

FM EQUIPMENT PERFORMANCE MEASUREMENT REPORT

KFOI (FM), Red Bluff, CA

Measurements completed: September 7, 2017

BROWN BROADCAST SERVICES
INCORPORATED

Michael D. Brown

3740 S.W. Comus St.

Portland, Oregon 97219-7418

503-245-6065

TECHNICAL STATEMENT/RESULTS

On September 7, 2017, I performed RF emissions equipment performance measurements on KFOI, Red Bluff, CA, to show compliance with FCC Rules 47 CFR §73.1590 and §73.317. I was retained by the station for the purpose of performing these measurements.

The results of these tests, contained herein, show that at the time of the measurements, KFOI appeared to met all standards as set forth in §73.317.

These measurements are required by §73.1590 upon installation of a new or replacement main transmitter, upon modification of an existing transmitter (made under provisions of §73.1690), and upon installation of stereo or subcarrier equipment. KFOI recently completed construction of a new FM facility, in compliance with Construction Permit BPED-20151216ASJ.

Copies of this report are required by §73.1590 to be on file at the transmitter and/or remote control point for at least two years, and made available to duly authorized representatives of the FCC, upon request. We recommend that this report be kept on file at both locations, indefinitely.

The data and exhibits contained herein were compiled and prepared by me, and that I believe them to be a true and accurate representation of the facts as evident at the time of the measurements.

Michael D. Brown

A handwritten signature in black ink, appearing to read "Michael D. Brown", with a long horizontal flourish extending to the right.

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MEASUREMENT PROCEDURE OVERVIEW

This report seeks to accurately quantify the performance of the FM transmission system. The emissions mask limits are:

± 120 to 240 kHz	≥-25dB below carrier level
± 240 to 600 kHz	≥-35dB below carrier level
± 600kHz and beyond	≥-43 +10log(power in watts) or 80dB, whichever is the lesser attenuation

For the ERP employed, the limit for ± 600kHz and beyond is -80.0dB below carrier.

All measurements were taken during normal audio programming. An Anritsu MT8222A Site Master swept-frequency spectrum analyzer was employed. To start, a reference level was established using the following setup during normal programming:

Span:	2MHz
Resolution Bandwidth:	1MHz
Video Bandwidth:	1MHz

For the occupied bandwidth measurements:

Span:	2MHz
Resolution Bandwidth:	1kHz
Video Bandwidth:	1kHz
Sweep:	Auto (566ms)
Attenuation:	Auto
Trace/View :	Max Hold
Preamp:	Off

For the harmonic and intermod measurements, a 175MHz high-pass filter was employed, to prevent errors from internal analyzer spurring. The insertion loss of this filter, at frequencies of interest, is less than 2.0dB. Plots were examined up to 500MHz.

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GENERAL DATA

STATION CALL LETTERS: KFOI
CITY OF LICENSE: Red Bluff
STATE OF LICENSE: CA
FREQUENCY: 90.9MHz
TRANSMITTER LOCATION: EMF Tower, Little Inskip Hill, near Paynes Creek, CA
TRANSMITTER: Nautel VS2.5
ERP: 12.0kW Horizontal, 6.2kW Vertical
TRANSMITTER TPO: 1824W
HD DIGITAL MODE: none
HD INJECTION LEVEL: none
COMBINING METHOD: n/a
BANDPASS FILTER: none
DATE OF MEASUREMENTS: September 7, 2017
MEASUREMENT POINT: RF sample - directional coupler

TEST EQUIPMENT EMPLOYED

Anritsu MT8222A BTS Master Spectrum Analyzer, serial# 0818047
Narda 6dB 50Ω inline pad
Bird Model 43 wattmeter/thru-line section with EIA 7/8" connectors
Coaxial Dynamics 87015 "Directional X-Tracktor" - directional coupler slug –
flat ±1dB to 500MHz - -50db attenuation
Scott 175MHz Hi-Pass filter - *employed only during harmonic and intermod measurements*

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POWER OUTPUT CALCULATIONS

Transmission lines: RFS HCA148-50J 1-5/8"
Eupin EC5-50a 7/8"
Length: RFS: 186ft; Eupin: 8ft
Loss dB: 0.340dB; 0.026dB
Other losses: Shively 99958-G502 Matching Section - 0.07dB
Antenna: Shively 6025-2-SS
Bays: 2
Bay Spacing: 0.75
Antenna power gain: Horizontal: 8.554dBd (7.168 power gain);
Vertical: 5.676 dBd (3.695 power gain)
System ERP: 12.0kW Horizontal; 6.186kW Vertical
Transmitter Output: 1824W

DATA ANALYSIS

SPURIOUS AND HARMONIC RADIATIONS

(using "peak hold" function; 175MHz HPF employed for harmonics)

	FREQ	SIGNAL	Δ CARRIER	COMMENTS
CARRIER:	90.9MHz	+7.04dBm	peak ref	--
2nd HARMONIC:	181.8MHz	unreadable	>80dB below carrier	FCC SPEC: -80.0dB - OK
3rd HARMONIC:	272.7MHz	unreadable	>80dB below carrier	FCC SPEC: -80.0dB - OK
4th HARMONIC:	363.6MHz	unreadable	>80dB below carrier	FCC SPEC: -80.0dB - OK
5th HARMONIC:	454.5MHz	unreadable	>80dB below carrier	FCC SPEC: -80.0dB - OK

OTHER SPURIOUS & INTERMOD PRODUCTS:

--none found--

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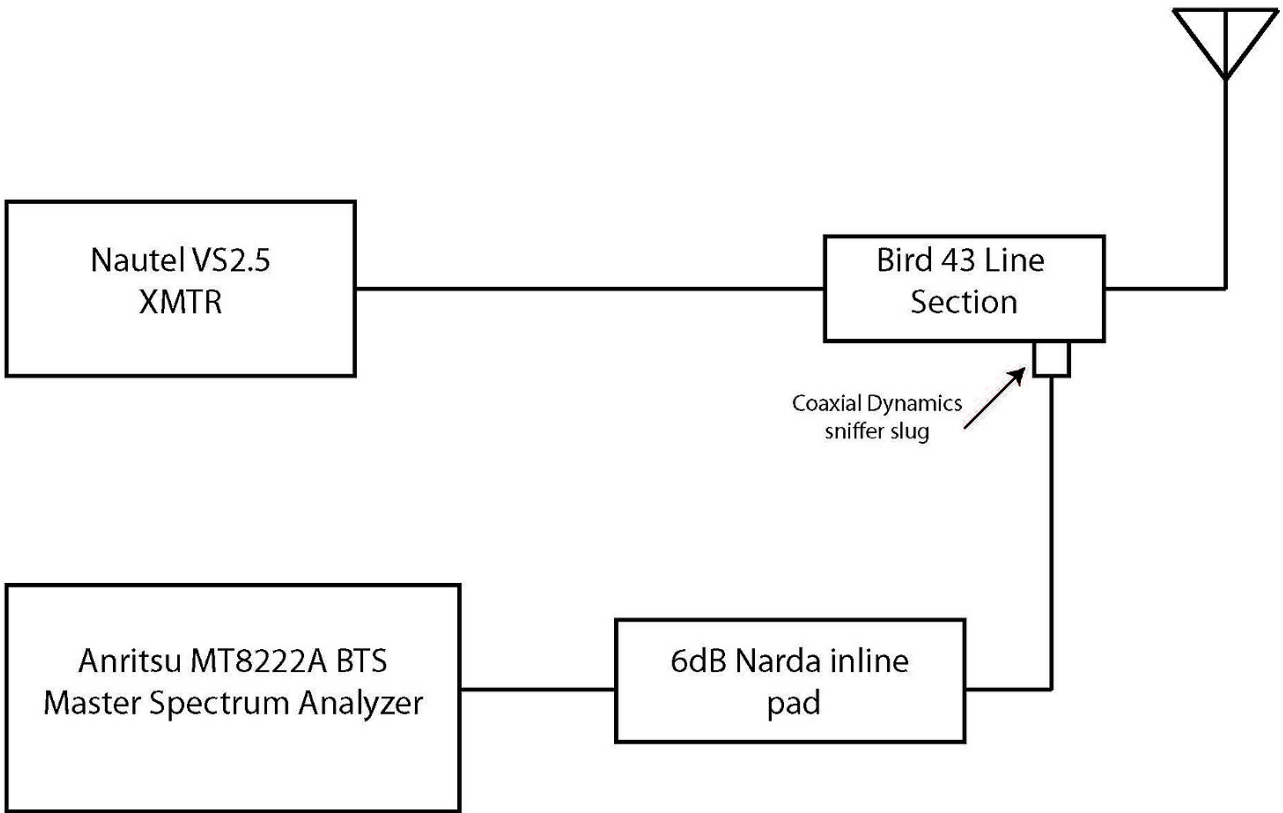
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TEST SETUP



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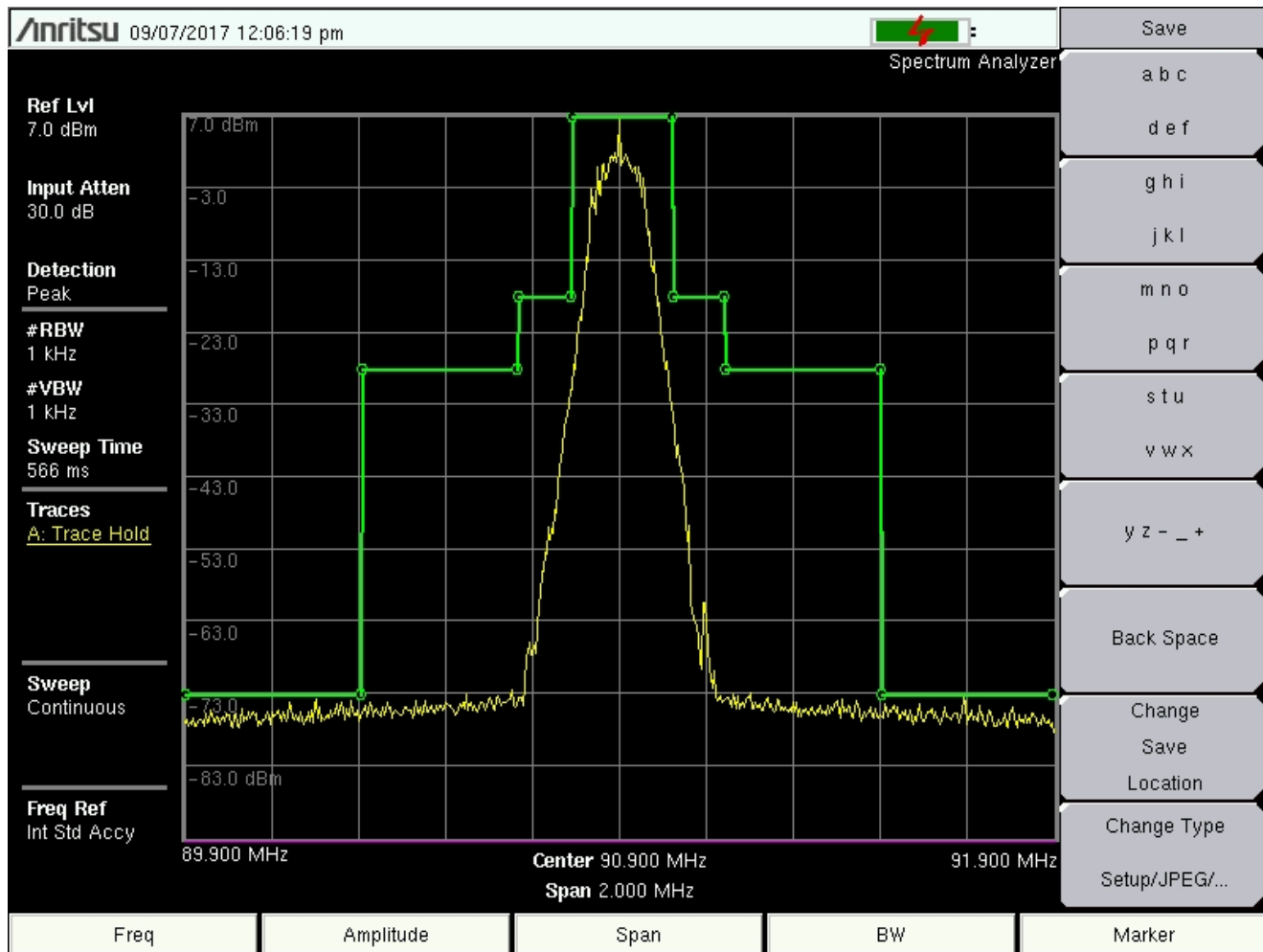
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PLOT 1

20kHz/div



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