ALLAN G. MOSKOWITZ, ESQ.

June 25, 2015

Federal Communications Commission c/o U.S. Bank – Government Lockbox # 979089 SL-MO-C2-GL, 1005 Convention Plaza, St. Louis, MO 63101 (Attention: FCC Government Lockbox)

> Re: FILING OF APPLICATION FOR LICENSE TO COVER CONSTRUCTION PERMIT AND REQUEST FOR PROGRAM TEST AUTHORITY File No. BP-20110919ADG Radio Station WNYG (AM) Facility ID No. 5208 Medford, New York Radio Cantico Nuevo, Inc.

Dear Ms. Dortch:

On behalf of Radio Cantico Nuevo, Inc., licensee of Radio Station WNYG (AM), Medford, New York, and holder of the above-referenced Construction Permit, I am herewith filing an original and two (2) copies of an application on FCC Forms 159 and 302 for a license to cover the modified Construction Permit.

The Permittee is also requesting Program Test Authority.

Attached hereto are FCC Form 159 with the payor's credit card number and his signed authorization for the FCC to charge the credit card in payment of the filing fee in the amount of \$1, 480.00.

I am also enclosing a copy of this cover letter which I request be "stamped' and returned to me in the attached envelope.

Should any questions arise with respect to this matter, please contact the undersigned counsel.

Respectfully submitted

Allan G. Moskowitz

Cc: Son Nguyen, Media Bureau (by email)

10845 TUCKAHOE WAY | NORTH POTOMAC, MD 20878 | T 301.908.4165 | F 301.251.1353 | AMOSKOWITZ@AMOSKOWITZLAW.COM

MEMBER OF THE DC BAR. NOT LICENSED TO PRACTICE LAW IN THE STATE OF MARYLAND

DREPROCEDING	¥ ₽Ŀ₽	NERAL COMMUNICATIONS COMM REMITTANCE ADVICE FORM 159	ISSION		Approved by C 300413 Page No 1
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Federal Communications Commission Washington, D. C. 20554

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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.

FOR COMMISSION USE ONLY	
FILE NO. BL-20150626AB	4

SECTION I - APPLICANT FEE INFORMATION			
1. PAYOR NAME (Last, First, Middle Initial)		8	
Radio Cantico Nuevo, Inc.			
MAILING ADDRESS (Line 1) (Maximum 35 characters) 820 Suffolk Avenue			
MAILING ADDRESS (Line 2) (Maximum 35 characters) Suite 203			
CITY Brentwood	STATE OR COUNTRY (if fo NY	reign address)	ZIP CODE 11717
TELEPHONE NUMBER (include area code) (908) 558-1430	CALL LETTERS WNYG	OTHER FCC IDE 5208	NTIFIER (If applicable)
2. A. Is a fee submitted with this application?		[V Yes No
B. If No, indicate reason for fee exemption (see 47 C.F.R. Section			
Governmental Entity Noncommercial educ	cational licensee	her (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 Co	des may be found i	n the "Mass Media Services
Fee Filing Guide." Column (B) lists the Fee Multiple applicable for thi	is application. Enter fee amou	nt due in Column (C)).
(A) (B)	(C) FEE DUE FOR FEE	-	
FEE TYPE FEE MULTIPLE	TYPE CODE IN COLUMN (A)		FOR FCC USE ONLY
M M R 0 0 1	\$690.00		
To be used only when you are requesting concurrent actions which res	sult in a requirement to list mor	e than one Fee Type	e Code.
(A)(B)	(C)		
M 0 R 0 0 1	\$790.00		FOR FCC USE ONLY
ADD ALL AMOUNTS SHOWN IN COLUMN C,	TOTAL AMOUNT REMITTED WITH THI APPLICATION	S I	FOR FCC USE ONLY
THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED	\$ 1,480.00		
REMITTANCE.		[

SECTION II - APPLICAN	IT INFORMATION				
Radio Cantico Nuevo, In	IC.				
820 Suffolk Ave, Suite 2	03				
CITY Brentwood			STATE NY		ZIP CODE 11717
2. This application is for:	Commercial	[ctional	Noncomn	nercial Ion-Directional	
Call letters	Community of License	Construct	ion Permit File No.	Modification of Construction	Expiration Date of Last
WNYG	Medford, NY	BP-20	110919ADG	Permit File No(s).	06/28/2015
3. Is the station n accordance with 47 C.F If No, explain in an Exhi	ow operating pursuant S.R. Section 73.1620? ibit.	to auto	matic program	test authority in	Yes V No Exhibit No. Directional
 Have all the term construction permit bee f No, state exceptions i 	s, conditions, and oblig n fully met? n an Exhibit.	jations so	et forth in the	above described	V Yes No Exhibit No.
 Apart from the chan he grant of the under epresentation containe f Yes, explain in an Ex 	ges already reported, ha lying construction permit d in the construction perr hibit.	is any ca t which v mit applic	use or circumsta vould result in a ation to be now	ance arisen since any statement or incorrect?	Yes 🗹 No
 Has the permittee fil sertification in accordan 	led its Ownership Report ce with 47 C.F.R. Sectior	(FCC Fo 1 73.3615	rm 323) or owne 5(b)?	ership	Yes No No Does not apply
f No, explain in an Exhi	bit.				Exhibit No.
7. Has an adverse find or administrative body v criminal proceeding, bro elony; mass media re another governmental u	ing been made or an advith respect to the application with respect to the application ought under the provision elated antitrust or unfai nit; or discrimination?	verse fina ant or par is of any l ir compe	al action been ta ties to the appli law relating to th tition; frauduler	ken by any court cation in a civil or ne following: any nt statements to	Yes 🖌 No
f the answer is Yes, a nvolved, including an id (by dates and file num information has been required by 47 U.S.C. S of that previous submiss the call letters of the st was filed, and the date of	attach as an Exhibit a function of the court of the court of the court of the disposition earlier disclosed in contraction 1.65(c), the applic sion by reference to the cation regarding which the profiling; and (ii) the disposition of filing; and (ii) the disposition of the dispo	Il disclos or adminis on of the nnection ant need file numb a applica sition of t	ture of the pers strative body an litigation. Wh with another a only provide: (i per in the case of ation or Section he previously rep	ons and matters d the proceeding ere the requisite application or as an identification of an application, 1.65 information ported 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?

If Yes, provide particulars as an Exhibit.

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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).

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	7 // /
Erick Salgado	all	lab
Title	Dale	Télephone Number
President	6/24/15	(908) 588-1430

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 (3060-0527), 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

 Yes		No	
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Exhibit	NO.	

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Ľ	Yes	L	NC

SECTION III - Page 2

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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	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall heigh above ground obstruction lig	it in meters 1 (without ghting)	Overall height in met above ground (inclu- obstruction lighting)	ters If a de load des Exh	ntenna is either top ied or sectionalized, cribe fully in an ibit.
guyed uni, cross	#1 56.4, #2 39.6	#1 57.3,	#2 40.5	#1 57.3, #2 40.	.5	Exhibit No. See Eng.
Excitation	Series	Shunt				
Geographic coordinates tower location.	to nearest second. For direc	tional antenna	give coordinate	s of center of array.	For single ve	ertical radiator give
North Latitude 40) ^o 47 '	45 "	West Longitud	^{je} 72 ⁰	59 '	32 "
If not fully described ab antenna mounted on tov	ove, attach as an Exhibit furt ver and associated isolation c	her details and ircuits.	I dimensions in	cluding any other	E	xhibit No. N/A
Also, if necessary for a dimensions of ground sy	a complete description, attac /stem.	ch as an Exhi	bit a sketch of	f the details and	E	xhibit No. iee 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?

No changes

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

N/A

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)	
Charles A. Hecht	Parles 4. Mett	• • • • • • • • • • • • • • • • • • • •
Address (include ZIP Code)	Date	
Charles A. Hecht & Associates, Inc.		
Freehold, NJ 07728	Telephone No. (Include Area Code) 732 577-0711	
Technical Director	Registered Professional Engineer	
Chief Operator	✓ Technical Consultant	
Other (specify)		
FCC 302-AM (Page 5) August 1995		

SECTION III I	CENSE ADDI ICATION ENCI			
Name of Applica	nt	ACCUNCLIATA	,	,
		Radio Canti	co Nuevo, Inc.	
PURPOSE OF A	UTHORIZATION APPLIED FOR	: (check one)	······································	
2	Station License	Direct Mea	surement of Power	
1. Facilities auth	orized in construction permit	······		
Call Sign	File No. of Construction Permit	Frequency	Hours of Operation	Power in kilowatts
WNYG	(if applicable) BP-20110919ADG	(kHz) 1440	Unlimited	Night Day 0.196 1.0
2. Station location	n			
State			City or Town	
	New York		Mec	lford
3. Transmitter lo	cation			
State	County		City or Town	Street address
NY	Suffolk		41 Pennsylvania Ave.	Medford
4. Main studio lo	cation			
State	County		City or Town	Street address
NY	Suffolk		41 Pennsylvania Ave.	Medford
5. Remote contro	ol point location (specify only if au	thorized direction	al antenna)	
State	County		City or Town	Street address (or other identification)
NY	Suffolk		41 Pennsylvania Ave.	Medford
6. Has type-appr	oved stereo generatino equipmer	nt been installed?		Yes 🖌 No
	5 - C - C - C - G - C - C - G - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1			
7. Does the sam	pling system meet the requirement	nts of 47 C.F.R. S	ection 73.68?	Yes No
				Not Applicable
644-ok		• 15	it-Nd	To blist NTo
Allach as an Ex	dibit a detailed description of the	sampling system	as installed.	See Eng.
8. Operating con	stants:		······································	
RF common poin	t or antenna current (in amperes)	without	RF common point or antenna	current (in amperes) without
	2.06		2 modulation for day system	2.66
Measured antenn	a or common point resistance (in	ohms) at	Measured antenna or commo	n point reactance (in ohms) at
operating frequer	lcy Dav		Operating frequency	Day
50	141		0	122.4
Antenna indicatio	ns for directional operation	······································	I	

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Puricerna analoadone tor ancor	ional operation						
Towers	Antenna Phase reading	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day	
1 (S)	-96.7		0.302				
<u>3 (N)</u>	0.0		1.000				
······							
		<u>_</u> į]		
Manufacturer and type of anti	enna monitor:	Gormar	Redlich CMR				

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ENGINEERING REPORT IN SUPPORT OF APPLICATION FOR LICENSE AND REQUEST FOR PROGRAM TEST AUTHORITY EMPLOYING MOMENT METHOD MODELING WNYG 1440 KHZ BP-20110919ADG 0.196 KW DA-N MEDFORD, NEW YORK

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JUNE 2015

ENGINEERING REPORT IN SUPPORT OF APPLICATION FOR LICENSE AND REQUEST FOR PROGRAM TEST AUTHORITY EMPLOYING MOMENT METHOD MODELING WNYG 1440 KHZ BP-20110919ADG 0.196 KW DA-N MEDFORD, NEW YORK

SUMMARY

1 F

This engineering report is submitted on behalf of Radio Cantico Nuevo, Inc., (hereinafter referred to as "Radio Cantico"), licensee of AM station WNYG Medford, New York in support of an application for license and request for program test authority for WNYG. WNYG is licensed to operate daytime hours only on 1440 kilohertz with power of 1 kilowatt employing a non-directional antenna. This report will demonstrate Radio Cantico has constructed WNYG in accordance with permit BP-20110919ADG. The permit authorizes nighttime operation with power of 0.196 kilowatts utilizing a directional antenna system from the existing transmitter site location. There are no changes for the daytime operation or for the ground system. The daytime operation is licensed to diplex with WLIM Patchogue, New York from this site.

In support thereof, contained in this report is a complete method of moments proof of performance for the directional antenna system with associated engineering exhibits, including spurious emissions measurements, and the Engineering section of FCC Form 302-AM.

METHODOLOGY

The antenna system has been adjusted to produce monitoring system parameters in compliance with the method of moments ("MoM") calculated values (as calculated using Expert Mininec Broadcast Professional Version 23 and the antenna monitoring system has been adjusted to produce monitoring system parameters which are within \pm 5% in field ratio and \pm 3° in phase of the modeled values as required by Section 73.151(c)(2)(ii) of the rules.

SAMPLE SYSTEM

Tower currents were sampled with new Phasetek, Inc. model P600-203 toroidal current transformers with a sensitivity of 1.0 volt per amp mounted in a metal cabinet located at the base of each tower. The toroidal sample devices were calibrated by the manufacturer and were certified as being within 2% amplitude and 2° phase accuracy. In addition, the transformers were measured with an Array Solutions VNA2180 vector network analyzer and found to be within the manufacturer's specifications as shown in the following table.

тст	SN	Amplitude 1440 Khz	Phase 1440 Khz
1	735	0.997	-0.2°
2	736	1.000	0.0°

The sampling transformers are connected to the antenna monitor with equal lengths of Andrew LDF4-50A foam coaxial cable. The sample lines are equal in length, buried and exposed to similar environmental conditions. Manufacturer specifications were verified following installation. The antenna monitor is a new Gorman Redlich CMR, serial number 501. The antenna monitor was calibrated with a "T" connector and two equal length cables. The results are within the manufacturer's rated maximum accuracy of $\pm 2\%$ amplitude and $\pm 1^{\circ}$ phase and are provided in the table below. The sample system as installed meets FCC type approval requirements.

INPUT	Amplitude 1440 Khz	Phase 1440 Khz
1	1.01	0.1°
2	1.00	0.0°

Impedance measurements were made on the antenna sampling system using an Array Solutions VNA2180 vector network analyzer. The measurements were made looking into the antenna monitor ends of the sample lines with the tower ends open-circuited, connected to the sampling toroid and measured at a frequency of 1440 kilohertz. All connectors were installed on the sample lines and readings were normalized to include the test leads.

All test and impedance measurements, field strength measurements, antenna adjustments and antenna modeling presented in this report were done by Kurt R. Gorman of Phasetek, Inc. The table below shows the frequencies above and below the carrier frequency where resonance, defined as zero reactance corresponding with low resistance, was found. The electrical length at carrier frequency appearing in the table below was calculated by ratioing the frequencies.

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Tower	Resonance Below 1440 Khz	Resonance Above 1440 Khz	Calculated Electrical Length @1440 khz
1	496.0 khz	1495.1 khz	260.1°
3*	496.3 khz	1495.5 khz	260.0°

Based upon the measurements shown above, the sample lines are within the required tolerance of one electrical degree.

To determine the characteristic impedance values of the sample lines, open-circuited measurements were made with frequencies offset to produce \pm 45 degrees of electrical length from resonance. The characteristic impedance was calculated using the following formula, where R1 +j X1 and R2 +j X2 are the measured impedances at the +45 and -45 degree offset frequencies, respectively:

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

^{*} There are three towers on the site. The center tower is not used for the night directional operation. Therefore, tower 2 on the construction permit is actually tower 3 of the array. See Exhibit III for additional information.

Tower	+45 Degree Offset Frequency (KHz)	+45 Degree Measured Impedance (Ohms)	-45 Degree Offset Frequency (KHz)	-45 Degree-45 DegreeCalculateOffsetMeasuredCharacterFrequencyImpedanceImpedan(KHz)(Ohms)(Ohms)		Line Impedance connected to TCT (Ohms)
1	1744.4	4.7 +j 50.6	1245.9	3.1 –j 50.9	50.9	53.5 -j3.4
3	1774.8	4.7 +j 49.7	1246.2	3.1 –j 50.0	50.1	51.7 -j3.3
				Max Impedance	50.9	
				Min Impedance	50.1	
			MAXIMUM IM	PEDANCE DELTA	0.8	

As shown above, the sample lines measured characteristic impedance meets the requirement that they be within 2 ohms.

TOWER BASE IMPEDANCE MEASUREMENTS

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> The impedance of each tower was measured at the jack at the output of the filter network at the base of each tower. All impedance measurements were obtained with a Delta Electronics OIB-3 Operating Impedance Bridge and a Hewlett Packard 8753ES Network Analyzer with a Tunwall Directional Coupler. Before use, tests of known impedances were made to verify accurate operation. Measurements were taken with the test leads shorted (for reference), from the output jack to the tower with the tower base shorted, and from the jack to the tower with the tower in-circuit. All measurements were taken for each tower with all other tower output jacks open-circuited. The following exhibits describe the measurement conditions and assumptions used in the MoM analysis.

EXHIBIT 1

WNYG TOWER IMPEDANCE MEASUREMENTS COMPARED TO METHOD OF MOMENTS MODEL



тамер	Specified	Measured	Measured	Modeled	Modeled	Measured
TOWER	Cs (pf)	$L_F(\mu H)$	$X_{\mathrm{F}}\left(\Omega ight)$	$Z_{ANT}(\Omega)$	$\mathrm{Z}_{\mathrm{ATU}}\left(\Omega ight)$	$Z_{ATU}(\Omega)$
1	15	0.66	+j6.0	77.2 +j 113.0	131.0 +j 130.1	134.2 +j 130.8
2	15	1.88	+j17.0	72.0 +j 100.2	75.3 +j 118.5	72.0 +j 118.1
3	15	0.55	+j5.0	42.6 +j 66.1	58.2 +j 77.4	56.4 +j79.5

Tower	Calculated $X_{OC}(\Omega)$
1	-j 7,368.3
2	-j 7,368.3
3	-j 7,368.3

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EXHIBIT II

WNYG MOM MODEL PARAMETERS

Tower #	Wire #	# of Segments	Base Node
1	1	12	1
2	2	12	13
3	3-6	16	25

Tower #	Physical Height Degrees	Modeled Height Degrees	Modeled Radius Meters	% of Equivalent Radius
1	97.5	106.0	.22	121.0
2	97.5	106.0	.20	110.0
3	68.4	74.3	.29	132.8

NOTES

- 1. ALL TOWERS ARE UNIFORM CROSS SECTION AND BASE INSULATED.
- 2. TOWERS 1 AND 2 ARE THREE SIDED WITH 15" FACE WIDTH. TOWER 3 IS THREE SIDED WITH 18" FACE WIDTH WITH GUY WIRE TOP-LOADING. GUY WIRE TOP-LOADING FOR TOWER 3 IS MODELED AS 94.5% OF ACTUAL LENGTH.
- 3. BASE INSULATORS FOR TOWERS 1 AND 2 ARE LAPP WITH AN ASSUMED CAPACITANCE OF 15 PF. TOWER 3 BASE INSULATOR IS AUSTIN A-4197L WITH AN ASSUMED CAPACITANCE OF 15 PF.
- 4. ALL TOWERS HAVE KTL STATIC DRAIN CHOKES. THESE MEASURE –J14,000 OHMS @ 1440 KHZ.
- 5. MEASURED EQUIVALENT SHUNT REACTANCE OF FILTER CIRCUIT AND CHOKE IS 218PF (-J507.0 OHMS @ 1440 KHZ)

EXHIBIT III

WNYG DERIVED OPERATING PARAMETERS

WNYG Calculated Night Parameters

Tower	Theoretical Field/Phase	Base Network Input Current	Normalized TCT Value Field/ Phase	
1 (S)	0.680/236.0°	0.58/-89.61°	0.302/-96.7°	
3 (N)	1.000/0.0°	1.92/7.04°	1.000/0.0°	

METHOD OF MOMENTS DETAIL

Although there are three towers on the WNYG site, only the two end towers are used for the nighttime directional operation. However, all three towers are included in the model. One wire was used to represent Towers 1 (S) and 2 (C). Four wires were used to represent Tower 3 (N) with the top-loading. Towers were driven individually to verify the Model compared to measured impedance data. Once the Model was verified, the night directional antenna system was computed. For the directional mode, 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.

EXHIBIT IV

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WNYG MOMENT MODELING

TOWER 1 GEOMETRY (others open) Wire coordinates in degrees; other dimensions in meters Environment: perfect ground wire caps Distance Angle Z radius seqs 1 none O 0 0 .22 12 0 0 107.5 2 none 54.7 350. 0 .2 12 54.7 350. 106. 3 none 109.4 350. 0 .29 10 109.4 350. 74.3 350. 4 none 109.4 74.3 .03 3 127.6 350. 57.1 350. 5 none 109.4 74.3 .03 3 358.93 101.5 57.1 6 none 109.4 350. 74.3 .03 3 101.5 341.07 57.1 Number of wires = 6 current nodes = 43 mínimum maximum Individual wires wire value wire value segment length 3 7.43 1 8.95833 radius 4 .03 3 .29 ELECTRICAL DESCRIPTION Frequencies (MHz) frequency no. of segment length (wavelengths) no. lowest steps minimum maximum step 1 1.44 0 1 .0248843 .0206389 Sources source node sector magnitude phase type 1 1 1 1. 0 voltage Lumped loads resistance inductance capacitance passive reactance load node (ohms) (ohms) (mH) (uF) circuit 13 1 0 -7,368.3 0 0 0 2 25 0 -7,368.3 0 0 0 IMPEDANCE normalization = 50. freq resist react imped phase VSWR S11S12 (MHz) (ohms) (ohms) (ohms) (deg) dB dB source = 1; node 1, sector 1 1.44 77.159 112.97 136.81 55.7 5.3112 -3.3103 -2.7297

CURRE	ENT rms						
Frequ	uency = 1	.44 MHz					
Input	power = .	00206125 w	atts				
Effic	ciency = 1	00. %					
coord	dinates in	dearees					
curre	ent	2		maq	phase	real	imaginary
no.	X	Y	7.	(amps)	(deg)	(amps)	(amps)
GND	0	0	0	5 17E-03	304 3	2 92E-03	-4 27F-03
2	0	0 0	8 92833	5.64E-03	300 0	2 200-03	-4.272 00
2	0	0	17 0167	5.045-03	200.9	2.095-03	-4.04E-03
2	0	0	26 075	5.055-03	290.9	2.026-03	-5.16-03
-4 E	0	0	20.070	5.052-03	297.4	2.7E-03	-5.19E-03
о С	0	0	35.8333	5.728-03	296.3	2.53E-03	-5.13E-03
6	U	0	44.7917	5.44E-03	295.3	2.32E-03	-4.92E-03
1	0	0	53.75	5.02E-03	294.4	2.08E-03	-4.57E-03
8	0	0	62.7083	4.47E-03	293.7	1.8E-03	-4.09E-03
9	0	0	71.6667	3.8E-03	293.	1.49E-03	-3.5E-03
10	0	0	80.625	3.03E-03	292.4	1.15E-03	-2.8E-03
11	0	0	89,5833	2.16E-03	291.8	8.01E-04	-2.E-03
12	0	0	98.5417	1.19E-03	291.2	4.3E-04	-1.11E-03
END	0	0	107.5	0	0	0	0
GND	53.869	9.49856	0	4.43E-05	194.5	-4.29E-05	-1.11E-05
14	53.869	9.49856	8.83333	3.12E-04	194.5	-3.02E-04	-7.81E-05
15	53.869	9.49856	17,6667	4.76E-04	194.5	-4.61E-04	-1.19E-04
16	53.869	9.49856	26.5	5.92E-04	194.5	~5 73E-04	-1.48F-04
17	53.869	9.49856	35,3333	6 67E-04	194 6	-6 46E-04	-1 685-04
18	53 869	9 49856	44 1667	7 055-04	194.0	-6 828-04	_1.00 <u>E</u> 04
10	53.869	0 10956	53	7.050-04	104 0	-6.02E-04	-1.796-04
20	53.000	0 40056	61 0000	6 718 04	105 1	-0.026-04	1 7 0 04
20	52.009	9,490J0 0 400EC	01.0333 70 6667	6.71E-04	195.1		-1./5E-04
21	53.009	9.49838	70.6667	6.04E-04	195.5	-5.8ZE-04	-1.616-04
22	53.869	9.49856	/9.5	5.05E-04	195.9	-4.85E-04	-1.38E-04
23	53.869	9.49856	88.3333	3.75E-04	196.4	-3.6E-04	-1.06E-04
24	53.869	9.49856	97.1667	2.14E-04	196.9	-2.05E-04	-6.22E-05
END	53,869	9.49856	106.	0	0	0	0
GND	107.738	18.9971	0	2.89E-05	145.2	-2.37E-05	1.65E-05
26	107.738	18.9971	7.43	2.09E-04	145.1	-1.72E-04	1.2E-04
27	107.738	18.9971	14.86	3.13E-04	145.	-2.56E-04	1.79E-04
28	107.738	18.9971	22.29	3.87E-04	144.9	-3.16E-04	2.22E-04
29	107.738	18.9971	29.72	4.37E-04	144.8	-3.57E-04	2.52E-04
30	107.738	18.9971	37.15	4.65E-04	144.7	-3.8E-04	2.69E-04
31	107.738	18.9971	44.58	4.74E-04	144.6	-3.86E-04	2.75E-04
32	107.738	18.9971	52,01	4.65E-04	144.5	-3.78E-04	2.7E - 04
33	107.738	18,9971	59.44	4.4E-04	144.5	-3.58E-04	2.56E-04
34	107.738	18,9971	66.87	4.04E-04	144.5	-3 28E-04	2 35E-04
.т.3	107.738	18,9971	74 3	3 61E-04	144 5	-2.94 E = 0.4	2.555 04
2.71	107 738	18 9971	74 3	1 16F-04	156 1	-1 06204	
36	112 713	20 0506	68 5667	0 16P-05	150.1	-1.00E-04	4.71 <u>0</u> -05
27	110 607	20.0000	60.0007	4 10E 05	103.0	-7.04E-05	2.895-05
	105 660	21.104	0Z.0000	4.105-05	103.4	-4.01E-05	1.28-05
GNU	123.002	22.15/5	57.1	0	U	U .	0
201	107.738	18.9971	/4.3	1.24E-04	139.1	-9.39E-05	8.13E-05
39	105.653	13.2966	68.5667	8.8E-05	137.9	-6.53E-05	5.9E-05
40	103.568	7.59598	62.8333	4.52E-05	136.4	-3.27E-05	3.11E-05
END	101.482	1.89542	57.1	0	0	0	0
2J1	107.738	18.9971	74.3	1.24E-04	139.1	-9.39E-05	8.13E-05
42	103.829	23.6407	68.5667	8.8E-05	137.9	-6.53E-05	5.9E-05
43	99.9196	28.2843	62.8333	4.52E-05	136.4	-3.27E-05	3.11E-05
END	96.0104	32.9279	57.1	0	0	0	0

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TOWER Wire Envire	2 GEC coordi onment	METRY nates : : perfe	(others in degre ect grou	open) es; othe nd	dimension	ns in met	ers		
		.	_		_				
wire	caps	Distand	ce A	ngle	Z	ra	dius	sec	gs
1	none	0	0		0	.2	2	12	2
		0	0	an pa	107.5	_			
2	none	54.7	3	50.	0	.2		12	2
		54./	3	50.	106.	_	_		_
3	none	109.4	3	50.	0	.2	9	1()
4		109.4	5	50.	74.3	0	2	-	
4	none	109.4	5	50.	/4.3	.0	3	3	
E		100 4	3	50.	1.10	0	~	~	
5	none	101 5	ა ი	50. E0 03	74.3	.0	3	3	
c		101.5	3	20.93	5/.1	0	2	~	
0	none	109.4	ວ ຈ	41 07	/4.3	.0	3	3	
		101.0	2	41.07	57.1				
Number	rofr	droe		- 6					
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	Ĺ	urrenc	nodes	- 40					
			70	inimum		T O	y i mum		
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Erecu	anciae	(MHa)	1100						
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no	lowest	4103	sten	ste	ns minim	ane render Mum	mavimum	ngu	157
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± .	4.11		0	÷.	+ 02.00	2020	.024004	5	
Source	20								
source	- node	SP(rtor ma	mitude	nhase		tuno		
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-	4.0	id.	•		v		vortage		
Lumped	d load	S							
t		resis	stance	reactar	re inc	luctance	canacita	nce	nassivo
load	node	(ohms	3)	(ohms)	(mF	1)	(nF)		circuit
1	1	0		-7.368	3 0	÷ /	(ur) N		0 0
2	25	Õ		-7.368	3 0		0		0
4	20	0		7,500.	5 0		U		0
TMPEDA	ANCE								
ימם יווב	-maliz	ation =	= 50						
frea	re	sist	react	imped	phase	VSWR	S11	S12)
(MHz)	10	hms)	(ohms)	(ohms)	(dea)	v Onix	dB	dR	•
source	,∵ ∋ = 1	; node	13, sect	tor 1	(~~9)		- ALP	чр	
1.44	72	.001	100.17	123.36	54.3	4.7095	-3.7457	-2.	3816

с. с. v.

CURREN	NT rms						
Freque	ency = 1	.44 MHz					
Input	power = $.0$	00236554 wa	ntts				
Effici	ency = 10	30 . %					
coordi	nates in d	degrees					
currer	nt			mag	phase	real	imaginary
no.	Х	Y	Z	(amps)	(deg)	(amps)	(amps)
GND	0	0	0	4.92E-05	195.8	-4.73E-05	-1.34E-05
2	0	0	8.95833	3.6E-04	195.8	-3.46E-04	-9.82E-05
3	0	0	17.9167	5.48E-04	195.9	-5.27E-04	-1.5E-04
4	0	0	26.875	6.82E-04	195.9	-6.56E-04	-1.87E-04
5	0	0	35.8333	7.68E-04	196.1	-7.38E-04	-2.13E-04
6	0	0	44.7917	8.11E-04	196.3	-7.78E-04	-2.27E-04
7	0	0	53.75	8.11E-04	196.5	-7.78E-04	-2.31E-04
8	0	0	62,7083	7.72E-04	196.9	-7.38E-04	-2.24E-04
9	0	0	71.6667	6 938-04	197 4	-6 62E-04	-2 078-04
10	0	0	80.625	5.79E-04	197 9	-5 51F-04	-1 78F-04
11	Ô	0	89 5833	4 3E-04	198 5	-4 08E-04	
12	õ	0	98 5417	2 45E-04	100.1	-2 328-04	-8.048-04
FND	0	0	107 5	0	199.1	-2.JZE-04	-0.046-03
GND	53 869	0 9 19856	107.5	5 70E-02	0 205 7	0 0 0 0 0 0 0 0 0	4 CEB 00
1 /	53 869	9.490J0 9.490J0	0 00000	6 17E-02	202.7	3.305-03	-4.05E-03
15	53 869	9.49050	17 6667	6 33E 03	200 7	3.32E-03	-J.ZE-03
16	53 860	9.49050	26 5	6 30E 03	200.7	3.236-03	~5.44E-03
17	53 060	9.49000	20.0 DE 0000	0.32E-03	299.4	3.1E~03	-5.51E-03
10	53,009	9.49000 0.400EC	30.3333	0.13E-03	290.2	2.91E-03	~5.41E-03
10	53.869	9.49856	44.100/	5.825-03	297.3	2.6/E-03	-5.17E-03
19	53.869	9.49856	53.	5.36E-03	296.5	2.398-03	-4.79E-03
20	53.869	9.49856	61.8333	4.76E-03	295.7	2.07E-03	-4.29E-03
21	53.869	9.49856	/0.666/	4.04E-03	295.1	1.71E-03	-3.66E-03
22	53.869	9.49856	/9.5	3.21E-03	294.4	1.33E-03	-2.92E-03
23	53.869	9.49856	88.3333	2.28E-03	293.8	9.22E-04	-2.09E-03
∠4	53.869	9.49856	97.1667	1.25E-03	293.3	4.94E-04	-1.15E-03
END	53.869	9.49856	106.	0	0	0	0
GND	107.738	18.9971	0	3.55E-05	196.8	-3.4E-05	-1.02E-05
26	107.738	18.9971	7.43	2.58E-04	196.7	-2.47E-04	-7.42E-05
27	107.738	18.9971	14.86	3.85E-04	196.7	-3.69E-04	-1.1E-04
28	107.738	18.9971	22.29	4.76E-04	196.6	-4.56E-04	-1.36E-04
29	107.738	18.9971	29.72	5.37E-04	196.6	-5.15E-04	-1.54E-04
30	107.738	18.9971	37.15	5.72E-04	196.6	-5.48E-04	-1.64E-04
31	107.738	18.9971	44.58	5.82E-04	196.7	-5.58E-04	-1.67E-04
32	107.738	18.9971	52.01	5.71E-04	196.8	-5.46E-04	-1.65E-04
33	107.738	18.9971	59.44	5.41E-04	196.9	-5.17E-04	-1.57E-04
34	107.738	18.9971	66.87	4.96E-04	197.	-4.74E-04	-1.45E-04
J3	107.738	18.9971	74.3	4.44E-04	196.9	-4.24E-04	-1.29E-04
2J1	107.738	18.9971	74.3	1.56E-04	217.2	-1.24E-04	-9.44E-05
36	113.713	20.0506	68.5667	1.13E-04	221.4	-8.48E-05	-7.46E-05
37	119.687	21.104	62.8333	6.E-05	226.1	-4.16E-05	-4.33E-05
END	125.662	22.1575	57.1	0	0	0	0
2J1	107.738	18.9971	74.3	1.51E-04	186.6	-1.5E-04	-1.74E-05
39	105.653	13.2966	68.5667	1.07E-04	184.	-1.07E-04	-7.41E-06
40	103.568	7.59598	62.8333	5.52E-05	181.1	-5.52E-05	-1.08E-06
END	101.482	1.89542	57.1	0	0	0	0
2J1	107.738	18.9971	74.3	1.51E-04	186.6	-1.5E-04	-1.74E-05
42	103.829	23.6407	68.5667	1.07E-04	184.	-1.07E-04	-7.41E-06
43	99.9196	28.2843	62,8333	5.52E-05	181.1	-5.52E-05	-1.08E-06
END	96.0104	32,9279	57.1	0	0	0	0
	÷ -			-	-	-	

TOWER	3 GE(OMETRY	(othe:	rs op	cen)								
Wire	coord:	inates	in dea	grees	s; o	ther	dime	nsior	ns ir	n mete	ers		
Envir	onment	t: perf	ect gi	round	đ								
wire	caps	Distan	ce	Ang	gle		Z			rad	dius	se	ys
1	none	0		0			0			. 22	2	12	2
_		0		0			10	6.					
2	none	54.7		35().		0			.2		1,	2
		54.7		350).		10	6.					
3	none	109.4		350).		0			.29	9	1()
		109.4		35().		74	.3					
4	none	109.4		350).		74	.3		.03	3	3	
_		127.6		350).		57	.1					
5	none	109.4		350).		74	.3		.03	3	3	
		101.5		358	3.93		57	• 1					
6	none	109.4		350).		74	.3		.03	3	3	
		101.5		341	L.07		57	.1					
NT}					~								
митре	rorv	vires			6								
	C	current	nodes	3 =	43								
						~							
India	idual	ut roe		utra arti	i.i.iiiui	u 				ma>	amum		
TUGTA	ruuar nt lor	wites	v	orre o		varue 7 AD				wire	varue		
radin	nu iei e	igen		.) A		N3 1140				1	0.000000		
Laulu				*1		.03				3	. 23		
ELECT	RTCAL	DESCRI	ΡΨΤΟΝ										
Freque	encies	(MH ₇)	11011										
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	freque	nev.				no (	٦F -	eormo	nt 1	onath		nath	
no.	lowest		step			sten	3 1	ninim	nitu il Nitu	enger	mavimum	nger	157
1	1.44		0			1		0206	389		024537		
			Ŭ			-		.0200	505		1024007		
Source	es												
source	e node	e sec	ctor	magn	nitu	de	D	hase			type		
1	25	1		1.			0				voltage		
							-				.010090		
Lumped	d load	ls											
-		resis	stance	2	read	ctance	è	ind	lucta	nce	capacita	nce	passive
load	node	(ohms	5)		(ohr	ns)		(mH	)		(uF)		circuit
1	1	0			-7,	368.3		0	*		0		0
2	13	0			-7,	368.3		0			0		Õ
													Ū.
IMPEDA	ANCE												
no:	rmaliz	ation =	= 50.										
freq	re	sist	react	1	impe	ed	phas	зе	VSW	R	S11	S12	
(MHz)	(c	hms)	(ohms	; )	(ohr	ns)	(dec	g)			dB	dB	
source	e = 1	; node	25, s	ecto	r 1								
1.44	42	.598	66.08	17	78.0	526	57.2	2	3.8	141	-4.6636	-1.	8158

CURREN	T rms						
Freque	ncy = 1.	44 MHz					
Input [	power = $.0$	0344531 wa [.] 0 %	tts				
ocordi	ency - iv						
CUEROR	naces In G +	egrees		m > 0	nhaeo	roal	imaginary
Curren	1 1.7	V	7	may (ampol	(dog)	(ompo)	(ampa)
HU.	A 0	1	<u>ь</u>		(deg)		(amps)
GND	0	0	0 0 0 0 0 0 0	4.96-05	143.0	-3.966-03	2.96-05
2	0	0	8.83333	3.555-04	143.7	~2.87E-04	Z.IE-04
3	0	0	1/.666/	5.4E-04	143./	-4.35E-04	3.2E-04
4	0	0	26.5	6.7E-04	143.6	-5.39E-04	3.98E-04
5	0	0	35.3333	7.54E-04	143.5	-6.06E-04	4.48E-04
6	0	0	44.1667	7.94E-04	143.4	-6.38E-04	4.73E-04
7	0	0	53.	7.93E-04	143.4	-6.37E-04	4.73E-04
8	0	0	61.8333	7.53E-04	143.4	-6.04E-04	4.49E-04
9	0	0	70.6667	6.76E-04	143.4	-5.43E-04	4.03E-04
10	0	0	79.5	5.64E-04	143.4	-4.53E-04	3.36E-04
11	0	0	88.3333	4.19E-04	143.4	-3.36E-04	2.5E-04
12	0	0	97.1667	2.39E-04	143.4	-1.92E-04	1.42E-04
END	0	0	106.	0	0	0	0
GND	53.869	9 49856	0	5.62E-05	193.7	-5.46E-05	-1.33E-05
1/1	53 869	9 49856	8 83333	3 965-04	194	-3.84E - 04	-9 6E-05
15	53.009	0 10056	17 6667	6 028-04	194 6	-5 97F-04	-1 528-04
4.5	53.000	9.49050 0.40056	26 5	7 465.04	105 2	-7 22 04	1 07E 04
17	53.009	9.49000	20.J DE 3333	0 200 04	106 0	-7.25-04	0 255 04
10	53.669	9,49856	33,3333	8.39E-04	190.2	-0.00E-04	-2.35%-04
19	53.869	9,49856	44.100/	8.83E~04	197.3	-8.43E-04	-2.635-04
19	53.869	9.49856	53.	8.81E-04	198.5	-8.36E-04	-2.8E-04
20	53.869	9.49856	61.8333	8.37E-04	199.9	-7.87E-04	-2.84E-04
21	53.869	9.49856	70.6667	7.51E-04	201.3	-7.E-04	-2.72E-04
22	53.869	9.49856	79.5	6.27E-04	202.6	-5.79E-04	-2.41E-04
23	53.869	9.49856	88.3333	4.65E-04	203.8	-4.26E-04	-1.88E-04
24	53.869	9.49856	97.1667	2.66E-04	204.8	-2.41E-04	-1.11E-04
END	53.869	9.49856	106.	0	0	0	0
GND	107.738	18.9971	0	8.99E-03	302.8	4.87E-03	-7.56E-03
26	107.738	18.9971	7.43	9.45E-03	300.8	4.84E-03	-8.12E-03
27	107.738	18.9971	14.86	9.59E-03	299.7	4.76E-03	-8.33E-03
28	107.738	18.9971	22.29	9.55E-03	298.9	4.62E-03	-8.36E-03
29	107.738	18,9971	29.72	9.34E-03	298.3	4.42E-03	-8.23E-03
30	107.738	18,9971	37.15	8 98E-03	297 7	4 18E-03	-7 95E-03
31	107 738	18 9971	44 58	8 5E-03	297 3	3 98-03	-7 55E-03
30	107 738	19 9971	52 01	7 92F-03	297.0	3 505-03	-7.05E-03
32	107 738	10.0071	50 44	7.275-03	206 8	3 208-03	-6 495-03
24	107.730	10.3371	66 97	6 610-03	290.0	2 078-02	-5.010-03
- 04 70	107.700	10.9971		6.01E-03	290.1	2.975-03	-3.91E-03
0.73	107.738	18.9971	74.3	6.UZEU3	290.0	2.725-03	-5.3/E-03
ZUI	107.738	18.9971	74.3	2.E-U3	296.7	8.99E-04	-1./9E-03
36	113.713	20.0506	68.566/	1.5E-03	297.1	6.85E-04	-1.34E-03
37	119.687	21.104	62,8333	8.26E-04	297.6	3.82E-04	-7.33E-04
END	125.662	22.1575	57,1	0	0	0	0
2J1	107.738	18.9971	74.3	2.01E-03	296.9	9.09E-04	-1.79E-03
39	105.653	13.2966	68.5667	1.51E-03	297.3	6.93E-04	-1.34E-03
40	103.568	7.59598	62.8333	8.31E-04	297.8	3.88E-04	-7.35E-04
END	101.482	1.89542	57.1	0	0	0	0
2J1	107.738	18.9971	74.3	2.01E-03	296.9	9.09E-04	-1.79E-03
42	103.829	23.6407	68.5667	1.51E-03	297.3	6.93E-04	-1.34E-03
43	99.9196	28.2843	62.8333	8.31E-04	297.8	3.88E-04	-7.35E-04
END	96,0104	32,9279	57.1	0	0	0	0

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#### MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

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> Frequency = 1.44 MHz field ratio magnitude tower phase (deg) 1 .68 236. 2 0 0 3 1. 0 VOLTAGES AND CURRENTS - rms source voltage current node magnitude phase (deg) magnitude phase (deg) 185.149 1 301.8 .862155 247.4 13 65.5753 314.5 .133749 50.3 25 142.828 70.6 1.92437 2.8 Sum of square of source currents = 8.92883 Total power = 196. watts TOWER ADMITTANCE MATRIX admittance real (mhos) imaginary (mhos) Y(1, 1).00316602 -.00551836 Y(1, 2).00185176 .00270123 Y(1, 3).00138102 .000360104 Y(2, 1).00185215 .00270111 Y(2, 2) .00174434 -.00559233 Y(2, 3) .00332813 .00230892 Y(3, 1).00138127 .000360581 Y(3, 2).002309 .00333302 Y(3, 3) .00494169 -.00915952 TOWER IMPEDANCE MATRIX impedance real (ohms) imaginary (ohms) Z(1, 1)73.1463 104.248 57.4458 Z(1, 2)-19.6693 Z(1, 3)14.8203 -36.5612 Z(2, 1)57.4454 -19.6706Z(2, 2)72.6771 101.103 Z(2, 3) 43.4529 -14.4116Z(3, 1)14.7942 -36.5399Z(3, 2)43.3992 -14.4334Z(3, 3)42.9194 66.1584

DIREC Wire	COORD	L GEOME inates	<u>TRY</u> in degr	ees; oth	ner di	mension	s in met	ers	
Envir	onmen	c: perr	ect gro	und					
wire 1	caps none	Distan 0	ce .	Angle O		Z O	ra .2	dius 2	segs 12
2	none	0 54.7		0 350.		106. 0	.2		12
3	none	54.7 109.4		350. 350. 350		106. 0 74 3	.2	9	10
4	none	109.4 109.4 127.6		350. 350.		74.3 74.3 57.1	.0	3	3
5	none	109.4 101.5		350. 358.93		74.3 57.1	.0	3	3
6	none	109.4 101.5		350. 341.07		74.3 57.1	. 0)	3	3
Numbe	r of w	wires current	nodes	= 6 = 43					
Indiv segme radiu	idual nt ler s	wires ngth	1 Wi 3 4	ninimum re va 7. .0	lue 43 )3		ma: wire 1 3	ximum value 8.83333 .29	
ELECT Frequ no. 1	RICAL encies freque lowest 1.44	DESCRI 3 (MHz) ency 5	PTION step 0	n s	no. of steps 1	segme minim .0206	nt lengtl um 389	n (wavele maximum .024537	ngths)
Sourc sourc 1 2	es e node 1 25	e se 1 1	ctor ma 21 21	agnitude 61.841 01.989	2	phase 301.8 70.6		type voltage voltage	
Lumpe	d load	is resi:	stance	react	ance	ind	uctance	capacita	nce passive
load l	node 13	(ohm) O	s)	(ohms 487.2	s) 15	(mH 0	)	(uF) 0	circuit 0
IMPED no freq (MHz) sourc	ANCE rmaliz re (c e = 1	ation = esist phms) ; node	= 50. react (ohms) 1, sect	imped (ohms tor 1	l p	hase deg)	VSWR	S11 dB	S12 dB
1.44	12	25.28	175.97	216.0	1 5	4.6	7.7187	-2.2633	-3.913
sourc 1.44	e = 2 28	2; node 3.3	25, sec 68.629	ctor 1 74.23	5 6	7.6	5.4788	-3.2067	-2.8224

CURRE Frequ Input Effic	INT rms lency = 1 power = 1 liency = 1	1.44 MHz 196. watts 100. %					
coord	linates in	dearees					
curre	ent			maq	phase	real	imaginary
no.	X	Y	7.	(amps)	(dea)	(amps)	(amps)
GND	0	0	0	.855377	247 2	- 330809	- 788819
2	0	Ō	8.83333	980329	241 9	- 461505	- 864904
3	õ	Õ	17.6667	1 04282	239.2	- 534512	- 895/17
4	Ő	Õ	26 5	1.04202	237 2	- 579031	- 999760
۰ ۲	0 0	0	25.2	1 06242	237.2	- 599674	090709
6	0	0	44 1667	1 02439	231 5	- 595081	- 022010
7	0	0	44.100/ 53	1.02439 056646	234.3	595081	- 7607
, 8	õ	0	61 8333	961	233.5	509440	7007
ğ	0	0	70 6667	730402	232.0	- 456045	003973
10	0	0	70.0007	50/16	231.0	400940	361407
11	0	0	88 3333 1712	.00410	201.2 000 E	- 2712000	-402744
12	0	0	97 1667	· 420047	200.0	- 160001	329354
FND	0	0	106	·200001	423.3	102221 0	101001
CND	53 860	9 19856	1001	124657	16	0026042	0000004
14	53 869	9.49050	0 03333	.134037	40.	.0936043	.0908024
15	53 960	9,49050	17 6667	.079952	40.7	.0558708	.0571909
16	53 869	9.49000	11.0001 26 6	.0443173	43.3	.0320973	.0308475
17	53.009	9.49050	20.0	- 01/2090	001 0	.UI43484	9,61E-03
10	52 060	9.49000	33.3333	7.03E-03	201.0	1.566-03	-/.4/E-03
10	53.009	9.49000	44.100/	.0218019	201.7	-6.85E-03	020699
7.2	53,009	9,49836		.0322601	249.1	0114958	0301423
20	53.009	9.49000 0.400EC	01.0000	.038112	249.8	013145	035//34
21	53.609	9.49856	70.6667	.0395872	251.3	0126596	03/5084
22	53.009	9.49856	79.5	.0368541	252.9	0108295	0352271
23	53.009	9.49856	07 1667	.0298972	204.1	-8.17E-03	0287594
24 END	53.009	9,49000	97.1007	+0184167	254.9	-4.8E-03	U1//804
CND	107 720	9.49850	106.	1 02000	0	01344	0
26	107.730	10,9971	U 10	1.92009	J. 1 7	1,91/44	.100812
20	107.730	10.99/1	1400	2.02127	1./	2.02038	.0599489
27	107.730	10.0071	14.00	2.05258	1.	2.05229	.0349707
20	107.730	10.3371	22.29	2.0442	-4	2.04414	.0152369
20	107,730	10.9971	29.72	2.00045	360.	2.00045	-3.29E-04
50	107.730	10.9971	37.15	1.92473	359.6	1.92469	0121457
20	107.730	10.9971	44.58	1.8212	359.4	1.82109	0204032
22	107.730	10,9971	52.01	1.69608	359.1	1.69589	0252306
27	107.730	10.99/1	59.44 66 07	1.00835	359.	1.55812	0267759
- 04 70	107,738	10.9971	00.07	1.41691	359.	1.41669	0252715
00	107.738	10.0071	74.3	1.28975	359.1	1.28957	0213275
201	1107.700	10.9971	74.3	.42617	358.9	.426088	-8.3/E-03
00 277	110.713	20.0506	68.566/	-319648	359.1	.319611	-4.81E-03
) ( 	119.687	21.104	62.8333	.1/5543	359.4	.1/5534	-1./4E-03
END 0.71	125.662	22,15/5	5/.1	0	0	0	0
201	107.738	18.9971	/4.3	.431797	359.1	.431749	-6.48E-03
39	105.653	13.2966	68.5667	.324624	359.4	.324608	-3.21E-03
40	103.568	/.59598	62.8333	.1/8754	359.7	.178752	-7.95E-04
END	101.482	1.89542	57.1	U	0	0	0
2U1	107.738	18.99/1	14.3	.431786	359.1	.431737	-6.48E-03
42	103.829	23.6407	68.5667	.324611	359.4	.324595	-3.21E-03
43 ENE	99.9196	28.2843	62.8333	.178747	359.7	,178745	-7.95E-04
сND	90.UIU4	36.9619	5/.1	U	υ	U	0

# EXHIBIT V TOWER BASE CIRCUIT ANALYSIS MODEL

### **CIRCUIT ANALYSIS**

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Circuit analysis was performed on each tower of the WNYG model. "Phasetek" nodal circuit analysis program was used to compute base model input/output voltages and currents. For the directional mode, the calculated Mininec tower base drive voltage was used to determine the base network input current. This point is the location of the sampling TCT. " $Z_1$ " represents the ATU shunt impedance, " $Z_2$ " represents the tower feed impedance, and " $Z_3$ " represents the tower base shunt impedance.



CHARLES A. HECHT & ASSOCIATES, INC. BROADCAST ENGINEERING CONSULTANTS

# EXHIBIT VI

# WNYG CIRCUIT ANALYSIS

#### BASE NETWORK COMPUTATION

NETWORK ID : TOWER 1 (OTHERS OPEN)

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FREQUENCY : 1440.00 kHz ATU SHUNT IMPEDANCE (R,X) : 0.00, -507.00 OHMS TOWER FEED IMPEDANCE (R,X) : 0.00, 6.00 OHMS TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7368.30 OHMS TOWER IMPEDANCE (R,X) : 77.20, 113.00 OHMS

NODE	ТО	NODE	IMPEDANCE R	(OHMS) X
1		GROUND	0.00	-507.00
2		GROUND	79.61	113.91
1		2	0.00	6.00

	VOLTAG	E
NODE	MAGNITUDE	PHASE
1 2	100.00 96.55	0.00 -1.37

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	131.04	130.11	184.66	44.80
INPUT CURRENT (AMPS) :	0.38	-0.38	0.54	-44.80
OUTPUT CURRENT (AMPS) :	0.38	-0.59	0.71	-57.03

INPUT/OUTPUT CURRENT RATIO = 0.7676 INPUT/OUTPUT PHASE = 12.23 DEGREES

#### BASE NETWORK COMPUTATION

NETWORK ID : TOWER 1 NIGHT

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FREQUENCY : 1440.00 kHz ATU SHUNT IMPEDANCE (R,X) : 0.00, -507.00 OHMS TOWER FEED IMPEDANCE (R,X) : 0.00, 6.00 OHMS TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7368.30 OHMS TOWER IMPEDANCE (R,X) : 125.28, 175.97 OHMS

NODE	TO	NODE	IMPEDANCE R	(OHMS) X
1		GROUND	0.00	-507.00
2		GROUND	131.45	177.99
1		2	0.00	6.00

	VOLTAGE	5
NODE	MAGNITUDE	PHASE
1	189.21	-57.30
2	185.15	301.80

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	277.82	175.73	328.73	32.31
INPUT CURRENT (AMPS) :	0.00	-0.58	0.58	-89.61
OUTPUT CURRENT (AMPS) :	-0.33	-0.79	0.86	-112.75

INPUT/OUTPUT CURRENT RATIO = 0.6715 INPUT/OUTPUT PHASE = 23.14 DEGREES

#### BASE NETWORK COMPUTATION

NETWORK ID : TOWER 2 (OTHERS OPEN)

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FREQUENCY : 1440.00 kHz ATU SHUNT IMPEDANCE (R,X) : 0.00,-14000.00 OHMS TOWER FEED IMPEDANCE (R,X) : 0.00, 17.00 OHMS TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7368.30 OHMS TOWER IMPEDANCE (R,X) : 72.00, 100.20 OHMS

			IMPEDANCE	(OHMS)
NODE	TO	NODE	R	Х
1		GROUND	0.00	-14000.00
2		GROUND	73.99	100.85
1		2	0.00	17.00

	VOLTAGE	
NODE	MAGNITUDE	PHASE
1	100.00	0.00
2	89.89	-4.14

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	75.25	118.45	140.33	57.57
INPUT CURRENT (AMPS) :	0.38	-0.60	0.71	-57.57
OUTPUT CURRENT (AMPS) :	0.38	-0.62	0.73	-58.44

INPUT/OUTPUT CURRENT RATIO = 0.9782 INPUT/OUTPUT PHASE = 0.87 DEGREES

#### BASE NETWORK COMPUTATION

NETWORK ID : TOWER 2 (OTHERS OPEN)

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> FREQUENCY : 1440.00 kHz ATU SHUNT IMPEDANCE (R,X) : 0.00, -14000.00 OHMS TOWER FEED IMPEDANCE (R,X) : 0.00, 17.00 OHMS TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7368.30 OHMS TOWER IMPEDANCE (R,X) : 72.00, 100.20 OHMS

			IMPEDANCE	(OHMS)
NODE	TO	NODE	R	Х
1.		GROUND	0.00	-14000.00
2		GROUND	73.99	100.85
1		2	0.00	17.00

	VOLTAGE	5
NODE	MAGNITUDE	PHASE
1	100.00	0.00
2	89.89	-4.14

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	75.25	118.45	140.33	57.57
INPUT CURRENT (AMPS) :	0.38	-0.60	0.71	-57.57
OUTPUT CURRENT (AMPS) :	0.38	-0.62	0.73	-58.44

INPUT/OUTPUT CURRENT RATIO = 0.9782 INPUT/OUTPUT PHASE = 0.87 DEGREES

### CHARLES A. HECHT & ASSOCIATES, INC. BROADCAST ENGINEERING CONSULTANTS

#### BASE NETWORK COMPUTATION

NETWORK ID : TOWER 3 (OTHERS OPEN)

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FREQUENCY : 1440.00 kHz ATU SHUNT IMPEDANCE (R,X) : 0.00, -507.00 OHMS TOWER FEED IMPEDANCE (R,X) : 0.00, 5.00 OHMS TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7368.30 OHMS TOWER IMPEDANCE (R,X) : 42.60, 66.10 OHMS

			IMPEDANCE	(OHMS)
NODE	TO	NODE	R	Х
1		GROUND	0.00	-507.00
2		GROUND	43.37	66.45
1		2	0.00	5.00

	VOLTAG	E
NODE	MAGNITUDE	PHASE
1	100.00	0.00
2	94.94	-1.87

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	58.19	77.37	96.81	53,05
INPUT CURRENT (AMPS) :	0.62	-0.83	1.03	-53.05
OUTPUT CURRENT (AMPS) :	0.62	-1.04	1.21	~59.07

INPUT/OUTPUT CURRENT RATIO = 0.8556 INPUT/OUTPUT PHASE = 6.02 DEGREES

# CHARLES A. HECHT & ASSOCIATES, INC. BROADCAST ENGINEERING CONSULTANTS

#### BASE NETWORK COMPUTATION

NETWORK ID : TOWER 3 NIGHT

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FREQUENCY : 1440.00 kHz ATU SHUNT IMPEDANCE (R,X) : 0.00, -507.00 OHMS TOWER FEED IMPEDANCE (R,X) : 0.00, 5.00 OHMS TOWER SHUNT IMPEDANCE (R,X) : 0.00, -7368.30 OHMS TOWER IMPEDANCE (R,X) : 28.30, 68.63 OHMS

NODE	TO	NODE	IMPEDANCE R	(OHMS) X
1		GROUND	0.00	-507.00
2		GROUND	28,83	69.16
1		2	0.00	5.00

	VOLTAGE				
NODE	MAGNITUDE	PHASE			
1	151.67	71.99			
2	142.83	70.60			

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	39.39	84.25	93.00	64,94
INPUT CURRENT (AMPS) :	1.62	0.20	1.63	7.04
OUTPUT CURRENT (AMPS) :	1.92	0.10	1.92	3.01

INPUT/OUTPUT CURRENT RATIO = 0.8477 INPUT/OUTPUT PHASE = 4.03 DEGREES

### FIELD STRENGTH MEASUREMENTS

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Reference field strength measurements were made using a Potomac Instruments FIM-41 field strength meter, serial number 2181, calibrated October 9, 2009. The meter was compared to a Potomac Instruments FIM-21, serial number 901, calibrated August 29, 2012 and found to be within manufacturer's specifications on all pertinent operating scales. Measurements were taken at three locations along each radial specified on the WNYG construction permit for the night pattern and on the major lobe radial of the pattern. The measured field strengths, descriptions, and GPS coordinates for the reference measurement points are shown below. All locations indicated are listed using NAD 27 datum.

49° Radial

Point No.	Dist. Km.	Latitude	Longitude	Time Local	Field mV/m	Point Description
1	1.85	40° 48' 25.4"	72° 58' 32.0"	1409	1.74	Mailbox 1045 Sipp Avenue
2	2.20	40° 48' 33.0"	72° 58' 21.2"	1415	1.19	In front 51 Matsunaye Drive
3	2.85	40° 48' 46.5"	72° 58' 00.1"	1421	0.81	70 Whitepine Way

170° Radial

Point No.	Dist. Km.	Latitude	Longitude	Time Local	Field mV/m	Point Description
1	0.94	40° 47' 16.5"	72° 59' 25.5"	1316	98	Across from 3 Patricia Road
2	2.88	40° 46' 14.4"	72° 59' 11.6"	1334	7.3	Mailbox 97 Hewlett Avenue
3	3.24	40° 46' 03.0"	72° 59' 08.2"	1341	9.0	SW corner Loews parking lot

Point No.	Dist. Km.	Latitude	Longitude	Time Local	Field mV/m	Point Description
1	1.52	40° 48' 04.1"	73° 00' 32.7"	1433	2.71	Mailbox 54 Southaven Ave.
2	1.95	40° 48' 09.2"	73° 00' 50.3"	1447	1.79	Storm drain opposite 26 Cedar Avenue
3	4.18	40° 48' 34.0"	73° 02' 19.4"	1509	0.40	Corporate Drive opposite SW corner Topaz Building

All measurements were conducted on June 20, 2015 by Kurt R. Gorman.

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#### SPECIAL OPERATING CONDITION 6

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In accordance with special operating condition 6 of the WNYG construction permit, spurious emissions measurements were conducted on WNYG and WLIM after construction was completed to demonstrate compliance with Section 73.44(d)(2) of the rules. A tabulation of the measurement data follows and documents the WNYG/WLIM diplex system is operating in compliance with Section 73.44(d)(2).

Filtering was installed and adjusted at all towers to prevent interaction and spurious radiation products. Filter circuits for towers 1 and 3 are located on the tower side of the sampling toroidal current transformers for both stations. The distributed capacity of the filter circuits in parallel with the static drain chokes was measured to be 218 pF (-j507 ohms @ 1440 kHz). This value is included in the circuit model for towers 1 and 3.

Although there was no significant change to the night directional operation of co-located station WLIM, a change was observed in the base impedance for the WLIM daytime non-directional operation. Accordingly, Form 302-AM is being filed for WLIM.

### ARRAY SURVEY

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A survey was made to confirm the WNYG towers were constructed within the authorized FCC tolerance of a circle with an 1.5 electrical degree radius per tower. The measured coordinates and results of the survey are provided below and demonstrate the array is well within FCC specifications. A copy of the signed and sealed survey follows.

Tower	Construction Permit Spacing°	Surveyed Spacing°	Construction Permit Bearing °T	Surveyed Bearing °T
1	Reference	Reference	Reference	Reference
2*	54.7	54.8	350.0	349.4
3	109.4	109.4	350.0	349.5

WNYG Array Survey Results

*Tower 2 is not used for the WNYG night directional operation, but the data is supplied for modeling purposes. Tower 3 serves as Tower 2 of the WNYG antenna system.

# PAUL BARYLSKI LICENSED LAND SURVEYING

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46 Terrell Street • Patchogue, New York 11772 • Tel (631) 294-6985 • Fax: (631) 627-3186 Email: paulbarylski@yahoo.com

JUNE 17, 2015

Pastor Erick Selgado WNYG(AM) 41 Pennsylvania Avenue Medford, NY 11763

As requested, we have performed a survey of the WNYG PROPERTY LOCATED ON THE CORNER OF PENNSYLVANIA AVENUE AND EAST WOODSIDE AVE. MEDFORD NY.

THE SOUTH TOWER SERVES AS A REFERENCE .

1. FROM THE SOUTH TOWER (#1) TO THE CENTER TOWER (#2) A NORTH AZIMUTH OF **349°23'14"** AND A DISTANCE OF **103.90'** FROM TRUE NORTH

2. FROM THE SOUTH TOWER (#1) TO THE NORTH TOWER (#3) A NORTH AZIMUTH OF **349°29'58''** AND A DISTANCE OF **207.58'** FROM TRUE NORTH

Paul Barylski, L.S. # 050782



# DAY MODE SPURIOUS RADIATION MEASUREMENTS WNYG 1440 KHZ 1 KW ND WLIM 1580 KHZ 10 KW ND

Frequency	Day Field	Attenuation (dB) relative to		
<u>khz</u>	<u>(mV/m)</u>	<u>WNYG</u>	<u>WLIM</u>	
1440	122			
1580	307			
1160	.025	73.7	81.8	
1300	.026	73.4	81.4	
1720	.024*	74.1	82.1	
1860	.012	80.1	88.1	
2740	<.010	>81.7	>89.7	
2880	<.010	>81.7	>89.7	
3020	.017	77.1	85.1	
3160	.015	78.2	86.2	
3300	<.010	>81.7	>89.7	
4320	<.010	>81.7	>89.7	
4460	<.010	>81.7	>89.7	
4600	.012	80.1	88.1	
4740	.018	76.6	84.6	

Measurements taken with Potomac Instruments, FIM-41, 0.94 km from the array on a bearing of 170.0° T. Point Coordinates (NAD27): N 40° 47' 16.5", W 72° 59' 25.5".

Measurements meet required day attenuation of 80 dB for WLIM and 73 dB for WNYG.

*Noise

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# NIGHT MODE SPURIOUS RADIATION MEASUREMENTS WNYG 1440 KHZ 0.196 KW DA WLIM 1580 KHZ 0.5 KW DA

Frequency	Night Field	Attenuation (dB) relative to		
<u>khz</u>	<u>(mV/m)</u>	WNYG	WLIM	
1440	98			
1580	163			
1160	.040*	67.8	72.2	
1300	<.010	>79.8	>84.2	
1720	.040*	67.8	72.2	
1860	<.010	>79.8	>84.2	
2740	<.010	>79.8	>84.2	
2880	<.010	>79.8	>84.2	
3020	.019	74.2	78.7	
3160	.020	73.8	78.2	
3300	<.010	>79.8	>84.2	
4320	<.010	>79.8	>84.2	
4460	<.010	>79.8	>84.2	
4600	<.010	>79.8	>84.2	
4740	.011	76.6	84.6	

Measurements taken with Potomac Instruments, FIM-41, 0.94 km from the array on a bearing of 170.0° T. Point Coordinates (NAD27): N 40° 47' 16.5", W 72° 59' 25.5".

Measurements meet required night attenuation of 70 db for WLIM and 65.9 for WNYG.

*Noise

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### **DECLARATION**

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The foregoing was prepared by or under the immediate supervision of Charles A. Hecht of Charles A. Hecht & Associates, Inc., Freehold, New Jersey, whose qualifications are a matter of record with the Federal Communications Commission. All statements herein are true and correct of his knowledge except such statements made on information and belief, and as to those statements, he believes them to be true and correct under the penalty of perjury.

Respectfully submitted,

/s/

Charles A. Hecht Charles A. Hecht & Associates, Inc. 19 Mackenzie Court Freehold, New Jersey 07728 (732) 577-0711 June 24, 2015

### **DECLARATION**

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The foregoing was prepared by or under the immediate supervision of Charles A. Hecht of Charles A. Hecht & Associates, Inc., Freehold, New Jersey, whose qualifications are a matter of record with the Federal Communications Commission. All statements herein are true and correct of his knowledge except such statements made on information and belief, and as to those statements, he believes them to be true and correct under the penalty of perjury.

Respectfully submitted,

/s/

Charles A. Hecht Charles A. Hecht & Associates, Inc. 19 Mackenzie Court Freehold, New Jersey 07728 (732) 577-0711 June 24, 2015