



Rogers Broadcast Services

NRSC-2 B Measurement Report December 17, 2018
KEXS AM 1090 Excelsior Springs MO
Michael Rogers

Qualifications

The measurements were conducted by a military trained SBE Broadcast Engineer.

Documentation by this engineer has been placed before the commission and is a matter of record.

Michael is currently Chairman of the Kansas City Chapter of the SBE

Equipment Used

RSA306 USB Real Time Spectrum Analyzer
Processed on a Spectre x360 i7 16 GB 1TB SSD



The antenna is a Scott Associates LP-3 shielded loop antenna with a Scott AM Notch Filter.

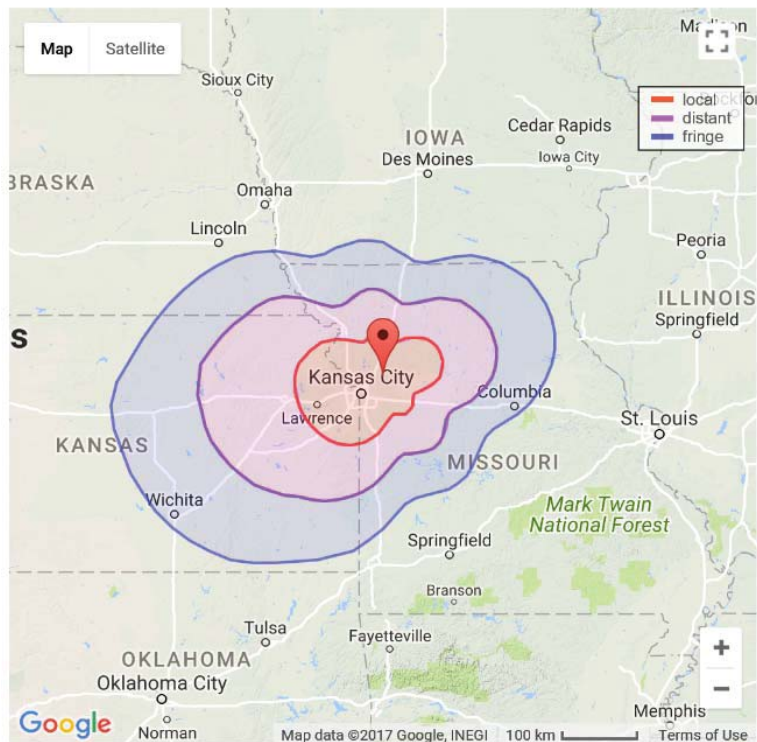


The antenna's frequency range is 0.5 to 10 MHz with a rising gain vs. frequency response.

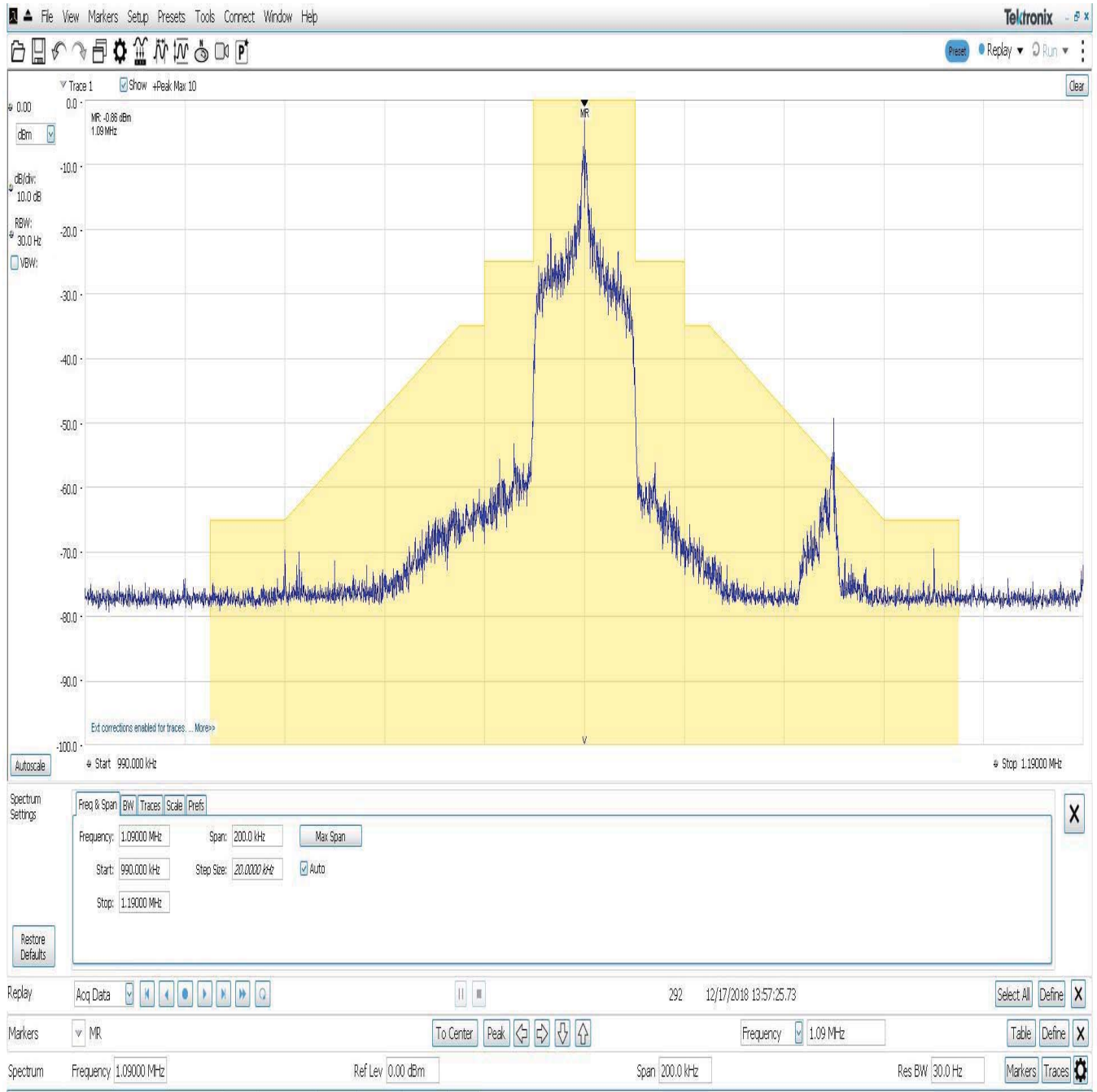
KEXS AM 1090 Excelsior Springs MO

Status	Construction Permit  for a Class D  AM Station
Area of Coverage	View Daytime Coverage Map
Hours of Operation	Daytime Operation Only
Antenna Mode	Directional - 2 Patterns
Daytime Power	10,000 Watts
 Critical Hours Power	4000 Watts
Number of Towers	3
Transmitter Location	39° 17' 39" N, 94° 15' 38" W
Construction Permit Granted	August 31 2017
Construction Permit Expires	August 31 2020
Last FCC Update	August 31 2017

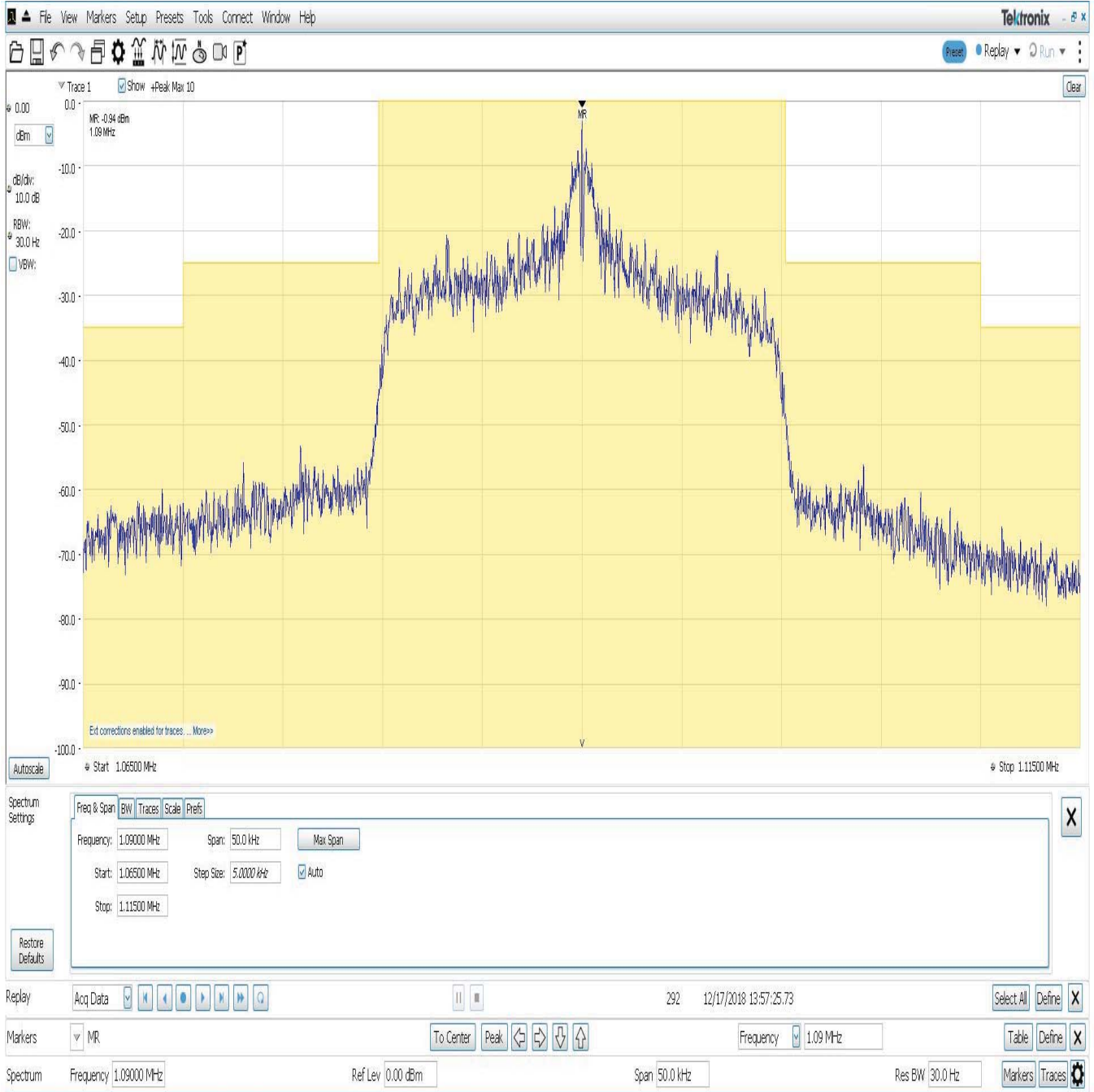
Day Map



KEXS AM 1090 Mask 200 kHz Span Day Passed



KEXS AM 1090 Mask 50 kHz Span Day Passed

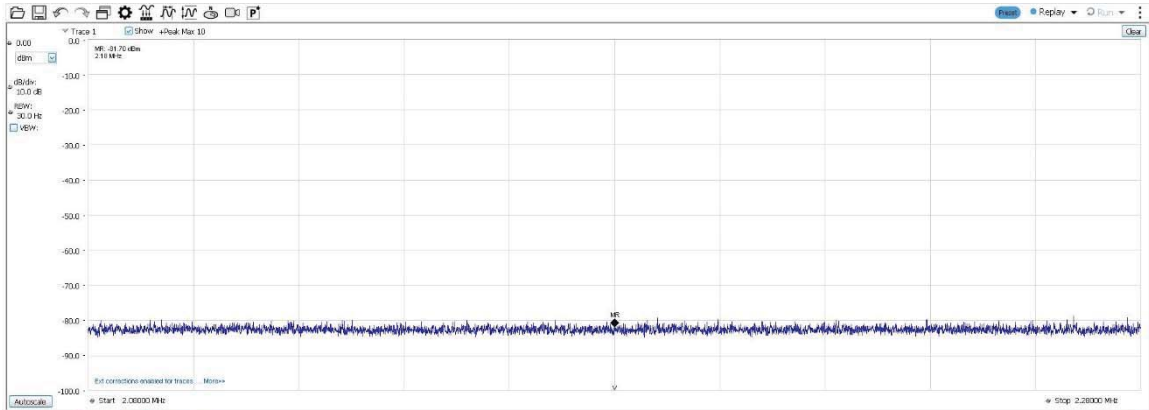


All Harmonic Measurements Day

2180 kHz Passed

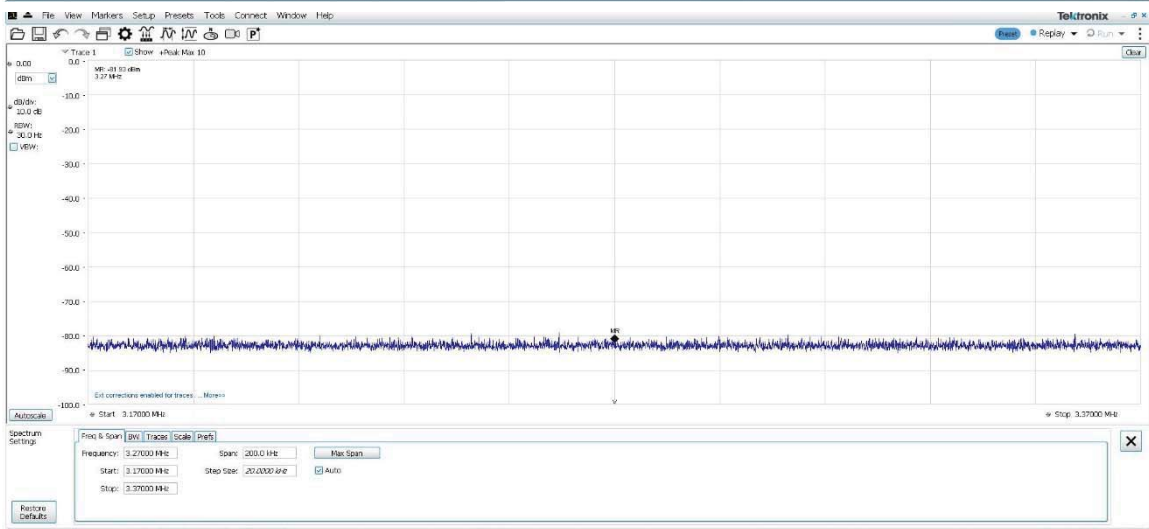
3270 kHz Passed

4360 kHz Passed



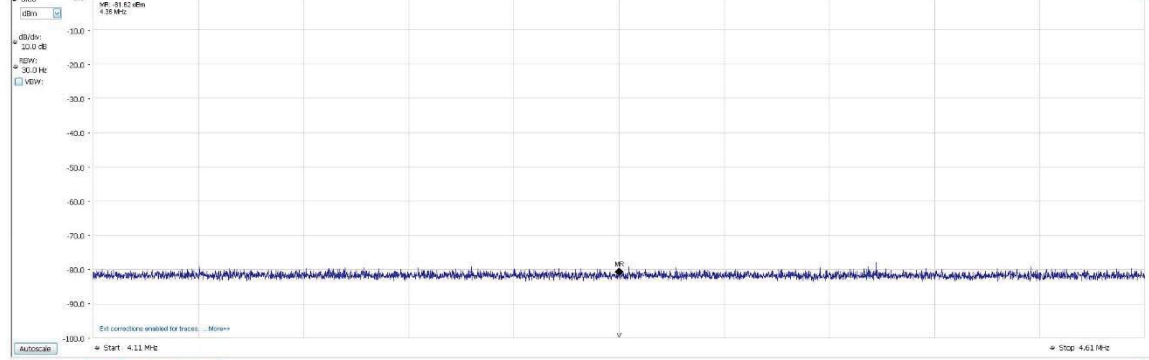
Spectrum Settings: Frequency: 2.18000 MHz, Span: 200.0 MHz, Start: 2.00000 MHz, Stop: 2.28000 MHz, Step Size: 20.0000 MHz, Auto: [checked].

Replay: 155, 12/17/2018 14:06:05.14. Markers: MR, Frequency: 2.18000 MHz, Ref Lev: 0.00 dBm, Span: 200.0 MHz, Res BW: 30.0 Hz.



Spectrum Settings: Frequency: 3.27000 MHz, Span: 200.0 MHz, Start: 3.17000 MHz, Stop: 3.37000 MHz, Step Size: 20.0000 MHz, Auto: [checked].

Replay: 155, 12/17/2018 14:07:32.51. Markers: MR, Frequency: 3.27000 MHz, Ref Lev: 0.00 dBm, Span: 200.0 MHz, Res BW: 30.0 Hz.



Spectrum Settings: Frequency: 4.36 MHz, Span: 500 MHz, Start: 4.11 MHz, Stop: 4.61 MHz, Step Size: 50.0000 MHz, Auto: [checked].

Replay: 276, 12/17/2018 14:09:18.54. Markers: MR, Frequency: 4.36000 MHz, Ref Lev: 0.00 dBm, Span: 500 MHz, Res BW: 30.0 Hz.

AM Harmonic Measurement Calculations

Call Letters: KEXS **Date:** 12/17/2018
Freq: 1090 **Time:** 12:30 PM
City: Excelsior Springs **Power:** 10000
State: MO

First Harmonic Attenuation	85.17
Second Harmonic Attenuation	87.63
Third Harmonic Attenuation	88.40

** To be legal all spurious harmonics must be in excess of: 83.00 db

	KhzReadings	dBm Reading	DB Attenuation	Formula	mVolt Reading	Calibration Factor Value	Megahertz Level	Reference Level	Harmonic Reading Divided By Reference Level
1st Fundamental	1090 Khz	-0.86 dBm	Final Calculation	0.101294	202.5279665 mV	388.14	1.09	78609.20492	
2nd Harmonic:	2180 Khz	-81.7 dBm	85.17	0.07	0.018385905 mV	235.76	2.18	4.33466	0.0000551
3rd Harmonic:	3270 Khz	-81.93 dBm	87.63	0.069958	0.01790544 mV	182.32	3.27	3.26452	0.0000415
4th Harmonic:	4360 Khz	-81.62 dBm	88.40	0.070225	0.018556027 mV	161.00	4.36	2.98752	0.0000380

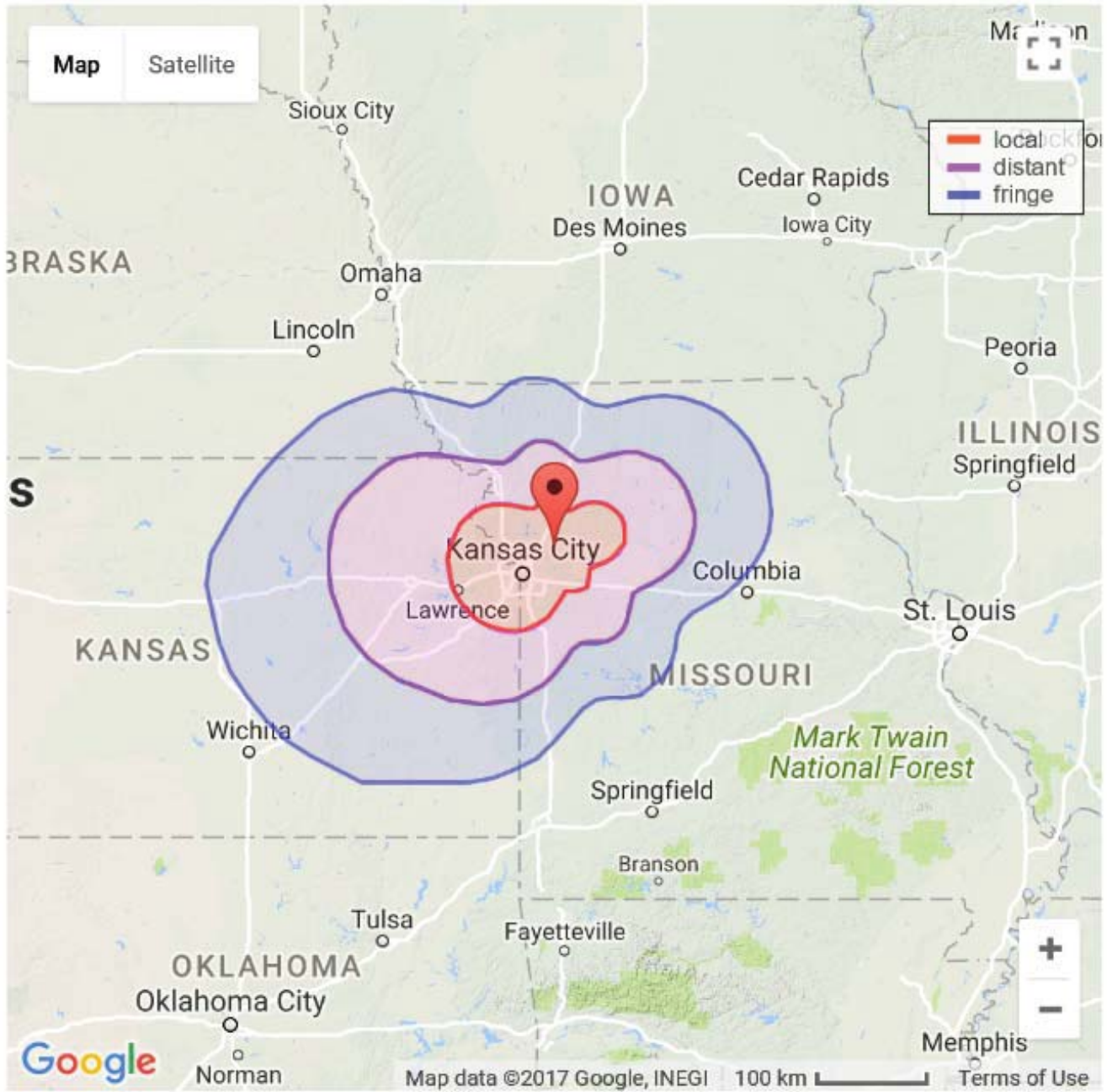
Signal Strength

Calculated Antenna Factor

Harmonic Reading Divided By Reference Level

Night Map

0



The pattern is the same for day power and night power.
No significant differences were noticed.

73.44 AM Transmission System Emission Limitations.

- (a) The emissions of stations in the AM service shall be attenuated in accordance with the requirements specified in paragraph (b) of this section. Emissions shall be measured using a properly operated and suitable swept-frequency RF spectrum analyzer using a peak hold duration of 10 minutes, no video filtering, and a 300 Hz resolution bandwidth, except that a wider resolution bandwidth may be employed above 11.5 kHz to detect transient emissions. Alternatively, other specialized receivers or monitors with appropriate characteristics may be used to determine compliance with the provisions of this section, provided that any disputes over measurement accuracy are resolved in favor of measurements obtained by using a calibrated spectrum analyzer adjusted as set forth above.
- (b) (b) Emissions 10.2 kHz to 20 kHz removed from the carrier must be attenuated at least 25 dB below the unmodulated carrier level, emissions 20 kHz to 30 kHz removed from the carrier must be attenuated at least 35 dB below the unmodulated carrier level, emissions 30 kHz to 60 kHz removed from the carrier must be attenuated at least $[5 + 1 \text{ dB/kHz}]$ below the unmodulated carrier level, and emissions between 60 kHz and 75 kHz of the carrier frequency must be attenuated at least 65 dB below the unmodulated carrier level. Emissions removed by more than 75 kHz must be attenuated at least $43 + 10 \text{ Log (Power in watts)}$ or 80 dB below the unmodulated carrier level, whichever is the lesser attenuation, except for transmitters having power less than 158 watts, where the attenuation must be at least 65 dB below carrier level.
- (c) Should harmful interference be caused to the reception of other broadcast or non-broadcast stations by out of band emissions, the licensee may be directed to achieve a greater degree of attenuation than specified in paragraphs (a) and (b) of this section.
- (d) Measurements to determine compliance with this section for transmitter type acceptance are to be made using signals sampled at the output terminals of the transmitter when operating into an artificial antenna of substantially zero reactance. Measurements made of the emissions of an operating station are to be made at ground level approximately 1 kilometer from the center of the antenna system. When a directional antenna is used, the carrier frequency reference field strength to be used in order of preference shall be:
 - (1) The measure non-directional field strength.
 - (2) The RMS field strength determined from the measured directional radiation pattern.
 - (3) The calculated expected field strength that would be radiated by a non-directional antenna at the stations authorized power.
- (e) Licensees of stations complying with the ANSI/EIA-549-1988, NRSC-1 AM Pre-emphasis / De-emphasis and Broadcast Transmission Bandwidth Specifications (NRSC-1), prior to June 30, 1990 or from the original commencement of operation will, until June 30, 1994, be considered to comply with paragraphs (a) and (b) of this section, absent any reason for the Commission to believe otherwise. Such stations are waived from having to make the periodic measurements required in 73.1590(a)(6) until June 30, 1994. However, licensees must make measurements to determine compliance with paragraphs (a) and (b) of this section upon receipt of an Official Notice of Violation or a Notice of Apparent Liability alleging noncompliance with those provisions, or upon specific request by the Commission.

I Michael Rogers hereby state that I have conducted the measurements contained in this report. To the best of my knowledge all measurements and analysis are compliant and were administered in method that is accepted by the Federal Communication Commission.

The results of the enclosed measurements, are in compliance with the applicable AM emission standards.



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