

Waiver Request – Second Adjacent Channels

Channel Specification for Waiver

COORDINATES 47 12 08.2 N 122 22 14.9 W
TOTAL TOWER HEIGHT 45.7 Meters
ANTENNA ABOVE GROUND 40 Meters
 AMSL 156 Meters
 HAAT 70 Meters
 Watts .018 kW
 Channel Number 237

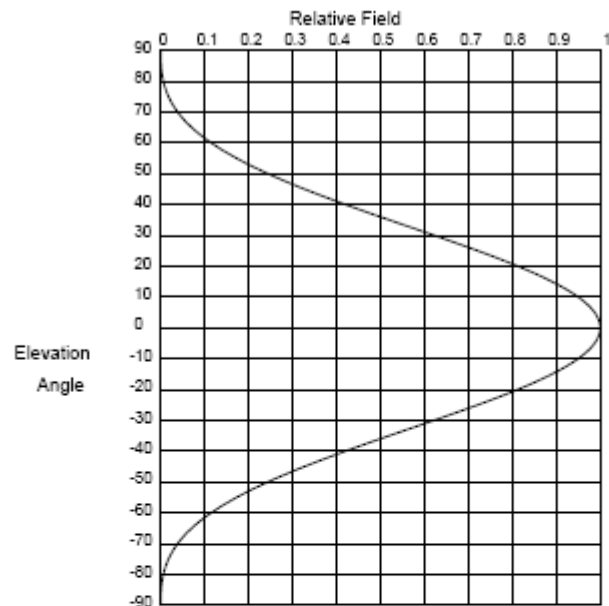
SECOND ADJACENT PROTECTION/WAIVER REQUEST

Station is short spaced regarding second adjacents concerning KUOW-FM Seattle and KJR-FM, which at the proposed site have field strengths of 67.9 dBu and 75.9 dBu respectively. We will use the 67.9 dBu value as to show the maximum interference area at the site as the smaller interference area.

Contour protection to second adjacent station KUOW-FM is provided using the ratio method. Using the appropriate U/D ratio of 40 db, the corresponding interfering contour of the proposed facility is thus 107.9 dBu. At 18 watts, this contour would extend to a distance of 119.7 meters from the antenna. However, the field strength of the proposed translator's antenna system falls quickly at depression angles below the horizon. Using elevation pattern data provided by SWR (see below) the distance to the 107.9 dBu contour at various depression angles is tabulated below. The data shows that the lowest point at which the signal strength rises to 107.9 dBu is 37.1 meters below the center of radiation of the antenna system, or 2.9 meters above the ground. Therefore, this is sufficient clearance, and the interference area encompasses zero population. The table below show that the lowest elevation point of the 107.9 dBu F(50,10) interfering contour is 2.9 meters above the ground.

Thus, the applicant requests second adjacent waiver based upon evidence no interference is proposed.

MAX ERP	DEPRESSION ANGLE BELOW HORIZON	RELATIVE FIELD	dB FROM RELATIVE	ERP	ANGULAR DISTANCE TO 107.9 dBu CONTOUR	VERTICAL DISTANCE (below antenna)	HORIZONTAL DISTANCE TO 107.9 dBu CONTOUR	CLEARANCE OF CONTOUR ABOVE GROUND
18	0	1	0.000	18.00	119.7	0	119.7	40
18	5	0.987	-0.114	17.54	118.2	10.2	117.7	29.8
18	10	0.95	-0.446	16.25	113.7	19.7	111.9	20.3
18	15	0.89	-1.012	14.26	106.5	27.5	102.8	12.5
18	20	0.812	-1.809	11.87	97.2	33.2	91.3	6.8
18	25	0.721	-2.841	9.36	86.3	36.4	78.2	3.6
18	30	0.622	-4.124	6.96	74.4	37.1	64.4	2.9
18	35	0.52	-5.680	4.87	62.2	35.6	50.9	4.4
18	40	0.42	-7.535	3.18	50.3	32.3	38.5	7.7
18	45	0.327	-9.709	1.92	39.1	27.6	27.6	12.4
18	50	0.244	-12.252	1.07	29.2	22.3	18.7	17.7
18	55	0.173	-15.239	0.54	20.7	16.9	11.8	23.1
18	60	0.115	-18.786	0.24	13.7	11.8	6.8	28.2
18	65	0.07	-23.098	0.09	8.3	7.5	3.5	32.5
18	70	0.039	-28.179	0.03	4.6	4.3	1.5	35.7
18	75	0.018	-34.895	0.01	2.1	2	0.5	38
18	80	0.006	-44.437	0.00	0.7	0.6	0.1	39.4
18	85	0.001	-60.000	0.00	0.1	0	0	40
18	90	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!



Elevation Pattern

Scale: Linear

Units: Field, Relative

Systems With Reliability LLC

CLIENT: Various / Date: 8/16/2013
 ANTENNA TYPE: FMECR/2-HWS
 FREQUENCY: 97.9
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 1.39/1.43 dBd Beam Tilt (Deg.): 0
 DIRECTIVITY(Horiz): 1.39/1.43 dBd Null Fill(s)(%): 0, 0, 0

Micro-Tek Eng. Ver. 2.5

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
90.0	.00 (-50)	52.0	.214 (-13.4)	14.0	.904 (-0.878)
89.0	.00 (-51.156)	51.0	.229 (-12.821)	13.0	.917 (-0.757)
88.0	.00 (-78.01)	50.0	.244 (-12.26)	12.0	.929 (-0.644)
87.0	.00 (-69.988)	49.0	.259 (-11.717)	11.0	.94 (-0.541)
86.0	.001 (-64.112)	48.0	.276 (-11.191)	10.0	.95 (-0.447)
85.0	.001 (-59.44)	47.0	.292 (-10.682)	9.9	.952 (-0.429)
84.0	.002 (-55.546)	46.0	.309 (-10.188)	9.8	.954 (-0.412)
83.0	.002 (-52.199)	45.0	.327 (-9.711)	9.7	.956 (-0.395)
82.0	.003 (-49.26)	44.0	.345 (-9.246)	9.6	.957 (-0.378)
81.0	.005 (-46.639)	43.0	.363 (-8.797)	9.5	.959 (-0.362)
80.0	.006 (-44.272)	42.0	.382 (-8.362)	9.4	.961 (-0.346)
79.0	.008 (-42.113)	41.0	.401 (-7.941)	9.3	.963 (-0.33)
78.0	.01 (-40.128)	40.0	.42 (-7.533)	9.2	.964 (-0.315)
77.0	.012 (-38.292)	39.0	.44 (-7.138)	9.1	.966 (-0.3)
76.0	.015 (-36.583)	38.0	.459 (-6.758)	9.0	.968 (-0.286)
75.0	.018 (-34.986)	37.0	.479 (-6.387)	8.9	.969 (-0.272)
74.0	.021 (-33.487)	36.0	.50 (-6.029)	8.8	.971 (-0.258)
73.0	.025 (-32.074)	35.0	.52 (-5.683)	8.7	.972 (-0.244)
72.0	.029 (-30.74)	34.0	.54 (-5.349)	8.6	.974 (-0.231)
71.0	.034 (-29.475)	33.0	.561 (-5.027)	8.5	.975 (-0.219)
70.0	.039 (-28.274)	32.0	.581 (-4.716)	8.4	.977 (-0.206)
69.0	.044 (-27.13)	31.0	.601 (-4.416)	8.3	.978 (-0.194)
68.0	.05 (-26.039)	30.0	.622 (-4.126)	8.2	.979 (-0.183)
67.0	.056 (-24.997)	29.0	.642 (-3.848)	8.1	.98 (-0.171)
66.0	.063 (-24)	28.0	.662 (-3.581)	8.0	.982 (-0.161)
65.0	.07 (-23.044)	27.0	.682 (-3.323)	7.9	.983 (-0.15)
64.0	.078 (-22.126)	26.0	.702 (-3.076)	7.8	.984 (-0.14)
63.0	.087 (-21.245)	25.0	.721 (-2.839)	7.7	.985 (-0.13)
62.0	.096 (-20.397)	24.0	.74 (-2.612)	7.6	.986 (-0.121)
61.0	.105 (-19.581)	23.0	.759 (-2.395)	7.5	.987 (-0.111)
60.0	.115 (-18.794)	22.0	.777 (-2.188)	7.4	.988 (-0.103)
59.0	.125 (-18.036)	21.0	.795 (-1.991)	7.3	.989 (-0.094)
58.0	.136 (-17.304)	20.0	.812 (-1.804)	7.2	.99 (-0.086)
57.0	.148 (-16.597)	19.0	.829 (-1.626)	7.1	.991 (-0.079)
56.0	.16 (-15.914)	18.0	.846 (-1.457)	7.0	.992 (-0.071)
55.0	.173 (-15.254)	17.0	.861 (-1.299)	6.9	.993 (-0.064)
54.0	.186 (-14.615)	16.0	.876 (-1.149)	6.8	.993 (-0.058)
53.0	.20 (-13.998)	15.0	.89 (-1.009)	6.7	.994 (-0.052)

Systems With Reliability LLC

Page 1 of 3

CLIENT: Various / Date: 8/16/2013
 ANTENNA TYPE: FMECR/2-HWS
 FREQUENCY: 97.9
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 1.39/1.43 dBd Beam Tilt (Deg.): 0
 DIRECTIVITY(Horiz): 1.39/1.43 dBd Null Fill(s)(%): 0, 0, 0

Micro-Tek Eng. Ver. 2.5

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
3.2	.995 (-0.046)	-4.4	.99 (-0.095)	-12.0	.929 (-0.644)
3.0	.995 (-0.04)	-4.6	.989 (-0.094)	-12.2	.926 (-0.666)
2.8	.995 (-0.035)	-4.8	.988 (-0.103)	-12.4	.924 (-0.688)
2.6	.997 (-0.03)	-5.0	.987 (-0.111)	-12.6	.921 (-0.711)
2.4	.997 (-0.025)	-5.2	.986 (-0.121)	-12.8	.919 (-0.733)
2.2	.998 (-0.022)	-5.4	.985 (-0.13)	-13.0	.917 (-0.757)
2.0	.998 (-0.018)	-5.6	.984 (-0.14)	-13.2	.914 (-0.78)
1.8	.998 (-0.014)	-5.8	.983 (-0.15)	-13.4	.912 (-0.804)
1.6	.999 (-0.011)	-6.0	.982 (-0.161)	-13.6	.909 (-0.828)
1.4	.999 (-0.009)	-6.2	.98 (-0.171)	-13.8	.906 (-0.853)
1.2	.999 (-0.006)	-6.4	.979 (-0.183)	-14.0	.904 (-0.878)
1.0	.999 (-0.004)	-6.6	.978 (-0.194)	-14.2	.901 (-0.904)
.8	1.00 (-0.003)	-6.8	.977 (-0.206)	-14.4	.899 (-0.929)
.6	1.00 (-0.002)	-7.0	.975 (-0.219)	-14.6	.896 (-0.956)
.4	1.00 (-0.001)	-7.2	.974 (-0.231)	-14.8	.893 (-0.982)
.2	1.00 (0)	-7.4	.972 (-0.244)	-15.0	.89 (-1.009)
.0	1.00 (0)	-7.6	.971 (-0.258)	-15.2	.888 (-1.036)
-.2	1.00 (0)	-7.8	.969 (-0.272)	-15.4	.885 (-1.064)
-.4	1.00 (-0.001)	-8.0	.968 (-0.286)	-15.6	.882 (-1.092)
-.6	1.00 (-0.003)	-8.2	.966 (-0.3)	-15.8	.879 (-1.12)
-.8	1.00 (-0.003)	-8.4	.964 (-0.315)	-16.0	.876 (-1.149)
-1.0	.999 (-0.004)	-8.6	.963 (-0.33)	-16.2	.873 (-1.178)
-1.2	.999 (-0.005)	-8.8	.961 (-0.346)	-16.4	.871 (-1.208)
-1.4	.999 (-0.009)	-9.0	.959 (-0.362)	-16.6	.867 (-1.238)
-1.6	.999 (-0.011)	-9.2	.957 (-0.378)	-16.8	.864 (-1.268)
-1.8	.998 (-0.014)	-9.4	.955 (-0.395)	-17.0	.861 (-1.299)
-2.0	.998 (-0.018)	-9.6	.954 (-0.412)	-17.2	.858 (-1.33)
-2.2	.998 (-0.022)	-9.8	.952 (-0.429)	-17.4	.855 (-1.361)
-2.4	.997 (-0.026)	-10.0	.95 (-0.447)	-17.6	.852 (-1.393)
-2.6	.997 (-0.03)	-10.2	.948 (-0.465)	-17.8	.849 (-1.425)
-2.8	.996 (-0.035)	-10.4	.946 (-0.483)	-18.0	.846 (-1.457)
-3.0	.995 (-0.04)	-10.6	.944 (-0.502)	-18.2	.842 (-1.49)
-3.2	.995 (-0.046)	-10.8	.942 (-0.521)	-18.4	.839 (-1.524)
-3.4	.994 (-0.052)	-11.0	.94 (-0.541)	-18.6	.836 (-1.557)
-3.6	.993 (-0.058)	-11.2	.937 (-0.561)	-18.8	.833 (-1.591)
-3.8	.993 (-0.064)	-11.4	.935 (-0.581)	-19.0	.829 (-1.626)
-4.0	.992 (-0.071)	-11.6	.933 (-0.602)	-19.2	.826 (-1.661)
-4.2	.991 (-0.079)	-11.8	.931 (-0.623)	-19.4	.823 (-1.696)

Systems With Reliability LLC

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CLIENT: Various /
 ANTENNA TYPE: FMECR/2-HWS
 FREQUENCY: 97.9
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 1.39/1.43 dBd
 DIRECTIVITY(Horiz): 1.39/1.43 dBd
 Beam Tilt (Deg.): 0
 Null Fill(s)(%): 0, 0, 0

Micro-Tek Eng. Ver. 2.5

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
-19.6	.819 (-1.731)	-27.2	.678 (-3.373)	-54.0	.186 (-14.615)
-19.8	.816 (-1.767)	-27.4	.674 (-3.424)	-55.0	.173 (-15.254)
-20.0	.812 (-1.804)	-27.6	.67 (-3.476)	-56.0	.16 (-15.914)
-20.2	.809 (-1.84)	-27.8	.666 (-3.528)	-57.0	.148 (-16.597)
-20.4	.806 (-1.877)	-28.0	.662 (-3.58)	-58.0	.136 (-17.304)
-20.6	.802 (-1.915)	-28.2	.658 (-3.633)	-59.0	.125 (-18.036)
-20.8	.799 (-1.953)	-28.4	.654 (-3.686)	-60.0	.115 (-18.794)
-21.0	.795 (-1.991)	-28.6	.65 (-3.739)	-61.0	.105 (-19.581)
-21.2	.792 (-2.03)	-28.8	.646 (-3.793)	-62.0	.096 (-20.397)
-21.4	.788 (-2.069)	-29.0	.642 (-3.848)	-63.0	.087 (-21.245)
-21.6	.784 (-2.108)	-29.2	.638 (-3.903)	-64.0	.078 (-22.126)
-21.8	.781 (-2.148)	-29.4	.634 (-3.958)	-65.0	.07 (-23.044)
-22.0	.777 (-2.188)	-29.6	.63 (-4.014)	-66.0	.063 (-24)
-22.2	.774 (-2.229)	-29.8	.626 (-4.07)	-67.0	.056 (-24.997)
-22.4	.77 (-2.27)	-30.0	.622 (-4.126)	-68.0	.05 (-26.039)
-22.6	.766 (-2.311)	-31.0	.601 (-4.416)	-69.0	.044 (-27.13)
-22.8	.763 (-2.353)	-32.0	.581 (-4.716)	-70.0	.039 (-28.274)
-23.0	.759 (-2.395)	-33.0	.561 (-5.027)	-71.0	.034 (-29.475)
-23.2	.755 (-2.438)	-34.0	.54 (-5.349)	-72.0	.029 (-30.74)
-23.4	.752 (-2.481)	-35.0	.52 (-5.683)	-73.0	.025 (-32.074)
-23.6	.748 (-2.524)	-36.0	.50 (-6.029)	-74.0	.021 (-33.487)
-23.8	.744 (-2.568)	-37.0	.479 (-6.387)	-75.0	.018 (-34.986)
-24.0	.74 (-2.612)	-38.0	.459 (-6.756)	-76.0	.015 (-36.583)
-24.2	.737 (-2.657)	-39.0	.44 (-7.138)	-77.0	.012 (-38.292)
-24.4	.733 (-2.701)	-40.0	.42 (-7.533)	-78.0	.01 (-40.128)
-24.6	.729 (-2.747)	-41.0	.401 (-7.941)	-79.0	.008 (-42.113)
-24.8	.725 (-2.793)	-42.0	.382 (-8.362)	-80.0	.006 (-44.272)
-25.0	.721 (-2.839)	-43.0	.363 (-8.797)	-81.0	.005 (-46.639)
-25.2	.717 (-2.885)	-44.0	.345 (-9.246)	-82.0	.003 (-49.26)
-25.4	.713 (-2.932)	-45.0	.327 (-9.71)	-83.0	.002 (-52.199)
-25.6	.71 (-2.98)	-46.0	.309 (-10.188)	-84.0	.002 (-55.546)
-25.8	.706 (-3.027)	-47.0	.292 (-10.682)	-85.0	.001 (-59.44)
-26.0	.702 (-3.076)	-48.0	.276 (-11.191)	-86.0	.001 (-64.112)
-26.2	.698 (-3.124)	-49.0	.259 (-11.717)	-87.0	.00 (-69.988)
-26.4	.694 (-3.173)	-50.0	.244 (-12.26)	-88.0	.00 (-76.01)
-26.6	.69 (-3.223)	-51.0	.229 (-12.821)	-89.0	.00 (-91.156)
-26.8	.686 (-3.272)	-52.0	.214 (-13.4)	-90.0	.00 (-50)
-27.0	.682 (-3.323)	-53.0	.20 (-13.998)	90.0	.00 (-50)

Systems With Reliability LLC

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CLIENT: Various /
 ANTENNA TYPE: FMECR/2-HWS
 FREQUENCY: 97.9
 PATTERN POL.: Circular
 DIRECTIVITY(Peak): 1.39/1.43 dBd
 DIRECTIVITY(Horiz): 1.39/1.43 dBd
 Beam Tilt (Deg.): 0
 Null Fill(s)(%): 0, 0, 0

Micro-Tek Eng. Ver. 2.5

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
3.2	.995 (-0.046)	-4.4	.99 (-0.085)	-12.0	.929 (-0.644)
3.0	.995 (-0.04)	-4.6	.989 (-0.094)	-12.2	.925 (-0.656)
2.8	.996 (-0.035)	-4.8	.988 (-0.103)	-12.4	.924 (-0.668)
2.6	.997 (-0.03)	-5.0	.987 (-0.111)	-12.6	.921 (-0.711)
2.4	.997 (-0.026)	-5.2	.986 (-0.121)	-12.8	.919 (-0.733)
2.2	.998 (-0.022)	-5.4	.985 (-0.13)	-13.0	.917 (-0.757)
2.0	.998 (-0.018)	-5.6	.984 (-0.14)	-13.2	.914 (-0.78)
1.8	.998 (-0.014)	-5.8	.983 (-0.15)	-13.4	.912 (-0.804)
1.6	.999 (-0.011)	-6.0	.982 (-0.161)	-13.6	.909 (-0.828)
1.4	.999 (-0.009)	-6.2	.98 (-0.171)	-13.8	.906 (-0.853)
1.2	.999 (-0.006)	-6.4	.979 (-0.183)	-14.0	.904 (-0.878)
1.0	.999 (-0.004)	-6.6	.978 (-0.194)	-14.2	.901 (-0.904)
.8	1.00 (-0.003)	-6.8	.977 (-0.206)	-14.4	.899 (-0.929)
.6	1.00 (-0.002)	-7.0	.975 (-0.219)	-14.6	.896 (-0.956)
.4	1.00 (-0.001)	-7.2	.974 (-0.231)	-14.8	.893 (-0.982)
.2	1.00 (0)	-7.4	.972 (-0.244)	-15.0	.89 (-1.009)
.0	1.00 (0)	-7.6	.971 (-0.258)	-15.2	.888 (-1.036)
-.2	1.00 (0)	-7.8	.969 (-0.272)	-15.4	.885 (-1.064)
-.4	1.00 (-0.001)	-8.0	.968 (-0.286)	-15.6	.882 (-1.092)
-.6	1.00 (-0.002)	-8.2	.966 (-0.3)	-15.8	.879 (-1.12)
-.8	1.00 (-0.003)	-8.4	.964 (-0.315)	-16.0	.876 (-1.149)
-1.0	.999 (-0.004)	-8.6	.963 (-0.33)	-16.2	.873 (-1.176)
-1.2	.999 (-0.006)	-8.8	.961 (-0.346)	-16.4	.87 (-1.205)
-1.4	.999 (-0.009)	-9.0	.959 (-0.362)	-16.6	.867 (-1.238)
-1.6	.999 (-0.011)	-9.2	.957 (-0.378)	-16.8	.864 (-1.268)
-1.8	.998 (-0.014)	-9.4	.956 (-0.395)	-17.0	.861 (-1.299)
-2.0	.998 (-0.018)	-9.6	.954 (-0.412)	-17.2	.858 (-1.33)
-2.2	.998 (-0.022)	-9.8	.952 (-0.429)	-17.4	.855 (-1.361)
-2.4	.997 (-0.026)	-10.0	.95 (-0.447)	-17.6	.852 (-1.393)
-2.6	.997 (-0.03)	-10.2	.948 (-0.465)	-17.8	.849 (-1.425)
-2.8	.996 (-0.035)	-10.4	.946 (-0.483)	-18.0	.846 (-1.457)
-3.0	.995 (-0.04)	-10.6	.944 (-0.502)	-18.2	.842 (-1.49)
-3.2	.995 (-0.046)	-10.8	.942 (-0.521)	-18.4	.839 (-1.524)
-3.4	.994 (-0.052)	-11.0	.94 (-0.541)	-18.6	.836 (-1.557)
-3.6	.993 (-0.058)	-11.2	.937 (-0.561)	-18.8	.833 (-1.591)
-3.8	.993 (-0.064)	-11.4	.935 (-0.581)	-19.0	.829 (-1.626)
-4.0	.992 (-0.071)	-11.6	.933 (-0.602)	-19.2	.826 (-1.661)
-4.2	.991 (-0.079)	-11.8	.931 (-0.623)	-19.4	.823 (-1.696)

Systems With Reliability

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CLIENT: K228EK	Date: 4/28/2012
ANTENNA TYPE: FMEC/2-HWS	
FREQUENCY: 93.5 MHz	
PATTERN POL.: Circular	
DIRECTIVITY(Peak): 1.39/1.43 dBd	Beam Tilt (Deg.): 0
DIRECTIVITY(Horiz): 1.39/1.43 dBd	Null Fill(s)(%): 0, 0, 0