

FCC Form 301 Section III-A #10b Supporting Exhibit 18
Schwab Multimedia LLC • K W I F (A M)
1500 KHz Nighttime Allocation Study, Culver City, California, October 2020

Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

Nighttime RSS Limit Calculations

Run Date: 10-22-2020 23:09:09

Call	AntID	Class	Freq	Location	Power	Mode	Status	File	Coordinates
WIRB	96879	O	1490 C	LEVEL PLAINS	AL US	1.000 KW, ND2-N	LIC BL	20061020ADU	31-17-58N/ 85-47-26W
WTKE:13.431 + WRLA:13.1424 + WSFB:12.9824 + WFZX:12.4166 + WKUN:10.5383 + WSNT:10.3371 + WHOC:9.9059 + WYYZ:9.7114 + WJOC:9.4007 + WIEZ:9.2455 = 35.50									
WDEP	138555	O B	1490 B	PONCE	PR US	1.000 KW, ND2-N	LIC BL	20190826ABO	17-59- 3N/ 66-38-12W
YVSQ:3.1348 + HJAY:2.9923 + HOR 43:2.9826 + HJOJ:2.4252 + HJTC:1.8974 + none:1.8713 + HJBS:1.8429 + none:1.7466 + WMDD:1.7353 = 7.08									
CKAY	66680	O B	1500 B	DUNCAN	BC CA	1.000 KW, DA2-N	Fac. ID: 105846		48-44-21N/123-41-58W
KSTP:5.8759 = 5.88									
CMKR	65287	O C	1500 C	HOLGUIN 1	CU	1.000 KW, ND1-N	Fac. ID: 105078		20-52- 0N/ 76-16- 0W
WFED:7.7934 + 4VBD:5.2594 = 9.40									
CMEM	65289	P C	1500 C	SANTA CLARA	CU	0.250 KW, ND1-N	Fac. ID: 105079		22-24- 0N/ 79-57- 0W
WFED:9.0395 = 9.04									
XEEBC	63088	O B	1500 B	ENSENADA	BN MX	0.250 KW, ND1-N	Fac. ID: 103731		31-51-10N/116-38- 9W
KSJX:5.732 + KSTP:4.8797 = 7.53									
XEJQ	63091	P B	1500 B	PARRAS	CI MX	0.250 KW, ND1-N	Fac. ID: 103733		25-27-35N/102- 9- 0W
KANI:4.7961 + KSTP:4.5713 = 6.63									
XEAI	36761	O B	1500 B	IZTAPALAPA	DF MX	20.000 KW, DAN-N	Fac. ID: 103736		19-22-43N/ 99- 6- 9W
XEFL:2.4015 + KSTP:2.1884 + KANI:1.6267 = 3.63									
XEAI	63097	P B	1500 B	IZTAPALAPA	DF MX	5.000 KW, ND1-N	Fac. ID: 103736		19-22-43N/ 99- 6- 9W
XEFL:2.4015 + KSTP:2.1884 + KANI:1.6267 = 3.63									
XEFL1	63102	P B	1500 B	GUANAJUATO	GT MX	0.500 KW, ND1-N	Fac. ID: 116237		21- 0-32N/101-15-43W
KSTP:2.7038 + KANI:1.9544 = 3.34									
XEFL	98035	P B	1500 B	GUANAJUATO	GT MX	0.080 KW, ND -N	Fac. ID: 103739		21- 2-18N/101-16-25W
KSTP:2.7129 + KANI:1.9645 = 3.35									
XE	63110	O B	1500 B	MELCHOR OCAMPO	MC MX	1.000 KW, ND1-N	Fac. ID: 103744		17-57-37N/102- 8-39W
XEFL:2.2591 + KSTP:2.0435 = 3.05									
XEUV	63116	O B	1500 B	VILLAHERMOSA	TB MX	1.000 KW, ND1-N	Fac. ID: 103748		17-59-15N/ 92-55- 0W
TILQA:2.5892 + KANI:1.9887 + WFED:1.7656 = 3.71									
XEGN	63119	O B	1500 B	PIEDRAS NEGRAS	VC MX	1.000 KW, ND1-N	Fac. ID: 103749		18-45-16N/ 96- 7-46W
KANI:1.8737 + KSTP:1.853 + XEFL:1.826 = 3.21									
XEYQ	36790	O B	1500 B	FRESNILLO	ZA MX	0.150 KW, ND1-N	Fac. ID: 103751		23- 7-50N/102-49-54W
KSTP:3.4426 + KANI:2.8875 + XEFL:2.4252 = 5.11									
XEYQ	63124	P B	1500 B	FRESNILLO	ZA MX	1.000 KW, ND1-N	Fac. ID: 103751		23- 7-50N/102-49-54W
KSTP:3.4426 + KANI:2.8875 + XEFL:2.4252 = 5.11									
KSJX	132269	O B	1500 B	SAN JOSE	CA US	5.000 KW, DAD-N	LIC BMML20170321ABS		37-21-28N/121-52-17W
KSTP:5.4867 + CKAY:1.6031 = 5.72									
WFED	113996	O A	1500 A	WASHINGTON	DC US	50.000 KW, DA2-N	LIC BML 20110215AFF		39- 2-31N/ 77- 2-47W
Class-A protected to 0.5 mv/m skywave contour.									

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<u>Call</u>	<u>AntID</u>	<u>Class</u>	<u>Freq</u>	<u>Location</u>	<u>Power</u>	<u>Mode</u>	<u>Status</u>	<u>File</u>	<u>Coordinates</u>
KHKA	138217	O B	1500 B	HONOLULU HI US	5.000 KW,	ND2-N	LIC BL	20190620ABD	21-20- 6N/157-53-37W
KSJX:1.413 + KSTP:1.0625 + KWIF:.4975 = 1.84									
WLQV	113246	O B	1500 B	DETROIT MI US	10.000 KW,	DA2-N	LIC	BMML20101117BHW	42-13-52N/ 83-11-58W
WFED:6.2298 + WLAC:3.7213 + KSTP:3.5437 = 8.08									
KSTP	86094	O A	1500 A	ST. PAUL MN US	50.000 KW,	DAN-N	LIC BL	20040503AHC	45- 1-32N/ 93- 3- 6W
Class-A protected to 0.5 mv/m skywave contour.									
WMNT	137789	O B	1500 B	MANATI PR US	0.290 KW,	ND2-N	LIC BL	20190411AAX	18-26- 1N/ 66-28-39W
none:18.1407 + WFED:8.0747 = 19.86									
KANI	22640	O B	1500 B	WHARTON TX US	0.500 KW,	DAN-N	LIC BL	19830720AA	29-19-22N/ 96- 3-32W
KSTP:8.164 + WLAC:2.8107 = 8.63									
KSPA	44894	O B	1510 B	ONTARIO CA US	1.000 KW,	DA2-N	LIC BL	12281	34- 5-41N/117-36-46W
KGA:2.0084 + KOKC:1.5219 + KSFN:1.2156 + WLAC:1.066 = 2.99									
KSPA	138070	P B	1510 B	ONTARIO CA US	6.000 KW,	DA2-N	CP BP	20190603AAZ	34- 5-41N/117-36-46W
KGA:2.0084 + KOKC:1.5219 + KSFN:1.2156 + WLAC:1.066 = 2.99									
KSFN	111653	O B	1510 B	PIEDMONT CA US	2.400 KW,	DA2-N	LIC	BMML20100527AGJ	37-49- 2N/122-17-10W
KGA:4.0232 + KSJX:1.8594 = 4.43									
KPLS	105685	O B	1510 B	LITTLETON CO US	25.000 KW,	DA2-N	LIC	BMML20080717AQB	39-52- 8N/104-55-37W
KOKC:5.3208 + KSTP:2.4731 = 5.87									
WRNJ	71453	O B	1510 B	HACKETTSTOWN NJ US	0.230 KW,	DAN-N	LIC BL	20001030ACC	40-49- 0N/ 74-49-35W
WFED:9.8286 + WWKB:9.4712 + WLAC:3.5585 = 14.11									
WBSG	22730	O B	1510 B	LAJAS PR US	1.000 KW,	DA1-U	LIC BL	19850603AE	18- 2-11N/ 67- 4-58W
HIJN:6.4528 + WLAC:6.3505 + WRSJ:2.48 = 9.39									
WLAC	112840	O A	1510 A	NASHVILLE TN US	50.000 KW,	DAN-N	LIC BL	20101004ADH	36-16-19N/ 86-45-28W
Class-A protected to 0.5 mv/m skywave contour.									
KGA	111635	O B	1510 B	SPOKANE WA US	15.000 KW,	DA2-N	LIC BL	20100527AGH	47-30- 8N/117-23- 6W
KSFN:1.6542 + KOKC:.8575 + KSTP:.6946 = 1.99									
KGA	138055	P B	1510 B	SPOKANE WA US	0.540 KW,	ND3-N	CP BMP	20190531ABB	47-30- 8N/117-23- 7W
KSFN:1.6542 + KOKC:.8575 + KSTP:.6946 = 1.99									
KWIF	128547	P B	1500 B	CULVER CITY CA US	0.170 KW,	DA2-N		SUBJECT STATION	33-59-11N/118-23-19W
KSJX:7.4031 + KSTP:6.3734 = 9.77 (50% RSS NIF)									

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Call	KHz.	Cls	Location		GC-KM	SL-KM	Bear.	G-MP	M-MP	S.W.F.	Min	Max	RSS50	RSS25	Max-IDF	AntID
KGA	1510	BO	SPOKANE	WA US	1505.1	1518.3	2.9°	40.7°	47.6°	0.020713	2.1°	5.6°	1.86	1.99	1200.1	111635
KSTP	1500	AO	ST. PAUL	MN US	2480.8	2488.8	52.8°	40.2°	48.8°	0.007260	0.0°	0.0°	0.50	0.50	344.4	86094
KPLS	1510	BO	LITTLETON	CO US	1361.4	1376.0	57.4°	37.1°	45.1°	0.026729	3.0°	6.9°	5.32	5.87	2743.9	105685
WLQV	1500	BO	DETROIT	MI US	3186.6	3192.9	62.8°	39.4°	48.8°	0.004185	0.0°	0.0°	7.26	8.08	2412.3	113246
WRNJ	1510	BO	HACKETTSTOWN	NJ US	3880.8	3885.9	65.7°	39.5°	49.3°	0.002515	0.0°	0.0°	13.65	14.11	10000+	71453
WFED	1500	AO	WASHINGTON	DC US	3704.6	3710.0	69.1°	38.4°	48.1°	0.003088	0.0°	0.0°	0.50	0.50	809.6	113996
WLAC	1510	AO	NASHVILLE	TN US	2874.6	2881.6	75.8°	36.2°	45.4°	0.006366	0.0°	0.0°	0.50	0.50	3927.1	112840
WIRB	1490	CO	LEVEL PLAINS	AL US	3053.6	3060.1	86.5°	33.7°	43.1°	0.006188	0.0°	0.0°	26.00	35.50	10000+	96879
KSPA	1510	BO	ONTARIO	CA US	72.5	212.7	80.2°	34.0°	41.1°	0.422909	63.1°	73.0°	2.52	2.99	88.5	44894
KSPA	1510	BP	ONTARIO	CA US	72.5	212.7	80.2°	34.0°	41.1°	0.422909	63.1°	73.0°	2.52	2.99	88.5	138070
WMNT	1500	BO	MANATI	PR US	5397.4	5401.1	95.0°	28.7°	39.3°	0.002127	0.0°	0.0°	18.14	19.86	10000+	137789
WDEP	1490	BO	PONCE	PR US	5407.5	5411.2	95.6°	28.4°	39.0°	0.002152	0.0°	0.0°	5.26	7.08	10000+	138555
WBSG	1510	BO	LAJAS	PR US	5363.7	5367.4	95.8°	28.4°	39.0°	0.002198	0.0°	0.0°	9.05	9.39	10000+	22730
KANI	1500	BO	WHARTON	TX US	2171.1	2180.3	97.7°	32.1°	40.9°	0.012810	0.0°	1.4°	8.16	8.63	842.5	22640
CMKR	1500	CO	HOLGUIN 1	CU	4369.9	4374.5	98.4°	29.1°	39.2°	0.001555	0.0°	0.0°	9.40	-n/a-	10000+	65287
CMEM	1500	CP	SANTA CLARA	CU	3953.9	3958.9	98.8°	29.6°	39.4°	0.001930	0.0°	0.0°	9.04	-n/a-	10000+	65289
XEJQ	1500	BP	PARRAS	CI MX	1828.6	1839.6	116.9°	30.0°	38.3°	0.013878	1.9°	1.9°	6.63	-n/a-	1193.6	63091
XEUV	1500	BO	VILLAHERMOSA	TB MX	3090.5	3096.9	118.7°	26.5°	35.6°	0.003365	0.0°	0.0°	3.71	-n/a-	2757.8	63116
XEGN	1500	BO	PIEDRAS NEGRAS	VC MX	2778.7	2785.9	121.9°	26.8°	35.7°	0.004330	0.0°	0.0°	3.21	-n/a-	1850.9	63119
XEYQ	1500	BO	FRESNILLO	ZA MX	1936.1	1946.4	124.5°	28.8°	37.1°	0.011558	1.3°	1.3°	5.11	-n/a-	1104.4	36790
XEYQ	1500	BP	FRESNILLO	ZA MX	1936.1	1946.4	124.5°	28.8°	37.1°	0.011558	1.3°	1.3°	5.11	-n/a-	1104.4	63124
XEAI	1500	BO	IZTAPALAPA	DF MX	2503.2	2511.2	125.5°	27.0°	35.6°	0.005658	0.0°	0.0°	3.63	-n/a-	1605.5	36761
XEAI	1500	BP	IZTAPALAPA	DF MX	2503.2	2511.2	125.5°	27.0°	35.6°	0.005658	0.0°	0.0°	3.63	-n/a-	1605.5	63097
XEFL	1500	BP	GUANAJUATO	GT MX	2212.2	2221.3	126.2°	27.8°	36.2°	0.007868	0.0°	0.0°	3.35	-n/a-	1064.3	98035
XEFL1	1500	BP	GUANAJUATO	GT MX	2215.4	2224.4	126.2°	27.8°	36.2°	0.007837	0.0°	0.0°	3.34	-n/a-	1064.3	63102
XE	1500	BO	MELCHOR OCAMPO	MC MX	2403.8	2412.1	133.8°	26.2°	34.6°	0.006136	0.0°	0.0°	3.05	-n/a-	1241.1	63110
XEEBC	1500	BO	ENSENADA	BN MX	288.2	350.8	144.9°	32.9°	40.0°	0.178048	33.0°	33.0°	7.53	-n/a-	105.7	63088
KHKA	1500	BO	HONOLULU	HI US	4106.7	4111.6	260.4°	29.1°	32.4°	0.005277	0.0°	0.0°	1.77	1.84	435.0	138217
KSJX	1500	BO	SAN JOSE	CA US	489.3	528.6	321.0°	35.7°	42.3°	0.125170	15.3°	24.9°	5.49	5.72	57.1	132269
KSFN	1510	BO	PIEDMONT	CA US	551.8	586.9	321.6°	35.9°	42.5°	0.107521	13.4°	22.2°	4.02	4.43	515.3	111653
CKAY	1500	BO	DUNCAN	BC CA	1698.0	1709.7	346.6°	41.4°	47.8°	0.017608	2.6°	2.6°	5.88	-n/a-	834.3	66680

KEY:

Call = Callsign	KHz. = Frequency in Kilohertz	Cls = Station Class
Location = City, State, Country	GC-KM = Distance in kilometers	SL-KM = Slant distance in KM
Bear. = Bearing to station in degrees	G-MP = Geographic Midpoint Latitude	M-MP = Geomagnetic Midpoint Latitude
S.W.F. = Skywave Factor in mv/m	Min = Minimum Critical Angle in degrees	Max = Maximum Critical Angle in degrees
RSS50 = 50% exclusion RSS	RSS25 = 25% exclusion RSS	

MaxIDF = Maximum calculated allowable radiation in mv/m/km. **AntID** = FCC Antenna ID

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Vert.	Critical Bearings from KWIF:		
Elev.	80.22°	144.92°	321.00°
-----	-----	-----	-----
0°	78.67	75.57	46.53
5°	77.90	75.19	46.38
10°	75.61	74.05	45.91
15°	71.89	72.17	45.14
20°	66.89	69.59	44.06
25°	60.80	66.37	42.68
30°	53.85	62.57	41.00
35°	46.33	58.27	39.02
40°	38.54	53.53	36.75
45°	30.82	48.45	34.20
50°	23.55	43.10	31.37
55°	17.14	37.58	28.27
60°	12.08	31.96	24.91

At minimum critical angles:

Theta=	63.1°	33.0°	15.3°
E(mv)=	9.87	60.05	45.08

At maximum critical angles:

Theta=	73.0°	33.0°	24.9°
E(mv)=	7.34	60.05	42.71

Point=	*KSPA	XEEBC	KSJX
RadLim=	88.49	105.70	57.08
SWFuV=	422.909	178.048	125.170
Limit=	0.083	2.138	1.129
R.S.S.=	2.99	7.53	5.72
% of RSS=	2.79%	28.40%	19.75%

Radiation Limit (RadLim) in mv/m/km, Skywave Factor (SWF) in uv/m/km.
Limit from KWIF to point in mv/m, RSS Limit for point in mv/m.
* = first-adjacent.





