

# **KEGA FM-7 Park City, UT**

## **Spurious Emissions Report**

On the early morning of September 28<sup>th</sup>, 2003, I made equipment performance measurements for radio station KEGA FM-7 Park City Utah. These measurements were made as a condition of Construction Permit BNPFTB-20040325AEN

KEGA-FM7 is one of two stations sharing a master antenna system at the Lewis Peak Communications Site in Summit County, Utah. The outputs of the two 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 both stations broadcast programming material. KEGA FM-7 operates stereophonically and has no subsidiary communications services. Both stations were operating into the combined antenna system at the full permitted power during the measurements.

Section 73.317 (b) and (c) require that all signals between 120 and 240 kHz removed from the carrier be attenuated below the level of the carrier by at least 25 dB, all signals between 240 kHz and 600 kHz removed from the carrier be attenuated by at least 35 dB below the level of the carrier, and that all signals greater than 600 kHz removed from the carrier be attenuated by at least 80 dB below the level of the carrier.

Three sets of measurements were made to assure compliance with these requirements. The first measurement looked at the spectrum between -600 kHz and +600 kHz, relative to the carrier frequency, in order to assess the station's occupied bandwidth under modulation. The second measurement looked at the spectrum from -1 MHz to -600 kHz and +600 kHz to +1 MHz, relative to the carrier frequency, to look for near-in inter modulation products. The third measurement scanned the spectrum from 9 kHz to 1 GHz in order to detect any out-of-band inter modulation products or harmonics.

All measurements were taken with an IFR AN940 Spectrum Analyzer, serial number 1009, within current calibration.

To measure the occupied bandwidth, the spectrum analyzer was set to 101.5 MHz center frequency, 200 kHz/div span, 9 kHz resolution bandwidth, 20 dB of attenuation, and 1 kHz video filtering. This results in a measurement noise floor of approximately -76 dBC. An un-modulated carrier was used to establish the reference point at the top of the screen. The analyzer was, then, placed in peak hold mode and modulation was once again applied. After 10 minutes of data collection, the following data was collected.

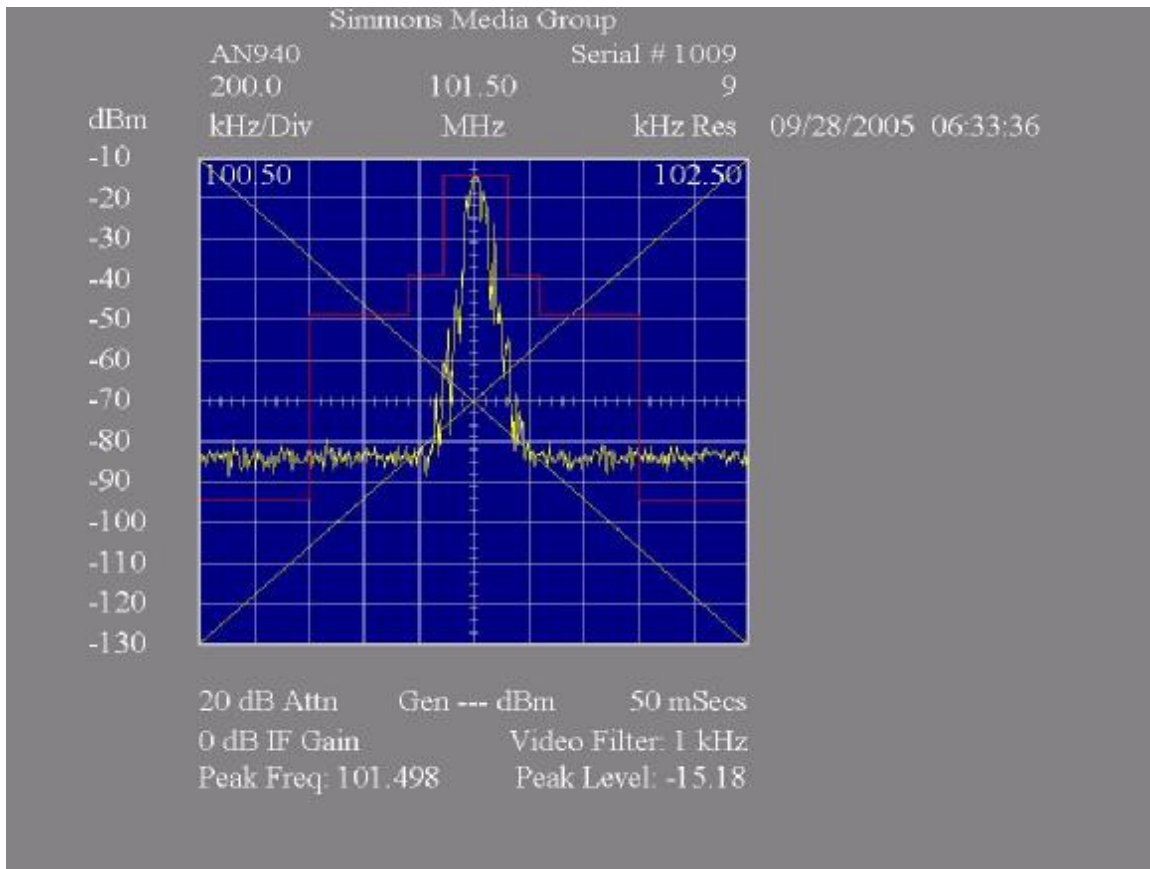


Figure 1

It can clearly be seen from this plot that the occupied bandwidth of KEGA-FM7 lies well within the prescribed limits between -600 kHz and +600 kHz, relative to the carrier frequency.

To measure spurious signals and harmonics, the spectrum analyzer was set to 2 MHz/div span, 10 kHz resolution bandwidth, 20 dB of attenuation, and 1 kHz video filtering. The analyzer was initially set at 10 MHz center frequency and the incremented successively by 20 MHz to scan the spectrum from 9 MHz to 1 GHz. Any signals that were greater than -80 dBc were noted. Upon completion of the scan, each noted signal was compared to a list of known transmitters in the area and the analyzer was used to demodulate the signal. All of the signals noted were identified as being either the other station in the combined system or ingress from other known transmitters. No inter-modulation products, spurious signals, or harmonics were found that could be attributed to the operation of KEGA.

In light of the above measurements, I believe that KEGA is in full compliance with the requirements of Section 73.317 (a-d).

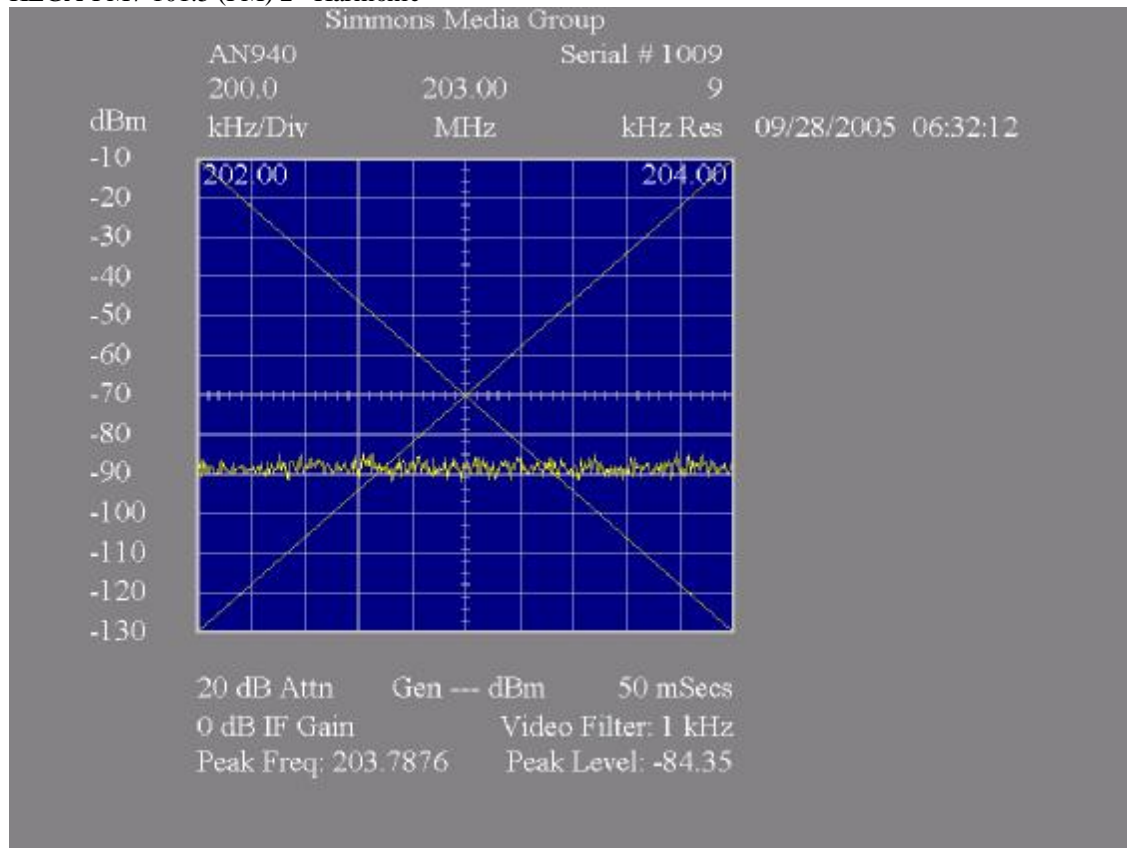
This report was prepared by me, and is based on measurements made by myself. To the best of my knowledge, all statements made herein are true and reflect the actual facts of the matter. My qualifications are a matter of record with the Commission.

Respectfully submitted:

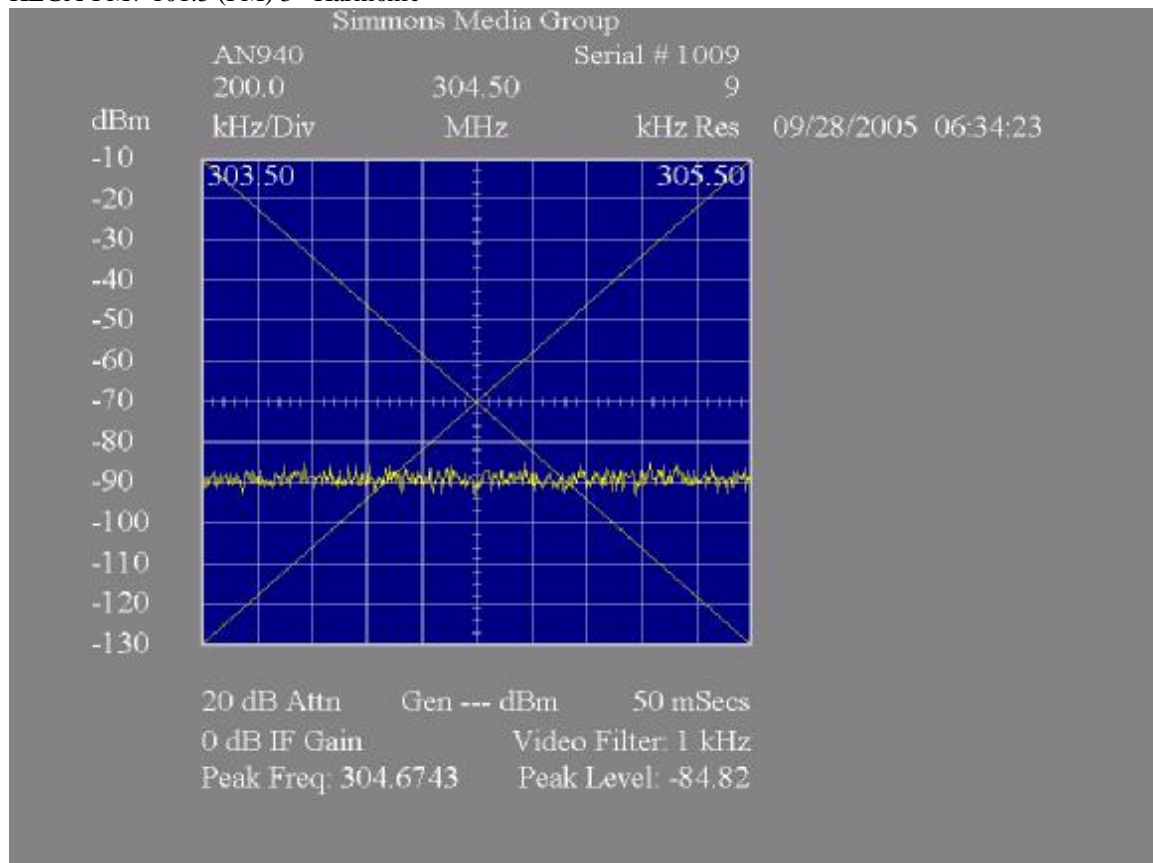
*Scot W. Mathews*

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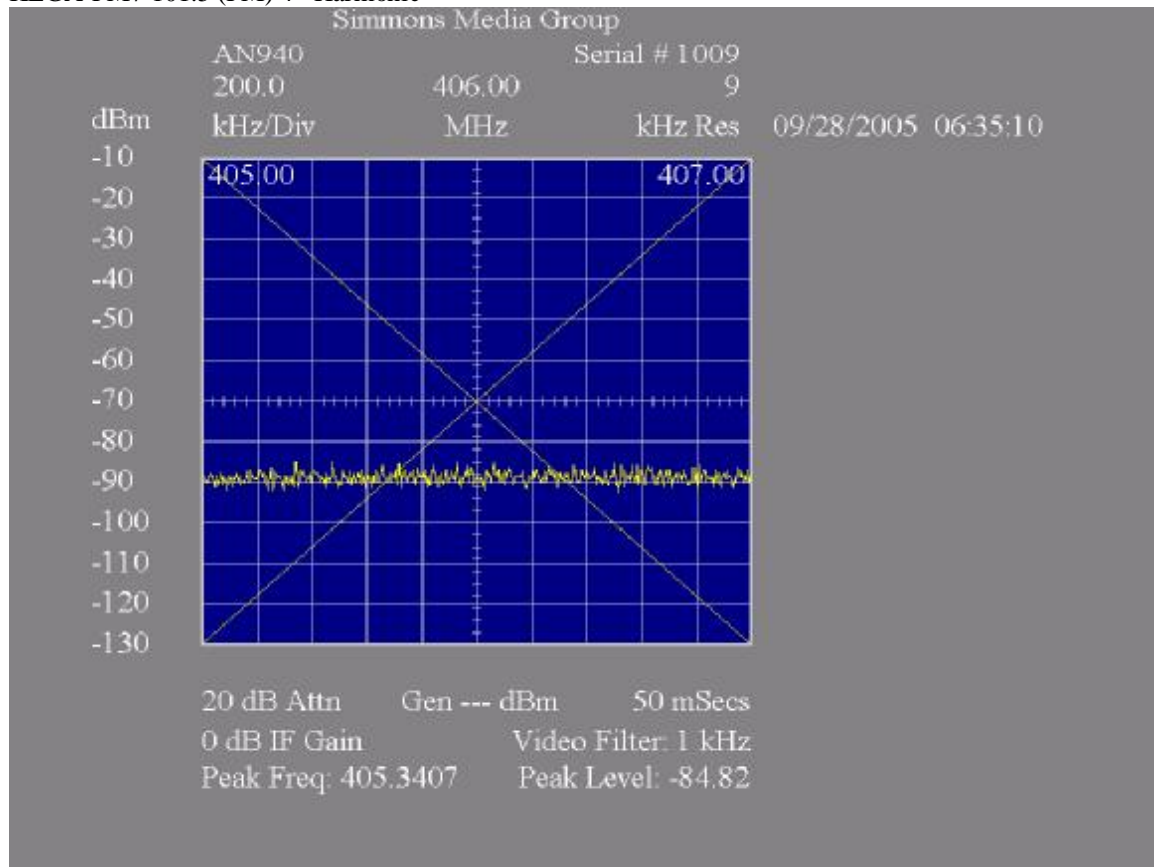
# KEGA-FM7 101.5 (FM) 2<sup>th</sup> Harmonic



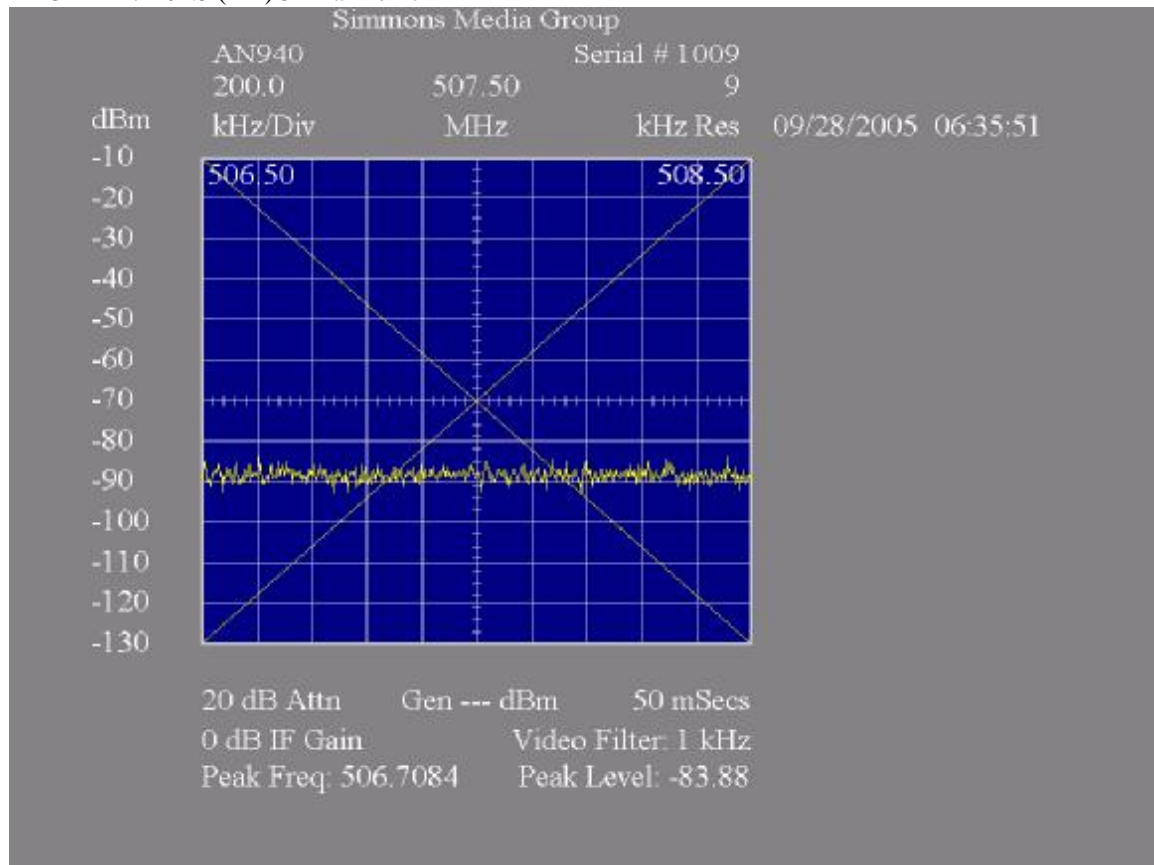
# KEGA-FM7 101.5 (FM) 3<sup>th</sup> Harmonic



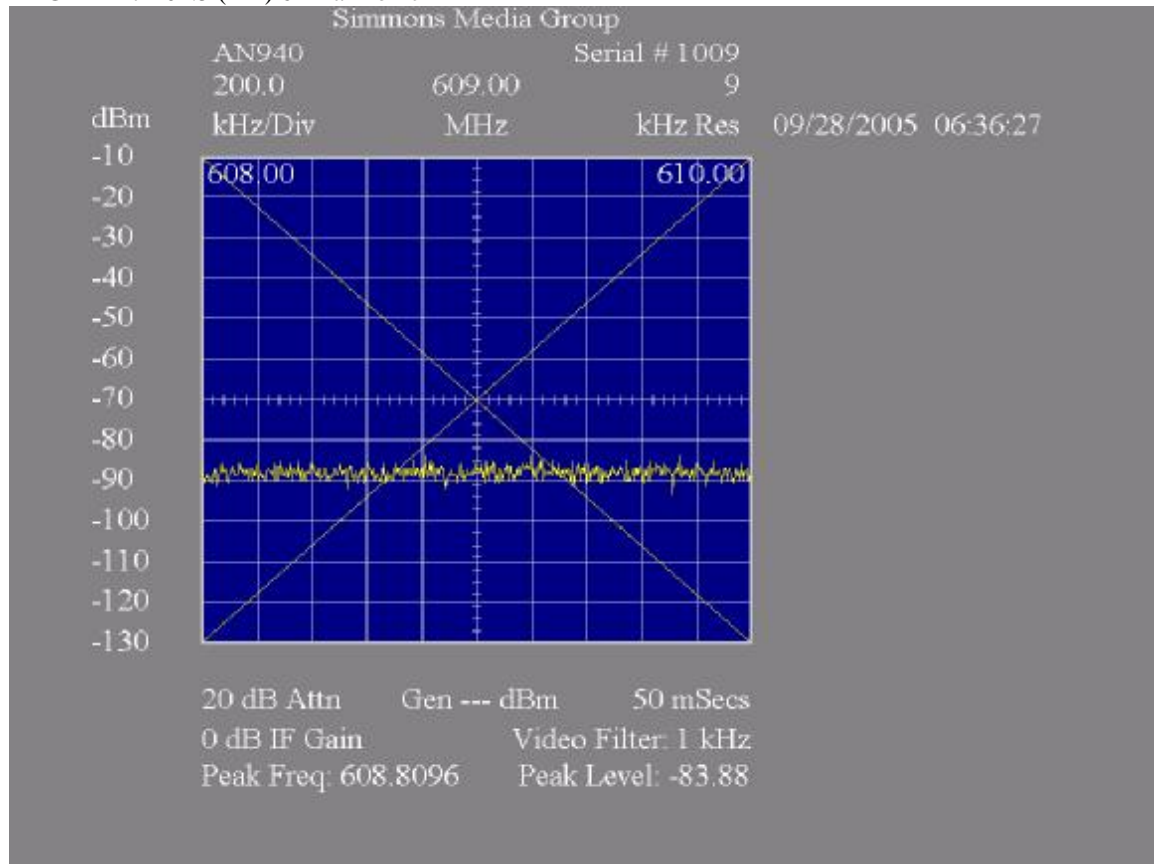
# KEGA-FM7 101.5 (FM) 4<sup>th</sup> Harmonic



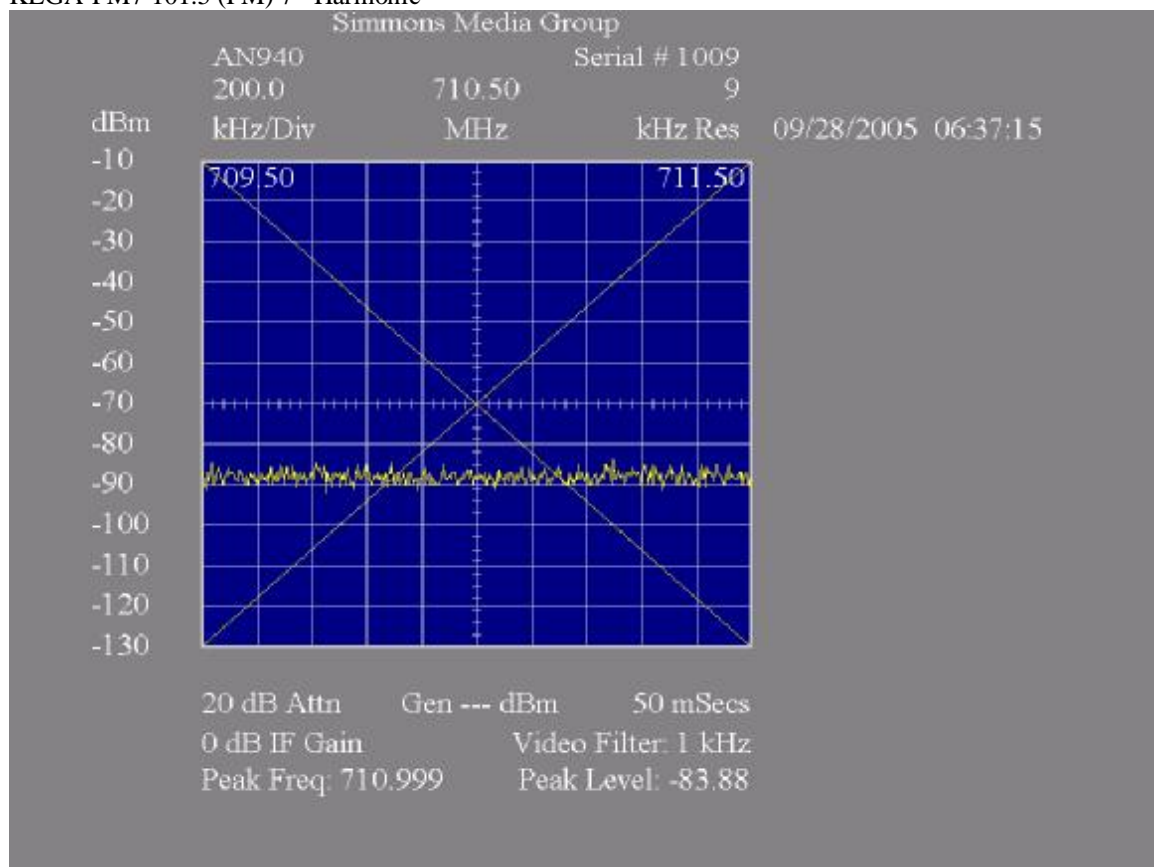
# KEGA-FM7 101.5 (FM) 5<sup>th</sup> Harmonic



# KEGA-FM7 101.5 (FM) 6<sup>th</sup> Harmonic

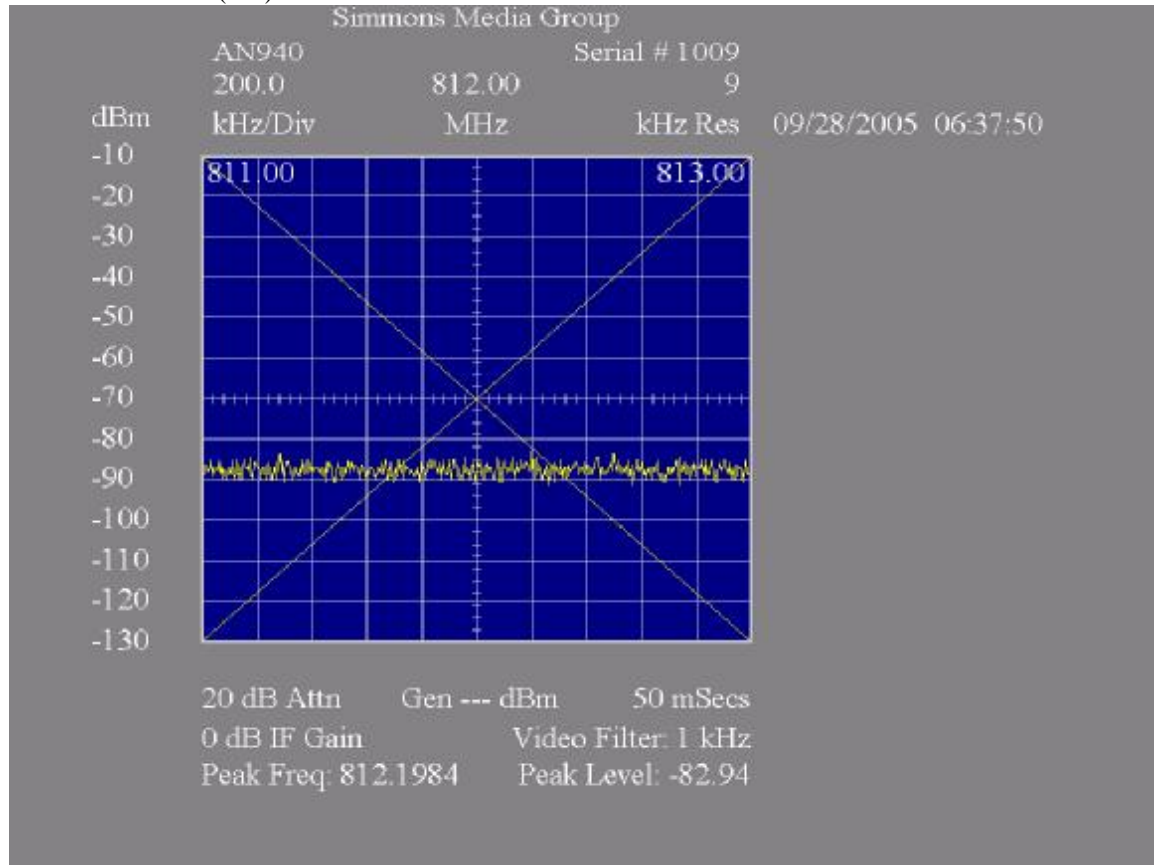


# KEGA-FM7 101.5 (FM) 7<sup>th</sup> Harmonic

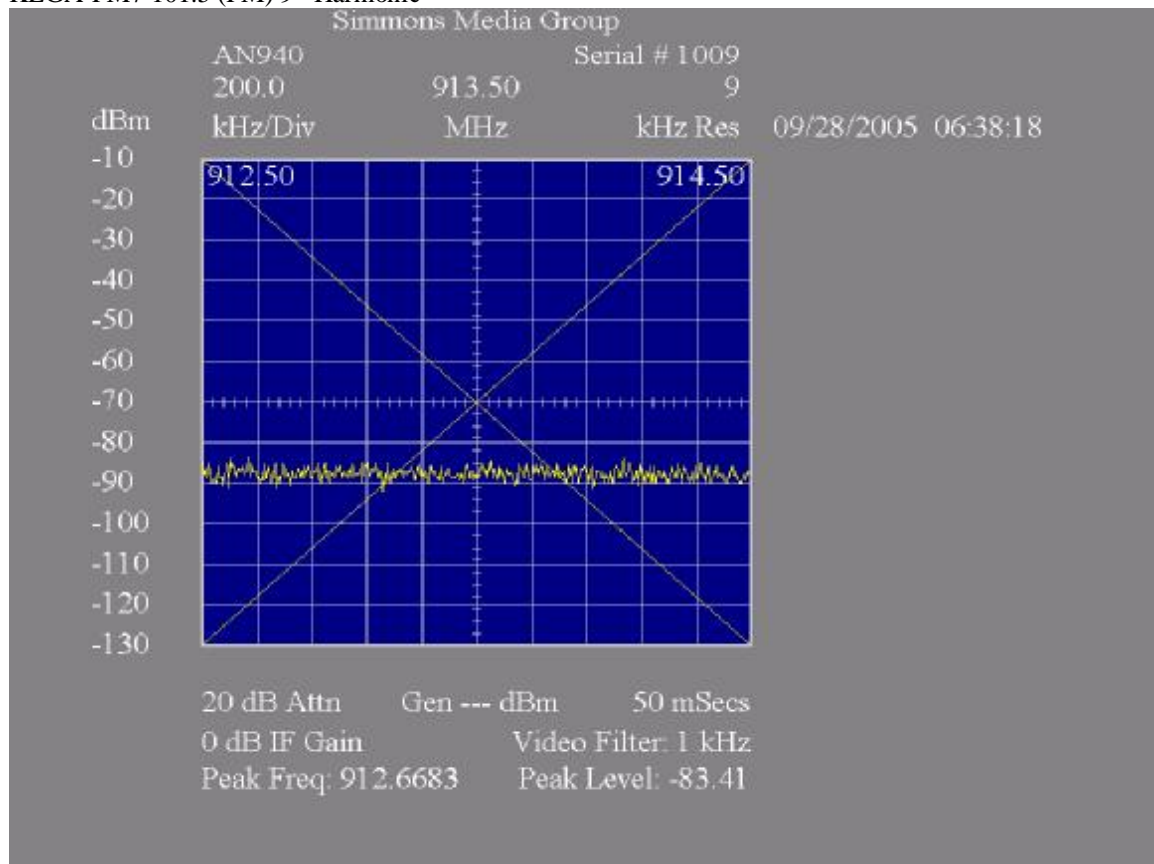




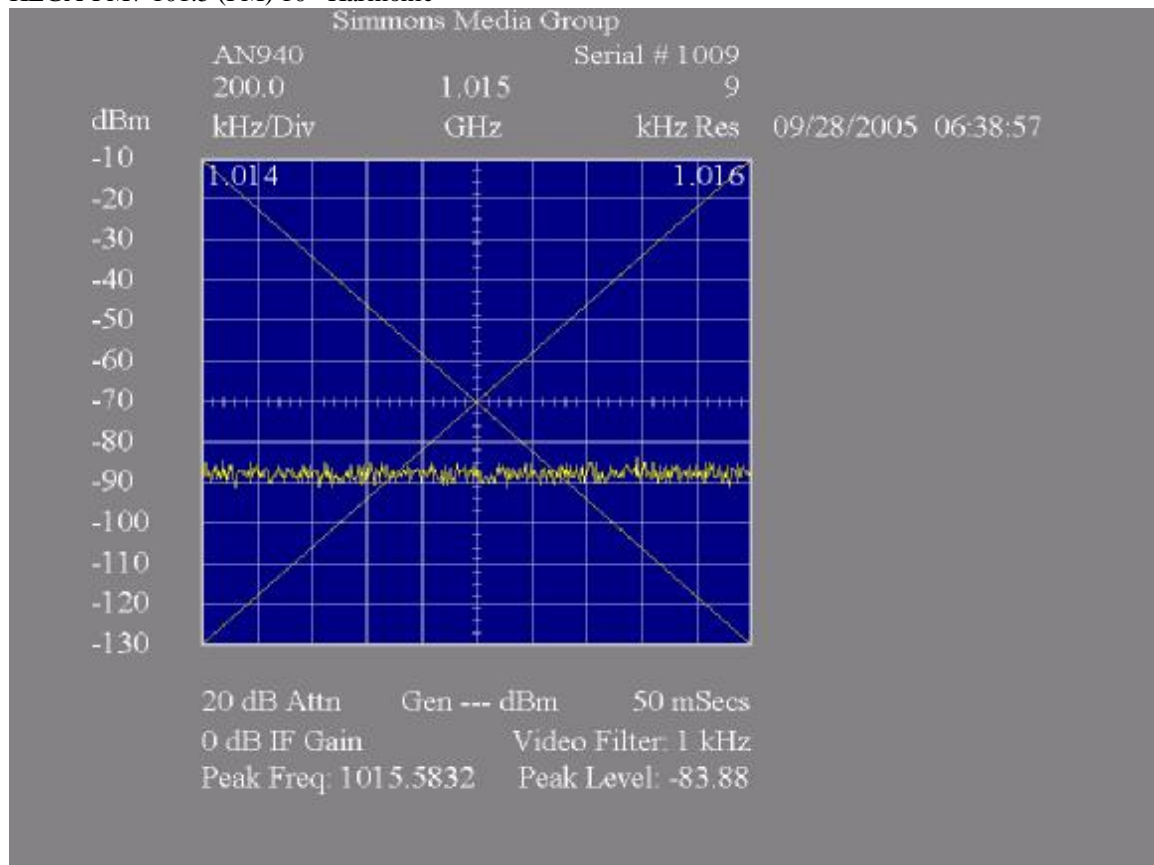
# KEGA-FM7 101.5 (FM) 8<sup>th</sup> Harmonic



# KEGA-FM7 101.5 (FM) 9<sup>th</sup> Harmonic



# KEGA-FM7 101.5 (FM) 10<sup>th</sup> Harmonic



## Measured Intermodulation Product with KJQN (FM) 103.1 MHz $2 \times 101.5 - 103.1 \text{ MHz} = 99.9 \text{ MHz}$

