

**Rocky Mount, North Carolina**  
**Application for Minor Modification of FM Translator W271BT**  
**On Channel 271**  
**by**  
**Shaw University**

**Exhibit 13**  
**Interference Analysis**

**May 2016**

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## Table of Contents

Description	Page
Declaration .....	2
Narrative .....	3
Allocations .....	3
Table 1: Allocations .....	5
Table 2: Facilities Protected by U/D Method .....	6
Undesired to Desired Method under §74.1204(d) .....	6
Source of Data .....	7
Licensed and Proposed Contours .....	Figure 1
Antenna Elevation Pattern .....	Figure 2
Interference Contour Vertical Elevation Plot .....	Figure 3
Transmitter Site Topographic Map .....	Figure 4
Transmitter Site Aerial Photograph.....	Figure 5

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 Shaw University, 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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13 May 2016

### Narrative

This Exhibit supports an amendment to a minor modification application for FM translator W271BT, on Channel 271 in Rocky Mount, North Carolina. Allocation details are provided in this exhibit. This proposal complies fully with the requirements of 47 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 and proposed 60 dBu F(50,50) coverage area. W271BT will continue to rebroadcast the analog and HD1 signal of primary station WSHA. The proposed modification is a minor modification of the authorized facilities.

The change is necessitated by a planned replacement of the tower. The new tower will be shorter, with increased strength to allow the collocation of wireless services. The FAA has been notified of the planned replacement in filing 2016-ASO-11707-OE, filed 4 May 2016. There are corrections of 1 second of Latitude and 2 meters of site elevation. With the decrease in elevation of the radiation center, an increase in Effective Radiated Power and a change of antenna are proposed.

### Allocations

This application proposes service to Rocky Mount, North Carolina, on channel 271. 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 Shaw University												
REFERENCE		CH# 271D - 102.1 MHz, Pwr= 0.019 kW, HAAT= 98.4 M, COR= 143 M								DISPLAY DATES		
35 57 18.0 N.		Average Protected F(50-50)= 6.8 km								DATA 05-13-16		
77 53 04.0 W.		Omni-directional								SEARCH 05-13-16		
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)	
271D Rocky Mount	W271BT!	CP	C NC	0.0 180.0	0.03 BNPFT20130328AQM	35 57 19.0 77 53 04.0	0.013 112	22.5 157	6.7 Shaw University	-29.0	-28.6	
Facility being modified.												
268C Raleigh	WRAL	LIC	C NC	242.4 62.0	66.46 BMLH20040903ABQ	35 40 35.0 78 32 08.0	100.000 555	13.4 646	91.0 WRAL-FM, Inc.	46.6	-24.8*	
Protected by U/D ratio, see text and figures.												
270C1 New Bern	WIKS	LIC	CN NC	142.8 323.2	104.74 BLH19870306KD	35 12 07.0 77 11 15.0	100.000 299	104.9 308	72.2 Beasley Media Group, Llc	-7.2*	22.6	
271C0 Reidsville	WJMH	LIC	C NC	281.5 100.3	188.51 BMLH20010731ACA	36 16 33.0 79 56 26.0	100.000 367	180.2 600	77.5 Entercom License, Llc	2.1	90.3	
272A Roanoke Rapids	WPTM	LIC	CX NC	12.0 192.1	62.26 BLH20031023ACJ	36 30 13.0 77 44 20.0	6.000 97	42.4 166	27.4 First Media Radio, Llc	13.1	25.3	
274D Wilson	W274AK	LIC	C NC	179.2 359.2	20.83 BLFT20010208ABB	35 46 02.0 77 52 52.0	0.038 77	0.4 113	6.8 Radio Training Network, In	13.5	13.7	
272A Smithfield	WKJO	LIC	CX NC	230.1 49.8	65.05 BLH20101029ACW	35 34 43.0 78 26 10.0	2.600 153	42.2 221	27.5 Triangle Marketing Associa	16.4	27.8	
272A Smithfield	AL8950	RSV-A	NC	216.9 36.6	66.94 RM10377	35 28 21.0 78 19 43.0	6.000 100	42.2 146	27.3	18.0	30.1	
270A South Hill	AL3575	RSV-A	VA	340.4 160.2	97.27 RM10592	36 46 48.0 78 15 04.0	6.000 100	45.9 211	29.8	45.1	58.2	
270L1 Raleigh	WKRP-LP	LIC	NC	258.4 78.0	62.22 BLL20151125AGI	35 50 26.2 78 33 33.1	0.100 8	96		47.9	47.7	
Oak City Media, Inc.												
271B Richmond	WRXL	LIC	CN VA	10.0 190.2	187.07 BLH19920608KG	37 36 52.0 77 30 56.0	20.000 241	128.0 301	65.0 Cc Licenses, Llc	52.3	90.3	
270A South Hill	WKSJ-FM	LIC	ZEX VA	344.3 164.1	91.03 BLH20040526ABK	36 44 39.0 78 09 42.0	6.000 96	31.0 199	21.0 Lakes Media, Llc	53.6	59.6	
270D Sanford	W270AW	LIC	C NC	243.8 63.2	110.47 BLFT20130701ABL	35 30 43.0 78 58 41.0	0.190 520	42.0 604	27.0 Educational Media Foundati	62.0	74.3	
273A Hillsborough	WPLW	LIC	CX NC	280.0 99.3	98.85 BLH20101029ACM	36 06 13.0 78 57 57.0	1.500 204	2.4 350	31.3 New Century Media Group, L	90.2	67.1	
273A Hillsborough	AL2642	RSV-A	NC	280.3 99.6	102.56 RM11038	36 06 49.0 79 00 20.0	6.000 100	3.1 263	32.3	93.2	69.8	
273C1 Columbia	WERX-FM	LIC	NCX NC	91.2 272.2	138.82 BMLH20110503ABA	35 55 05.0 76 20 48.0	64.000 210	7.4 210	60.2 Lawrence Loesch & Margaret	124.0	78.1	
269A Franklin	WLQM-FM	LIC	CX VA	43.4 223.9	112.61 BMLH20160308AAL	36 41 15.4 77 00 59.6	3.000 143	2.6 156	28.4 Franklin Broadcasting Corp	102.9	83.9	
Franklin Broadcasting Corp												

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. 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	WRAL Raleigh, North Carolina
Relationship	268C, third adjacent
Distance (km)	66.47
Bearing (degrees)	242.4
ERP (kW, on azimuth)	100
HAAT (m, on azimuth)	578.7
Ratio	40
Signal Strength (dBu)	70.1
Translator Signal Strength	110.1
Translator distance (km)	.095

**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 Nicom BKG77-2 two level antenna, with bays spaced at 0.85 wavelength. The elevation pattern is shown in Figure 2. The elevation of the 110.1 dBu contour is shown in Figure 3. The modification will reduce the signal strength at ground level in the vicinity of the tower.

The WRAL field strength calculated at ground level at the proposed W271BT site is 70.1 dBu, using the FM Curves calculator on the FCC web site. For the translator interference contour, free space calculations are used. The corresponding 110.1 dBu field strength distance is .095 kilometers in the horizontal plane. The proposed antenna location is 95 meters above ground. The 110.1 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 flat terrain. Figure 5 is an aerial photograph of the site with the 110.1 dBu contour plotted. There are no buildings within the contour, and therefore no population within the 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 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.



**W271BTmod**

Proposed

Latitude: 35-57-18 N

Longitude: 077-53-04 W

ERP: 0.019 kW

Channel: 271 102.1 MHz

AMSL Height: 143.0 m

Elevation: 48.0 m

Horiz. Pattern: Omni

**W271BT.C**

BLFT20160504ABL

Latitude: 35-57-19 N

Longitude: 077-53-04 W

ERP: 0.013 kW

Channel: 271 102.1 MHz

AMSL Height: 157.0 m

Elevation: 50.0 m

Horiz. Pattern: Omni

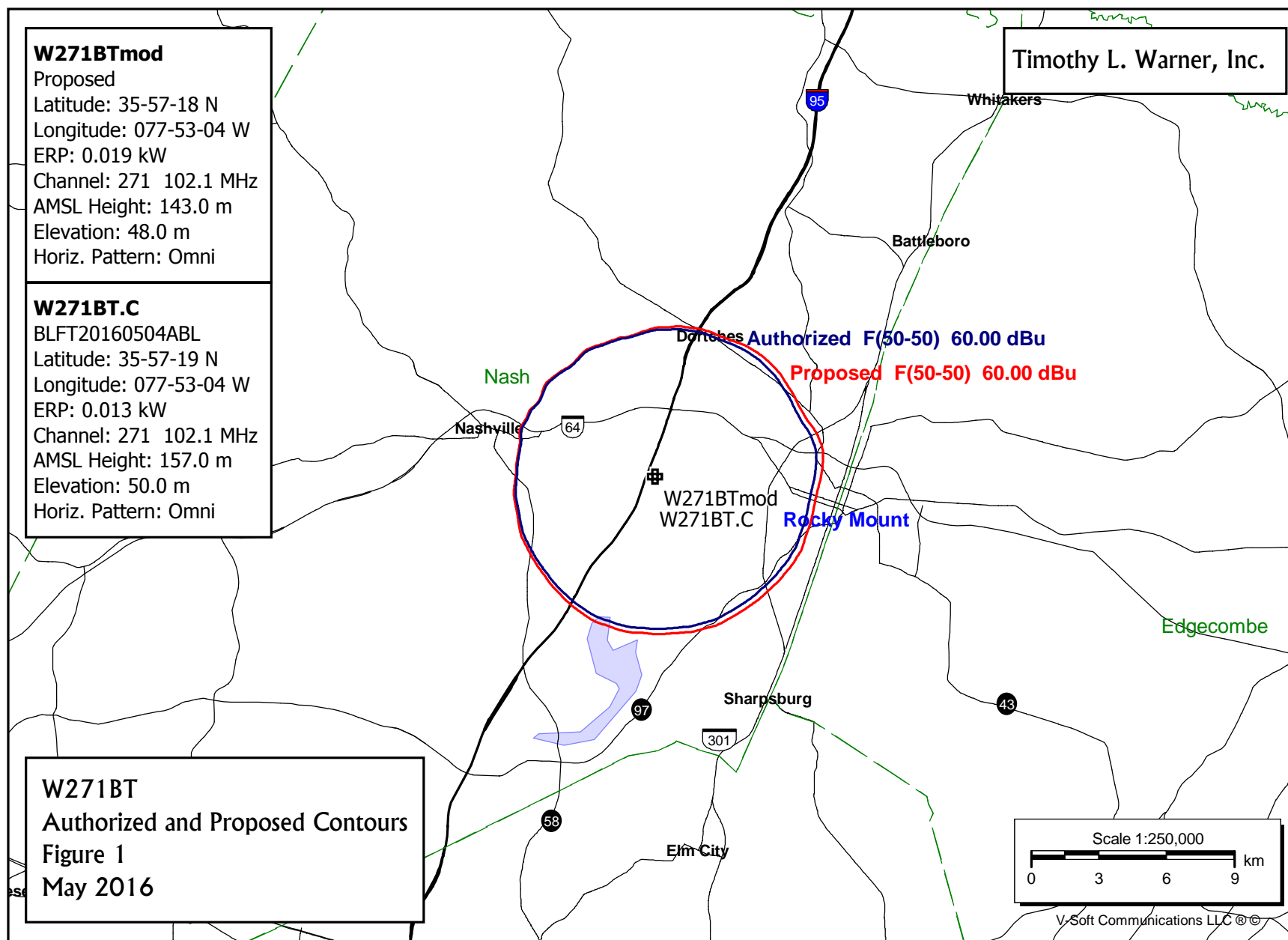
**W271BT**

Authorized and Proposed Contours

Figure 1

May 2016

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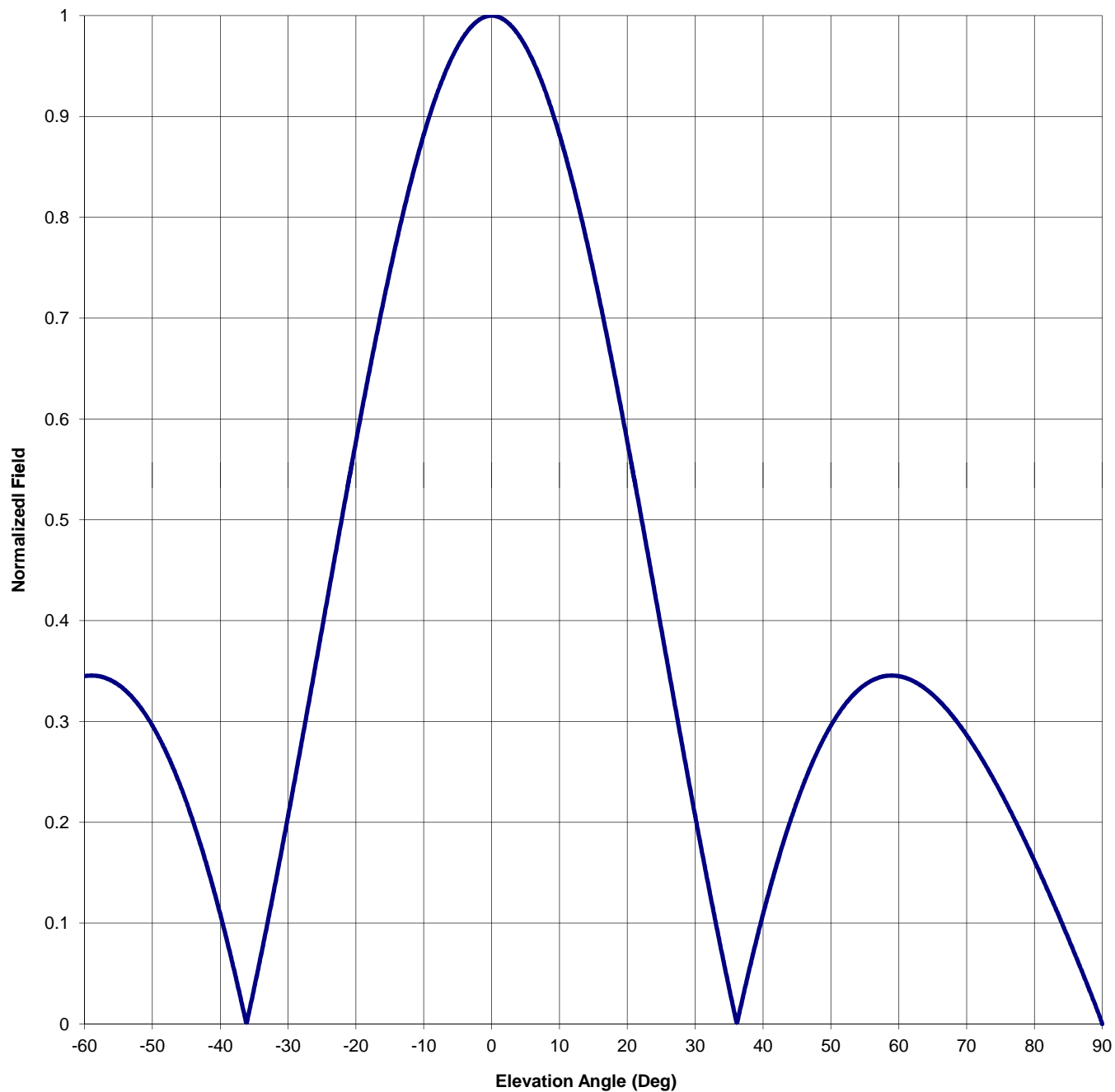


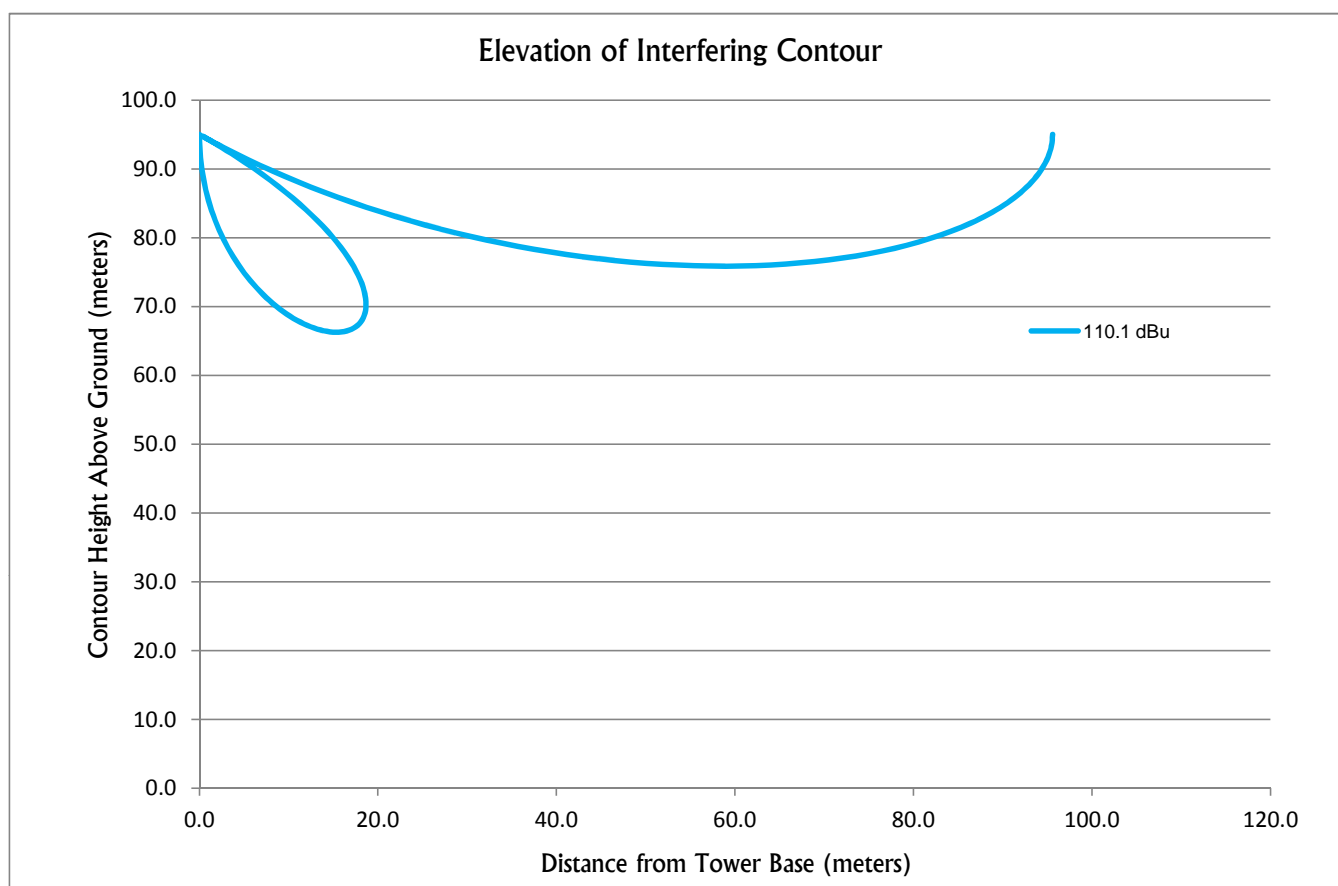
V-Soft Communications LLC ©

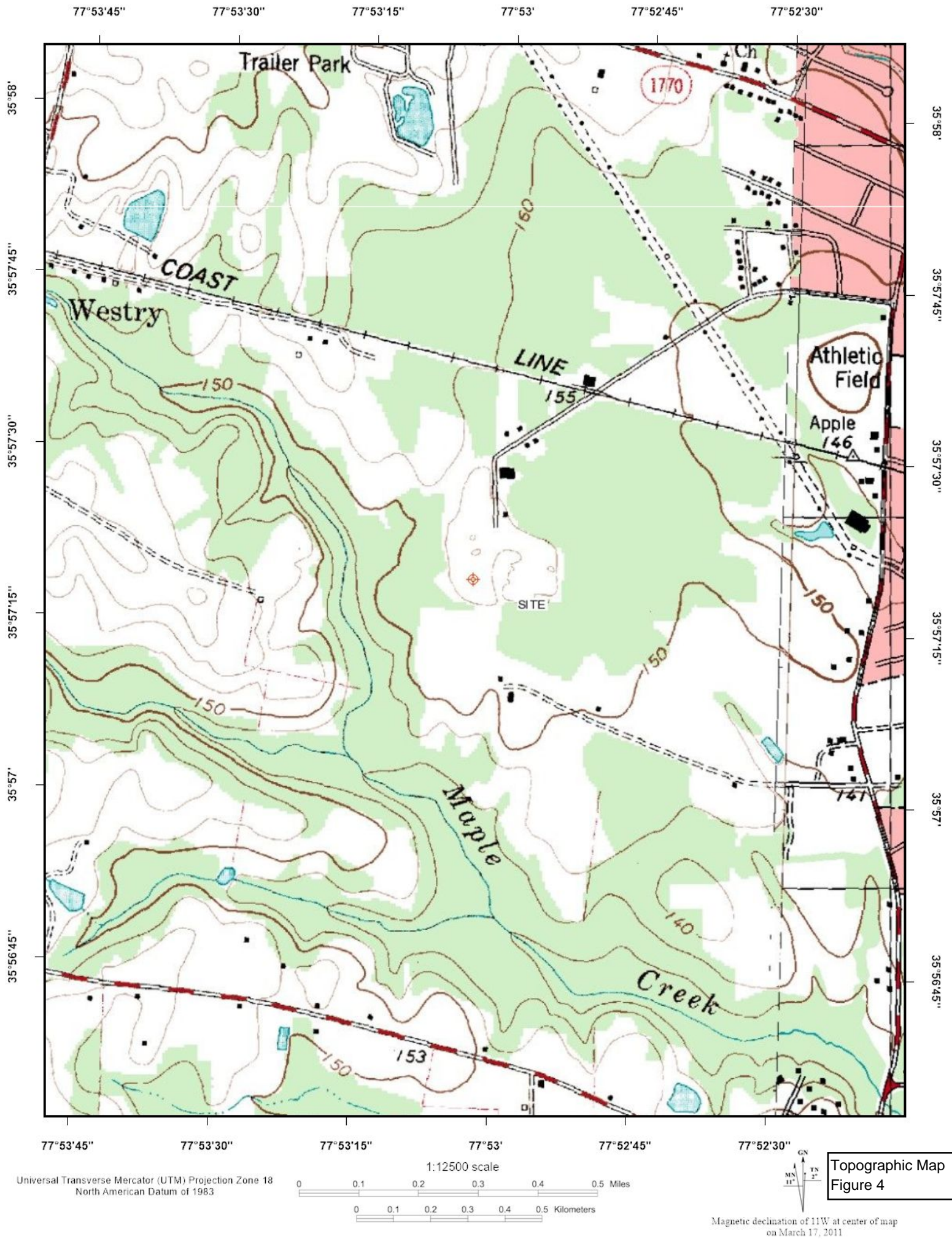
Antenna Mfg.: Nicom  
Antenna Type: BKG77-2  
Station: W271BT  
Frequency: 102.1  
Channel #: 271  
Figure: 2

Date: 5/13/2016

Beam Tilt	0	
Gain (Max)	1.004	0.019 dB
Gain (Horizon)	1.004	0.019 dB









# W271BT

Aerial Photograph with Interference Contour  
May 2016  
Figure 5

## Legend



W271BTmod (271) - 50 10 Field Strength: 110.1 dBu FCC [FCC 30 US]

