

FOR
FCC
USE
ONLY

COPY

FCC 302-AM
APPLICATION FOR AM
BROADCAST STATION LICENSE

(Please read instructions before filling out form.)

FOR COMMISSION USE ONLY

FILE NO

BMM-L-2016-021-ANX

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)

GENESIS COMMUNICATIONS OF TAMPA BAY, INC.

MAILING ADDRESS (Line 1) (Maximum 35 characters)

POST OFFICE BOX 25434

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY

TAMPA

STATE OR COUNTRY (if foreign address)

FLORIDA

ZIP CODE

33622

TELEPHONE NUMBER (include area code)

813-281-1140

CALL LETTERS

WMGG

OTHER FCC IDENTIFIER (If applicable)

FACILITY ID NUMBER 67135

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:

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		
M	M	R

(B)

FEE MULTIPLE			
0	0	0	1

(C)

FEE DUE FOR FEE TYPE CODE IN COLUMN (A)
\$ 690.00

FOR FCC USE ONLY

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

(A)

M	O	R
----------	----------	----------

(B)

0	0	0	1
----------	----------	----------	----------

(C)

\$ 790.00

FOR FCC USE ONLY

ADD ALL AMOUNTS SHOWN IN COLUMN C, AND ENTER THE TOTAL HERE. THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED REMITTANCE.

TOTAL AMOUNT REMITTED WITH THIS APPLICATION

\$ 1,480.00

FOR FCC USE ONLY

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT GENESIS COMMUNICATIONS OF TAMPA BAY, INC.		
MAILING ADDRESS POST OFFICE BOX 25434		
CITY TAMPA	STATE FLORIDA	ZIP CODE 33622

2. This application is for:

- ☒ Commercial
 ☐ Noncommercial
☒ AM Directional
 ☐ AM Non-Directional

Call letters WMGG	Community of License EGYPT LAKE	Construction Permit File No. BP-20120808ABK	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit JUNE 19, 2016
----------------------	------------------------------------	--	---	--

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. DIRECTIONAL ANTENNA

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

If No, explain in an Exhibit.

☐ Does not apply

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 BRUCE C. MADURI	Signature COPY	
Title PRESIDENT AND CEO	Date 6/18/2016	Telephone Number 813-281-1040

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

GENESIS COMMUNICATIONS OF TAMPA BAY, INC.

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)



Station License



Direct Measurement of Power

1. Facilities authorized in construction permit

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
WMGG	BP-20120808ABK	1470	Unlimited	Night 0.8	Day 2.8

2. Station location

State Florida	City or Town Egypt Lake
-------------------------	-----------------------------------

3. Transmitter location

State FL	County Hillsborough	City or Town Tampa	Street address (or other identification) 3325 W. Sligh Ave.
--------------------	-------------------------------	------------------------------	---

4. Main studio location

State FL	County Pinellas	City or Town Largo	Street address (or other identification) 800 8th Ave. SE
--------------------	---------------------------	------------------------------	--

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

State FL	County Pinellas	City or Town Largo	Street address (or other identification) 800 8th Ave. SE
--------------------	---------------------------	------------------------------	--

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.

ENG

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system 4.16	RF common point or antenna current (in amperes) without modulation for day system 7.78
Measured antenna or common point resistance (in ohms) at operating frequency Night 50.0 Day 50.0	Measured antenna or common point reactance (in ohms) at operating frequency Night -5.0 Day -5.0

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
1(NW)	7.5		.813			
2(SE)	0.0	160.3	1.000	.530		
3(C)	-177.0	0.0	.968	1.000		

Manufacturer and type of antenna monitor:

Potomac Instruments 1901-5

SECTION III - Page 2

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

Type Radiator Guyed Tower	Overall height in meters of radiator above base insulator, or above base, if grounded. 70.1	Overall height in meters above ground (without obstruction lighting) 70.9 towers 1/2, 71.0 tower 3	Overall height in meters above ground (include obstruction lighting) 70.9 towers 1/2, 71.0 tower 3	If antenna is either top loaded or sectionalized, describe fully in an Exhibit. Exhibit No. ENG
-------------------------------------	---	--	--	--

Excitation



Series



Shunt

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

North Latitude 28 ° 00 ' 42 "	West Longitude 82 ° 29 ' 53 "
--	--

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.
ENG

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system.

Exhibit No.
ENG

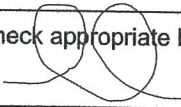
10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit?

Tower number changed to actual

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

New Construction

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) Kurt Gorman	Signature (check appropriate box below) 
Address (include ZIP Code) Phasetek Inc. 550 California Rd., Unit 11 Quakertown, PA 18951	Date June, 17, 2016 Telephone No. (Include Area Code) 215-536-6648



Technical Director



Registered Professional Engineer



Chief Operator



Technical Consultant



Other (specify)

ENGINEERING STATEMENT CONCERNING

APPLICATION FOR LICENSE INFORMATION

EMPLOYING MOMENT METHOD MODELING

WMGG, 1470 KHZ, DA-2

EGYPT LAKE, FLORIDA

JUNE, 2016

PHASETEK INC.
ENGINEERING STATEMENT CONCERNING
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

TABLE OF CONTENTS

302-AM

ENGINEERING STATEMENT

FIGURE 1:	ANTENNA SYSTEM AS ADJUSTED
FIGURE 2:	SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS
FIGURE 3:	TOWER IMPEDANCE MEASUREMENTS VS. MODELED
FIGURE 4:	MOMENT MODEL PARAMETERS
FIGURE 5:	MOMENT MODEL SUMMARY FOR INDIVIDUAL TOWERS
FIGURE 6:	MOMENT MODEL ARRAY SYNTHESIS (DIRECTIONAL DAY)
FIGURE 7:	MOMENT MODEL SUMMARY FOR DIRECTIONAL DAY MODE
FIGURE 8:	MOMENT MODEL ARRAY SYNTHESIS (DIRECTIONAL – NIGHT)
FIGURE 9:	MOMENT MODEL SUMMARY FOR DIRECTIONAL NIGHT MODE
FIGURE 10:	DERIVED DIRECTIONAL PARAMETERS
FIGURE 11:	TOWER BASE CIRCUIT ANALYSIS DESCRIPTION
FIGURE 12:	CIRCUIT ANALYSIS FOR INDIVIDUAL TOWERS
FIGURE 13:	CIRCUIT ANALYSIS FOR DIRECTIONAL DAY MODE
FIGURE 14:	CIRCUIT ANALYSIS FOR DIRECTIONAL NIGHT MODE
FIGURE 15	REFERENCE FIELD INTENSITY MEASUREMENTS
FIGURE 16:	CERTIFIED ARRAY GEOMETRY SURVEY
FIGURE 17:	SPURIOUS FREQUENCY MEASUREMENTS
FIGURE 18:	TOWER #3 CURRENT DISTRIBUTION MEASUREMENTS

PHASETEK INC.

ENGINEERING STATEMENT CONCERNING APPLICATION FOR LICENSE INFORMATION EMPLOYING MOMENT METHOD MODELING WMGG, 1470 KHZ, DA-2 EGYPT LAKE, FLORIDA JUNE, 2016

SUMMARY

Adjustment of the Antenna System and a Proof of Performance employing Moment Method Modeling were performed on Radio Station WMGG, 1470 KHz, Egypt Lake, Florida, after installation of Antenna Phasing and diplexing equipment. WMGG holds Construction Permit Number: BP-20120808ABK to change transmitter site. This report was prepared on behalf of Genesis Communications of Tampa Bay, Inc. licensee of Radio Station WMGG.

SITE MODIFICATIONS

The WMGG Transmitter site is that as currently licensed for Radio Station WTMP, 1150 KHz. New Transmission Lines, Sampling Lines, and Antenna Phasing and Branching equipment have been installed. All Towers remain unchanged. A License Application employing Moment Method Modeling as set forth in Section 73.151(C) has been done to cover the Radio Station WMGG Construction Permit and license under the new rules. In addition, a separate direct measurement of power application will be filed for Radio Station WTMP. The actual tower numbering reflects tower #1 as the northwest tower, tower #2 the southeast tower, and tower #3 the center tower. This differs from the construction permit. Towers #2 and #3 are used for Daytime operation and all towers are used for Nighttime operation.

REFERENCE POINTS

Reference Points were measured at pattern minima and maxima for the Directional modes of operation. These Points and their measured field intensity are shown in Figure 15.

SPECIAL OPERATING CONDITIONS #2 AND #3

All towers and grounding remain as previously licensed for WTMP, 1150 kHz, however, new operating parameters are specified due to system modifications. Verification of no spurious products from the two operating stations was performed. Tower #3 (center) has guy wire top-loading. Measurement of the current distribution was performed to verify the effective electrical height. This data is included in Figure 18.

PHASETEK INC.

ENGINEERING STATEMENT CONCERNING APPLICATION FOR LICENSE INFORMATION EMPLOYING MOMENT METHOD MODELING WMGG, 1470 KHZ, DA-2 EGYPT LAKE, FLORIDA JUNE, 2016

SPURIOUS EMISSIONS

Due to the common usage of the Transmitter site by both radio Stations WMGG, 1470 KHz and WTMP, 1150 KHz, filtering has been installed and adjusted at all Towers to prevent interaction and spurious radiation products. Figure 17 shows measurement of any spurious radiation products. The “reject” 1470 kHz Filters (located in the WTMP equipment) measure greater than 40,000 ohms, and are not included in the circuit model.

METHOD OF MOMENTS DETAIL

All Moment Method Modeling was done with Expert MININEC Broadcast Professional, Version 23. One wire was used to represent each Tower with an additional three wires to represent guy wire top-loading on tower #3 (center). Towers were driven individually to verify the Model compared to measured impedance data. Once the Model was verified, both the Day and Night Directional Antenna Systems were computed. For Directional modes, the complex voltage values for sources located at ground level were computed. These sources produce current moment sums for each Tower that, when normalized, equate to the Theoretical Field Parameters for each respective Tower.

MEASURING EQUIPMENT AND PERSONNEL

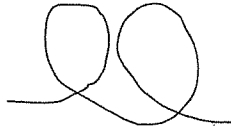
All Tower Resistance and Reactance measurements were made with a Delta Electronics OIB-3 Operating Impedance Bridge and HP8753ES network analyzer with a Tunwall directional coupler. Before use, tests of known impedances were made to verify operation. All Field Intensity Measurements were made with a Potomac Instruments Field Intensity Meter, model 4100, Serial Number 249, calibrated on January 21, 2016. The meter was calibrated by Potomac Instruments, Frederick, Maryland. All measurements were taken by Phasetek Inc. personnel supervised by Kurt Gorman of Phasetek Inc.

PHASETEK INC.

**ENGINEERING STATEMENT CONCERNING
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016**

CONCLUSION

It is believed that the WMGG Antenna System has been constructed and adjusted in accordance with all applicable Commission rules and regulations. The foregoing was prepared on behalf of Genesis Communications of Tampa Bay, Inc., under the immediate supervision of Kurt Gorman, Phasetek Inc., Quakertown, Pennsylvania, whose qualifications are a matter of record with the Federal Communications Commission. The statements herein are true and correct of his knowledge, except such statements made on information and belief, and as to these statements he believes them to be true and correct.



**Kurt Gorman, President
Phasetek Inc.
Quakertown, Pennsylvania**

FIGURE 1

ANTENNA SYSTEM AS ADJUSTED

APPLICATION FOR LICENSE INFORMATION EMPLOYING MOMENT METHOD MODELING WMGG, 1470 KHZ, DA-2 EGYPT LAKE, FLORIDA JUNE, 2016

ANTENNA SYSTEM DESCRIPTION

1. The Antenna System consists of three (3), uniform, guyed, vertical steel transmitting Towers. All Towers stand 70.1M (123.7°) above their Base Insulators. The Towers are arranged with Tower 3 as a reference; Tower 1 is spaced 81.2° on a bearing of 344.0°T. Tower 2 is spaced 81.2° on a bearing of 164.0°T. Tower 3 incorporates guy wire top-loading at 29.7° electrical length. Tower 3 supports a RPU antenna. The feed for this Antenna is connected to the base and not brought across the base insulator. Towers 1 and 2 have aviation obstruction lighting. The lighting circuits are isolated at the base with a choke for each tower.
2. The Ground System for each Tower consists of (120) buried copper Radials, 59.7M in length, except where they intersect with copper transverse straps between Towers or property boundaries. In addition, (120) 15.2M copper radials are interspersed at the base of each tower. Copper strap connects all Towers to the main Transmitter grounding point.
3. The Sampling System consists of three (3), P600-206-3 Voltage Sampling Units. The Voltage Sampling Units are at the tower output of each Antenna Tuning Unit. These sampling units are connected to a Potomac Instruments 1901-5 Antenna Monitor via three (3) equal lengths of RFS, LCF12-50J, 1/2" phase stabilized foam coaxial cable.
4. Tower registration numbers:
Tower 1: 1040048
Tower 2: 1040049
Tower 3: 1030544

**FIGURE 1
ANTENNA SYSTEM AS ADJUSTED**

**APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
CONTINUED
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016**

ANTENNA SYSTEM DESCRIPTION – Continued

DIRECTIONAL OPERATION (DAY)

COMMON POINT

Impedance = 50.0 – j 5.0 Ohms
Current = 7.78 Amperes
Power = 3,024 Watts

DIRECTIONAL OPERATION (NIGHT)

COMMON POINT

Impedance = 50.0 – j 5.0 Ohms
Current = 4.16 Amperes
Power = 864 Watts

Directional Antenna Monitor indications are within $\pm 5\%$ and $\pm 3^\circ$ of the modeled TCT values.

FIGURE 2
WMGG SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

SAMPLING SYSTEM DESCRIPTION

The Sampling System consists of Phasetek Inc. model number P600-206-3 Voltage Sampling Units (VSU) mounted at the base of each Tower. The sampling devices are connected to the Antenna Monitor with equal lengths of RFS LCF12-50J, ½" foam cable. The Antenna Monitor is a Potomac Instruments Model 1901-5, Serial Number 716.

SAMPLE LINE MEASUREMENTS

Impedance measurements were made of the Antenna Sampling Lines using a HP8753ES Network Analyzer and Tunwall directional coupler. Measurements were done with the lines open circuited and then connected to the TCT's.

The table below shows the frequencies above and below the carrier frequency where resonance, defined as zero reactance corresponding with low resistance, was found. Frequencies of resonance occur at odd multiples of 90 degrees electrical length, the Sample Line length at the resonant frequency above the carrier frequency, which is the closest one to the carrier frequency, was found to be 270 electrical degrees. The electrical length at carrier frequency appearing in the table below was calculated by ratioing the frequencies.

SAMPLE LINE MEASUREMENTS

	Resonant Frequency (KHz) below 1470 KHz	Resonant Frequency (KHz) above 1470 KHz	Calculated Electrical Length (deg) at 1470 KHz	Measured Impedance (ohms) Connected to VSU @ 1470 KHz
Tower 1	589.50	1780.0	223.0	51.45 +j 0.25
Tower 2	591.25	1784.0	222.5	51.07 +j 0.37
Tower 3	590.00	1779.0	223.1	51.81 +j 0.71

FIGURE 2
WMGG SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING

CONTINUED
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

SAMPLE LINE MEASUREMENTS (CONTINUED)

To determine the characteristic impedance values of the Sample Lines, open-circuited measurements were made with frequencies offset to produce ± 45 degrees of electrical length from resonance. The characteristic impedance was calculated using the following formula, where $R_1 + j X_1$ and $R_2 + j X_2$ are the measured impedances at the +45 and -45 degree offset frequencies, respectively:

$$Z_0 = ((R_1^2 + X_1^2)^{1/2} \cdot (R_2^2 + X_2^2)^{1/2})^{1/2}$$

Tower	+ 45 Degree Offset Frequency (kHz)	+ 45 Degree Measured Impedance (Ohms)	- 45 Degree Offset Frequency (kHz)	- 45 Degree Measured Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)
1	2076.7	9.9 +j 48.6	1483.3	9.2 -j 48.4	49.43
2	2081.4	9.9 +j 48.5	1486.6	9.1 -j 48.4	49.37
3	2075.6	9.8 +j 48.6	1482.4	9.2 -j 48.5	49.47

SAMPLING VSU MEASUREMENTS

Measurements of the Phasetek Inc. Model P600-206-3 voltage sampling units were performed by a Hewlett Packard 8752A, Network Analyzer. Measurements are normalized to Tower #3 (Day reference) and are within the manufacturer's rating of $\pm 2.0\%$ and $\pm 2.0^\circ$.

FIGURE 2
WMGG SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
CONTINUED
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

SAMPLING VSU MEASUREMENTS CONT'D

TOWER	VSU SERIAL #	MAGNITUDE	PHASE
1	14701	1.004	0.1°
2	14702	1.006	0.3°
3	14703	1.000	0.0°

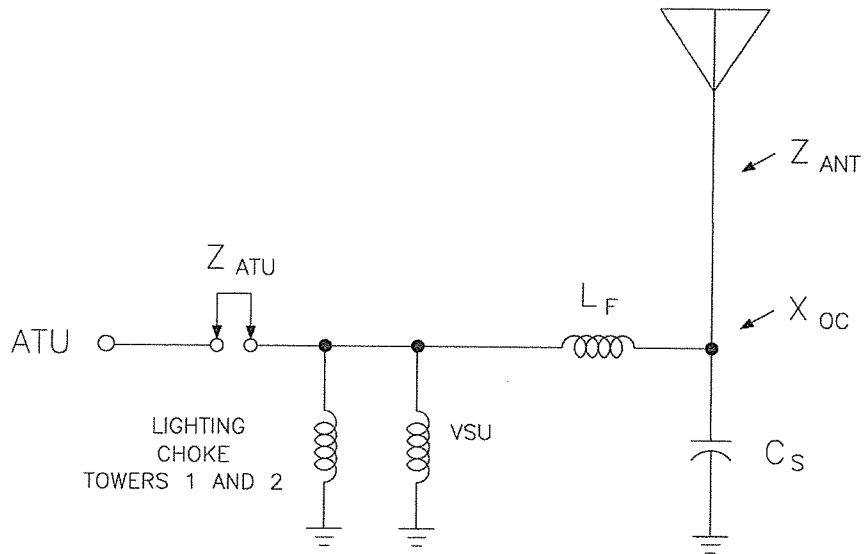
ANTENNA MONITOR MEASUREMENT

Measurement of the Potomac Instruments Model 1901-5 Antenna Monitor was performed to verify calibration. A single RF Voltage was applied to the Day Reference Input (Tower #3) and each other Input by use of a "T" divider and equal electrical length coaxial cables. This yields the following:

Tower	Ratio	Phase
1	1.001	0.4°
2	1.000	0.2°
3	1.000	0.0°

The above is within the manufacturer's rating of $\pm 1.0\%$ and $\pm 1.0^\circ$.

FIGURE 3
WMGG TOWER IMPEDANCE MEASUREMENTS COMPARED TO
METHOD OF MOMENTS MODEL
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016



TOWER	Specified	Measured	Measured	Modeled	Modeled	Measured
	Cs (pf)	L _F (μH)	X _F (Ω)	Z _{ANT} (Ω)	Z _{ATU} (Ω)	Z _{ATU} (Ω)
1	15	3.14	+j29.0	255.3 +j 411.1	217.3 +j 414.0	220.0 +j 421.0
2	15	3.03	+j28.0	255.5 +j 411.5	217.6 +j 413.6	221.0 +j 420.0
3	10	1.62	+j15.0	641.2 +j 634.1	711.4 +j 644.2	690.0 +j 622.0

Tower	Calculated X _{OC} (Ω)
1	+ j 5,622.4
2	+ j 5,619.2
3	-j 12,141.2

FIGURE 4
WMGG MOMENT MODEL PARAMETERS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

Tower #	Wire #	# of Segments	Base Node
1	1	15	1
2	2	15	16
3	3-6	24	31

Tower #	Physical Height Degrees	Modeled Height Degrees	Modeled Radius Meters	% of Equivalent Radius
1	123.7	136.0	.145	100.0
2	123.7	136.0	.145	100.0
3	123.7 + TL	119.0 + TL	.218	100.0

All Towers are uniform cross section, guyed with Base Insulator. Towers are 1 and 2 are three (3) sided, 12" face width. Tower 3 is three (3) sided, 18" face width.

Base Insulators for towers 1 and 2 are manufactured by Lapp Insulators, with an assumed capacity of 15pf (-j7,217.9 ohms @ 1470 kHz). Tower #3 base insulator is manufactured by Austin insulators, with an assumed capacity of 10pf (-j10,826.9 ohms @ 1470 kHz).

Tower 3 guy wire top-loading modeled at 100% actual length.

Towers have Phasetek Inc. 3 wire lighting choke. These measure +j3,237.3 ohms @ 1470 kHz. Voltage Sampling Units measure +j100,000.0 ohms @ 1470 kHz. These are in parallel with lighting chokes at towers 1 and 2.

FIGURE 5
WMGG MOMENT SUMMARY FOR INDIVIDUAL TOWERS

WMGG TOWER 1 (OTHERS OPEN)

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	81.2	344.	0	.145	15
		81.2	344.	136.		
2	none	81.2	164.	0	.145	15
		81.2	164.	136.		
3	none	0	0	0	.218	15
		0	0	119.		
4	none	0	0	119.	.03	3
		21.	30.	98.		
5	none	0	0	119.	.03	3
		21.	150.	98.		
6	none	0	0	119.	.03	3
		21.	270.	98.		

Number of wires = 6
current nodes = 54

	minimum	maximum
Individual wires	wire value	wire value
segment length	3 7.93333	4 9.8995
radius	4 .03	3 .218

ELECTRICAL DESCRIPTION

Frequencies (MHz)

no.	frequency	step	no. of	segment length	(wavelengths)
lowest			steps	minimum	maximum
1	1.47	0	1	.022037	.0274986

Sources

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

Lumped loads

load	node	resistance	reactance	inductance	capacitance	passive
		(ohms)	(ohms)	(mH)	(uF)	circuit
1	16	0	5,619.2	0	0	0
2	31	0	-12,141.2	0	0	0

IMPEDANCE

normalization = 50.

freq	resist	react	impd	phase	VSWR	S11	S12
(MHz)	(ohms)	(ohms)	(ohms)	(deg)		dB	dB
source = 1; node 1, sector 1							
1.47	255.33	411.09	483.93	58.2	18.485	-.94068	-7.105

IMPEDANCE

normalization = 50.

freq	resist	react	impd	phase	VSWR	S11	S12
(MHz)	(ohms)	(ohms)	(ohms)	(deg)		dB	dB
source = 1; node 1, sector 1							
.81	51.	55.39	75.294	47.4	2.8531	-6.3583	-1.1424

WMGG TOWER 2 (OTHERS OPEN)

GEOMETRY

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	81.2	344.	0	.145	15
		81.2	344.	136.		
2	none	81.2	164.	0	.145	15
		81.2	164.	136.		
3	none	0	0	0	.218	15
		0	0	119.		
4	none	0	0	119.	.03	3
		21.	30.	98.		
5	none	0	0	119.	.03	3
		21.	150.	98.		
6	none	0	0	119.	.03	3
		21.	270.	98.		

Number of wires = 6
current nodes = 54

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	7.93333	4	9.8995
radius	4	.03	3	.218

ELECTRICAL DESCRIPTION

Frequencies (MHZ)

frequency		no. of steps	segment length (wavelengths)	
no. lowest	step		minimum	maximum
1 1.47	0	1	.022037	.0274986

Sources

source	node	sector	magnitude	phase	type
1	16	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	5,622.4	0	0	0
2	31	0	-12,141.2	0	0	0

IMPEDANCE

normalization = 50.

freq (MHZ)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 16, sector 1							
1.47	255.54	411.46	484.35	58.2	18.503	-.93979	-7.1089

WMGG TOWER 3 (OTHERS OPEN)

GEOMETRY

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	81.2	344.	0	.145	15
		81.2	344.	136.		
2	none	81.2	164.	0	.145	15
		81.2	164.	136.		
3	none	0	0	0	.218	15
		0	0	119.		
4	none	0	0	119.	.03	3
		21.	30.	98.		
5	none	0	0	119.	.03	3
		21.	150.	98.		
6	none	0	0	119.	.03	3
		21.	270.	98.		

Number of wires = 6
current nodes = 54

	minimum	maximum
Individual wires	wire value	wire value
segment length	3 7.93333	4 9.8995
radius	4 .03	3 .218

ELECTRICAL DESCRIPTION

Frequencies (MHz)

no.	frequency	step	no. of steps	segment length (wavelengths)
1	lowest		1	minimum maximum
1	1.47	0	1	.022037 .0274986

Sources

source	node	sector	magnitude	phase	type
1	31	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	5,622.4	0	0	0
2	16	0	5,619.2	0	0	0

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 31, sector 1							
1.47	641.19	634.05	901.74	44.7	25.402	-.68423	-8.3635

FIGURE 6
WMGG MOMENT MODEL ARRAY SYNTHESIS
(DIRECTIONAL – DAY)

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

WMGG DAY

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.47 MHz

tower	field ratio magnitude	phase (deg)
1	0	0
2	.702	151.
3	1.	0

VOLTAGES AND CURRENTS - rms

source	voltage node	magnitude	phase (deg)	current magnitude	phase (deg)
1	417.612	359.	1.11885	86.3	
16	1,079.82	240.5	2.31748	151.5	
31	2,149.16	79.8	1.49385	48.2	

Sum of square of source currents = 17.7082

Total power = 2,800. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00139117	-.00147466
Y(1, 2)	.000254028	-.000368871
Y(1, 3)	.000815961	.000154772
Y(2, 1)	.000254034	-.000368871
Y(2, 2)	.0013914	-.0014741
Y(2, 3)	.000816309	.000153969
Y(3, 1)	.000816461	.000155068
Y(3, 2)	.000816789	.000154299
Y(3, 3)	.000949699	-.000275072

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	261.624	397.957
Z(1, 2)	-190.387	-41.3431
Z(1, 3)	82.3816	-294.493
Z(2, 1)	-190.387	-41.3496
Z(2, 2)	261.801	398.31
Z(2, 3)	81.8516	-294.759
Z(3, 1)	82.2622	-294.318
Z(3, 2)	81.711	-294.594
Z(3, 3)	624.705	660.625

FIGURE 7
WMGG MOMENT MODEL SUMMARY FOR
DIRECTIONAL DAY MODE

APPLICATION FOR LICENSE INFORMATION
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016
EMPLOYING MOMENT METHOD MODELING

WMGG DAY

GEOMETRY

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	81.2	344.	0	.145	15
		81.2	344.	136.		
2	none	81.2	164.	0	.145	15
		81.2	164.	136.		
3	none	0	0	0	.218	15
		0	0	119.		
4	none	0	0	119.	.03	3
		21.	30.	98.		
5	none	0	0	119.	.03	3
		21.	150.	98.		
6	none	0	0	119.	.03	3
		21.	270.	98.		

Number of wires = 6
 current nodes = 54

	minimum	maximum
Individual wires	wire value	wire value
segment length	3 7.93333	4 9.8995
radius	4 .03	3 .218

ELECTRICAL DESCRIPTION
 Frequencies (MHZ)

no.	frequency	step	no. of steps	segment length (wavelengths)
1	lowest			minimum maximum
1	1.47	0	1	.022037 .0274986

Sources

source	node	sector	magnitude	phase	type
1	16	1	1,527.09	240.5	voltage
2	31	1	3,039.38	79.8	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	372.84	0	0	0

IMPEDANCE

normalization = 50.

freq (MHZ)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 16, sector 1							
1.47	8.8828	465.03	465.11	88.9	492.7	-3.5E-02	-20.923
source = 2; node 31, sector 1							
1.47	1,229.7	762.76	1,447.	31.8	34.067	-.51007	-9.5541

CURRENT rms
Frequency = 1.47 MHz
Input power = 2,800. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	78.0545	22.3818	0	1.11675	87.5	.04938	1.11565
2	78.0545	22.3818	9.06667	.787198	87.6	.0329341	.786508
3	78.0545	22.3818	18.1333	.547894	88.2	.0169778	.547631
4	78.0545	22.3818	27.2	.34089	90.1	-3.53E-04	.34089
5	78.0545	22.3818	36.2667	.16144	96.5	-.018259	.160405
6	78.0545	22.3818	45.3333	.0359261	171.3	-.035509	5.46E-03
7	78.0545	22.3818	54.4	.133278	247.6	-.0507723	-.123228
8	78.0545	22.3818	63.4667	.233248	254.4	-.0628225	-.224629
9	78.0545	22.3818	72.5333	.306124	256.6	-.0706901	-.29785
10	78.0545	22.3818	81.6	.350183	257.8	-.0737683	-.342325
11	78.0545	22.3818	90.6667	.365037	258.6	-.0718682	-.357892
12	78.0545	22.3818	99.7333	.350902	259.3	-.0652032	-.34479
13	78.0545	22.3818	108.8	.308388	259.9	-.0543006	-.30357
14	78.0545	22.3818	117.867	.238135	260.4	-.0398188	-.234782
15	78.0545	22.3818	126.933	.13976	260.8	-.0222405	-.137979
END	78.0545	22.3818	136.	0	0	0	0
GND	-78.0545	-22.3818	0	2.33821	151.6	-2.05669	1.11231
17	-78.0545	-22.3818	9.06667	3.16775	151.3	-2.77885	1.52075
18	-78.0545	-22.3818	18.1333	3.69989	151.2	-3.24216	1.78257
19	-78.0545	-22.3818	27.2	4.0876	151.1	-3.57975	1.97327
20	-78.0545	-22.3818	36.2667	4.34809	151.1	-3.80648	2.10157
21	-78.0545	-22.3818	45.3333	4.486	151.1	-3.92623	2.17001
22	-78.0545	-22.3818	54.4	4.50328	151.1	-3.94058	2.17978
23	-78.0545	-22.3818	63.4667	4.40219	151.	-3.85138	2.13218
24	-78.0545	-22.3818	72.5333	4.18644	151.	-3.66182	2.02913
25	-78.0545	-22.3818	81.6	3.86164	151.	-3.37682	1.87333
26	-78.0545	-22.3818	90.6667	3.43534	150.9	-3.00304	1.66832
27	-78.0545	-22.3818	99.7333	2.91663	150.9	-2.54858	1.41827
28	-78.0545	-22.3818	108.8	2.31536	150.9	-2.02222	1.12762
29	-78.0545	-22.3818	117.867	1.64011	150.8	-1.43168	.800146
30	-78.0545	-22.3818	126.933	.892369	150.7	-.778504	.436182
END	-78.0545	-22.3818	136.	0	0	0	0
GND	0	0	0	1.49584	48.	1.00113	1.11143
32	0	0	7.93333	2.85348	16.2	2.74082	.793886
33	0	0	15.8667	3.9304	8.4	3.88827	.573914
34	0	0	23.8	4.84652	4.5	4.83144	.38192
35	0	0	31.7333	5.61513	2.2	5.61117	.2109
36	0	0	39.6667	6.23976	.5	6.23948	.0591738
37	0	0	47.6	6.7199	359.4	6.7195	-.0731865
38	0	0	55.5333	7.05461	358.5	7.05217	-.18556
39	0	0	63.4667	7.24433	357.8	7.23903	-.27725
40	0	0	71.4	7.29226	357.3	7.28396	-.34773
41	0	0	79.3333	7.20552	356.8	7.19459	-.396814
42	0	0	87.2667	6.99765	356.5	6.98474	-.42483
43	0	0	95.2	6.69062	356.3	6.67661	-.432813
44	0	0	103.133	6.31365	356.2	6.29949	-.422592
45	0	0	111.067	5.89382	356.1	5.88046	-.396606
J3	0	0	119.	5.50898	356.2	5.49707	-.362025
2J1	0	0	119.	1.81791	356.9	1.81532	-.0970395
47	6.06218	-3.5	112.	1.35195	357.5	1.35065	-.059157
48	12.1244	-7.	105.	.737722	358.1	.73732	-.0243613
END	18.1865	-10.5	98.	0	0	0	0
2J1	0	0	119.	1.8654	355.2	1.85891	-.155495
50	-6.06218	-3.5	112.	1.39408	355.4	1.38963	-.111364
51	-12.1244	-7.	105.	.765094	355.6	.762843	-.0586453
END	-18.1865	-10.5	98.	0	0	0	0
2J1	0	0	119.	1.82614	356.6	1.82285	-.109491
53	0	7.	112.	1.35894	357.	1.35713	-.0700999
54	0	14.	105.	.741884	357.6	.741222	-.0313176
END	0	21.	98.	0	0	0	0

FIGURE 8
WMGG MOMENT MODEL ARRAY SYNTHESIS
(DIRECTIONAL – NIGHT)

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

WMGG NIGHT

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.47 MHz

tower	field ratio magnitude	phase (deg)
1	1.06	199.
2	1.28	194.
3	1.	0

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	864.021	281.7	1.89564	207.9
16	1,068.78	273.9	2.27697	206.7
31	1,080.61	98.6	.789885	324.

Sum of square of source currents = 18.804

Total power = 800. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00139117	-.00147466
Y(1, 2)	.000254028	-.000368871
Y(1, 3)	.000815961	.000154772
Y(2, 1)	.000254034	-.000368871
Y(2, 2)	.0013914	-.0014741
Y(2, 3)	.000816309	.000153969
Y(3, 1)	.000816461	.000155068
Y(3, 2)	.000816789	.000154299
Y(3, 3)	.000949699	-.000275072

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	261.624	397.957
Z(1, 2)	-190.387	-41.3431
Z(1, 3)	82.3816	-294.493
Z(2, 1)	-190.387	-41.3496
Z(2, 2)	261.801	398.31
Z(2, 3)	81.8516	-294.759
Z(3, 1)	82.2622	-294.318
Z(3, 2)	81.711	-294.594
Z(3, 3)	624.705	660.625

FIGURE 9
WMGG MOMENT MODEL SUMMARY FOR
DIRECTIONAL NIGHT MODE

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

GEOMETRY
WMGG NIGHT

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	81.2	344.	0	.145	15
		81.2	344.	136.		
2	none	81.2	164.	0	.145	15
		81.2	164.	136.		
3	none	0	0	0	.218	15
		0	0	119.		
4	none	0	0	119.	.03	3
		21.	30.	98.		
5	none	0	0	119.	.03	3
		21.	150.	98.		
6	none	0	0	119.	.03	3
		21.	270.	98.		

Number of wires = 6
current nodes = 54

	minimum	maximum
Individual wires	wire value	wire value
segment length	3 7.93333	4 9.8995
radius	4 .03	3 .218

ELECTRICAL DESCRIPTION

Frequencies (MHz)

no.	frequency	step	no. of steps	segment length (wavelengths)
1	1.47	0	1	.022037
				maximum .0274986

Sources

source	node	sector	magnitude	phase	type
1	1	1	1,221.91	281.7	voltage
2	16	1	1,511.49	273.9	voltage
3	31	1	1,528.21	98.6	voltage

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.47	126.97	437.75	455.79	73.8	33.087	-.5252	-9.4346
source = 2; node 16, sector 1							
1.47	181.84	432.73	469.39	67.2	24.467	-.71041	-8.2131
source = 3; node 31, sector 1							
1.47	-960.13	974.54	1,368.1	134.6	****	****	****

CURRENT rms

Frequency = 1.47 MHz

Input power = 800. watts

Efficiency = 100. %

coordinates in degrees

current

no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	78.0545	22.3818	0	1.89563	207.9	-1.67583	-.88601
2	78.0545	22.3818	9.06667	2.53437	203.6	-2.32166	-1.01634
3	78.0545	22.3818	18.1333	2.94677	201.8	-2.73681	-1.09241
4	78.0545	22.3818	27.2	3.24683	200.5	-3.04047	-1.13906
5	78.0545	22.3818	36.2667	3.44709	199.7	-3.24626	-1.15943
6	78.0545	22.3818	45.3333	3.55101	199.	-3.35801	-1.15475
7	78.0545	22.3818	54.4	3.56016	198.4	-3.37745	-1.12587
8	78.0545	22.3818	63.4667	3.47652	198.	-3.30653	-1.0738
9	78.0545	22.3818	72.5333	3.30317	197.6	-3.14823	-.999797
10	78.0545	22.3818	81.6	3.04466	197.3	-2.90691	-.905455
11	78.0545	22.3818	90.6667	2.70698	197.	-2.58833	-.792658
12	78.0545	22.3818	99.7333	2.29725	196.8	-2.19934	-.663497
13	78.0545	22.3818	108.8	1.8231	196.6	-1.74733	-.520112
14	78.0545	22.3818	117.867	1.29114	196.4	-1.23869	-.364266
15	78.0545	22.3818	126.933	.702393	196.2	-.674452	-.196139
END	78.0545	22.3818	136.	0	0	0	0
GND	-78.0545	-22.3818	0	2.27697	206.7	-2.03421	-1.02304
17	-78.0545	-22.3818	9.06667	3.04386	200.6	-2.84839	-1.0732
18	-78.0545	-22.3818	18.1333	3.54506	198.	-3.37242	-1.09279
19	-78.0545	-22.3818	27.2	3.9122	196.2	-3.7566	-1.09236
20	-78.0545	-22.3818	36.2667	4.15908	195.	-4.01814	-1.07356
21	-78.0545	-22.3818	45.3333	4.2893	194.	-4.16196	-1.03739
22	-78.0545	-22.3818	54.4	4.30448	193.2	-4.19031	-.984821
23	-78.0545	-22.3818	63.4667	4.20683	192.6	-4.10567	-.917002
24	-78.0545	-22.3818	72.5333	3.99999	192.1	-3.9118	-.835303
25	-78.0545	-22.3818	81.6	3.68937	191.6	-3.61413	-.741294
26	-78.0545	-22.3818	90.6667	3.28216	191.2	-3.2198	-.636738
27	-78.0545	-22.3818	99.7333	2.78694	190.8	-2.73734	-.523483
28	-78.0545	-22.3818	108.8	2.21291	190.5	-2.17584	-.403347
29	-78.0545	-22.3818	117.867	1.56801	190.2	-1.54321	-.277812
30	-78.0545	-22.3818	126.933	.853444	189.9	-.840663	-.147145
END	-78.0545	-22.3818	136.	0	0	0	0
GND	0	0	0	.789885	324.	.639041	-.464268
32	0	0	7.93333	1.54777	347.7	1.51198	-.330905
33	0	0	15.8667	2.10208	353.5	2.08847	-.238782
34	0	0	23.8	2.56779	356.5	2.56289	-.158645
35	0	0	31.7333	2.95671	358.3	2.95541	-.0875467
36	0	0	39.6667	3.27178	359.6	3.27168	-.0247698
37	0	0	47.6	3.51302	.5	3.51289	.0296824
38	0	0	55.5333	3.67992	1.2	3.67915	.0755924
39	0	0	63.4667	3.77262	1.7	3.77094	.11273
40	0	0	71.4	3.79263	2.1	3.79001	.140961
41	0	0	79.3333	3.74367	2.5	3.74023	.160312
42	0	0	87.2667	3.63269	2.7	3.62867	.171045
43	0	0	95.2	3.47119	2.9	3.46684	.173729
44	0	0	103.133	3.27439	3.	3.27001	.169265
45	0	0	111.067	3.05642	3.	3.0523	.158793
J3	0	0	119.	2.8576	2.9	2.8539	.145323

2J1	0	0	119.	.947926	3.1	.946538	.0512763
47	6.06218	-3.5	112.	.706442	2.8	.705569	.0351233
48	12.1244	-7.	105.	.38627	2.6	.385881	.017347
END	18.1865	-10.5	98.	0	0	0	0
2J1	0	0	119.	.964562	2.7	.96348	.0456653
50	-6.06218	-3.5	112.	.721789	2.4	.721155	.0302398
51	-12.1244	-7.	105.	.396945	2.1	.396687	.0143025
END	-18.1865	-10.5	98.	0	0	0	0
2J1	0	0	119.	.945125	2.9	.943886	.0483815
53	0	7.	112.	.703526	2.6	.702778	.0324515
54	0	14.	105.	.383851	2.3	.383538	.0154879
END	0	21.	98.	0	0	0	0

FIGURE 10
DERIVED DIRECTIONAL PARAMETERS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

DAY:

	Theoretical		Base Network Input Voltage		Normalized VSU	
Tower	Field	Phase	Amplitude	Phase	Amplitude	Phase
1 (NW)			Detuned			
2 (SE)	.702	151.0°	1142.79	-119.44°	.530	160.3°
3 (C)	1.000	0.0°	2158.01	80.30°	1.000	0.0°

NIGHT:

	Theoretical		Base Network Input Voltage		Normalized VSU	
Tower	Field	Phase	Amplitude	Phase	Amplitude	Phase
1 (NW)	1.060	199.0°	913.47	-77.34°	.813	7.5°
2 (SE)	1.280	194.0°	1123.68	-84.84°	1.000	0.0°
3 (C)	1.000	0.0°	1087.58	98.16°	.968	-177.0°

FIGURE 11
WMGG TOWER BASE CIRCUIT ANALYSIS DESCRIPTION

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WMGG, 1470 KHZ, DA-2
EGYPT LAKE, FLORIDA
JUNE, 2016

CIRCUIT ANALYSIS

Circuit Analysis was performed on each Tower of the WMGG model. "Phasetek" nodal Circuit Analysis program was used to compute base model Input/Output voltages and currents. For the Directional modes, the calculated Mininec Tower Base Drive Voltage was used to determine the Base Network Input Voltage. This point is the location of the Sampling VSU. " Z_1 " represents the ATU Shunt impedance, " Z_2 " represents the Tower Feed impedance, and " Z_3 " represents the Tower Base Shunt impedance.

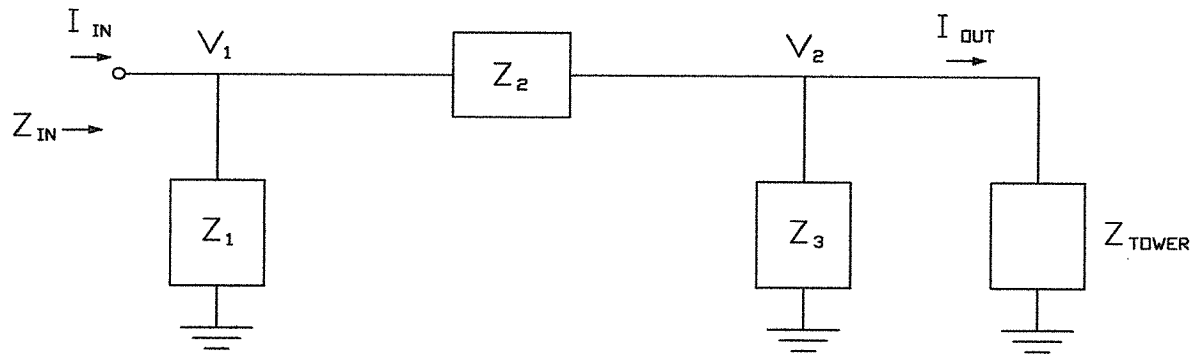


FIGURE 12 **WMGG CIRCUIT ANALYSIS FOR INDIVIDUAL TOWERS**

CUSTOMER : WMGG
NETWORK ID : TOWER 1 (OTHERS OPEN)

FREQUENCY : 1470.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3131.50 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 29.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7217.90 OHMS
TOWER IMPEDANCE (R,X) : 255.33, 411.09 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	3131.50
2		GROUND	286.70	425.16
1		2	0.00	29.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	100.00	0.00
2	95.48	-1.73

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	217.28	414.01	467.57	62.31
INPUT CURRENT (AMPS) :	0.10	-0.19	0.21	-62.31
OUTPUT CURRENT (AMPS) :	0.10	-0.17	0.20	-59.89

INPUT/OUTPUT CURRENT RATIO = 1.0840
INPUT/OUTPUT PHASE = -2.42 DEGREES

CUSTOMER : WMGG
NETWORK ID : TOWER 2 (OTHERS OPEN)

FREQUENCY : 1470.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3131.50 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 28.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7217.90 OHMS
TOWER IMPEDANCE (R,X) : 255.54, 411.46 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	3131.50
2		GROUND	286.96	425.56
1		2	0.00	28.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	100.00	0.00
2	95.63	-1.67

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	217.55	413.59	467.32	62.26
INPUT CURRENT (AMPS) :	0.10	-0.19	0.21	-62.26
OUTPUT CURRENT (AMPS) :	0.10	-0.17	0.20	-59.83

INPUT/OUTPUT CURRENT RATIO = 1.0838
INPUT/OUTPUT PHASE = -2.43 DEGREES

CUSTOMER : WMGG
 NETWORK ID : TOWER 3 (OTHERS OPEN)

FREQUENCY : 1470.00 kHz
 ATU SHUNT IMPEDANCE (R,X) : 0.00,100000.00 OHMS
 TOWER FEED IMPEDANCE (R,X) : 0.00, 15.00 OHMS
 TOWER SHUNT IMPEDANCE (R,X) : 0.00,-10826.90 OHMS
 TOWER IMPEDANCE (R,X) : 641.19, 634.05 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	100000.00
2		GROUND	720.59	628.16
1		2	0.00	15.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	100.00	0.00
2	98.97	-0.67

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	711.37	644.15	959.67	42.16
INPUT CURRENT (AMPS) :	0.08	-0.07	0.10	-42.16
OUTPUT CURRENT (AMPS) :	0.08	-0.08	0.11	-45.35

INPUT/OUTPUT CURRENT RATIO = 0.9494
 INPUT/OUTPUT PHASE = 3.19 DEGREES

FIGURE 13 **WMGG CIRCUIT ANALYSIS FOR DIRECTIONAL DAY MODE**

CUSTOMER : WMGG
NETWORK ID : TOWER 2 DAY

FREQUENCY : 1470.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3131.50 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 29.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7217.90 OHMS
TOWER IMPEDANCE (R,X) : 8.88, 465.11 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	3131.50
2		GROUND	10.15	497.13
1		2	0.00	29.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	1142.79	-119.44
2	1079.82	240.50

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	7.44	450.47	450.53	89.05
INPUT CURRENT (AMPS) :	-2.23	1.21	2.54	151.51
OUTPUT CURRENT (AMPS) :	-2.04	1.10	2.32	151.59

INPUT/OUTPUT CURRENT RATIO = 1.0928
INPUT/OUTPUT PHASE = -0.08 DEGREES

CUSTOMER : WMGG
 NETWORK ID : TOWER 3 DAY

FREQUENCY : 1470.00 kHz
 ATU SHUNT IMPEDANCE (R,X) : 0.00,100000.00 OHMS
 TOWER FEED IMPEDANCE (R,X) : 0.00, 15.00 OHMS
 TOWER SHUNT IMPEDANCE (R,X) : 0.00,-10826.90 OHMS
 TOWER IMPEDANCE (R,X) :1229.70, 762.76 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	100000.00
2		GROUND	1402.23	649.24
1		2	0.00	15.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	2158.01	80.30
2	2149.16	79.80

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	1383.51	679.13	1541.21	26.15
INPUT CURRENT (AMPS) :	0.82	1.14	1.40	54.16
OUTPUT CURRENT (AMPS) :	0.99	1.10	1.49	47.99

INPUT/OUTPUT CURRENT RATIO = 0.9428
 INPUT/OUTPUT PHASE = 6.17 DEGREES

FIGURE 14 **WMGG CIRCUIT ANALYSIS FOR DIRECTIONAL NIGHT MODE**

CUSTOMER : WMGG
NETWORK ID : TOWER 1 NIGHT

FREQUENCY : 1470.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3131.50 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 29.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7217.90 OHMS
TOWER IMPEDANCE (R,X) : 126.97, 437.75 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	3131.50
2		GROUND	143.84	463.32
1		2	0.00	29.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	913.47	-77.34
2	864.02	281.70

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	107.25	429.69	442.87	75.99
INPUT CURRENT (AMPS) :	-1.84	-0.93	2.06	-153.33
OUTPUT CURRENT (AMPS) :	-1.68	-0.89	1.90	-152.13

INPUT/OUTPUT CURRENT RATIO = 1.0881
INPUT/OUTPUT PHASE = -1.20 DEGREES

CUSTOMER : WMGG
NETWORK ID : TOWER 2 NIGHT

FREQUENCY : 1470.00 KHZ
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3131.50 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 28.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7217.90 OHMS
TOWER IMPEDANCE (R,X) : 181.84, 432.73 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	3131.50
2		GROUND	205.63	454.82
1		2	0.00	28.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	1123.68	-84.84
2	1068.78	273.90

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	153.86	427.07	453.94	70.19
INPUT CURRENT (AMPS) :	-2.24	-1.05	2.48	-155.03
OUTPUT CURRENT (AMPS) :	-2.03	-1.02	2.28	-153.31

INPUT/OUTPUT CURRENT RATIO = 1.0871
INPUT/OUTPUT PHASE = -1.72 DEGREES

CUSTOMER : WMGG
 NETWORK ID : TOWER 3 NIGHT

FREQUENCY : 1470.00 kHz
 ATU SHUNT IMPEDANCE (R,X) : 0.00,100000.00 OHMS
 TOWER FEED IMPEDANCE (R,X) : 0.00, 15.00 OHMS
 TOWER SHUNT IMPEDANCE (R,X) : 0.00,-10826.90 OHMS
 TOWER IMPEDANCE (R,X) :-960.13, 974.54 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS)	
			R	X
1		GROUND	0.00	100000.00
2		GROUND	-1148.56	959.01
1	2		0.00	15.00

NODE	VOLTAGE	
	MAGNITUDE	PHASE
1	1087.58	98.16
2	1080.61	98.60

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	-1126.36	977.42	1491.32	139.05
INPUT CURRENT (AMPS) :	0.55	-0.48	0.73	-40.89
OUTPUT CURRENT (AMPS) :	0.64	-0.46	0.79	-35.97

INPUT/OUTPUT CURRENT RATIO = 0.9233
 INPUT/OUTPUT PHASE = -4.91 DEGREES

FIGURE 15
WMGG DAY REFERENCE POINT MEASUREMENTS – JUNE 16, 2016

<u>Radial</u>		<u>Dist</u> <u>km</u>	<u>mV/m</u>	<u>Time</u>	<i>CO-ORD NAD27</i>			<u>Description</u>
					<u>Deg</u>	<u>Min</u>	<u>Sec</u>	
95°	1	1.12	90.5	1754	N 28	00	38.8	Off 6901 Tampania
					W 82	29	12.1	
	2	1.40	91.5	1746	N 28	00	38.7	Sligh and Armenia, Amscot Lot
					W 82	29	01.8	
	3	1.53	34.1	1750	N 28	00	38.1	6902 Howard Ave.
					W 82	28	57.0	
	1	1.46	112	1822	N 27	59	56.6	3110 Henry
					W 82	29	38.0	
	2	1.61	102	1818	N 27	59	51.7	Opposite 3107 Rio Vista
					W 82	29	36.7	
164°	3	1.80	78.6	1814	N 27	59	46.0	Hillsborough and Macdill NW corner
					W 82	29	34.4	
	1	1.17	102	1833	N 28	00	18.8	Jehovahs Witness lot at East end
					W 82	30	27.2	
	2	1.55	84.6	1837	N 28	00	11.4	Hanna east of Hale Smith at sidewalk
					W 82	30	38.3	
	3	1.68	92.6	1840	N 28	00	09.4	6016 N. Clark
					W 82	30	42.1	
					N 28	00		
					W 82	30		

FIGURE 15 CONTINUED
WMGG DAY REFERENCE POINT MEASUREMENTS – JUNE 16, 2016

		CO-ORD NAD27							
<u>Radial</u>		<u>Dist</u> <u>km</u>	<u>mV/m</u>	<u>Time</u>		<u>Deg</u>	<u>Min</u>	<u>Sec</u>	<u>Description</u>
344°	1	1.17	289	1904	N	28	01	18.4	Edna west of Himes at first driveway South
					W	82	30	03.4	
	2	1.60	201	1851	N	28	01	31.9	Waters, Dollar Tree lot at light pole
					W	82	30	08.8	
	3	1.99	233	1859	N	28	01	43.5	Humphrey east of Dale Mabry at gate
					W	82	30	14.6	

FIGURE 15 CONTINUED

WMGG NIGHT REFERENCE POINT MEASUREMENTS – JUNE 16, 2016

		CO-ORD NAD27							
<u>Radial</u>		<u>Dist km</u>	<u>mV/m</u>	<u>Time</u>		<u>Deg</u>	<u>Min</u>	<u>Sec</u>	<u>Description</u>
22.5°	1	1.15	77.5	1030	N W	28 82	01 29	16.5 37.3	Driveway 3204 Sitka
	2	1.80	28.8	1044	N W	28 82	01 29	36.2 28.3	Gomez and Xanthus, SE corner
	3	1.86	27.1	1051	N W	28 82	01 29	38.5 28.5	Gomez East side, opposite pole 130460
77°	1	1.05	226	1059	N W	28 82	00 29	49.4 15.7	Hamilton and Poller, North side
	2	1.28	139	1108	N W	28 82	00 29	51.5 07.4	Armenia east side parking lot
	3	1.36	121	1104	N W	28 82	00 29	52.4 04.6	7303 Coarsey
130.5°	1	1.75	32.5	1119	N W	28 82	00 29	04.5 04.9	Armenia and Idlewild, NW corner
	2	1.84	47.5	1123	N W	28 82	00 29	03.7 00.8	2312 Idlewild
	3	2.26	26.0	1127	N W	27 82	59 28	54.4 49.7	Opposite 5613 Albany

FIGURE 15 CONTINUED

WMGG NIGHT REFERENCE POINT MEASUREMENTS – JUNE 16, 2016

<u>Radial</u>		<u>Dist</u> <u>km</u>	<u>mV/m</u>	<u>Time</u>	<i>CO-ORD NAD27</i>			<u>Description</u>
					<u>Deg</u>	<u>Min</u>	<u>Sec</u>	
197.5°	1	0.96	80.0	1148	N 28	00	12.8	Himes and Paris, SE corner
					W 82	30	03.3	
	2	1.17	82.5	1145	N 28	00	05.6	3603 Idlewild
					W 82	30	05.1	
	3	1.81	59.0	1138	N 27	59	46.0	Hillsboro Ave, Walmart lot
					W 82	30	13.0	
	1	1.46	186	1159	N 28	00	25.7	6606 Clark
					W 82	30	43.4	
	2	1.62	167	1203	N 28	00	25.6	Lois and Lambright, NW corner
					W 82	30	49.5	
251°	3	1.83	150	1207	N 28	00	22.3	6413 Hubert
					W 82	30	56.7	
	1	1.02	88.0	1221	N 28	01	01.2	Opposite 7512 Church Ave.
					W 82	30	23.7	
	2	1.19	75.5	1225	N 28	01	08.7	Richard and Kirby, SW corner
					W 82	30	29.1	
	3	2.04	38.5	1233	N 28	01	20.9	8113 Thatcher
					W 82	30	53.3	

FIGURE 16
CERTIFIED ARRAY GEOMETRY



June 16, 2016

Laura Maduri
Genesis Communications
PO Box 25434
Tampa, FL 33622

Re: 3325 W Sligh Ave, Radio Transmittal Antenna Site

Dear Laura:

Per your Job Order with American Surveying Inc, of June 14, 2016; I sent a fieldcrew to the site mentioned above to measure your Antenna Towers with the goal of establishing their relationship to True North utilizing GPS Equipment and Conventional Surveying Equipment.

Our measurements are based on the National Geodetic Survey, NAD 83, Florida State Plane Coordinate Geometry Base, Florida West Zone.

Our measurements show that the Central Tower is located N 15°43'00"W, (Azimuth 344.283333°) 151.10 ft horizontally from the southernmost tower.
From Central Tower to the northernmost tower we measure N 15°38'06"W, (Azimuth 344.365000°) 150.48 ft horizontally.

Overall from the southernmost tower to the northernmost tower we measure N 15°40'33"W, (Azimuth 344.324166°) 301.58 ft horizontally.

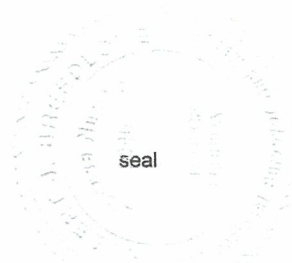
Our measurements were taken to the center of each towers support base by measuring to the corners of each support base and calculating the exact center of each base which we were told by Max Anduze would be the best and safest way to obtain the towers location.

I hope this satisfies your needs.

Thank you for your business.

Respectfully,

Robert J Breedlove, PSM #7040
Vice President / Senior Project Manager



4847 North Florida Avenue
Tampa, Florida 33603

Telephone: 813-234-0103
Facsimile: 813-234-0108

FIGURE 17
WMGG SPURIOUS RADIATION MEASUREMENTS
JUNE, 2016
WTMP (1150 KHZ), 10.0 KW DAY MODE
WMGG (1470 KHZ), 2.8 KW DAY MODE

<u>Frequency (kHz)</u>	<u>Field Intensity (mV/M)</u>	<u>Attenuation (dB) relative to</u>	
		<u>WTMP</u>	<u>WMGG</u>
1150	400	--	--
1470	243	--	--
510	<.01	>92.0	>87.7
640	.012	90.5	86.1
830	.018	86.9	82.6
1790	.024	84.4	80.1
1980	.014	89.1	84.8
2110	.012	90.5	86.1
2620	.015	88.5	84.4
3770	<.01	>92.0	>87.7
4090	<.01	>92.0	>87.7
4920	.012	90.5	86.1

Above taken with Potomac Instruments, FIM-41, 1.01 km from the Antenna on a bearing of 302°T.

Above readings meet required attenuation of 77.5dB (WMGG Day) and 80.0dB (WTMP Day).

FIGURE 18
CURRENT DISTRIBUTION MEASUREMENTS

