

**Report of Inter-modulation Product Findings
(Heege rd. combined Auxiliary transmitter site)
ASR# 1001160**

**KLOU-FM 103.3 Mhz Clear Channel Radio
KSLZ-FM 107.7 Mhz Clear Channel Radio**

October 2007

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Report of Findings KLOU/KSLZ St. Louis, MO.

Introduction: This report of findings is based on data collected at the Heege Rd. transmitter site in St. Louis, MO. for stations KLOU-FM and KSLZ-FM. This site is and auxiliary transmitter site for both stations. This report will show proof of combined operation for transmitters and combiner system for FCC Rules and Regulations by Code of Federal Regulations CFR Title 47 section 73.317 paragraphs (b) thru (d). The collection of measurements presents in this report shows that all third order inter-modulation (IM) products generated by this multi-station system are less than the maximum allowable level required by section 73.317 (b) thru (d).

The Nature of Inter-modulation Products (IM): Inter-modulation products result from inadequate transmitter-to-transmitter isolation. Inter-modulation products are commonly generated from radio stations operating into multiplexed facilities and congested antenna broadcast sites. The mechanics associated with the phenomenon have been well documented. When two or more transmitters are coupled to each other, new spectral components are produced by mixing of the station frequencies in the active circuits of each transmitter. The common term used to describe this phenomenon is third order product denoted by the mathematical expression $[2(f_1)-(f_2)]$, where f_1 signifies the frequency of the transmitter that is generating the inter-modulation product, and f_2 signifies the frequency causing the interference.

The Multiplexed system: Measurements were taken with both FM stations operating from the combined antenna system. The KLOU-FM and KSLZ-FM multiplexed system is fundamentally comprised of an antenna, multiplexer and feedline. The Antenna is an ERI brand model SPH-6-AC-SP full wave antenna the multiplexer is also manufactured by ERI and is a constant impedance combiner the line is rigid made by ERI. To accomplish the aggregation of the multiple transmitter signals into a common antenna feed and provide transmitter-to-transmitter isolation, a multiplexing scheme consisting of a 973-3 Tee combiner was installed. The Combiner utilizes ERI model 970 series filter modules for each transmitter. Per ERI manufacturer test data the transmitter port-to-port isolation was -63 db for KLOU-FM and -64 for KSLZ.

IM Measurement method: Measurements were made at the directional coupler port at the output of the combiner system, these directional couplers typically provide antenna reflections measurements greater than -30 db directivity and forward signal sample of -45 db.

The Forward port of the DC was used for sampling the outgoing carrier levels and IM products the reflected port was terminated with a 50ohm load. The IM sampled signal was fed by shielded cable into a set of Microwave Filter Company model 6367 tunable notch filters tuned to the both transmitter frequencies to ensure and adequate signal for measurements without overloading the front end of the Agilent 4402B spectrum analyzer for all calculated IM frequencies outside the FM band of 88mhz to 108mhz. For calculated IM frequencies within the FM band 88mhz to 108mhz a Remec Wacom LP model WP-410D-1 serial 38918 band pass filter was used and tuned to the frequency that was being measured to ensure accurate measurements without overloading the Agilent 4402B spectrum analyzer.

Prior to measurements all broadcasting equipment was set to optimal operating performance. All transmitters were operating at the licensed or requested power levels. (KLOU-FM 20kw, KSLZ-FM 20kw) A reference of each transmitters output was made at the final Combiner system output, and the analyzer was set using external input attenuation for a zero reference level displayed.

KLOU/KSLZ IM Measurements (cont.)

IM Measurements: Below listed are the third order frequencies and there measured level from reference per the described methods above.

Frequency A 103.3
Frequency B 107.7

DESCRIPTION	FREQ. MHZ	ATTENUATION DB	DESCRIPTION	FREQ. MHZ	ATTENUATION DB
A + B	211	>-90	(2 X B) + (3 X A)	525.3	>-90
A + (2 X B)	318.7	>-90	3 X A	309.9	>-90
B + (2 X A)	314.3	>-90	(3 X A) - B	202.2	>-90
A + (3 X B)	426.4	>-90	3 X B	323.1	>-90
B + (3 X A)	417.6	>-90	(3 X B) - A	219.8	>-90
2 X A	206.6	>-90	(3 X A) - (2 X B)	94.5	-89.6
(2 X A) - B	98.9	-86.7	(3 X B) - (2 X A)	116.5	>-90
2 X B	215.4	>-90	(3 X A) - (3 X B)	-13.2	>-90
(2 X B) - A	112.1	-87.4	4 X A	413.2	>-90
(2 X A) + (2 X B)	422	>-90	4 X B	430.8	>-90
(2 X A) - (2 X B)	-8.8	>-90	5 X A	516.5	>-90
(2 X A) + (3 X B)	529.7	>-90	5 X B	538.5	>-90

KLOU/KSLZ IM Measurements (cont.)

Conclusion: Based upon my observations and measurements taken October 10, 2007 as summarized in this document, I Daniel J. Mettler find the combiner system for operation of radio stations KLOU-FM and KSLZ-FM into the common antenna (known as the Heege Rd. site) to be in proper working order. Based on the measured data above, it is my opinion that there are no inter-modulation (IM) products in excess of 80 db below the referenced carrier levels generated from or with in the stations operating on the installed multiplexed system. Based on the data, I conclude that KLOU-FM and KSLZ-FM is in compliance with the requirements of Section 73.317 paragraph's (b) thru (d) of the RFF Rules and Regulations.

Respectfully Submitted



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