

**August 2021
New FM Channel 231A
Boardman, Oregon
Allocation Study**

Background

The instant application is being filed by the winning bidder for the Channel 231C3 allotment at Boardman, Oregon, offered as Permit MM-FM1096-C3 in FM Auction #109. This application proposes a one-step downgrade to Channel 231A.

Spacing Study

The attached spacing study shows that the proposed transmitter site meets the co-channel and adjacent channel spacing requirements for Class A stations as prescribed in §73.207 of the Commission's Rules.

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SEARCH PARAMETERS FM Database Date: 20210806

Channel: 231A 94.1 MHz Page 1

Latitude: 45 52 36.1 (NAD83)

Longitude: 119 48 12.4

Safety Zone: 32 km

Job Title: BOARDMAN 231A

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KQFM LIC	HERMISTON OR	BLH-20160310AAS	229A 93.7	5.300 94.0	45 51 56.5 119 18 46.1	91.7	38.12 7.12	31 CLOSE
K230BW LIC	KENNEWICK WA	BLFT-20160509ABI	230D 93.9	0.250 0.0	DA 46 14 7.4 119 19 17.0	42.8	54.60 0.00	0 TRANS
KCLK-FM LIC	CLARKSTON WA	BLH-19831227AC	231C0 94.1	100.000 376.0	46 27 26.6 117 6 6.6	71.8	218.41 3.41	215 CLOSE
ALC	BOARDMAN OR		231C3 94.1	0.000 0.0	45 53 50.5 119 55 25.1	283.9	9.61 -132.39	142 SHORT
K231CT LIC	WALLA WALLA WA	BLFT-20160802AAT	231D 94.1	0.155 0.0	DA 46 1 24.0 118 21 21.0	81.2	113.42 0.00	0 TRANS
KSWD LIC	SEATTLE WA	0000153511	231C 94.1	73.000 698.0	47 30 16.7 121 58 7.8	318.4	245.33 19.33	226 CLEAR
K232CB LIC	PENDLETON OR	BLFT-19860327TZ	232D 94.3	0.009 0.0	45 40 3.4 118 46 55.9	106.0	82.77 0.00	0 TRANS
KSAE-LP LIC	KENNEWICK WA	BLL-20151009ABR	232L1 94.3	0.100 16.7	46 17 14.4 119 11 13.0	45.9	66.01 0.00	0 LPFM
KATS LIC	YAKIMA WA	BLH-19840625CS	233C1 94.5	100.000 277.0	46 31 58.4 120 30 18.2	323.8	90.84 15.84	75 CLEAR

===== END OF FM SPACING STUDY FOR CHANNEL 231 =====

**August 2021
New FM Channel 231A
Boardman, Oregon
RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 231A (94.1 MHz) with an effective radiated power of 2 kilowatts. Operation is proposed with a four-element half-wave-spaced, omnidirectional antenna which will be mounted on a tower on Canoe Ridge, a hilltop which is across the Columbia River from Boardman.

The proposed antenna support structure will not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

DETERMINATION Results							
PASS SLOPE(100:1): NO FAA REQ-RWY MORE THAN 10499 MTRS & 6622.69 MTRS (6.6227 KM) AWAY							
Type	C/R	Latitude	Longitude	Name	Address	Lowest Elevation (m)	Runway Length (m)
AIRP	R	45-49-3.00N	119-48-48.00W	BOARDMAN	MORROW BOARDMAN, OR	111.7	1280.2
Your Specifications							
NAD83 Coordinates							
Latitude						45-52-36.1 north	
Longitude						119-48-12.4 west	
Measurements (Meters)							
Overall Structure Height (AGL)						15.2	
Support Structure Height (AGL)						15.2	
Site Elevation (AMSL)						253	
Structure Type							
LTOWER - Lattice Tower							

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

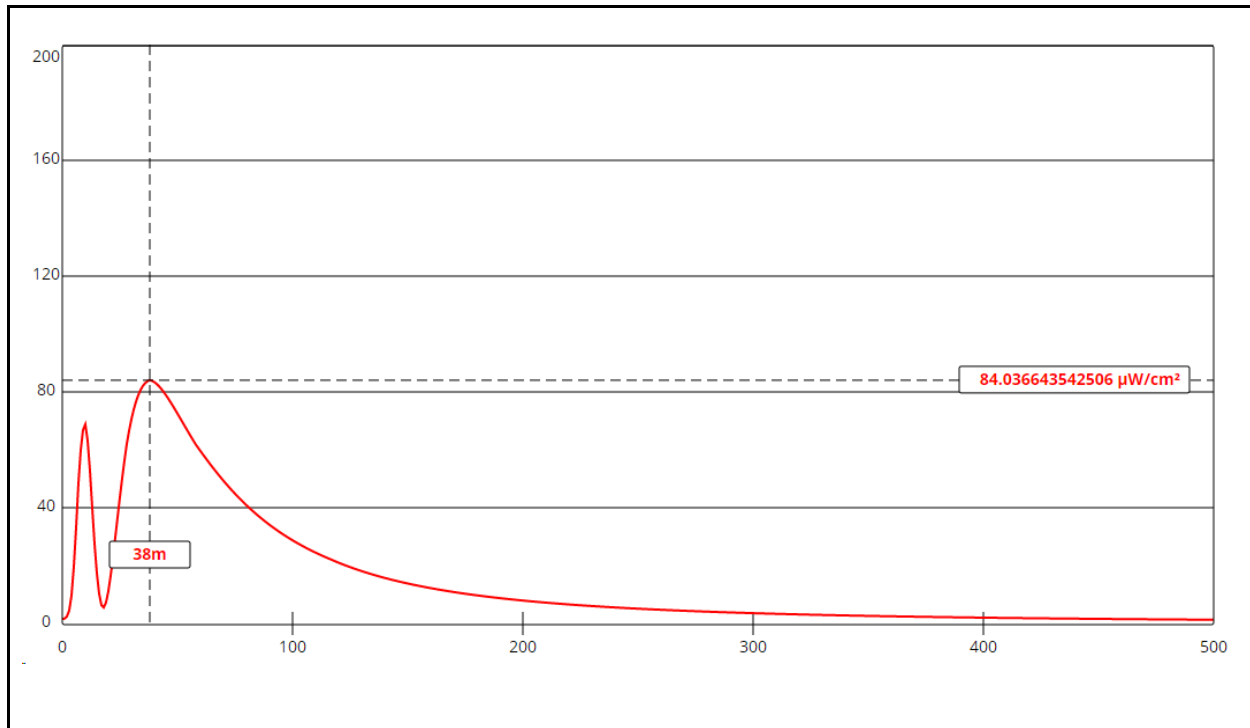
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the ground-level power density produced by the proposed antenna system assume a Type 2 element pattern, which is the appropriate element pattern for the Nicom BKG77 antenna to be used. The highest calculated ground level power density occurs at a distance of 38 meters from the base of the antenna support structure. At this point the power density is calculated to be 84.0 $\mu W/cm^2$, which is 42% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

The antenna will be installed on a tower which is adjacent to a building which is used for storage and wireless internet service. The building is on private property, but is not a residence or office, and aside from its utility functions it is not regularly occupied. An uncontrolled exterior staircase is used to access the second floor. Accordingly, an additional calculation has been made of the power density at the second floor level, i.e. 10 feet higher than ground level. The highest calculated second-floor-level power density occurs at a distance of 27 meters from the base of the antenna support structure. At this point the power density is calculated to be 168.8 $\mu W/cm^2$, which is 84.4% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).¹

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

¹ 27 meters is farther than the farthest point of the building from the tower. The farthest point of the building is approximately 15 meters from the tower. Within a 15 meter radius of the tower the highest calculated second-floor-level power density is 153.1 $\mu W/cm^2$, which is 76.6% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).



Ground-Level RF Exposure

OET FMModel

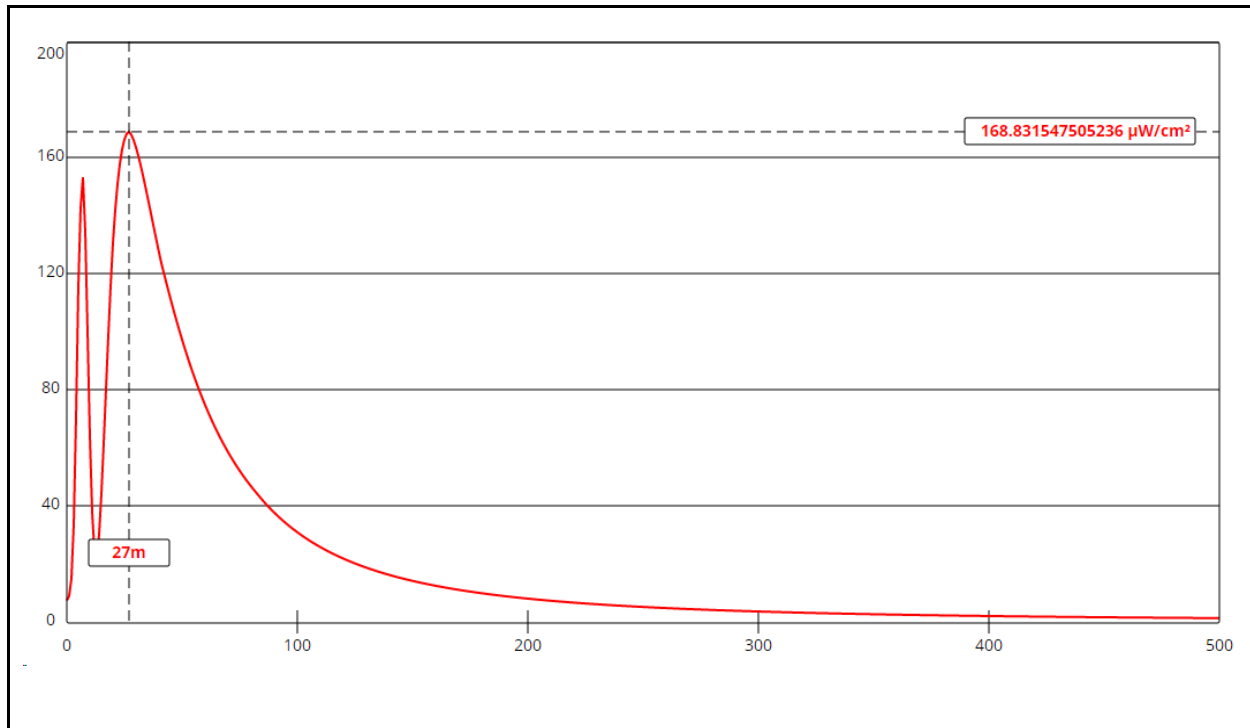
New 231A Boardman

Antenna Type: Nicom BKG77-4 half wave (Type 2)
No. of Elements: 4
Element Spacing: 0.5 wavelength

Distance: 500 meters
Horizontal ERP: 4.8 kW
Vertical ERP: 4.8 kW

Antenna Height: 12.2 meters AGL

Maximum Calculated Power Density is 84.0 $\mu\text{W}/\text{cm}^2$ at 38 meters from the antenna structure.



Second Floor-Level RF Exposure

OET FMModel

New 231A Boardman

Antenna Type: Nicom BKG77-4 half wave (Type 2)

No. of Elements: 4

Element Spacing: 0.5 wavelength

Distance: 500 meters

Horizontal ERP: 4.8 kW

Vertical ERP: 4.8 kW

Antenna Height: 9.2 meters above second floor level

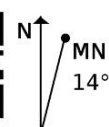
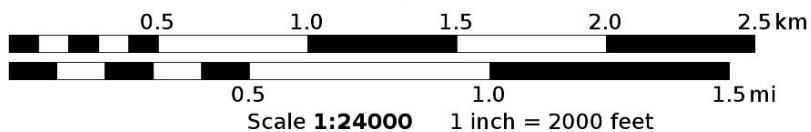
Maximum Calculated Power Density is 168.8 $\mu\text{W}/\text{cm}^2$ at 27 meters from the antenna structure.



Mercator Projection

WG584

USNG Zone 11TKL



Hatfield & Dawson Consulting Engineers

