

EXHIBIT 13

Interference Contour Calculations – 103.3, Enon, with directional RFS CPF-500 250 watts max

Take ERP at a given HAAT, looking at 103.3 MHz to ensure that the translator's interference contour will not overlap the protected contour of other stations. If the distance of the protected contour plus the distance of the worst-case interference contour is less than the distance between stations, there is no possible overlap using contour protection techniques.

Station and Call Sign	Facility ID #	Station		Azimuth Degrees	Dist. km	Other Station's (50,50) Protected Contour toward 103.3				103.3 Interference (50,10) Contour at 70m AGL				Clearance km
		Class	Freq.			W	HAAT	dBu	km	W	HAAT	dB	km	
WEBN, Cincinnati, OH (LIC)	29734	B	102.7	210.42	99.9	16,000	283	54	66.5	220	78	94	1.4	42.0
WDHT, Urbana, OH (LIC)	60252	B	102.9	30.83	7.8	50,000	174	54	68.0	71	62	94	0.9	See Note
WVKO, Johnstown, OH (LIC)	58633	A	103.1	70.32	113.4	1,600	150	60	25.1	68	63	54	10.6	77.7
WRAC, Georgetown, OH (LIC)	50136	A	103.1	173.47	114.2	6,000	63	60	22.9	72	71	54	11.3	70.0
WMLX, St Marys, OH (LIC)	37499	A	103.3	343.34	86.0	1,950	152	60	26.4	121	40	40	22.7	36.9
WGRR, Hamilton, OH (LIC)	72126	B	103.5	214.26	92.9	11,000	329	54	66.2	219	83	48	24.0	2.7
WNND, Pickerington, OH (LIC)	60590	A	103.5	86.03	102.0	4,200	155	60	31.8	56	51	54	9.1	61.1
W279BB, Urbana, OH (LIC)	138892	D	103.7	35.76	21.4	13	109	60	6.5	116	65	100	0.8	14.1
W279BR, Greenville, OH (LIC)	142405	D	103.7	289.95	65.7	80	50	60	6.9	238	90	100	0.9	57.9
WZDA, Beavercreek, OH (LIC)	67689	A	103.9	232.95	31.5	2,900	172	60	30.6	227	105	100	0.8	0.1
WJKR, Worthington, OH (LIC)	60099	A	103.9	82.94	69.5	1,215	69	60	15.9	53	52	100	0.5	53.1

Using actual ERP and HAAT for each station to calculate protected contour.

NOTE:

WDHT (LIC) Interference Analysis:

The proposed translator is within the 54 dbu contour of lower second adjacent station WDHT (LIC) channel 275. The WDHT (LIC) contour at the translator site is 95.3 dBμ f(50,50). Using the ratio of 100:1 (translator to WDHT) on the second adjacent channel, the interference contour affecting WDHT (LIC) extends to the 135.3 dBμ (95.3 dbμ + 40 dbμ) contour. Using the free space equation, the predicted interference area extends 19.0 meters from the antenna.

Therefore, the application is in compliance with the following: *74.1204 (d) the provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. In addition, an application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population or such other factors as may be applicable.*

Relative Field Values

FCC > Media Bureau > MB-CDBS > CDBS Public Access > Antenna Search

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[site map](#)

Antenna Make	Model	Service	Antenna Id
RFS	CPF500	FM	127448

Antenna relative field values:

0°	0.949	10°	0.965	20°	0.968	30°	0.957	40°	0.962	50°	0.967
60°	0.977	70°	0.975	80°	0.969	90°	0.932	100°	0.822	110°	0.73
120°	0.62	130°	0.501	140°	0.446	150°	0.436	160°	0.521	170°	0.662
180°	0.699	190°	0.644	200°	0.523	210°	0.449	220°	0.489	230°	0.556
240°	0.644	250°	0.784	260°	0.893	270°	0.964	280°	0.996	290°	0.993
300°	1	310°	0.991	320°	0.973	330°	0.954	340°	0.938	350°	0.935

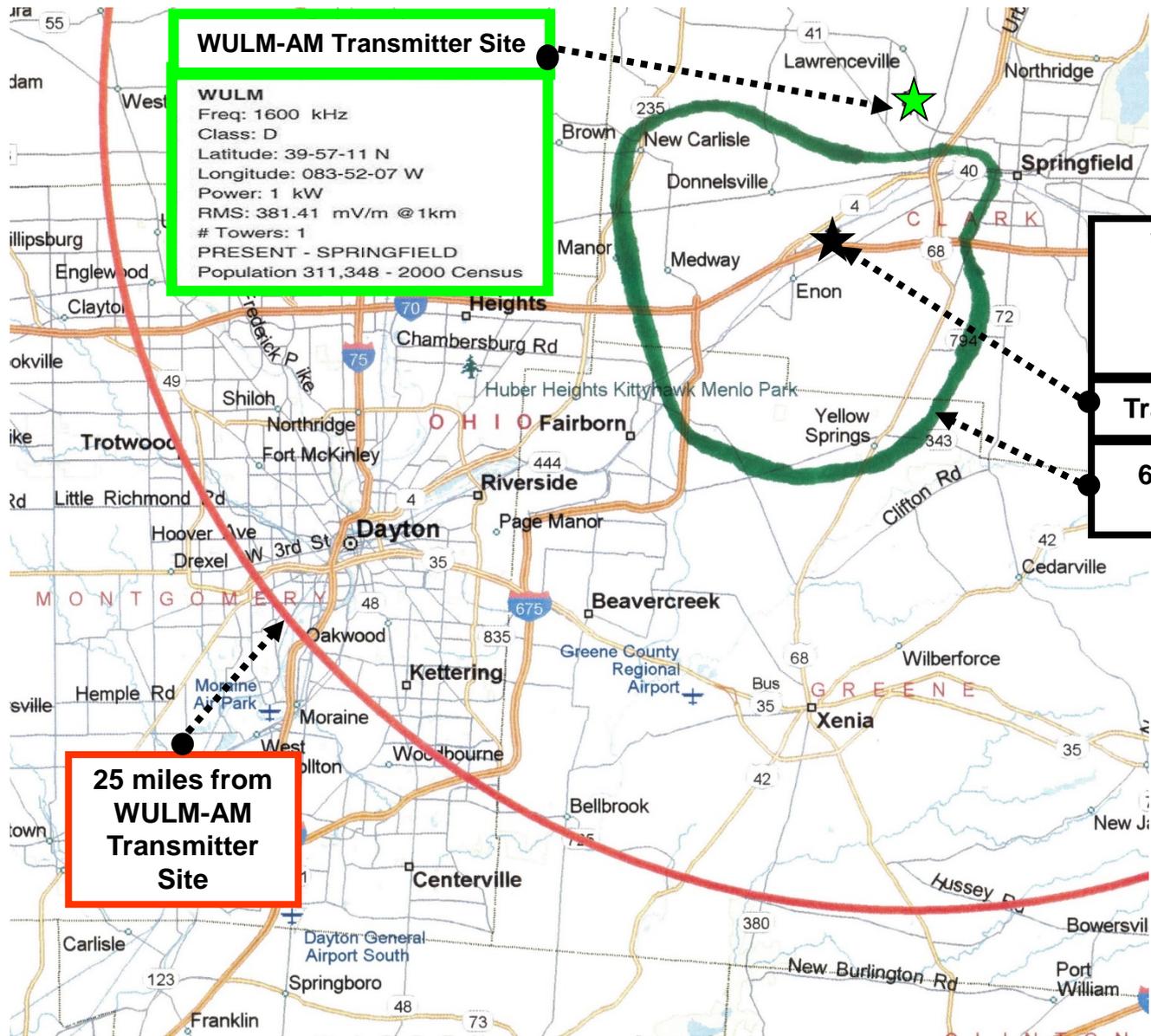
Additional Azimuths:

175°	0.681
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RFS CPF500-1

Single-Bay

Reference Degrees	Relative Field	Power Gain	ERP with 161W at antenna	Azimuth with 230 degree offset	ERP with 161W at antenna	Rad.Ctr. HAAT (m)	60dBu (50,50) Coverage (km)	100dBu (50,10) Interference (km)	
0	0.949	0.901	225	230	225	103	12.720	0.832	
3	0.954	0.910	227	233	227	105	12.866	0.836	
10	0.965	0.931	232	240	232	103	12.815	0.847	
20	0.968	0.937	234	250	234	97	12.472	0.850	
30	0.957	0.916	229	260	229	94	12.224	These calculations are used to show no interference to WZDA-FM	
40	0.962	0.925	231	270	231	87	11.809		
50	0.967	0.935	233	280	233	87	11.833		
60	0.977	0.955	238	290	238	90	12.084		
70	0.975	0.951	237	300	237	89	12.007		
80	0.969	0.939	234	310	234	74	10.992		
90	0.932	0.869	217	320	217	62	9.968		
100	0.822	0.676	169	330	169	49	8.247		
110	0.730	0.533	133	340	133	41	7.008		
120	0.620	0.384	96	350	96	38	6.226		
130	0.501	0.251	63	0	63	34	5.319		
140	0.446	0.199	50	10	50	35	5.087		
150	0.436	0.190	47	20	47	43	5.573		
160	0.521	0.271	68	30	68	61	7.272		
170	0.662	0.438	109	40	109	68	8.713		
180	0.699	0.489	122	50	122	69	9.043		
190	0.644	0.415	103	60	103	68	8.580		
200	0.523	0.274	68	70	68	63	7.380		
210	0.449	0.202	50	80	50	54	6.352		
220	0.489	0.239	60	90	60	52	6.507		
230	0.556	0.309	77	100	77	52	6.925		
240	0.644	0.415	103	110	103	51	7.380		
250	0.784	0.615	153	120	153	56	8.663		
260	0.893	0.797	199	130	199	59	9.534		
270	0.964	0.929	232	140	232	60	9.988		
280	0.996	0.992	248	150	248	63	10.376		
290	0.993	0.986	246	160	246	64	10.427		
300	1.000	1.000	250	170	250	70	10.892		
310	0.991	0.982	245	180	245	75	11.183		
320	0.973	0.947	236	190	236	68	10.604		
330	0.954	0.910	227	200	227	72	10.779		
340	0.938	0.880	220	210	220	78	11.095		
344	0.937	0.878	219	214	219	83	11.406		0.809
350	0.935	0.874	218	220	218	91	11.896		0.814



WULM-AM Transmitter Site

WULM
 Freq: 1600 kHz
 Class: D
 Latitude: 39-57-11 N
 Longitude: 083-52-07 W
 Power: 1 kW
 RMS: 381.41 mV/m @1km
 # Towers: 1
 PRESENT - SPRINGFIELD
 Population 311,348 - 2000 Census

**W277AO on
103.3 MHz
Translator
Application**

Transmitter Site

**60dBu (50,50)
Coverage**

**25 miles from
WULM-AM
Transmitter
Site**

FM Translator, 102.1, Enon, OH

Antenna at 361m AMSL, 70m AGL

Antenna Height Above Average Terrain Calculations -- Input

Latitude	39 53 34.0 North	
Longitude	83 54 56.0 West	(NAD 27)

Height of antenna radiation center above mean sea level [RCAMSL] = **361.0** meters

Number of Evenly Spaced Radials = 12 0° is referenced to True North

Results:

Calculated HAAT= 68. meters

(Antenna Height Above Average Terrain)
using the 30 second FCC/NGDC terrain data)

Antenna Radiation Center Heights Above Individual Radials:

0.0°	34.0 meters
30.0°	60.5 meters
60.0°	68.0 meters
90.0°	52.3 meters
120.0°	56.2 meters
150.0°	62.5 meters
180.0°	74.9 meters
210.0°	77.8 meters
240.0°	102.8 meters
270.0°	87.4 meters
300.0°	88.8 meters
330.0°	49.2 meters

Antenna at 361m AMSL, 70m AGL

Antenna Height Above Average Terrain Calculations -- Input

Latitude	39 53 34.0 North	
Longitude	83 54 56.0 West	(NAD 27)

Height of antenna radiation center above mean sea level [RCAMSL] = **361.0** meters

Number of Evenly Spaced Radials = 360 0° is referenced to True North

Results:

Calculated HAAT= 67. meters

(Antenna Height Above Average Terrain)
using the 30 second FCC/NGDC terrain data)

Antenna Radiation Center Heights Above Individual Radials:

0.0°	34.0 meters
1.0°	34.2 meters
2.0°	34.5 meters
3.0°	34.7 meters
4.0°	35.0 meters
5.0°	35.1 meters
6.0°	34.9 meters
7.0°	34.6 meters
8.0°	34.6 meters
9.0°	34.7 meters
10.0°	34.8 meters
11.0°	35.2 meters
12.0°	35.8 meters
13.0°	36.6 meters
14.0°	37.4 meters

15.0°	38.1 meters
16.0°	38.6 meters
17.0°	39.1 meters
18.0°	39.7 meters
19.0°	41.2 meters
20.0°	43.1 meters
21.0°	45.5 meters
22.0°	48.6 meters
23.0°	51.8 meters
24.0°	54.3 meters
25.0°	56.1 meters
26.0°	57.6 meters
27.0°	58.7 meters
28.0°	59.3 meters
29.0°	59.8 meters
30.0°	60.5 meters
31.0°	61.6 meters
32.0°	62.7 meters
33.0°	63.6 meters
34.0°	64.1 meters
35.0°	64.6 meters
36.0°	65.5 meters
37.0°	66.5 meters
38.0°	67.1 meters
39.0°	67.5 meters
40.0°	67.6 meters
41.0°	67.7 meters
42.0°	67.7 meters
43.0°	67.6 meters
44.0°	68.0 meters
45.0°	68.8 meters
46.0°	69.5 meters
47.0°	69.8 meters
48.0°	69.5 meters
49.0°	69.1 meters
50.0°	68.8 meters
51.0°	68.8 meters
52.0°	68.9 meters
53.0°	69.2 meters
54.0°	69.4 meters
55.0°	69.6 meters
56.0°	69.5 meters

57.0°	69.3 meters
58.0°	69.1 meters
59.0°	68.6 meters
60.0°	68.0 meters
61.0°	67.4 meters
62.0°	66.8 meters
63.0°	66.2 meters
64.0°	65.6 meters
65.0°	65.0 meters
66.0°	64.5 meters
67.0°	64.0 meters
68.0°	63.6 meters
69.0°	63.3 meters
70.0°	62.9 meters
71.0°	62.3 meters
72.0°	61.6 meters
73.0°	60.5 meters
74.0°	59.0 meters
75.0°	57.2 meters
76.0°	55.6 meters
77.0°	54.8 meters
78.0°	54.2 meters
79.0°	53.9 meters
80.0°	53.6 meters
81.0°	53.1 meters
82.0°	52.6 meters
83.0°	52.2 meters
84.0°	51.9 meters
85.0°	51.6 meters
86.0°	51.4 meters
87.0°	51.4 meters
88.0°	51.7 meters
89.0°	52.0 meters
90.0°	52.3 meters
91.0°	52.4 meters
92.0°	52.4 meters
93.0°	52.4 meters
94.0°	52.4 meters
95.0°	52.5 meters
96.0°	52.6 meters
97.0°	52.7 meters
98.0°	52.7 meters

99.0°	52.5 meters
100.0°	52.3 meters
101.0°	52.1 meters
102.0°	52.2 meters
103.0°	52.0 meters
104.0°	51.8 meters
105.0°	51.5 meters
106.0°	51.3 meters
107.0°	51.1 meters
108.0°	51.0 meters
109.0°	51.0 meters
110.0°	51.2 meters
111.0°	51.6 meters
112.0°	52.2 meters
113.0°	52.9 meters
114.0°	53.6 meters
115.0°	54.3 meters
116.0°	54.9 meters
117.0°	55.3 meters
118.0°	55.7 meters
119.0°	55.9 meters
120.0°	56.2 meters
121.0°	56.3 meters
122.0°	56.6 meters
123.0°	56.8 meters
124.0°	57.0 meters
125.0°	57.3 meters
126.0°	57.5 meters
127.0°	57.8 meters
128.0°	58.1 meters
129.0°	58.4 meters
130.0°	58.7 meters
131.0°	58.9 meters
132.0°	59.1 meters
133.0°	59.1 meters
134.0°	59.0 meters
135.0°	58.9 meters
136.0°	58.8 meters
137.0°	59.0 meters
138.0°	59.4 meters
139.0°	59.7 meters
140.0°	59.5 meters

141.0°	59.4 meters
142.0°	59.4 meters
143.0°	59.5 meters
144.0°	59.6 meters
145.0°	59.7 meters
146.0°	59.9 meters
147.0°	60.1 meters
148.0°	60.7 meters
149.0°	61.6 meters
150.0°	62.5 meters
151.0°	62.8 meters
152.0°	62.3 meters
153.0°	61.7 meters
154.0°	61.3 meters
155.0°	61.3 meters
156.0°	61.4 meters
157.0°	61.5 meters
158.0°	61.9 meters
159.0°	62.6 meters
160.0°	63.6 meters
161.0°	64.6 meters
162.0°	65.5 meters
163.0°	66.6 meters
164.0°	67.7 meters
165.0°	68.6 meters
166.0°	69.2 meters
167.0°	69.4 meters
168.0°	69.5 meters
169.0°	69.4 meters
170.0°	70.0 meters
171.0°	71.1 meters
172.0°	72.2 meters
173.0°	72.4 meters
174.0°	72.4 meters
175.0°	72.8 meters
176.0°	73.1 meters
177.0°	73.4 meters
178.0°	73.9 meters
179.0°	74.4 meters
180.0°	74.9 meters
181.0°	75.0 meters
182.0°	74.7 meters

183.0°	74.3 meters
184.0°	73.8 meters
185.0°	73.2 meters
186.0°	72.4 meters
187.0°	70.8 meters
188.0°	69.5 meters
189.0°	68.5 meters
190.0°	67.6 meters
191.0°	66.9 meters
192.0°	67.0 meters
193.0°	67.9 meters
194.0°	69.2 meters
195.0°	70.5 meters
196.0°	71.6 meters
197.0°	72.2 meters
198.0°	72.5 meters
199.0°	72.4 meters
200.0°	72.1 meters
201.0°	72.2 meters
202.0°	72.5 meters
203.0°	72.9 meters
204.0°	73.2 meters
205.0°	73.4 meters
206.0°	73.9 meters
207.0°	74.9 meters
208.0°	76.2 meters
209.0°	77.2 meters
210.0°	77.8 meters
211.0°	78.6 meters
212.0°	79.8 meters
213.0°	81.3 meters
214.0°	82.7 meters
215.0°	84.2 meters
216.0°	85.8 meters
217.0°	87.4 meters
218.0°	88.8 meters
219.0°	90.1 meters
220.0°	91.2 meters
221.0°	92.4 meters
222.0°	93.6 meters
223.0°	94.6 meters
224.0°	95.8 meters

225.0°	97.2 meters
226.0°	98.9 meters
227.0°	100.3 meters
228.0°	101.4 meters
229.0°	102.2 meters
230.0°	102.9 meters
231.0°	103.6 meters
232.0°	104.4 meters
233.0°	104.9 meters
234.0°	105.3 meters
235.0°	105.5 meters
236.0°	105.7 meters
237.0°	105.6 meters
238.0°	105.0 meters
239.0°	104.0 meters
240.0°	102.8 meters
241.0°	101.3 meters
242.0°	100.0 meters
243.0°	98.9 meters
244.0°	98.2 meters
245.0°	97.7 meters
246.0°	97.5 meters
247.0°	97.5 meters
248.0°	97.4 meters
249.0°	97.3 meters
250.0°	97.0 meters
251.0°	96.7 meters
252.0°	96.3 meters
253.0°	95.9 meters
254.0°	95.4 meters
255.0°	94.9 meters
256.0°	94.6 meters
257.0°	94.5 meters
258.0°	94.4 meters
259.0°	94.3 meters
260.0°	93.8 meters
261.0°	93.1 meters
262.0°	92.3 meters
263.0°	91.6 meters
264.0°	90.9 meters
265.0°	90.3 meters
266.0°	89.7 meters

267.0°	89.0 meters
268.0°	88.3 meters
269.0°	87.7 meters
270.0°	87.4 meters
271.0°	87.3 meters
272.0°	87.2 meters
273.0°	87.2 meters
274.0°	87.3 meters
275.0°	87.6 meters
276.0°	87.7 meters
277.0°	87.8 meters
278.0°	87.5 meters
279.0°	87.2 meters
280.0°	86.9 meters
281.0°	86.7 meters
282.0°	87.0 meters
283.0°	87.4 meters
284.0°	87.8 meters
285.0°	88.1 meters
286.0°	88.3 meters
287.0°	88.5 meters
288.0°	89.0 meters
289.0°	89.4 meters
290.0°	89.8 meters
291.0°	90.0 meters
292.0°	90.1 meters
293.0°	90.2 meters
294.0°	90.4 meters
295.0°	90.4 meters
296.0°	90.4 meters
297.0°	90.2 meters
298.0°	89.8 meters
299.0°	89.3 meters
300.0°	88.8 meters
301.0°	88.2 meters
302.0°	87.6 meters
303.0°	86.6 meters
304.0°	85.2 meters
305.0°	83.5 meters
306.0°	81.4 meters
307.0°	79.3 meters
308.0°	77.2 meters

309.0°	75.4 meters
310.0°	73.6 meters
311.0°	71.9 meters
312.0°	70.5 meters
313.0°	69.1 meters
314.0°	67.9 meters
315.0°	66.6 meters
316.0°	65.6 meters
317.0°	64.9 meters
318.0°	64.2 meters
319.0°	63.1 meters
320.0°	61.9 meters
321.0°	60.7 meters
322.0°	59.6 meters
323.0°	58.5 meters
324.0°	57.3 meters
325.0°	56.1 meters
326.0°	54.7 meters
327.0°	53.0 meters
328.0°	51.3 meters
329.0°	49.9 meters
330.0°	49.2 meters
331.0°	48.9 meters
332.0°	48.3 meters
333.0°	47.4 meters
334.0°	46.4 meters
335.0°	45.1 meters
336.0°	43.8 meters
337.0°	42.7 meters
338.0°	41.9 meters
339.0°	41.2 meters
340.0°	40.7 meters
341.0°	40.4 meters
342.0°	40.1 meters
343.0°	39.7 meters
344.0°	39.0 meters
345.0°	38.3 meters
346.0°	37.9 meters
347.0°	37.9 meters
348.0°	38.2 meters
349.0°	38.1 meters
350.0°	37.8 meters

351.0°	37.3 meters
352.0°	37.0 meters
353.0°	36.8 meters
354.0°	36.6 meters
355.0°	36.3 meters
356.0°	35.8 meters
357.0°	35.2 meters
358.0°	34.6 meters
359.0°	34.0 meters