

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

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FM Translator Station W284DN  
0.250 kW ERP / 104.7 MHz  
Jerseyville, Illinois

DJ TWO RIVERS RADIO, INC.

July 2021

## *APPLICATION FOR LICENSE*

The following engineering statement has been prepared for **DJ Two Rivers Radio, Inc.** ("DJ"), permittee of FM translator station W284DN at Jerseyville, Illinois, and is in support of their application for license to cover the initial construction of that facility. This application is being filed to cover the construction permit assigned FCC File No. BNPFT-20180418AGN. The Facility ID for W284DN is 202598.

The referenced construction permit authorized operation on FM channel 284, 104.7 MHz, with an effective radiated power of 250 Watts at a center of radiation of 245 meters above mean sea level, 50 meters above ground, utilizing an Electronics Research, Inc. ("ERI"), model LPX-2E-HW antenna, that is slightly directional. The facility has been constructed in accordance with the parameters specified in the construction permit application.

The construction permit as issued by the Commission, lists four special conditions or restrictions.

The first condition pertains to RF radiation safety at the site. DJ certifies that it will coordinate with all other users of the site to ensure that persons are not exposed to levels of RF radiation in excess of the applicable safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation, as necessary.

The second special condition or restriction pertains to program test authority, and this license application. Under this condition DJ is required to have this application for license on file

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with the Commission prior to the commencement of program tests. DJ will commence operation under program test authority once this application is filed with the Commission.

Under the third condition, DJ is required to perform and submit a partial proof of performance for AM station WJBM at Jerseyville, Illinois.<sup>1</sup> The partial proof of performance on this station has been completed, however, the data has not yet been provided to the undersigned engineer for submission to the Commission. It has been relayed to the undersigned engineer that the addition of the antenna and transmission line for W28DN to the WJBM array element has made no substantial difference to the directional pattern. The partial proof of performance will be submitted as an amendment to this license application, and DJ is cognizant of the fact that a grant of the license will not occur until after this partial has been filed.

The final special condition or restriction pertains to the Commission's *AM Revitalization* efforts. Under this condition, DJ is advised, among other things, that this translator is tied to the primary station, WJBM, in perpetuity, and that this translator may only be assigned or transferred in conjunction with the authorization for the primary station. DJ is cognizant of all requirements or restrictions under this condition, and will abide by the same.

The specified transmitter power output achieves the authorized effective radiated power. The antenna authorized and installed is an Electronics Research, Inc. ("ERI") model LPX-2E-HW antenna. This is a two-bay antenna, with full wave spacing between the bays. This slightly directional antenna has a numerical power gain of 0.717. The input power to this antenna to

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<sup>1</sup> The Facility ID for WJBM at Jerseyville, Illinois is 23265.

achieve the authorized effective radiated power is 348.7 Watts. This antenna has been installed in accordance with the instructions of the manufacturer.

Preceding the antenna is the vertical run of transmission line, which consists of 160 feet of Andrew LDF4-50B, which is a semi-flexible coaxial cable with a nominal diameter of one-half inch. The insertion loss, including connectors, for this run of line is 1.12, which translates to an efficiency of 77.27 percent. The input power to this run of transmission line to achieve the authorized effective radiated power is 451.2 Watts.

Ahead of the vertical run of transmission line is a Kintronic Labs FMC 1.5 isocoupler. Data from the manufacturer lists the insertion loss of the isocoupler at 0.2 dB. This value corresponds to an efficiency of 95.50 percent. The input power to the isocoupler to achieve the authorized effective radiated power is 472.5 Watts.

Preceding the isocoupler is the horizontal run of transmission line to the transmitter building. This section of line is comprised of 195 feet of Andrew LDF4-50B. The insertion loss of this run of line based on data from the manufacturer is 1.35 dB. This corresponds to an efficiency of 73.3 percent. The input power to the horizontal run to achieve the authorized effective radiated power is 644.8 Watts.

Between the transmitter and the horizontal run of transmission line is a jumper cable, which consists of 10 feet of superflexible FSJ4-50B coaxial cable. The insertion loss of this jumper cable is 0.14 dB. This value corresponds to an efficiency of 98.63 percent. The input power to the jumper to achieve the authorized effective radiated power is 665.9 Watts, which rounds to 0.666

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kW. The input to the jumper cable is the output of the transmitter. Thus, the specified transmitter power output achieves the authorized effective radiated power.

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  
July 8, 2021

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