

VIRGINIA TECH FOUNDATION, INCORPORATED
MARCH 2009 AMENDMENT TO HARRISONBURG TRANSLATOR
APPLICATION (BNFT-20080612ABJ)

ENGINEERING EXHIBIT

William Culpepper & Associates
900 Jefferson Drive
Charlotte, NC 28270

VIRGINIA TECH FOUNDATION, INCORPORATED

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VIRGINIA TECH FOUNDATION, INCORPORATED

MARCH 2009 AMENDMENT TO HARRISONBURG TRANSLATOR
APPLICATION (BNPFT-20080612ABJ)

ENGINEERING NARRATIVE

PREFACE

Applicant Virginia Tech Foundation, Inc. (VTF) has filed, and so far once amended, the instant application for a new FM Translator Station to serve Harrisonburg, Virginia. The original application and first amendment were the subject of opposing pleadings and engineering statements by Station WEMC, Harrisonburg, Virginia. This second amendment is designed to correct erroneous information contained in the original and amended applications, and is based on additional work done by the applicants technical staff and its engineering consultant. Also, changes have been made to address concerns expressed by WEMC.

In addition to changes in this engineering attachment, changes are made in Section III-A, item 4 and in Section III-A, item 6.

Original erroneous information about the proposed transmitter site drawn from an Antenna Survey Registration (ASR) has been corrected by actual measurements at the site and are documented in this attachment. The Application for Registration was incorrectly filed by the owner of the tower in question. That application has been withdrawn, and a copy of the Termination by the WTB is attached.

This engineering exhibit is in three parts as follows:

The first part shows that the application will not cause any interference to WEMC due to lack of population

The second part demonstrates that even if the previous amendment would have caused interference as petitioner claimed, this amendment will cure the problem so that interference will not be caused to any potential WEMC listener

The third part shows that the attempt by WEMC to discredit the previous amendment is defective and cannot be used.

LACK OF POPULATION

The acceptability of this application is premised on a waiver of the Commissions interference rules under §74.1204(d) which states that, “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 ...lack of population”.

Attached is a map that shows that the authorized WEMC 66.5 dBu contour passes through the proposed translator site. Using the FCC sanctioned U/D method of establishing translator interference to full-service FM stations, the interfering signal of the proposed translator to second-adjacent channel WEMC is 106.5 dBu. The attached aerial photograph and USGS topographic map show the location of the proposed translator antenna and the 106.5 dBu contour based on an antenna with no vertical directivity (a single bay antenna). The contour is at 81 meters. As a supplement to the information on the topographic map and aerial photograph, J. Paxton Durham, Director of Engineering of VTF, has examined the site and states in his attached declaration that there is no structure inside the overlap area (81 meter radius) that is occupied as a residence or as a work place. All of the buildings inside the contour contain communications equipment and are unattended.

Any person inside the proposed 106.5 dBu contour would be either an electronic technician visiting one of the communications facilities on an irregular basis or a hiker passing through the privately-owned electronic site on an irregular basis. The road to the site is a “dead end” access road on private property, and it cannot be classified as a highway or a heavily traveled road. In addition, in order to reach the overlap area, a vehicle must pass through a locked gate. Based on the foregoing, if a person were present inside the 106.5 dBu contour, (1) they would not live there, (2) they would not work there on a regular basis, and (3) they would not regularly travel there. Therefore, for the purpose of §74.1204(d), there is no population inside the overlap area. (See Living Way Ministries, Inc., 17 FCC Rcd 17054 (2002), recon denied FCC 08-242, released October 10, 2008, especially the section “Guidance for Future Applicants to Demonstrate Lack of Population” at paras. 7-13.)

AMENDMENT OF PARAMETERS AND INTERFERENCE SHOWING

The technical portion of this amendment is filed for the following reasons:

1. To correct an error of one second in the tower coordinates
2. To correct the elevation of the tower site
3. To increase the height of the antenna above ground level by one meter
4. To modify the exhibit demonstrating protection of the WEMC CP.

The tower proposed in this application as the antenna support structure is on Massanutten Mountain, and it is owned by Great Eastern Resort Management, Inc. (hereafter Massanutten Tower).

The tower data incorporated in this amendment is taken from the attached surveyor’s plat that is sealed by Simon H. Cheng, Registered Professional Engineer in the Commonwealth of Virginia. In addition to the changes in tower data, the antenna height above ground has been increased one meter to further reduce radiation at ground level.

As shown on Figure 1, the authorized WEMC 66.5 dBu contour passes through the proposed translator site. As noted earlier, the proposed interfering signal at the tower site will be 106.5 dBu.

In prior filings the terrain data at the site was taken from the county tax map (GIS). The terrain data used in this amendment is more accurate as it was obtained by on-site measurements by J. Paxton Durham, Director of Engineering of VTF. His declaration is attached. The measurements were made by attaching a calibrated fiberglass pole to the tower shown at the right end of the blue line on the attached property plat. The distances were measured by a surveyor's tape. The elevation at each point was determined by sighting on the calibrated pole with a surveyor's transit.

Following this narrative there is a tabulation of the distances from the tower to the measured points. The tabulation also shows the data used in the calculation of the signal level at those points. The right hand column is the signal level two meters above ground level at each point.

Following the tabulation there is a page with a definition of terms and a sample calculation at 45 meters from the tower. Then a tower/ground elevation sketch based on the parameters in the sample calculation. The antenna proposed in this amendment and the antenna on which the calculations are based is an SWR FMEC/4 HWS four bay, with half-wave spacing. The vertical elevation pattern of the antenna is included in this attachment.

The line of measured elevation points is either in the pedestrian path or near the path. It deviates from the path in order to make the measurements on the highest ground inside the proposed 106.5 dBu contour. All other ground inside the contour that is on, or near, the pedestrian path will have less signal strength than the points shown because they are at a lower elevation.

Using calculations based on Free Space, the distance to the 106.5 dBu contour with the proposed 6 watts is 81 meters, therefore, the area beyond 81 meters will be devoid of interference regardless of terrain elevation and antenna type. The attached topographic map and aerial photograph show the 106.5 dBu contour.

It is demonstrated in the following pages that the translator, as proposed in this amendment, will not cause interference to a potential WEMC listener, even for a pedestrian with a receiver on his or her head, that strays off the path. Referring to the spread sheet, the greatest signal strength at two meters above ground is near the pedestrian path at 45 meters from the tower where it is 105.3 dBu. That is 1.2 dB below the interference level.

Approval for this installation has been received from the National Radio Astronomy Laboratory at Greenbank. A copy of the letter is attached.

The tower has been checked by TOWAIR, and notification is not required. A copy of the TOWAIR print-out is attached.

PARTIAL RESPONSE TO WEMC REPLY TO OPPOSITION

WEMC has attempted to show that the proposed signal at 2 meters above ground level will exceed 106.5 dBu at three points as follows:

54.1 meters from tower -107.0 dBu (0.5 dB above the interference level)

58.1 meters from tower – 106.7 dBu (0.2 dB above the interference level)

71.3 meters from tower – 106.6 dBu (0.1 dB above the interference level)

WEMC provides a detailed engineering exhibit with discussion and speculation regarding the WPKZ tower and the CFW tower and it has included as its Photograph 6 a red line from one of those towers to the machinery house of the nearby ski-lift. The tower proposed in the VTF application is approximately 42 meters south of the tower used by the WEMC engineering consultant in his attempt to discredit the prior VTF showing of No Interference. The ground elevation at the proposed tower is approximately two meters higher than the tower used in the calculations in the petitioner's Reply to Opposition. In view of the incorrect tower location and tower elevation used by WEMC, the calculations it has presented are in error and must not be relied on.

SUMMARY

This exhibit has demonstrated that:

- (1) The proposed translator will not cause interference to WEMC because of a Lack of Population as provided in §74.1204(d) and as defined in Living Way Ministries, *supra*.
- (2) Even without reliance on (1), it has been clearly demonstrated that the 40 dB ratio of the proposed signal to the authorized WEMC signal will not be exceeded inside the proposed 106.5 dBu contour, even at two meters above ground level.
- (3) The engineering exhibit in the most recent WEMC Response cannot be applied to the parameters in this amendment, if for no other reason because the proposed antenna height above ground has been increased and WEMC used the incorrect tower in its engineering showing.

FIELD STRENGTH vs DISTANCE FROM TOWER

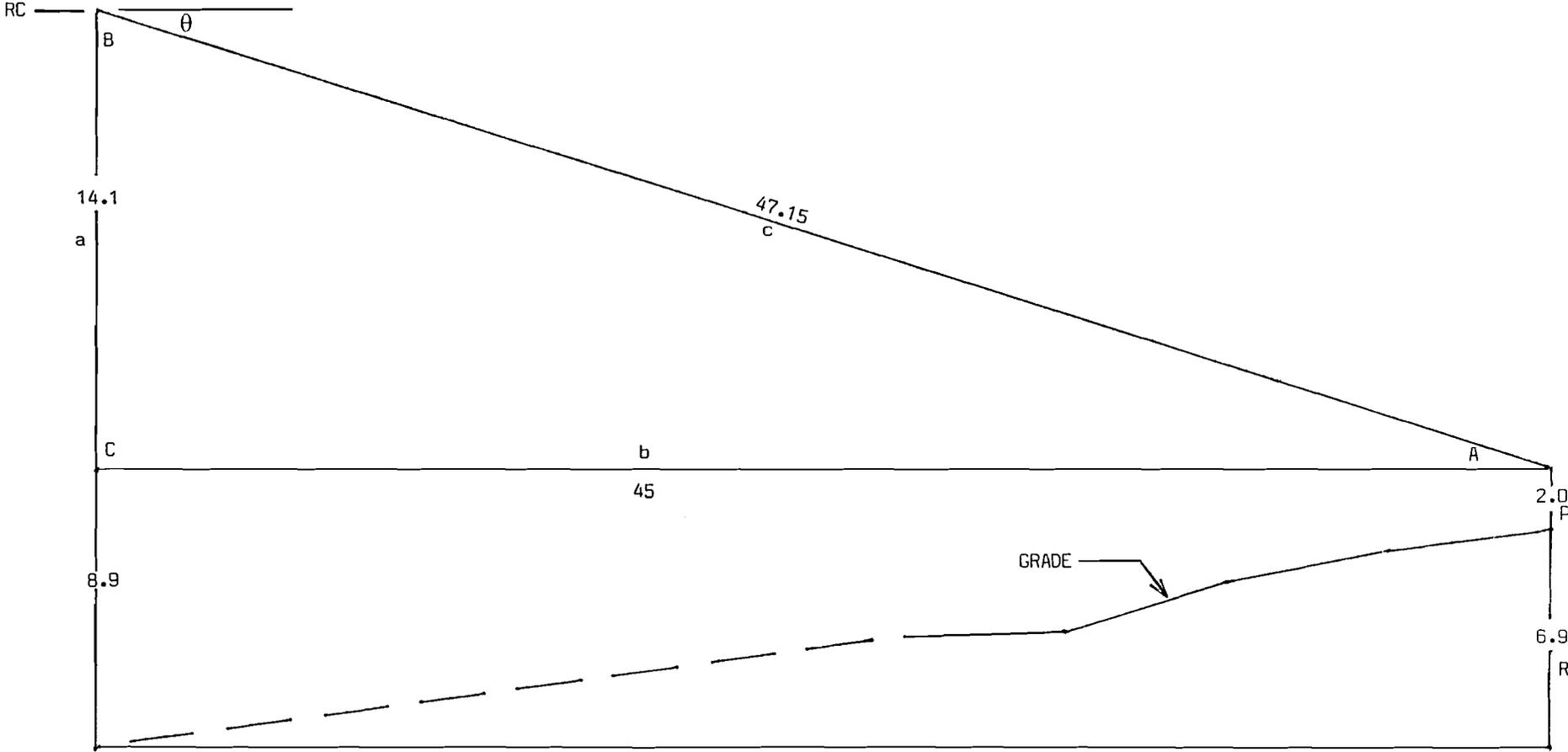
b	R	P	Elevation	a+P+R	a	θ	F	ERP	c	F
Dist from Twr Base	Point El Above Twr Base (Rise)	Head Height AGL	of A (R+P)	Antenna RCAGL	RCAGL-(R+P)	$\tan^{-1} a/b$ (degrees)	Field at θ	At Angle θ (Watts)	$\sqrt{a^2+b^2}$ (Slant Distance)	Field Strength at Point A (dBu)
25	3.7	2	5.7	23	17.3	34.68	0.119	0.084966	30.40	96.55
30	3.8	2	5.8	23	17.2	29.83	0.006	0.000216	34.58	69.50
35	5.2	2	7.2	23	15.8	24.3	0.206	0.254600	38.40	99.29
40	6.2	2	8.2	23	14.8	20.3	0.290	0.504600	42.65	101.36
45	6.9	2	8.9	23	14.1	17.4	0.505	1.530000	47.15	105.30
50	5.8	2	7.8	23	15.2	16.9	0.532	1.698000	52.26	104.87
55	5.9	2	7.9	23	15.1	15.35	0.594	2.117000	57.04	105.06
60	6.0	2	8.0	23	15.0	14.03	0.655	2.574100	61.85	105.21
65	6.0	2	8.0	23	15.0	12.99	0.697	2.914800	66.71	105.08
70	6.4	2	8.4	23	14.6	11.78	0.745	3.330000	71.51	105.06
80	3.5	2	5.5	23	17.5	12.34	0.721	3.119000	81.89	103.61

KEY The column headings refer to the site elevation drawing where appropriate.

Column

- b Distance from tower base to point (on ground)
- R Elevation of point above tower base
- P Height of persons head above ground (2 meters)
- A Point elevation (R) + Head Height above ground (P)
- E Antenna Radiation Center Above Ground (23 meters)
- C Distance from Antenna to listener's head (hypotenuse or Slant Distance)
- θ Depression angle from the antenna to a persons head at the point of interest (alternate angle of angle A)
- F Field Strength in dBu at point A (2 meters AGL)
- ERP Radiated power at angle θ
- dBu Signal Strength at point of interest (point A)

ANTENNA, TOWER AND TERRAIN PROFILE
FOR SAMPLE CALCULATION AT 45 METERS



Dimensions are in meters.
Scale: 1 inch = 5 meters.

VIRGINIA TECH FOUNDATION, INC.

DEFINITION of TERMS and SAMPLE CALCULATION

The signal levels at the various points of interest from the tower are calculated as follows:
(Refer to ANTENNA, TOWER AND TERRAIN PROFILE on preceding page.)

$A = \tan^{-1} a/c$ where:

a = effective antenna height = (RCAGL) – (elev. of point above tower base + 2 meters)
(Note: two meters are added to account for persons head height above ground.)

c = horizontal distance from tower to point of interest

θ is the depression angle which is the alternate angle of angle A .

$$ERP = (F_r)^2 \times P_{\max}$$

Where F_r = Relative Field (from attached SWR FMEC/4 HWS antenna pattern)

P_{\max} = maximum power (6 watts)

D_s (or slant distance) = side b (hypotenuse) of triangle ABC , or distance from antenna to point 2 meters above the point of interest = $\sqrt{a^2 + c^2}$

The following sample calculation is for the point 45 meters from the base of the tower:

$$\theta = \tan^{-1} 14.1\text{m}/45.0\text{ m} = 17.4\text{ degrees}$$

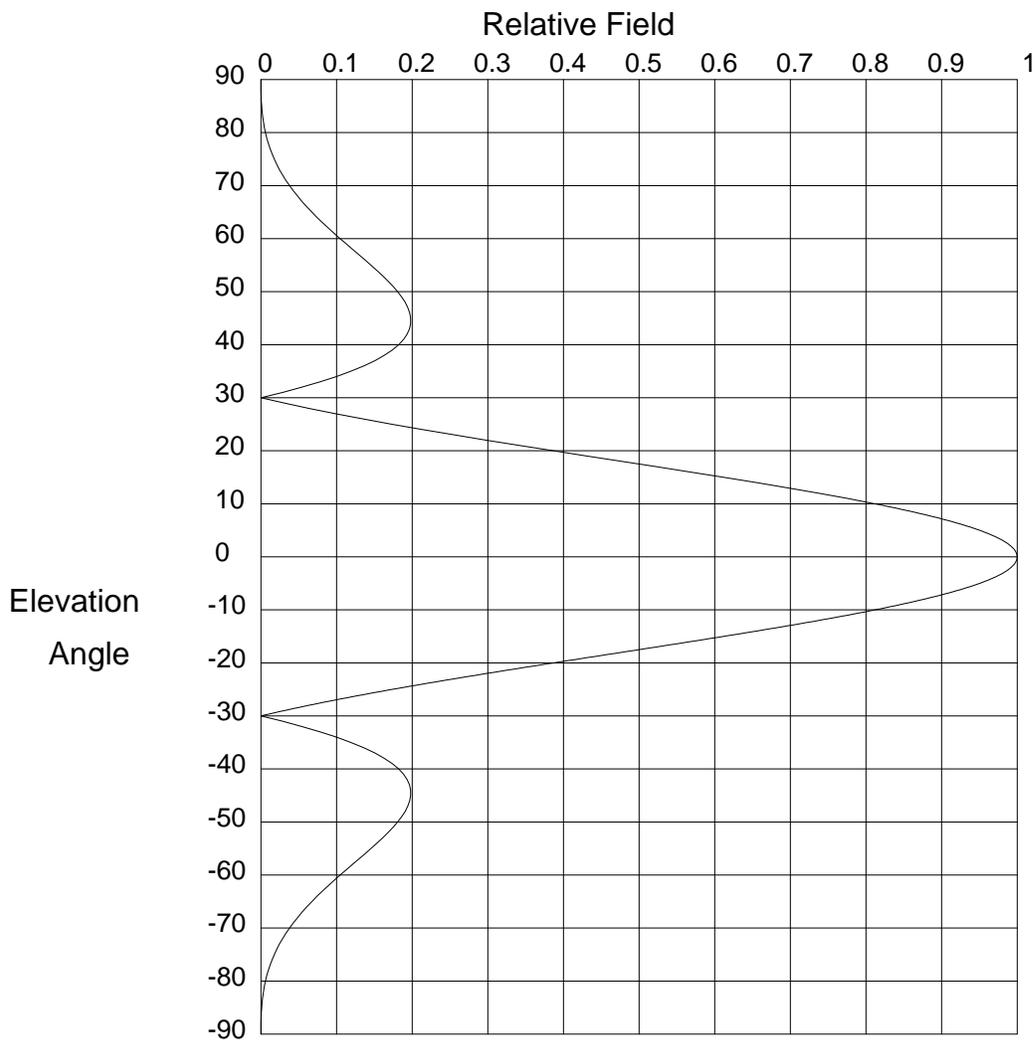
$$D_s = \sqrt{(14.1)^2 + (45)^2} = 47.15\text{ m}$$

Relative field = 0.505 (from the attached SWR pattern tabulation).

$$\text{Power at } \theta 17.4\text{ degrees} = 6\text{ watts} \times (0.505)^2 = 1.53\text{ watts}$$

From FCC Shortcut Program "FM Curves", for 0.00153 kW at 0.04715 kM, the field strength 2 meters above ground 45 meters from tower is 105.9 dBu

Note: To enhance the accuracy of program FM Curves for this use, the power was multiplied by 10,000 and 40 dB was subtracted from the result for all distances except 30 meters where 1,000,000 and 60 dB were used.



Elevation Pattern

Scale: Linear

Units: Field, Relative

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CLIENT: *WVTF Public Radio*
 ANTENNA TYPE: FMEC/4 HWS
 FREQUENCY: 92.1
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 2.627/4.195 dBd
 DIRECTIVITY(Horiz): 2.627/4.195 dBd

Date: 7/28/2008

Beam Tilt (Deg.) : 0
 Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
90.0	.00 (-50)	52.0	.168 (-15.488)	14.0	.655 (-3.674)
89.0	.00 (-91.156)	51.0	.175 (-15.15)	13.0	.697 (-3.135)
88.0	.00 (-78.01)	50.0	.181 (-14.854)	12.0	.737 (-2.646)
87.0	.00 (-69.988)	49.0	.186 (-14.601)	11.0	.776 (-2.205)
86.0	.001 (-64.112)	48.0	.191 (-14.393)	10.0	.812 (-1.809)
85.0	.001 (-59.441)	47.0	.194 (-14.232)	9.8	.819 (-1.735)
84.0	.002 (-55.547)	46.0	.197 (-14.121)	9.6	.826 (-1.663)
83.0	.002 (-52.201)	45.0	.198 (-14.065)	9.4	.833 (-1.592)
82.0	.003 (-49.264)	44.0	.198 (-14.066)	9.2	.839 (-1.523)
81.0	.005 (-46.646)	43.0	.197 (-14.132)	9.0	.846 (-1.456)
80.0	.006 (-44.281)	42.0	.193 (-14.268)	8.8	.852 (-1.39)
79.0	.008 (-42.127)	41.0	.189 (-14.483)	8.6	.858 (-1.326)
78.0	.01 (-40.149)	40.0	.182 (-14.79)	8.4	.865 (-1.264)
77.0	.012 (-38.32)	39.0	.174 (-15.202)	8.2	.871 (-1.203)
76.0	.015 (-36.621)	38.0	.163 (-15.742)	8.0	.877 (-1.144)
75.0	.018 (-35.036)	37.0	.151 (-16.436)	7.8	.882 (-1.086)
74.0	.021 (-33.551)	36.0	.136 (-17.328)	7.6	.888 (-1.03)
73.0	.025 (-32.156)	35.0	.119 (-18.483)	7.4	.894 (-0.976)
72.0	.029 (-30.843)	34.0	.10 (-20.011)	7.2	.899 (-0.923)
71.0	.033 (-29.603)	33.0	.078 (-22.118)	7.0	.905 (-0.871)
70.0	.038 (-28.431)	32.0	.055 (-25.266)	6.8	.91 (-0.822)
69.0	.043 (-27.321)	31.0	.028 (-30.932)	6.6	.915 (-0.773)
68.0	.049 (-26.269)	30.0	.00 (-50)	6.4	.92 (-0.727)
67.0	.055 (-25.271)	29.0	.031 (-30.277)	6.2	.925 (-0.681)
66.0	.061 (-24.324)	28.0	.063 (-23.956)	6.0	.929 (-0.638)
65.0	.067 (-23.425)	27.0	.098 (-20.153)	5.8	.934 (-0.595)
64.0	.074 (-22.573)	26.0	.135 (-17.391)	5.6	.938 (-0.555)
63.0	.082 (-21.764)	25.0	.174 (-15.209)	5.4	.942 (-0.515)
62.0	.089 (-20.998)	24.0	.214 (-13.399)	5.2	.947 (-0.478)
61.0	.097 (-20.273)	23.0	.255 (-11.853)	5.0	.95 (-0.441)
60.0	.105 (-19.587)	22.0	.298 (-10.506)	4.8	.954 (-0.406)
59.0	.113 (-18.941)	21.0	.342 (-9.313)	4.6	.958 (-0.373)
58.0	.121 (-18.333)	20.0	.387 (-8.248)	4.4	.961 (-0.341)
57.0	.129 (-17.764)	19.0	.432 (-7.289)	4.2	.965 (-0.311)
56.0	.138 (-17.232)	18.0	.477 (-6.422)	4.0	.968 (-0.282)
55.0	.146 (-16.738)	17.0	.523 (-5.635)	3.8	.971 (-0.254)
54.0	.153 (-16.283)	16.0	.568 (-4.919)	3.6	.974 (-0.228)
53.0	.161 (-15.866)	15.0	.612 (-4.267)	3.4	.977 (-0.203)

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CLIENT: *WVTF Public Radio*
 ANTENNA TYPE: FMEC/4 HWS
 FREQUENCY: 92.1
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 2.627/4.195 dBd
 DIRECTIVITY(Horiz): 2.627/4.195 dBd

Date: 7/28/2008

Beam Tilt (Deg.) : 0
 Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
3.2	.98 (-0.18)	-4.4	.961 (-0.341)	-12.0	.737 (-2.646)
3.0	.982 (-0.158)	-4.6	.958 (-0.373)	-12.2	.729 (-2.74)
2.8	.984 (-0.138)	-4.8	.954 (-0.406)	-12.4	.721 (-2.836)
2.6	.986 (-0.119)	-5.0	.95 (-0.441)	-12.6	.713 (-2.933)
2.4	.988 (-0.101)	-5.2	.947 (-0.478)	-12.8	.705 (-3.033)
2.2	.99 (-0.085)	-5.4	.942 (-0.515)	-13.0	.697 (-3.135)
2.0	.992 (-0.07)	-5.6	.938 (-0.555)	-13.2	.689 (-3.238)
1.8	.993 (-0.057)	-5.8	.934 (-0.595)	-13.4	.68 (-3.344)
1.6	.995 (-0.045)	-6.0	.929 (-0.638)	-13.6	.672 (-3.452)
1.4	.996 (-0.034)	-6.2	.925 (-0.681)	-13.8	.664 (-3.562)
1.2	.997 (-0.025)	-6.4	.92 (-0.727)	-14.0	.655 (-3.674)
1.0	.998 (-0.018)	-6.6	.915 (-0.773)	-14.2	.647 (-3.788)
.8	.999 (-0.011)	-6.8	.91 (-0.822)	-14.4	.638 (-3.904)
.6	.999 (-0.006)	-7.0	.905 (-0.871)	-14.6	.629 (-4.023)
.4	1.00 (-0.003)	-7.2	.899 (-0.923)	-14.8	.621 (-4.144)
.2	1.00 (-0.001)	-7.4	.894 (-0.976)	-15.0	.612 (-4.267)
.0	1.00 (0)	-7.6	.888 (-1.03)	-15.2	.603 (-4.392)
-.2	1.00 (-0.001)	-7.8	.882 (-1.086)	-15.4	.594 (-4.52)
-.4	1.00 (-0.003)	-8.0	.877 (-1.144)	-15.6	.585 (-4.651)
-.6	.999 (-0.006)	-8.2	.871 (-1.203)	-15.8	.577 (-4.783)
-.8	.999 (-0.011)	-8.4	.865 (-1.264)	-16.0	.568 (-4.919)
-1.0	.998 (-0.018)	-8.6	.858 (-1.326)	-16.2	.559 (-5.057)
-1.2	.997 (-0.025)	-8.8	.852 (-1.39)	-16.4	.55 (-5.197)
-1.4	.996 (-0.034)	-9.0	.846 (-1.456)	-16.6	.541 (-5.34)
-1.6	.995 (-0.045)	-9.2	.839 (-1.523)	-16.8	.532 (-5.486)
-1.8	.993 (-0.057)	-9.4	.833 (-1.592)	-17.0	.523 (-5.635)
-2.0	.992 (-0.07)	-9.6	.826 (-1.663)	-17.2	.514 (-5.786)
-2.2	.99 (-0.085)	-9.8	.819 (-1.735)	-17.4	.505 (-5.941)
-2.4	.988 (-0.101)	-10.0	.812 (-1.809)	-17.6	.496 (-6.098)
-2.6	.986 (-0.119)	-10.2	.805 (-1.885)	-17.8	.486 (-6.259)
-2.8	.984 (-0.138)	-10.4	.798 (-1.962)	-18.0	.477 (-6.422)
-3.0	.982 (-0.158)	-10.6	.791 (-2.041)	-18.2	.468 (-6.589)
-3.2	.98 (-0.18)	-10.8	.783 (-2.122)	-18.4	.459 (-6.759)
-3.4	.977 (-0.203)	-11.0	.776 (-2.205)	-18.6	.45 (-6.932)
-3.6	.974 (-0.228)	-11.2	.768 (-2.29)	-18.8	.441 (-7.109)
-3.8	.971 (-0.254)	-11.4	.761 (-2.376)	-19.0	.432 (-7.289)
-4.0	.968 (-0.282)	-11.6	.753 (-2.464)	-19.2	.423 (-7.473)
-4.2	.965 (-0.311)	-11.8	.745 (-2.554)	-19.4	.414 (-7.661)

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CLIENT: *WVTF Public Radio*
 ANTENNA TYPE: FMEC/4 HWS
 FREQUENCY: 92.1
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 2.627/4.195 dBd
 DIRECTIVITY(Horiz): 2.627/4.195 dBd

Date: 7/28/2008

Beam Tilt (Deg.) : 0
 Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
-19.6	.405 (-7.853)	-27.2	.091 (-20.807)	-54.0	.153 (-16.283)
-19.8	.396 (-8.048)	-27.4	.084 (-21.506)	-55.0	.146 (-16.738)
-20.0	.387 (-8.248)	-27.6	.077 (-22.258)	-56.0	.138 (-17.232)
-20.2	.378 (-8.452)	-27.8	.07 (-23.071)	-57.0	.129 (-17.764)
-20.4	.369 (-8.66)	-28.0	.063 (-23.956)	-58.0	.121 (-18.333)
-20.6	.36 (-8.873)	-28.2	.057 (-24.93)	-59.0	.113 (-18.941)
-20.8	.351 (-9.091)	-28.4	.05 (-26.012)	-60.0	.105 (-19.587)
-21.0	.342 (-9.313)	-28.6	.043 (-27.232)	-61.0	.097 (-20.273)
-21.2	.333 (-9.541)	-28.8	.037 (-28.632)	-62.0	.089 (-20.998)
-21.4	.325 (-9.774)	-29.0	.031 (-30.277)	-63.0	.082 (-21.764)
-21.6	.316 (-10.012)	-29.2	.024 (-32.277)	-64.0	.074 (-22.573)
-21.8	.307 (-10.256)	-29.4	.018 (-34.839)	-65.0	.067 (-23.425)
-22.0	.298 (-10.506)	-29.6	.012 (-38.424)	-66.0	.061 (-24.324)
-22.2	.29 (-10.762)	-29.8	.006 (-44.509)	-67.0	.055 (-25.271)
-22.4	.281 (-11.024)	-30.0	.00 (-50)	-68.0	.049 (-26.269)
-22.6	.272 (-11.293)	-31.0	.028 (-30.932)	-69.0	.043 (-27.321)
-22.8	.264 (-11.57)	-32.0	.055 (-25.266)	-70.0	.038 (-28.431)
-23.0	.255 (-11.853)	-33.0	.078 (-22.118)	-71.0	.033 (-29.603)
-23.2	.247 (-12.145)	-34.0	.10 (-20.011)	-72.0	.029 (-30.843)
-23.4	.239 (-12.445)	-35.0	.119 (-18.483)	-73.0	.025 (-32.156)
-23.6	.23 (-12.754)	-36.0	.136 (-17.328)	-74.0	.021 (-33.551)
-23.8	.222 (-13.072)	-37.0	.151 (-16.436)	-75.0	.018 (-35.036)
-24.0	.214 (-13.399)	-38.0	.163 (-15.742)	-76.0	.015 (-36.621)
-24.2	.206 (-13.737)	-39.0	.174 (-15.202)	-77.0	.012 (-38.32)
-24.4	.198 (-14.087)	-40.0	.182 (-14.79)	-78.0	.01 (-40.149)
-24.6	.19 (-14.448)	-41.0	.189 (-14.483)	-79.0	.008 (-42.127)
-24.8	.182 (-14.821)	-42.0	.193 (-14.268)	-80.0	.006 (-44.281)
-25.0	.174 (-15.209)	-43.0	.197 (-14.132)	-81.0	.005 (-46.646)
-25.2	.166 (-15.611)	-44.0	.198 (-14.066)	-82.0	.003 (-49.264)
-25.4	.158 (-16.028)	-45.0	.198 (-14.065)	-83.0	.002 (-52.201)
-25.6	.15 (-16.463)	-46.0	.197 (-14.121)	-84.0	.002 (-55.547)
-25.8	.143 (-16.917)	-47.0	.194 (-14.232)	-85.0	.001 (-59.441)
-26.0	.135 (-17.391)	-48.0	.191 (-14.393)	-86.0	.001 (-64.112)
-26.2	.128 (-17.888)	-49.0	.186 (-14.601)	-87.0	.00 (-69.988)
-26.4	.12 (-18.409)	-50.0	.181 (-14.854)	-88.0	.00 (-78.01)
-26.6	.113 (-18.958)	-51.0	.175 (-15.15)	-89.0	.00 (-91.156)
-26.8	.105 (-19.538)	-52.0	.168 (-15.488)	-90.0	.00 (-50)
-27.0	.098 (-20.153)	-53.0	.161 (-15.866)	90.0	.00 (-50)

Systems With Reliability Inc

Page 3 of 3

CLIENT: *WVTF Public Radio*
 ANTENNA TYPE: FMEC/4 HWS
 FREQUENCY: 92.1
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 2.627/4.195 dBd
 DIRECTIVITY(Horiz): 2.627/4.195 dBd

Date: 7/28/2008

Beam Tilt (Deg.) : 0
 Null Fill(s)(%) : 0, 0, 0

FIGURE 1 - THE AUTHORIZED WEMC 66.5 dBu CONTOUR AND THE PROPOSED TRANSLATOR SITE

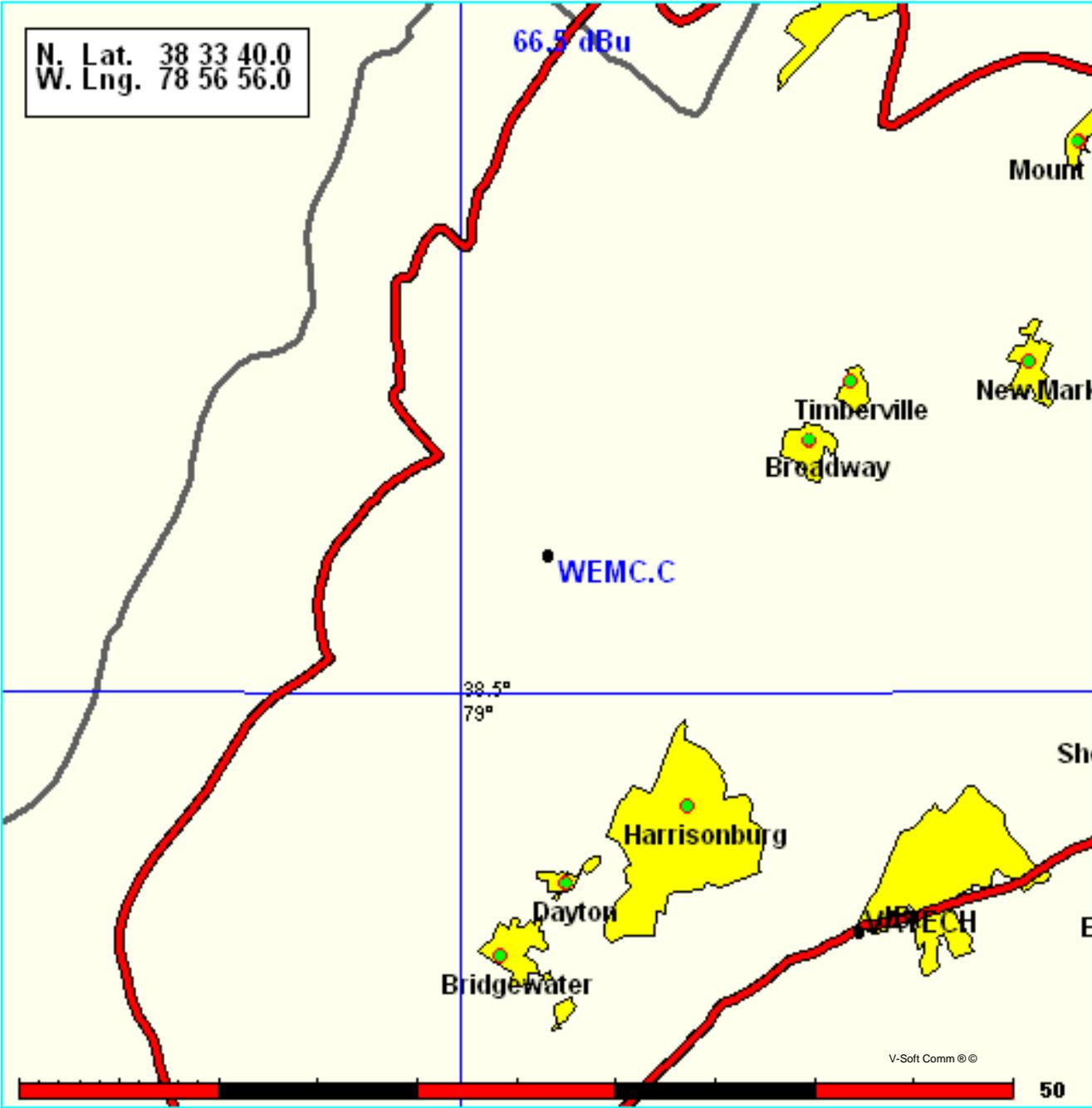
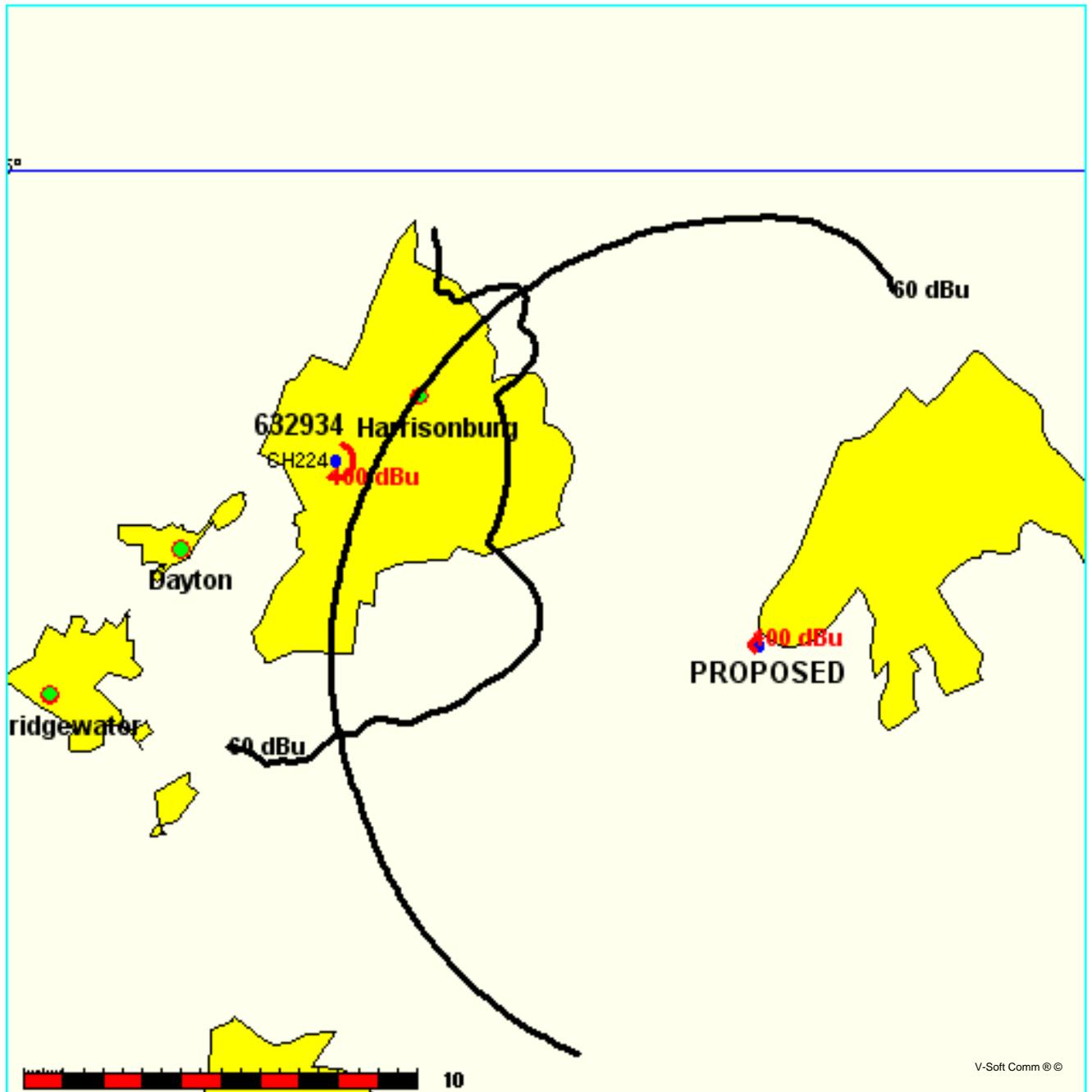
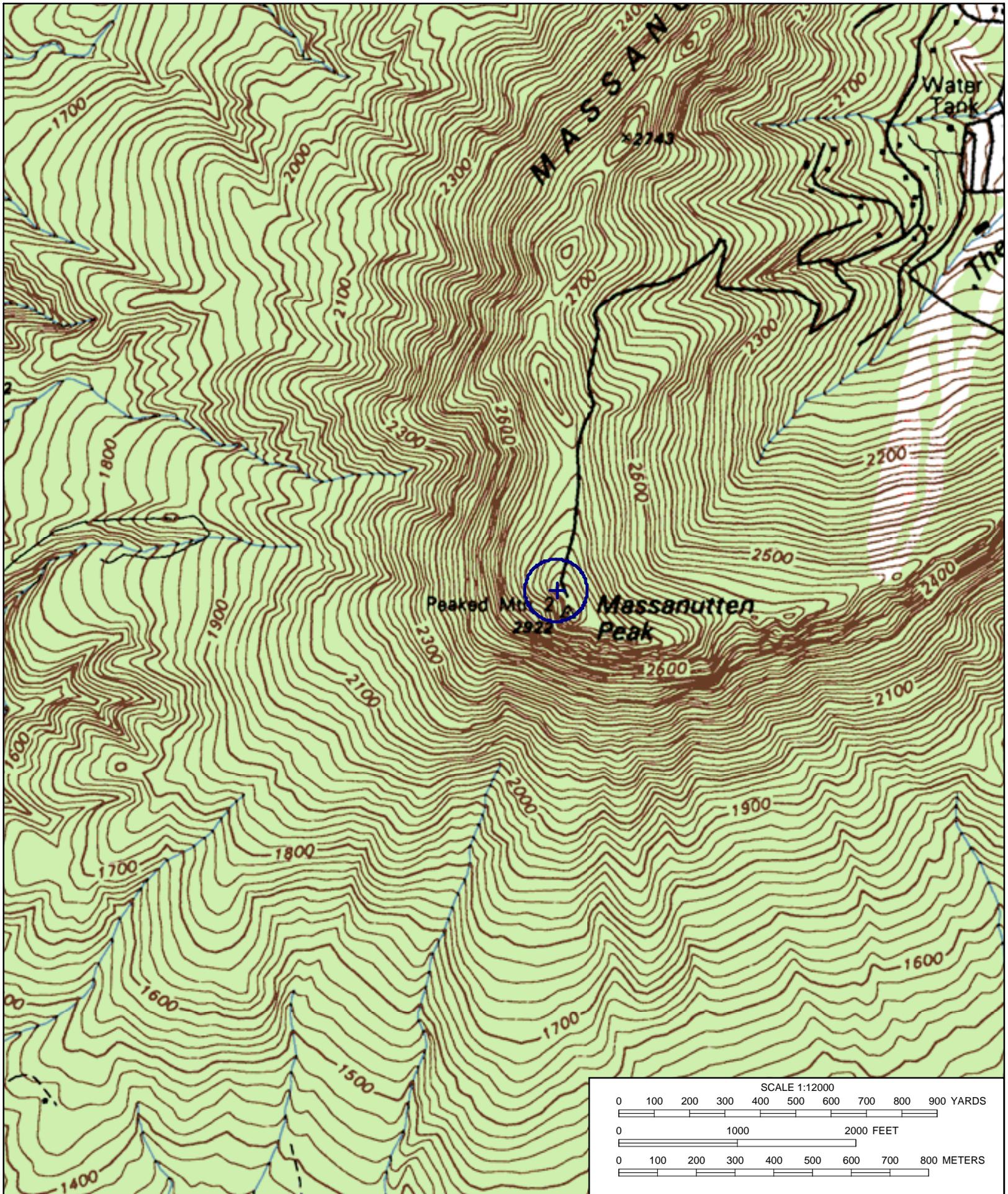


FIGURE 2.
ALLOCATION STUDY - TRANSLATOR 632934





Name: HARRISONBURG
 Date: 1/29/2009
 Scale: 1 inch equals 1000 feet

Location: 038° 23' 34.73" N 078° 46' 19.72" W NAD27
 Caption: The proposed translator site at 38-23-35.4 N and 78-46-14.0 W and the 6 watt 106.5 dBu contour (81 meters).



Name: HARRISONBURG SE, VA
Date: 1/29/2009
Scale: 1 inch equals 500 feet

Location: 038° 23' 30.97" N 078° 46' 18.72" W NAD27
Caption: The proposed translator site at 38-23-35.4 N and 78-46-14.0 W and the 6 watt 106.5 dBu contour (81 meters).

VIRGINIA TECH FOUNDATION
HARRISONBURG, VIRGINIA
Average Protected F(50-50)= 10.62 km
Omni-directional

REFERENCE
38 23 36.0 N.
78 46 13.0 W.

CH# 221D - 92.1 MHz, Pwr= 0.006 kW, HAAT= 461.5 M, COR= 885 M

DISPLAY DATES
DATA 03-07-09
SEARCH 03-07-09

CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DI ST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
221D Harrisonburg	1261032	APP VA	_C_	0.0 0.0	0.0 BNPFT20080612ABJ	38 23 36.0 78 46 13.0	0.006	38.9 906	10.7 Virginia Tech Foundation,	-49.6*	-48.7*
221D Harrisonburg	644154	APP VA	_C_	0.0 0.0	0.0 BNPFT20030317LEQ	38 23 36.0 78 46 13.0	0.008	41.4 896	11.6 Virginia Tech Foundation,	-52.0*	-49.6*
219B Harrisonburg	WEMC	CP VA	DCX	320.2 140.1	24.3 BPED20070907AAU	38 33 40.0 78 56 56.0	9.500 199	2.5 715	34.4 Board Of Trustees Of Easte	11.2	-10.3*
224D Harrisonburg	632934	APP VA	_C_	293.2 113.1	11.7 BNPFT20030310ACW	38 26 05.0 78 53 37.0	0.038	0.4 460	4.4 Positive Alternative Radi o	0.7	7.2
219A Harrisonburg	WEMC	LIC VA	_CN	311.9 131.9	13.1 BLED19940707KB	38 28 20.0 78 52 57.0	1.850 58	1.6 506	11.8 Board Of Trustees Of Easte	1.0	1.2
220A Charlottesville	WNRN	LIC VA	NCN	151.2 331.4	52.1 BLED19970121KB	37 58 55.0 78 29 03.0	0.320 325	37.6 493	25.0 Stu-comm, Inc.	3.7	11.1
223B Winchester	WINC-FM	LIC VA	_CN	45.8 226.2	90.1 BLH19910930KD	38 57 21.0 78 01 28.0	22.000 434	6.2 706	68.1 Centennial Li censi ng Li , L	74.0	21.6
224A Charlottesville	WUVA	LIC VA	_CN	150.7 330.8	51.9 BLH19981119KC	37 59 08.0 78 28 47.0	0.750 274	1.8 441	28.1 Wuva, Inc.	39.5	23.6
218D Crozet	W218BZ	LIC VA	DV_	183.9 3.8	36.4 BLFT20051108AGG	38 03 58.0 78 47 54.0	0.010	0.0 881	0.7 Stu-comm, Inc	25.4	35.6
222C Roanoke	WXLK	LIC VA	DCX	222.8 42.0	179.9 BLH20050912ACD	37 11 56.0 80 09 01.0	93.000 625	142.8 1212	97.0 Mel Wheeler, Inc.	26.1	65.8
221B1 Mechanicsville	WCDX	LIC VA	NCN	127.8 308.6	140.1 BLH19960117KA	37 36 52.0 77 30 56.0	4.500 235	99.7 295	44.3 Radio One Licenses, Lic	29.7	50.7
218B1 Scottsville	1211631	APP VA	DCX	187.8 7.8	61.9 BNPED20071015ALJ	37 50 27.0 78 52 00.0	1.650 229	1.3 576	24.7 Virginia Organi zi ng Projec	49.5	37.0
220B1 Frostburg	WFWM	LIC MD	NEN	355.3 175.2	132.4 BLED19970825KA	39 34 54.0 78 53 53.0	1.300 434	72.5 913	48.2 Frostburg State Uni versi ty	49.3	68.4
218A Culpeper	WARN	LIC VA	_C_	84.1 264.6	68.8 BMLED20000918AGH	38 27 15.0 77 59 10.0	0.930 37	1.6 157	10.0 Ameri can Fami ly Associati o	56.1	58.7

Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM
Contour distances are on direct line to and from reference station. Reference zone = 1, 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)
"*"affixed to 'IN' or 'OUT' values = site inside protected contour.
"<" = Contour Overlap
Reference station has protected zone issue: WV Quiet Zone



NATIONAL RADIO ASTRONOMY OBSERVATORY

POST OFFICE BOX 2
GREEN BANK, WV 24944-0002
TELEPHONE (304) 456-2107 FAX (304) 456-2276
<http://www.gb.nrao.edu>

November 17, 2008

Virginia Tech Foundation Inc.,
3520 Kingsbury Lane
Roanoke, VA 24014-1348

inrc:

Radio Service Code: FM Translator
Applicant: Addressee
Fixed transmitter location: Massanutten Mountain, VA
Operating Frequency: 92.1 MHz
- Prior Coordination Notification
- New application for a FM Translator
- Modification of existing FCC application
Purpose of application:
Previous FCC Filing: BNPFT-20030317LEQ
Previous NRAO Coordination: NRQZ#5479/09JUN08
FCC File Number: BNPFT-20080612ABJ
NRAO Coordination: NRQZ#5479-2/30OCT08

Dear Dr. Smoot:

The National Radio Quiet Zone office evaluated the above-mentioned transmitter to determine the possible interference impact on our highly sensitive radio astronomy operations.

The National Radio Astronomy Observatory, Green Bank, WV, **does not object** to and **recommends for approval** the new application for a call sign by the FCC.

As notification has been made to the NRAO prior to the application filing, the applicant must provide notice upon actual filing of the application with the FCC (47CFR1.924 (a)(2)).

The NRQZ office recommends that you attach a copy of this Letter of Concurrence to your application when filing with the FCC.

The Sugar Grove Research Station, Sugar Grove, WV does not object to the granting of the referenced new application.

This letter **constitutes coordination** of assignment in the National Radio Quiet Zone as required by the FCC Rules and Regulations 47CFR1.924.

This document supersedes our letter dated 12 June 2008.

If I can be of assistance, please feel free to contact me.

Sincerely,

Paulette W. Woody
Interference Office
NRQZ Administrator

File: 5479 30OCT08.doc / PWW/pww
Cc: Paxton Durham for applicant

TOWAIR Determination Results

*** NOTICE ***

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

DETERMINATION Results

Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.

Your Specifications

NAD83 Coordinates

Latitude	38-23-35.9 north
Longitude	078-46-13.1 west

Measurements (Meters)

Overall Structure Height (AGL)	45.7
Support Structure Height (AGL)	45.7
Site Elevation (AMSL)	884.5

Structure Type

TOWER - Free standing or Guyed Structure used for Communications Purposes

[Tower Construction Notifications](#)

Notify Tribes and Historic Preservation Officers of your plans to build a tower.

CLOSE WINDOW



Federal Communications Commission
Wireless Telecommunications Bureau
1270 Fairfield Road
Gettysburg, PA 17325-7245

NOTICE OF ANTENNA STRUCTURE REGISTRATION TERMINATION

ATTN: SAMUEL LILLY
ADVANTAGE COMMUNICATIONS INC
2617 GRACE CHAPEL RD
HARRISONBURG, VA 22801

Date: 02-27-2009
Reference No.: 0619043

Re: ADVANTAGE COMMUNICATIONS INC

The Commission has **TERMINATED** the following antenna structure registration effective 02-26-2009.

<u>Registration Number</u>	<u>NAD 83 Coordinates</u>	<u>Overall Height (AGL)</u>
1243197	38-23-35.0 N 078-46-13.0 W	42.4 meters
<u>Location</u>	<u>City</u>	<u>State</u>
DEAD END RAINER RD	MASSANUTTEN	VA

The antenna structure previously registered for this site is no longer valid. If you believe an error has occurred, please notify the Commission immediately in writing. Correspondence should include a copy of this notice and be mailed to the address on the letterhead. Overnight couriers and hand deliveries should be sent to Federal Communications Commission, 1280 Fairfield Road, Gettysburg, PA 17325.

For additional information or assistance, you may visit the website at <http://wireless.fcc.gov/antenna>. You may also call the FCC at (877) 480-3201 (TTY 717-338-2824). To provide quality service and ensure security, all telephone calls are recorded.

Terminated record per fax request from Charlie Powell, indicating this structure does not require registration (passes the slope calculation).

VIRGINIA TECH FOUNDATION, INCORPORATED
TRANSLATOR APPLICATION, HARRISONBURG, VIRGINIA

DECLARATION

I declare, under penalty of perjury, that I made the terrain elevation measurements contained in this exhibit, that I determined that all of the buildings within 81 meters of the proposed VTF tower contain radio equipment and that none have any personnel in regular attendance, and that the foregoing is true to the best of my knowledge and belief.

Executed on March 3, 2009.



J. Paxton Durham
Director of Engineering
Virginia Tech Foundation

VIRGINIA TECH FOUNDATION, INCORPORATED
TRANSLATOR APPLICATION, HARRISONBURG, VIRGINIA

DECLARATION

I declare, under penalty of perjury, that I prepared the attached engineering exhibit, and that all of the information contained therein is true to the best of my knowledge and belief.

Executed on March 7, 2009.

A handwritten signature in blue ink, reading "William A. Culpepper", is written over a horizontal line.

William A. Culpepper, P.E.
900 Jefferson Drive
Charlotte, NC 28270