ORIGINAL

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO. BR-20110909ADD
BMAL-

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)
Disney Worldwide Services, Inc.

MAILING ADDRESS (Line 1) (Maximum 35 characters)
77 West 66th Street, 16th Floor

MAILING ADDRESS (Line 2) (Maximum 35 characters)
ATTN: John W. 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)
212-456-7387	KIID	Fac. ID# 65482

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	$ 635	

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	$ 730	

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

TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
$ 1365	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Radio Disney Sacramento, LLC		
MAILING ADDRESS 77 West 66th Street, 16th Floor		
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
KIID	Sacramento, CA	BP-20100901ACW	N/A	12/22/2013

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. STA, Rule 73.1615(b)(6) extended by further STA.

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.

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	7.12.2011	212.456.7387

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

FCC FORM 302-AM, SECTION III

APPLICATION FOR STATION LICENSE
(Method of Moments Proof)

RADIO STATION KIID
(Facility ID # 65482)
CP File # BP20100901ACW

Radio Disney Sacramento, LLC.

1470 kHz, 5.0/1.0 kW, DA-2

Sacramento, California

JUNE, 2011

WILLOUGHBY & VOSS
BROADCAST TECHNICAL CONSULTANTS
P.O. BOX 701190
SAN ANTONIO, TEXAS 78270-1190
(210) 525-1111

RADIO DISNEY SACRAMENTO, LLC.
KIID RADIO
1470 kHz, 5.0/1.0 kW, DA-2
SACRAMENTO, CALIFORNIA
JUNE, 2011

APPLICATION FOR STATION LICENSE
(Method of Moments Proof)

FCC Form 302, Section III

Technical Summary Statement

Exhibits:

1. Verification of Method of Moments Model
2. DA-Day Operating Parameter Determination
3. DA-Night Operating Parameter Determination
4. Details of Model for Towers Individually Driven
5. Detail of Model for DA-DAY
6. Detail of Model for DA-NIGHT
7. Sample System Measurements
8. Reference Field Strength Measurements
9. Direct Measurement of Power
10. Antenna Monitor and Sample System
11. Radio Frequency Radiation Considerations

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
Radio Disney Sacramento, LLC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

X Station License W 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
KIID	BP-20100901ACW	1470	Unlimited	1.0	5.0

2. Station location	
State	City or Town
California	Sacramento

3. Transmitter location			
State	County	City or Town	Street address (or other identification)
CA	Sacramento	Sacramento	Am. River & N Levee,1mi S of N Sacramento

4. Main studio location			
State	County	City or Town	Street address (or other identification)
CA	Sacramento	Roseville	8265 Sierra College Blvd #312

5. Remote control point location (specify only if authorized directional antenna)			
State	County	City or Town	Street address (or other identification)
CA	Sacramento	Roseville	8265 Sierra College Blvd #312

6. Has type-approved stereo generating equipment been installed? W Yes X No

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

W Not Applicable

Attach as an Exhibit a detailed description of the sampling system as installed.

Exhibit No. Tech. Statem.

8. Operating constants:	
RF common point or antenna current (in amperes) without modulation for night system 4.78	RF common point or antenna current (in amperes) without modulation for day system 10.65
Measured antenna or common point resistance (in ohms) at operating frequency Night 47.3 Day 47.6	Measured antenna or common point reactance (in ohms) at operating frequency Night -6.35 Day -6.85

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(C)	0.0	0.0	1.000	1.000		
2(NE)	110.2	-136.0	1.167	0.603		
3(SW)	- 61.8	172.2	1.278	0.604		

Manufacturer and type of antenna monitor: Potomac Instruments 1901-3

SECTION III - Page 2

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

ASR Registration # T1= ~~1016357~~ 1275753, T2= ~~1016358~~ 1275754, T3= ~~1016359~~ 1016358

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.
(3) vertical, guyed, uniform cross-section, steel, towers	56.37	60.8	60.8	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			
	38 °	35 '	30 "		121 °	27 '	~~47~~ 46 "

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. Tech. State.

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

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

Does Not Apply

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

See attached Technical Statement

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)
Lyndon H. Willoughby	Lyndon H. Willoughby
Address (include ZIP Code)	Date
Willoughby & Voss, LLC. P.O. Box 701190 San Antonio, TX 78270-1190	June 27, 2011
	Telephone No. (Include Area Code)
	210-862-5285

[ ] Technical Director

[ ] Chief Operator

[ ] Other (specify)

[ ] Registered Professional Engineer

[X] Technical Consultant

email: willvoss@satx.rr.com

KIID - Technical Summary Statement

These technical exhibits support an application for station license for radio station KIID, Sacramento, California. KIID operates on 1470 kHz, with a daytime directional power of 5.0 kW and nighttime directional power of 1.0 kW.

KIID has performed a reduction in the heights of all towers. Towers 1 & 2 are new towers and were erected after fire felled them, when Tower 3 was reduced in height and refurbished. No tower obstruction lights were installed on the towers, as they are below the height above ground requirement. The legacy tower base piers were re-used and therefore no other alterations from previously licensed operation has been proposed. These minor changes are authorized by the FCC in Construction Permit BP-20100901ACW.

There were originally four conditions attached to this Construction Permit, all have been address. The instant Method of Moments Proof satisfies Condition #1. Condition #2 is satisfied in that KIID utilizes a Nautel ND5 type accepted transmitter. The instant Form 302 meets the requirement of Condition #3. Condition #4, the requirement to consider KRJY(AM) and KSMH(AM), was removed after discussions with Son Nguyen of the FCC Audio Division.

Discussions with Commission Staff determined that the instant application did not require a registered land surveyor certificate, for verification of actual tower locations and such documents have not been included.

Information is provided herein demonstrating that the directional antenna parameters for both the daytime and nighttime patterns have been determined in accordance with the requirements of Section 73.151(c) [Method of Moments Proof] 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.

Lyndon H. Willoughby

Lyndon H. Willoughby
Willoughby & Voss, LLC.
June 27, 2011

KIID - Verification of Method of Moments Model - Exhibit 1

The base impedance of each tower was measured with a Hewlett-Packard 8753C network analyzer and a Tunwall Radio directional coupler, in a calibrated measurement system.

The measurement point and the open circuit point ("Reference Point"), was at the normal mounting location of the toroidal transformer (removed for calibration measurements). The RF current travels on copper tubing through the ATU bowl insulator and is connected to the tower. The shunt components between the "Reference Point" and each tower base are as follows:
All three towers have parallel high impedance shunt reactance formed by the base insulator (20 pF, -j .00002 uF) and Kintronic static drain choke (SDC-1F, +j 27,000 ohms) resulting in a net reactance of -j 6,770 ohms. Due to the high impedance of these components, they exhibited little effect on the circuit impedance but were included in the process of calibrating the method of moments model ("model") to converge with the measured self impedances.

The following pages show the calculation of circuits which were performed to relate the model impedances of the tower base feedpoints to the Reference Point measured impedances. Westberg Circuit Analysis Program ("WCAP"), was used to calculate values for the assumed circuit.

In each of the WCAP tabulations, node 2 represents the ATU Reference Point and node 3 represents the feedpoint of the tower. Ground potential is represented by node 0.

The calculated Reference Point impedance is shown below "TO IMPEDANCE" on line R 1>2 following the phantom 1.0 ohm resistors 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 shunt capacitance and the inductance of static drain chokes for the three towers appear at C 3>0 and L 2>0 on the WCAP printout. Their combined equivalent circuit appears as the lumped load on the model with the net values stated above.

The modeled and measured self-impedance at the ATU Reference Point, with all other towers open circuited at their Reference Point, agree within the +/-2 ohms and +/- 4% (resistance and reactance), as required by the FCC Rules.

WCAP - KIID T1 OC Self analysis 2

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	202.7946 ∠	58.0500° V
Node:	2	202.2672 ∠	58.2904° V
Node:	3	202.1893 ∠	58.2766° V

	WCAP PART		CURRENT IN	CURRENT OUT
	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT
L	2→3	0.01000000	0.09 ∠ 90.227° V	0.99 ∠ 0.227° A
R	1→2	1.00000000	1.00 ∠ 0.000° V	1.00 ∠ 0.000° A
C	3→0	0.00002000	202.19 ∠ 58.277° V	0.04 ∠ 148.277° A
R	3→0	101.09000000	202.19 ∠ 58.277° V	1.03 ∠ -0.877° A
L	2→0	2923.00000000	202.27 ∠ 58.290° V	0.01 ∠ -31.710° A

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	107.68 + j 172.750	107.68 + j 172.658
R	1→2	1.00000000	107.31 + j 172.073	106.31 + j 172.073
C	3→0	0.00002000	0.00 - j 5413.433	0.00 + j 0.000
R	3→0	101.09000000	101.09 + j 169.270	0.00 + j 0.000
L	2→0	2923.00000000	0.00 + j 26997.653	0.00 + j 0.000

Measured at TCT
106.13 +j172.02

WCAP PART	VSWR

WCAP INPUT DATA:

1.4700 0.00001000 1

L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	1.00000000	0	1	0.00000000
C	0.00002000	3	0	
R	101.09000000	3	0	169.27000000
L	2923.00000000	2	0	0.00000000

WCAP - KIID T2 OC Self analysis 2

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	201.9699 ∠	56.8825° V
Node:	2	201.4253 ∠	57.1208° V
Node:	3	201.3484 ∠	57.1065° V

WCAP PART		CURRENT IN	CURRENT OUT

WCAP PART			BRANCH VOLTAGE	BRANCH CURRENT
L	2→3	0.01000000	0.09 ∠ 90.234° V	0.99 ∠ 0.234° A
R	1→2	1.00000000	1.00 ∠ 0.000° V	1.00 ∠ 0.000° A
C	3→0	0.00002000	201.35 ∠ 57.106° V	0.04 ∠ 147.106° A
R	3→0	104.06000000	201.35 ∠ 57.106° V	1.03 ∠ -0.903° A
L	2→0	2923.00000000	201.43 ∠ 57.121° V	0.01 ∠ -32.879° A

WCAP PART			FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	110.73 + j 169.776	110.73 + j 169.683
R	1→2	1.00000000	110.35 + j 169.160	109.35 + j 169.160
C	3→0	0.00002000	0.00 - j 5413.433	0.00 + j 0.000
R	3→0	104.06000000	104.06 + j 166.590	0.00 + j 0.000
L	2→0	2923.00000000	0.00 + j 26997.653	0.00 + j 0.000

Measured at TCT
109.55 +j169.77

WCAP PART	VSWR

WCAP INPUT DATA:

1.4700 0.00001000 1

L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	1.00000000	0	1	0.00000000
C	0.00002000	3	0	
R	104.06000000	3	0	166.59000000
L	2923.00000000	2	0	0.00000000

WCAP - KIID T3 OC Self analysis 2

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	220.7037 ∠	54.7022° V
Node:	2	220.1274 ∠	54.9147° V
Node:	3	220.0526 ∠	54.9008° V

	WCAP PART	CURRENT IN	CURRENT OUT

	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT
L	2→3	0.01000000	0.09 ∠ 90.270° V	0.99 ∠ 0.270° A
R	1→2	1.00000000	1.00 ∠ 0.000° V	1.00 ∠ 0.000° A
C	3→0	0.00002000	220.05 ∠ 54.901° V	0.04 ∠ 144.901° A
R	3→0	120.02000000	220.05 ∠ 54.901° V	1.03 ∠ -1.043° A
L	2→0	2923.00000000	220.13 ∠ 54.915° V	0.01 ∠ -35.085° A

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	128.23 + j 180.734	128.23 + j 180.642
R	1→2	1.00000000	127.53 + j 180.130	126.53 + j 180.130
C	3→0	0.00002000	-0.01 - j 5413.433	0.00 + j 0.000
R	3→0	120.02000000	120.02 + j 177.560	0.00 + j 0.000
L	2→0	2923.00000000	0.00 + j 26997.653	0.00 + j 0.000

Measured at ATU
126.32 +j180.81

	WCAP PART	VSWR

WCAP INPUT DATA:

1.4700 0.00001000 1

L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	1.00000000	0	1	0.00000000
C	0.00002000	3	0	
R	120.02000000	3	0	177.56000000
L	2923.00000000	2	0	0.00000000

VERIFICATION OF METHOD OF MOMENTS MODEL

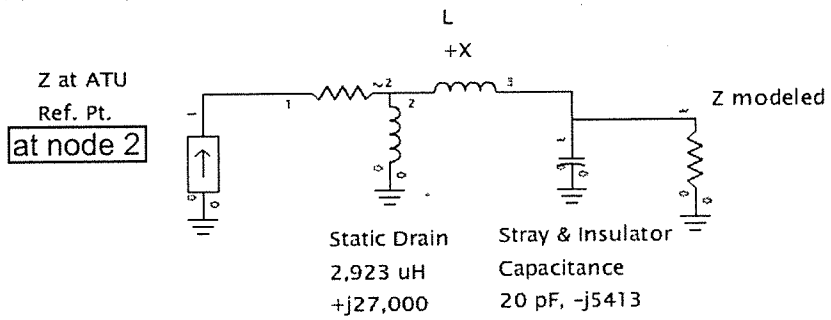
KIID, 1470 kHz, 5.0/1.0 kW, DA-2

SACRAMENTO, CALIFORNIA

Center Frequency 1.47 MHz

Frequency Range [illegible] kHz

Frequency Step [illegible] kHz



(Feedlines, Chokes & Strays combined as Xoc)

TWR	L(uH)	XL	Xoc	Z Base modeled	Z ATU (model)	Z ATU (msrd)
1	0.01	+j 0	-j 6,770	101.09 +j 169.27	106.31 +j 172.073	106.13 +j 172.02
2	0.01	+j 0	-j 6,770	104.06 +j 166.59	109.35 +j 169.160	109.55 +j 169.77
3	0.01	+j 0	-j 6,770	120.02 +j 177.56	126.53 +j 180.130	126.53 +j 180.81

KIID - DA-DAY Operating Parameter Determination - Exhibit 2

After converging the model with the measured open-circuit self impedance for each tower in the array, the model was used to make the directional antenna calculations.

The model calculated the voltage values for the source point of each tower in the array, as well as the tower currents. The summation of current moments, when normalized, equate to the theoretical field parameters which produce the directional pattern.

The ATU output currents were calculated using WCAP nodal analysis. WCAP input data consists of:

- Tower currents calculated using the method of moments model for the directional antenna.
- Tower operating impedances calculated by the method of moments for the directional antenna. In WCAP these are treated as a complex load from node 3 to ground.
- The circuit values which were derived from analysis of the measured open-circuit self impedances.

The WCAP nomenclature, in the following tabulations are defined as:

- Node 2 is the ATU Reference Point (where the TCT sampler is located).
- Node 3 is the tower feedpoint.
- Node 0 is ground potential.
- Node 1>2 is a phantom 1.0 ohm resistor.
- Node 2>3 is the assumed series reactance.
- Node 3>0 is both the assumed shunt capacitance of base insulator & strays, as well as a resistor that represents the complex load presented by the tower.
- "TO IMPEDANCE" is the impedance from one node to the following node.

Since the TCT samplers and the sampling lines are identical, the antenna monitor ratios and phases corresponding to the theoretical parameters were calculated directly from the modeled ATU currents.

KIID - DA-DAY Operating Parameter Determination - Exhibit 2

KIID, 1470 kHz, 5.0/1.0 kW, DA-2

Sacramento, California

TOWER	Modeled Current Node	Current Magnitude @ TCT in amps	Current Phase @ TCT in degrees	Antenna Monitor Ratio	Antenna Monitor Phase in deg
1(C)	1	8.08	4.14	1.000	00.0
2(NE)	13	4.87	- 131.9	0.603	- 136.0
3(SW)	25	4.88	+ 176.3	0.604	+ 172.2

WCAP - KIID DA-Day T1

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	1819.7018 ∠	83.2707° V
Node:	2	1818.1955 ∠	83.5207° V
Node:	3	1817.4682 ∠	83.5164° V

	WCAP PART		CURRENT IN		CURRENT OUT		
	WCAP PART		BRANCH VOLTAGE		BRANCH CURRENT		
L	2→3	0.01000000	0.74 ∠	94.229° V	8.01 ∠	4.229° A	
R	1→2	1.00000000	8.08 ∠	4.140° V	8.08 ∠	4.140° A	TCT Ref. Pt.
C	3→0	0.00002000	1817.47 ∠	83.516° V	0.34 ∠	173.516° A	
R	3→0	38.88600000	1817.47 ∠	83.516° V	8.34 ∠	3.800° A	Twr. Base
L	2→0	2923.00000000	1818.20 ∠	83.521° V	0.07 ∠	-6.479° A	

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	42.16 + j 222.932	42.16 + j 222.839
R	1→2	1.00000000	42.47 + j 221.170	41.47 + j 221.170
C	3→0	0.00002000	0.00 - j 5413.433	0.00 + j 0.000
R	3→0	38.88600000	38.89 + j 214.320	0.00 + j 0.000
L	2→0	2923.00000000	-0.00 + j 26997.653	0.00 + j 0.000

WCAP PART	VSWR

WCAP INPUT DATA:

	1.4700	0.00001000	1	
L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	8.08000000	0	1	4.14000000
C	0.00002000	3	0	
R	38.88600000	3	0	214.32000000
L	2923.00000000	2	0	0.00000000

WCAP - KIID T2 Day

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	1538.4409 ∠	-53.7642° V
Node:	2	1537.4470 ∠	-53.5866° V
Node:	3	1537.0118 ∠	-53.5900° V

	WCAP PART		CURRENT IN	CURRENT OUT	
	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT	
L	2→3	0.01000000	0.44 ∠ -41.763° V	4.81 ∠ -131.763° A	
R	1→2	1.00000000	4.87 ∠ -131.900° V	4.87 ∠ -131.900° A	TCT Ref. Pt.
C	3→0	0.00002000	1537.01 ∠ -53.590° V	0.28 ∠ 36.410° A	
R	3→0	58.48200000	1537.01 ∠ -53.590° V	5.09 ∠ -132.417° A	Twr. Base
L	2→0	2923.00000000	1537.45 ∠ -53.587° V	0.06 ∠ -143.587° A	

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	65.44 + j 312.578	65.44 + j 312.485
R	1→2	1.00000000	64.95 + j 309.153	63.95 + j 309.153
C	3→0	0.00002000	0.00 - j 5413.433	0.00 + j 0.000
R	3→0	58.48200000	58.48 + j 296.100	0.00 + j 0.000
L	2→0	2923.00000000	0.00 + j 26997.653	0.00 + j 0.000

WCAP PART	VSWR

WCAP INPUT DATA:

```
      1.4700      0.00001000   1
L       0.01000000   2   3      0.00000000
R       1.00000000   1   2      0.00000000
I       4.87000000   0   1    228.10000000
C       0.00002000   3   0
R      58.48200000   3   0    296.10000000
L    2923.00000000   2   0      0.00000000
```

WCAP - KIID T3 Day

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	1066.3208 ∠ -102.5168° V
Node:	2	1065.5837 ∠ -102.2575° V
Node:	3	1065.1417 ∠ -102.2611° V

	WCAP PART		CURRENT IN	CURRENT OUT	
	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT	
L	2→3	0.01000000	0.45 ∠ -93.630° V	4.84 ∠ 176.370° A	
R	1→2	1.00000000	4.88 ∠ 176.300° V	4.88 ∠ 176.300° A	TCT Ref. Pt.
C	3→0	0.00002000	1065.14 ∠ -102.261° V	0.20 ∠ -12.261° A	
R	3→0	30.51500000	1065.14 ∠ -102.261° V	5.04 ∠ 176.034° A	Twr. Base
L	2→0	2923.00000000	1065.58 ∠ -102.257° V	0.04 ∠ 167.743° A	

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	33.02 + j 217.627	33.02 + j 217.535
R	1→2	1.00000000	33.49 + j 215.926	32.49 + j 215.926
C	3→0	0.00002000	-0.00 - j 5413.433	0.00 + j 0.000
R	3→0	30.51500000	30.51 + j 209.310	0.00 + j 0.000
L	2→0	2923.00000000	0.01 + j 26997.653	0.00 + j 0.000

WCAP PART	VSWR

WCAP INPUT DATA:

1.4700 0.00001000 1

L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	4.88000000	0	1	176.30000000
C	0.00002000	3	0	
R	30.51500000	3	0	209.31000000
L	2923.00000000	2	0	0.00000000

KIID - DA-Night Operating Parameter Determination - Exhibit 3

After converging the model with the measured open-circuit self impedance for each tower in the array, the model was used to make the directional antenna calculations.

The model calculated the voltage values for the source point of each tower in the array, as well as the tower currents. The summation of current moments, when normalized, equate to the theoretical field parameters which produce the directional pattern.

The ATU output currents were calculated using WCAP nodal analysis. WCAP input data consists of:

- Tower currents calculated using the method of moments model for the directional antenna.
- Tower operating impedances calculated by the method of moments for the directional antenna. In WCAP these are treated as a complex load from node 3 to ground.
- The circuit values which were derived from analysis of the measured open-circuit self impedances.

The WCAP nomenclature, in the following tabulations are defined as:

- Node 2 is the ATU Reference Point (where the TCT sampler is located).
- Node 3 is the tower feedpoint.
- Node 0 is ground potential.
- Node 1>2 is a phantom 1.0 ohm resistor.
- Node 2>3 is the assumed series reactance.
- Node 3>0 is both the assumed shunt capacitance of base insulator & strays, as well as a resistor that represents the complex load presented by the tower.
- "TO IMPEDANCE" is the impedance from one node to the following node.

Since the TCT samplers and the sampling lines are identical, the antenna monitor ratios and phases corresponding to the theoretical parameters were calculated directly from the modeled ATU currents.

KIID - DA-NIGHT Operating Parameter Determination - Exhibit 3

KIID, 1470 kHz, 5.0/1.0 kW, DA-2

Sacramento, California

TOWER	Modeled Current Node	Current Magnitude @ TCT in amps	Current Phase @ TCT in degrees	Antenna Monitor Ratio	Antenna Monitor Phase in deg
1(C)	1	1.26	11.50	1.000	00.0
2(NE)	13	1.47	121.7	1.167	+110.2
3(SW)	25	1.61	- 50.3	1.278	- 61.8

WCAP - KIID DA-Night T1

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	234.8205 ∠	67.0690° V
Node:	2	234.1104 ∠	67.3233° V
Node:	3	234.0149 ∠	67.3073° V

	WCAP PART	CURRENT IN	CURRENT OUT	

	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT	
L	2→3	0.01000000	0.12 ∠ 101.723° V	1.25 ∠ 11.723° A	
R	1→2	1.00000000	1.26 ∠ 11.500° V	1.26 ∠ 11.500° A	TCT Ref. Pt
C	3→0	0.00002000	234.01 ∠ 67.307° V	0.04 ∠ 157.307° A	
R	3→0	99.77200000	234.01 ∠ 67.307° V	1.29 ∠ 10.636° A	Twr. Base
L	2→0	2923.00000000	234.11 ∠ 67.323° V	0.01 ∠ -22.677° A	

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	105.57 + j 154.185	105.57 + j 154.093
R	1→2	1.00000000	105.37 + j 153.716	104.37 + j 153.716
C	3→0	0.00002000	-0.00 - j 5413.433	0.00 + j 0.000
R	3→0	99.77200000	99.77 + j 151.720	0.00 + j 0.000
L	2→0	2923.00000000	-0.00 + j 26997.653	0.00 + j 0.000

	WCAP PART	VSWR

WCAP INPUT DATA:

	1.4700	0.00001000	1	
L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	1.26000000	0	1	11.50000000
C	0.00002000	3	0	
R	99.77200000	3	0	151.72000000
L	2923.00000000	2	0	0.00000000

WCAP - KIID DA-Night T2

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	322.6933 ∠ -175.9789° V
Node:	2	322.0131 ∠ -175.7473° V
Node:	3	321.8937 ∠ -175.7584° V

	WCAP PART	CURRENT IN	CURRENT OUT	

	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT	
L	2→3	0.01000000	0.13 ∠ -148.084° V	1.46 ∠ 121.916° A	
R	1→2	1.00000000	1.47 ∠ 121.700° V	1.47 ∠ 121.700° A	TCT Ref. Pt.
C	3→0	0.00002000	321.89 ∠ -175.758° V	0.06 ∠ -85.758° A	
R	3→0	95.39600000	321.89 ∠ -175.758° V	1.51 ∠ 120.870° A	Twr. Base
L	2→0	2923.00000000	322.01 ∠ -175.747° V	0.01 ∠ 94.253° A	

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	102.44 + j 195.423	102.44 + j 195.330
R	1→2	1.00000000	101.97 + j 194.399	100.97 + j 194.399
C	3→0	0.00002000	-0.01 - j 5413.433	0.00 + j 0.000
R	3→0	95.39600000	95.40 + j 190.270	0.00 + j 0.000
L	2→0	2923.00000000	0.00 + j 26997.653	0.00 + j 0.000

	WCAP PART	VSWR

WCAP INPUT DATA:

	1.4700	0.00001000	1	
L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	1.47000000	0	1	121.70000000
C	0.00002000	3	0	
R	95.39600000	3	0	190.27000000
L	2923.00000000	2	0	0.00000000

WCAP - KIID DA-Night T3

WCAP OUTPUT AT FREQUENCY: 1.470 MHz

NODE VOLTAGES

Node:	1	513.7798 ∠	-9.0323° V
Node:	2	512.5707 ∠	-8.9136° V
Node:	3	512.4742 ∠	-8.9261° V

	WCAP PART		CURRENT IN		CURRENT OUT		
	WCAP PART		BRANCH VOLTAGE		BRANCH CURRENT		
L	2→3	0.01000000	0.15 ∠	40.211° V	1.60 ∠	-49.789° A	
R	1→2	1.00000000	1.61 ∠	-50.300° V	1.61 ∠	-50.300° A	TCT Ref.
C	3→0	0.00002000	512.47 ∠	-8.926° V	0.09 ∠	81.074° A	
R	3→0	224.42000000	512.47 ∠	-8.926° V	1.66 ∠	-52.260° A	Twr. Base
L	2→0	2923.00000000	512.57 ∠	-8.914° V	0.02 ∠	-98.914° A	

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
L	2→3	0.01000000	242.61 + j 209.974	242.61 + j 209.881
R	1→2	1.00000000	239.86 + j 210.483	238.86 + j 210.483
C	3→0	0.00002000	-0.00 - j 5413.433	0.00 + j 0.000
R	3→0	224.42000000	224.42 + j 211.730	0.00 + j 0.000
L	2→0	2923.00000000	0.00 + j 26997.653	0.00 + j 0.000

WCAP PART	VSWR

WCAP INPUT DATA:

1.4700 0.00001000 1

L	0.01000000	2	3	0.00000000
R	1.00000000	1	2	0.00000000
I	1.61000000	0	1	309.70000000
C	0.00002000	3	0	
R	224.42000000	3	0	211.73000000
L	2923.00000000	2	0	0.00000000

KIID - Details of Model for Towers Individually Driven - Exhibit 4

Using Expert MININEC Broadcast Professional, Version 14.5, the KIID three tower array was modeled. Each tower was represented by one wire. The top and bottom wire end points were specified using electrical degrees for the frequency of 1470 kHz. Each tower wire was modeled based on 12 wire segments. The towers are physically 99.5 electrical degrees in height, the segment length is between 9.52 and 9.76 electrical degrees.

The characteristics (height & radius) were adjusted until the modeled resistance approximately matched the measured resistance. Final adjustment to converge the model was made based on the introduction of a circuit model which consists of branches representing feedline inductances and stray capacitances. The base impedances were measured at the normal location of the current sampling TCTs (Reference Point) with the other towers opened circuited at their respective Reference Point. The method of moments model assumed loads at ground level having the reactances that were calculated for each case using the base circuit models for the open circuited towers of the array.

The modeled heights relative to the physical heights of the individual towers is within the specified range of 75% to 125%. The modeled radius is within the specified range of 80% to 150% of the cylindrical radius that represents the circumference equal to the sum of the tower face width. KIID uses towers of uniform cross-section, triangular shape having face widths of 18 inches. The tower radii are 0.2183 m.

TOWER	Physical Height (deg)	Modeled Height (deg)	Modeled % of Height	Physical Radius (m)	Modeled Radius (m)	Equival. % of Radius
1(C)	99.5	116.0	116.6	0.2183	0.27	123.7
2(NE)	99.5	114.2	114.8	0.2183	0.18	82.5
3(SW)	99.5	117.1	117.7	0.2183	0.25	114.5

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

Tower 1 Self (all others OC)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.27	12
		0	0	116.		
2	none	90.6	63.5	0	.18	12
		90.6	63.5	114.2		
3	none	90.6	256.7	0	.25	12
		90.6	256.7	117.1		

Number of wires = 3
current nodes = 36

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	2	9.51667	3	9.75833
radius	2	.18	1	.27

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.47	0	1	.0264352	.0271065

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	13	0	-6,770.	0	0	0
2	25	0	-6,770.	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.47	101.09	169.27	197.16	59.2	8.0611	-2.1662	-4.0591

Tower 2 Self (all others OC)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.27	12
		0	0	116.		
2	none	90.6	63.5	0	.18	12
		90.6	63.5	114.2		
3	none	90.6	256.7	0	.25	12
		90.6	256.7	117.1		

Number of wires = 3
current nodes = 36

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	2	9.51667	3	9.75833
radius	2	.18	1	.27

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.47	0	1	.0264352	.0271065

Sources

source	node	sector	magnitude	phase	type
1	13	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-6,770.	0	0	0
2	25	0	-6,770.	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 13, sector 1							
1.47	104.06	166.59	196.42	58.	7.7666	-2.2492	-3.9337

Tower 3 Self (all others OC)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.27	12
		0	0	116.		
2	none	90.6	63.5	0	.18	12
		90.6	63.5	114.2		
3	none	90.6	256.7	0	.25	12
		90.6	256.7	117.1		

Number of wires = 3
current nodes = 36

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	2	9.51667	3	9.75833
radius	2	.18	1	.27

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.47	0	1	.0264352	.0271065

Sources

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

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-6,770.	0	0	0
2	13	0	-6,770.	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 25, sector 1							
1.47	120.02	177.56	214.32	55.9	7.945	-2.1981	-4.0101

KIID - Details of Model for DA-DAY - Exhibit 5

Using Expert MININEC Broadcast Professional, Version 14.5, with the individual tower's 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.

Tower	Wire	Base Node
1(C)	1	1
2(NE)	2	13
3(SW)	3	25

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

KIID Full Daytime Model

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.47 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	.65	-137.
3	.6	173.

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	1,817.2	83.5	8.34283	3.8
13	1,537.54	306.5	5.09418	227.6
25	1,066.52	257.7	5.04218	176.

Sum of square of source currents = 241.954
Total power = 5,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00275499	-.00293004
Y(1, 2)	.00184789	.000525817
Y(1, 3)	.00181991	.000523378
Y(2, 1)	.00184789	.00052584
Y(2, 2)	.00277609	-.00382819
Y(2, 3)	.000387462	-.000553557
Y(3, 1)	.00181991	.000523348
Y(3, 2)	.000387456	-.000553566
Y(3, 3)	.00270713	-.00336903

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	102.617	168.841
Z(1, 2)	43.9121	-53.8442
Z(1, 3)	44.5554	-61.2093
Z(2, 1)	43.9111	-53.8445
Z(2, 2)	104.298	166.62
Z(2, 3)	-47.1893	-33.5385
Z(3, 1)	44.5568	-61.2089
Z(3, 2)	-47.1888	-33.5395
Z(3, 3)	120.357	177.471

KIID Full Daytime Model

KIID DA-Day

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.27	12
		0	0	116.		
2	none	90.6	63.5	0	.18	12
		90.6	63.5	114.2		
3	none	90.6	256.7	0	.25	12
		90.6	256.7	117.1		

Number of wires = 3
current nodes = 36

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	2	9.51667	3	9.75833
radius	2	.18	1	.27

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.47	0	1	.0264352	.0271065

Sources

source	node	sector	magnitude	phase	type
1	1	1	2,569.91	83.5	voltage
2	13	1	2,174.42	306.5	voltage
3	25	1	1,508.29	257.7	voltage

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.47	38.886	214.32	217.82	79.7	25.648	-.67765	-8.4022
source = 2; node 13, sector 1							
1.47	58.482	296.1	301.82	78.8	31.977	-.54343	-9.2953
source = 3; node 25, sector 1							
1.47	30.515	209.31	211.52	81.7	30.93	-.56184	-9.1596

CURRENT rms
Frequency = 1.47 MHz
Input power = 5,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	8.3428	3.8	8.32439	.55386
2	0	0	9.66667	10.0272	2.	10.0212	.347582
3	0	0	19.3333	10.8784	1.1	10.8764	.209894
4	0	0	29.	11.2935	.5	11.2931	.0959845
5	0	0	38.6667	11.3191	0.0	11.3191	2.E-03
6	0	0	48.3333	10.9791	359.6	10.9789	-.0726487
7	0	0	58.	10.2939	359.3	10.2931	-.127571
8	0	0	67.6667	9.28669	359.	9.28528	-.16217
9	0	0	77.3333	7.98395	358.7	7.98201	-.175895
10	0	0	87.	6.41396	358.5	6.41175	-.168312

11	0	0	96.6667	4.60124	358.3	4.59914	-.13897
12	0	0	106.333	2.55002	358.	2.54854	-.0867773
END	0	0	116.	0	0	0	0
GND	40.4255	-81.0811	0	5.09417	227.6	-3.43257	-3.76405
14	40.4255	-81.0811	9.51667	6.32729	225.4	-4.44607	-4.50189
15	40.4255	-81.0811	19.0333	7.00616	224.3	-5.01683	-4.89057
16	40.4255	-81.0811	28.55	7.3792	223.5	-5.34984	-5.08251
17	40.4255	-81.0811	38.0667	7.47803	223.	-5.47079	-5.09818
18	40.4255	-81.0811	47.5833	7.31762	222.5	-5.39121	-4.94797
19	40.4255	-81.0811	57.1	6.91072	222.2	-5.12044	-4.64102
20	40.4255	-81.0811	66.6167	6.27189	221.9	-4.66914	-4.18757
21	40.4255	-81.0811	76.1333	5.41824	221.6	-4.0499	-3.5994
22	40.4255	-81.0811	85.65	4.36842	221.4	-3.27663	-2.88908
23	40.4255	-81.0811	95.1667	3.139	221.2	-2.36178	-2.06769
24	40.4255	-81.0811	104.683	1.73318	221.	-1.30773	-1.13744
END	40.4255	-81.0811	114.2	0	0	0	0
GND	-20.8425	88.17	0	5.04216	176.	-5.02958	.356005
26	-20.8425	88.17	9.75833	6.01147	174.5	-5.98424	.571596
27	-20.8425	88.17	19.5167	6.50146	173.9	-6.46404	.696483
28	-20.8425	88.17	29.275	6.73397	173.4	-6.68884	.77831
29	-20.8425	88.17	39.0333	6.73603	173.	-6.68566	.822229
30	-20.8425	88.17	48.7917	6.52168	172.7	-6.46861	.830283
31	-20.8425	88.17	58.55	6.10342	172.4	-6.05024	.803915
32	-20.8425	88.17	68.3083	5.4955	172.2	-5.44481	.744737
33	-20.8425	88.17	78.0667	4.71445	172.	-4.66877	.654727
34	-20.8425	88.17	87.825	3.77808	171.8	-3.73985	.536118
35	-20.8425	88.17	97.5833	2.70218	171.7	-2.67375	.390946
36	-20.8425	88.17	107.342	1.49082	171.5	-1.47456	.219577
END	-20.8425	88.17	117.1	0	0	0	0

KIID - Details of Model for DA-NIGHT - Exhibit 6

Using Expert MININEC Broadcast Professional, Version 14.5, with the individual tower's 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.

Tower	Wire	Base Node
1(C)	1	1
2(NE)	2	13
3(SW)	3	25

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

KIID Full Nighttime Model

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.47 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	1.18	112.
3	1.51	-73.

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	233.69	67.3	1.28692	10.6
13	320.419	184.3	1.50543	120.9
25	512.231	351.	1.6602	307.7

Sum of square of source currents = 13.3575
Total power = 1,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00275499	-.00293004
Y(1, 2)	.00184789	.000525817
Y(1, 3)	.00181991	.000523378
Y(2, 1)	.00184789	.00052584
Y(2, 2)	.00277609	-.00382819
Y(2, 3)	.000387462	-.000553557
Y(3, 1)	.00181991	.000523348
Y(3, 2)	.000387456	-.000553566
Y(3, 3)	.00270713	-.00336903

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	102.617	168.841
Z(1, 2)	43.9121	-53.8442
Z(1, 3)	44.5554	-61.2093
Z(2, 1)	43.9111	-53.8445
Z(2, 2)	104.298	166.62
Z(2, 3)	-47.1893	-33.5385
Z(3, 1)	44.5568	-61.2089
Z(3, 2)	-47.1888	-33.5395
Z(3, 3)	120.357	177.471

KIID Full Nighttime Model

KIID DA-Night

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.27	12
		0	0	116.		
2	none	90.6	63.5	0	.18	12
		90.6	63.5	114.2		
3	none	90.6	256.7	0	.25	12
		90.6	256.7	117.1		

Number of wires = 3
current nodes = 36

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	2	9.51667	3	9.75833
radius	2	.18	1	.27

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.47	0	1	.0264352	.0271065

Sources

source	node	sector	magnitude	phase	type
1	1	1	330.487	67.3	voltage
2	13	1	453.141	184.3	voltage
3	25	1	724.404	351.	voltage

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.47	99.772	151.72	181.59	56.7	6.9676	-2.5106	-3.5751
source = 2; node 13, sector 1							
1.47	95.396	190.27	212.84	63.4	9.921	-1.757	-4.7791
source = 3; node 25, sector 1							
1.47	224.42	211.73	308.54	43.3	8.5899	-2.0316	-4.2758

CURRENT rms
Frequency = 1.47 MHz
Input power = 1,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	1.28692	10.6	1.26499	.236597
2	0	0	9.66667	1.4724	5.7	1.46514	.146042
3	0	0	19.3333	1.56251	3.2	1.56012	.0863214
4	0	0	29.	1.59866	1.3	1.59822	.0376172
5	0	0	38.6667	1.5854	359.9	1.5854	-1.89E-03
6	0	0	48.3333	1.52532	358.8	1.52497	-.0326395
7	0	0	58.	1.42089	357.8	1.41983	-.0546618
8	0	0	67.6667	1.27507	356.9	1.27326	-.0679405
9	0	0	77.3333	1.09135	356.2	1.08894	-.0724982
10	0	0	87.	.873436	355.5	.870752	-.0684206

11	0	0	96.6667	.624532	354.9	.622035	-.0557882
12	0	0	106.333	.345101	354.3	.343379	-.0344243
END	0	0	116.	0	0	0	0
GND	40.4255	-81.0811	0	1.50543	120.9	-.77269	1.292
14	40.4255	-81.0811	9.51667	1.73808	116.9	-.785793	1.55031
15	40.4255	-81.0811	19.0333	1.85778	114.7	-.777774	1.68713
16	40.4255	-81.0811	28.55	1.91036	113.2	-.753026	1.75569
17	40.4255	-81.0811	38.0667	1.9017	112.	-.712777	1.76307
18	40.4255	-81.0811	47.5833	1.83494	111.	-.658247	1.71281
19	40.4255	-81.0811	57.1	1.7131	110.2	-.590874	1.60797
20	40.4255	-81.0811	66.6167	1.53977	109.4	-.512303	1.45205
21	40.4255	-81.0811	76.1333	1.31915	108.8	-.424356	1.24903
22	40.4255	-81.0811	85.65	1.05579	108.2	-.328901	1.00325
23	40.4255	-81.0811	95.1667	.753681	107.6	-.227588	.718498
24	40.4255	-81.0811	104.683	.413625	107.	-.121101	.3955
END	40.4255	-81.0811	114.2	0	0	0	0
GND	-20.8425	88.17	0	1.66019	307.7	1.01504	-1.31375
26	-20.8425	88.17	9.75833	2.01445	297.5	.929187	-1.78735
27	-20.8425	88.17	19.5167	2.22122	292.6	.854821	-2.05015
28	-20.8425	88.17	29.275	2.34067	289.4	.775993	-2.20829
29	-20.8425	88.17	39.0333	2.37691	286.9	.692128	-2.27391
30	-20.8425	88.17	48.7917	2.33201	285.	.604172	-2.25239
31	-20.8425	88.17	58.55	2.20853	283.4	.513631	-2.14797
32	-20.8425	88.17	68.3083	2.01017	282.1	.422236	-1.96532
33	-20.8425	88.17	78.0667	1.74181	281.	.331752	-1.70992
34	-20.8425	88.17	87.825	1.40904	280.	.243853	-1.38778
35	-20.8425	88.17	97.5833	1.01685	279.	.159933	-1.00419
36	-20.8425	88.17	107.342	.565913	278.2	.0806808	-.560132
END	-20.8425	88.17	117.1	0	0	0	0

KIID - Sample System Measurements - Exhibit 7

Using a Hewlett-Packard 8753C network analyzer and a Tunwall Radio directional coupler, in a calibrated measurement system, impedance measurements were made of the antenna monitor sampling system. The towers were placed in an open circuited condition by removing the ATU output j-plug. The measurement equipment was connected to the antenna monitor end of the sample lines and measurements were made for two conditions. The first condition was with the sample line terminated in its associated Delta Electronics TCT sampler and the second condition where the sample line was open circuited by disconnecting the line from its TCT.

The following table shows the frequencies of the first and second resonances. As the length of a distortionless transmission line is 180 electrical degrees at the difference frequency between adjacent resonant frequencies, and frequencies of resonance occur at odd multiples of 90 degrees electrical length. The sample line length at the resonant frequency closest to the carrier frequency, was found to be 270 electrical degrees. The electrical lengths at carrier frequency appearing in the following table were calculated by dividing the carrier frequency by the resonant frequency closest to the carrier and multiplying by 270 degrees.

Tower	Sample Line Open-Circuited First Frequency of Resonance (MHZ)	Sample Line Open-Circuited Second Frequency of Resonance (MHZ)	Sample Line Calculated Electrical Length at 1470 kHz (Degrees)	1470 kHz Measured Z with TCT-1 Connected (Ohms)
1 (C)	.527400	1.598660	248.270	50.71 -j 1.74
2 (NE)	.527400	1.599100	248.202	50.82 -j 1.80
3 (SW)	.527400	1.598660	248.270	50.80 -j 1.72

The sample line lengths meet the specification that they be equal in length within one electrical degree.

The Characteristic impedance was calculated using the following formula, where R1 +jX1 and R2 +jX2 are the measured impedances at the +45 and -45 degree offset frequencies respectively:

$$Zo = ((R1^2 + X1^2)^{1/2} \bullet (R2^2 + X2^2)^{1/2})^{1/2}$$

Tower	+45 Degree Offset Frequency (MHz)	+45 Degree Measured Impedance (Ohms)	-45 Degree Offset Frequency (MHz)	-45 Degree Measured Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)
2 (E)	1.86562	7.85 +j49.11	1.33258	5.32 -j48.99	49.50
1 (C)	1.86510	7.95 +j49.10	1.33221	5.34 -j49.02	49.48
3 (W)	1.86510	7.82 +j49.05	1.33221	5.30 -j49.04	49.50

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

The TCTs were calibrated by measuring their outputs with a common reference signal using a Hewlett-Packard 8753C network analyzer in a calibrated measurement system. The TCTs were placed side by side, bolted to a two inch wide piece of copper strap with a conductor passing the reference signal through them. The outputs of the TCTs were fed into the Channel A and Channel B receiver inputs of the 8753C, which was set up to measure the relative ratios and phases of the output voltages. The following results were measured for the carrier frequency, 1470 kHz:

Tower	Ratio	Phase (deg)	TCT Model #	TCT Serial #
1 (C)	Reference	Reference	TCT-1	18022
2 (E)	1.0015	+0.2700	TCT-1	18023
3 (W)	0.9996	+0.6100	TCT-1	18024

TCT-1 are 0.5 Volt/amp toroidal current transformers manufactured by Delta Electronics. These TCTs are rated for absolute magnitude accuracy of +/- 2% and absolute phase accuracy of +/- 3 degrees. The maximum measured transformer-to-transformer variations among the seven were 0.19% and 0.610 degree, and as such provide far more accurate relative indications than could be the case within the manufacturer's rated accuracy.

KIID - Reference Field Strength Measurements - Exhibit 8

Reference field strength measurements were made using a Potomac Instruments FIM-4100 meter, the meter being factory calibrated May 20, 2011. Measurements were made at three point locations along each monitored radial and along a radial through the major lobe of each directional pattern. The following pages contain the measured field strength values, the GPS coordinates and point descriptions.

KIID, 1470 kHz.

Daytime Reference Field Strength Measurements

Radial Deg. T	Point Num.	Distance (km)	Field (mV/m)	Coordinates (NAD 83) Lat. N	Long. W	Description
68.0	1	3.42	252.0	38-36-10.9	121-25-28.7	Behind Nordstrom, corner of Parking Lot 1D, 1st uncovered slot.
	2	5.58	152.0	38-36-37.4	121-24-15.8	2447 Burgundy.
	3	7.62	88.0	38-37-02.3	121-22-57.6	Watts & Marconi, behind Jack-In-Box, at Raley's sign.
152.5	1	3.82	17.2	38-33-39.9	121-26-37.2	1486 51st Street.
	2	5.59	5.21	38-32-49.1	121-26-02.9	Broadway & 61st Street at 2911 at corner.
	3	7.05	13.7	38-32-07.7	121-25-34.2	67th Street & 19th Ave, at street sign.
203.5	1	3.06	11.1	38-33-58.5	121-28-39.8	Between 24th & 25th Streets @ first pole west of 25th.
	2	4.79	3.19	38-33-07.6	121-29-09.0	4th Ave & 22nd St. #2916.
	3	6.80	2.41	38-32-07.6	121-29-40.7	Sutterville Rd & 19th St. at park entrance.
286.5	1	2.41	31.8	38-35-52.7	121-29-24.7	714 N. 7th Street.
	2	4.57	17.9	38-36-13.4	121-30-50.3	1321 Garden Parkway in entrance to office bldg.
	3	8.72	11.4	38-36-54.0	121-33-34.0	On Garden Parkway at group of three mailboxes.
352.5	1	2.52	83.4	38-36-50.0	121-28-06.5	At deadend of Wilson Av, at gate to levee.
	2	5.19	48.1	38-38-16.3	121-28-14.3	Where Morrison deadends at Western Av, at RR tracks.
	3	7.26	18.7	38-39-21.5	121-28-35.7	In industrial park, at base of levee (705 W. Del Paso).

KIID, 1470 kHz.

Nighttime Reference Field Strength Measurements

Radial Deg. T	Point Num.	Distance (km)	Field (mV/m)	Coordinates (NAD 83) Lat. N	Long. W	Description
147.5	1	3.27	4.20	38-33-59.9	121-26-37.9	J Street & 48th Ave. at the large "Z".
	2	4.47	4.15	38-33-27.3	121-26-11.2	On Fulsom Blvd in lot of Conti Bros. west side at street.
	3	6.92	1.31	38-32-20.7	121-25-16.3	2839 71st Street at pale green pole.
250.0	1	2.60	137.0	38-35-01.8	121-29-31.2	G Street & 10th Ave. at NW corner.
	2	5.36	37.2	38-34-31.5	121-31-19.0	Drever & Soule streets at the street sign.
	3	8.03	23.1	38-34-05.3	121-33-04.4	At gate of Harbor Port where Harbor Blvd, in front of guard hut.
351.0	1	2.52	17.5	38-36-50.0	121-36-50.0	At deadend of Wilson Ave. at gate to levee.
	2	4.72	4.47	38-38-00.0	121-28-20.9	428 Patio at double mailbox.
	3	7.31	2.60	38-39-22.5	121-28-41.0	725W Del Paso (inside industrial park.

KIID - Direct Measurement of Power - Exhibit 9

Measurement of the Common Point Impedance for each pattern was made with a Hewlett-Packard 8753-C Vector Network Analyzer and a Tunwall Radio Directional Coupler. The analyzer was connected at the node directly adjacent to the common point current meter. The resistance value was adjusted with the common point matching network to provide the correct impedance at the authorized common point current value for each directional antenna pattern. The measured Common Point Impedance is R = 47.6 Ohms, X= -j 6.85 Ohms for Day and is R= 47.3 Ohms, X= -j 6.35 for Night operation. The common point currents of 10.65 Amperes for Daytime and 4.78 Amperes for Nighttime were established.

KIID - Antenna Monitor and Sample System - Exhibit 10

KIID utilizes a Potomac Instruments AM-1901-3 antenna monitor. The antenna monitor is provided an ATU output sample over equal length (see Exhibit 7) sample lines from Delta Electronics Toroidal Current Transformers, model TCT-1, that provides a 0.5 volt per ampere. The sample lines are Andrew FSJ2-50, 3/8 inch foam dielectric coaxial cable. The coaxial sample lines are connected directly to the TCTs and the antenna monitor.

The calibration of the PI-AM1901 was verified by comparing the tower current ratio and phase, at the carrier frequency, using a Hewlett-Packard 8753C network analyzer. The carrier reference signal, supplied by the analyzer was amplified and fed into the common point of the respective directional antenna. The network analyzer was calibrated using the internal calibration function at the time of measurement.

In the case of the daytime directional, Tower 1 (ref) sample line was connected to the analyzer "B" receiver port and Towers 2 and 3 sample lines were successively connected to the analyzer "A" receiver port.

For the nighttime directional case, Tower 1 (ref) sample line was connected to the analyzer "B" receiver port and Towers 2 and 3 sample lines were successively connected to the analyzer "A" receiver port.

The measurements of the antenna monitor ratio and phase were made immediately upon applying full authorized power to each directional mode after an adequate inactive period, so as to minimize the effects of system warming.

DAYTIME

Tower	Network	Analyzer	Antenna	Monitor
	Ratio	Phase	Ratio	Phase
1(C)	1.000	0.0	1.000	0.0
2(NE)	0.60312	-135.63	0.603	-135.7
3(SW)	0.60959	+172.24	0.610	+172.2

NIGHTTIME

Tower	Network	Analyzer	Antenna	Monitor
	Ratio	Phase	Ratio	Phase
1(C)	1.000	0.0	1.000	0.0
2(NE)	1.1621	+110.38	1.163	+110.1
3(SW)	1.2773	-61.38	1.278	-61.4

The network analyzer and the antenna monitor agreed within the Potomac Instruments rated antenna monitor accuracy of 0.010 ratio and 1.0 degree phase.

KIID - Radio Frequency Radiation Considerations - Exhibit 11

Operation of KIID will not result in exposure of the workers or the general public to levels of non-ionizing energy in excess of the limits specified in 47 CFR 1.1310. Access to the transmitter site is restricted by locked fences. Each tower base is enclosed within a locked perimeter fence spaced in accordance with Recommended Guidelines. Warning signs are posted on the entry gate and on all four sides of each tower base fence. The signs state that a potential exists for possible exposure to hazardous R.F. energy. In the case where personnel must enter the tower enclosure fences, operation is switched to non-directional operation at reduced power on Tower number 1(C) or operation is ceased, in accordance with the KIID RFR Plan.