Akin Gump
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TOM W. DAVIDSON
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tdavidson@akingump.com

July 11, 2017

VIA HAND DELIVERY

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

On behalf of ABC Radio Los Angeles Assets, LLC, licensee of AM radio station KRDC, Pasadena, CA (Facility ID 25076), enclosed are an original and three copies of an Application for License and Direct Power Measurement (FCC Form 302-AM) as well as a copy of the electronically filed Form 159. Please stamp one copy of the application and return it to the undersigned in the enclosed envelope.

If you have any questions regarding this application, please feel free to contact me.

Sincerely,

Tom W. Davidson

Agency Tracking ID:PGC2970492 Authorization Number:286349
Successful Authorization -- Date Paid: 7/11/17
FILE COPY ONLY!!

READ INSTRUCTIONS CAREFULLY BEFORE PROCEEDING (1) LOCKBOX #979089	FEDERAL COMMUNICATIONS COMMISSION **REMITTANCE ADVICE** **FORM 159** PAGE NO 1 OF 1	APPROVED BY OMB 3060-059 SPECIAL USE FCC USE ONLY

SECTION A - Payer Information

(2) PAYER NAME (if paying by credit card, enter name exactly as it appears on your card)	(3) TOTAL AMOUNT PAID (dollars and cents)
ABC Radio Los Angeles Assets, LLC	**$1505.00**

(4) STREET ADDRESS LINE NO. 1
77 WEST 66TH STREET, 16TH FLOOR
(5) STREET ADDRESS LINE NO. 2

(6) CITY	(7) STATE	(8) ZIP CODE
NEW YORK	**NY**	**10023-6298**

(9) DAYTIME TELEPHONE NUMBER (INCLUDING AREA CODE)	(10) COUNTRY CODE (IF NOT IN U.S.A.)
212-4567777	**US**

FCC REGISTRATION NUMBER (FRN) AND TAX IDENTIFICATION NUMBER (TIN) REQUIRED

(11) PAYER (FRN)	(12) FCC USE ONLY
0014625727	

IF PAYER NAME AND THE APPLICANT NAME ARE DIFFERENT, COMPLETE SECTION B
IF MORE THAN ONE APPLICANT, USE CONTINUATION SHEETS (FORM 159-C)

(13) APPLICANT NAME
ABC Radio Los Angeles Assets, LLC
(14) STREET ADDRESS LINE NO. 1
77 WEST 66TH STREET, 16TH FLOOR
(15) STREET ADDRESS LINE NO. 2

(16) CITY	(17) STATE	(18) ZIP CODE
NEW YORK	**NY**	**10023-6298**

(19) DAYTIME TELEPHONE NUMBER (INCLUDING AREA CODE)	(20) COUNTRY CODE (IF NOT IN U.S.A.)
212-4567777	**US**

FCC REGISTRATION NUMBER (FRN) AND TAX IDENTIFICATION NUMBER (TIN) REQUIRED

(21) APPLICANT (FRN)	(22) FCC USE ONLY
0014625727	

COMPLETE SECTION C FOR EACH SERVICE, IF MORE BOXES ARE NEEDED, USE CONTINUATION SHEET

(23A) FCC Call Sign/Other ID	(24A) Payment Type Code(PTC)	(25A) Quantity
KRDC	**MMR**	**1**
(26A) Fee Due for (PTC)	(27A) Total Fee	FCC Use Only
$700.00	**$700.00**	
(28A) FCC CODE 1	(29A) FCC CODE 2	
25076	**302-AM**	

(23B) FCC Call Sign/Other ID	(24B) Payment Type Code(PTC)	(25B) Quantity
KRDC	**MOR**	**1**
(26B) Fee Due for (PTC)	(27B) Total Fee	FCC Use Only
$805.00	**$805.00**	
(28B) FCC CODE 1	(29B) FCC CODE 2	
25076	**302-AM**	

ORIGINAL

ACCEPTED/FILED

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

JUL 11 2017

Federal Communications Commission
Office of the Secretary

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO. BZ-20170711ACG

SECTION I - APPLICANT FEE INFORMATION

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

ABC Radio Los Angeles Assets, LLC

MAILING ADDRESS (Line 1) (Maximum 35 characters)
77 W. 66th St., 16th Floor

MAILING ADDRESS (Line 2) (Maximum 35 characters)
Attn: John Zukcer, Esq.

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

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
212-456-7777	KRDC	0014625727

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 ~~70~~ 25076

[ ] 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
M M R	0 0 0 1	$ 700.00	

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
M O R	0 0 0 1	$ 805.00	

	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.	$ 1505.00	

RECEIVED
2017 JUL 13 A 11: 36

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 Zucker, Esq.		
Title	Date	Telephone Number
Secretary	07/11/2017	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.

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant

ABC Radio Los Angeles Assets, LLC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

[X] 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
KRDC	Not Applicable	1110 kHz	Unlimited	20.0	50.0

2. Station location

State	City or Town
California	Pasadena

3. Transmitter location

State	County	City or Town	Street address (or other identification)
CA	Los Angeles	Irwindale	277 Longden Ave.

4. Main studio location

State	County	City or Town	Street address (or other identification)
CA	Los Angeles	Burbank	3800 W. Alameda Blvd.

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

State	County	City or Town	Street address (or other identification)
CA	Los Angeles	Burbank	3800 W. Alameda Blvd.

6. Has type-approved stereo generating equipment been installed? [ ] Yes [x] No

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68? [x] Yes [ ] No [ ] Not Applicable

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

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system	RF common point or antenna current (in amperes) without modulation for day system
20.5	32.4

Measured antenna or common point resistance (in ohms) at operating frequency		Measured antenna or common point reactance (in ohms) at operating frequency	
Night	Day	Night	Day
50	50	- J6	- J6

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 (NE)	-149.2		0.408		no	no
2 (East Center)	106.5		1.085			
3 (West Center)	0		1		longer	longer
4 (SW)	-106.9	-48.5	0.325	0.679		
5 (N)		0		1	required	required

Manufacturer and type of antenna monitor: Potomac Instruments AM-1901

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT ABC Radio Los Angeles Assets, LLC		
MAILING ADDRESS 77 W. 66th St., 16th Floor		
CITY New York	STATE NY	ZIP CODE 10023

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
KRDC	Pasadena, 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?

☐ 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.

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.
five uniform cross section vertical towers	112.7 (all)	99.6 (all)	100.5 (all)	Exhibit No. DNA

Excitation [X] 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 ° 06 ' 50 "	117 ° 59 ' 51 "

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. see below

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

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

Not applicable
Tower Registration: (1) 1012884, (2) 1012885, (3) 1012886, (4) 1012887, (5) 1012888
(Numbered per antenna monitor numbering in paragraph 8 of this form)

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

Mounting of translator antenna on East Center tower. Existing unused RPU/two-way antenna remains on Northeast (#1)tower.

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Name (Please Print or Type)	Signature (check appropriate box below)
Benj. F. Dawson III, P.E.	Benj. F. Dawson III, P.E.
Address (include ZIP Code) Hatfield & Dawson Consulting Engineers 9500 Greenwood Avenue North Seattle, WA 98103	Date July 10, 2017 Telephone No. (Include Area Code) (206) 783 9151

[ ] Technical Director

[X] Registered Professional Engineer

[ ] Chief Operator

[ ] Technical Consultant

[X] Other (specify) Consulting Engineer

HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
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DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE
MICHAEL H. MEHIGAN, PE

TELEPHONE (206) 783-9151
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E-MAIL hatdaw@hatdaw.com

JAMES B. HATFIELD, PE
CONSULTANT

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

ENGINEERING REPORT:

APPLICATION FOR LICENSE
and Direct Power Measurement

RADIO STATION KRDC Pasadena, CA
1110 kHz, 50 kW-D, 20 kW-N, DA-2
Facility ID #25076

ABC RADIO LOS ANGELES ASSETS, LLC

July 10, 2017

APPLICATION FOR LICENSE
and Direct Power Measurement

RADIO STATION KRDC Pasadena, CA
1110 kHz, 50 kW-D, 20 kW-N, DA-2
Facility ID #25076

	Purpose of Application
Item 1	Tower Impedance Measurements and Verification of Method of Moments Model
Item 2	Derivation of Operating Parameters for Directional Antenna
Item 3	Method of Moments Model Details for Towers Driven Individually
Item 4	Method of Moments Model Details for Directional Antenna Operation
Item 5	Array Geometry
Item 6	Sampling Line Measurements
Item 7	Reference Field Strength Measurements
Item 8	Direct Measurement of Power
Item 9	Antenna Monitor Data, Sample Device Description and Location

Purpose of Application

This engineering exhibit supports an application for a "moment method license" for the presently authorized and unmodified antenna radiation patterns of radio station KRDC, Pasadena, CA. KRDC is authorized per license to operate on 1110 kHz with a power of 50 kW day and 20 kW night, employing separate directional antenna patterns for the daytime and nighttime operation.

The antenna towers and ground system are unmodified from their long-established conditions and adjustments of the antenna parameters were made in accordance with the terms of the license and specifications provided for the previous licensing of the station. Information is provided herein demonstrating that the directional antenna parameters for the pattern authorized by the station license have been determined in accordance with the requirements of section 73.151(c) of the FCC Rules. The system has been adjusted to produce antenna monitor parameters within +/- 5 percent in ratio and +/- 3 degrees in phase of the modeled values, as required by the Rules. Measurements described in this report were made by Burt Weiner and Ashley Wallen under my direction.

Benjamin F.Dawson III, P.E.

July 10, 2017

Item 1

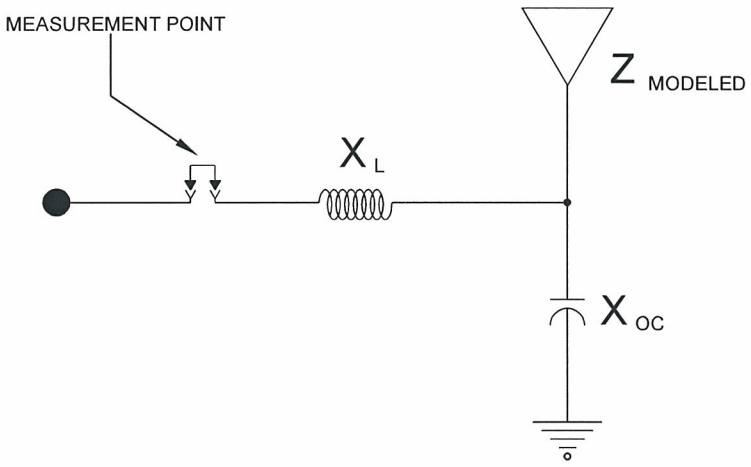
Analysis of Tower Impedance Measurements to Verify Method of Moments Model - KRDC

Tower impedance measurements were made at the locations of the sample system current transformers using an AIM-120 network analyzer in a calibrated measurement system. The other towers were open circuited at the same point where impedance measurements were made (the "reference points") for each of the measurements.

Circuit calculations were performed to relate the method of moments modeled impedances at the tower feed points to those at the current sample device locations as shown in the table. The base conditions shown for each tower, which includes the stray capacitances, were used in the moment method model as a load at ground level for the open circuited case. The lighting transformers in use on three of the towers and the newly installed FM isocoupler on one tower have been included in the models because of the high impedance of the 132 degree tall towers.

The following page shows the schematic of the assumed circuit and tabulation of calculated values. These calculations show the impedance transformations between the tower base values produced by the MININEC moment method model and the "J" plug locations where the measurements were made.

NOTE: All tower numbering in this report is per the FCC CDBS database numbering, EXCEPT as specifically noted in the tables for operating parameters and in the FCC Form 302-AM. This provides consistency with the current station license, which has the theoretical pattern numbering and the operating parameter numbering for towers 1 through 4 reversed.



TOWERS NUMBERED PER "THEORETICAL PARAMETERS"
(CDBS DATA) FROM FCC LICENSE BZ20091019AGD

TOWER	X_L (Ω)	X_{OC} (Ω)	$Z_{MODELED}$ (Ω)	$Z_{ATU\ MODELED}$ (Ω)	$Z_{ATU\ MEASURED}$ (Ω)
#1	+j30	-j1793	346.8 + j352.4	507.8 +j346.4	515.7+j339.1
#2	+j40	-j7170	347.3 +j521.97	402.9 +j581.9	418.0 +j602.0
#3	+j30	-j1400	311.96 +j419.8	577.9 +j445.7	597.5 +j429.3
#4	+j40	-j1793	229.3 +j365.2	352.5 +j442.0	338.2 +j455.1
#5	+j50	-j1793	523.2+j313.6	683.1 +j188.5	664.5 +j196.6

Xoc= TOWERS 1,4,5 BASE INSULATOR + AUSTIN TRANSFORMER;
TOWER 2 BASE INSULATOR ONLY; TOWER 3 BASE INSULATOR AND FM ISOCOUPLER

Dwayne Straume, H&D — KDRC MOM TABLE.dwg

HATFIELD & DAWSON
CONSULTING ENGINEERS

ANALYSIS OF TOWER IMPEDANCE MEASUREMENTS TO VERIFY METHOD OF MOMENTS MODEL

RADIO STATION KDRC 1110 KHZ — PASADENA, CA

MEASURED AND MOMENT METHOD MODEL IMPEDANCE COMPARISON

Tower # FCC theo At J Plug	Lo R	Meas R	Model R	Hi R
1	493.2	515.7	507.8	538.4
2	399.4	418.0	402.9	436.8
3	571.7	597.5	577.9	623.5
4	322.8	338.2	352.5	353.8
5	636.0	664.5	683.1	693.2

Tower # FCC theo At J Plug	Low XL	Meas XL	Model XL	Hi XL
1	323.6	339.1	346.4	354.7
2	576.0	602.0	581.9	628.2
3	410.2	429.3	445.7	448.6
4	435.0	455.1	442.0	475.4
5	186.8	196.6	188.5	206.5

All other towers open circuited at J plug.

Item 2
Derivation of Operating Parameters for Directional Antenna - KRDC

The method of moments model of the array, following verification with the measured individual open circuited base impedances, was used for directional antenna calculations. Calculations were made to determine the complex voltage values for sources located at ground level at the base of 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 and phases were calculated. 33 segments were used for towers in the moment method model. The currents and voltages at the sample loop locations on the towers (segments 11, 44, 778, 110, 143) are shown.

NIGHT

Tower FCC CDBS Numbering	Modeled Current Pulse	Loop Current Magnitude	Loop Current Phase	Antenna Monitor Sample Ratio	Antenna Monitor Sample Phase	Tower # per Licensed Operating Parameters
1	11	3.1948	1.8	0.325	-106.9	4
2	44	9.8185	108.7	1	0	3
3	77	10.6516	215.2	1.085	106.5	2
4	110	4.0047	319.5	0.4079	-149.2	1

DAY

Tower FCC CDBS Numbering	Modeled Current Pulse	Loop Current Magnitude	Loop Current Phase	Antenna Monitor Sample Ratio	Antenna Monitor Sample Phase	Tower # per Licensed Operating Parameters
1	11	13.1181	312.2	0.679	-48.5	4
5	143	19.3122	0.1	1	0	5

Note: Each segment is 4° in physical length. The bottom of segment 11 from each tower base is 40 degrees
and its top is 44 degrees. The detuned current minimum is at segment 11 in each case. The sample loops are located at the aproximate midpoint of segment 11 on each tower.

These loop values are very close to the far field amplitudes and phases as expected for ~1/3 height loop monitoring.

Item 3

Method of Moments Model Details for Towers Driven Individually - KRDC

The array of towers was modeled using MININEC. A single wire was used to represent each tower, which are uniform cross section.. The top and bottom wire end points were specified using the theoretical directional antenna specifications in electrical degrees. The maximum and minimum segment lengths are 4.24242 and 3.99242 electrical degrees respectively.

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.

Tower # FCC CDBS Numbering	Physical Height (degrees)	Modeled Height (degrees)	Modeled Percentage of Height	Modeled Radius (Meters)	Percent of Equivalent Radius
1	132.0	137.0	103.79	0.25	85.89
2	132.0	140.0	106.06	0.291	100.0
3	132.0	137.0	103.79	0.26	89.32
4	132.0	131.5	99.62	0.235	80.74
5	132.0	139.5	105.68	0.305	104.78

The following pages show the details of the method of moments models for the individually driven towers.

C:\Expert MBPro V.14\KRDC **twr1othersopen** rev 06-29-2017 08:57:40
33 segment KRDC
GEOMETRY
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.25	33
		0	0	137.		
2	none	90.	60.	0	.291	33
		90.	60.	140.		
3	none	180.	60.	0	.26	33
		180.	60.	137.		
4	none	270.	60.	0	.235	33
		270.	60.	131.75		
5	none	165.	14.	0	.305	33
		165.	14.	139.5		

Number of wires = 5
current nodes = 165

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	3.99242	2	4.24242
radius	4	.235	5	.305

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,110.	1.	1	.0110901	.0117845

Sources

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

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	34	0	-7,170.	0	0	0
2	67	0	-1,400.	0	0	0
3	100	0	-1,793.	0	0	0
4	133	0	-1,793.	0	0	0

C:\Expert MBPro V.14\KRDC twr1othersopen rev 06-29-2017 13:18:18

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1,110.	346.84	352.41	494.46	45.5	14.172	-1.2279	-6.0858

C:\Expert MBPro V.14\KRDC **twr2othersopen** rev 06-29-2017 08:54:48

33 segment KRDC

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.25	33
		0	0	137.		
2	none	90.	60.	0	.291	33
		90.	60.	140.		
3	none	180.	60.	0	.26	33
		180.	60.	137.		
4	none	270.	60.	0	.235	33
		270.	60.	131.75		
5	none	165.	14.	0	.305	33
		165.	14.	139.5		

Number of wires = 5
current nodes = 165

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	3.99242	2	4.24242
radius	4	.235	5	.305

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,110.	1.	1	.0110901	.0117845

Sources

source	node	sector	magnitude	phase	type
1	34	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-1,793.	0	0	0
2	67	0	-1,400.	0	0	0
3	100	0	-1,793.	0	0	0
4	133	0	-1,793.	0	0	0

C:\Expert MBPro V.14\KRDC twr2othersopen rev 06-29-2017 08:54:48

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 34, sector 1							
1,110.	347.32	521.97	626.96	56.4	22.735	-.76459	-7.9202

C:\Expert MBPro V.14\KRDC **twr3othersopen** rev 06-29-2017 08:51:44

33 segment KRDC

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.25	33
		0	0	137.		
2	none	90.	60.	0	.291	33
		90.	60.	140.		
3	none	180.	60.	0	.26	33
		180.	60.	137.		
4	none	270.	60.	0	.235	33
		270.	60.	131.75		
5	none	165.	14.	0	.305	33
		165.	14.	139.5		

Number of wires = 5
current nodes = 165

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	3.99242	2	4.24242
radius	4	.235	5	.305

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,110.	1.	1	.0110901	.0117845

Sources

source	node	sector	magnitude	phase	type
1	67	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-1,793.	0	0	0
2	34	0	-7,170.	0	0	0
3	100	0	-1,793.	0	0	0
4	133	0	-1,793.	0	0	0

C:\Expert MBPro V.14\KRDC twr3othersopen rev 06-29-2017 08:51:44

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 67, sector 1							
1,110.	311.96	419.79	523.01	53.4	17.641	-.98582	-6.9234

C:\Expert MBPro V.14\KRDC **twr4othersopen** rev 06-29-2017 09:09:32

33 segment KRDC

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.25	33
		0	0	137.		
2	none	90.	60.	0	.291	33
		90.	60.	140.		
3	none	180.	60.	0	.26	33
		180.	60.	137.		
4	none	270.	60.	0	.235	33
		270.	60.	131.75		
5	none	165.	14.	0	.305	33
		165.	14.	139.5		

Number of wires = 5
current nodes = 165

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	3.99242	2	4.24242
radius	4	.235	5	.305

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,110.	1.	1	.0110901	.0117845

Sources

source	node	sector	magnitude	phase	type
1	100	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-1,793.	0	0	0
2	34	0	-7,170.	0	0	0
3	133	0	-1,793.	0	0	0
4	67	0	-1,400.	0	0	0

C:\Expert MBPro V.14\KRDC twr4othersopen rev 06-29-2017 09:09:32

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 100, sector 1							
1,110.	229.33	365.19	431.23	57.9	16.374	-1.0622	-6.6359

C:\Expert MBPro V.14\KRDC **twr5othersopen** rev 06-29-2017 08:38:15

33 segment KRDC

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.25	33
		0	0	137.		
2	none	90.	60.	0	.291	33
		90.	60.	140.		
3	none	180.	60.	0	.26	33
		180.	60.	137.		
4	none	270.	60.	0	.235	33
		270.	60.	131.75		
5	none	165.	14.	0	.305	33
		165.	14.	139.5		

Number of wires = 5
current nodes = 165

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	3.99242	2	4.24242
radius	4	.235	5	.305

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,110.	1.	1	.0110901	.0117845

Sources

source	node	sector	magnitude	phase	type
1	133	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-1,793.	0	0	0
2	34	0	-7,170.	0	0	0
3	100	0	-1,793.	0	0	0
4	67	0	-1,400.	0	0	0

C:\Expert MBPro V.14\KRDC twr5othersopen rev 06-29-2017 08:38:15

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 133, sector 1							
1,110.	523.19	313.64	610.	30.9	14.25	-1.2211	-6.1065

Item 4

Method of Moments Model Details for Directional Antennas - KRDC

The array was modeled using MININEC with the individual tower characteristics that were verified by the respective 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 (FCC CDBS Numbering)	Wire	Base Node	Loop Node
1	1	1	11
2	2	34	44
3	3	67	77
4	4	100	110
5	5	133	143

C:\Expert MBPro V.14\ KRDC Day 7-5 rev 07-05-2017 10:19:16

33 segment KRDC

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.25	33
		0	0	137.		
2	none	90.	60.	0	.291	33
		90.	60.	140.		
3	none	180.	60.	0	.26	33
		180.	60.	137.		
4	none	270.	60.	0	.235	33
		270.	60.	131.75		
5	none	165.	14.	0	.305	33
		165.	14.	139.5		

Number of wires = 5
current nodes = 165

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	3.99242	2	4.24242
radius	4	.235	5	.305

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,110.	1.	1	.0110901	.0117845

Sources

source	node	sector	magnitude	phase	type
1	1	1	4,327.98	11.5	voltage
2	133	1	6,578.92	75.5	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	34	0	316.76	0	0	0
2	67	0	334.23	0	0	0
3	100	0	354.88	0	0	0

C:\Expert MBPro V.14\KRDC Day 7-5 rev 07-05-2017 10:19:16

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1,110.	296.01	176.21	344.49	30.8	8.063	-2.1656	-4.0599

source = 2; node 133, sector 1

1,110. 308.8 394.35 500.87 51.9 16.349 -1.0639 -6.6299

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CURRENT rms
Frequency = 1110 KHz
Input power = 50,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	8.88366	340.7	8.38615	-2.93121
2	0	0	4.15152	9.79445	332.6	8.6965	-4.50579
3	0	0	8.30303	10.422	328.3	8.86493	-5.48004
4	0	0	12.4546	10.9729	324.9	8.98259	-6.30223
5	0	0	16.6061	11.4598	322.2	9.05917	-7.01847
6	0	0	20.7576	11.8869	319.9	9.09905	-7.64892
7	0	0	24.9091	12.2547	318.	9.10436	-8.20294
8	0	0	29.0606	12.5627	316.3	9.07657	-8.68547
9	0	0	33.2121	12.8098	314.7	9.0166	-9.09898
10	0	0	37.3636	12.9953	313.4	8.92546	-9.44525
11	0	0	41.5152	13.1181	312.2	8.80376	-9.72512
12	0	0	45.6667	13.1779	311.	8.65251	-9.93931
13	0	0	49.8182	13.174	310.	8.47241	-10.0883
14	0	0	53.9697	13.1068	309.1	8.26445	-10.1728
15	0	0	58.1212	12.9761	308.2	8.02962	-10.1933
16	0	0	62.2727	12.7826	307.4	7.76898	-10.1507
17	0	0	66.4242	12.527	306.7	7.48367	-10.0459
18	0	0	70.5758	12.2104	306.	7.17487	-9.88005
19	0	0	74.7273	11.8341	305.3	6.84395	-9.65434
20	0	0	78.8788	11.3996	304.7	6.49222	-9.3703
21	0	0	83.0303	10.9088	304.1	6.12115	-9.02954
22	0	0	87.1818	10.3636	303.6	5.73219	-8.63399
23	0	0	91.3333	9.76613	303.1	5.32686	-8.18547
24	0	0	95.4849	9.11881	302.6	4.90666	-7.68618
25	0	0	99.6364	8.42398	302.1	4.47314	-7.13824
26	0	0	103.788	7.68398	301.6	4.02774	-6.54377
27	0	0	107.939	6.90115	301.2	3.57185	-5.9049
28	0	0	112.091	6.07751	300.7	3.10667	-5.22348
29	0	0	116.242	5.21453	300.3	2.63311	-4.5009
30	0	0	120.394	4.31259	299.9	2.15153	-3.73756
31	0	0	124.546	3.36986	299.5	1.66122	-2.93195
32	0	0	128.697	2.3793	299.2	1.15903	-2.07792
33	0	0	132.849	1.32144	298.8	.635974	-1.15833
END	0	0	137.	0	0	0	0
GND	45.	-77.9423	0	4.88632	19.8	4.59766	1.65458
35	45.	-77.9423	4.24242	3.99537	19.8	3.75912	1.35352
36	45.	-77.9423	8.48485	3.43717	19.8	3.23322	1.16637
37	45.	-77.9423	12.7273	2.94531	19.9	2.76931	1.0029
38	45.	-77.9423	16.9697	2.49494	20.	2.34401	.854595
39	45.	-77.9423	21.2121	2.07496	20.2	1.94691	.717629
40	45.	-77.9423	25.4545	1.6805	20.6	1.57345	.590218
41	45.	-77.9423	29.697	1.30933	21.1	1.2215	.471463
42	45.	-77.9423	33.9394	.96055	22.1	.890184	.360873
43	45.	-77.9423	38.1818	.634186	24.	.579251	.258187
44	45.	-77.9423	42.4242	.331798	29.5	.288851	.163263

45	45.	-77.9423	46.6667	.0784476	75.7	.0193241	.0760303
46	45.	-77.9423	50.9091	.228905	180.9	-.228877	-3.55E-03
47	45.	-77.9423	55.1515	.461474	189.4	-.455258	-.0754886
48	45.	-77.9423	59.3939	.673986	192.	-.659325	-.139811
49	45.	-77.9423	63.6364	.863285	193.2	-.840616	-.196534
50	45.	-77.9423	67.8788	1.02849	193.8	-.998718	-.245689
51	45.	-77.9423	72.1212	1.16915	194.2	-1.13329	-.287317
52	45.	-77.9423	76.3636	1.28494	194.5	-1.24408	-.321478
53	45.	-77.9423	80.6061	1.37569	194.7	-1.33088	-.348249
54	45.	-77.9423	84.8485	1.44133	194.8	-1.39363	-.367722
55	45.	-77.9423	89.0909	1.48186	194.9	-1.43231	-.380009
56	45.	-77.9423	93.3333	1.49741	194.9	-1.447	-.38524
57	45.	-77.9423	97.5757	1.48816	194.9	-1.43788	-.38356
58	45.	-77.9423	101.818	1.45438	194.9	-1.40517	-.37513
59	45.	-77.9423	106.061	1.39638	194.9	-1.34915	-.360122
60	45.	-77.9423	110.303	1.31451	194.9	-1.27012	-.338713
61	45.	-77.9423	114.545	1.20907	194.9	-1.16837	-.311078
62	45.	-77.9423	118.788	1.08029	194.9	-1.04408	-.277367
63	45.	-77.9423	123.03	.928139	194.8	-.897191	-.237677
64	45.	-77.9423	127.273	.752047	194.8	-.727132	-.191974
65	45.	-77.9423	131.515	.550069	194.7	-.531983	-.139891
66	45.	-77.9423	135.758	.317177	194.7	-.306842	-.0803068
END	45.	-77.9423	140.	0	0	0	0
GND	90.	-155.885	0	2.78255	346.2	2.7027	-.66178
68	90.	-155.885	4.15152	2.28071	346.3	2.21537	-.542005
69	90.	-155.885	8.30303	1.96118	346.3	1.90531	-.464754
70	90.	-155.885	12.4546	1.67996	346.4	1.63267	-.395795
71	90.	-155.885	16.6061	1.4227	346.5	1.38348	-.331746
72	90.	-155.885	20.7576	1.18312	346.8	1.15163	-.271157
73	90.	-155.885	24.9091	.958462	347.1	.934399	-.213419
74	90.	-155.885	29.0606	.747414	347.8	.730463	-.158277
75	90.	-155.885	33.2121	.549442	348.9	.539187	-.105659
76	90.	-155.885	37.3636	.3646	351.2	.360337	-.055596
77	90.	-155.885	41.5152	.194051	357.6	.193879	-8.18E-03
78	90.	-155.885	45.6667	.0540502	42.4	.0399023	.0364587
79	90.	-155.885	49.8182	.128068	142.4	-.101444	.07817
80	90.	-155.885	53.9697	.257936	153.1	-.229981	.116789
81	90.	-155.885	58.1212	.377544	156.2	-.34553	.152146
82	90.	-155.885	62.2727	.484271	157.7	-.447924	.184072
83	90.	-155.885	66.4242	.577498	158.4	-.53702	.212398
84	90.	-155.885	70.5758	.656937	158.9	-.61271	.236964
85	90.	-155.885	74.7273	.722416	159.1	-.674922	.257617
86	90.	-155.885	78.8788	.773838	159.2	-.723625	.274213
87	90.	-155.885	83.0303	.811158	159.3	-.758832	.286619
88	90.	-155.885	87.1818	.834379	159.3	-.780597	.294717
89	90.	-155.885	91.3333	.843557	159.3	-.789018	.298394
90	90.	-155.885	95.4849	.83879	159.2	-.784238	.297554
91	90.	-155.885	99.6364	.820191	159.1	-.766412	.292107
92	90.	-155.885	103.788	.787926	159.	-.735745	.281969
93	90.	-155.885	107.939	.742138	158.9	-.692423	.267057
94	90.	-155.885	112.091	.682984	158.8	-.636646	.247282
95	90.	-155.885	116.242	.610541	158.6	-.568543	.222529
96	90.	-155.885	120.394	.524755	158.5	-.488122	.192626
97	90.	-155.885	124.546	.425256	158.3	-.395102	.157282
98	90.	-155.885	128.697	.310917	158.1	-.288503	.115911
99	90.	-155.885	132.849	.178803	157.9	-.165684	.0672274
END	90.	-155.885	137.	0	0	0	0

GND	135.	-233.827	0	1.5409	287.9	.472588	-1.46664
101	135.	-233.827	3.99242	1.26506	287.9	.388331	-1.20398
102	135.	-233.827	7.98485	1.08763	287.9	.334931	-1.03477
103	135.	-233.827	11.9773	.93155	288.1	.288739	-.885673
104	135.	-233.827	15.9697	.788795	288.3	.247263	-.749038
105	135.	-233.827	19.9621	.655912	288.6	.209406	-.621586
106	135.	-233.827	23.9546	.531357	289.2	.174638	-.501838
107	135.	-233.827	27.947	.414414	290.1	.142669	-.389081
108	135.	-233.827	31.9394	.304834	291.8	.113322	-.282988
109	135.	-233.827	35.9318	.202806	295.2	.0864813	-.183443
110	135.	-233.827	39.9242	.109695	304.5	.0620632	-.0904496
111	135.	-233.827	43.9167	.0402072	354.2	.0399991	-4.09E-03
112	135.	-233.827	47.9091	.0781956	75.	.0202284	.0755339
113	135.	-233.827	51.9015	.1483	89.	2.69E-03	.148275
114	135.	-233.827	55.8939	.214371	93.4	-.0126677	.213996
115	135.	-233.827	59.8864	.273786	95.4	-.0259158	.272557
116	135.	-233.827	63.8788	.325947	96.5	-.0371192	.323826
117	135.	-233.827	67.8712	.370599	97.2	-.0463506	.367689
118	135.	-233.827	71.8636	.407597	97.6	-.0536879	.404046
119	135.	-233.827	75.8561	.436846	97.8	-.0592149	.432815
120	135.	-233.827	79.8485	.45829	97.9	-.0630208	.453937
121	135.	-233.827	83.8409	.471897	97.9	-.0651996	.467371
122	135.	-233.827	87.8333	.47766	97.9	-.0658502	.473099
123	135.	-233.827	91.8258	.475592	97.9	-.0650758	.471119
124	135.	-233.827	95.8182	.465725	97.8	-.0629827	.461447
125	135.	-233.827	99.8106	.448098	97.7	-.0596805	.444106
126	135.	-233.827	103.803	.422753	97.5	-.0552797	.419123
127	135.	-233.827	107.796	.389721	97.4	-.0498913	.386515
128	135.	-233.827	111.788	.348995	97.2	-.0436235	.346258
129	135.	-233.827	115.78	.300484	97.	-.0365772	.29825
130	135.	-233.827	119.773	.243917	96.8	-.0288369	.242207
131	135.	-233.827	123.765	.178584	96.6	-.0204457	.17741
132	135.	-233.827	127.758	.102709	96.3	-.0113447	.10208
END	135.	-233.827	131.75	0	0	0	0
GND	160.099	-39.9171	0	9.28792	23.5	8.5159	3.70741
134	160.099	-39.9171	4.22727	11.5353	15.2	11.1326	3.02123
135	160.099	-39.9171	8.45455	12.9467	11.6	12.6837	2.59614
136	160.099	-39.9171	12.6818	14.1559	9.	13.9804	2.22185
137	160.099	-39.9171	16.9091	15.2127	7.1	15.0962	1.8795
138	160.099	-39.9171	21.1364	16.1405	5.5	16.0649	1.56047
139	160.099	-39.9171	25.3636	16.9494	4.3	16.9025	1.26094
140	160.099	-39.9171	29.5909	17.6441	3.2	17.6169	.979138
141	160.099	-39.9171	33.8182	18.2268	2.2	18.2128	.714256
142	160.099	-39.9171	38.0455	18.6987	1.4	18.6929	.46603
143	160.099	-39.9171	42.2727	19.0605	.7	19.059	.234505
144	160.099	-39.9171	46.5	19.3122	.1	19.3122	.0198931
145	160.099	-39.9171	50.7273	19.4545	359.5	19.4537	-.177504
146	160.099	-39.9171	54.9545	19.4879	358.9	19.4846	-.357347
147	160.099	-39.9171	59.1818	19.4131	358.5	19.4062	-.519294
148	160.099	-39.9171	63.4091	19.2315	358.	19.22	-.663024
149	160.099	-39.9171	67.6364	18.9442	357.6	18.9278	-.788255
150	160.099	-39.9171	71.8636	18.5533	357.2	18.5317	-.894752
151	160.099	-39.9171	76.0909	18.0609	356.9	18.0342	-.982341
152	160.099	-39.9171	80.3182	17.4695	356.6	17.4378	-1.05091
153	160.099	-39.9171	84.5455	16.782	356.2	16.7459	-1.10041
154	160.099	-39.9171	88.7727	16.0014	355.9	15.9614	-1.13086
155	160.099	-39.9171	93.	15.1314	355.7	15.0882	-1.14235

156	160.099	-39.9171	97.2273	14.1754	355.4	14.1299	-1.13501
157	160.099	-39.9171	101.455	13.1374	355.2	13.0905	-1.10906
158	160.099	-39.9171	105.682	12.021	354.9	11.9737	-1.06471
159	160.099	-39.9171	109.909	10.8299	354.7	10.7834	-1.00223
160	160.099	-39.9171	114.136	9.5672	354.5	9.52268	-.921841
161	160.099	-39.9171	118.364	8.23525	354.3	8.19395	-.823716
162	160.099	-39.9171	122.591	6.83452	354.1	6.79777	-.707821
163	160.099	-39.9171	126.818	5.36183	353.9	5.33105	-.573723
164	160.099	-39.9171	131.046	3.80524	353.7	3.782	-.41992
165	160.099	-39.9171	135.273	2.13398	353.5	2.12015	-.242624
END	160.099	-39.9171	139.5	0	0	0	0

C:\Expert MBPro V.14\KRDC Day 7-5 rev 07-05-2017 10:20:04

CURRENT MOMENTS(amp-degrees) rms

Frequency = 1110 KHz
Input power = 50,000. watts

			vertical current moment	
wire	magnitude	phase (deg)	magnitude	phase (deg)
1	1,399.83	311.	1,399.83	311.
2	10.9159	99.	10.9159	99.
3	8.47526	61.6	8.47526	61.6
4	6.41581	11.5	6.41581	11.5
5	2,094.72	360.	2,094.72	360.

Medium wave array vertical current moment (amps-degrees) rms
(Calculation assumes tower wires are grouped together.
The first wire of each group must contain the source.)

tower	magnitude	phase (deg)
1	1,390.89	311.8
2	2,094.72	360.

C:\Expert MBPro V.14\ KRDC Nite 7-5 rev 07-05-2017 11:00:44

33 segment KRDC

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.25	33
		0	0	137.		
2	none	90.	60.	0	.291	33
		90.	60.	140.		
3	none	180.	60.	0	.26	33
		180.	60.	137.		
4	none	270.	60.	0	.235	33
		270.	60.	131.75		
5	none	165.	14.	0	.305	33
		165.	14.	139.5		

Number of wires = 5
current nodes = 165

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	3.99242	2	4.24242
radius	4	.235	5	.305

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1,110.	1.	1	.0110901	.0117845

Sources

source	node	sector	magnitude	phase	type
1	1	1	2,608.96	81.1	voltage
2	34	1	4,544.	182.6	voltage
3	67	1	3,692.99	290.5	voltage
4	100	1	1,000.19	40.	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	133	0	313.5	0	0	0

C:\Expert MBPro V.14\KRDC Nite 7-5 rev 07-05-2017 11:01:28

IMPEDANCE
normalization = 50.

freq (KHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1,110.	492.98	-996.52	1,111.8	296.3	50.229	-.3459	-11.16

source = 2; node 34, sector 1

1,110.	852.78	383.43	935.02	24.2	20.514	-.84752	-7.5132

source = 3; node 67, sector 1

1,110.	268.22	394.57	477.1	55.8	17.101	-1.017	-6.8033

source = 4; node 100, sector 1

1,110.	70.42	246.19	256.06	74.	19.28	-.90184	-7.2697

C:\Expert MBPro V.14\KRDC Nite 7-5 rev 07-05-2017 11:01:28

CURRENT rms
Frequency = 1110 KHz
Input power = 20,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	1.65932	144.8	-1.35518	.9575
2	0	0	4.15152	.896225	116.1	-.393922	.805012
3	0	0	8.30303	.736214	73.3	.211227	.705261
4	0	0	12.4546	.956887	40.	.732626	.615543
5	0	0	16.6061	1.31081	23.9	1.19819	.531561
6	0	0	20.7576	1.68177	15.6	1.62002	.451533
7	0	0	24.9091	2.03835	10.6	2.00361	.374741
8	0	0	29.0606	2.37086	7.3	2.35169	.300927
9	0	0	33.2121	2.67554	4.9	2.66563	.230073
10	0	0	37.3636	2.95054	3.2	2.94607	.162292
11	0	0	41.5152	3.19476	1.8	3.19326	.0977751
12	0	0	45.6667	3.40745	.6	3.40725	.0367581
13	0	0	49.8182	3.58804	359.7	3.58798	-.0204996
14	0	0	53.9697	3.7361	358.9	3.73537	-.07373
15	0	0	58.1212	3.85134	358.2	3.84939	-.122666
16	0	0	62.2727	3.93357	357.6	3.93002	-.16705
17	0	0	66.4242	3.98272	357.	3.97735	-.206641
18	0	0	70.5758	3.99885	356.5	3.99157	-.241217
19	0	0	74.7273	3.98212	356.1	3.97292	-.270581
20	0	0	78.8788	3.93283	355.7	3.92178	-.294559
21	0	0	83.0303	3.85137	355.3	3.83863	-.313008
22	0	0	87.1818	3.73828	355.	3.72405	-.32581
23	0	0	91.3333	3.59415	354.7	3.5787	-.332876
24	0	0	95.4849	3.41967	354.4	3.40331	-.334143
25	0	0	99.6364	3.21563	354.1	3.19869	-.32957
26	0	0	103.788	2.9828	353.9	2.96568	-.319135
27	0	0	107.939	2.72198	353.6	2.70508	-.302825
28	0	0	112.091	2.43383	353.4	2.4176	-.280629
29	0	0	116.242	2.11885	353.2	2.10375	-.252511
30	0	0	120.394	1.77704	352.9	1.76357	-.218383
31	0	0	124.546	1.40747	352.7	1.39617	-.178022
32	0	0	128.697	1.00689	352.5	.998349	-.130878
33	0	0	132.849	.566552	352.3	.561483	-.0756144
END	0	0	137.	0	0	0	0
GND	45.	-77.9423	0	3.4364	158.4	-3.19525	1.26461
35	45.	-77.9423	4.24242	4.50764	136.6	-3.27472	3.09759
36	45.	-77.9423	8.48485	5.35804	128.2	-3.31267	4.21128
37	45.	-77.9423	12.7273	6.14222	122.9	-3.33444	5.15833
38	45.	-77.9423	16.9697	6.85999	119.2	-3.34249	5.9906

39	45.	-77.9423	21.2121	7.51369	116.4	-3.33805	6.73149
40	45.	-77.9423	25.4545	8.10376	114.2	-3.32179	7.39166
41	45.	-77.9423	29.697	8.6299	112.4	-3.29417	7.97644
42	45.	-77.9423	33.9394	9.09155	111.	-3.25557	8.48867
43	45.	-77.9423	38.1818	9.48796	109.8	-3.20637	8.92976
44	45.	-77.9423	42.4242	9.81847	108.7	-3.14691	9.3005
45	45.	-77.9423	46.6667	10.0824	107.8	-3.07759	9.60123
46	45.	-77.9423	50.9091	10.2794	107.	-2.99877	9.83231
47	45.	-77.9423	55.1515	10.4092	106.2	-2.9109	9.99389
48	45.	-77.9423	59.3939	10.4716	105.6	-2.81442	10.0863
49	45.	-77.9423	63.6364	10.467	105.	-2.70979	10.1101
50	45.	-77.9423	67.8788	10.3956	104.5	-2.59754	10.0659
51	45.	-77.9423	72.1212	10.2583	104.	-2.47817	9.95443
52	45.	-77.9423	76.3636	10.0559	103.5	-2.35223	9.77695
53	45.	-77.9423	80.6061	9.78972	103.1	-2.2203	9.53462
54	45.	-77.9423	84.8485	9.46114	102.7	-2.08294	9.22901
55	45.	-77.9423	89.0909	9.07177	102.4	-1.94076	8.86174
56	45.	-77.9423	93.3333	8.62353	102.	-1.79435	8.43479
57	45.	-77.9423	97.5757	8.11847	101.7	-1.64431	7.95021
58	45.	-77.9423	101.818	7.55861	101.4	-1.49122	7.41005
59	45.	-77.9423	106.061	6.94623	101.1	-1.33566	6.8166
60	45.	-77.9423	110.303	6.28336	100.8	-1.17817	6.17192
61	45.	-77.9423	114.545	5.57192	100.5	-1.01921	5.47791
62	45.	-77.9423	118.788	4.81325	100.3	-.859176	4.73595
63	45.	-77.9423	123.03	4.0077	100.	-.698261	3.9464
64	45.	-77.9423	127.273	3.15345	99.8	-.53633	3.10751
65	45.	-77.9423	131.515	2.24353	99.6	-.372456	2.2124
66	45.	-77.9423	135.758	1.25953	99.3	-.203974	1.2429
END	45.	-77.9423	140.	0	0	0	0
GND	90.	-155.885	0	5.47331	234.7	-3.16214	-4.46743
68	90.	-155.885	4.15152	6.67027	227.9	-4.46881	-4.95199
69	90.	-155.885	8.30303	7.43111	224.8	-5.26972	-5.2394
70	90.	-155.885	12.4546	8.0786	222.6	-5.94374	-5.47135
71	90.	-155.885	16.6061	8.64207	220.9	-6.52886	-5.6621
72	90.	-155.885	20.7576	9.1344	219.6	-7.04188	-5.81801
73	90.	-155.885	24.9091	9.56123	218.4	-7.49059	-5.94208
74	90.	-155.885	29.0606	9.92528	217.5	-7.879	-6.03594
75	90.	-155.885	33.2121	10.2279	216.6	-8.20936	-6.10056
76	90.	-155.885	37.3636	10.4699	215.9	-8.48294	-6.1366
77	90.	-155.885	41.5152	10.6516	215.2	-8.70059	-6.14455
78	90.	-155.885	45.6667	10.7732	214.6	-8.86273	-6.12483
79	90.	-155.885	49.8182	10.8351	214.1	-8.96985	-6.07789
80	90.	-155.885	53.9697	10.8377	213.6	-9.02253	-6.00417
81	90.	-155.885	58.1212	10.7815	213.2	-9.02112	-5.90417
82	90.	-155.885	62.2727	10.6671	212.8	-8.96639	-5.7785
83	90.	-155.885	66.4242	10.4955	212.4	-8.85905	-5.6278
84	90.	-155.885	70.5758	10.2676	212.1	-8.70002	-5.45281
85	90.	-155.885	74.7273	9.98471	211.8	-8.49037	-5.25435
86	90.	-155.885	78.8788	9.64823	211.4	-8.23128	-5.03333
87	90.	-155.885	83.0303	9.25973	211.2	-7.92412	-4.79072
88	90.	-155.885	87.1818	8.82106	210.9	-7.57049	-4.52755
89	90.	-155.885	91.3333	8.33407	210.6	-7.17197	-4.24495
90	90.	-155.885	95.4849	7.80074	210.4	-6.73024	-3.94403
91	90.	-155.885	99.6364	7.2232	210.1	-6.24715	-3.62598
92	90.	-155.885	103.788	6.60352	209.9	-5.72447	-3.29194
93	90.	-155.885	107.939	5.94368	209.7	-5.16392	-2.943
94	90.	-155.885	112.091	5.24544	209.5	-4.56701	-2.58012

95	90.	-155.885	116.242	4.51006	209.3	-3.93482	-2.20406
96	90.	-155.885	120.394	3.73785	209.1	-3.26759	-1.81505
97	90.	-155.885	124.546	2.92716	208.9	-2.56383	-1.41245
98	90.	-155.885	128.697	2.07172	208.7	-1.818	-.993428
99	90.	-155.885	132.849	1.15447	208.5	-1.01499	-.550084
END	90.	-155.885	137.	0	0	0	0
GND	135.	-233.827	0	2.76199	326.	2.28924	-1.54531
101	135.	-233.827	3.99242	3.10069	324.2	2.51426	-1.81461
102	135.	-233.827	7.98485	3.30614	323.2	2.64871	-1.97861
103	135.	-233.827	11.9773	3.47377	322.5	2.7567	-2.11369
104	135.	-233.827	15.9697	3.6135	321.9	2.84499	-2.22788
105	135.	-233.827	19.9621	3.72967	321.4	2.91652	-2.32472
106	135.	-233.827	23.9546	3.82433	321.	2.97273	-2.4059
107	135.	-233.827	27.947	3.8986	320.6	3.01438	-2.47236
108	135.	-233.827	31.9394	3.95315	320.3	3.04195	-2.52466
109	135.	-233.827	35.9318	3.9884	320.	3.05575	-2.56315
110	135.	-233.827	39.9242	4.00469	319.7	3.05602	-2.58811
111	135.	-233.827	43.9167	4.0023	319.5	3.04297	-2.59976
112	135.	-233.827	47.9091	3.9815	319.3	3.01681	-2.59831
113	135.	-233.827	51.9015	3.94256	319.	2.97774	-2.58396
114	135.	-233.827	55.8939	3.88581	318.9	2.92602	-2.55694
115	135.	-233.827	59.8864	3.8116	318.7	2.86193	-2.51748
116	135.	-233.827	63.8788	3.72033	318.5	2.78577	-2.46584
117	135.	-233.827	67.8712	3.61245	318.3	2.69789	-2.40234
118	135.	-233.827	71.8636	3.48845	318.2	2.59867	-2.32727
119	135.	-233.827	75.8561	3.34888	318.	2.48856	-2.241
120	135.	-233.827	79.8485	3.19432	317.8	2.368	-2.14389
121	135.	-233.827	83.8409	3.0254	317.7	2.23748	-2.03635
122	135.	-233.827	87.8333	2.84277	317.5	2.09752	-1.91879
123	135.	-233.827	91.8258	2.64713	317.4	1.94867	-1.79164
124	135.	-233.827	95.8182	2.43916	317.3	1.79146	-1.65535
125	135.	-233.827	99.8106	2.21954	317.1	1.62644	-1.51032
126	135.	-233.827	103.803	1.9889	317.	1.45409	-1.35696
127	135.	-233.827	107.796	1.74779	316.8	1.27488	-1.1956
128	135.	-233.827	111.788	1.4966	316.7	1.08914	-1.02644
129	135.	-233.827	115.78	1.23538	316.6	.896943	-.849503
130	135.	-233.827	119.773	.963558	316.4	.697941	-.664321
131	135.	-233.827	123.765	.67907	316.3	.490698	-.469415
132	135.	-233.827	127.758	.3763	316.1	.271242	-.260824
END	135.	-233.827	131.75	0	0	0	0
GND	160.099	-39.9171	0	1.6401	201.3	-1.52776	-.596566
134	160.099	-39.9171	4.22727	1.3379	201.3	-1.24616	-.486883
135	160.099	-39.9171	8.45455	1.15054	201.4	-1.07135	-.419449
136	160.099	-39.9171	12.6818	.985447	201.5	-.91711	-.360575
137	160.099	-39.9171	16.9091	.834304	201.6	-.775681	-.307216
138	160.099	-39.9171	21.1364	.693338	201.8	-.643562	-.257964
139	160.099	-39.9171	25.3636	.560889	202.2	-.51921	-.212174
140	160.099	-39.9171	29.5909	.436199	202.9	-.401913	-.169517
141	160.099	-39.9171	33.8182	.318984	204.	-.291372	-.129818
142	160.099	-39.9171	38.0455	.209301	206.4	-.187513	-.0929838
143	160.099	-39.9171	42.2727	.107918	213.1	-.0903851	-.0589644
144	160.099	-39.9171	46.5	.0277348	269.8	-1.13E-04	-.0277345
145	160.099	-39.9171	50.7273	.0831447	.5	.0831415	7.19E-04
146	160.099	-39.9171	54.9545	.161377	9.4	.159202	.0264031
147	160.099	-39.9171	59.1818	.233166	12.2	.227888	.0493269
148	160.099	-39.9171	63.4091	.297267	13.5	.289028	.0695007
149	160.099	-39.9171	67.6364	.35333	14.2	.342467	.0869401

150	160.099	-39.9171	71.8636	.401167	14.7	.388071	.101666
151	160.099	-39.9171	76.0909	.440651	15.	.425727	.113707
152	160.099	-39.9171	80.3182	.471701	15.1	.455356	.123097
153	160.099	-39.9171	84.5455	.494269	15.2	.476899	.12988
154	160.099	-39.9171	88.7727	.508339	15.3	.490332	.134103
155	160.099	-39.9171	93.	.513927	15.3	.495655	.135823
156	160.099	-39.9171	97.2273	.511074	15.3	.492894	.135102
157	160.099	-39.9171	101.455	.499844	15.3	.482099	.132005
158	160.099	-39.9171	105.682	.48032	15.3	.463334	.126604
159	160.099	-39.9171	109.909	.452586	15.2	.43667	.11897
160	160.099	-39.9171	114.136	.416725	15.2	.402171	.109172
161	160.099	-39.9171	118.364	.372779	15.1	.359865	.0972702
162	160.099	-39.9171	122.591	.320704	15.1	.309696	.0833035
163	160.099	-39.9171	126.818	.260263	15.	.251422	.0672625
164	160.099	-39.9171	131.046	.19074	14.9	.184333	.0490197
165	160.099	-39.9171	135.273	.110362	14.8	.106702	.0281853
END	160.099	-39.9171	139.5	0	0	0	0

C:\Expert MBPro V.14\KRDC Nite 7-5 rev 07-05-2017 11:00:49

CURRENT MOMENTS(amp-degrees) rms

Frequency = 1110 KHz
Input power = 20,000. watts

			vertical current moment	
wire	magnitude	phase (deg)	magnitude	phase (deg)
1	365.069	360.	365.069	360.
2	1,097.76	107.6	1,097.76	107.6
3	1,147.41	214.6	1,147.41	214.6
4	410.301	319.5	410.301	319.5
5	4.45886	294.7	4.45886	294.7

Medium wave array vertical current moment (amps-degrees) rms
(Calculation assumes tower wires are grouped together.
The first wire of each group must contain the source.)

tower	magnitude	phase (deg)
1	365.069	360.
2	1,097.76	107.6
3	1,147.41	214.6
4	414.352	319.2

Item 5
Array Geometry – KRDC

Per the provisions of the Commission's Public Notice DA 09-2340, October 29, 2009, paragraph 5, licensed stations applying to be re-licensed under the MM Docket 93-177 Rules are exempt from the requirement to submit an as-built surveyor's certification when there is no change in the theoretical patterns, as is the case in this application.

Item 6

Sampling System Measurements – KRDC

Impedance measurements were made of the antenna monitor sampling system using an AIM-120 network analyzer 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 loops.

The following table shows the frequency closest to the carrier frequency where series resonance – zero reactance corresponding with low resistance – was found. As 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 – was found to be 450 electrical degrees. The electrical length at carrier frequency appearing in the table below was calculated by ratioing the carrier frequency to the resonant frequency.

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 R1 + jX1 and R2 + jX2 are the measured impedances of the +45 and -45 degree offset frequencies respectively:

$$Zo = ((R^2 + X^2)^{1/2} \times (R^2 + X^2)^{1/2})^{1/2}$$

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

KDIS 1150 kHz Sample Line Measurements

Tower	Sampling Line Open-Circuited Resonance Below 1110 kHz (kHz)	Sampling Line Open-Circuited Resonance Above 1110 kHz (kHz)	Sampling Line Calculated Electrical Length at 1110 kHz (Degrees)	1110 kHz Measured Impedance with Sampling Loops Connected (Ohms)
1	779.377	1304.277	382.970	5.04 +j29.3
2	778.790	1304.298	382.964	4.50 +j29.9
3	778.962	1304.036	383.041	5.35 +j29.6
4	778.662	1303.577	383.176	5.00 +j30.0
5	777.668	1301.779	383.705	4.77 +j29.9

Tower	-45 Degrees Offset Frequency (kHz)	-45 Degrees Measured Impedance (Ohms)	+45 Degrees Offset Frequency (kHz)	+45 Degrees Measured Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)
1	1173.849	6.286-j49.380	1434.705	7.929+j49.512	49.9607
2	1173.868	6.233-j49.513	1434.728	7.800+j49.113	49.8162
3	1173.632	6.282-j49.527	1434.439	7.913+j49.178	49.8672
4	1173.219	6.576–j49.592	1433.935	8.346+j49.924	50.3214
5	1171.601	6.281-j49.624	1431.977	7.817+j49.276	49.9560

Item 7

Reference Field Strength Measurements - KRDC

Reference field strength measurements were made along radials of five of the eight pattern inflection azimuths for the night pattern and four of the 6 for the day pattern. Both patterns are symmetrical around the lines of the respective towers and one radial of each symmetrical pair has been included, rendering measurement of the additional inflection radials unnecessary. The measured field strengths, point descriptions, and measured coordinates are shown on the following page. The measurements were made on July 7, 2017. The coordinates are NAD-27.

The measurements were performed by Burt Weiner and Ashley Wallen, who are experienced in the proper techniques for such work. The measurements were made with a Potomac Instruments FIM-4100 serial number 226. This instrument's calibration was checked by comparison with readings of a Potomac Instruments FIM-21, serial number 803, which was most recently calibrated by the manufacturer on March 3, 2016, and found to agree well within the manufacturer's stated accuracy for the instruments.

KDRC Reference Point Field Measurements

DAY	PATTERN					
Radial	KM Distance	Time	Field mV/m	Latitude	Longitude	Description
51°	2.30	08:45 AM	125	34 07 36.9	117 58 43.6	1232 Galen St. on water meter
	3.80	09:05 AM	58	34 08 6.2	117 57 59.1	1504 Highland Ave. GTE manhole cover
	5.18	09:25 AM	51	34 08 36.0	117 57 13.3	2322 Royal Oaks Ave between mailboxes
						on sidewalk
14°	2.10	10:24 AM	534	34 07 55.4	117 59 35.3	458 Duarte at curb on manhole cover
	4.00	09:50 AM	275	34 08 55.4	117 59 11.9	825 Oakdale at fire hydrant
	4.89	10:04 AM	196	34 09 23.3	117 59 8.6	921 Graystone Ave opposite driveway
						at stop sign
121°	2.70	10:55 AM	826	34 06 4.9	117 58 22.5	13819 Calais St. on water meter
	4.10	11:08 AM	475	34 05 40.8	117 57 40.3	14359 Rockenbach St. on water meter
	6.40	11:27 AM	263	34 05 3.8	117 56 21.2	740 Conlon Ave. on water meter
194°	5.80	12:16 PM	230	34 03 48.0	118 00 45.4	12260 Garvey Ave. center of driveway
						on curb
	4.00	12:30 PM	252	34 04 42.0	118 00 27.2	12140 Lambert Ave. on water meter
	1.80	12:45 PM	266	34 05 51.5	118 00 10.4	11937 Rio Hondo P'way center of driveway
						on curb
NIGHT	PATTERN					
Radial	KM Distance	Time	Field mV/m	Latitude	Longitude	Description
5°	2.03	03:01 PM	46.2	34 07 55.3	117 59 46.1	E. Duarte Rd. on curb right of driveway
	4.20	03:15 PM	33.2	34 09 6.4	117 59 39	415 Foothill Blvd @ fire hydrant
	5.40	03:24 PM	32.2	34 09 46.6	117 59 37.8	Crestview Pl. manhole center of
						cul de sac
39°	1.80	04:09 PM	15.4	34 07 35.7	117 59 8.9	2138 Broach in front of fire hydrant
	2.60	03:55 PM	9.28	34 07 55.4	117 58 49.8	1803 Broadland Ave. @ fire hydrant
	4.30	03:43 PM	5.45	34 08 36.4	117 58 4.7	1714 Royal Oaks Ave. center of
						driveway on street edge
60°	2.20	05:51 PM	55.5	34 07 26.7	117 58 38.3	2240 Buena Vista St. center of shipping
						driveway at curb
	6.50	05:20 PM	19.2	34 08 34.9	117 56 15.3	777 Encanto P'way center of driveway
						at curb
	4.90	05:00 PM	10.9	34 08 9.3	117 57 9.9	Andres Duarte School end of walkway
						right of driveway
109°	6.70	06:42 PM	4.01	34 05 39.2	117 55 47.6	16166 E. Ringside Dr. at water meter
	4.40	06:27 PM	5.05	34 06 4.5	117 57 11.8	14853 Anada St. @ Park Ave on water mtr
	3.00	06:12 PM	25	34 06 18.7	117 58 05.0	5074 Benham Ave on manhole cover
						in cul de sac
240°	6.00	07:30 PM	284	34 05 16.8	118 03 20	4410 Temple City Bvd in front of hydrant
	4.00	07:40 PM	363	34 05 46.2	118 02 9.2	10703 Grand Ave in front of hydrant
	2.00	07:59 PM	1360	34 06 17.0	118 01 2.5	3237 Hempstead Ave on water meter
			Hatfield & Dawson Consulting Engineers			

POTOMAC INSTRUMENTS, inc.
Frederick, MD

CERTIFICATE OF CALIBRATION

Field Intensity Meter Type FIM-21 Serial Number 803

This instrument was calibrated in an induction field of 220.0 millivolts per meter. At each measurement frequency the measured field was recorded and a correction factor K was computed; the indicated field must be multiplied by K to obtain the true field.

kHz	K	kHz	K
540	1.000	1100	1.000
600	1.000	1200	1.000
700	1.000	1300	1.000
800	1.000	1400	1.000
900	1.000	1500	1.005
1000	1.000	1600	1.005

The calibrating field is maintained equal to the National Institute of Standards and Technology (NIST) standard field within an accuracy of 1.0 percent. NIST states that the absolute accuracy of its field is "believed to be within 3.0 percent."

The error at points on the meter scale other than the calibration point is less than 3.0 percent. The attenuator ratios are correct within 2.0 percent. These accuracies apply for battery voltages that are indicated by the instrument's battery check circuit to be useable.

NEXT RECOMMENDED CALIBRATION DATE: March 3, 2018

Calibrated by _____ Date: Mar. 3, 2016

STATE OF MARYLAND

Technician Michael Prettyman, personally appeared before me on Mar. 3, 2016, and testified under oath that the above calibration was made either by himself or under his direction and that the statements in the above certificate are true to the best of his knowledge and belief.

MARCELLA R. LALIBERTE
NOTARY PUBLIC
MY COMMISSION EXPIRES 12/17/2016
FREDERICK COUNTY, MD

Marcella R. Laliberte
Notary Public

Item 8

Direct Measurement of Power - KRDC

Common point impedance measurements were made with a Delta OIB impedance meter. The measurements were made at the phasor cabinet input adjacent to the common point current meter used to determine operating power. The impedance measured at this point was adjusted to a value of 50 - J6 ohms for the day and night common point networks, providing the main transmitter with its desired load.

Item 9

Antenna Monitor and Sampling System – KRDC

The antenna monitor is a Potomac Instruments model AM-1901 serial number 106. The sample transformers are connected through equal lengths of Andrew 3/8 inch foam Heliax solid outer conductor transmission lines to the antenna monitor. The five sample lines are routed to the towers such that they are subject to similar environmental conditions. The five identical sample loops are mounted at approximately 32% of the total height of the towers (42 degrees from the base), such that with 33 segments in the moment method model segment 11 on each tower (40 to 44 electrical degrees) encompasses the location of the loops.

The antenna monitor calibration was checked by placing an RF feed divided into outputs with T connectors and the outputs were connected with short, equal length coaxial cables to the inputs of the antenna monitor. The resulting readings are well within the manufacturer's rated specifications.

DAY			NIGHT	
Input #	Ratio	Phase	Ratio	Phase
1	1.000	+/-0	1.000	-0.1
2	1.000	-0.1	1.000	-0.2
3	1.000	+0.2	1.000	-0.1
4	1.000	+/-0	0.999	-0.1
5	1.000	-0.1	0.998	+0.3