

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-2014120AJW

SECTION I - APPLICANT FEE INFORMATION

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

Clear Channel Broadcasting Licenses, INC.

MAILING ADDRESS (Line 1) (Maximum 35 characters)

2625 S. Memorial

MAILING ADDRESS (Line 2) (Maximum 35 characters)

Suite A

CITY

Tulsa

STATE OR COUNTRY (if foreign address)

OK

ZIP CODE

74129

TELEPHONE NUMBER (include area code)

918-664-4581

CALL LETTERS

WYLD

OTHER FCC IDENTIFIER (If applicable)

FAC ID: 60707

2. A. Is a fee submitted with this application?



Yes



No

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



Governmental Entity



Noncommercial educational licensee



Other (Please explain):

C. If Yes, provide the following information:

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

(A)		
FEE TYPE CODE		
M	M	R

(B)			
FEE MULTIPLE			
0	0	0	1

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

FOR FCC USE ONLY

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

(A)		
FEE TYPE CODE		
M	O	R

(B)			
FEE MULTIPLE			
0	0	0	1

(C)
FEE DUE FOR FEE TYPE CODE IN COLUMN (A)
\$ 790.00

FOR FCC USE ONLY

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

TOTAL AMOUNT REMITTED WITH THIS APPLICATION
\$ 1480.00

FOR FCC USE ONLY

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Clear Channel Broadcasting Licenses, INC		
MAILING ADDRESS 2625 S. Memorial, Suite A		
CITY Tulsa	STATE OK	ZIP CODE 74129

2. This application is for:

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

Call letters WYLD	Community of License New Orleans, LA	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
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3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620?

☐ Yes ☐ No

Exhibit No.

If No, explain in an Exhibit.

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

☐ Yes ☐ No

Exhibit No.

If No, state exceptions in an Exhibit.

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

Exhibit No.

If Yes, explain in an Exhibit.

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

Exhibit No.

If No, explain in an Exhibit.

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

Exhibit 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.

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

☐ Yes ☒ No

If Yes, provide particulars as an Exhibit.

Exhibit No.

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

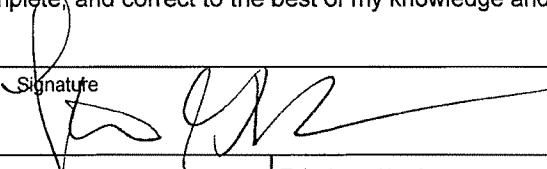
The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

CERTIFICATION

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

☒ Yes ☐ No

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

Name Stephen G. Davis	Signature 	
Title Senior Vice President, Facilities	Date 11/18/14	Telephone Number 918-664-4581

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

Clear Channel Broadcasting Licenses, INC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)



Station License



Direct Measurement of Power

1. Facilities authorized in construction permit

Call Sign WYLD	File No. of Construction Permit (if applicable)	Frequency (kHz) 940	Hours of Operation Unlimited	Power in kilowatts	
				Night 0.50	Day 10.0

2. Station location

State Louisiana	City or Town New Orleans
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3. Transmitter location

State LA	County Orleans	City or Town New Orleans	Street address (or other identification) 5000 Lennox Blvd
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4. Main studio location

State LA	County Orleans	City or Town New Orleans	Street address (or other identification) 929 Howard Ave
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5. Remote control point location (specify only if authorized directional antenna)

State LA	County Orleans	City or Town New Orleans	Street address (or other identification) 929 Howard Ave
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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.

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system 3.29a		RF common point or antenna current (in amperes) without modulation for day system 14.51a	
Measured antenna or common point resistance (in ohms) at operating frequency Night 50	Day 50	Measured antenna or common point reactance (in ohms) at operating frequency Night -j4.0	Day -j4.0

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
Twr 1 (ASRN 1045167)	35.2	--	0.500	--		
Twr 2 (ASRN 1045166)	0.0	104.5	1.0	0.484		
Twr 3 (ASRN 1045163)	-41.2	24.1	0.555	0.381		
Twr 4 (ASRN 1045165)	--	0.0	--	1.0		
Twr 5 (ASRN 1045164)	--	130.0	--	0.392		

Manufacturer and type of antenna monitor:

Potomac Instruments AM-1901

SECTION III - Page 2

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

Type Radiator	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.
See Tower exhibit	See tower exhibit	See tower exhibit	See tower exhibit	Exhibit No. Item 1

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	29 ° 53 ' 57 "	West Longitude	90 ° 00 ' 17 "
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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.

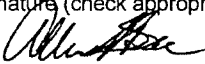
Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system.

Exhibit No.

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

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

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) Allan Brace	Signature (check appropriate box below) 
Address (include ZIP Code) 2625 S. Memorial Suite A Tulsa, OK 74129	Date 11/18/14 Telephone No. (Include Area Code) 918-664-4581

☒ Technical Director
 ☐ Registered Professional Engineer
☐ Chief Operator
 ☐ Technical Consultant
☐ Other (specify)

APPLICATION FOR LICENSE INFORMATION
RADIO STATION WYLD
NEW ORLEANS, LOUISIANA

940 KHZ 10KW D, .5 KW N, DA2

Tower Exhibit

Tower #	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)
Tower 1 (ASRN 1045167)	Uniform cross-section, guyed	79.1	81.1	82.0
Tower 2 (ASRN 1045166)	Uniform cross-section, guyed	79.1	81.2	82.1
Tower 3 (ASRN 1045163)	Uniform cross-section, guyed	79.1	81.0	81.9
Tower 4 (ASRN 1045165)	Uniform cross-section, guyed	79.1	81.1	82.0
Tower 5 (ASRN 1045164)	Uniform cross-section, guyed	79.1	81.1	82.0

APPLICATION FOR LICENSE INFORMATION

RADIO STATION WYLD

CLEAR CHANNEL BROADCASTING LICENSES, INC.

NEW ORLEANS, LOUISIANA

FID 60707

940 KHZ 10KW D, .5KW N, DA2

November 14, 2014

APPLICATION FOR LICENSE INFORMATION
RADIO STATION WYLD
NEW ORLEANS, LOUISIANA

940 KHZ 10KW D, .5 KW N, DA2

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Item 9	Ground System Detail
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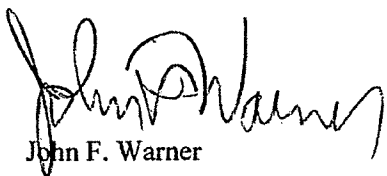
EXECUTIVE SUMMARY

This engineering exhibit has been prepared in support of an application for licensing for radio station WYLD New Orleans Louisiana, Facility ID #60707. Measurements included comply with the requirements of Rule Section 73.151c

Towers designated number two (2) and four (4) were replaced with towers identical in height after the original towers were destroyed by Hurricane Katrina. The towers remain as described in current license BL20050803ADR. Top loading of tower two (2) was replicated by measurement of the physical length of the top loading elements of the damaged original tower. The sample system has been converted from sample loops to sample torroids which are mounted in the tuning houses. The system has been adjusted to operating parameters computed using the Moment Method process as described in Rule Section 73.151c. Mininec Broadcast Professional version 14.6 by EM Scientific Inc. was used in the analysis.

The system was adjusted to produce antenna monitor parameters within +/-5% in ratio and +/-3 degrees in phase.

The measurements and calculations contained in this report were made by Jacob Wyatt of the Clear Channel corporate engineering staff and the undersigned. Any questions regarding the contents of this report should be directed to:



John F. Warner

johnwarner@clearchannel.com

443-255-5299

Analysis of Tower Impedance Measurements to Verify Method of Moments Model

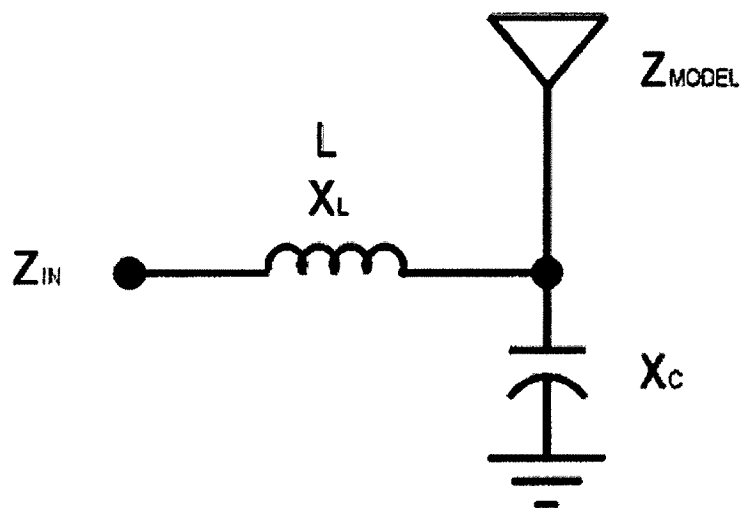
Impedance measurements were made of the individual towers with the other tower bases open circuited. Measurements were made using a Hewlett-Packard 4396A network analyzer and a Tunwall Radio directional coupler in a calibrated measurement system. Measurements were made immediately adjacent to the torroidal antenna sampling transformers, inside the antenna coupling units. These measured values were related to the modeled values obtained using Expert MININEC Broadcast Professional V14.6. Heights of the towers were adjusted as permitted by Rule Section 73.151(c)(1). The tower radii were modeled at their actual values. The towers were segmented so that each segment is less than ten (10) degrees in length.

Tower	Physical Height (Degrees)	Model Height (Degrees)	Model Percent of Height	Model Equivalent Radius Meters	Model Percent Of Radius
1*	89.4	91	101.8	.2911	100
2*	89.4	91.6	102.5	.2911	100
3*	89.4	89.8	100.4	.2911	100
4	89.4	93.7	104.8	.2911	100
5	89.4	94.2	105.4	.2911	100
*Denotes tower top loaded to 110 degrees electrical length by non-structural guys attached to the tops of the towers.					

79.2 m

Method of Moments Model Details for Towers Driven Individually

The model was verified by comparison of modeled to measured tower impedances. The tower resistance and reactance were measured immediately adjacent to the torroidal base sampling transformers, inside the antenna tuning units.. The measured and modeled impedances were correlated using the Westberg Consulting WCAP Pro software program. WCAP is based on the SPICE nodal analysis program. The shunt capacitive reactance of the tower base insulator is represented in the drawing below as X_c . The series inductive reactance of the tower feed conductor is represented as X_l . Z model represents the modeled impedance of the tower and Z_{in} represents the impedance measured at the sampling point. In the following WCAP tabulations, the modeled impedance is represented between nodes 3-2. The measured impedance is represented between nodes 1-0. Node 0 represents ground. The calculated reference point impedances appear under the "TO NODE IMPEDANCE" columns of the WCAP calculations, following the extremely short transmission line (TL 3-2) that were included in series with the drive current sources (I 0-3) to provide calculation points for the impedances.



Tower	L (uh)	Xl (+j)	Xc (-j)	Z Modeled	Z in Modeled	Z in Measured
1	1.85	10.9	-2605	107.6 +206.6	126.8 +230.1	126.5 +230
2	2.2	13	-1992	108 +209	134.3 +238.3	134 +238
3	3.3	19.5	-2605	95.5 +191.6	111 +221.9	111 +222
4	6.65	39.3	-2605	45.8 +36.7	47.1 +75.6	47.3 +75.6
5	5.05	29.8	-2605	46.8 +38.5	48.2 +68	48.4 +68

WCAP - Tower 1 Driven, others floated

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 25317.9598 \angle 59.9426° V

Node: 2 26269.4072 \angle 61.1364° V

Node: 3 26269.4335 \angle 61.1364° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	100.00 \angle 0.000° A	100.00 \angle -0.001° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 1.85000000	1092.68 \angle 89.999° V	100.00 \angle -0.001° A
C 1→0 0.00006500	25317.96 \angle 59.943° V	9.72 \angle 149.943° A
R 1→0 107.67000000	25317.96 \angle 59.943° V	108.52 \angle -2.572° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 1.85000000	126.80 + j 230.055	126.80 + j 219.129
C 1→0 0.00006500	-0.00 - j 2604.827	0.00 + j 0.000
R 1→0 107.67000000	107.67 + j 206.960	0.00 + j 0.000
TL 3→2 50.00000000	126.81 + j 230.060	126.80 + j 230.055

WCAP PART	VSWR
TL 3→2 50.00000000	11.1887

WCAP INPUT DATA:

0.9400	0.00000000	0
I 100.00000000	0 3	0.00000000
L 1.85000000	2 1	0.00000000
C 0.00006500	1 0	
R 107.67000000	1 0	206.96000000
TL 50.00000000	3 2	100.00000000 0.00100000 0.00000000

WCAP - Tower 2 Driven, others floated

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 26228.2133 \angle 59.2096° V

Node: 2 27352.5562 \angle 60.6030° V

Node: 3 27352.5824 \angle 60.6030° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	100.00 \angle 0.000° A	100.00 \angle -0.001° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 2.20000000	1299.40 \angle 89.999° V	100.00 \angle -0.001° A
C 1→0 0.00008500	26228.21 \angle 59.210° V	13.17 \angle 149.210° A
R 1→0 107.96000000	26228.21 \angle 59.210° V	111.52 \angle -3.466° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 2.20000000	134.25 + j 238.302	134.25 + j 225.308
C 1→0 0.00008500	0.00 - j 1991.927	0.00 + j 0.000
R 1→0 107.96000000	107.96 + j 208.950	0.00 + j 0.000
TL 3→2 50.00000000	134.26 + j 238.307	134.25 + j 238.302

WCAP PART	VSWR
TL 3→2 50.00000000	11.4297

WCAP INPUT DATA:

0.9400	0.00000000	0
I 100.00000000	0 3	0.00000000
L 2.20000000	2 1	0.00000000
C 0.00008500	1 0	
R 107.96000000	1 0	208.95000000
TL 50.00000000	3 2	100.00000000 0.00100000 0.00000000

WCAP - Tower 3 Driven, others floated

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 23083.1749 \angle 61.2444° V

Node: 2 24809.6447 \angle 63.4103° V

Node: 3 24809.6716 \angle 63.4103° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	100.00 \angle 0.000° A	100.00 \angle -0.001° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 3.30000000	1949.10 \angle 89.999° V	100.00 \angle -0.001° A
C 1→0 0.00006500	23083.17 \angle 61.244° V	8.86 \angle 151.244° A
R 1→0 95.46000000	23083.17 \angle 61.244° V	107.86 \angle -2.266° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 3.30000000	111.04 + j 221.852	111.04 + j 202.362
C 1→0 0.00006500	0.00 - j 2604.827	0.00 + j 0.000
R 1→0 95.46000000	95.46 + j 191.550	0.00 + j 0.000
TL 3→2 50.00000000	111.05 + j 221.857	111.04 + j 221.852

WCAP PART	VSWR
TL 3→2 50.00000000	11.4486

WCAP INPUT DATA:

0.9400	0.00000000	0
I	100.00000000	0 3 0.00000000
L	3.30000000	2 1 0.00000000
C	0.00006500	1 0
R	95.46000000	1 0 191.55000000
TL	50.00000000	3 2 100.00000000 0.00100000 0.00000000

WCAP - Tower 4 Driven, others floated

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 5948.7057 \angle 37.6454° V

Node: 2 8908.1172 \angle 58.0784° V

Node: 3 8908.1427 \angle 58.0785° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	100.00 \angle 0.000° A	100.00 \angle -0.000° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 6.65000000	3927.65 \angle 90.000° V	100.00 \angle -0.000° A
C 1→0 0.00006500	5948.71 \angle 37.645° V	2.28 \angle 127.645° A
R 1→0 45.80000000	5948.71 \angle 37.645° V	101.41 \angle -1.022° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 6.65000000	47.10 +j 75.609	47.10 +j 36.333
C 1→0 0.00006500	-0.00 -j 2604.827	0.00 +j 0.000
R 1→0 45.80000000	45.80 +j 36.650	0.00 +j 0.000
TL 3→2 50.00000000	47.10 +j 75.610	47.10 +j 75.609

WCAP PART	VSWR
TL 3→2 50.00000000	4.1925

WCAP INPUT DATA:

0.9400	0.00000000	0
I 100.00000000	0 3	0.00000000
L 6.65000000	2 1	0.00000000
C 0.00006500	1 0	
R 45.80000000	1 0	36.65000000
TL 50.00000000	3 2	100.00000000 0.00100000 0.00000000

WCAP - Tower 5 Driven, others floated

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 6150.0486 \angle 38.3973° V

Node: 2 8337.0341 \angle 54.6804° V

Node: 3 8337.0586 \angle 54.6805° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	100.00 \angle -0.000° A	100.00 \angle -0.000° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 5.05000000	2982.65 \angle 90.000° V	100.00 \angle -0.000° A
C 1→0 0.00006500	6150.05 \angle 38.397° V	2.36 \angle 128.397° A
R 1→0 46.80000000	6150.05 \angle 38.397° V	101.48 \angle -1.045° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 5.05000000	48.20 + j 68.025	48.20 + j 38.199
C 1→0 0.00006500	-0.00 - j 2604.827	0.00 + j 0.000
R 1→0 46.80000000	46.80 + j 38.500	0.00 + j 0.000
TL 3→2 50.00000000	48.20 + j 68.025	48.20 + j 68.025

WCAP PART	VSWR
TL 3→2 50.00000000	3.6473

WCAP INPUT DATA:

0.9400	0.00000000	0
I 100.00000000	0 3	0.00000000
L 5.05000000	2 1	0.00000000
C 0.00006500	1 0	
R 46.80000000	1 0	38.50000000
TL 50.00000000	3 2	100.00000000 0.00100000 0.00000000

Tower 1 Driven, others floated

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
.94	107.67	206.96	233.29	62.5	10.478	-1.663	-4.974

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	-133.7	108.2	0 1	.2911	15
		-133.7	108.2	91. 2		
2	none	-133.7	108.2	91. 2	.005	3
		-136.	92.4	67.6 3		
3	none	-133.7	108.2	91. 2	.005	3
		-146.3	118.4	67.6 4		
4	none	-133.7	108.2	91. 2	.005	3
		-118.6	114.	67.6 5		
5	none	0	0	0 6	.2911	15
		0	0	91.6 7		
6	none	0	0	91.6 7	.005	3
		15.2	-5.5	68.2 8		
7	none	0	0	91.6 7	.005	3
		-12.4	-10.4	68.2 9		
8	none	0	0	91.6 7	.005	3
		-2.8	16.6	68.2 10		
9	none	133.7	-108.2	0 11	.2911	15
		133.7	-108.2	89.8 12		
10	none	133.7	-108.2	89.8 12	.005	3
		141.8	-122.2	66.4 13		
11	none	133.7	-108.2	89.8 12	.005	3
		117.5	-108.2	66.4 14		
12	none	133.7	-108.2	89.8 12	.005	3
		141.8	-94.2	66.4 15		
13	none	23.5	64.6	0 16	.2911	15
		23.5	64.6	93.7 17		
14	none	110.	-173.	0 18	.2911	15
		110.	-173.	94.2 19		

Number of wires = 14
current nodes = 102

	minimum	maximum
Individual wires	wire value	wire value
segment length	9 5.98667	8 9.60879
radius	2 5.E-03	1 .2911

ELECTRICAL DESCRIPTION

Frequencies (MHz)

no.	frequency	step	no. of steps	segment length (wavelengths)
	lowest			minimum maximum
1	.94	0	1	.0166296 .0266911

Sources

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

Lumped loads

		resistance	reactance	inductance	capacitance
passive					
load	node	(ohms)	(ohms)	(mH)	(uF)
circuit					
1	25	0	-1,992.	0	0
2	49	0	-2,605.	0	0
3	73	0	-2,605.	0	0
4	88	0	-2,605.	0	0

Tower 2 Driven, others floated

IMPEDANCE

normalization = 50.

freq	resist	react	imped	phase	VSWR	S11	S12
(MHz)	(ohms)	(ohms)	(ohms)	(deg)		dB	dB
source = 1; node 25, sector 1							
.94	107.96	208.95	235.19	62.7	10.616	-1.6412	-5.0209

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	-133.7	108.2	0	.2911	15
		-133.7	108.2	91.		
2	none	-133.7	108.2	91.	.005	3
		-136.	92.4	67.6		
3	none	-133.7	108.2	91.	.005	3
		-146.3	118.4	67.6		
4	none	-133.7	108.2	91.	.005	3
		-118.6	114.	67.6		
5	none	0	0	0	.2911	15
		0	0	91.6		
6	none	0	0	91.6	.005	3
		15.2	-5.5	68.2		
7	none	0	0	91.6	.005	3
		-12.4	-10.4	68.2		
8	none	0	0	91.6	.005	3
		-2.8	16.6	68.2		
9	none	133.7	-108.2	0	.2911	15
		133.7	-108.2	89.8		

10	none	133.7	-108.2	89.8	.005	3
		141.8	-122.2	66.4		
11	none	133.7	-108.2	89.8	.005	3
		117.5	-108.2	66.4		
12	none	133.7	-108.2	89.8	.005	3
		141.8	-94.2	66.4		
13	none	23.5	64.6	0	.2911	15
		23.5	64.6	93.7		
14	none	110.	-173.	0	.2911	15
		110.	-173.	94.2		

Number of wires = 14
current nodes = 102

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	9	5.98667	8	9.60879
radius	2	5.E-03	1	.2911

ELECTRICAL DESCRIPTION

Frequencies (MHz)

frequency			no. of steps	segment length (wavelengths)	
no.	lowest	step		minimum	maximum
1	.94	0	1	.0166296	.0266911

Sources

source	node	sector	magnitude	phase	type
1	25	1	1.	0	voltage

Lumped loads

		resistance	reactance	inductance	capacitance
passive					
load	node	(ohms)	(ohms)	(mH)	(uF)
circuit					
1	1	0	-2,605.	0	0
2	49	0	-2,605.	0	0
3	73	0	-2,605.	0	0
4	88	0	-2,605.	0	0

Tower 3 Driven, others floated

IMPEDANCE

normalization = 50.

freq	resist	react	imped	phase	VSWR	S11	S12
(MHz)	(ohms)	(ohms)	(ohms)	(deg)		dB	dB
source = 1; node 49, sector 1							
.94	95.46	191.55	214.02	63.5	10.021	-1.7394	-4.8145

passive		resistance	reactance	inductance	capacitance	
load	node	(ohms)	(ohms)	(mH)	(uF)	
circuit						
1	1	0	-2,605.	0	0	0
2	25	0	-1,992.	0	0	0
3	73	0	-2,605.	0	0	0
4	88	0	-2,605.	0	0	0

Tower 4 Driven, others floated

IMPEDANCE

normalization = 50.

freq	resist	react	imped	phase	VSWR	S11	S12
(MHz)	(ohms)	(ohms)	(ohms)	(deg)		dB	dB
source = 1; node 73, sector 1							
.94	45.796	36.654	58.658	38.7	2.1236	-8.8811	-.60175

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	-133.7	108.2	0	.2911	15
		-133.7	108.2	91.		
2	none	-133.7	108.2	91.	.005	3
		-136.	92.4	67.6		
3	none	-133.7	108.2	91.	.005	3
		-146.3	118.4	67.6		
4	none	-133.7	108.2	91.	.005	3
		-118.6	114.	67.6		
5	none	0	0	0	.2911	15
		0	0	91.6		
6	none	0	0	91.6	.005	3
		15.2	-5.5	68.2		
7	none	0	0	91.6	.005	3
		-12.4	-10.4	68.2		
8	none	0	0	91.6	.005	3
		-2.8	16.6	68.2		
9	none	133.7	-108.2	0	.2911	15
		133.7	-108.2	89.8		
10	none	133.7	-108.2	89.8	.005	3
		141.8	-122.2	66.4		
11	none	133.7	-108.2	89.8	.005	3
		117.5	-108.2	66.4		
12	none	133.7	-108.2	89.8	.005	3
		141.8	-94.2	66.4		
13	none	23.5	64.6	0	.2911	15
		23.5	64.6	93.7		
14	none	110.	-173.	0	.2911	15
		110.	-173.	94.		

Number of wires = 14
current nodes = 102

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	-133.7	108.2	0	.2911	15
		-133.7	108.2	91.		
2	none	-133.7	108.2	91.	.005	3
		-136.	92.4	67.6		
3	none	-133.7	108.2	91.	.005	3
		-146.3	118.4	67.6		
4	none	-133.7	108.2	91.	.005	3
		-118.6	114.	67.6		
5	none	0	0	0	.2911	15
		0	0	91.6		
6	none	0	0	91.6	.005	3
		15.2	-5.5	68.2		
7	none	0	0	91.6	.005	3
		-12.4	-10.4	68.2		
8	none	0	0	91.6	.005	3
		-2.8	16.6	68.2		
9	none	133.7	-108.2	0	.2911	15
		133.7	-108.2	89.8		
10	none	133.7	-108.2	89.8	.005	3
		141.8	-122.2	66.4		
11	none	133.7	-108.2	89.8	.005	3
		117.5	-108.2	66.4		
12	none	133.7	-108.2	89.8	.005	3
		141.8	-94.2	66.4		
13	none	23.5	64.6	0	.2911	15
		23.5	64.6	93.7		
14	none	110.	-173.	0	.2911	15
		110.	-173.	94.2		

Number of wires = 14
current nodes = 102

	minimum	maximum
Individual wires	wire value	wire value
segment length	9 5.98667	8 9.60879
radius	2 5.E-03	1 .2911

ELECTRICAL DESCRIPTION

Frequencies (MHz)

no.	frequency	step	no. of steps	segment length (wavelengths)
	lowest			minimum maximum
1	.94	0	1	.0166296 .0266911

Sources

source	node	sector	magnitude	phase	type
1	49	1	1.	0	voltage

Lumped loads

	minimum	maximum
Individual wires	wire value	wire value
segment length	9 5.98667	8 9.60879
radius	2 5.E-03	1 .2911

ELECTRICAL DESCRIPTION

Frequencies (MHz)

no.	frequency	step	no. of steps	segment length (wavelengths)
	lowest			minimum maximum
1	.94	0	1	.0166296 .0266911

Sources

source	node	sector	magnitude	phase	type
1	73	1	1.	0	voltage

Lumped loads

	resistance	reactance	inductance	capacitance
passive load node	(ohms)	(ohms)	(mH)	(uF)
circuit				
1 1	0	-2,605.	0	0 0
2 25	0	-1,992.	0	0 0
3 49	0	-2,605.	0	0 0
4 88	0	-2,605.	0	0 0

Tower 5 Driven, others floated

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 88, sector 1							
.94	46.785	38.509	60.595	39.5	2.1795	-8.6131	-.64303

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	-133.7	108.2	0	.2911	15
		-133.7	108.2	91.		
2	none	-133.7	108.2	91.	.005	3
		-136.	92.4	67.6		
3	none	-133.7	108.2	91.	.005	3
		-146.3	118.4	67.6		
4	none	-133.7	108.2	91.	.005	3
		-118.6	114.	67.6		
5	none	0	0	0	.2911	15
		0	0	91.6		
6	none	0	0	91.6	.005	3
		15.2	-5.5	68.2		
7	none	0	0	91.6	.005	3
		-12.4	-10.4	68.2		
8	none	0	0	91.6	.005	3

		-2.8	16.6	68.2		
9	none	133.7	-108.2	0	.2911	15
		133.7	-108.2	89.8		
10	none	133.7	-108.2	89.8	.005	3
		141.8	-122.2	66.4		
11	none	133.7	-108.2	89.8	.005	3
		117.5	-108.2	66.4		
12	none	133.7	-108.2	89.8	.005	3
		141.8	-94.2	66.4		
13	none	23.5	64.6	0	.2911	15
		23.5	64.6	93.7		
14	none	110.	-173.	0	.2911	15
		110.	-173.	94.2		

Number of wires = 14
current nodes = 102

		minimum		maximum
Individual wires	wire	value	wire	value
segment length	9	5.98667	8	9.60879
radius	2	5.E-03	1	.2911

ELECTRICAL DESCRIPTION

Frequencies (MHz)

frequency		no. of steps	segment length (wavelengths)	
no. lowest	step		minimum	maximum
1	.94	0	1	
			.0166296	.0266911

Sources

source node	sector	magnitude	phase	type
1	88	1	0	voltage

Lumped loads

		resistance	reactance	inductance	capacitance
passive load circuit	node	(ohms)	(ohms)	(mH)	(uF)
1	1	0	-2,605.	0	0
2	25	0	-1,992.	0	0
3	49	0	-2,605.	0	0
4	73	0	-2,605.	0	0

CURRENT NODES

coordinates (degrees)				connections		node
wire	X	Y	Z	end1	end2	no.
1	-133.7	108.2	0	GND	1	1
1	-133.7	108.2	6.06667	1	1	2
1	-133.7	108.2	12.1333	1	1	3
1	-133.7	108.2	18.2	1	1	4
1	-133.7	108.2	24.2667	1	1	5
1	-133.7	108.2	30.3333	1	1	6
1	-133.7	108.2	36.4	1	1	7
1	-133.7	108.2	42.4667	1	1	8
1	-133.7	108.2	48.5333	1	1	9
1	-133.7	108.2	54.6	1	1	10
1	-133.7	108.2	60.6667	1	1	11
1	-133.7	108.2	66.7333	1	1	12
1	-133.7	108.2	72.8	1	1	13
1	-133.7	108.2	78.8667	1	1	14
1	-133.7	108.2	84.9333	1	END	15
2	-133.7	108.2	91.	1	2	16
2	-134.467	102.933	83.2	2	2	17
2	-135.233	97.6667	75.4	2	END	18
3	-133.7	108.2	91.	1	3	19
3	-137.9	111.6	83.2	3	3	20
3	-142.1	115.	75.4	3	END	21
4	-133.7	108.2	91.	1	4	22
4	-128.667	110.133	83.2	4	4	23
4	-123.633	112.067	75.4	4	END	24
5	0	0	0	GND	5	25
5	0	0	6.10667	5	5	26
5	0	0	12.2133	5	5	27
5	0	0	18.32	5	5	28
5	0	0	24.4267	5	5	29
5	0	0	30.5333	5	5	30
5	0	0	36.64	5	5	31
5	0	0	42.7467	5	5	32
5	0	0	48.8533	5	5	33
5	0	0	54.96	5	5	34
5	0	0	61.0667	5	5	35
5	0	0	67.1733	5	5	36
5	0	0	73.28	5	5	37
5	0	0	79.3867	5	5	38
5	0	0	85.4933	5	END	39
6	0	0	91.6	5	6	40
6	5.06667	-1.83333	83.8	6	6	41
6	10.1333	-3.66667	76.	6	END	42
7	0	0	91.6	5	7	43
7	-4.13333	-3.46667	83.8	7	7	44
7	-8.26667	-6.93333	76.	7	END	45
8	0	0	91.6	5	8	46
8	-.933333	5.53333	83.8	8	8	47
8	-1.86667	11.0667	76.	8	END	48
9	133.7	-108.2	0	GND	9	49
9	133.7	-108.2	5.98667	9	9	50
9	133.7	-108.2	11.9733	9	9	51
9	133.7	-108.2	17.96	9	9	52
9	133.7	-108.2	23.9467	9	9	53
9	133.7	-108.2	29.9333	9	9	54

9	133.7	-108.2	35.92	9	9	55
9	133.7	-108.2	41.9067	9	9	56
9	133.7	-108.2	47.8933	9	9	57
9	133.7	-108.2	53.88	9	9	58
9	133.7	-108.2	59.8667	9	9	59
9	133.7	-108.2	65.8533	9	9	60
9	133.7	-108.2	71.84	9	9	61
9	133.7	-108.2	77.8267	9	9	62
9	133.7	-108.2	83.8133	9	END	63
10	133.7	-108.2	89.8	9	10	64
10	136.4	-112.867	82.	10	10	65
10	139.1	-117.533	74.2	10	END	66
11	133.7	-108.2	89.8	9	11	67
11	128.3	-108.2	82.	11	11	68
11	122.9	-108.2	74.2	11	END	69
12	133.7	-108.2	89.8	9	12	70
12	136.4	-103.533	82.	12	12	71
12	139.1	-98.8667	74.2	12	END	72
13	23.5	64.6	0	GND	13	73
13	23.5	64.6	6.24667	13	13	74
13	23.5	64.6	12.4933	13	13	75
13	23.5	64.6	18.74	13	13	76
13	23.5	64.6	24.9867	13	13	77
13	23.5	64.6	31.2333	13	13	78
13	23.5	64.6	37.48	13	13	79
13	23.5	64.6	43.7267	13	13	80
13	23.5	64.6	49.9733	13	13	81
13	23.5	64.6	56.22	13	13	82
13	23.5	64.6	62.4667	13	13	83
13	23.5	64.6	68.7133	13	13	84
13	23.5	64.6	74.96	13	13	85
13	23.5	64.6	81.2067	13	13	86
13	23.5	64.6	87.4533	13	END	87
14	110.	-173.	0	GND	14	88
14	110.	-173.	6.28	14	14	89
14	110.	-173.	12.56	14	14	90
14	110.	-173.	18.84	14	14	91
14	110.	-173.	25.12	14	14	92
14	110.	-173.	31.4	14	14	93
14	110.	-173.	37.68	14	14	94
14	110.	-173.	43.96	14	14	95
14	110.	-173.	50.24	14	14	96
14	110.	-173.	56.52	14	14	97
14	110.	-173.	62.8	14	14	98
14	110.	-173.	69.08	14	14	99
14	110.	-173.	75.36	14	14	100
14	110.	-173.	81.64	14	14	101
14	110.	-173.	87.92	14	END	102

Derivation of Operating Parameters for Daytime Antenna Array

Following verification of the moment method model of the individual array elements, by comparison of the measured and modeled base impedances, directional antenna array base parameters were calculated. Calculations were made to determine the complex voltage sources which when applied to the base of each array element produce current moment sums which when normalized, equate to the theoretical field parameters of the authorized directional pattern. Using these voltages, the tower currents were calculated. The currents at the ATU sampling points were related to those of the moment method model by using the WCAP Pro nodal analysis program from Westberg Consulting. The assumptions that were used for the single tower calculations were used in the directional array case as well. In the following WCAP calculations node 2 represents the reference point, node 1 represents the tower feed point, and node 0 represents ground. The tower operating impedance is represented from node 1 to ground ((R 1-0). The current magnitude and phases at the sample point are represented across the extremely short fifty (50) ohm transmission line which was added to facilitate calculation. The value shown at TL 3-2 has been rounded by the program. The actual current values shown as "I" in the "WCAP INPUT DATA" represent the values before rounding and were used in the calculation of antenna monitor amplitude and phase indications to yield greater accuracy.

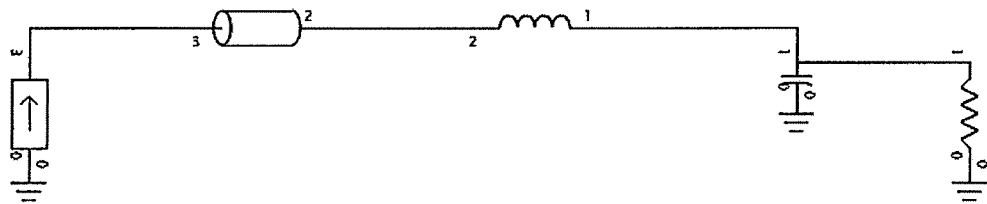
In so much as the sample lines are equal in length and the sample torroids responses are identical, the antenna monitor currents and phases have been calculated directly from the reference point currents and phases. The antenna monitor reference is Tower #4. Tower #1 has been detuned in the day array.

Tower	Model Pulse	Model Current Magnitude at Torroid, Amps	Model Current Phase at Torroid Degrees	Indicated Antenna Monitor Ratio	Indicated Antenna Monitor Phase
2	1	6.271	110.396	.484	+104.5
3	12	4.935	29.95	.381	+24.1
4	33	12.948	5.854	1.0	0.0
5	44	5.081	135.88	.392	+130.0

Center Frequency: 0.94 MHz

Frequency Range: ± 0 kHz

Frequency Step: 0 kHz



WCAP - Base Model Tower 2, Day Array

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 896.3543 \angle -152.0592° V

Node: 2 977.1920 \angle -152.6865° V

Node: 3 977.1939 \angle -152.6865° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	6.27 \angle 110.396° A	6.27 \angle 110.396° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 2.20000000	81.48 \angle -159.604° V	6.27 \angle 110.396° A
C 1→0 0.00008500	896.35 \angle -152.059° V	0.45 \angle -62.059° A
R 1→0 -16.35600000	896.35 \angle -152.059° V	6.72 \angle 110.900° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 2.20000000	-18.77 +j 154.690	-18.77 +j 141.696
C 1→0 0.00008500	0.00 -j 1991.927	0.00 +j 0.000
R 1→0 -16.35600000	-16.36 +j 132.430	0.00 +j 0.000
TL 3→2 50.00000000	-18.77 +j 154.693	-18.77 +j 154.690

WCAP PART	VSWR
TL 3→2 50.00000000	28.5054

WCAP INPUT DATA:

0.9400	0.00000000	0
I	6.27100000	0 3 110.39600000
L	2.20000000	2 1 0.00000000
C	0.00008500	1 0
R	-16.35600000	1 0 132.43000000
TL	50.00000000	3 2 100.00000000 0.00100000 0.00000000

WCAP - Base Model Tower 3, Day Array

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 1181.0302 \angle 97.5944° V

Node: 2 1270.5162 \angle 99.2445° V

Node: 3 1270.5176 \angle 99.2445° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	4.93 \angle 29.950° A	4.94 \angle 29.949° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 3.30000000	96.19 \angle 119.949° V	4.94 \angle 29.949° A
C 1→0 0.00006500	1181.03 \angle 97.594° V	0.45 \angle -172.406° A
R 1→0 77.24200000	1181.03 \angle 97.594° V	5.36 \angle 28.105° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 3.30000000	91.02 + j 240.815	91.02 + j 221.325
C 1→0 0.00006500	0.00 - j 2604.827	0.00 + j 0.000
R 1→0 77.24200000	77.24 + j 206.480	0.00 + j 0.000
TL 3→2 50.00000000	91.03 + j 240.822	91.02 + j 240.815

WCAP PART	VSWR
TL 3→2 50.00000000	15.0460

WCAP INPUT DATA:

0.9400	0.00000000	0
I	4.93500000	0 3 29.95000000
L	3.30000000	2 1 0.00000000
C	0.00006500	1 0
R	77.24200000	1 0 206.48000000
TL	50.00000000	3 2 100.00000000 0.00100000 0.00000000

WCAP - Base Model Tower 4, Day Array

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 906.7820 \angle 51.6523° V

Node: 2 1319.8742 \angle 67.2349° V

Node: 3 1319.8776 \angle 67.2350° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	12.95 \angle 5.854° A	12.95 \angle 5.854° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 6.65000000	508.55 \angle 95.854° V	12.95 \angle 5.854° A
C 1→0 0.00006500	906.78 \angle 51.652° V	0.35 \angle 141.652° A
R 1→0 46.98000000	906.78 \angle 51.652° V	13.20 \angle 4.800° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 6.65000000	48.82 +j 89.482	48.82 +j 50.205
C 1→0 0.00006500	0.00 -j 2604.827	0.00 +j 0.000
R 1→0 46.98000000	46.98 +j 50.120	0.00 +j 0.000
TL 3→2 50.00000000	48.83 +j 89.483	48.82 +j 89.482

WCAP PART	VSWR
TL 3→2 50.00000000	5.0837

WCAP INPUT DATA:

0.9400	0.00000000	0
I	12.94800000	0 3 5.85400000
L	6.65000000	2 1 0.00000000
C	0.00006500	1 0
R	46.98000000	1 0 50.12000000
TL	50.00000000	3 2 100.00000000 0.00100000 0.00000000

WCAP - Base Model Tower 5, Day Array

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 134.0013 \angle -163.2030° V

Node: 2 276.4375 \angle -147.7484° V

Node: 3 276.4390 \angle -147.7483° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	5.08 \angle 135.880° A	5.08 \angle 135.880° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 5.05000000	151.55 \angle -134.120° V	5.08 \angle 135.880° A
C 1→0 0.00006500	134.00 \angle -163.203° V	0.05 \angle -73.203° A
R 1→0 12.59500000	134.00 \angle -163.203° V	5.13 \angle 135.600° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 5.05000000	12.82 +j 52.874	12.82 +j 23.048
C 1→0 0.00006500	0.00 -j 2604.827	0.00 +j 0.000
R 1→0 12.59500000	12.60 +j 22.907	0.00 +j 0.000
TL 3→2 50.00000000	12.82 +j 52.875	12.82 +j 52.874

WCAP PART	VSWR
TL 3→2 50.00000000	8.3994

WCAP INPUT DATA:

0.9400 0.00000000 0

I	5.08100000	0	3	135.88000000
L	5.05000000	2	1	0.00000000
C	0.00006500	1	0	
R	12.59500000	1	0	22.90700000
TL	50.00000000	3	2	100.00000000 0.00100000 0.00000000

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = .94 MHz

	field ratio	
tower	magnitude	phase (deg)
1	0	0
2	.65	112.2
3	.57	21.9
4	1.	0
5	.37	134.1

VOLTAGES AND CURRENTS - rms

	source voltage		current	
node	magnitude	phase (deg)	magnitude	phase (deg)
1	222.439	284.3	.458837	13.4
25	896.371	207.9	6.7175	110.9
49	1,180.99	97.6	5.35709	28.1
73	906.972	51.7	13.2027	4.8
88	134.006	196.8	5.12645	135.6

Sum of square of source currents = 549.248

Total power = 10,000. watts

NOTE: Tower #1 is not driven in the day array. Voltage indicated at Node 1 is the voltage developed across the reactive element inserted at base of tower #1 to detune it.

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	-133.7	108.2	0	.2911	15
		-133.7	108.2	91.		
2	none	-133.7	108.2	91.	.005	3
		-136.	92.4	67.6		
3	none	-133.7	108.2	91.	.005	3
		-146.3	118.4	67.6		
4	none	-133.7	108.2	91.	.005	3
		-118.6	114.	67.6		
5	none	0	0	0	.2911	15
		0	0	91.6		
6	none	0	0	91.6	.005	3
		15.2	-5.5	68.2		
7	none	0	0	91.6	.005	3
		-12.4	-10.4	68.2		
8	none	0	0	91.6	.005	3
		-2.8	16.6	68.2		
9	none	133.7	-108.2	0	.2911	15
		133.7	-108.2	89.8		
10	none	133.7	-108.2	89.8	.005	3
		141.8	-122.2	66.4		

11	none	133.7	-108.2	89.8	.005	3
		117.5	-108.2	66.4		
12	none	133.7	-108.2	89.8	.005	3
		141.8	-94.2	66.4		
13	none	23.5	64.6	0	.2911	15
		23.5	64.6	93.7		
14	none	110.	-173.	0	.2911	15
		110.	-173.	94.2		

Number of wires = 14
current nodes = 102

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	9	5.98667	8	9.60879
radius	2	5.E-03	1	.2911

ELECTRICAL DESCRIPTION

Frequencies (MHz)

frequency			no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	.94	0	1	.0166296	.0266911

Sources

source	node	sector	magnitude	phase	type
1	1	1	314.576	284.3	voltage
2	25	1	1,267.66	207.9	voltage
3	49	1	1,670.17	97.6	voltage
4	73	1	1,282.65	51.7	voltage
5	88	1	189.513	196.8	voltage

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
.94	7.4503	-484.73	484.79	270.9	637.63	-2.7E-02	-22.039
source = 2; node 25, sector 1							
.94	-16.355	132.43	133.44	97.	****	****	****
source = 3; node 49, sector 1							
.94	77.243	206.48	220.45	69.5	13.155	-1.3231	-5.8067
source = 4; node 73, sector 1							
.94	46.978	50.122	68.696	46.9	2.7035	-6.7453	-1.0324
source = 5; node 88, sector 1							
.94	12.594	22.906	26.14	61.2	4.8489	-3.6348	-2.4644

CURRENT NODES				connections		node
coordinates (degrees)				end1	end2	no.
wire	X	Y	Z			
1	-133.7	108.2	0	GND	1	1
1	-133.7	108.2	6.06667	1	1	2
1	-133.7	108.2	12.1333	1	1	3
1	-133.7	108.2	18.2	1	1	4
1	-133.7	108.2	24.2667	1	1	5
1	-133.7	108.2	30.3333	1	1	6
1	-133.7	108.2	36.4	1	1	7
1	-133.7	108.2	42.4667	1	1	8
1	-133.7	108.2	48.5333	1	1	9
1	-133.7	108.2	54.6	1	1	10
1	-133.7	108.2	60.6667	1	1	11
1	-133.7	108.2	66.7333	1	1	12
1	-133.7	108.2	72.8	1	1	13
1	-133.7	108.2	78.8667	1	1	14
1	-133.7	108.2	84.9333	1	END	15
2	-133.7	108.2	91.	1	2	16
2	-134.467	102.933	83.2	2	2	17
2	-135.233	97.6667	75.4	2	END	18
3	-133.7	108.2	91.	1	3	19
3	-137.9	111.6	83.2	3	3	20
3	-142.1	115.	75.4	3	END	21
4	-133.7	108.2	91.	1	4	22
4	-128.667	110.133	83.2	4	4	23
4	-123.633	112.067	75.4	4	END	24
5	0	0	0	GND	5	25
5	0	0	6.10667	5	5	26
5	0	0	12.2133	5	5	27
5	0	0	18.32	5	5	28
5	0	0	24.4267	5	5	29
5	0	0	30.5333	5	5	30
5	0	0	36.64	5	5	31
5	0	0	42.7467	5	5	32
5	0	0	48.8533	5	5	33
5	0	0	54.96	5	5	34
5	0	0	61.0667	5	5	35
5	0	0	67.1733	5	5	36
5	0	0	73.28	5	5	37
5	0	0	79.3867	5	5	38
5	0	0	85.4933	5	END	39
6	0	0	91.6	5	6	40
6	5.06667	-1.83333	83.8	6	6	41
6	10.1333	-3.66667	76.	6	END	42
7	0	0	91.6	5	7	43
7	-4.13333	-3.46667	83.8	7	7	44
7	-8.26667	-6.93333	76.	7	END	45
8	0	0	91.6	5	8	46
8	-.933333	5.53333	83.8	8	8	47
8	-1.86667	11.0667	76.	8	END	48
9	133.7	-108.2	0	GND	9	49
9	133.7	-108.2	5.98667	9	9	50
9	133.7	-108.2	11.9733	9	9	51
9	133.7	-108.2	17.96	9	9	52

9	133.7	-108.2	23.9467	9	9	53
9	133.7	-108.2	29.9333	9	9	54
9	133.7	-108.2	35.92	9	9	55
9	133.7	-108.2	41.9067	9	9	56
9	133.7	-108.2	47.8933	9	9	57
9	133.7	-108.2	53.88	9	9	58
9	133.7	-108.2	59.8667	9	9	59
9	133.7	-108.2	65.8533	9	9	60
9	133.7	-108.2	71.84	9	9	61
9	133.7	-108.2	77.8267	9	9	62
9	133.7	-108.2	83.8133	9	END	63
10	133.7	-108.2	89.8	9	10	64
10	136.4	-112.867	82.	10	10	65
10	139.1	-117.533	74.2	10	END	66
11	133.7	-108.2	89.8	9	11	67
11	128.3	-108.2	82.	11	11	68
11	122.9	-108.2	74.2	11	END	69
12	133.7	-108.2	89.8	9	12	70
12	136.4	-103.533	82.	12	12	71
12	139.1	-98.8667	74.2	12	END	72
13	23.5	64.6	0	GND	13	73
13	23.5	64.6	6.24667	13	13	74
13	23.5	64.6	12.4933	13	13	75
13	23.5	64.6	18.74	13	13	76
13	23.5	64.6	24.9867	13	13	77
13	23.5	64.6	31.2333	13	13	78
13	23.5	64.6	37.48	13	13	79
13	23.5	64.6	43.7267	13	13	80
13	23.5	64.6	49.9733	13	13	81
13	23.5	64.6	56.22	13	13	82
13	23.5	64.6	62.4667	13	13	83
13	23.5	64.6	68.7133	13	13	84
13	23.5	64.6	74.96	13	13	85
13	23.5	64.6	81.2067	13	13	86
13	23.5	64.6	87.4533	13	END	87
14	110.	-173.	0	GND	14	88
14	110.	-173.	6.28	14	14	89
14	110.	-173.	12.56	14	14	90
14	110.	-173.	18.84	14	14	91
14	110.	-173.	25.12	14	14	92
14	110.	-173.	31.4	14	14	93
14	110.	-173.	37.68	14	14	94
14	110.	-173.	43.96	14	14	95
14	110.	-173.	50.24	14	14	96
14	110.	-173.	56.52	14	14	97
14	110.	-173.	62.8	14	14	98
14	110.	-173.	69.08	14	14	99
14	110.	-173.	75.36	14	14	100
14	110.	-173.	81.64	14	14	101
14	110.	-173.	87.92	14	END	102

CURRENT rms

Frequency = .94 MHz

Input power = 10,000. watts

Efficiency = 100. %

coordinates in degrees

current

no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	-133.7	108.2	0	.458834	13.4	.446275	.106617
2	-133.7	108.2	6.06667	.313855	13.1	.305735	.0709291
3	-133.7	108.2	12.1333	.21863	12.6	.213324	.0478744
4	-133.7	108.2	18.2	.138679	12.	.135634	.028904
5	-133.7	108.2	24.2667	.0700263	10.7	.0688097	.012996
6	-133.7	108.2	30.3333	.0114208	358.7	.0114176	-2.68E-04
7	-133.7	108.2	36.4	.038754	196.7	-.0371289	-.0111048
8	-133.7	108.2	42.4667	.0795711	194.3	-.0771035	-.0196626
9	-133.7	108.2	48.5333	.111757	193.5	-.108673	-.0260745
10	-133.7	108.2	54.6	.135474	193.	-.132	-.0304831
11	-133.7	108.2	60.6667	.150977	192.6	-.147313	-.0330567
12	-133.7	108.2	66.7333	.158659	192.4	-.154973	-.034001
13	-133.7	108.2	72.8	.15908	192.2	-.1555	-.0335592
14	-133.7	108.2	78.8667	.152962	192.1	-.149578	-.0319961
15	-133.7	108.2	84.9333	.141168	192.1	-.138034	-.0295803
END	-133.7	108.2	91.	.126011	192.3	-.123106	-.0269014
2J1	-133.7	108.2	91.	.0462668	193.1	-.0450647	-.010478
17	-134.467	102.933	83.2	.0281191	194.8	-.02719	-7.17E-03
18	-135.233	97.6667	75.4	.0113877	197.6	-.0108517	-3.45E-03
END	-136.	92.4	67.6	0	0	0	0
2J1	-133.7	108.2	91.	.0358213	228.3	-.0238354	-.0267403
20	-137.9	111.6	83.2	.0232044	248.2	-8.6E-03	-.021552
21	-142.1	115.	75.4	.0128453	273.2	7.25E-04	-.0128249
END	-146.3	118.4	67.6	0	0	0	0
2J1	-133.7	108.2	91.	.0551791	169.2	-.054206	.0103169
23	-128.667	110.133	83.2	.0369621	162.1	-.0351677	.0113768
24	-123.633	112.067	75.4	.0181539	151.2	-.0159092	8.74E-03
END	-118.6	114.	67.6	0	0	0	0
GND	0	0	0	6.71748	110.9	-2.39652	6.27545
26	0	0	6.10667	7.27507	111.5	-2.66119	6.77087
27	0	0	12.2133	7.58352	111.8	-2.81135	7.04316
28	0	0	18.32	7.78158	112.	-2.91258	7.21594
29	0	0	24.4267	7.88662	112.1	-2.97311	7.30476
30	0	0	30.5333	7.90651	112.3	-2.99678	7.31656
31	0	0	36.64	7.84673	112.4	-2.98614	7.25632
32	0	0	42.7467	7.71218	112.4	-2.94357	7.12833
33	0	0	48.8533	7.50911	112.5	-2.87189	6.93823
34	0	0	54.96	7.24575	112.5	-2.7748	6.69338
35	0	0	61.0667	6.93419	112.5	-2.65746	6.40476
36	0	0	67.1733	6.5912	112.5	-2.52687	6.08759
37	0	0	73.28	6.23461	112.5	-2.39045	5.75813
38	0	0	79.3867	5.87508	112.5	-2.25281	5.42599
39	0	0	85.4933	5.51295	112.6	-2.11454	5.0913
END	0	0	91.6	5.20151	112.6	-1.99651	4.80309
2J5	0	0	91.6	1.72578	112.6	-.662935	1.59337
41	5.06667	-1.83333	83.8	1.30113	112.6	-.500226	1.20113
42	10.1333	-3.66667	76.	.722603	112.6	-.277294	.667281
END	15.2	-5.5	68.2	0	0	0	0
2J5	0	0	91.6	1.6641	110.2	-.575307	1.56149
44	-4.13333	-3.46667	83.8	1.24624	109.8	-.423119	1.17221
45	-8.26667	-6.93333	76.	.687069	109.4	-.228452	.647976
END	-12.4	-10.4	68.2	0	0	0	0
2J5	0	0	91.6	1.81429	114.7	-.758265	1.64824
47	-.933333	5.53333	83.8	1.37207	115.2	-.58321	1.24195
48	-1.86667	11.0667	76.	.765119	115.7	-.331338	.689654
END	-2.8	16.6	68.2	0	0	0	0

GND	133.7	-108.2	0	5.35708	28.1	4.72345	2.52732
50	133.7	-108.2	5.98667	6.05582	25.6	5.45936	2.62075
51	133.7	-108.2	11.9733	6.46704	24.3	5.89322	2.66318
52	133.7	-108.2	17.96	6.76035	23.3	6.20681	2.67914
53	133.7	-108.2	23.9467	6.95586	22.6	6.42224	2.67187
54	133.7	-108.2	29.9333	7.06232	22.	6.54911	2.64303
55	133.7	-108.2	35.92	7.08505	21.5	6.59313	2.59395
56	133.7	-108.2	41.9067	7.02872	21.1	6.55914	2.52599
57	133.7	-108.2	47.8933	6.89886	20.7	6.4526	2.44094
58	133.7	-108.2	53.88	6.70299	20.4	6.2808	2.34129
59	133.7	-108.2	59.8667	6.45215	20.2	6.05426	2.23072
60	133.7	-108.2	65.8533	6.16149	20.1	5.78738	2.1143
61	133.7	-108.2	71.84	5.84694	20.	5.49527	1.99716
62	133.7	-108.2	77.8267	5.51796	19.9	5.18714	1.88187
63	133.7	-108.2	83.8133	5.17563	20.	4.86439	1.76772
END	133.7	-108.2	89.8	4.87201	20.1	4.57635	1.67138
2J9	133.7	-108.2	89.8	1.63091	18.7	1.54436	.524238
65	136.4	-112.867	82.	1.21318	18.9	1.14789	.392606
66	139.1	-117.533	74.2	.663864	19.	.627521	.21664
END	141.8	-122.2	66.4	0	0	0	0
2J9	133.7	-108.2	89.8	1.61942	19.9	1.52256	.551656
68	128.3	-108.2	82.	1.20302	20.3	1.12844	.416975
69	122.9	-108.2	74.2	.65762	20.7	.615082	.232677
END	117.5	-108.2	66.4	0	0	0	0
2J9	133.7	-108.2	89.8	1.62265	21.5	1.50943	.595481
71	136.4	-103.533	82.	1.20682	22.2	1.11746	.45573
72	139.1	-98.8667	74.2	.66087	22.9	.608644	.257491
END	141.8	-94.2	66.4	0	0	0	0
GND	23.5	64.6	0	13.2026	4.8	13.156	1.10877
74	23.5	64.6	6.24667	13.5725	3.1	13.5525	.736557
75	23.5	64.6	12.4933	13.6462	2.1	13.6372	.493929
76	23.5	64.6	18.74	13.5263	1.2	13.5231	.293322
77	23.5	64.6	24.9867	13.2271	.5	13.2266	.124674
78	23.5	64.6	31.2333	12.7571	359.9	12.7571	-.0156573
79	23.5	64.6	37.48	12.1236	359.4	12.1229	-.129103
80	23.5	64.6	43.7267	11.3339	358.9	11.3319	-.216312
81	23.5	64.6	49.9733	10.3965	358.5	10.3928	-.277686
82	23.5	64.6	56.22	9.31991	358.1	9.31463	-.313621
83	23.5	64.6	62.4667	8.11318	357.7	8.10668	-.324605
84	23.5	64.6	68.7133	6.78471	357.4	6.77757	-.311213
85	23.5	64.6	74.96	5.34053	357.1	5.33349	-.274002
86	23.5	64.6	81.2067	3.77977	356.8	3.77376	-.213154
87	23.5	64.6	87.4533	2.08178	356.5	2.07787	-.127495
END	23.5	64.6	93.7	0	0	0	0
GND	110.	-173.	0	5.12643	135.6	-3.66374	3.58571
89	110.	-173.	6.28	5.17726	135.1	-3.67029	3.65144
90	110.	-173.	12.56	5.14671	134.8	-3.62968	3.64884
91	110.	-173.	18.84	5.05379	134.6	-3.54847	3.5985
92	110.	-173.	25.12	4.90185	134.4	-3.42821	3.50364
93	110.	-173.	31.4	4.69337	134.2	-3.27035	3.36638
94	110.	-173.	37.68	4.43087	134.	-3.07656	3.18864
95	110.	-173.	43.96	4.1171	133.8	-2.84877	2.97238
96	110.	-173.	50.24	3.75511	133.6	-2.58921	2.71972
97	110.	-173.	56.52	3.34822	133.4	-2.30036	2.43288
98	110.	-173.	62.8	2.89982	133.2	-1.98485	2.11407
99	110.	-173.	69.08	2.41309	133.	-1.64522	1.76529
100	110.	-173.	75.36	1.89039	132.8	-1.28352	1.38786
101	110.	-173.	81.64	1.33167	132.5	-.900209	.981314
102	110.	-173.	87.92	.729981	132.3	-.491156	.540035
END	110.	-173.	94.2	0	0	0	0

Derivation of Operating Parameters for Nighttime Antenna Array

Following verification of the moment method model of the individual array elements, by comparison of the measured and modeled base impedances, directional antenna array base parameters were calculated. Calculations were made to determine the complex voltage sources which when applied to the base of each array element produce current moment sums which when normalized, equate to the theoretical field parameters of the authorized directional pattern. Using these voltages, the tower currents were calculated. The currents at the ATU sampling points were related to those of the moment method model by using the WCAP Pro nodal analysis program from Westberg Consulting. The assumptions that were used for the single tower calculations were used in the directional array case as well. In the following WCAP calculations node 2 represents the reference point, node 1 represents the tower feed point, and node 0 represents ground. The tower operating impedance is represented from node 1 to ground (R_{1-0}). The current magnitude and phases at the sample point are represented across the extremely short fifty (50) ohm transmission line which was added to facilitate calculation. The value shown at TL 3-2 has been rounded by the program. The actual current values shown as "I" in the "WCAP INPUT DATA" represent the values before rounding and were used in the calculation of antenna monitor amplitude and phase indications to yield greater accuracy.

In so much as the sample lines are equal in length and the sample torroids responses are identical, the antenna monitor amplitudes and phases have been calculated directly from the reference point currents and phases.

The antenna monitor reference is Tower #2. Towers #4 and #5 have been detuned in the night array.

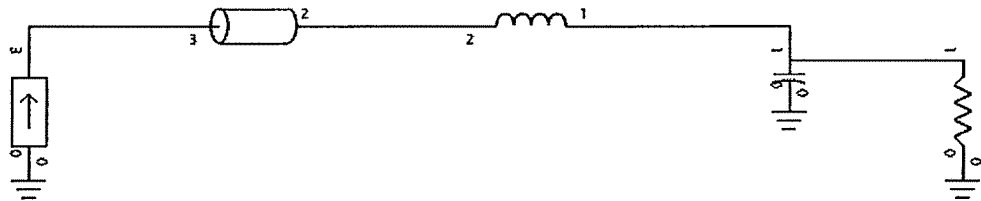
Tower	Model Pulse	Model Current Magnitude At Torroid, Amps	Model Current Phase at Torroid, Degrees	Indicated Antenna Monitor Ratio	Indicated Antenna Monitor Phase, Degrees
1	1	.923	45.42	.500	+35.2
2	25	1.846	10.27	1.000	0.0
3	49	1.0248	329.11	.555	-41.2

WCAP Circuit Diagram

Center Frequency: 0.94 MHz

Frequency Range: ± 0 kHz

Frequency Step: 0 kHz



WCAP - Base Model Tower 1, Night Array

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 171.2332 \angle 121.4220° V

Node: 2 181.0353 \angle 122.1943° V

Node: 3 181.0356 \angle 122.1943° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	0.92 \angle 45.424° A	0.92 \angle 45.424° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 1.85000000	10.09 \angle 135.424° V	0.92 \angle 45.424° A
C 1→0 0.00006500	171.23 \angle 121.422° V	0.07 \angle -148.578° A
R 1→0 39.26000000	171.23 \angle 121.422° V	0.99 \angle 44.500° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 1.85000000	44.89 + j 190.928	44.89 + j 180.002
C 1→0 0.00006500	0.00 - j 2604.827	0.00 + j 0.000
R 1→0 39.26000000	39.26 + j 169.000	0.00 + j 0.000
TL 3→2 50.00000000	44.89 + j 190.933	44.89 + j 190.928

WCAP PART	VSWR
TL 3→2 50.00000000	18.1998

WCAP INPUT DATA:

	0.9400	0.00000000	0
I	0.92300000	0 3	45.42400000
L	1.85000000	2 1	0.00000000
C	0.00006500	1 0	
R	39.26000000	1 0	169.00000000
TL	50.00000000	3 2	100.00000000 0.00100000 0.00000000

WCAP - Base Model Tower 2, Night Array

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 413.6920 \angle 72.0532° V

Node: 2 434.9762 \angle 73.5473° V

Node: 3 434.9767 \angle 73.5473° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	1.85 \angle 10.271° A	1.85 \angle 10.270° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 2.20000000	23.99 \angle 100.270° V	1.85 \angle 10.270° A
C 1→0 0.00008500	413.69 \angle 72.053° V	0.21 \angle 162.053° A
R 1→0 87.50000000	413.69 \angle 72.053° V	2.03 \angle 7.500° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 2.20000000	105.96 + j 210.459	105.96 + j 197.465
C 1→0 0.00008500	0.00 - j 1991.927	0.00 + j 0.000
R 1→0 87.50000000	87.50 + j 183.890	0.00 + j 0.000
TL 3→2 50.00000000	105.96 + j 210.463	105.96 + j 210.459

WCAP PART	VSWR
TL 3→2 50.00000000	10.8596

WCAP INPUT DATA:

0.9400	0.00000000	0
I	1.84600000	0 3 10.27100000
L	2.20000000	2 1 0.00000000
C	0.00008500	1 0
R	87.50000000	1 0 183.89000000
TL	50.00000000	3 2 100.00000000 0.00100000 0.00000000

WCAP - Base Model Tower 3, Night Array

WCAP OUTPUT AT FREQUENCY: 0.940 MHz

NODE VOLTAGES

Node: 1 159.8902 \angle 21.2660° V

Node: 2 176.0905 \angle 25.2565° V

Node: 3 176.0908 \angle 25.2565° V

WCAP PART	CURRENT IN	CURRENT OUT
TL 3→2 50.00000000	1.02 \angle -30.890° A	1.02 \angle -30.891° A

WCAP PART	BRANCH VOLTAGE	BRANCH CURRENT
L 2→1 3.30000000	19.97 \angle 59.109° V	1.02 \angle -30.891° A
C 1→0 0.00006500	159.89 \angle 21.266° V	0.06 \angle 111.266° A
R 1→0 87.16000000	159.89 \angle 21.266° V	1.07 \angle -32.900° A

WCAP PART	FROM IMPEDANCE	TO IMPEDANCE
L 2→1 3.30000000	95.72 + j 142.697	95.72 + j 123.206
C 1→0 0.00006500	0.00 - j 2604.827	0.00 + j 0.000
R 1→0 87.16000000	87.16 + j 120.700	0.00 + j 0.000
TL 3→2 50.00000000	95.72 + j 142.698	95.72 + j 142.697

WCAP PART	VSWR
TL 3→2 50.00000000	6.5384

WCAP INPUT DATA:

0.9400 0.00000000 0

I	1.02480000	0	3	329.11000000		
L	3.30000000	2	1	0.00000000		
C	0.00006500	1	0			
R	87.16000000	1	0	120.70000000		
TL	50.00000000	3	2	100.00000000	0.00100000	0.00000000

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = .94 MHz

tower	field ratio magnitude	phase (deg)
1	.5	41.
2	1.07	0
3	.5	-41.
4	0	0
5	0	0

Note: Towers #4 and #5 are not driven in the night array. Voltages indicated are those developed across the reactive elements inserted at the towers bases to detune the towers.

VOLTAGES AND CURRENTS - rms

source	voltage node	magnitude	phase (deg)	current magnitude	phase (deg)
1	171.229	121.4	.986899	44.5	
25	413.821	72.1	2.03205	7.5	
49	159.849	21.3	1.07369	327.1	
73	98.7126	328.9	.193446	59.2	
88	62.0713	254.7	.121083	344.	

Sum of square of source currents = 12.6162

Total power = 500. watts

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	-133.7	108.2	0	.2911	15
		-133.7	108.2	91.		
2	none	-133.7	108.2	91.	.005	3
		-136.	92.4	67.6		
3	none	-133.7	108.2	91.	.005	3
		-146.3	118.4	67.6		
4	none	-133.7	108.2	91.	.005	3
		-118.6	114.	67.6		
5	none	0	0	0	.2911	15
		0	0	91.6		
6	none	0	0	91.6	.005	3
		15.2	-5.5	68.2		
7	none	0	0	91.6	.005	3
		-12.4	-10.4	68.2		
8	none	0	0	91.6	.005	3
		-2.8	16.6	68.2		
9	none	133.7	-108.2	0	.2911	15
		133.7	-108.2	89.8		
10	none	133.7	-108.2	89.8	.005	3
		141.8	-122.2	66.4		
11	none	133.7	-108.2	89.8	.005	3

		117.5	-108.2	66.4		
12	none	133.7	-108.2	89.8	.005	3
		141.8	-94.2	66.4		
13	none	23.5	64.2	0	.2911	15
		23.5	64.6	93.7		
14	none	110.	-173.	0	.2911	15
		110.	-173.	94.2		

Number of wires = 14
current nodes = 102

		minimum		maximum
Individual wires	wire	value	wire	value
segment length	9	5.98667	8	9.60879
radius	2	5.E-03	1	.2911

ELECTRICAL DESCRIPTION

Frequencies (MHz)

no.	frequency	step	no. of steps	segment length (wavelengths)
	lowest			minimum maximum
1	.94	0	1	.0166296 .0266911

Sources

source	node	sector	magnitude	phase	type
1	1	1	242.154	121.4	voltage
2	25	1	585.231	72.1	voltage
3	49	1	226.06	21.3	voltage
4	73	1	139.601	328.9	voltage
5	88	1	87.7821	254.7	voltage

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
.94	39.255	169.	173.5	76.9	16.55	-1.0509	-6.6771
source = 2; node 25, sector 1							
.94	87.496	183.89	203.65	64.6	9.9506	-1.7517	-4.7897
source = 3; node 49, sector 1							
.94	87.158	120.7	148.88	54.2	5.4771	-3.2077	-2.8215
source = 4; node 73, sector 1							
.94	-2.4042	-510.28	510.29	269.7	****	****	****
source = 5; node 88, sector 1							
.94	5.9507	-512.6	512.63	270.7	891.64	-1.9E-02	-23.491

CURRENT rms

Frequency = .94 MHz

Input power = 500. watts

Efficiency = 100. %

coordinates in degrees

current

no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	-133.7	108.2	0	.986898	44.5	.70427	.691355
2	-133.7	108.2	6.06667	1.09203	43.2	.796633	.74693
3	-133.7	108.2	12.1333	1.15229	42.4	.850486	.777456
4	-133.7	108.2	18.2	1.19354	41.9	.888585	.796838
5	-133.7	108.2	24.2667	1.21896	41.4	.913722	.806822
6	-133.7	108.2	30.3333	1.22993	41.1	.927094	.808222
7	-133.7	108.2	36.4	1.22735	40.8	.929448	.801568
8	-133.7	108.2	42.4667	1.21201	40.5	.921402	.787391
9	-133.7	108.2	48.5333	1.18485	40.3	.903703	.766291
10	-133.7	108.2	54.6	1.14716	40.1	.877321	.73911
11	-133.7	108.2	60.6667	1.10083	40.	.843719	.707089
12	-133.7	108.2	66.7333	1.04852	39.9	.80492	.671932
13	-133.7	108.2	72.8	.993029	39.8	.763095	.635448
14	-133.7	108.2	78.8667	.936034	39.8	.719558	.598661
15	-133.7	108.2	84.9333	.877591	39.8	.674424	.561532
END	-133.7	108.2	91.	.826243	39.8	.634327	.529439
2J1	-133.7	108.2	91.	.274742	40.3	.209484	.177763
17	-134.467	102.933	83.2	.205603	40.7	.155944	.133992
18	-135.233	97.6667	75.4	.113334	41.1	.0854601	.0744385
END	-136.	92.4	67.6	0	0	0	0
2J1	-133.7	108.2	91.	.274291	38.9	.21341	.172312
20	-137.9	111.6	83.2	.204605	39.	.158938	.128849
21	-142.1	115.	75.4	.112338	39.2	.0870907	.0709574
END	-146.3	118.4	67.6	0	0	0	0
2J1	-133.7	108.2	91.	.277265	40.3	.211433	.179365
23	-128.667	110.133	83.2	.207455	40.7	.157373	.135172
24	-123.633	112.067	75.4	.114343	41.	.0862379	.0750826
END	-118.6	114.	67.6	0	0	0	0
GND	0	0	0	2.03205	7.5	2.01455	.266155
26	0	0	6.10667	2.27144	4.6	2.26408	.182764
27	0	0	12.2133	2.41241	3.	2.40902	.127812
28	0	0	18.32	2.51208	1.9	2.51076	.0815428
29	0	0	24.4267	2.57714	.9	2.57681	.0416782
30	0	0	30.5333	2.61048	.2	2.61047	7.37E-03
31	0	0	36.64	2.61386	359.5	2.61377	-.0217083
32	0	0	42.7467	2.58886	359.	2.58846	-.0457211
33	0	0	48.8533	2.53743	358.5	2.5366	-.0647498
34	0	0	54.96	2.46221	358.2	2.46095	-.0788748
35	0	0	61.0667	2.3672	357.9	2.36555	-.0882143
36	0	0	67.1733	2.25795	357.6	2.25604	-.0929576
37	0	0	73.28	2.14052	357.5	2.13848	-.0933931
38	0	0	79.3867	2.01867	357.4	2.01667	-.089905
39	0	0	85.4933	1.8929	357.5	1.89108	-.0829761
END	0	0	91.6	1.7819	357.6	1.78037	-.0739322
2J5	0	0	91.6	.590952	357.7	.590481	-.0235811
41	5.06667	-1.83333	83.8	.441616	358.3	.441415	-.0133203
42	10.1333	-3.66667	76.	.242938	358.9	.242892	-4.7E-03
END	15.2	-5.5	68.2	0	0	0	0
2J5	0	0	91.6	.587886	357.6	.587374	-.024534
44	-4.13333	-3.46667	83.8	.438717	358.2	.43849	-.0141254
45	-8.26667	-6.93333	76.	.24099	358.8	.240934	-5.17E-03
END	-12.4	-10.4	68.2	0	0	0	0
2J5	0	0	91.6	.603064	357.5	.602512	-.0258171
47	-.933333	5.53333	83.8	.449385	358.1	.449135	-.0150068
48	-1.86667	11.0667	76.	.246498	358.7	.246434	-5.61E-03
END	-2.8	16.6	68.2	0	0	0	0

GND	133.7	-108.2	0	1.07369	327.1	.901581	-.58307
50	133.7	-108.2	5.98667	1.15514	324.1	.936116	-.676777
51	133.7	-108.2	11.9733	1.20087	322.4	.951857	-.732159
52	133.7	-108.2	17.96	1.23046	321.1	.957867	-.772351
53	133.7	-108.2	23.9467	1.24616	320.1	.955343	-.800147
54	133.7	-108.2	29.9333	1.24901	319.2	.944927	-.816778
55	133.7	-108.2	35.92	1.23967	318.4	.927101	-.822958
56	133.7	-108.2	41.9067	1.21884	317.8	.902416	-.819281
57	133.7	-108.2	47.8933	1.18741	317.2	.871544	-.80644
58	133.7	-108.2	53.88	1.14659	316.8	.835417	-.785333
59	133.7	-108.2	59.8667	1.09826	316.4	.795423	-.757282
60	133.7	-108.2	65.8533	1.04498	316.1	.753436	-.724091
61	133.7	-108.2	71.84	.989383	316.	.711349	-.687649
62	133.7	-108.2	77.8267	.932969	315.9	.670131	-.649119
63	133.7	-108.2	83.8133	.875707	316.	.629569	-.608692
END	133.7	-108.2	89.8	.826199	316.1	.595629	-.572565
2J9	133.7	-108.2	89.8	.278918	315.3	.198343	-.1961
65	136.4	-112.867	82.	.209705	315.8	.150437	-.146099
66	139.1	-117.533	74.2	.116129	316.4	.084089	-.0800932
END	141.8	-122.2	66.4	0	0	0	0
2J9	133.7	-108.2	89.8	.272331	316.8	.198571	-.186371
68	128.3	-108.2	82.	.203987	317.6	.150701	-.137478
69	122.9	-108.2	74.2	.112601	318.6	.0844037	-.0745311
END	117.5	-108.2	66.4	0	0	0	0
2J9	133.7	-108.2	89.8	.274997	316.3	.198715	-.190094
71	136.4	-103.533	82.	.206383	317.	.150866	-.140832
72	139.1	-98.8667	74.2	.114151	317.8	.0845076	-.0767394
END	141.8	-94.2	66.4	0	0	0	0
GND	23.5	64.2	0	.193444	59.2	.0990627	.166154
74	23.5	64.2267	6.24667	.128157	59.3	.0653409	.110248
75	23.5	64.2533	12.4933	.0856805	59.6	.0433541	.0739025
76	23.5	64.28	18.74	.0506431	60.2	.0251923	.0439326
77	23.5	64.3067	24.9867	.0212766	62.	9.98E-03	.0187933
78	23.5	64.3333	31.2333	3.34E-03	219.	-2.59E-03	-2.1E-03
79	23.5	64.36	37.48	.0228035	236.4	-.0126135	-.0189974
80	23.5	64.3867	43.7267	.0378289	237.8	-.0201315	-.0320273
81	23.5	64.4133	49.9733	.048348	238.6	-.0251904	-.0412671
82	23.5	64.44	56.22	.0544457	239.2	-.0278613	-.046777
83	23.5	64.4667	62.4667	.0562263	239.8	-.0282538	-.048612
84	23.5	64.4933	68.7133	.0538085	240.5	-.0265165	-.0468212
85	23.5	64.52	74.96	.0473034	241.2	-.0228223	-.0414337
86	23.5	64.5467	81.2067	.0367534	241.9	-.0173319	-.0324101
87	23.5	64.5733	87.4533	.0219617	242.6	-.010106	-.0194983
END	23.5	64.6	93.7	0	0	0	0
GND	110.	-173.	0	.121083	344.	.116408	-.0333219
89	110.	-173.	6.28	.0799173	343.7	.0767132	-.0224022
90	110.	-173.	12.56	.0531647	343.4	.0509477	-.0151925
91	110.	-173.	18.84	.0311487	342.9	.0297738	-9.15E-03
92	110.	-173.	25.12	.0127501	341.7	.0121039	-4.01E-03
93	110.	-173.	31.4	2.49E-03	172.5	-2.47E-03	3.24E-04
94	110.	-173.	37.68	.014641	164.7	-.0141229	3.86E-03
95	110.	-173.	43.96	.0238843	164.	-.0229549	6.6E-03
96	110.	-173.	50.24	.0302686	163.6	-.0290413	8.53E-03
97	110.	-173.	56.52	.0338689	163.4	-.032461	9.66E-03
98	110.	-173.	62.8	.0347754	163.3	-.0333046	.0100065
99	110.	-173.	69.08	.0330925	163.2	-.0316747	9.58E-03
100	110.	-173.	75.36	.0289249	163.1	-.0276724	8.42E-03
101	110.	-173.	81.64	.0223399	163.	-.0213629	6.53E-03
102	110.	-173.	87.92	.0132643	162.9	-.0126781	3.9E-03
END	110.	-173.	94.2	0	0	0	0

Sampling System Measurements

The following calculations confirm that the sample system as installed complies with Rule Section 73.151(c)(2)(1) in all respects. The sample torroids are Delta model TCT3 and their outputs are in agreement within the manufacturer's specification of +/-2% and +/-2°. The antenna monitor is a Potomac Instruments model 1901. The antenna monitor calibration was checked against an Agilent model 4396A network analyzer in the amplitude and phase modes and the calibration of the monitor was found to be in agreement within the Potomac specifications. The sample lines are equal in length and constructed of ½" Andrew LDF2-50A coaxial cable that has a solid outer conductor and foam dielectric. The cables are equal in length within 1° as required. The cables have all been buried so as to be exposed to the same environmental conditions. The length of the cables was confirmed by measuring the impedance, looking into the line with the far end opened. The lines were found to be 5/4 wavelength long at the frequencies listed. These frequencies were used to calculate the electrical lengths of the lines at the operating frequency of 940 kHz. Frequencies were calculated at which the lines were +/- 45° the length of the resonate frequency. The impedance was then calculated using the following formula:

$$Z_o = ((R1^2 + X1^2)^{1/2} * (R2^2 + X2^2)^{1/2})^{1/2}$$

Sample Line Length Calculation

Tower	Resonate Frequency At 450°, kHz	Electrical Length At 940 kHz
1	1402.11	301.7
2	1402.25	301.7
3	1401.91	301.7
4	1401.96	301.7
5	1401.64	301.8

Sample Line Impedance Calculation

Tower	270° Resonant Frequency kHz	45° Above Resonant Frequency kHz	Resistance Ohms	Reactance Ohms	45° Below Resonant Frequency kHz	Resistance Ohms	Reactance Ohms	Characteristic Impedance Ohms
1	1402.11	1542.32	11.01	49.10	1261.90	8.76	-49.40	50.25
2	1402.25	1542.48	11.00	49.02	1262.03	8.75	-49.03	50.02
3	1401.91	1542.10	10.98	48.90	1261.72	8.73	-48.90	49.89
4	1401.96	1542.16	11.04	49.10	1261.76	8.87	-49.40	50.26
5	1401.64	1541.80	11.14	49.30	1261.48	8.89	-49.50	50.42

The sample torroid calibration was confirmed by passing a common conductor through the torroids. The common conductor was driven by a Hewlett-Packard 4396A vector network analyzer that was properly calibrated for response measurement. The output from the tower 1 torroid was fed to the reference receiver of the analyzer and the other outputs were alternately fed to the B input. The output of the towers 2 – 5, torroids were compared to that of the tower 1 torroid and the results noted in the chart below.

Sample Torroid Calibration Verification

Tower	Serial Number	Indicated Ratio	Indicated Phase
1	17848	1.0000	0.0°
2	17844	1.0047	-0.2°
3	17858	1.0065	-0.4°
4	17860	1.0037	-0.08°
5	17863	1.0022	-0.1°

Sample Lines Terminated By Torroids

Tower	Serial Number	Impedance at Input to Sample Line with Torroid Connected
1	17848	48.9-j1.7
2	17844	48.7-j2.0
3	17858	48.3-j2.3
4	17860	48.5-j1.9
5	17863	48.6-j1.8

Item 6

Direct Measurement of Power

The common point networks in both the daytime and nighttime phasors were adjusted to provide the proper operating resistance of 50 ohms and a reactance of 0 (zero) ohms to the transmitter output. In order to compensate for hookup inductance between the power measurement point and the transmitter the common point reactance was set for a value of $-j7$ at the measurement point. The daytime and nighttime operating powers were calculated by adding +5.3% to the daytime and +8.0% to the nighttime nominal operating powers of 10kW and .5kW respectively. The common point currents were then calculated as indicated below.

Pattern	Nominal Power Watts	Operating Power Watts	Operating Common Point Current, Amps
Daytime	10000	10527	14.51
Nighttime	500	540	3.29

Reference Field Strength Measurements

Reference field strength measurements were made on radials having maximum radiation limits specified in the construction permit in both the daytime and nighttime directional patterns as well as the major lobes as follows:

Daytime

Radial Degrees, True	Distance Km	Date	Time	Field Strength Mv/m	Point Description
20°T	1.4	2/19/14	1047	200	Center of parking lot 5163 De Gaulle by tree 29°54'40.4"N 90°00'00.3"W
"	1.85	"	1054	170	3650 Rue Michelle 29°54'53.7"N 89°59'55.5"W
"	2.58	"	1110	158	5179 MacArthur 29°55'15.8"N 89°59'44.3"
39°T	2.36	"	1124	111	213 Fairfax 29°54'56.6"N 88°59'22.1"W
"	2.84	"	1132	159	328 Neil 29°55'09.3"N 89°59'10.1"W
"	3.39	"	1140	122	Carver at bus stop nr General Myer 29°55'22.0"N 89°58'58.0"W
95°T	2.16	"	1155	42	S side Edw Herbert Blvd in parking lot of abandoned brick complex 29°53'49.4"N 89°58'56.9"
"	1.74	"	1204	100	So side Rt 406 30m E of culvert 29°53'51.1"N 89°59'14.9"W
"	2.25	"	1210	55	Gate, 323 Herbert 29°53'47.7"N 89°58'53.8"W
179°T	3.42	"	1348	162	Corner Belle Chase Hwy & Dr Bowen in JRB Credit Union lot 29°52'05.8"N 90°00'16.8"W
"	3.66	"	1316	170	E Barriere Rd across from large white warehouse 29°51'58.7"N 90°00'15.8"W

Radial Degrees, True	Distance Km	Date	Time	Field Strength Mv/m	Directions
179°T	3.81	2/19/14	1328	157	101 Good News Ave. 29°51'53.8"N 90°00'15.4"W
219°T	2.7	"	1404	162	North end Firethorn Ave MB101 29°52'49.3"N 90°01'20.7"
	2.82	"	1411	149	117 Southwood 29°52'46.8"N 90°01'23.8"W
	3.35	"	1420	171	401 Bannerwood 29°52'32.7"N 90°01'36.0"W
249°T	2.46	"	1430	238	2036 Laurel 29°53'28.4"N 90°01'42.7"W
	3.36	"	1444	212	2036 Laurel 29°53'28.4"N 90°01'42.7"W
	3.41	"	1452	205	333 Westmeade 29°53'17.8"N 90°02'16.6"W
320°T Main Lobe	4.19	"	1518	360	Wall Blvd 100m N of DeGualle @ S entrance to parking area on right 29°55'47.4"N 90°01'48.1"W
	4.49	"	1525	370	Vespasian Ave 30m E of Shirley Pl 29°55'55.2"N 90°01'53.9"W
	4.89	"	1533	310	1839 Farragut 29°56'06.4"N 90°02'03.3"

Nighttime

Radial Degrees, True	Distance Km	Date	Time	Field Strength Mv/m	Directions
39°T	2.36	2/20/14	1030	22.6	213 Fairfax 29°54'56.6"N 88°59'22.1"W
	2.84	"	1037	32.5	328 Neil 29°55'09.3"N 89°59'10.1"W
	3.39	"	1041	18.8	Carver at bus stop nr General Myer 29°55'22.0"N 89°58'58.0"W
115°T Lobe	1.33	"	1103	109	Across from 4071 RT406 29°53'37.3"N 89°59'33.0"W
	3.53	"	1115	89	Parking lot across from Edw Herbert baseball field 29°53'12.2"N 89°58'16.0"W
	3.69	"	1120	72	Parking lot 3712 Main St Belle Chase 29°53'06.5"N 89°58'12.5"W
179°T	3.42	"	1156	2.6	Corner Belle Chase Hwy & Dr Bowen in JRB Credit Union lot 29°52'05.8"N 90°00'16.8"W
	3.66	"	1140	3.0	E Barriere Rd across from large white warehouse 29°51'58.7"N 90°00'15.8"W
	3.81	"	1145	2.7	101 Good News Ave. 29°51'53.8"N 90°00'15.4"W
219°T	2.7	"	1232	15.7	North end Firethorn Ave MB101 29°52'49.3"N 90°01'20.7"
	2.82	"	1240	12.5	117 Southwood 29°52'46.8"N 90°01'23.8"W
	3.35	"	1244	15.7	401 Bannerwood 29°52'32.7"N 90°01'36.0"W
249°T	2.46	"	1315	11.8	2036 Laurel 29°53'28.4"N 90°01'42.7"W
	3.36	"	1330	6.8	2036 Laurel 29°53'28.4"N 90°01'42.7"W
	3.41	"	1336	7.0	333 Westmeade 29°53'17.8"N 90°02'16.6"W
320°T Main Lobe	4.19	"	1433	62	Wall Blvd 100m N of DeGualle @ S entrance to parking area on right 29°55'47.4"N 90°01'48.1"W
	4.49	"	1437	54	Vespasian Ave 30m E of Shirley Pl 29°55'55.2"N 90°01'53.9"W
	4.85	"	1447	48	1839 Farragut 29°56'06.4"N 90°02'03.3"

RFR Compliance

Operation of WYLD at 10 kW daytime and .5 kW nighttime will not result in exposure of workers or the general public to RF radiation in excess of levels specified in 47CFR 1.1310. Fences have been installed around all tower bases to comply with the minimum distance of 3.5 meters which exceeds the distances specified in OET Bulletin 65 for this frequency, calculated power levels in the towers and tower height to prevent electric and magnetic exposure greater than permissible levels. These fences limit access by the general public. If it becomes necessary for workers to enter the tower base areas for maintenance, the station will either reduce power or cease operation to provide RFR safety for the workers.

Ground System Detail

The ground system at WYLD remains as previously licensed. The ground system consists of 120 equally spaced, buried copper radials varying in length of 49.4 to 79.2 meters with a 7.3 square meter ground screen about the base of each tower. Intersecting radials are shortened and bonded to transverse copper straps.

STL Antenna Mounting on Tower #2

A 1.8 meter diameter parabolic STL receive antenna is mounted at 36.6 meters above ground on tower #2. The antenna is connected via coaxial cable to an iso-coupler across the base region of the tower. The coaxial outer conductor is electrically bonded to the tower at each antenna and at 15 meter intervals between the towers.

A depiction of the antenna follows.

