KOZE AM

CALENDAR 2018

NRSC-2
SPLATTER
MEASUREMENT
Compliance Report

This document is for FCC inspection purposes.
Do NOT remove without chief operator's permission.

GENERAL TECHNICAL STATEMENT

This entire document is the annual RF emissions measurements conducted on the transmitting apparatus of radio station **KOZE AM**, Lewiston, ID. This station transmits on 950 kHz.

Radio Station **KOZE AM** has engaged Sweatte Broadcasting, Inc., for the purpose of conducting these Emission Measurements.

The licensee of each broadcast station shall make emissions measurements of authorized main transmitters at least once each calendar year. These measurements demonstrate whether the station is complying with NRSC-2 limitations as described in the Federal Communication Commission (FCC) rules, Sections 73.44 (a) and (b) and Section 73.1590 (b). These measurements must be made once each calendar year with no more than 14 months between successive measurements.

Furthermore, the FCC's "AM Broadcast Station Self-Inspection Checklist," specifically "Section IV: Technical Emissions E," which is found on page 16 (http://transition.fcc.gov/eb/bc-chklsts/) describes requirements of compliance (Part 78) and proof of compliance that is required to be kept on file for a period of time specified (Part 79).

The equipment used for these measurements ((Delta Electronics SM-1 (Splatter Monitor) and AWA-1 (Active Whip Antenna)) are specifically designed to measure compliance with FCC rules. The calibration and process of using this type of FCC accepted instrument is described in the *List of Equipment Used for Conducting Measurements* found on page 5 and 6 of this report. Furthermore, the *Field Test Configurations* (on page 7) shows the configuration used for verifying measurements made by the Delta SM-1 so the accuracy can be compared to measurements obtained by using the LPT-3000 calibrated spectrum analyzer.

This station demonstrated compliance with NRSC-2 FCC regulations.

These measurements should be kept on file in the station's public inspection file at the transmitter, and, on request, they should be made available to any duly authorized representative of the FCC or an authorized voluntary inspector from a state's broadcasting association, if the state in which this study was conducted has such a program available to broadcast stations.

Ronald S. Sweatte

QUALIFICATIONS OF PERSON TAKING MEASUREMENTS

Ronald S. Sweatte (of Sweatte Broadcasting, Inc.) has been employed as a radio and television broadcast engineer since 1984. He attended Spokane Falls Community College and Lake Washington Technical College for the purpose of advancing his education in radio and TV broadcasting. He attended technical programs at Harris Broadcast Division in Quincy, IL, in 1985, 1986, and 1991 to receive training on MW, K and HT series transmitters. He also received training on Acrodyne Quantum IOT high-power television transmitters in 2005 and continues to attend engineering seminars and schooling on an ongoing basis.

He is or has been employed in following positions:

Presently he is the Chief Technology Officer (CTO) of Northwest Broadcasting, Inc. (NBI) and other wholly owned subsidiaries of its president and CEO of approximately ± 12 network affiliated television stations operating in numerous states. He has been employed by NBI since July 15, 2002 and is recognized by the FCC in this capacity under FRN 0027290907.

Past:

KKZX/KUDY AM/FM – Spokane, WA	Assistant Engineer
KRPM AM/FM – Seattle, WA	Assistant Engineer
KZZU AM/FM – Spokane, WA	Chief Engineer
United/Unicom Broadcasting – WA, ID, NV	Director of Engineering
KXXR FM – Kansas City, MO	Chief Engineer
KLUV FM – Dallas, TX	Director of Engineering
KUBE FM – Seattle, WA	Engineering Manager
Sweatte Broadcasting, Inc. (founded in 1994)	Consulting Engineer
Clear Channel (Town Square Media) – Pasco, WA	Director of Engineering

In 1999, he was accepted to the National Association of Broadcasters (NAB) NRSC advisory committee as an associate member and NAB TV Technology Committee Member (NAB Labs).

He is a member in good standing with the Institute of Electrical and Electronics Engineers (IEEE) and he is a senior member in good standing with the Society of Broadcast Engineers, Inc. (SBE), Society of Cable Telecommunications Engineers (SCTE), Society of Motion Picture and Television Engineers (SMPTE) as well as a member of the American Radio Relay League (ARRL).

He maintains home office(s) in Spokane, Washington, and Palm Desert, California, for Sweatte Broadcasting, Inc., through which he conducts NRSC-2 measurements and other broadcast-related consulting services and engineering studies including with his employment with NBI.

A complete set of FCC rules, especially Parts 73 and 74, are kept up to date at both offices so that he can accurately perform FCC-compliant repairs and maintenance on equipment, as well as conduct compliant broadcast performance measurements such as the ones outlined in this report.

He is licensed by the FCC as a general class amateur radio operator. Call sign is N8VSB.

He is fully qualified to conduct and report the findings and measurements stated in this document and has been doing so since 1996 as requested by radio stations who engage the services of Sweatte Broadcasting, Inc.

NRSC-2 TEST PROCEDURES

A location was chosen less than one kilometer from the AM transmitter - tower site to conduct the emission study.

The Delta SM-1 monitor and AWA-1 antenna were connected, and the monitor's power cable was hooked to the twelve-volt accessory connector inside a vehicle. The monitor's power switch was then turned on, and equipment was tested to make sure electrical power line noise would not interfere with this study where power lines are in proximity of the chosen location.

A digital voltmeter was inserted into the test jack of the mobile whip antenna, and the whip length was adjusted for the proper DC level, reducing the possibility of RF overload.

The emission monitor was calibrated on the station's transmitted frequency, and all "splatter" measurements were taken in reference to this level. The transmitter was modulated with normal programming. The measurements were taken using the monitor's "peak hold" feature.

The monitor's CARRIER thumb wheel was adjusted to the station frequency and the OFF SET thumb wheel selector was set to 11.0 kHz. The RF CAL control was adjusted for the 0 dB calibrate level with the MEASUREMENT switch in the RF CAL position.

To measure the "splatter" content of the signal, the DETECTOR control was set to the in-phase (I) position. The OFFSET thumb wheel selector was adjusted to 11 (indicating 11 kHz. frequency carrier), and the OFFSET BW control was turned to the "0.5 kHz" position. Measurements were then taken at the offset frequency steps indicated on the tabulated data sheet. These measurements were repeated with the OFFSET BW control turned to the OPTION (or 0.3 kHz bandwidth) for FCC measurements. The meter indications were logged.

Calibration and Verification

The calibration and verification of the Delta SM-1 "splatter" monitor accuracy was verified so the accuracy could be compared to measurements obtained by using the calibrated spectrum analyzer as demonstrated on the *Field Test Configurations* diagram on page 6 of this report.

This same location was chosen for the harmonic radiation study. A spectrum analyzer and or field strength meter was used to measure the harmonic content of the station's signal. The field intensity of the main carrier was measured and recorded as the reference level of 0 dB or millivolts per meter and converted to dB depending on the measurement device used the signal ratio (i.e., harmonic) - measurements are resolved using the dB scale of the meter. The meter was tuned to the second harmonic and then to the third harmonic. Afterward, the levels were recorded. The amount of harmonic attenuation in dB was calculated, $db1 - db2 + N \times 20 = Ratio\ in\ db \pm = \Sigma(k)$ correction factors applied where required and compared against FCC limits for the stations licensed power level. When/if the Potomac FIM-41 was used the meter readings and frequencies were compared to the calibration certificate and correction (k) factor calculated and noted on page 8 of this report

In certain situations, filtering was used, such as an AM notch filter, to remove fundamental or unwanted signals. A low-pass filter may have been used to remove unwanted brute force FM signals that caused the spectrum analyzer to overload and/or to create inter-modulation distortion products. Insertion loss was factored in during system setup, calibration, and in verifying the characteristics and insertion losses of filtering before the actual broadcast measurements were documented in field notes that are not attached to this report.

Sweatte Broadcasting, Inc., using the station's daytime antenna and/or nighttime antenna took these measurements as reported on the *RF Emission Measurements* on page 8, they were carefully made, and it is believed they are a true representation of the RF parameters shown herein at the time they were taken.

CALIBRATION STATUS FOR EQUIPMENT USED FOR CONDUCTING MEASUREMENTS

Sweatte Broadcasting, Inc., owns and maintains the electronic equipment listed below. All equipment is always kept in good working order, never loaned or rented out to maintain quality control that either meets or exceeds the FCC specifications for NRSC-2 compliance determination and verification, as well as all harmonic emission measurements. All instrumentation calibrations are self-tested and verified against manufacture specifications and or calibration certifications as a function of maintaining the accuracy of this report.

Manufacturer recommendations for operating and maintaining electronic test equipment does not always include suggested calibration intervals. Where that is the case we typically characterize the equipment operating parameters at regular intervals to assure the accuracy range is within the manufacturer's specifications. Where intervals are specified, the suggestions are generally followed.

Sweatte Broadcasting, Inc. maintains high standards and verifies all cable, connectors and test fixtures and methods which may often time require calculating the logarithmic system gains and losses during this process. The (dB *disambiguation*) may not be noted in this report where it's not clearly necessary to use. These calculations are always double checked against known sources and accepted industry practices.

Where interference is noted (+) on page 8, interference is not "splatter" related to the station or signal in this study. It may or may not be mutually exclusive but was not deemed "splatter" when demodulated and/or further studied. It may also be further observed with a Potomac Instruments FIM-41 or by other methods that are generally not spelled out unless a customer wishes further investigation.

Equipment always travels in high quality safety cases to protect and maintain its integrity at all times and is stored in the same manner.

LIST OF EQUIPMENT USED FOR CONDUCTING MEASUREMENTS

MEASUREMENT RECEIVER *

Delta Electronics	Model SM-1 Splatter Monitor	S/N 122
Frequency Range	450 kHz. to 1700 kHz.	
Measurement Range	0 to -85 dBc	
Measurement Accuracy	± 2 dB	
Detector Modes	I, Q, I and Q (chopped)	
Offset Range	11 to 99 kHz	
Options Installed	PH-1 Peak Hold Option - SA-1 Spectrum Analyzer Option	

MEASUREMENT ANTENNA

Delta Electronics	Model AWA-1 Active Whip Antenna	S/N 054

SPECTRUM ANALYZER *

LP Technologies	Model 3000	S/N 69L013
Frequency Range	9 kHz – 3 GHz	
Sensitivity	-105 dBm	
Accuracy	± 1.5 dB	

MEASUREMENT ANTENNA

Scott-Inc	LP-3 Standard H-Field Loop Antenna	S/N none
Accuracy	± 1.5 dB, .50 - 5.0 MHz ± 3dB 5-10 MHz. Null depth greater than 25dB rejection from unwanted signal(s)	

ANTENNA CALIBRATION VOLT METER

Fluke 87V		S/N 87730113
Accuracy	± (0.05% +1)	

AM NOTCH FILTER

Scott-Inc	AM Tunable Notch Filter	S/N none
Frequency Range	530 kHz - 1.27 MHz	

FIELD STRENGTH METER

Potomac Instruments Inc.	Model FIM-41	S/N 289
Accuracy of (current) calibration	± 1%, referenced to NIST Standard field	(10-04-2016)

ELECTRONICS CALIBRATION SOURCE

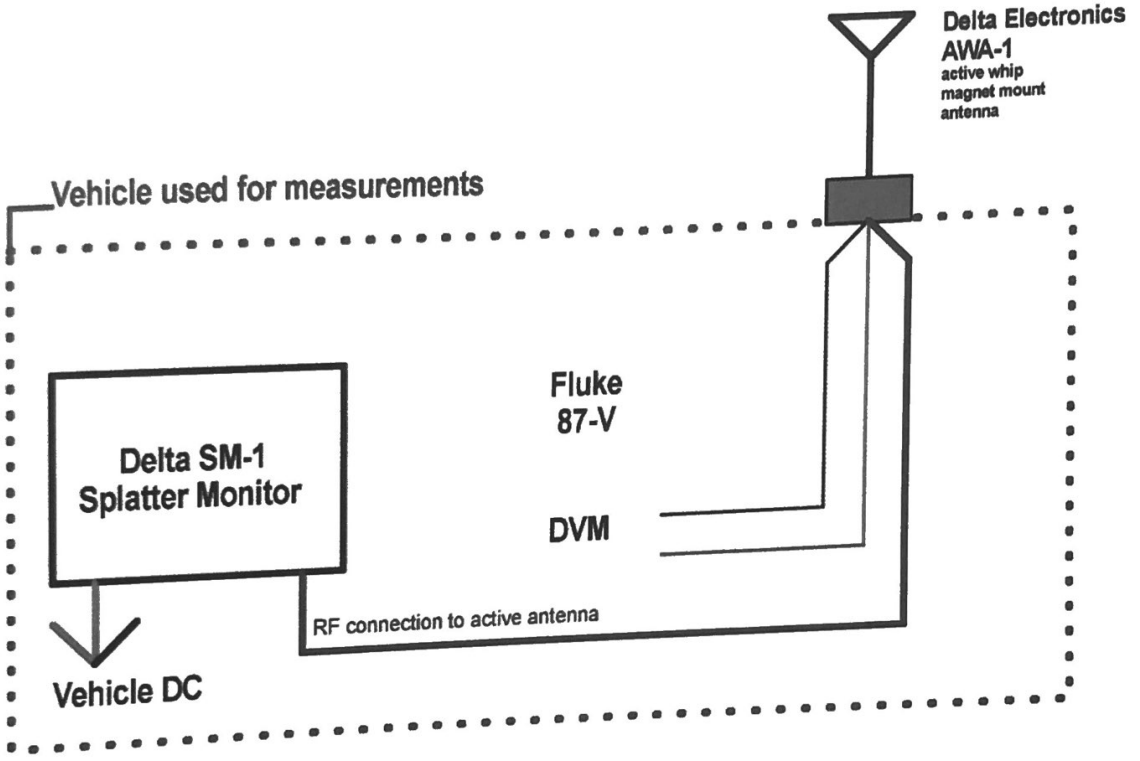
Copper Mountain Technologies Planar TR1300/1 Vector Network Analyzer S/N 0490215

Accuracy Dynamic range:	130 dB (10 Hz)
Frequency range:	300 kHz to 1.3 GHz
Measured parameters:	S11, S21 @ 50 Ω

Calibration Kit O/S/L/T N1.1 Operating frequency: DC to 1.5 GHz 50 Ω S/N 16026

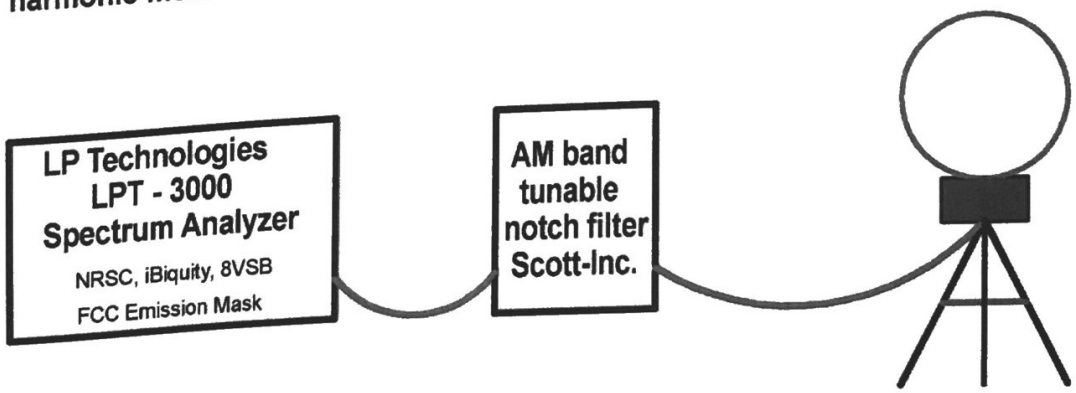
** Model SM-1 Splatter Monitor Verification Process: The Delta SM-1 Splatter Monitor is calibrated so the accuracy can be compared to measurements obtained by using the LPT-3000 calibrated spectrum analyzer.*

Typical Field Test Configurations



NRSC-2 verification / harmonic measurement configuration

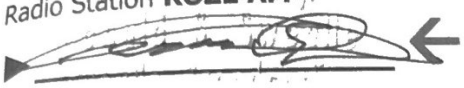
LP-3 series standard H-field loop antenna Chris Scott Inc.



Sweatte Broadcasting, Inc.

RF EMISSION MEASUREMENTS

Radio Station **KOZE AM**



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RF Emission Measurements
For Calendar Year **2018**

SIDEBAND NRSC-2 "SPLATTER" MEASUREMENTS dB BELOW CARRIER (dBc)			
Offset From Carrier (kHz)	**FCC Limit (dB)**	**Offset Bandwidth** 0.5 kHz I (dB)	NRSC-2 0.3 kHz I (dB)
11	-25	-41	-44
15	-25	-51	-56
20	-35	-53	-58
30	-35	-59	-76
40	-45	-59	-59
50	-55	-75	-82
60	-65	-74	-79
70	-65	-83	-85
80	-80*	-83	-85
90	-80*	-84	-85
99	-80*	-81	-82

*** Note**: Maximum limit varies with carrier power. Limit = - (43+10 log Pc) dBc.
(Pc <158W -65 dBc) (250W -67dBc) (1kW -73dBc) (5 to 50kW -80 dBc)

Harmonic Level Measurements			
Carrier Calibration	-0dB ref.	Notes: *blank - ok*	db1 - db2 + N x 20 = Ratio in db ± = Σ (k) (k) = *Correction factor*
2nd Harmonic	-88		
3rd Harmonic	-86		

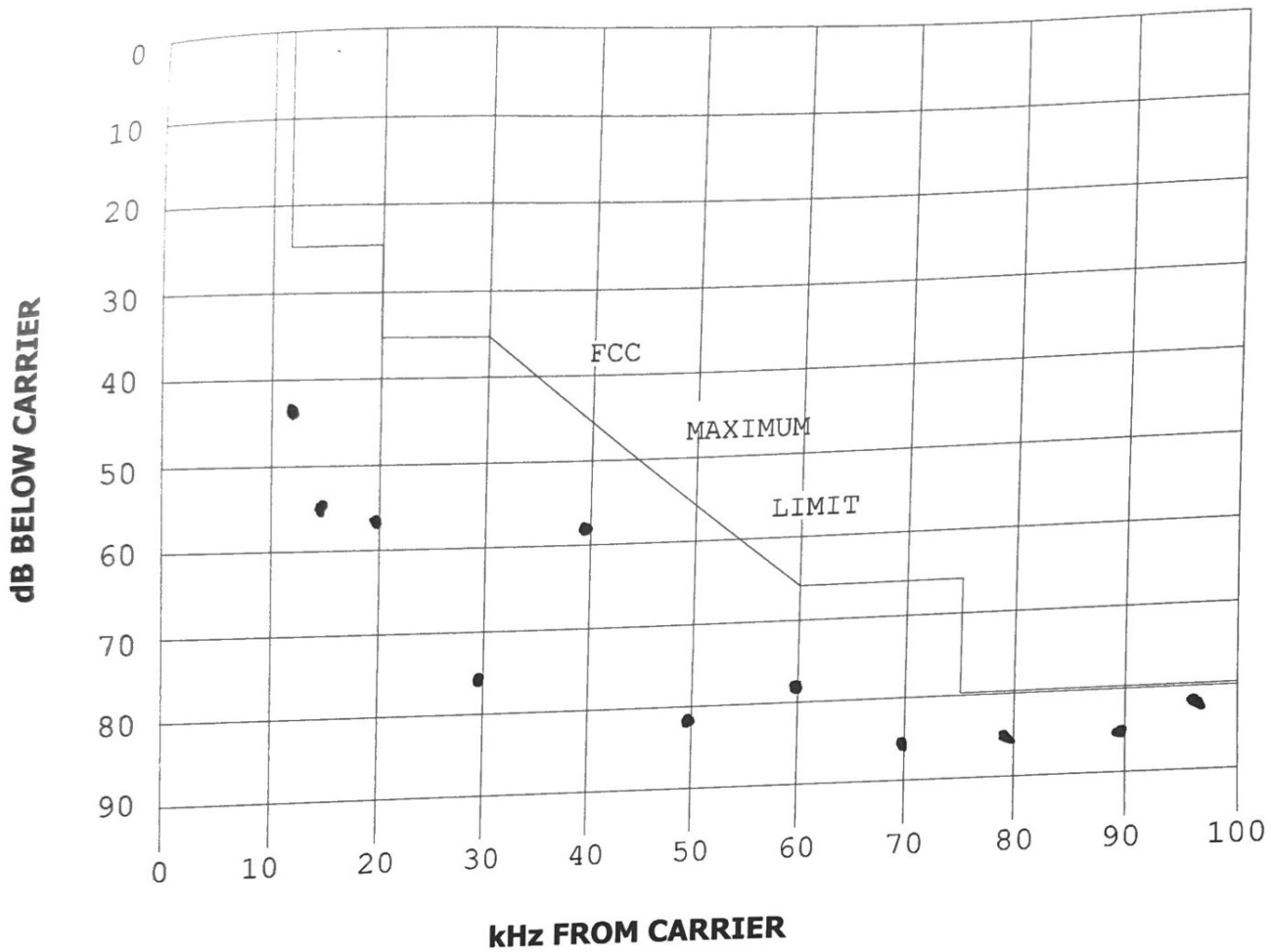
-80 dBc 5KW FCC limit (43+10 log Pc) dBc.
(Pc <158W -65 dBc) (250W -67dBc) (1kW -73dBc) (5 to 50kW -80 dBc)
Please Note: " + " indicates interference *not "Splatter"*

Date of Study: April 3rd 2018 6:32pm

Location of Study: 329 W. Swallows View Drive in front of residential home

Study conducted under normal programming and operating conditions.

SIDEBAND TEST CHART



Dots on the above graph represent 2018 Side Band levels carried over from page 8, and are below FCC limits, unless otherwise noted by the " + " symbol next to measurement data in the previous Sideband "Splatter" Measurements page 8. Note: Maximum limit varies with carrier power.

Limit = - (43+10 log Pc) dBc.
(Pc <158W -65 dBc) (250W -67dBc) (1kW -73dBc) (5 to 50kW -80 dBc)