

FCC FORM 302, SECTION III  
APPLICATION FOR DIRECT MEASUREMENT OF POWER  
RADIO STATION WTIK  
WTIK, INC.

(PARTIAL PROOF OF PERFORMANCE)

690 kHz, 5.0/10.0 kW, DA-2  
NEW ORLEANS, LOUISIANA

AUGUST, 2001

**WILLOUGHBY & VOSS**  
**BROADCAST TECHNICAL CONSULTANTS**

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WTIX, INC.  
WTIX RADIO  
690 kHz, 5.0 kW/10.0 (8.89) kW, DA-2  
NEW ORLEANS, LOUISIANA  
AUGUST, 2001

FCC Form 302, Section III

Technical Statement

Exhibits:

- A Summary & Point Measurement Data
- B DA-DAY and DA-N Common Point Impedance Data
- C Monitor Point Information

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FCC FORM 302-AM, SECTION III





TECHNICAL STATEMENT

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TECHNICAL STATEMENT IN SUPPORT OF  
PARTIAL PROOF OF PERFORMANCE  
WTIX, INC.  
WTIX(AM) RADIO, 690 kHz, DA-2.  
NEW ORLEANS, LOUISIANA  
AUGUST, 2001

### INTRODUCTION

The firm of Willoughby & Voss has been retained to prepare this statement, on behalf of AM broadcast station WTIX, New Orleans, Louisiana. This statement and the attached exhibits, constitute an Antenna Partial Proof of Performance and pertinent R.F. impedance measurements, in accordance with § 73.54 and 73.154 of the FCC Rules for the restoration of direct measurement of power.

WTIX-AM, 690 kHz, New Orleans, Louisiana, is licensed to operate with a nighttime directional power of 5.0 kW and a daytime directional power of 10.0 (8.89) kW with different directional antenna patterns.

### BACKGROUND

WTIX has been operating with parameters at variance for an extended period of time while various system repairs have been performed. During the repair process, WTIX has been operated with a reduced power level (day and night) to maintain monitor point values within their specified limits.

Repairs included the installation of ground straps which had been vandalized at all towers and at eight locations along the cable trays. The Potomac Instruments AM19 antenna monitor was replaced with a Potomac Instruments 1901-4 antenna monitor. The base current meter at Tower 1 which had been destroyed by a bullet has been replaced. The Common Point current meter was replaced.

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The sample line isolation coil at Tower 2 was replaced as was the feed cable that connects the tower mounted sample loop to the isolation coil. The sample loop at Tower 2 was removed and rehabilitated. The capacitor in the output arm of the Tower 3 antenna tuning unit was replaced. The R.F. contactor which changes patterns at the base of Tower 2 was replaced. The DA-Day common point matching network was reconfigured.

### FACILITIES

All information contained in FCC File BZ-901109AA and in the FCC AM Engineering Database, is accurate and valid, except for the antenna operating specifications. The changes in these operating specifications are detailed on FCC Form 302, Section III, page 4, (attached), and are the result of the minor retuning referenced above and the installation of a new antenna monitor. Therefore, it is requested that a new FCC Form 352 (Standard Broadcast Station License) be issued to specify these new operating parameters.

### SAMPLE SYSTEM

The WTIx antenna sampling system consists of; tower mounted, rigid, non-rotatable sample loops. The output of the sample loops is fed through solid outer conductor, phase stabilized coaxial cable, through a isolation coil at the base of the tower directly to the Potomac Instruments 1901-4 antenna monitor. All sample lines are of the same physical and electrical characteristics and are the same length. The sample system complies with the requirements of §73.68.

### FIELD STRENGTH MEASUREMENTS

The WTIx system was operated in each directional mode with the common point current properly maintained at 10.4 amperes Nighttime and 13.3 amperes Daytime.

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Measurements were made along the construction permit radials established by the 1968 (most recent) full proof of performance.

Using topographical maps, a measurement was made as close as possible to the original ground level points along each radial. In some cases, the measurement locations were so contaminated by objects not present in 1968 and 1990, (PCS & TV towers, high tension power lines), that the readings obtained were useless. In these few cases, the readings were not included in the analysis of array performance.

Because of the terrain surrounding the WTIX array, the ability to make ground level measurements as prescribed by §73.154(a) & (b) is impossible for most compass bearings. However, it is believed that study of the attached data, clearly shows that the WTIX directional antennas are operating within the authorized Augmented Standard Patterns.

Analysis of the data was conducted using logarithmic ratios of the current directional readings divided by the 1968 directional reading on a point to point basis, then multiplying the radial antilog of the average ratio by the 1968 directional inverse distance field (IDF) to establish the 2001 directional IDF.

In Exhibit A, a summary page immediately proceeds the individual radial tabulations. This summary page shows the 1968 DA-IDF, the Augmented Standard Pattern Maximum IDF, the 2001 antilog ratio, and the resulting 2001 DA-IDF.

All measurements were made by the undersigned, using FIM-41 field strength meter serial number 463, which was factory calibrated February, 1998.

### MONITOR POINTS

Based on the results of this partial proof, a new limit for each point is requested in Exhibit C, no other change to monitor points is proposed.

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R.F. IMPEDANCE MEASUREMENTS

Exhibit B contains the procedure and equipment, used to obtain the directional common point impedance measurements. A schematic diagram of the phasing system and measurement location is found in Exhibit B.

CERTIFICATION

Lyndon H. Willoughby, the undersigned certifies and attests, under penalty of perjury, that:

1. He has been engaged in broadcast technology since 1964.
2. He has held a valid First Class Radiotelephone Operators License since 1967, and that his presently held document, number P1-8-14307, is valid for life.
3. His credentials are contained in other filings and are a matter of record with the Federal Communications Commission.
4. He is the owner of the firm of Willoughby & Voss, which has offices in San Antonio, Texas.
5. He made the R.F. Impedance and field strength measurements as well as the field strength measurement analysis contained in this document. He is familiar with the proper and normally accepted procedures for making such measurements and analysis.
6. Willoughby & Voss has been retained by WTIX, Inc. to prepare the attached Section III of FCC Form 302 and its exhibits.
7. The above statements and all statements contained in the attached material are true of his own knowledge and belief, and as to such statements made on belief, he believes them to be true.

August 15, 2001

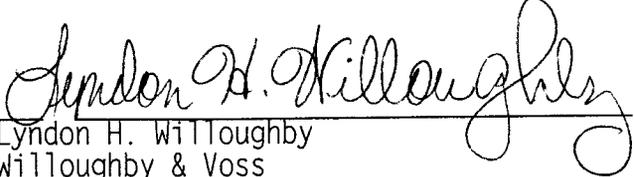
  
Lyndon H. Willoughby  
Willoughby & Voss

EXHIBIT A  
FIELD STRENGTH MEASUREMENTS  
& ANALYSIS

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WTIX, NEW ORLEANS, LOUISIANA  
SUMMARY TABLE OF RADIAL ANALYSIS  
DA-DAY

<u>RADIAL</u> <u>(degree)</u>	<u>FULL PROOF</u> <u>1968 DA-D</u>	<u>2001 DA-D</u> <u>RADIAL RATIO</u>	<u>2001</u> <u>DA-D IDF</u>	<u>AUGMENTED</u> <u>STD. PAT.</u>
176.0 CP	257.0	1.1090	285.0	308.18
196.0 CP	167.0	1.0270	171.0	200.25
217.0 CP	322.0	0.7429	239.0	398.63
259.0 CP	996.0	0.8895	886.0	1094.08
300.0 CP	744.0	1.0470	779.0	871.65
356.0 CP	1527.0	0.7700	1176.0	1566.41

mV/m stated @ 1 KILOMETER

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WTIX DA-DAY MEASUREMENT DATES & TIMES

RADIAL BEARING DEGREES TRUE	DA-DAY TIMES	DA-DAY DATES
176°	1330-1508	6-18-01
196°	1500-1709	6-18-01
217°	1529-1725	6-18-01
259°	0910-1605	6-19-01
300°	1420-1627	6-20-01
356°	1224-1354	6-20-01

WTIX RADIO  
DA-DAY  
MEASUREMENT DATES

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WTIX DA-DAY RADIATION ANALYSIS at 176.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
			1968 (mV/m)	2001 (mV/m)	
MP	9	3.19	88.0	95.0	0.0332
	10	3.59	82.0	88.0	0.0307
	11	3.96	67.5	70.0	0.0158
	12	4.12	69.0	67.0	-0.0128
	13	5.07	53.2	66.0	0.0936
	17	8.21	32.5	38.0	0.0679
	18	8.38	31.6	40.0	0.1024
	19	8.71	30.5	37.0	0.0839
	21	10.11	23.2	25.0	0.0325
	22	10.54	23.8	24.0	0.0036

-----  
Average Log Ratio: 0.0451

Antilog: 1.109

1968 DA-DAY Analyzed Field Strength (mV/m): 257.

2001 DA-DAY Analyzed Field Strength (mV/m): 285.

Augmented Standard Pattern Maximum (mV/m): 308.

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WTIX DA-DAY RADIATION ANALYSIS at 196.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
			1968 (mV/m)	2001 (mV/m)	
MP	11	3.04	53.0	43.0	-0.0908
	12	3.22	51.0	39.0	-0.1165
	13	3.38	40.0	51.0	0.1055
	14	3.54	46.0	48.0	0.0185
	15	5.09	29.0	45.0	0.1908
	16	5.25	27.5	30.0	0.0378
	19	6.47	31.3	28.0	-0.0484
	20	7.05	22.6	29.0	0.1083
	21	7.89	25.3	20.0	-0.1021

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Average Log Ratio: 0.0115

Antilog: 1.027

1968 DA-DAY Analyzed Field Strength (mV/m): 167.

2001 DA-DAY Analyzed Field Strength (mV/m): 171.

Augmented Standard Pattern Maximum (mV/m): 200.

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WTIX DA-DAY RADIATION ANALYSIS at 217.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
		1968 (mV/m)	2001 (mV/m)	
6	2.45	115.	100.	-0.0607
7	2.59	114.	65.0	-0.2440
8	2.74	104.	96.0	-0.0348
MP 9	2.99	92.3	64.0	-0.1590
10	5.02	61.1	58.0	-0.0226
11	5.15	52.9	31.0	-0.2321
12	5.42	50.7	31.0	-0.2136
13	5.54	51.4	45.0	-0.0578
14	5.65	50.0	35.0	-0.1549
15	5.75	51.7	40.0	-0.1114

-----  
Average Log Ratio: -0.1291

Antilog: .7429

1968 DA-DAY Analyzed Field Strength (mV/m): 322.

2001 DA-DAY Analyzed Field Strength (mV/m): 239.

Augmented Standard Pattern Maximum (mV/m): 399.

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WTIX DA-DAY RADIATION ANALYSIS at 259.0 degrees True

MP	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
			1968 (mV/m)	2001 (mV/m)	
	5	3.51	306.	280.	-0.0386
	6	3.62	271.	270.	-0.0016
	7	3.72	262.	270.	0.0131
	8	4.06	223.	250.	0.0496
	10	5.52	252.	180.	-0.1461
	11	5.97	180.	98.0	-0.2640
	12	7.85	167.	145.	-0.0613
	13	8.29	130.	160.	0.0902
	14	8.45	117.	142.	0.0841
	15	9.27	137.	80.0	-0.2336

-----  
Average Log Ratio: -0.0508

Antilog: .8895

1968 DA-DAY Analyzed Field Strength (mV/m): 996.

2001 DA-DAY Analyzed Field Strength (mV/m): 886.

Augmented Standard Pattern Maximum (mV/m): 1094.

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WTIX DA-DAY RADIATION ANALYSIS at 300.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
			1968 (mV/m)	2001 (mV/m)	
MP	19	8.10	90.0	98.0	0.0370
	20	8.88	80.7	90.0	0.0474
	21	9.53	74.5	80.0	0.0309
	22	10.67	64.0	62.0	-0.0138
	23	11.31	61.0	69.0	0.0535
	24	11.88	58.4	62.0	0.0260
	25	12.12	59.9	56.0	-0.0292
	26	12.59	58.0	58.0	0.0000
	27	13.24	56.2	58.0	0.0137
	28	13.68	53.6	58.0	0.0343

-----  
Average Log Ratio: 0.0200

Antilog: 1.047

1968 DA-DAY Analyzed Field Strength (mV/m): 744.

2001 DA-DAY Analyzed Field Strength (mV/m): 779.

Augmented Standard Pattern MAXimum (mV/m): 871.7

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WTIX DA-DAY RADIATION ANALYSIS at 356.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
			1968 (mV/m)	2001 (mV/m)	
	11	5.10	293.	252.	-0.0655
MP	12	5.15	306.	255.	-0.0792
	13	5.68	250.	210.	-0.0757
	14	6.21	269.	200.	-0.1287
	15	6.49	177.	76.0	-0.3672
	16	6.98	207.	235.	0.0551
	18	8.11	221.	162.	-0.1349
	19	8.85	189.	148.	-0.1062
	20	9.69	149.	130.	-0.0592
	21	10.41	161.	108.	-0.1734

Average Log Ratio: -0.1135

Antilog: .7700

1968 DA-DAY Analyzed Field Strength (mV/m): 1527

2001 DA-DAY Analyzed Field Strength (mV/m): 1176

Augmented Standard Pattern Maximum (mV/m): 1566

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WTIX, NEW ORLEANS, LOUISIANA  
SUMMARY TABLE OF RADIAL ANALYSIS  
DA-NIGHT

<u>RADIAL</u> <u>(degree)</u>	<u>FULL PROOF</u> <u>1968 DA-N</u>	<u>2001 DA-N</u> <u>RADIAL RATIO</u>	<u>2001</u> <u>DA-N IDF</u>	<u>AUGMENTED</u> <u>STD. PAT.</u>
22.0 CP	82.5	0.9310	76.8	93.34
37.0 CP	135.0	0.5897	79.6	168.98
176.0 CP	526.0	0.5333	280.0	564.24
217.0 CP	65.3	0.8753	57.2	88.51
300.0 CP	237.0	0.8188	194.0	295.65
356.0 CP	156.0	0.8710	136.0	177.03

mV/m stated @ 1 KILOMETER

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WTIX DA-NIGHT MEASUREMENT DATES & TIMES

RADIAL BEARING DEGREES TRUE	DA-NIGHT TIMES	DA-NIGHT DATES
22°	0900-1208	7-23-01
37°	1241-1535	7-23-01
176°	1310-1425	7-24-01
217°	1455-1805	7-24-01
300°	0916-1207	7-24-01
356°	1600-1754	7-23-01

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WTIX DA-NIGHT RADIATION ANALYSIS at 22.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
	-----	-----	1968 (mV/m)	2001 (mV/m)	-----
	13	5.73	11.2	18.0	0.2061
	14	6.26	13.7	14.0	0.0094
	15	7.89	9.60	12.0	0.0969
MP	16	8.08	10.8	15.0	0.1427
	17	8.47	8.80	10.0	0.0555
	18	8.66	10.0	9.70	-0.0132
	19	8.74	9.50	8.60	-0.0432
	20	8.84	8.40	6.00	-0.1461
	21	9.01	8.60	5.20	-0.2185
	23	9.30	6.20	4.30	-0.1589
	31	18.02	5.05	2.70	-0.2719

-----  
Average Log Ratio: -0.0310

Antilog: .9310

1968 DA-NIGHT Analyzed Field Strength (mV/m): 82.5

2001 DA-NIGHT Analyzed Field Strength (mV/m): 76.8

Augmented Standard Pattern Maximum (mV/m): 93.3

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WTIX DA-NIGHT RADIATION ANALYSIS at 37.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
			1968 (mV/m)	2001 (mV/m)	
MP	6	2.53	60.0	48.0	-0.0969
	7	2.57	58.0	28.0	-0.3163
	18	9.62	12.5	6.00	-0.3188
	20	10.44	8.80	6.80	-0.1120
	21	10.80	9.50	7.90	-0.0801
	22	11.49	10.5	4.80	-0.3399
	23	11.88	10.3	5.10	-0.3053
	25	12.49	12.5	8.50	-0.1675
	26	15.66	8.50	4.00	-0.3274

-----  
Average Log Ratio: -0.2293

Antilog: .5897

1968 DA-NIGHT Analyzed Field Strength (mV/m): 135.

2001 DA-NIGHT Analyzed Field Strength (mV/m): 79.6

Augmented Standard Pattern Maximum (mV/m): 169.

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WTIX DA-NIGHT RADIATION ANALYSIS at 176.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
			1968 (mV/m)	2001 (mV/m)	
MP	9	3.19	177.	95.0	-0.2702
	10	3.59	157.	88.0	-0.2514
	11	3.96	140.	70.0	-0.3010
	12	4.12	140.	67.0	-0.3201
	13	5.07	116.	66.0	-0.2449
	17	8.21	67.0	38.0	-0.2463
	18	8.38	62.0	40.0	-0.1903
	19	8.71	67.5	37.0	-0.2611
	21	10.11	52.5	25.0	-0.3222
	22	10.54	50.5	24.0	-0.3231

-----  
Average Log Ratio: -0.2731

Antilog: .5333

1968 DA-NIGHT Analyzed Field Strength (mV/m): 526.

2001 DA-NIGHT Analyzed Field Strength (mV/m): 280.

Augmented Standard Pattern Maximum (mV/m): 564.

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WTIX DA-NIGHT RADIATION ANALYSIS at 217.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/DA)
		1968 (mV/m)	2001 (mV/m)	
6	2.45	17.0	35.0	0.3136
7	2.59	29.0	26.0	-0.0474
8	2.74	28.5	29.0	0.0076
MP 9	2.99	25.0	20.0	-0.0969
11	5.15	8.90	9.00	0.0049
12	5.42	10.9	6.50	-0.2245
14	5.65	9.50	5.00	-0.2788
15	5.75	5.80	5.00	-0.0645
17	6.21	9.50	9.00	-0.0235
18	6.50	9.70	9.00	-0.0325
19	6.66	9.90	2.00	-0.6946
22	8.56	7.60	8.20	0.0330
23	9.91	9.60	12.0	0.0969
24	10.09	6.60	8.00	0.0835
25	10.96	4.40	5.00	0.0555

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Average Log Ratio: -0.0578

Antilog: .8753

1968 DA-NIGHT Analyzed Field Strength (mV/m): 65.3

2001 DA-NIGHT Analyzed Field Strength (mV/m): 57.2

Augmented Standard Pattern Maximum (mV/m): 88.5

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WTIX DA-NIGHT RADIATION ANALYSIS at 300.0 degrees True

	Point Number	Distance (km)	Measured 1968 (mV/m)	Field 2001 (mV/m)	Log Ratio (DA/DA)
MP	19	8.10	29.2	23.0	-0.1037
	20	8.88	20.8	16.8	-0.0928
	21	9.53	22.3	20.0	-0.0473
	22	10.67	16.8	16.5	-0.0078
	23	11.31	19.2	16.5	-0.0658
	24	11.88	21.7	13.5	-0.2061
	25	12.12	17.0	12.2	-0.1441
	26	12.59	25.2	17.0	-0.1710
	27	13.24	16.2	15.8	-0.0109
	28	13.68	18.8	18.0	-0.0189

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Average Log Ratio: -0.0868

Antilog: .8188

1968 DA-NIGHT Analyzed Field Strength (mV/m): 237.

2001 DA-NIGHT Analyzed Field Strength (mV/m): 194.

Augmented Standard Pattern Maximum (mV/m): 296.

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WTIX DA-NIGHT RADIATION ANALYSIS at 356.0 degrees True

	Point	Distance	Measured Field		Log Ratio
	Number	(km)	1968	2001	(DA/DA)
			(mV/m)	(mV/m)	
	11	5.10	30.5	44.0	0.1592
MP	12	5.15	30.0	40.0	0.1249
	13	5.68	27.2	28.0	0.0126
	14	6.21	28.8	10.0	-0.4594
	15	6.49	19.0	11.2	-0.2295
	16	6.98	21.0	32.0	0.1829
	18	8.11	18.2	18.8	0.0141
	19	8.85	15.7	17.0	0.0345
	20	9.69	18.2	16.0	-0.0560
	21	10.41	14.5	6.00	-0.3832

-----  
Average Log Ratio: -0.0600

Antilog: .8710

1968 DA-NIGHT Analyzed Field Strength (mV/m): 156.

2001 DA-NIGHT Analyzed Field Strength (mV/m): 136.

Augmented Standard Pattern Maximum (mV/m): 177.

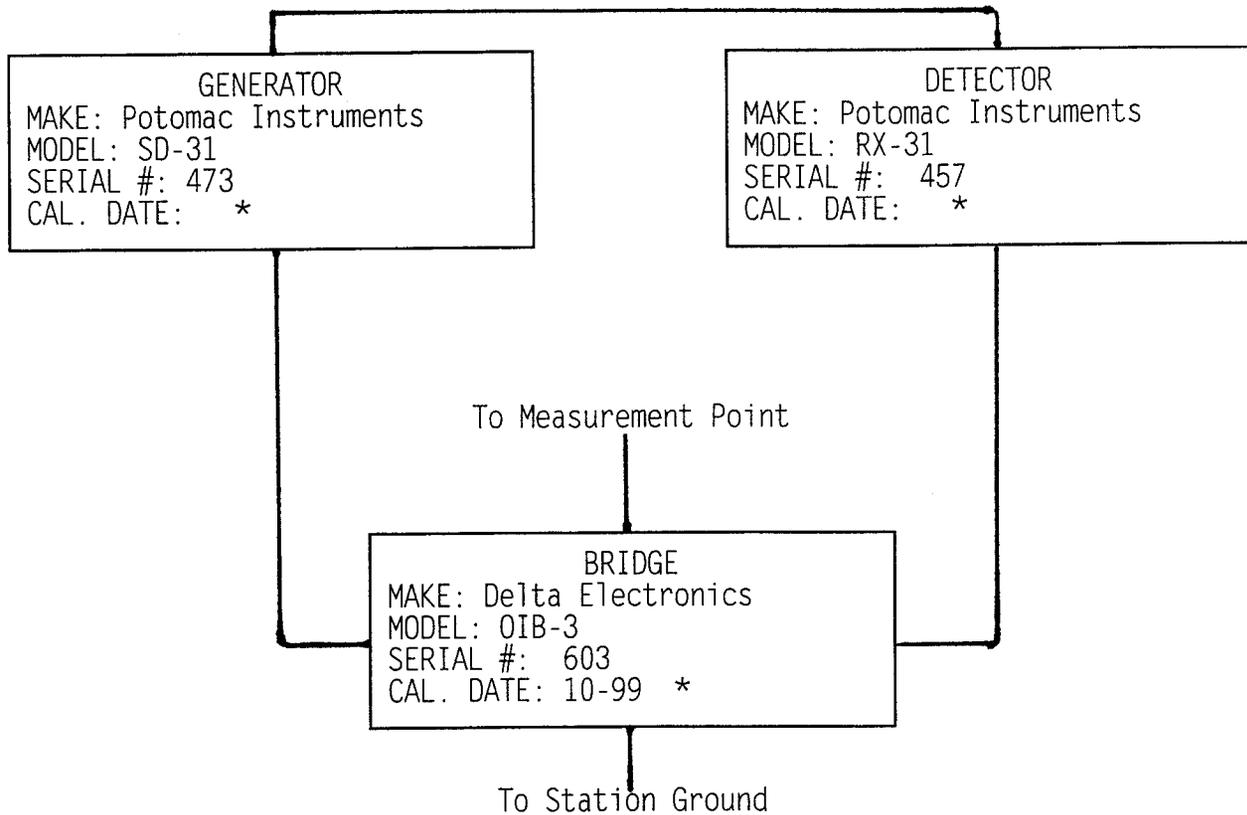
EXHIBIT B  
R.F. COMMON POINT  
IMPEDANCE MEASUREMENTS

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TEST EQUIPMENT SET-UP



IMPEDANCE MEASUREMENT PROCEDURE

\* Prior to measurements, the equipment was connected together in the manner specified by the manufacturer. The bridge calibration was confirmed by measuring precision resistance and reactance standards. The bridge indications were found to be within 1% and 2% for resistance and reactance respectively. The digitally synthesized frequency generator was calibrated to zero beat with known broadcast stations, and is believed to be accurate within  $\pm 20$  Hertz. These calibration procedures were performed on the job site by the individual making the measurements.

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The feed line normally connected to the output terminal of the appropriate r.f. ammeter was connected to the bridge by means of the factory provided lead. The ground lead from the bridge was connected to the station ground. The equipment was operated according to the manufacturers' recommended procedures.

The resistance and reactance values were read from the bridge dials. These readings were corrected for the frequency of measurement in accordance with the manufacturer's specifications.

The corrected measurements are tabulated and graphed and are contained in this report. A diagram showing the point at which these impedance measurements were made is also attached.

Delta Electronics rates the accuracy of the OIB-1 as follows:

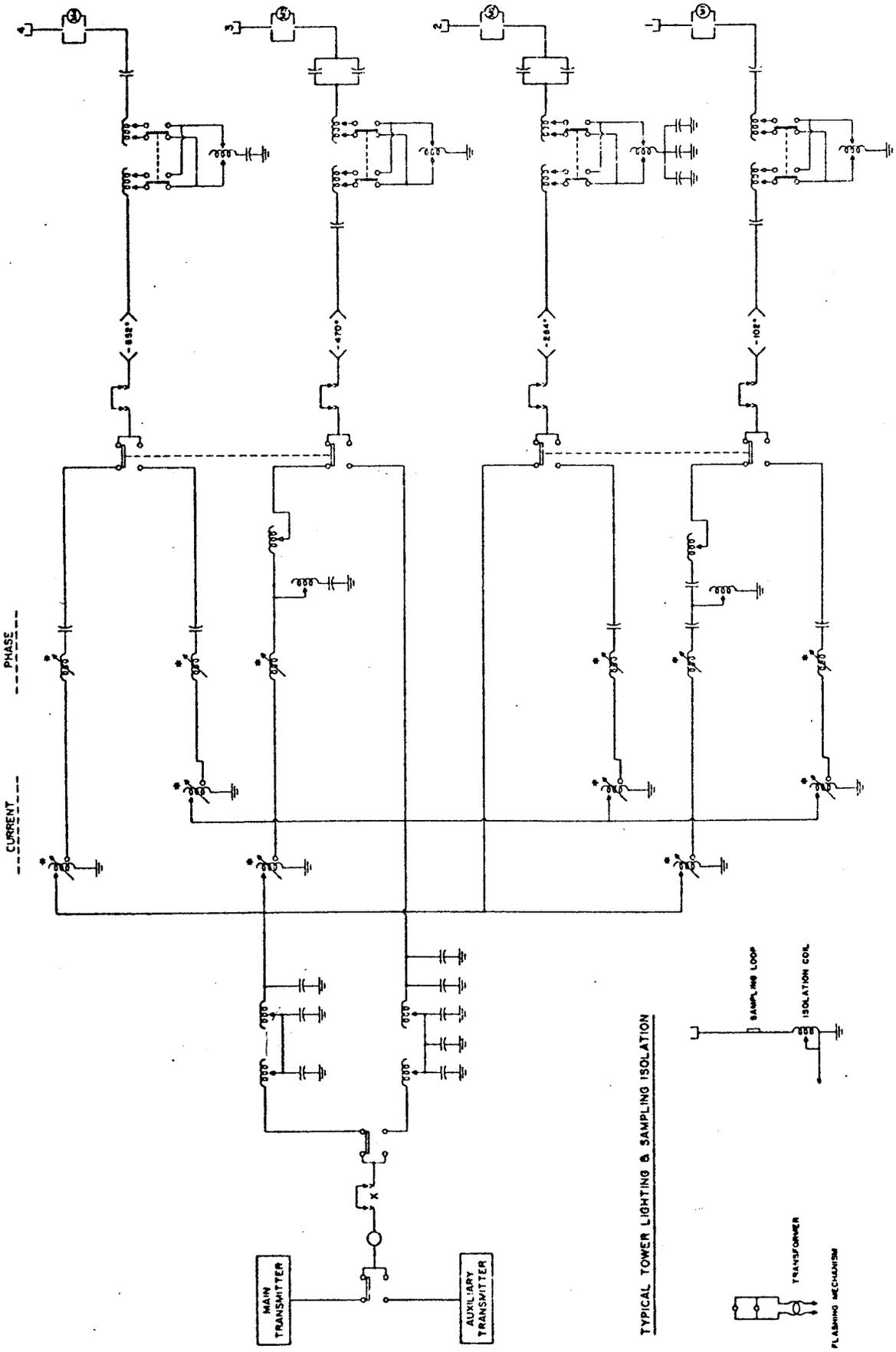
Resistance:  $\pm 2\%$ , 1 $\Omega$

Reactance:  $\pm 2\%$ , 1 $\Omega$

POINT OF MEASUREMENT : The bridge leads were connected to point where the common point current for each pattern is measured.

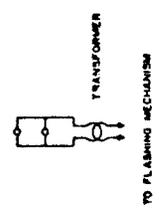
MEASUREMENT RESULTS : The WTIx DA-Night Common Point Impedance was found to be: Resistance = 50.0 ohms Reactance =  $\pm 0.0$  ohms  
CP Current for 5.4 kW input = 10.4 Amperes  
The WTIx DA-Day Common Point Impedance was found to be: Resistance = 50.0 ohms Reactance =  $\pm 0.0$  ohms  
CP Current for 8.89 kW input = 13.3 Amperes

# WTIX ANTENNA COUPLING SYSTEM



RELAYS ARE SHOWN IN DAYTIME POSITION  
 \* DENOTES FRONT PANEL CONTROL  
 X POINT OF CP IMPEDANCE MEASUREMENT

TYPICAL TOWER LIGHTING & SAMPLING ISOLATION



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EXHIBIT C  
MONITOR POINT INFORMATION

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MONITOR POINT INFORMATION

No changes in the monitor point designation are requested. All monitor points and their descriptions remain unchanged. New maximum permissible monitor point values are proposed as follows:

$$\frac{93.34}{76.8} = 1.2154 * 15.0 = 18.23 \text{ mV/m Nighttime}$$

$$\frac{168.98}{79.6} = 2.1229 * 48.0 = 101.89 \text{ mV/m Nighttime}$$

$$\frac{564.24}{280} = 2.0151 * 95.0 = 191.43 \text{ mV/m Nighttime}$$

$$\frac{308.18}{285} = 1.1090 * 95.0 = 102.73 \text{ mV/m Daytime}$$

$$\frac{200.25}{171} = 1.1711 * 43.0 = 50.36 \text{ mV/m Daytime}$$

$$\frac{88.51}{57.2} = 1.5472 * 20.0 = 30.94 \text{ mV/m Nighttime}$$

$$\frac{398.63}{239} = 1.6679 * 64.0 = 106.75 \text{ mV/m Daytime}$$

$$\frac{1094.08}{886} = 0.8895 * 280. = 345.76 \text{ mV/m Daytime}$$

$$\frac{295.65}{194} = 1.5240 * 23.0 = 35.05 \text{ mV/m Nighttime}$$

$$\frac{871.65}{779} = 1.1189 * 98.0 = 109.66 \text{ mV/m Daytime}$$

$$\frac{177.03}{136} = 1.3017 * 40.0 = 52.07 \text{ mV/m Nighttime}$$

$$\frac{1566.41}{1176} = 1.3320 * 255. = 339.65 \text{ mV/m Daytime}$$

