

KEGA FM-5 Provo, UT

Spurious Emissions Report

On the evening of September 12th, 2003, I made equipment performance measurements for radio station KEGA FM-5 Provo, UT. These measurements were made as a condition of Construction Permit BNPFTB-20021204AAS

KEGA 101.5 (FM) is one of two stations sharing a master antenna system at the Utah Valley Water District located in Provo 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 in Sacramento CA.

Measurements were made while both stations broadcast programming material. KEGA FM-5 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 intermodulation products. The third measurement scanned the spectrum from 9 kHz to 1 GHz in order to detect any out-of-band intermodulation products or harmonics.

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



An Aeroflex Company

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CERTIFICATE OF CALIBRATION

Certificate:	25312	Customer:	SIMMONS RADIO GROUP 515 S. 700 EAST SUITE 1C SALT LAKE CITY, UT
Manufacturer:	IFR		
Model:	940		84102
Description:	AN-940		
Serial No:	1009		
Calibration Date:	11-Aug-2003	Temperature:	23.2 C
Cal Due Date:	11-Aug-2004	Humidity:	40.0 %
Accessories:			

INSTRUMENT CONDITION:

Pre-Calibration Description: OUT OF TOLERANCE

Post-Calibration Description: IN TOLERANCE

IFR Certifies that at the time of calibration the above instrument was calibrated in accordance with applicable IFR procedures. The calibration was performed using standards whose accuracy are traceable to the National Institute of Standards and Technology, derived from accepted values of natural physical constants, or derived by the ratio type of self-calibration techniques. The supporting calibration system complies with ANSI/NCSL Z540-1-1994. This certificate shall not be reproduced, except in full, without the written approval of the calibration facility.

STEPHEN D FOREMAN
Calibrated By

STEPHEN D FOREMAN
Certified By


Authorized Signature

To measure the occupied bandwidth, the spectrum analyzer was set to 101.5 MHz center frequency, 200 kHz/div span, 3 kHz resolution bandwidth, 0 dB of attenuation, and 10 kHz video filtering. This results in a measurement noise floor of approximately -109 dBC. An unmodulated 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:

KEGA FM-5 Carrier Frequency = 101.5 MHz

<u>FREQUENCY</u>	<u>SIGNAL</u>	<u>DIFFERENCE</u>
Carrier +0 kHz	-31 dBC	0 dB down
Carrier -120 kHz	-63 Dbc	32 Db down
Carrier +120 kHz	-60 Dbc	31 Db down
Carrier -240 kHz	-101 Dbc	70 Db down
Carrier +240 kHz	-100 Dbc	76 Db down
Carrier -600 kHz	-107 Dbc	76 Db down
Carrier +600 kHz	-108 Dbc	77 Db down
Noise Floor:	-109 Dbc	78 Db down

Please note that the transmitter TPO is only 100 watts therefore it was difficult to achieve the -80 dbc due to Low signal.

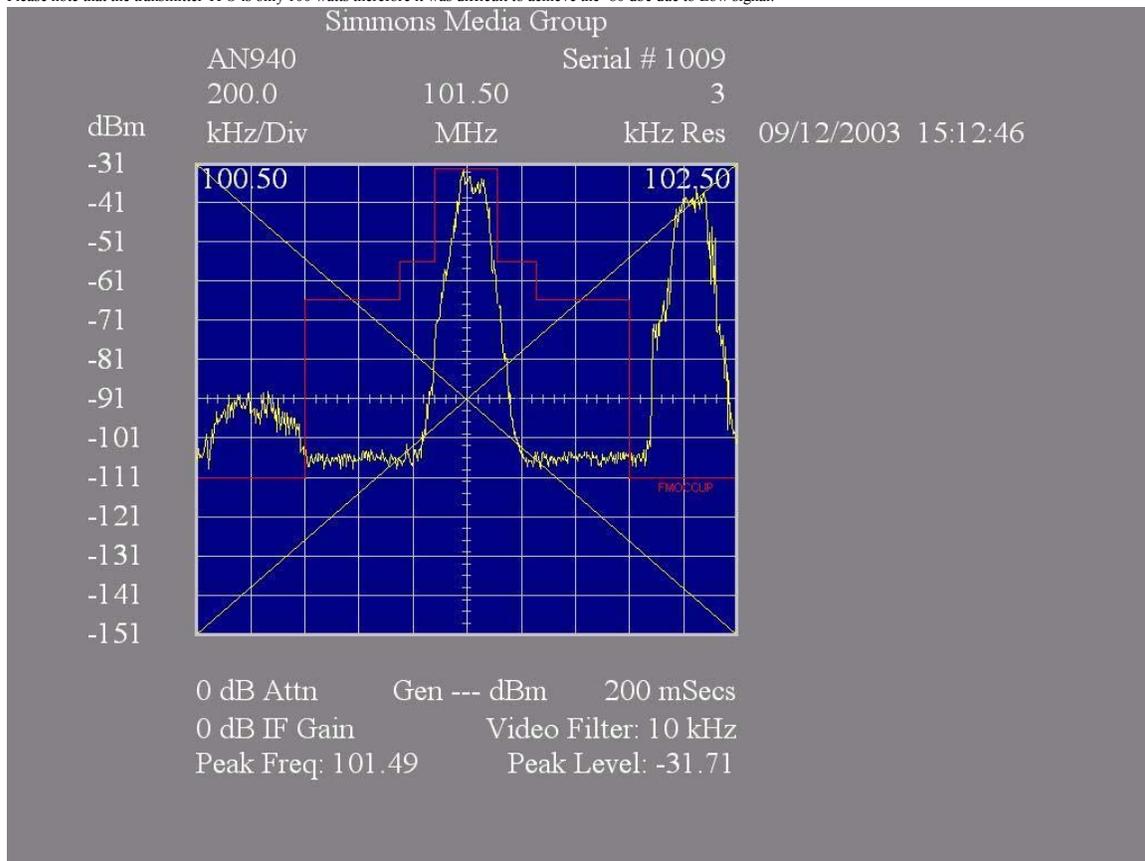


Figure 1

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

To make the second set of measurements, the analyzer was once again placed in peak hold mode, data collected for ten minutes, and data from the resulting spectrum was examined. The signal that appeared 800 kHz above the KEGA carrier was identified as KWKD FM-5 Provo, UT, which is also part of the antenna system. Other than this signal, there are no signals above the prescribed emissions limit.

To measure spurious signals and harmonics, the spectrum analyzer was set to 2 MHz/div span, 10 kHz resolution bandwidth, 0 dB of attenuation, and 30 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 kHz 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 intermodulation 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:



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