

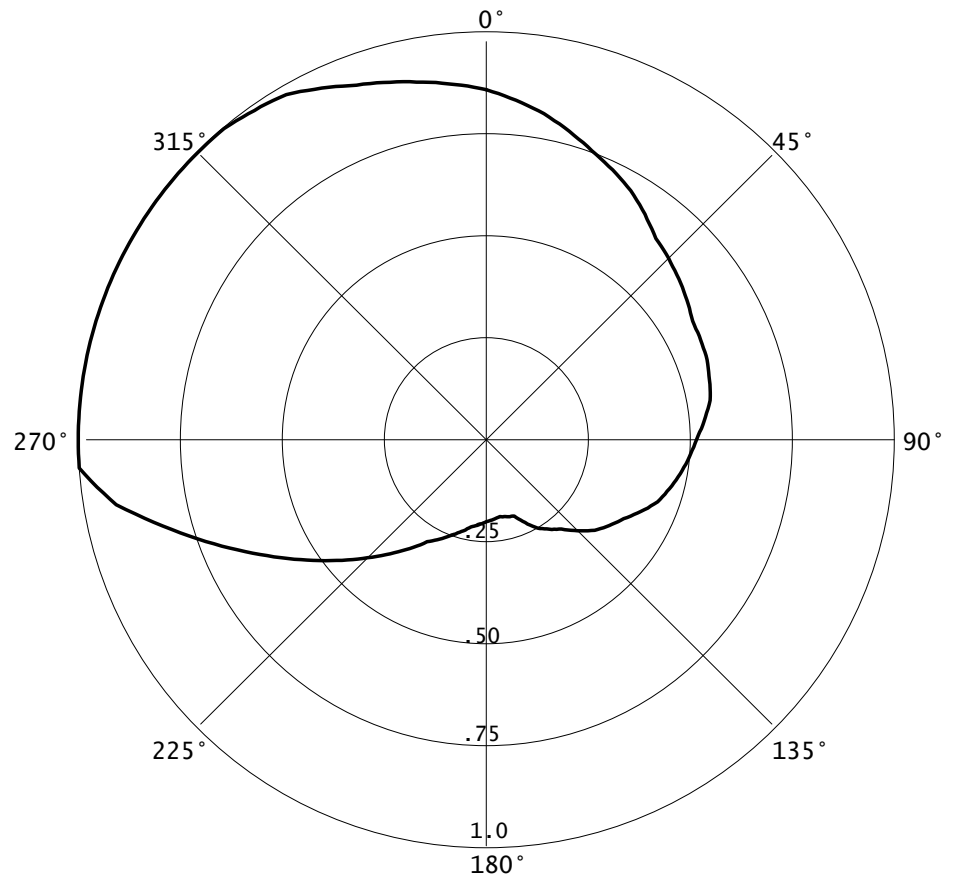
WWPJ

11-29-2016

RMS(V)= .674

Graph is Relative Field

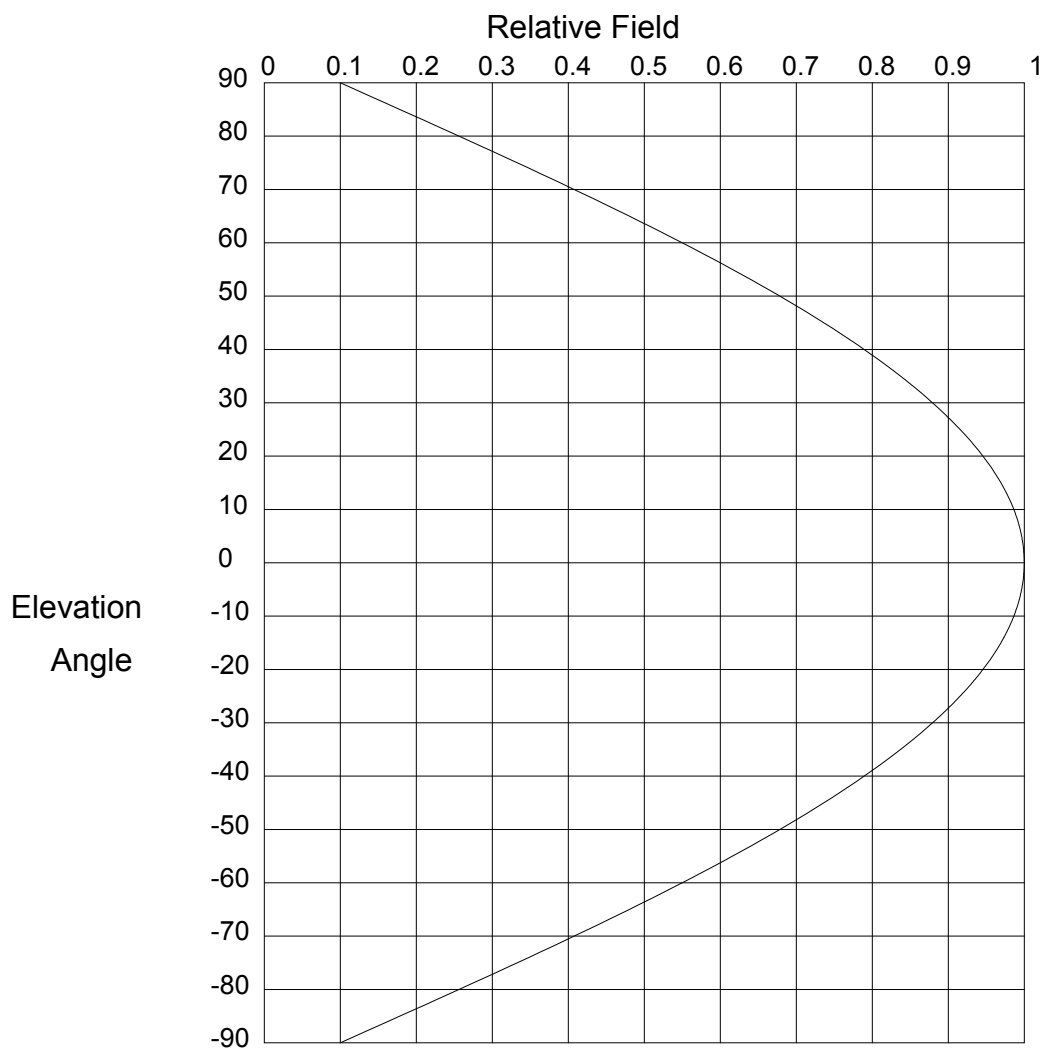
Azi	Field	dBk	kw
000	0.862	-07.768	0.167
010	0.815	-08.255	0.149
020	0.757	-08.896	0.129
030	0.708	-09.478	0.113
040	0.647	-10.260	0.094
050	0.616	-10.687	0.085
060	0.584	-11.150	0.077
070	0.576	-11.270	0.075
080	0.557	-11.561	0.070
090	0.515	-12.242	0.060
100	0.483	-12.799	0.052
110	0.447	-13.472	0.045
120	0.389	-14.679	0.034
130	0.347	-15.672	0.027
140	0.287	-17.321	0.019
150	0.251	-18.485	0.014
160	0.200	-20.458	0.009
170	0.192	-20.812	0.008
180	0.202	-20.371	0.009
190	0.218	-19.709	0.011
200	0.250	-18.519	0.014
210	0.290	-17.230	0.019
220	0.367	-15.185	0.030
230	0.462	-13.185	0.048
240	0.581	-11.195	0.076
250	0.732	-09.188	0.121
260	0.921	-07.193	0.191
270	1.000	-06.478	0.225
280	1.000	-06.478	0.225
290	1.000	-06.478	0.225
300	1.000	-06.478	0.225
310	1.000	-06.478	0.225
320	1.000	-06.478	0.225
330	0.981	-06.645	0.217
340	0.929	-07.118	0.194
350	0.894	-07.451	0.180



## **Directional Antenna**

The proposed custom directional antenna pattern meets the Commission's rules in that the radio frequency emission does not change more than two dB for each ten degrees of azimuthal variation. Also, the maximum pattern attenuation in the deepest null is less than 15 dB. A graph and tables of the field values in the vertical plane is also included. The horizontal plane is omni-directional.

The proposed antenna will be mounted on a pole at the top of the tower according to the specifications by the antenna manufacturer in accordance with the instructions provided. The antenna will not be mounted on the top of a tower that includes a top mounted platform larger than the nominal cross-sectional area of the tower in the horizontal plane. No other antennas of any type will be mounted at the same tower level as the directional antenna nor within the horizontal or vertical distance specified by the manufacturer as being necessary to maintain proper directional operation. The antenna will be designed and tested by a major manufacturer of broadcast antennas known to the Commission. The pattern will be achieved through traditional methods including power-splitting, resonators and phasing.



## Elevation Pattern

Scale: Linear

Units: Field, Relative

## Systems With Reliability

CLIENT: *WWPJ*

Date: 11/9/2016

ANTENNA TYPE: FMEE/2 1-1-0-DA

FREQUENCY: 89.5 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 0.883/-0.539 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 0.883/-0.539 dBd

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	.10 (-20)	52.0	.654 (-3.687)	14.0	.973 (-0.235 )
89.0	.116 (-18.733)	51.0	.666 (-3.525)	13.0	.977 (-0.203 )
88.0	.131 (-17.627)	50.0	.679 (-3.369)	12.0	.98 (-0.173 )
87.0	.147 (-16.648)	49.0	.69 (-3.217)	11.0	.983 (-0.145 )
86.0	.163 (-15.768)	48.0	.702 (-3.071)	10.0	.986 (-0.12 )
85.0	.178 (-14.97)	47.0	.714 (-2.928)	9.8	.987 (-0.115 )
84.0	.194 (-14.241)	46.0	.725 (-2.791)	9.6	.987 (-0.11 )
83.0	.21 (-13.569)	45.0	.736 (-2.658)	9.4	.988 (-0.106 )
82.0	.225 (-12.946)	44.0	.747 (-2.529)	9.2	.988 (-0.101 )
81.0	.241 (-12.367)	43.0	.758 (-2.404)	9.0	.989 (-0.097 )
80.0	.256 (-11.826)	42.0	.769 (-2.283)	8.8	.989 (-0.093 )
79.0	.272 (-11.317)	41.0	.779 (-2.167)	8.6	.99 (-0.088 )
78.0	.287 (-10.839)	40.0	.789 (-2.054)	8.4	.99 (-0.084 )
77.0	.302 (-10.387)	39.0	.799 (-1.944)	8.2	.991 (-0.08 )
76.0	.318 (-9.959)	38.0	.809 (-1.839)	8.0	.991 (-0.076 )
75.0	.333 (-9.553)	37.0	.819 (-1.737)	7.8	.992 (-0.073 )
74.0	.348 (-9.167)	36.0	.828 (-1.638)	7.6	.992 (-0.069 )
73.0	.363 (-8.799)	35.0	.837 (-1.543)	7.4	.993 (-0.065 )
72.0	.378 (-8.448)	34.0	.846 (-1.451)	7.2	.993 (-0.062 )
71.0	.393 (-8.112)	33.0	.855 (-1.363)	7.0	.993 (-0.058 )
70.0	.408 (-7.791)	32.0	.863 (-1.277)	6.8	.994 (-0.055 )
69.0	.423 (-7.483)	31.0	.871 (-1.195)	6.6	.994 (-0.052 )
68.0	.437 (-7.187)	30.0	.879 (-1.116)	6.4	.994 (-0.049 )
67.0	.452 (-6.904)	29.0	.887 (-1.04)	6.2	.995 (-0.046 )
66.0	.466 (-6.631)	28.0	.895 (-0.967)	6.0	.995 (-0.043 )
65.0	.48 (-6.369)	27.0	.902 (-0.897)	5.8	.995 (-0.04 )
64.0	.495 (-6.116)	26.0	.909 (-0.83)	5.6	.996 (-0.037 )
63.0	.509 (-5.873)	25.0	.916 (-0.765)	5.4	.996 (-0.035 )
62.0	.523 (-5.638)	24.0	.922 (-0.704)	5.2	.996 (-0.032 )
61.0	.536 (-5.411)	23.0	.928 (-0.645)	5.0	.997 (-0.03 )
60.0	.55 (-5.193)	22.0	.934 (-0.589)	4.8	.997 (-0.027 )
59.0	.564 (-4.982)	21.0	.94 (-0.535)	4.6	.997 (-0.025 )
58.0	.577 (-4.778)	20.0	.946 (-0.485)	4.4	.997 (-0.023 )
57.0	.59 (-4.58)	19.0	.951 (-0.437)	4.2	.998 (-0.021 )
56.0	.603 (-4.39)	18.0	.956 (-0.391)	4.0	.998 (-0.019 )
55.0	.616 (-4.205)	17.0	.961 (-0.348)	3.8	.998 (-0.017 )
54.0	.629 (-4.027)	16.0	.965 (-0.308)	3.6	.998 (-0.015 )
53.0	.642 (-3.854)	15.0	.969 (-0.271)	3.4	.998 (-0.014 )

## Systems With Reliability

Page 1 of 3

CLIENT: *WWPJ*

Date: 11/9/2016

ANTENNA TYPE: FMEE/2 1-1-0-DA

FREQUENCY: 89.5 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 0.883/-0.539 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 0.883/-0.539 dBd

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	.999 (-0.012)	-4.4	.997 (-0.023)	-12.0	.98 (-0.173 )
3.0	.999 (-0.011)	-4.6	.997 (-0.025)	-12.2	.98 (-0.178 )
2.8	.999 (-0.009)	-4.8	.997 (-0.027)	-12.4	.979 (-0.184 )
2.6	.999 (-0.008)	-5.0	.997 (-0.03)	-12.6	.978 (-0.19 )
2.4	.999 (-0.007)	-5.2	.996 (-0.032)	-12.8	.978 (-0.196 )
2.2	.999 (-0.006)	-5.4	.996 (-0.035)	-13.0	.977 (-0.203 )
2.0	.999 (-0.005)	-5.6	.996 (-0.037)	-13.2	.976 (-0.209 )
1.8	1.00 (-0.004)	-5.8	.995 (-0.04)	-13.4	.975 (-0.215 )
1.6	1.00 (-0.003)	-6.0	.995 (-0.043)	-13.6	.975 (-0.222 )
1.4	1.00 (-0.002)	-6.2	.995 (-0.046)	-13.8	.974 (-0.229 )
1.2	1.00 (-0.002)	-6.4	.994 (-0.049)	-14.0	.973 (-0.235 )
1.0	1.00 (-0.001)	-6.6	.994 (-0.052)	-14.2	.973 (-0.242 )
.8	1.00 (-0.001)	-6.8	.994 (-0.055)	-14.4	.972 (-0.249 )
.6	1.00 (0)	-7.0	.993 (-0.058)	-14.6	.971 (-0.256 )
.4	1.00 (0)	-7.2	.993 (-0.062)	-14.8	.97 (-0.263 )
.2	1.00 (0)	-7.4	.993 (-0.065)	-15.0	.969 (-0.271 )
.0	1.00 (0)	-7.6	.992 (-0.069)	-15.2	.969 (-0.278 )
-.2	1.00 (0)	-7.8	.992 (-0.073)	-15.4	.968 (-0.285 )
-.4	1.00 (0)	-8.0	.991 (-0.076)	-15.6	.967 (-0.293 )
-.6	1.00 (0)	-8.2	.991 (-0.08)	-15.8	.966 (-0.3 )
-.8	1.00 (-0.001)	-8.4	.99 (-0.084)	-16.0	.965 (-0.308 )
-1.0	1.00 (-0.001)	-8.6	.99 (-0.088)	-16.2	.964 (-0.316 )
-1.2	1.00 (-0.002)	-8.8	.989 (-0.093)	-16.4	.963 (-0.324 )
-1.4	1.00 (-0.002)	-9.0	.989 (-0.097)	-16.6	.962 (-0.332 )
-1.6	1.00 (-0.003)	-9.2	.988 (-0.101)	-16.8	.962 (-0.34 )
-1.8	1.00 (-0.004)	-9.4	.988 (-0.106)	-17.0	.961 (-0.348 )
-2.0	.999 (-0.005)	-9.6	.987 (-0.11)	-17.2	.96 (-0.357 )
-2.2	.999 (-0.006)	-9.8	.987 (-0.115)	-17.4	.959 (-0.365 )
-2.4	.999 (-0.007)	-10.0	.986 (-0.12)	-17.6	.958 (-0.374 )
-2.6	.999 (-0.008)	-10.2	.986 (-0.124)	-17.8	.957 (-0.383 )
-2.8	.999 (-0.009)	-10.4	.985 (-0.129)	-18.0	.956 (-0.391 )
-3.0	.999 (-0.011)	-10.6	.985 (-0.134)	-18.2	.955 (-0.4 )
-3.2	.999 (-0.012)	-10.8	.984 (-0.14)	-18.4	.954 (-0.409 )
-3.4	.998 (-0.014)	-11.0	.983 (-0.145)	-18.6	.953 (-0.418 )
-3.6	.998 (-0.015)	-11.2	.983 (-0.15)	-18.8	.952 (-0.427 )
-3.8	.998 (-0.017)	-11.4	.982 (-0.156)	-19.0	.951 (-0.437 )
-4.0	.998 (-0.019)	-11.6	.982 (-0.161)	-19.2	.95 (-0.446 )
-4.2	.998 (-0.021)	-11.8	.981 (-0.167)	-19.4	.949 (-0.456 )

## Systems With Reliability

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Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 0.883/-0.539 dBd

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	.948 (-0.465)	-27.2	.90 (-0.911)	-54.0	.629 (-4.027 )
-19.8	.947 (-0.475)	-27.4	.899 (-0.924)	-55.0	.616 (-4.205 )
-20.0	.946 (-0.485)	-27.6	.898 (-0.939)	-56.0	.603 (-4.39 )
-20.2	.945 (-0.495)	-27.8	.896 (-0.953)	-57.0	.59 (-4.58 )
-20.4	.944 (-0.505)	-28.0	.895 (-0.967)	-58.0	.577 (-4.778 )
-20.6	.942 (-0.515)	-28.2	.893 (-0.981)	-59.0	.564 (-4.982 )
-20.8	.941 (-0.525)	-28.4	.892 (-0.996)	-60.0	.55 (-5.193 )
-21.0	.94 (-0.535)	-28.6	.89 (-1.01)	-61.0	.536 (-5.411 )
-21.2	.939 (-0.546)	-28.8	.889 (-1.025)	-62.0	.523 (-5.638 )
-21.4	.938 (-0.556)	-29.0	.887 (-1.04)	-63.0	.509 (-5.873 )
-21.6	.937 (-0.567)	-29.2	.886 (-1.055)	-64.0	.495 (-6.116 )
-21.8	.936 (-0.578)	-29.4	.884 (-1.07)	-65.0	.48 (-6.369 )
-22.0	.934 (-0.589)	-29.6	.883 (-1.085)	-66.0	.466 (-6.631 )
-22.2	.933 (-0.6)	-29.8	.881 (-1.101)	-67.0	.452 (-6.904 )
-22.4	.932 (-0.611)	-30.0	.879 (-1.116)	-68.0	.437 (-7.187 )
-22.6	.931 (-0.622)	-31.0	.871 (-1.195)	-69.0	.423 (-7.483 )
-22.8	.93 (-0.633)	-32.0	.863 (-1.277)	-70.0	.408 (-7.791 )
-23.0	.928 (-0.645)	-33.0	.855 (-1.363)	-71.0	.393 (-8.112 )
-23.2	.927 (-0.656)	-34.0	.846 (-1.451)	-72.0	.378 (-8.448 )
-23.4	.926 (-0.668)	-35.0	.837 (-1.543)	-73.0	.363 (-8.799 )
-23.6	.925 (-0.68)	-36.0	.828 (-1.638)	-74.0	.348 (-9.167 )
-23.8	.923 (-0.692)	-37.0	.819 (-1.737)	-75.0	.333 (-9.553 )
-24.0	.922 (-0.704)	-38.0	.809 (-1.839)	-76.0	.318 (-9.959 )
-24.2	.921 (-0.716)	-39.0	.799 (-1.944)	-77.0	.302 (-10.387 )
-24.4	.92 (-0.728)	-40.0	.789 (-2.054)	-78.0	.287 (-10.839 )
-24.6	.918 (-0.74)	-41.0	.779 (-2.167)	-79.0	.272 (-11.317 )
-24.8	.917 (-0.753)	-42.0	.769 (-2.283)	-80.0	.256 (-11.826 )
-25.0	.916 (-0.765)	-43.0	.758 (-2.404)	-81.0	.241 (-12.367 )
-25.2	.914 (-0.778)	-44.0	.747 (-2.529)	-82.0	.225 (-12.946 )
-25.4	.913 (-0.791)	-45.0	.736 (-2.658)	-83.0	.21 (-13.569 )
-25.6	.912 (-0.803)	-46.0	.725 (-2.791)	-84.0	.194 (-14.241 )
-25.8	.91 (-0.816)	-47.0	.714 (-2.928)	-85.0	.178 (-14.97 )
-26.0	.909 (-0.83)	-48.0	.702 (-3.071)	-86.0	.163 (-15.768 )
-26.2	.908 (-0.843)	-49.0	.69 (-3.217)	-87.0	.147 (-16.648 )
-26.4	.906 (-0.856)	-50.0	.679 (-3.369)	-88.0	.131 (-17.627 )
-26.6	.905 (-0.87)	-51.0	.666 (-3.525)	-89.0	.116 (-18.733 )
-26.8	.903 (-0.883)	-52.0	.654 (-3.687)	-90.0	.10 (-20 )
-27.0	.902 (-0.897)	-53.0	.642 (-3.854)	90.0	.00 (-50 )

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Page 3 of 3

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