

ENGINEERING REPORT
PARTIAL PROOF OF PERFORMANCE

WEOL(AM) – Elyria, OH

November 2004

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MUNN-REESE, INC.
Broadcast Engineering Consultants
Coldwater, MI 49036

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CERTIFICATION OF ENGINEERS

The firm of Munn-Reese, Inc., Broadcast Engineering Consultants, with offices at 385 Airport Drive, Coldwater, Michigan, has been retained for the purpose of preparing the technical data forming this report.

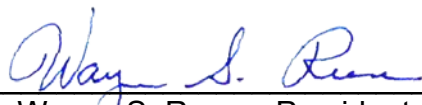
The data utilized in this report is based on field measurements made by the undersigned, or others under the supervision of the undersigned, on the dates and times indicated in the report.


The report has been prepared by properly trained electronics specialists under the direction of the undersigned whose qualifications are a matter of record before the Federal Communications Commission.

I declare under penalty of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

November 1, 2004

MUNN-REESE, INC.

By 
Wayne S. Reese, President

By 
Justin W. Asher, Project Engineer

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DISCUSSION

This firm was retained to prepare a daytime and nighttime Partial Proof-of-Performance and Direct Measurement of Power application for WEOL(AM) – Elyria, OH. WEOL(AM) operates on 930 kHz with 1.0 kW of daytime directional power using four towers and 1.0 kW of nighttime power using the same four daytime towers with separate operating parameters. This partial proof was conducted as a result of a new tower construction on the property grounds. While the tower was detuned, inspection of monitor point readings indicated the daytime and nighttime patterns were outside of acceptable limits. Antenna phase and current ratios were adjusted to bring the monitor points back into compliance, however adjustments beyond 5% in ratio and/or 3° in phase were required. This partial proof of performance is being filed in response to these adjustments. This report has been prepared under the modified AM directional rules, as proposed and adopted by the FCC.

The daytime and nighttime pattern was restored by placing observers equipped with field intensity meters and two-way radios at monitoring point locations. The phasor was then adjusted to bring the field intensity at the monitoring points back within licensed values.

Measurements were taken on the four (4) daytime monitor point radials and three (3) nighttime monitor point radials plus one additional adjacent radial, meeting the requirements of 47 C.F.R. §73.154(a) of the FCC Rules. Field strength measurements were taken on the dates and at the times indicated in the respective Tabulations of Field Strength Measurements, shown as **Figure(s) 2.0** and **2.1** for day and night operation. The tabulation sheets show the distance from the transmitter site to each point in units of kilometers. The locations and point numbers were derived from topographical maps used in a previous proof. At least eight (8) points were taken on each radial. Points were taken from the latest 1981 full proof-of-performance. Distances to point locations are reflective of the original 1981 proof. Measurements were made by Mr. Donald Baad and Mr. Edmund Trombley, engineer(s) for Munn-Reese, Inc. and by Mr. Glen Smith and Gary Kneisley staff engineers for WEOL. Potomac Instruments Field Intensity Meters, Model FIM-41, Serial #1474, calibrated October 7, 2003, Model FIM-41, Serial #1336, calibrated August 24, 2004 were employed for the measurements taken. Potomac Instruments Field Intensity Meters Model FIM-41 Serial #1307 and Model FIM-41 Serial #1149 were also employed. These units were compared to the existing calibrated meters and found to be in good operating condition.

A tabulation of the daytime and nighttime operating specifications, as well as the field strength values measured at each of the monitoring points, is found in **Figure(s) 1.0 to 1.1**. Tabulations of the individual points measured can be found in **Figure(s) 2.0. to 2.1**. Direct and Log ratios have been provided between the present measurements and the corresponding 1981 original Directional Proof-of-Performance values. **Figure(s) 3.0 to 3.1** are tabulations of the measured inverse distance fields in relation to the Augmented Standard Patterns authorized by the FCC for daytime and nighttime operations.

Inspection of the inverse distance fields shows each of the measured radials is well within the Augmented Standard Pattern authorized by the FCC. Inspection of **Figure(s) 1.0 and 1.1** shows the field intensity measured at each of the monitoring point locations is also well within licensed maximum values.

No changes have been made in the existing fences surrounding the base of each tower. The station continues to operate in compliance with the current Commission guidelines for exposure to radiofrequency radiation.

Since the measured monitoring point radials are within authorized limits and the antenna resistance has been measured and recorded, the applicant hereby requests authorization to return to the direct measurement of power. The applicant further requests that a new license be issued authorizing the operating parameters set forth in this application.

FIGURE 1.0

TABULATION OF DAYTIME OPERATING PARAMETERS

Theoretical Daytime Antenna System Parameters (as corrected in Form 301):

TOWER	FIELD	PHASE	SPACING	ORIENTATION
1 (N)	0.500	+110.0°	0.0°	0.0° T.
2 (NC)	0.910	-80.0°	60.0°	145.0° T.
3 (SC)	1.090	+80.0°	180.0°	145.0° T.
4 (S)	0.500	-110.0°	240.0°	145.0° T.
* Referenced to preceding tower.				

Licensed Daytime Antenna System Parameters:

Tower	Antenna Monitor Indication	Field Ratio	Phase	Base Current Ratio
1 (N)	0.916	0.916	-171.0°	N/A
2 (NC)	1.000	1.000	±0.0°	N/A
3 (SC)	0.957	0.957	+158.1°	N/A
4 (S)	0.529	0.529	-31.1°	N/A

Daytime Antenna System Operating Parameters:

Tower	Antenna Monitor Indication	Field Ratio	Phase	Base Current (Amperes)	Base Current Ratio
1 (N)	0.837	0.837	-171.1°	N/A	N/A
2 (NC)	1.000	1.000	±0.0°	N/A	N/A
3 (SC)	0.959	0.959	+158.1°	N/A	N/A
4 (S)	0.594	0.594	-30.0°	N/A	N/A

Day Monitoring Point Field Strengths:

Azimuth (° True)	Measured (mV/m)	Licensed Limit (mV/m)
45.0°	7.8	20.0
85.0°	11.0	18.0
145.0°	39.0	46.5
225.0°	16.5	21.3

Day Common Point Resistance: 50. Ohms
 Day Common Point Current: 4.65 Amperes
 Allowable Day Input Power: 1,080 Watts
 Nominal Day Power: 1,000 Watts

FIGURE 1.1

TABULATION OF NIGHTTIME OPERATING PARAMETERS

Theoretical Nighttime Antenna System Parameters:

TOWER	FIELD	PHASE	SPACING	ORIENTATION
1 (N)	0.500	+110.0°	0.0°	0.0° T.
2 (NC)	1.000	-80.0°	60.0°	145.0° T.
3 (SC)	1.000	+80.0°	180.0°	145.0° T.
4 (S)	0.500	-110.0°	240.0°	145.0° T.
* Referenced to preceding tower.				

Licensed Nighttime Antenna System Parameters:

Tower	Antenna Monitor Indication	Field Ratio	Phase	Base Current Ratio
1 (N)	0.903	0.903	-175.3°	N/A
2 (NC)	1.000	1.000	±0.0°	N/A
3 (SC)	0.831	0.831	+153.5°	N/A
4 (S)	0.647	0.647	-39.2°	N/A

Nighttime Antenna System Operating Parameters:

Tower	Antenna Monitor Indication	Field Ratio	Phase	Base Current (Amperes)	Base Current Ratio
1 (N)	0.815	0.815	-177.6°	N/A	N/A
2 (NC)	1.000	1.000	±0.0°	N/A	N/A
3 (SC)	0.830	0.830	153.0°	N/A	N/A
4 (S)	0.653	0.653	-38.3°	N/A	N/A

Night Monitoring Point Field Strengths:

Azimuth (° True)	Measured (mV/m)	Licensed Limit (mV/m)
65.0°	1.28	3.9
145.0°	31.00	48.8
225.0°	3.95	6.9

Night Common Point Resistance: 50.0 Ohms
 Night Common Point Current: 4.65 Amperes
 Allowable Night Input Power: 1,080 Watts
 Nominal Night Power: 1,000 Watts

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Figure 2.0 – Radials 145.0° & 225.0° Day Tabulation of Field Strength Measurements

Call:	WEOL			Frequency (kHz):		930		Power (kW):		1.0	
				Bearing (°T):		145.0					
Point	1981 Proof			2004 Measurements			Distance	Distance	Direct		Log
#	mV/m	Time	Date	mV/m	Time	Date	km	mi	Ratio	Remarks	Ratio
18	37.00	1634	1981	37.50	0852	10-21-04	5.99	3.72	1.0135		0.0134
19	37.50	1631	1981	39.00	0857	10-21-04	6.28	3.90	1.0400	MP	0.0392
20	26.50	1628	1981	34.00	0903	10-21-04	7.27	4.52	1.2830		0.2492
21	26.00	1624	1981	27.00	0911	10-21-04	8.35	5.19	1.0385		0.0377
22	23.00	1619	1981	23.50	0918	10-21-04	9.58	5.95	1.0217		0.0215
23	20.80	1616	1981	18.20	0925	10-21-04	10.23	6.36	0.8750		-0.1335
24	19.50	1611	1981	19.00	0930	10-21-04	11.57	7.19	0.9744		-0.0260
25	13.50	1602	1981	18.50	0940	10-21-04	13.84	8.60	1.3704		0.3151
26	10.00	1555	1981	13.80	0949	10-21-04	16.43	10.21	1.3800		0.3221
27	10.00	1549	1981	10.30	0958	10-21-04	17.41	10.82	1.0300		0.0296
								Arithmetic Ratio:	1.1026		
								Log Ratio:	1.0907		

Call:	WEOL			Frequency (kHz):		930		Power (kW):		1.0	
				Bearing (°T):		225.0					
Point	1981 Proof			2004 Measurements			Distance	Distance	Direct		Log
#	mV/m	Time	Date	mV/m	Time	Date	km	mi	Ratio	Remarks	Ratio
19	16.00	0836	1981	16.50	0828	10-21-04	4.51	2.80	1.0313	MP	0.0308
20	12.00	0840	1981	16.70	0833	10-21-04	4.92	3.06	1.3917		0.3305
21	10.20	0846	1981	9.60	0840	10-21-04	6.87	4.27	0.9412		-0.0606
22	10.00	0851	1981	10.00	0844	10-21-04	7.26	4.51	1.0000		0.0000
23	7.40	0857	1981	6.50	0853	10-21-04	8.61	5.35	0.8784		-0.1297
24	3.95	0910	1981	4.10	0903	10-21-04	11.14	6.92	1.0380		0.0373
25	3.90	0917	1981	3.25	0913	10-21-04	13.76	8.55	0.8333		-0.1823
26	2.55	0924	1981	2.62	0919	10-21-04	15.75	9.79	1.0275		0.0271
27	1.60	0932	1981	1.59	0927	10-21-04	18.02	11.20	0.9938		-0.0063
28	2.10	0939	1981	1.54	0933	10-21-04	19.55	12.15	0.7333		-0.3102
							Arithmetic Ratio:		0.9868		
							Log Ratio:		0.9740		

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Figure 3.0
Tabulation of Daytime Ratios

WEOL Daytime Operation (based on 1981 Proof using mV/m at 1 km)						
Azimuth	1981 NDA	1981 DA	2004/1981	2004 DA	AUG PTN	Max Allowable
(° True)	(mV/m/km)	(mV/m/km)	Log Ratio	(mV/m/km)	(mV/m/km)	Log Ratio
45.0°	225.3	46.17	0.6467	29.85	101.84	2.2060
85.0°	206.0	76.67	0.9536	73.11	104.45	1.3623
145.0°	225.3	261.87	1.0907	285.63	314.65	1.2015
225.0°	206.0	71.60	0.9740	69.74	103.42	1.4444

Figure 3.1
Tabulation of Nighttime Ratios

WEOL Nighttime Operation (Based on mV/m at 1 km)						
Azimuth	1981 NDA	1981 DA	2004/1981	2004 DA	AUG PTN	Max Allowable
(° True)	(mV/m/km)	(mV/m/km)	Log Ratio	(mV/m/km)	(mV/m/km)	Log Ratio
65.0°	193.1	7.89	0.9630	7.59	24.14	3.0612
85.0°	206.0	23.26	0.4120	9.58	40.23	1.7299
145.0°	225.3	242.56	0.9650	234.07	324.47	1.3377
225.0°	206.0	13.94	1.2557	17.50	24.14	1.7321