ORIGINAL

SOUTHMAYD & MILLER

4 Ocean Ridge Boulevard South
Palm Coast, Florida 32137
(386) 445-9156
(888) 557-3686 Telecopier

Writer E-Mail:
jdsouthmayd@msn.com

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW,
Washington, DC 20554

Re: WDLM(AM) EAST MOLINE, IL
FACILITY ID #66055

Dear Ms. Dortch;

Transmitted herewith, in triplicate, on behalf of The Moody Bible Institute of Chicago, the licensee of noncommercial, educational AM station WDLM(AM), East Moline, Illinois, is an FCC Form 302-AM application to cover changes made in the technical facility of the station. WDLM has been operating pursuant to an STA granted on May 7, 2013 (attached) and it filing this application in connection with the station's return to full operation.

Please contact the undersigned should you have any questions on this matter.

Very truly yours,

The Moody Bible Institute of Chicago

By:_____
Jeffrey D. Southmayd

Its Attorney

Attachments

FEDERAL COMMUNICATIONS COMMISSION
445 TWELFTH STREET SW
WASHINGTON DC 20554

MEDIA BUREAU
AUDIO DIVISION
APPLICATION STATUS: (202) 418-2730
HOME PAGE: www.fcc.gov/mb/audio/

ENGINEER: Joseph Szczesny
TELEPHONE: (202) 418-2700
FACSIMILE: (202) 418-1410
E-MAIL: Joseph.Szczesny@fcc.gov

May 7, 2013

Jeffrey D. Southmayd, Esq.
Southmayd & Miller
4 Ocean Ridge Blvd. South
Palm Coast Florida 32137

Re: The Moody Bible Institute of Chicago (MBI)
WDLM (AM), East Moline, Illinois
Facility Identification Number: 66005
Special Temporary Authority (STA)
BESTA- 20130415ABD

Dear Mr. Southmayd:

This is in reference to the request filed on April 15, 2013. MBI requests extension of the STA originally granted on October 31, 2012, to operate Station WDLM with temporary facilities.[1] In support of the request, MBI reiterated that a new phasor and tuning units are still being installed.

Requests for extension of STA will be granted only where the licensee can show that one or more of the following criteria have been met:

- Restoration of licensed facilities is complete and testing is underway;

- Substantial progress has been made during the most recent STA period toward restoration of licensed operation; or

- No progress has been made during the most recent STA period for reasons clearly beyond the licensee's control, and the licensee has taken all possible steps to expeditiously resolve the problem.

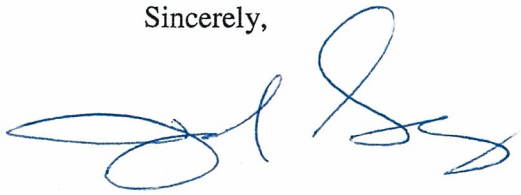
Accordingly, the request for STA IS HEREBY GRANTED, and station WDLM may operate with parameters at variance and/or reduced power while maintaining monitor points within licensed limits. Operation with a temporary non-directional antenna and reduced power **not to exceed 0.25 kilowatt daytime and 0.025 kilowatt nighttime** also is authorized, only as necessary to facilitate the planned repair work. It will be necessary to further reduce power or

[1] WDLM is licensed for operation on 960 kHz with 1 kilowatt daytime and 0.102 kilowatt nighttime, employing different directional antenna patterns.

cease operation if complaints of interference are received. MBI must notify the Commission when licensed operation is restored.[2] MBI must use whatever means are necessary to protect workers and the public from exposure to radio frequency radiation in excess of the Commission's exposure guidelines. *See* 47 CFR § 1.1310.

This authority expires on **November 7, 2013**.

Sincerely,



Joseph Szczesny, Engineer
Audio Division
Media Bureau

cc: Elizabeth A.S. Brown, VP & GC, MBI

[2] *See* 47 CFR §§ 73.45(c), 73.51, 73.61(b).

SoN

Federal Communications Commission
Washington, D. C. 20554

Approved by OMB
3060-0627
Expires 01/31/98

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.)

SVC 7/10/1

FOR COMMISSION USE ONLY
FILE NO. BMML-20130702ACO

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)
THE MOODY BIBLE INSTITUTE OF CHICAGO

MAILING ADDRESS (Line 1) (Maximum 35 characters)
820 NORTH LASALLE

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
CHICAGO	ILLINOIS	60610

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
3123294438	WDLM	66005

2. A. Is a fee submitted with this application? ☐ Yes ☐ No

B. If No, indicate reason for fee exemption (see 47 C.F.R. Section

☐ Governmental Entity ☑ Noncommercial educational licensee ☐ Other (Please explain):

C. If Yes, provide the following information: 0006791354

Enter in Column (A) the correct Fee Type Code for the service you are applying for. Fee Type Codes may be found in the "Mass Media Services Fee Filing Guide." Column (B) lists the Fee Multiple applicable for this application. Enter fee amount due in Column (C).

(A) FEE TYPE CODE	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
	0001	$	

To be used only when you are requesting concurrent actions which result in a requirement to list more than one Fee Type Code.

(A)	(B)	(C)	FOR FCC USE ONLY
	0001	$	

	TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
ADD ALL AMOUNTS SHOWN IN COLUMN C, AND ENTER THE TOTAL HERE. THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED REMITTANCE.	$	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT THE MOODY BIBLE INSTITUTE OF CHICAGO		
MAILING ADDRESS 820 NORTH LASALLE		
CITY CHICAGO	STATE ILLINOIS	ZIP CODE 60610

2. This application is for:

☐ Commercial ☐ Noncommercial

☑ AM Directional ☐ AM Non-Directional

Call letters	Community of License	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
WDLM	EAST MOLINE			

3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620?

☑ Yes ☐ No

If No, explain in an Exhibit.

Exhibit No.

4. Have all the terms, conditions, and obligations set forth in the above described construction permit been fully met?

☑ Yes ☐ No

If No, state exceptions in an Exhibit.

Exhibit No.

5. Apart from the changes already reported, has any cause or circumstance arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect?

☐ Yes ☑ No

If Yes, explain in an Exhibit.

Exhibit No.

6. Has the permittee filed its Ownership Report (FCC Form 323) or ownership certification in accordance with 47 C.F.R. Section 73.3615(b)?

☐ Yes ☐ No

☑ Does not apply

If No, explain in an Exhibit.

Exhibit No.

7. Has an adverse finding been made or an adverse final action been taken by any court or administrative body with respect to the applicant or parties to the application in a civil or criminal proceeding, brought under the provisions of any law relating to the following: any felony; mass media related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination?

☐ Yes ☑ No

If the answer is Yes, attach as an Exhibit a full disclosure of the persons and matters involved, including an identification of the court or administrative body and the proceeding (by dates and file numbers), and the disposition of the litigation. Where the requisite information has been earlier disclosed in connection with another application or as required by 47 U.S.C. Section 1.65(c), the applicant need only provide: (i) an identification of that previous submission by reference to the file number in the case of an application, the call letters of the station regarding which the application or Section 1.65 information was filed, and the date of filing; and (ii) the disposition of the previously reported matter.

Exhibit No.

8. Does the applicant, or any party to the application, have a petition on file to migrate to the expanded band (1605-1705 kHz) or a permit or license either in the existing band or expanded band that is held in combination (pursuant to the 5 year holding period allowed) with the AM facility proposed to be modified herein?

☐ Yes ☑ No

If Yes, provide particulars as an Exhibit.

Exhibit No.

The APPLICANT hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because use of the same, whether by license or otherwise, and requests and authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended).

The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

CERTIFICATION

1. By checking Yes, the applicant certifies, that, in the case of an individual applicant, he or she is not subject to a denial of federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, or, in the case of a non-individual applicant (e.g., corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits that includes FCC benefits pursuant to that section. For the definition of a "party" for these purposes, see 47 C.F.R. Section 1.2002(b).

☑ Yes ☐ No

2. I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Name	Signature	
ELIZABETH A.S. BROWN	ELIZABETH A.S. BROWN	
Title	Date	Telephone Number
VICE PRESIDENT & GENERAL COUNSEL	6/29/2013	3123294438

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION

FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT AND THE PAPERWORK REDUCTION ACT

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The Commission will use the information provided in this form to determine whether grant of the application is in the public interest. In reaching that determination, or for law enforcement purposes, it may become necessary to refer personal information contained in this form to another government agency. In addition, all information provided in this form will be available for public inspection. If information requested on the form is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Your response is required to obtain the requested authorization.

Public reporting burden for this collection of information is estimated to average 639 hours and 53 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, can be sent to the Federal Communications Commission, Records Management Branch, Paperwork Reduction Project (3060-0627), Washington, D. C. 20554. Do NOT send completed forms to this address.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
The Moody Bible Institute of Chicago

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☑ Station License ☐ Direct Measurement of Power **Moment Method Proof**

1. Facilities authorized in construction permit

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
				Night	Day
WDLM		960 kHz	Unlimited	0.102 kW	1.0 kW

2. Station location

State	City or Town
Illinois	East Moline

3. Transmitter location

State	County	City or Town	Street address (or other identification)
Illinois	Henry	Coal Valley	18239 East 200 Street

4. Main studio location

State	County	City or Town	Street address (or other identification)
Illinois	Henry	Coal Valley	18239 East 200 Street

5. Remote control point location (specify only if authorized directional antenna)

State	County	City or Town	Street address (or other identification)

6. Has type-approved stereo generating equipment been installed? ☐ Yes ☑ No

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68? ☑ Yes ☐ No ☐ Not Applicable

Attach as an Exhibit a detailed description of the sampling system as installed. Exhibit No. See Report

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for Night System	RF common point or antenna current (in amperes) without modulation for day system
1.48 amperes	4.65 amperes
Measured antenna or common point resistance (in ohms) at operating frequency	**Measured antenna or common point reactance (in ohms) at operating frequency**
Night: 50 ohms Day: 50 ohms	Night: +j 0 ohms Day: +j 0 ohms

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
T1 (W)	0.0°	0.0°	1.000	1.000	N/A	N/A
T2 (E)	20.6°	20.6°	1.232	1.232	N/A	N/A

Manufacturer and type of antenna monitor: Potomac Instruments AM-19D (204)

SECTION III - Page 2

9. Description of antenna system (if directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.)

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
Guyed, uniform cross-section steel towers mounted on concrete base piers and insulators	T1 = 78.0 m T2 = 78.0 m	T1 = 78.6 m T2 = 78.6 m	T1 = 79.5 m T2 = 79.5 m	Exhibit No.

Excitation ☑ Series ☐ Shunt

ASR T1(W) = 1009732
ASR T2(E) = 1009731

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude	West Longitude
41 ° 24 ' 57 "	90 ° 23 ' 54 "

If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits. Exhibit No. See Report

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system. Exhibit No.

10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit?

11. Give reasons for the change in antenna or common point resistance.

See Report. There is no change in common point resistance. The instant application is being filed to relicense WDLM under the Moment Method proof rules and procedures.

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Name (Please Print or Type)	Signature (check appropriate box below)
Donald J. Baad	Donald J Baad
Address (include ZIP Code) P.O. Box 220 385 Airport Drive Coldwater, MI 49036	Date June 25, 2013 Telephone No. (Include Area Code) (517) 278-7339

☐ Technical Director ☐ Registered Professional Engineer

☐ Chief Operator ☑ Technical Consultant

☐ Other (specify)

MOMENT METHOD ANTENNA PROOF OF PERFORMANCE

WDLM – East Moline, IL

Facility ID # 66005

June 2013

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

Table of Contents

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.

Some of the data utilized in this report was taken from the FCC Secondary Database and data on file. While this information is believed accurate, errors or omissions in the database and file data are possible. This firm may not be held liable for damages as a result of such data errors or omissions. Other data utilized in this report is based on field measurements and/or observations made by the undersigned, or others under the supervision of the undersigned.

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 the laws of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

June 25, 2013

MUNN-REESE, INC.
385 Airport Drive, PO Box 220
Coldwater, Michigan 49036
Telephone: 517-278-7339

By _____
Wayne S. Reese, President

By _____
Donald J. Baad, Staff Engineer

By _____
Richard Grzebik, Staff Engineer

Discussion of Report

The firm of Munn-Reese, Inc. was retained to prepare an Antenna Proof of Performance under the Moment Method rules found in §73.151(c). This report supplies technical support for an application to relicense the existing WDLM, East Moline, IL (Facility ID # 66005) daytime directional array under the new Moment Method rules. The existing phasing and coupling equipment has been replaced but no changes are requested in either the theoretical pattern or the theoretical parameters. The array will continue to operate during daytime hours with a power of 1.0 kW. In addition, WDLM has an unprotected, nighttime authorization of 0.102 kW using the daytime array.

Self-impedance measurements were made at each tower with the other tower "floating" in an open circuit configuration as set forth in §73.151(c)(1). Measurements were made using an HP 8753C Network Analyzer with the Tunwall Radio Directional Couplers designed for AM measurements. The measurements were made at the output of each ATU. This output point was opened to "float" the unused towers. The results of these measurements are shown in ***Exhibit 1.10***, along with the dimensions of the individual towers.

A capacitance of approximately 50 pf was used to represent the base insulator and any stray capacitance near each tower base. The WDLM array does employ an isocoupler across the base insulator of the east tower (Tower 2) for an aural STL. An additional shunt capacitance of 75 pf was assumed for the isocoupler on the east tower. At 960 kHz, this can be modeled by a shunt reactance of –j 3316 ohms for the west tower (Tower 1) and –j 1326 ohms for the east tower.

Individual printouts from Mininec Broadcast Professional, Version 14.5, are shown for the modeling of each tower in ***Exhibits 1.11 - 1.12***. The base impedance predicted by the Mininec software was adjusted by first combining the predicted base impedance with the assumed parallel shunt reactance and then adding the assumed series reactance to represent the series path between the base of the tower and the ATU output. The results of these calculations are shown in the "Adjusted Model" columns of ***Exhibit 1.10***. The circuit diagram and formulas used to calculate these adjusted values are shown at the end of the exhibit.

The predicted self impedance values were calibrated by altering the tower dimensions of the model within the limitations described in §73.151(c)(1)(i)-(ix). The "Model Check" portion of ***Exhibit 1.10*** confirms that each adjusted model is within the dimensional limitations. These cells are conditionally formatted to show green when the dimensions are within the limits and red when the limits are exceeded. The model for each tower was adjusted until the base resistance and reactance predicted by the moment method software adjusted for the assumed shunt and series reactance matched the measured data within the ±2 ohms and ±4 percent specified in §73.151(c)(2)(ii). The resulting values are shown in the "Adjusted Model" columns of ***Exhibit 1.10***. These cells have also been conditionally formatted to indicate the acceptability of the predicted values.

Discussion of Report

The modeled tower parameters were used, along with the theoretical field parameters, to generate predicted drive points and base parameters using the moment method software as specified in §73.151(c)(2)(i). The computed data for the existing pattern is shown in ***Exhibit 1.20***. The predicted base current and phases were adjusted to reflect the presence of the assumed shunt reactance at each tower. These adjusted values are shown in the "ATU Output" column of ***Exhibit 1.20***. The "ATU Output" magnitudes and phases were normalized to produce the "Mininec Model" "Ratio" and "Phase" parameters shown in the upper middle portion of the exhibit. These are the operating parameters used on Form 302-AM. A supporting exhibit of the array synthesis is shown in ***Exhibit 1.21***. An array summary has also been included in ***Exhibit 1.22***.

Since this Moment Method proof is being filed to relicense an existing array, and no changes are requested in the theoretical pattern, WDLM qualifies for the exemption from a post construction survey as clarified in Public Notice DA 09-2340 (released October 29, 2009).

In addition to the Moment Method proof, the project included updating and replacement of the phasing and coupling equipment. Although not specifically required by the Moment Method rules, a copy of the new phasing and coupling schematic has been included as ***Exhibit 2.0***.

Exhibit 3.10 shows the details of the sample system. The sample lines are Andrew LDF4-50A cable. This cable is listed with a velocity factor of 0.88. When the field engineers measured the open circuit phase delay of these lines in accordance with §73.151(c)(2)(i), they found the "Maximum Deviation" between the longest and shortest lines was 0.2°. This is indicated by the conditional formatting of the "Maximum Deviation" cell. No additional trimming of line length was required.

The open circuit impedance of each line was also measured using the procedure described in §73.151(c)(2)(i). Good agreement was found, and the measured values, shown in ***Exhibit 3.10***, are well within the two ohm tolerance.

The Delta TCT-3 current sensing transformers were removed from the ATU panels and compared using the network analyzer. The results of these measurements are also shown in ***Exhibit 3.10***. The magnitudes and phases were within the tolerances specified by the manufacturer. These cells have also been conditionally formatted to indicate the acceptability of the measured values.

As a final step, the impedance of each sample line was again measured from the antenna monitor end with the sample transformer attached at the ATU end. The results are also shown in ***Exhibit 3.10***.

WDLM uses a Potomac Instruments Model AM-19D (204) digital antenna monitor. Munn-Reese Field Engineer Richard P. Grzebik checked the calibration using a "T"

Discussion of Report

connector with equal length cables to confirm the Tower 2 input had a Ratio of 1.000 and a Phase of 0° when fed the same signal as the reference tower.

Mr. John Johnson, Chief Operator for WDLM, tuned the array to the parameters generated by the moment method modeling software. The final tuning parameters, as read from the antenna monitor, are shown in the "As Tuned" column of ***Exhibit 1.20***. These cells have been formatted to indicate the parameters are within the accepted limits of the modeled parameters. The common point impedance for the array was maintained at 50 ohms resistance and ±j 0 ohms reactance.

§73.151(c)(3) calls for the establishment of field strength measurement reference points along each pattern maxima and minima. These are shown in ***Exhibit 4.10***. Each point includes the measured field strength value, the distance (in km) from the array, the NAD27 geographic coordinates and a brief description of the location.

The modeling of the arrays was performed by Donald J. Baad, Staff Engineer with this office. Field work was performed by and under the direction of Richard P. Grzebik, Field and Staff Engineer with this office. Assistance was provided by John Johnson who is a regular employee of the licensee and the Chief Operator for WDLM.

Exhibit 1.10

Moment Method Modeling Data Summary Sheet

WDLM - East, Moline, IL

Modeling Software: Mininec Broadcast Professional - Version 14.5

Station: WDLM - East Moline, IL

Freq (kHz) 960

Self-Impedances:
Measured

Twr	Open R	Open X	Electrical Ht (°)	Number of Faces	Face Width (in)	Equiv Radius (m)
1 (W)	52.15	94.80	90°	3	18.5	0.224
2 (E)	54.65	98.40	90°	3	18.5	0.224

Model Check

Twr	Adjusted Ht(°)	Adjusted Radius(m)	Number Segments
1	95.0°	0.235	12
2	95.0°	0.235	12

Twr	Mininec R	Mininec X	Shunt X	Series X	Adjusted Model R	Adjusted Model X
1	50.87	47.64	-3316	47.00	52.35	94.51
2	50.68	47.69	-1326	51.00	54.45	98.31

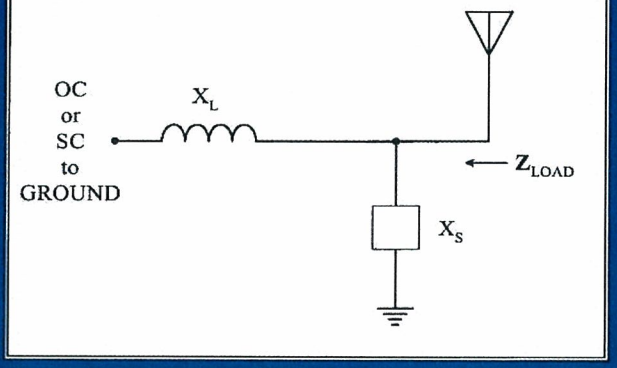
Munn-Reese, Inc.
Broadcast Engineering Consultants
Coldwater, MI 49036

Exhibit 1.10

Moment Method Modeling Data Summary Sheet

WDLM - East, Moline, IL

Added Series Inductance and Shunt Reactance Bases Open and Shorted



Added Series Inductance and Shunt Reactance Base Impedance Formulas

$Z_{BASE} = R_B + jX_B$

$Z_{ATU} = R_A + jX_A$

X_S = Shunt Reactance

X_L = Inductive Series Reactance

$R_A = R_B X_S^2 / (R_B^2 + (X_B + X_S)^2)$

$X_A = + jX_S (R_B^2 + X_B^2 + X_B X_S)) / (R_B^2 + (X_B + X_S)^2) + jX_L$

Munn-Reese, Inc.
Broadcast Engineering Consultants
Coldwater, MI 49036

Exhibit 1.11
Tower 1 Model

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 10:48:10

WDLM - East Moline, IL
Licensed Parameters

GEOMETRY
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.235	12
		0	0	95.		
2	none	200.	82.	0	.235	12
		200.	82.	95.		

Number of wires = 2
current nodes = 24

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	7.91667	1	7.91667
radius	1	.235	1	.235

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	960.	0	1	.0219907	.0219907

Sources

source	node	sector	magnitude	phase	type
1	1	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	13	0	-1,326.	0	0	0

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 10:48:12

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
960.	50.87	47.635	69.691	43.1	2.491	-7.3896	-.87462

Exhibit 1.11
Tower 1 Model

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 10:48:12

CURRENT rms
Frequency = 960 KHz
Input power = .00523697 watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	.0101463	316.9	7.41E-03	-6.94E-03
2	0	0	7.91667	.0104112	314.9	7.35E-03	-7.38E-03
3	0	0	15.8333	.0103893	313.6	7.17E-03	-7.52E-03
4	0	0	23.75	.0101503	312.6	6.87E-03	-7.47E-03
5	0	0	31.6667	9.71E-03	311.8	6.47E-03	-7.24E-03
6	0	0	39.5833	9.07E-03	311.	5.96E-03	-6.84E-03
7	0	0	47.5	8.25E-03	310.4	5.35E-03	-6.29E-03
8	0	0	55.4167	7.27E-03	309.8	4.65E-03	-5.58E-03
9	0	0	63.3333	6.13E-03	309.3	3.88E-03	-4.74E-03
10	0	0	71.25	4.85E-03	308.8	3.03E-03	-3.78E-03
11	0	0	79.1667	3.43E-03	308.3	2.13E-03	-2.69E-03
12	0	0	87.0833	1.87E-03	307.9	1.15E-03	-1.48E-03
END	0	0	95.	0	0	0	0
GND	27.8346	-198.054	0	1.62E-04	83.2	1.91E-05	1.61E-04
14	27.8346	-198.054	7.91667	3.11E-04	83.2	3.69E-05	3.09E-04
15	27.8346	-198.054	15.8333	4.02E-04	83.1	4.82E-05	3.99E-04
16	27.8346	-198.054	23.75	4.63E-04	83.	5.64E-05	4.6E-04
17	27.8346	-198.054	31.6667	5.E-04	82.9	6.19E-05	4.96E-04
18	27.8346	-198.054	39.5833	5.14E-04	82.8	6.48E-05	5.09E-04
19	27.8346	-198.054	47.5	5.05E-04	82.6	6.5E-05	5.E-04
20	27.8346	-198.054	55.4167	4.74E-04	82.4	6.25E-05	4.7E-04
21	27.8346	-198.054	63.3333	4.23E-04	82.2	5.71E-05	4.19E-04
22	27.8346	-198.054	71.25	3.51E-04	82.	4.87E-05	3.48E-04
23	27.8346	-198.054	79.1667	2.6E-04	81.8	3.7E-05	2.57E-04
24	27.8346	-198.054	87.0833	1.48E-04	81.6	2.17E-05	1.46E-04
END	27.8346	-198.054	95.	0	0	0	0

Exhibit 1.12
Tower 2 Model

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 10:52:18

WDLM - East Moline, IL
Licensed Parameters

GEOMETRY
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.235	12
		0	0	95.		
2	none	200.	82.	0	.235	12
		200.	82.	95.		

Number of wires = 2
current nodes = 24

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	7.91667	1	7.91667
radius	1	.235	1	.235

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	960.	0	1	.0219907	.0219907

Sources

source	node	sector	magnitude	phase	type
1	13	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-3,316.	0	0	0

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 10:52:20

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 13, sector 1							
960.	50.68	47.688	69.588	43.3	2.4972	-7.3689	-.87926

Exhibit 1.12
Tower 2 Model

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 10:52:20

CURRENT rms
Frequency = 960 KHz
Input power = .00523274 watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	6.34E-05	84.5	6.11E-06	6.31E-05
2	0	0	7.91667	2.11E-04	84.4	2.05E-05	2.1E-04
3	0	0	15.8333	3.02E-04	84.3	2.99E-05	3.E-04
4	0	0	23.75	3.66E-04	84.2	3.7E-05	3.64E-04
5	0	0	31.6667	4.07E-04	84.1	4.22E-05	4.05E-04
6	0	0	39.5833	4.27E-04	83.9	4.54E-05	4.24E-04
7	0	0	47.5	4.26E-04	83.7	4.66E-05	4.23E-04
8	0	0	55.4167	4.05E-04	83.5	4.57E-05	4.02E-04
9	0	0	63.3333	3.64E-04	83.3	4.24E-05	3.62E-04
10	0	0	71.25	3.05E-04	83.1	3.67E-05	3.03E-04
11	0	0	79.1667	2.27E-04	82.8	2.83E-05	2.25E-04
12	0	0	87.0833	1.3E-04	82.6	1.68E-05	1.29E-04
END	0	0	95.	0	0	0	0
GND	27.8346	-198.054	0	.0101613	316.7	7.4E-03	-6.96E-03
14	27.8346	-198.054	7.91667	.0104269	314.7	7.34E-03	-7.41E-03
15	27.8346	-198.054	15.8333	.0104051	313.5	7.16E-03	-7.55E-03
16	27.8346	-198.054	23.75	.0101658	312.5	6.87E-03	-7.5E-03
17	27.8346	-198.054	31.6667	9.72E-03	311.7	6.46E-03	-7.26E-03
18	27.8346	-198.054	39.5833	9.09E-03	310.9	5.95E-03	-6.86E-03
19	27.8346	-198.054	47.5	8.27E-03	310.3	5.35E-03	-6.31E-03
20	27.8346	-198.054	55.4167	7.28E-03	309.7	4.65E-03	-5.6E-03
21	27.8346	-198.054	63.3333	6.14E-03	309.2	3.88E-03	-4.76E-03
22	27.8346	-198.054	71.25	4.85E-03	308.7	3.03E-03	-3.79E-03
23	27.8346	-198.054	79.1667	3.43E-03	308.2	2.12E-03	-2.7E-03
24	27.8346	-198.054	87.0833	1.88E-03	307.7	1.15E-03	-1.48E-03
END	27.8346	-198.054	95.	0	0	0	0

Exhibit 1.20

Moment Method Array Parameter Sheet

WDLM - East Moline, IL

Modeling Software: Mininec Broadcast Professional - Version 14.5

Station: WDLM - East Moline, IL

Freq (kHz) 960

Day Pattern

	Field Parameters		Mininec Model		Tuning Check	
Twr	Ratio	Phase	Ratio	Phase	Ratio	Phase
1	1.000	0.0°	1.000	0.0°	***1.000***	***0.0°***
2	1.300	20.0°	1.232	20.6°	***1.232***	***20.6°***

Mininec Model Data

	Drive Point		Current		Shunt	ATU Output	
Twr	R	X	Mag	Phase	X	Mag	Phase
1	37.06	25.82	3.2745	3.8°	-3316	3.2492	4.445°
2	35.28	42.49	4.1333	23.5°	-1326	4.0023	25.074°

Formulas for Calculating ATU Output Current with Shunt Reactance

I_{ATU} = ATU Output Current for Unity Base Current at 0 Degrees

$Z_{BASE} = R_B + jX_B$

X_S = Shunt Reactance

I_{ATU} Magnitude = $((1.00 + X_B / X_S)^2 + (R_B / X_S)^2)^{1/2}$

I_{ATU} Angle = $\arctan (- R_B / X_S) / (1 + X_B / X_S)$

Munn-Reese, Inc.
Broadcast Engineering Consultants
Coldwater, MI 49036

Exhibit 1.22
WDLM Directional Array Summary

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 11:14:43

WDLM - East Moline, IL
Licensed Parameters

GEOMETRY
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.235	12
		0	0	95.		
2	none	200.	82.	0	.235	12
		200.	82.	95.		

Number of wires = 2
current nodes = 24

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	7.91667	1	7.91667
radius	1	.235	1	.235

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	960.	0	1	.0219907	.0219907

Sources

source	node	sector	magnitude	phase	type
1	1	1	209.142	38.7	voltage
2	13	1	322.83	73.8	voltage

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 11:14:45

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
960.	37.055	25.817	45.162	34.9	1.9328	-9.9498	-.46319
source = 2; node 13, sector 1							
960.	35.277	42.494	55.229	50.3	2.7879	-6.521	-1.0946

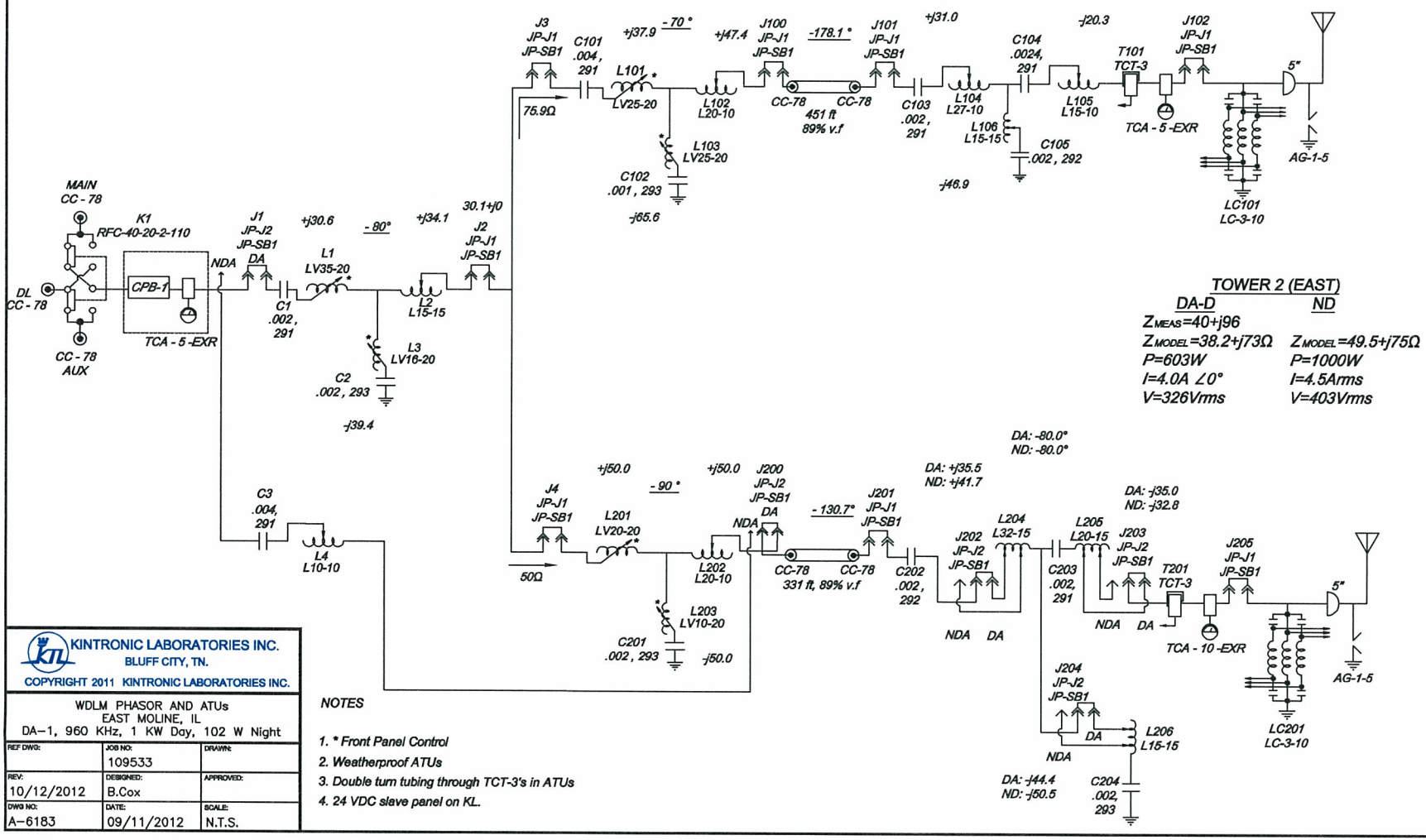
Exhibit 1.22
WDLM Directional Array Summary

C:\Expert MININEC Broadcast Professional\Jobs\WDLM MoM Proof 03-07-2013 11:14:45

CURRENT rms
Frequency = 960 KHz
Input power = 1,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	3.27453	3.8	3.26736	.216531
2	0	0	7.91667	3.30877	2.3	3.30608	.1335
3	0	0	15.8333	3.26891	1.4	3.26798	.077776
4	0	0	23.75	3.16767	.6	3.1675	.0329437
5	0	0	31.6667	3.00834	359.9	3.00834	-2.96E-03
6	0	0	39.5833	2.79404	359.4	2.79387	-.0305643
7	0	0	47.5	2.52831	358.9	2.52781	-.050084
8	0	0	55.4167	2.21514	358.4	2.21428	-.0616497
9	0	0	63.3333	1.85882	358.	1.85767	-.0653837
10	0	0	71.25	1.46339	357.6	1.4621	-.0614225
11	0	0	79.1667	1.03155	357.2	1.03035	-.0498618
12	0	0	87.0833	.561135	356.9	.560304	-.0305243
END	0	0	95.	0	0	0	0
GND	27.8346	-198.054	0	4.13328	23.5	3.78964	1.65002
14	27.8346	-198.054	7.91667	4.22493	22.1	3.91353	1.59196
15	27.8346	-198.054	15.8333	4.20467	21.3	3.91861	1.52439
16	27.8346	-198.054	23.75	4.09849	20.6	3.83761	1.43888
17	27.8346	-198.054	31.6667	3.9118	20.	3.67683	1.33531
18	27.8346	-198.054	39.5833	3.649	19.4	3.44091	1.21464
19	27.8346	-198.054	47.5	3.31484	19.	3.13454	1.07834
20	27.8346	-198.054	55.4167	2.91456	18.6	2.76282	.928175
21	27.8346	-198.054	63.3333	2.45373	18.2	2.3311	.766008
22	27.8346	-198.054	71.25	1.93766	17.8	1.8445	.593595
23	27.8346	-198.054	79.1667	1.36985	17.5	1.30638	.412132
24	27.8346	-198.054	87.0833	.747254	17.2	.713859	.220894
END	27.8346	-198.054	95.	0	0	0	0

Exhibit 2.10
Diagram of Phasing and Coupling Equipment



NOTES

1. * Front Panel Control
2. Weatherproof ATUs
3. Double turn tubing through TCT-3's in ATUs
4. 24 VDC slave panel on KL.

KINTRONIC LABORATORIES INC.
BLUFF CITY, TN.

WDLM PHASOR AND ATUs
EAST MOLINE, IL
DA-1, 960 KHz, 1 KW Day, 102 W Night

REF DWG:	JOB NO:	DRAWN:
	109533	
REV:	DESIGNED:	APPROVED:
10/12/2012	B.Cox	
DWG NO:	DATE:	SCALE:
A-6183	09/11/2012	N.T.S.

Exhibit 3.10
Sample System Documentation

Carrier Freq (kHz) 960 WDLM East Moline

Sample Line

Manufacturer	Model	Velocity Factor (0.xx)	Design Length (feet)	Full Wave Freq (kHz)
Andrew	LDF4-50A	0.88	517	1674.2

Theoretical Calculations

	90°	270°	450°	630°
Resonant Frequency (kHz)	418.5	1255.6	2092.7	2929.8
Distance from Carrier (kHz)	-541.5	295.6	1132.7	1969.8

Open Circuit Line Length Measurements

Measurement Date: 2/25/2013

Sample Lines	Selected Resonance (Electrical °)	Measured Freq at Resonance (MHz)	Line Length at Carrier Freq (Electrical °)	Maximum Deviation
Twr 1	270°	1.22056	212.4°	*0.2°*
Twr 2	270°	1.22177	212.2°	

Exhibit 3.10
Sample System Documentation

Sample Line Impedance Measurements

Measurement Date: 2/25/2013

Sample Lines	+45° Frequency (MHz)	Measured Resistance	Measured Reactance	Line Impedance	Average Impedance	Maximum Deviation
Twr 1	1.42399	5.15	50.66	50.92	50.77	*0.43*
Twr 2	1.42540	5.07	50.16	50.42	50.34	

Sample Lines	-45° Frequency (MHz)	Measured Resistance	Measured Reactance	Line Impedance
Twr 1	1.01713	3.44	-50.51	50.63
Twr 2	1.01814	3.42	-50.15	50.27

Sampling Devices

Measurement Date: 2/25/2013

Location	Manufacturer	Model	Serial Number	Magnitude	Phase
Twr 1	Delta	TCT-3	18122	*1.000*	*0.0°*
Twr 2	Delta	TCT-3	18120	*0.992*	*-0.2°*

Note: Phase Tracking Tolerance for TCT-1 and TCT-2 is ±0.5°. Tolerance for TCT-3 is ±1.0°

Sample Line Measurements with Sampling Devices Attached

Measurement Date: 2/25/2013

Sample Line	Frequency (MHz)	Measured Resistance	Measured Reactance	Line Impedance
Twr 1	960	49.87	1.88	49.91
Twr 2	960	49.95	1.44	49.97

Exhibit 4.10 - Field Strength Measurement Reference Points

WDLM - East Moline, IL					
Directional Pattern					
Radial:	**45.0°**				
		Distance	**NAD27**		
Point #	**mV/m**	**km**	**North Latitude**	**West Longitude**	**Description**
1	13.0	3.10	41 26' 07"	90 22' 19"	10' past fenceline at beige house
2	5.2	6.20	41 27' 18"	90 20' 45"	Hwy 6 North side of road, 100' west of barn
3	2.4	9.41	41 28' 33"	90 19' 05"	Left leg of Y at end of Exchange street
Radial:	**119.0°**				
		Distance	**NAD27**		
Point #	**mV/m**	**km**	**North Latitude**	**West Longitude**	**Description**
1	14.5	3.00	41 24' 10"	90 22' 01"	West side of E. 350th between first two driveways after sharp turn south
2	6.00	6.70	41 23' 14"	90 19' 43"	74N East shoulder 50 ft south of small grove of trees
3	5.20	9.50	41 22' 28"	90 17' 56"	East side of 700th st. 75' south of corner of field
Radial:	**178.0°**				
		Distance	**NAD27**		
Point #	**mV/m**	**km**	**North Latitude**	**West Longitude**	**Description**
1	70.0	3.63	41 23' 02"	90 23' 46"	NW corner of E200th and N1600th intersection
2	19.50	6.83	41 21' 18"	90 23' 45"	NE corner of E200th and N1400th intersection
3	13.50	10.00	41 22' 28"	90 23' 41"	1200th St. halfway between farm driveway and sharp north turn
Radial:	**262.0°**				
		Distance	**NAD27**		
Point #	**mV/m**	**km**	**North Latitude**	**West Longitude**	**Description**
1	10.50	2.70	41 24' 47"	90 25' 50"	West side of 150 across from 4th utility pole north of 1800th st
2	3.70	5.80	41 24' 32"	90 28' 02"	North side of 104th st. 50' east of intersection
3	2.30	10.70	41 24' 09"	90 31' 31"	NW corner of intersection of Knoxville rd. and 116th st.

Exhibit 4.10 - Field Strength Measurement Reference Points

Radial:	**346.0°**				
		Distance	**NAD27**		
Point #	**mV/m**	**km**	**North Latitude**	**West Longitude**	**Description**
1	79.50	3.40	41 26' 44"	90 24' 29"	100' past house at 20267 Glenwood on east side of road
2	26.00	6.50	41 28' 21"	90 25' 02"	N. side of John Deere Place, middle of driveway entry to machine sheds
3	17.90	9.10	41 29' 45"	90 25' 30"	Frontage road along 19th, center of driveway into East Moline School District office
					District Office

Edward Lubetzky

From: Don Baad <don@munn-reese.com>
Sent: Tuesday, August 20, 2013 11:10 AM
To: Edward Lubetzky
Cc: 'John Johnson'; 'Wayne Reese'; jdsouthmayd@msn.com
Subject: WDLM MoM Proof Questions

Edward,

Thank you for your phone call regarding the Moment Method Proof for WDLM, East Moline, IL (Facility ID # 66005).

In response to your questions, the field strength measurements for the reference points were made by Mr. John Johnson, the chief operator for WDLM, during normal daytime hours (and not during critical hours). Mr. Johnson used an older model Potomac Instruments FIM-41field meter, which is believed to have been last calibrated in approximately 1982. However, the meter was compared to a currently calibrated meter owned by one of the other AM stations in the area, and the WDLM meter was found to still be accurate.

Regarding the phasing and coupling diagram, the theoretical tower parameters noted on the diagram are the initial values Kintronic Labs modeled in designing the system. These are not based on the actual self-impedance measurements performed as part of the proof procedure. The parameters shown in Exhibit 1.20 are the parameters derived from the measured self-impedances and moment method modeling. The parameters shown in Exhibit 1.20 are the ones to be used in licensing and operating WDLM.

Please let us know if you have further questions.

Thanks,

Don

Donald J. Baad – Staff Engineer
Munn-Reese, Inc.
Broadcast Engineering Consultants
PO Box 220
Coldwater, MI 49036
517-278-7339 - Ext 106
www.munn-reese.com