
59.00	0.224	1.0	0.0125	64.5052	33.2227	025.708
60.00	0.227	1.0	0.0129	65.3692	32.6846	024.389
61.00	0.228	1.0	0.0130	65.6571	31.8312	023.575
62.00	0.229	1.0	0.0131	65.9451	30.9593	022.774
63.00	0.229	1.0	0.0131	65.9451	29.9384	022.242
64.00	0.228	1.0	0.0130	65.6571	28.7822	021.988 (1)
65.00	0.226	1.0	0.0128	65.0812	27.5045	022.016
66.00	0.224	1.0	0.0125	64.5052	26.2366	022.072
67.00	0.22	1.0	0.0121	63.3534	24.7541	022.683
68.00	0.216	1.0	0.0117	62.2015	23.3011	023.328
69.00	0.211	1.0	0.0111	60.7616	21.7750	024.274
70.00	0.205	1.0	0.0105	59.0338	20.1908	025.526

E-3 W270BK Mod. +40 dBu Tabulation Within WPRT-FM 273C1, cont.

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle (m)	Dist to IX Contour From Tower Base (m)	Height IX Above Ground (m)
71.00	0.199	1.0	0.0099	057.3060	018.6570	026.816
72.00	0.192	1.0	0.0092	055.2902	017.0856	028.416
73.00	0.184	1.0	0.0085	052.9865	015.4917	030.329
74.00	0.176	1.0	0.0077	050.6827	013.9700	032.281
75.00	0.168	1.0	0.0071	048.3789	012.5214	034.270
76.00	0.159	1.0	0.0063	045.7872	011.0769	036.573
77.00	0.149	1.0	0.0056	042.9075	009.6521	039.192
78.00	0.139	1.0	0.0048	040.0278	008.3222	041.847
79.00	0.129	1.0	0.0042	037.1481	007.0882	044.534
80.00	0.118	1.0	0.0035	033.9804	005.9006	047.536
81.00	0.107	1.0	0.0029	030.8128	004.8202	050.567
82.00	0.096	1.0	0.0023	027.6451	003.8475	053.624
83.00	0.085	1.0	0.0018	024.4774	002.9830	056.705
84.00	0.073	1.0	0.0013	021.0218	002.1974	060.093
85.00	0.061	1.0	0.0009	017.5662	001.5310	063.501
86.00	0.049	1.0	0.0006	014.1105	000.9843	066.924
87.00	0.037	1.0	0.0003	010.6549	000.5576	070.360
88.00	0.025	1.0	0.0002	007.1992	000.2513	073.805
89.00	0.012	1.0	0.0000	003.4556	000.0603	077.545
90.00	0.001	1.0	0.0000	000.2880	000.0000	080.712

(1) The +40 111.71 dBu F(50-10) contour lowest point within the WPRT-FM 273C1 second adjacent protected contour = 21.9 meters.

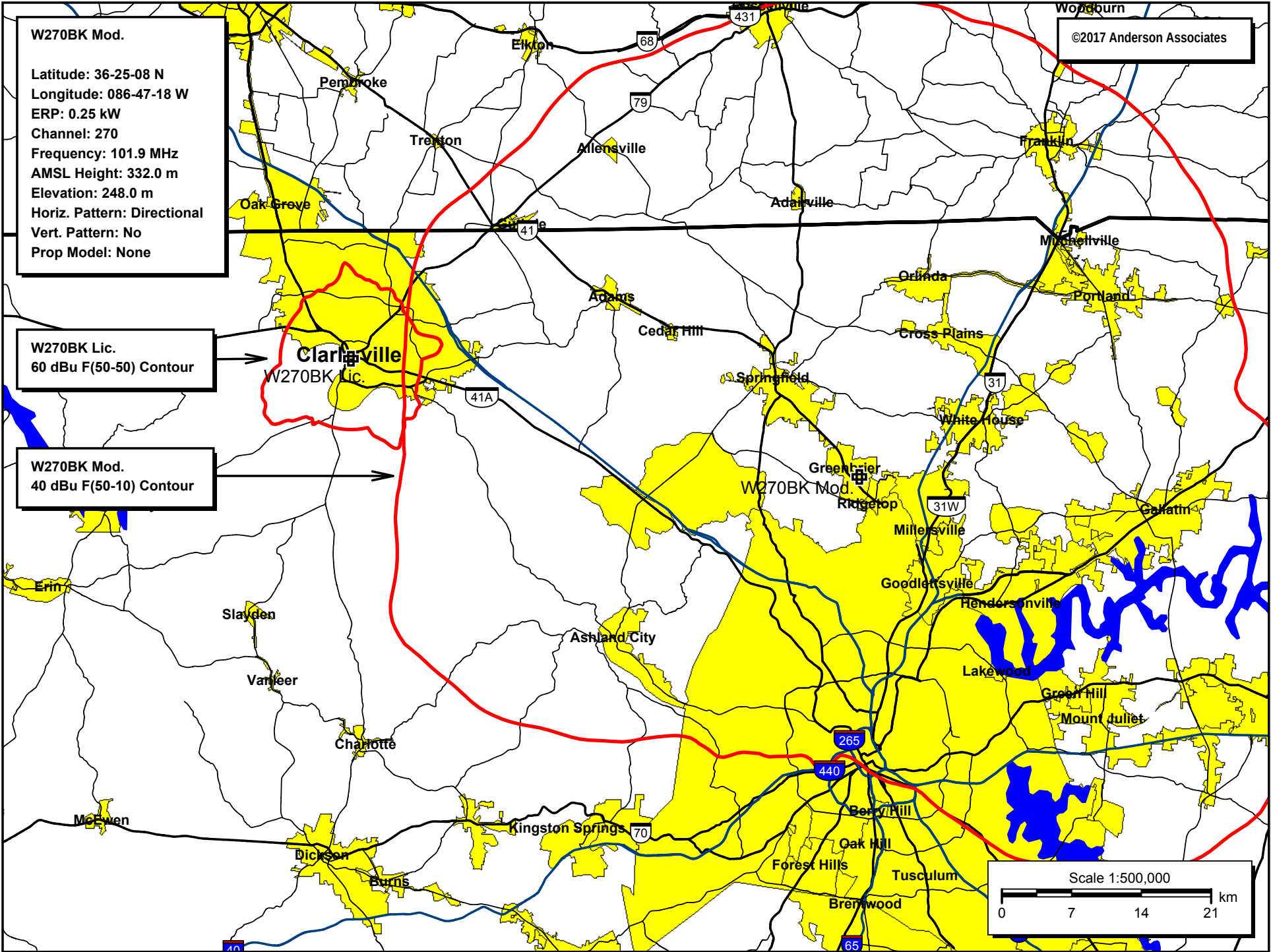


Google Earth

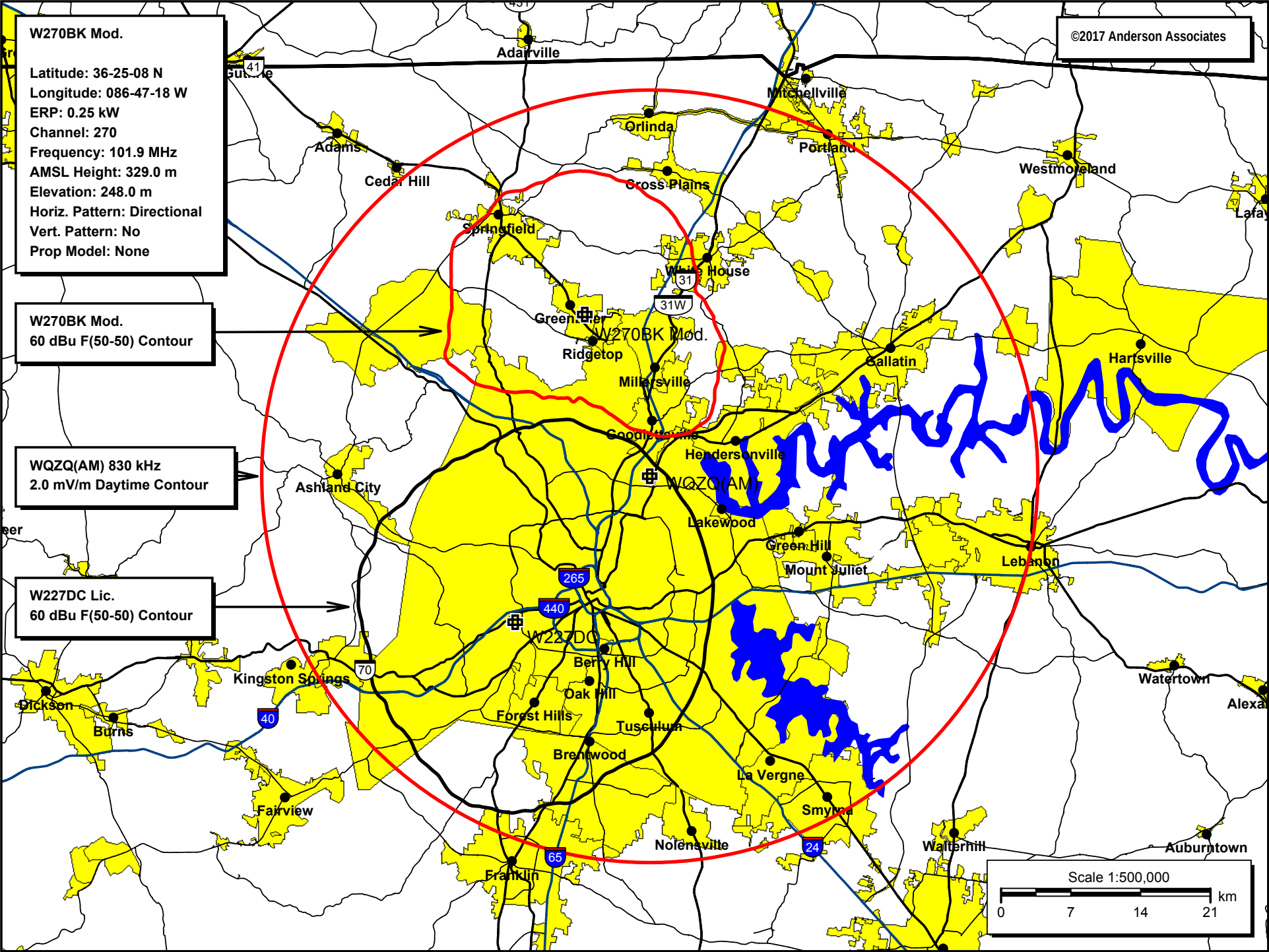
feet
meters



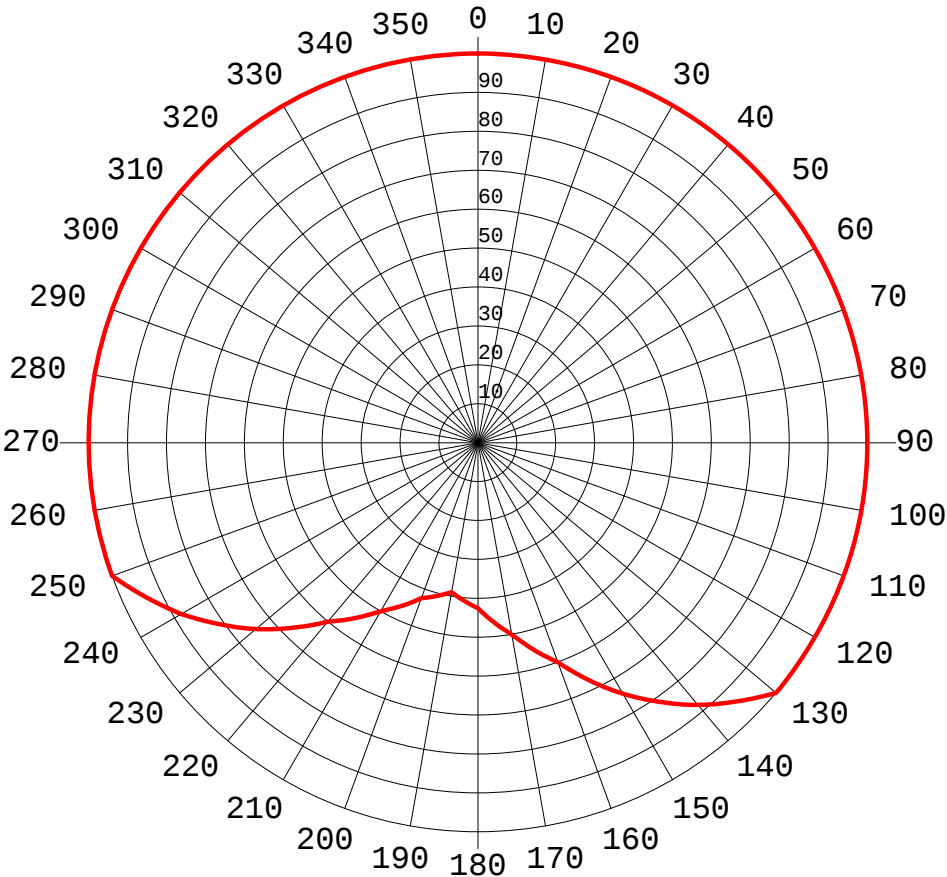
E-5 W270BK Mod. Mattoon Overlap Plot



E-6 W270BK Mod. 60 dBu Contour Plot



E-7 W270BK Directional Antenna Pattern



Azi	Rel	dBk	kW	dB	Azi	Rel	dBk	kW	dB
0	1.000	-6.02	0.250	0.00	180	0.425	-13.45	0.045	-7.43
10	1.000	-6.02	0.250	0.00	190	0.390	-14.20	0.038	-8.18
20	1.000	-6.02	0.250	0.00	200	0.425	-13.45	0.045	-7.43
30	1.000	-6.02	0.250	0.00	210	0.500	-12.04	0.062	-6.02
40	1.000	-6.02	0.250	0.00	220	0.600	-10.46	0.090	-4.44
50	1.000	-6.02	0.250	0.00	230	0.745	-8.58	0.139	-2.56
60	1.000	-6.02	0.250	0.00	240	0.880	-7.13	0.194	-1.11
70	1.000	-6.02	0.250	0.00	250	1.000	-6.02	0.250	0.00
80	1.000	-6.02	0.250	0.00	260	1.000	-6.02	0.250	0.00
90	1.000	-6.02	0.250	0.00	270	1.000	-6.02	0.250	0.00
100	1.000	-6.02	0.250	0.00	280	1.000	-6.02	0.250	0.00
110	1.000	-6.02	0.250	0.00	290	1.000	-6.02	0.250	0.00
120	1.000	-6.02	0.250	0.00	300	1.000	-6.02	0.250	0.00
130	1.000	-6.02	0.250	0.00	310	1.000	-6.02	0.250	0.00
140	0.880	-7.13	0.194	-1.11	320	1.000	-6.02	0.250	0.00
150	0.745	-8.58	0.139	-2.56	330	1.000	-6.02	0.250	0.00
160	0.600	-10.46	0.090	-4.44	340	1.000	-6.02	0.250	0.00
170	0.500	-12.04	0.062	-6.02	350	1.000	-6.02	0.250	0.00

Rotation Angle = 0

ASR Registration 1000876

Registration Detail

Reg Number	1000876	Status	Constructed
File Number	A1012772	Constructed	09/10/2009
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

Location (in NAD83 Coordinates)

Lat/Long	36-25-08.6 N 086-47-17.6 W	Address	2331 INDUSTRIAL CT
City, State	GREENBRIAR , TN		
Zip	37073	County	ROBERTSON
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
248.4	90.8
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
339.2	86.9

Painting and Lighting Specifications

FAA Chapters 4, 6, 12

Paint and Light in Accordance with FAA Circular Number 70/7460-1K

FAA Notification

FAA Study	2009-ASO-3842-OE	FAA Issue Date	09/02/2009
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Owner & Contact Information

FRN	0005793682	Owner Entity	Limited Liability Company Type
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Owner

Crown Castle GT Company LLC
2000 Corporate Drive
Canonsburg , PA 15317

P: (724)416-2000
F:
E: Regulatory.Department@CrownCastle.com

Contact

Snyder , Don
2000 Corporate Drive
Canonsburg , PA 15317

P: (724)416-2470
F:
E: Don.Snyder@crowncastle.com

Last Action Status

Status	Constructed	Received	05/06/2016
Purpose	Admin Update	Entered	05/06/2016
Mode	Interactive		