

**September 2014**  
**FM Booster KGZG-FM1**  
**Spokane, Washington Channel 283D**  
**Allocation Study**

The instant application is being filed in order to modify the licensed KGZG-FM1 booster antenna license, to change to a new transmitter site.

Contours in this application have been calculated using terrain data extracted from the 3-second terrain database.

The attached spacing study shows the spacing between the proposed booster site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. There are no first-adjacent channel stations or authorizations close enough to required detailed allocation study maps.

The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

## =====

SEARCH PARAMETERS FM Database Date: 140829  
 Channel: 283A 104.5 MHz Page 1  
 Latitude: 47 41 54  
 Longitude: 117 24 40  
 Safety Zone: 50 km  
 Job Title: KGZG-FM1 DIVISION ST

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KDRKaux LIC	SPOKANE WA	BXLH-71105AEY	229C 93.7	0.300 413.0	47-34-38 117-17-54	147.9	15.91 0.00	0 AUX
KDRK-FM LIC	SPOKANE WA	BLH-40728AFM	229C 93.7	64.000 739.0	47-34-14 117-04-55	119.8	28.53 -0.47	29 SHORT
NOTE: SEPARATION ROUNDS TO NEAREST WHOLE KILOMETER TO SATISFY SPACING REQUIREMENT								
KBBB LIC	SPOKANE WA	BLH-20802AAS	280C1 103.9	39.000 432.0	47-36-04 117-17-53	141.9 SS	13.75 -61.25	75 SHORT
KHTR LIC	PULLMAN WA	BLH-870112KB	282C1 104.3	24.000 509.0	46-48-40 116-54-55	159.0	105.54 -27.46	133 SHORT
K283AT LIC	WALLACE ID	BLFT-70829ADY	283D 104.5	0.005 1031.0	47-33-49 115-50-01	96.6	119.50 0.00	0 TRANS
KGZG-FM2 CP	COLVILLE WA	BNPFTB-40409ABB	283D 104.5	1.000 0.0	DA 48-34-23 117-53-46	339.9	103.75 0.00	0 BOOST
KGZGaux CP	NEWPORT WA	BXPB-40117ABH	283C1 104.5	0.150 129.0	47-44-22 117-25-57	340.7	4.84 0.00	0 AUX
KGZGaux LIC	NEWPORT WA	BXLH-50914ABW	283C1 104.5	4.000 79.0	DA 47-41-52 117-31-07	269.6	8.07 0.00	0 AUX
KGZG-FM LIC	NEWPORT WA	BLH-31017ACO	283C1 104.5	87.000 319.0	DA 48-23-09 117-14-15	9.5	77.53 -122.47	200 SHORT
ABSOLUTE MINIMUM 73.215 SPACING = 178 KM								
KGZG-FM1 CP	SPOKANE WA	BPFTB-40106DQV	283D 104.5	0.150 0.0	47-44-22 117-25-57	340.7	4.84 0.00	0 BOOST
KGZG-FM1 LIC	SPOKANE WA	BLFTB-00419ABF	283D 104.5	2.000 0.0	DA 47-42-03 117-30-22	272.3	7.14 0.00	0 BOOST
K284BW LIC	MOSCOW ID	BLFT-31028ARY	284D 104.7	0.100 586.0	DA 46-48-40 116-54-55	159.0	105.54 0.00	0 TRANS
KEEH LIC	SPOKANE WA	BLED-21121AAW	285C1 104.9	10.500 472.0	47-34-45 117-17-51	147.2 SS	15.76 -59.24	75 SHORT

===== END OF FM SPACING STUDY FOR CHANNEL 283 =====

**September 2014**  
**FM Booster KGZG-FM1**  
**Spokane, Washington Channel 283D**  
**RF Exposure Study**

**Facilities Proposed**

The proposed booster operation will be on Channel 283D (104.5 MHz) with an effective radiated power of 365 watts. Operation is proposed with an antenna to be mounted on a tower extending above the top of an existing building.

The antenna support structure does not exceed 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.

**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 1000 meters. Values past this point are increasingly negligible.

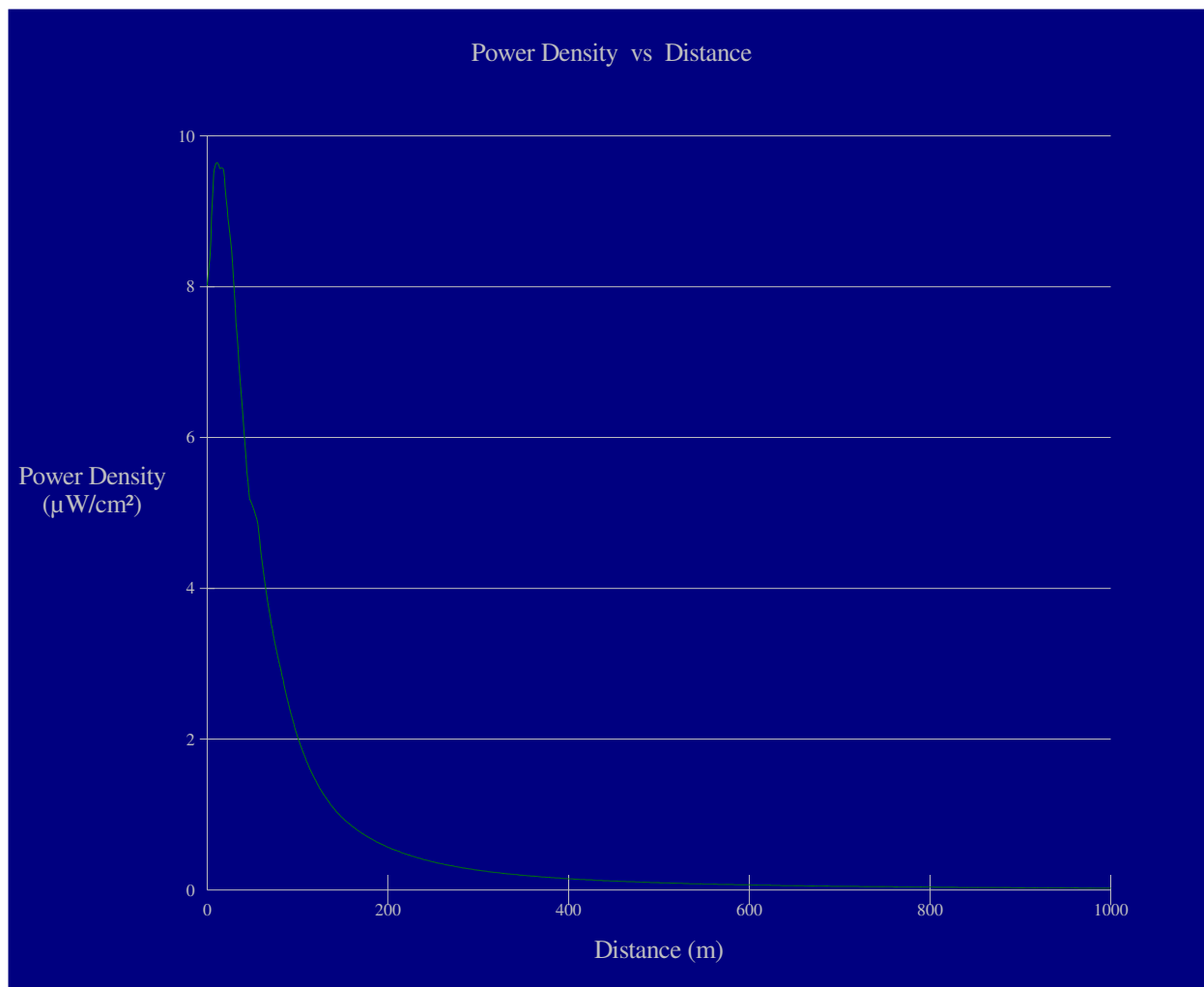
Since the Commission does not recognize the Nicom BKG-77 antenna as a "Type 2" antenna for use with FMModel, calculations of the power density produced by the proposed booster antenna system have been made using the "worst case" element pattern for a "ring stub" antenna.

The highest calculated ground level power density from the booster occurs at a distance of 11 meters from the base of the antenna support structure. At this point the power density is calculated to be 9.6  $\mu W/cm^2$ , which is 4.8% of 200  $\mu W/cm^2$  (the FCC standard for uncontrolled environments).

The antenna will be installed on a tower on a building rooftop, such that the antenna will be located 35 feet above the rooftop. The highest calculated rooftop level power density from the booster occurs at a distance of 2 meters from the base of the antenna support structure. At this point the power density is calculated to be 197.6  $\mu W/cm^2$ , which is 98.8% of 200  $\mu W/cm^2$  (the FCC standard for uncontrolled environments).

Hatfield & Dawson Consulting Engineers

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.



## Ground-Level RF Exposure

## OET FMModel

### KGZG-FM1 Spokane

Antenna Type: Nicom BKG77-1

No. of Elements: 1

Element Spacing: dna

Distance: 1000 meters

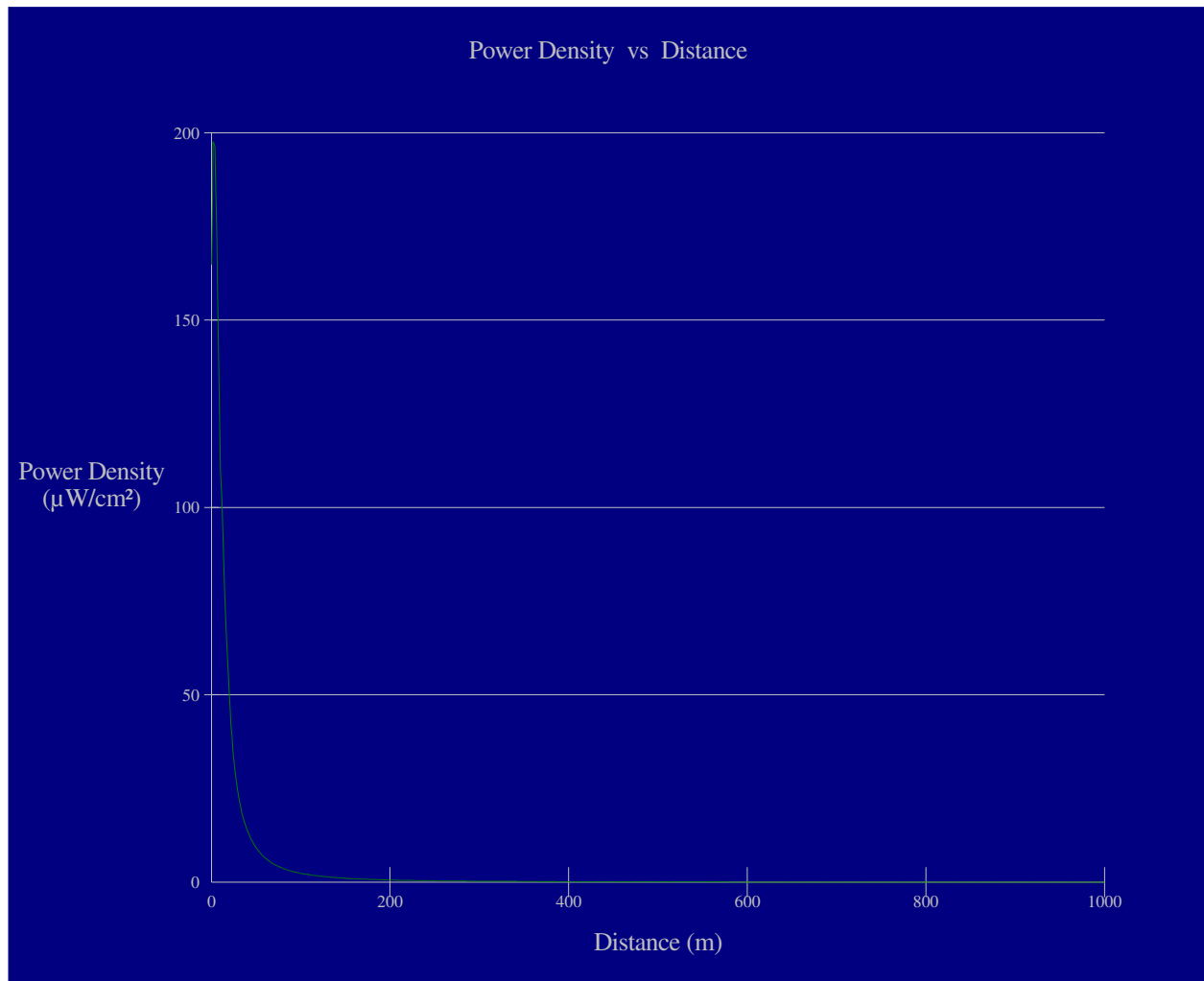
Horizontal ERP: 365 W

Vertical ERP: 365 W

Antenna Height: 41 meters AGL

Maximum Calculated Power Density is  $9.6 \mu\text{W}/\text{cm}^2$  at 11 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers



## Rooftop-Level RF Exposure

OET FMModel

### KGZG-FM1 Spokane

Antenna Type: Nicom BKG77-1  
No. of Elements: 1  
Element Spacing: dna

Distance: 1000 meters  
Horizontal ERP: 365 W  
Vertical ERP: 365 W

Antenna Height: 10.6 meters (35 feet) above the rooftop

Maximum Calculated Power Density is 197.6  $\mu\text{W}/\text{cm}^2$  at 2 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers