

KTWI Engineering Narrative

April 8.2011

This application seeks relocation of KTWI to 140 meters above ground on a tower identified by registration number 1028060 to operate with 8,900 watts non-directional.

As this location and height results in a Height Above Average Terrain 76 meters greater than the reference 100 meters for a class C3 facility, the FCC "FM Power" tool was utilized to determine equivalent ERP. This location does meet the spacing requirements of Section 73.207; a spacing study is presented below.

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 facility will utilize an ERI MPX-3 full wave 3 section antenna. This antenna has been modeled as proposed mounted 140 meters above ground has been analyzed using the program "FM Model" set to calculate values for a "Roto Tiller" antenna array with 3 element spaced 1 wavelength operated with an effective radiated power of 8.9 Kilowatts in both the horizontal and vertical planes. At 2 meters above the surface, at 70 meters from the base of the tower, this proposal will contribute worst case, 3.28 microwatts per square centimeter, or 0.33 percent of the allowable ANSI limit for controlled exposure, and 1.65 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.

FM Power Results

http://www.fcc.gov/fcc-bin/fmpower - Windows Internet Explorer
http://www.fcc.gov/fcc-bin/fmpower

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Audio Division Fmpower Results
(202)-418-2700 FCC > MB > Audio Division > Fmpower FM Propagation Curves FCC site map

Fmpower Results

Class C3 facilities for Equivalency Determination:

Reference ERP = 25.000 kW
Reference HAAT = 100.0 meters
F(50,50) 60 dBu protected contour at 39.1 km distance

Equivalent ERP (rounded per 47 CFR 73.212) = 7.900 kW

at **176.0 meters HAAT**

Unrounded ERP = 7.880 kW for 176.0 meters HAAT

Class C3 stations are authorized in IA.

Enter New Data in Fmpower?

Related items: [FM and TV Propagation Curves](#)
This document may be accessed at <http://www.fcc.gov/mb/audio/bickel/fmpower.html>

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Calculation of Antenna Height Above Average Terrain Calculations

The screenshot shows a web browser window displaying the FCC's HAAT calculation tool. The page title is "Antenna Height Above Average Terrain (HAAT) Results" and the URL is "http://www.fcc.gov/fcc-bin/haat_calculator?dlat=41&mlat=15&slat=26.0&ns=1&dlon=95&mlon=57&slon=48.9&ew=1&nad=27&rcar". The browser's address bar shows the URL, and the search bar contains "verti". The page content includes the FCC logo, navigation links, and a breadcrumb trail: "FCC > MB > Audio Division > HAAT/Contour Calculations". The main heading is "Antenna Height Above Average Terrain Calculations -- Input". The input parameters are: Latitude 41 15 26.0 North, Longitude 95 57 48.9 West (NAD 27), Height of antenna radiation center above mean sea level [RCAMSL] = 506.0 meters, and Number of Evenly Spaced Radials = 8. The results section shows "Calculated HAAT = 176. meters" with a note that it uses 30 second FCC/NGDC terrain data. A table lists "Antenna Radiation Center Heights Above Individual Radials" for various angles from 0.0° to 315.0°. The page footer includes navigation links like "FCC Home", "Search", "RSS", "Updates", "E-Filing", "Initiatives", "Consumers", and "Find People".

Antenna Height Above Average Terrain (HAAT) Results

Audio Division - Windows Internet Explorer

http://www.fcc.gov/fcc-bin/haat_calculator?dlat=41&mlat=15&slat=26.0&ns=1&dlon=95&mlon=57&slon=48.9&ew=1&nad=27&rcar

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Audio Division | Antenna Height Above Average Terrain (HAAT) / Contour Calculations

(202)-418-2700 | FCC > MB > Audio Division > HAAT/Contour Calculations | FCC site map

Antenna Height Above Average Terrain Calculations -- Input

Latitude **41 15 26.0 North**
Longitude **95 57 48.9 West** (NAD 27)

Height of antenna radiation center above mean sea level [RCAMSL] = **506.0** meters

Number of Evenly Spaced Radials = 8 0° is referenced to True North

Results:

Calculated HAAT = 176. meters
(Antenna Height Above Average Terrain)
using the 30 second FCC/NGDC terrain data)

Antenna Radiation Center Heights Above Individual Radials:

0.0°	169.3 meters
45.0°	181.9 meters
90.0°	194.2 meters
135.0°	207.5 meters
180.0°	165.4 meters
225.0°	175.4 meters
270.0°	164.5 meters
315.0°	149.5 meters

[New Antenna Height Above Average Terrain \(HAAT\) calculation?](#)

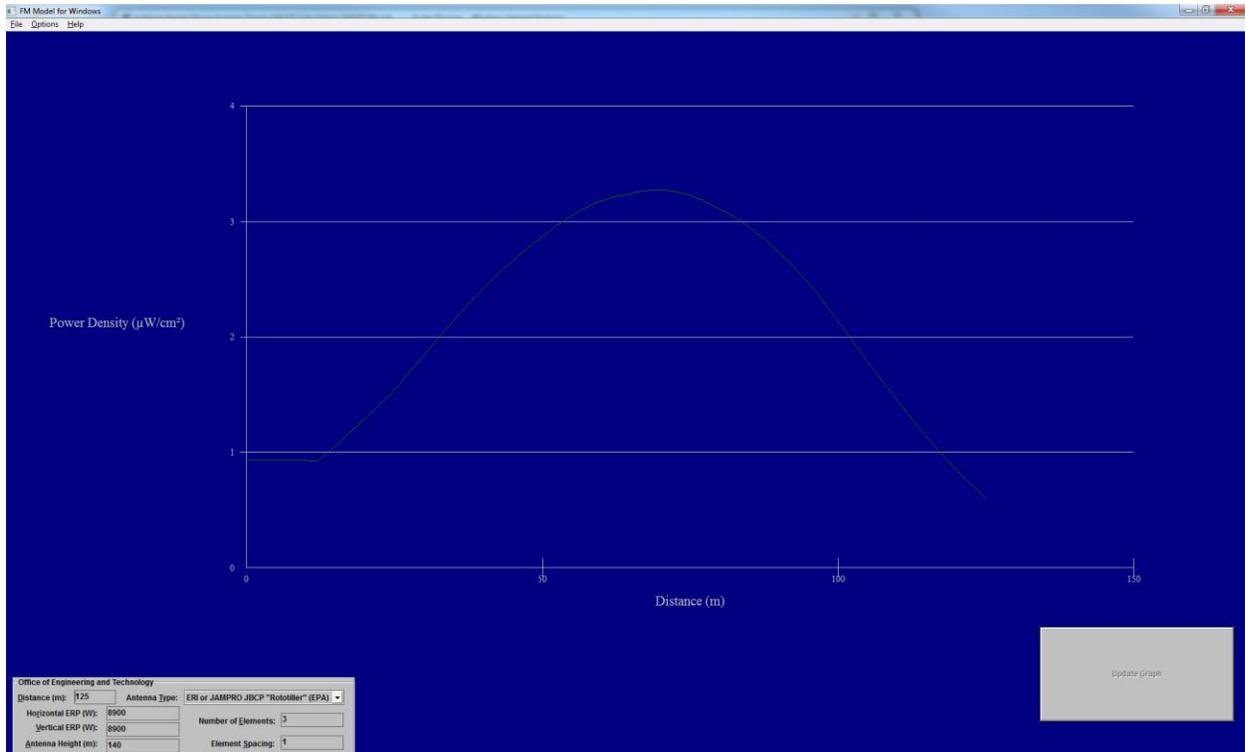
FCC Home | Search | RSS | Updates | E-Filing | Initiatives | Consumers | Find People

Done | Internet | Protected Mode: Off | 100%

Spacing Study

Callsign	Chanl	ERP_w	ARN	Class	Status	Dist_km	Sep	Clr	Comments
KTWI	227	9600	BLH20000217ABU	C3	LIC	7.53	153	-145.5	This Lic
KIOA	227	2800	BLH19980410KG	C	LIC	202.17	237	-34.8	Aux Fac
K229BI	229	92	BLFT20070314ABY	D	LIC	0	0	0	
K224DJ	224	140	BLFT20050202AEQ	D	LIC	0.74	0	0.7	
KKOT	228	100000	BLH19910822KC	C1	LIC	146.89	144	2.9	
KIOA	227	82000	BLH20000207ABQ	C1	LIC	213.55	211	2.6	
KRSS	228	11000	BMLH20080328ABB	C3	LIC	104.99	99	6	
KTGL	225	100000	BLH19871019KB	C1	LIC	106.47	76	30.5	
KMXV	227	35000	BXLH20060403AYS	C0	LIC	261.92	226	35.9	

FM Model Results



Maximum Value of Graph.

The Max Power Density was found to be 3.27386124872948 $\mu\text{W}/\text{cm}^2$ at 69.5 meters.

Note: Graph resolution is 500 points.

OK