



Comprehensive Engineering Statement

Town of Monroe

8/18/2020

The applicant proposes a minor change application to move the transmitter and antenna of W209CJ.

Licensed Geographic Coordinates:

N. Lat. 41-14-20.30 (NAD 83)

W. Long. 73 42 44.40

Proposed New Coordinates:

N. Lat. 41-13-34.9 (NAD 83)

W. Long. 73 42 58.9

Proposed Antenna COR, 127.7 m AMSL

Elevation at the site, 93 m

Tower height above ground, 44.65 m

Antenna height C.O.R. above ground, 34.7 m

Antenna Type, Shively 6812-2 HW

ERP: 0.008 kW circularly polarized

Page #2 of this statement is a contour-to-contour tabular channel study. (See page #10 for information on how to read the study.)

Page #3 is a coverage map showing the proposed 60 dBu coverage is contained within the licensed 60 dBu coverage.

Pages #4 through #5 is a study for WQXW. This study shows that, at the power level proposed with the Shively half-wave antenna, no interference will be caused. Pages #6 through #13 compose the remainder of the allocation study, showing that all the Commission's rules under section 74.1204, regarding protection to other stations and translators, have been fully met.

Page #14 is a narrative on how to read the computer printout.

Page #15 is an exhibit with the qualifications of the preparer.

Due to the low power radiated and the relatively high antenna height, provided by the existing tower, this translator should be considered categorically excluded from further R.F. hazard analysis.

Proposed W209CJ Contour-to-Contour Relationships
Town Of Monroe, Connecticut
CH# 209D - 89.7 MHz, Pwr= 0.008 kW, HAAT= -16.0 M, COR= 127.7 M
Average Protected F(50-50)= 2.98 km
Omni-directional

REFERENCE
41 13 34.90 N.
73 42 58.92 W.

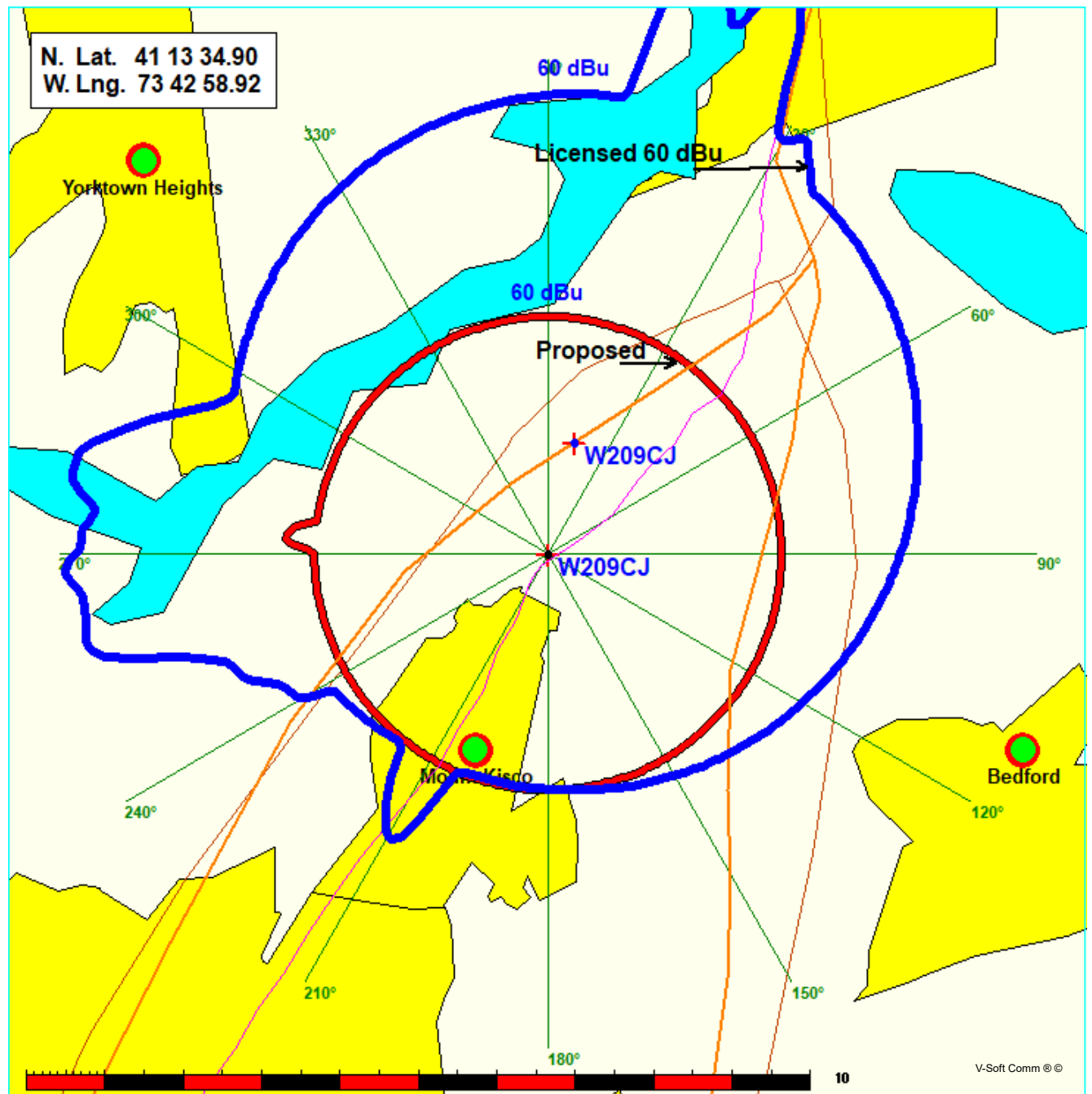
DISPLAY DATES
DATA 08-18-20
SEARCH 08-18-20

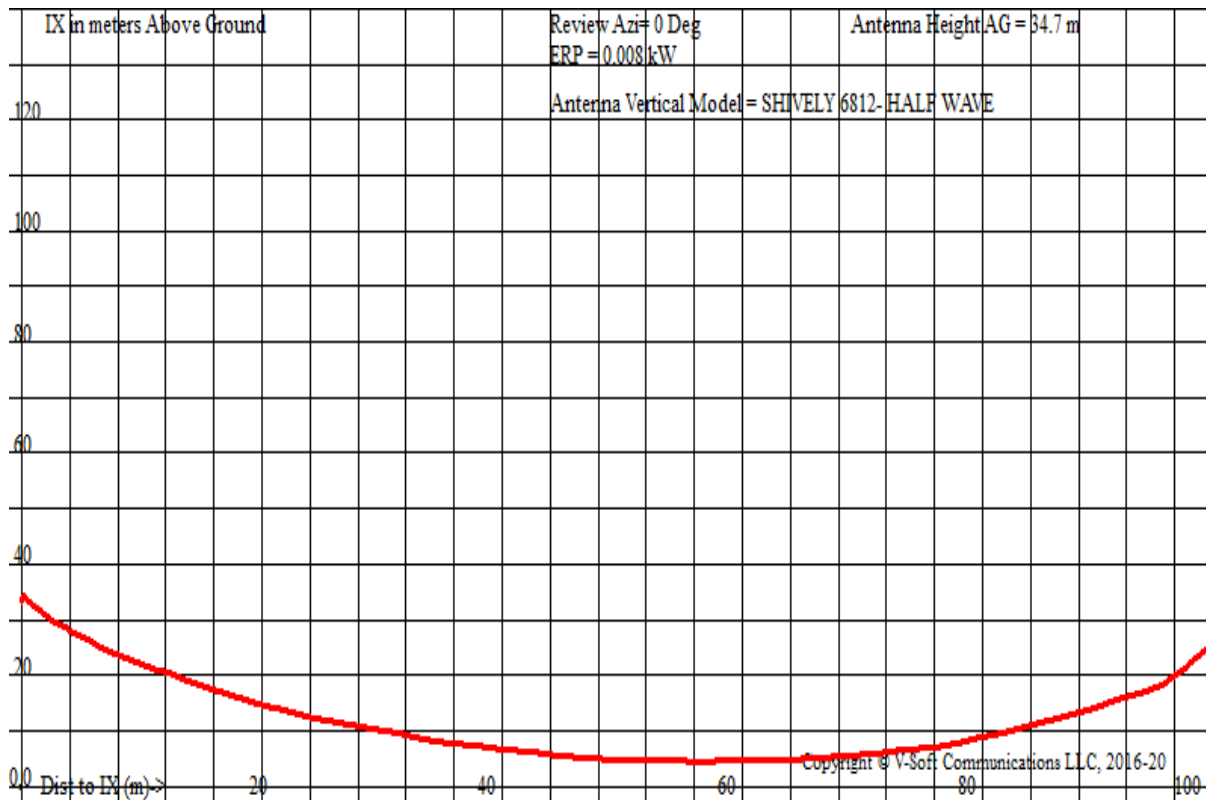
CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DI ST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*OUT* (Overlap in km)
209D W209CJ Mount Ki sco		LIC ___ NY		13.5 193.5	1.44 BMLFT20110602ACX	41 14 20.30 73 42 44.40	0.038 33	166	---Reference---	Town Of Monroe, Connecticu
212A WQXW Ossi ning		LIC D___ NY		215.1 35.0	10.09 BMLED20140401ACT	41 09 07.30 73 47 08.40	0.250 145	1.1 244	13.8	-3.9*<*** New York Public Radio
206B U New York		VAC ___N NY		201.8 21.7	57.01	40 45 00.37 73 58 05.50	50.000 150	5.9 166	51.8	5.0
208B WPKN Bri dgeport		LIC D___ CT		82.3 262.7	44.78 BMLED20060201AYV	41 16 44.30 73 11 06.40	10.000 169	46.6 253	30.3 Wpkn, Inc.	10.1
211A WPUT North Salem		APP D___ NY		33.7 213.8	21.11 0000115866	41 23 03.30 73 34 33.40	1.000 -27	0.8 160	6.1 Foothills Public Radio, In	14.0
207B1 WLJP Monroe		CP D___ NY		295.8 115.5	39.01 BPED20170414ADH	41 22 42.30 74 08 14.50	1.600 283	1.3 494	24.5 Sound Of Life, Inc.	14.0
207B1 WLJP Monroe		APP DH___ NY		295.8 115.5	39.01 0000112485	41 22 42.30 74 08 14.50	1.600 283	1.3 494	24.5 Sound Of Life, Inc.	14.0
206B1 WFDU Teaneck		LIC D___ NJ		210.4 30.3	34.19 BLED20151103AYC	40 57 39.40 73 55 21.50	3.000 195	1.2 236	17.9 Fairleigh Dickinson Uni ver	14.6
211A WPUT North Salem		LIC D___ NY		33.7 213.8	21.11 BLED20120628AAJ	41 23 03.30 73 34 33.40	0.440 -13	0.5 160	4.6 Foothills Public Radio, In	15.6
211D W211AI Stamford		LIC D___ CT		145.5 325.6	24.05 BLFT19940317TI	41 02 52.30 73 33 14.40	0.250 29	1.1 65	7.0 Sacred Heart University, I	16.8
207A WLJP Monroe		LIC ___ NY		295.8 115.5	39.01 BLED20130503ACB	41 22 42.30 74 08 14.50	0.200 283	1.0 494	21.4 Sound Of Life, Inc.	17.4
06 -- WNYZ-LP« New York		CP D_N NY		199.8 19.6	56.56 BDFCDVL-20150120AI	44 31 32.10 72 48 56.40	3.000	1.6 213	24.4 26.0R	30.6M
06+-- WNYZ-LP« New York		LI D_N NY		199.8 19.6	56.56 BLTVL-20080128ACC	44 31 32.10 72 48 56.40	3.000	1.6 213	24.0 25.6R	31.0M

Terrain database is GLOBE 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.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
Incoming contour overlap is ignored.
"***"affixed to 'IN' or 'OUT' values = site inside restricted contour.
"<***" 3rd adjacent WQXW is protected using U/D, see attached table, map and graph showing no interference, on
pages 3 - 4.

Proposed W209CJ 60 dBu Coverage & Licensed Coverage
Town Of Monroe, Connecticut

Coverage Study - GLOBE 30 Sec
08-18-2020





W209CJ Mt Kisco, NY, Showing Protection to WQXW, Channel: 212
 Geographic Coordinates: N. 411334.90 W. 73 42 58.92
 74.1204(d) Study - Using GLOBE 30 SEC Terrain Database
 Translator or LPFM Maximum Antenna ERP = 0.008 kW, Channel: 209
 Translator or LPFM Antenna Height AG = 34.7 meters
 W209CJ Antenna Azimuth Model = Shively 6812 HW -2

Protected Station's Contour = 65.69473 dBu
 Translator's or LPFM's full Interference contour 105.69473

Review Azimuth = 0 Degrees True
 Relative Field on the horizontal at Review Azimuth = 1.000
 Translator/LPFM ERP on the horizontal at Review Azimuth = 0.008 kW
 Distance between stations = 10.1 km
 Protected Station= WQXW, .25 kW, 244 M meters COR AMSL

Depression Angle From Horiz. (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)
00.0	1.0	1.0	0.0080	102.9932	102.9932	034.700
05.0	0.989	1.0	0.0078	101.8603	101.4727	025.822
10.0	0.955	1.0	0.0073	098.3585	096.8642	017.620
15.0	0.878	1.0	0.0062	090.4280	087.3468	011.296
20.0	0.801	1.0	0.0051	082.4975	077.5223	006.484
25.0	0.698	1.0	0.0039	071.8377	065.1071	004.340
30.0	0.594	1.0	0.0028	061.1780	052.9817	004.111
35.0	0.486	1.0	0.0019	050.0032	040.9602	006.019
40.0	0.377	1.0	0.0011	038.8284	029.7443	009.742
45.0	0.284	1.0	0.0006	029.1986	020.6465	014.053
50.0	0.190	1.0	0.0003	019.5687	012.5785	019.710
55.0	0.136	1.0	0.0001	013.9556	008.0046	023.268
60.0	0.081	1.0	0.0001	008.3424	004.1712	027.475
65.0	0.052	1.0	0.0000	005.3041	002.2416	029.893
70.0	0.022	1.0	0.0000	002.2659	000.7750	032.571
75.0	0.016	1.0	0.0000	001.6479	000.4265	033.108
80.0	0.010	1.0	0.0000	001.0299	000.1788	033.686
85.0	0.010	1.0	0.0000	001.0299	000.0898	033.674
90.0	0.020	1.0	0.0000	002.0599	000.0000	032.640

Satellite Map, showing nearest building to be 46.37 meters from the proposed transmitting antenna.



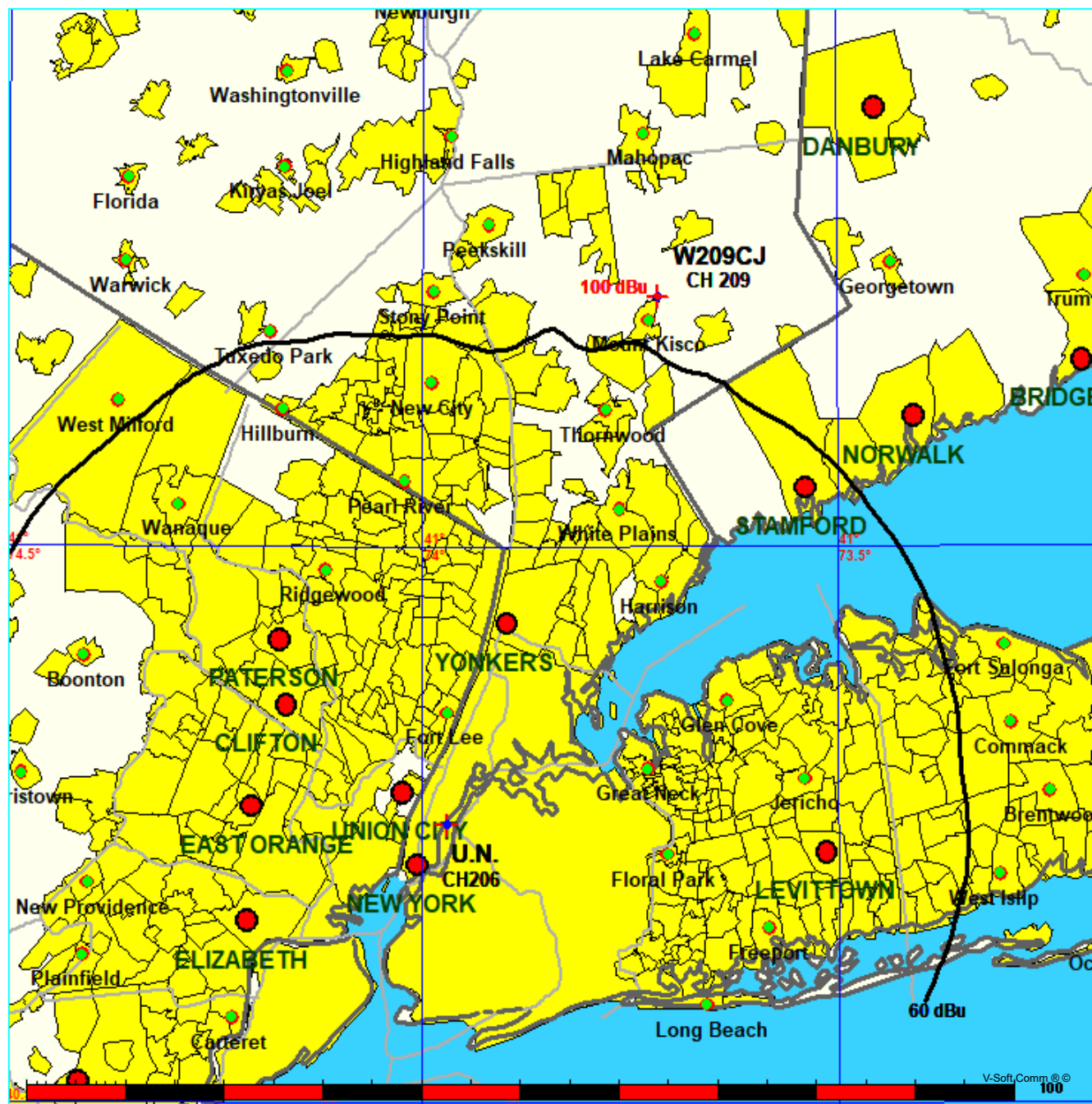
FMCommander Map Study - 08-18-2020 - GLOBE 30 Sec
W209CJ's Overlaps (In= 48.12 km, Out= 4.96 km)

W209CJ CH 209 D

Lat= 41 13 34.90, Lng= 73 42 58.92
0.008 kW -16 m HAAT, 127.7 m COR
Prot.= 60 dBu, Intef.= 100 dBu

U-N- CH 206 B

Lat= 40 45 00.37, Lng= 73 58 05.50
50.0 kW 150 m HAAT, 165.6 m COR
Prot.= 60 dBu, Intef.= 100 dBu



08-18-2020

Terrain Data: GLOBE 30 Sec

FMOver Analysis

WPKN BMLED20060201AYV

W209CJ

Channel = 208B

Max ERP = 10 kW

RCAMSL = 253 m

N. Lat. 41 16 44.30

W. Lng. 73 11 06.40

Protected

60 dBu

Channel = 209D

Max ERP = 0.008 kW

RCAMSL = 127.74 m

N. Lat. 41 13 34.90

W. Lng. 73 42 58.92

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
203.0	006.3123	0183.2	037.9	134.2	000.0080	-0016.9	041.6	17.08	
204.0	006.0996	0181.7	037.5	134.0	000.0080	-0016.5	040.8	17.31	
205.0	005.8906	0181.3	037.2	133.9	000.0080	-0016.2	040.1	17.53	
206.0	005.6852	0181.5	036.9	133.8	000.0080	-0016.0	039.4	17.76	
207.0	005.4834	0181.6	036.6	133.7	000.0080	-0015.8	038.7	17.98	
208.0	005.2853	0181.3	036.3	133.5	000.0080	-0015.3	038.0	18.22	
209.0	005.0908	0180.2	035.9	133.1	000.0080	-0014.5	037.3	18.46	
210.0	004.9000	0178.1	035.4	132.6	000.0080	-0013.9	036.5	18.71	
211.0	004.7403	0174.7	034.8	131.9	000.0080	-0013.4	035.8	18.97	
212.0	004.5833	0171.1	034.1	131.1	000.0080	-0014.0	035.1	19.22	
213.0	004.4289	0168.3	033.6	130.3	000.0080	-0014.8	034.5	19.47	
214.0	004.2772	0166.7	033.1	129.7	000.0080	-0015.5	033.8	19.70	
215.0	004.1281	0165.7	032.7	129.1	000.0080	-0016.0	033.2	19.93	
216.0	003.9816	0164.7	032.3	128.5	000.0080	-0016.4	032.6	20.15	
217.0	003.8378	0163.7	031.9	127.8	000.0080	-0016.9	032.0	20.38	
218.0	003.6966	0162.5	031.5	127.0	000.0080	-0017.5	031.5	20.60	
219.0	003.5581	0161.0	031.1	126.2	000.0080	-0018.2	031.0	20.83	
220.0	003.4222	0159.7	030.7	125.4	000.0080	-0019.0	030.4	21.07	
221.0	003.3235	0158.7	030.4	124.7	000.0080	-0019.5	029.9	21.31	
222.0	003.2262	0157.6	030.1	124.0	000.0080	-0019.9	029.5	21.55	
223.0	003.1304	0155.7	029.7	123.1	000.0080	-0020.0	029.0	21.79	
224.0	003.0360	0153.2	029.2	122.1	000.0080	-0019.9	028.6	22.02	
225.0	002.9431	0150.5	028.8	121.0	000.0080	-0019.7	028.2	22.24	
226.0	002.8516	0148.1	028.4	119.9	000.0080	-0019.6	027.8	22.45	
227.0	002.7615	0145.9	028.0	118.8	000.0080	-0019.0	027.4	22.66	
228.0	002.6729	0143.7	027.6	117.7	000.0080	-0017.9	027.1	22.86	
229.0	002.5857	0141.3	027.2	116.6	000.0080	-0016.0	026.8	23.04	
230.0	002.5000	0139.0	026.8	115.4	000.0080	-0014.1	026.5	23.22	
231.0	002.4800	0137.5	026.6	114.6	000.0080	-0012.8	026.2	23.43	
232.0	002.4602	0137.1	026.6	114.0	000.0080	-0012.1	025.8	23.68	
233.0	002.4404	0137.1	026.5	113.4	000.0080	-0011.9	025.4	23.93	
234.0	002.4206	0137.8	026.5	112.9	000.0080	-0012.1	025.0	24.19	
235.0	002.4010	0139.4	026.6	112.5	000.0080	-0012.5	024.6	24.49	
236.0	002.4010	0141.1	026.7	112.2	000.0080	-0013.0	024.1	24.81	

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
237.0	002.4010	0141.7	026.8	111.7	000.0080	-0013.9	023.7	25.11
238.0	002.4338	0141.0	026.8	111.1	000.0080	-0015.3	023.3	25.39
239.0	002.4668	0139.3	026.8	110.2	000.0080	-0016.7	023.0	25.63
240.0	002.5000	0137.8	026.7	109.4	000.0080	-0018.0	022.6	25.87
241.0	002.5857	0136.6	026.8	108.8	000.0080	-0018.7	022.2	26.18
242.0	002.6729	0135.3	026.9	108.1	000.0080	-0019.2	021.8	26.49
243.0	002.7615	0133.8	027.0	107.4	000.0080	-0019.6	021.4	26.77
244.0	002.8516	0131.8	027.0	106.5	000.0080	-0020.2	021.1	27.04
245.0	002.9431	0129.8	027.0	105.6	000.0080	-0020.9	020.7	27.29
246.0	003.0360	0128.0	027.0	104.7	000.0080	-0022.1	020.4	27.55
247.0	003.1304	0127.1	027.1	103.8	000.0080	-0024.0	020.0	27.85
248.0	003.2262	0126.7	027.3	102.9	000.0080	-0025.7	019.6	28.17
249.0	003.3235	0126.1	027.4	102.0	000.0080	-0026.8	019.3	28.47
250.0	003.4222	0125.0	027.5	100.9	000.0080	-0028.4	018.9	28.73
251.0	003.5581	0123.6	027.6	099.8	000.0080	-0030.8	018.6	29.01
252.0	003.6966	0122.9	027.8	098.7	000.0080	-0033.2	018.2	29.33
253.0	003.8378	0123.2	028.0	097.7	000.0080	-0035.4	017.8	29.69
254.0	003.9816	0123.6	028.3	096.6	000.0080	-0037.9	017.3	30.07
255.0	004.1281	0123.0	028.5	095.3	000.0080	-0040.5	017.0	30.35
256.0	004.2772	0122.0	028.6	093.8	000.0080	-0042.2	016.7	30.60
257.0	004.4289	0121.6	028.8	092.3	000.0080	-0042.6	016.4	30.88
258.0	004.5833	0121.2	029.0	090.8	000.0080	-0043.0	016.1	31.13
259.0	004.7403	0121.3	029.2	089.2	000.0080	-0043.4	015.7	31.42
260.0	004.9000	0121.6	029.5	087.4	000.0080	-0042.2	015.4	31.70
261.0	005.0908	0122.1	029.8	085.6	000.0080	-0039.9	015.0	32.02
262.0	005.2853	0122.5	030.1	083.7	000.0080	-0037.9	014.7	32.37
263.0	005.4834	0122.6	030.4	081.6	000.0080	-0035.4	014.4	32.70
264.0	005.6852	0120.6	030.4	079.5	000.0080	-0035.8	014.4	32.73
265.0	005.8906	0118.5	030.4	077.4	000.0080	-0029.6	014.4	32.70
266.0	006.0996	0116.7	030.5	075.3	000.0080	-0017.1	014.5	32.65
267.0	006.3123	0115.7	030.6	073.1	000.0080	-0014.9	014.4	32.68
268.0	006.5286	0115.6	030.8	070.8	000.0080	-0017.7	014.4	32.77
269.0	006.7486	0115.5	031.1	068.5	000.0080	-0015.9	014.3	32.83
270.0	006.9722	0115.4	031.3	066.1	000.0080	-0016.6	014.3	32.84
271.0	007.1318	0113.3	031.2	064.3	000.0080	-0019.0	014.6	32.47
272.0	007.2932	0110.9	031.1	062.7	000.0080	-0018.9	015.0	32.04
273.0	007.4563	0108.4	030.9	061.3	000.0080	-0016.3	015.4	31.68
274.0	007.6213	0106.2	030.7	059.9	000.0080	-0015.8	015.8	31.33
275.0	007.7881	0104.3	030.6	058.5	000.0080	-0018.4	016.2	30.99
276.0	007.9566	0102.8	030.6	057.2	000.0080	-0021.3	016.6	30.67
277.0	008.1270	0101.1	030.5	056.0	000.0080	-0023.0	017.0	30.33
278.0	008.2992	0100.4	030.5	054.6	000.0080	-0025.3	017.3	30.06
279.0	008.4732	0099.6	030.6	053.3	000.0080	-0028.1	017.7	29.76
280.0	008.6490	0099.2	030.6	051.9	000.0080	-0028.8	018.0	29.49
281.0	008.7797	0098.5	030.7	050.8	000.0080	-0025.7	018.4	29.16
282.0	008.9114	0097.1	030.5	050.0	000.0080	-0022.1	018.9	28.77
283.0	009.0440	0096.5	030.6	049.0	000.0080	-0016.4	019.3	28.43
284.0	009.1776	0095.5	030.5	048.2	000.0080	-0012.3	019.8	28.05
285.0	009.3123	0094.0	030.4	047.7	000.0080	-0010.2	020.3	27.65
286.0	009.4478	0092.3	030.2	047.3	000.0080	-0009.1	020.8	27.23
287.0	009.5844	0090.5	030.0	047.0	000.0080	-0008.5	021.4	26.80

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
288.0	009.7220	0088.7	029.8	046.8	000.0080	-0008.1	021.9	26.38
289.0	009.8605	0087.1	029.6	046.5	000.0080	-0007.8	022.5	25.99
290.0	010.0000	0085.0	029.4	046.5	000.0080	-0007.7	023.0	25.57
291.0	010.0000	0082.4	029.0	046.9	000.0080	-0008.2	023.7	25.10
292.0	010.0000	0080.6	028.7	047.0	000.0080	-0008.4	024.3	24.69
293.0	010.0000	0079.6	028.5	046.8	000.0080	-0008.2	024.8	24.33
294.0	010.0000	0079.3	028.4	046.5	000.0080	-0007.8	025.3	24.02
295.0	010.0000	0079.6	028.5	046.0	000.0080	-0007.4	025.7	23.73
296.0	010.0000	0079.5	028.5	045.6	000.0080	-0007.4	026.2	23.42
297.0	010.0000	0078.8	028.4	045.5	000.0080	-0007.4	026.7	23.11
298.0	010.0000	0077.4	028.1	045.6	000.0080	-0007.4	027.2	22.78
299.0	010.0000	0076.7	028.0	045.6	000.0080	-0007.4	027.7	22.49
300.0	010.0000	0077.9	028.2	044.9	000.0080	-0007.2	028.1	22.25
301.0	010.0000	0080.6	028.7	043.7	000.0080	-0006.7	028.5	22.05
302.0	010.0000	0083.3	029.1	042.7	000.0080	-0006.2	028.9	21.83
303.0	010.0000	0084.2	029.3	042.2	000.0080	-0005.9	029.4	21.58
304.0	010.0000	0083.0	029.1	042.4	000.0080	-0006.1	029.9	21.32
305.0	010.0000	0081.2	028.8	042.8	000.0080	-0006.3	030.5	21.06
306.0	010.0000	0079.5	028.5	043.2	000.0080	-0006.4	031.0	20.81
307.0	010.0000	0078.6	028.3	043.4	000.0080	-0006.5	031.5	20.59
308.0	010.0000	0078.8	028.4	043.2	000.0080	-0006.5	032.0	20.39
309.0	010.0000	0079.8	028.5	042.9	000.0080	-0006.3	032.5	20.21
310.0	010.0000	0081.1	028.8	042.4	000.0080	-0006.1	033.0	20.02
311.0	010.0000	0082.1	028.9	042.1	000.0080	-0005.8	033.5	19.83
312.0	010.0000	0083.4	029.1	041.7	000.0080	-0005.5	034.0	19.64
313.0	010.0000	0085.2	029.4	041.3	000.0080	-0005.2	034.5	19.45
314.0	010.0000	0087.3	029.8	040.7	000.0080	-0004.7	035.0	19.26
315.0	010.0000	0089.9	030.2	040.1	000.0080	-0004.0	035.6	19.06
316.0	010.0000	0092.7	030.7	039.4	000.0080	-0003.4	036.1	18.86
317.0	010.0000	0095.2	031.1	038.9	000.0080	-0003.1	036.7	18.65
318.0	010.0000	0097.7	031.5	038.4	000.0080	-0002.6	037.3	18.44
319.0	010.0000	0100.2	031.9	037.9	000.0080	-0002.1	037.9	18.23
320.0	010.0000	0102.2	032.2	037.6	000.0080	-0001.7	038.5	18.03
321.0	010.0000	0103.3	032.4	037.6	000.0080	-0001.7	039.1	17.84
322.0	010.0000	0104.4	032.5	037.5	000.0080	-0001.6	039.7	17.65

Proposed W209CJ Contour-to-Contour W209CJ vs WPKN
Town Of Monroe, Connecticut

FMCommander Map Study - 08-18-2020 - GLOBE 30 Sec
W209CJ's Overlaps (In= -4.77 km, Out= 10.12 km)

W209CJ CH 209 D

Lat= 41 13 34.90, Lng= 73 42 58.92

0.008 kW -16 m HAAT, 127.7 m COR

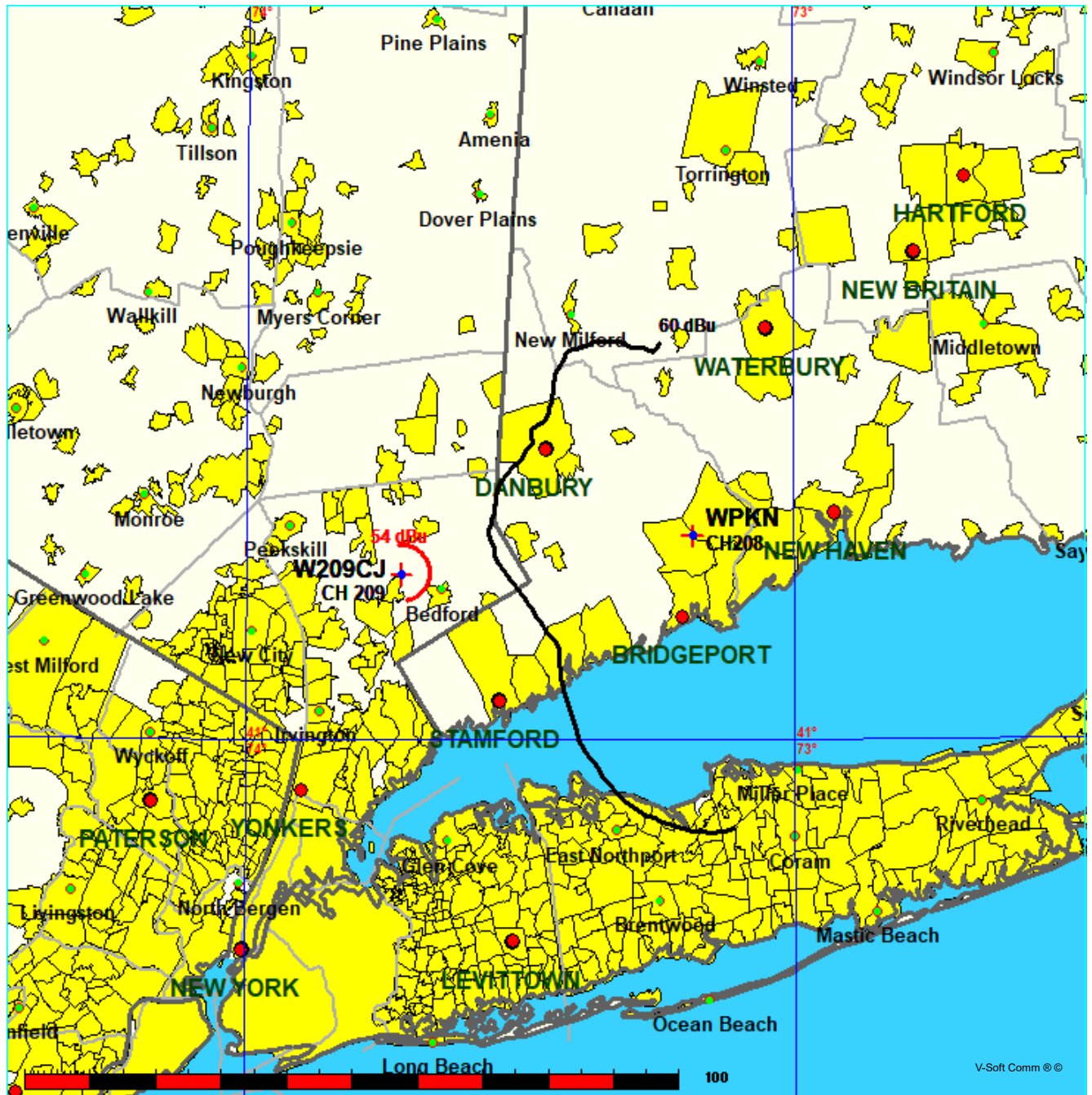
Prot.= 60 dBu, Intef.= 54 dBu

WPKN CH 208 B DA BMLED20060201AYV

Lat= 41 16 44.30, Lng= 73 11 06.40

10.0 kW 169 m HAAT, 253 m COR

Prot.= 60 dBu, Intef.= 54 dBu



08-18-2020

Terrain Data: GLOBE 30 Sec

FMOver Analysis

WPKN BMLED20060201AYV

W209CJ

Channel = 208B

Max ERP = 10 kW

RCAMSL = 253 m

N. Lat. 41 16 44.30

W. Lng. 73 11 06.40

Protected

60 dBu

Channel = 209D

Max ERP = 0.008 kW

RCAMSL = 127.74 m

N. Lat. 41 13 34.90

W. Lng. 73 42 58.92

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
203.0	006.3123	0183.2	037.9	134.2	000.0080	-0016.9	041.6	17.08	
204.0	006.0996	0181.7	037.5	134.0	000.0080	-0016.5	040.8	17.31	
205.0	005.8906	0181.3	037.2	133.9	000.0080	-0016.2	040.1	17.53	
206.0	005.6852	0181.5	036.9	133.8	000.0080	-0016.0	039.4	17.76	
207.0	005.4834	0181.6	036.6	133.7	000.0080	-0015.8	038.7	17.98	
208.0	005.2853	0181.3	036.3	133.5	000.0080	-0015.3	038.0	18.22	
209.0	005.0908	0180.2	035.9	133.1	000.0080	-0014.5	037.3	18.46	
210.0	004.9000	0178.1	035.4	132.6	000.0080	-0013.9	036.5	18.71	
211.0	004.7403	0174.7	034.8	131.9	000.0080	-0013.4	035.8	18.97	
212.0	004.5833	0171.1	034.1	131.1	000.0080	-0014.0	035.1	19.22	
213.0	004.4289	0168.3	033.6	130.3	000.0080	-0014.8	034.5	19.47	
214.0	004.2772	0166.7	033.1	129.7	000.0080	-0015.5	033.8	19.70	
215.0	004.1281	0165.7	032.7	129.1	000.0080	-0016.0	033.2	19.93	
216.0	003.9816	0164.7	032.3	128.5	000.0080	-0016.4	032.6	20.15	
217.0	003.8378	0163.7	031.9	127.8	000.0080	-0016.9	032.0	20.38	
218.0	003.6966	0162.5	031.5	127.0	000.0080	-0017.5	031.5	20.60	
219.0	003.5581	0161.0	031.1	126.2	000.0080	-0018.2	031.0	20.83	
220.0	003.4222	0159.7	030.7	125.4	000.0080	-0019.0	030.4	21.07	
221.0	003.3235	0158.7	030.4	124.7	000.0080	-0019.5	029.9	21.31	
222.0	003.2262	0157.6	030.1	124.0	000.0080	-0019.9	029.5	21.55	
223.0	003.1304	0155.7	029.7	123.1	000.0080	-0020.0	029.0	21.79	
224.0	003.0360	0153.2	029.2	122.1	000.0080	-0019.9	028.6	22.02	
225.0	002.9431	0150.5	028.8	121.0	000.0080	-0019.7	028.2	22.24	
226.0	002.8516	0148.1	028.4	119.9	000.0080	-0019.6	027.8	22.45	
227.0	002.7615	0145.9	028.0	118.8	000.0080	-0019.0	027.4	22.66	
228.0	002.6729	0143.7	027.6	117.7	000.0080	-0017.9	027.1	22.86	
229.0	002.5857	0141.3	027.2	116.6	000.0080	-0016.0	026.8	23.04	
230.0	002.5000	0139.0	026.8	115.4	000.0080	-0014.1	026.5	23.22	
231.0	002.4800	0137.5	026.6	114.6	000.0080	-0012.8	026.2	23.43	
232.0	002.4602	0137.1	026.6	114.0	000.0080	-0012.1	025.8	23.68	
233.0	002.4404	0137.1	026.5	113.4	000.0080	-0011.9	025.4	23.93	
234.0	002.4206	0137.8	026.5	112.9	000.0080	-0012.1	025.0	24.19	
235.0	002.4010	0139.4	026.6	112.5	000.0080	-0012.5	024.6	24.49	
236.0	002.4010	0141.1	026.7	112.2	000.0080	-0013.0	024.1	24.81	

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
237.0	002.4010	0141.7	026.8	111.7	000.0080	-0013.9	023.7	25.11
238.0	002.4338	0141.0	026.8	111.1	000.0080	-0015.3	023.3	25.39
239.0	002.4668	0139.3	026.8	110.2	000.0080	-0016.7	023.0	25.63
240.0	002.5000	0137.8	026.7	109.4	000.0080	-0018.0	022.6	25.87
241.0	002.5857	0136.6	026.8	108.8	000.0080	-0018.7	022.2	26.18
242.0	002.6729	0135.3	026.9	108.1	000.0080	-0019.2	021.8	26.49
243.0	002.7615	0133.8	027.0	107.4	000.0080	-0019.6	021.4	26.77
244.0	002.8516	0131.8	027.0	106.5	000.0080	-0020.2	021.1	27.04
245.0	002.9431	0129.8	027.0	105.6	000.0080	-0020.9	020.7	27.29
246.0	003.0360	0128.0	027.0	104.7	000.0080	-0022.1	020.4	27.55
247.0	003.1304	0127.1	027.1	103.8	000.0080	-0024.0	020.0	27.85
248.0	003.2262	0126.7	027.3	102.9	000.0080	-0025.7	019.6	28.17
249.0	003.3235	0126.1	027.4	102.0	000.0080	-0026.8	019.3	28.47
250.0	003.4222	0125.0	027.5	100.9	000.0080	-0028.4	018.9	28.73
251.0	003.5581	0123.6	027.6	099.8	000.0080	-0030.8	018.6	29.01
252.0	003.6966	0122.9	027.8	098.7	000.0080	-0033.2	018.2	29.33
253.0	003.8378	0123.2	028.0	097.7	000.0080	-0035.4	017.8	29.69
254.0	003.9816	0123.6	028.3	096.6	000.0080	-0037.9	017.3	30.07
255.0	004.1281	0123.0	028.5	095.3	000.0080	-0040.5	017.0	30.35
256.0	004.2772	0122.0	028.6	093.8	000.0080	-0042.2	016.7	30.60
257.0	004.4289	0121.6	028.8	092.3	000.0080	-0042.6	016.4	30.88
258.0	004.5833	0121.2	029.0	090.8	000.0080	-0043.0	016.1	31.13
259.0	004.7403	0121.3	029.2	089.2	000.0080	-0043.4	015.7	31.42
260.0	004.9000	0121.6	029.5	087.4	000.0080	-0042.2	015.4	31.70
261.0	005.0908	0122.1	029.8	085.6	000.0080	-0039.9	015.0	32.02
262.0	005.2853	0122.5	030.1	083.7	000.0080	-0037.9	014.7	32.37
263.0	005.4834	0122.6	030.4	081.6	000.0080	-0035.4	014.4	32.70
264.0	005.6852	0120.6	030.4	079.5	000.0080	-0035.8	014.4	32.73
265.0	005.8906	0118.5	030.4	077.4	000.0080	-0029.6	014.4	32.70
266.0	006.0996	0116.7	030.5	075.3	000.0080	-0017.1	014.5	32.65
267.0	006.3123	0115.7	030.6	073.1	000.0080	-0014.9	014.4	32.68
268.0	006.5286	0115.6	030.8	070.8	000.0080	-0017.7	014.4	32.77
269.0	006.7486	0115.5	031.1	068.5	000.0080	-0015.9	014.3	32.83
270.0	006.9722	0115.4	031.3	066.1	000.0080	-0016.6	014.3	32.84
271.0	007.1318	0113.3	031.2	064.3	000.0080	-0019.0	014.6	32.47
272.0	007.2932	0110.9	031.1	062.7	000.0080	-0018.9	015.0	32.04
273.0	007.4563	0108.4	030.9	061.3	000.0080	-0016.3	015.4	31.68
274.0	007.6213	0106.2	030.7	059.9	000.0080	-0015.8	015.8	31.33
275.0	007.7881	0104.3	030.6	058.5	000.0080	-0018.4	016.2	30.99
276.0	007.9566	0102.8	030.6	057.2	000.0080	-0021.3	016.6	30.67
277.0	008.1270	0101.1	030.5	056.0	000.0080	-0023.0	017.0	30.33
278.0	008.2992	0100.4	030.5	054.6	000.0080	-0025.3	017.3	30.06
279.0	008.4732	0099.6	030.6	053.3	000.0080	-0028.1	017.7	29.76
280.0	008.6490	0099.2	030.6	051.9	000.0080	-0028.8	018.0	29.49
281.0	008.7797	0098.5	030.7	050.8	000.0080	-0025.7	018.4	29.16
282.0	008.9114	0097.1	030.5	050.0	000.0080	-0022.1	018.9	28.77
283.0	009.0440	0096.5	030.6	049.0	000.0080	-0016.4	019.3	28.43
284.0	009.1776	0095.5	030.5	048.2	000.0080	-0012.3	019.8	28.05
285.0	009.3123	0094.0	030.4	047.7	000.0080	-0010.2	020.3	27.65
286.0	009.4478	0092.3	030.2	047.3	000.0080	-0009.1	020.8	27.23
287.0	009.5844	0090.5	030.0	047.0	000.0080	-0008.5	021.4	26.80

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
288.0	009.7220	0088.7	029.8	046.8	000.0080	-0008.1	021.9	26.38
289.0	009.8605	0087.1	029.6	046.5	000.0080	-0007.8	022.5	25.99
290.0	010.0000	0085.0	029.4	046.5	000.0080	-0007.7	023.0	25.57
291.0	010.0000	0082.4	029.0	046.9	000.0080	-0008.2	023.7	25.10
292.0	010.0000	0080.6	028.7	047.0	000.0080	-0008.4	024.3	24.69
293.0	010.0000	0079.6	028.5	046.8	000.0080	-0008.2	024.8	24.33
294.0	010.0000	0079.3	028.4	046.5	000.0080	-0007.8	025.3	24.02
295.0	010.0000	0079.6	028.5	046.0	000.0080	-0007.4	025.7	23.73
296.0	010.0000	0079.5	028.5	045.6	000.0080	-0007.4	026.2	23.42
297.0	010.0000	0078.8	028.4	045.5	000.0080	-0007.4	026.7	23.11
298.0	010.0000	0077.4	028.1	045.6	000.0080	-0007.4	027.2	22.78
299.0	010.0000	0076.7	028.0	045.6	000.0080	-0007.4	027.7	22.49
300.0	010.0000	0077.9	028.2	044.9	000.0080	-0007.2	028.1	22.25
301.0	010.0000	0080.6	028.7	043.7	000.0080	-0006.7	028.5	22.05
302.0	010.0000	0083.3	029.1	042.7	000.0080	-0006.2	028.9	21.83
303.0	010.0000	0084.2	029.3	042.2	000.0080	-0005.9	029.4	21.58
304.0	010.0000	0083.0	029.1	042.4	000.0080	-0006.1	029.9	21.32
305.0	010.0000	0081.2	028.8	042.8	000.0080	-0006.3	030.5	21.06
306.0	010.0000	0079.5	028.5	043.2	000.0080	-0006.4	031.0	20.81
307.0	010.0000	0078.6	028.3	043.4	000.0080	-0006.5	031.5	20.59
308.0	010.0000	0078.8	028.4	043.2	000.0080	-0006.5	032.0	20.39
309.0	010.0000	0079.8	028.5	042.9	000.0080	-0006.3	032.5	20.21
310.0	010.0000	0081.1	028.8	042.4	000.0080	-0006.1	033.0	20.02
311.0	010.0000	0082.1	028.9	042.1	000.0080	-0005.8	033.5	19.83
312.0	010.0000	0083.4	029.1	041.7	000.0080	-0005.5	034.0	19.64
313.0	010.0000	0085.2	029.4	041.3	000.0080	-0005.2	034.5	19.45
314.0	010.0000	0087.3	029.8	040.7	000.0080	-0004.7	035.0	19.26
315.0	010.0000	0089.9	030.2	040.1	000.0080	-0004.0	035.6	19.06
316.0	010.0000	0092.7	030.7	039.4	000.0080	-0003.4	036.1	18.86
317.0	010.0000	0095.2	031.1	038.9	000.0080	-0003.1	036.7	18.65
318.0	010.0000	0097.7	031.5	038.4	000.0080	-0002.6	037.3	18.44
319.0	010.0000	0100.2	031.9	037.9	000.0080	-0002.1	037.9	18.23
320.0	010.0000	0102.2	032.2	037.6	000.0080	-0001.7	038.5	18.03
321.0	010.0000	0103.3	032.4	037.6	000.0080	-0001.7	039.1	17.84
322.0	010.0000	0104.4	032.5	037.5	000.0080	-0001.6	039.7	17.65

HOW TO READ THE FM COMPUTER PRINT-OUT

Translator Reference Station

The computer printout should be self-explanatory for the most part. The parameters of the station being checked, (reference station) are printed in the heading. The 60 dBu protected contour is predicted from the Commission's F(50-50) table. Contour distances are in kilometers and are predicted using the Commission's TVFMINT FORTRAN subroutine. When interference contour distances are less than 16 kilometers the F(50-50) tables are used. If signal contour distances are less than 1.6 km the free-space equation is used.

All distances are derived by the method detailed in Sec. 73.208 of the Rules and Regulations as amended in Docket 80-90. The column labeled "* OUT *" shows the greatest distance in kilometers of overlap (or smallest distance of clearance) between the reference station's interference contour and the database station's protected contour. Negative distance figures in this column indicate outgoing contour overlap. Since translators are able to receive interference there is no "In" or incoming column in this report.

Listed antenna heights and power are the specific antenna heights and power from the FCC database.

Under the "AZI" column, the first row of numbers indicate the True North azimuths from the reference station toward the database stations, while the numbers in the second row indicate the reverse bearings from the database stations to the reference station. Bearings are calculated using spherical trigonometry.

The columns labeled "INT" and "PRO" contain the distance in kilometers of the appropriate interference contour and the protected contour of a data base station.

For I.F. relationships the minimum spacings the "OUT" columns change its significance. The letter "R" stands for the minimum **required** distance in kilometers, while the letter "M" in the next column displays the **available clear space** separation in kilometers. Minimum separation distances when displayed are taken from Sec 73.207 of the rules as amended. Canadian and Mexican separation distances, U/D ratios and protected contour values are from the US/Mexican Working Agreement and the US/Canada Working Agreement".

The first three letters of the "TYPE" column identify the current FCC status of the stations. The fourth letter will be a "D" if the facility is directional. "Z" indicates a 73.215 directional. An "N" indicates it is a 73.215 station that operates with an omni-directional antenna. The fifth letter will be an E, H or V depending on the type of antenna polarization. The sixth letter will be a "Y" if the antenna uses beam tilt or an "X" if the commission is not sure, otherwise it will be an "N" or left blank.

Declaration:

I, Douglas L. Vernier, declare that I have received training as an engineer from the University of Michigan, School of Engineering. That, I have received degrees from the University in the field of Broadcast Telecommunications. That, I have been active in broadcast consulting for over 40 years.

That, I have held a Federal Communications Commission First Class Radiotelephone License continually since 1964. In 1985, this license was reissued by the Commission as a lifetime General Radiotelephone license no. PG-16-16464.

That, I am certified as a Professional Broadcast Engineer (#50258) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Life-time Certification received in 2010).

That, my qualifications are a matter of record with the Federal Communications Commission.

That, I have been retained by The Town of Monroe to prepare the engineering showings appended hereto.

That, I have prepared these broadcast engineering showings, the technical information contained in same and the facts stated within are true of my knowledge.

That, under penalty of perjury, I declare that the foregoing is correct.

Douglas L. Vernier

A handwritten signature in blue ink, appearing to read "Doug Vernier", with a large, stylized initial "D" and a horizontal line extending to the right.

Executed of August 18, 2020