# Compliance with Special Operating Conditions

The K215FJ Construction Permit (File Number 0000125712) contains three Special Operating Conditions:

1. *The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of the FCC guidelines.*

2. *Prior to commencing program test operations, FM Translator or FM Booster permittee must have on file at the Commission, FCC Form 350, Application for an FM Translator or FM Booster Station License, pursuant to 47 C.F.R. Section 74.14.*

3. *BEFORE PROGRAM TESTS COMMENCE, sufficient measurements shall be made to establish that the operation authorized in this construction permit is in compliance with the spurious emissions requirements of 47 C.F.R. Sections 73.317(b) through 73.317(d). All measurements must be made with all stations simultaneously utilizing the shared antenna. These measurements shall be submitted to the Commission along with the FCC application for license.*

Educational Media Foundation (EMF) complies with, or agrees to, the condition as follows:

1. EMF agrees to reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna.

2. Form 350 is being filed prior to commencing program test operations.

3. Spurious Emissions Measurements have been done with the results of these measurements contained in Exhibit 1-A.

# FM Station RF Proof Report

Station: K215FJ
Carson City NV

FIN# 144149

Frequency: 90.9 MHz

August 17, 2021

David Leishman
Broadcast Engineer
Educational Media Foundation
5700 West Oaks Blvd
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# Introduction

The licensee for the K215FJ is Educational Media Foundation. K215FJ has been constructed to combine with K226AL

# Test Equipment

- Agilent N9912A 2-Port Network Analyzer
- Agilent N9912A Spectrum Analyzer
- Bird BPME7VA-VM Line section and Power Meter as a directional coupler
- Telewave FM Notch Filter
- Mini Circuits High Pass filters

# Station Equipment

- Crown FM30E Transmitter
- AAT C-IR-2-3-2K-N FM Branch Combiner  s/n 3055i
- Nicom BKG77 1 Bay FM Antenna
- Andrew 7/8 Foam Coaxial line

# Summary

Harmonics, Intermodulation, Spurious, and Occupied Bandwidth Emissions measurements were made for K226AL and K215FJ at the output of the Combiner filter with K226AL and K215FJ operating at 100% power. These measurements provide proof that K226ALand K215FJ are in compliance with the requirements of FCC Part 73.317.

K-LOVE. Air1 RADIO
EDUCATIONAL MEDIA FOUNDATION

# AFFIDAVIT

STATE OF CALIFORNIA
Sacramento County

I, David Leishman, do affirm that:

1. I have been engaged in the RF engineering and installation of broadcast facilities since 2014

2. That I have been a Broadcast Engineer involved in RF Engineering since 2014.

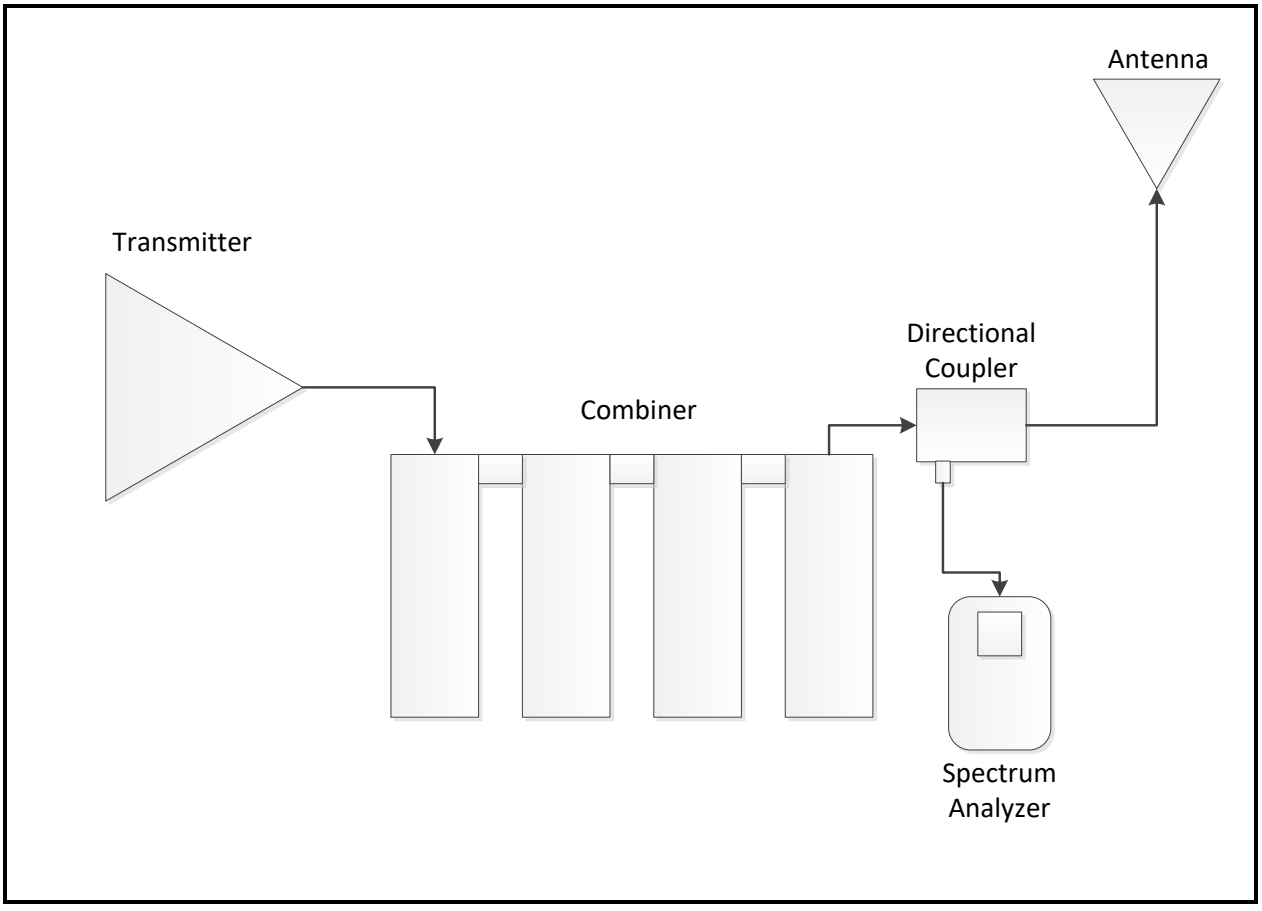
3. I further declare, under penalty of perjury, that the statements contained herein are true and correct to the best of my knowledge.

David C Leishman

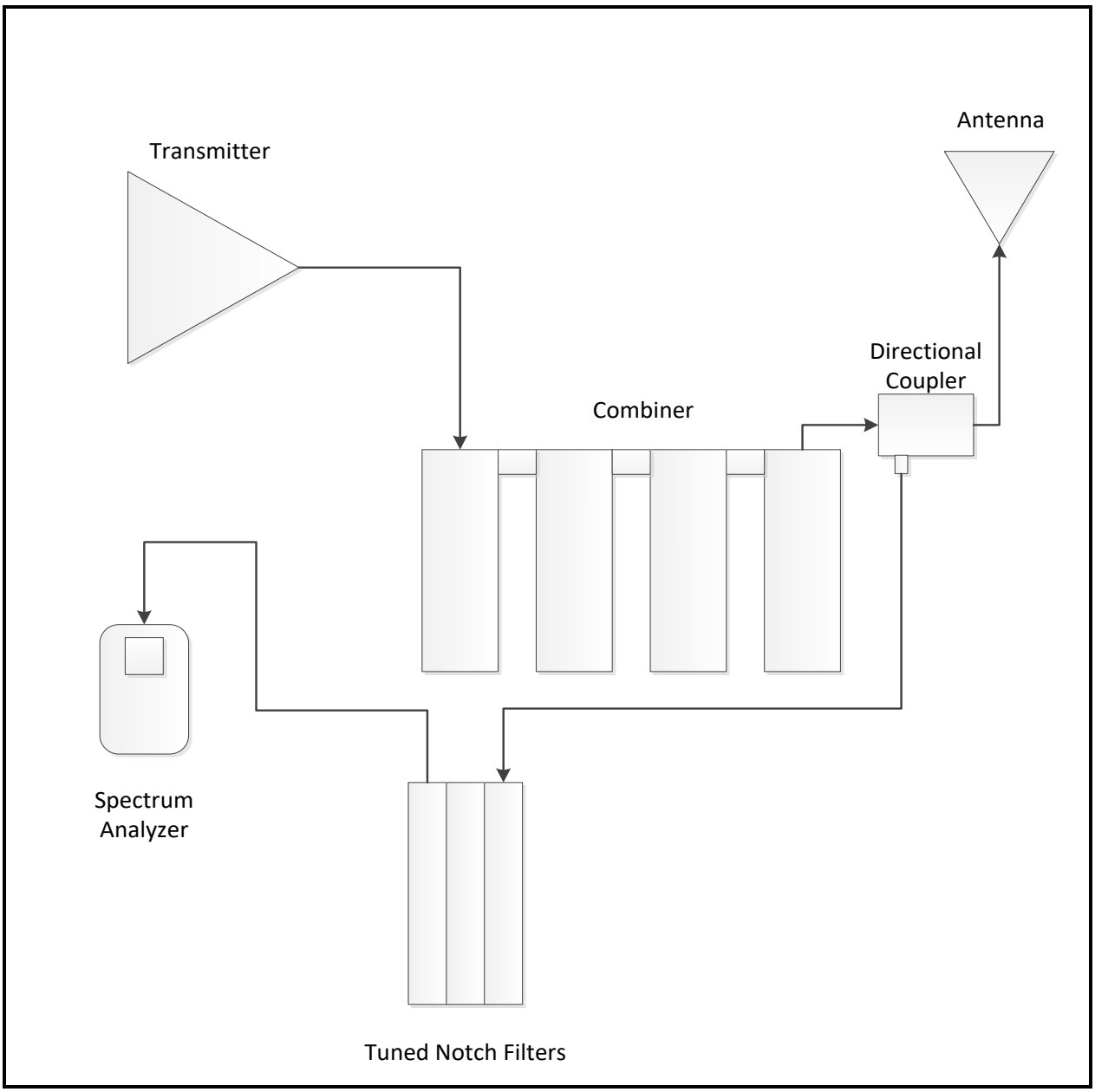
Engineer

Measurement Diagrams

## Harmonic Emissions, Spurious Emissions, and Occupied Bandwidth measurement configuration



# Intermodulation frequency measurement configuration



# Measurement Results

## Frequency Measurement

| | | | |
|---|---|---|---|
| Assigned Frequency | 90.9000000 | MHz | Variance in Hz |
| Measured Frequency | 90.8997623 | MHz | 237.7 |

## TPO Calculation

| Transmitter output KW | Combiner Power Efficiency | Coax Power Efficiency | Antenna Power Efficiency | ERP KW |
|---|---|---|---|---|
| .023 | 0.794 | 0.918 | 0.47 | .008 |

## 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 -1.493 dBm. Some devices have 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) | Sample Port (dB) | High Pass Filter (dBm) | Dev Ref (dBm) | Instrument Reading (dBm) | Corrected Measurement (dBc) | FCC Limit (dBc) | Clearance (dBm) |
|---|---|---|---|---|---|---|---|---|
| X2 | 181.8 | 0.83 | -0.5 | -1.49 | -99.1 | **-97.94** | -56.62 | 41.3 |
| X3 | 272.7 | 0.44 | -0.4 | -1.49 | -101.4 | **-99.95** | -56.62 | 43.3 |
| X4 | 363.6 | -0.72 | -0.3 | -1.49 | -99.6 | **-97.12** | -56.62 | 40.5 |
| X5 | 454.5 | -2.45 | -0.1 | -1.49 | -97.5 | **-93.50** | -56.62 | 36.9 |
| X6 | 545.4 | -4.50 | -0.1 | -1.49 | -97.6 | **-91.5** | -56.62 | 34.9 |
| X7 | 636.3 | -6.64 | -0.1 | -1.49 | -98.9 | **-90.65** | -56.62 | 34.0 |
| X8 | 727.2 | -8.41 | -0.1 | -1.49 | -101.3 | **-91.3** | -56.62 | 34.7 |
| X9 | 818.1 | -10.26 | -0.2 | -1.49 | -101.8 | **-89.85** | -56.62 | 33.2 |

## Intermodulation Emissions Measurement

Due to the relationship between the fundamental frequencies, intermodulation products were evaluated 2.2 MHz above and below each fundamental frequency.

| IM Product Frequency (MHz) | Notch Filter (dB) | 90.9 MHz Reference Level (dB) | Sample Port (dB) | Instrument Reading (dB) | Corrected Measurement (dBc) | FCC Limit (dBc) | Clearance (dB) |
|---|---|---|---|---|---|---|---|
| 88.7 | 2.97 | -1.49 | 0.00 | -83.00 | **-81.52** | -61.8 | 19.72 |
| 95.3 | 3.02 | -1.49 | 0.00 | -90.75 | **-89.22** | -61.8 | 27.42 |

## Spurious Emissions Measurement

The K215FJtransmitter emissions were thoroughly analyzed using an Agilent N9912A spectrum analyzer and are. The K215FJ 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 an average spectrum sweep, and demonstrate that K215FJ is operating within the permissible bandwidth.