

# Proof of Performance Report

K243BP Casa Grande, AZ

FIN: 146671

96.5 MHz

April 16, 2016

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## Introduction

The licensee/permittee for the K243BP Construction Permit (file number BMPFT-20160411AAJ) is Educational Media Foundation. Steve Wilde is an RF Engineer employed by Educational Media Foundation. Steve Wilde completed the K243BP spurious emissions proof on April 16, 2016.

## Test Equipment

- Agilent N9912A 2-Port Network Analyzer
- Agilent N9912A Spectrum Analyzer
- Bird B series Directional Coupler
- Mini Circuits High Pass filters

## Station Equipment

- Crown 150R
- Shively Branch FM Combiner
- Nicom BKG-77 Antenna
- RFS ½" coaxial line

## Summary

Harmonics, Intermodulation, Spurious, and Occupied Bandwidth Emissions measurements were made for K243BP transmission circuit at the output of the Shively Combiner network with K243BP and all other transmissions operating at 100% power. These measurements provide proof that K243BP is 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 equipment since 2005.
2. I hold a Bachelor of Science degree in Electrical Engineering from DeVry University Chicago, IL.
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  
April 16, 2016

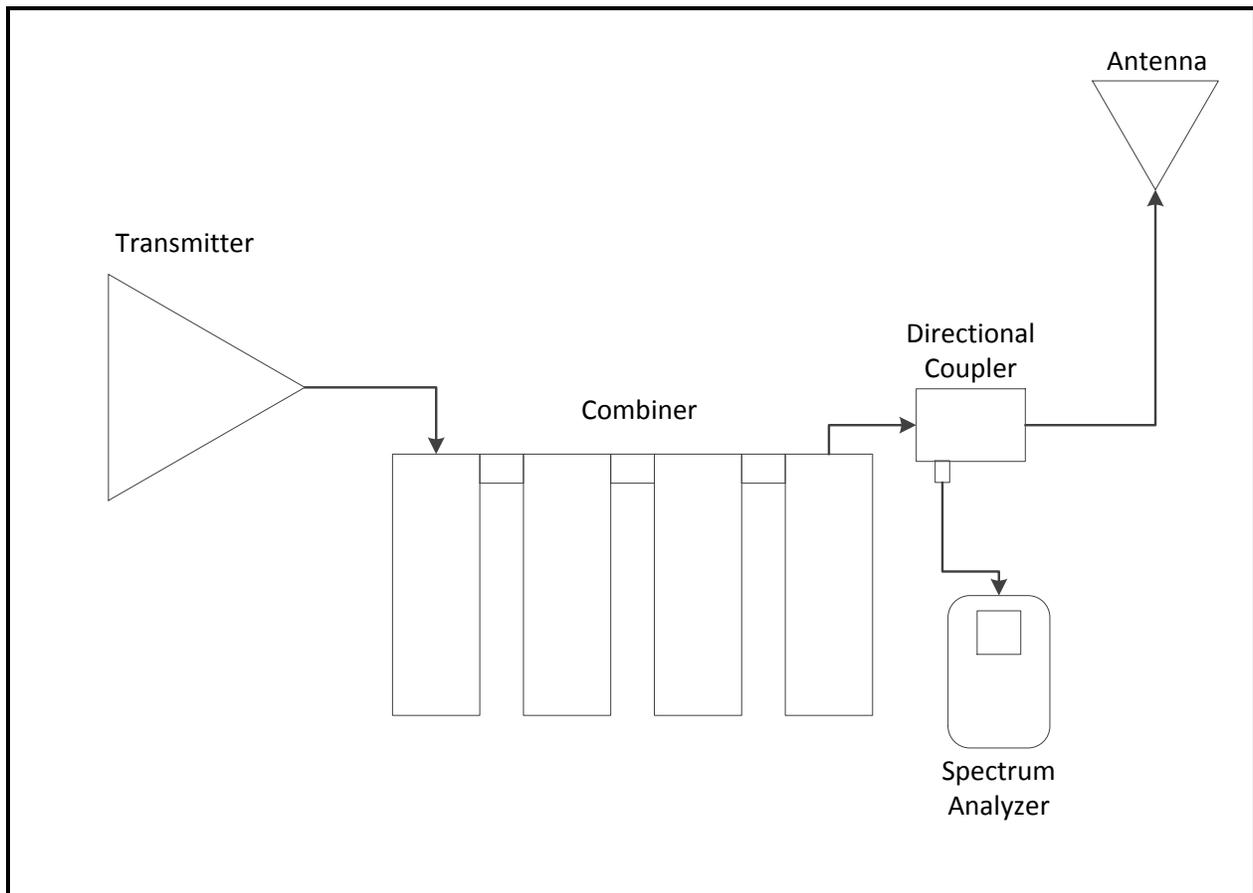
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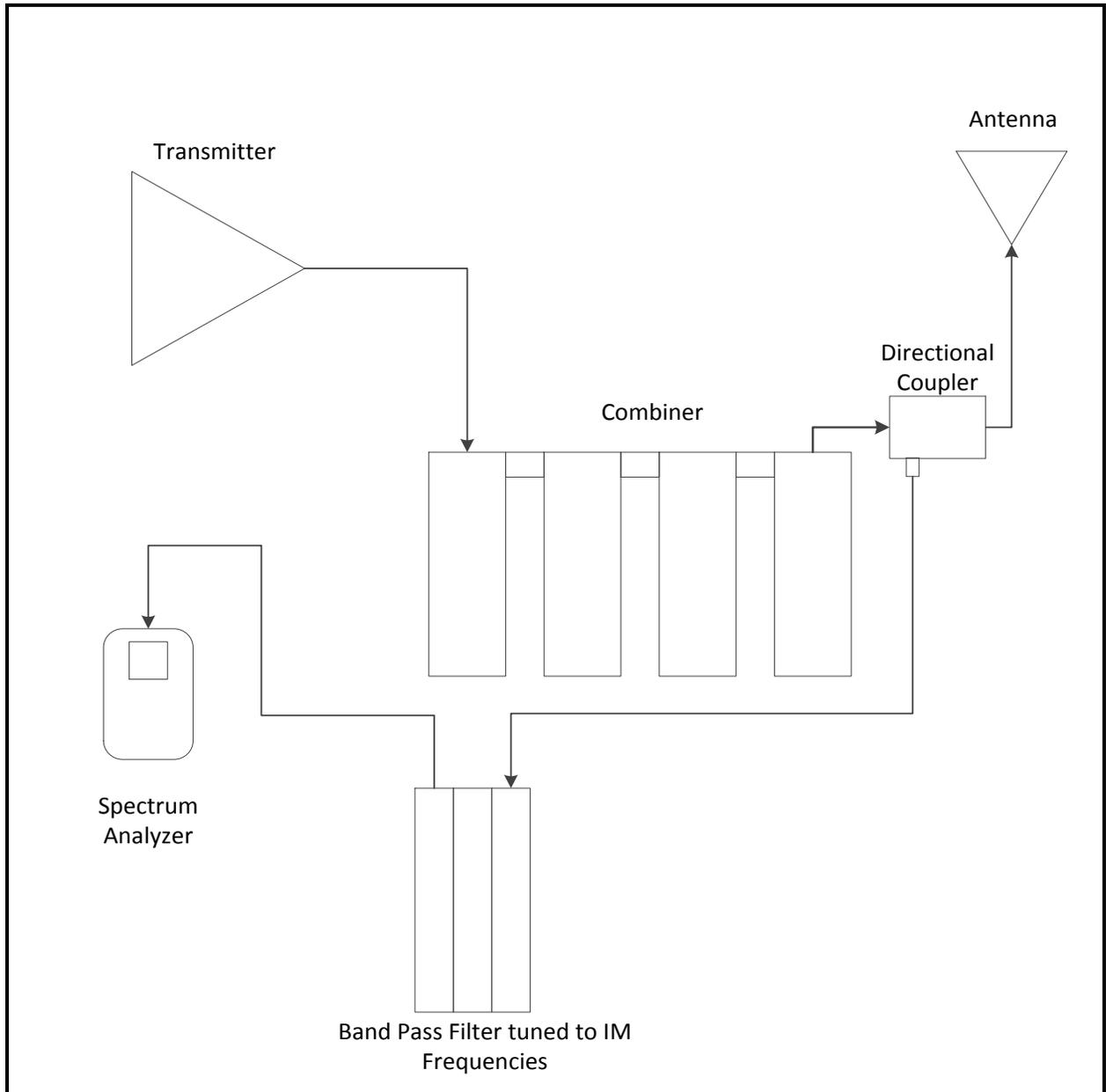
Steve Wilde  
RF Design Engineer

## Measurement Diagrams

### Harmonic Emissions, Spurious Emissions, and Occupied Bandwidth Measurement Configuration



Intermodulation Frequency Measurement Configuration



## Measurement Results

### Frequency Measurement

Assigned Frequency	96.500000	MHz	Variance in Hz
Measured Frequency	96.5000594	MHz	59.4

### TPO Calculation

Transmitter output Watts	Combiner Efficiency	½" Coax Efficiency	Antenna Power Gain	ERP Watts
163.6921	0.809	0.964	0.47	60

### 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 forward power sample port has less loss at the harmonic frequencies relative to the fundamental frequency. The losses and gains are a dB reference relative to the fundamental frequency; therefore the directional coupler forward port loss or gain, high pass filter loss, and dB reference point are added to the instrument measurement to provide the resulting dBc calculation.

### Harmonic Emissions Measurement

Harmonic	Frequency (MHz)	Directional Coupler (dB)	High Pass Filter (dB)	Reference Level (dB)	Instrument Reading (dB)	Corrected Measurement (dBc)	FCC Limit (dBc)	Clearance (dB)
X2	193.00	0.06	0.50	0.00	-101.70	<b>-101.14</b>	-60.78	<b>40.36</b>
X3	289.50	1.26	0.40	0.00	-106.70	<b>-105.04</b>	-60.78	<b>44.26</b>
X4	386.00	3.86	0.30	0.00	-108.10	<b>-103.94</b>	-60.78	<b>43.16</b>
X5	482.50	6.66	0.10	0.00	-107.90	<b>-101.14</b>	-60.78	<b>40.36</b>
X6	579.00	8.96	0.10	0.00	-107.30	<b>-98.24</b>	-60.78	<b>37.46</b>
X7	675.50	11.16	0.10	0.00	-110.20	<b>-98.94</b>	-60.78	<b>38.16</b>
X8	772.00	11.96	0.10	0.00	-107.20	<b>-95.14</b>	-60.78	<b>34.36</b>
X9	868.50	13.26	0.20	0.00	-112.90	<b>-99.44</b>	-60.78	<b>38.66</b>

### Intermodulation Emissions Measurement

The intermodulation products were measured with all fundamental frequencies operating at 100% power.

IM Product Frequency (MHz)	Reference Level (dB)	Directional Coupler (dB)	Instrument Reading (dB)	Corrected Measurement (dBc)	FCC Limit (dBc)	Clearance (dB)
91.9	0.00	0.00	<b>-79.42</b>	<b>-79.42</b>	-60.78	<b>18.64</b>
105.7	0.00	0.00	<b>-77.30</b>	<b>-77.30</b>	-60.78	<b>16.52</b>

### Spurious Emissions Measurement

The K243BP transmitter emissions were thoroughly analyzed using an Agilent N9912A spectrum analyzer. The K243BP 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 five minutes using a max-hold spectrum sweep, and demonstrate that K243BP is operating within the permissible bandwidth.