

**Engineering Statement  
In Support of an Application  
For Construction Permit**

**WWIZ, Mercer, Pennsylvania**

**Human Exposure To Radiofrequency Radiation Study**

<u>CALL</u>	<u>Service</u>	<u>Channel</u>	<u>Freq.</u>	<u>Polarization</u>	<u>Antenna Height** (AGL)</u>	<u>ERP (kW)</u>	<u>Relative Field Factor</u>	<u>Vertical Predicted Power Density (mW/cm<sup>2</sup>)</u>	<u>FCC Uncontrolled Limit (mW/cm<sup>2</sup>)</u>	<u>Percent of Uncontrolled Limit</u>
WWIZ	FM	280	103.9	H&V	46	6.000	1.000	0.0214716	0.200	10.7358%

Total Percentage of ANSI value = 10.736%

\* The antenna height indicated above is 2 meters less than the actual antenna height so that the predicted power density consider the 2 meter human height allowance.

The elevation patterns for the antenna of the following facility was used to determine the power density. Furthermore, the highest field between the depression angles of 70 and 90 degrees were used. At a depression angle of 70 degrees or less, the inclination of the angle would place the area of concern above 2 meters. The computations were derived by using the following formula:

$(33.41 * \text{Total ERP in kW considering the elevation pattern tabulations}) / (\text{COR in meters} - 2 \text{ meter})^2$

WWIZ has a RCA Model BFH-3B (3 element, full wave-length between element) antenna mounted 46 meters above ground level. Attached is the elevation pattern for WWIZ, provided by Dielectric. The highest relative field is 0.322 at 70.0 degrees depression which produces a power density of 21.472  $\mu\text{W}/\text{cm}^2$ .

As demonstrated, the total percentage of the ANSI values at the study site is 10.736% of the limit for “uncontrolled” environments 2.15% of the limit for “controlled” environments.



Proposal Number  
Date **09 Dec 2003**  
Call Letters  
Location  
Customer  
Antenna Type **BFH-3B**

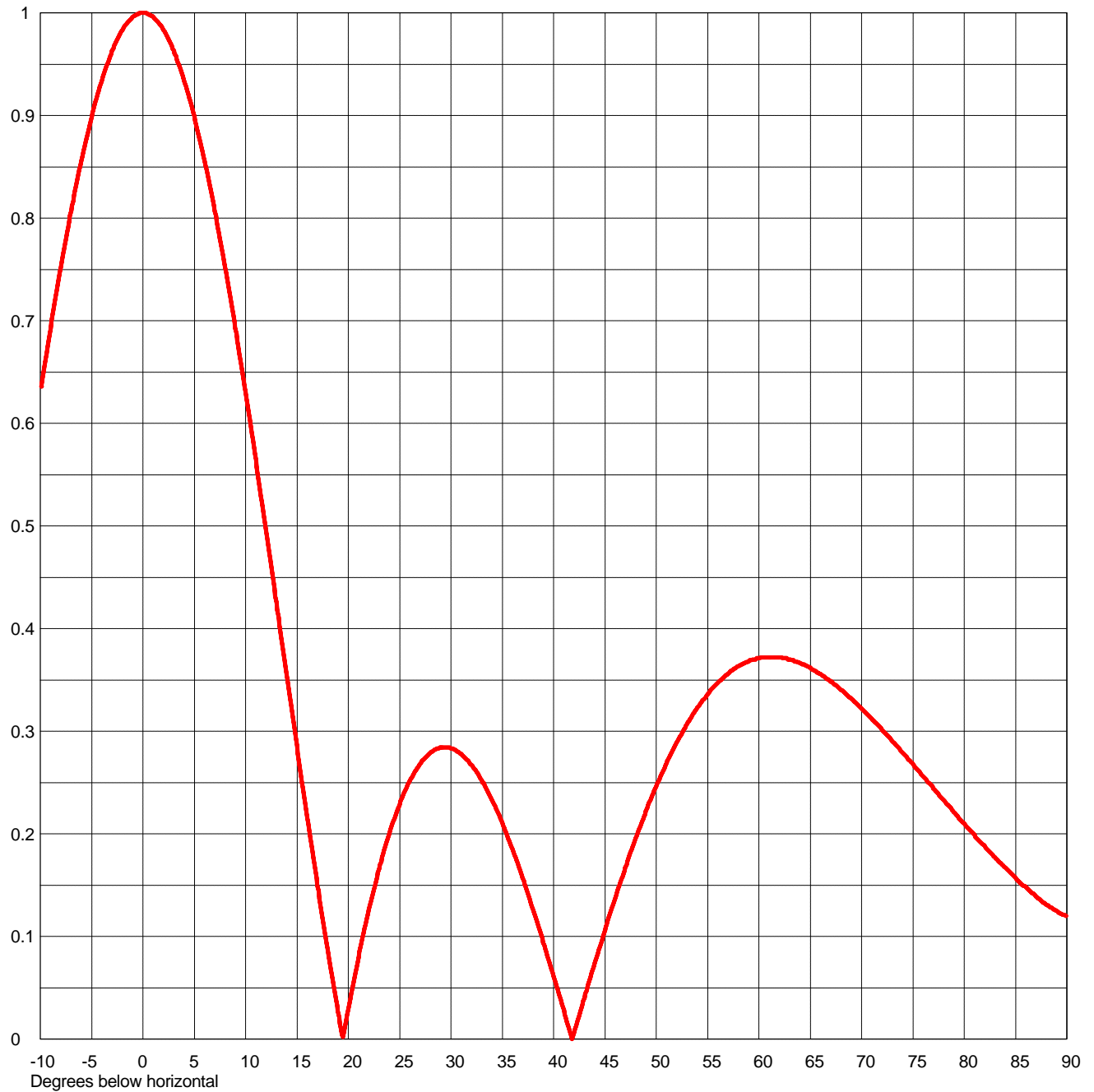
Revision  
Channel

### ELEVATION PATTERN

RMS Gain at Main Lobe  
RMS Gain at Horizontal  
Calculated / Measured

**3.0 (4.77 dB)**  
**3.0 (4.77 dB)**  
**Calculated**

Beam Tilt **0.00 Degrees**  
Frequency **MHz**  
Drawing # **3FH030000-90**



Remarks:



Proposal Number

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**09 Dec 2003**

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Antenna Type

**BFH-3B**

## TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #

**3FH030000-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.630	2.4	0.976	10.6	0.590	30.5	0.281	51.0	0.269	71.5	0.307
-9.5	0.662	2.6	0.972	10.8	0.577	31.0	0.278	51.5	0.279	72.0	0.301
-9.0	0.693	2.8	0.968	11.0	0.564	31.5	0.273	52.0	0.289	72.5	0.296
-8.5	0.723	3.0	0.963	11.5	0.529	32.0	0.267	52.5	0.298	73.0	0.290
-8.0	0.752	3.2	0.958	12.0	0.495	32.5	0.260	53.0	0.307	73.5	0.285
-7.5	0.780	3.4	0.952	12.5	0.460	33.0	0.252	53.5	0.315	74.0	0.279
-7.0	0.807	3.6	0.947	13.0	0.425	33.5	0.243	54.0	0.323	74.5	0.273
-6.5	0.832	3.8	0.941	13.5	0.390	34.0	0.233	54.5	0.330	75.0	0.268
-6.0	0.856	4.0	0.934	14.0	0.355	34.5	0.222	55.0	0.336	75.5	0.262
-5.5	0.878	4.2	0.928	14.5	0.320	35.0	0.210	55.5	0.342	76.0	0.256
-5.0	0.899	4.4	0.921	15.0	0.285	35.5	0.198	56.0	0.347	76.5	0.250
-4.5	0.917	4.6	0.914	15.5	0.250	36.0	0.185	56.5	0.352	77.0	0.244
-4.0	0.934	4.8	0.906	16.0	0.216	36.5	0.171	57.0	0.356	77.5	0.239
-3.5	0.950	5.0	0.899	16.5	0.183	37.0	0.157	57.5	0.360	78.0	0.233
-3.0	0.963	5.2	0.891	17.0	0.150	37.5	0.142	58.0	0.363	78.5	0.227
-2.8	0.968	5.4	0.882	17.5	0.118	38.0	0.126	58.5	0.366	79.0	0.221
-2.6	0.972	5.6	0.874	18.0	0.087	38.5	0.110	59.0	0.368	79.5	0.215
-2.4	0.976	5.8	0.865	18.5	0.056	39.0	0.094	59.5	0.370	80.0	0.210
-2.2	0.980	6.0	0.856	19.0	0.027	39.5	0.078	60.0	0.371	80.5	0.204
-2.0	0.983	6.2	0.847	19.5	0.002	40.0	0.061	60.5	0.372	81.0	0.199
-1.8	0.987	6.4	0.837	20.0	0.029	40.5	0.044	61.0	0.372	81.5	0.193
-1.6	0.989	6.6	0.827	20.5	0.055	41.0	0.028	61.5	0.372	82.0	0.188
-1.4	0.992	6.8	0.817	21.0	0.080	41.5	0.011	62.0	0.372	82.5	0.182
-1.2	0.994	7.0	0.807	21.5	0.103	42.0	0.006	62.5	0.371	83.0	0.177
-1.0	0.996	7.2	0.797	22.0	0.126	42.5	0.023	63.0	0.370	83.5	0.172
-0.8	0.997	7.4	0.786	22.5	0.146	43.0	0.040	63.5	0.368	84.0	0.167
-0.6	0.998	7.6	0.775	23.0	0.166	43.5	0.057	64.0	0.366	84.5	0.162
-0.4	0.999	7.8	0.764	23.5	0.184	44.0	0.074	64.5	0.364	85.0	0.157
-0.2	1.000	8.0	0.752	24.0	0.200	44.5	0.090	65.0	0.362	85.5	0.152
0.0	1.000	8.2	0.741	24.5	0.215	45.0	0.106	65.5	0.359	86.0	0.148
0.2	1.000	8.4	0.729	25.0	0.229	45.5	0.122	66.0	0.356	86.5	0.143
0.4	0.999	8.6	0.717	25.5	0.241	46.0	0.137	66.5	0.352	87.0	0.139
0.6	0.998	8.8	0.705	26.0	0.252	46.5	0.153	67.0	0.348	87.5	0.135
0.8	0.997	9.0	0.693	26.5	0.261	47.0	0.167	67.5	0.345	88.0	0.131
1.0	0.996	9.2	0.681	27.0	0.268	47.5	0.182	68.0	0.340	88.5	0.128
1.2	0.994	9.4	0.668	27.5	0.274	48.0	0.196	68.5	0.336	89.0	0.125
1.4	0.992	9.6	0.656	28.0	0.279	48.5	0.209	69.0	0.332	89.5	0.122
1.6	0.989	9.8	0.643	28.5	0.282	49.0	0.222	69.5	0.327	90.0	0.120
1.8	0.987	10.0	0.630	29.0	0.284	49.5	0.234	70.0	0.322		
2.0	0.983	10.2	0.617	29.5	0.284	50.0	0.246	70.5	0.317		
2.2	0.980	10.4	0.604	30.0	0.283	50.5	0.258	71.0	0.312		

Remarks: