

Compliance with Special Operating Conditions

Special Condition #1

The instant application includes a request for program test authority and contains the documentation required by this Special Condition.

Special Condition #2

The underlying auxiliary construction permit allows WLS-FM to use the existing ERI Cogwheel master antenna located on the east tower atop the John Hancock Building for auxiliary purposes only.¹ The John Hancock Building rooftops and towers are home to many and various antennas including the shared master antenna specified herein.

There is a comprehensive RFR safety plan in effect at the John Hancock building.² Security for access to the rooftop is very stringent. The area is not accessible to the public and all visitors require an escort and acceptable training certificates. There is a plan among the users that prohibit access to the rooftop area whenever the master antenna is in operation. Further, additional controls are in place that prevents the auxiliary master antenna from being operated when persons must access the penthouse roof. WLS-FM is immediately party to the joint user's agreement and WLS-FM will follow all necessary protocols to ensure the safety of all personnel.

Special Condition #3

The instant application contains the documentation required by this Special Condition.

Special Condition #4

The applicant in coordination with other users of the site is committed to reducing power or ceasing operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Special Condition #5

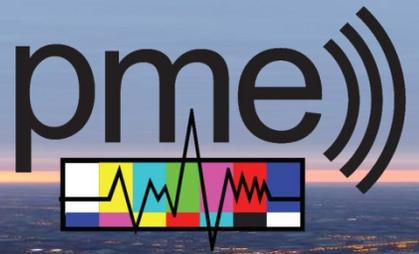
The attached report demonstrates compliance with 47 C.F.R. Sections 73.317(b) through 73.317(d). The spurious measurements were made with all stations simultaneously in operation.

¹ Radio station WKQX(FM) is presently licensed to use this antenna as its main facility pursuant to FCC File No. BMLH-20110629BQS.

² See WKQX(FM) Application for Renewal of License FCC File No. BRH-20120801AJU, Attachment 15, RF Hazard Assessment.

Special Condition #6

In order to implement the underlying WLS-FM auxiliary construction permit, the WLS-FM auxiliary transmitter was plumbed into an existing combiner system which feeds into an existing antenna. No construction took place on the tower above the co-located existing directional antenna of WXRT(FM), Chicago, IL. Therefore, the implementation of the WLS-FM auxiliary construction permit had no effect on the WXRT directional antenna pattern.



October 7, 2020

EXHIBIT
for
CONSTRUCTION PERMIT
FCC File# BXPB-20190729AAF
RADIO LICENSE HOLDINGS LLC
CUMULUS MEDIA
WLS-FM
FCC FACILITY ID# 73228
FM CHANNEL 234B 94.7 MHz
CHICAGO, ILLINOIS



INTRODUCTION and ENGINEERING STATEMENT

The firm of PME / Public Media Engineering, L.L.C, has been contracted by the licensee of WLS-FM, to prepare the engineering calculations and exhibits required by FCC Form 302-FM, an application for modified FM Broadcast Station License.

The specifications of the facility are as follows.

Summary of Proposed Operation:

Effective Radiated Power 4.5 kW H & V

Antenna Height Above Average Terrain 425 meters H & V

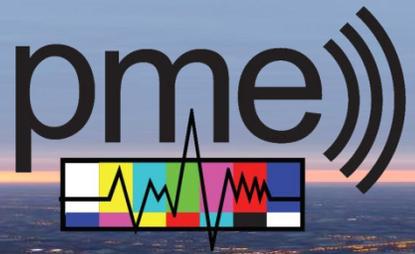
Antenna Radiation Center Above Mean Sea Level 606 meters H & V

Antenna Radiation Center Above Ground Level 425 meters H & V

Antenna Structure Registration Number: (ASR#) 1009012

These specifications are exactly as specified in the existing station's FCC FM Broadcast Station

License, FCC File Number BXPB-20190729AAF



INTRODUCTION and ENGINEERING STATEMENT cont'd page two: WLS-FM

The reason the exhibit prepare is to demonstrate technical information of the installation of an auxiliary transmitter facility for WLS-FM at the John Hancock Center in Chicago IL

The specified transmitter power output produces the authorized effective radiated power. Working backwards from the specified antenna to the transmitter, this exhibit will provide the basis for this statement.

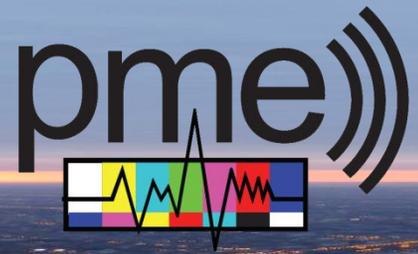
The antenna utilized is an Electronics Research Inc. COG3-20P-2-70-2. The custom specified antenna has a maximum power gain of 0.888 as specified by the manufacturer per the desired frequency. The antenna input power to achieve the desired 4,500 Watts effective radiated power (ERP) is 5,068 Watts.

Preceding the antenna and prior to the combiner system is 460 feet of EIA 6-1/8" Dielectric 675-003 transmission line utilized. For this length of line, total line loss is -0.230023dB and the fractional efficiency is 0.948413 based on frequency.

Prior to the main transmission line run to the antenna input is a Shively 10 station constant impedance combiner system, four modules include group delay compensation devices, were installed at the site in 1989 and still utilized. The system uses Shively Labs Type 2540B combiner modules and only nine of the ten modules are presently used by the FM Broadcast Group. The manufacturer specified insertion loss of -0.673dB. This insertion loss corresponds to a fractional efficiency of 0.856446. The input power needed to the input of the constant impedance combiner to achieve the authorized effective radiated power is 6,239 Watts.

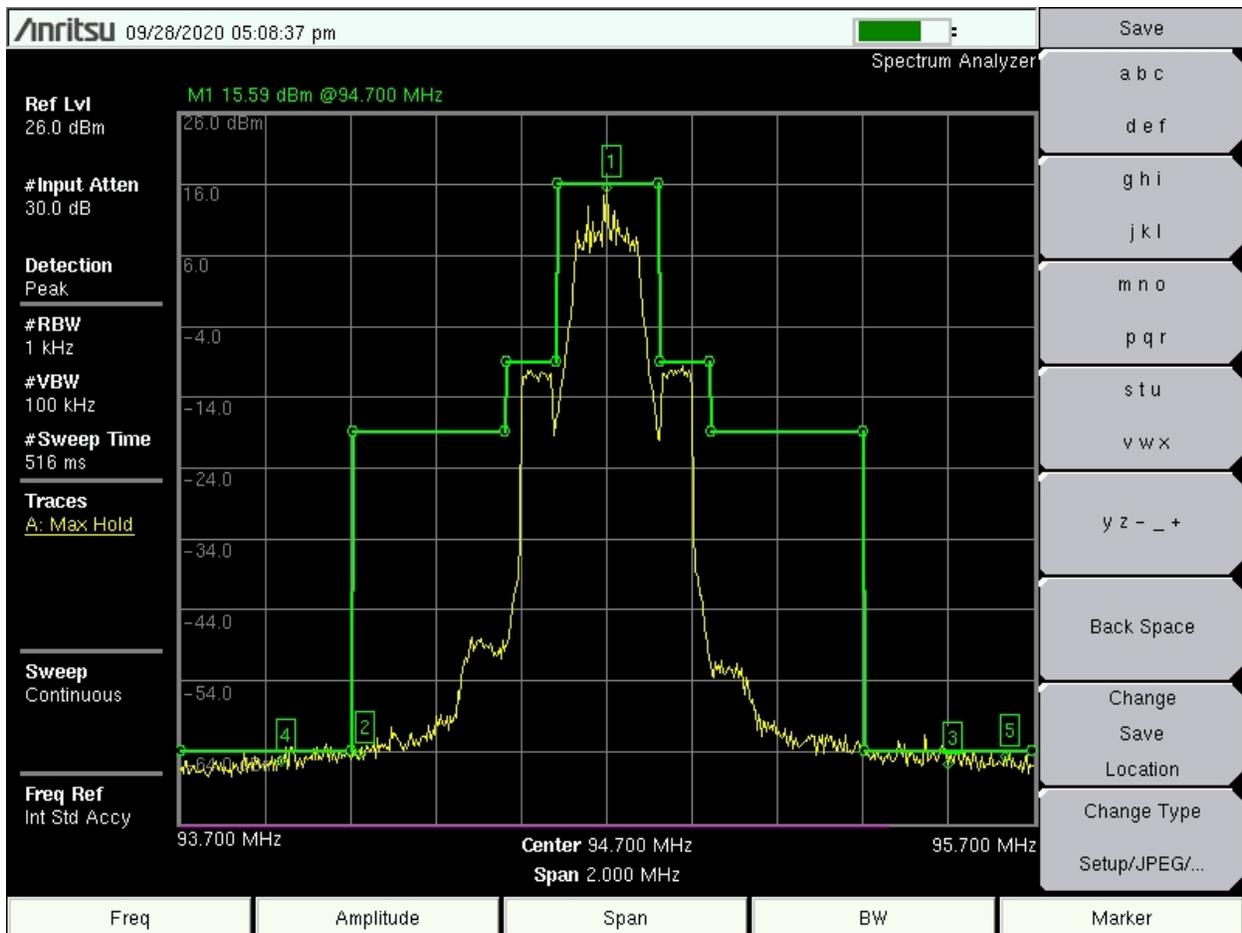
The final component in the transmission line system prior to the transmitter is an intermediary transmission line run from the transmitter suite to the input of the constant impedance combiner. This consist of 303 feet of EIA 3-1/8" Dielectric rigid transmission line. For this length of line, total line loss is 0.2919405dB and the fractional efficiency is 0.934988 based on frequency. Preceding this is a Dielectric 6000 series 3-18" coaxial switch with a manufacturer specified insertion loss of 0.1dB thus producing a fractional efficiency of 0.977237. Last prior to the transmitter output is 25 feet of EIA 3-1/8" Dielectric rigid transmission line. For this length of line, total line loss is 0.0240875dB and the fractional efficiency is 0.994469 based on frequency. The input to this transmission line section is located at the output of the transmitter, thus the specified transmitter power output achieves the authorized effective radiated power. The transmitter power output required to achieve authorized effective radiated power is 6,866 Watts.

FCC FORM 302-FM EXHIBIT



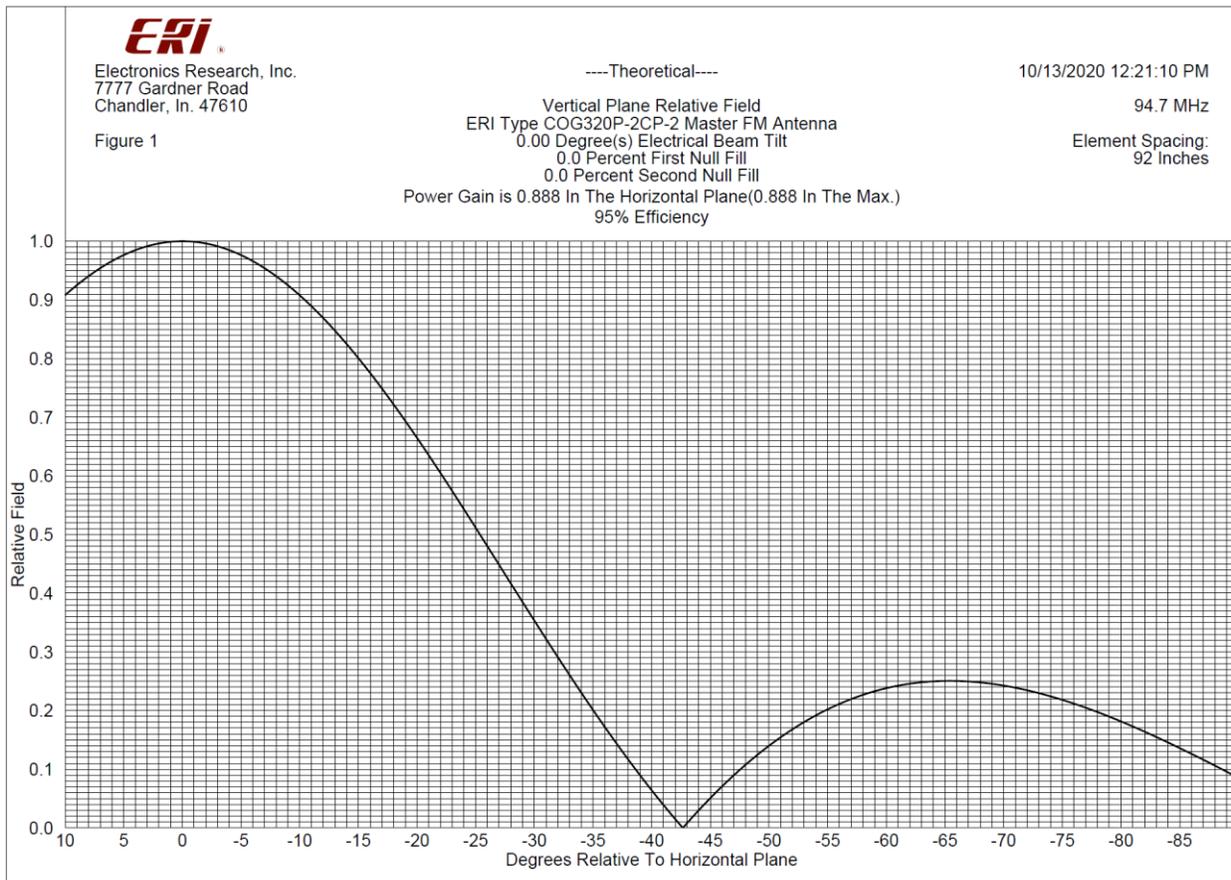
INTRODUCTION and ENGINEERING STATEMENT cont'd page three: WLS-FM

The focus of the test below was to show compliance with the FCC specification for FM Radio occupied bandwidth requirements per provisions of 47 C.F.R. Section 73.317 of the FCC Rules.





INTRODUCTION and ENGINEERING STATEMENT cont'd page four: WLS-FM



Respectfully submitted,

Peter Femal

Consulting Broadcast Engineer

October 7th 2020

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