

# KYLZ-FM2 Spurious Emissions Report

Spirit Hill - Provo, Utah

On the afternoon of April 3, 2009 equipment performance measurements were made for broadcast booster station KYLZ-FM2 permit No. BNPFTB-20081009AFP

This Engineering evaluation report and RF proof of performance measurements were prepared in support of the operation of the specified transmitting system herein as to comply with 47 C.F.R. Section 73.317 (b) through 73.317 (d).

KYLZ-FM2 (104.7 MHz) is one of six stations sharing a master antenna system at the Spirit Hill Communications site located in Provo, Utah. The outputs of the six stations are combined using a constant impedance balanced bandpass filter combining system Model RCCC-29A – 0.8 designed and fabricated by Jampro antenna Systems of Sacramento, CA

Measurements were made while all stations broadcast programming material. All stations were operating into the combined antenna system at the full permitted power during measurements.

In the case of the KYLZ-FM2 transmission system, the measurement equipment was feed by a directional coupler at the combined output. Measurements were made on the station's carrier frequency for reference purposes and to look at occupied bandwidth for any spurious emissions. The use of the IFR AN940 Serial Number 1009 spectrum analyzer within current calibration was used to make all measurements. The assigned carrier frequency level was recorded. <sup>1</sup>All other harmonic intermodulation products or spurious emission levels were referenced to this initial carrier frequency reference level with a noise floor of -78 dBC. The radio spectrum from 50 MHz up to the stations 10<sup>th</sup> carrier frequency harmonic was tuned to look for any unusual emissions.

A set of Trilithic bandpass filters model VF-40003 Serial #200514038 was used to reduce the effects of multi signal mixing in the IFR AN940 analyzer; all insertion losses have been accounted for to reflect accuracy in this report.

The intermodulation products measured in this study 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 the each of the combined individual stations was

subtracted one at a time from the 2X sum to find the common intermodulation product.

All of the signals noted were identified as being either signals from other stations in the combined system or ingress from other known transmitters.

No intermodulation products, spurious signals or harmonics were found that could be attributed to the operation of KYLZ-FM2.

With consideration to the KYLZ-FM2 transmission system, I believe that the station is in compliance with the requirements of 47 CFR § 73.1590 (a) & (b) and 47 CFR § 73.317 (b-d). This report and associated exhibits were prepared by me and are based on measurements made by myself. I believe them to be true and accurate to the best of my knowledge.

Respectfully submitted,

A handwritten signature in black ink that reads "Scot W. Mathews". The signature is written in a cursive, flowing style.

Scot W. Mathews  
Consultant Engineer

# Simmons Media Group

AN940

Serial # 1009

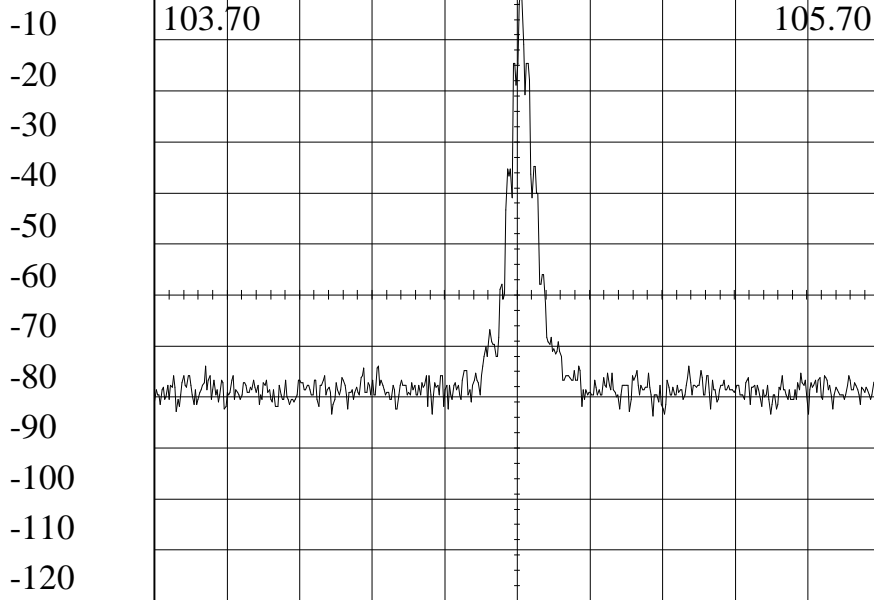
dBm  
0

200.0  
kHz/Div

104.70  
MHz

9  
kHz Res

104.7 Provo w/o mod  
04/03/2009 14:45:47



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 104.71

Peak Level: -.63

Simmons Media Group

AN940

Serial # 1009

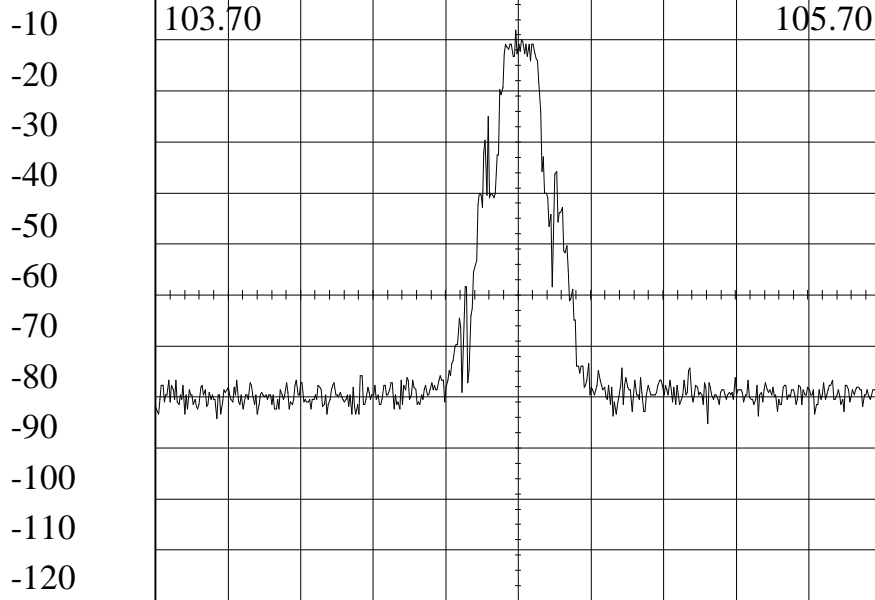
dBm  
0

200.0  
kHz/Div

104.70  
MHz

9  
kHz Res

104.7 Provo w mod  
04/03/2009 14:48:25



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 104.694

Peak Level: -5.33

Simmons Media Group

AN940

Serial # 1009

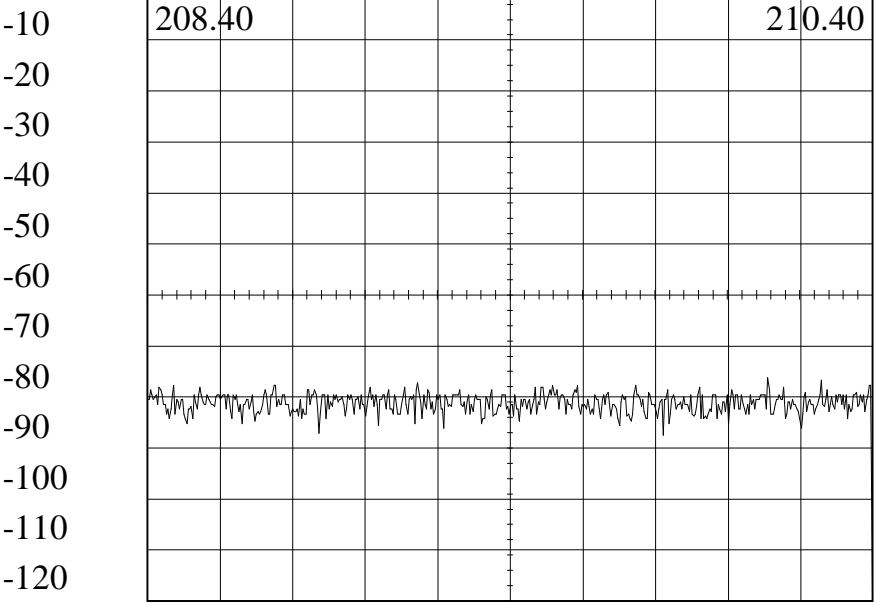
dBm  
0

200.0  
kHz/Div

209.40  
MHz

9  
kHz Res

104.7 Pro. 2nd order  
04/03/2009 14:50:17



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 210.1114

Peak Level: -50.82

Simmons Media Group

AN940

Serial # 1009

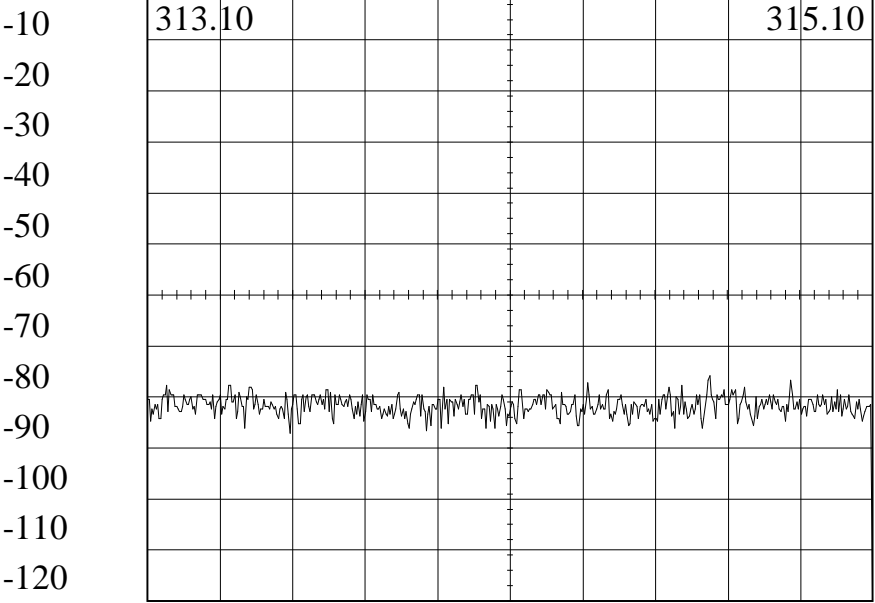
dBm  
0

200.0  
kHz/Div

314.10  
MHz

9  
kHz Res

104.7 Pro. 3rd order  
04/03/2009 14:52:28



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 314.6511

Peak Level: -50.51

Simmons Media Group

AN940

Serial # 1009

dBm  
0

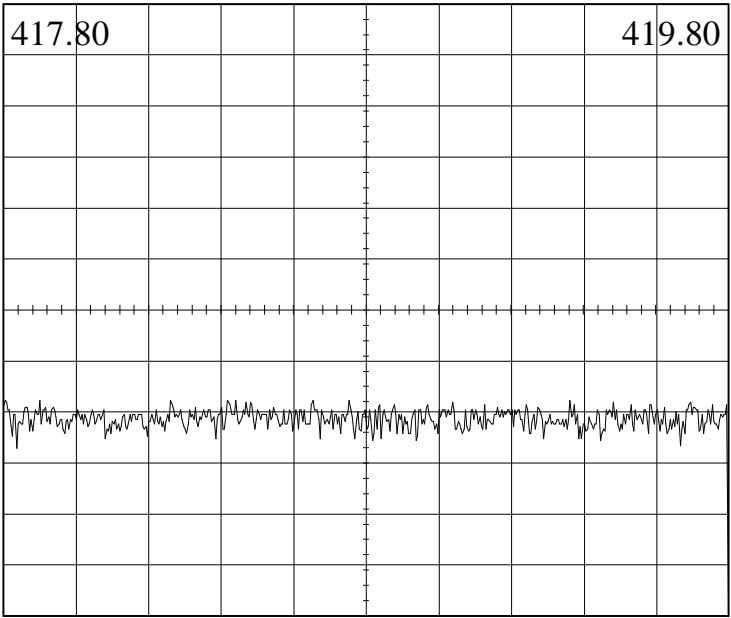
200.0  
kHz/Div

418.80  
MHz

9  
kHz Res

104.7 Pro. 4th order  
04/03/2009 14:56:03

-10  
-20  
-30  
-40  
-50  
-60  
-70  
-80  
-90  
-100  
-110  
-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 417.804

Peak Level: -51.76

Simmons Media Group

AN940

Serial # 1009

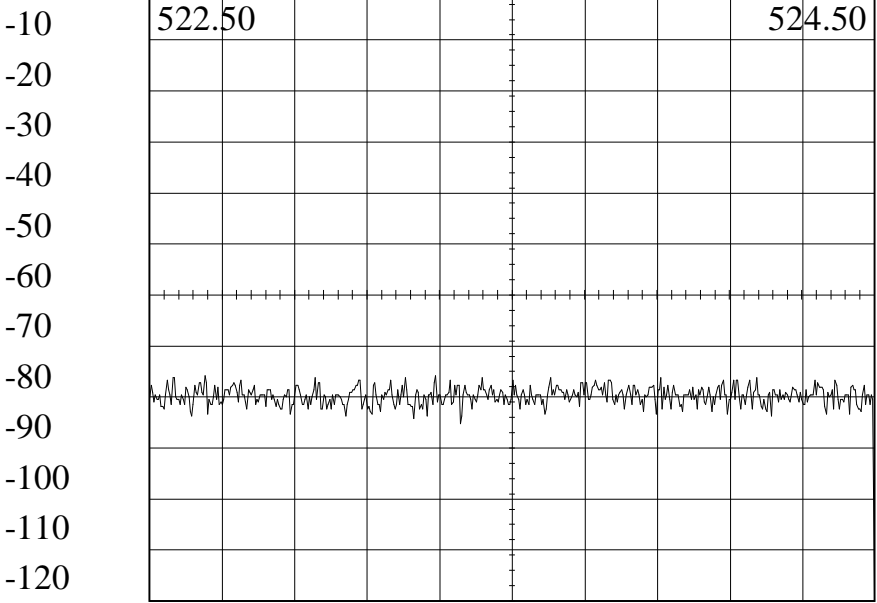
dBm  
0

200.0  
kHz/Div

523.50  
MHz

9  
kHz Res

104.7 Pro. 5th order  
04/03/2009 14:57:44



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 522.6523

Peak Level: -50.51



Simmons Media Group

AN940

Serial # 1009

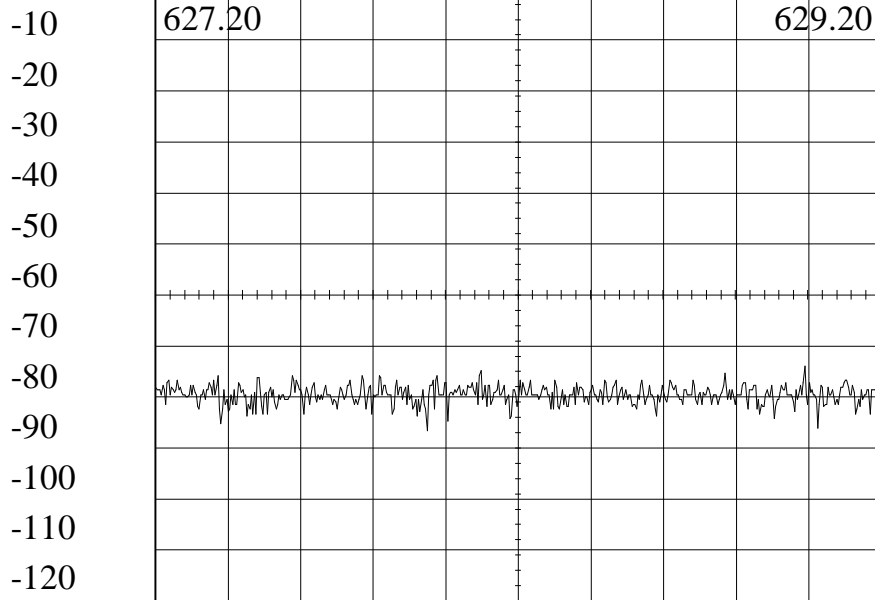
dBm  
0

200.0  
kHz/Div

628.20  
MHz

9  
kHz Res

104.7 Pro. 6th order  
04/03/2009 14:59:25



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 628.9916

Peak Level: -49.25

# Simmons Media Group

AN940

Serial # 1009

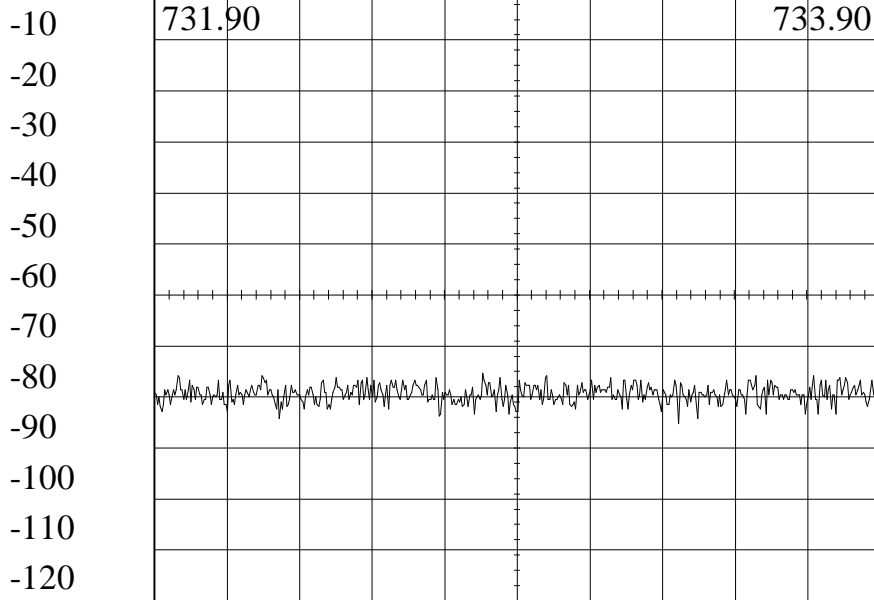
dBm  
0

200.0  
kHz/Div

732.90  
MHz

9  
kHz Res

104.7 Pro. 7th order  
04/03/2009 15:00:54



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 732.8058

Peak Level: -50.2

Simmons Media Group

AN940

Serial # 1009

200.0

837.60

9

104.7 Pro. 8th order

kHz/Div

MHz

kHz Res

04/03/2009 15:01:45

dBm  
0

-10

-20

-30

-40

-50

-60

-70

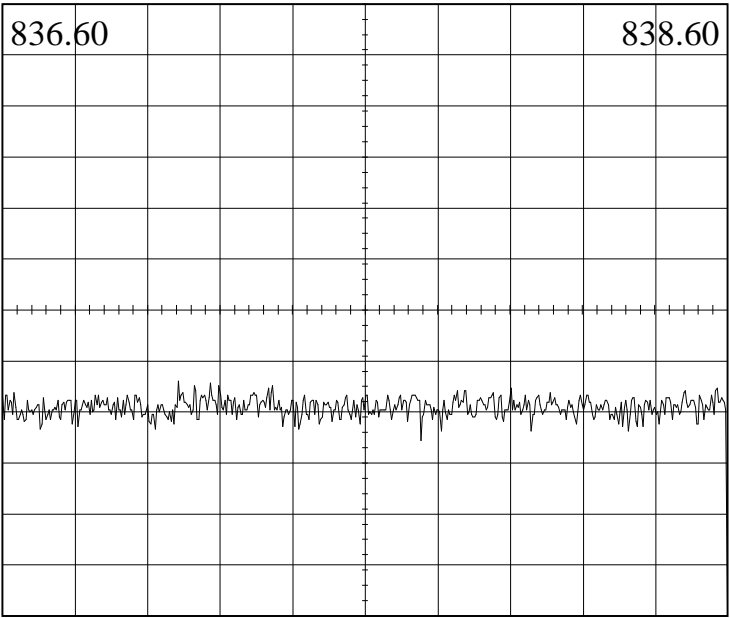
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 837.085

Peak Level: -49.25

Simmons Media Group

AN940

Serial # 1009

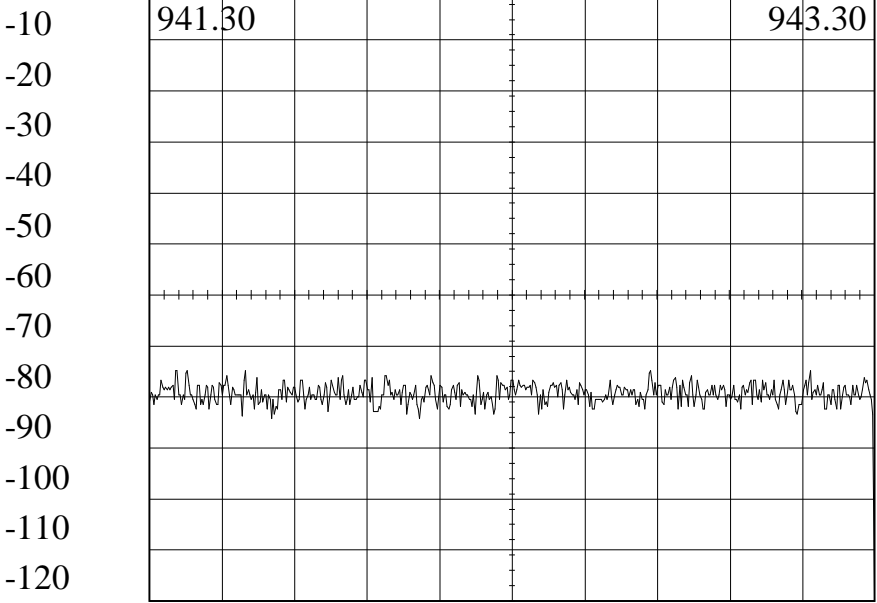
dBm  
0

200.0  
kHz/Div

942.30  
MHz

9  
kHz Res

104.7 Pro. 9th order  
04/03/2009 15:03:22



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 941.3721

Peak Level: -49.88

Simmons Media Group

AN940

Serial # 1009

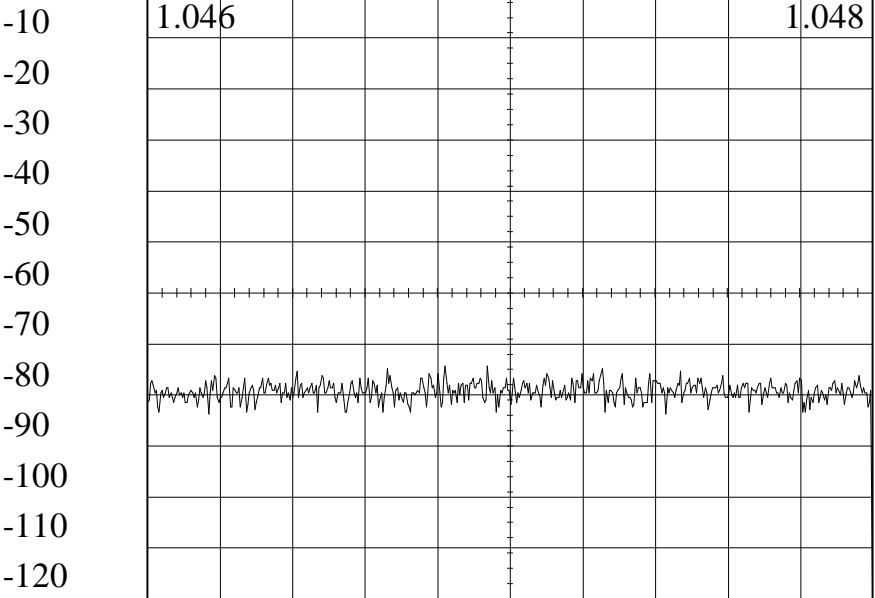
dBm  
0

200.0  
kHz/Div

1.047  
GHz

9  
kHz Res

104.7 Pro.10th order  
04/03/2009 15:04:47



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 1046.8216

Peak Level: -49.57

Simmons Media Group

AN940

Serial # 1009

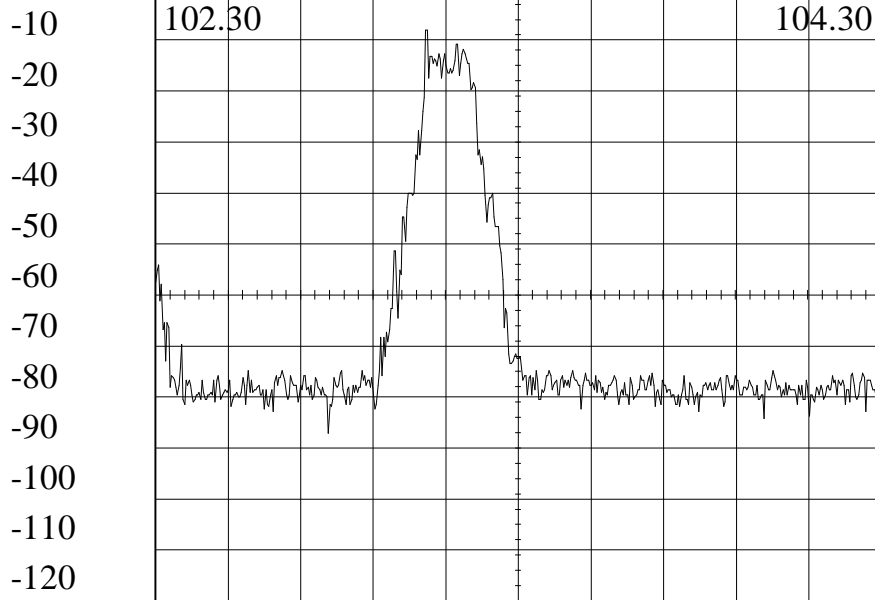
dBm  
0

200.0  
kHz/Div

103.30  
MHz

9  
kHz Res

104.7 Pro.IM w 106.1  
04/03/2009 15:06:11



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 103.0455

Peak Level: -5.33

Simmons Media Group

AN940

Serial # 1009

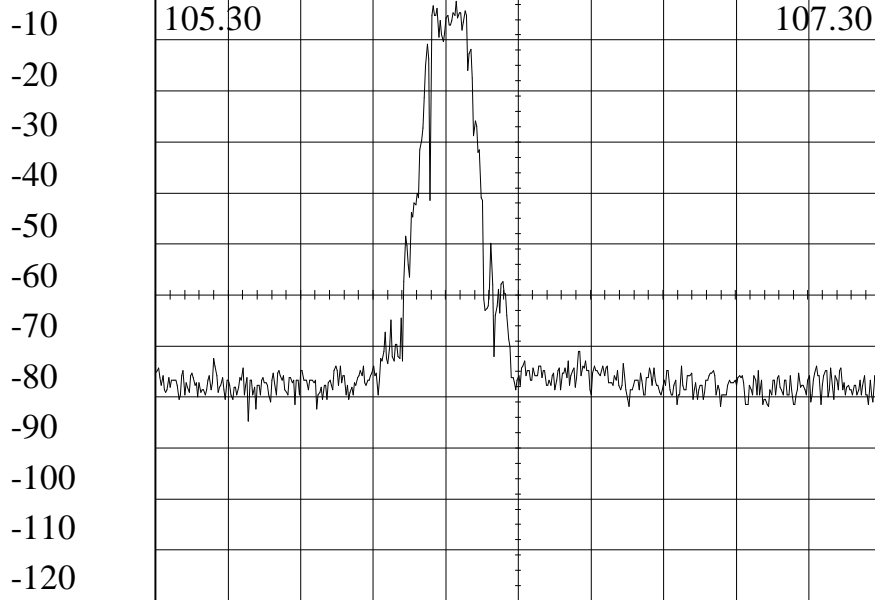
dBm  
0

200.0  
kHz/Div

106.30  
MHz

9  
kHz Res

104.7 Pro IM w 103.1  
04/03/2009 15:07:56



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 106.1297

Peak Level: -1.57

Simmons Media Group

AN940

Serial # 1009

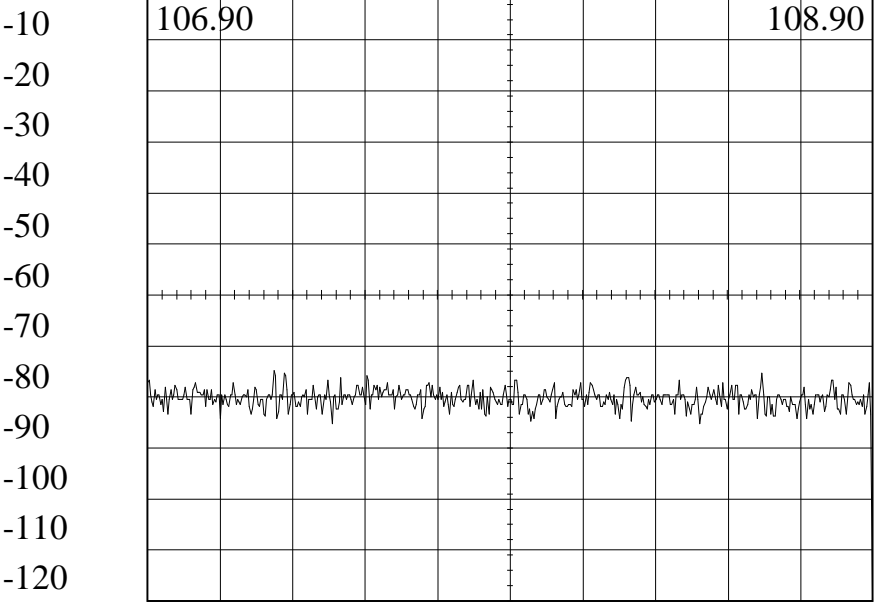
dBm  
0

200.0  
kHz/Div

107.90  
MHz

9  
kHz Res

104.7 Pro IM w 101.5  
04/03/2009 15:10:19



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 107.2487

Peak Level: -49.88



Simmons Media Group

AN940

Serial # 1009

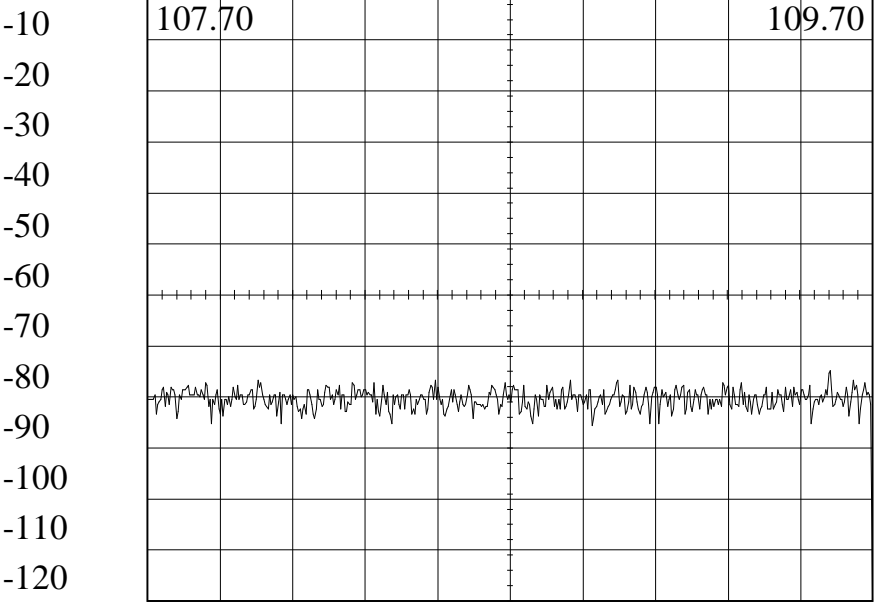
dBm  
0

200.0  
kHz/Div

108.70  
MHz

9  
kHz Res

104.7 Pro IM w 100.7  
04/03/2009 15:12:06



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 109.5838

Peak Level: -49.88

Simmons Media Group

AN940

Serial # 1009

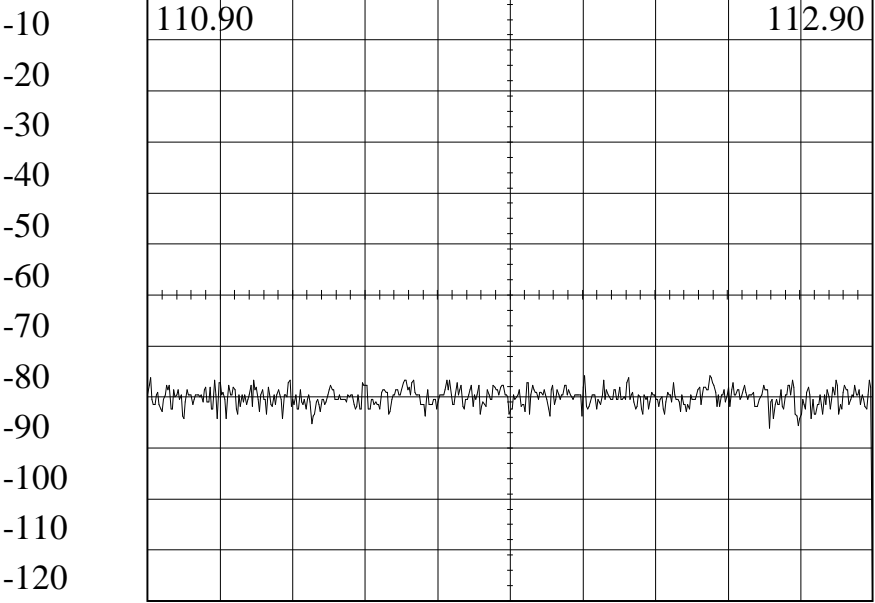
dBm  
0

200.0  
kHz/Div

111.90  
MHz

9  
kHz Res

104.7 Pro IM w 97.5  
04/03/2009 15:21:30



30 dB Attn      Gen --- dBm      20 mSecs  
0 dB IF Gain      Video Filter: 1 kHz  
Peak Freq: 112.1064      Peak Level: -50.51