

Boone, North Carolina
Application for Minor Modification of FM Translator W233BY
On Channel 232
by
Eastern Airwaves, LLC

Exhibit 13
Interference Analysis

April 2015

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Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Exhibit 13, Interference Analysis, for Eastern Airwaves, LLC, and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



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5 April 2015

Narrative

This Exhibit supports a minor modification application for FM translator W233BY, on Channel 232 in Boone, North Carolina. Allocation details are provided in this exhibit. This proposal complies fully with the requirements of 74 C.F.R. §74.1204(a), with the exception of facilities protected under 47 C.F.R. §74.1204(d) by the Undesired to Desired (U/D) method described below. The proposed modified facilities create no mutual exclusivities with any licensed facilities, construction permits, or applications as shown in the allocation table in this exhibit.

Figure 1 shows the authorized 60 dBu F(50,50) coverage area, and the proposed 60 dBu F(50,50) coverage area. Figure 1 shows fill-in status confirmation. As shown on Figure 1, the proposed modification is a minor modification of the authorized facilities.

The modifications consist of a new primary station, change to a first adjacent channel, a new site, increase in elevation, increase in power, and a new directional antenna.

Allocations

This application proposes service to Boone, North Carolina, on channel 232. An updated Table 1: Allocations is included in this exhibit with a list of the stations, construction permits, allocations, and applications studied. All are protected under §74.1204(a) contour protection by this application, with the exception of facilities protected by the Undesired to Desired (U/D) method. Facilities protected by the U/D method are listed in Table 2. The allocations table was prepared using the NGDC 30 arcsecond terrain database which is described below. Where the outgoing protection is provided by interference contours with a

separation of less than 3.2 kilometers (2 miles), the lack of overlap is plotted in figures in this exhibit, and the output of the FM Over program is provided. For this application, there is one (1) facilities for which additional detail is provided.

Table and Figure	Call Sign	Location	Channel, class and relationship
3	W234CF	Boone, North Carolina	234D, second adjacent

Table 1: Allocations

Allocation Study											
Eastern Airwaves, LLC											
REFERENCE	CH# 232D - 94.3 MHz, Pwr= 0.045 kW DA, HAAT= 421.0 M, COR= 1450 M DISPLAY DATES										
36 13 58.0 N.	Average Protected F(50-50)= 17.3 km DATA 04-05-15										
81 41 54.0 W.	Standard Directional SEARCH 04-05-15										
CH CITY	CALL	TYPE	ANT STATE	AZI. <--	DIST FILE #	LAT. LNG.	Pwr(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
230C Marion	WMEV-FM	LIC DEX	VA	10.5 190.6	75.45 BLH20060512AAB	36 54 04.0 81 32 35.0	100.000 452	12.3 1187	84.8 Holston Valley Broadcasting	57.8	-9.4*
Protected by U/D contour, see text and figures.											
233D Boone	W233BY!	CP DH	NC	294.6 114.6	0.52 BNPFT20130828AFA	36 14 05.0 81 42 13.0	0.030 403	2.2 1437	1.1 Eastern Airwaves, LLC	-3.0	-3.1
Facility being modified.											
231C1 Lexington	WWLV	CP NCX	NC	127.4 307.9	105.92 BPH20131212AII	35 39 05.0 80 46 02.0	53.000 355	100.4 603	69.0 Educational Media Foundation	-0.3	34.4
232C2 Jenkins	WIFX-FM	LIC ZEX	KY	321.9 141.4	132.36 BLH20070511ACW	37 09 59.0 82 37 13.0	6.300 410	125.3 956	51.7 Ajspd, Llc	0.6	74.9
234D Boone	W234CF	CP DC	NC	136.5 316.5	5.36 BNPFT20130830ACK	36 11 52.0 81 39 26.0	0.250 -11	1.0 965	3.2 Blue Ridge Broadcasting Co	2.3*	1.8
232D Kingsport	W232BP	LIC DC	TN	292.6 112.1	86.13 BLFT20070907AFM	36 31 37.0 82 35 12.0	0.250 285	68.8 733	22.9 Holston Valley Broadcasting	6.7	45.0
233C Greenville	WGTK-FM	LIC CX	SC	204.4 24.0	157.17 BLH20080425ABD	34 56 29.0 82 24 41.0	100.000 454	124.4 760	83.7 Caron Broadcasting, Inc.	15.9	50.0
231C Lexington	WWLV	LIC DCX	NC	105.1 285.9	131.29 BMLED20131205ASW	35 55 02.0 80 17 37.0	100.000 309	107.0 543	73.7 Educational Media Foundation	19.7	53.1
235C0 Greeneville	WAEZ	LIC DEX	TN	259.2 78.6	91.01 BMLH20010504AAT	36 04 34.0 82 41 28.0	100.000 332	2.9 1042	42.8 Bristol Broadcasting Company	73.1	27.2
231D Weaverville	W231AR	LIC C	NC	223.9 43.5	76.55 BLFT20060126ANW	35 44 06.0 82 17 10.0	0.010 922	26.6 2009	16.3 Radio Training Network, In	32.1	33.3
233C1 Eden	WPTI	LIC DE	NC	85.0 266.0	161.30 BMLH20010514AAN	36 20 48.0 79 54 30.0	100.000 299	106.2 522	73.2 Clear Channel Broadcasting	49.5	80.1
233C1 Eden	WPTI	LIC DEX	NC	85.0 266.1	161.43 BLH20150227ABY	36 20 42.0 79 54 24.0	100.000 299	105.8 519	72.9 Clear Channel Broadcasting	50.1	80.6
229C Greenville	WFBC-FM	LIC CX	SC	213.6 33.1	149.08 BLH20021022AAJ	35 06 43.0 82 36 24.0	100.000 552	9.4 1150	69.7 Entercom License, LLC	122.1	76.1
235C Roanoke	WSLC-FM	LIC C	VA	51.6 232.6	174.68 BLH20121126ARA	37 11 50.0 80 09 11.0	100.000 598	12.9 1181	88.5 Mel wheeler, Inc.	155.8	85.1
233D Rogersville	W233BP	LIC C	TN	280.4 99.7	117.26 BLFT20091201ANJ	36 24 58.0 82 59 04.0	0.250 64	20.1 480	13.4 wrgs, Inc.	85.4	92.2
229D Greeneville	W229BA	LIC C	TN	266.4 85.7	102.19 BLFT20060615ABL	36 10 12.0 82 49 55.0	0.010 124	0.2 551	6.1 Positive Alternative Radio	87.6	95.6
231A Morristown	WMXK	LIC CX	TN	270.3 89.3	146.89 BLED20090901ADD	36 13 42.0 83 19 56.0	1.000 247	40.9 632	26.9 Educational Media Foundation	92.0	101.8

Terrain database is FCC NGDC 30 Sec,
R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. Reference Zone= East Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding. Call signs with exclamation marks need not be protected.
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.

Table 2: Facilities Protected by U/D Method

Facility	WMEV-FM Marion, Virginia
Relationship	230C, second adjacent
Distance (km)	75.45
Bearing (degrees)	10.5
ERP (kW, on azimuth)	100.0
HAAT (m, on azimuth)	469.9
Ratio	40
Signal Strength (dBu)	63.9
Translator Signal Strength	103.9
Translator distance (km)	.301

Undesired to Desired Method under §74.1204(d)

Protection to some facilities is provided through the use of Undesired to Desired Signal Strength Ratio (U/D) calculations. Table 2 lists the parameters studied. The proposed antenna is a Scala YA7 directional antenna. The horizontal plane pattern is shown in Figure 2.

The WMEV-FM field strength calculated at ground level at the proposed W233BY site is 63.9 dBu, using the FM Curves calculator on the FCC web site. For the translator interference contour, free space calculations are used. The corresponding 103.9 dBu field strength distance is .301 kilometers in the horizontal plane in the direction of maximum power. The proposed antenna location is 30 meters above ground.

Figure 4 is a topographic map of the transmitter site, showing that the site is on a ridge, with no significant higher ground in the vicinity. Figure 5 is an aerial photograph of the site, showing the absence of any structures in the area of interest. Figure 6 is a Google Earth map with the 103.9 dBu contour plotted. There are no structures other than the proposed transmitter building within the 103.9 dBu contour. There is no population within the predicted interference area and therefore this facility is permitted under §74.1204(d).

The applicant recognizes that the U/D method is only a tool for predicting likely interference. Should any actual interference be experienced, the applicant will cooperate fully in correcting the interference. Corrective steps may require changes in the transmitting antenna or other steps which would require Commission authorization, may require that the translator cease operation except for brief equipment tests, or may require filtering at the receivers which report interference.

Source of Data

Transmitter location, effective radiated power, directional antenna pattern, and elevation data are extracted from the Commission's CDBS. All contours for existing and proposed facilities are calculated using height above average terrain calculated at one degree horizontal increments.

The contours were evaluated using terrain extracted from the NGDC 30 arcsecond terrain database, formatted by V-Soft Communications to match the database in use at the Commission..

All population data is from 2010 U.S. Census PL data files. Population is counted by considering the location of the centroid of each census block. The data for each block is counted if it falls within the area being counted.

Table 3: FM Over Output for Protection of W234CF

04-04-2015 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

W233BY.C

W234CF BNPFT20130830ACK

Channel = 232D
 Max ERP = 0.045 kw
 RCAMSL = 1450 M
 N. Lat. 36 13 58.0
 W. Lng. 81 41 54.0
 Protected
 60 dBu

Channel = 234D
 Max ERP = 0.25 kw
 RCAMSL = 965 M
 N. Lat. 36 11 52.0
 W. Lng. 81 39 26.0
 Interfering
 100 dBu

Azimuth (degrees)	ERP (kw)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kw)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
077.0	000.0008	0470.8	005.2	015.1	000.0453	-0063.5	005.2	57.83	
078.0	000.0008	0469.1	005.1	014.6	000.0447	-0066.8	005.1	58.18	
079.0	000.0007	0467.7	005.0	014.0	000.0441	-0071.4	005.0	58.52	
080.0	000.0007	0468.5	004.9	013.3	000.0434	-0076.7	004.9	58.84	
081.0	000.0006	0469.7	004.8	012.6	000.0426	-0082.3	004.7	59.15	
082.0	000.0006	0470.7	004.7	011.8	000.0418	-0087.6	004.6	59.46	
083.0	000.0006	0472.7	004.6	010.8	000.0408	-0092.8	004.5	59.76	
084.0	000.0005	0475.1	004.5	009.8	000.0398	-0100.9	004.4	60.05	
085.0	000.0005	0475.3	004.4	008.6	000.0386	-0108.3	004.3	60.33	
086.0	000.0005	0474.9	004.2	007.0	000.0370	-0115.4	004.2	60.57	
087.0	000.0004	0471.8	004.1	005.1	000.0352	-0124.3	004.1	60.76	
088.0	000.0004	0467.8	003.9	003.1	000.0334	-0141.8	004.0	60.90	
089.0	000.0004	0463.8	003.8	000.9	000.0315	-0169.3	003.9	60.98	
090.0	000.0003	0461.9	003.6	358.6	000.0294	-0180.8	003.9	60.98	
091.0	000.0003	0463.0	003.4	356.2	000.0274	-0163.5	003.8	60.91	
092.0	000.0003	0464.1	003.3	353.7	000.0254	-0161.2	003.8	60.76	
093.0	000.0002	0465.3	003.1	351.0	000.0233	-0148.2	003.8	60.50	
094.0	000.0002	0473.9	002.9	348.5	000.0225	-0148.8	003.8	60.41	
095.0	000.0002	0487.4	002.8	346.1	000.0225	-0181.8	003.8	60.43	
096.0	000.0002	0500.9	002.7	344.5	000.0225	-0211.0	003.7	60.49	
097.0	000.0002	0512.8	002.6	342.9	000.0225	-0233.9	003.7	60.52	
098.0	000.0001	0522.9	002.5	341.2	000.0225	-0251.8	003.7	60.50	
099.0	000.0001	0532.7	002.4	339.6	000.0225	-0264.7	003.7	60.47	
100.0	000.0001	0544.2	002.3	338.1	000.0225	-0274.2	003.8	60.41	
101.0	000.0001	0557.1	002.2	336.5	000.0225	-0274.3	003.8	60.30	
102.0	000.0001	0566.0	002.1	334.8	000.0225	-0258.5	003.8	60.15	
103.0	000.0001	0571.8	002.0	333.2	000.0225	-0236.6	003.9	59.95	
104.0	000.0001	0575.9	001.9	331.6	000.0225	-0215.5	003.9	59.73	
105.0	000.0001	0579.4	001.8	330.0	000.0225	-0193.5	004.0	59.47	
106.0	000.0001	0584.3	001.7	329.5	000.0217	-0185.7	004.0	59.34	
107.0	000.0001	0588.8	001.7	328.9	000.0209	-0177.7	004.0	59.19	
108.0	000.0001	0591.3	001.7	328.4	000.0201	-0169.6	004.0	59.03	
109.0	000.0001	0589.6	001.7	327.8	000.0193	-0161.3	004.0	58.85	
110.0	000.0001	0583.5	001.6	327.2	000.0185	-0153.4	004.0	58.65	
111.0	000.0001	0575.3	001.6	326.7	000.0178	-0146.2	004.0	58.43	
112.0	000.0001	0569.4	001.6	326.1	000.0170	-0140.0	004.0	58.21	
113.0	000.0001	0563.8	001.6	325.5	000.0163	-0134.7	004.0	57.99	
114.0	000.0001	0556.3	001.5	325.0	000.0156	-0130.5	004.0	57.75	
115.0	000.0001	0544.7	001.6	325.2	000.0158	-0131.8	003.9	58.14	
116.0	000.0000	0530.9	001.5	324.4	000.0149	-0127.7	003.9	57.75	
117.0	000.0000	0519.1	001.5	323.8	000.0141	-0126.0	004.0	57.35	
118.0	000.0000	0510.8	001.4	323.1	000.0133	-0126.1	004.0	56.95	
119.0	000.0000	0504.4	001.4	322.5	000.0126	-0127.6	004.1	56.55	
120.0	000.0000	0497.6	001.3	321.9	000.0120	-0129.9	004.1	56.15	
121.0	000.0000	0490.4	001.3	321.3	000.0114	-0132.6	004.1	55.76	
122.0	000.0000	0484.4	001.2	320.8	000.0108	-0135.5	004.2	55.37	
123.0	000.0000	0480.0	001.2	320.3	000.0103	-0138.2	004.2	54.98	
124.0	000.0000	0476.3	001.1	319.9	000.0100	-0140.6	004.3	54.66	
125.0	000.0000	0472.2	001.1	319.4	000.0100	-0142.6	004.3	54.48	
126.0	000.0000	0468.1	001.0	319.0	000.0100	-0144.2	004.4	54.26	
127.0	000.0000	0464.5	001.0	318.6	000.0100	-0145.4	004.4	54.04	
128.0	000.0000	0461.8	000.9	318.3	000.0100	-0146.0	004.5	53.82	
129.0	000.0000	0458.5	000.8	317.9	000.0100	-0146.2	004.5	53.60	
130.0	000.0000	0453.5	000.8	317.6	000.0100	-0145.9	004.6	53.39	
131.0	000.0000	0446.0	000.7	317.4	000.0100	-0145.5	004.7	53.18	
132.0	000.0000	0435.8	000.7	317.2	000.0100	-0144.7	004.7	52.97	
133.0	000.0000	0424.1	000.6	317.0	000.0100	-0144.0	004.8	52.77	
134.0	000.0000	0414.0	000.5	316.8	000.0100	-0143.2	004.8	52.57	
135.0	000.0000	0408.9	000.5	316.7	000.0100	-0142.5	004.9	52.37	

136.0	000.0000	0410.6	000.5	316.6	000.0100	-0141.9	004.9	52.40
137.0	000.0000	0419.4	000.5	316.5	000.0100	-0141.2	004.9	52.43
138.0	000.0000	0432.7	000.5	316.4	000.0100	-0140.5	004.9	52.46
139.0	000.0000	0446.6	000.5	316.3	000.0100	-0139.8	004.9	52.49
140.0	000.0000	0457.8	000.5	316.2	000.0100	-0139.0	004.8	52.52
141.0	000.0000	0467.0	000.5	316.1	000.0100	-0138.1	004.8	52.55
142.0	000.0000	0475.0	000.5	315.9	000.0100	-0137.1	004.8	52.57
143.0	000.0000	0480.4	000.5	315.8	000.0100	-0136.1	004.8	52.60
144.0	000.0000	0480.4	000.6	315.7	000.0100	-0135.0	004.8	52.63
145.0	000.0000	0474.7	000.6	315.6	000.0100	-0133.8	004.8	52.65
146.0	000.0000	0468.0	000.7	315.2	000.0100	-0130.9	004.7	52.96
147.0	000.0000	0464.9	000.8	314.9	000.0100	-0127.5	004.6	53.27
148.0	000.0000	0464.7	000.8	314.4	000.0100	-0123.7	004.5	53.59
149.0	000.0000	0463.1	000.9	313.9	000.0100	-0119.4	004.4	53.92
150.0	000.0000	0459.6	001.0	313.4	000.0100	-0114.3	004.4	54.25
151.0	000.0000	0458.0	001.1	312.8	000.0100	-0108.1	004.3	54.59
152.0	000.0000	0459.9	001.2	312.1	000.0100	-0100.1	004.2	54.93
153.0	000.0000	0460.9	001.3	311.3	000.0100	-0090.0	004.1	55.26
154.0	000.0000	0457.2	001.4	310.5	000.0100	-0078.8	004.0	55.60
155.0	000.0000	0448.3	001.5	309.6	000.0100	-0068.4	004.0	55.93
156.0	000.0001	0437.0	001.7	307.7	000.0100	-0053.2	003.8	56.84
157.0	000.0001	0426.8	002.1	304.6	000.0100	-0028.4	003.5	58.12
158.0	000.0001	0419.0	002.4	301.2	000.0100	0000.5	003.3	59.27
159.0	000.0002	0411.6	002.7	297.4	000.0100	0013.3	003.1	60.30
160.0	000.0002	0403.2	002.9	293.2	000.0100	0003.6	002.9	61.22
161.0	000.0003	0395.5	003.2	288.7	000.0100	0017.4	002.8	62.03
162.0	000.0003	0389.5	003.4	283.8	000.0100	0024.6	002.7	62.66
163.0	000.0004	0383.1	003.6	278.8	000.0101	-0017.5	002.7	63.11
164.0	000.0004	0376.9	003.9	273.9	000.0106	-0047.4	002.6	63.50
165.0	000.0005	0374.7	004.1	269.0	000.0115	-0047.5	002.6	63.81
166.0	000.0006	0379.4	004.5	259.8	000.0158	-0098.2	002.6	65.14
167.0	000.0008	0389.4	004.9	250.6	000.0249	-0134.0	002.7	66.46
168.0	000.0010	0400.3	005.3	242.8	000.0504	-0066.3	002.9	68.43
169.0	000.0011	0410.0	005.7	236.6	000.1121	-0172.0	003.1	70.62
170.0	000.0013	0417.4	006.1	231.7	000.2082	-0184.6	003.4	72.02
171.0	000.0016	0426.9	006.4	227.4	000.2500	-0172.9	003.6	71.40
172.0	000.0018	0435.6	006.8	223.7	000.2500	-0145.7	004.0	69.90
173.0	000.0020	0442.3	007.2	220.7	000.2500	-0103.6	004.3	68.44
174.0	000.0023	0448.3	007.6	218.3	000.2500	-0075.7	004.7	67.07
175.0	000.0026	0452.5	008.0	216.5	000.2500	-0063.7	005.0	65.87
176.0	000.0030	0453.7	008.5	214.3	000.2500	-0052.7	005.5	64.40
177.0	000.0035	0455.3	008.9	212.8	000.2500	-0041.0	005.9	63.03
178.0	000.0040	0461.7	009.4	211.7	000.2500	-0029.2	006.4	61.75
179.0	000.0045	0468.0	009.8	210.9	000.2500	-0019.3	006.9	60.59
180.0	000.0051	0474.1	010.2	210.4	000.2500	-0011.7	007.3	59.52
181.0	000.0057	0475.1	010.5	210.3	000.2500	-0009.0	007.7	58.61
182.0	000.0063	0462.5	010.8	210.5	000.2500	-0013.9	008.0	57.95
183.0	000.0070	0450.5	011.0	211.0	000.2500	-0020.6	008.3	57.40
184.0	000.0077	0434.5	011.2	211.7	000.2500	-0029.5	008.5	56.98
185.0	000.0084	0415.3	011.2	212.6	000.2500	-0039.4	008.7	56.70
186.0	000.0093	0399.4	011.3	213.5	000.2500	-0046.7	008.8	56.36
187.0	000.0102	0389.0	011.5	214.2	000.2500	-0051.8	009.1	55.95
188.0	000.0111	0387.5	011.7	214.6	000.2500	-0054.5	009.4	55.38
189.0	000.0121	0392.1	012.0	214.9	000.2500	-0056.2	009.7	54.72
190.0	000.0131	0394.4	012.3	215.3	000.2500	-0058.3	010.1	54.12
191.0	000.0141	0399.0	012.6	215.7	000.2500	-0060.2	010.4	53.48
192.0	000.0152	0405.2	012.9	216.1	000.2500	-0061.9	010.8	52.83
193.0	000.0163	0415.6	013.3	216.4	000.2500	-0063.3	011.3	52.10
194.0	000.0175	0427.4	013.7	216.6	000.2500	-0064.7	011.7	51.37
195.0	000.0187	0432.7	014.0	217.2	000.2500	-0067.5	012.1	50.78
196.0	000.0198	0430.9	014.2	217.9	000.2500	-0072.7	012.4	50.40

04-04-2015 Terrain Data: FCC NGDC 30 Sec FMOVer Analysis

W234CF BNPFT20130830ACK

W233BY.C

Channel = 234D
 Max ERP = 0.25 kW
 RCAMSL = 965 M
 N. Lat. 36 11 52.0
 W. Lng. 81 39 26.0
 Protected
 60 dBu

Channel = 232D
 Max ERP = 0.045 kW
 RCAMSL = 1450 M
 N. Lat. 36 13 58.0
 W. Lng. 81 41 54.0
 Interfering
 100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
257.0	000.0184	-0117.1	003.7	178.5	000.0043	0465.1	004.7	68.40	
258.0	000.0174	-0110.5	003.6	178.1	000.0040	0462.4	004.6	68.33	
259.0	000.0165	-0104.6	003.6	177.6	000.0038	0458.9	004.6	68.21	
260.0	000.0156	-0095.8	003.5	177.1	000.0035	0455.8	004.5	68.05	
261.0	000.0151	-0083.7	003.5	176.8	000.0034	0454.5	004.4	68.04	
262.0	000.0146	-0074.4	003.5	176.6	000.0033	0453.7	004.4	68.03	
263.0	000.0142	-0065.1	003.4	176.3	000.0031	0453.5	004.3	67.99	
264.0	000.0137	-0057.8	003.4	175.9	000.0030	0453.7	004.3	67.93	
265.0	000.0132	-0053.3	003.4	175.6	000.0028	0453.5	004.2	67.84	
266.0	000.0128	-0050.7	003.3	175.2	000.0027	0452.9	004.1	67.72	
267.0	000.0123	-0049.9	003.3	174.8	000.0025	0451.7	004.1	67.61	
268.0	000.0119	-0049.2	003.3	174.3	000.0024	0449.7	004.0	67.52	
269.0	000.0114	-0047.4	003.3	173.8	000.0023	0447.3	004.0	67.40	
270.0	000.0110	-0045.5	003.2	173.3	000.0021	0444.0	003.9	67.24	
271.0	000.0109	-0043.5	003.2	173.1	000.0021	0442.7	003.9	67.26	
272.0	000.0108	-0044.0	003.2	172.8	000.0020	0441.2	003.8	67.27	
273.0	000.0107	-0045.9	003.2	172.6	000.0019	0439.6	003.7	67.26	
274.0	000.0106	-0047.5	003.2	172.3	000.0019	0437.7	003.7	67.23	
275.0	000.0105	-0046.2	003.2	172.0	000.0018	0435.4	003.6	67.19	
276.0	000.0104	-0037.3	003.2	171.7	000.0017	0433.0	003.6	67.12	
277.0	000.0103	-0028.7	003.2	171.3	000.0016	0430.0	003.5	67.03	
278.0	000.0102	-0022.5	003.2	170.9	000.0015	0426.1	003.5	66.92	
279.0	000.0101	-0016.1	003.2	170.5	000.0014	0421.9	003.4	66.78	
280.0	000.0100	-0007.7	003.2	170.1	000.0014	0418.1	003.4	66.62	
281.0	000.0100	0000.3	003.2	169.8	000.0013	0415.6	003.3	66.53	
282.0	000.0100	0010.5	003.2	169.4	000.0012	0413.1	003.3	66.42	
283.0	000.0100	0019.7	003.2	169.0	000.0011	0410.2	003.2	66.29	
284.0	000.0100	0025.7	003.2	168.6	000.0011	0406.3	003.2	66.11	
285.0	000.0100	0028.7	003.2	168.2	000.0010	0402.0	003.1	65.91	
286.0	000.0100	0026.5	003.2	167.7	000.0009	0397.5	003.1	65.66	
287.0	000.0100	0023.9	003.2	167.2	000.0008	0392.0	003.0	65.37	
288.0	000.0100	0020.0	003.2	166.7	000.0007	0385.8	003.0	65.02	
289.0	000.0100	0016.3	003.2	166.1	000.0006	0380.4	002.9	64.62	
290.0	000.0100	0013.2	003.2	165.5	000.0006	0376.3	002.9	64.15	
291.0	000.0100	0008.6	003.2	164.9	000.0005	0374.6	002.9	63.68	
292.0	000.0100	0005.1	003.2	164.2	000.0004	0375.9	002.8	63.43	
293.0	000.0100	0003.6	003.2	163.5	000.0004	0379.7	002.8	63.15	
294.0	000.0100	0004.6	003.2	162.8	000.0004	0384.6	002.7	62.81	
295.0	000.0100	0007.3	003.2	162.0	000.0003	0389.5	002.7	62.41	
296.0	000.0100	0011.0	003.2	161.2	000.0003	0394.3	002.6	61.94	
297.0	000.0100	0013.1	003.2	160.3	000.0002	0400.5	002.6	61.37	
298.0	000.0100	0013.0	003.2	159.4	000.0002	0408.1	002.6	60.69	
299.0	000.0100	0011.1	003.2	158.5	000.0001	0415.5	002.5	59.87	
300.0	000.0100	0007.1	003.2	157.5	000.0001	0422.6	002.5	58.86	
301.0	000.0100	0001.5	003.2	156.5	000.0001	0431.6	002.5	57.62	
302.0	000.0100	-0005.3	003.2	155.4	000.0001	0443.4	002.4	56.04	
303.0	000.0100	-0013.5	003.2	154.3	000.0000	0454.6	002.4	54.98	
304.0	000.0100	-0022.6	003.2	153.2	000.0000	0460.5	002.4	54.43	
305.0	000.0100	-0032.4	003.2	152.0	000.0000	0460.0	002.4	53.79	
306.0	000.0100	-0041.6	003.2	150.8	000.0000	0458.0	002.3	53.04	
307.0	000.0100	-0049.0	003.2	149.6	000.0000	0461.1	002.3	52.17	
308.0	000.0100	-0055.3	003.2	148.3	000.0000	0464.5	002.3	51.14	
309.0	000.0100	-0062.5	003.2	147.0	000.0000	0464.9	002.3	49.91	
310.0	000.0100	-0072.4	003.2	145.7	000.0000	0470.0	002.3	48.40	
311.0	000.0100	-0085.3	003.2	144.3	000.0000	0479.0	002.2	47.44	
312.0	000.0100	-0099.0	003.2	142.9	000.0000	0480.2	002.2	47.29	
313.0	000.0100	-0110.6	003.2	141.6	000.0000	0471.6	002.2	47.10	
314.0	000.0100	-0120.0	003.2	140.1	000.0000	0459.3	002.2	46.89	
315.0	000.0100	-0128.8	003.2	138.7	000.0000	0443.1	002.2	46.67	
316.0	000.0100	-0137.6	003.2	137.3	000.0000	0423.2	002.2	46.41	
317.0	000.0100	-0144.0	003.2	135.9	000.0000	0410.0	002.2	46.15	
318.0	000.0100	-0146.2	003.2	134.5	000.0000	0410.9	002.2	46.58	
319.0	000.0100	-0144.2	003.2	133.0	000.0000	0423.7	002.2	47.96	

320.0	000.0100	-0139.9	003.2	131.6	000.0000	0439.8	002.2	49.14
321.0	000.0110	-0134.5	003.2	129.8	000.0000	0454.4	002.2	50.75
322.0	000.0121	-0129.4	003.3	127.9	000.0000	0462.1	002.1	52.24
323.0	000.0132	-0126.3	003.4	125.8	000.0000	0468.9	002.0	53.63
324.0	000.0144	-0126.3	003.4	123.6	000.0000	0477.8	002.0	54.82
325.0	000.0156	-0130.6	003.5	121.2	000.0000	0489.0	002.0	55.88
326.0	000.0169	-0139.0	003.6	118.6	000.0000	0506.8	001.9	56.94
327.0	000.0182	-0150.4	003.7	115.9	000.0000	0531.6	001.9	57.91
328.0	000.0196	-0164.1	003.7	113.2	000.0001	0562.6	001.9	58.54
329.0	000.0210	-0178.6	003.8	110.4	000.0001	0580.4	001.9	58.97
330.0	000.0225	-0192.9	003.8	107.5	000.0001	0590.6	001.9	59.33
331.0	000.0225	-0206.9	003.8	106.1	000.0001	0584.6	001.9	59.28
332.0	000.0225	-0221.1	003.8	104.7	000.0001	0578.0	001.9	59.36
333.0	000.0225	-0234.6	003.8	103.4	000.0001	0573.6	002.0	59.81
334.0	000.0225	-0247.7	003.8	102.2	000.0001	0567.1	002.1	60.16
335.0	000.0225	-0260.9	003.8	101.0	000.0001	0557.5	002.1	60.43
336.0	000.0225	-0271.3	003.8	100.0	000.0001	0544.2	002.2	60.63
337.0	000.0225	-0276.0	003.8	99.0	000.0001	0533.2	002.2	60.78
338.0	000.0225	-0274.4	003.8	98.2	000.0001	0524.3	002.3	60.88
339.0	000.0225	-0269.2	003.8	97.3	000.0002	0516.4	002.3	60.94
340.0	000.0225	-0262.0	003.8	96.6	000.0002	0508.2	002.4	60.96
341.0	000.0225	-0253.7	003.8	95.9	000.0002	0499.4	002.5	60.95
342.0	000.0225	-0243.9	003.8	95.3	000.0002	0490.8	002.5	60.92
343.0	000.0225	-0232.6	003.8	94.7	000.0002	0483.0	002.6	60.94
344.0	000.0225	-0218.5	003.8	94.1	000.0002	0475.9	002.6	60.98
345.0	000.0225	-0202.7	003.8	93.7	000.0002	0469.6	002.7	60.99
346.0	000.0225	-0183.2	003.8	93.2	000.0002	0466.0	002.8	60.98
347.0	000.0225	-0165.9	003.8	92.8	000.0002	0465.1	002.8	60.95
348.0	000.0225	-0152.6	003.8	92.5	000.0003	0464.7	002.9	60.90
349.0	000.0225	-0146.7	003.8	92.2	000.0003	0464.3	003.0	60.83
350.0	000.0225	-0145.7	003.8	91.9	000.0003	0464.0	003.0	60.75
351.0	000.0233	-0147.9	003.9	91.1	000.0003	0463.1	003.1	60.94
352.0	000.0240	-0153.1	003.9	90.3	000.0003	0462.3	003.2	61.08
353.0	000.0248	-0159.1	003.9	89.6	000.0003	0461.5	003.2	61.19
354.0	000.0256	-0160.2	004.0	89.0	000.0004	0463.7	003.3	61.27
355.0	000.0264	-0160.0	004.0	88.4	000.0004	0466.1	003.3	61.32
356.0	000.0272	-0162.7	004.0	87.8	000.0004	0468.4	003.4	61.36
357.0	000.0281	-0169.0	004.1	87.3	000.0004	0470.6	003.5	61.39
358.0	000.0289	-0176.3	004.1	86.8	000.0004	0472.6	003.6	61.38
359.0	000.0298	-0184.0	004.1	86.3	000.0005	0474.4	003.6	61.36
000.0	000.0306	-0180.7	004.2	85.9	000.0005	0474.8	003.7	61.31
001.0	000.0315	-0168.6	004.2	85.5	000.0005	0474.9	003.8	61.24
002.0	000.0324	-0156.3	004.2	85.2	000.0005	0475.2	003.9	61.15
003.0	000.0333	-0142.9	004.2	84.9	000.0005	0475.4	003.9	61.05
004.0	000.0342	-0132.0	004.3	84.7	000.0005	0475.4	004.0	60.92
005.0	000.0352	-0124.9	004.3	84.5	000.0005	0475.4	004.1	60.78
006.0	000.0361	-0118.7	004.3	84.3	000.0005	0475.4	004.2	60.63
007.0	000.0371	-0115.3	004.4	84.1	000.0005	0475.3	004.3	60.47
008.0	000.0380	-0112.8	004.4	84.0	000.0005	0475.1	004.3	60.30
009.0	000.0390	-0105.6	004.4	83.9	000.0005	0475.0	004.4	60.13
010.0	000.0400	-0099.2	004.4	83.9	000.0005	0474.9	004.5	59.96
011.0	000.0410	-0091.6	004.5	83.8	000.0005	0474.8	004.6	59.77
012.0	000.0420	-0086.2	004.5	83.8	000.0005	0474.8	004.7	59.59
013.0	000.0431	-0079.3	004.5	83.8	000.0005	0474.7	004.7	59.40
014.0	000.0441	-0071.2	004.5	83.7	000.0005	0474.7	004.8	59.22
015.0	000.0452	-0064.2	004.6	83.8	000.0005	0474.7	004.9	59.03
016.0	000.0462	-0059.5	004.6	83.8	000.0005	0474.7	005.0	58.83

W233BYmod

Proposed
Latitude: 36-13-58 N
Longitude: 081-41-54 W
ERP: 0.045 kW
Channel: 232 94.3 MHz
AMSL Height: 1450.0 m
Elevation: 1420.0 m
Horiz. Pattern: Directional

WMMY

BLH20000104ABR
Latitude: 36-19-53 N
Longitude: 081-35-17 W
ERP: 10.50 kW
Channel: 291 106.1 MHz
AMSL Height: 1226.0 m
Elevation: 1177.0 m
Horiz. Pattern: Omni

W233BY.C

BNPFT20130828AFA
Latitude: 36-14-06 N
Longitude: 081-42-08 W
ERP: 0.025 kW
Channel: 233 94.5 MHz
AMSL Height: 1440.0 m
Elevation: 1427.63 m
Horiz. Pattern: Directional

W233BY

Authorized and Proposed Contours
Figure 1
April 2015

Timothy L. Warner, Inc.

WMMY

Proposed F(50-50) 60.00 dBu

50-50) 60.00 dBu

W233BY.C

W233BYmod

Authorized F(50-50) 60.00 dBu

Beech Mountain

Banner Elk

Sugar Mountain

Blowing Rock

Elk Park

Scale 1:250,000

0 3 6 9 km

V-Soft Communications LLC ©

Figure 2: W233BY Modified Antenna Pattern
Pre-Rotation Antenna Pattern....

Azimuth (deg)	Relative Field
0.0	1.0
10.0	0.96
20.0	0.84
30.0	0.665
40.0	0.463
50.0	0.269
60.0	0.118
70.0	0.024
80.0	0.015
90.0	0.012
100.0	0.016
110.0	0.039
120.0	0.042
130.0	0.05
140.0	0.093
150.0	0.138
160.0	0.175
170.0	0.173
180.0	0.174
190.0	0.168
200.0	0.159
210.0	0.139
220.0	0.106
230.0	0.064
240.0	0.039
250.0	0.034
260.0	0.023
270.0	0.01
280.0	0.012
290.0	0.032
300.0	0.105
310.0	0.24
320.0	0.433
330.0	0.645
340.0	0.83
350.0	0.954

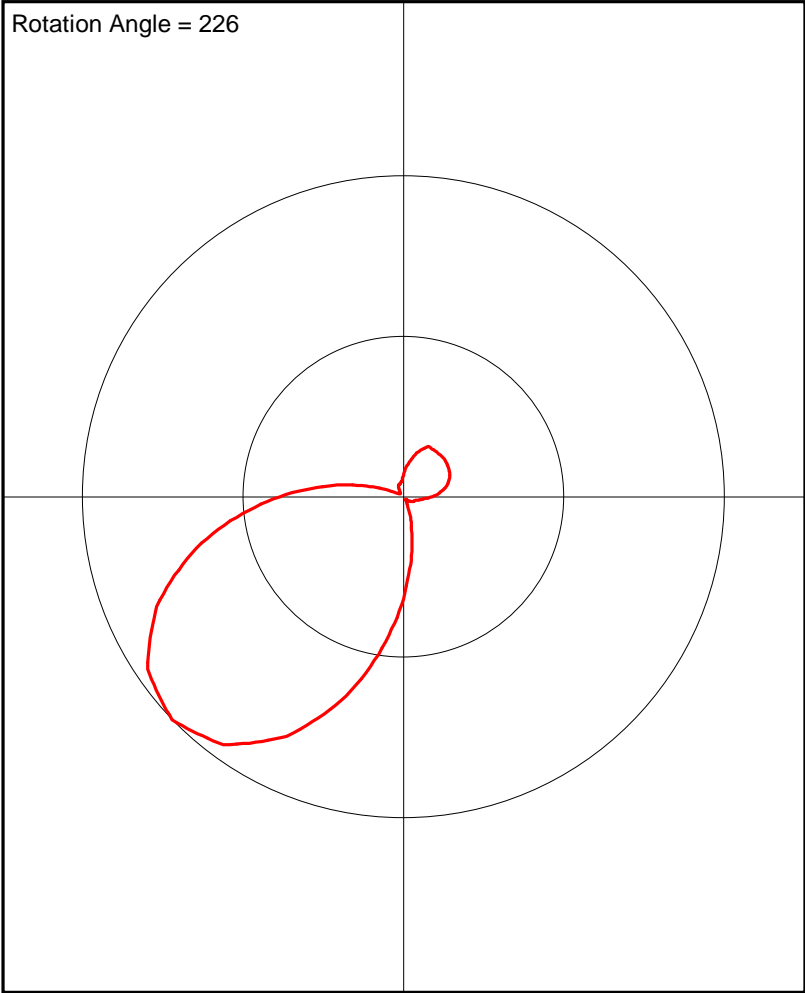


Figure 3: Allocation Study: W234CF
Eastern Airwaves, LLC

FMCommander Single Allocation Study - 04-04-2015 - FCC NGDC 30 Sec
W233BY.C's Overlaps (In= 2.35 km, Out= 1.83 km)

W233BY.C CH 232 D DA
Lat= 36 13 58.0, Lng= 81 41 54.0
0.045 kW 421 M HAAT, 1450 M COR
Prot.= 60 dBu, Intef.= 100 dBu

W234CF CH 234 D DA BNPFT20130830ACK
Lat= 36 11 52.0, Lng= 81 39 26.0
0.25 kW -11 M HAAT, 965 M COR
Prot.= 60 dBu, Intef.= 100 dBu

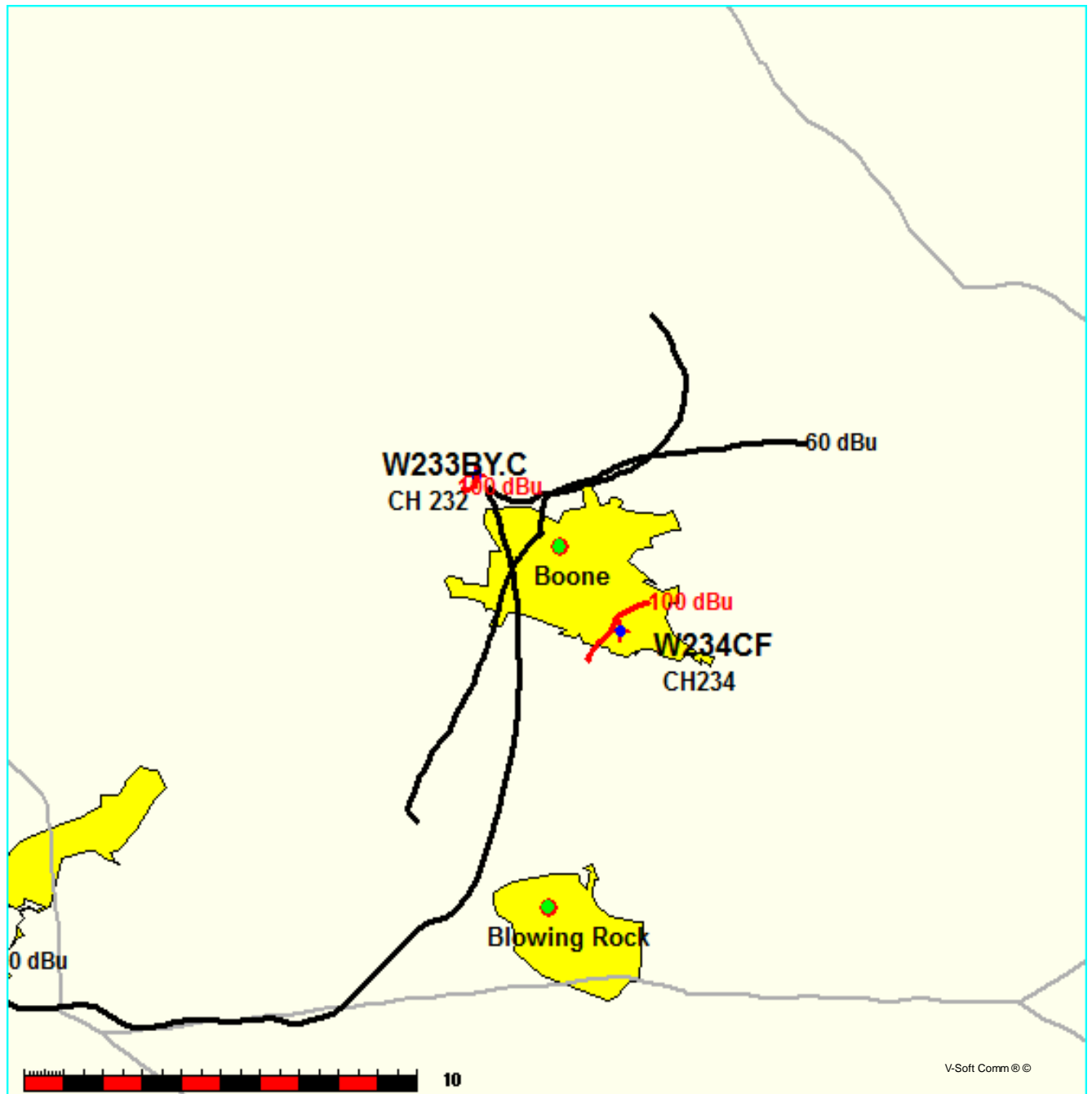
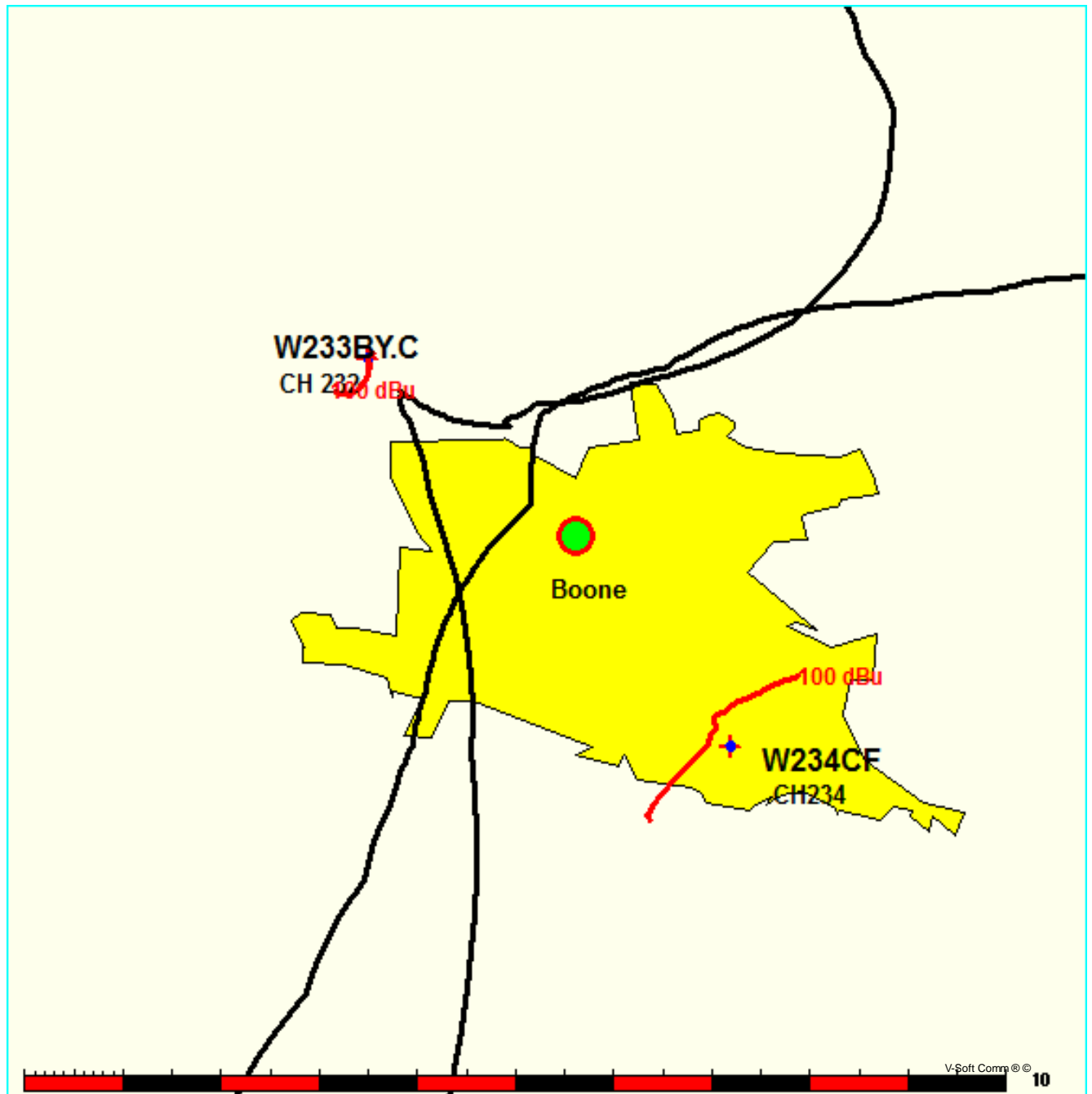


Figure 3A: Allocation Study: W234CF Detail
Eastern Airwaves, LLC

FMCommander Single Allocation Study - 04-04-2015 - FCC NGDC 30 Sec
W233BY.C's Overlaps (In= 2.35 km, Out= 1.83 km)

W233BY.C CH 232 D DA
Lat= 36 13 58.0, Lng= 81 41 54.0
0.045 kW 421 M HAAT, 1450 M COR
Prot.= 60 dBu, Intef.= 100 dBu

W234CF CH 234 D DA BNPFT20130830ACK
Lat= 36 11 52.0, Lng= 81 39 26.0
0.25 kW -11 M HAAT, 965 M COR
Prot.= 60 dBu, Intef.= 100 dBu



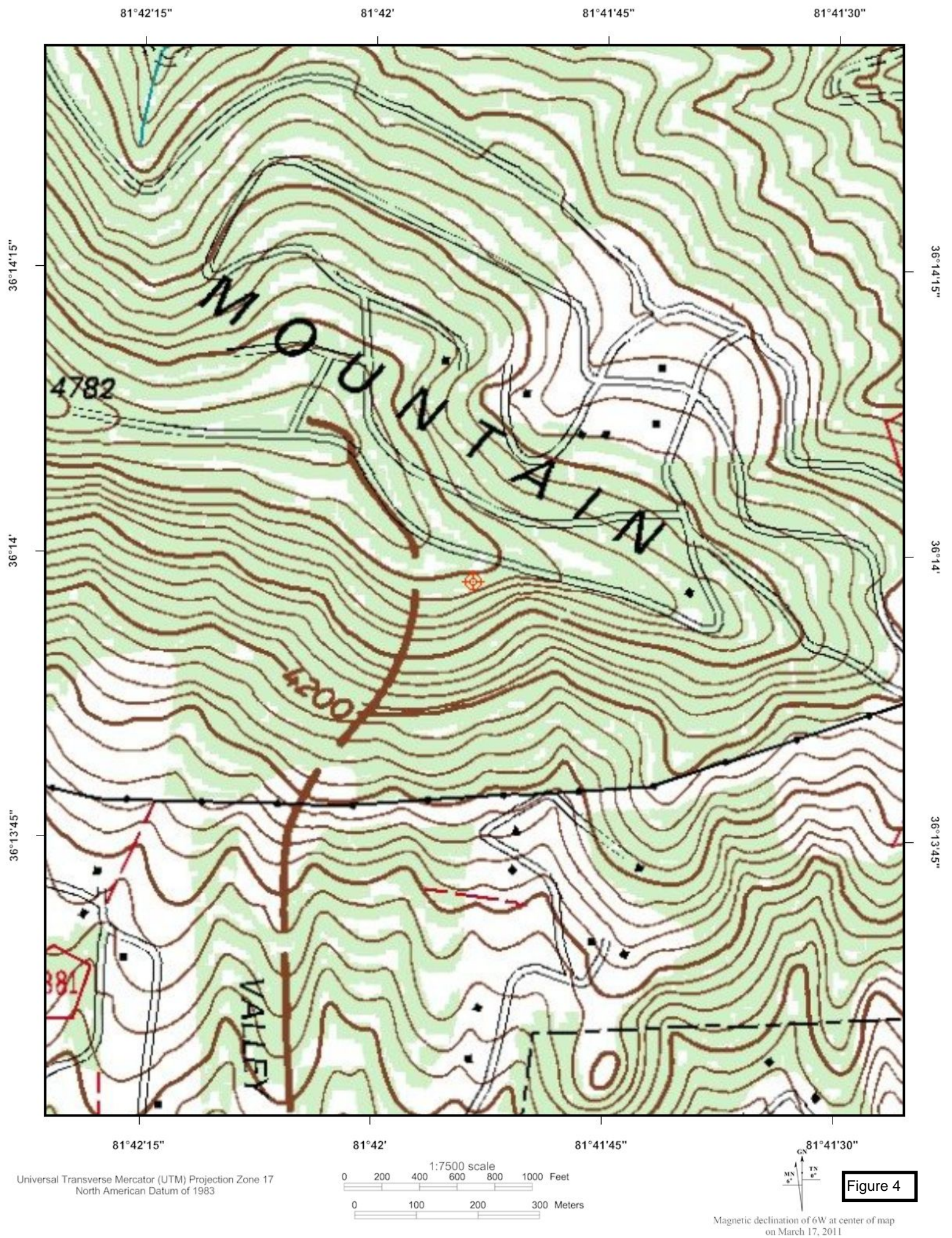


Figure 4

81°42'

81°41'55"

81°41'50"

81°41'45"

36°14'05"

36°14'

36°13'55"

36°13'50"

36°14'05"

36°14'

36°13'55"

36°13'50"

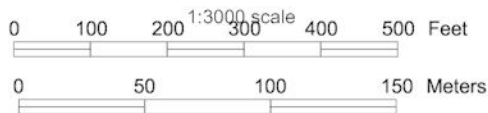
81°42'

81°41'55"

81°41'50"

81°41'45"

Universal Transverse Mercator (UTM) Projection Zone 17
North American Datum of 1983



Magnetic declination of 6°W at center of map
on March 17, 2011

Figure 5

Figure 6

Google Earth Aerial Image
with 103.9 dBu contour

