

# ***KLEIN BROADCAST ENGINEERING, L.L.C.***

*dedicated to improving the science and technology of radio & television communications*

**JANUARY 2010**

## **FCC FORM 350 APPLICATION for STATION LICENSE**

**FCC File# BPFTB-20090727ADH  
HUTTON BROADCASTING, L.L.C.  
K Q B A – F M 1  
(FCC FACILITY ID# 123369)  
FM CHANNEL 298 DB / 107.5mHz.  
SANTA FE, NEW MEXICO**

### **INTRODUCTION and ENGINEERING STATEMENT**

The firm of Klein Broadcast Engineering, L.L.C, has been retained by the licensee/permittee of KQBA-FM1 FM Booster Station, to prepare the engineering calculations and exhibits required by FCC Form 350, an application for FM Broadcast Booster Station License for the Booster Transmission Facility authorized in FCC FM Broadcast Booster Station Construction Permit, file number, BPFTB-20090727ADH.

The specifications of the facility are as follows:

#### **Summary of Proposed Operation:**

Effective Radiated Power	12.0 kW	V Pol Only
Antenna Radiation Center Above Ground Level	35 meters	V Pol Only
Antenna Radiation Center Above Mean Sea Level	2156 meters	V Pol Only

Overall Height of Antenna Structure Above Ground	60.6 meters
Antenna Structure Registration Number: (ASR#)	1224069

Transmitter Power Output:	2.8 kW
---------------------------	--------

**FCC FORM 350**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page two: KQBA-FM1

The reason for filing the instant application with the Commission is the Booster Station Facility authorized by FCC FM Broadcast Booster Station Construction Permit, BPFTB-20090727ADH is ready to commenced operations. The instant application is being filed for Program Test Authority and a Station License to cover the outstanding FCC construction permit captioned above.

FM Booster Station KQBA-FM1 is ready for operation from a common site with Station KKIM-FM1, Santa Fe, New Mexico. (FCC facility ID# 123368) It was decided to operate both stations into a common antenna. The antenna is use is an Kathrein/Scala model CL-FM-VRN-50 stacked vertical directional array. The antenna radiation center height above the ground is 35 meters.

**FCC FORM 350**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page three: KQBA-FM1

The transmitter power output (TPO) is specified at 2.8 kilowatts to achieve the authorized Effective Radiated Power of 12.0kW. The antenna system power gain at 107.5 MHz. is 7.7

Engineering Exhibit E-1 is a copy of the existing KQBA-FM1, FM Broadcast Booster Station Construction Permit, FCC File Number BPFTB-20090727ADH. It is included herein as an aid to Commission staff processing this instant application.

Engineering Exhibit E-2 and E-3 are a complete RF Proof of Performance Measurement Reports to show compliance with 47 C.F.R. Section 73.317 of the Commission's Rules. The measurements found in the Report were made with both Station KQBA-FM1 and Station KKIM-FM1 operating simultaneously into the combiner and common antenna system.

## **FCC FORM 350**

### **INTRODUCTION and ENGINEERING STATEMENT** cont'd page four: KQBA-FM1

#### **Special Operating Conditions or Restrictions:**

There were four (4) Special Operating Conditions or Restrictions listed on the KQBA-FM1 FCC Construction Permit, FCC File Number BPFTB-20090727ADH. They are all answered and addressed below:

#### **Special Operating Condition or Restriction #1:**

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.

#### **Answer to Special Operating Condition or Restriction #1:**

The applicant acknowledges and accepts this Special Operating Condition or Restriction as issued above. This FCC Form 350 is being filed to comply with Special Operating Condition or Restriction #1 as listed above.

#### **Special Operating Condition or Restriction #2:**

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 FCC guidelines.

#### **Answer to Special Operating Condition or Restriction #2:**

The applicant/permittee/licensee will comply with the terms of Special Operating Condition or Restriction #2 by reducing power or ceasing operations as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

## **FCC FORM 350**

### **INTRODUCTION and ENGINEERING STATEMENT** cont'd page five: KQBA-FM1

#### **Special Operating Condition or Restriction #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 Form 350 FM application for license.

#### **Answer to Special Operating Condition or Restriction #3:**

The applicant/permittee/licensee has complied with the terms of Special Operating Condition or Restriction by making the required measurements as specified above on January 14, 2010. These measurements are included herein with this instant application FCC Form 350 and are marked Exhibit E-2 for the measurements taken on KQBA-FM1 and Exhibit E-3 for the measurements made on KKIM-FM1. The attached exhibits show complete compliance with 47 C.F.R. Sections 73.317(b) through Section 73.317(d), as required.

#### **Special Operating Condition or Restriction #4:**

Warning signs which describe the radiofrequency radiation hazard must be posted at appropriate intervals. Access must be restricted to prevent the exposure of humans to RF emissions in excess of the FCC guidelines (O.E.T. Bulletin 65, Edition 97-01, released August 1997) Permittee shall submit compliance documentation of compliance with this special operation condition when filing FCC Form 350, application for license.

**FCC FORM 350**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page six: KQBA-FM1

Answer to Special Operating Condition or Restriction #4:

The applicant has posted five warning signs the describe the radiofrequency radiation hazard to humans. The warning signs are posted at eye level, approximately five feet above ground level on the chain-link perimeter site fence and on the three other sides of the rectangular shape fence. The fifth sign is posted on the transmitter equipment building the contains this stations transmitting equipment. The signs are commercially made and are the normal, yellow, black and white colors.

The instant application requests the Commission grant a new station license for FM Broadcast Booster Station KQBA-FM1, as specified herein. The applicant, Hutton Broadcasting, L.L.C, respectfully requests the Commission staff consider and grant the instant application for the facilities requested.

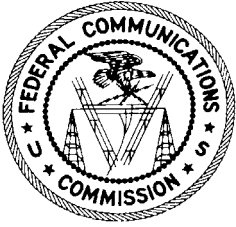
Respectfully submitted,

Elliott Kurt Klein,  
Consulting Broadcast Engineer

23 January 2010

**EXHIBIT E-1**

**United States of America**



**FEDERAL COMMUNICATIONS COMMISSION  
FM BROADCAST TRANSLATOR/BOOSTER STATION  
CONSTRUCTION PERMIT**

Authorizing Official:

Official Mailing Address:

HUTTON BROADCASTING, LLC  
C/O TED HUTTON  
221 SEABREEZE COURT  
VERO BEACH FL 32963

James D. Bradshaw  
Deputy Chief  
Audio Division  
Media Bureau

Facility Id: 123369

Call Sign: KQBA-FM1

Permit File Number: BPFTB-20090727ADH

Grant Date: July 29, 2009

This permit expires 3:00 a.m.  
local time, 36 months after the  
grant date specified above.

Commission rules which became effective on February 16, 1999, have a bearing on this construction permit. See Report & Order, Streamlining of Mass Media Applications, MM Docket No. 98-43, 13 FCC RCD 23056, Para. 77-90 (November 25, 1998); 63 Fed. Reg. 70039 (December 18, 1998). Pursuant to these rules, this construction permit will be subject to automatic forfeiture unless construction is complete and an application for license to cover is filed prior to expiration. See Section 73.3598.

Name of Permittee: HUTTON BROADCASTING, LLC

Principal community to be served: NM-LOS ALAMOS&SANTA FE

Primary Station: KQBA (FM) , Channel 298, LOS ALAMOS, NM

Via: Direct - off-air

Frequency (MHz): 107.5

Channel: 298

Hours of Operation: Unlimited

Antenna Coordinates: North Latitude: 35 deg 41 min 20 sec  
 West Longitude: 105 deg 58 min 42 sec

Transmitter: Type Accepted. See Sections 73.1660, 74.1250 of the Commission's Rules

Antenna type: (directional or non-directional): Directional

Major lobe directions 130 140  
 (degrees true):

Horizontally	Vertically
Polarized	Polarized
Antenna:	Antenna:

Effective radiated power in the Horizontal Plane (kw):	12
Height of radiation center above ground (Meters):	35
Height of radiation center above mean sea level (Meters):	2156

Antenna structure registration number: 1224069

Overall height of antenna structure above ground (including obstruction lighting if any) see the registration for this antenna structure.

Special operating conditions or restrictions:

- 1 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.
- 2 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 FCC guidelines.
- 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 Form 350-FM application for license.



Special operating conditions or restrictions:

- 4 Warning signs which describe the radiofrequency electromagnetic field radiation hazard must be posted at appropriate intervals. Access must be restricted to prevent the exposure of humans to RF emissions in excess of the FCC guidelines (OET Bulletin 65, Edition 97-01, released August 1997). Permittee shall submit documentation of compliance with this special operating condition when filing FCC Form 350, application for license.

\*\*\* END OF AUTHORIZATION \*\*\*

**EXHIBIT E-2**

***KLEIN BROADCAST ENGINEERING, L.L.C.***

*dedicated to improving the science and technology of radio & television communications*

**ENGINEERING / EVALUATION  
REPORT**

**EQUIPMENT PERFORMANCE MEASUREMENTS  
FM RF PROOF OF PERFORMANCE  
HUTTON BROADCASTING, L.L.C.  
K Q B A – FM1  
(FCC FACILITY ID# 123369)  
FM CHANNEL 298 / 107.5mHz.  
SANTA FE, NEW MEXICO  
FM BOOSTER STATION TRANSMISSION FACILITY**

**INTRODUCTION and ENGINEERING STATEMENT**

**This Engineering Evaluation Report, RF Proof of Performance Measurements, was prepared in support of certification of the operations of the specified transmitting systems herein as being in compliance with 47 C.F.R. Section 73.1590 of the Rules and Regulations of the Federal Communications Commission and in compliance with 47 C.F.R. 73.317 of the Rules and Regulations of the Federal Communications Commission.**

**In the case of the KQBA-FM1 Transmission System, the measurement equipment was set up according to Good Engineering Practice. The calibration of the Tektronix 3408A Spectrum Analyzer was checked according to the manufacturer's instructions. The point of measurement in the system was a Bird Electronics directional coupler at the output port of an six section IRTE FM combiner.**

**INTRODUCTION and ENGINEERING STATEMENT cont'd page two: KQBA-FM1**

Measurements were made on the station's carrier frequency for reference purposes and to look at occupied bandwidth for any unusual spurious emission. The assigned carrier frequency reference level was recorded and screen shot saved. All other harmonic, intermodulation product or spurious emission levels were referenced to this initial carrier frequency reference level. The radio spectrum from 50MHz. up to this station's 10<sup>th</sup> carrier frequency harmonic was tuned to look for any unusual emissions. Any deviation from the FCC prescribed limits will be noted in this report.

The intermodulation products measured in this report were calculated as the common  $2 \times A - B =$  Intermodulation product. As in the case herein the carrier frequency of the station under test was multiplied times 2 and then the carrier frequency of each of the combined individual stations was subtracted one at a time from the 2X sum to find the common intermodulation product.

No unusual spurious emissions, carrier frequency harmonics or intermodulation products were noted on the Transmission System for Station KQBA-FM1. Harmonic products were measured up to and including the 10<sup>th</sup> order. The spectrum analyzer measurements were adjusted by a factor of -6dB per octave as prescribed by Good Engineering Practice. The measurement levels found in this report have been adjusted by this octave factor.

**INTRODUCTION and ENGINEERING STATEMENT cont'd page three: KQBA-FM1**

The input amplifiers of the spectrum analyzer were protected from overload by using a calibrated set of tunable band-pass filters that cover the radio spectrum from 50mHz to 1.4GHz. This practice prevents level compression and false readings from occurring by keeping the input amplifiers of the spectrum analyzer in their linear range of operation. This measurement set up is common to Good Engineering Standards and Practice. All cables used in the test set up were RG-223 or RG-400 double shielded coaxial cables to insure no stray fields were induced into the measurement cables.

Unless otherwise noted the FM transmission system under test and documented in this report complied with all the provisions of 47 C.F.R. Section 73.317 of the Rules and Regulations of the Federal Communications Commission.

The measurements found herein were made on January 14, 2010 between the hours of 8:50pm M.S.T. and 11:55pm M.S.T.

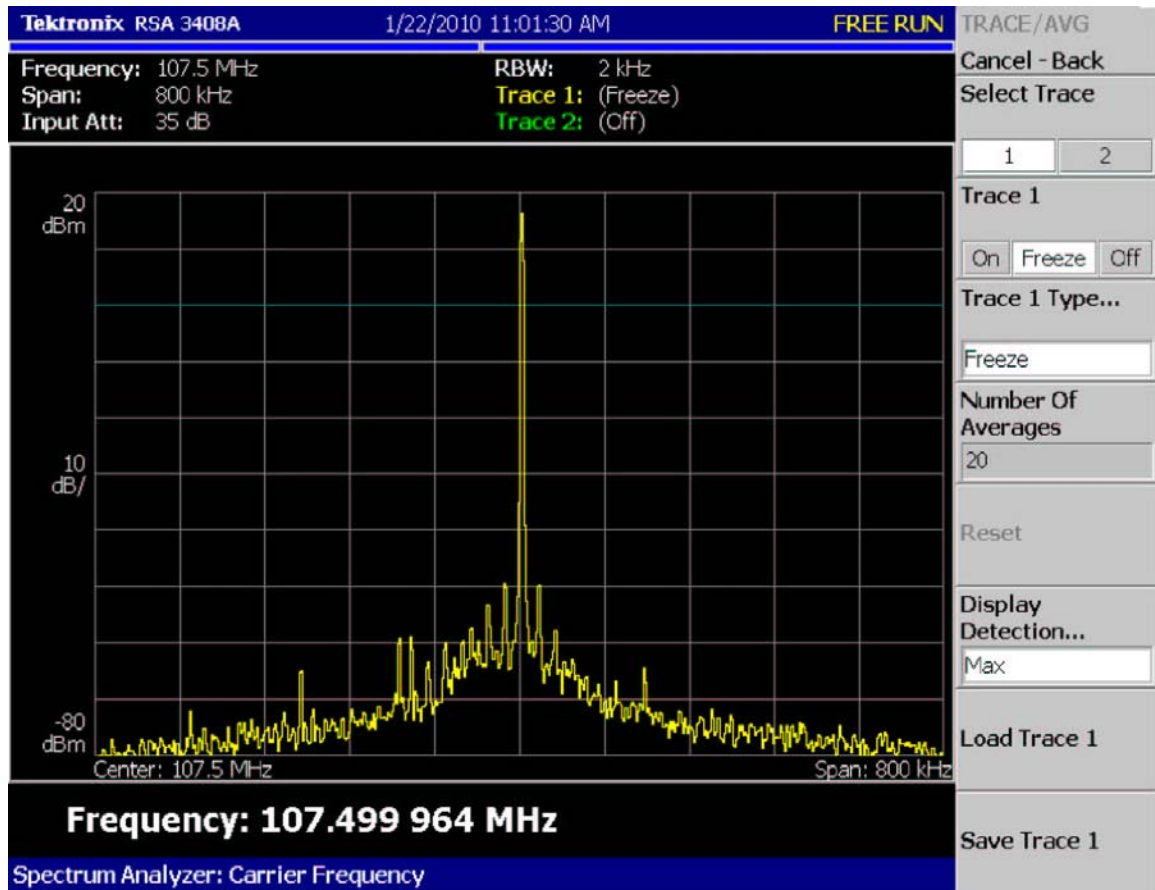
Respectfully submitted,

Elliott Kurt Klein,  
Consulting Broadcast Engineer

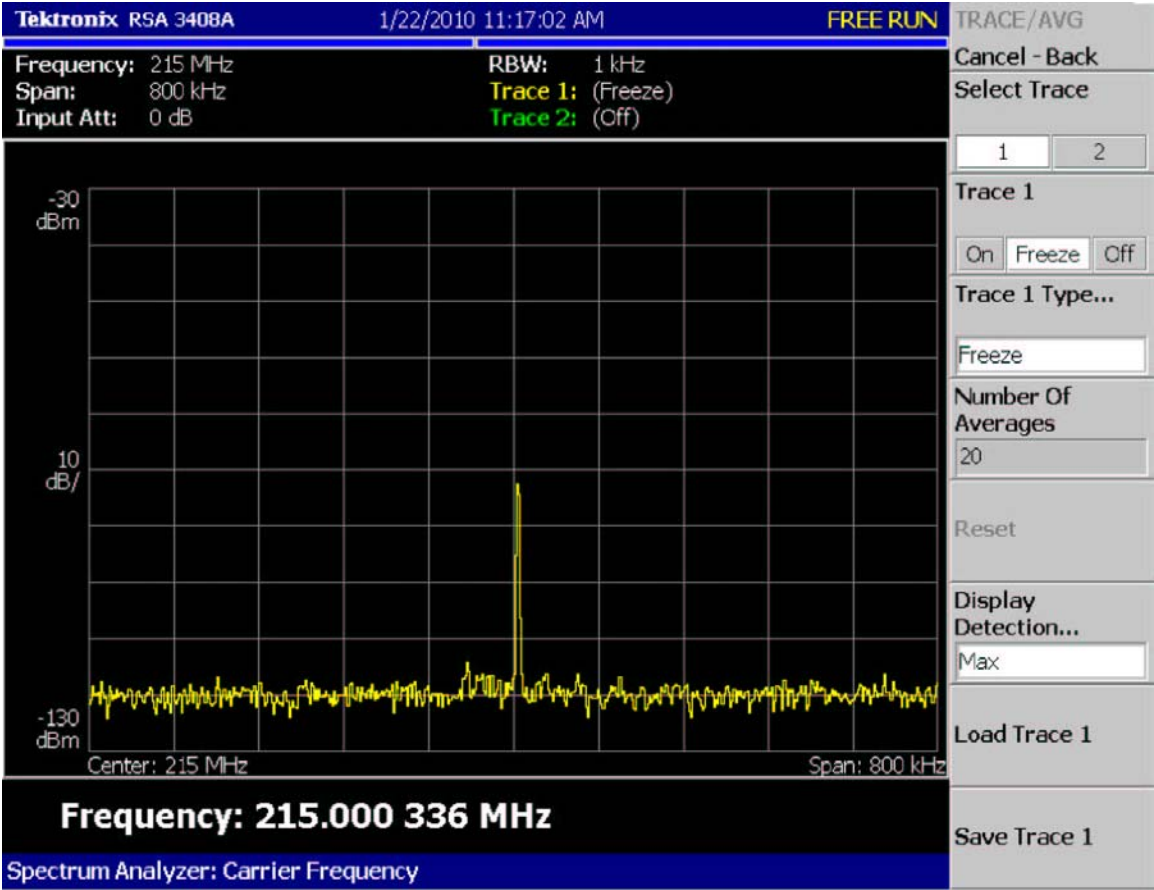
22 January 2010

## TABLE of READINGS and SPECTRUM ANALYZER SCREEN SHOTS

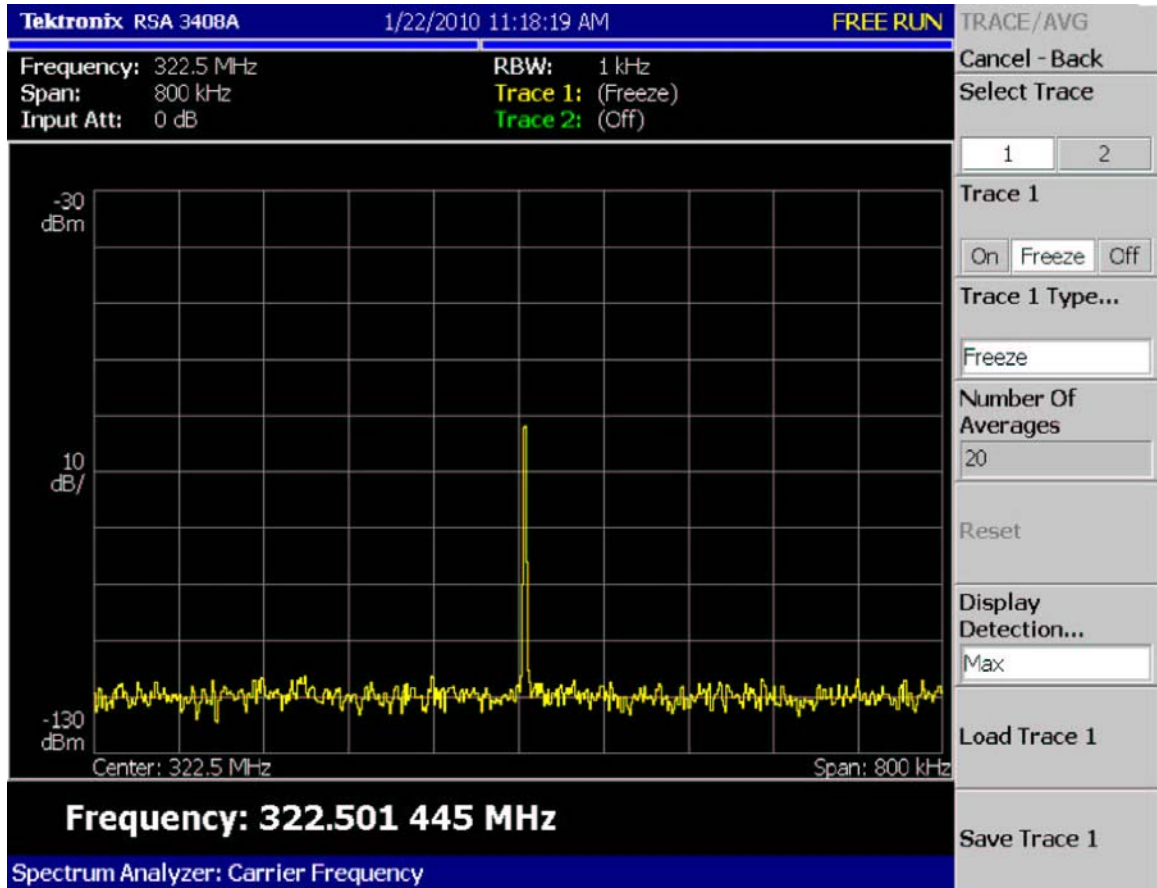
**Main Transmission System Reference Level 107.5mHz. +16.0dBm**



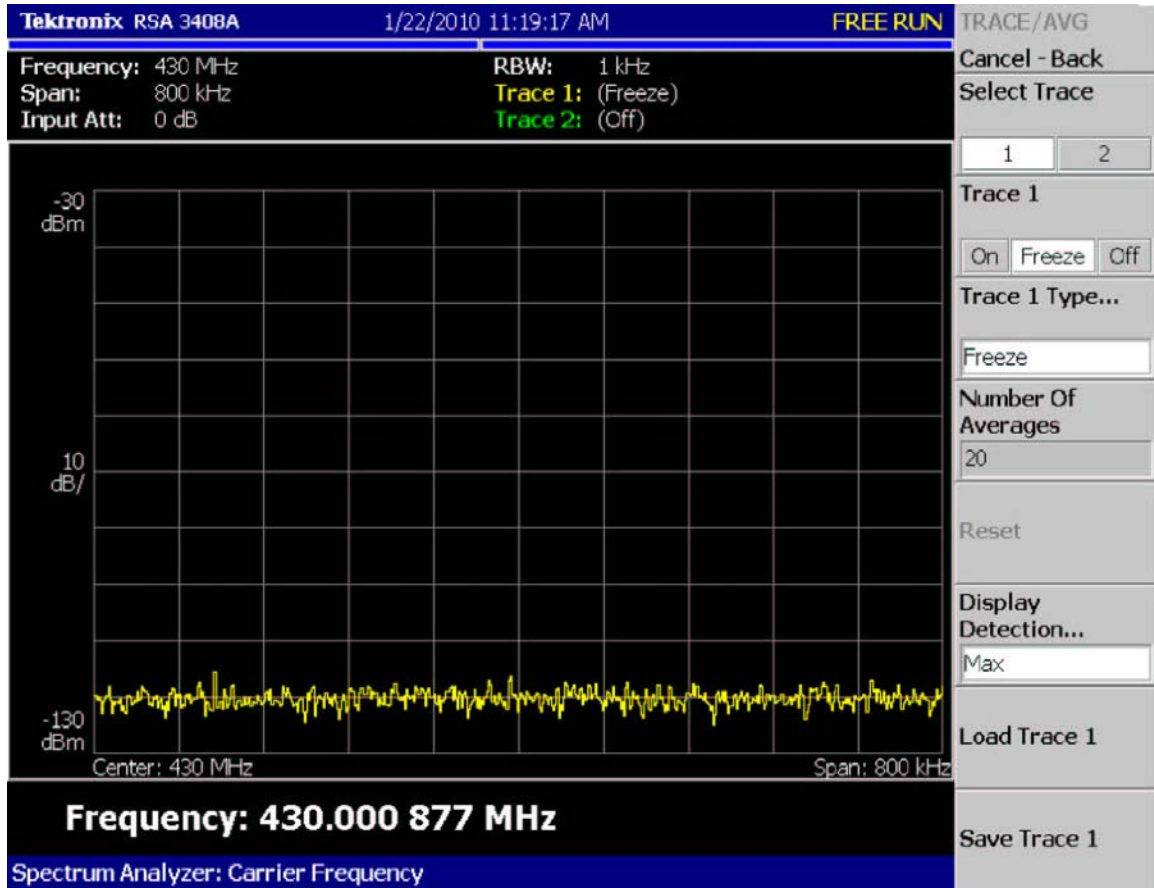
Main Transmission System 2<sup>nd</sup> Harmonic 215.0mHz. -102.0dBc



# Main Transmission System 3<sup>rd</sup> Harmonic 322.5mHz. -95.0dBc

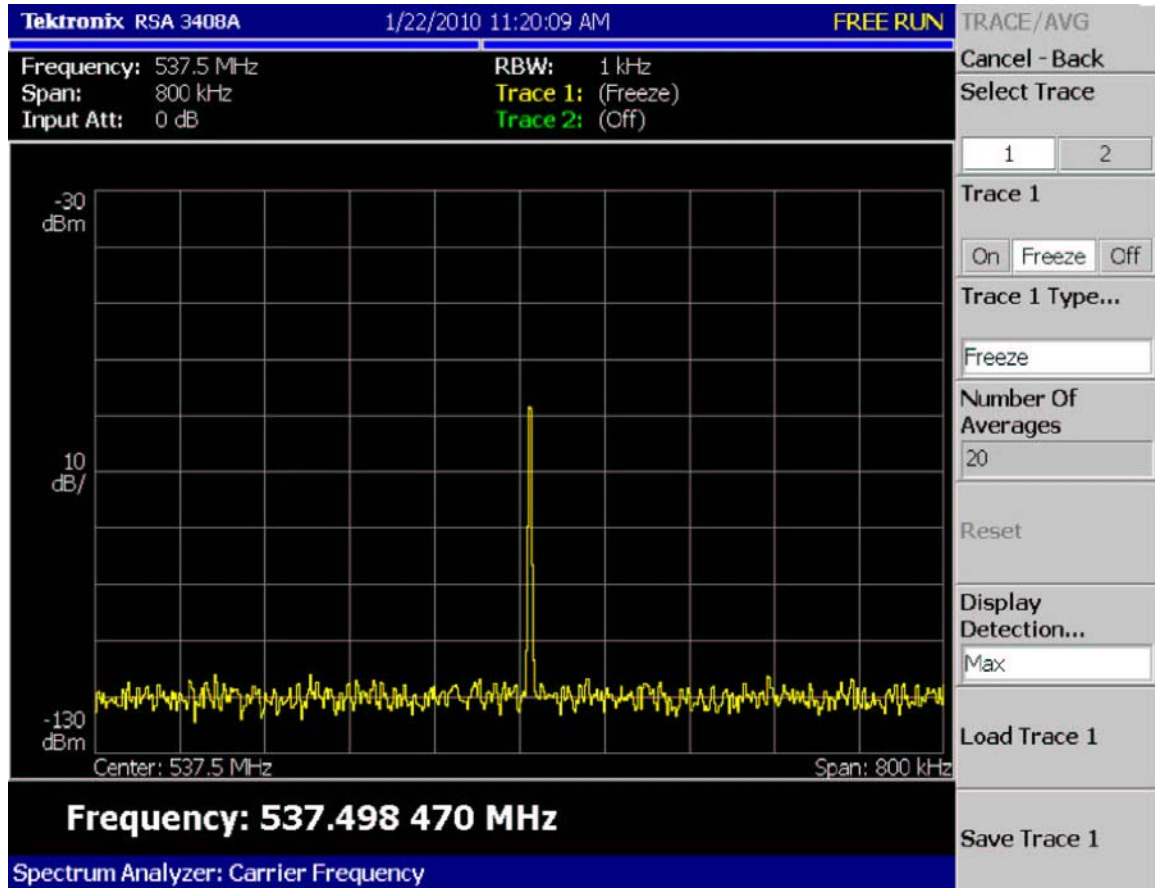


**Main Transmission System 4<sup>th</sup> Harmonic 430.0mHz. -146.0dBc**

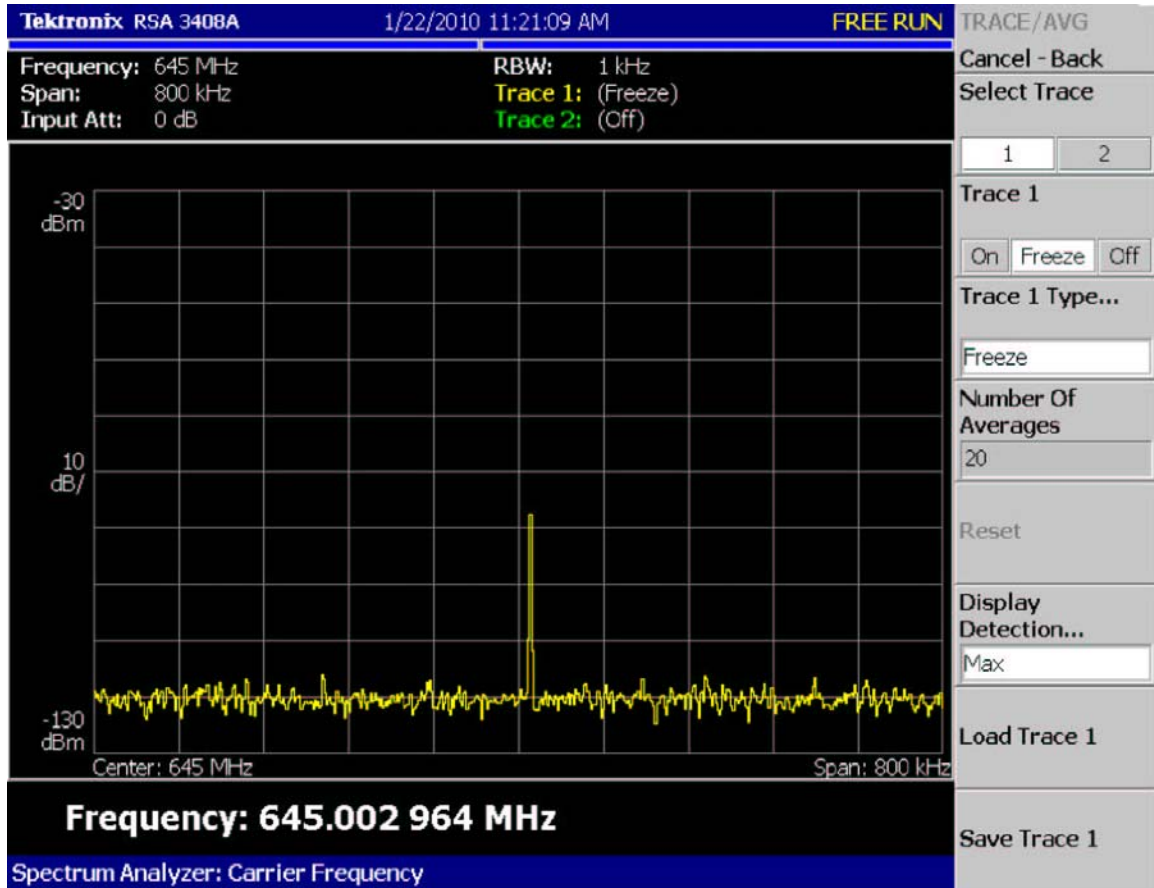




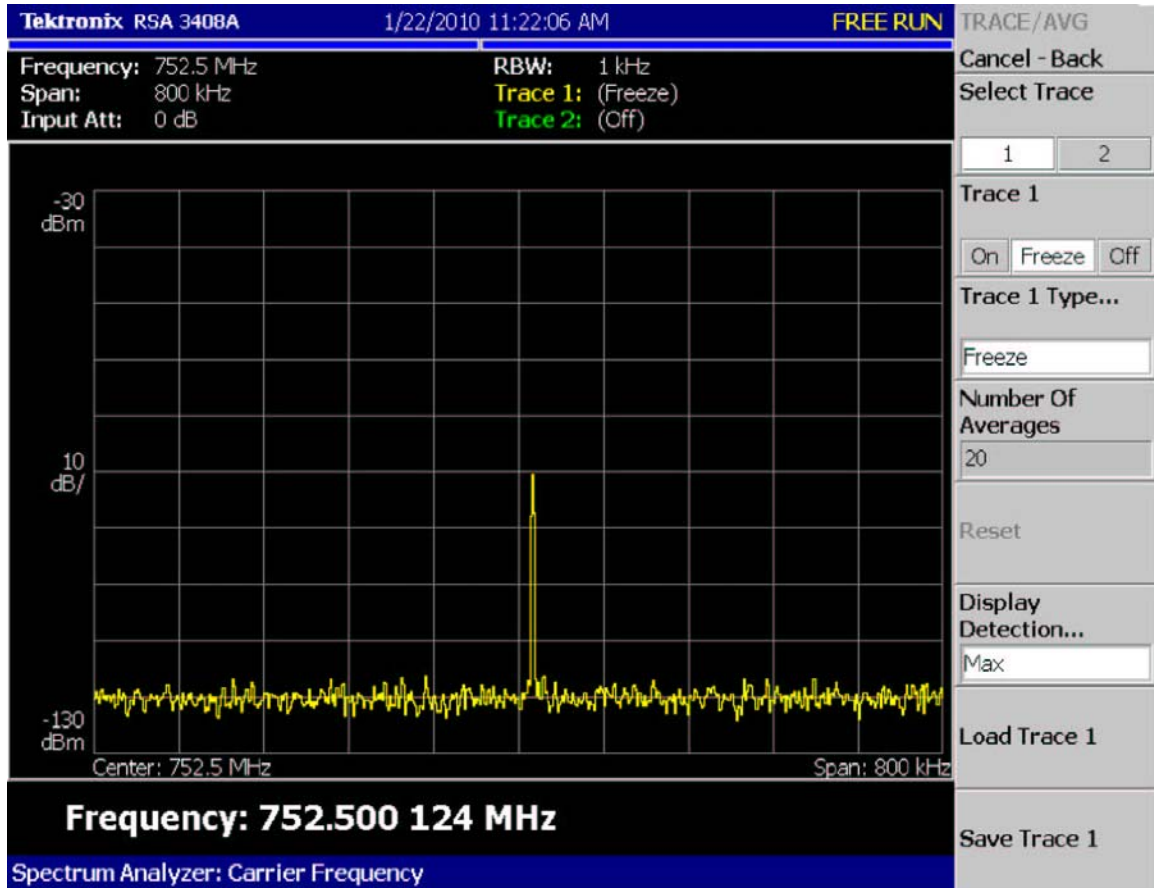
**Main Transmission System 5<sup>th</sup> Harmonic 537.5mHz. -99.5dBc**



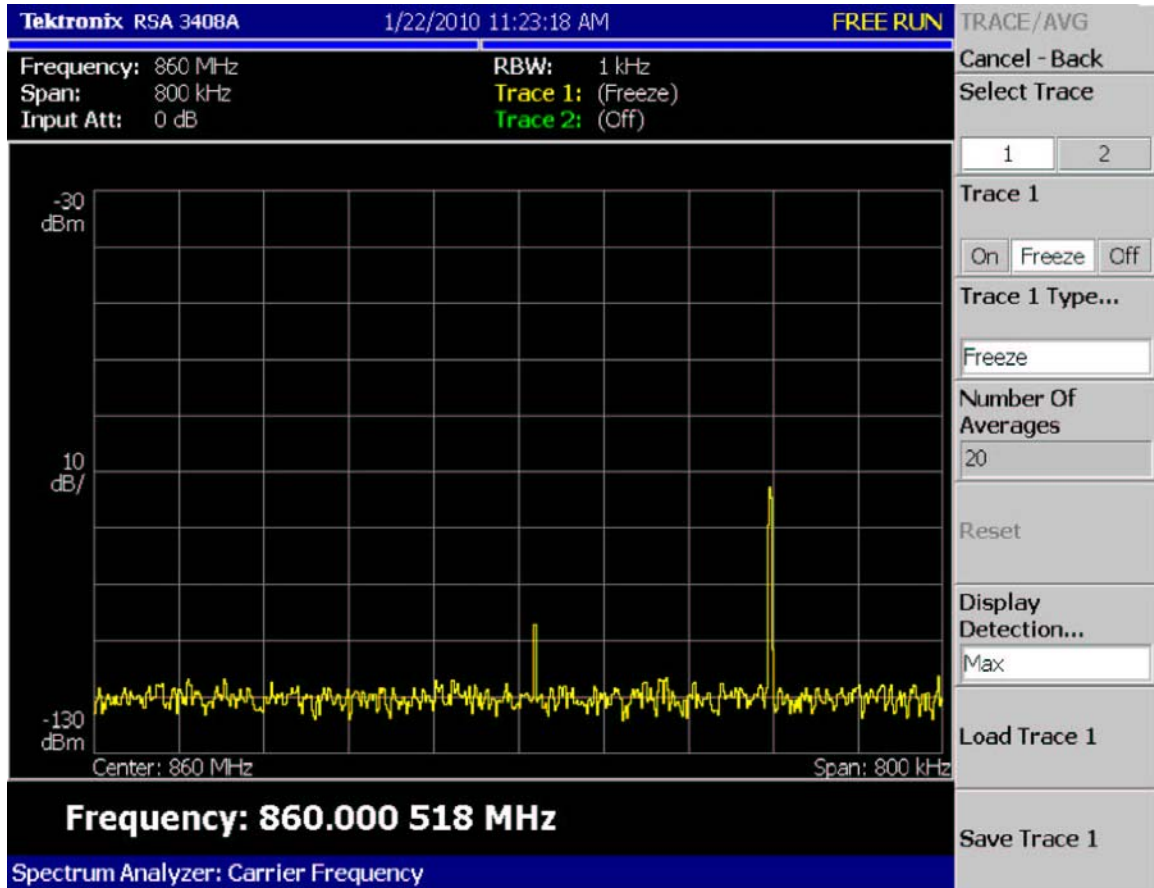
**Main Transmission System 6<sup>th</sup> Harmonic 645.0mHz. -121.0dBc**



**Main Transmission System 7<sup>th</sup> Harmonic 752.5mHz. -116.5dBc**

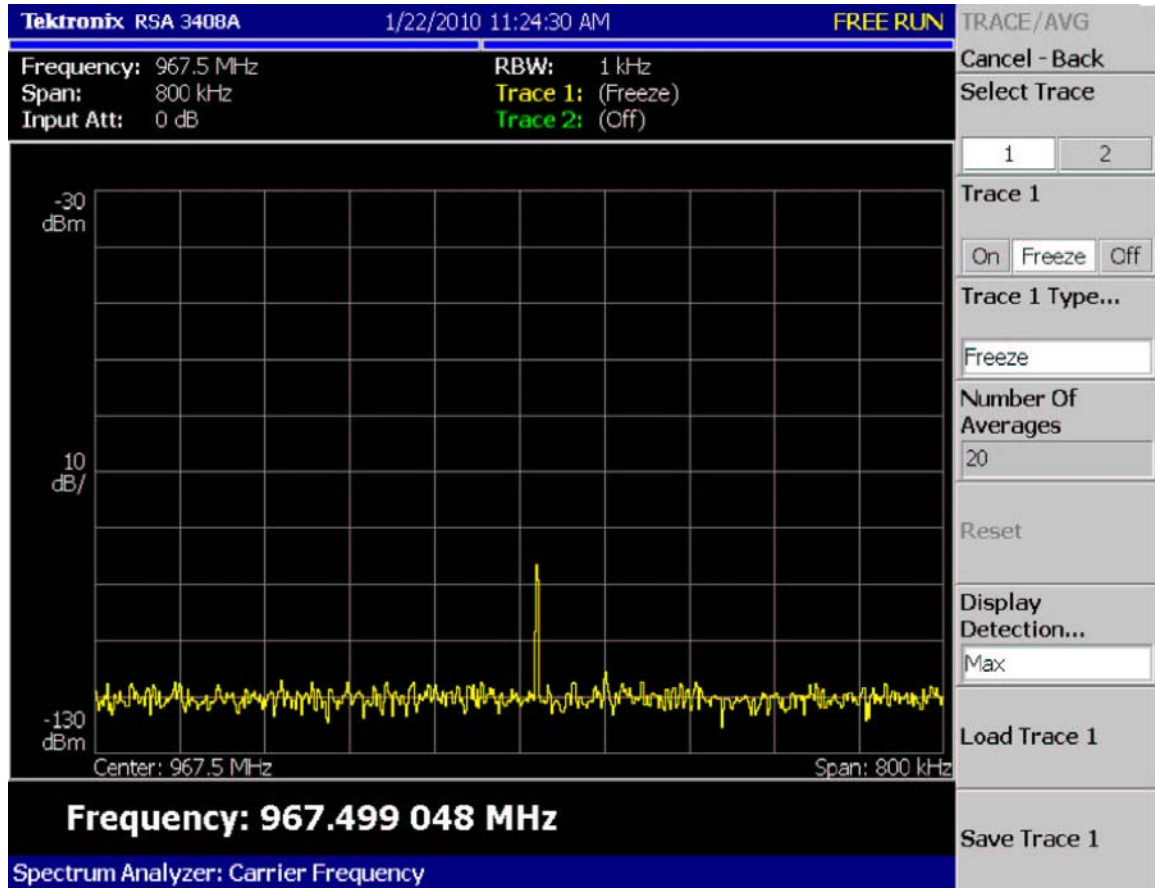


## Main Transmission System 8<sup>th</sup> Harmonic 860.0mHz. -144.0dBc

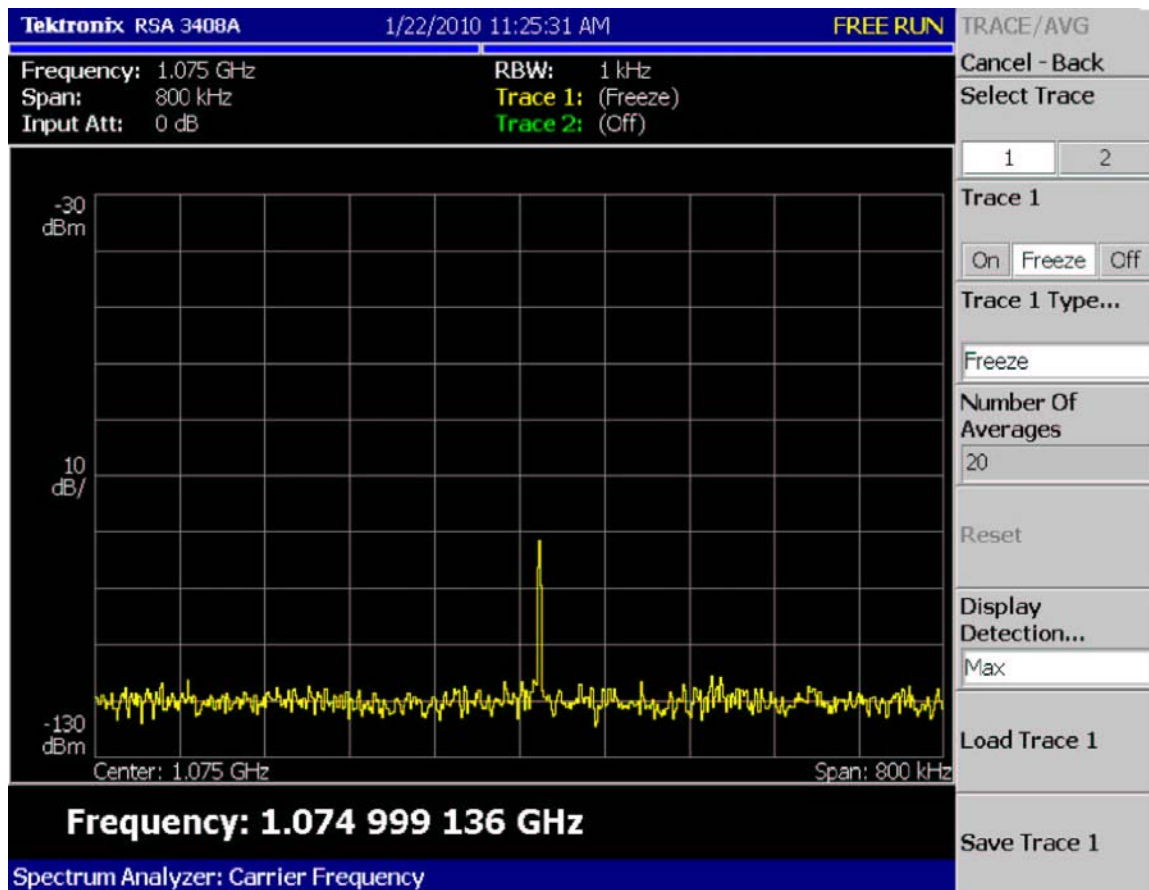


Note: The carrier to the right side of this screen capture is that of a cellular carrier on the common site and is not an intermodulation product or spurious emission related to the combined operations of KQBA-FM1 & KKIM-FM1.

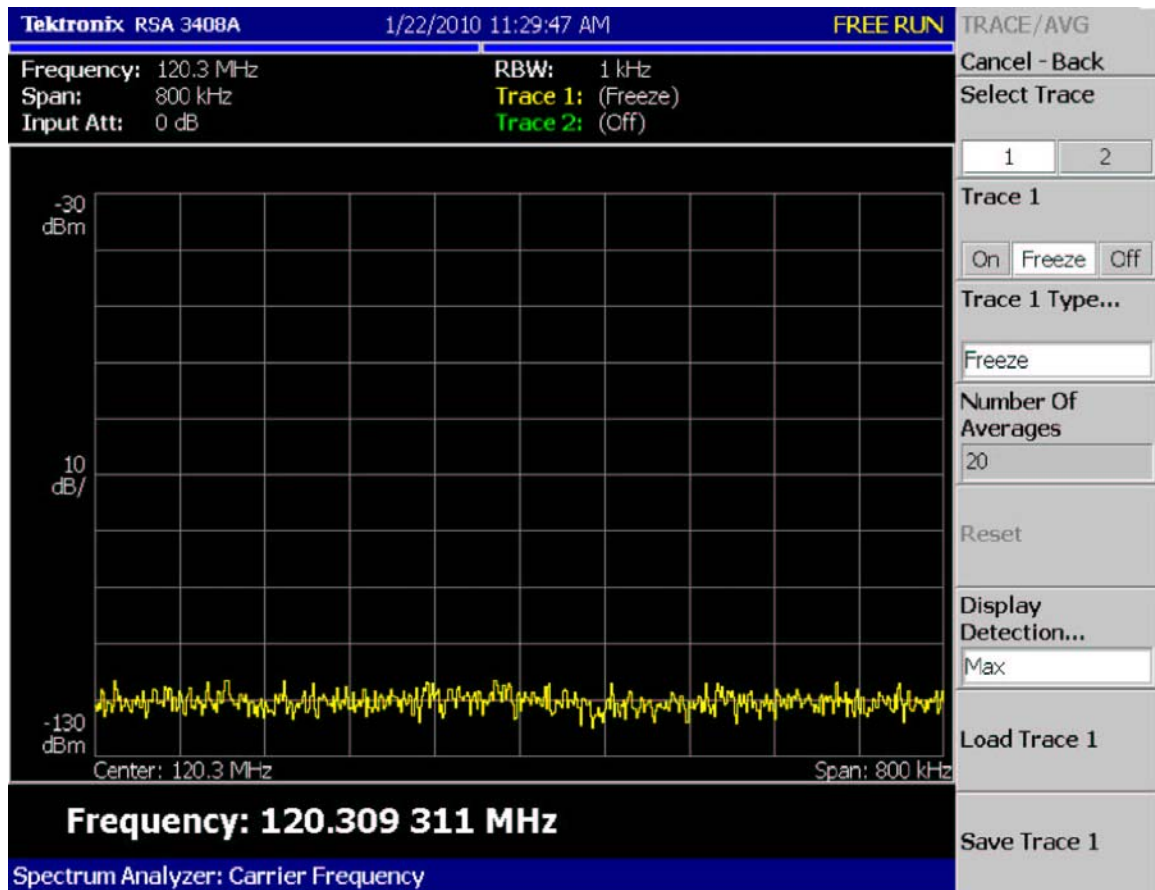
# Main Transmission System 9<sup>th</sup> Harmonic 967.5mHz. -148.75dBc



# Main Transmission System 10<sup>th</sup> Harmonic 1.075GHz. -125.50dBc



Measured Intermodulation Product with KKIM-FM1 94.7mHz  
 $2 \times 107.5\text{mHz} - 94.7\text{mHz} = 120.3\text{mHz}$ . Measured -136.0 dBc



### **Measurement Equipment Listing**

- 1. Tektronix Spectrum Analyzer model RSA3408A, serial #B010214-1, calibrated NBS traceable 25 September 2009, Tektronix Cal. Cert. # 1271845-RSA3408A-B010214-1**
- 2. Trilithic Series VF-40003, serial #9711119, Custom Tunable Band-Pass Filter set 50mHz. to 1.4GHz. calibrated 07/2008**
- 3. Tektronix C-5A Scope Camera with Polaroid 667 3000ASA Film**
- 4. Test Cables RG223 & RG-400 Double Shielded Coaxial Cable**
- 5. Hewlett-Packard RF Frequency Counter, model 53181A, serial # 3710A02728, calibrated NBS traceable, 30 December 2009**
- 6. Bird Electronics RF BNC Sniffer Slug**
- 7. Bird Electronics 2watt RF Termination -47dB return loss @ 100mHz.**



**EXHIBIT E-3**

***KLEIN BROADCAST ENGINEERING, L.L.C.***

*dedicated to improving the science and technology of radio & television communications*

**ENGINEERING / EVALUATION  
REPORT**

**EQUIPMENT PERFORMANCE MEASUREMENTS  
FM RF PROOF OF PERFORMANCE  
AGM-NEVADA, L.L.C.  
K K I M – FM1  
(FCC FACILITY ID# 123368)  
FM CHANNEL 234 / 94.7mHz.  
SANTA FE, NEW MEXICO  
FM BOOSTER STATION TRANSMISSION FACILITY**

**INTRODUCTION and ENGINEERING STATEMENT**

**This Engineering Evaluation Report, RF Proof of Performance Measurements, was prepared in support of certification of the operations of the specified transmitting systems herein as being in compliance with 47 C.F.R. Section 73.1590 of the Rules and Regulations of the Federal Communications Commission and in compliance with 47 C.F.R. 73.317 of the Rules and Regulations of the Federal Communications Commission.**

**In the case of the KKIM-FM1 Transmission System, the measurement equipment was set up according to Good Engineering Practice. The calibration of the Tektronix RSA-3408A Spectrum Analyzer was checked according to the manufacturer's instructions. The point of measurement in the system was a Bird Electronics directional coupler at the output port of a six section IRTE FM combiner.**

**INTRODUCTION and ENGINEERING STATEMENT cont'd page two: KKIM-FM1**

Measurements were made on the station's carrier frequency for reference purposes and to look at occupied bandwidth for any unusual spurious emission. The assigned carrier frequency reference level was recorded and screen shot saved. All other harmonic, intermodulation product or spurious emission levels were referenced to this initial carrier frequency reference level. The radio spectrum from 50mHz. up to this station's 10<sup>th</sup> carrier frequency harmonic was tuned to look for any unusual emissions. Any deviation from the FCC prescribed limits will be noted in this report.

The intermodulation products measured in this report were calculated as the common  $2 \times A - B = \text{Intermodulation product}$ . As in the case herein the carrier frequency of the station under test was multiplied times 2 and then the carrier frequency of each of the combined individual stations was subtracted one at a time from the 2X sum to find the common intermodulation product.

No unusual spurious emissions, carrier frequency harmonics or intermodulation products were noted on the Transmission System for Station KKIM-FM1. Harmonic products were measured up to and including the 10<sup>th</sup> order. The spectrum analyzer measurements were adjusted by a factor of -6dB per octave as prescribed by Good Engineering Practice. The measurement levels found in this report have been adjusted by this octave factor.

**INTRODUCTION and ENGINEERING STATEMENT cont'd page three: KKIM-FM1**

The input amplifiers of the spectrum analyzer were protected from overload by using a calibrated set of tunable band-pass filters that cover the radio spectrum from 50mHz to 1.4gHz. This practice prevents level compression and false readings from occurring by keeping the input amplifiers of the spectrum analyzer in their linear range of operation. This measurement set up is common to Good Engineering Standards and Practice. All cables used in the test set up were RG-223 or RG-400 double shielded coaxial cables to insure no stray fields were induced into the measurement cables.

Unless otherwise noted the FM transmission system under test and documented in this report complied with all the provisions of 47 C.F.R. Section 73.317 of the Rules and Regulations of the Federal Communications Commission.

The measurements found herein were made on January 14, 2010 between the hours of 8:50pm M.S.T. and 11:55pm M.S.T.

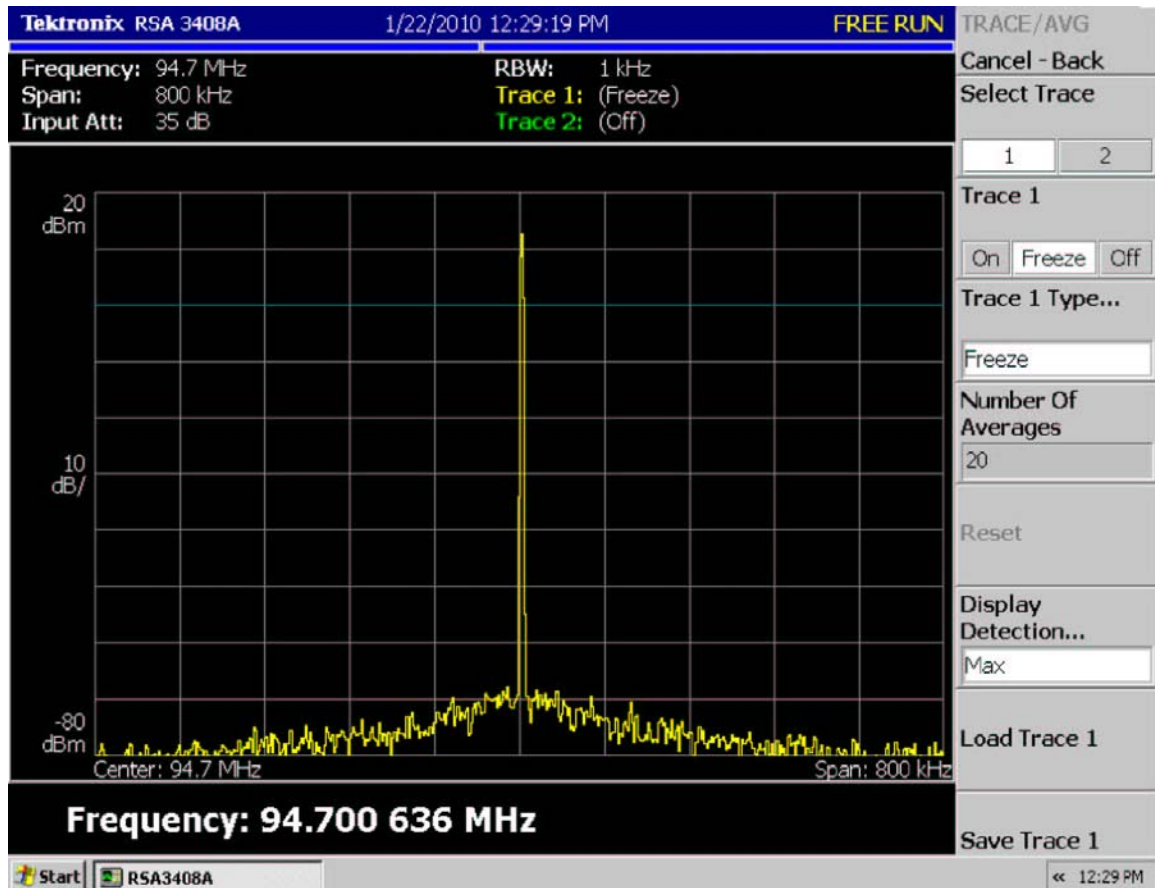
Respectfully submitted,

Elliott Kurt Klein,  
Consulting Broadcast Engineer

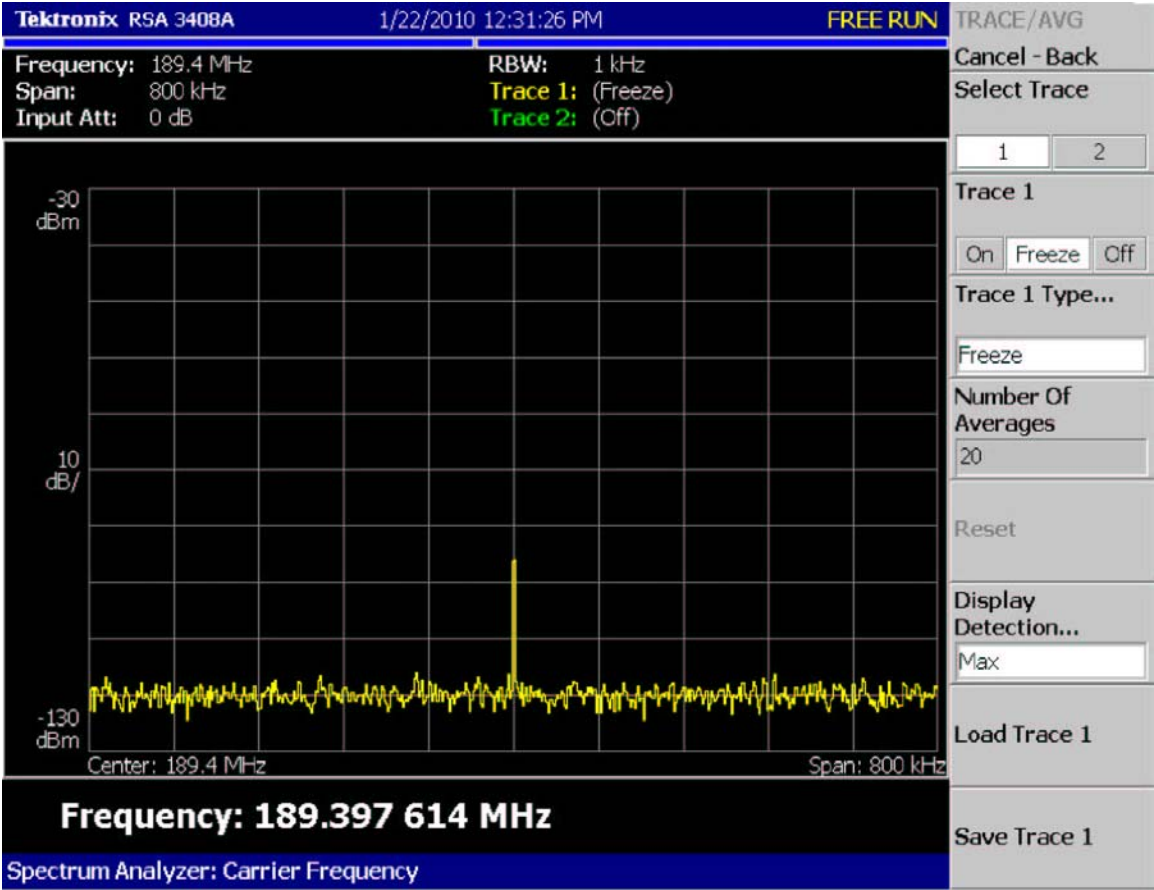
22 January 2006

## TABLE of READINGS and SPECTRUM ANALYZER PHOTOGRAPHS

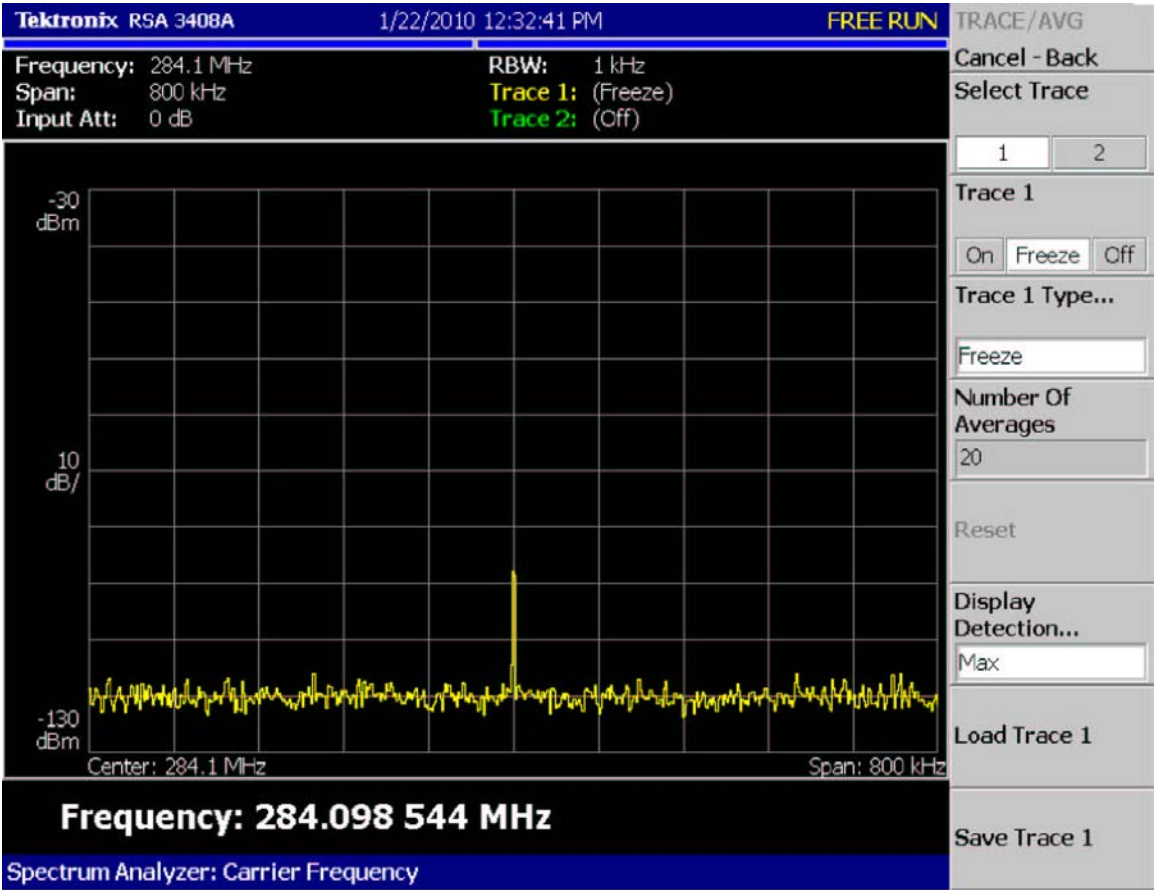
**Main Transmission System Reference Level 94.7mHz. +13.0dBm**



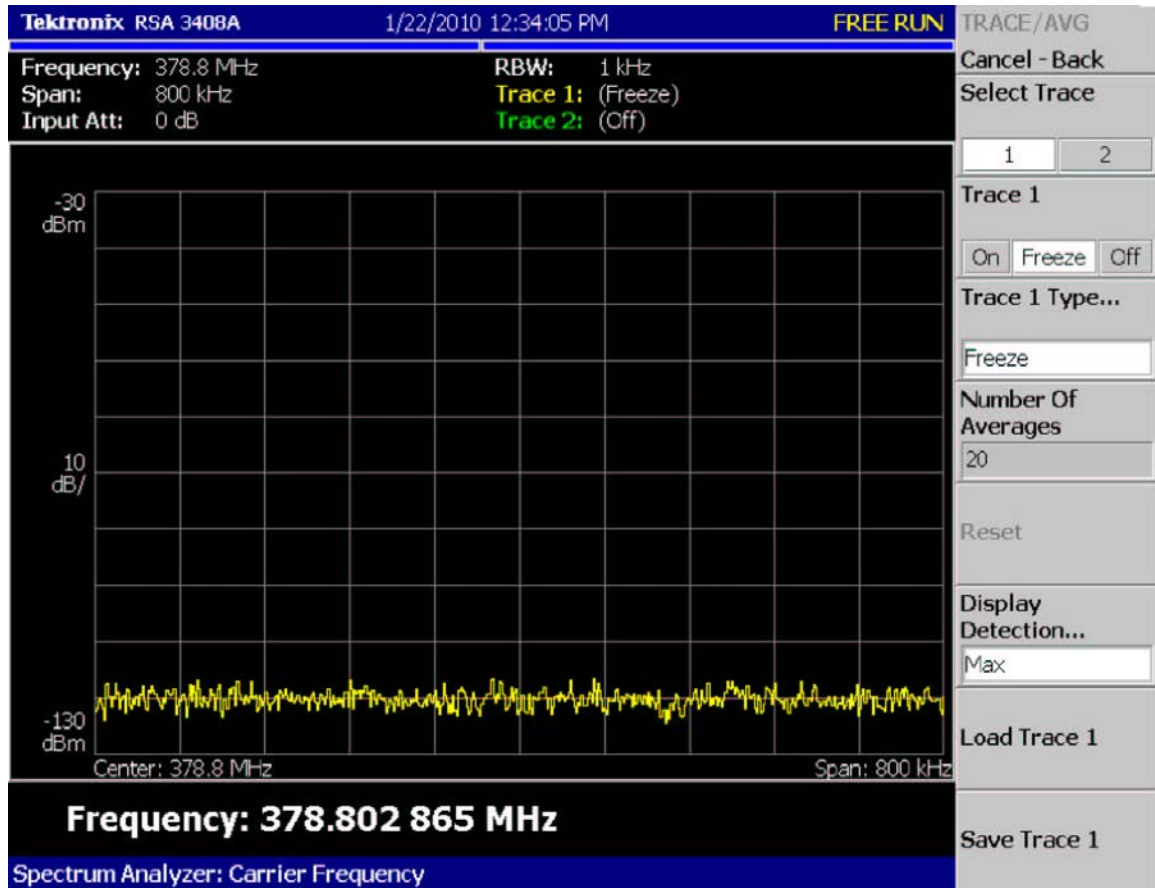
Main Transmission System 2<sup>nd</sup> Harmonic 189.4mHz. -115.0dBc



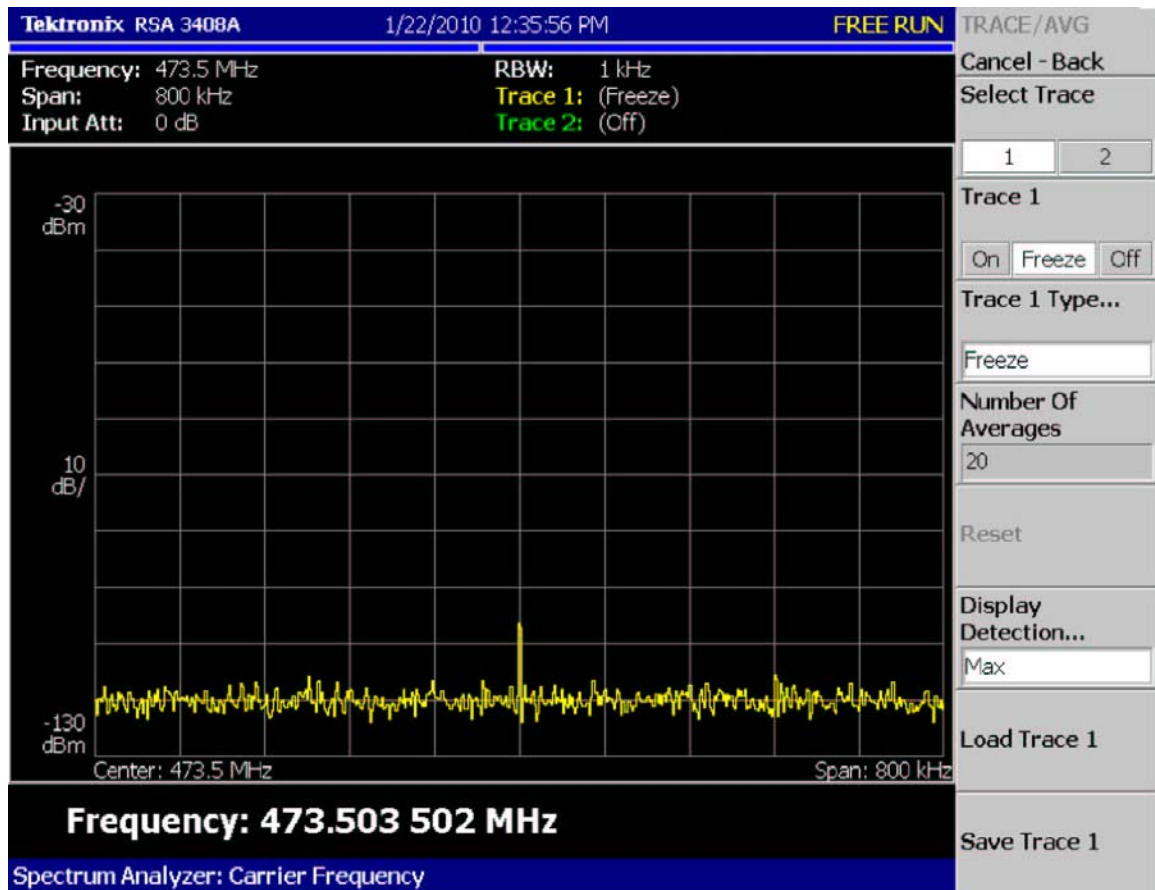
Main Transmission System 3<sup>rd</sup> Harmonic 284.1mHz. -119.0dBc



**Main Transmission System 4<sup>th</sup> Harmonic 378.8mHz. -145.0dBc**

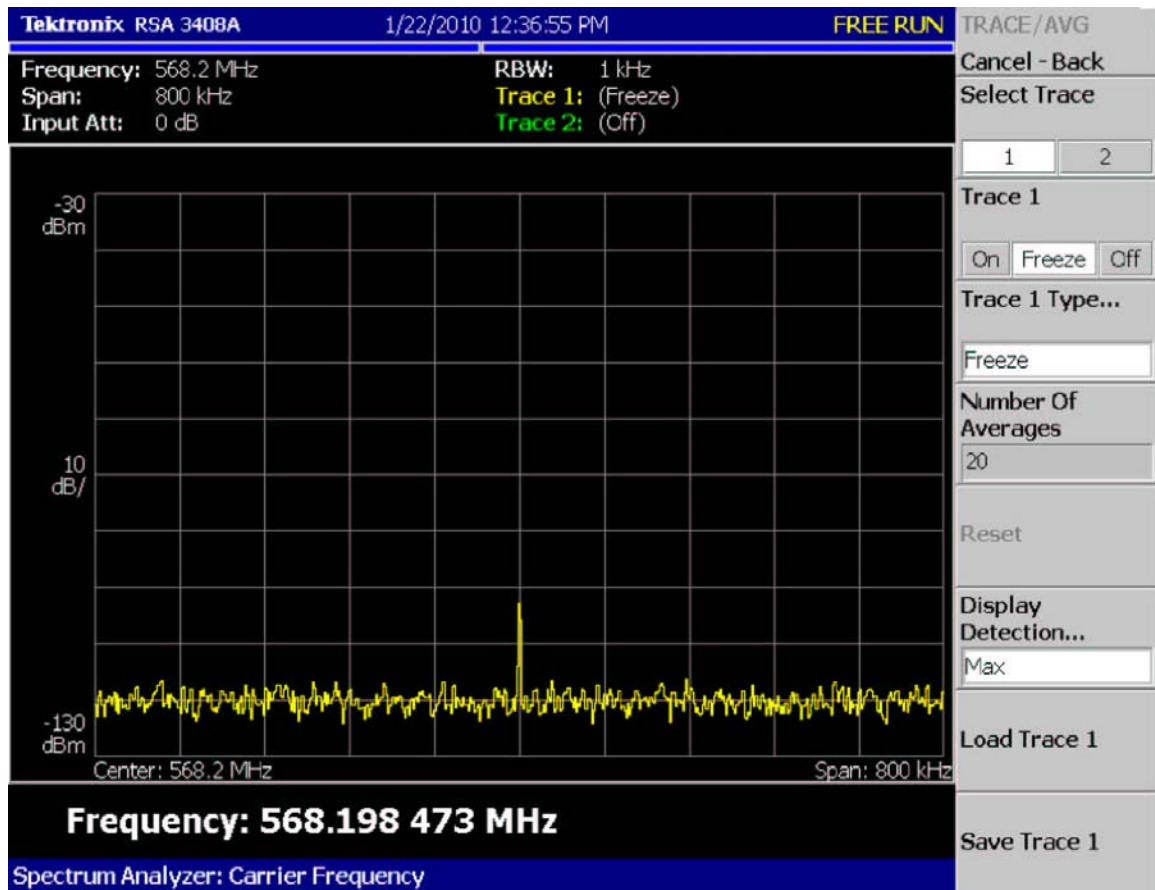


**Main Transmission System 5<sup>th</sup> Harmonic 473.5mHz. -132.5dBc**

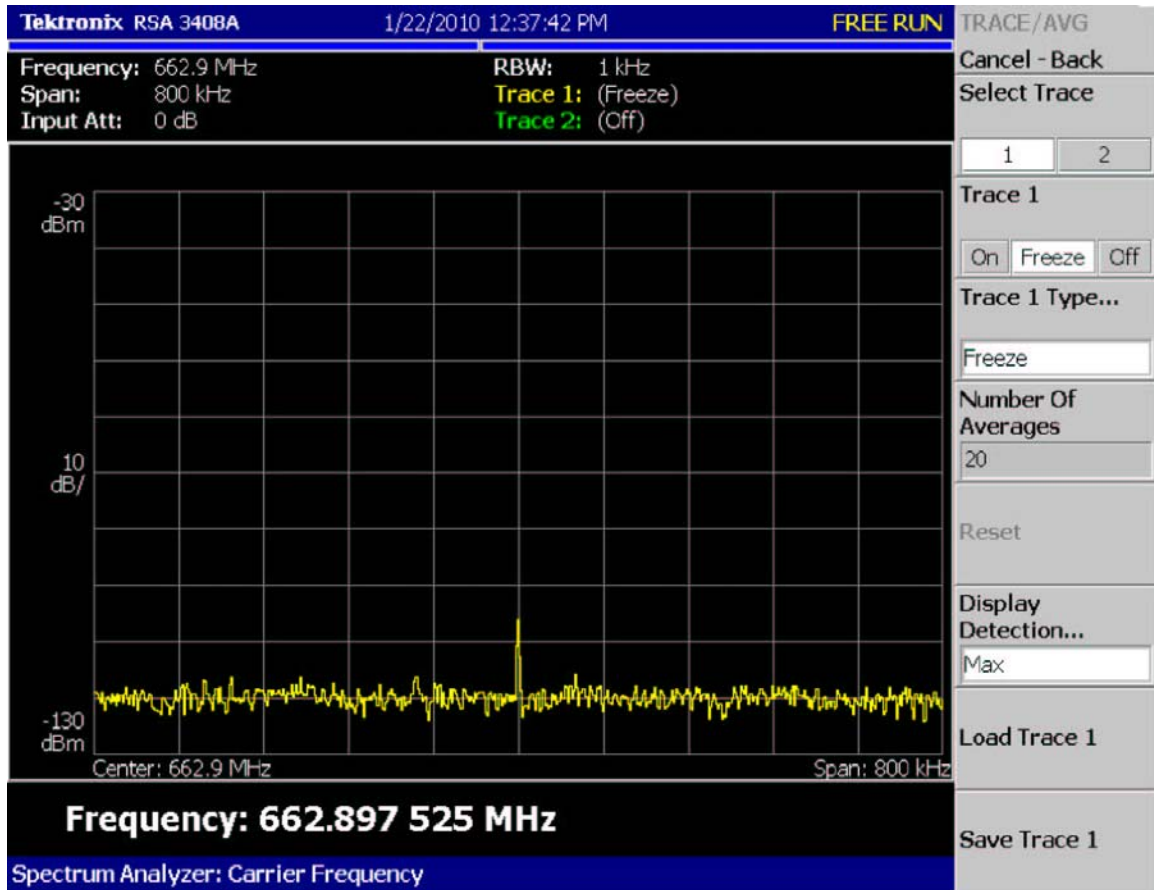




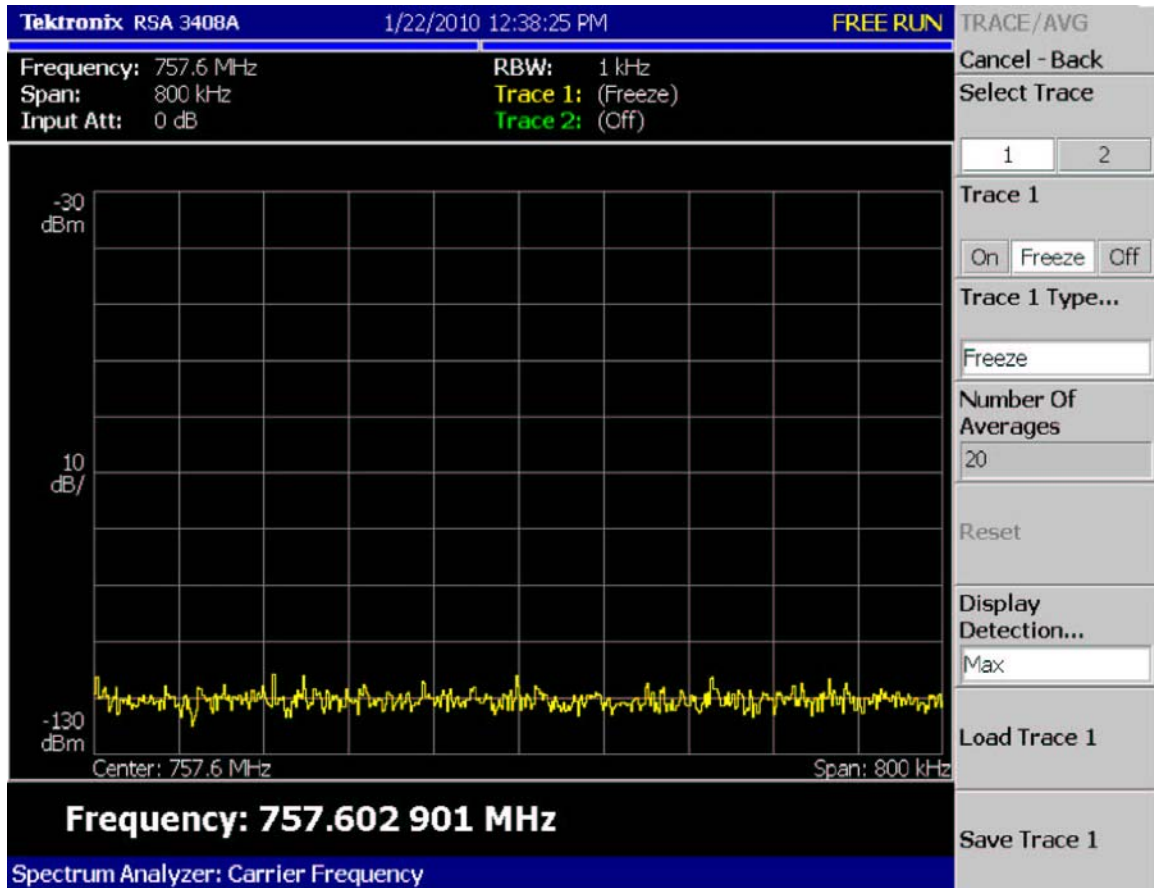
**Main Transmission System 6<sup>th</sup> Harmonic 568.2mHz. -128.0dBc**



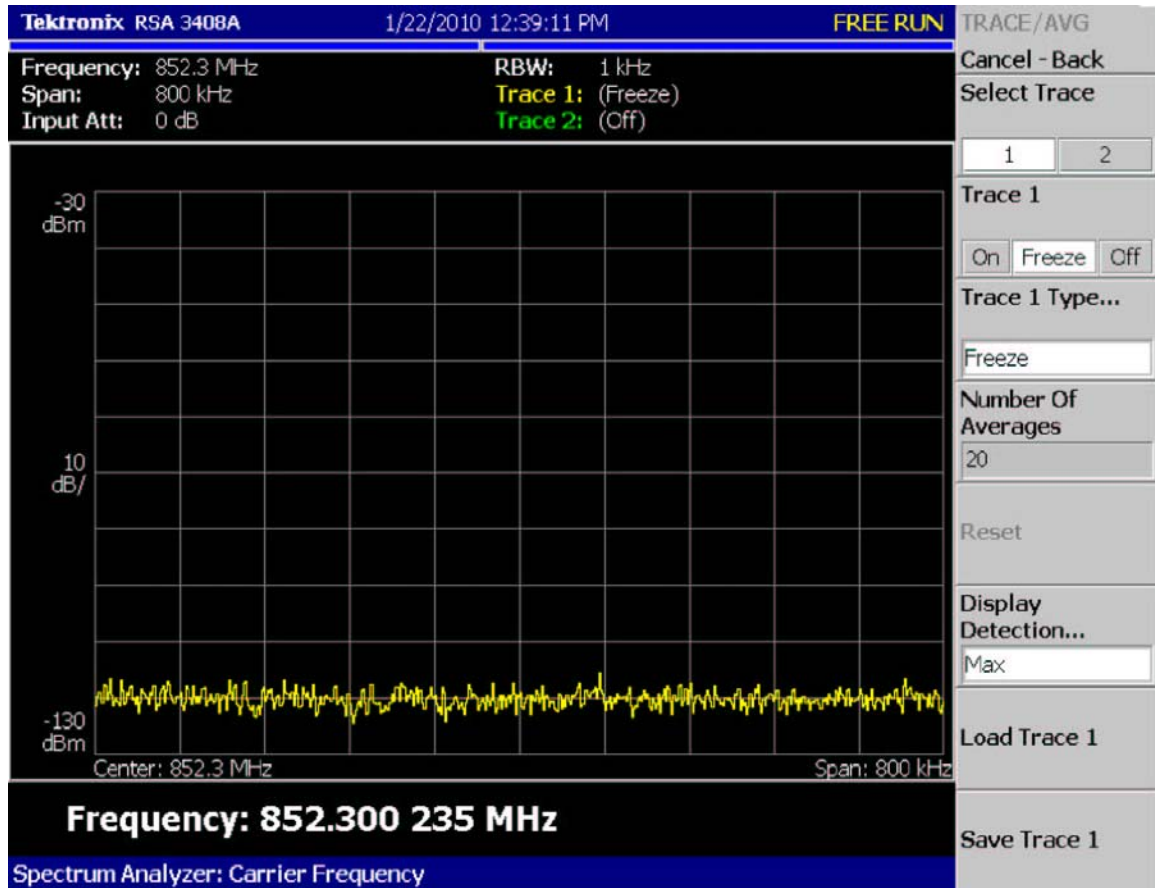
**Main Transmission System 7<sup>th</sup> Harmonic 662.9mHz. -134.5dBc**



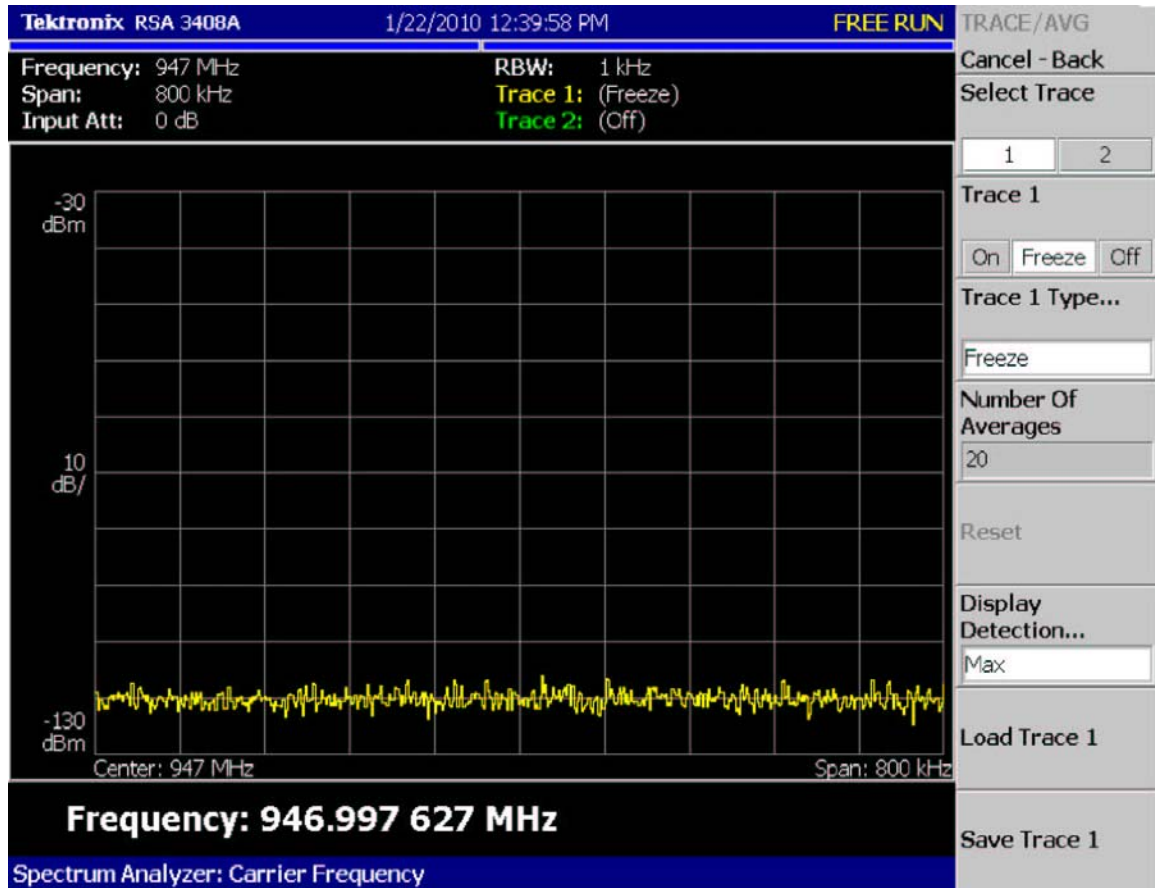
**Main Transmission System 8<sup>th</sup> Harmonic 757.6mHz. -144.0dBc**



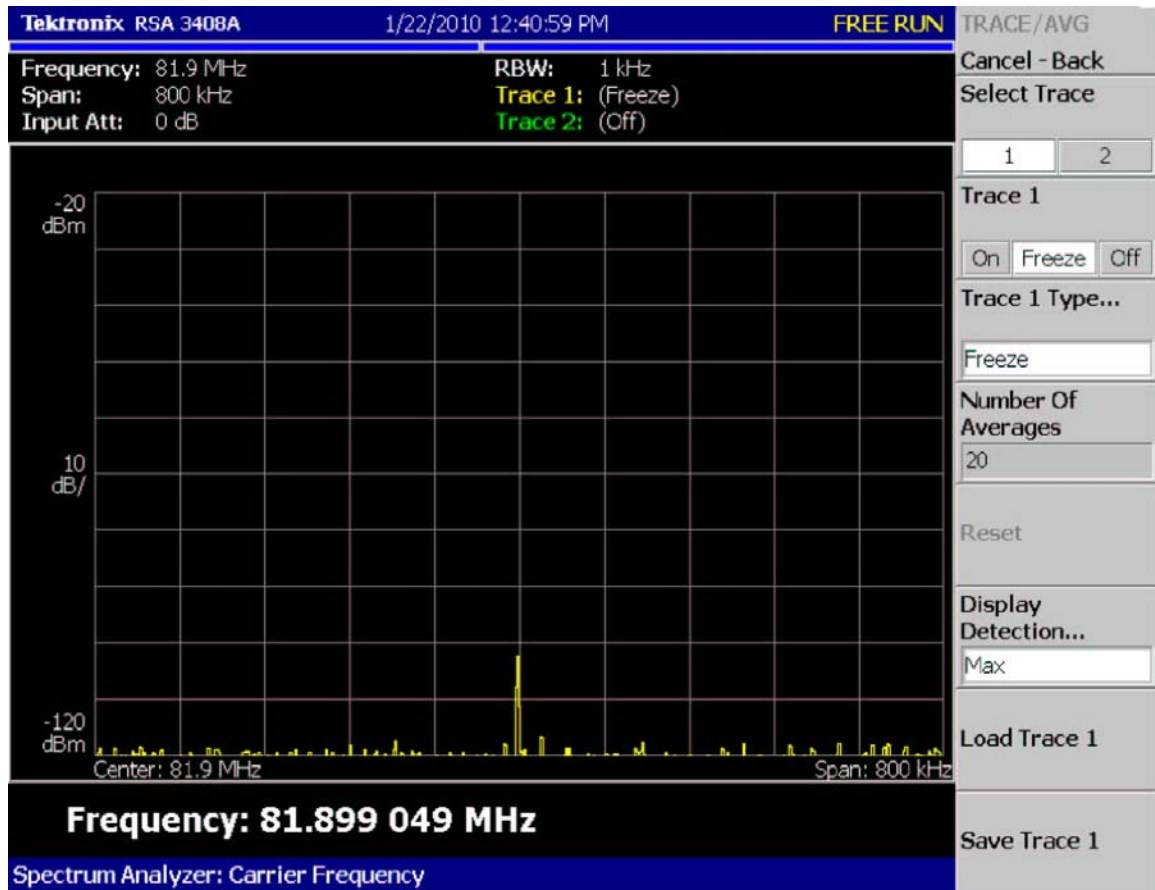
# Main Transmission System 9<sup>th</sup> Harmonic 852.3mHz. -151.75dBc



# Main Transmission System 10<sup>th</sup> Harmonic 947.0mHz. -136.5dBc



**Measured KKIM-FM1 Intermodulation Product with KQBA-FM1 107.5mHz**  
 **$2 \times 94.7\text{mHz} - 107.5\text{mHz} = 81.9\text{mHz}$ . Measured -114.5 dBc**



### **Measurement Equipment Listing**

- 1. Tektronix Spectrum Analyzer model RSA3408A, serial #B010214-1, calibrated NBS traceable 25 September 2009, Tektronix Cal. Cert. # 1271845-RSA3408A-B010214-1**
- 2. Trilithic Series VF-40003, serial #9711119, Custom Tunable Band-Pass Filter set 50mHz. to 1.4GHz. calibrated 07/2008**
- 3. Tektronix C-5A Scope Camera with Polaroid 667 3000ASA Film**
- 4. Test Cables RG223 & RG-400 Double Shielded Coaxial Cable**
- 5. Hewlett-Packard RF Frequency Counter, model 53181A, serial # 3710A02728, calibrated NBS traceable, 30 December 2009**
- 6. Bird Electronics RF BNC Sniffer Slug**
- 7. Bird Electronics 2watt RF Termination -47dB return loss @ 100mHz.**