

## INTERFERENCE ANALYSIS

Channel 300  
University of Wisconsin  
Long Form 349

Madison, WI  
BNPFT-20030314AZD  
ERP = .038 kW H & V  
August 2003

Page #3 of this exhibit is a computer generated channel study, showing the contour relationship between the proposed translator and adjacent stations. Page #4 is an explanation of the methods used in preparing the study. This proposal causes 3rd adjacent contour overlap with local class B station, WSJY, Fort Atkinson, WI..

Section 73.1204(a) of the Commissions Rules states that "an application for an FM translator station will not be accepted for filing if the proposed operation would involve overlap of predicted field strength contours with any other station, including commercial and noncommercial educational FM stations, FM translators and Class D (secondary) noncommercial educational FM stations." However, Section 74.1204(d) states that "the provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. 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 intervening terrain, lack of population or other such factors as may be applicable.*" (Emphasis added.)

Using the undesired-to-desired signal ratio method regarding interference to a third adjacent frequency<sup>1</sup>, "interference is predicted to occur where the translator's undesired signal exceeds the protection station's desired signal by 40 dB or more."<sup>2</sup> The FCC F(50-50) curves were used to determine the signal strength, in dBu, of WSJY at the proposed translator's transmitter site. This signal strength was calculated to be 66.1 dBu, based on WSJY's HAAT toward the reference of 201.8 meters, power of 26 kW and distance of 39.42 km. Incorporating the 40 dB U/D ratio, the resulting translator interference contour is the 106.1 dBu. (66.1 + 40 = 106.1 dBu) Page # 5 of this exhibit is a scaled topographic map showing that there are no buildings, major roads or population around the tower, within a distance of 108 meters. The applicant certifies that it has confirmed this distance through a visit to the site. The applicant proposes to use a Shively 6812-3, 3-bay, antenna. The vertical elevation field of this antenna has been measured by the

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<sup>1</sup> Second Report and Order, FCC 00-368 at 9 and 39.

<sup>2</sup> Memorandum Opinion and Order, FCC 02-244 at 5 and 6, (In response to application of Living Way Ministries, Inc., File No. BPFT-19981001ITA.

manufacturer and a graph of same can be found on Page #7 of this exhibit. By using the vertical elevation field values at various depression angles beginning at a horizontal distance from the tower base of 100 meters, we have calculated the pertinent signal strength, every ten meters, to 200 meters. The topographic map shows that the area beyond 108 kilometers from the tower base, to the north and east of the tower, is populated. However, when the vertical elevation field of the antenna is considered, the signal strength from 100 to 200 kilometers never exceeds 106.1 dBu. (See page #6 of this exhibit.) In fact, the maximum field strength does not rise above 98.7 dBu. These signal calculations were made using the free-space equation used by the FCC in the program TVFMINT. Based on this analysis, no interference to any population or populated area will occur at any location around the proposed tower.

If it is necessary to request a waiver of Section 73.1204(a) of the Commissions Rules it is here so, respectfully, requested.

University of Wisconsin

REFERENCE		CH# 300D - 107.9 MHz, Pwr= 0.038 kW, MAX HAAT=71.4 M, COR= 331 M								DISPLAY DATES	
43 02 30 N		Average Protected F(50-50)= 6.79 km								DATA	08-20-03
89 24 31 W		Ave. F(50-10) 40 dBu= 22.7 54 dBu= 9.7 80 dBu= 2.1 100 dBu= .4								SEARCH	08-20-03
CH CITY	CALL	TYPE STATE	AZI. <--	DIST FILE #	LAT. LNG.	Pwr(kW) HAAT(M)	COR(M) INT(km)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*	
300D Madison	AP300	APP C WI	1.7 181.7	3.83 BNPFT20030314AZD	43 04 34 89 24 26	0.070 14	308 21.7	5.1 Board Of Regents Of The Un	-19.38*	-23.04*	
297B Fort Atkinson	WSJY	LIC CN WI	132.8 312.8	39.42 BLH19900817KC	42 48 02 89 03 16	26.000 202	474 0.9	64.3 Newradio Group, Lic	27.52	-25.74*	
299B Milwaukee	WVCYFM	LIC DC WI	94.2 274.2	109.25 BLED20010710AAS	42 57 46 88 04 23	43.000 129	403 13.1	60.6 Vcy America, Inc.	29.92	35.49	
300B Aurora	WLEYFM	LIC DCN IL	137.9 317.9	164.95 BLH19910827KB	41 56 01 88 04 23	7.688 213	455 27.6	54.0 Wley Licensing, Inc.	52.91	83.36	
300C Waterloo	KFMW.A	APP CY IA	251.1 71.1	211.77 BPH20030711ACJ	42 24 02 91 50 36	100.000 546	834 14.0	89.4 Kxel Broadcasting Company,	13.35	108.34	
300C Waterloo	KFMW	LIC CY IA	251.1 71.1	211.89 BLH19861209KH	42 24 04 91 50 43	100.000 546	834 14.0	89.4 Kxel Broadcasting Company,	13.48	108.47	
300D Oshkosh	AP300	APP C WI	31.7 211.7	134.02 BNPFT20030314AUM	44 03 51 88 31 43	0.027 63	310 22.6	5.9 Lakeshore Communications,	107.66	105.49	
300C Wausau	WYCO	LIC CN WI	359.4 179.4	224.18 BLH19850205KW	45 03 33 89 26 10	100.000 342	742 22.3	75.5 Seehafer Broadcasting Corp	40.40	126.33	
298D Mayville	AP298	APP C WI	54.3 234.3	86.32 BNPFT20030317EAW	43 29 26 88 32 27	0.120 35	312 0.4	6.3 Sister Grace, Inc.	79.71	79.54	
298A Galena	WDBQFM	LIC CN IL	228.9 48.9	107.93 BMLH19970117KB	42 24 02 90 23 55	6.000 66	346 0.4	23.3 Cumulus Licensing Corp.	101.21	84.18	
300D Appleton	AP300	APP C WI	29.5 209.5	151.58 BNPFT20030317FEU	44 13 26 88 28 16	0.250 9	250 22.5	7.1 Sister Grace, Inc.	121.10	122.02	

\*\*\*Affixed to 'IN' or 'Out' values = site inside protected contour.  
 ERP and HAAT are on direct line to and from reference station.

## HOW TO READ THE FM COMPUTER PRINT-OUT

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, while the 40, 54, 80 and 100 dBu contours are interference contours derived from the Commission's F(50-10) table. Contour distances are in kilometers and are predicted using spline interpolation from data points identical to those published in Report No. RS 76-01 by Gary C. Kalagian. Critical contour distances are determined 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.

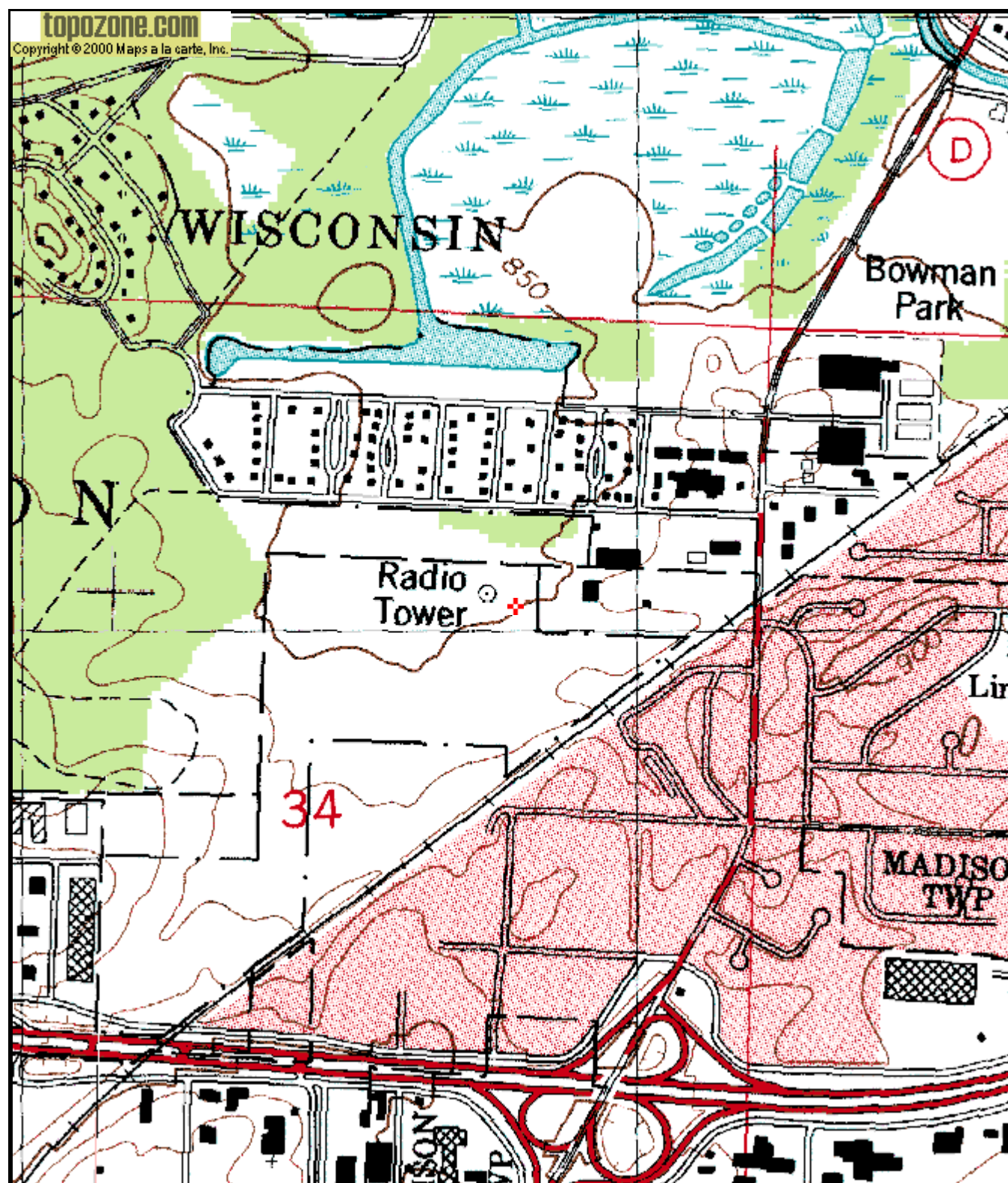
The column listed "**\* IN \***" is the sum of the reference station's 60 dBu protected contour and the data file station's interference contour subtracted from the distance between the stations. (All distances are derived by the method detailed in Sec. 73.208 of the Rules and Regulations as amended in Docket 80-90.) Therefore, the column is a measure of incoming interference. Negative distances in this column indicate the presence of interference. Listed antenna heights are the average heights of eight standard radials as found in the Commission's records unless otherwise noted, in which case the specific antenna heights and the DA power, if applicable, along the straight line azimuths between the reference station and the database station are used and visa versa. The column labeled "**\* OUT \***" shows the distance in kilometers of overlap or clearance between the reference station's interference contour and the database station's protected contour. Negative distance figures in this column indicate outgoing overlap interference.

Under the "AZIMUTH" column, the first row of numbers indicate the bearings from True North of the data base stations in relationship with the reference station, while the numbers in the second row indicate the reverse bearings from the database station to the reference station.

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

For I.F. relationships the "IN" and "OUT" columns change their significance. The letter "R" stands for the minimum **required** distance in kilometers, while the letter "M" in the next column follows 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 omni. 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".



Map center is 43° 02' 30"N, 89° 24' 31"W (NAD27)

Madison West quadrangle

Projection is UTM Zone 16 NAD83 Datum

MN  
GN  
MN=0.054  
GN=1.645

Calulation of signal strength at depression angles  
Horizontal distance is in meters from base of tower  
Hypotenuse= distance COR to ground  
Antenna is a Shively 6812 -3 (3 bay) Max Pwr = .038 kW

Horz Dist	Hypotenuse	Depression angle	Vert Elev Field	ERP	Signal in dBu
100	123.2234	35.7	0.19	0.00137	96.5
110	131.4686	33.2	0.26	0.00257	98.6
120	139.9428	31	0.28	0.00298	98.7
130	148.6069	29	0.285	0.00309	98.4
140	157.4294	27.2	0.275	0.00287	97.6
150	166.3851	25.6	0.225	0.00192	95.3
160	175.4537	24.3	0.205	0.00160	94.1
170	184.6185	23	0.14	0.00074	90.3
180	193.8659	21.8	0.1	0.00038	87
190	203.1846	20.8	0.065	0.00016	82.8
200	212.5653	19.8	0.02	0.00002	73.4
39	81.8	61.5	0.385	0.00563	162.6 *

\* Maxima at vertical angle of 61.5 degrees



FIELD ELEVATION PATTERN  
ANT. MFG.: SHIVELY LABS  
ANT. TYPE: 6810-3  
STATION: WPAW  
FREQ: 98 MHz CHAN: 250  
Power Gain 1.55 1.90 db  
DATE: 2/25/86  
FIGURE NO.: 3

