THOMPSON HINE
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6287

August 11, 2009

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

ORIGINAL

Re: Station WLQY(AM)
Hollywood, Florida
Facility ID No. 23609
Request for Modification of License
Stop Code 1800B2

FILED/ACCEPTED
AUG 11 2009
Federal Communications Commission
Office of the Secretary

Dear Ms. Dortch:

Transmitted herewith, in triplicate, on behalf of Entravision Holdings, LLC ("Entravision"), the licensee of Station WLQY(AM), Hollywood, Florida, is an application on FCC Form 302-AM. The application requests a modification of the Station's license reflecting revised operating parameters for the directional antenna employed by the Station, which result from modifications to the Station's operating facilities as a result of the replacement of antenna supporting structures and related elements of the Station's broadcast transmission system.

In that the instant application involves a method of moments showing, Entravision will pay the required application fees through the Commission's Fee Filer system upon issuance of a an application file number required for the Fee Filer system.

Should there be any questions in regard hereto, please communicate with the undersigned.

RECEIVED
2009 AUG 13 A 8:16
AUDIO SERVICES DIVISION

Respectfully submitted,

Barry A. Friedman

Enclosures

cc: Mr. Rick Santos (For Public Inspection)
Mr. Rick Hunt
Ms. Ann Gallagher, Audio Division, FCC Media Bureau

THOMPSON HINE LLP
ATTORNEYS AT LAW
1920 N Street, N.W.
Washington, D.C. 20036-1600
www.ThompsonHine.com
Phone 202.331.8800
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FILED/ACCEPTED

AUG 11 2009

Federal Communications Commission
Office of the Secretary

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO. BMML- 20090811 ACU

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)
Entravision Holdings, LLC

MAILING ADDRESS (Line 1) (Maximum 35 characters)
Suite 6000 West

MAILING ADDRESS (Line 2) (Maximum 35 characters)
2425 Olympic Boulevard

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
Santa Monica	CA	90404

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (if applicable)
310-447-3870	WLOY	FIN: 23609

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: 0001529627

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

(A) FEE TYPE CODE	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
	0 0 0 1	$	

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

(A)	(B)	(C)	FOR FCC USE ONLY
	0 0 0 1	$	

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	FOR FCC USE ONLY
	$	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Entravision Holdings LLC		
MAILING ADDRESS Suite 6000 West, 2425 Olympic Boulevard		
CITY Santa Monica	STATE CA	ZIP CODE 90404

2. This application is for:

☑ Commercial ☐ Noncommercial

☑ AM Directional ☐ AM Non-Directional

Call letters	Community of License	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
WLQY	Hollywood, FL			

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.
N/A

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.
N/A

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.
N/A

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

☐ Yes ☐ No

☑ Does not apply

If No, explain in an Exhibit.

Exhibit No.
N/A

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.
N/A

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.
N/A

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

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

CERTIFICATION

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

☑ Yes ☐ No

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

Name	Signature	
Walter F. Ulloa	[signature]	
Title	**Date**	**Telephone Number**
Chief Executive Officer	8/10/2009	310-447-3870

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
ENTRAVISION HOLDINGS, LLC

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 Night	Power in kilowatts Day
WLQY	N/A	1320	UNLIMITED	5	5

2. Station location

State	City or Town
FLORIDA	HOLLYWOOD

3. Transmitter location

State	County	City or Town	Street address (or other identification)
FL	BROWARD	HOLLYWOOD	9881 SHERIDAN STREET

4. Main studio location

State	County	City or Town	Street address (or other identification)
FL	DADE	N. MIAMI	10800 BISCAYNE BLVD-SUITE 810

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

State	County	City or Town	Street address (or other identification)
FL	DADE	N. MIAMI	10800 BISCAYNE BLVD-SUITE 810

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.
ITEM 11

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system	RF common point or antenna current (in amperes) without modulation for day system
10.39	10.39

Measured antenna or common point resistance (in ohms) at operating frequency Night	Day	Measured antenna or common point reactance (in ohms) at operating frequency Night	Day
50.0	50.0	-j8.0	-j8.0

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees Night	Day	Antenna monitor sample current ratio(s) Night	Day	Antenna base currents Night	Day
1	+107.0	0.0	0.997	1.000	-	-
2	-4.1	-96.6	0.784	0.643	-	-
3	+109.5	-	1.134	-	-	-
4	0.0	-	1.000	-	-	-

Manufacturer and type of antenna monitor: POTOMAC INSTRUMENTS AM-1901

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 height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
UNIFORM CROSS-SECTION, STEEL GUYED	60.6	62.7	63.7	Exhibit No. N/A

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		West Longitude	
North Latitude	26 ° 01 ' 53 "	West Longitude	80 ° 16 ' 42 "

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. N/A

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

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

N/A - No changes requiring a construction permit. Revised ground system description.

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
RONALD D. RACKLEY	[signature]
Address (include ZIP Code) DLR, INC. 201 FLETCHER AVENUE SARASOTA, FL 34237	Date 8/11/2009 Telephone No. (Include Area Code) 941-329-6000

☐ Technical Director

☑ Registered Professional Engineer

☐ Chief Operator

☐ Technical Consultant

☐ Other (specify)

APPLICATION FOR
DIRECT MEASUREMENT OF POWER
INFORMATION
RADIO STATION WLQY
HOLLYWOOD, FLORIDA

August 11, 2009

1320 KHZ 5 KW U DA-2

APPLICATION FOR
DIRECT MEASUREMENT OF POWER
INFORMATION
RADIO STATION WLQY
HOLLYWOOD, FLORIDA

1320 KHZ 5 KW U DA-2

Executive Summary - WLQY

This engineering exhibit supports an application for Direct Measurement of Power (requesting modification of the station license to specify new antenna monitor operating parameters) for the newly refurbished directional antenna system of radio station WLQY in Hollywood, Florida. WLQY operates fulltime on 1320 kilohertz with 5.0 kilowatts nominal power, using different directional antenna patterns day and night.

The WLQY towers and ground system have been replaced, new antenna tuning units have been installed in weatherproof enclosures at the tower bases, new transmission lines and sampling lines have been installed between the transmitter building and the tower bases, and the RF networks within the phasing system cabinet have been reconfigured to work with the phase shifts of the new antenna tuning units and transmission lines. No changes requiring a construction permit were made.

It is proposed that the numbering of the towers be revised to remove the reference to a formerly used tower that no longer exists. The details about the proposed numbering scheme are provided elsewhere herein.

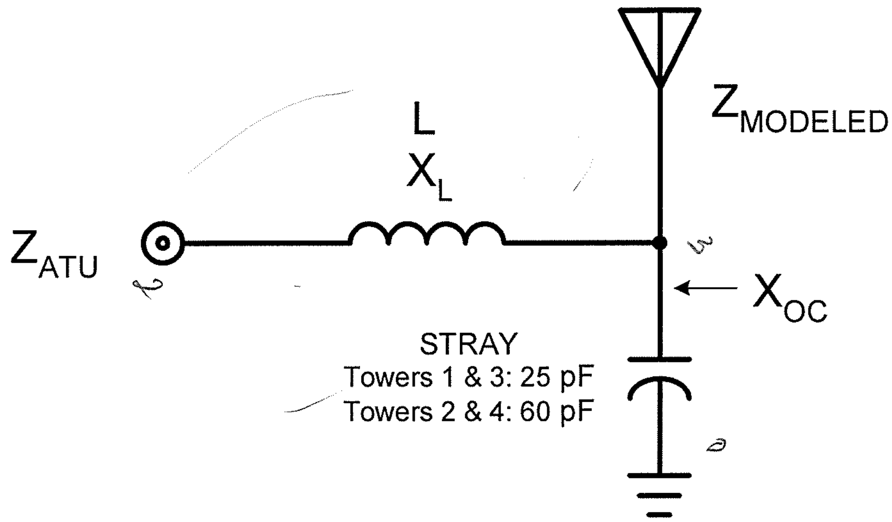
The elevated "counterpoise" portions of the ground system immediately surrounding the tower bases described on the present station license are no longer employed. To reflect this and further describe the characteristics of the newly installed ground system for the new license, the following description is provided:

"The ground system consists of 120 equally spaced, buried, copper wire radials 186 feet in length except where intersecting radials are shortened and bonded to transverse copper straps midway between adjacent towers or where they are shortened and bonded to perimeter copper straps that surround buildings on the transmitter site property. In addition, 120 buried copper wire radials 50 feet in length are interspersed with the longer radials surrounding each tower base."

Information is provided herein demonstrating that the directional antenna parameters for both the daytime and nighttime patterns have been determined in accordance with the requirements of section 73.151(c) of the FCC Rules. The system has been adjusted to produce antenna monitor parameters within +/- 5 percent in ratio and +/- 3 degrees in phase of the modeled values, as required by the Rules.

Ronald D. Rackley

Ronald D. Rackley, P.E.
August 11, 2009



TOWER	L(uH)	X_L	X_{OC}	$Z_{MODELED}$	$Z_{ATU\ (MODELED)}$	$Z_{ATU\ (MEASURED)}$
1	3.706	+j30.7	-j4823	62.8 +j82.0	65.0 +j113.3	64.8 +j113.3
2	5.582	+j46.3	-j2009	66.2 +j91.0	72.5 +j139.2	72.9 +j139.1
3	5.305	+j44.0	-j4823	60.1 +j80.7	62.2 +j125.3	61.6 +j125.3
4	4.075	+j33.8	-j2009	65.1 +j83.8	70.8 +j118.9	70.7 +j118.9

ANALYSIS OF TOWER IMPEDANCE MEASUREMENTS TO VERIFY METHOD OF MOMENTS MODEL

Shut Capacitor

RADIO STATION WLQY
HOLLYWOOD, FLORIDA
1320 KHZ 5 KW U DA-2

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Tower 1

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY1OC.CIR

I	1.0000	0	1	0.0000	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.7060	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	62.7700	3	0	82.0300	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	131.1190	59.8030
2	130.6189	60.1821
3	105.0688	51.8179

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
VSWR			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1.00	0.000	1.00	0.000	65.95	113.33	64.95	113.33
L	2- 3	3.706	30.74	90.000	1.00	0.000	64.95	113.33	64.95	82.59
C	3- 0	0.000	105.07	51.818	0.02	141.818	0.00	-4822.88	0.00	-4822.88
R	3- 0	62.770	105.07	51.818	1.02	-0.759	62.77	82.03	62.77	82.03

Tower 2

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY2OC.CIR

I	1.0000	0	1	0.0000	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	5.5820	2	3	0.0000	0.0000	0.0000
C	0.0001	3	0	0.0000	0.0000	0.0000
R	66.1500	3	0	91.0400	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	157.3706	62.1607
2	156.9061	62.4836
3	117.8051	52.0229

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
VSWR			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1.00	0.000	1.00	0.000	73.49	139.16	72.49	139.16
L	2- 3	5.582	46.30	90.000	1.00	0.000	72.49	139.16	72.49	92.86
C	3- 0	0.000	117.81	52.023	0.06	142.023	0.00	-2009.53	0.00	-2009.53
R	3- 0	66.150	117.81	52.023	1.05	-1.975	66.15	91.04	66.15	91.04

Tower 3

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY3OC.CIR

I	1.0000	0	1	0.0000	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	5.3050	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	60.1000	3	0	80.7400	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	140.3386	63.2556
2	139.8915	63.6213
3	102.3582	52.6112

				BRANCH VOLTAGE MAG	BRANCH VOLTAGE PHASE	BRANCH CURRENT MAG	BRANCH CURRENT PHASE	FROM NODE IMPEDANCE RESISTANCE	FROM NODE IMPEDANCE REACTANCE	TO NODE IMPEDANCE RESISTANCE	TO NODE IMPEDANCE REACTANCE
VSWR											
R	1-	2	1.000	1.00	0.000	1.00	0.000	63.15	125.33	62.15	125.33
L	2-	3	5.305	44.00	90.000	1.00	0.000	62.15	125.33	62.15	81.33
C	3-	0	0.000	102.36	52.611	0.02	142.611	0.00	-4822.88	0.00	-4822.88
R	3-	0	60.100	102.36	52.611	1.02	-0.726	60.10	80.74	60.10	80.74

Tower 4

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY4OC.CIR

I	1.0000	0	1	0.0000	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	4.0750	2	3	0.0000	0.0000	0.0000
C	0.0001	3	0	0.0000	0.0000	0.0000
R	65.0900	3	0	83.8100	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	138.8635	58.8661
2	138.3491	59.2206
3	110.6722	50.2299

				BRANCH VOLTAGE MAG	BRANCH VOLTAGE PHASE	BRANCH CURRENT MAG	BRANCH CURRENT PHASE	FROM NODE IMPEDANCE RESISTANCE	FROM NODE IMPEDANCE REACTANCE	TO NODE IMPEDANCE RESISTANCE	TO NODE IMPEDANCE REACTANCE
VSWR											
R	1-	2	1.000	1.00	0.000	1.00	0.000	71.80	118.86	70.80	118.86
L	2-	3	4.075	33.80	90.000	1.00	0.000	70.80	118.86	70.80	85.06
C	3-	0	0.000	110.67	50.230	0.06	140.230	0.00	-2009.53	0.00	-2009.53
R	3-	0	65.090	110.67	50.230	1.04	-1.936	65.09	83.81	65.09	83.81

Derivation of Operating Parameters for Daytime Directional Antenna - WLQY

The method of moments model of the array, following verification with the measured individual open circuited base impedances, was utilized for directional antenna calculations. Calculations were made to determine the complex voltage values for sources located at ground level under each tower of the array to produce current moment sums for the towers that, when normalized, equated to the theoretical field parameters of the authorized directional antenna pattern. With these voltage sources, the tower currents were calculated. The currents at the ATU outputs, where the antenna monitor samples are taken, were calculated from the method of moments tower currents for directional antenna operation using WCAP circuit modeling with the assumptions that were derived from the single tower measurements on the array and the method of moments calculated tower operating impedances. In each of the following WCAP tabulations, node 2 represents the ATU output reference point and node 3 represents the tower feedpoint. Node 0 represents ground potential. The tower operating impedances are represented by complex loads from node 3 to ground (R 3 - 0). It should be noted that the calculated ATU output current magnitudes and phases appear in the first and fourth columns following the drive current sources (I 0 - 1)), and that all currents and voltages have been scaled upward by a factor of 100 to preserve more significant digits in the tabulations. As the current transformers and sampling lines are identical, the antenna monitor ratios and phases corresponding to the theoretical parameters were calculated directly from the modeled ATU currents.

TOWER	Modeled Current Pulse	Current Magnitude @ Toroid (amperes)	Current Phase @ Toroid (degrees)	Antenna Monitor Ratio	Antenna Monitor Phase (degrees)
1	1	7.470	4.6	1.000	0.0
2	11	4.804	-92.0	0.643	-96.6

Tower 1

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY1DAD.CIR

I	746.9600	0	1	4.6400	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.7060	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	36.9200	3	0	66.0700	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	78376.5000	72.8495
2	78102.2969	73.3583
3	57317.7422	64.9988

				BRANCH VOLTAGE MAG	PHASE	BRANCH CURRENT MAG	PHASE	FROM NODE IMPEDANCE RESISTANCE	REACTANCE	TO NODE IMPEDANCE RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	746.96	4.640	746.96	4.640	38.95	97.43	37.95	97.43
L	2-	3	3.706	22959.19	94.640	746.96	4.640	37.95	97.43	37.95	66.69
C	3-	0	0.000	57317.74	64.999	11.88	154.999	0.00	-4822.88	0.00	-4822.88
R	3-	0	36.920	57317.74	64.999	757.31	4.195	36.92	66.07	36.92	66.07

Tower 2

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY2DAD.CIR

I	480.3800	0	1	-91.9800	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	5.5820	2	3	0.0000	0.0000	0.0000
C	0.0001	3	0	0.0000	0.0000	0.0000
R	108.4500	3	0	140.2000	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	109399.2500	-35.5439
2	109134.3984	-35.3338
3	91379.5703	-43.0236

				BRANCH VOLTAGE MAG	PHASE	BRANCH CURRENT MAG	PHASE	FROM NODE IMPEDANCE RESISTANCE	REACTANCE	TO NODE IMPEDANCE RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	480.38	-91.980	480.38	-91.980	125.91	189.76	124.91	189.76
L	2-	3	5.582	22239.67	-1.980	480.38	-91.980	124.91	189.76	124.91	143.47
C	3-	0	0.000	91379.57	-43.024	45.47	46.976	0.00	-2009.53	0.00	-2009.53
R	3-	0	108.450	91379.57	-43.024	515.54	-95.300	108.45	140.20	108.45	140.20

Derivation of Operating Parameters for Nighttime Directional Antenna - WLQY

The method of moments model of the array, following verification with the measured individual open circuited base impedances, was utilized for directional antenna calculations. Calculations were made to determine the complex voltage values for sources located at ground level under each tower of the array to produce current moment sums for the towers that, when normalized, equated to the theoretical field parameters of the authorized directional antenna pattern. With these voltage sources, the tower currents were calculated. The currents at the ATU outputs, where the antenna monitor samples are taken, were calculated from the method of moments tower currents for directional antenna operation using WCAP circuit modeling with the assumptions that were derived from the single tower measurements on the array and the method of moments calculated tower operating impedances. In each of the following WCAP tabulations, node 2 represents the ATU output reference point and node 3 represents the tower feedpoint. Node 0 represents ground potential. The tower operating impedances are represented by complex loads from node 3 to ground (R 3 - 0). It should be noted that the calculated ATU output current magnitudes and phases appear in the first and fourth columns following the drive current sources (I 0 -1)), and that all currents and voltages have been scaled upward by a factor of 100 to preserve more significant digits in the tabulations. As the current transformers and sampling lines are identical, the antenna monitor ratios and phases corresponding to the theoretical parameters were calculated directly from the modeled ATU currents.

TOWER	Modeled Current Pulse	Current Magnitude @ Toroid (amperes)	Current Phase @ Toroid (degrees)	Antenna Monitor Ratio	Antenna Monitor Phase (degrees)
1	1	5.915	115.6	0.997	107.0
2	11	4.650	4.5	0.784	-4.1
3	21	6.728	118.1	1.134	109.5
4	31	5.933	8.6	1.000	0.0

Tower 1

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY1DAN.CIR

I	591.4500	0	1	115.6300	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.7060	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	27.7500	3	0	60.9400	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	57299.6133	-172.0757
2	57122.5195	-171.5105
3	40110.0898	-179.1868

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	591.45	115.630	591.45	115.630	29.46	92.29	28.46	92.29
L	2-	3	3.706	18179.30	-154.370	591.45	115.630	28.46	92.29	28.46	61.55
C	3-	0	0.000	40110.09	-179.187	8.32	-89.187	0.00	-4822.88	0.00	-4822.88
R	3-	0	27.750	40110.09	-179.187	599.01	115.296	27.75	60.94	27.75	60.94

Tower 2

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY2DAN.CIR

I	464.9600	0	1	4.5100	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	5.5820	2	3	0.0000	0.0000	0.0000
C	0.0001	3	0	0.0000	0.0000	0.0000
R	98.0300	3	0	145.3600	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	105974.8906	64.3245
2	105741.8672	64.5423
3	87755.1484	57.5043

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	464.96	4.510	464.96	4.510	114.60	197.02	113.60	197.02
L	2-	3	5.582	21525.79	94.510	464.96	4.510	113.60	197.02	113.60	150.72
C	3-	0	0.000	87755.15	57.504	43.67	147.504	0.00	-2009.53	0.00	-2009.53
R	3-	0	98.030	87755.15	57.504	500.52	1.500	98.03	145.36	98.03	145.36

Tower 3

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY3DAN.CIR

I	672.8300	0	1	118.1200	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	5.3050	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	18.5100	3	0	49.6500	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	64707.7383	-163.8199
2	64571.8945	-163.2359
3	36022.5859	-172.5481

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
VSWR			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	672.83	118.120	672.83	118.120	19.90	94.09	18.90	94.09
L	2- 3	5.305	29603.60	-151.880	672.83	118.120	18.90	94.09	18.90	50.09
C	3- 0	0.000	36022.59	-172.548	7.47	-82.548	0.00	-4822.88	0.00	-4822.88
R	3- 0	18.510	36022.59	-172.548	679.82	117.898	18.51	49.65	18.51	49.65

Tower 4

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = WLQY4DAN.CIR

I	593.2800	0	1	8.5600	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	4.0750	2	3	0.0000	0.0000	0.0000
C	0.0001	3	0	0.0000	0.0000	0.0000
R	62.5100	3	0	88.0900	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 1.320

NODE	VOLT MAG	VOLT PHASE
1	84122.8828	69.3018
2	83834.5156	69.6555
3	66985.9531	61.3366

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
VSWR			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	593.28	8.561	593.28	8.561	69.30	123.70	68.30	123.70
L	2- 3	4.075	20051.23	98.560	593.28	8.560	68.30	123.70	68.30	89.91
C	3- 0	0.000	66985.95	61.337	33.33	151.337	0.00	-2009.53	0.00	-2009.53
R	3- 0	62.510	66985.95	61.337	620.15	6.697	62.51	88.09	62.51	88.09

Method of Moments Model Details for Towers Driven Individually – WLQY

The array of towers was modeled using Expert MININEC Broadcast Professional Version 14.5. One wire was used to represent each tower. The top and bottom wire end points were specified using meters in the Cartesian coordinate system, as converted from the theoretical directional antenna specifications taking into account the carrier frequency wavelength. Each tower was modeled using 10 wire segments. As the towers are physically 96.0 degrees in electrical height, the segment length is 9.6 electrical degrees.

The individual tower characteristics were adjusted to provide a match of their modeled impedances, when presented to a circuit model which included branches representing the stray capacitances and feedline hookup inductances with the base impedances that were measured at the output jacks of the Antenna Tuning Units while the other towers of the array were open circuited. The method of moments model assumed loads at ground level having the reactances that were calculated for them using the base circuit models for the open circuited towers of the array.

Each tower's modeled height relative to its physical height falls within the required range of 75 to 125 percent and each modeled radius falls within the required range of 80 percent to 150 percent of the radius of a circle having a circumference equal to the sum of the widths of the tower sides. The array consists of identical, uniform cross section towers having a face width of 18 inches.

TOWER	Physical Height (meters)	Modeled Height (meters)	Modeled Percent of Height	Modeled Radius (meters)	Percent Equivalent Radius
1	60.6	64.5	106.4	0.29	133
2	60.6	65.2	107.6	0.29	133
3	60.6	64	105.6	0.29	133
4	60.6	64.7	106.8	0.29	133

The following pages show the details of the method of moments models for the individually driven towers. The numerals in the file names shown on the tabulations correspond to the tower numbers.

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IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1,320.	62.765	82.034	103.29	52.6	3.9427	-4.5044	-1.9007

GEOMETRY
Dimensions in meters
Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	0	0	0	.29	10
		0	0	64.5 101.4		
2	none	-24.	51.46	0	.29	10
		-24.	51.46	65.2 102.6		
3	none	-98.35	56.78	0	.29	10
		-98.35	56.78	64. 100.71		
4	none	-122.33	108.23	0	.29	10
		-122.33	108.23	64.7 101.81		

Number of wires = 4
current nodes = 40

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	6.4	2	6.52
segment/radius ratio	3	22.069	2	22.4828
radius	1	.29	1	.29

ELECTRICAL DESCRIPTION
Frequencies (KHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1,320.	0	1	.0281788	.0287071

Sources

source	node	sector	magnitude	phase	type
1	1	1	1,000.	0	voltage

Lumped loads

passive circuit load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	
1	11	0	-2,009.	0	0	0
2	21	0	-4,823.	0	0	0
3	31	0	-2,009.	0	0	0

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IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 11, sector 1							
1,320.	66.147	91.043	112.54	54.	4.3554	-4.061	-2.165

GEOMETRY
Dimensions in meters
Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	0	0	0	.29	10
		0	0	64.5		
2	none	-24.	51.46	0	.29	10
		-24.	51.46	65.2		
3	none	-98.35	56.78	0	.29	10
		-98.35	56.78	64.		
4	none	-122.33	108.23	0	.29	10
		-122.33	108.23	64.7		

Number of wires = 4
current nodes = 40

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	6.4	2	6.52
segment/radius ratio	3	22.069	2	22.4828
radius	1	.29	1	.29

ELECTRICAL DESCRIPTION
Frequencies (KHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1,320.	0	1	.0281788	.0287071

Sources

source	node	sector	magnitude	phase	type
1	11	1	1,000.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-4,823.	0	0	0
2	21	0	-4,823.	0	0	0
3	31	0	-2,009.	0	0	0

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IMPEDANCE

normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 21, sector 1							
1,320.	60.104	80.741	100.66	53.3	3.9501	-4.4956	-1.9056

GEOMETRY

Dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	0	0	0	.29	10
		0	0	64.5		
2	none	-24.	51.46	0	.29	10
		-24.	51.46	65.2		
3	none	-98.35	56.78	0	.29	10
		-98.35	56.78	64.		
4	none	-122.33	108.23	0	.29	10
		-122.33	108.23	64.7		

Number of wires = 4

current nodes = 40

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	6.4	2	6.52
segment/radius ratio	3	22.069	2	22.4828
radius	1	.29	1	.29

ELECTRICAL DESCRIPTION

Frequencies (KHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1,320.	0	1	.0281788	.0287071

Sources

source	node	sector	magnitude	phase	type
1	21	1	1,000.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-4,823.	0	0	0
2	11	0	-2,009.	0	0	0
3	31	0	-2,009.	0	0	0

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IMPEDANCE

normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 31, sector 1							
1,320.	65.094	83.814	106.12	52.2	3.9769	-4.4639	-1.9231

GEOMETRY

Dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	0	0	0	.29	10
		0	0	64.5		
2	none	-24.	51.46	0	.29	10
		-24.	51.46	65.2		
3	none	-98.35	56.78	0	.29	10
		-98.35	56.78	64.		
4	none	-122.33	108.23	0	.29	10
		-122.33	108.23	64.7		

Number of wires = 4

current nodes = 40

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	6.4	2	6.52
segment/radius ratio	3	22.069	2	22.4828
radius	1	.29	1	.29

ELECTRICAL DESCRIPTION

Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,320.	0	1	.0281788	.0287071

Sources

source	node	sector	magnitude	phase	type
1	31	1	1,000.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-4,823.	0	0	0
2	11	0	-2,009.	0	0	0
3	21	0	-4,823.	0	0	0

Method of Moments Model Details for Daytime Directional Antenna- WLQY

The array of towers was modeled using Expert MININEC Broadcast Professional Version 14.5 with the individual towers characteristics that were verified by the individual tower impedance measurements. Calculations were made to determine the complex voltage values for sources located at ground level under each tower of the array to produce current moment sums for the towers that, when normalized, equated to the theoretical field parameters of the authorized directional antenna pattern. The following pages contain details of the method of moments model of the directional antenna pattern.

Towers 3 and 4 of the array, which are not used by the daytime pattern, were detuned by terminating Tower 3 with the load reactance, +j359 ohms, shown at its base (node 21) and Tower 4 with the load reactance, +j326 ohms, shown at its base (node 31)in the tabulation. This value is the opposite sign reactance of the method of moments modeled operating impedance for the directional antenna with a field ratio 0.0 specified for tower 3 and 4.

Tower	Wire	Base Node
1	1	1
2	2	11

It should be noted that voltages and currents shown on the tabulations that are not specified as “rms” values are the corresponding peak values.

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MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1320 KHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	.8	-106.3
3	.001	0
4	.001	0

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	575.278	65.	7.59719	4.3
11	917.086	317.	5.14872	264.3
21	331.792	220.6	.75991	310.7
31	269.762	156.3	.62045	245.8

Sum of square of source currents = 170.378

Total power = 5,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00557881	-.00619035
Y(1, 2)	.00330512	.00202224
Y(1, 3)	.00163719	-.000574913
Y(1, 4)	-2.8027E-05	-.00035852
Y(2, 1)	.00330516	.00202215
Y(2, 2)	.0052379	-.00469717
Y(2, 3)	.0036071	.00168205
Y(2, 4)	.00143955	-.000546274
Y(3, 1)	.0016372	-.000574894
Y(3, 2)	.00360706	.00168219
Y(3, 3)	.00593542	-.00510589
Y(3, 4)	.00340628	.00216758
Y(4, 1)	-2.8019E-05	-.000358537
Y(4, 2)	.00143957	-.000546258
Y(4, 3)	.00340632	.00216748
Y(4, 4)	.00537476	-.00607788

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	64.0191	82.0751
Z(1, 2)	31.8771	-33.1959
Z(1, 3)	-18.8713	-21.1464
Z(1, 4)	-21.7948	13.1954
Z(2, 1)	31.878	-33.1953
Z(2, 2)	66.2898	90.7983
Z(2, 3)	11.0559	-32.3658
Z(2, 4)	-19.8101	-21.9765
Z(3, 1)	-18.8714	-21.1462
Z(3, 2)	11.0547	-32.3661
Z(3, 3)	61.3176	80.2008
Z(3, 4)	31.1738	-31.8806
Z(4, 1)	-21.7948	13.1953
Z(4, 2)	-19.8103	-21.9762
Z(4, 3)	31.1748	-31.88
Z(4, 4)	65.1861	83.8337

GEOMETRY
Dimensions in meters
Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	0	0	0	.29	10
		0	0	64.5		
2	none	-24.	51.46	0	.29	10
		-24.	51.46	65.2		
3	none	-98.35	56.78	0	.29	10
		-98.35	56.78	64.		
4	none	-122.33	108.23	0	.29	10
		-122.33	108.23	64.7		

Number of wires = 4
current nodes = 40

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	6.4	2	6.52
segment/radius ratio	3	22.069	2	22.4828
radius	1	.29	1	.29

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,320.	0	1	.0281788	.0287071

Sources

source	node	sector	magnitude	phase	type
1	1	1	813.566	65.	voltage
2	11	1	1,296.96	317.	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	21	0	359.	0	0	0
2	31	0	326.	0	0	0

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IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1,320.	36.924	66.071	75.689	60.8	4.2201	-4.1961	-2.0798
source = 2; node 11, sector 1							
1,320.	108.45	140.2	177.25	52.3	6.0905	-2.8783	-3.1464

CURRENT rms
Frequency = 1320 KHz
Input power = 5,000. watts
Efficiency = 100. %
coordinates in meters

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	7.57305	4.2	7.55272	.554506
2	0	0	6.45	7.98286	2.2	7.97692	.307787
3	0	0	12.9	8.00971	1.1	8.00835	.147657
4	0	0	19.35	7.76651	.2	7.76648	.0222676
5	0	0	25.8	7.27472	359.4	7.27435	-.0729049
6	0	0	32.25	6.553	358.8	6.55153	-.138626
7	0	0	38.7	5.62192	358.2	5.6192	-.174684
8	0	0	45.15	4.50362	357.7	4.49999	-.180725
9	0	0	51.6	3.21832	357.2	3.21452	-.15635
10	0	0	58.05	1.77291	356.8	1.77006	-.100489
END	0	0	64.5	0	0	0	0
GND	-24.	51.46	0	5.15535	264.7	-.474019	-5.13351
12	-24.	51.46	6.52	5.84027	259.3	-1.08893	-5.73785
13	-24.	51.46	13.04	6.11239	256.4	-1.43221	-5.94223
14	-24.	51.46	19.56	6.12022	254.5	-1.63965	-5.8965
15	-24.	51.46	26.08	5.88305	252.9	-1.72658	-5.62398
16	-24.	51.46	32.6	5.41522	251.7	-1.70009	-5.14143
17	-24.	51.46	39.12	4.73252	250.7	-1.56606	-4.46589
18	-24.	51.46	45.64	3.85277	249.8	-1.3307	-3.61567
19	-24.	51.46	52.16	2.79286	249.	-1.00004	-2.60767
20	-24.	51.46	58.68	1.55844	248.3	-.575919	-1.44812
END	-24.	51.46	65.2	0	0	0	0
GND	-98.35	56.78	0	.908093	312.	.607363	-.675087
22	-98.35	56.78	6.4	.57656	312.	.385786	-.428475
23	-98.35	56.78	12.8	.358761	312.1	.240587	-.266135
24	-98.35	56.78	19.2	.184857	312.5	.125	-.136188
25	-98.35	56.78	25.6	.0485912	315.6	.0347055	-.0340093
26	-98.35	56.78	32.	.051863	127.2	-.0313486	.0413163
27	-98.35	56.78	38.4	.115986	129.3	-.0734509	.0897646
28	-98.35	56.78	44.8	.14423	129.6	-.091867	.111188
29	-98.35	56.78	51.2	.136652	129.5	-.0869591	.105413
30	-98.35	56.78	57.6	.0927245	129.3	-.0587775	.0717149
END	-98.35	56.78	64.	0	0	0	0
GND	-122.33	108.23	0	.771943	249.2	-.27385	-.721735
32	-122.33	108.23	6.47	.513114	249.3	-.181391	-.479982
33	-122.33	108.23	12.94	.340378	249.7	-.118292	-.319162
34	-122.33	108.23	19.41	.199985	250.8	-.0657375	-.188872
35	-122.33	108.23	25.88	.087605	255.1	-.0225258	-.0846595
36	-122.33	108.23	32.35	.0124114	332.8	.011039	-5.67E-03
37	-122.33	108.23	38.82	.0589892	54.5	.0342149	.0480528
38	-122.33	108.23	45.29	.0892696	58.9	.0461582	.07641
39	-122.33	108.23	51.76	.0917144	59.9	.0459757	.0793585
40	-122.33	108.23	58.23	.0651889	60.1	.0324832	.0565193
END	-122.33	108.23	64.7	0	0	0	0

Method of Moments Model Details for Nighttime Directional Antenna- WLQY

The array of towers was modeled using Expert MININEC Broadcast Professional Version 14.5 with the individual towers characteristics that were verified by the individual tower impedance measurements. Calculations were made to determine the complex voltage values for sources located at ground level under each tower of the array to produce current moment sums for the towers that, when normalized, equated to the theoretical field parameters of the authorized directional antenna pattern. The following pages contain details of the method of moments model of the directional antenna pattern.

Tower	Wire	Base Node
1	1	1
2	2	11
3	3	21
4	4	31

It should be noted that voltages and currents shown on the tabulations that are not specified as "rms" values are the corresponding peak values.

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MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1320 KHz

tower	field ratio magnitude	phase (deg)
1	1.	112.
2	1.	-8.
3	1.1	120.
4	1.1	0

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	401.083	180.8	5.99011	115.3
11	877.541	57.5	5.00522	1.5
21	360.206	228.4	6.79821	117.9
31	669.873	61.3	6.20149	6.7

Sum of square of source currents = 291.216
Total power = 5,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00557881	-.00619035
Y(1, 2)	.00330512	.00202224
Y(1, 3)	.00163719	-.000574913
Y(1, 4)	-2.8027E-05	-.00035852
Y(2, 1)	.00330516	.00202215
Y(2, 2)	.0052379	-.00469717
Y(2, 3)	.0036071	.00168205
Y(2, 4)	.00143955	-.000546274
Y(3, 1)	.0016372	-.000574894
Y(3, 2)	.00360706	.00168219
Y(3, 3)	.00593542	-.00510589
Y(3, 4)	.00340628	.00216758
Y(4, 1)	-2.8019E-05	-.000358537
Y(4, 2)	.00143957	-.000546258
Y(4, 3)	.00340632	.00216748
Y(4, 4)	.00537476	-.00607788

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	64.0191	82.0751
Z(1, 2)	31.8771	-33.1959
Z(1, 3)	-18.8713	-21.1464
Z(1, 4)	-21.7948	13.1954
Z(2, 1)	31.878	-33.1953
Z(2, 2)	66.2898	90.7983
Z(2, 3)	11.0559	-32.3658
Z(2, 4)	-19.8101	-21.9765
Z(3, 1)	-18.8714	-21.1462
Z(3, 2)	11.0547	-32.3661
Z(3, 3)	61.3176	80.2008
Z(3, 4)	31.1738	-31.8806
Z(4, 1)	-21.7948	13.1953
Z(4, 2)	-19.8103	-21.9762
Z(4, 3)	31.1748	-31.88
Z(4, 4)	65.1861	83.8337

GEOMETRY
Dimensions in meters
Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	0	0	0	.29	10
		0	0	64.5		
2	none	-24.	51.46	0	.29	10
		-24.	51.46	65.2		
3	none	-98.35	56.78	0	.29	10
		-98.35	56.78	64.		
4	none	-122.33	108.23	0	.29	10
		-122.33	108.23	64.7		

Number of wires = 4
current nodes = 40

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	6.4	2	6.52
segment/radius ratio	3	22.069	2	22.4828
radius	1	.29	1	.29

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,320.	0	1	.0281788	.0287071

Sources

source	node	sector	magnitude	phase	type
1	1	1	567.217	180.8	voltage
2	11	1	1,241.03	57.5	voltage
3	21	1	509.408	228.4	voltage
4	31	1	947.344	61.3	voltage

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1,320.	27.75	60.936	66.957	65.5	4.8258	-3.6526	-2.4508
source = 2; node 11, sector 1							
1,320.	98.026	145.36	175.33	56.	6.6309	-2.64	-3.4152
source = 3; node 21, sector 1							
1,320.	-18.513	49.646	52.985	110.5	****	****	****
source = 4; node 31, sector 1							
1,320.	62.512	88.092	108.02	54.6	4.3003	-4.1149	-2.1304

CURRENT rms
Frequency = 1320 KHz
Input power = 5,000. watts
Efficiency = 100. %
coordinates in meters

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	5.99012	115.3	-2.55747	5.41672
2	0	0	6.45	6.28221	113.8	-2.53214	5.7493
3	0	0	12.9	6.28344	112.9	-2.44371	5.78877
4	0	0	19.35	6.07718	112.2	-2.29584	5.62683
5	0	0	25.8	5.68009	111.6	-2.09261	5.28057
6	0	0	32.25	5.10691	111.1	-1.83945	4.76413
7	0	0	38.7	4.37384	110.7	-1.54285	4.09269
8	0	0	45.15	3.49831	110.2	-1.20985	3.28244
9	0	0	51.6	2.49624	109.8	-.846959	2.34816
10	0	0	58.05	1.37318	109.4	-.457169	1.29485
END	0	0	64.5	0	0	0	0
GND	-24.	51.46	0	5.00523	1.5	5.00342	.134459
12	-24.	51.46	6.52	5.69093	356.6	5.68102	-.335803
13	-24.	51.46	13.04	5.96266	354.1	5.93118	-.61189
14	-24.	51.46	19.56	5.97268	352.3	5.91939	-.796061
15	-24.	51.46	26.08	5.74148	351.	5.6706	-.899362
16	-24.	51.46	32.6	5.28402	349.9	5.20217	-.926423
17	-24.	51.46	39.12	4.61641	349.	4.53161	-.880787
18	-24.	51.46	45.64	3.75669	348.2	3.67771	-.766235
19	-24.	51.46	52.16	2.72185	347.6	2.65791	-.586494
20	-24.	51.46	58.68	1.51796	346.9	1.47873	-.342852
END	-24.	51.46	65.2	0	0	0	0
GND	-98.35	56.78	0	6.79821	117.9	-3.18163	6.00774
22	-98.35	56.78	6.4	7.05103	118.9	-3.40848	6.17246
23	-98.35	56.78	12.8	7.00595	119.5	-3.44888	6.09824
24	-98.35	56.78	19.2	6.74147	119.9	-3.36408	5.84213
25	-98.35	56.78	25.6	6.2749	120.3	-3.16516	5.41813
26	-98.35	56.78	32.	5.62223	120.6	-2.8611	4.83979
27	-98.35	56.78	38.4	4.80114	120.8	-2.46146	4.12216
28	-98.35	56.78	44.8	3.8306	121.1	-1.97641	3.28136
29	-98.35	56.78	51.2	2.7277	121.3	-1.41523	2.33183
30	-98.35	56.78	57.6	1.49805	121.4	-.781177	1.27824
END	-98.35	56.78	64.	0	0	0	0
GND	-122.33	108.23	0	6.2015	6.7	6.15913	.723653
32	-122.33	108.23	6.47	6.6799	3.4	6.66808	.397252
33	-122.33	108.23	12.94	6.78987	1.6	6.78725	.188629
34	-122.33	108.23	19.41	6.64996	.2	6.6499	.0285219
35	-122.33	108.23	25.88	6.27966	359.2	6.27902	-.0898832
36	-122.33	108.23	32.35	5.69513	358.3	5.69263	-.16877
37	-122.33	108.23	38.82	4.91413	357.6	4.90967	-.209365
38	-122.33	108.23	45.29	3.95618	356.9	3.95044	-.212971
39	-122.33	108.23	51.76	2.83933	356.3	2.83356	-.181025
40	-122.33	108.23	58.23	1.57007	355.8	1.5659	-.114256
END	-122.33	108.23	64.7	0	0	0	0

Summary of Certified Array Geometry - WLQY

The WLQY tower locations were surveyed by Robert L. Thompson, Professional Surveyor and Mapper, State of Florida Number 3869, on October 29, 2008. The drawing prepared by Accurate Land Surveyors, Inc. of Pompano Beach, Florida, the firm with which Mr. Thompson is affiliated, shows the location of each tower in Florida State Plane Coordinates of 1983, 1990 adjustment Florida East Zone. This drawing is being retained in the station files.

The surveyed tower coordinates were used to calculate the distance and azimuth of each tower relative to the midpoint along the diagonal line between towers 1 and 4. As the FCC's engineering database entry for WLQY does not provide distances and azimuths for the towers from a common reference point, but rather provides them sequentially for the parallelogram's sides, the distances and azimuths for the authorized array geometry had to be calculated relative to the reference point. Those values were compared to the distances and azimuths from the survey. For that comparison, the surveyed and authorized values were converted to the rectangular coordinate system to facilitate finding the individual tower authorized-to-surveyed differences, which were then converted to the polar coordinate system to determine their magnitudes. This tabulation shows those distances and other information that is relevant to their determination.

Tower	Specified Array Geometry			Post-Construction Certification*		Distance From Specified Location	
	Spacing (Deg.)	Spacing (Feet)	Azimuth (Deg. T.)	Spacing (Feet)	Azimuth (Deg. T.)	(Feet)	(Deg.)
1	129.5	268.0	318.5	269.0	318.1	2.3	1.1
2	59.1	122.3	355.9	123.7	355.4	1.8	0.9
3	59.1	122.3	175.9	122.6	175.5	1.0	0.5
4	129.5	268.0	138.5	269.0	138.1	2.3	1.1

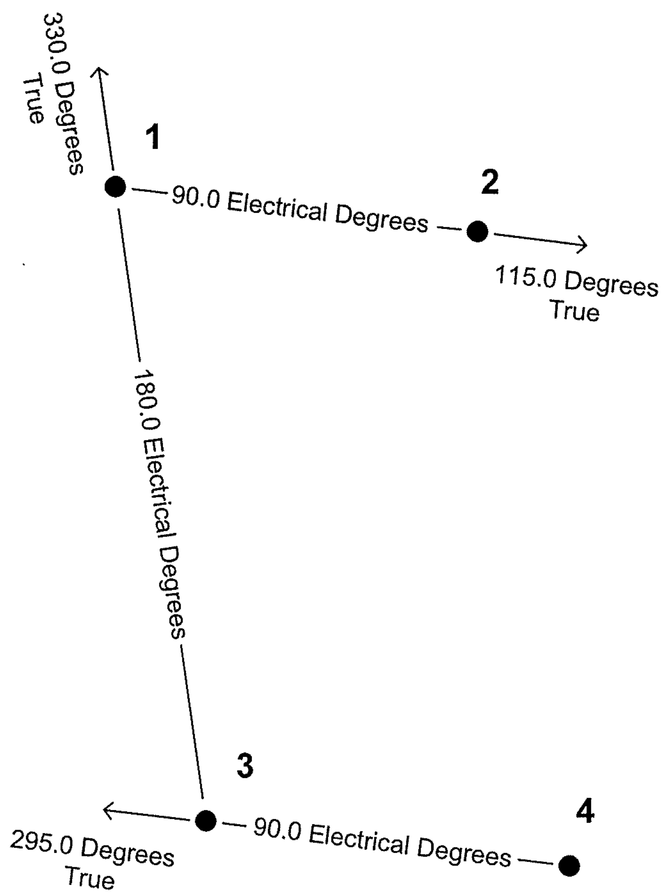
The "as built" tower displacements from their specified locations are expressed in electrical degrees at carrier frequency, which correspond to the maximum possible space phasing differences in the far-field radiation pattern of the array, are well below the +/- 3 degree operating phase range specified for antenna monitor parameters by the FCC Rules.

It should be noted that the tower numbering of the FCC's engineering database entry is not the same as the tower numbering of the existing station license. Towers 1, 2, 4, and 5 of the station license are towers 3, 4, 2, and 1 of the FCC engineering database, respectively.

Tower 3 of the station license, which was employed by a previous directional antenna pattern and had not been physically removed when the present directional antenna patterns were licensed, remained on the license document even though there were no theoretical or operating parameters for it because it was no longer used in the directional antenna system. The tower has now been removed from the property. It is proposed that towers 4 and 5 of the present license be renumbered 3 and 4, with the numbering of towers 1 and 2 remaining unchanged. Tower marking and lighting remain unchanged for the towers in their physical locations. Tower 4 under the proposed numbering system meets the marking and lighting requirements specified for tower 5 on the old station license. This tower numbering scheme is used exclusively herein.

AUG 2009

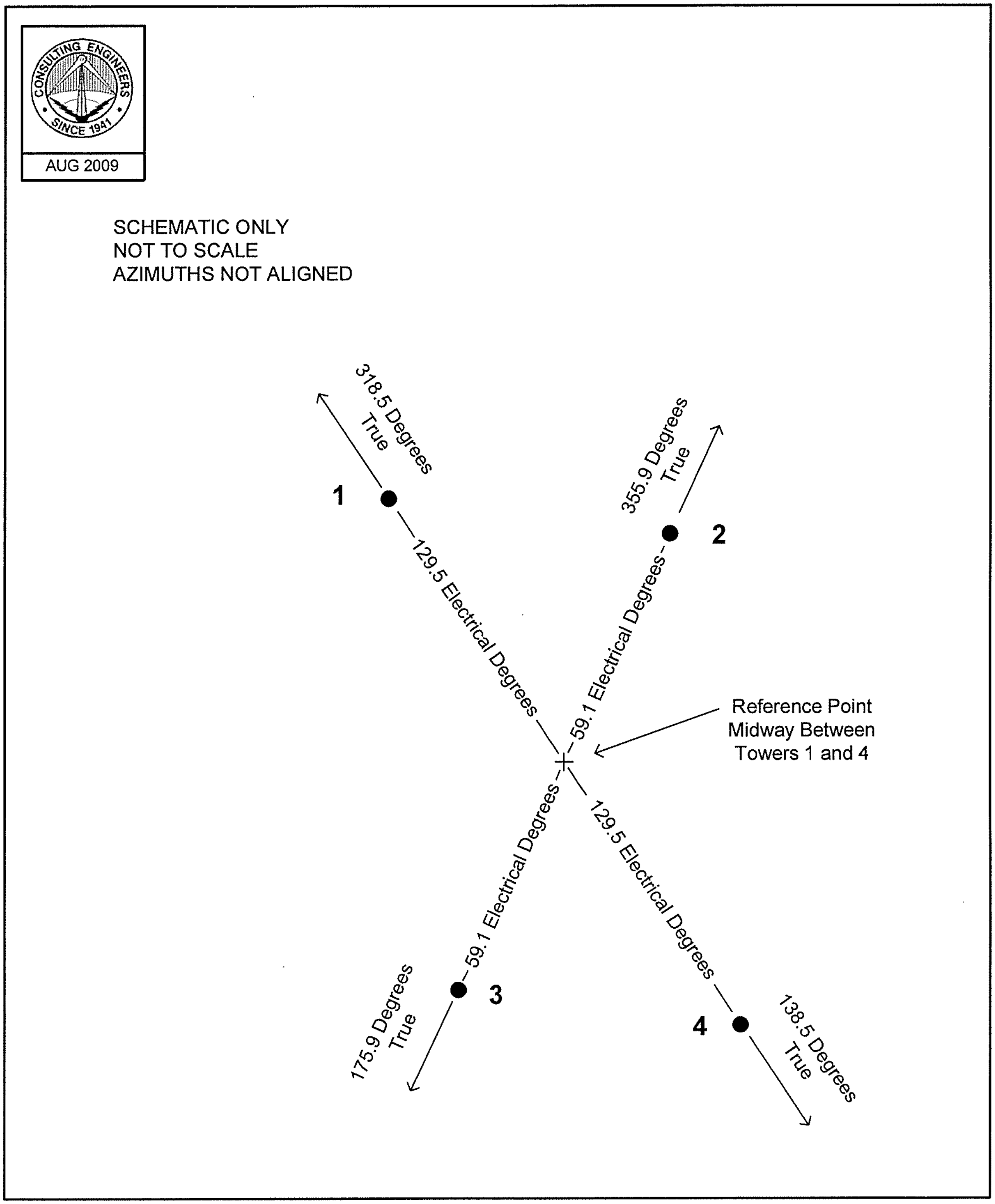
SCHEMATIC ONLY
NOT TO SCALE
AZIMUTHS NOT ALIGNED



TOWER GEOMETRY FROM FCC ENGINEERING DATABASE

RADIO STATION WLQY
HOLLYWOOD, FLORIDA
1320 KHZ 5 KW DA-2

du Treil, Lundin & Rackley, Inc. Sarasota, Florida



TOWER LOCATIONS FROM FCC ENGINEERING DATABASE
CALCULATED RELATIVE TO REFERENCE POINT

RADIO STATION WLQY
HOLLYWOOD, FLORIDA
1320 KHZ 5 KW DA-2

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

AUG 2009

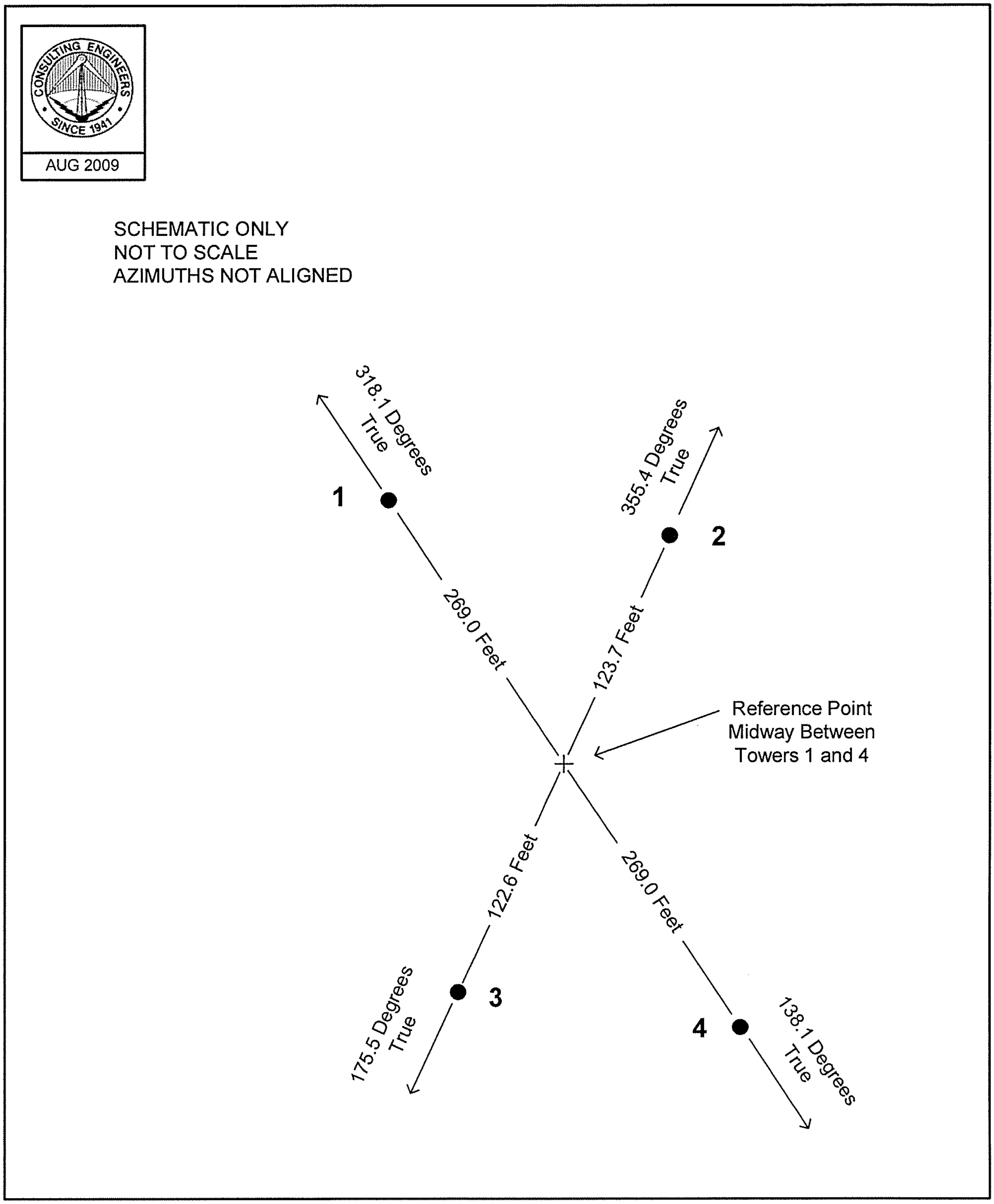
SCHEMATIC ONLY
NOT TO SCALE
AZIMUTHS NOT ALIGNED

Coordinates Transcribed From Survey by
Robert L. Thompson,
Professional Surveyor and Mapper,
Florida No. 3869
October 29, 2008

SURVEYED STATE PLANE COORDINATES OF TOWERS
(SURVEY FEET)

RADIO STATION WLQY
HOLLYWOOD, FLORIDA
1320 KHZ 5 KW DA-2

du Treil, Lundin & Rackley, Inc. Sarasota, Florida



TOWER LOCATIONS FROM SURVEYED COORDINATES

RADIO STATION WLQY
HOLLYWOOD, FLORIDA
1320 KHZ 5 KW DA-2

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Sampling System Measurements – WLQY

Impedance measurements were made of the antenna monitor sampling system using a Hewlett-Packard 8751A network analyzer and a Tunwall Radio directional coupler in a calibrated measurement system. The measurements were made looking into the antenna monitor ends of the sampling lines for two conditions – with and without the sampling lines connected to the sampling devices at the tower bases under open-circuited conditions.

The following table shows the frequencies above and below the carrier frequency where resonance – zero reactance corresponding with low resistance – was found. As the length of a distortionless transmission line is 180 electrical degrees at the difference frequency between adjacent frequencies of resonance, and frequencies of resonance occur at odd multiples of 90 degrees electrical length, the sampling line length at the resonant frequency below carrier frequency – which is the closest one to the carrier frequency in terms of the ratio of frequencies – was found to be 270 electrical degrees. The electrical lengths at carrier frequency appearing in the table below were calculated by ratioing the frequencies.

Tower	Sampling Line Open-Circuited Resonance Below 1320 kHz (kHz)	Sampling Line Open-Circuited Resonance Above 1320 kHz (kHz)	Sampling Line Calculated Electrical Length at 1320 kHz (meters)	1320 kHz Measured Impedance with Sampling Loop Connected (Ohms)
1	1252.8	2091.3	284.5	50.8 - j2.9
2	1252.0	2090.5	284.7	51.3 - j2.1
3	1252.8	2091.6	284.5	51.3 - j2.1
4	1252.8	2092.0	284.5	51.5 - j2.0

The sampling line lengths meet the requirement that they be equal in length within 1 electrical degree.

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:

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

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	1044.0	3.4 - j49.7	1461.5	5.6 + j50.7	50.4
2	1043.3	3.5 - j50.4	1460.7	5.6 + j50.6	50.7
3	1044.0	3.5 - j50.5	1461.5	5.5 + j50.6	50.7
4	1044.0	3.5 - j50.5	1461.5	5.6 + j50.5	50.7

The sampling line measured characteristic impedances meet the requirement that they be equal within 2 ohms.

The toroidal transformers were calibrated by measuring their outputs with a common reference signal using a Hewlett-Packard 8751A network analyzer in a calibrated measurement system. They were placed side-by-side with a conductor passing the reference signal passing through them and their outputs were fed into the A and B receiver inputs of the analyzer which was configured to measure the relative ratios and phases of their output voltages. The following results were found for carrier frequency, 1320 kilohertz:

Tower	Ratio	Phase(Degrees)
1	REF.	REF.
2	1.002	-0.18
3	1.001	-0.19
4	1.000	-0.22

Delta type TCT-1 toroidal transformers are rated for absolute magnitude accuracy of +/- 2% and absolute phase accuracy of +/- 3 degrees. As the maximum measured transformer-to-transformer variations among of the four were approximately 0.1 percent and 0.1 degree, they provide far more accurate relative indications than could be the case within their rated accuracies.

Reference Field Strength Measurements – WLQY

Reference field strength measurements were made using a Potomac Instruments field strength meter of known calibration at three locations along radials at the azimuths having monitor points and, additionally, on a major lobe radial for each directional pattern. The measured field strengths, descriptions and GPS coordinates for the reference measurement points are shown on the following pages

WLQY 1320 KHz Hollywood, FL

5 KW DA-2

Reference Field Strength Measurements - Day

Radial	Point	Distance (km)	Field (mv/m)	Coordinates (NAD 27)		Description
115°	1	1.24	600	26-02-02.7	80-16-00.8	SE corner NW 91 Ter & NW 21 St at stop sign.
	2	2.24	305	26-01-48.1	80-15-25.9	On NW 16 St in Driveway E of NW 85 Way.
	3	4.17	145	26-01-21.7	80-14-22.9	NE Corner NW 8 St & NW 76 Ave.
260°	1	2.82	77	26-02-03.8	80-18-18.6	2120 NW 118 Avenue at mailbox.
	2	3.59	75	26-02-00.6	80-18-45.4	Midpoint of canal at north guard rail. Flamingo Town Center.
	3	7.42	20.5	26-01-38.1	80-21-01.8	East side of NW 155 Ave at sewer grate.
295°	1	2.89	73	26-02-58.4	80-18-13.4	S. Side Stone Bridge Pkwy at storm sewer. N of N Lake Blvd.
	2	5.73	22	26-03-37.4	80-19-46.2	5335 SW 136 Ave at mailbox.
	3	7.24	21	26-03-58.0	80-20-35.4	S side of Palomino Rd opposite mailbox # 14671.
330°	1	2.15	98	26-03-19.0	80-17-19.3	S side SW 57 Place at fire hydrant.
	2	3.19	68	26-03-49.2	80-17-38.8	11000 SW 51 ST at driveway.
	3	6.14	21	26-05-11.3	80-18-31.4	Driveway, 12041 on unnamed road. E of SW 121 Dr Ave.

Day reference measurements were made August 5, 2009 by George D Butch using Potomac Instruments FIM-21, SN 1001 calibrated July 15, 2008.

WLQY 1320 KHz Hollywood, FL

5 KW DA-2

Reference Field Strength Measurements - Night

Radial	Point	Distance (km)	Field (mv/m)	Coordinates (NAD 27)		Description
67°	1	3.57	360	26-03-05.5	80-14-40.5	NE Corner NW 41 ST & NW 78 Ave at stop sign.
	2	4.46	250	26-03-17.0	80-14-10.7	N side of Dead End Rd midway between 6725 and 6775.
	3	5.44	255	26-03-29.3	80-13-38.8	W side SW 61 Ave on sidewalk at gate to Davie Lift Station #45.
135°	1	1.81	145	26-01-37.4	80-15-53.2	NE Corner NW 13 St & NW 89 Ter.
	2	2.58	108	26-01-19.5	80-15-34.2	8670 NW 7 Ct at Mailbox.
	3	3.98	55	26-00-46.9	80-14-58.0	NE curb at 3rd entrance to car lot. On the way to Handy Stg.
156°	1	2.75	71	26-00-57.3	80-16-00.4	S side Pines Blvd at "Begin Right Turn" sign
	2	3.74	41	26-00-27.1	80-15-45.5	NE corner of SW 10 St & SW 88 Way.
	3	4.46	18.6	26-00-06.4	80-15-35.1	Pembroke Rd. S shoulder at start of R turn lane to Douglas Rd.
165°	1	2.84	35	26-00-50.0	80-16-14.3	Corner of Palm Way and Palm Circle W at street sign.
	2	4.27	9.8	26-00-05.1	80-16-01.2	S side Pembroke Rd. E end of Bus stop at School Zone sign.
	3	5.03	15.2	25-59-41.1	80-15-53.3	Fire Hydrant at 9020 S Lake Miramar Cir.
210°	1	2.59	205	26-01-08.0	80-17-26.9	N Corner of NW 2 Cir & NW 107Ave. At "No Outlet" sign.
	2	3.86	150	26-00-32.6	80-17-50.0	In Driveway at 720 SW 113 Ter.
	3	5.65	78	25-59-42.3	80-18-22.3	E edge Red Rd. 2nd light pole S of Entrance "Vil of Renaissance".
245°	1	2.28	94	26-01-49.1	80-17-54.3	In Driveway at 11141 Taft St.
	2	3.26	60	26-01-36.1	80-18-25.5	12120 NW 13 Ct at Mailbox.
	3	5.53	33	26-01-05.0	80-19-39.6	105 NW 6 St at light pole.

Night reference measurements were made August 5 & 6, 2009 by George D Butch using Potomac Instruments FIM-21, SN 1001 calibrated July 15, 2008.

Direct Measurement of Power - WLQY

Common point impedance measurements were made using a Hewlett-Packard 8751A network analyzer and a Tunwall Radio directional coupler in a calibrated measurement system. The measurements were made at the phasor cabinet input jack adjacent to the common point current meter that is used to determine operating power. The resistance value was adjusted to provide the correct input power with the specified common point current. The reactance value was adjusted to cancel incidental inductance in the circuit between the transmitter output port and the common point in the phasor cabinet, including the main-auxiliary switching contactor, to provide a non-reactive load for the transmitter at carrier frequency.

Antenna Monitor and Sampling System - WLQY

The antenna monitor is a Potomac Instruments model AM-1901. The sampling devices for the towers are Delta Electronics Type TCT-1 shielded toroidal transformers located at the ATU output reference points. The TCT-1 transformers have a sensitivity of 0.5 volt per ampere of RF current. The toroids are connected through equal length ½ inch foam heliax sampling lines to the antenna monitor.

RFR Protection - WLQY

The measures to restrict human exposure to radio frequency fields, by limiting access to areas with field levels that might exceed the limits specified in 47 CFR 1.1310 with fencing around the tower base areas and cabinet enclosures for the indoor antenna system equipment, previously provided to the FCC remain in force at the WLQY transmitter site. No changes have been made to the authorized directional antenna patterns.

Detuning of Antenna Pole on Adjacent Property - WLQY

On property adjacent to, and northeast of, the WLQY transmitter site, there is a metal pole that supports land-mobile communications antennas. It stands 150 feet in height and has been detuned to not re-radiate the 1320 kilohertz signal of WLQY since it was originally constructed. The detuning is accomplished with a wire skirt that extends from approximately 8 feet above ground level to the top of the pole, which is shorted to the pole at the top and connected to an adjustable network in a weatherproof enclosure at the bottom.

The detuning system was tested and found to be functioning correctly before the tower base impedances included herein were measured. With a field strength meter placed at ground level near the base of the pole, on the northeast side of the pole so as to be shielded from the fields of the WLQY towers by the pole, a very pronounced null in current was observed while adjusting the detuning network either side of the minimum condition. By this means, a field strength meter can be used to sample the current flowing to ground at the base of the pole by responding to the magnetic field component that is present there. Tests were also done using a shielded toroidal current transformer to sample the current flowing from the base of the pole to ground through a grounding conductor with the same results, to verify the simpler method that requires only a field strength meter.