



**DIRECTIONAL ANTENNA PATTERN PERFORMANCE
RECERTIFICATION REPORT
STATION WZAB – SWEETWATER, FLORIDA
880 kHz – 4 kW-D, 5 kW-N, U, DA-2
Facility ID: 21763**

Licensee: Caron Broadcasting, Inc.

1.0 GENERAL

Section 73.155 of the FCC's Rules and Regulations requires that a licensee of a station, having a directional antenna pattern that has been licensed pursuant to a proof of performance using moment method modeling and internal array parameters, shall recertify the performance of the directional antenna pattern at least once within every 24 month period.¹ To satisfy this requirement, measurements were performed by the undersigned on January 24, 2017, to verify the continuing integrity of the WZAB sampling system and, in addition, field strength measurements were performed at each of the reference point locations established in the original license application. A description of the recertification measurements and procedures is contained in the paragraphs below.

¹ The WZAB Moment Method based license was granted on February 28, 2011. The measurements contained herein are the third set of recertification measurements that have been performed since grant of the license in 2011.



2.0 SAMPLE SYSTEM MEASUREMENTS

In accordance with the procedures contained in Sections 73.155(a)(1) and (2), measurements were performed to: 1) verify the performance of each of the sample current transformers; 2) verify the electrical length and characteristic impedance of each of the sample transmission lines; 3) verify the impedance of each sample transmission cable with the sample current transformer connected to the cable; and 4) verify the performance of the antenna monitor.

2.1 CURRENT TRANSFORMER PERFORMANCE MEASUREMENTS

The WZAB sampling system utilizes eight identical, Delta Electronics, Model TCT-3, toroidal current transformers for sampling the base current input to each tower at a location corresponding to the output branch of the antenna matching network and the input to the diplexer filter. The performance of each of the toroidal current transformers was verified by driving a common reference current through all eight transformers and comparing their outputs with respect to each other as observed on the Hewlett-Packard, Model 4396A, network analyzer. Based on the measured relative outputs, it was determined that the performance of the current transformers was within the manufacturer's stated accuracy. A tabulation of the measured relative output values along with the serial number of each of the current transformers is contained in the tables of Figure 1.

2.2 SAMPLE TRANSMISSION LINE LENGTH AND CHARACTERISTIC IMPEDANCE

MEASUREMENTS

The WZAB sampling system employs equal lengths of Andrew, Type LDF4-50A, phase stabilized, ½ inch, foam dielectric, coaxial cable. The sampling lines were verified to be equal length within 1 electrical degree, by measuring the open circuit series resonant frequency closest to the WZAB operating frequency. The characteristic impedance of each line was verified by measuring the impedance at frequencies corresponding to 1/8 wavelength immediately above and below the open circuit series resonant frequency closest to the WZAB operating frequency. The sample line length and characteristic impedance measurements were performed by the undersigned using a Hewlett-Packard, Model 4396A, network analyzer; an Amplifier Research, Model 5W1000, power amplifier and a Tunwall Radio directional coupler.

The sample line length and characteristic impedance measurement data is tabulated in Figure 2. Based on the measurement data, the sample line lengths are well within the required 1 electrical degree tolerance and the sample line characteristic impedances are well within the required 2 ohms tolerance.

In addition to the above measurements, the impedance of each sample line was measured with the toroidal current transformer connected. This data is included in the tabulation of Figure 2. A comparison of the new impedance data with that contained in the license application is shown in Figure 3. Based on the data of Figure 3, the impedance of the sample transmission lines with the toroidal current transformers

connected is well within the ± 2 Ohms and the $\pm 4\%$ tolerance when compared to the corresponding measured impedance values contained in the license application.

2.3 ANTENNA MONITOR VERIFICATION

The Potomac Instruments, Model 1901-8, Serial No. 770, antenna monitor employed at WZAB was most recently calibrated by the manufacturer June 18, 2008. The performance of the antenna monitor was verified to be within the manufacturer's stated accuracy. The verification was performed by comparison of the measured relative directional operating parameters, as observed on the antenna monitor, with those measured using the Hewlett-Packard, Model 4396A, network analyzer when the phasing and coupling system common point was driven with the network analyzer swept source through a power amplifier.

3.0 REFERENCE FIELD STRENGTH MEASUREMENTS

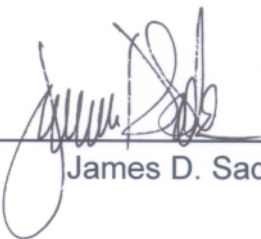
Reference field strength measurements were performed on the following four radial bearings in the daytime operating mode: 72°, 148°, 194°, and 261°. In the nighttime operating mode, reference field strength measurements were performed on the following seven radial bearings: 0°, 19°, 72°, 118°, 194°, 225°, and 285°. Three reference point field strength measurements were performed on each of the nine radials. The reference point locations were the same as those measured during the 2015 recertification and 2011 proof.

All of the measurements were performed by Mr. Scott Horner, National Project Manager for Salem Communications Corporation, the parent company of the licensee, accompanied by the undersigned. Measurements were made using a Potomac Instruments, Model PI4100, field intensity meter, Serial 352, last calibrated by the manufacturer on March 11, 2016. The GPS coordinates (NAD83) and descriptions of the reference point locations are provided in Figure 4, sheets 1 through 5, along with the corresponding measured field strength value for each established reference location.

4.0 SUMMARY

Recertification measurements have been performed in accordance with the requirements of Section 73.155 of the FCC's Rules and Regulations within the 24 month period initiated by grant of the underlying license application. The measurements verify that the WZAB daytime and nighttime directional antenna patterns continue to operate in full compliance with the technical terms of the station's FCC license. This report was prepared by the undersigned and the information contained in this report is believed to be true and correct.

Dated: January 31, 2017



James D. Sadler

SAMPLE DEVICE VERIFICATION
 STATION WZAB - SWEETWATER, FLORIDA
 880 kHz - 4 kW-D, 5 kW-N, U, DA-2
 JANUARY, 2017

Reference Sample Toroid Number	Measured Sample Toroid Number	Measured	
		Field Ratio	Phase (degrees)
1	2	1.004	-0.4
1	3	1.006	-0.4
1	4	1.004	-0.3
1	5	1.004	-0.3
1	6	1.004	-0.4
1	7	1.004	-0.4
1	8	1.005	-0.5
2	8	1.004	-0.5

Sample Toroid Number	Type	Serial Number
1	Delta Electronics, TCT-3	17801
2	Delta Electronics, TCT-3	177818
3	Delta Electronics, TCT-3	17800
4	Delta Electronics, TCT-3	177817
5	Delta Electronics, TCT-3	177824
6	Delta Electronics, TCT-3	17803
7	Delta Electronics, TCT-3	177825
8	Delta Electronics, TCT-3	17802

SAMPLE LINE VERIFICATION MEASUREMENTS

STATION WZAB - SWEETWATER, FLORIDA

880 kHz - 4 kW-D, 5 kW-N, U, DA-2

JANUARY, 2017

Tower	Open Circuit Series Resonant Frequency ¹ (kHz)	Open Circuit Measured Line Length ² (degrees)	Resonant Frequency -45 degree Offset Frequency (kHz)	Resonant Frequency -45 degree Offset Impedance (Ohms)	Resonant Frequency +45 degree Offset Frequency (kHz)	Resonant Frequency +45 degree Offset Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)	Reference Impedance Sample Toroid Connected ² (Ohms)
1	996.1	397.6	896.49	6.39 -j 48.15	1095.71	10.00 +j 51.05	50.27	50.0 +j0.51
2	996.1	397.6	896.49	6.40 -j 48.19	1095.71	9.99 +j 50.94	50.23	49.9 +0.57
3	996.1	397.6	896.49	6.42 -j 48.44	1095.71	10.08 +j 51.35	50.57	49.9 +j0.77
4	996.1	397.6	896.49	6.40 -j 48.16	1095.71	10.00 +j 51.02	50.26	50.0 +j0.78
5	996.2	397.5	896.58	6.43 -j 48.35	1095.82	10.07 +j 51.27	50.48	50.3 +j0.89
6	996.2	397.5	896.58	7.06 -j 48.11	1095.82	10.67 +j 51.00	50.33	49.9 +j0.62
7	996.1	397.6	896.49	6.36 -j 48.15	1095.71	9.97 +j 50.95	50.21	49.7 +j0.55
8	996.4	397.4	896.76	6.35 -j 48.32	1096.04	10.03 +j 51.33	50.21	49.9 +j0.68

¹ At this frequency, the sample line electrical length is equal to 450°.

² At carrier frequency (880 kHz)

**SAMPLE LINE IMPEDANCE WITH CURRENT
TRANSFORMERS CONNECTED**
STATION WZAB - SWEETWATER, FLORIDA
880 kHz - 4 kW-D, 5 kW-N, U, DA-2
JANUARY, 2017

Tower	Measured Impedance MOM Proof December, 2010	Measured Impedance Recertification January, 2017	Delta Impedance Recertification January, 2017
1	52.04 +j 0.54	50.00 +j 0.51	-2.04 -j 0.03
2	52.05 +j 0.53	49.90 +j 0.57	-2.15 +j 0.04
3	52.04 +j 0.64	49.90 +j 0.77	-2.14 +j 0.13
4	52.23 +j 0.54	50.00 +j 0.78	-2.23 +j 0.24
5	52.30 +j 0.68	50.30 +j 0.89	-2.00 +j 0.21
6	51.96 +j 0.47	49.90 +j 0.62	-2.06 +j 0.15
7	52.50 +j 0.41	49.70 +j 0.55	-2.80 +j 0.14
8	52.07 +j 0.56	49.90 +j 0.68	-2.17 +j 0.12

REFERENCE FIELD STRENGTH MEASUREMENTS

STATION WZAB - SWEETWATER, FLORIDA

880 kHz - 4 kW-D, 5 kW-N, U, DA-2

JANUARY, 2017

0 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	6.48	---	5.42	25° 48' 27.4"	80° 32' 50.2"	Point is located in the everglades and is accessible via airboat.
2	7.61	---	4.29	25° 49' 04.0"	80° 32' 48.9"	Point is located in the everglades and is accessible via airboat.
3	8.43	---	4.0	25° 49' 30.3"	80° 32' 48.4"	Point is located in the everglades and is accessible via airboat.

19 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	6.49	---	5.0	25° 48' 16.6"	80° 31' 33.9"	Point is located in the everglades and is accessible via airboat.
2	7.58	---	4.3	25° 48' 49.1"	80° 31' 18.7"	Point is located in the everglades and is accessible via airboat.
3	8.53	---	4.4	25° 49' 18.1"	80° 31' 07.6"	Point is located in the everglades and is accessible via airboat.

REFERENCE FIELD STRENGTH MEASUREMENTS

STATION WZAB - SWEETWATER, FLORIDA

880 kHz - 4 kW-D, 5 kW-N, U, DA-2

JANUARY, 2017

72 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	4.18	247	375	25° 45' 39.6"	80° 30' 26.2"	Point is located on the center of the Tamiami Trail (US 41), 20 feet north of satellite control box on post.
2	14.50	49.2	76	25° 47' 22.2"	80° 24' 32.5"	Point is located on the curb at the southwest corner of the intersection of NW 132nd Avenue and NW 17th Street.
3	16.27	37.5	58.5	25° 47' 39.1"	80° 23' 33.2"	Point is located on the curb at the southwest corner of the intersection of NW 121st Court and NW 25th Street.

118 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	9.58	---	1.86	25° 42' 29.6"	80° 27' 46.1"	Point is located on the curb at the southeast corner of the intersection of SW 167th Avenue and SW 61st Lane.
2	13.47	---	1.72	25° 41' 32.4"	80° 25' 41"	Point is located in the center of the street at the center of the property located at 7940 SW 145th Avenue.
3	15.93	---	1.9	25° 40' 55.0"	80° 24' 23.1"	Point is located in the center of the street at the center of the property located at 12960 SW 130th Avenue.

REFERENCE FIELD STRENGTH MEASUREMENTS

STATION WZAB - SWEETWATER, FLORIDA

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JANUARY, 2017

148 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	10.36	3.73	---	25° 40' 12.9"	80° 29' 31.1"	Point is located in the center of the entrance driveway to 18300 SW 100th Street.
2	12.47	1.81	---	25° 39' 16.5"	80° 28' 52.2"	Point is located on the west side of Krome Avenue (Highway 997) approximately 60 feet west of the power lines.
3	18.22	1.8	---	25° 36' 37.5"	80° 27' 01.7"	Point is located in the center of SW 168th Street approximately 200 yards east of SW 160th Avenue.

194 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	12.18	0.69	2.2	25° 38' 35.2"	80° 34' 34.5"	Point is located at the north end of SW 237th Avenue near the gate.
2	14.39	0.695	1.27	25° 37' 21.7"	80° 34' 32.9"	Point is located on the west side of SW 237th Avenue at the southwest corner of the intersection with locked road.
3 ¹	15.00	0.40	0.38	25° 37' 02.8"	80° 34' 32.3"	Point is located at the locked gate on west side of SW 237th Avenue for Chekika Everglades Park.

¹ Point relocated as the original point is no longer accessible.

REFERENCE FIELD STRENGTH MEASUREMENTS

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JANUARY, 2017

225 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	4.26	---	16.2	25° 43' 20.4"	80° 34' 36.8"	Point is located in the everglades and is accessible via airboat.
2	5.37	---	13.0	25° 42' 55.9"	80° 35' 05.9"	Point is located in the everglades and is accessible via airboat.
3	6.03	---	10.7	25° 42' 40.4"	80° 35' 22.3"	Point is located in the everglades and is accessible via airboat.

261 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1	3.08	37.1	---	25° 44' 43.0"	80° 34' 38.0"	Point is located in the everglades and is accessible via airboat.
2	4.25	22.8	---	25° 44' 35.6"	80° 35' 18.7"	Point is located in the everglades and is accessible via airboat.
3	5.13	18.0	---	25° 44' 32.3"	80° 35' 50.7"	Point is located in the everglades and is accessible via airboat.

REFERENCE FIELD STRENGTH MEASUREMENTS

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880 kHz - 4 kW-D, 5 kW-N, U, DA-2

JANUARY, 2017

285 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Nighttime Field (mV/m)	Geographic Coordinates (NAD83)		Description
				Latitude	Longitude	
1 ¹	2.58	---	31.9	25° 45' 19.7"	80° 34' 17.9"	Point is located in the everglades and is accessible via airboat.
2 ¹	3.40	---	26.5	25° 45' 25.5"	80° 34' 46.6"	Point is located in the everglades and is accessible via airboat.
3 ²	5.42	---	28	25° 45' 39.6"	80° 35' 57.9"	Point is located on the North shoulder of the Tamiami Trail (US 41), 3.25 miles west of the transmitter site entrance, adjacent to the north side guardrail, opposite east end of guard rail at west edge of pull off on south side of road.

¹ Point relocated as the original point is no longer accessible.

² Point description updated from original.