

**W233CG  
MINOR MODIFICATION  
ERP INCREASE TO 250W**

**AMENDMENT**

The W233CG application (0000149926) is amended to correct the Canadian exhibit. An increase in ERP to 250 Watts is requested. Exhibit E3 demonstrates that the 34 dBu (50:10) contour does not exceed 60 km toward Canada or over the border.

The modified W233CG translator will continue to rebroadcast WJMO(AM) (facility ID # 41389). The facility will remain at the licensed site and continue to comply with the “250 mile” rule with respect to its original site prior to the move.

**Distance between**

**N Latitude 41 30 48.00, W Longitude 81 36 5.00 (Point 1)**

**and N Latitude 39 52 59.00, W Longitude 83 48 17.00 (Point 2)**

**259.720 kilometers; 161.382 miles**

**Allocations:**

All exhibits utilize the Globe 30 second terrain database unless otherwise noted.

- E1 Channel study
- E2 Interference analysis to WQMX
- E3 Canadian analysis
- E4 Contours
- E5 ASR

A channel study is included as E1 demonstrating compliance with §74.1204 with the exception of 2nd adjacent channel station WQMX.

A plot of the proposed 60 dBu contour is provided as E4 showing that it is entirely contained within primary station WJMO’s 2 mV/m or 40 km radius.

**WQMX analysis:**

The proposed facility will be located inside the protected contour of WQMX on 235B. Interference analyses have been conducted based on the U/D ratio of +40 dB at the proposed site and are included as E2 and E2A-G. The buildings within the interference contour were thoroughly reviewed using Google Street View and the tallest are individually evaluated in exhibits E2A-E2G.

The 101.97 dBu (50:10) interference contour is at least 21 meters above ground within the first 190 meters from the tower. A street view of the closest buildings which are 2 stories at 23 meters is provided. The tallest building within the 190 meters radius is the six story stadium at a maximum height of 20 meters for a person in the highest stairwell (assuming 12 feet per story- see E1B for Google Street Views) located west of the tower at distances of 95 to 173 meters. At these distances the interfering contour clears the ground by 32.6 meters and clears the top of the stadium by at least 12.6 meters.

The tallest buildings outside the 190 meter radius are twelve (12) story buildings at a range of 340-720 meters from the tower.

The interfering contour over each of the six tallest buildings has been individually evaluated based on the actual antenna field in that direction. All other buildings identified were significant shorter than these.

(1) 12 story building at Euclid and Mayfield (N41-30-31.5 W81-36-20.8) is located at 627 meters at 215.6° azimuth. Its height is 43.9 meters or 41.7 meters for a person standing on the highest floor. The interference contour at that point is 48.3 meters AGL or 6.6 meters above the highest person (see E2A).

(2) The Seidman Cancer Center (N41-30-28 W81-36-21) is located at 720 meters and 211° azimuth. The interference contour is 55.2 meters AGL at that point or 13.3 meters above the highest occupied area of the nine story building assuming 16 feet per floor and a six foot person standing on the highest floor (see E2B).

(3) The Clarke Tower (N41-30-52 W 81-36-20) on the Case Western Reserve campus is at a distance of 369 meters at 289.7° azimuth. It is an eleven story residence hall of vintage construction. Assuming 12 ft floors and an 18 foot lobby, the highest occupied area for a standing six foot person would be 39.3 meters. The interference contour at this distance is 59.1 meters AGL. Therefore, the interference clears the highest occupied area by 19.8 meters. (E2C).

(4) The first apartment building on Mayfield road is at N 41-30-32.5 W 81-36-09.5 and 489 meters at 192.3° azimuth. The building is 12 stories or 43.9 meters or 41.7 meters to a six foot person standing on the top floor. The interference contour at this building is 49.4 meters AGL and clears the highest occupied area by 7.7 meters (E2D).

(5) One Triangle Place, a 12 story apartment building on Mayfield road, is located at N 41-30-32.3 W 81-36-12.6 or 515 meters at an azimuth of 200°. The interference contour at this point is 48.2 meters AGL or 6.5 meters above the highest occupied space (E2E).

(6) One Triangle Place building #2 is located within the interference contour at N 41-30-34.4 W 81-36-12.2 or a distance of 451 meters at 201.6° azimuth. The interference contour at this point is 50.7 meters AGL or 9 meters above the highest occupied space (see E2F).

It is clear from exhibits E2 and E2A-E2G that the interference contour will not reach any populated area or major highways. Based on this showing, a waiver of Section 74.1204 is requested in accordance with *Living Way Ministries, Inc.* (FCC 08-242).

**Canada - §74.1235(d)(3):**

The proposed 34 dBu F(50,10) interfering contour extends slightly north of the US-Canada border entirely over water within Lake Erie, but does not exceed the 60 km distance limit specified in 47 CFR § 74.1235(d)(3) toward Canada and it clears all Canadian land area (see E3). Therefore, the proposed facility would have no impact on any present or future Canadian FM broadcast facilities. The Commission has routinely granted such applications since 1998 (see for example W295DE - BMPFT-20160912AAX). If deemed necessary, a waiver of 47 CFR § 74.1235(d)(3) and/or Canadian referral is requested.

**RF Exposure Calculation:**

The proposed facility will utilize a six bay Bext TFC-2K full wavelength spaced, circularly polarized antenna with a center of radiation at 102 meters AGL on existing tower ASR #1014404. The RF contribution of the proposed translator was calculated based on a worst case F factor of 1.0 using the formula included below to be 1.67  $\mu$ Watts/cm<sup>2</sup> or 0.84% of the maximum permissible 200 microwatts/cm<sup>2</sup> exposure for general population/uncontrolled exposure, and well below the 5% of that limit which requires consideration. The proposed translator clearly complies with Commission RF radiation limits.

$$S \text{ (RF in } \mu\text{Watts/cm}^2\text{)} = \frac{33.4 (F^2 \text{ Vertical Factor}) X (H \text{ ERP} + V \text{ ERP in Watts})}{R^2 \text{ (distance to radiation center in meters}^2\text{ - 2 m)}}$$

*July 22, 2021*

*Charles M. Anderson*

# E1 Channel Study

REFERENCE CH# 233D - 94.5 MHz, Pwr= 0.25 kW DA, HAAT= 80.1 M, COR= 312.6 M DISPLAY DATES  
 41 30 48.00 N. Average Protected F(50-50)= 11.58 km DATA 06-06-21  
 81 36 04.00 W. Standard Directional SEARCH 06-06-21

CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
233D Cl evel and	W233CG	LIC DCN OH		0.0 118.1	0.00 BLFT20161116AAW	41 30 48.20 81 36 04.50	0.200		---Reference---		Blue Chip Broadcasting Li c
235B Medi na	WQMX	LIC _CN OH		183.3 3.2	47.94 BMLH20140625AOS	41 04 58.20 81 38 01.40	16.000 268	5.6 587	65.2 Rubber Ci ty Radi o Group, I	31.3	-18.9*

See E2 and E2A-E2G for clearance to WQMX based on Living Way.

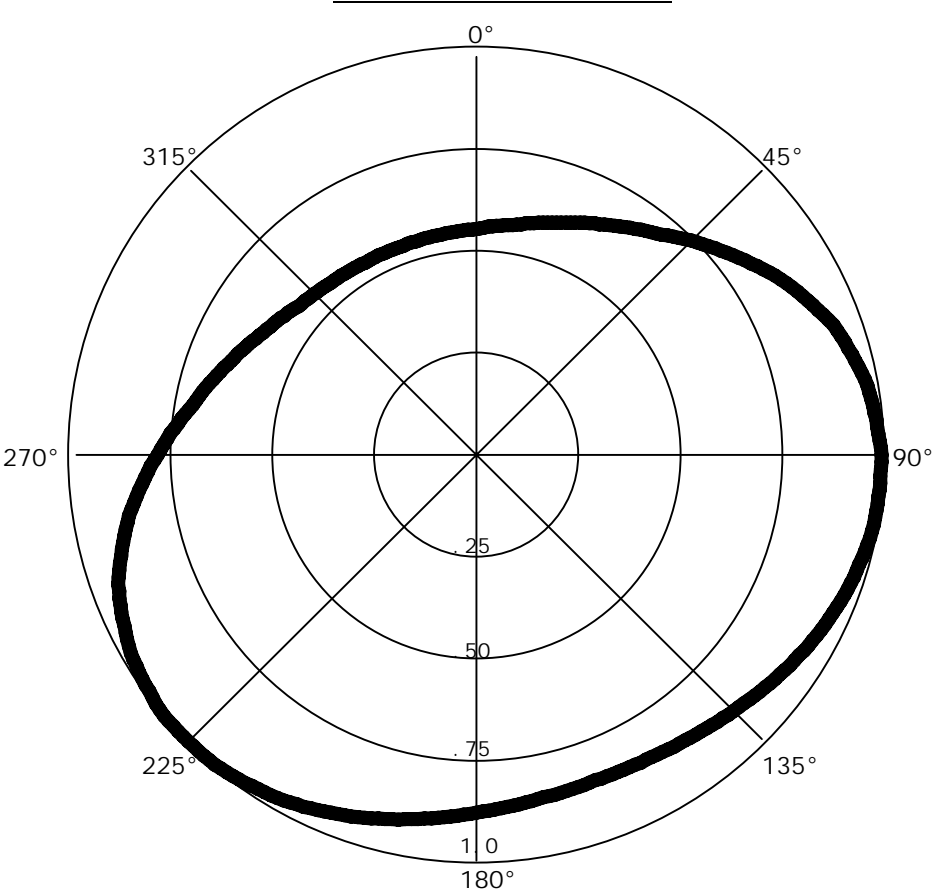
233B OH	WXKR	LIC ZCN BLH20080910ACQ	270.0 83 16 15.70 188	139.04		41 30 03.20 374	30.000	129.6	63.7	-3.9	14.2 Port Clinton
231B Canton	WHBC-FM	LIC _CN OH	160.8 341.0	72.37 BMLH19880406KA		40 53 53.20 81 19 06.30	45.000 157	5.9 509	64.8 Al pha Medi a Li censee LLC	57.1	6.0
234D Pai nesville	W234DO	CP DCN OH	50.4 230.7	39.38 BNPFT20180426AAS		41 44 18.20 81 14 06.40	0.003	4.0 257	2.8 Radi o Advantage One, LLC	23.9	20.8
232B Chatham	AL8509	VAC ____ ON	334.2 153.8	109.65		42 24 00.13 82 10 59.58	50.000 150	77.4 331	65.0	21.1	20.9
233B Pittsburgh	WWSW-FM	LIC _CN PA	130.5 311.6	177.68 BMLH19821004BH		40 27 48.20 80 00 17.10	50.000 247	150.0 558	74.7 I hm Li censes, LLC	21.0	68.2
232B Chatham	NEW	LIC DHN ON	338.0 157.7	110.81		42 26 14.10 82 06 22.60	50.000 134	75.0 320	62.2	24.6	22.1
236B Grove Ci ty	WYLE	LIC DEN PA	105.2 286.0	107.71 BLH19880926KA		41 15 08.20 80 21 27.20	19.000 245	5.6 590	65.1 Fm Radi o Li censes, LLC	95.1	39.8
233D Canton	W233CE	LIC _CN OH	169.2 349.3	76.84 BLFT20160811ADO		40 50 03.20 81 25 48.40	0.210	27.0 398	7.8 Li vi ng Bread Radi o, Inc.	39.8	41.0
230C1 Windsor	CKLWFM	LIC DCN ON	302.9 121.9	136.59		42 10 15.10 82 59 28.70	100.000 200	8.2 387	77.2	116.6	49.2

Terrain database is GLOBE 30 Sec , R= 73.215 qual i fying 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.  
 Reference station has protected zone issue: Canada- AM tower

E1A W233CG DA

RMS(V)= .819 Graph is Relative Field

Azi	Field	dBk	kW
000	0.556	-11.119	0.077
010	0.575	-10.827	0.083
020	0.608	-10.343	0.092
030	0.652	-9.736	0.106
040	0.707	-9.032	0.125
050	0.782	-8.156	0.153
060	0.863	-7.300	0.186
070	0.932	-6.632	0.217
080	0.974	-6.249	0.237
090	0.993	-6.082	0.247
100	0.990	-6.108	0.245
110	0.969	-6.294	0.235
120	0.940	-6.558	0.221
130	0.907	-6.868	0.206
140	0.878	-7.151	0.193
150	0.859	-7.341	0.184
160	0.853	-7.402	0.182
170	0.861	-7.321	0.185
180	0.881	-7.121	0.194
190	0.911	-6.830	0.207
200	0.945	-6.512	0.223
210	0.976	-6.232	0.238
220	0.997	-6.047	0.249
230	1.000	-6.021	0.250
240	0.978	-6.214	0.239
250	0.934	-6.614	0.218
260	0.864	-7.290	0.187
270	0.781	-8.168	0.152
280	0.705	-9.057	0.124
290	0.649	-9.776	0.105
300	0.602	-10.429	0.091
310	0.569	-10.918	0.081
320	0.553	-11.166	0.076
330	0.546	-11.277	0.075
340	0.545	-11.293	0.074
350	0.548	-11.245	0.075



## E2A-1 WQMX Interference Calculation at Maximum Field

W233CG Cleveland, OH, Showing Protection to WQMX, Channel: 235  
 Geographic Coordinates: N. 413048.0 W. 813604.0  
 74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
 Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 233  
 Translator or LPFM Antenna Height AG = 102 meters  
 W233CG Antenna Model = Bext TFC-2K-6 Full-wave

Protected Station's Contour = 61.9735 dBu  
 Translator's or LPFM's full Interference contour 101.9735

Review Azimuth = 230 Degrees True  
 Horizontal Relative Field at Review Azimuth = 1.000  
 Translator/LPFM ERP on the horizontal at Review Azimuth = 0.25 kW  
 Distance between stations = 47.9 km  
 Protected Station= WQMX, 16 kW, 587 M meters COR AMSL

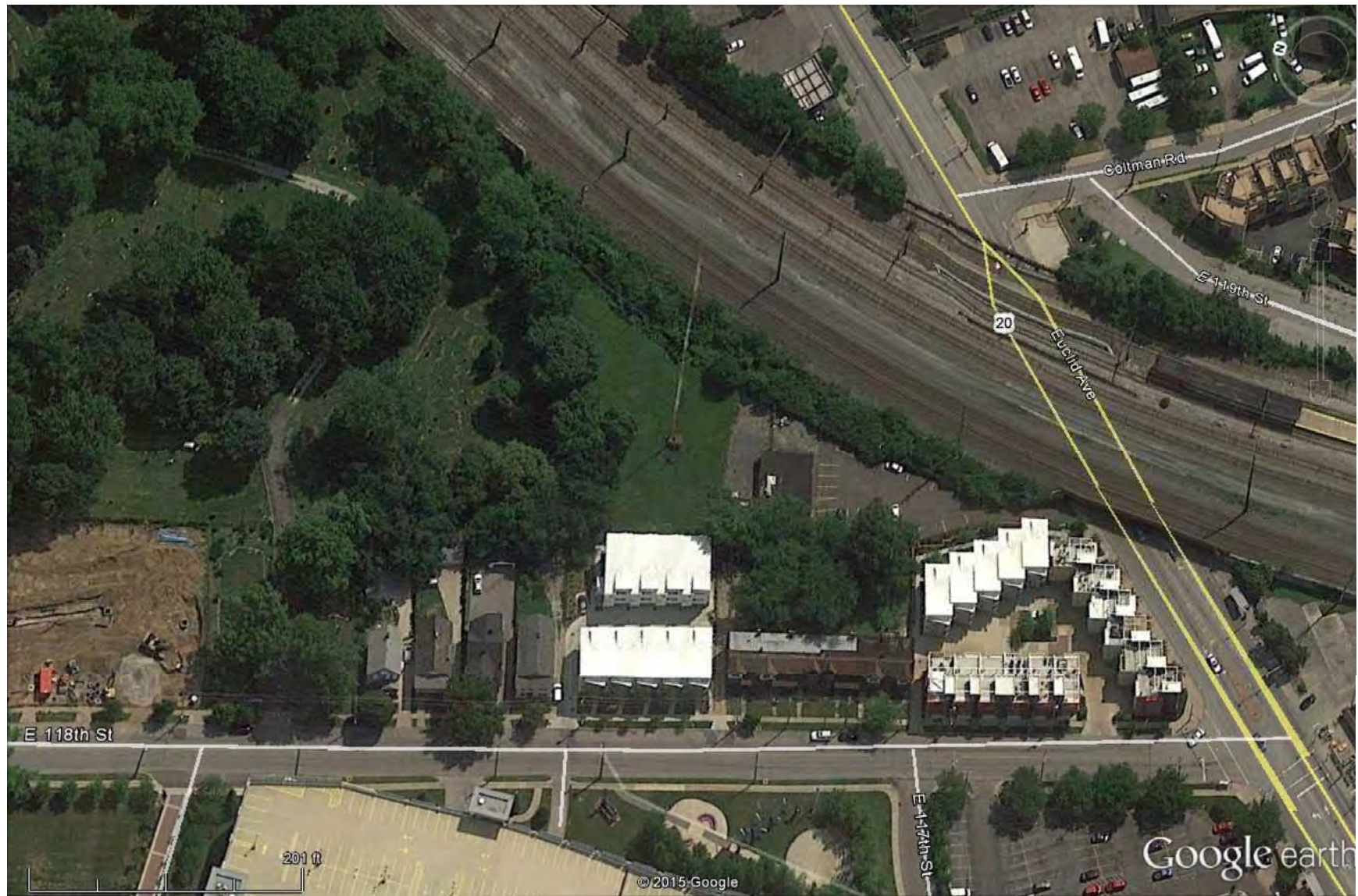
Depression Angle From Degree(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.000	1.0	0.2500	883.6800	883.6800	102.000
01.00	0.986	1.0	0.2430	871.3084	871.1757	086.794
02.00	0.947	1.0	0.2242	836.8449	836.3352	072.795
03.00	0.886	1.0	0.1962	782.9404	781.8674	061.024
04.00	0.804	1.0	0.1616	710.4787	708.7480	052.440
05.00	0.707	1.0	0.1250	624.7617	622.3843	047.548
06.00	0.599	1.0	0.0897	529.3243	526.4246	046.671
07.00	0.484	1.0	0.0586	427.7011	424.5131	049.876
08.00	0.367	1.0	0.0337	324.3106	321.1544	056.865
09.00	0.252	1.0	0.0159	222.6874	219.9457	067.164
10.00	0.145	1.0	0.0053	128.1336	126.1870	079.750
11.00	0.047	1.0	0.0006	041.5330	040.7699	094.075
12.00	0.037	1.0	0.0003	032.6962	031.9817	095.202
13.00	0.106	1.0	0.0028	093.6701	091.2693	080.929
14.00	0.158	1.0	0.0062	139.6214	135.4741	068.223
15.00	0.194	1.0	0.0094	171.4339	165.5924	057.630
16.00	0.213	1.0	0.0113	188.2238	180.9324	050.118
17.00	0.217	1.0	0.0118	191.7585	183.3796	045.935
18.00	0.207	1.0	0.0107	182.9218	173.9689	045.474
19.00	0.185	1.0	0.0086	163.4808	154.5741	048.776
20.00	0.153	1.0	0.0059	135.2030	127.0493	055.758
21.00	0.114	1.0	0.0032	100.7395	094.0484	065.898
22.00	0.071	1.0	0.0013	062.7413	058.1727	078.497
23.00	0.026	1.0	0.0002	022.9757	021.1492	093.023
24.00	0.018	1.0	0.0001	015.9062	014.5311	095.530
25.00	0.058	1.0	0.0008	051.2534	046.4514	080.339
26.00	0.094	1.0	0.0022	083.0659	074.6591	065.586
27.00	0.122	1.0	0.0037	107.8090	096.0585	053.056
28.00	0.143	1.0	0.0051	126.3662	111.5748	042.675
29.00	0.154	1.0	0.0059	136.0867	119.0241	036.024
30.00	0.157	1.0	0.0062	138.7378	120.1504	032.631
31.00	0.151	1.0	0.0057	133.4357	114.3767	033.276
32.00	0.137	1.0	0.0047	121.0641	102.6682	037.846
33.00	0.116	1.0	0.0034	102.5069	085.9695	046.171
34.00	0.09	1.0	0.0020	079.5312	065.9344	057.527
35.00	0.061	1.0	0.0009	053.9045	044.1560	071.082
36.00	0.029	1.0	0.0002	025.6267	020.7325	086.937
37.00	0.003	1.0	0.0000	002.6510	002.1172	100.405
38.00	0.034	1.0	0.0003	030.0451	023.6759	083.502
39.00	0.062	1.0	0.0010	054.7882	042.5784	067.521
40.00	0.087	1.0	0.0019	076.8802	058.8936	052.582
41.00	0.106	1.0	0.0028	093.6701	070.6937	040.547
42.00	0.12	1.0	0.0036	106.0416	078.8043	031.044
43.00	0.129	1.0	0.0042	113.9947	083.3705	024.256
44.00	0.132	1.0	0.0044	116.6458	083.9079	020.971
45.00	0.129	1.0	0.0042	113.9947	080.6064	021.394
46.00	0.122	1.0	0.0037	107.8090	074.8904	024.449
47.00	0.111	1.0	0.0031	098.0885	066.8962	030.263
48.00	0.097	1.0	0.0024	085.7170	057.3558	038.300
49.00	0.08	1.0	0.0016	070.6944	046.3797	048.646

## E2A-1 Continued

50.00	0.061	1.0	0.0009	053.9045	034.6491	060.707
51.00	0.042	1.0	0.0004	037.1146	023.3569	073.157
52.00	0.022	1.0	0.0001	019.4410	011.9690	086.680
53.00	0.003	1.0	0.0000	002.6510	001.5954	099.883
54.00	0.015	1.0	0.0001	013.2552	007.7912	091.276
55.00	0.031	1.0	0.0002	027.3941	015.7126	079.560
56.00	0.045	1.0	0.0005	039.7656	022.2366	069.033
57.00	0.058	1.0	0.0008	051.2534	027.9146	059.015
58.00	0.068	1.0	0.0012	060.0902	031.8430	051.041
59.00	0.076	1.0	0.0014	067.1597	034.5898	044.433
60.00	0.081	1.0	0.0016	071.5781	035.7890	040.012
61.00	0.085	1.0	0.0018	075.1128	036.4154	036.305
62.00	0.087	1.0	0.0019	076.8802	036.0930	034.119
63.00	0.087	1.0	0.0019	076.8802	034.9029	033.499
64.00	0.086	1.0	0.0018	075.9965	033.3147	033.695
65.00	0.081	1.0	0.0016	071.5781	030.2502	037.128
66.00	0.079	1.0	0.0016	069.8107	028.3946	038.225
67.00	0.075	1.0	0.0014	066.2760	025.8961	040.993
68.00	0.07	1.0	0.0012	061.8576	023.1723	044.647
69.00	0.064	1.0	0.0010	056.5555	020.2677	049.201
70.00	0.058	1.0	0.0008	051.2534	017.5297	053.838
71.00	0.052	1.0	0.0007	045.9514	014.9603	058.552
72.00	0.046	1.0	0.0005	040.6493	012.5613	063.340
73.00	0.041	1.0	0.0004	036.2309	010.5929	067.352
74.00	0.035	1.0	0.0003	030.9288	008.5251	072.269
75.00	0.03	1.0	0.0002	026.5104	006.8614	076.393
76.00	0.025	1.0	0.0002	022.0920	005.3445	080.564
77.00	0.021	1.0	0.0001	018.5573	004.1745	083.918
78.00	0.017	1.0	0.0001	015.0226	003.1234	087.306
79.00	0.013	1.0	0.0000	011.4878	002.1920	090.723
80.00	0.01	1.0	0.0000	008.8368	001.5345	093.297
81.00	0.008	1.0	0.0000	007.0694	001.1059	095.018
82.00	0.006	1.0	0.0000	005.3021	000.7379	096.750
83.00	0.004	1.0	0.0000	003.5347	000.4308	098.492
84.00	0.003	1.0	0.0000	002.6510	000.2771	099.363
85.00	0.002	1.0	0.0000	001.7674	000.1540	100.239
86.00	0.001	1.0	0.0000	000.8837	000.0616	101.118
87.00	0.001	1.0	0.0000	000.8837	000.0462	101.118
88.00	0.0	1.0	0.0000	000.0884	000.0031	101.912
89.00	0.0	1.0	0.0000	000.0884	000.0015	101.912
90.00	0.0	1.0	0.0000	000.0884	000.0000	101.912



## E2A-2 Propose Site Aerial View





**E2A-3 Aerial View of  
101.97 dBu (50:10)  
Interference Contour**



101.97 dBu

W233CG



E2A-4 Aerial View  
of 190 Meter Radius

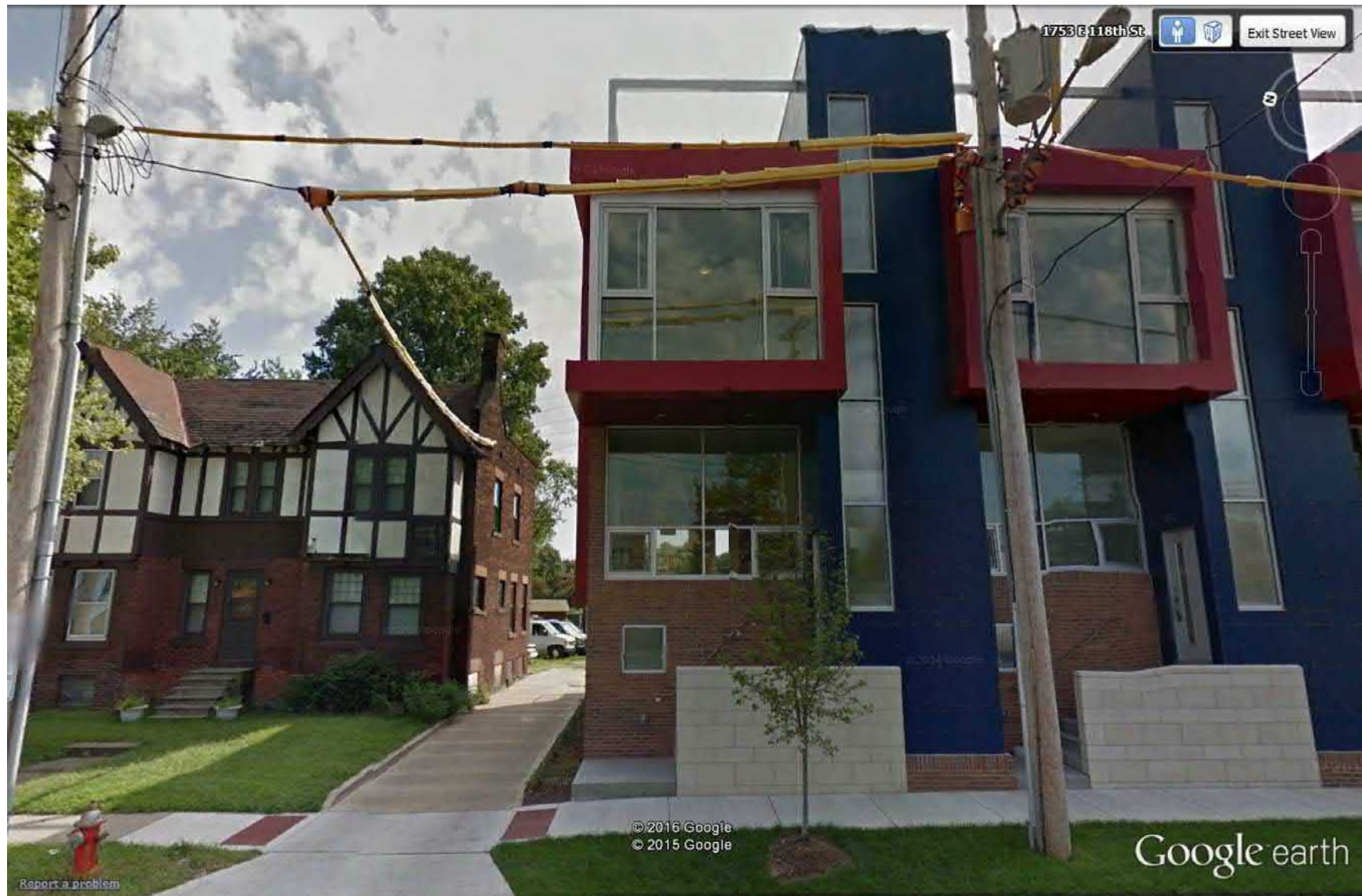


W233CG

190 Meter Radius



## E2A-5 Buildings Closest to Tower



## E2A-6 Stadium 95-173 Meters West





## E2A-7 Stadium



## E2B-1 12 Story Building at 627 Meters and 215.6 Degrees

W233CG Cleveland, OH, Showing Protection to WQMX, Channel: 235  
Geographic Coordinates: N. 413048.0 W. 813604.0  
74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 233  
Translator or LPFM Antenna Height AG = 102 meters  
W233CG Antenna Model = TFC2K-6 FW

Protected Station's Contour = 61.9735 dBu  
Translator's or LPFM's full Interference contour 101.9735

Review Azimuth = 215.6 Degrees True  
Horizontal Relative Field at Review Azimuth = 0.989  
Translator/LPFM ERP on the horizontal at Review Azimuth = 0.244 kW  
Distance between stations = 47.9 km  
Protected Station= WQMX, 16 kW, 587 M meters COR AMSL

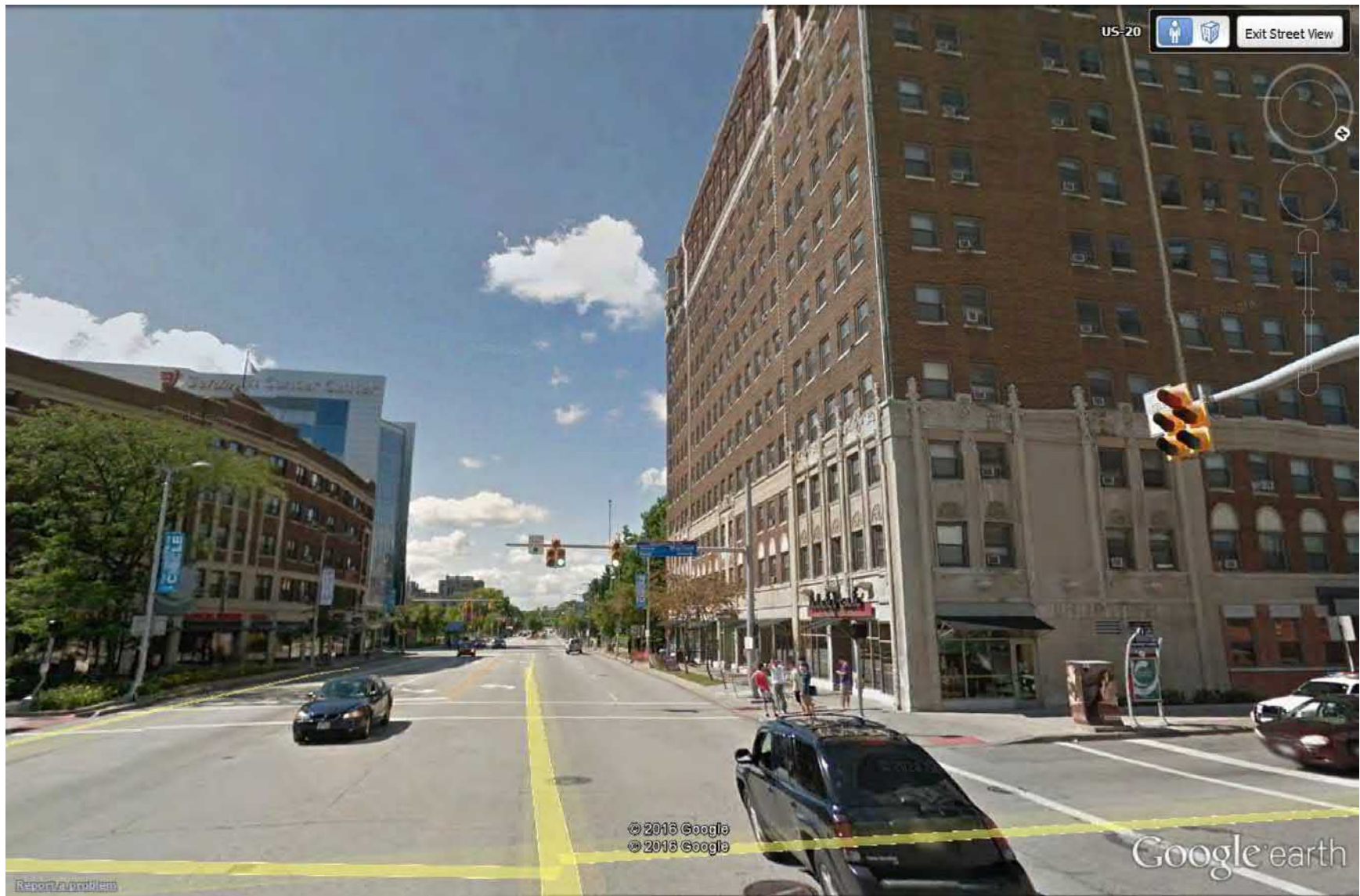
Depression Angle From Degree(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.00	0.99	0.2472	878.6285	878.6285	102.000
01.00	0.986	0.99	0.2403	866.3278	866.1958	086.880
02.00	0.947	0.99	0.2216	832.0613	831.5544	072.961
03.00	0.886	0.99	0.1940	778.4649	777.3980	061.258
04.00	0.804	0.99	0.1598	706.4174	704.6966	052.723
05.00	0.707	0.99	0.1235	621.1904	618.8266	047.860
06.00	0.599	0.99	0.0887	526.2985	523.4154	046.987
07.00	0.484	0.99	0.0579	425.2562	422.0864	050.174
08.00	0.367	0.99	0.0333	322.4567	319.3186	057.123
09.00	0.252	0.99	0.0157	221.4144	218.6884	067.363
10.00	0.145	0.99	0.0052	127.4011	125.4656	079.877

A 12 story building located at 627 meters and 215.6 degrees.

The interference contour is 48.3 m AGL at the building (interpolated). It clears  
occupied spaced by 6.6 meters assuming 12 foot floors and 6 ft person standing on  
highest floor.

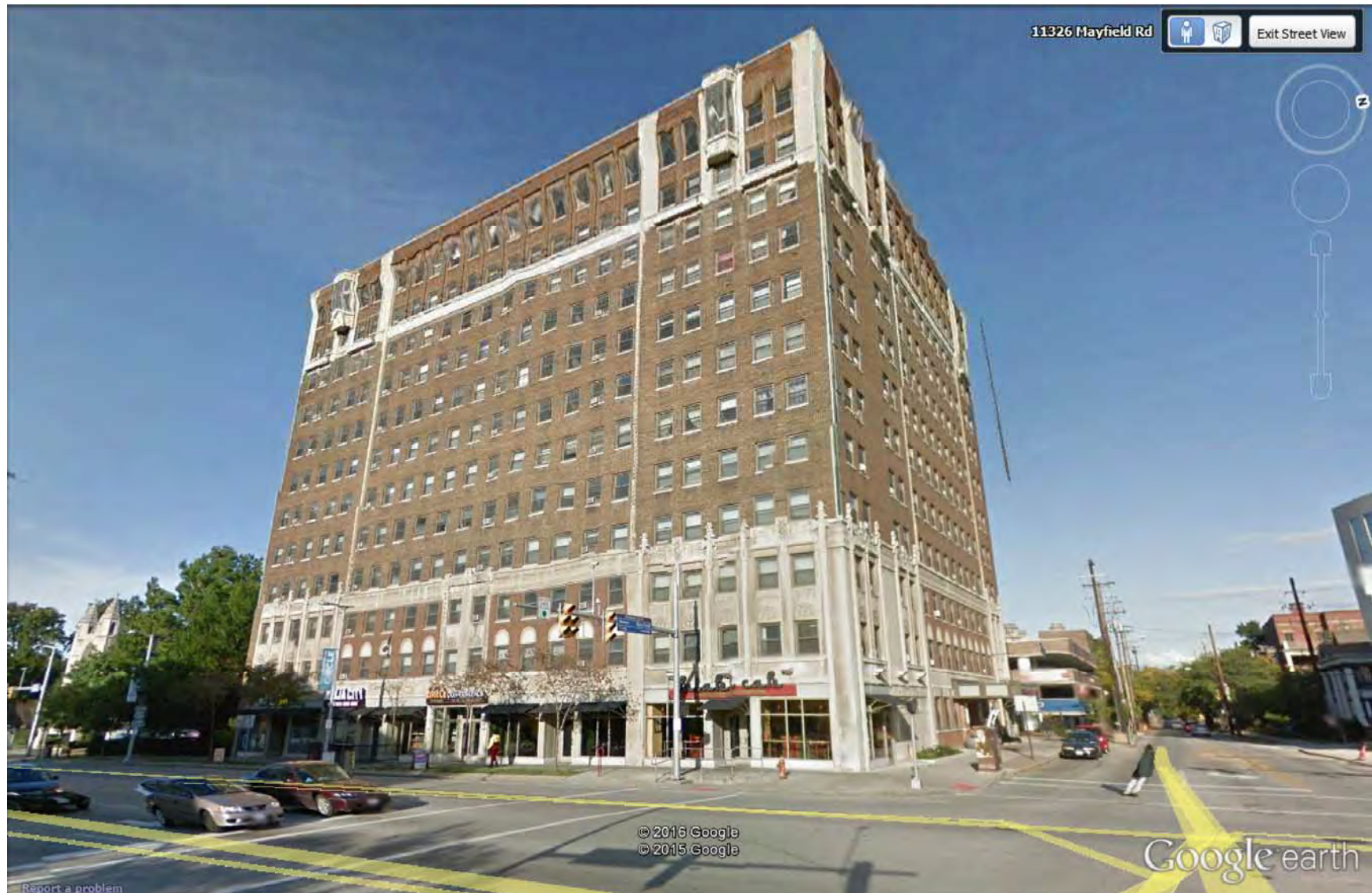


**E2B-2 12 Story Building at Euclid and Mayfield - N41-30-31.5 W 81-36-20.8 720M @215.6 Degrees**





## E2B-3 Another View of Mayfield and Euclid Building



## E2C-1 Seidman Center at 720 meters and 210.95 Degrees

W233CG Cleveland, OH, Showing Protection to WOMX, Channel: 235  
 Geographic Coordinates: N. 413048.0 W. 813604.0  
 74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
 Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 233  
 Translator or LPFM Antenna Height AG = 102 meters  
 W233CG Antenna Model = TFC2K-6 FW

Protected Station's Contour = 61.9735 dBu  
 Translator's or LPFM's full Interference contour 101.9735

Review Azimuth = 210.95 Degrees True  
 Horizontal Relative Field at Review Azimuth = 0.978  
 Translator/LPFM ERP on the horizontal at Review Azimuth = 0.239 kW  
 Distance between stations = 47.9 km  
 Protected Station= WOMX, 16 kW, 587 M meters COR AMSL

Depression Angle From Degree(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	0.98	0.2445	873.9501	873.9501	102.000
01.00	0.986	0.98	0.2377	861.7148	861.5836	086.961
02.00	0.947	0.98	0.2193	827.6308	827.1266	073.116
03.00	0.886	0.98	0.1920	774.3198	773.2586	061.475
04.00	0.804	0.98	0.1581	702.6559	700.9443	052.985
05.00	0.707	0.98	0.1222	617.8827	615.5315	048.148
06.00	0.599	0.98	0.0877	523.4961	520.6283	047.280
07.00	0.484	0.98	0.0573	422.9918	419.8389	050.450
08.00	0.367	0.98	0.0329	320.7397	317.6183	057.362
09.00	0.252	0.98	0.0155	220.2354	217.5240	067.548
10.00	0.145	0.98	0.0051	126.7228	124.7976	079.995

Seidman Building at 720 metes @ 210.95 degrees.

Interference contour at building = 55.2 meters AGL (interpolated). **Clears highest occupied area in the 9 story building by at least 13.3 meters** assuming 16 feet per floor in this modern structure and a 6 ft person standing on the highest floor.

E2C-2 Seidman Cancer Center N41-30-28 W81-36-21 720 Meters @211 Degrees





## E2D-1 11 Story Building at 369 Meters and 289.7 Degrees

W233CG Cleveland, OH, Showing Protection to WOMX, Channel: 235  
Geographic Coordinates: N. 413048.0 W. 813604.0  
74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 233  
Translator or LPFM Antenna Height AG = 102 meters  
W233CG Antenna Model = TFC2K-6 FW

Protected Station's Contour = 61.9735 dBu  
Translator's or LPFM's full Interference contour 101.9735

Review Azimuth = 289.7 Degrees True  
Horizontal Relative Field at Review Azimuth = 0.649  
Translator/LPFM ERP on the horizontal at Review Azimuth = 0.105 kW  
Distance between stations = 47.9 km  
Protected Station= WOMX, 16 kW, 587 M meters COR AMSL

Depression Angle From Degree(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	0.65	0.1622	711.8973	711.8973	102.000
01.00	0.986	0.65	0.1577	701.9307	701.8238	089.750
02.00	0.947	0.65	0.1455	674.1668	673.7561	078.472
03.00	0.886	0.65	0.1274	630.7410	629.8766	068.990
04.00	0.804	0.65	0.1049	572.3654	570.9712	062.074
05.00	0.707	0.65	0.0811	503.3114	501.3962	058.134
06.00	0.599	0.65	0.0582	426.4265	424.0905	057.426
07.00	0.484	0.65	0.0380	344.5583	341.9900	060.009
08.00	0.367	0.65	0.0219	261.2663	258.7237	065.639
09.00	0.252	0.65	0.0103	179.3981	177.1894	073.936
10.00	0.145	0.65	0.0034	103.2251	101.6569	084.075

Eleven story building at 369 meters and 192.8 degrees.

The interfering contour is 59.1 meters (interpolated) and clears the highest occupied area by 19.8meters assuming 12 foot floors and a 6 foot person standing on the highest floor.

**E2D-2 Clarke Tower N 41-30-52 W 81-36-20 369 M @289.7 Degrees 11 Stories**



## E2E-1 12 Story Building at 489 Meters and 192.8 Degrees

W233CG Cleveland, OH, Showing Protection to WOMX, Channel: 235  
Geographic Coordinates: N. 413048.0 W. 813604.0  
74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 233  
Translator or LPFM Antenna Height AG = 102 meters  
W233CG Antenna Model = TFC2K-6 FW

Protected Station's Contour = 61.9735 dBu  
Translator's or LPFM's full Interference contour 101.9735

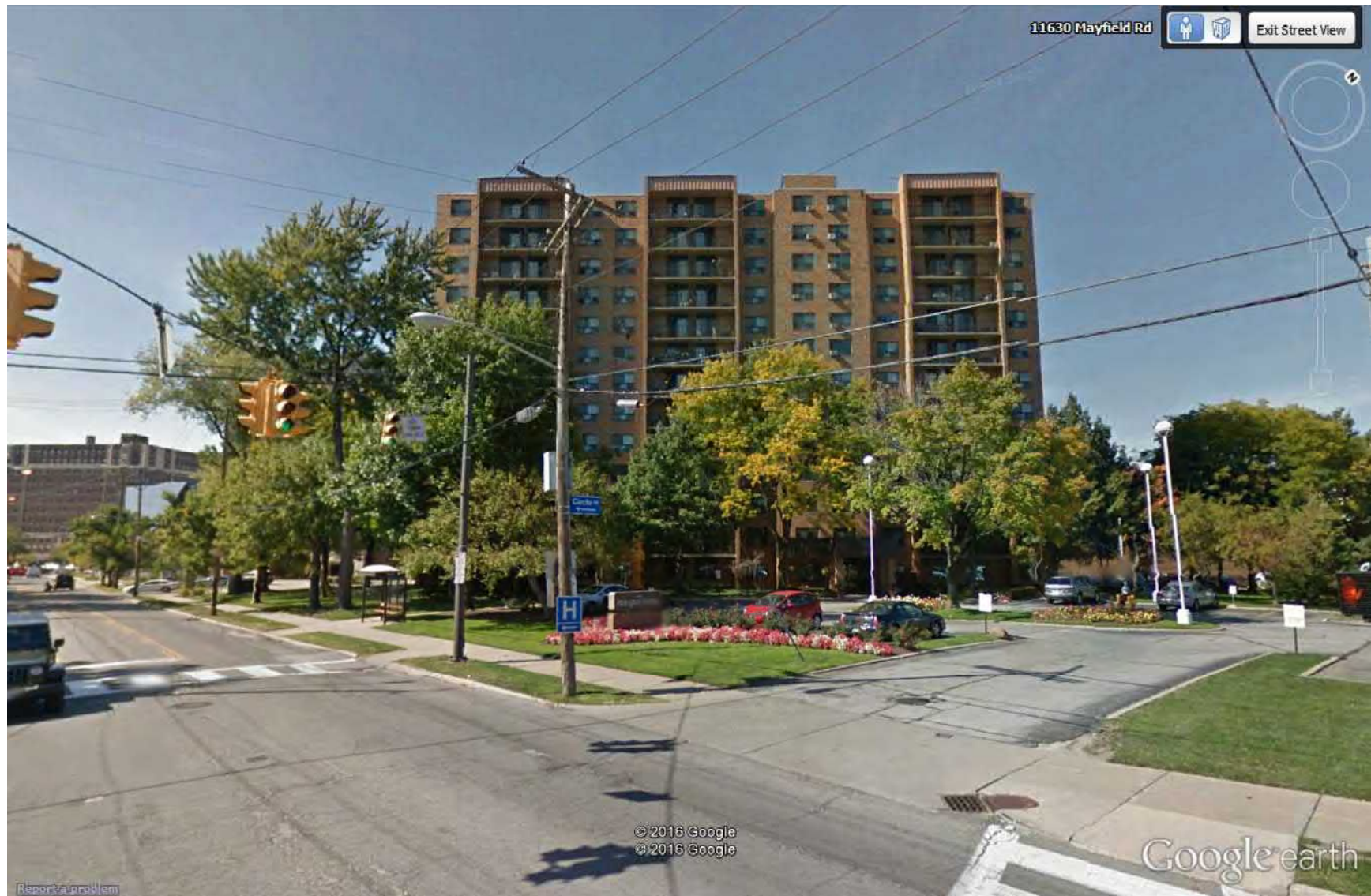
Review Azimuth = 192.8 Degrees True  
Horizontal Relative Field at Review Azimuth = 0.921  
Translator/LPFM ERP on the horizontal at Review Azimuth = 0.212 kW  
Distance between stations = 47.9 km  
Protected Station= WOMX, 16 kW, 587 M meters COR AMSL

Depression Angle From Degree(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	0.92	0.2303	848.1487	848.1487	102.000
01.00	0.986	0.92	0.2239	836.2746	836.1472	087.405
02.00	0.947	0.92	0.2065	803.1968	802.7075	073.969
03.00	0.886	0.92	0.1808	751.4597	750.4298	062.672
04.00	0.804	0.92	0.1489	681.9115	680.2504	054.432
05.00	0.707	0.92	0.1151	599.6411	597.3593	049.738
06.00	0.599	0.92	0.0826	508.0410	505.2579	048.895
07.00	0.484	0.92	0.0539	410.5039	407.4441	051.972
08.00	0.367	0.92	0.0310	311.2706	308.2413	058.680
09.00	0.252	0.92	0.0146	213.7335	211.1021	068.565
10.00	0.145	0.92	0.0048	122.9816	121.1132	080.644

The interfering contour at the 12 story building located at 489 meters and 192.8 degrees from the site **clears the highest occupied area by at least 7.7 meters** assuming 12 foot floors and a 6 ft person standing on the highest floor.



**E2E-2 12 Story Apartments on Mayfield N 41-30-32.5 W 81-36-09.5 489 M @192.8 Degrees**



## E2F-1 12 Story Building at 515 Meters and 200 Degrees

W233CG Cleveland, OH, Showing Protection to WOMX, Channel: 235  
 Geographic Coordinates: N. 413048.0 W. 813604.0  
 74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
 Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 233  
 Translator or LPFM Antenna Height AG = 102 meters  
 W233CG Antenna Model = TFC2K-6 FW

Protected Station's Contour = 61.9735 dBu  
 Translator's or LPFM's full Interference contour 101.9735

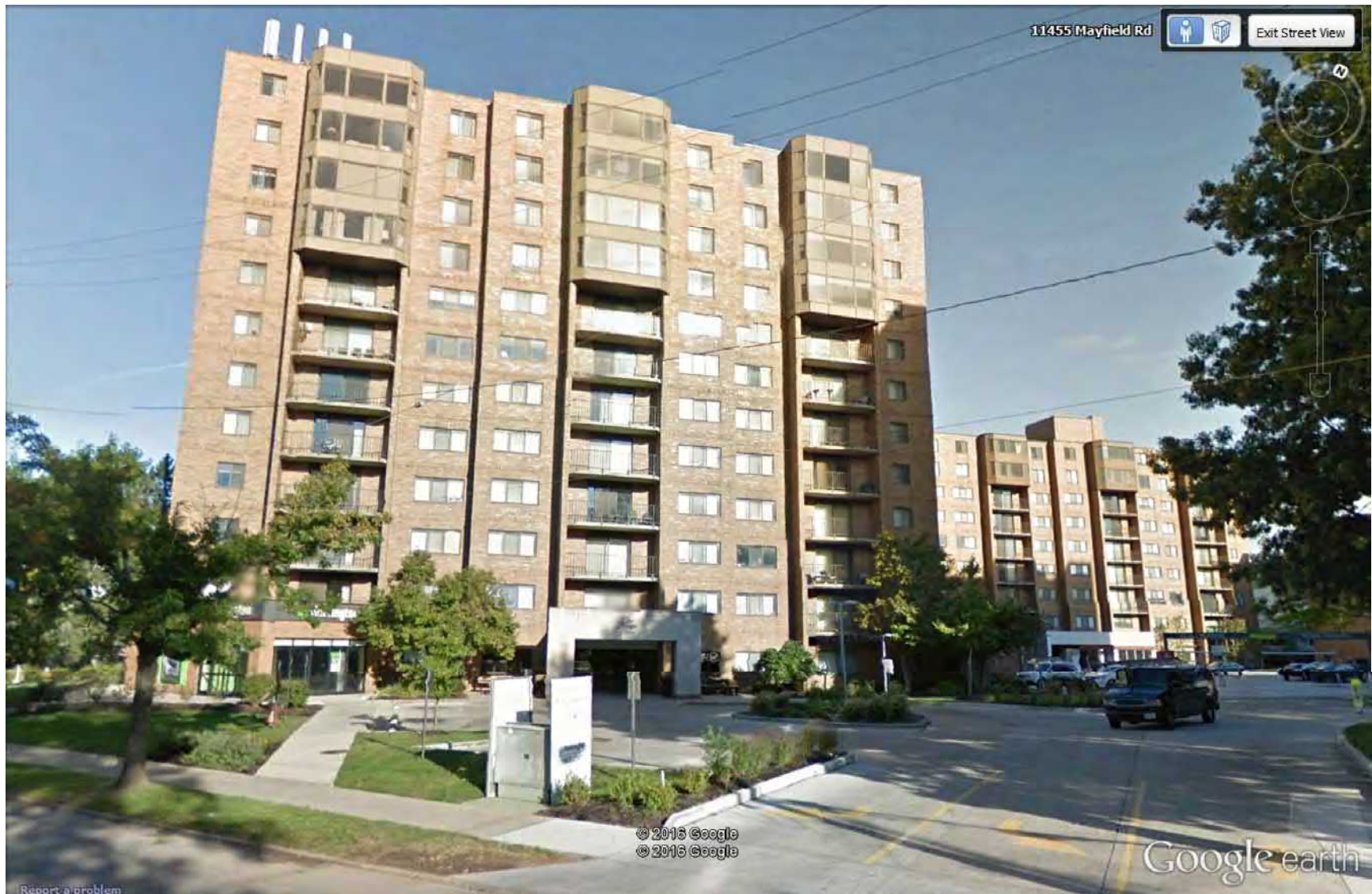
Review Azimuth = 200 Degrees True  
 Horizontal Relative Field at Review Azimuth = 0.945  
 Translator/LPFM ERP on the horizontal at Review Azimuth = 0.223 kW  
 Distance between stations = 47.9 km  
 Protected Station= WOMX, 16 kW, 587 M meters COR AMSL

Depression Angle From Degree(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	0.95	0.2362	859.0351	859.0351	102.000
01.00	0.986	0.95	0.2297	847.0086	846.8796	087.218
02.00	0.947	0.95	0.2119	813.5063	813.0107	073.609
03.00	0.886	0.95	0.1855	761.1051	760.0620	062.167
04.00	0.804	0.95	0.1527	690.6642	688.9818	053.822
05.00	0.707	0.95	0.1181	607.3378	605.0267	049.067
06.00	0.599	0.95	0.0848	514.5620	511.7432	048.214
07.00	0.484	0.95	0.0553	415.7730	412.6739	051.330
08.00	0.367	0.95	0.0318	315.2659	312.1977	058.123
09.00	0.252	0.95	0.0150	216.4768	213.8117	068.136
10.00	0.145	0.95	0.0050	124.5601	122.6677	080.370

Interference contour above ground at 12 story building located 515 meters at 200 degrees from the site at is 48.2 meters AGL (interpolated) and **clears the highest occupied area by 6.5 meters** based on 12 foot floors and a person six feet in height standing on the highest floor.



**E2F-2 One Triangle Place - 12 Stories N 41-30-32.3 W 81-36-12.6 515 M @200 Degrees**



## E2G-1 12 Story Building at 451 Meters and 201.6 Degrees

W233CG Cleveland, OH, Showing Protection to WOMX, Channel: 235  
 Geographic Coordinates: N. 413048.0 W. 813604.0  
 74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
 Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 233  
 Translator or LPFM Antenna Height AG = 102 meters  
 W233CG Antenna Model = TFC2K-6 FW

Protected Station's Contour = 61.9735 dBu  
 Translator's or LPFM's full Interference contour 101.9735

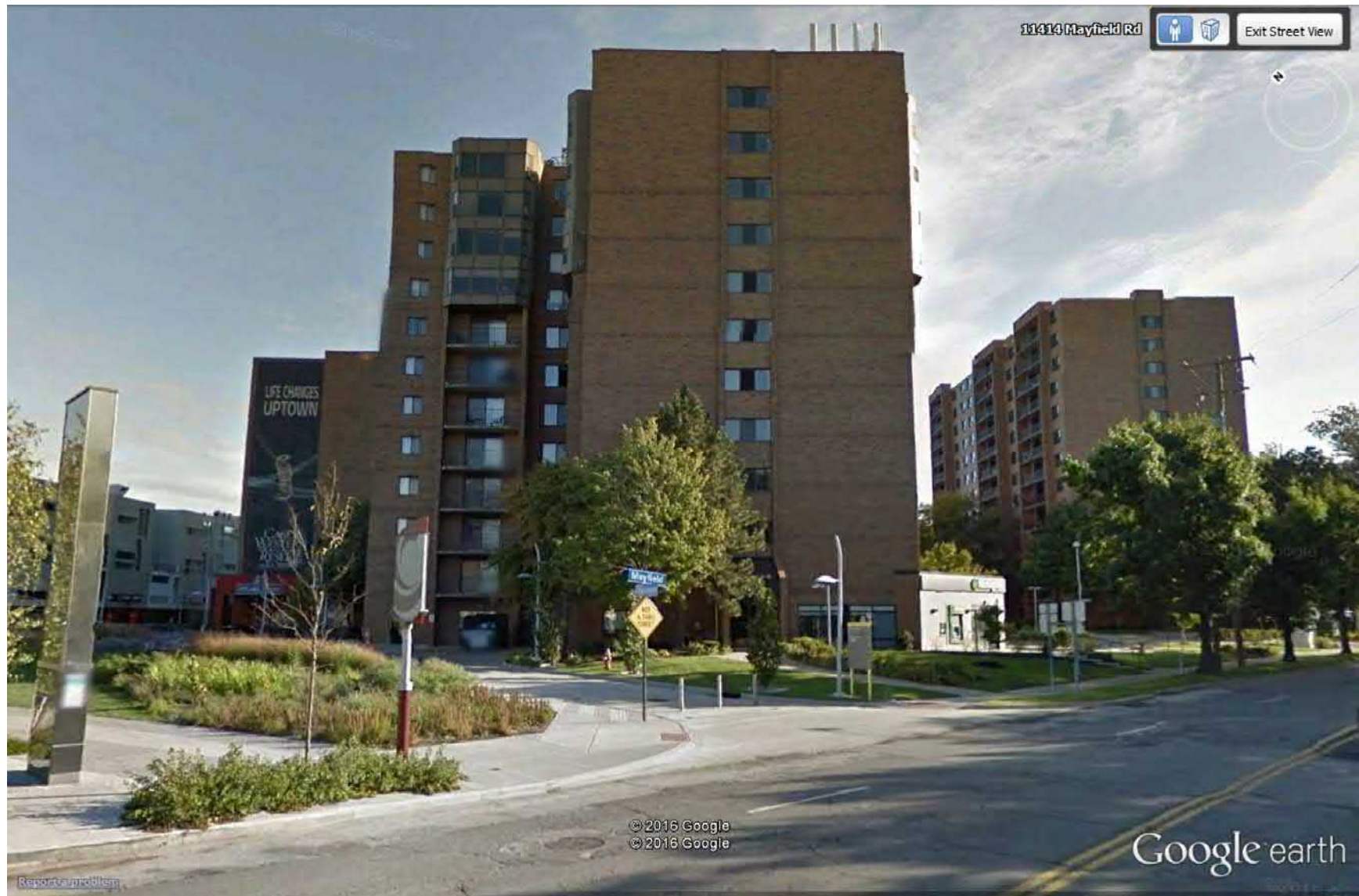
Review Azimuth = 201.6 Degrees True  
 Horizontal Relative Field at Review Azimuth = 0.951  
 Translator/LPFM ERP on the horizontal at Review Azimuth = 0.226 kW  
 Distance between stations = 47.9 km  
 Protected Station= WOMX, 16 kW, 587 M meters COR AMSL

Depression Angle From Degree(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	0.95	0.2378	861.8485	861.8485	102.000
01.00	0.986	0.95	0.2312	849.7826	849.6532	087.169
02.00	0.947	0.95	0.2133	816.1705	815.6734	073.516
03.00	0.886	0.95	0.1867	763.5977	762.5513	062.036
04.00	0.804	0.95	0.1537	692.9262	691.2383	053.664
05.00	0.707	0.95	0.1189	609.3269	607.0082	048.894
06.00	0.599	0.95	0.0853	516.2472	513.4192	048.037
07.00	0.484	0.95	0.0557	417.1347	414.0254	051.164
08.00	0.367	0.95	0.0320	316.2984	313.2202	057.980
09.00	0.252	0.95	0.0151	217.1858	214.5119	068.025
10.00	0.145	0.95	0.0050	124.9680	123.0695	080.300

Interference contour at Mayfield Road Triangle Place 12 story building 451 meter from the site at 201.6 degrees azimuth is 50.7 meters AGL (interpolated) and clears the highest occupied area by 9.0 meters based on 12 foot floors and a 6 ft person standing on the highest floor.



**E2G-2 One Triangle Place Tower #2 - 12 Stories N 41-30-34.4 W 81-36-12.2 451 M @201.6 Degrees**



## E3 CANADA ANALYSIS

### NED 30 Meter Terrain

W233CG 34 dBu (50:10)  
exceeds US-Canada Border  
entirely over water, but is  
less than 60 km.

W233CG.A  
0000149926  
Latitude: 41-30-48 N  
Longitude: 081-36-04 W  
ERP: 0.25 kW  
Channel: 233  
Frequency: 94.5 MHz  
AMSL Height: 312.6 m  
Elevation: 210.6 m  
Horiz. Pattern: Directional

60 km Radius

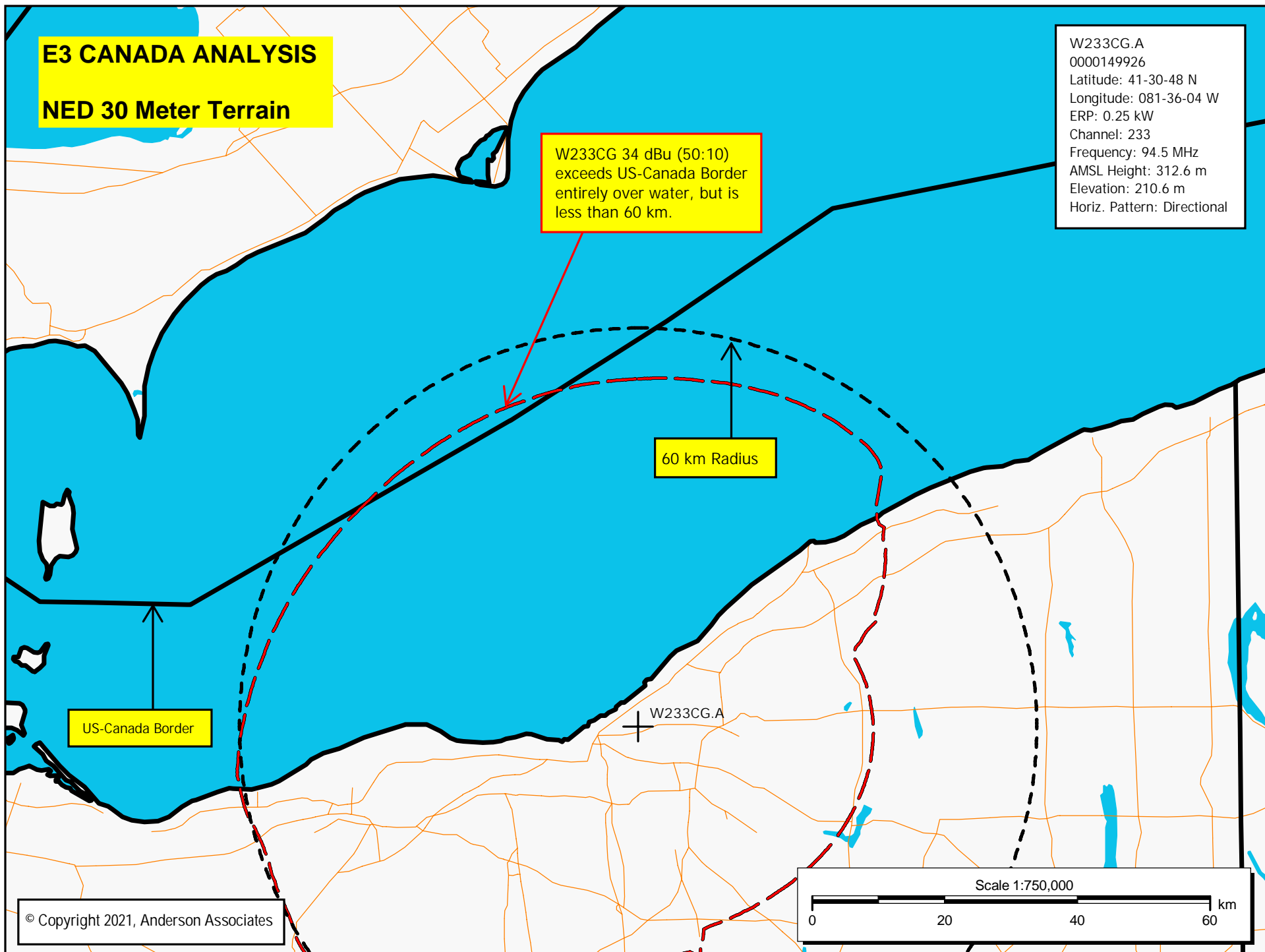
US-Canada Border

W233CG.A

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Scale 1:750,000

0 20 40 60 km





**E3A CANADA  
AERIAL VIEW**

60 km Radius



34 dBu (50:10)



Google Earth

Image NOAA  
Image Landsat / Copernicus

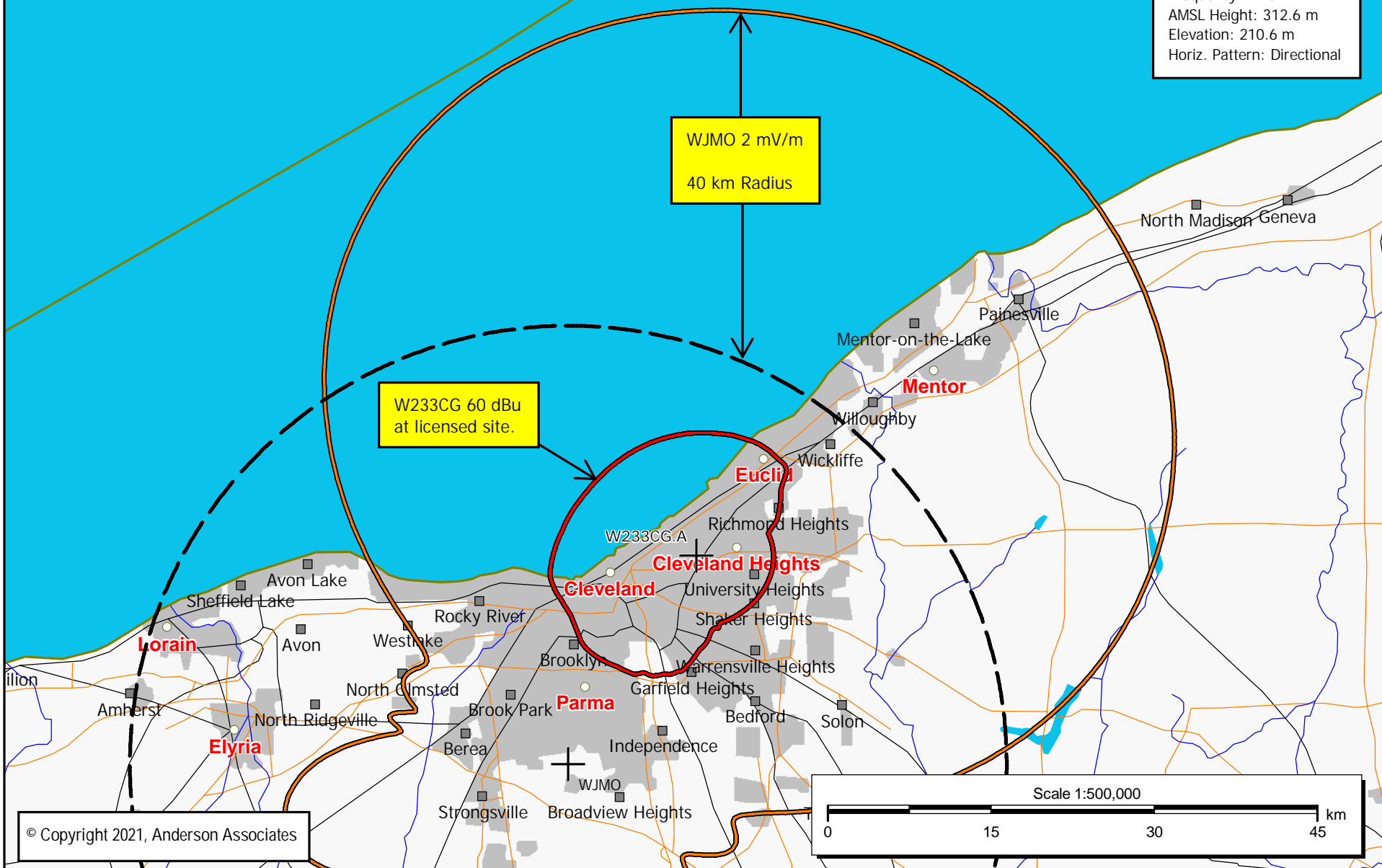
40 mi

## E4 CONTOURS

W233CG.A  
0000149926  
Latitude: 41-30-48 N  
Longitude: 081-36-04 W  
ERP: 0.25 kW  
Channel: 233  
Frequency: 94.5 MHz  
AMSL Height: 312.6 m  
Elevation: 210.6 m  
Horiz. Pattern: Directional

WJMO 2 mV/m  
40 km Radius

W233CG 60 dBu  
at licensed site.







## E5 Registration 1014404

### Registration Detail

Reg Number	1014404	Status	Constructed
File Number	A0600512	Constructed	06/21/1983
EMI	No	Dismantled	
NEPA	No		

### Antenna Structure

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

#### Location (in NAD83 Coordinates)

Lat/Long	41-30-48.0 N 081-36-04.0 W	Address	11821 EUCLID AVE
City, State	CLEVELAND , OH		
Zip	44106	County	CUYAHOGA
Center of AM Array		Position of Tower in Array	

#### Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
210.6	109.1
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
319.7	108.2

#### Painting and Lighting Specifications

FCC Paragraphs 1, 3, 12, 21

### FAA Notification

FAA Study	FAA Issue Date
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### Owner & Contact Information

FRN	0007164544	Owner Entity Type
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#### Owner

Blue Chip Broadcasting Licenses, Ltd	P: (301)306-1111
Attention To: Sonya Hall-Harris	F:
5900 Princess Garden Pkwy	E: sharris@radio-one.com
Lanham , MD 20706	

#### Contact

Hall-Harris , Sonya	P: (301)306-1111
5900 Princess Garden Pkwy	F:
Lanham , MD 20706	E: sharris@radio-one.com

### Last Action Status

Status	Constructed	Received	07/28/2008
Purpose	Admin Update	Entered	07/28/2008
Mode	Interactive		

### Related Applications

07/28/2008	A0600512	- Admin Update (AU)
07/25/2003	A0335903	- Change Owner (OC)
02/25/1997	A0079270	- New (NE)

## 6 Bay TFC2K 96.1MHz

June 5, 2015

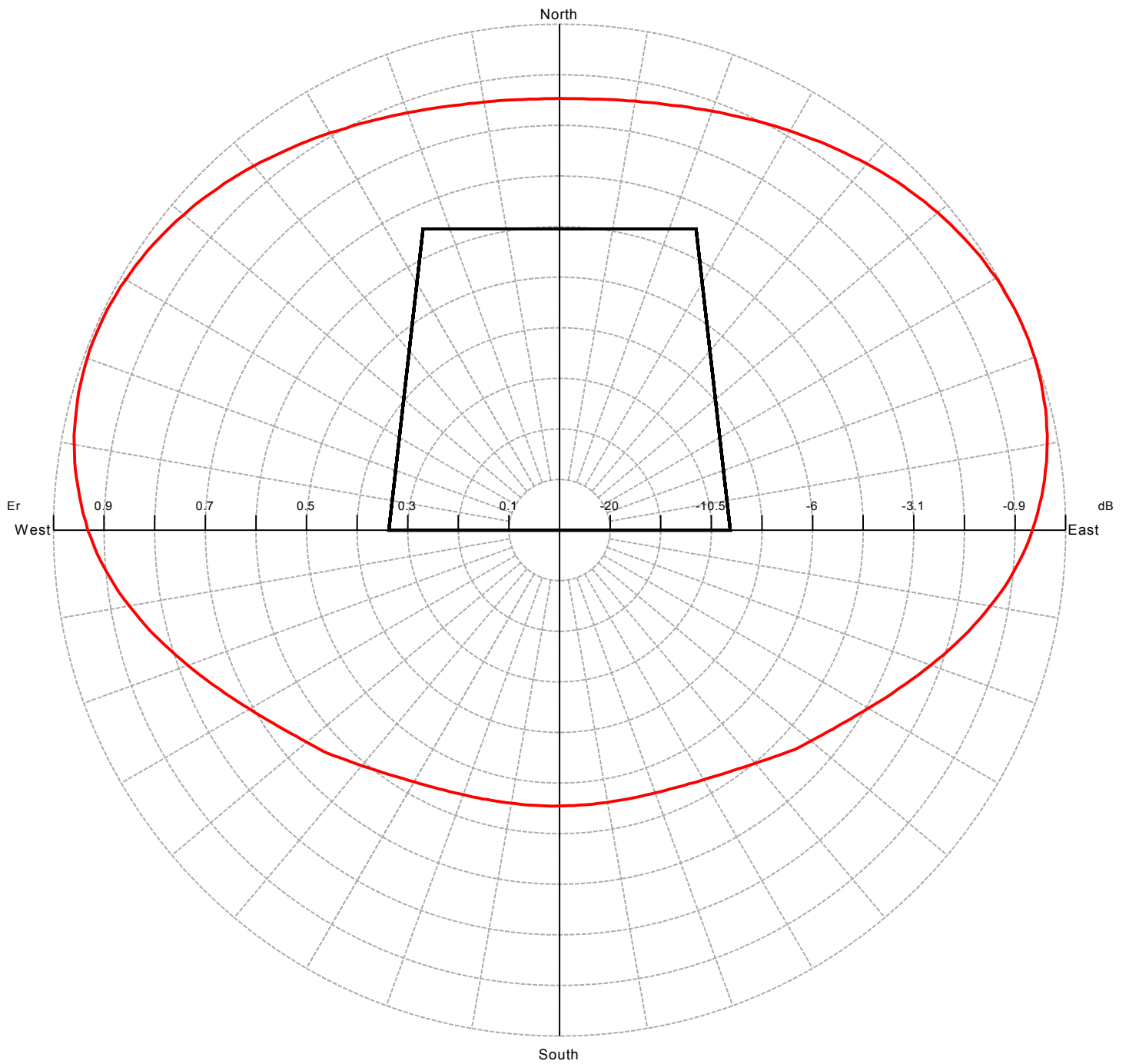




**Geometrical and electrical data of antenna System**

	<i>Power (%)</i>	<i>Tilt (°)</i>	<i>Az. (°/N)</i>	<i>Phase (°)</i>	<i>V dist. (m)</i>	<i>Scr-d (cm)</i>	<i>Scr-Az (°/N)</i>	<i>Rot. (1÷4)</i>	<i>Type (1÷2)</i>	<i>L cables (cm)</i>	<i>Car. phase (°)</i>
1	16.667	0	0	0 +0.0	6.50	0.0	0.0	1	1	0.0	0.0
2	16.667	0	0	0 +0.0	3.90	0.0	0.0	1	1	0.0	0.0
3	16.667	0	0	0 +0.0	1.30	0.0	0.0	1	1	0.0	0.0
4	16.667	0	0	0 +0.0	-1.30	0.0	0.0	1	1	0.0	0.0
5	16.667	0	0	0 +0.0	-3.90	0.0	0.0	1	1	0.0	0.0
6	16.667	0	0	0 +0.0	-6.50	0.0	0.0	1	1	0.0	0.0

# Horizontal diagram at 0.0° tilt (Total Antenna)



— 0.0° Tilt (Total Antenna), Gain (dBd): 4.26

ERP T.Max(KW): 2.668 ERP E.Max(KW): 2.168

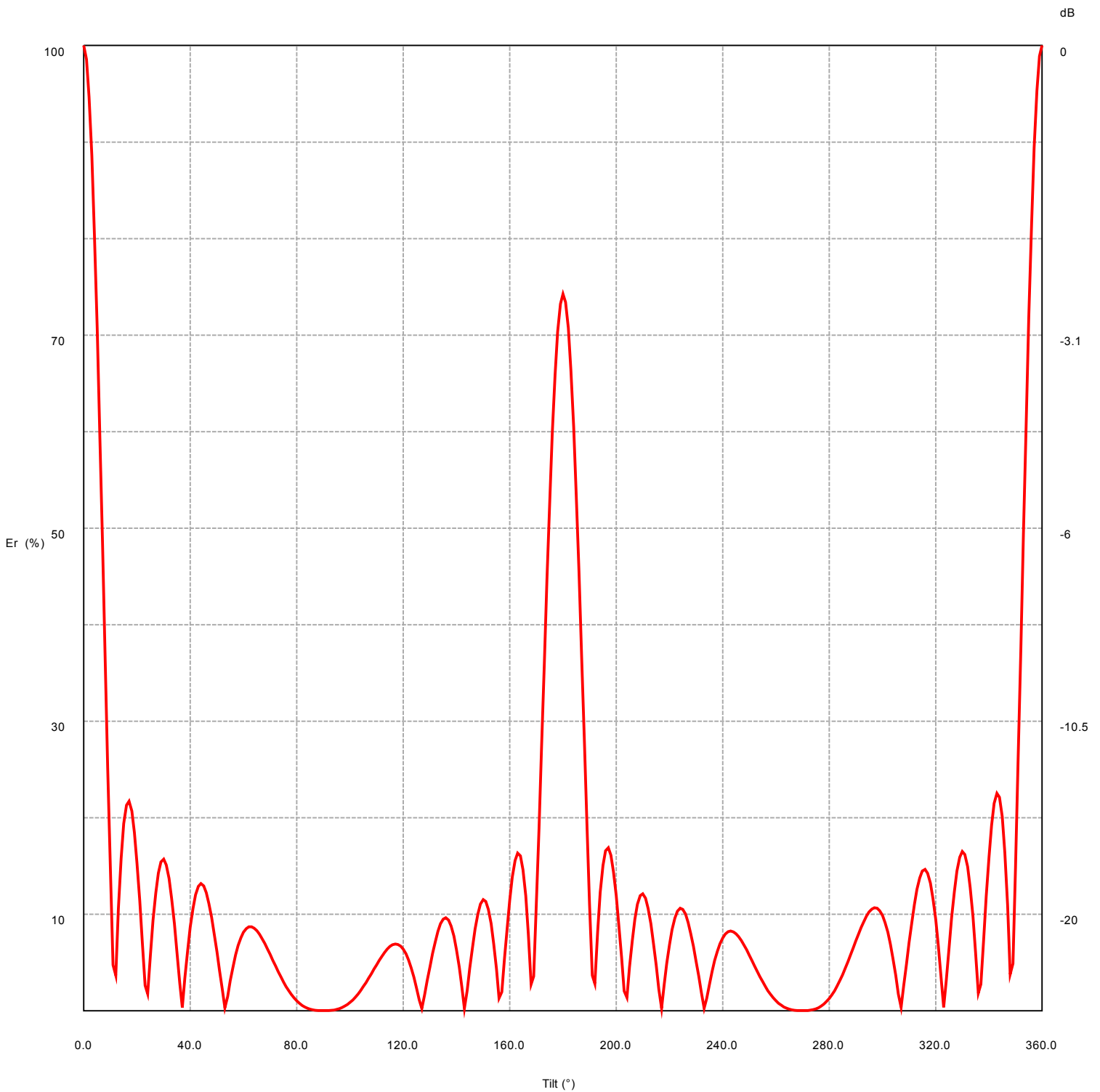
### Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)
0.0	85.3	1.578	60.0	99.7	2.154	120.0	70.5	1.076
1.0	85.3	1.578	61.0	99.8	2.158	121.0	69.8	1.056
2.0	85.3	1.578	62.0	99.8	2.158	122.0	69.1	1.036
3.0	85.4	1.582	63.0	99.9	2.163	123.0	68.6	1.019
4.0	85.4	1.582	64.0	100.0	2.168	124.0	68.0	1.001
5.0	85.5	1.585	65.0	100.0	2.168	125.0	67.4	0.984
6.0	85.6	1.589	66.0	100.0	2.168	126.0	66.8	0.969
7.0	85.7	1.593	67.0	100.0	2.168	127.0	66.3	0.953
8.0	85.8	1.596	68.0	100.0	2.168	128.0	65.8	0.939
9.0	85.9	1.600	69.0	99.9	2.163	129.0	65.3	0.925
10.0	86.1	1.608	70.0	99.9	2.163	130.0	64.9	0.912
11.0	86.2	1.611	71.0	99.8	2.158	131.0	64.4	0.900
12.0	86.4	1.619	72.0	99.7	2.154	132.0	64.0	0.888
13.0	86.6	1.626	73.0	99.5	2.149	133.0	63.6	0.876
14.0	86.7	1.630	74.0	99.3	2.139	134.0	63.0	0.860
15.0	86.9	1.637	75.0	99.1	2.129	135.0	62.5	0.847
16.0	87.2	1.649	76.0	99.0	2.124	136.0	62.0	0.833
17.0	87.4	1.656	77.0	98.7	2.114	137.0	61.5	0.820
18.0	87.6	1.664	78.0	98.4	2.100	138.0	61.1	0.809
19.0	87.9	1.676	79.0	98.2	2.090	139.0	60.6	0.796
20.0	88.1	1.683	80.0	97.8	2.076	140.0	60.2	0.785
21.0	88.4	1.695	81.0	97.5	2.061	141.0	59.7	0.774
22.0	88.6	1.703	82.0	97.2	2.047	142.0	59.4	0.765
23.0	88.9	1.715	83.0	96.7	2.028	143.0	59.0	0.755
24.0	89.2	1.726	84.0	96.4	2.014	144.0	58.7	0.746
25.0	89.5	1.738	85.0	95.9	1.996	145.0	58.3	0.738
26.0	89.8	1.750	86.0	95.5	1.978	146.0	58.1	0.731
27.0	90.2	1.763	87.0	95.0	1.955	147.0	57.7	0.723
28.0	90.5	1.775	88.0	94.5	1.937	148.0	57.5	0.716
29.0	90.8	1.787	89.0	94.0	1.915	149.0	57.2	0.709
30.0	91.1	1.799	90.0	93.4	1.893	150.0	56.9	0.703
31.0	91.4	1.812	91.0	92.9	1.871	151.0	56.7	0.698
32.0	91.7	1.825	92.0	92.3	1.848	152.0	56.5	0.693
33.0	92.0	1.837	93.0	91.6	1.821	153.0	56.3	0.687
34.0	92.5	1.854	94.0	91.0	1.794	154.0	56.2	0.684
35.0	92.8	1.867	95.0	90.3	1.767	155.0	56.0	0.679
36.0	93.1	1.880	96.0	89.6	1.739	156.0	55.8	0.674
37.0	93.4	1.893	97.0	88.9	1.712	157.0	55.6	0.671
38.0	93.8	1.906	98.0	88.0	1.681	158.0	55.5	0.668
39.0	94.2	1.924	99.0	87.2	1.650	159.0	55.4	0.665
40.0	94.5	1.937	100.0	86.4	1.620	160.0	55.3	0.662
41.0	94.8	1.951	101.0	85.6	1.590	161.0	55.2	0.661
42.0	95.2	1.964	102.0	84.8	1.560	162.0	55.1	0.658
43.0	95.5	1.978	103.0	83.9	1.528	163.0	55.0	0.656
44.0	95.8	1.991	104.0	83.2	1.500	164.0	54.9	0.655
45.0	96.2	2.005	105.0	82.3	1.469	165.0	54.9	0.653
46.0	96.4	2.014	106.0	81.4	1.438	166.0	54.8	0.652
47.0	96.7	2.028	107.0	80.6	1.409	167.0	54.8	0.650
48.0	97.1	2.042	108.0	79.8	1.380	168.0	54.7	0.649
49.0	97.3	2.052	109.0	78.9	1.349	169.0	54.6	0.647
50.0	97.6	2.066	110.0	78.1	1.322	170.0	54.6	0.647
51.0	97.8	2.076	111.0	77.2	1.293	171.0	54.6	0.646
52.0	98.1	2.085	112.0	76.4	1.267	172.0	54.6	0.646
53.0	98.3	2.095	113.0	75.6	1.240	173.0	54.6	0.646
54.0	98.5	2.105	114.0	74.8	1.214	174.0	54.6	0.646
55.0	98.7	2.114	115.0	74.0	1.188	175.0	54.5	0.644
56.0	99.0	2.124	116.0	73.3	1.166	176.0	54.5	0.644
57.0	99.2	2.134	117.0	72.6	1.142	177.0	54.5	0.644
58.0	99.3	2.139	118.0	71.9	1.120	178.0	54.5	0.644
59.0	99.4	2.144	119.0	71.1	1.098	179.0	54.5	0.644

### Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)
180.0	54.5	0.644	240.0	70.7	1.084	300.0	99.0	2.124
181.0	54.6	0.646	241.0	71.4	1.106	301.0	98.9	2.119
182.0	54.6	0.646	242.0	72.1	1.128	302.0	98.7	2.114
183.0	54.6	0.646	243.0	72.8	1.149	303.0	98.5	2.105
184.0	54.6	0.646	244.0	73.5	1.173	304.0	98.4	2.100
185.0	54.6	0.647	245.0	74.2	1.195	305.0	98.2	2.090
186.0	54.6	0.647	246.0	75.0	1.221	306.0	97.9	2.080
187.0	54.7	0.649	247.0	75.8	1.245	307.0	97.7	2.071
188.0	54.8	0.650	248.0	76.6	1.272	308.0	97.5	2.061
189.0	54.8	0.650	249.0	77.4	1.298	309.0	97.3	2.052
190.0	54.8	0.652	250.0	78.2	1.325	310.0	96.9	2.038
191.0	54.9	0.653	251.0	79.0	1.352	311.0	96.7	2.028
192.0	55.0	0.655	252.0	79.8	1.380	312.0	96.5	2.019
193.0	55.0	0.656	253.0	80.6	1.409	313.0	96.2	2.005
194.0	55.1	0.658	254.0	81.4	1.438	314.0	95.8	1.991
195.0	55.1	0.659	255.0	82.3	1.469	315.0	95.5	1.978
196.0	55.3	0.662	256.0	83.2	1.500	316.0	95.3	1.969
197.0	55.3	0.664	257.0	83.9	1.528	317.0	95.0	1.955
198.0	55.5	0.667	258.0	84.7	1.557	318.0	94.6	1.942
199.0	55.5	0.668	259.0	85.5	1.586	319.0	94.3	1.928
200.0	55.6	0.671	260.0	86.3	1.616	320.0	94.0	1.915
201.0	55.8	0.675	261.0	87.1	1.647	321.0	93.6	1.902
202.0	56.0	0.679	262.0	87.9	1.677	322.0	93.2	1.884
203.0	56.1	0.682	263.0	88.7	1.704	323.0	92.9	1.871
204.0	56.2	0.685	264.0	89.4	1.732	324.0	92.6	1.858
205.0	56.4	0.690	265.0	90.1	1.759	325.0	92.3	1.846
206.0	56.6	0.695	266.0	90.8	1.786	326.0	91.9	1.833
207.0	56.8	0.700	267.0	91.4	1.813	327.0	91.6	1.820
208.0	57.0	0.705	268.0	92.0	1.836	328.0	91.3	1.808
209.0	57.3	0.711	269.0	92.6	1.858	329.0	91.0	1.795
210.0	57.5	0.716	270.0	93.2	1.884	330.0	90.7	1.783
211.0	57.7	0.723	271.0	93.6	1.902	331.0	90.3	1.767
212.0	58.0	0.729	272.0	94.2	1.924	332.0	89.9	1.754
213.0	58.3	0.736	273.0	94.6	1.942	333.0	89.7	1.746
214.0	58.6	0.744	274.0	95.1	1.960	334.0	89.4	1.734
215.0	58.9	0.753	275.0	95.5	1.978	335.0	89.1	1.722
216.0	59.3	0.762	276.0	95.9	1.996	336.0	88.8	1.711
217.0	59.6	0.771	277.0	96.4	2.014	337.0	88.5	1.699
218.0	60.0	0.779	278.0	96.7	2.028	338.0	88.3	1.691
219.0	60.4	0.790	279.0	97.1	2.042	339.0	88.0	1.679
220.0	60.8	0.801	280.0	97.4	2.057	340.0	87.8	1.672
221.0	61.2	0.812	281.0	97.7	2.071	341.0	87.5	1.660
222.0	61.6	0.824	282.0	97.9	2.080	342.0	87.3	1.653
223.0	62.1	0.835	283.0	98.2	2.090	343.0	87.1	1.645
224.0	62.6	0.849	284.0	98.4	2.100	344.0	86.9	1.637
225.0	63.1	0.862	285.0	98.6	2.109	345.0	86.7	1.630
226.0	63.6	0.876	286.0	98.9	2.119	346.0	86.5	1.622
227.0	64.0	0.888	287.0	99.0	2.124	347.0	86.3	1.615
228.0	64.4	0.898	288.0	99.1	2.129	348.0	86.2	1.611
229.0	64.8	0.910	289.0	99.2	2.134	349.0	86.0	1.604
230.0	65.2	0.923	290.0	99.3	2.139	350.0	85.9	1.600
231.0	65.7	0.935	291.0	99.4	2.144	351.0	85.8	1.596
232.0	66.1	0.948	292.0	99.4	2.144	352.0	85.7	1.593
233.0	66.6	0.963	293.0	99.4	2.144	353.0	85.6	1.589
234.0	67.2	0.979	294.0	99.4	2.144	354.0	85.5	1.585
235.0	67.7	0.994	295.0	99.4	2.144	355.0	85.4	1.582
236.0	68.3	1.010	296.0	99.4	2.144	356.0	85.4	1.582
237.0	68.9	1.029	297.0	99.3	2.139	357.0	85.3	1.578
238.0	69.5	1.046	298.0	99.2	2.134	358.0	85.3	1.578
239.0	70.1	1.066	299.0	99.2	2.134	359.0	85.3	1.578

# Vertical diagram at an azimuth of 65.0°



65.0° Az. (Total Antenna), Gain (dBd): 4.26

ERP T.Max(KW): 2.668

ERP E.Max(KW): 2.168

### Vertical diagram at an azimuth of 65.0°

Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
0.0	100.0	2.168	60.0	8.1	0.014	120.0	6.4	0.009
1.0	98.6	2.106	61.0	8.5	0.016	121.0	5.9	0.008
2.0	94.7	1.943	62.0	8.7	0.016	122.0	5.3	0.006
3.0	88.6	1.702	63.0	8.7	0.016	123.0	4.4	0.004
4.0	80.4	1.402	64.0	8.6	0.016	124.0	3.5	0.003
5.0	70.7	1.085	65.0	8.3	0.015	125.0	2.4	0.001
6.0	59.9	0.777	66.0	7.9	0.014	126.0	1.1	0.000
7.0	48.4	0.507	67.0	7.5	0.012	127.0	0.2	0.000
8.0	36.7	0.292	68.0	7.0	0.011	128.0	1.7	0.001
9.0	25.2	0.138	69.0	6.4	0.009	129.0	3.1	0.002
10.0	14.5	0.046	70.0	5.8	0.007	130.0	4.6	0.005
11.0	4.7	0.005	71.0	5.2	0.006	131.0	5.9	0.008
12.0	3.7	0.003	72.0	4.6	0.005	132.0	7.2	0.011
13.0	10.6	0.024	73.0	4.1	0.004	133.0	8.2	0.015
14.0	15.8	0.054	74.0	3.5	0.003	134.0	9.0	0.018
15.0	19.4	0.082	75.0	3.0	0.002	135.0	9.5	0.020
16.0	21.3	0.098	76.0	2.5	0.001	136.0	9.6	0.020
17.0	21.7	0.102	77.0	2.1	0.001	137.0	9.4	0.019
18.0	20.7	0.093	78.0	1.7	0.001	138.0	8.8	0.017
19.0	18.5	0.074	79.0	1.3	0.000	139.0	7.7	0.013
20.0	15.3	0.051	80.0	1.0	0.000	140.0	6.3	0.009
21.0	11.4	0.028	81.0	0.8	0.000	141.0	4.5	0.004
22.0	7.1	0.011	82.0	0.6	0.000	142.0	2.5	0.001
23.0	2.6	0.001	83.0	0.4	0.000	143.0	0.2	0.000
24.0	1.8	0.001	84.0	0.3	0.000	144.0	2.1	0.001
25.0	5.8	0.007	85.0	0.2	0.000	145.0	4.4	0.004
26.0	9.4	0.019	86.0	0.1	0.000	146.0	6.6	0.009
27.0	12.2	0.032	87.0	0.1	0.000	147.0	8.5	0.016
28.0	14.3	0.044	88.0	0.0	0.000	148.0	10.0	0.022
29.0	15.4	0.052	89.0	0.0	0.000	149.0	11.1	0.026
30.0	15.7	0.053	90.0	0.0	0.000	150.0	11.5	0.029
31.0	15.1	0.049	91.0	0.0	0.000	151.0	11.3	0.028
32.0	13.7	0.041	92.0	0.0	0.000	152.0	10.5	0.024
33.0	11.6	0.029	93.0	0.0	0.000	153.0	9.0	0.018
34.0	9.0	0.018	94.0	0.1	0.000	154.0	6.9	0.010
35.0	6.1	0.008	95.0	0.1	0.000	155.0	4.3	0.004
36.0	2.9	0.002	96.0	0.2	0.000	156.0	1.3	0.000
37.0	0.3	0.000	97.0	0.3	0.000	157.0	2.0	0.001
38.0	3.4	0.003	98.0	0.5	0.000	158.0	5.3	0.006
39.0	6.2	0.008	99.0	0.7	0.000	159.0	8.6	0.016
40.0	8.7	0.016	100.0	0.9	0.000	160.0	11.5	0.029
41.0	10.6	0.024	101.0	1.1	0.000	161.0	13.9	0.042
42.0	12.0	0.031	102.0	1.4	0.000	162.0	15.6	0.052
43.0	12.9	0.036	103.0	1.7	0.001	163.0	16.3	0.058
44.0	13.2	0.038	104.0	2.1	0.001	164.0	16.0	0.056
45.0	12.9	0.036	105.0	2.5	0.001	165.0	14.6	0.046
46.0	12.2	0.032	106.0	2.9	0.002	166.0	11.9	0.031
47.0	11.1	0.027	107.0	3.4	0.002	167.0	7.9	0.014
48.0	9.7	0.020	108.0	3.8	0.003	168.0	2.8	0.002
49.0	8.0	0.014	109.0	4.3	0.004	169.0	3.6	0.003
50.0	6.1	0.008	110.0	4.8	0.005	170.0	10.9	0.026
51.0	4.2	0.004	111.0	5.2	0.006	171.0	18.9	0.078
52.0	2.2	0.001	112.0	5.7	0.007	172.0	27.4	0.163
53.0	0.3	0.000	113.0	6.1	0.008	173.0	36.1	0.283
54.0	1.5	0.000	114.0	6.4	0.009	174.0	44.7	0.433
55.0	3.1	0.002	115.0	6.7	0.010	175.0	52.7	0.603
56.0	4.5	0.004	116.0	6.8	0.010	176.0	59.9	0.778
57.0	5.8	0.007	117.0	6.9	0.010	177.0	65.9	0.941
58.0	6.8	0.010	118.0	6.9	0.010	178.0	70.4	1.073
59.0	7.6	0.012	119.0	6.7	0.010	179.0	73.2	1.162

### Vertical diagram at an azimuth of 65.0°

Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
180.0	74.2	1.195	240.0	7.5	0.012	300.0	9.9	0.021
181.0	73.4	1.169	241.0	7.9	0.014	301.0	9.1	0.018
182.0	70.7	1.085	242.0	8.2	0.015	302.0	8.1	0.014
183.0	66.4	0.955	243.0	8.3	0.015	303.0	6.9	0.010
184.0	60.5	0.793	244.0	8.2	0.015	304.0	5.4	0.006
185.0	53.4	0.618	245.0	8.0	0.014	305.0	3.7	0.003
186.0	45.3	0.446	246.0	7.7	0.013	306.0	1.7	0.001
187.0	36.8	0.293	247.0	7.3	0.011	307.0	0.4	0.000
188.0	28.0	0.170	248.0	6.8	0.010	308.0	2.6	0.001
189.0	19.3	0.081	249.0	6.3	0.009	309.0	4.8	0.005
190.0	11.1	0.027	250.0	5.8	0.007	310.0	7.0	0.011
191.0	3.7	0.003	251.0	5.2	0.006	311.0	9.1	0.018
192.0	2.8	0.002	252.0	4.6	0.005	312.0	11.0	0.026
193.0	8.2	0.014	253.0	4.1	0.004	313.0	12.6	0.034
194.0	12.3	0.033	254.0	3.5	0.003	314.0	13.8	0.041
195.0	15.1	0.049	255.0	3.0	0.002	315.0	14.5	0.045
196.0	16.6	0.060	256.0	2.5	0.001	316.0	14.6	0.046
197.0	16.9	0.062	257.0	2.1	0.001	317.0	14.2	0.044
198.0	16.1	0.056	258.0	1.7	0.001	318.0	13.2	0.038
199.0	14.4	0.045	259.0	1.3	0.000	319.0	11.6	0.029
200.0	11.9	0.031	260.0	1.0	0.000	320.0	9.4	0.019
201.0	8.9	0.017	261.0	0.8	0.000	321.0	6.8	0.010
202.0	5.5	0.007	262.0	0.6	0.000	322.0	3.7	0.003
203.0	2.0	0.001	263.0	0.4	0.000	323.0	0.4	0.000
204.0	1.4	0.000	264.0	0.3	0.000	324.0	3.1	0.002
205.0	4.5	0.004	265.0	0.2	0.000	325.0	6.5	0.009
206.0	7.3	0.011	266.0	0.1	0.000	326.0	9.6	0.020
207.0	9.5	0.019	267.0	0.1	0.000	327.0	12.3	0.033
208.0	11.0	0.026	268.0	0.0	0.000	328.0	14.5	0.046
209.0	11.9	0.031	269.0	0.0	0.000	329.0	15.9	0.055
210.0	12.1	0.032	270.0	0.0	0.000	330.0	16.5	0.059
211.0	11.7	0.029	271.0	0.0	0.000	331.0	16.2	0.057
212.0	10.6	0.024	272.0	0.0	0.000	332.0	14.9	0.048
213.0	9.0	0.018	273.0	0.1	0.000	333.0	12.8	0.035
214.0	7.0	0.011	274.0	0.1	0.000	334.0	9.8	0.021
215.0	4.7	0.005	275.0	0.2	0.000	335.0	6.1	0.008
216.0	2.2	0.001	276.0	0.3	0.000	336.0	1.8	0.001
217.0	0.3	0.000	277.0	0.5	0.000	337.0	2.7	0.002
218.0	2.7	0.002	278.0	0.7	0.000	338.0	7.4	0.012
219.0	4.9	0.005	279.0	1.0	0.000	339.0	11.9	0.031
220.0	6.8	0.010	280.0	1.3	0.000	340.0	15.9	0.055
221.0	8.4	0.015	281.0	1.6	0.001	341.0	19.2	0.080
222.0	9.6	0.020	282.0	2.1	0.001	342.0	21.5	0.100
223.0	10.3	0.023	283.0	2.6	0.001	343.0	22.5	0.110
224.0	10.6	0.024	284.0	3.1	0.002	344.0	22.1	0.106
225.0	10.5	0.024	285.0	3.7	0.003	345.0	20.1	0.088
226.0	10.0	0.022	286.0	4.4	0.004	346.0	16.4	0.058
227.0	9.2	0.018	287.0	5.1	0.006	347.0	10.9	0.026
228.0	8.0	0.014	288.0	5.8	0.007	348.0	3.8	0.003
229.0	6.7	0.010	289.0	6.5	0.009	349.0	4.9	0.005
230.0	5.2	0.006	290.0	7.2	0.011	350.0	14.9	0.048
231.0	3.6	0.003	291.0	8.0	0.014	351.0	25.9	0.146
232.0	1.9	0.001	292.0	8.6	0.016	352.0	37.5	0.306
233.0	0.3	0.000	293.0	9.3	0.019	353.0	49.4	0.530
234.0	1.3	0.000	294.0	9.8	0.021	354.0	61.0	0.807
235.0	2.7	0.002	295.0	10.2	0.023	355.0	71.9	1.121
236.0	4.1	0.004	296.0	10.5	0.024	356.0	81.4	1.438
237.0	5.2	0.006	297.0	10.7	0.025	357.0	89.4	1.733
238.0	6.2	0.008	298.0	10.6	0.024	358.0	95.3	1.970
239.0	6.9	0.010	299.0	10.4	0.023	359.0	98.9	2.121