Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

Engineering Exhibit For
Carthage Broadcasting Company, Inc.
K228FS
Carthage, Missouri
April 2020

K228FS Transmitter Power Output Calculation

Frequency = 93.5 MHz
ERP = 250 watts
ERI LPX-1E Antenna gain = 0.4611
436 feet 7/8" foam Heliax = 0.6792
Bandpass filter = 0.9550

TPO = 250 / 0.4611 / 0.6792 / 0.9550 = **836 watts**

Special Operating Condition Responses

Construction permit BNPFT-20171204ACC contains three special operating conditions, all of which are met.

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 electromagnetic fields in excess of FCC guidelines.

The tower is fenced to prevent casual access and warning signs are posted. The transmitter power will be reduced as necessary to protect workers near the antenna.

2 Prior to commencing program test operations, FM Translator or FM Booster permittee must have on file at the Commission, FCC Form 350, Application for an FM Translator or FM Booster Station License, pursuant to 47 C.F.R. Section 74.14.

This is the required filing for covering license.

3 The AM station identified below may be affected by the facilities authorized by this construction permit. Pursuant to Section 1.30004 of the Commission's Rules, at least 30 days prior to commencement of construction of the facilities authorized herein, the permittee must provide notification of the construction to the AM station licensee. As part of this notification, the permittee must examine the potential impact of the construction of the authorized facilities on the AM station using a moment method analysis. The analysis shall consist of a model of the AM antenna together with the potential re-radiating tower in a lossless environment. The model shall employ the methodology specified in Section 73.151(c) of the Commission's Rules, except that the AM antenna element may be modeled as a series of thin wires driven to produce the required radiation pattern, without any requirement for measurement of tower impedances. If the construction distorts the AM station nondirectional radiation pattern by more than 2 dB, the permittee is responsible for the installation and maintenance of any detuning apparatus

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necessary to restore proper operation of the nondirectional antenna. (See Section 1.30002 of the Commission's Rules.) The permittee must submit confirmation of completion of these notice and analysis requirements in the application for license to cover this construction permit. If the facilities authorized by this Construction Permit do not result in a significant modification of the existing tower specified as defined in Section 1.30002(d) of the Commission's Rules, the permittee shall submit a certification and any necessary evidence supporting that certification in the Application for License.

Station KDMO(AM), Carthage, MO, Fac. ID No. 9216.

Station KDMO operates fulltime with a nondirectional antenna, is owned and operated by the K228FS permittee Carthage Broadcasting Company, Inc. and no formal notification was necessary as the same personnel are involved with both facilities. The K228FS tower (ASRN 1003528) was constructed in 1966 and no changes were made to it other than the installation of the single-bay ERI antenna. This tower is grounded and an existing length of 7/8" foam coax already on the tower was re-purposed for the translator. Section §1.30002(a) of the Rules states *"[p]roponents of construction or significant modification of a tower which is within one wavelength of a nondirectional AM station, and is taller than 60 electrical degrees at the AM frequency, must notify the AM station at least 30 days in advance of the commencement of construction."* Using the FCC's online program "Distance and Azimuths Between Two Sets of Coordinates" the subject tower (ASRN 1003528) is 207 meters from the KDMO tower (ASRN 1003304), 370.1° at the assigned KDMO frequency of 1490 KHz, and is therefore *"presumed to have no significant effect on"* KDMO per §1.30002(g).

Distance between:	37 10 58.0 N Latitude,	94 21 44.0 W Longitude (Point 1)
	37 10 57.9 N Latitude,	94 21 35.6 W Longitude (Point 2)

Distance = 0.207 km (0.129 miles)

via the method in Sections 73.208 and 73.611(d)
This method is only suitable for distances up to 475 km (295 miles).

Azimuth, Point 1 to Point 2: 90.86 ° True
Azimuth, Point 2 to Point 1: 270.86° True