

**BNPFT-20170801AGF**

**Baraboo, Wisconsin**

**Application for New FM Translator**

**On Channel 247**

**by**

**Magnum Communications, Inc.**

**Exhibit 17**

**Nonionizing Electromagnetic Radiofrequency Radiation Analysis**

**November 2017**

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Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Exhibit 17, Nonionizing Electromagnetic Radiofrequency Radiation Analysis, for Magnum Communications, Inc., and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



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30 November 2017

### Narrative

This Exhibit supports an application for a new FM translator, file number BNPFT-20170801AGF, Baraboo, Wisconsin. The application proposes fill-in service with AM station WRDB, Reedsburg.

This Exhibit shows that the proposed operation is in compliance with nonionizing electromagnetic radiation regulations. The proposed antenna radiation center is 30 meters (98 feet) above ground level and 20 meters (66 feet) above adjacent roof level. This analysis addresses roof level. At ground level, the power density will be less.

### Radio Frequency Radiation Evaluation

The proposed BNPFT-20170801AGF facilities, when evaluated under worst case methods in OET-65<sup>1</sup>, will create 0.051 mW/cm<sup>2</sup> two meters above roof level. That power density is in compliance with the public/uncontrolled limits at 26% of the limit.

A Nicom BKG1/P antenna, using slant polarization, is proposed which reduces the power density at ground level.

The antenna elevation pattern is provided as Figure 1.

The site was also evaluated using FM Model<sup>2</sup>, a program available on the FCC web site. That program evaluates near field effects, using data measured by the EPA. The current version includes more detailed calculations in areas near the antenna than prior versions. There is no specific antenna which matches the vertical dipole antenna proposed, so the EPA Type 1:

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<sup>1</sup>Cleveland, Robert F., Jr., Sylvar, David M., and Ulcek, Jerry L., *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65, Edition 97-01*.

<sup>2</sup> See <https://www.fcc.gov/general/fm-model>.

Ring-and-stub or “Other” antenna model was used to provide the worst case prediction. The output of FM Model is provided as Figure 2. FM Model calculates a maximum power density of  $39.2 \mu\text{W}/\text{cm}^2$  ( $0.0392 \text{ mW}/\text{cm}^2$ ) which is 20% of the general population/uncontrolled limit.

### Summary

Under worst case assumptions, the proposed BNPFT-20170801AGF power density is 26% of the general population/uncontrolled exposure at roof top near the base of the tower, well under the general population /uncontrolled exposure limit.

Figure 1: Nicom BKG1/P Vertical Pattern

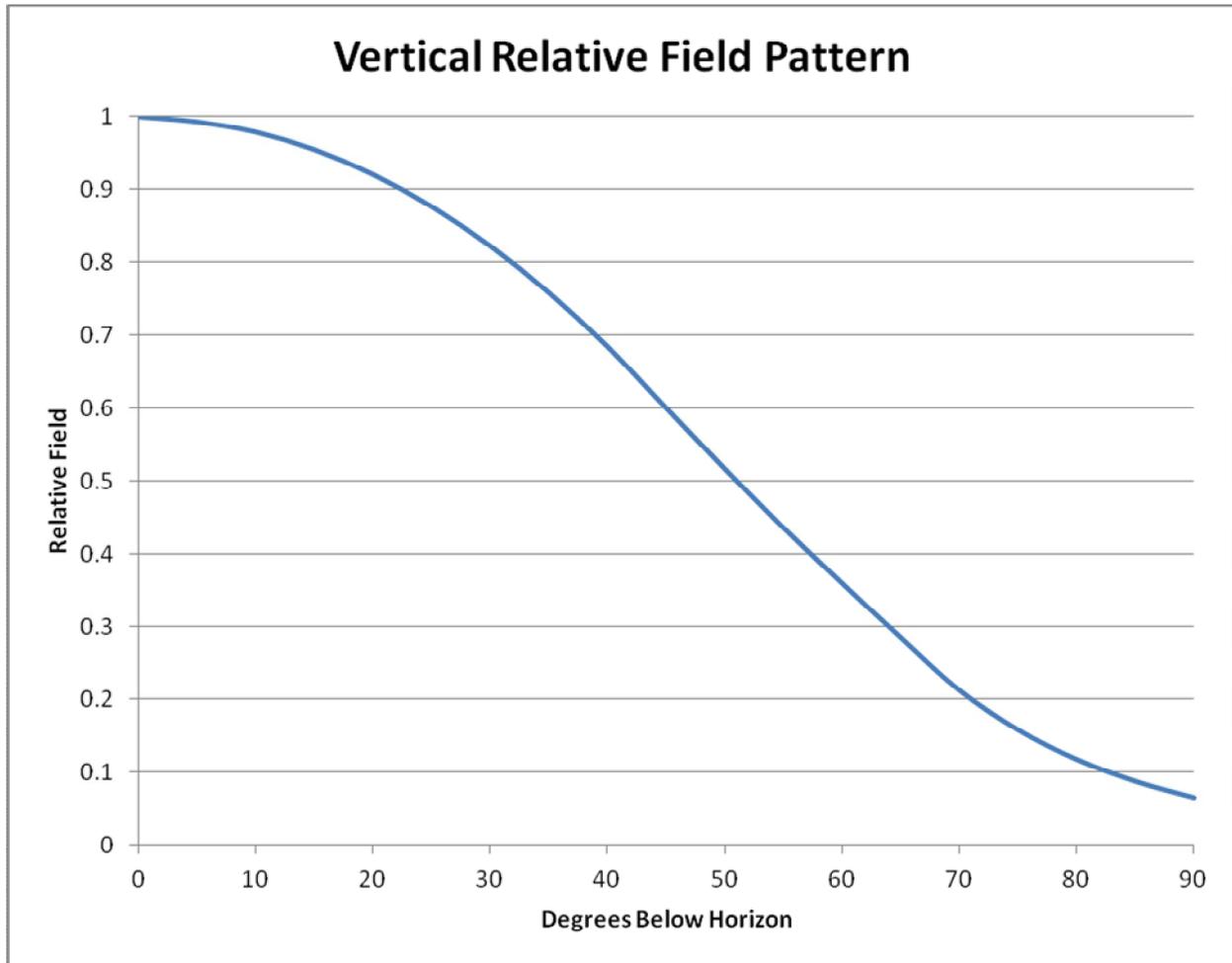


Figure 2: FM Model Output

