

FM Station RF Proof Report

Station: KKLV Kaysville, UT

FIN# 69553

Frequency: 107.5 MHz

January 2, 2014

Steve Wilde
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Educational Media Foundation
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Introduction

The licensee for the KKLV Construction Permit is Educational Media Foundation. KKLV has been constructed to combine with KUER-FM which is owned by the University of Utah. Steve Wilde is a Broadcast Engineer employed by Education Media Foundation. Steve Wilde completed the KKLV emissions proof on January 2, 2014.

Test Equipment

- Agilent N9912A 2-Port Network Analyzer
- Agilent N9912A Spectrum Analyzer
- Jampro 6'' 4-port Directional Coupler
- Telewave FM Notch Filters
- Mini Circuits High Pass filters

Station Equipment

- 816R-1A Continental FM Transmitter
- Jampro RCCC-629-0.8H FM Combiner
- Jampro JAHD-6/3 (18) HR RFR.8 FM Antenna
- RFS 5'' Air Coaxial line

Summary

Harmonics, Intermodulation, Spurious, and Occupied Bandwidth Emissions measurements were made for KKLV and KUER-FM at the output of the Jampro RCCC-620-0.8H FM Combiner filter with KKLV and KUER-FM operating at 100% power. These measurements provide proof that KKLV and KUER-FM 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
January 2, 2014

1/21/2014

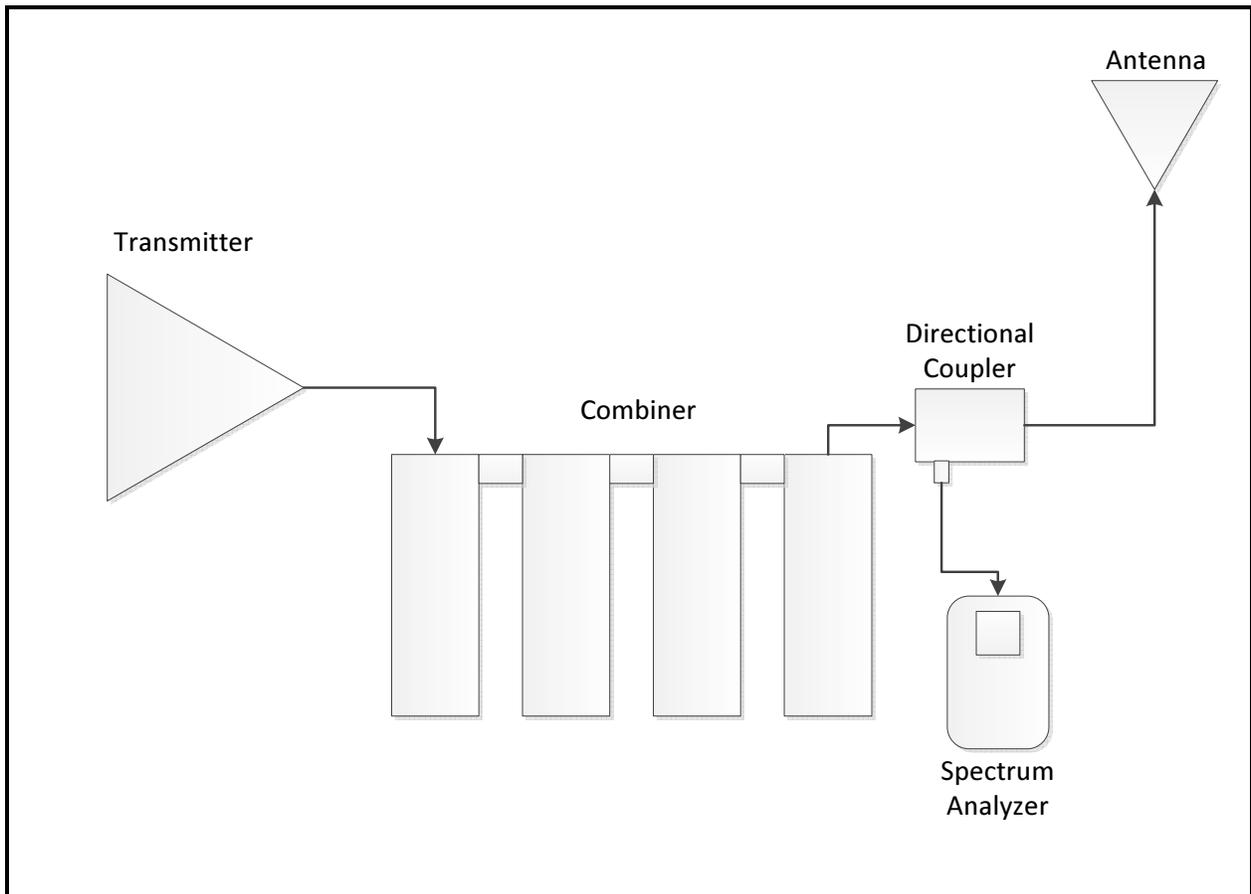
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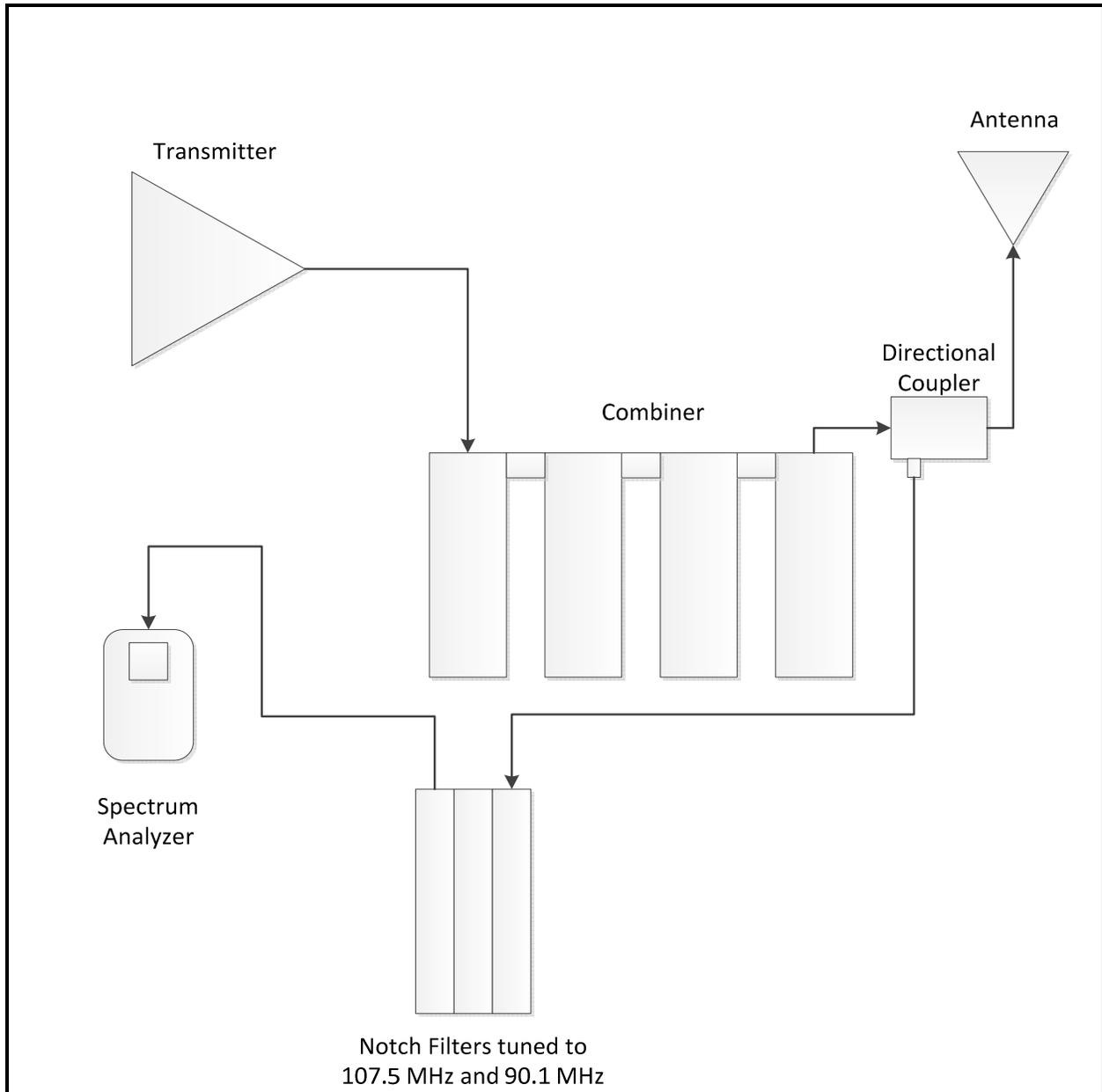
Steve Wilde
Broadcast Engineer
Signed by: swilde

Measurement Diagrams

Harmonic Emissions, Spurious Emissions, and Occupied Bandwidth measurement configuration



Intermodulation frequency measurement configuration



Measurement Results

Frequency Measurement

Assigned Frequency	107.5000000	MHz	Variance in Hz
Measured Frequency	107.5002196	MHz	219.60

TPO Calculation

Transmitter output KW	Combiner Power Efficiency	5" Coax Power Efficiency	Antenna Power Efficiency	ERP KW
7.88	0.9332113	0.958	3.119	22.00

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 -1.87 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)	107.5 MHz Reference Level (dB)	Instrument Reading (dB)	Corrected Measurement (dBc)	FCC Limit (dBc)	Clearance (dB)
X2	215.00	-5.63	0.5	1.87	-125.0	-128.26	-80.00	48.26
X3	322.50	-9.07	0.4	1.87	-103.6	-110.40	-80.00	30.40
X4	430.00	-11.52	0.3	1.87	-122.0	-131.35	-80.00	51.35
X5	537.50	-13.52	0.1	1.87	-116.7	-128.25	-80.00	48.25
X6	645.00	-15.12	0.1	1.87	-121.4	-134.55	-80.00	54.55
X7	752.00	-16.19	0.1	1.87	-124.2	-138.42	-80.00	58.42
X8	860.00	-18.41	0.1	1.87	-120.6	-137.04	-80.00	57.04
X9	967.50	-24.36	0.2	1.87	-121.4	-143.69	-80.00	63.09

Intermodulation Emissions Measurement

Due to the relationship between the fundamental frequencies, intermodulation products were evaluated 17.4 MHz above and below each fundamental frequency.

IM Product Frequency (MHz)	Notch Filter (dB)	107.5 MHz Reference Level (dB)	Directional Coupler (dB)	Instrument Reading (dB)	Corrected Measurement (dBc)	FCC Limit (dBc)	Clearance (dB)
72.7	2.97	1.87	3.27	-120.9	-112.79	-80	32.79
124.9	8.02	1.87	-1.49	-113.8	-105.4	-80	25.40

Spurious Emissions Measurement

The KKLTV transmitter emissions were thoroughly analyzed using an Agilent N9912A spectrum analyzer. The KKLTV 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 KKLTV is operating within the permissible bandwidth.

