

Hickory, North Carolina  
Application for Minor Modification of FM Translator W224BN  
On Channel 267  
by  
Radio Training Network, Inc.

Exhibit 13  
Interference Analysis

January 2016

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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 Radio Training Network, Inc., 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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29 January 2016

### Narrative

This Exhibit supports an amendment to a minor modification application for FM translator W224BN, on Channel 267 in Hickory, 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 proposed 60 dBu F(50,50) coverage area. Figure 1 shows fill-in status confirmation.

The changes are a new primary station, a new site, a new antenna, a change of channel, a change of height, and an increase in power.

### AM Translator Window Filing

This application is being filed in response to a filing window for currently authorized translators to rebroadcast AM radio stations, under specific definitions for minor modification.<sup>1</sup> This application complies with the conditions for consideration as a minor modification. Specifically, W224BN is authorized on a non-reserved channel; the proposed primary station is AM station WNNC; the primary station is authorized as a Class C station; and the distance from the authorized W224BN location to the proposed location is 2.13 miles, calculated from the authorized W224BN site to the translator site proposed in this application.

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<sup>1</sup> See *Revitalization of the AM Service*, First Report and Order, Further Notice of Proposed Rule Making, and Notice of Inquiry, FCC 15-142, para 15 (rel. October 23, 2015) (*AMR Order*).

Allocations

This application proposes service to Hickory, North Carolina, on channel 267. 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.

Table 1: Allocations

Allocation Study Ratio Training Network												
REFERENCE		CH# 267D - 101.3 MHz, Pwr= 0.25 kw, HAAT= 83.2 M, COR= 391 M							DISPLAY DATES			
35 43 20.0 N.		Average Protected F(50-50)= 11.8 km							DATA 01-29-16			
81 16 38.0 W.		Omni-directional							SEARCH 01-29-16			
CH CITY	CALL	TYPE	ANT STATE	AZI. <--	DIST FILE #	LAT. LNG.	Pwr(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap	*OUT* in km)	
270C0 Gastonia	WBAV-FM	LIC	CY NC	179.9 359.9	54.33 BLH19880129KD	35 13 57.0 81 16 35.0	100.000 301	10.1 552	72.4 wkis License	30.5 Limited Partn	-19.2*	
Protected by U/D ratio, see text and figures.												
265D Hickory	W265CT	APP	C NC	0.0 0.0	0.00 BMPFT20160128BCO	35 43 20.0 81 16 38.0	0.250	1.1 391	10.7 Radio Training Network, Inc	-11.8*	-11.8*	
Coordinated application for common site. Protected by U/D ratio, see text and figures.												
268C Johnson City	WQUT	LIC	CY TN	302.8 122.1	113.33 BMLH19980904KD	36 16 07.0 82 20 21.0	100.000 457	106.1 1069	72.9 Radio License Holding Cbc,	-3.6	23.2	
265D Hickory	W265CT	CP	C NC	286.2 106.2	7.97 BNPFT20130827AEM	35 44 32.0 81 21 43.0	0.055 31	0.5 352	5.6 Radio Training Network, Inc	-2.7*	0.9	
This facility has a pending application (above) to a common site with this application.												
267D Wilkesboro	W267AN	LIC	C NC	3.6 183.6	72.76 BLFT20030408AAO	36 22 36.0 81 13 33.0	0.010 399	51.4 1136	13.6 Triad Family Network, Inc.	11.0	22.6	
267L1 Charlotte	NEW	CP	NC	119.3 299.6	63.81 BNPL20131114BCC	35 26 25.0 80 39 49.0	0.100 28	239	32.4 Monte Calvario Foundation,	14.3		
267C Sumter	WWDW	LIC	DEN SC	163.5 343.9	193.20 BMLH19980925KB	34 03 04.0 80 40 55.0	100.000 403	162.6 471	70.2 Alpha Media Licensee Llc	16.7	75.6	
269D Mooresville	W269CY	CP	DE NC	147.0 327.1	35.40 BMPFT20151214ABB	35 27 17.5 81 03 50.0	0.250	0.2 459	7.1 Educational Media Foundati	21.6	26.3	
264D Statesville	W264CU	LIC	C NC	75.2 255.4	36.03 BLFT20141028AAE	35 48 15.0 80 53 30.0	0.250	1.1 369	11.9 Iredell Broadcasting, Inc.	21.7	22.9	
267D Salisbury	W267AG	LIC	CN NC	94.5 275.0	73.29 BLFT19951102TX	35 40 03.0 80 28 13.0	0.038 58	21.9 279	6.5 Triad Family Network, Inco	38.2	21.7	
Translator for WBFJ(FM), Winston-Salem, NC												
267D Charlotte	W267BZ	CP	C NC	144.3 324.6	72.72 BMPFT20151209ABS	35 11 23.0 80 48 36.0	0.080	17.4 236	5.3 Isothermal Community Colle	41.7	22.5	
268L1 Belmont	NEW	CP	NC	157.6 337.7	55.40 BNPL20131114BDY	35 15 38.5 81 02 38.0	0.065 37	244	34.3 Belmont Abbey College	29.1		
267D Winston-salem	W267AM	LIC	DC NC	61.8 242.4	93.85 BLFT20140114AAZ	36 06 59.0 80 21 26.0	0.250 119	49.7 366	14.7 Eastern Airwaves, Llc	31.5	36.6	
266C1 Anderson	WROQ	LIC	DCX SC	217.3 36.8	149.65 BLH20080225ABJ	34 38 51.0 82 16 13.0	100.000 296	98.7 540	67.5 Entercom License, Llc	38.4	62.0	
266C0 Burlington	WYMY	LIC	CX NC	81.2 262.3	167.57 BMLH20140908AEE	35 56 15.0 79 26 30.0	100.000 359	110.8 551	75.7 Carolina Radio Group, Inc.	43.5	71.9	

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 adj.

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.

< = Station meets FCC minimum distance spacing for its class.

Reference station has protected zone issue: AM tower: WAIZ

**Table 2: Facilities Protected by U/D Method**

Facility	WBAV-FM Gastonia, North Carolina	W265CT.A Hickory, North Carolina
Relationship	270C0, third adjacent	265D, second adjacent
Distance (km)	54.33	0.0
Bearing (degrees)	179.9	0.0
ERP (kW, on azimuth)	100.0	.25
HAAT (m, on azimuth)	300.7	67.5
Ratio	40	40
Signal Strength (dBu)	68.0	100
Translator Signal Strength	108.0	140
Translator distance (km)	.299	.01

**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 an Shively 6832-4 four level antenna, to be shared with W265CT.A and an additional translator for which an application is being prepared. The elevation pattern is shown in Figure 2. The elevation of the 108.0 dBu and 140 dBu contours are shown in Figure 3.

The WBAV-FM field strength calculated at ground level at the proposed W224BN site is 68.0 dBu, using the FM Curves calculator on the FCC web site. For the translator interference contour, free space calculations are used. The corresponding 108.0 dBu field strength distance is .299 kilometers in the horizontal plane. The proposed antenna location is 81 meters above ground. As Figure 3 shows, the 108.0 dBu signal level does not reach ground level. The minimum elevation is 46 meters above ground

W265CT.A has an application, BMPFT-20160128BCO, to share a common antenna with the facilities proposed in this application. The W265CT.A field strength calculated at ground level at the proposed W224BN site is at least 100 dBu. For the translator interference contour, free space calculations are used. The corresponding 140 dBu field strength distance is

.01 kilometers in the horizontal plane. The proposed antenna location is 81 meters above ground. As Figure 3 shows, the 140 dBu signal level does not reach ground level.

Figure 4 is a topographic map of the transmitter site, showing that the site is on a gently rolling terrain. Figure 5 is a Google Earth aerial photograph with a 108.0 dBu field strength line plotted. As shown, most of the area within the contours is in the tower guy area. 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

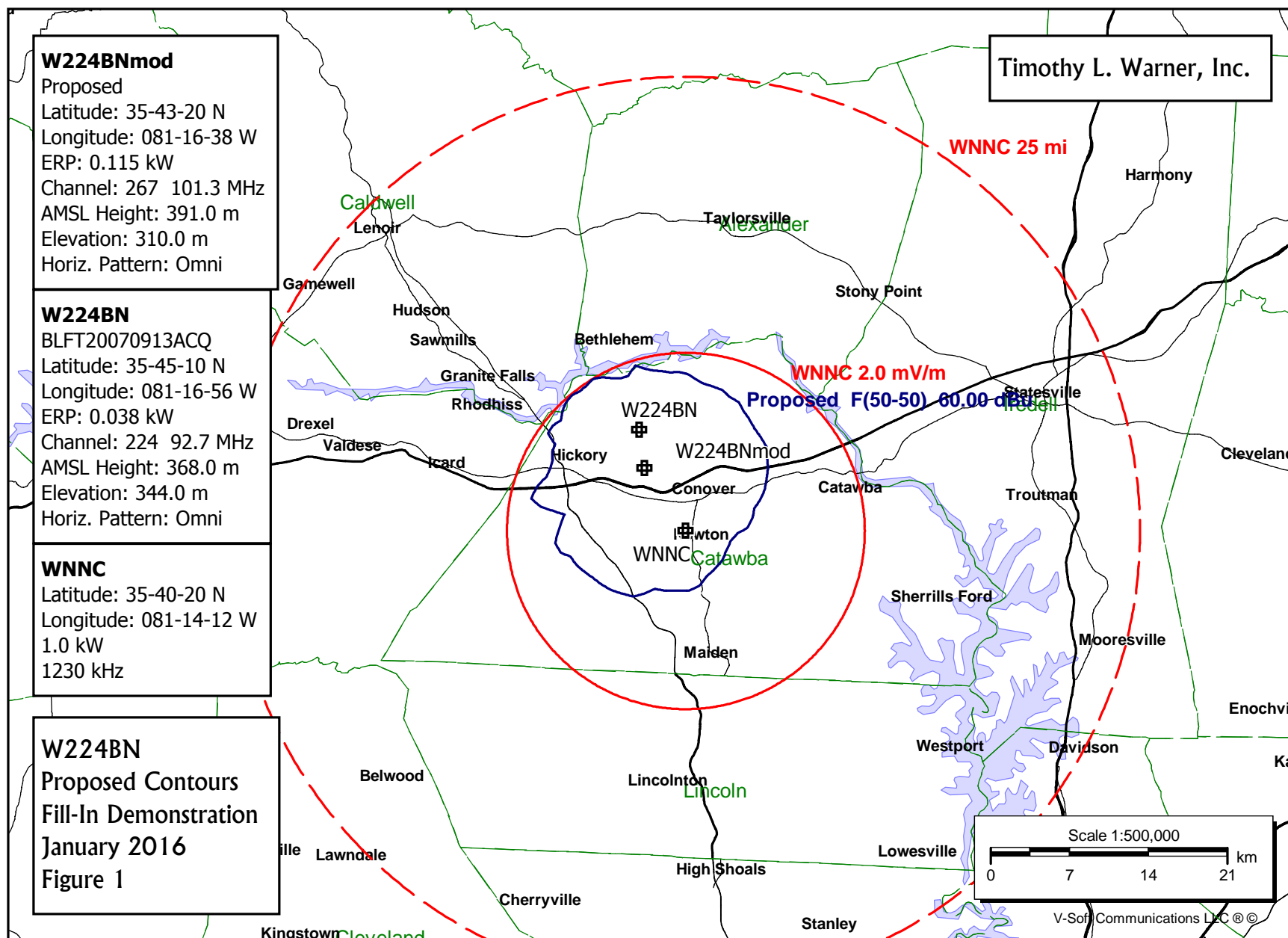
Transmitter location, effective radiated power, directional antenna pattern, and elevation data are extracted from the Commission's CDBS. All contours for existing and proposed facilities are calculated using height above average terrain calculated at one degree horizontal increments.

The contours were evaluated using terrain extracted from the National Geophysical Data Center's (NGDC) 30 arcsecond terrain database, formatted by V-Soft Communications. This is the same database in use at the Federal Communications Commission. The terrain data



is formatted by V-Soft Communications® for use with its FMCommander allocations and Probe™ mapping programs.

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.



**W224BNmod**

Proposed

Latitude: 35-43-20 N

Longitude: 081-16-38 W

ERP: 0.115 kW

Channel: 267 101.3 MHz

AMSL Height: 391.0 m

Elevation: 310.0 m

Horiz. Pattern: Omni

**W224BN**

BLFT20070913ACQ

Latitude: 35-45-10 N

Longitude: 081-16-56 W

ERP: 0.038 kW

Channel: 224 92.7 MHz

AMSL Height: 368.0 m

Elevation: 344.0 m

Horiz. Pattern: Omni

**WNNC**

Latitude: 35-40-20 N

Longitude: 081-14-12 W

1.0 kW

1230 kHz

**W224BN**

Fill-In Demonstration Detail

January 2016

Figure 1A

Timothy L. Warner, Inc.

Bethlehem

WNNC 2.0 mV/m

Proposed F(50-50) 60.00 dBu

W224BN

Hickory

ingview

Scale 1:100,000

0 1 2 3 km

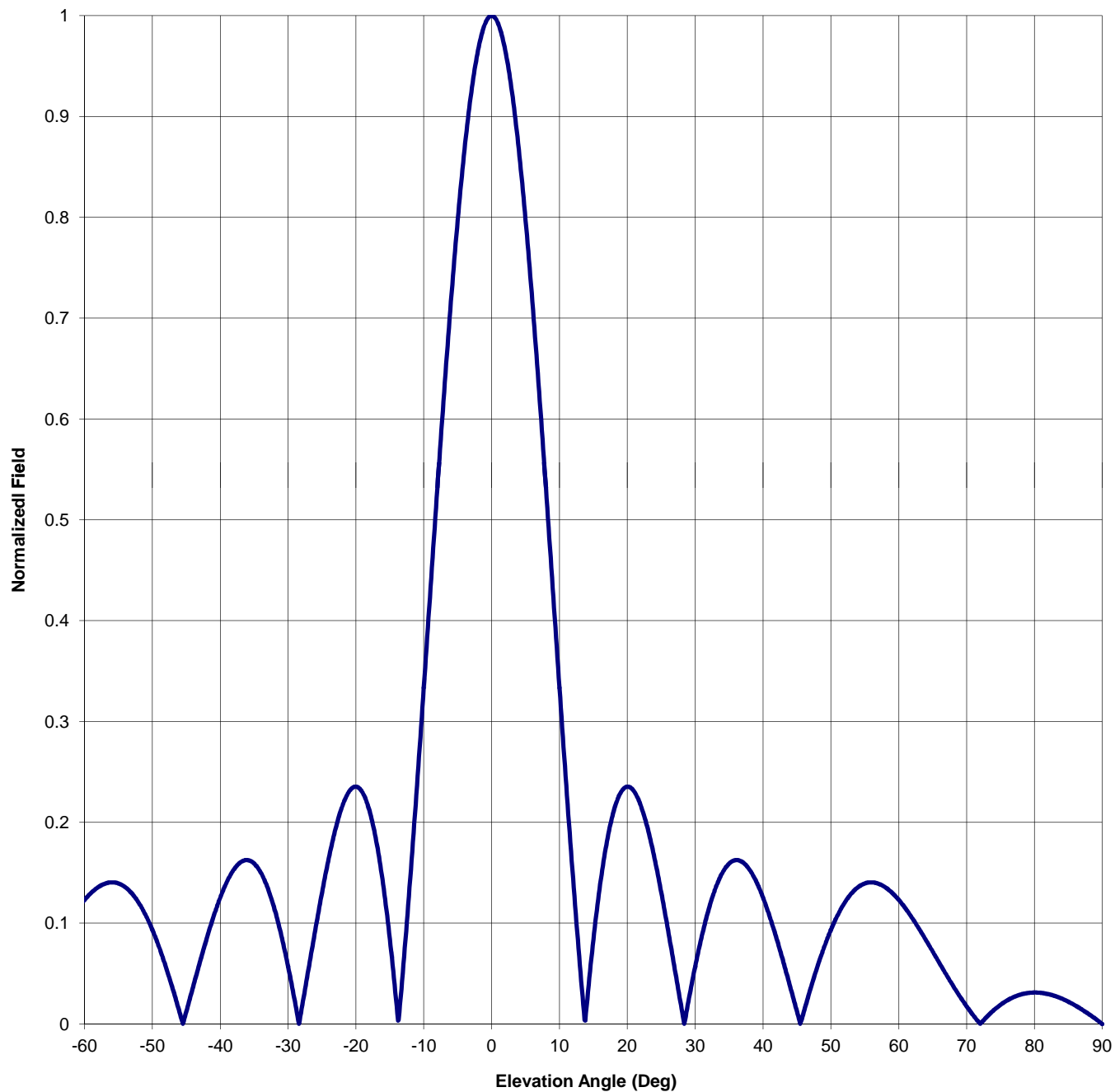
W224BN

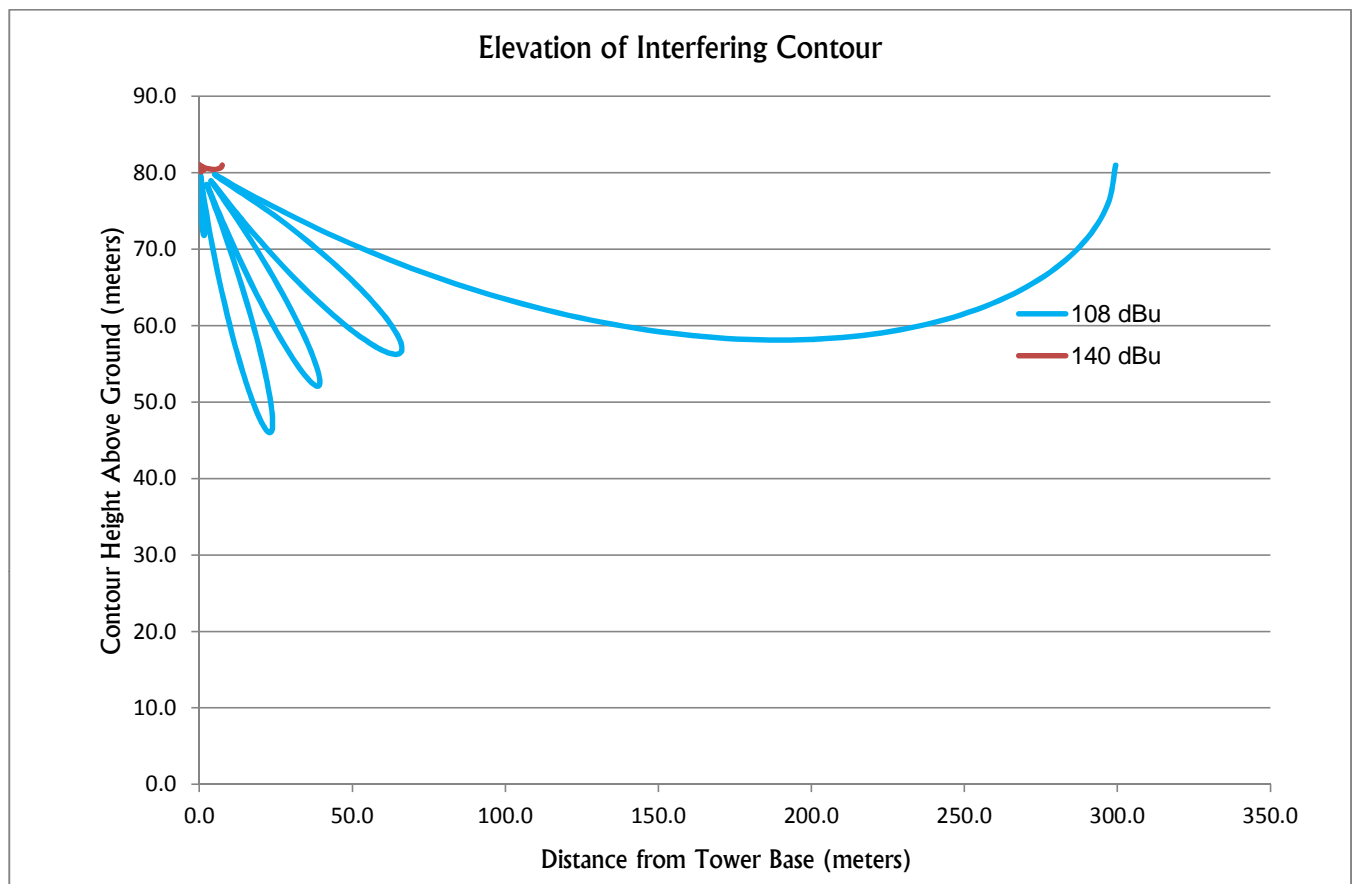
V-Soft Communications LLC ©

Antenna Mfg.: Shively  
Antenna Type: 6832-4  
Station: W224BN  
Frequency: 101.3  
Channel #: 267  
Figure: 2

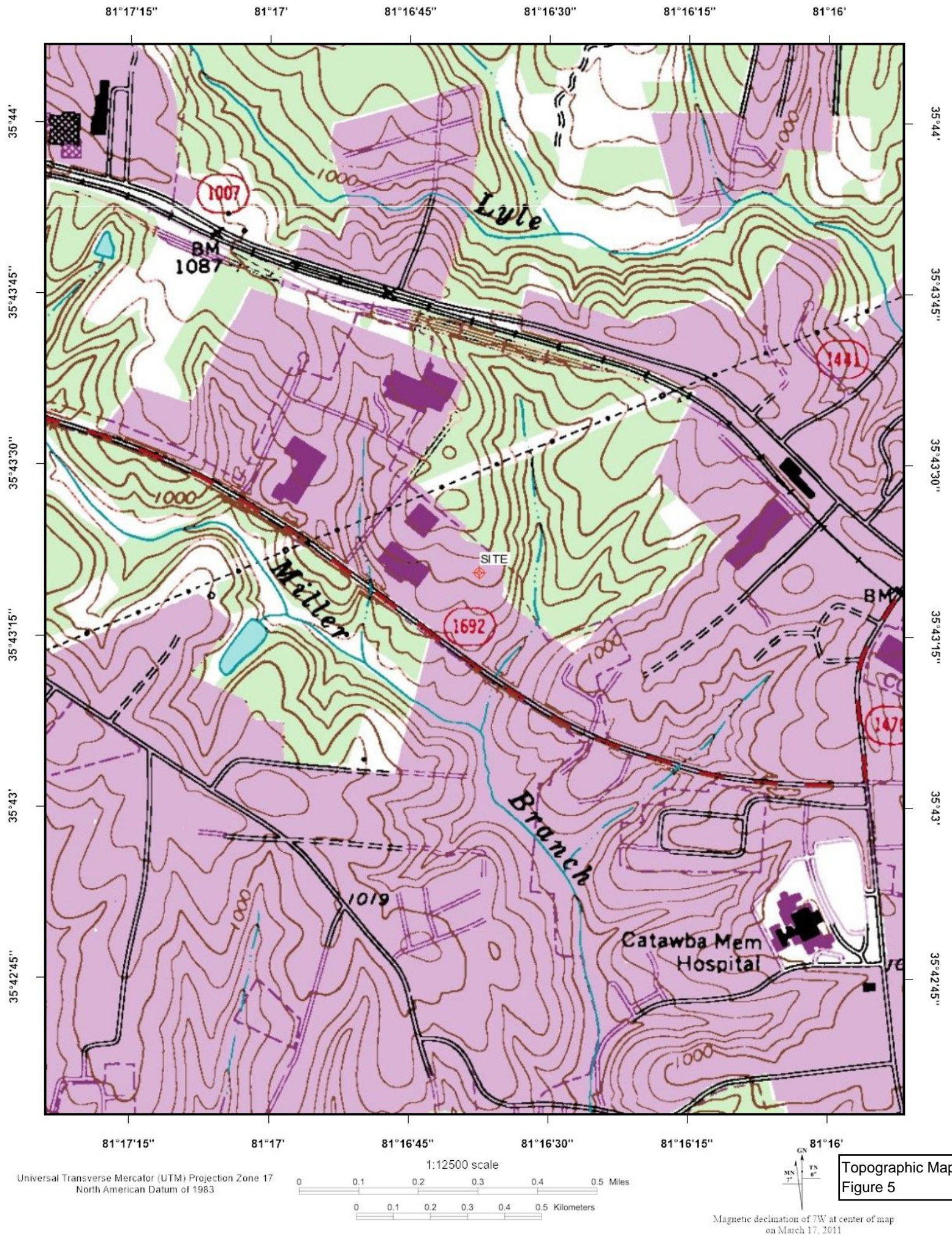
Date: 1/28/2016

Beam Tilt	0	
Gain (Max)	2.588	4.130 dB
Gain (Horizon)	2.588	4.130 dB









Topographic Map  
Figure 5



# W224BN mod

Aerial Photograph  
January 2016  
Figure 5

## Legend



W224BNmod (267) - 50 10 Field Strength: 108.0 dBu FCC [FCC 30 US]

Google earth

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1692

1000 ft