

# ***TECHNICAL EXHIBIT APPLICATION FOR LICENSE***

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FM Translator Station W252CY  
0.055 kW ERP ND / 95.3 MHz  
Anderson, Indiana

INTER-MIRIFICA, INC.

May 2021

## **APPLICATION FOR LICENSE**

The following engineering statement has been prepared for **Inter-Mirifica, Inc.** ("IMI"), licensee of FM translator station W252CY at Anderson, Indiana, and are in support of their application for license to cover authorized changes to the facility.<sup>1</sup> This application is being filed to cover the construction permit assigned LMS File No. 0000144190. This permit authorized a reduction in the maximum effective radiated power of the translator as it was being converted from a fill-in translator to a non-fill-in translator, and the ERP reduction was necessary for compliance with Section 74.1235 of the Commission's Rules.

The referenced construction permit authorizes operation on FM channel 252, 95.3 MHz, with a maximum effective radiated power of 55 Watts at a center of radiation of 321.3 meters above mean sea level, 56.1 meters above ground level, utilizing a non-directional antenna. The antenna utilized by the facility is unchanged from that authorized under the original license for the facility, which is a Propagation Systems, Inc. ("PSI"), model PSIFML-3/0.625.<sup>2</sup> The only activity required to complete construction of the facility was a reduce the transmitter power output to 81 Watts, which as will be subsequently demonstrated, achieves the authorized effective radiated power of 55 Watts.

The construction permit, as issued, listed one special condition or restriction. This condition pertains to the submission of this application for license. Under this condition, it is required that this license application be on file prior to the commencement of program tests. IMI will commence

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<sup>1</sup> The Facility ID for W252CY at Anderson, Indiana is 143533.

<sup>2</sup> See FCC File No. BLFT-20160728ACI.

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operation of the translator under automatic program test authority with the authorized parameters upon submission of this license application.

The specified transmitter power output achieves the authorized effective radiated power. The antenna utilized by the facility has a power gain of 1.10 at the W252CY frequency of operation. To achieve the authorized effective radiated power of 55 Watts, the input power to the antenna is 50 Watts.

Ahead of the antenna is the main run of transmission line, which consists of 349 feet of Andrew/Commscope AVA5-50FX. Manufacturer data provides an insertion loss for this line at the frequency of operation at 0.351 dB per 100 feet of length. The total run of line has an insertion loss of 1.225 dB, which corresponds to an efficiency of 75.42 percent. The input to this run of line to achieve the authorized effective radiated power is 66.3 Watts.

Immediately preceding this main run of transmission line is an Andrew/Commscope FSJ4-50B jumper that is three feet in length. The insertion loss of this jumper, based on manufacturer data, is 0.06 dB at the frequency of operation. This corresponds to an efficiency of 98.63 percent. The input power to the jumper to achieve the authorized effective radiated power is 67.2 Watts.

The input side of this jumper is connected to a Polyphaser lightning protection device. The manufacturer specified insertion loss of this device is 0.1 dB, which equates to an efficiency of 97.72 percent. The input power to the Polyphaser to achieve the authorized effective radiated power is 68.8 Watts.

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Ahead of the Polyphaser is a second Andrew/Commscope FSJ4-50B jumper. Thus, jumper is fifteen feet in length, and has a manufacturer specified insertion loss of 0.19 dB. This insertion loss corresponds to an efficiency of 95.72 percent. The input power to this jumper to achieve the authorized effective radiated power is 71.9 Watts.

Preceding this jumper is the combiner system. The measured insertion loss of the combiner at the operating frequency of 98.3 MHz is 0.2533 dB. This insertion loss corresponds to an efficiency of 94.33 percent. The input power to the combiner to achieve the authorized effective radiated power is 76.2 Watts.<sup>3</sup>

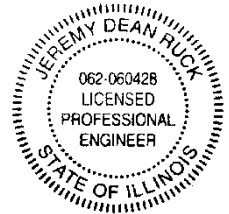
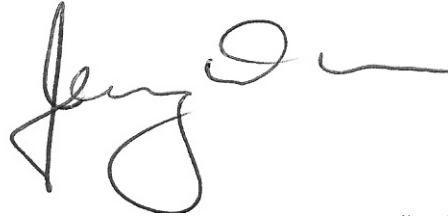
Between the combiner and the transmitter is a third Andrew/Commscope FSJ4-50B jumper, which is 25 feet in length. Manufacturer data indicates the insertion loss of this jumper is 0.29 dB. This insertion loss corresponds to an efficiency of 93.54 percent. The input power to this jumper to achieve the authorized effective radiated power is 81.4 Watts, which rounds to 81 Watts. Since the input to this jumper is the output of the translator, it is demonstrated that the specified transmitter power achieves the authorized effective radiated power.

The facility utilizes a non-directional antenna. This antenna has been installed in accordance with the instructions of the manufacturer.

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<sup>3</sup> W252CY shares an antenna system with co-located FM translator W279CL (Facility ID 142530) also at Anderson, Indiana.

The preceding statement has been prepared by me, or under my direction, and is true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature  
License Expires November 30, 2021

Jeremy D. Ruck, PE  
May 21, 2021

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