

FM Station RF Proof Report

Station: KAER Mesquite, NV

FIN# 93355

Frequency: 89.3 MHz

June 11, 2014

Steve Wilde
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Introduction

The licensee for the KAER Construction Permit is Educational Media Foundation. KAER has been constructed to combine with KRRN which is owned by Entravision Holdings, LLC. Steve Wilde is a Broadcast Engineer employed by Education Media Foundation. Steve Wilde completed the KAER emissions proof on June 11, 2014.

Test Equipment

- Agilent N9912A 2-Port Network Analyzer
- Agilent N9912A Spectrum Analyzer
- Shively 3-1/8" 4-port Directional Coupler
- Shively FM 3-Cavity Band Pass Filters
- Mini Circuits High Pass filters

Station Equipment

- Harris Z10 FM Transmitter
- Shively 2530-2A-16 FM Combiner
- Shively 6513BB-14 HORZ FM Antenna
- Andrew 5" Air Coaxial line

Summary

Harmonics, Intermodulation, Spurious, and Occupied Bandwidth Emissions measurements were made for KAER and KRRN at the output of the Shively 2530-2A-16 FM Combiner filter with KAER and KRRN operating at 100% power. These measurements provide proof that KAER and KRRN are in compliance with the requirements of FCC Part 73.317.

AFFIDAVIT

STATE OF CALIFORNIA
Sacramento County

I, Steve Wilde, do affirm that:

1. I have been engaged in the RF engineering and installation of broadcast facilities since 2005.
2. That I have been a Broadcast Engineer involved in RF Engineering since 2005.
3. I further declare, under penalty of perjury, that the statements contained herein are true and correct to the best of my knowledge.

Steve Wilde
Educational Media Foundation
June 11, 2014

6/13/2014

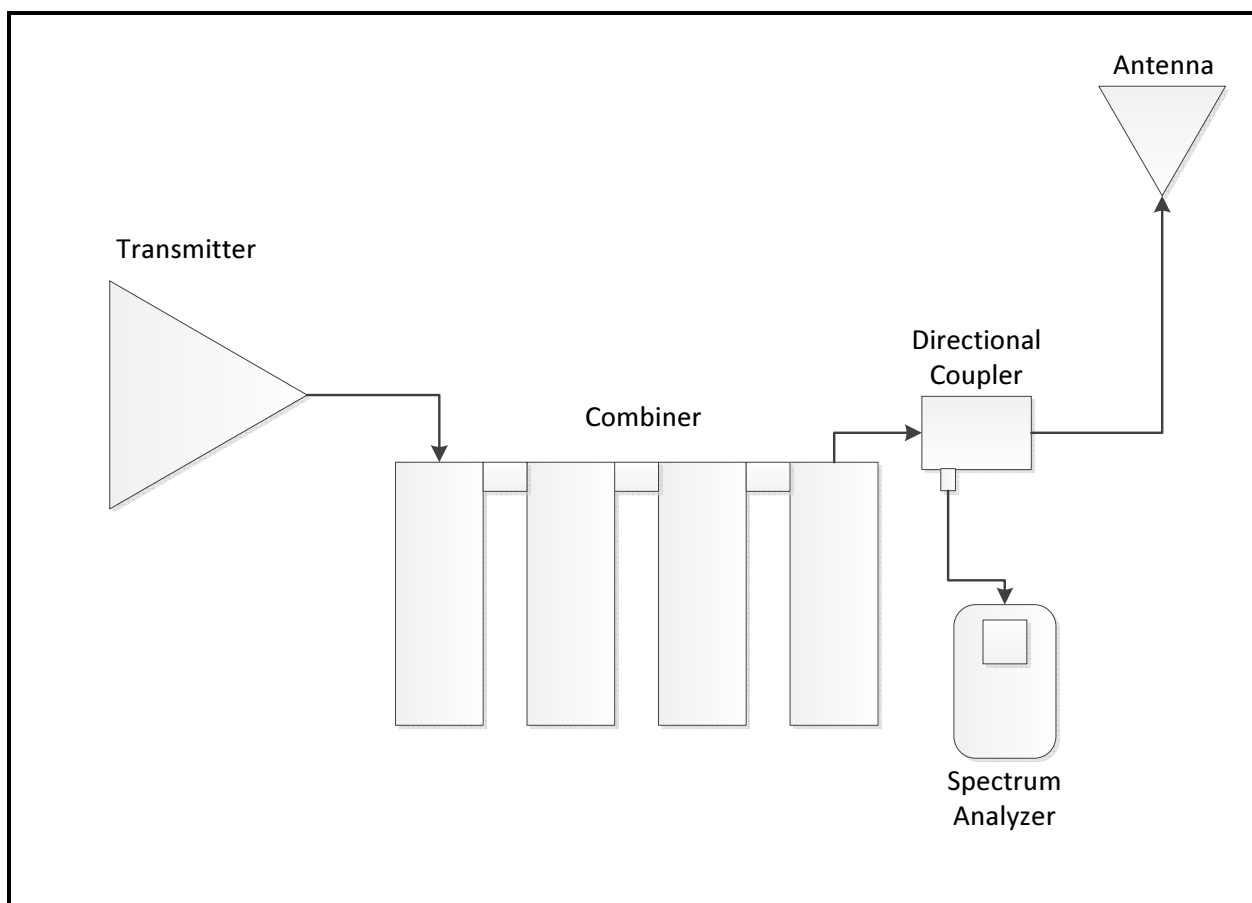
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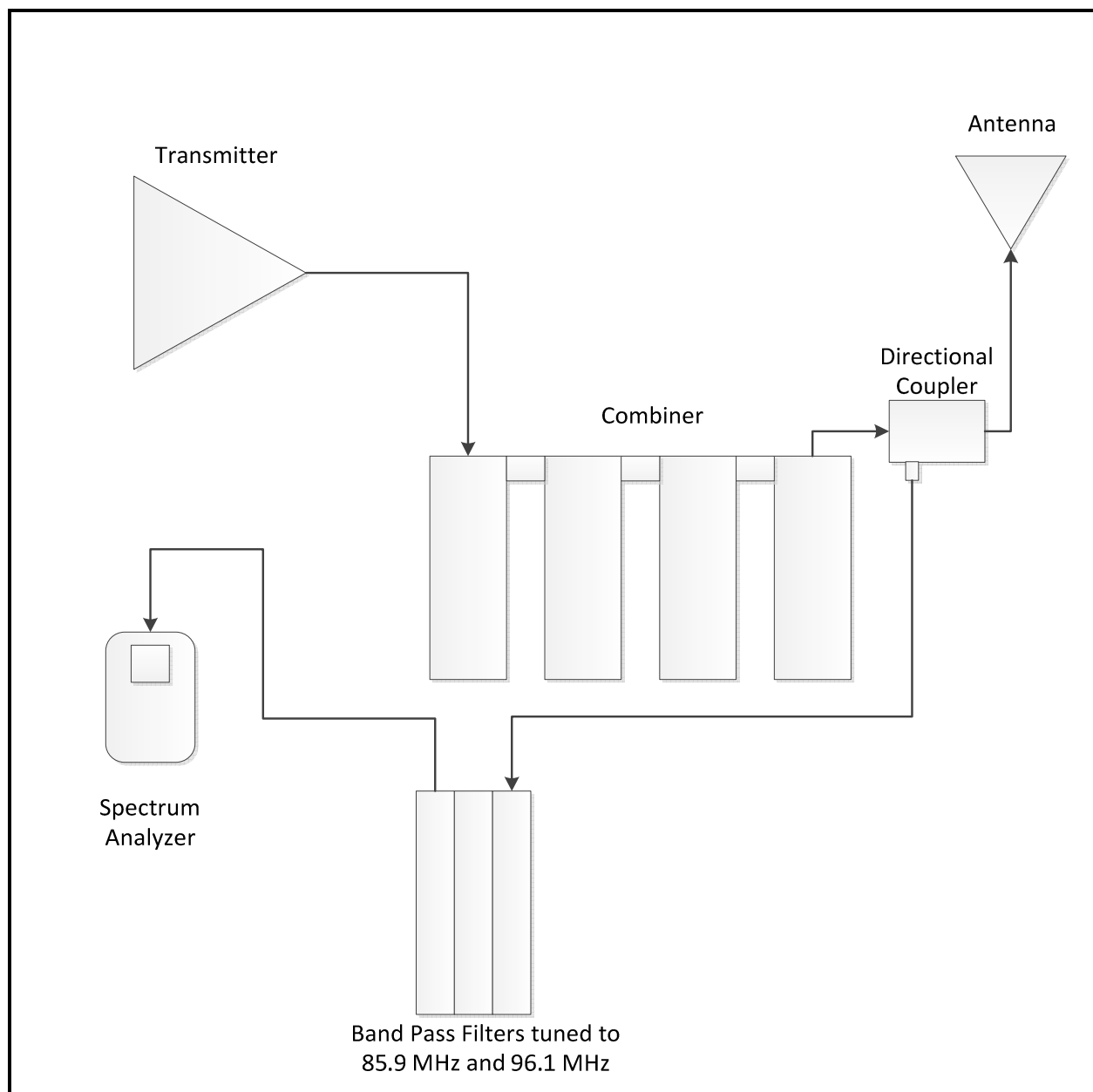
Steve Wilde
Broadcast Engineer
Signed by: swilde

Measurement Diagrams

Harmonic Emissions, Spurious Emissions, and Occupied Bandwidth measurement configuration



Intermodulation frequency measurement configuration



Measurement Results

Frequency Measurement

Assigned Frequency	89.3000000	MHz	Variance in Hz
Measured Frequency	89.2997192	MHz	280.8

TPO Calculation

Transmitter output KW	Combiner Power Efficiency	5" Coax Power Efficiency	Antenna Power Efficiency	ERP KW
7.92	0.946	0.800	16.187	97.00

Measurement Methodology

To ensure accurate measurements, the frequency response of all couplers, RF filters, and sample ports were determined prior to taking any measurements. The resulting dB reductions at each frequency were then added to the recorded measurements to ensure accurate calculations.

The spectrum analyzer reference point of the fundamental frequency is 0.00 dBm. The directional coupler has less reduction at the harmonic frequencies and thus appears as a gain in reference to the fundamental frequency. The high pass filters have more reduction at all harmonic frequencies and thus shows as a loss in reference to the fundamental frequency. The losses and gains are a dB reference relative to the fundamental frequency; therefore the directional coupler gain, high pass filter loss, and reference point are then added to the measurement to provide the resulting dBc calculation.

Harmonic Emissions Measurement

Harmonic	Frequency (MHz)	Directional Coupler (dB)	High Pass Filter (dB)	89.3 MHz Reference Level (dB)	Instrument Reading (dB)	Corrected Measurement (dBc)	FCC Limit (dBc)	Clearance (dB)
X2	178.6	-5.70	0.5	0.00	-103.1	-108.3	-80.00	28.30
X3	267.9	-8.75	0.4	0.00	-108.1	-116.45	-80.00	36.45
X4	357.2	-10.85	0.3	0.00	-88.00	-98.52	-80.00	18.52
X5	446.5	-11.62	0.1	0.00	-111.3	-122.82	-80.00	42.82
X6	535.8	-12.37	0.1	0.00	-117.3	-129.57	-80.00	49.57
X7	625.1	-14.66	0.1	0.00	-118.4	-132.96	-80.00	52.96
X8	714.4	-14.27	0.1	0.00	-121.6	-135.77	-80.00	55.77
X9	803.7	-14.16	0.2	0.00	-120.6	-134.56	-80.00	54.56

Intermodulation Emissions Measurement

Due to the relationship between the fundamental frequencies, intermodulation products were evaluated 3.4 MHz above and below each fundamental frequency.

IM Product Frequency (MHz)	Bandpass Filter (dB)	89.3 MHz Reference Level (dB)	Directional Coupler (dB)	Instrument Reading (dB)	Corrected Measurement (dBc)	FCC Limit (dBc)	Clearance (dB)
85.9	2.2	0.00	1.02	-102.9	-99.68	-80	19.68
96.1	1.2	0.00	-1.29	-100.7	-100.79	-80	20.79

Spurious Emissions Measurement

The KAER transmitter emissions were thoroughly analyzed using an Agilent N9912A spectrum analyzer. The KAER transmitter and RF circuit are free of spurious emissions.

Occupied Bandwidth Measurement

The occupied bandwidth was measured with an Agilent N9912A spectrum analyzer utilizing fourteen mask segments to determine the occupied bandwidth. Measurements were made over twenty minutes using a max-hold spectrum sweep, and demonstrate that KAER is operating within the permissible bandwidth.

