

ENGINEERING EXHIBIT

Application for Modification of License

prepared for

HJV Limited Partnership
WIKG(FM) Mercersburg PA
Facility ID 39495
Ch. 221A (92.1 MHz) 4 kW 90 m

HJV Limited Partnership (“HJV”) is the licensee of WIKG(FM), Channel 221A, Mercersburg PA (file number BLH-19960412KB). *HJV* herein seeks a modification of the WIKG license to cover replacement of its nondirectional transmitting antenna and to specify corrected geographic coordinates.

WIKG is licensed to operate with Class A facilities of 4.0 kW effective radiated power (“ERP”) nondirectional at 90 meters antenna height above average terrain (“HAAT”). The antenna has been replaced pursuant to §73.1690(c)(1). The replacement antenna is a Shively model 6813-3R having three elements at one wavelength spacing. The transmitter power output (“TPO”) has been adjusted to 3.0 kW to achieve the authorized ERP of 4.0 kW. Table 1, attached, supplies a summary of the system gains and losses, and provides a determination of the TPO.

Additionally, pursuant to §73.1690(c)(11), a geographic coordinate correction of 2.7 seconds latitude and 1.2 seconds longitude is requested in order to match the coordinates specified in the WIKG tower’s antenna structure registration (“ASR,” number 1027012). The ground elevation at the tower location specified in the ASR is 1.8 meters lower than the WIKG licensed value. No changes to the transmitting antenna’s actual location or height above ground have occurred. The licensed and corrected coordinates and elevation data for WIKG are listed below.

	<u>Licensed WIKG</u>	<u>Corrected WIKG</u>
Latitude N (NAD-83)	39° 48’ 34.3”	39° 48’ 37.0”
Longitude W	77° 48’ 20.9”	77° 48’ 22.1”
Site Elevation (m AMSL)	185	183.2
Antenna C/R (m AGL)	105	105
Antenna C/R (m AMSL)	290	288.2

The antenna radiation center height above ground level is unchanged at 90 meters. While the decrease in ground elevation by 1.8 meters creates a commensurate decrease of antenna height AMSL by 1.8 meters, that change is within the tolerance permitted in §73.1690(c)(1) of 2 meters above and 4 meters below the authorized values.

An allocation spacing summary for the licensed and corrected WIKG site coordinates is provided in Table 2. The geographic coordinate correction corresponds to a distance of 0.08 km. The corrected site location is fully spaced to all authorized full power facilities, proposed stations, and allotments contained in the FCC's LMS database except for WKHL(FM) (Ch. 221A, Palmyra PA) and WERQ-FM (Ch. 222B, Baltimore, MD). The licensed WIKG facility was authorized pursuant to the contour protection rule §73.215. The licensed and corrected WIKG site locations are both 113 km from WKHL and 111 km from WERQ-FM, short of the §73.207 minimum distance separation requirements. The proposed coordinate correction does not raise any allocation issues since a new short-spacing will not be created, the existing §73.215 spacing relationships will not be worsened,¹ and no appreciable change in contour locations will occur.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The WIKG operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. According to the FCC's "FMModel" software analysis² for the replacement antenna (a three element, one wavelength spaced EPA Type-1 "other" antenna type), the maximum RF electromagnetic field near the tower at two meters above ground level attributable to WIKG is 21.3 $\mu\text{W}/\text{cm}^2$, which is 10.7 percent of the general population/uncontrolled maximum permitted exposure limit. No other authorized FM, AM, or TV facilities are located within 2 km of the WIKG site.

The general public will not be exposed to RF levels attributable to WIKG in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker

¹DA 12-122 (letter dated February 2, 2012 regarding BMLH-20110201ACF) clarifies that rounding short-spaced distances to the nearest kilometer does not invoke 73.215 processing for a coordinate correction license modification.

²"Office of Engineering and Technology Announces Updates to FMModel Software," Public Notice, DA 16-340, March 31, 2016. FMModel is available at <https://www.fcc.gov/oet/software/fmmodel>.

safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

This exhibit is limited to the evaluation of exposure to RF electromagnetic field. The proposal involves continued use of a side-mounted transmitting antenna on an existing antenna support structure.

List of Attachments

Table 1	Transmitter Power Output Determination
Table 2	WIKG §73.207 Allocation Spacing Study

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	June 17, 2020	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

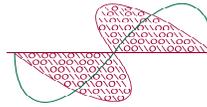


Table 1

**Transmitter Power Output Determination
Antenna / Line System Gains and Losses**

prepared for

HJV Limited Partnership

WIKG(FM) Mercersburg PA

Facility ID 39495

Modification of License for Replacement Nondirectional Antenna

License File Number: BLH-19960412KB

Authorized Effective Radiated Power: 4.0 kW

Antenna System

Shively 6813-3R Power Gain: 1.56
3 elements, 1 wavelength spacing

Antenna Input Power: 2.56 kW

Line and Other Losses

Transmission Line Efficiency: 85.9%
RFS HCA158-50J 1-5/8" coax (358 ft length)

Other Losses
None

Transmitter Power Output: 2.985 kW
Rounded per §73.212: 3.0 kW

Table 2

WIKG §73.207 Allocation Spacing Study

prepared for

HJV Limited Partnership

WIKG(FM) Mercersburg PA



Corrected WIKG (FM)

REFERENCE 39 48 37.0 N. CLASS = A Int = A DISPLAY DATES DATA 06-16-20
 77 48 22.1 W. Current Spacings to 3rd Adj. SEARCH 06-16-20
 ----- Channel 221 - 92.1 MHz -----

Call	Channel	Location	Azi	Dist	FCC	Margin
WIKG	LIC	221A	Mercersburg PA	161.1	0.08	115.0 -114.9
WKHL	LIC	221A	Palmyra PA	54.6	112.51	115.0 -2.5
WERQ-FM	LIC	222B	Baltimore MD	117.9	111.06	113.0 -1.9
WFWM	LIC	220B1	Frostburg MD	255.1	97.01	96.0 1.0
WJHT	LIC	221A	Johnstown PA	302.3	118.14	115.0 3.1
WGTS	LIC	220B	Takoma Park MD	150.2	117.38	113.0 4.4
WZXH	LIC	219A	Hagerstown MD	166.7	39.86	31.0 8.9
WINC-FM	LIC	223B	Winchester VA	191.2	96.69	69.0 27.7
WBJC	LIC	218B	Baltimore MD	116.7	103.65	69.0 34.7
WSQV	LIC	221A	Lock Haven PA	10.1	150.72	115.0 35.7
WSQV	CP	221A	Lock Haven PA	10.1	150.72	115.0 35.7
WSQV	LIC	221A	Lock Haven PA	10.2	150.87	115.0 35.9
WMMH	LIC	220A	Houtzdale PA	337.0	111.15	72.0 39.2
WJSM-FM	LIC	224A	Martinsburg PA	319.2	79.10	31.0 48.1

Licensed WIKG (FM)

REFERENCE 39 48 34.3 N. CLASS = A Int = A DISPLAY DATES DATA 06-16-20
 77 48 20.9 W. Current Spacings to 3rd Adj. SEARCH 06-16-20
 ----- Channel 221 - 92.1 MHz -----

Call	Channel	Location	Azi	Dist	FCC	Margin
WIKG	LIC-N	221A	Mercersburg PA	90.0	0.00	115.0 -115.0
WKHL	LIC-N	221A	Palmyra PA	54.5	112.54	115.0 -2.5
WERQ-FM	LIC-D	222B	Baltimore MD	117.8	111.00	113.0 -2.0
WFWM	LIC-N	220B1	Frostburg MD	255.2	97.01	96.0 1.0
WJHT	LIC	221A	Johnstown PA	302.3	118.21	115.0 3.2
WGTS	LIC	220B	Takoma Park MD	150.2	117.29	113.0 4.3
WZXH	LIC-D	219A	Hagerstown MD	166.7	39.77	31.0 8.8
WINC-FM	LIC	223B	Winchester VA	191.3	96.61	69.0 27.6
WBJC	LIC-D	218B	Baltimore MD	116.7	103.59	69.0 34.6
WSQV	LIC	221A	Lock Haven PA	10.1	150.80	115.0 35.8
WSQV	CP	221A	Lock Haven PA	10.1	150.80	115.0 35.8
WSQV	LIC	221A	Lock Haven PA	10.2	150.94	115.0 35.9
WMMH	LIC-N	220A	Houtzdale PA	337.0	111.24	72.0 39.2
WJSM-FM	LIC-N	224A	Martinsburg PA	319.3	79.18	31.0 48.2