

Engineering Exhibit Facility ID No. : 197583
Minor Change of License BLL-20171116AAX
Minor Change in Transmitter Site

April 2019

This exhibit is in support of a minor change of License BLL-20171116AAX to make a slight change in transmitter site on Channel 256 (99.1 MHz). The site is no longer available due to a sale. No change in power is requested; however, a slight change in location and antenna height is requested.

Spacing Study

Figure 1 is a spacing study from the requested location on channel of 256 demonstrating with respect to all facilities, applications, and allocations this proposal is fully spaced with the exception of the second adjacent channel facility of KSJN for which a continuation of the prior waiver of the second-adjacent channel separation distance is requested as needed.

Second-Adjacent Channel Compliance

KSJN is located 20.06 km from the proposal at 93° True and is a second adjacent-channel station to the channel 256 LPFM facility. Using the well-established Living Way Ministries Methodology, no actual interference to any population is predicted to exist to KSJN. Note that a rule waiver of Section 73.807 for this second adjacent-channel protection using the well-established Living Way Ministries Methodology is respectfully requested if such a rule waiver is deemed necessary for protection to any station.

The F50,50 signal strength from KSJN at the proposed LPFM transmitter site is greater than 88.6 dBu (the “desired” signal for KSJN). The second/third adjacent-channel protection is an undesired to desired (“U/D”) dB signal strength ratio of 40:1. Therefore, predicted interference to KSJN is a signal of greater than or equal to 128.6 dBu.

The 128.6 dBu signal based on a free space field determination is predicted to extend out to 26 meters from the proposed LPFM transmit antenna (using the maximum allowed ERP of 100 watts for the LPFM). However, utilizing the vertical pattern for the proposed antenna, Nicom BLD1/BKG1 vertical polarized antenna, the interfering signal level will not reach any point at ground level or at 2 meters above ground level. **See Exhibit 2.**

Therefore KSJN is adequately protected by the proposed facility on channel 256.

Figure 1 - Spacing Table

Callsign	Latitude	Longitude	City	State	Srv	Channel	Cls	Stat	Min	Clearance	ERP	HAAT	Adjacency	Distance	Bearing	Service	Fac. ID
KSJN	N45:03:30	W093:07:27	MINNEAPOLIS	MN	FM	258 : 99.5 MHz	C	LIC	93	-72.9393	100	315	2nd Adj	20.06075	93 FM		42911
KTIS-FM	N45:03:30	W093:07:27	MINNEAPOLIS	MN	FM	253 : 98.5 MHz	C0	LIC	84	-63.9393	100	315	3rd Adj	20.06075	93 FM		49787
KPJT-LP	N45:05:19	W093:25:57	MAPLE GROVE	MN	FM	256 : 99.1 MHz	L1	LIC	24	-19.09	0	24.9	Primary	4.909953	300 FL		197583
KRSM-LP	N44:56:55	W093:16:12	MINNEAPOLIS	MN	FM	255 : 98.9 MHz	L1	LIC	14	1.640612	0	28.1	1st Adj	15.64061	147 FL		196844
WVIC-LP	N44:58:02	W093:02:45	SAINT PAUL	MN	FM	256 : 99.1 MHz	L1	LIC	24	4.452299	0	0	Primary	28.4523	113 FL		196635
KBEM-FM	N44:59:54	W093:11:18	MINNEAPOLIS	MN	FM	203 : 88.5 MHz	A	LIC	6	10.79393	2.9	146	IF	16.79393	117 FM		4275
KEEZ-FM	N44:03:06	W094:17:59	MANKATO	MN	FM	256 : 99.1 MHz	C1	LIC	111	23.42562	100	239	Primary	134.4256	213 FM		21193
KZPK	N45:34:03	W094:30:42	PAYNESVILLE	MN	FM	255 : 98.9 MHz	C2	LIC	80	24.85884	24	220	1st Adj	104.8588	302 FM		57562
WKFX	N45:22:23	W091:55:22	RICE LAKE	WI	FM	256 : 99.1 MHz	C2	LIC	91	28.32235	44	159	Primary	119.3224	73 FM		55339
20171204AAA	N44:47:04	W093:20:38	SHAKOPEE	MN	FM	256 : 99.1 MHz		APP	0	31.45181	0.25	0	Primary	31.45181	175 FX		201624
20170802AAV	N44:47:04	W093:20:38	SHAKOPEE	MN	FM	256 : 99.1 MHz		APP	0	31.45181	0.25	0	Primary	31.45181	175 FX		201624
KJGT	N44:47:20	W093:54:27	WACONIA	MN	FM	202 : 88.3 MHz	C3	LIC	9	42.90843	11	86	IF	51.90843	234 FM		172741
K257GK	N45:32:21	W094:10:05	ST. CLOUD	MN	FM	257 : 99.3 MHz		LIC	0	81.20773	0.25	0	1st Adj	81.20773	310 FX		200117
K263AL	N44:32:14	W092:31:20	RED WING	MN	FM	255 : 98.9 MHz		CP	0	89.71667	0.25	0	1st Adj	89.71667	131 FX		142579
WHWC	N45:02:49	W091:51:47	MENOMONIE	WI	FM	202 : 88.3 MHz	C1	LIC	20	99.40181	70	320	IF	119.4018	91 FM		63078

Figure 2 – Antenna Vertical Pattern

Exhibit 2									
Freespace Interference Study for a given antenna based on Vertical Radiation Pattern									
Antenna Make: Nicom					Antenna Model BLD1/BKG1				
Depression	Antenna	Distance to							
Angle from	Relative	ERP	ERP	Ground from	Free Space	2.5 dB Loss	Signal Strength	Circular	
Antenna	Field	Watts	dBk	Antenna (km)	Signal (dBu)	for Reflection	at Ground (dBu)	From Tower (m)	
90	0.149	2.2201	-26.54	0.015	116.8619002	0	116.8619002	0	
85	0.173	2.9929	-25.24	0.015057298	118.1259814	0	118.1259814	1.312329953	
80	0.215	4.6225	-23.35	0.015231399	119.9139732	0	119.9139732	2.644904711	
75	0.254	6.4516	-21.9	0.015529143	121.1937247	0	121.1937247	4.019237886	
70	0.332	11.0224	-19.58	0.015962667	123.2806528	0	123.2806528	5.459553514	
65	0.391	15.2881	-18.16	0.016550669	124.3872242	0	124.3872242	6.994614872	
60	0.483	23.3289	-16.32	0.017320508	125.8277301	0	125.8277301	8.660254038	
55	0.540	29.16	-15.35	0.018311619	126.3133404	0	126.3133404	10.50311307	
50	0.621	38.5641	-14.14	0.019581109	126.9450862	0	126.9450862	12.58649447	
45	0.675	45.5625	-13.41	0.021213203	126.9739503	0	126.9739503	15	
40	0.755	57.0025	-12.44	0.023335857	127.1184638	0	127.1184638	17.87630389	
35	0.799	63.8401	-11.95	0.026151702	126.6209364	0	126.6209364	21.4222201	
30	0.853	72.7609	-11.38	0.03	125.9965555	0	125.9965555	25.98076211	
25	0.887	78.6769	-11.04	0.035493024	124.8756124	0	124.8756124	32.16760381	
20	0.931	86.6761	-10.62	0.043857066	123.4582021	0	123.4582021	41.21216129	
15	0.957	91.5849	-10.38	0.05795555	121.2763382	0	121.2763382	55.98076211	
10	0.987	97.4169	-10.11	0.086381557	118.0779225	0	118.0779225	85.06922729	
5	0.998	99.6004	-10.02	0.172105699	112.1867058	0	112.1867058	171.4507845	
Distance to Ground Level assumes flat ground or a site where the ground level is above average terrain in all azimuths.									
Maximum ERP		100 watts			Max dBu to Ground Level		127.1184638		
Radiation Center AG		0.015 km							
Radiation Center AG		49.2126 ft.							