



Request for Experimental Authority IBOC Asymmetrical

KQAL, Winona State University

9/16/2020

Winona State University respectfully requests authority to operate with elevated Asymmetrical IBOC for the purpose of testing IBOC coverage penetration in various environments, including within buildings and in vehicles. The University understands its responsibility to provide yearly reports within the five-year franchise.

File BLED-20120720ADE, Facility ID: 72955

Licensed Geographic Coordinates: N. Lat. 44-04-25.9, W. Long. 91-34-38.5 (NAD 83)

Site elevation: 353.6 m, Tower height = 142 m A.G., I.D. 1200126

Channel Number: 208, 89.5 Mhz

Licensed COR: 480.0 m AMSL, 2.5 kW, polarized circularly, Output power= -0.44793 dBk (0.902 kW)

Antenna height: C.O.R. above ground, 126.4 m

Antenna: Shively 6810-3R-DA, Horizontal Power gain 3.358, Line efficiency 82.2 % (427' HJ750A)

Asymmetric powers: Lower sideband: -17 dBc, Upper sideband = - 13 dBc (per NRSC-G202-A)

Transmitter sideband power: Lower -17.44793 dBk (0.018 kW), Upper = -13.4493 dBk (0.0452 kW)

Total IBOC sideband transmitter power = -11.993 dBk (0.0632kW), (-11.545 dBc)

Transmitter Total Power Output with IBOC: -0.1538 dBk (0.9652 kW), Power radiated= 2.5632 kW

With regard to R.F. safety, using the OET 65 formulas for worst case, we find the power density at head calculates to be $11.032 \mu\text{W}/\text{cm}^2$. This is 5.52 percent of an uncontrolled environment. KQAL shares its tower with KRIV-FM (5 kW, 138 m A.G.) and translators K270AB and W297AW (0.235 kW, 122 m AG each.) KRIV-FM contributes $18.08 \mu\text{W}/\text{cm}^2$ at head height (9.01 % uncontrolled) and the two translators contribute $1.09 \mu\text{W}/\text{cm}^2$ each that amounts to a total of 1.09 percent (uncontrolled.) The total summed percentage contribution of all four transmitters is 15.62 percent, therefore no additional analysis was deemed required. KQAL will reduce power or terminate transmissions to protect workers on the tower and at the site. The four owners of the four transmitters have a cooperative agreement to keep emissions exposure at or below the Commission's maximum to protect workers and the general public when tower work is being done.

Page #2 of this request is a contour-to-contour channel study that shows the first adjacent stations requiring protection. Page #3 of this request, is a map used to calculate the IBOC power levels (Using the (NPR) maximum permissible FM digital table.)

Page #4 is an exhibit stating the qualifications of the preparer of these documents.

Doug Vernier, Telecommuni cation Consul tants
V-Soft Communi cations

CH 208 Contour-to-Contour Study
Winona State University

REFERENCE
44 04 25.90 N.
91 34 38.50 W.

CH# 208C3 - 89.5 MHz, Pwr= 2.5 kW DA, HAAT= 210.3 M, COR= 480 M
Average Protected F(50-50)= 32.6 km
Standard Directional

DISPLAY DATES
DATA 09-12-20
SEARCH 09-12-20

CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
208C3 Winona	KOAL	LIC D__ MN		0.0 274.9	0.00 BLED20120720ADE	44 04 25.90 91 34 38.50	2.500 210	480	---Reference---		Winona State University
207C3 Sparta	WEQS	CP D__ WI		106.4 287.0	79.70 BPED20180716ABH	43 52 04.80 90 37 23.40	10.000 127	50.2 469	31.2 The Salvation Poem Foundat	0.9	0.4
208C1 Wausau	WCLQ	LIC D__ WI		57.3 238.7	177.47 BLED20040225ABB	44 55 10.90 89 40 45.40	90.000 185	155.0 569	59.8 Christian Life Communi cati	0.6	51.0
205C2 La Crosse	WLSU	LIC D__ WI		150.6 330.8	34.25 BMLLED20190313AAD	43 48 18.30 91 22 05.10	8.200 283	4.0 546	30.4 Board Of Regents Of The Un	1.0	0.8
208A Decorah	KLCD	LIC ____ IA		191.5 11.3	86.00 BLED19811023AJ	43 18 55.90 91 47 18.60	0.100 55	24.4 387	7.1 Minnesota Public Radio	34.8	0.9
209C3 Eau Claire	WUEC	LIC ____ WI		6.2 186.3	81.21 BMLLED20190213AAD	44 48 00.00 91 27 57.00	5.200 192	54.3 472	36.4 Board Of Regents Of The Un	1.8	6.7
207C1 Northfield	KCMP	LIC ____ MN		300.5 119.4	137.10 BLED20060308AIB	44 41 20.90 93 04 21.80	100.000 234	98.4 517	67.0 Minnesota Public Radio	5.7	22.4
207A Sparta	WEQS	LIC D__ WI		103.5 284.2	81.96 BLED20120308ABF	43 53 49.90 90 34 57.50	0.450 229	36.9 570	24.7 The Salvation Poem Foundat	13.3	11.2

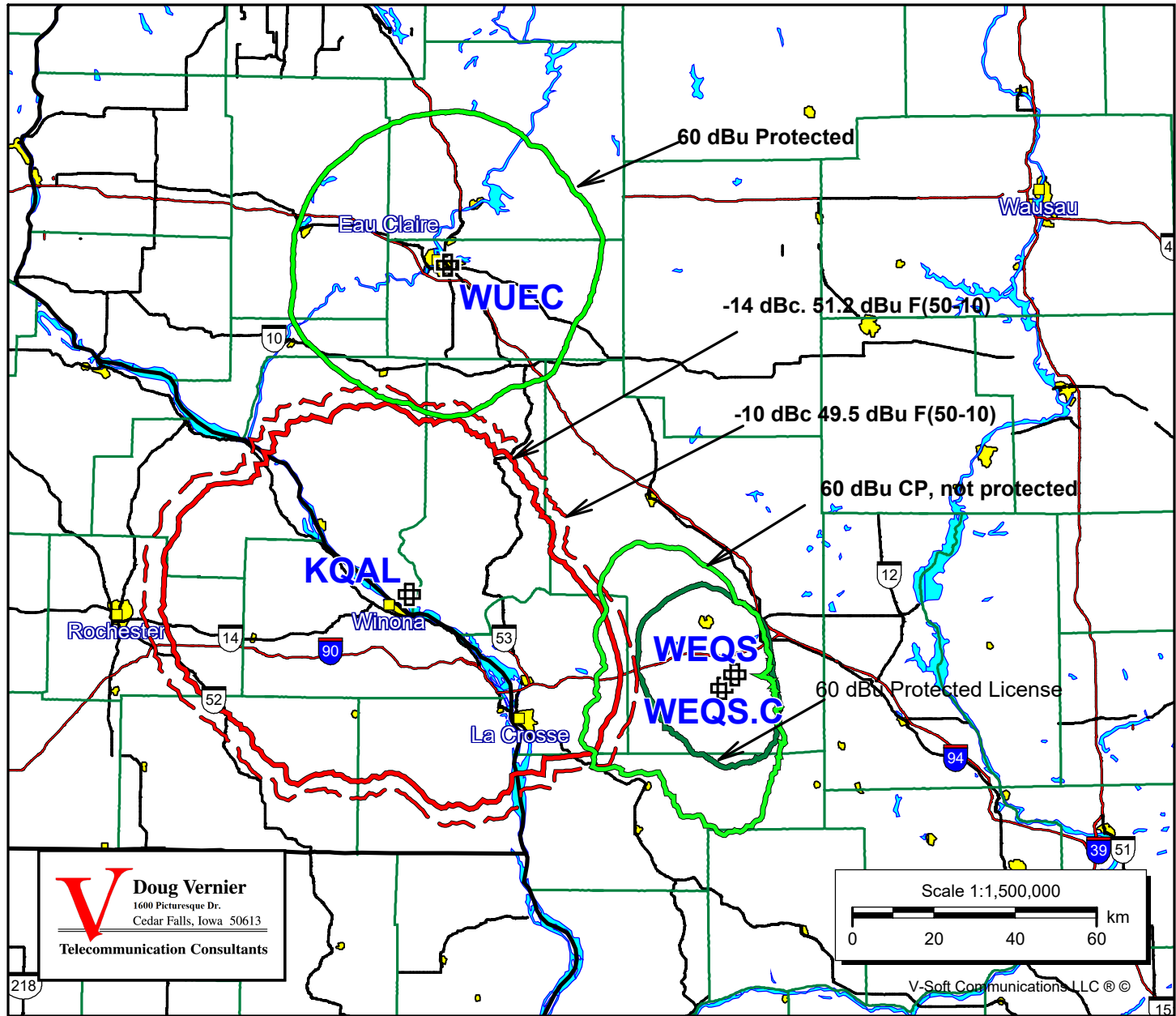
Terrain database is GLOBE 30 Sec , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. Reference zone= - Zone 2, Co to 3rd adjacent.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
"*"affixed to 'IN' or 'OUT' values = site inside restricted contour.

Calculation of the Maximum HD Power Under the Rules

KQAL
 BLED20120720ADE
 Latitude: 44-04-25.90 N
 Longitude: 091-34-38.50 W
 ERP: 2.50 kW
 Channel: 208
 Frequency: 89.5 MHz
 AMSL Height: 480.0 m
 Elevation: 353.6 m
 Horiz. Pattern: Directional

WEQS
 BLED20120308ABF
 Latitude: 43-53-49.90 N
 Longitude: 090-34-57.50 W
 ERP: 0.45 kW
 Channel: 207
 Frequency: 89.3 MHz
 AMSL Height: 570.0 m
 Elevation: 439.0 m
 Horiz. Pattern: Directional

WUEC
 BMLED20190213AAD
 Latitude: 44-48-00 N
 Longitude: 091-27-57 W
 ERP: 5.20 kW
 Channel: 209
 Frequency: 89.7 MHz
 AMSL Height: 472.0 m
 Elevation: 271.0 m
 Horiz. Pattern: Omni



Declaration:

I, Douglas L. Vernier, declare that I have received training as an engineer from the University of Michigan, School of Engineering. That, I have received degrees from the University in the field of Broadcast Telecommunications. That, I have been active in broadcast consulting for over 40 years.

That, I have held a Federal Communications Commission First Class Radiotelephone License continually since 1964. In 1985, this license was reissued by the Commission as a lifetime General Radiotelephone license no. PG-16-16464.

That, I am certified as a Professional Broadcast Engineer (#50258) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Life-time Certification received in 2010).

That, my qualifications are a matter of record with the Federal Communications Commission.

That, I have been retained by Winona State University to prepare the engineering showings appended hereto.

That, I have prepared these broadcast engineering showings, the technical information contained in same and the facts stated within are true of my knowledge.

That, under penalty of perjury, I declare that the foregoing is correct.

Douglas L. Vernier

A handwritten signature in blue ink that reads "Doug Vernier". The signature is stylized with a large, looping initial "D" and a horizontal line extending to the right.

Executed of September 16, 2020