

**Technical Report
W251CB.CP Minor Modification
250 Mile Move**

This technical report is submitted for a minor modification to W251CB.CP, FCC file no. BNPFT-20130820AAR. A move to channel 295 and new tower site within the allowed 250 mile radius is submitted with corresponding changes in antenna and ERP. The translator is to serve as a fill-in facility to rebroadcast WKZO(AM) 590 kHz at Kalamazoo, MI, FCC facility I.D. no. 54485.

W251CB.CP Modification Analysis:

An overlap study (exhibit E-1) shows the W251CB.CP modification to channel 295 is within the WVFM(FM) 293B second-adjacent protected contour. A tabulation of the +40 dBu F(50-10) contour in exhibit E-2 using the vertical elevation pattern of the Bext TFC2K two bay, 0.75 wavelength-spaced antenna (exhibit E-3) shows the lowest point above the site elevation = 26.5 meters, which will not reach any population, roads or buildings (exhibit E-4). The 60 dBu F(50-50) contour is contained within the primary WKZO(AM) 2.0 mV/m daytime contour (exhibit E-5), and is located within 250 miles of the current facility (exhibit E-6).

Antenna System:

W251CB.CP is to be relocated to the ASR tower 1021494 at coordinates:

42 17 48N 085 38 29W NAD 27.

A Bext TFC2K two bay, 0.75 wavelength-spaced, directional antenna (exhibit E-7) will be mounted at a COR AGL of 59 meters, 346 meters AMSL and operate at 0.200 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 4.1 $\mu\text{W/cm}^2$ to the ground, which is 2% and less than 5% of the 200 $\mu\text{W/cm}^2$ maximum permissible for general public exposure allowing exclusion from consideration.

Conclusion:

It is concluded that the W251CB.CP modification complies with all Commission rules and policies.



Christopher Anderson July 18, 2016
andersce@bham.rr.com
© 2016 Anderson Associates

E1 CHANNEL STUDY

REFERENCE
42 17 48.0 N.
85 38 29.0 W.

CH# 295D - 106.9 MHz, Pwr= 0.2 kW DA, HAAT= 82.8 M, COR= 346 M
Average Protected F(50-50)= 11.15 km
Standard Directional

DISPLAY DATES
DATA 07-11-16
SEARCH 07-11-16

CH CITY	CALL	TYPE STATE	ANT AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
293B Kalamazoo	WVFM	LIC NCX MI	32.7 212.8	23.76 BLH20060726ANY	42 28 35.0 85 29 05.0	33.000 183	5.8 452	64.4 Midwest Communications, In	7.7	-42.1* (1)
295B Muskegon	WOOD-FM	LIC _C_ MI	340.9 160.6	109.88 BLH20000410ACJ	43 13 48.0 86 05 03.0	50.000 146	137.7 347	65.1 Cc Licenses, Llc	-36.9*	1.5
295A Spring Arbor	WSAE	LIC NC_ MI	99.7 280.4	91.29 BMLH20141105ACS	42 09 13.0 84 32 58.0	3.900 102	80.1 417	25.8 Spring Arbor University	-1.3	22.6
297B Greenville	WBBL-FM	LIC _CN MI	16.4 196.6	83.82 BLH19891122KB	43 01 10.0 85 20 58.0	50.000 150	6.3 399	67.0 Radio License Holding Cbc,	68.3	15.5
296A St. Joseph	WIRX	LIC _CN MI	247.7 67.2	65.05 BLH19901010KE	42 04 19.0 86 22 14.0	1.200 152	32.5 359	21.9 wsjm, Inc.	22.6	29.1
295B Marion	WXXC	LIC _CN IN	180.4 0.4	188.88 BLH19830418AS	40 35 52.0 85 39 21.0	50.000 152	137.9 408	65.3 Hoosier Am/fm, Llc	40.9	74.4
241B Holland	WMAX-FM	LIC DEN MI	342.3 162.1	61.01 BLH19850403KR	42 49 10.0 85 52 09.0	50.000 150	5.8 357	64.3 Cc Licenses, Llc	14.5R	46.5M

Terrain database is USGS 03 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 115.76 interference contour to WVFM clears the ground by 25 meters. The tallest building within the contour is two stories. See E2 and E4.

E2 WVFM ANALYSIS

W251CB Kalamazoo, MI

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 59 Meters

W251CB Antenna Model = BEXT TFC2K-2-75%

Protected Station's Contour = 75.76119 dBu

Translator's or LPFM's full Interference contour 115.76119

Review Azimuth = 0 Degrees True

Relative Field on the horizon at Review Azimuth = 1.000

Translator/LPFM ERP on the horizon at Review Azimuth = 0.2 kW

Distance between stations = 23.8 km

Protected Station= WVFM, 33 kW, 452 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	1.00	1.0	0.2000	161.6053	161.6053	059.000
05.00	0.955	1.0	0.1824	154.3330	153.7457	045.549
10.00	0.859	1.0	0.1476	138.8189	136.7100	034.894
15.00	0.737	1.0	0.1086	119.1031	115.0447	028.174
20.00	0.615	1.0	0.0756	099.3872	093.3935	025.008 (1)
25.00	0.494	1.0	0.0488	079.8330	072.3533	025.261
30.00	0.35	1.0	0.0245	056.5618	048.9840	030.719
35.00	0.194	1.0	0.0075	031.3514	025.6816	041.018
40.00	0.051	1.0	0.0005	008.2419	006.3136	053.702
45.00	0.071	1.0	0.0010	011.4740	008.1133	050.887
50.00	0.149	1.0	0.0044	024.0792	015.4778	040.554
55.00	0.184	1.0	0.0068	029.7354	017.0555	034.642
60.00	0.19	1.0	0.0072	030.7050	015.3525	032.409
65.00	0.178	1.0	0.0063	028.7657	012.1569	032.929
70.00	0.156	1.0	0.0049	025.2104	008.6225	035.310
75.00	0.126	1.0	0.0032	020.3623	005.2701	039.332
80.00	0.09	1.0	0.0016	014.5445	002.5256	044.676
85.00	0.051	1.0	0.0005	008.2419	000.7183	050.789
90.00	0.02	1.0	0.0001	003.2321	000.0000	055.768

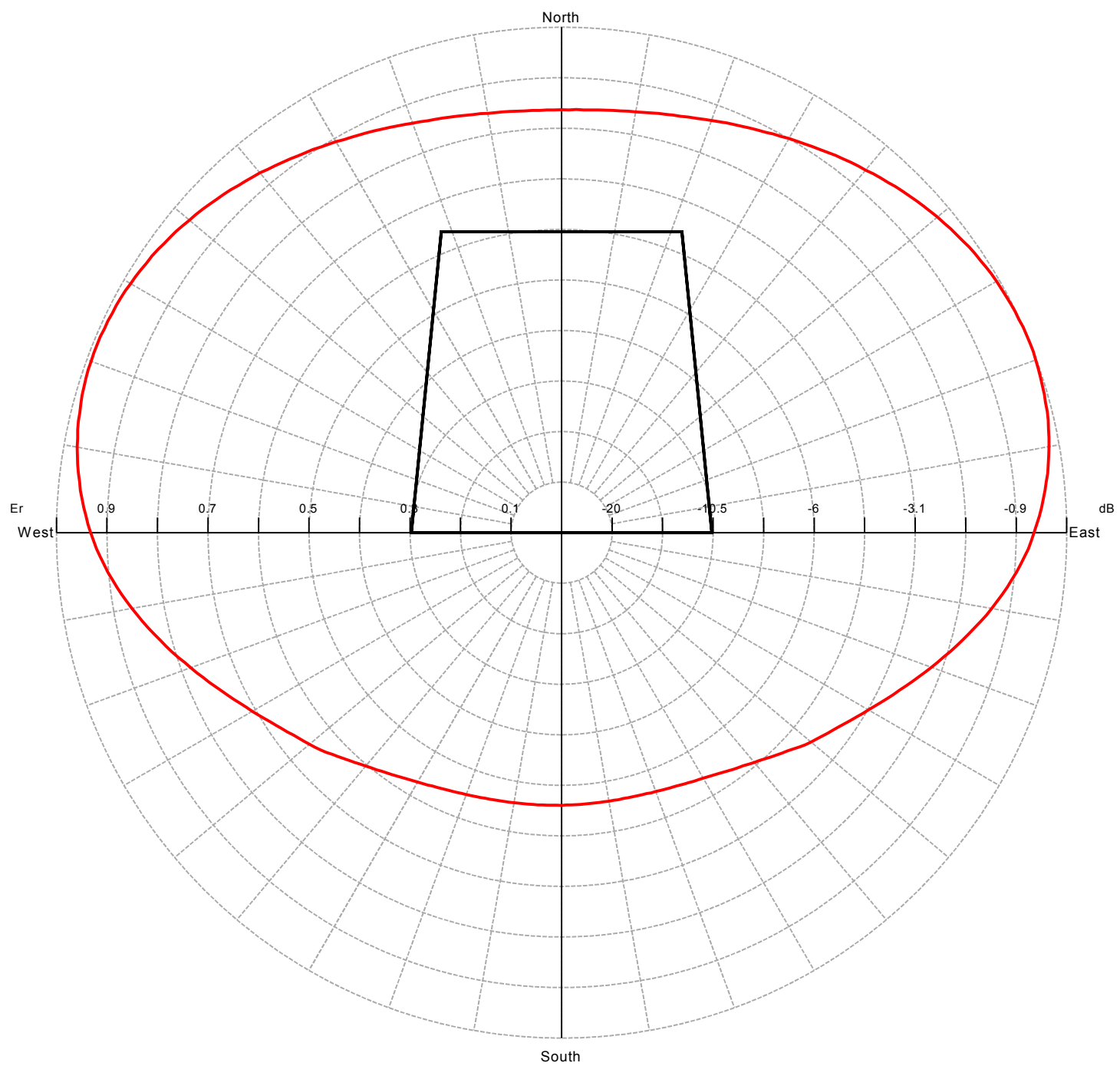
(1) Minimum height above ground is 25 meters. The tallest building is two stories.

X-Field™ By V-Soft

Communications®LLC

E3 TFC-2K ANTENNA TABULATION

Horizontal diagram at 0.0° tilt (Total Antenna)



0.0° Tilt (Total Antenna), Gain (dBd): -0.72 ERP T.Max(KW): 0.0008 ERP E.Max(KW): 0.0008

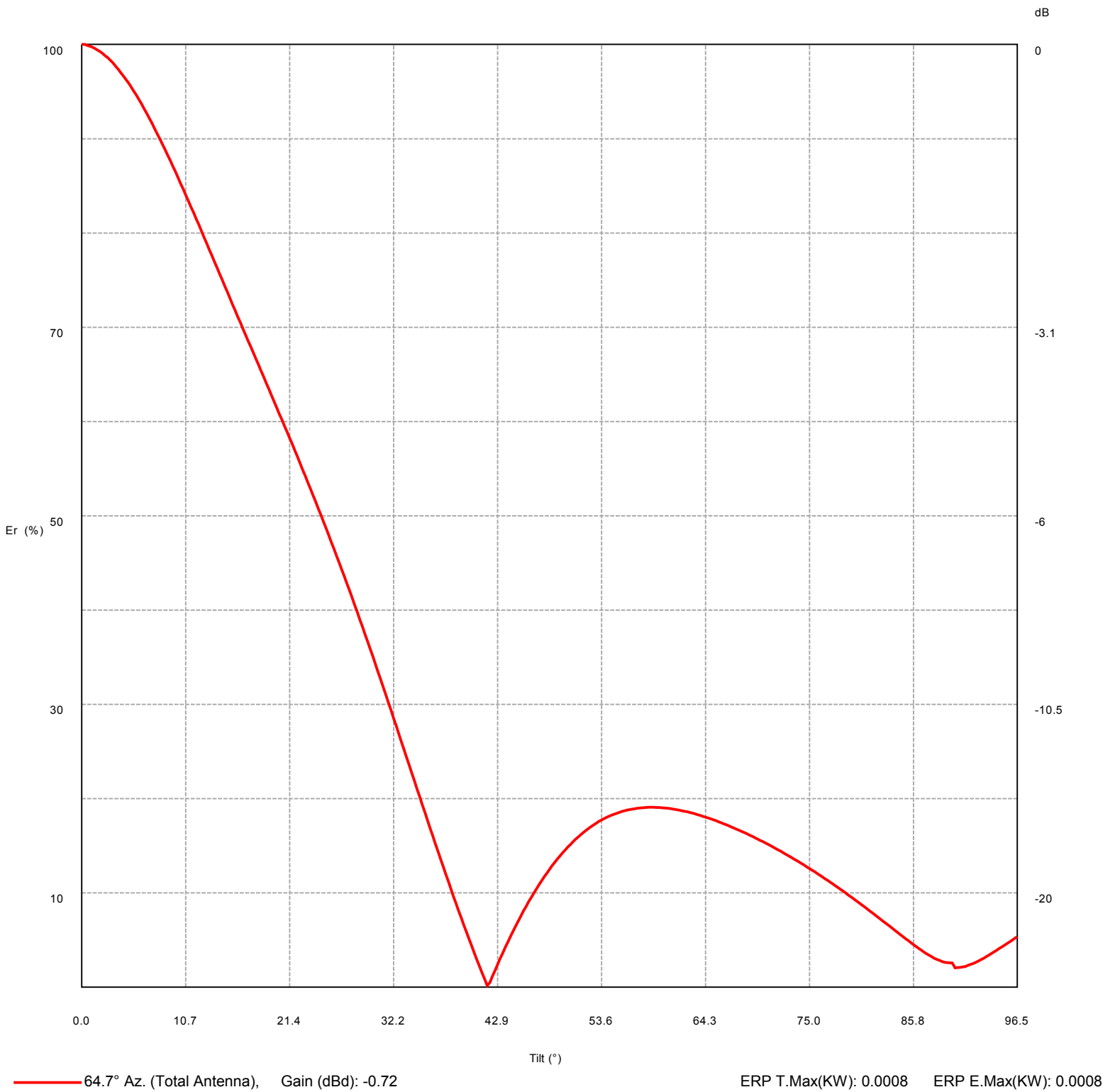
Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)
0.0	83.7	0.6	60.0	99.4	0.8	120.0	70.2	0.4
1.0	83.7	0.6	61.0	99.5	0.8	121.0	69.5	0.4
2.0	83.8	0.6	62.0	99.7	0.8	122.0	68.8	0.4
3.0	83.8	0.6	63.0	99.8	0.8	123.0	68.2	0.4
4.0	83.8	0.6	64.0	99.9	0.8	124.0	67.6	0.4
5.0	83.9	0.6	65.0	99.9	0.8	125.0	67.0	0.4
6.0	84.0	0.6	66.0	100.0	0.8	126.0	66.5	0.4
7.0	84.1	0.6	67.0	100.0	0.8	127.0	66.0	0.4
8.0	84.2	0.6	68.0	100.0	0.8	128.0	65.4	0.4
9.0	84.4	0.6	69.0	100.0	0.8	129.0	64.9	0.4
10.0	84.5	0.6	70.0	99.9	0.8	130.0	64.5	0.4
11.0	84.7	0.6	71.0	99.8	0.8	131.0	63.9	0.3
12.0	84.9	0.6	72.0	99.7	0.8	132.0	63.3	0.3
13.0	85.1	0.6	73.0	99.5	0.8	133.0	62.8	0.3
14.0	85.3	0.6	74.0	99.4	0.8	134.0	62.2	0.3
15.0	85.5	0.6	75.0	99.2	0.8	135.0	61.7	0.3
16.0	85.7	0.6	76.0	99.1	0.8	136.0	61.2	0.3
17.0	86.0	0.6	77.0	98.9	0.8	137.0	60.7	0.3
18.0	86.2	0.6	78.0	98.5	0.8	138.0	60.2	0.3
19.0	86.5	0.6	79.0	98.3	0.8	139.0	59.7	0.3
20.0	86.8	0.6	80.0	97.9	0.8	140.0	59.3	0.3
21.0	87.1	0.6	81.0	97.6	0.8	141.0	58.9	0.3
22.0	87.4	0.6	82.0	97.3	0.8	142.0	58.5	0.3
23.0	87.7	0.7	83.0	96.9	0.8	143.0	58.2	0.3
24.0	88.0	0.7	84.0	96.5	0.8	144.0	57.9	0.3
25.0	88.3	0.7	85.0	96.1	0.8	145.0	57.5	0.3
26.0	88.6	0.7	86.0	95.6	0.8	146.0	57.2	0.3
27.0	88.9	0.7	87.0	95.2	0.8	147.0	56.9	0.3
28.0	89.3	0.7	88.0	94.6	0.8	148.0	56.6	0.3
29.0	89.6	0.7	89.0	94.1	0.8	149.0	56.3	0.3
30.0	90.1	0.7	90.0	93.5	0.7	150.0	56.1	0.3
31.0	90.4	0.7	91.0	93.0	0.7	151.0	55.9	0.3
32.0	90.7	0.7	92.0	92.4	0.7	152.0	55.7	0.3
33.0	91.1	0.7	93.0	91.8	0.7	153.0	55.5	0.3
34.0	91.4	0.7	94.0	91.1	0.7	154.0	55.3	0.3
35.0	91.8	0.7	95.0	90.4	0.7	155.0	55.1	0.3
36.0	92.3	0.7	96.0	89.6	0.7	156.0	55.0	0.3
37.0	92.6	0.7	97.0	88.9	0.7	157.0	54.9	0.3
38.0	93.0	0.7	98.0	88.1	0.7	158.0	54.8	0.3
39.0	93.3	0.7	99.0	87.3	0.6	159.0	54.6	0.3
40.0	93.6	0.7	100.0	86.4	0.6	160.0	54.5	0.3
41.0	94.1	0.8	101.0	85.6	0.6	161.0	54.4	0.3
42.0	94.4	0.8	102.0	84.8	0.6	162.0	54.3	0.3
43.0	94.7	0.8	103.0	83.9	0.6	163.0	54.3	0.2
44.0	95.2	0.8	104.0	83.0	0.6	164.0	54.2	0.2
45.0	95.5	0.8	105.0	82.2	0.6	165.0	54.1	0.2
46.0	95.8	0.8	106.0	81.3	0.6	166.0	54.1	0.2
47.0	96.2	0.8	107.0	80.5	0.5	167.0	54.0	0.2
48.0	96.5	0.8	108.0	79.6	0.5	168.0	54.0	0.2
49.0	96.8	0.8	109.0	78.8	0.5	169.0	53.9	0.2
50.0	97.2	0.8	110.0	77.9	0.5	170.0	53.9	0.2
51.0	97.4	0.8	111.0	77.0	0.5	171.0	53.9	0.2
52.0	97.7	0.8	112.0	76.2	0.5	172.0	53.9	0.2
53.0	97.9	0.8	113.0	75.4	0.5	173.0	53.9	0.2
54.0	98.2	0.8	114.0	74.6	0.5	174.0	53.9	0.2
55.0	98.5	0.8	115.0	73.8	0.5	175.0	53.9	0.2
56.0	98.7	0.8	116.0	73.1	0.5	176.0	53.9	0.2
57.0	98.9	0.8	117.0	72.3	0.4	177.0	53.9	0.2
58.0	99.1	0.8	118.0	71.5	0.4	178.0	53.9	0.2
59.0	99.3	0.8	119.0	70.8	0.4	179.0	53.9	0.2

Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)
180.0	54.0	0.2	240.0	70.7	0.4	300.0	98.5	0.8
181.0	54.0	0.2	241.0	71.3	0.4	301.0	98.4	0.8
182.0	54.0	0.2	242.0	72.0	0.4	302.0	98.2	0.8
183.0	54.0	0.2	243.0	72.7	0.4	303.0	97.9	0.8
184.0	54.0	0.2	244.0	73.5	0.5	304.0	97.8	0.8
185.0	54.1	0.2	245.0	74.2	0.5	305.0	97.6	0.8
186.0	54.1	0.2	246.0	75.0	0.5	306.0	97.3	0.8
187.0	54.1	0.2	247.0	75.8	0.5	307.0	97.1	0.8
188.0	54.1	0.2	248.0	76.5	0.5	308.0	96.8	0.8
189.0	54.2	0.2	249.0	77.4	0.5	309.0	96.5	0.8
190.0	54.3	0.3	250.0	78.1	0.5	310.0	96.2	0.8
191.0	54.3	0.3	251.0	78.9	0.5	311.0	95.9	0.8
192.0	54.4	0.3	252.0	79.8	0.5	312.0	95.6	0.8
193.0	54.4	0.3	253.0	80.6	0.6	313.0	95.3	0.8
194.0	54.5	0.3	254.0	81.5	0.6	314.0	95.0	0.8
195.0	54.6	0.3	255.0	82.2	0.6	315.0	94.6	0.8
196.0	54.7	0.3	256.0	83.1	0.6	316.0	94.3	0.8
197.0	54.8	0.3	257.0	84.0	0.6	317.0	93.9	0.7
198.0	54.9	0.3	258.0	84.8	0.6	318.0	93.5	0.7
199.0	55.0	0.3	259.0	85.6	0.6	319.0	93.2	0.7
200.0	55.1	0.3	260.0	86.4	0.6	320.0	92.9	0.7
201.0	55.3	0.3	261.0	87.2	0.6	321.0	92.5	0.7
202.0	55.5	0.3	262.0	88.0	0.7	322.0	92.2	0.7
203.0	55.6	0.3	263.0	88.7	0.7	323.0	91.7	0.7
204.0	55.7	0.3	264.0	89.4	0.7	324.0	91.4	0.7
205.0	55.9	0.3	265.0	90.2	0.7	325.0	91.0	0.7
206.0	56.1	0.3	266.0	90.8	0.7	326.0	90.7	0.7
207.0	56.3	0.3	267.0	91.4	0.7	327.0	90.4	0.7
208.0	56.5	0.3	268.0	92.1	0.7	328.0	89.9	0.7
209.0	56.7	0.3	269.0	92.7	0.7	329.0	89.6	0.7
210.0	57.0	0.3	270.0	93.2	0.7	330.0	89.3	0.7
211.0	57.3	0.3	271.0	93.8	0.7	331.0	88.9	0.7
212.0	57.5	0.3	272.0	94.2	0.8	332.0	88.6	0.7
213.0	57.8	0.3	273.0	94.7	0.8	333.0	88.3	0.7
214.0	58.1	0.3	274.0	95.2	0.8	334.0	88.0	0.7
215.0	58.5	0.3	275.0	95.6	0.8	335.0	87.7	0.7
216.0	58.8	0.3	276.0	95.9	0.8	336.0	87.4	0.6
217.0	59.1	0.3	277.0	96.4	0.8	337.0	87.1	0.6
218.0	59.5	0.3	278.0	96.7	0.8	338.0	86.8	0.6
219.0	59.9	0.3	279.0	97.1	0.8	339.0	86.5	0.6
220.0	60.3	0.3	280.0	97.4	0.8	340.0	86.2	0.6
221.0	60.7	0.3	281.0	97.6	0.8	341.0	86.0	0.6
222.0	61.2	0.3	282.0	97.9	0.8	342.0	85.7	0.6
223.0	61.6	0.3	283.0	98.2	0.8	343.0	85.5	0.6
224.0	62.1	0.3	284.0	98.3	0.8	344.0	85.3	0.6
225.0	62.6	0.3	285.0	98.5	0.8	345.0	85.1	0.6
226.0	63.1	0.3	286.0	98.7	0.8	346.0	84.9	0.6
227.0	63.7	0.3	287.0	98.9	0.8	347.0	84.7	0.6
228.0	64.2	0.4	288.0	99.0	0.8	348.0	84.5	0.6
229.0	64.7	0.4	289.0	99.1	0.8	349.0	84.4	0.6
230.0	65.1	0.4	290.0	99.1	0.8	350.0	84.2	0.6
231.0	65.6	0.4	291.0	99.2	0.8	351.0	84.1	0.6
232.0	66.1	0.4	292.0	99.2	0.8	352.0	84.0	0.6
233.0	66.5	0.4	293.0	99.2	0.8	353.0	83.9	0.6
234.0	67.1	0.4	294.0	99.1	0.8	354.0	83.8	0.6
235.0	67.6	0.4	295.0	99.1	0.8	355.0	83.8	0.6
236.0	68.2	0.4	296.0	99.0	0.8	356.0	83.8	0.6
237.0	68.8	0.4	297.0	99.0	0.8	357.0	83.7	0.6
238.0	69.4	0.4	298.0	98.9	0.8	358.0	83.7	0.6
239.0	70.0	0.4	299.0	98.7	0.8	359.0	83.7	0.6

Vertical diagram at an azimuth of 64.7°



Vertical diagram at an azimuth of 64.7°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.1	0.8	16.1	71.1	0.4	32.2	28.5	0.1
0.3	100.0	0.8	16.3	70.5	0.4	32.4	27.7	0.1
0.5	99.9	0.8	16.6	69.8	0.4	32.7	26.8	0.1
0.8	99.8	0.8	16.9	69.2	0.4	33.0	26.0	0.1
1.1	99.7	0.8	17.2	68.5	0.4	33.2	25.2	0.1
1.3	99.6	0.8	17.4	67.9	0.4	33.5	24.3	0.1
1.6	99.4	0.8	17.7	67.3	0.4	33.8	23.5	0.0
1.9	99.2	0.8	18.0	66.7	0.4	34.0	22.7	0.0
2.1	99.0	0.8	18.2	66.0	0.4	34.3	21.9	0.0
2.4	98.8	0.8	18.5	65.4	0.4	34.6	21.0	0.0
2.7	98.6	0.8	18.8	64.7	0.4	34.8	20.2	0.0
2.9	98.3	0.8	19.0	64.1	0.3	35.1	19.4	0.0
3.2	98.0	0.8	19.3	63.4	0.3	35.4	18.5	0.0
3.5	97.7	0.8	19.6	62.8	0.3	35.6	17.7	0.0
3.8	97.4	0.8	19.8	62.1	0.3	35.9	16.9	0.0
4.0	97.0	0.8	20.1	61.5	0.3	36.2	16.1	0.0
4.3	96.6	0.8	20.4	60.8	0.3	36.4	15.2	0.0
4.6	96.3	0.8	20.6	60.2	0.3	36.7	14.4	0.0
4.8	95.9	0.8	20.9	59.5	0.3	37.0	13.6	0.0
5.1	95.5	0.8	21.2	58.9	0.3	37.3	12.8	0.0
5.4	95.1	0.8	21.4	58.2	0.3	37.5	12.0	0.0
5.6	94.6	0.8	21.7	57.6	0.3	37.8	11.2	0.0
5.9	94.2	0.8	22.0	56.9	0.3	38.1	10.4	0.0
6.2	93.7	0.7	22.2	56.2	0.3	38.3	9.6	0.0
6.4	93.2	0.7	22.5	55.6	0.3	38.6	8.9	0.0
6.7	92.7	0.7	22.8	54.9	0.3	38.9	8.1	0.0
7.0	92.1	0.7	23.0	54.2	0.2	39.1	7.3	0.0
7.2	91.6	0.7	23.3	53.5	0.2	39.4	6.6	0.0
7.5	91.1	0.7	23.6	52.8	0.2	39.7	5.8	0.0
7.8	90.5	0.7	23.9	52.2	0.2	39.9	5.1	0.0
8.0	90.0	0.7	24.1	51.5	0.2	40.2	4.4	0.0
8.3	89.4	0.7	24.4	50.8	0.2	40.5	3.6	0.0
8.6	88.9	0.7	24.7	50.1	0.2	40.7	2.9	0.0
8.8	88.3	0.7	24.9	49.4	0.2	41.0	2.2	0.0
9.1	87.7	0.7	25.2	48.7	0.2	41.3	1.5	0.0
9.4	87.1	0.6	25.5	47.9	0.2	41.5	0.8	0.0
9.6	86.5	0.6	25.7	47.2	0.2	41.8	0.2	0.0
9.9	85.9	0.6	26.0	46.5	0.2	42.1	0.5	0.0
10.2	85.3	0.6	26.3	45.8	0.2	42.3	1.1	0.0
10.5	84.7	0.6	26.5	45.0	0.2	42.6	1.8	0.0
10.7	84.0	0.6	26.8	44.3	0.2	42.9	2.4	0.0
11.0	83.4	0.6	27.1	43.6	0.2	43.1	3.0	0.0
11.3	82.8	0.6	27.3	42.8	0.2	43.4	3.6	0.0
11.5	82.1	0.6	27.6	42.1	0.1	43.7	4.2	0.0
11.8	81.5	0.6	27.9	41.3	0.1	44.0	4.8	0.0
12.1	80.9	0.6	28.1	40.6	0.1	44.2	5.4	0.0
12.3	80.2	0.5	28.4	39.8	0.1	44.5	6.0	0.0
12.6	79.6	0.5	28.7	39.0	0.1	44.8	6.5	0.0
12.9	78.9	0.5	28.9	38.2	0.1	45.0	7.1	0.0
13.1	78.3	0.5	29.2	37.4	0.1	45.3	7.6	0.0
13.4	77.6	0.5	29.5	36.6	0.1	45.6	8.1	0.0
13.7	77.0	0.5	29.7	35.8	0.1	45.8	8.6	0.0
13.9	76.3	0.5	30.0	35.0	0.1	46.1	9.1	0.0
14.2	75.7	0.5	30.3	34.2	0.1	46.4	9.5	0.0
14.5	75.0	0.5	30.6	33.4	0.1	46.6	10.0	0.0
14.7	74.4	0.5	30.8	32.6	0.1	46.9	10.5	0.0
15.0	73.7	0.5	31.1	31.8	0.1	47.2	10.9	0.0
15.3	73.1	0.5	31.4	31.0	0.1	47.4	11.3	0.0
15.5	72.4	0.4	31.6	30.2	0.1	47.7	11.7	0.0
15.8	71.8	0.4	31.9	29.3	0.1	48.0	12.1	0.0

Vertical diagram at an azimuth of 64.7°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
48.2	12.5	0.0	64.3	18.0	0.0	80.4	8.8	0.0
48.5	12.9	0.0	64.6	17.9	0.0	80.7	8.5	0.0
48.8	13.2	0.0	64.9	17.8	0.0	80.9	8.3	0.0
49.0	13.6	0.0	65.1	17.8	0.0	81.2	8.1	0.0
49.3	13.9	0.0	65.4	17.7	0.0	81.5	7.9	0.0
49.6	14.2	0.0	65.7	17.6	0.0	81.7	7.7	0.0
49.8	14.6	0.0	65.9	17.4	0.0	82.0	7.5	0.0
50.1	14.9	0.0	66.2	17.3	0.0	82.3	7.3	0.0
50.4	15.1	0.0	66.5	17.2	0.0	82.5	7.1	0.0
50.7	15.4	0.0	66.7	17.1	0.0	82.8	6.9	0.0
50.9	15.7	0.0	67.0	17.0	0.0	83.1	6.6	0.0
51.2	15.9	0.0	67.3	16.9	0.0	83.3	6.4	0.0
51.5	16.2	0.0	67.5	16.8	0.0	83.6	6.2	0.0
51.7	16.4	0.0	67.8	16.6	0.0	83.9	6.0	0.0
52.0	16.6	0.0	68.1	16.5	0.0	84.2	5.8	0.0
52.3	16.8	0.0	68.3	16.4	0.0	84.4	5.6	0.0
52.5	17.0	0.0	68.6	16.3	0.0	84.7	5.4	0.0
52.8	17.2	0.0	68.9	16.1	0.0	85.0	5.1	0.0
53.1	17.4	0.0	69.1	16.0	0.0	85.2	4.9	0.0
53.3	17.6	0.0	69.4	15.9	0.0	85.5	4.7	0.0
53.6	17.7	0.0	69.7	15.7	0.0	85.8	4.5	0.0
53.9	17.9	0.0	69.9	15.6	0.0	86.0	4.3	0.0
54.1	18.0	0.0	70.2	15.4	0.0	86.3	4.1	0.0
54.4	18.1	0.0	70.5	15.3	0.0	86.6	3.9	0.0
54.7	18.3	0.0	70.8	15.2	0.0	86.8	3.7	0.0
54.9	18.4	0.0	71.0	15.0	0.0	87.1	3.5	0.0
55.2	18.5	0.0	71.3	14.9	0.0	87.4	3.4	0.0
55.5	18.6	0.0	71.6	14.7	0.0	87.6	3.2	0.0
55.7	18.6	0.0	71.8	14.6	0.0	87.9	3.1	0.0
56.0	18.7	0.0	72.1	14.4	0.0	88.2	2.9	0.0
56.3	18.8	0.0	72.4	14.2	0.0	88.4	2.8	0.0
56.5	18.8	0.0	72.6	14.1	0.0	88.7	2.7	0.0
56.8	18.9	0.0	72.9	13.9	0.0	89.0	2.6	0.0
57.1	18.9	0.0	73.2	13.8	0.0	89.2	2.6	0.0
57.4	19.0	0.0	73.4	13.6	0.0	89.5	2.6	0.0
57.6	19.0	0.0	73.7	13.4	0.0	89.8	2.5	0.0
57.9	19.0	0.0	74.0	13.3	0.0	90.0	2.0	0.0
58.2	19.1	0.0	74.2	13.1	0.0	90.3	2.1	0.0
58.4	19.1	0.0	74.5	12.9	0.0	90.6	2.1	0.0
58.7	19.1	0.0	74.8	12.8	0.0	90.9	2.1	0.0
59.0	19.1	0.0	75.0	12.6	0.0	91.1	2.2	0.0
59.2	19.1	0.0	75.3	12.4	0.0	91.4	2.3	0.0
59.5	19.1	0.0	75.6	12.2	0.0	91.7	2.4	0.0
59.8	19.0	0.0	75.8	12.0	0.0	91.9	2.5	0.0
60.0	19.0	0.0	76.1	11.9	0.0	92.2	2.6	0.0
60.3	19.0	0.0	76.4	11.7	0.0	92.5	2.8	0.0
60.6	19.0	0.0	76.6	11.5	0.0	92.7	2.9	0.0
60.8	18.9	0.0	76.9	11.3	0.0	93.0	3.1	0.0
61.1	18.9	0.0	77.2	11.1	0.0	93.3	3.2	0.0
61.4	18.8	0.0	77.5	10.9	0.0	93.5	3.4	0.0
61.6	18.8	0.0	77.7	10.8	0.0	93.8	3.6	0.0
61.9	18.7	0.0	78.0	10.6	0.0	94.1	3.7	0.0
62.2	18.6	0.0	78.3	10.4	0.0	94.3	3.9	0.0
62.4	18.6	0.0	78.5	10.2	0.0	94.6	4.1	0.0
62.7	18.5	0.0	78.8	10.0	0.0	94.9	4.3	0.0
63.0	18.5	0.0	79.1	9.8	0.0	95.1	4.4	0.0
63.2	18.4	0.0	79.3	9.6	0.0	95.4	4.6	0.0
63.5	18.3	0.0	79.6	9.4	0.0	95.7	4.8	0.0
63.8	18.2	0.0	79.9	9.2	0.0	95.9	5.0	0.0
64.1	18.1	0.0	80.1	9.0	0.0	96.2	5.2	0.0

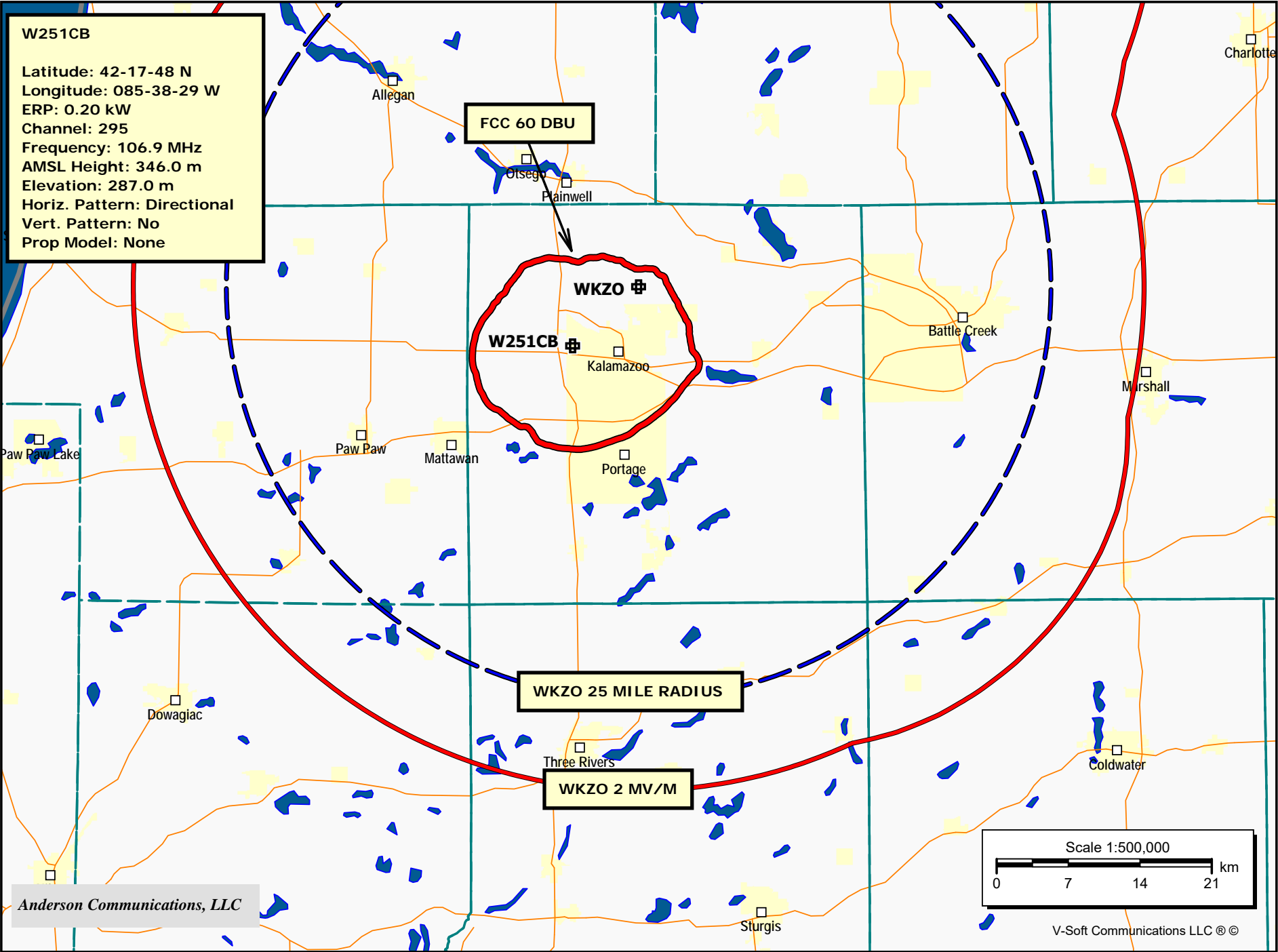
E4 AERIAL VIEW OF 115.76 DBU INTERFERENCE CONTOUR



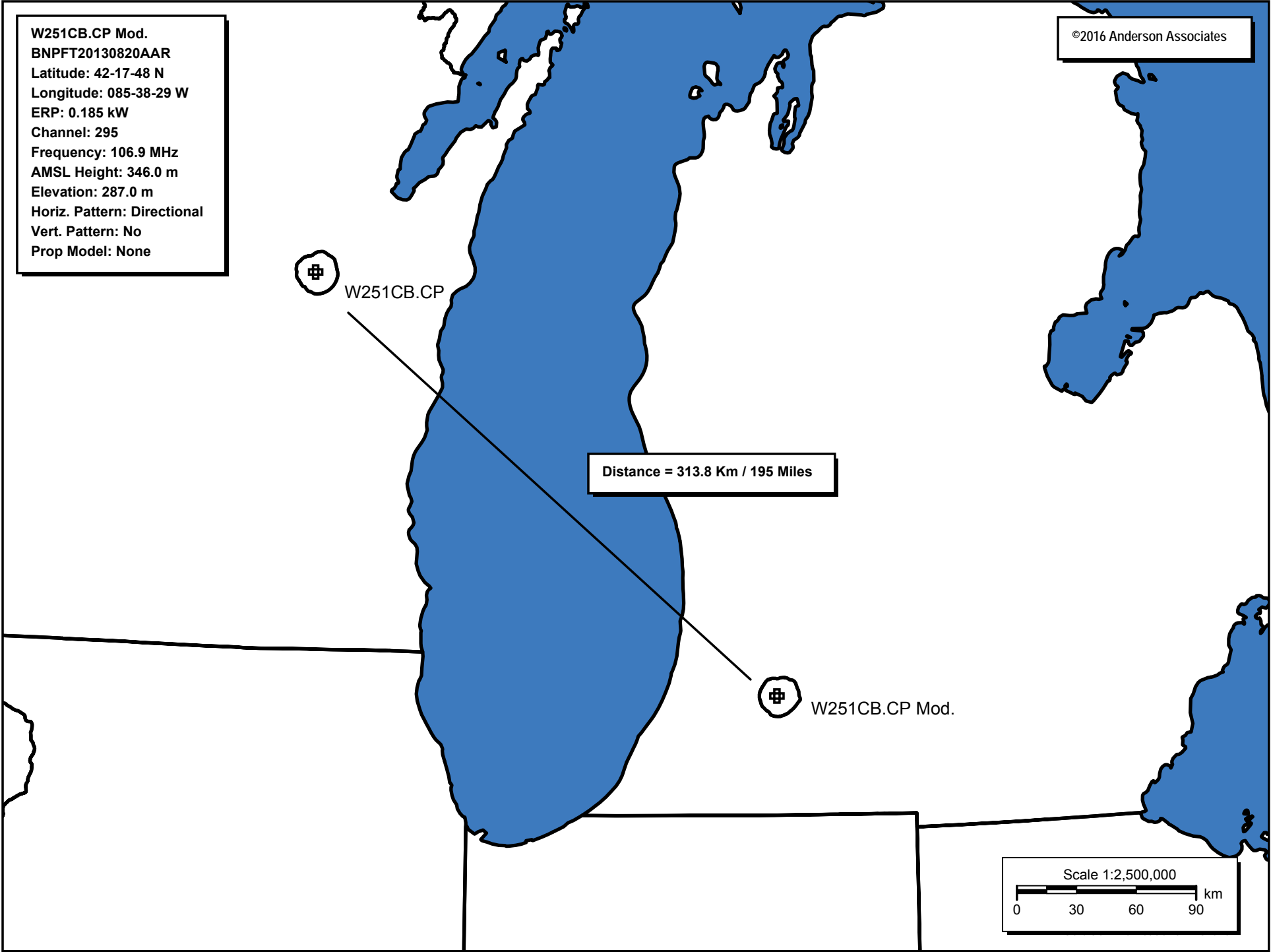
E4 STREET VIEW OF TALLEST BUILDING WITH INTERFERENCE CONTOUR



E5 W251CB 60 DBU AND WKZO 2MV CONTOURS



E-6 W251CB.CP Mod. 250 Mile Distance Plot



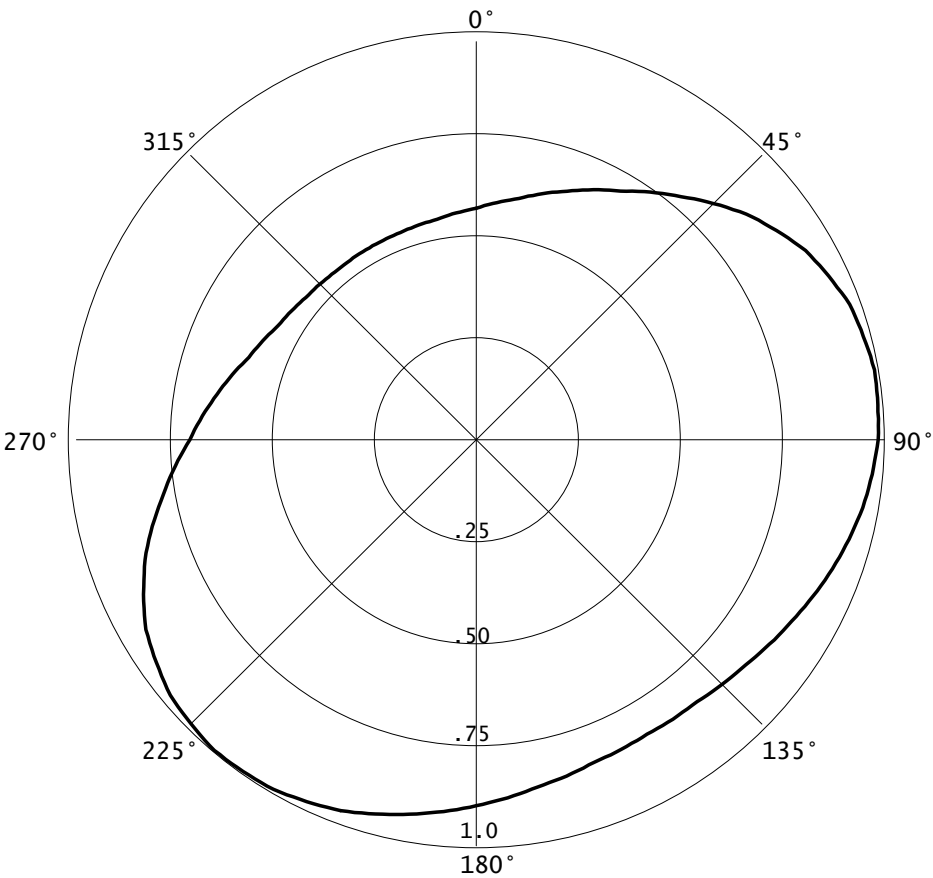
E7 W252CB DIRECTIONAL ANTENNA TABULATION

07-19-2016

RMS(V)= .813

Graph is Relative Field

Azi	Field	dBk	kw
000	0.570	-11.872	0.065
010	0.603	-11.383	0.073
020	0.651	-10.718	0.085
030	0.707	-10.001	0.100
040	0.781	-09.137	0.122
050	0.864	-08.259	0.149
060	0.932	-07.601	0.174
070	0.974	-07.219	0.190
080	0.991	-07.068	0.196
090	0.985	-07.121	0.194
100	0.962	-07.326	0.185
110	0.929	-07.629	0.173
120	0.893	-07.973	0.159
130	0.862	-08.280	0.149
140	0.842	-08.483	0.142
150	0.837	-08.535	0.140
160	0.845	-08.453	0.143
170	0.868	-08.219	0.151
180	0.901	-07.895	0.162
190	0.936	-07.564	0.175
200	0.972	-07.236	0.189
210	0.994	-07.042	0.198
220	0.999	-06.998	0.200
230	0.979	-07.174	0.192
240	0.935	-07.573	0.175
250	0.864	-08.259	0.149
260	0.779	-09.159	0.121
270	0.702	-10.063	0.099
280	0.645	-10.799	0.083
290	0.593	-11.529	0.070
300	0.561	-12.010	0.063
310	0.545	-12.262	0.059
320	0.539	-12.358	0.058
330	0.540	-12.342	0.058
340	0.543	-12.294	0.059
350	0.551	-12.167	0.061



TFC2K 2 BAY 0.75 SPACED ORIENTED AT 150 DEGREES TRUE

Registration 1021494

Registration Detail

Reg Number	1021494	Status	Constructed
File Number	A0991036	Constructed	08/22/1991
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

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

Location (in NAD83 Coordinates)

Lat/Long	42-17-48.0 N 085-38-29.0 W	Address	WEST MAIN STREET CELL SITE (Kalamazoo II - 120000991)
City, State	KALAMAZOO , MI		
Zip	49006	County	KALAMAZOO
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
286.5	60.3
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
346.8	54.8

Painting and Lighting Specifications

None

FAA Notification

FAA Study	2006-AGL-4471-OE	FAA Issue Date	06/27/2006
-----------	------------------	----------------	------------

Owner & Contact Information

FRN	0020532149	Owner Entity Type	Corporation
-----	------------	-------------------	-------------

Owner

Alltel Communications Wireless, Inc. Attention To: Network Regulatory 1120 Sanctuary Pkwy #150 MCGASA5REG Alpharetta , GA 30009	P: (770)797-1070 F: E: Network.Regulatory@VerizonWireless.com
---	---

Contact

Manager , Regulatory Attention To: Network Regulatory 1120 Sanctuary Pkwy #150 MCGASA5REG Alpharetta , GA 30009	P: (770)797-1070 F: E: Network.Regulatory@VerizonWireless.com
---	---

Last Action Status

Status	Constructed	Received	01/05/2016
--------	-------------	----------	------------