

# Comprehensive Engineering Exhibit

## Minor Change Application

### Facility ID No. 139604, K296GB

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This exhibit is for the minor change application of translator K296GB seeking to relocate the translator to an element in the standard band antenna of KLIB.

### Antenna Location

The proposed antenna is to be mounted on ASR 1026717 at 105 meters above ground, to serve as a fill-in for primary station KQJK(FM), Facility ID 11273. This location provides for overlap of the licensed and proposed 60 dBu contours, as well as the service contour of this proposal being wholly contained within that of the primary station.

Below as Figure 1 is a spacing study from which it can be determined that this proposal is within the protected contour of third adjacent channel station KBZC. 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 such other factors as may be applicable.”*

We will demonstrate that a lack of population and/or other factors allow this proposal to be compliant with 74.1204. The process commonly called “Living Way”<sup>1</sup>, allows for the use of U/D Analysis, also known as “signal strength ratio methodology” to be utilized. In this instant case the facility to be protected is third adjacent and is to be afforded protection from signals 40 dB stronger than is presented in the location of the proposed antenna location.

Figure 2 is a map showing the predicted signal contour of KBZC at the proposed translator antenna location utilizing the FCC F50:50 curve is 85.5 dBu. Applying the 40 dB radio, protection of the KBZC 85.5 dBu contour from a signal produced by this proposal exceeding 125.5 is required. From the line of sight equation<sup>2</sup> table of Figure 3 it has been determined that a 125.5 dBu signal is developed by 250 watts as proposed reaches a maximum distance from the antenna of 59 meters. An examination of the image of the proposed location area in Figure 4 illustrates that no habitable space extends into an area of interference. Thus the provisions of the rules section concerning prohibited overlap will not apply as it has been demonstrated that no actual interference will occur due to a lack of population and other factors as applied in this instant proposal.

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<sup>1</sup> As recently described in FCC 08-242 in connection with BPFT-19981001TA

<sup>2</sup>  $\text{ReachDistMeters} = 106.92 - (20 * (\text{LOG10}[\text{DistMeters}/1000])) + [\text{ERP in dBk}]$

## **RF Radiation Statement**

The proposed facilities were evaluated in terms of potential radio frequency radiation exposure at ground level in accordance with OET Bulletin No. 65, "Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio frequency Radiation."

The proposed antenna system is an ERI LPX "Roto-Tiller", 2- element; half-wave spaced antenna mounted 105 meters above ground. For purposes of this analysis the FM Model program has been set to calculate values for this type of antenna element array, operated with an effective radiated power of 0.250 Kilowatts in both the horizontal and vertical planes. At 2 meters above the surface, at 210 meters from the base of the tower, this proposal will contribute worst case, 0.14 microwatts per square centimeter, or 0.014 percent of the allowable ANSI limit for controlled exposure, and 0.07 percent of the allowable limit for uncontrolled exposure. This figure is less than 5% of the applicable FCC exposure limit at all locations extending out from the base of the tower. Section 1.1307(b)(3) excludes applications when the calculated level is predicted to be less than 5% of the applicable exposure limit. It is therefore believed that this proposal is in compliance with OET Bulletin Number 65 as required by the Federal Communications Commission.

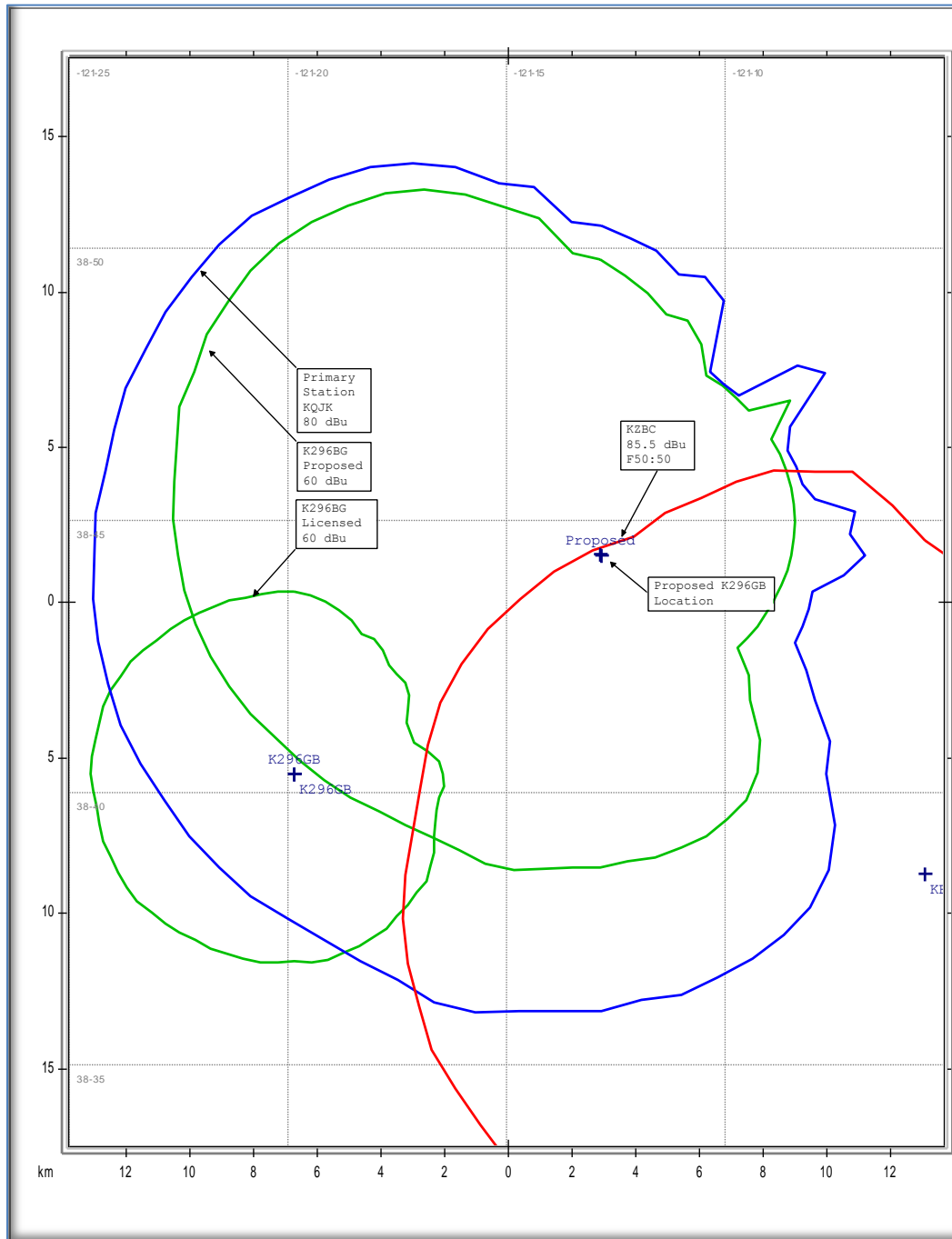
Further, the applicant will see that signs are posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The site itself is restricted from public access. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less than specified by the Federal Communications Commission should anyone be required to climb the tower for maintenance or inspection.

**Figure 1. Spacing Study**

K296GB At KL1B(am) Array ASR 1026717 Educational Media Foundation											
REFERENCE 38 44 22.4 N. 121 12 51.2 W.		CH# 296D - 107.1 MHz, Pwr= 0.25 kw, HAAT= 86.7 M, COR= 187 M Average Protected F(50-50)= 12.01 km Omni-directional								DISPLAY DATES DATA 07-09-13 SEARCH 07-09-13	
CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT* (in km)
293B	KBZC	LIC	_CY	135.3	15.30	38 38 30.0	50.000	6.7	69.8	-0.8	-56.1*
	Sacramento	CA		315.4	BLH19830216AD	121 05 25.0	125	299	Entercom Sacramento		Licens
296D	K296GB	CP	DV_	233.7	12.58	38 40 21.0	0.250	28.7	8.7	-31.7*	-47.2
	North Highlands	CA		53.6	BPFT20130206ACS	121 19 51.0		113	Educational Media Foundati		
296D	K296GB	LIC	_C_	233.7	12.58	38 40 21.0	0.019	14.6	4.7	-17.6*	-43.2
	North Highlands	CA		53.6	BLFT20101005ABH	121 19 51.0	78	113	Educational Media Foundati		
295C	KRNO	LIC	_CY	60.7	131.51	39 18 38.0	37.000	125.4	85.4	-1.0	36.0
	Incline Village	NV		241.5	BMLH20010806AAN	119 53 01.0	911	2987	Americom Las Vegas Limited		
297B	KLVS	LIC	_HX	206.0	113.31	37 49 17.0	8.100	97.1	80.9	1.3	0.7
	Livermore	CA		25.6	BLFD20120628AAI	121 46 49.0	491	713	San Joaquin Broadcasting C		
296D	K296EX	LIC	_DC_	314.9	73.65	39 12 20.0	0.010	50.8	13.8	7.7	9.5
	Yuba City	CA		134.5	BLFT20080805AAX	121 49 09.0	605	651	Educational Media Foundati		
298A	1432289	RSV-A	___	137.0	52.76	38 23 30.0	6.000	3.8	40.4	39.0	11.3
	Sutter Creek	CA		317.3		120 48 06.0	100	480	Calvary Chapel of Amador C		
	One Step Application										
298A	1422321	RSV-A	___	137.0	52.76	38 23 30.0	6.000	3.8	40.4	39.0	11.3
	Sutter Creek	CA		317.3		120 48 06.0	100	480	Sutter Hill Seventh-day Ad		
	One Step Application (missing FA corrected from procedure data_one_steps)										
298A	1513664	RSV-A	___	137.0	52.76	38 23 30.0	6.000	3.8	40.4	39.0	11.3
	Sutter Creek	CA		317.3		120 48 06.0	100	480	Sutter Hill Seventh-day Ad		
	One Step Application										
298A	DKSAC	VAC	_N	137.0	52.76	38 23 30.0	6.000	3.8	40.4	39.0	11.3
	Sutter Creek	CA		317.3		120 48 06.0	100	480			
	10/19/2004: per MB 04-85 reserved for Noncommercial										
295B	KFRC-FM	LIC	_C_	229.0	149.40	37 51 04.0	80.000	109.1	88.2	24.9	28.4
	San Francisco	CA		48.2	BMLH20050811ABJ	122 29 50.0	305	369	Cbs Radio Stations Inc.		
298A	1432058	APP	_CX	116.6	67.32	38 27 59.0	4.800	3.6	40.6	56.6	25.6
	Sutter Creek	CA		297.1	BNPED20100225AAO	120 31 27.0	111	1103	Calvary Chapel of Amador C		
298A	1509306	APP	_CX	120.9	66.83	38 25 45.0	2.600	3.0	38.7	56.8	27.0
	Sutter Creek	CA		301.3	BNPED20100225ADX	120 33 25.0	148	1023	Sutter Hill Seventh-day Ad		
	One Step Application										
298A	1357799	APP	_CX	120.8	67.02	38 25 44.6	2.100	2.8	38.4	57.2	27.5
	Sutter Creek	CA		301.3	BNPED20100225ADX	120 33 16.3	170	1051	Sutter Hill Seventh-day Ad		
298A	1358990	APP	_CX	120.9	66.83	38 25 45.0	1.870	2.7	37.9	57.1	27.8
	Sutter Creek	CA		301.3	BNPED20100226AJU	120 33 25.0	184	1055	Sonora Sierra Heritage Fou		
298A	1358480	APP	_CX	120.9	66.83	38 25 45.0	1.800	2.6	37.9	57.1	27.9
	Sutter Creek	CA		301.3	BNPED20100224ACJ	120 33 25.0	186	1060	Farms of Amador		
298B	KQPT	LIC	_CN	302.6	114.50	39 17 17.0	28.000	7.6	78.4	91.4	34.3
	Colusa	CA		121.9	BLH19860925KB	122 20 02.0	193	410	Mapleton License of Chico,		
296L1	KRBS-LP<	LIC	___	342.1	89.86	39 30 33.0	0.100	0.0	0.0	31.5R	58.4M
	Oroville	CA		161.9	BLL20100929AFN	121 32 11.0		85	Oroville Southside Communi		
296D	K296FO	LIC	_DH_	139.6	110.04	37 58 58.0	0.200	27.7	8.3	71.4	64.7
	Sonora	CA		320.1	BLFT20071113AJD	120 24 03.0	178	750	Central valley Broadcastin		
296A	KSRT	LIC	_CX	273.4	159.62	38 48 34.0	3.500	78.9	25.5	65.0	82.8
	Cloverdale	CA		92.2	BLH20020509AAT	123 02 56.0	131	471	Lazer Licenses, Llc		
299D	KSAN-FM1	LIC	_HN	213.0	113.36	37 52 55.0	0.185	1.0	37.8	97.5	74.5
	Pleasanton, Etc.	CA		32.6	BLFTB19900803TD	121 55 05.0		1155	Susquehanna Radio Corp.		

Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM  
Contour distances are on direct line to and from reference station. Reference zone= , Co to 3rd adjacent.  
All separation margins (if shown) include rounding.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
"-"affixed to 'IN' or 'OUT' values = site inside protected contour.  
« = Station meets FCC minimum distance spacing for its class.

**Figure 2. Contour Map**



**Figure 3. Line of Site Calculations.**

<b>Proposed Antenna:</b> ERI LPX 2 bay half wave <b>Proposed Power:</b> 0.25 kW <b>Antenna Height AGL:</b> 105 meters <b>Interference Contour:</b> 125.5 dBu f(50:10) <b>Artificial Rcv Antenna Height:</b> 2 meters								
<b>Distance (Free Space)</b> <b>Equation:</b> $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)) * 1000}$ <b>Field Strength (dBu)</b> <b>Equation</b> $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters}] / 1000)) + [\text{ERP in dBk}]$								
<div>Fill in "yellow" cells</div>								
Depression				Distance				
Angle	Antenna			from Ant.	Distance	Field Strength	Distance	Field Strength
Below	Relative	ERP	ERP	to Interf	from Ant. to	in dBu @	from Ant.	in dBu @
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level
0°	1.000	0.250	-6.02	58.88 m	infinite	---	infinite	---
-5°	0.984	0.242	-6.16	57.94 m	1181.79 m	99.31 dBu	1204.74 m	99.14 dBu
-10°	0.938	0.220	-6.58	55.23 m	593.15 m	104.88 dBu	604.67 m	104.71 dBu
-15°	0.865	0.187	-7.28	50.93 m	397.96 m	107.64 dBu	405.69 m	107.48 dBu
-20°	0.772	0.149	-8.27	45.46 m	301.15 m	109.08 dBu	307.00 m	108.91 dBu
-25°	0.665	0.111	-9.56	39.16 m	243.72 m	109.62 dBu	248.45 m	109.45 dBu
-30°	0.553	0.076	-11.17	32.56 m	206.00 m	109.48 dBu	210.00 m	109.31 dBu
-35°	0.431	0.046	-13.33	25.38 m	179.58 m	108.50 dBu	183.06 m	108.34 dBu
-40°	0.339	0.029	-15.42	19.96 m	160.24 m	107.41 dBu	163.35 m	107.24 dBu
-45°	0.248	0.015	-18.13	14.60 m	145.66 m	105.52 dBu	148.49 m	105.35 dBu
-50°	0.172	0.007	-21.31	10.13 m	134.46 m	103.04 dBu	137.07 m	102.87 dBu
-55°	0.112	0.003	-25.04	6.59 m	125.74 m	99.89 dBu	128.18 m	99.73 dBu
-60°	0.068	0.001	-29.37	4.00 m	118.93 m	96.04 dBu	121.24 m	95.88 dBu
-65°	0.037	0.000	-34.66	2.18 m	113.65 m	91.15 dBu	115.85 m	90.99 dBu
-70°	0.018	0.000	-40.92	1.06 m	109.61 m	85.21 dBu	111.74 m	85.04 dBu
-75°	0.007	0.000	-49.12	0.41 m	106.63 m	77.24 dBu	108.70 m	77.08 dBu
-80°	0.002	0.000	-60.00	0.12 m	104.59 m	66.53 dBu	106.62 m	66.36 dBu
-85°	0.001	0.000	-66.02	0.06 m	103.39 m	60.61 dBu	105.40 m	60.44 dBu
-90°	0.000	0.000	-86.02	0.01 m	103.00 m	40.64 dBu	105.00 m	40.48 dBu



**Figure 4. Aerial View of Antenna Location.**

