

ENGINEERING REPORT
PARTIAL PROOF OF PERFORMANCE

on

WTCA(AM) – Plymouth, IN

In Response to Recent Construction and
Antenna Installation of LPFM Station

WJUK-LP – CH289LP – 105.7 MHz

Menominee Radio Corporation

June, 2008

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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.

June 12, 2008

MUNN-REESE, INC.

By Wayne S. Reese
Wayne S. Reese, President

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DISCUSSION

The firm of Munn-Reese, Inc., was retained to prepare this report detailing a Daytime/Nighttime Partial Proof of Performance on AM Radio Station WTCA(AM), Plymouth, IN for Menominee Radio Corporation. WTCA(AM) operates with 0.250 kW daytime and 0.250 kW nighttime utilizing the same two tower directional antenna array. This partial proof was conducted before and after the construction of a new tower and installation of the WJUK-LP (Low Power FM) single bay antenna on that tower. Measurements have been made and detuning of the tower and associated LPFM hardware is not believed necessary. The results show the WTCA(AM) directional operation to remain essentially unchanged before and after the nearby tower construction and installation of the WJUK-LP broadcasting antenna.

Field strength measurements on the day/night pattern were conducted by Mr. Ed Trombley, an engineer in the employ of Munn-Reese, Inc. Mr. Trombley made his measurements using a Potomac Instruments Field Intensity Meter, Model #FIM-41, S/N 1263. The meter was last calibrated Sept. 16, 2007.

Measurements were taken on the three (3) daytime/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 **Exhibits(s) 1.1** and **1.2** for day/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 with the aided use of GPS mapping software. Before and after measurements were taken less than two weeks apart, therefore climatic variances are not believed to be an issue.

Exhibit 2.1 provides a summary of the field intensity measurements made on the common directional array. As seen in the exhibit, all ratios indicate nominal changes before to after with all radials showing a relationship of well less than the required 10%, with the worst case variance being no more than $\pm 2.43\%$ (arithmetic ratio). Again as seen in this exhibit as well as the actual measurements in **Exhibit(s) 1.1** to **1.2**, all ratios are well within the allowable 10% for each individual radial as well as the average of all radials combined. In addition, all Monitor Points were noted to be well within allowable values, both for the before and after measurement programs.

In light of the measurements taken and uniform results obtained, the recent LPFM installation and tower construction for WJUK-LP is believed to have had a negligible effect on the WTCA(AM) daytime and nighttime operations.

Exhibit 1.1

Tabulation of WTCA(AM) Radial(s) 80.0°T & 185.0°T

Call:	WTCA		Frequency (kHz): 1050				Power (kW): 0.250			
			Bearing (°T): 80.0							
Point	2008 Day	Directional Before	2008 Day Directional After				Distance	Direct		Log
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio
1	7.00	0901	06/05/08	7.00	1510	06/11/08	4.14	1.0000	MP	0.0000
2	5.50	1030	06/05/08	5.50	1515	06/11/08	5.39	1.0000		0.0000
3	3.80	1035	06/05/08	3.80	1526	06/11/08	7.64	1.0000		0.0000
4	3.10	1039	06/05/08	3.30	1531	06/11/08	9.24	1.0645		0.0625
5	2.30	1043	06/05/08	2.20	1535	06/11/08	11.68	0.9565		-0.0445
6	2.00	1047	06/05/08	2.00	1541	06/11/08	13.08	1.0000		0.0000
7	1.80	1051	06/05/08	1.90	1546	06/11/08	13.28	1.0556		0.0541
8	1.30	1055	06/05/08	1.20	1549	06/11/08	14.93	0.9231		-0.0800
9	1.10	1059	06/05/08	1.00	1555	06/11/08	16.58	0.9091		-0.0953
10	0.95	1102	06/05/08	0.92	1610	06/11/08	17.38	0.9684		-0.0321
							Arithmetic Ratio: 0.9877			
							Log Ratio: 0.9866			

Call:	WTCA		Frequency (kHz): 1050				Power (kW): 0.250			
			Bearing (°T): 185.0							
Point	2008 Day	Directional Before	2008 Day Directional After				Distance	Direct		Log
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio
1	13.00	1510	06/05/08	14.00	1308	06/11/08	3.36	1.0769		0.0741
2	7.50	1515	06/05/08	7.40	1310	06/11/08	5.18	0.9867		-0.0134
3	4.10	1521	06/05/08	4.40	1315	06/11/08	7.42	1.0732		0.0706
4	3.50	1526	06/05/08	3.50	1326	06/11/08	9.03	1.0000		0.0000
5	2.60	1538	06/05/08	2.70	1335	06/11/08	11.51	1.0385		0.0377
6	2.30	1544	06/05/08	2.40	1340	06/11/08	12.34	1.0435		0.0426
7	2.10	1549	06/05/08	2.10	1347	06/11/08	13.13	1.0000		0.0000
8	1.50	1550	06/05/08	1.50	1349	06/11/08	13.94	1.0000		0.0000
9	1.30	1614	06/05/08	1.30	1401	06/11/08	15.18	1.0000		0.0000
							Arithmetic Ratio: 1.0243			
							Log Ratio: 1.0238			

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Exhibit 1.2

Tabulation of WTCA(AM) Radial(s) 215.0°T & 260.0°T

Call:	WTCA		Frequency (kHz): 1050				Power (kW): 0.250			
			Bearing (°T): 215.0							
Point	2008 Day Directional Before			2008 Day Directional After			Distance	Direct		Log
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio
1	5.00	0924	06/05/08	5.00	1048	06/11/08	2.77	1.0000	MP	0.0000
2	4.20	1335	06/05/08	4.00	1057	06/11/08	4.14	0.9524		-0.0488
3	3.40	1340	06/05/08	3.50	1104	06/11/08	5.92	1.0294		0.0290
4	2.70	1346	06/05/08	2.80	1107	06/11/08	7.05	1.0370		0.0364
5	1.00	1354	06/05/08	1.00	1110	06/11/08	7.45	1.0000		0.0000
6	0.95	1358	06/05/08	0.95	1115	06/11/08	8.58	1.0000		0.0000
7	0.85	1410	06/05/08	0.84	1119	06/11/08	11.07	0.9882		-0.0118
8	0.45	1415	06/05/08	0.45	1124	06/11/08	11.67	1.0000		0.0000
9	0.32	1419	06/05/08	0.33	1129	06/11/08	12.58	1.0313		0.0308
10	0.24	1434	06/05/08	0.25	1134	06/11/08	17.86	1.0417		0.0408
							Arithmetic Ratio		1.0080	
							Log Ratio:		1.0077	

Call:	WTCA		Frequency (kHz): 1050				Power (kW): 0.250			
			Bearing (°T): 260.0							
Point	2008 Day Directional Before			2008 Day Directional After			Distance	Direct		Log
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio
1	17.50	0958	06/05/08	18.00	0901	06/11/08	3.93	1.0286	MP	0.0282
2	16.40	1145	06/05/08	16.20	0904	06/11/08	5.54	0.9878		-0.0123
3	12.10	1156	06/05/08	11.50	0908	06/11/08	6.36	0.9504		-0.0509
4	4.20	1159	06/05/08	4.20	0915	06/11/08	8.00	1.0000		0.0000
5	4.00	1204	06/05/08	4.00	0937	06/11/08	8.80	1.0000		0.0000
6	1.75	1210	06/05/08	1.80	0942	06/11/08	10.36	1.0286		0.0282
7	1.60	1215	06/05/08	1.60	0945	06/11/08	11.26	1.0000		0.0000
8	1.49	1222	06/05/08	1.50	0951	06/11/08	12.09	1.0067		0.0067
9	1.30	1230	06/05/08	1.30	1009	06/11/08	13.18	1.0000		0.0000
10	1.10	1239	06/05/08	1.10	1020	06/11/08	14.84	1.0000		0.0000
							Arithmetic Ratio		1.0002	
							Log Ratio:		1.0000	

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Exhibit 2.1

Tabulation of Ratios

Daytime/Nighttime Operation:

Radial	Arithmetic Ratio	Log Ratio
080.0°T	0.9877	0.9866
185.0°T	1.0243	1.0238
215.0°T	1.0080	1.0070
260.0°T	1.0002	1.0000
Average:	1.0051	1.0044

Daytime/Nighttime Monitor Point Values:

Radial	2008 Before Value (mV/m)	2008 After Value (mV/m)	Maximum Allowable Value (mV/m)
080.0°T	7.00	7.00	11.55
185.0°T	non mp	non mp	non mp
215.0°T	5.00	5.00	19.50
260.0°T	17.50	18.00	25.70