

KJQN-FM2 Spurious Emissions Report

Ensign Peak - Salt Lake City, Utah

On the morning of March 30, 2009 equipment performance measurements were made for broadcast booster station KJQN-FM2 permit No. BPFTB-20081006AHN

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).

KJQN-FM2 (103.1 MHz) is one of six stations sharing a master antenna system at the Ensign Peak Communications site located in Salt Lake City, 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 KJQN-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. All other harmonic intermodulation products or spurious emission levels were referenced to this initial carrier frequency reference level with a noise floor of -79dBC. The radio spectrum from 50 MHz up to the stations 10th 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 KJQN-FM2.

With consideration to the KJQN-FM2 Ensign Peak SLC 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
Director of Engineering

Simmons Media Group

AN940

Serial # 1009

200.0

103.10

9

103.1 without mod

kHz/Div

MHz

kHz Res

04/01/2009 00:57:53

dBm
0

-10

-20

-30

-40

-50

-60

-70

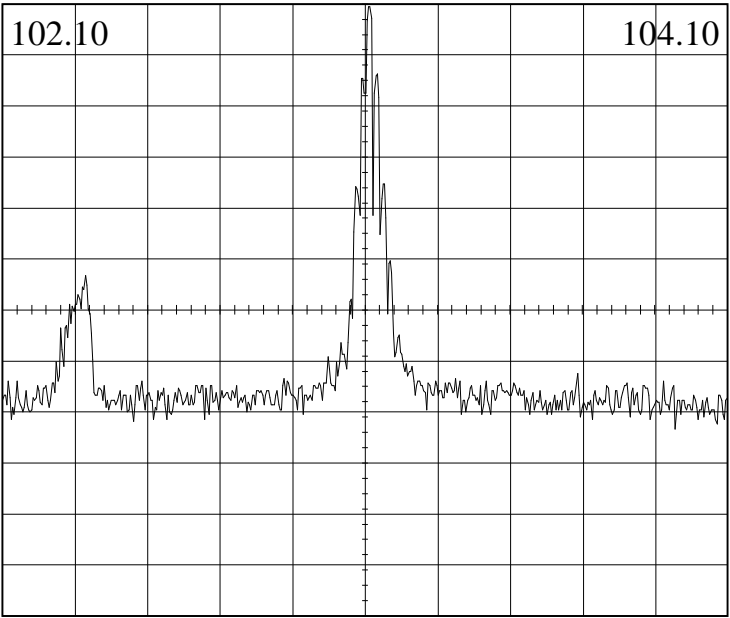
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 103.11

Peak Level: -.31

Simmons Media Group

AN940

Serial # 1009

200.0

103.10

9

103.1 with mod

kHz/Div

MHz

kHz Res

04/01/2009 00:58:58

dBm
0

-10

-20

-30

-40

-50

-60

-70

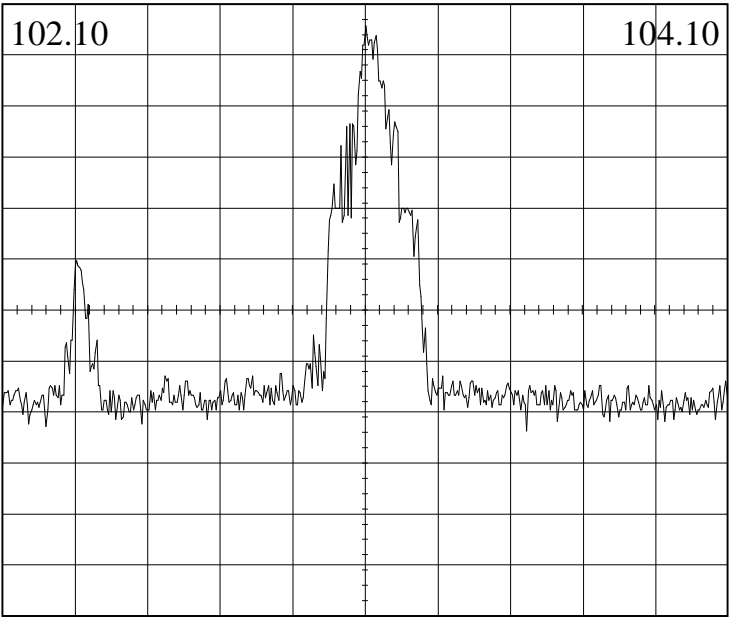
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 103.102

Peak Level: -2.82

Simmons Media Group

AN940

Serial # 1009

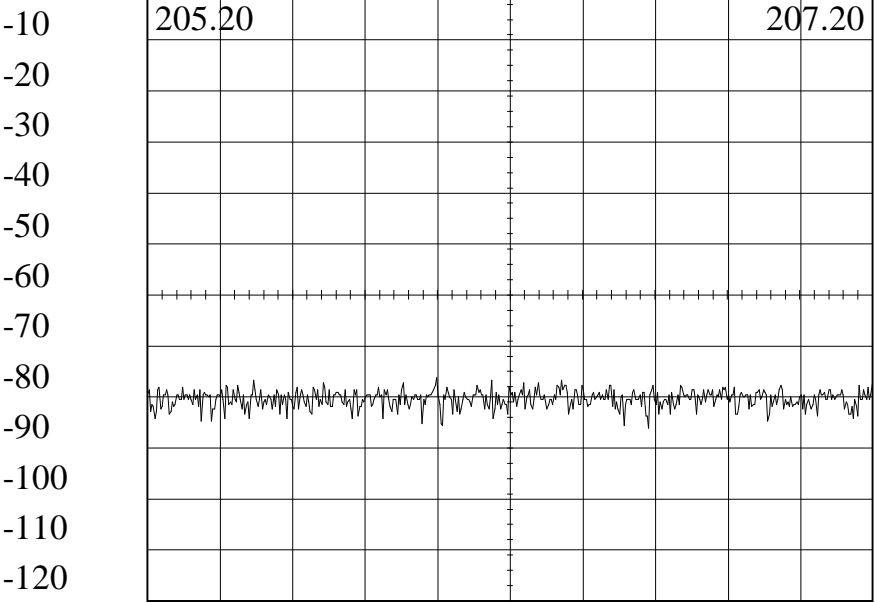
dBm
0

200.0
kHz/Div

206.20
MHz

9
kHz Res

103.1 2nd order
04/01/2009 01:00:57



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 205.9976

Peak Level: -50.82

Simmons Media Group

AN940

Serial # 1009

200.0

309.30

9

103.1 3rd order

kHz/Div

MHz

kHz Res

04/01/2009 01:01:40

dBm
0

-10

-20

-30

-40

-50

-60

-70

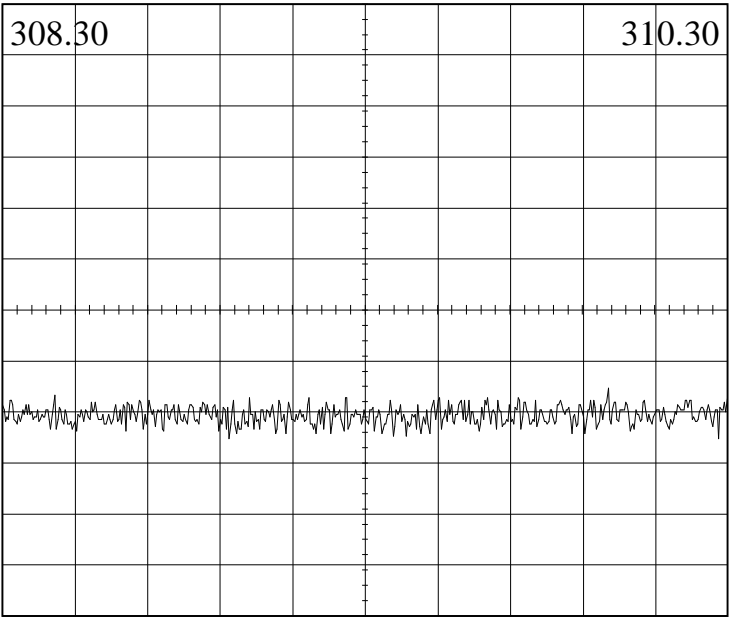
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 309.9713

Peak Level: -50.2

Simmons Media Group

AN940

Serial # 1009

200.0

412.40

9

103.1 4th order

kHz/Div

MHz

kHz Res

04/01/2009 01:02:26

dBm

0

-10

-20

-30

-40

-50

-60

-70

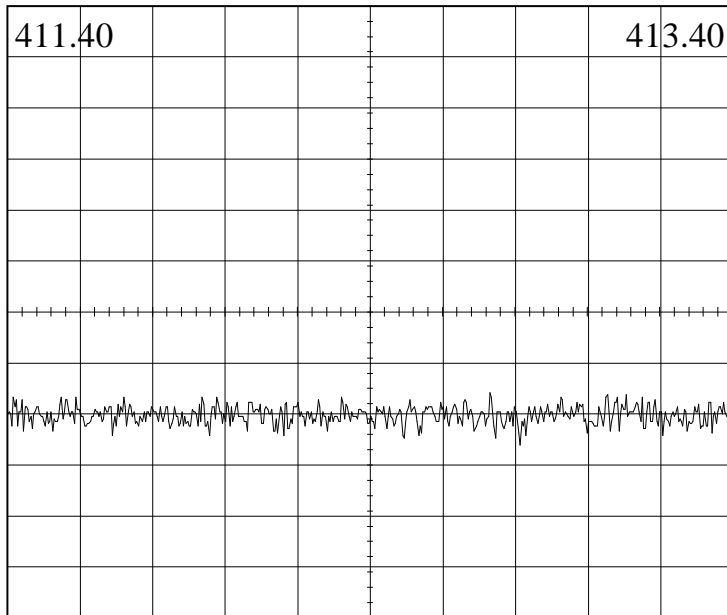
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 412.7307

Peak Level: -50.51

Simmons Media Group

AN940

Serial # 1009

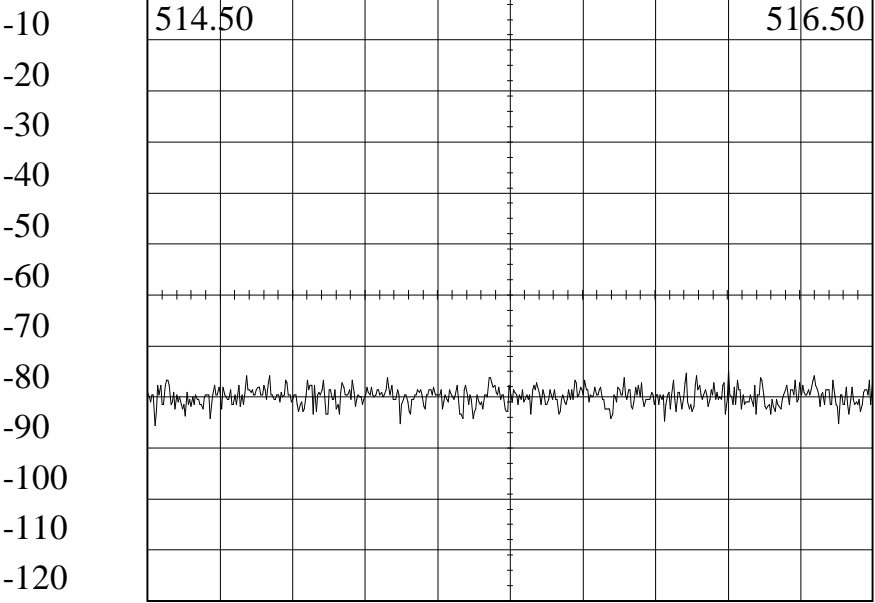
dBm
0

200.0
kHz/Div

515.50
MHz

9
kHz Res

103.1 5th order
04/01/2009 01:03:14



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 516.1032

Peak Level: -49.88

Simmons Media Group

AN940

Serial # 1009

200.0

618.60

9

103.1 6th order

kHz/Div

MHz

kHz Res

04/01/2009 01:03:57

dBm
0

-10

-20

-30

-40

-50

-60

-70

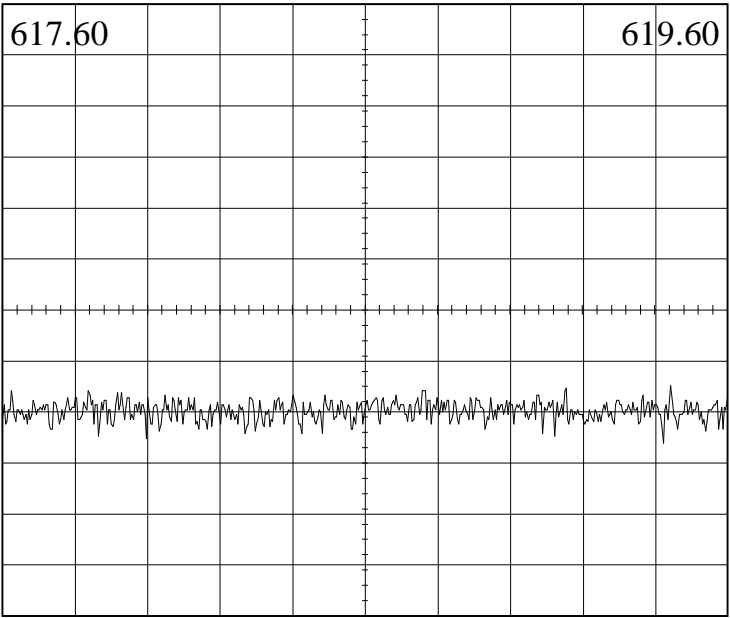
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 619.4437

Peak Level: -49.88

Simmons Media Group

AN940

Serial # 1009

200.0

721.70

9

103.1 7th order

kHz/Div

MHz

kHz Res

04/01/2009 01:04:54

dBm

0

-10

-20

-30

-40

-50

-60

-70

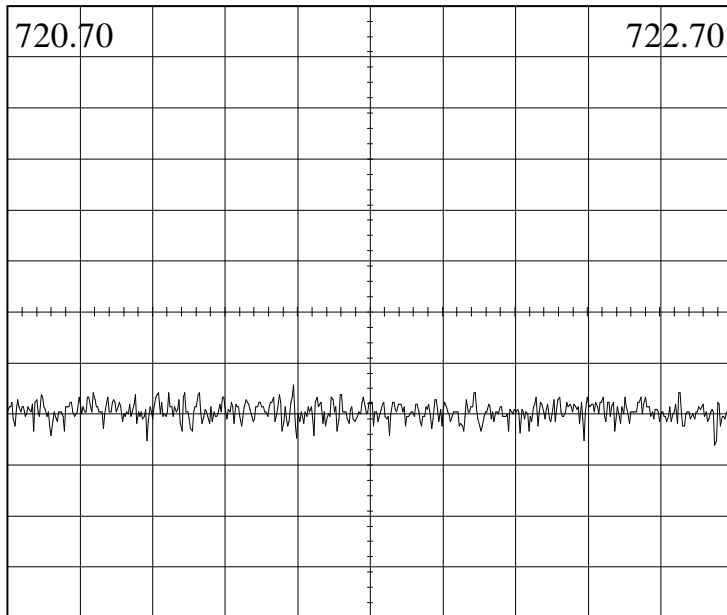
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 721.4896

Peak Level: -49.57

Simmons Media Group

AN940

Serial # 1009

200.0

844.80

9

103.1 8th order

kHz/Div

MHz

kHz Res

04/01/2009 01:05:51

dBm
0

-10

-20

-30

-40

-50

-60

-70

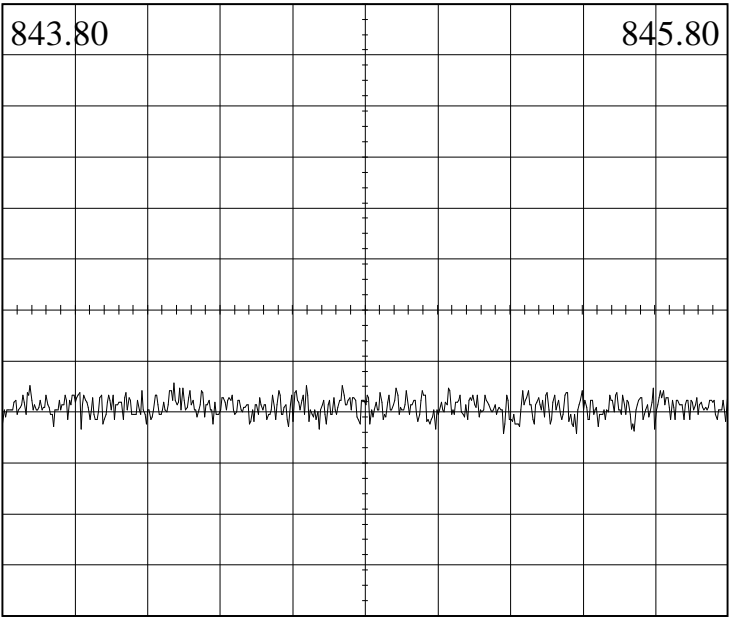
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 844.2729

Peak Level: -49.57

Simmons Media Group

AN940

Serial # 1009

200.0

927.90

9

103.1 9th order

kHz/Div

MHz

kHz Res

04/01/2009 01:06:58

dBm

0

-10

-20

-30

-40

-50

-60

-70

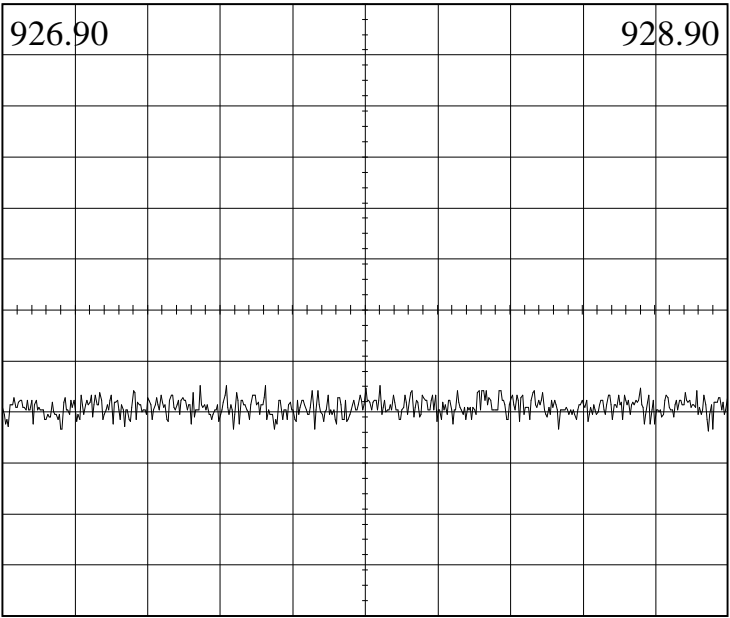
-80

-90

-100

-110

-120



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 927.4451

Peak Level: -49.88

Simmons Media Group

AN940

Serial # 1009

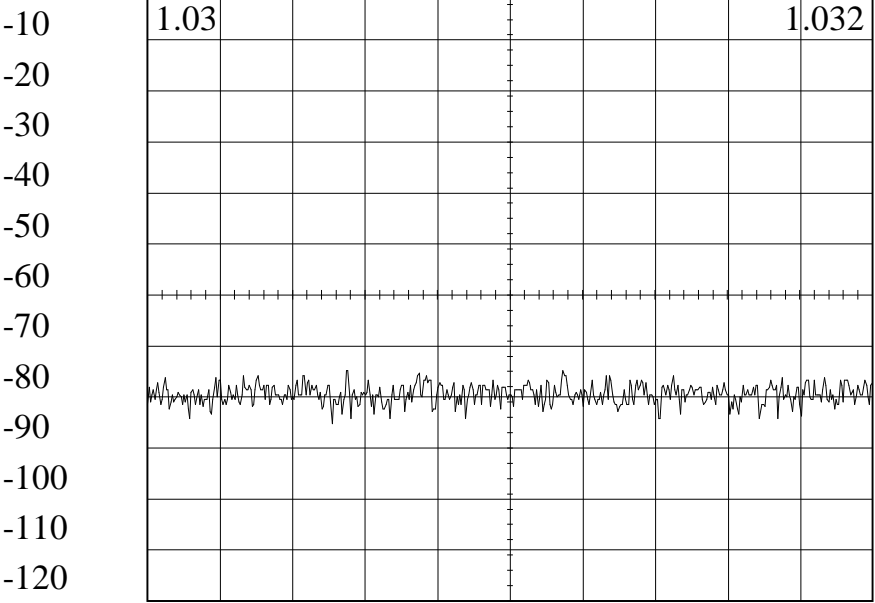
dBm
0

200.0
kHz/Div

1.031
GHz

9
kHz Res

103.1 10th order
04/01/2009 01:07:34



30 dB Attn Gen --- dBm 20 mSecs
0 dB IF Gain Video Filter: 1 kHz
Peak Freq: 1030.5491 Peak Level: -49.88

Simmons Media Group

AN940

Serial # 1009

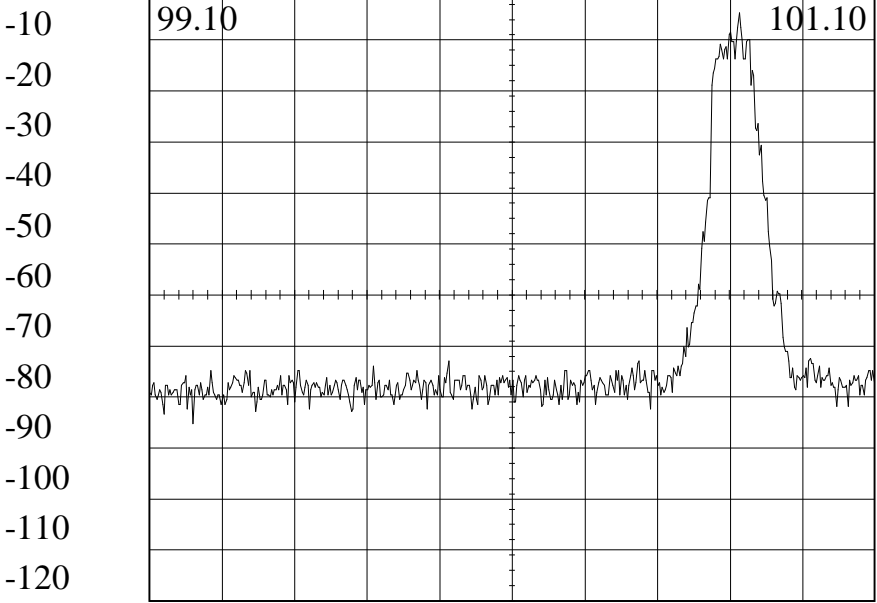
dBm
0

200.0
kHz/Div

100.10
MHz

9
kHz Res

103.1 IM with 106.1
04/01/2009 01:08:28



30 dB Attn Gen --- dBm 20 mSecs
0 dB IF Gain Video Filter: 1 kHz
Peak Freq: 100.7273 Peak Level: -3.14

Simmons Media Group

AN940

Serial # 1009

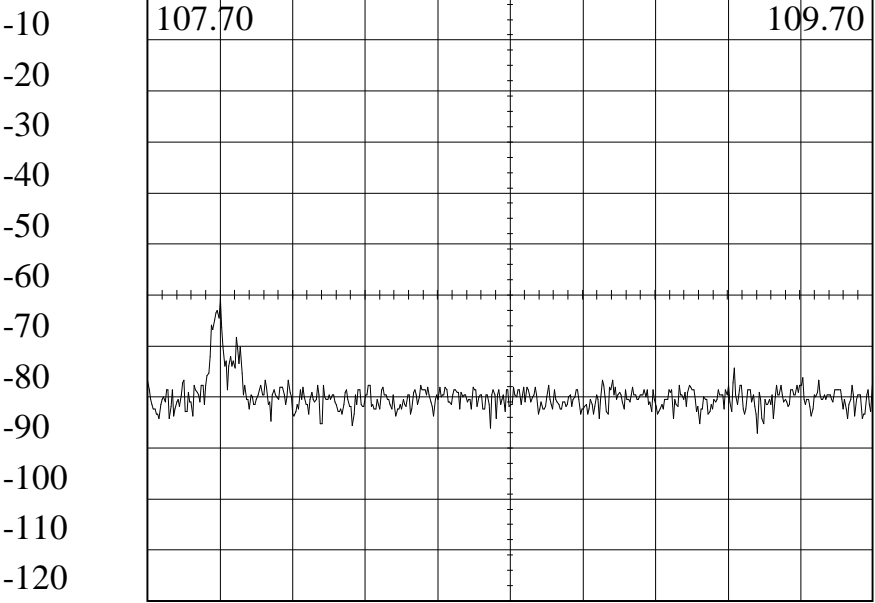
dBm
0

200.0
kHz/Div

108.70
MHz

9
kHz Res

103.1 IM with 97.5
04/01/2009 01:10:19



30 dB Attn Gen --- dBm 20 mSecs
0 dB IF Gain Video Filter: 1 kHz
Peak Freq: 107.9004 Peak Level: -40.47

Simmons Media Group

AN940

Serial # 1009

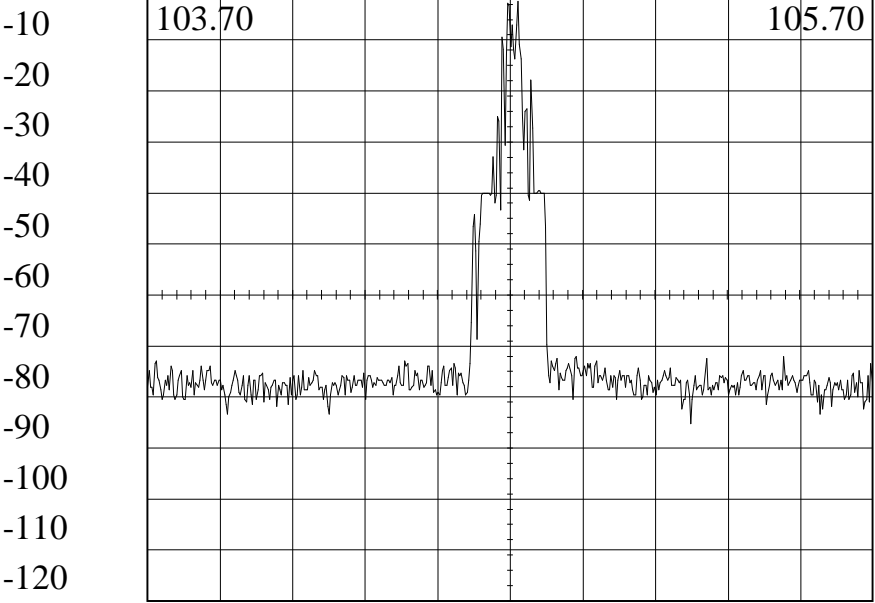
dBm
0

200.0
kHz/Div

104.70
MHz

9
kHz Res

103.1 IM with 101.5
04/01/2009 01:11:14



30 dB Attn Gen --- dBm 20 mSecs
0 dB IF Gain Video Filter: 1 kHz
Peak Freq: 104.722 Peak Level: -1.57

Simmons Media Group

AN940

Serial # 1009

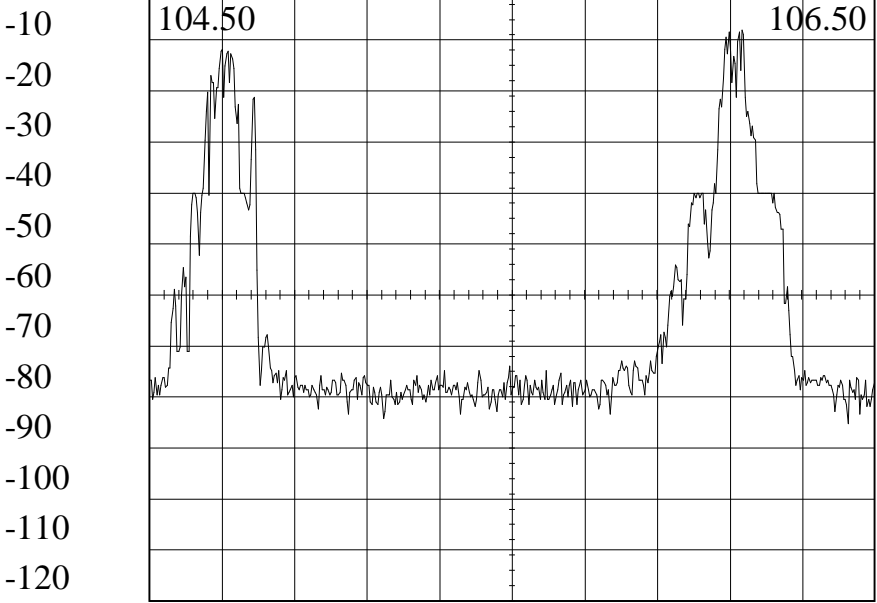
dBm
0

200.0
kHz/Div

105.50
MHz

9
kHz Res

103.1 IM with 100.7
04/01/2009 01:12:02



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 106.1353

Peak Level: -5.33

Simmons Media Group

AN940

Serial # 1009

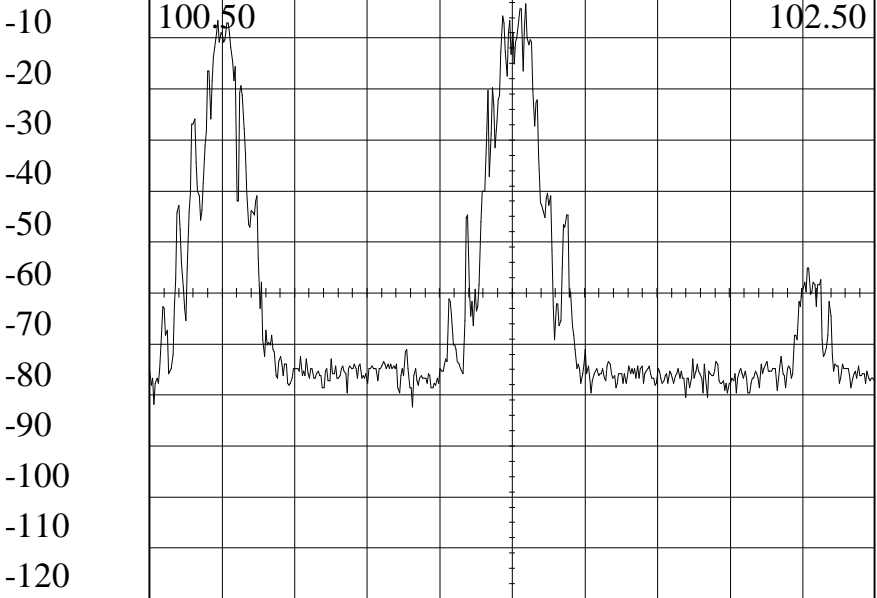
dBm
0

200.0
kHz/Div

101.50
MHz

9
kHz Res

103.1 IM with 104.7
04/01/2009 01:13:02



30 dB Attn

Gen --- dBm

20 mSecs

0 dB IF Gain

Video Filter: 1 kHz

Peak Freq: 101.5381

Peak Level: -2.2