0909154004837001 DUPLICATE

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

BMML-20090914ACR

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO. BMML-20090914ACR

SECTION I - APPLICANT FEE INFORMATION

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

Michael Tosch

MAILING ADDRESS (Line 1) (Maximum 35 characters)
Disney Worldwide Services, Inc.

MAILING ADDRESS (Line 2) (Maximum 35 characters)
77 West 66th Street, 16th Floor, ATTN: John Zucker

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
New York	NY	10023-6298

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
212-456-7777 x 7387	KSPN	Fac. ID # 33255

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	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
MMR	0001	$ 615.00	

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
MOR	0001	$ 705.00	

	TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
ADD ALL AMOUNTS SHOWN IN COLUMN C, AND ENTER THE TOTAL HERE. THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED REMITTANCE.	$ 1320.00	

CLEAR ALL PAGES

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT ABC Radio Los Angeles Assets, LLC		
MAILING ADDRESS 77 West 66th Street, 16th Floor, ATTN: John Zucker		
CITY New York	STATE NY	ZIP CODE 10023-6298

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
KSPN	Los Angeles CA	NA	NA	NA

3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620? BSTA-20090602AAV expires 12/2/09

☑ Yes ☐ No

If No, explain in an Exhibit.

Exhibit No.

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

☑ Yes ☐ No

If No, state exceptions in an Exhibit.

Exhibit No.

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

☐ Yes ☑ No

If Yes, explain in an Exhibit.

Exhibit No.

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

☑ Yes ☐ No

☐ Does not apply

If No, explain in an Exhibit.

Exhibit No.

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

☐ Yes ☑ No

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

Exhibit No.

CLEAR ALL PAGES

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

☐ Yes ☑ No

If Yes, provide particulars as an Exhibit.

Exhibit No.

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

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

CERTIFICATION

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

☑ Yes ☐ No

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

Name	Signature	
JOHN W. ZUCKER		
Title	Date	Telephone Number
ASSISTANT SECRETARY	9.11.09	212.456.7777

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.

CLEAR ALL PAGES

APPLICATION FOR
DIRECT MEASUREMENT OF POWER
INFORMATION
RADIO STATION KSPN
LOS ANGELES, CALIFORNIA

August 25, 2009

710 KHZ 50 KW-D 10 KW-N U DA-N

APPLICATION FOR
DIRECT MEASUREMENT OF POWER
INFORMATION
RADIO STATION KSPN
LOS ANGELES, CALIFORNIA

710 KHZ 50 KW-D 10 KW-N U DA-N

	Executive Summary
Item 1	Analysis of Tower Impedance Measurements to Verify Method of Moments Model
Item 2	Derivation of Operating Parameters for Nighttime Directional Antenna
Item 3	Method of Moments Model Details for Towers Driven Individually
Item 4	Method of Moments Model Details for Nighttime Directional Antenna
Item 5	Summary of Certified Array Geometry
Item 6	Sampling System Measurements
Item 7	Reference Field Strength Measurements
Item 8	Direct Measurement of Power
Item 9	Antenna Monitor and Sampling System
Item 10	RFR Protection
Appendix A	Certified Post Construction Array Geometry Survey

Executive Summary - KSPN

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 rebuilt directional antenna system of radio station KSPN in Los Angeles, California. KSPN operates fulltime on 710 kilohertz with 50 kilowatts and a non-directional antenna during daytime hours and 10 kilowatts into a three-tower directional antenna during nighttime hours.

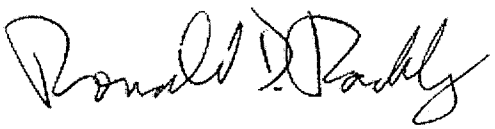
The KSPN phasing and coupling system equipment has been replaced. A new phasor cabinet has been installed in a new transmitter building. New transmission lines, antenna monitor sampling lines and control cables have been installed between the new transmitter building and new antenna tuning unit enclosures at the tower bases. The towers and ground system remain unchanged. No changes requiring a construction permit were made.

The ground system description that appears on the station license can be read to say that all radials are 525 feet in length, which is not the case. Ground screens are no longer employed near the tower bases. The radial wire ground system remains unchanged. For clarity, the following ground system description is provided:

"The ground system consists of 120 equally spaced, buried, copper wire radials 525 feet in length, except at the property boundaries or where intersecting radials are shortened and bonded to transverse copper straps midway between adjacent towers."

Information is provided herein demonstrating that the directional antenna parameters for the nighttime pattern has 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.

Information regarding direct measurement of power for both modes of operation is included herein.



Ronald D. Rackley, P.E.
August 26, 2009

Analysis of Tower Impedance Measurements to Verify Method of Moments Model - KSPN

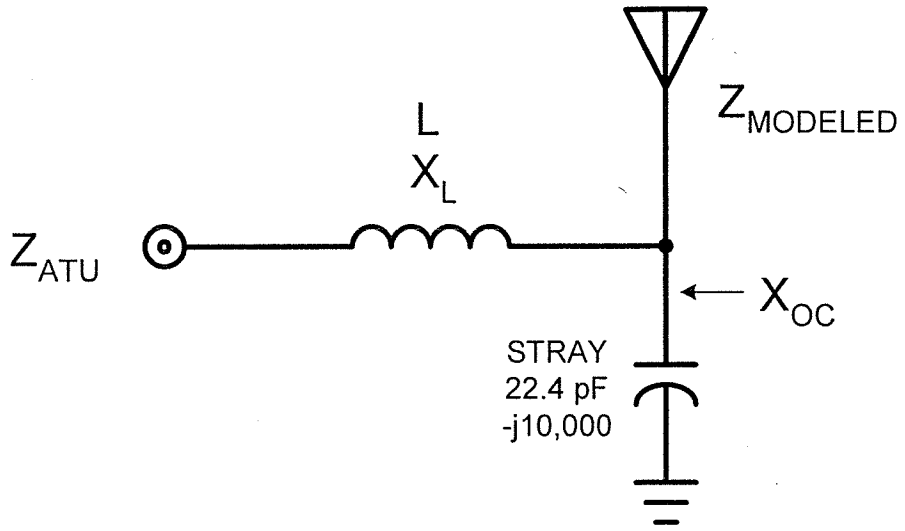
Tower base impedance measurements were made at the final J-plugs within the Antenna Tuning Units ("ATUs") using a Hewlett-Packard 8751A network analyzer and a Tunwall Radio directional coupler in a calibrated measurement system. The other towers were all open circuited at the same points where impedance measurements were made for them (the "reference points") for each of the measurements.

The reference point in each ATU is adjacent to the sampling transformer of the antenna monitor system at the output of the ATU enclosure. The current passes directly from that point over conductors through the enclosure insulator and on to the tower above the base insulator. There are no components in shunt with the ATU outputs following the sampling transformers other than static drain chokes, which have very high impedances and were found to not require consideration in the process of calibrating the method of moments model to the measured base impedances. Circuit calculations were performed to relate the method of moments modeled impedances of the tower feedpoints to the ATU output measurement (reference) points as shown on the following pages. The Xoc shown for each tower, which was calculated for the assumed stray capacitance, was used in the method of moments model as a load at ground level for the open circuited case.

In addition to the page showing the schematic of the assumed circuit and tabulation of calculated values, pages showing the results of calculations using the WCAP network analysis program from Westberg Consulting are provided. WCAP performs such calculations using nodal analysis, as do other modern circuit analysis programs such as the commonly available ones based on SPICE software.

In each of the WCAP tabulations, node 2 represents the ATU output reference point and node 3 represents the tower feedpoint. Node 0 represents ground potential. It should be noted that the calculated ATU output impedances appear under the "TO NODE IMPEDANCE" columns of the WCAP tabulations, following the phantom 1.0 ohm resistors (R 1 - 2) that were included in series with the drive current sources (I 0 -1)) to provide calculation points for the impedances. The tower feedpoint impedances from the method of moments model are represented by complex loads from node 3 to ground (R 3 - 0). The assumed stray capacitance of 22.4 picofarads was used for the calculations of all of the towers, although it appears as 0.0000 (microfarad) on the WCAP printout due to rounding. The numerals in the file names shown on the tabulations correspond to the tower numbers. One model was used for both tower 1 and tower 3 as they are symmetrical in the array geometry and near-symmetrical in measured impedance.

The modeled and measured base impedances at the ATU output jacks with the other towers open circuited at their ATU output jacks agree within +/- 2 ohms and +/- 4 percent for resistance and reactance, as required by the FCC Rules.



TOWER	L(uH)	X_L	X_{OC}	$Z_{MODELED}$	$Z_{ATU\ (MODELED)}$	$Z_{ATU\ (MEASURED)}$
1	3.078	+j13.7	-j10,000	30.7 -j17.4	30.6 -j3.7	30.8 -j3.7
2	3.399	+j15.1	-j10,000	30.1 -j18.7	30.0 -j3.6	30.7 -j3.6
3	3.078	+j13.7	-j10,000	30.7 -j17.4	30.6 -j3.7	30.6 -j3.7

ANALYSIS OF TOWER IMPEDANCE MEASUREMENTS TO VERIFY METHOD OF MOMENTS MODEL

RADIO STATION KSPN
LOS ANGELES, CALIFORNIA
710 KHZ 50 KW-D 10 KW-N U DA-N

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

Towers 1 & 3

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = kspn1oc.cir

I	1.0000	0	1	0.0000	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.0780	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	30.7430	3	0	-17.4070	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 0.710

NODE	VOLT MAG	VOLT PHASE
1	31.8563	-6.7414
2	30.8634	-6.9594
3	35.2675	-29.6947

				BRANCH VOLTAGE		BRANCH CURRENT	FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	1.00	0.000	1.00	0.000	31.64	-3.74	30.64	-3.74
L	2-	3	3.078	13.73	90.000	1.00	0.000	30.64	-3.74	30.64	-17.47
C	3-	0	0.000	35.27	-29.695	0.00	60.305	0.00	-10007.23	0.00	-10007.23
R	3-	0	30.743	35.27	-29.695	1.00	-0.176	30.74	-17.41	30.74	-17.41

Tower 2

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = kspn2oc.cir

I	1.0000	0	1	0.0000	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.3990	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	30.1410	3	0	-18.6530	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 0.710

NODE	VOLT MAG	VOLT PHASE
1	31.2306	-6.5185
2	30.2373	-6.7336
3	35.3798	-31.9239

				BRANCH VOLTAGE		BRANCH CURRENT	FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	1.00	0.000	1.00	0.000	31.03	-3.55	30.03	-3.55
L	2-	3	3.399	15.16	90.000	1.00	0.000	30.03	-3.55	30.03	-18.71
C	3-	0	0.000	35.38	-31.924	0.00	58.076	0.00	-10007.23	0.00	-10007.23
R	3-	0	30.141	35.38	-31.924	1.00	-0.172	30.14	-18.65	30.14	-18.65

Derivation of Operating Parameters for Nightime Directional Antenna - KSPN

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)). 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	11.27	125.8	0.516	123.7
2	11	21.85	2.1	1.000	0.0
3	21	9.84	-125.0	0.450	-127.1

WESTBERG CIRCUIT ANALYSIS PROGRAM

Tower 1

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = KSPN1DAN.CIR

I	11.2700	0	1	125.8300	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.0780	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	4.9993	3	0	-33.9080	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 0.710

NODE	VOLT MAG	VOLT PHASE
1	235.9135	52.3881
2	232.9524	49.7301
3	384.9698	44.1886

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	11.27	125.830	11.27	125.830	5.97	-20.06	4.97	-20.06
L	2-	3	3.078	154.75	-144.170	11.27	125.830	4.97	-20.06	4.97	-33.80
C	3-	0	0.000	384.97	44.189	0.04	134.189	0.00	-10007.23	0.00	-10007.23
R	3-	0	4.999	384.97	44.189	11.23	125.801	5.00	-33.91	5.00	-33.91

Tower 2

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = KSPN2DAN.CIR

I	21.8500	0	1	2.1100	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.3990	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	19.1700	3	0	-11.3100	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 0.710

NODE	VOLT MAG	VOLT PHASE
1	447.6566	12.8824
2	426.2112	13.4314
3	485.7807	-28.5396

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	21.85	2.110	21.85	2.110	20.13	3.83	19.13	3.83
L	2-	3	3.399	331.31	92.110	21.85	2.110	19.13	3.83	19.13	-11.33
C	3-	0	0.000	485.78	-28.540	0.05	61.460	0.00	-10007.23	0.00	-10007.23
R	3-	0	19.170	485.78	-28.540	21.83	2.000	19.17	-11.31	19.17	-11.31

Tower 3

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = KSPN3DAN.CIR

I	9.8400	0	1	-124.9900	0.0000	0.0000
R	1.0000	1	2	0.0000	0.0000	0.0000
L	3.0780	2	3	0.0000	0.0000	0.0000
C	0.0000	3	0	0.0000	0.0000	0.0000
R	2.4230	3	0	38.9240	0.0000	0.0000
EX	0.0000	0	0	0.0000	0.0000	0.0000

FREQ = 0.710

NODE	VOLT MAG	VOLT PHASE
1	520.7191	-38.7193
2	520.1718	-37.6377
3	385.2520	-38.5660

				BRANCH VOLTAGE		BRANCH CURRENT	FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			VSWR	MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1-	2	1.000	9.84	-124.990	9.84	-124.990	3.44	52.81	2.44	52.81
L	2-	3	3.078	135.11	-34.990	9.84	-124.990	2.44	52.81	2.44	39.08
C	3-	0	0.000	385.25	-38.566	0.04	51.434	0.00	-10007.23	0.00	-10007.23
R	3-	0	2.423	385.25	-38.566	9.88	-125.004	2.42	38.92	2.42	38.92

Method of Moments Model Details for Towers Driven Individually – KSPN

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 76.7 degrees in electrical height, the segment length is 7.67 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, square uniform cross section towers having a face width of 24 inches.

TOWER	Physical Height (meters)	Modeled Height (meters)	Modeled Percent of Height	Modeled Radius (meters)	Percent Equivalent Radius
1	90.0	97.3	108.1	0.39	100
2	90.0	97.3	108.1	0.39	100
3	90.0	97.3	108.1	0.39	100

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. One model was used for both tower 1 and tower 3 as they are symmetrical in the array geometry and near-symmetrical in measured impedance.

Towers 1 & 3

J:KSPN1OC 08-11-2009 16:51:10

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
710.	30.743	-17.407	35.329	330.5	1.9166	-10.054	-.45165

GEOMETRY
Dimensions in meters
Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	80.9	14.3	0	.39	10
		80.9	14.3	97.3		
2	none	0	0	0	.39	10
		0	0	97.3		
3	none	-80.9	-14.3	0	.39	10
		-80.9	-14.3	97.3		

Number of wires = 3
current nodes = 30

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	9.73	1	9.73
segment/radius ratio	1	24.9487	1	24.9487
radius	1	.39	1	.39

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	710.	0	1	.023043	.023043

Sources

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

Lumped loads

passive load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	circuit
1	11	0	-10,000.	0	0	0
2	21	0	-10,000.	0	0	0

Tower 2

J:\KSPN2OC 08-11-2009 16:55:43

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 11, sector 1							
710.	30.141	-18.653	35.446	328.2	1.9901	-9.6004	-.50434

GEOMETRY
Dimensions in meters
Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	80.9	14.3	0	.39	10
		80.9	14.3	97.3		
2	none	0	0	0	.39	10
		0	0	97.3		
3	none	-80.9	-14.3	0	.39	10
		-80.9	-14.3	97.3		

Number of wires = 3
current nodes = 30

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	9.73	1	9.73
segment/radius ratio	1	24.9487	1	24.9487
radius	1	.39	1	.39

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	710.	0	1	.023043	.023043

Sources

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

Lumped loads

		resistance	reactance	inductance	capacitance	
passive load	node	(ohms)	(ohms)	(mH)	(uF)	
circuit						
1	1	0	-10,000.	0	0	0
2	21	0	-10,000.	0	0	0

Method of Moments Model Details for Nighttime Directional Antenna- KSPN

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

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

J:\KSPNDAN 08-12-2009 09:44:44

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 710 KHz

tower	field ratio magnitude	phase (deg)
1	1.	125.
2	2.03	0
3	1.	-125.

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	384.893	44.1	11.2297	125.8
11	485.818	331.4	21.8271	2.
21	385.421	321.5	9.88273	235.

Sum of square of source currents = 1,400.39
Total power = 10,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.0196877	.0212505
Y(1, 2)	-.00120395	-.0283706
Y(1, 3)	-.0141922	.021171
Y(2, 1)	-.00120396	-.0283706
Y(2, 2)	.0223463	.0524234
Y(2, 3)	-.00120314	-.0283707
Y(3, 1)	-.0141922	.021171
Y(3, 2)	-.00120314	-.0283707
Y(3, 3)	.0196865	.0212507

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	30.7914	-17.4038
Z(1, 2)	21.0577	-10.5602
Z(1, 3)	1.27502	-17.3348
Z(2, 1)	21.0577	-10.5602
Z(2, 2)	30.23	-18.5863
Z(2, 3)	21.0577	-10.5602
Z(3, 1)	1.27501	-17.3348
Z(3, 2)	21.0577	-10.5602
Z(3, 3)	30.7914	-17.4046

GEOMETRY
Dimensions in meters
Environment: perfect ground

wire	caps	X	Y	Z	radius	segs
1	none	80.9	14.3	0	.39	10
		80.9	14.3	97.3		
2	none	0	0	0	.39	10
		0	0	97.3		
3	none	-80.9	-14.3	0	.39	10
		-80.9	-14.3	97.3		

Number of wires = 3
current nodes = 30

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	9.73	1	9.73
segment/radius ratio	1	24.9487	1	24.9487
radius	1	.39	1	.39

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	710.	0	1	.023043	.023043

Sources

source	node	sector	magnitude	phase	type
1	1	1	544.321	44.1	voltage
2	11	1	687.05	331.4	voltage
3	21	1	545.068	321.5	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							
710.	4.9993	-33.908	34.275	278.4	14.633	-1.189	-6.2069
source = 2; node 11, sector 1							
710.	19.17	-11.31	22.258	329.5	2.7632	-6.585	-1.0764
source = 3; node 21, sector 1							
710.	2.4227	38.924	39.	86.4	33.163	-.52398	-9.444

CURRENT rms
Frequency = 710 KHz
Input power = 10,000. watts
Efficiency = 100. %
coordinates in meters

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	80.9	14.3	0	11.2297	125.8	-6.56227	9.11277
2	80.9	14.3	9.73	10.8127	125.5	-6.28183	8.80072
3	80.9	14.3	19.46	10.271	125.3	-5.93992	8.37921
4	80.9	14.3	29.19	9.54821	125.1	-5.49665	7.80738
5	80.9	14.3	38.92	8.64727	125.	-4.9541	7.08747
6	80.9	14.3	48.65	7.57968	124.7	-4.32005	6.22805
7	80.9	14.3	58.38	6.36049	124.5	-3.60496	5.24024
8	80.9	14.3	68.11	5.00556	124.3	-2.81992	4.13566
9	80.9	14.3	77.84	3.52684	124.	-1.97397	2.92268
10	80.9	14.3	87.57	1.91997	123.8	-1.06707	1.59613
END	80.9	14.3	97.3	0	0	0	0
GND	0	0	0	21.8271	2.	21.8142	.750283
12	0	0	9.73	21.3992	1.1	21.3952	.414444
13	0	0	19.46	20.5747	.6	20.5738	.199368
14	0	0	29.19	19.324	.1	19.324	.0344206
15	0	0	38.92	17.6616	359.7	17.6613	-.0885397
16	0	0	48.65	15.6119	359.4	15.6109	-.172188
17	0	0	58.38	13.2048	359.1	13.203	-.217558
18	0	0	68.11	10.4706	358.8	10.4682	-.225105
19	0	0	77.84	7.43177	358.5	7.42922	-.194806
20	0	0	87.57	4.0752	358.2	4.07327	-.125278
END	0	0	97.3	0	0	0	0
GND	-80.9	-14.3	0	9.88272	235.	-5.66253	-8.09962
22	-80.9	-14.3	9.73	10.0683	234.9	-5.78247	-8.24218
23	-80.9	-14.3	19.46	9.91271	234.9	-5.69794	-8.11143
24	-80.9	-14.3	29.19	9.48604	234.9	-5.45293	-7.76212
25	-80.9	-14.3	38.92	8.80594	234.9	-5.05895	-7.20775
26	-80.9	-14.3	48.65	7.88859	235.	-4.52666	-6.46059
27	-80.9	-14.3	58.38	6.75084	235.	-3.86734	-5.53331
28	-80.9	-14.3	68.11	5.40937	235.1	-3.09235	-4.43831
29	-80.9	-14.3	77.84	3.87616	235.2	-2.21039	-3.18414
30	-80.9	-14.3	87.57	2.14448	235.3	-1.21948	-1.76399
END	-80.9	-14.3	97.3	0	0	0	0

Summary of Post Construction Certified Array Geometry- KSPN

The tower locations based on the relative distances in feet and azimuths (referenced to true north) were compared to the relative distances and azimuths relative to true north of the array elements specified on the construction permit. The surveyed and specified values were converted to the rectangular coordinate system to facilitate finding the individual tower specified-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 Base Location	
	Spacing (Deg.)	Spacing (Feet)	Azimuth (Deg. T.)	Spacing (Feet)	Azimuth (Deg. T.)	(Feet)	(Deg.)
1	70.0	269.4	10.0	269.1	10.3	1.4	0.4
2	REF.	REF.	REF.	REF.	REF.	REF.	REF.
3	70.0	269.4	190.0	269.0	190.3	1.4	0.4

*From August 20, 2009 Record Survey Plan prepared by Darrel L. Tenney LLS

The "as built" tower displacements from their specified locations expressed in electrical degrees at carrier frequency, which correspond to 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.

Sampling System Measurements – KSPN

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 above 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 710 kHz (kHz)	Sampling Line Open-Circuited Resonance Above 710 kHz (kHz)	Sampling Line Calculated Electrical Length at 710 kHz (degrees)	710 kHz Measured Impedance with Sampling Loop Connected (Ohms)
1	243.0	734.6	261.0	53.1 - j1.3
2	243.0	734.6	261.0	53.2 - j1.3
3	243.0	734.6	261.0	53.1 - j1.3

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	612.2	4.3 - j50.9	857.0	6.8 +j50.6	51.1
2	612.2	4.4 - j50.9	857.0	6.9 +j50.6	51.1
3	612.2	4.4 - j50.8	857.0	6.9 +j50.7	51.1

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, 710 kilohertz:

Tower	Ratio	Phase(Degrees)
1	0.9989	-0.011
2	Reference	Reference
3	0.9983	-0.075

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 – KSPN

Reference field strength measurements were made using a Potomac Instruments FIM-41 field strength meter that was most recently calibrated on September 12, 2008 at three locations along radials at the azimuths with radiation values specified on the construction permit and, additionally, on a major lobe radial for the directional pattern. The measured field strengths, descriptions and GPS coordinates for the reference measurement points are shown on the following page.

Reference Field Strength Measurements

KSPN - Night

Radial	Point	Distance (km)	Field (mV/m)	Coordinates(NAD27)		Description
190	1	0.85	1100	N34-9-59.2	W118-24-40.6	City Water Meter in front of 5250 Goodman Ave, Sherman Oaks, CA
	2	2.27	760	N34-9-14.2	W118-24-51.0	Fire Hydrant in front of 4559 Van Noord Ave, Studio City, CA
	3	3.33	602	N34-8-40.2	W118-24-57.6	City Water Meter in front of 13032 Dickens St., Studio City, CA
332	1	1.49	42	N34-11-8.9	W118-25-2.2	Center of Driveway at Curb in front of 6330 Ethel Ave, Van Nuys, CA
	2	2.61	23.9	N43-11-40.7	W118-25-23.5	City Water Meter in front of 6830 Varna St, Van Nuys, CA
	3	5.18	14.2	N34-12-54.2	W118-26-10.9	City Water Meter in front of 7934 Broadleaf Ave, Panorama City, CA
348	1	1.86	30.5	N34-11-25.3	W118-24-50.5	Fire Hydrant in front of 12930 Kittridge St, North Hollywood, CA
	2	2.67	19.8	N34-11-50.8	W118-24-57.9	Center of half circle driveway of Madison Middle School at 13000 Hart Ave, North Hollywood, CA
	3	4.03	20.9	N34-12-34.0	W118-25-7.8	City Water Meter in front of 7632 Mary Ellen Ave, North Hollywood, CA
66	1	1.17	160	N34-10-41.9	W118-23-53.4	Center of Driveway at curb in front of 12200 Tiara St, North Hollywood, CA
	2	2.96	33.5	N34-11-5.1	W118-22-49.0	Center of driveway at curb in front of 6257 Farmdale Ave, North Hollywood, CA
	3	4.63	27	N34-11-28.0	W118-21-49.9	City Water Meter in front of 6620 Denny Ave, North Hollywood, CA

All measurements were taken on 8/22/09 by Mike Tosch with Field Intensity Meter shown below:

MODEL: Potomac FIM-41
SERIAL # : 627
CAL DATE: 9/12/2008

Direct Measurement of Power - KSPN

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 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. A rotation network between the phasor cabinet input and the common point jack was adjusted to provide a non-reactive load for the transmitter, so no reactance offset to compensate for inadvertent inductance within the cabinet was necessary. The common point impedance was adjusted to 50.0 + j0.0 ohms for both the nondirectional and nighttime directional patterns.

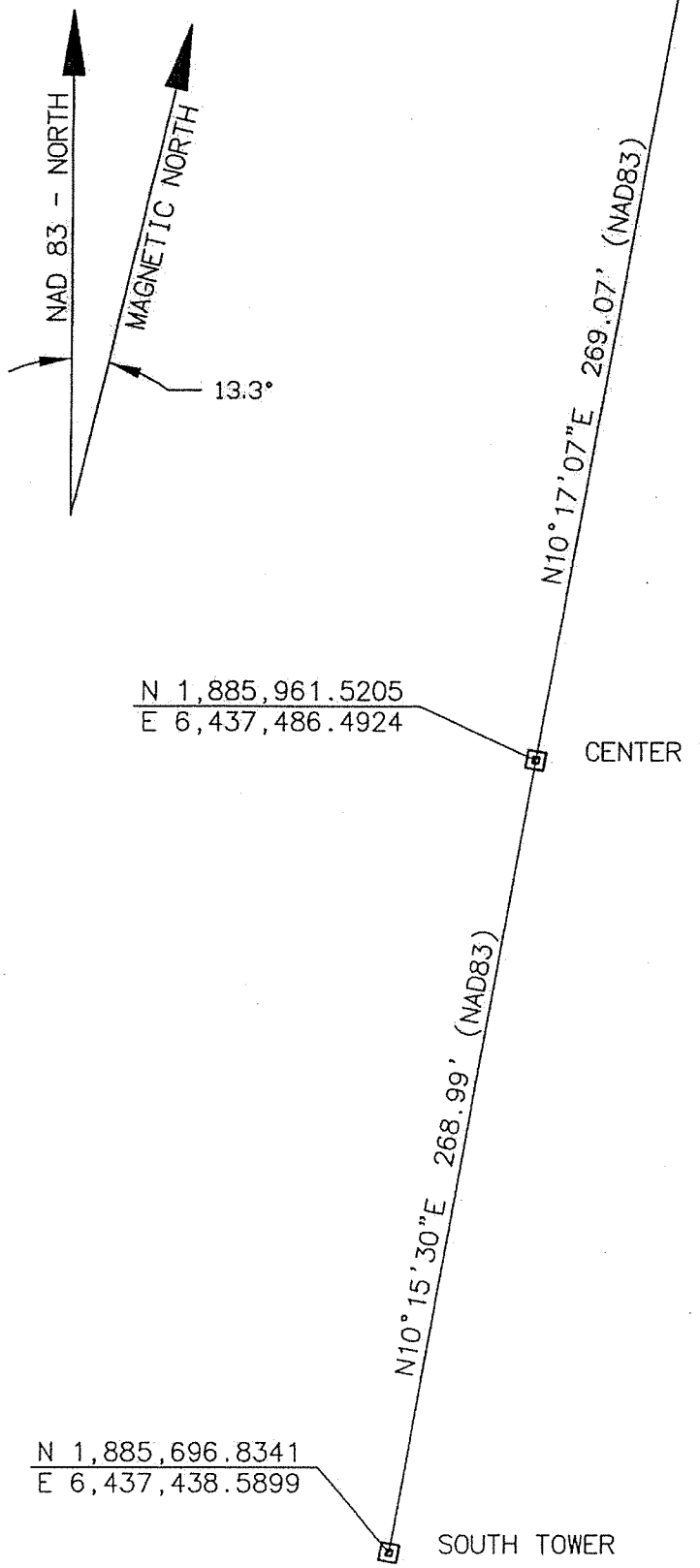
Antenna Monitor and Sampling System - KSPN

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 - KSPN

The operation of KSPN will not result in the exposure of workers or the general public to levels of radio frequency radiation in excess of the limits specified in 47 CFR 1.1310. The measures to restrict human exposure to radio frequency fields, by limiting access to areas with field levels that might exceed the limits 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 KSPN transmitter site. No changes have been made to the authorized directional antenna pattern.

Certified Post Construction Array Geometry Survey



NOTE:
ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON THE "NAD83" COORDINATE SYSTEM. UNLESS OTHERWISE NOTED.

LICENSED LAND SURVEYOR
DARREL L. TENNEY
NO. 4002
Exp. 6/30/2008
STATE OF CALIFORNIA

Darrel L. Tenney 8/20/09

DARREL L. TENNEY DATE
L.S. 4002
EXPIRATION 6/30/10

THE CORNERSTONE GROUP
1485 SPRUCE STREET, SUITE H
RIVERSIDE, CA 92507
951-342-0036 fax 951-342-0268

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
ABC RADIO LOS ANGELES ASSETS, 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	Day
KSPN	N/A	710	UNLIMITED	10	50

2. Station location	
State	City or Town
CALIFORNIA	LOS ANGELES

3. Transmitter location			
State	County	City or Town	Street address (or other identification)
CA	LOS ANGELES	LOS ANGELES	12755 BURBANK BLVD

4. Main studio location			
State	County	City or Town	Street address (or other identification)
CA	LOS ANGELES	LOS ANGELES	800 W. OLYMPIC BLVD #A200

5. Remote control point location (specify only if authorized directional antenna)			
State	County	City or Town	Street address (or other identification)
CA	LOS ANGELES	LOS ANGELES	800 W. OLYMPIC BLVD #A200

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

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68? ☑ Yes ☐ No

☐ Not Applicable

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

8. Operating constants:	
RF common point or antenna current (in amperes) without modulation for night system 14.5	RF common point or antenna current (in amperes) without modulation for day system 31.6
Measured antenna or common point resistance (in ohms) at operating frequency Night 50.0 Day 50.0	Measured antenna or common point reactance (in ohms) at operating frequency Night +j0.0 Day +j0.0

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
1	+123.7	-	0.516	-	-	-
2	0.0	-	1.000	-	-	-
3	-127.1	-	0.450	-	-	-

Manufacturer and type of antenna monitor: POTOMAC INSTRUMENTS 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.
UNIFORM CROSS-SECTION, STEEL GUYED	90.0	93.0	93.9	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
34 ° 10 ' 26 "	118 ° 24 ' 35 "

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

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

GROUND SYSTEM RE-DECRIBED. SEE EXECUTIVE SUMMARY

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	Ronald D Rackley
Address (include ZIP Code)	Date
DLR, INC. 201 FLETCHER AVENUE SARASOTA, FL 34237	8/26/2009
	Telephone No. (Include Area Code) 941-329-6000

☐ Technical Director ☑ Registered Professional Engineer

☐ Chief Operator ☐ Technical Consultant

☐ Other (specify)