JON

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

SNC
9/25/12

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO. BAML-20120921AEZ

SECTION I - APPLICANT FEE INFORMATION

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

Clear Channel Broadcasting Licenses, Inc.

MAILING ADDRESS (Line 1) (Maximum 35 characters)
2625 S MEMORIAL DRIVE

MAILING ADDRESS (Line 2) (Maximum 35 characters)
Suite A

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
Tulsa	OK	74129

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
918-664-4581	KAKC	11939

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
M O R	0 0 0 1	$ 730.00	

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
	0 0 0 1	$	

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

TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
$ 730.00	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Clear Channel Broadcasting Licenses, Inc.		
MAILING ADDRESS 2625 S MEMORIAL DRIVE, SUITE A		
CITY TULSA	STATE OK	ZIP CODE 74129

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
KAKC	TULSA, OK			

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.

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	
Stephen G. Davis		
Title	Date	Telephone Number
Senior Vice President Engineering	9/7/2012	918-664-4581

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION

FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT AND THE PAPERWORK REDUCTION ACT

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The Commission will use the information provided in this form to determine whether grant of the application is in the public interest. In reaching that determination, or for law enforcement purposes, it may become necessary to refer personal information contained in this form to another government agency. In addition, all information provided in this form will be available for public inspection. If information requested on the form is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Your response is required to obtain the requested authorization.

Public reporting burden for this collection of information is estimated to average 639 hours and 53 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, can be sent to the Federal Communications Commission, Records Management Branch, Paperwork Reduction Project (3060-0627), Washington, D. C. 20554. Do NOT send completed forms to this address.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
Clear Channel Broadcasting Licenses, Inc.

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☐ Station License ☑ Direct Measurement of Power

1. Facilities authorized in construction permit

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
				Night	Day
KAKC	NA	1300	unlimited	1.0	5.0

2. Station location

State	City or Town
Oklahoma	Tulsa

3. Transmitter location

State	County	City or Town	Street address (or other identification)
OK	Tulsa	Bixby	15002 S. 105th East Street

4. Main studio location

State	County	City or Town	Street address (or other identification)
OK	Tulsa	Tulsa	2625 S. Memorial Drive

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

State	County	City or Town	Street address (or other identification)
OK	Tulsa	Tulsa	2625 S. Memorial Drive

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

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

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

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
4.65	10.39
Measured antenna or common point resistance (in ohms) at operating frequency	**Measured antenna or common point reactance (in ohms) at operating frequency**
Night: 50 Day: 50	Night: -8 Day: -8

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 (ASRN 1020600)	-1.7	+61.2	0.540	0.549		
2 (ASRN1020601)	---	0.0	---	1.000		
3 (ASRN 1020602)	0.0	-74.4	1.000	0.446		
4 (ASRN 1020603)	-9.1	---	0.583	---		

Manufacturer and type of antenna monitor: Potomac Instruments AM1901 (FCC ID: IJ3PI1900)

SECTION III - Page 2

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

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
See Tower Exhibit	See Tower Exhibit	See Tower Exhibit	See Tower Exhibit	Exhibit No. NA

Excitation ☑ Series ☐ Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude	35 °	59 '	40 "	West Longitude	95 °	51 '	27 "

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. Tower Exhibit

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

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

NA

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

NA

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)
Samuel T. Cox, P.E.	Samuel T. Cox, P.E.
Address (include ZIP Code)	Date
2625 S. Memorial Drive Suite A Tulsa, OK 74129	9/26/2012
	Telephone No. (Include Area Code) 918-644-4581

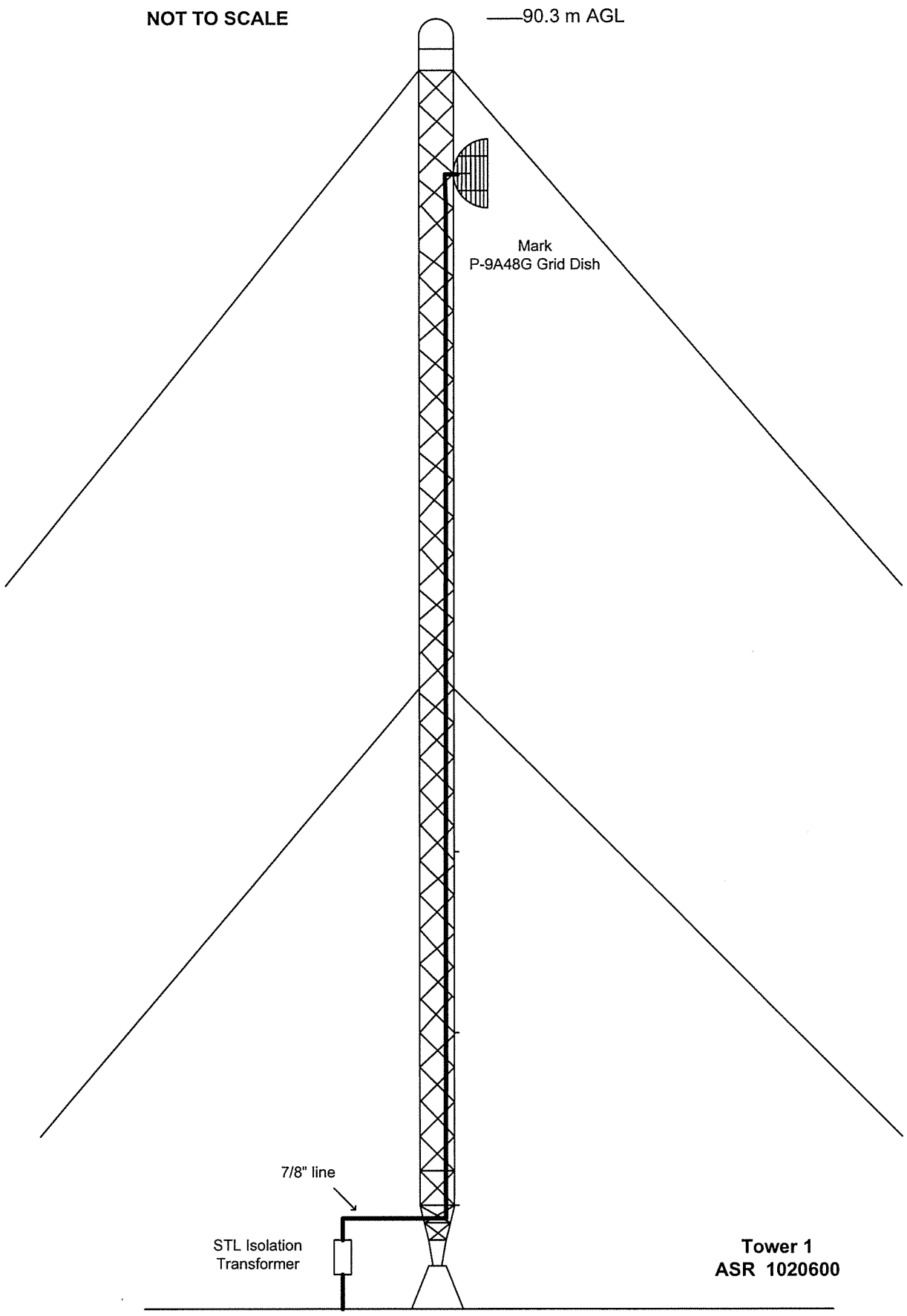
☑ Technical Director ☑ Registered Professional Engineer

☐ Chief Operator ☐ Technical Consultant

☐ Other (specify)

TOWER EXHIBIT

	T1	T2	T3	T4
Type Radiator	uniform cross section, guyed steel tower	uniform cross section, guyed steel tower	uniform cross section, guyed steel tower	uniform cross section, guyed steel tower
Overall height in meters of radiator above base insulator, or above base, if grounded	87.1m	87.1m	87.1m	87.1m
Overall height in meters above ground (without obstruction lighting)	89.1m	89.1m	89.1m	89.1m
Overall height in meters above ground (include obstruction lighting)	90.3m	90.5m	90.9m	90.8m



Sketch of Additional Antennas

ENGINEERING EXHIBIT

Application for Direct Power Measurement

KAKC (AM)

Tulsa, OK

Clear Channel Broadcasting Licenses, Inc.

FID 11939

1300 kHz

DA-2

Table of Contents

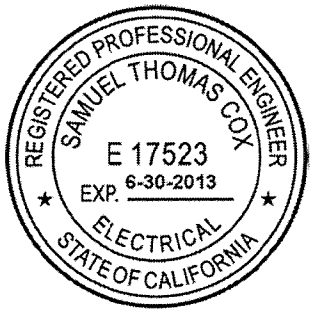
Engineering Statement

This application is being filed to relicense the existing daytime and nighttime operation of KAKC (AM) Tulsa, OK pursuant to the sections of 47 CFR 73.151 allowing performance verification by computer modeling and sampling system verification. No changes were made to the ground system or radiators and they remain as authorized in the current station license BL-19830705AK. All antenna system measurements included in this application were made August 20-21, 2012 by Mr. Erik W. Kuhlmann and the undersigned unless otherwise noted. Field measurements were conducted by Mr. Brett Gilbert from August 29-30, 2012.

Analysis of the daytime and nighttime antenna systems was performed using a combination of a method of moments model and a circuit model. The method of moments model was produced using the computer program Expert Mininec Broadcast Professional version 14.6 by EM Scientific Inc. The circuit model was produced using the nodal analysis program WCAP Pro version 1.1 by Westberg Consulting. The impedance of each radiator was measured at a point immediately across the base insulator with the other radiators shorted. Any shunting elements across the base of the radiator were disconnected. The method of moments models and the circuit models for each radiator were adjusted to produce the same matrix impedances as those measured.

Once the model was adjusted to match the measured matrix impedances, the array synthesis module of the computer program was used to calculate the proper base drive voltages to generate the fields necessary to form the required patterns for daytime and nighttime operation. The current distribution was calculated for each radiator and given that the sampling system utilizes loop sampling devices the operating parameters calculated from the resulting currents at the location on each radiator corresponding to the location of the sampling loops. The daytime and nighttime antenna systems each utilize only three of the four available radiators. The unused radiator was detuned for each pattern by terminating it with the appropriate reactance necessary to produce a current minima at 1/3 the height above the base.

Samuel T. Cox, P.E.
September 6, 2012



Description of Radiators

The KAKC (AM) radiators are identical triangular, uniform cross section, guyed towers 136.0 electrical degrees in height with a face width of 76.2 centimeters.

The tower numbering used in the last full proof of performance in 1982 placed tower 1 at the Eastern most position in the array with the subsequent numbers assigned sequentially toward the West. That convention will be used throughout this report. The tower numbering as it corresponds to the numbering used in the theoretical parameters in the CDBS is shown in the table below. To avoid confusion at the radio station, the antenna monitor retains the numbering used in the 1982 proof of performance and the operating parameters shown on FCC form 302 that accompanies this report reflect this numbering.

1982 Proof Tower #	CDBS Day	CDBS Night	ASRN	Face Width	Electrical Height
1	3	1	ASRN 1020600	76.2 cm	136°
2	2	NA	ASRN 1020601	76.2 cm	136°
3	1	2	ASRN 1020602	76.2 cm	136°
4	NA	3	ASRN 1020603	76.2 cm	136°

Description of Sampling System

The sampling system consists of equal lengths of solid outer jacket foam filled coaxial cable connected to a fixed unshielded sampling loop mounted 29.0 m above the base insulator. This location corresponds to 33.3% of the electrical height and the point on the tower where the current minima occurs when the radiator is properly detuned. The sampling lines are buried and exposed to similar environmental conditions. The antenna monitor is a Potomac Instruments AM1901 (FCC ID: IJ3PI1900) last calibrated by the manufacturer on 7/19/2012.

Matrix Impedance Measurements

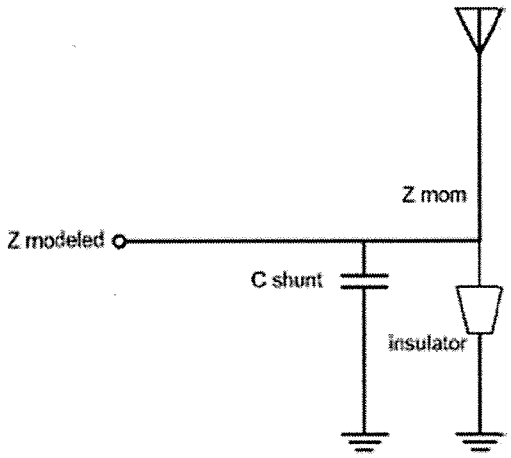
Tower 1 driven with all others shorted	630 – j18.6 Ω
Tower 2 driven with all others shorted	548 + j42.5 Ω
Tower 3 driven with all others shorted	599 – j27.6 Ω
Tower 4 driven with all others shorted	686 + j58.8 Ω

All measurements above made with a Hewlett Packard 8753E vector network analyzer and directional coupler in a calibrated measurement system.

Description of Model

The overall model of the antenna system consists of two components: the method of moments model and the circuit model. The method of moments model was adjusted by varying the electrical height and effective radius of the radiators to produce an impedance at the base node such that when combined with the circuit model produced an impedance within +/- 2Ω and +/- 4% of the measured matrix resistance and reactance at the measurement point. The modeled electrical heights used fall within the range of 75-125% of the physical height. The effective radii used fall within the range of 80-150% of the radius of a circle with a circumference equal to the sum of the widths of the tower sides.

The circuit model consists of a lumped shunt capacitive reactance combined with the calculated base impedance produced by the method of moments model. The general form of the circuit model is:



Comparison of Modeled and Measured Matrix Impedances

T	Z_{mom}	C_{shunt}	$Z_{modeled}$[1]	$Z_{measured}$
1	547.2+j212.1Ω	81.0 pF	**628.9-j18.1Ω**	**630-j18.6Ω**
2	467.4+j195.0Ω	76.0 pF	**545.6+j41.8Ω**	**548+j42.5Ω**
3	505.3+j224.9Ω	99.0 pF	**604.2-j26.9Ω**	**599-j27.6Ω**
4	597.2+j235.0Ω	54.5 pF	**684.6+j59.2Ω**	**686+j58.8Ω**

[1]Modeled impedance at measurement point. A mathematically insignificant length of transmission line was inserted into the circuit model at the measurement point to allow the program to calculate the impedance.

MoM Calculated Impedance Tower 1 Driven with Other Towers Shorted

```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCT1DAOSFINALX  09-06-2012   13:10:03

IMPEDANCE
   normalization = 50.
freq     resist   react    imped    phase    VSWR    S11      S12
(MHz)    (ohms)   (ohms)   (ohms)   (deg)            dB       dB
source =  1; node 1, sector 1
1.3      547.18   212.07   586.84   21.2     12.599  -1.3817  -5.6463
```

INPUT FILE

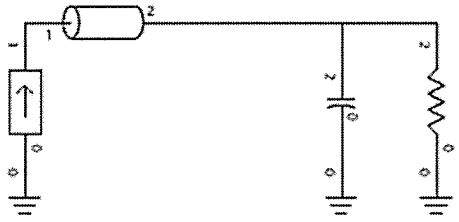
```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCT1DAOSFINALX  09-06-2012   13:19:21

KAKC

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

wire  caps Distance     Angle        Z            radius       segs
 1    none 0            0            0            .3636         21
           0            0            145.5
 2    none 123.5        256.         0            .3636         21
           123.5        256.         143.1
 3    none 247.         256.         0            .3636         21
           247.         256.         142.9
 4    none 523.4        253.         0            .3636         21
           523.4        253.         146.5

Number of wires          =  4
          current nodes  =  84

                         minimum                  maximum
Individual wires      wire    value            wire  value
segment length         3      6.80476           4    6.97619
radius                 1      .3636             1    .3636


ELECTRICAL DESCRIPTION
Frequencies (MHz)
     frequency                 no. of  segment length (wavelengths)
 no. lowest       step         steps   minimum        maximum
 1   1.3          0             1      .0189021       .0193783

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

WCAP - KAKC Tower 1 Base Model

Center Frequency: 1.3 MHz

Frequency Range: ±0 kHz

Frequency Step: 0 kHz




```
WCAP - KAKC T1 BASE MODEL


WCAP OUTPUT AT FREQUENCY: 1.300 MHz


NODE VOLTAGES
Node:   1    629.1507 ∠   -1.6510° V
Node:   2    629.1507 ∠   -1.6510° V


    WCAP PART                    CURRENT IN              CURRENT OUT
TL   1→2      50.00000000      1.00 ∠    -0.000° A      1.00 ∠    -0.001° A

    WCAP PART                    BRANCH VOLTAGE          BRANCH CURRENT
C    2→0       0.00008100    629.15 ∠    -1.651° V      0.42 ∠    88.349° A
R    2→0     547.20000000    629.15 ∠    -1.651° V      1.07 ∠   -22.838° A

    WCAP PART                    FROM IMPEDANCE          TO IMPEDANCE
C    2→0       0.00008100      0.00 - j   1511.443      0.00 + j      0.000
TL   1→2      50.00000000    628.89 - j     18.126    628.89 - j     18.126
R    2→0     547.20000000    547.20 + j    212.100      0.00 + j      0.000

    WCAP PART                  VSWR
TL   1→2      50.00000000   12.5883

WCAP INPUT DATA:
      1.3000       0.00000000   0
C       0.00008100   2   0
I       1.00000000   0   1      0.00000000
TL     50.00000000   1   2    100.00000000      0.00001000      0.00000000
R     547.20000000   2   0    212.10000000
```

MoM Calculated Impedance Tower 2 Driven with Other Towers Shorted

```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCT2DAOSFINALX  09-06-2012   13:26:17

IMPEDANCE
   normalization = 50.
freq     resist   react    imped    phase    VSWR    S11      S12
(MHz)    (ohms)   (ohms)   (ohms)   (deg)            dB       dB
source =  1; node 22, sector 1
1.3      467.43   195.04   506.49   22.6     10.992  -1.5848  -5.1465
```

INPUT FILE

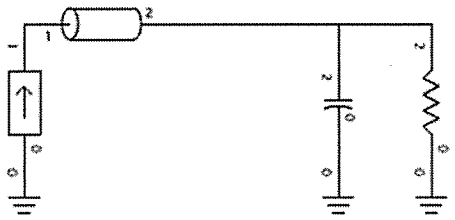
```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCT2DAOSFINALX  09-06-2012   13:31:20

KAKC

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

wire  caps Distance     Angle        Z            radius      segs
 1    none 0            0            0            .3636        21
           0            0            145.5
 2    none 123.5        256.         0            .3636        21
           123.5        256.         143.1
 3    none 247.         256.         0            .3636        21
           247.         256.         142.9
 4    none 523.4        253.         0            .3636        21
           523.4        253.         146.5

Number of wires          =  4
          current nodes  =  84

                         minimum                  maximum
Individual wires      wire    value            wire  value
segment length         3      6.80476           4    6.97619
radius                 1      .3636             1    .3636


ELECTRICAL DESCRIPTION
Frequencies (MHz)
     frequency                 no. of  segment length (wavelengths)
 no. lowest       step         steps   minimum        maximum
 1   1.3          0             1      .0189021       .0193783

Sources
source node    sector  magnitude      phase          type
 1      22      1       1.             0              voltage
```

WCAP - KAKC Tower 2 Base Model

Center Frequency: 1.3 MHz

Frequency Range: ±0 kHz

Frequency Step: 0 kHz



```
WCAP - KAKC T2 BASE MODEL


WCAP OUTPUT AT FREQUENCY: 1.300 MHz


NODE VOLTAGES
Node:   1     547.1537 ∠     4.3772° V
Node:   2     547.1537 ∠     4.3772° V

    WCAP PART                    CURRENT IN              CURRENT OUT
TL   1→2       50.00000000      1.00 ∠     0.000° A     1.00 ∠    -0.001° A

    WCAP PART                  BRANCH VOLTAGE          BRANCH CURRENT
C    2→0        0.00007600    547.15 ∠     4.377° V     0.34 ∠    94.377° A
R    2→0      467.40000000    547.15 ∠     4.377° V     1.08 ∠   -18.269° A

    WCAP PART                  FROM IMPEDANCE          TO IMPEDANCE
C    2→0        0.00007600      0.00 - j   1610.880     0.00 + j      0.000
TL   1→2       50.00000000    545.56 + j     41.760    545.56 + j     41.761
R    2→0      467.40000000    467.40 + j    195.000     0.00 + j      0.000

    WCAP PART                  VSWR
TL   1→2       50.00000000   10.9756

WCAP INPUT DATA:
      1.3000      0.00000000   0
C       0.00007600   2   0
I       1.00000000   0   1      0.00000000
TL     50.00000000   1   2    100.00000000      0.00001000      0.00000000
R     467.40000000   2   0    195.00000000
```

MoM Calculated Impedance Tower 3 Driven with Other Towers Shorted

C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC FINAL\KAKCT3DAOSFINALX 09-06-2012 13:37:18

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 43, sector 1							
1.3	**505.28**	**224.87**	553.06	24.	12.124	-1.4361	-5.5042

INPUT FILE

C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC FINAL\KAKCT3DAOSFINALX 09-06-2012 14:00:36

KAKC

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.3636	21
		0	0	145.5		
2	none	123.5	256.	0	.3636	21
		123.5	256.	143.1		
3	none	247.	256.	0	.3636	21
		247.	256.	142.9		
4	none	523.4	253.	0	.3636	21
		523.4	253.	146.5		

Number of wires = 4
current nodes = 84

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	6.80476	4	6.97619
radius	1	.3636	1	.3636

ELECTRICAL DESCRIPTION
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1.3	0	1	.0189021	.0193783

Sources

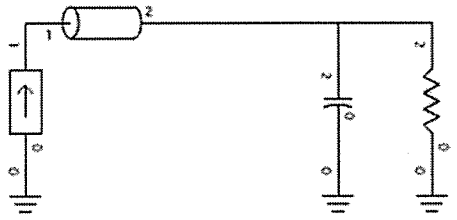
source	node	sector	magnitude	phase	type
1	43	1	1.	0	voltage

WCAP - KAKC Tower 3 Base Model

Center Frequency: 1.3 MHz

Frequency Range: ±0 kHz

Frequency Step: 0 kHz



WCAP - KAKC T3 BASE MODEL

WCAP OUTPUT AT FREQUENCY: 1.300 MHz

NODE VOLTAGES
Node: 1 604.8012 ∠ -2.5464° V
Node: 2 604.8012 ∠ -2.5464° V

	WCAP PART		CURRENT IN	CURRENT OUT
TL	1→2	50.00000000	1.00 ∠ -0.000° A	1.00 ∠ -0.001° A

	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT
C	2→0	0.00009900	604.80 ∠ -2.546° V	0.49 ∠ 87.454° A
R	2→0	505.30000000	604.80 ∠ -2.546° V	1.09 ∠ -26.539° A

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
C	2→0	0.00009900	-0.01 - j 1236.635	0.00 + j 0.000
TL	1→2	50.00000000	**604.20 - j 26.870**	604.20 - j 26.870
R	2→0	505.30000000	505.30 + j 224.900	0.00 + j 0.000

	WCAP PART		VSWR
TL	1→2	50.00000000	12.1081

WCAP INPUT DATA:

	1.3000	0.00000000	0			
C	**0.00009900**	2	0			
I	1.00000000	0	1	0.00000000		
TL	50.00000000	1	2	100.00000000	0.00001000	0.00000000
R	**505.30000000**	2	0	**224.90000000**		

MoM Calculated Impedance Tower 4 Driven with Other Towers Shorted

```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCT4DAOSFINALX  09-06-2012   14:37:10

IMPEDANCE
   normalization = 50.
freq     resist    react     imped     phase     VSWR     S11       S12
(MHz)    (ohms)    (ohms)    (ohms)    (deg)              dB        dB
source =  1; node 64, sector 1
1.3      597.2     234.96    641.76    21.5      13.804   -1.2607   -5.987
```

INPUT FILE

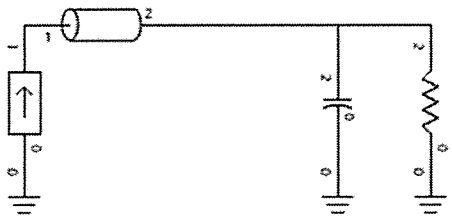
```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCT4DAOSFINALX  09-06-2012   14:45:34

KAKC

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

wire  caps Distance     Angle        Z            radius      segs
 1    none 0            0            0            .3636        21
           0            0            145.5
 2    none 123.5        256.         0            .3636        21
           123.5        256.         143.1
 3    none 247.         256.         0            .3636        21
           247.         256.         142.9
 4    none 523.4        253.         0            .3636        21
           523.4        253.         146.5

Number of wires          =  4
          current nodes  =  84

                         minimum                  maximum
Individual wires       wire    value             wire  value
segment length          3      6.80476            4    6.97619
radius                  1      .3636              1    .3636


ELECTRICAL DESCRIPTION
Frequencies (MHz)
     frequency                 no. of  segment length (wavelengths)
 no. lowest       step          steps   minimum        maximum
 1   1.3          0              1      .0189021       .0193783

Sources
source node    sector  magnitude      phase          type
 1      64      1       1.             0              voltage
```

WCAP - KAKC Tower 4 Base Model

Center Frequency: 1.3 MHz

Frequency Range: ±0 kHz

Frequency Step: 0 kHz



```
WCAP - KAKC T4 BASE MODEL

WCAP OUTPUT AT FREQUENCY: 1.300 MHz

NODE VOLTAGES
Node:   1    687.1084 ∠    4.9429° V
Node:   2    687.1084 ∠    4.9429° V

    WCAP PART                    CURRENT IN              CURRENT OUT
TL   1→2       50.00000000      1.00 ∠     0.001° A      1.00 ∠    -0.001° A

    WCAP PART                  BRANCH VOLTAGE          BRANCH CURRENT
C    2→0        0.00005450    687.11 ∠     4.943° V      0.31 ∠    94.943° A
R    2→0      597.20000000    687.11 ∠     4.943° V      1.07 ∠   -16.537° A

    WCAP PART                  FROM IMPEDANCE          TO IMPEDANCE
C    2→0        0.00005450      0.00 - j   2246.365      0.00 + j      0.000
TL   1→2       50.00000000    684.55 + j     59.203    684.55 + j     59.204
R    2→0      597.20000000    597.20 + j    235.000      0.00 + j      0.000

    WCAP PART                   VSWR
TL   1→2       50.00000000   13.7940

WCAP INPUT DATA:
      1.3000       0.00000000   0
C       0.00005450   2   0
I       1.00000000   0   1      0.00000000
TL     50.00000000   1   2    100.00000000       0.00001000       0.00000000
R     597.20000000   2   0    235.00000000
```

MoM Calculated Base Drive Voltages and Currents for Day Pattern

NOTE: The order of the towers in the model and thus the node numbers at the base of each tower have been modified for analysis of the daytime operation to place the unused, detuned towers first in the geometry point list. Expert Mininec Broadcast Professional v 14.6 produces anomalous results when unused radiators are placed after driven radiators in the model geometry.

```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC FINAL\KAKCDAYFINALX
09-06-2012   14:51:18

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS
Frequency =  1.3 MHz

       field ratio
tower  magnitude    phase (deg)
 1     .558         61.3
 2     1.           0
 3     .443         -74.6
VOLTAGES AND CURRENTS - rms
source voltage                    current
node   magnitude    phase (deg)  magnitude    phase (deg)
 22    585.086      135.6        1.48975      83.4
 43    1,283.13     67.3         2.67964      40.9
 64    739.167      333.5        1.95051      349.6
Sum of square of source currents = 26.4086
Total power = 5,000. Watts
```

INPUT FILE

```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC FINAL\KAKCDAYFINALX
09-06-2012   14:52:49

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

wire  caps Distance     Angle        Z            radius      segs
 1    none 523.4        253.         0            .3636        21
           523.4        253.         146.5
 2    none 0            0            0            .3636        21
           0            0            145.5
 3    none 123.5        256.         0            .3636        21
           123.5        256.         143.1
 4    none 247.         256.         0            .3636        21
           247.         256.         142.9

Number of wires          =  4
          current nodes  =  84

                          minimum                  maximum
Individual wires      wire    value              wire  value
segment length         4      6.80476             1    6.97619
radius                 1      .3636               1    .3636

ELECTRICAL DESCRIPTION
Frequencies (MHz)
     frequency                 no. of  segment length (wavelengths)
 no. lowest       step          steps   minimum        maximum
 1   1.3          0              1      .0189021       .0193783

Sources                peak
source node    sector  magnitude      phase          type
 1      22      1       827.436        135.6          voltage
 2      43      1       1,814.62       67.3           voltage
 3      64      1       1,045.34       333.5          voltage
Lumped loads
             resistance    reactance     inductance  capacitance passive
load  node   (ohms)        (ohms)        (mH)        (uF)        circuit
 1     1     0             261.1         0           0            0
```

MoM Calculated Current Distribution for Day Pattern

C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC FINAL\KAKCDAYFINALX
09-06-2012 14:54:21

CURRENT rms
Frequency = 1.3 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	-153.027	500.53	0	.672535	123.5	-.371418	.560671
2	-153.027	500.53	6.97619	.51412	123.6	-.284201	.428427
3	-153.027	500.53	13.9524	.410759	123.7	-.227918	.341726
4	-153.027	500.53	20.9286	.318816	124.	-.178442	.264201
5	-153.027	500.53	27.9048	.234595	124.7	-.133676	.192784
6	-153.027	500.53	34.881	.156951	126.3	-.0928948	.126508
7	-153.027	500.53	41.8571	.0859609	130.6	-.0559281	.0652788
8	-153.027	500.53	48.8333	.0246521	157.7	-.0228123	9.34E-03
9	-153.027	500.53	55.8095	.0413865	278.8	6.34E-03	-.0408984
10	-153.027	500.53	62.7857	.0906103	290.3	.0313867	-.0850006
11	-153.027	500.53	69.7619	.133172	293.1	.0522133	-.12251
12	-153.027	500.53	76.7381	.167728	294.2	.0687258	-.153002
13	-153.027	500.53	83.7143	.193781	294.7	.0808732	-.176099
14	-153.027	500.53	90.6905	.211008	294.8	.08865	-.191482
15	-153.027	500.53	97.6667	.219188	294.8	.0921	-.198899
16	-153.027	500.53	104.643	.218184	294.7	.0913129	-.198158
17	-153.027	500.53	111.619	.207927	294.6	.0864191	-.189117
18	-153.027	500.53	118.595	.188375	294.3	.0775732	-.171661
19	-153.027	500.53	125.571	.159451	294.	.0649322	-.145632
20	-153.027	500.53	132.548	.120845	293.7	.048575	-.110653
21	-153.027	500.53	139.524	.0715649	293.3	.0283358	-.0657162
END	-153.027	500.53	146.5	0	0	0	0
GND	0	0	0	1.48975	83.4	.170899	1.47991
23	0	0	6.92857	1.91996	73.9	.531984	1.84479
24	0	0	13.8571	2.19003	69.9	.751655	2.057
25	0	0	20.7857	2.40845	67.2	.93191	2.22085
26	0	0	27.7143	2.58332	65.2	1.08188	2.34586
27	0	0	34.6429	2.71763	63.7	1.20507	2.43584
28	0	0	41.5714	2.81231	62.4	1.30272	2.49239
29	**0**	**0**	**48.5**	**2.86768**	**61.3**	**1.37532**	**2.51636**
30	0	0	55.4286	2.88399	60.4	1.42309	2.50843
31	0	0	62.3571	2.86165	59.6	1.44621	2.46932
32	0	0	69.2857	2.80134	58.9	1.44498	2.39991
33	0	0	76.2143	2.70406	58.3	1.41984	2.30131
34	0	0	83.1429	2.57114	57.8	1.3714	2.17486
35	0	0	90.0714	2.40424	57.3	1.3005	2.02214
36	0	0	97.	2.2053	56.8	1.20811	1.84494
37	0	0	103.929	1.9765	56.3	1.09538	1.6452
38	0	0	110.857	1.72011	55.9	.963518	1.42493
39	0	0	117.786	1.43833	55.5	.813717	1.18602
40	0	0	124.714	1.13283	55.2	.64688	.929973
41	0	0	131.643	.803785	54.8	.463054	.657002
42	0	0	138.571	.447406	54.5	.259962	.364131
END	0	0	145.5	0	0	0	0
GND	-29.8773	119.832	0	2.67965	40.9	2.02559	1.75428
44	-29.8773	119.832	6.81429	3.3258	23.3	3.05506	1.31435
45	-29.8773	119.832	13.6286	3.80927	15.7	3.6667	1.0324
46	-29.8773	119.832	20.4429	4.22903	10.7	4.15551	.785115
47	-29.8773	119.832	27.2571	4.5826	7.	4.54803	.561829
48	-29.8773	119.832	34.0714	4.86801	4.2	4.85478	.358759
49	-29.8773	119.832	40.8857	5.08295	2.	5.07994	.174955
50	**-29.8773**	**119.832**	**47.7**	**5.2255**	**.1**	**5.22549**	**.010548**
51	-29.8773	119.832	54.5143	5.2944	358.6	5.2927	-.1339
52	-29.8773	119.832	61.3286	5.28914	357.2	5.28286	-.257692
53	-29.8773	119.832	68.1429	5.21002	356.	5.19755	-.360159
54	-29.8773	119.832	74.9572	5.05813	355.	5.03889	-.44074
55	-29.8773	119.832	81.7714	4.83536	354.1	4.80954	-.499043
56	-29.8773	119.832	88.5857	4.54429	353.2	4.51271	-.534863
57	-29.8773	119.832	95.4	4.18817	352.5	4.15214	-.548196

MoM Calculated Current Distribution for Day Pattern(cont.)

58	-29.8773	119.832	102.214	3.77074	351.8	3.73199	-.539225
59	-29.8773	119.832	109.029	3.296	351.1	3.25657	-.508285
60	-29.8773	119.832	115.843	2.76782	350.5	2.73003	-.455785
61	-29.8773	119.832	122.657	2.18913	349.9	2.15554	-.382037
62	-29.8773	119.832	129.471	1.55989	349.4	1.53329	-.286818
63	-29.8773	119.832	136.286	.87235	348.9	.855953	-.16834
END	-29.8773	119.832	143.1	0	0	0	0
GND	-59.7547	239.663	0	1.95051	349.6	1.9183	-.353027
65	-59.7547	239.663	6.80476	1.87072	330.2	1.62308	-.930157
66	-59.7547	239.663	13.6095	1.91605	318.2	1.42746	-1.27812
67	-59.7547	239.663	20.4143	2.00011	308.7	1.24951	-1.56178
68	-59.7547	239.663	27.2191	2.09682	301.1	1.08235	-1.79588
69	-59.7547	239.663	34.0238	2.19052	294.9	.923729	-1.98623
70	-59.7547	239.663	40.8286	2.27079	289.9	.773342	-2.13505
71	**-59.7547**	**239.663**	**47.6333**	**2.33055**	**285.7**	**.631674**	**-2.24331**
72	-59.7547	239.663	54.4381	2.36492	282.2	.499544	-2.31155
73	-59.7547	239.663	61.2429	2.37062	279.2	.377896	-2.3403
74	-59.7547	239.663	68.0476	2.34555	276.6	.267688	-2.33023
75	-59.7547	239.663	74.8524	2.28858	274.3	.169822	-2.28227
76	-59.7547	239.663	81.6571	2.19927	272.2	.0851003	-2.19762
77	-59.7547	239.663	88.4619	2.07788	270.4	.0142014	-2.07783
78	-59.7547	239.663	95.2667	1.92513	268.7	-.0423417	-1.92467
79	-59.7547	239.663	102.071	1.7422	267.2	-.0841394	-1.74017
80	-59.7547	239.663	108.876	1.53049	265.8	-.110937	-1.52647
81	-59.7547	239.663	115.681	1.29147	264.6	-.122579	-1.28564
82	-59.7547	239.663	122.486	1.02626	263.3	-.118939	-1.01934
83	-59.7547	239.663	129.291	.734609	262.2	-.0997098	-.727811
84	-59.7547	239.663	136.095	.412689	261.1	-.0639416	-.407706
END	-59.7547	239.663	142.9	0	0	0	0

MoM Calculated Current Moments for Day Pattern

C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC FINAL\KAKCDAYFINALX
09-06-2012 14:56:53

CURRENT MOMENTS(amp-degrees) rms

Frequency = 1.3 MHz
Input power = 5,000. watts

			vertical current moment	
wire	magnitude	phase (deg)	magnitude	phase (deg)
1	2.46615	201.1	2.46615	201.1
2	276.089	61.3	276.089	61.3
3	494.782	0.0	494.782	0.0
4	219.188	285.4	219.188	285.4

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	276.089	61.3
2	494.782	0.0
3	219.188	285.4

Normalized to Tower 2

tower	magnitude	phase (deg)
1	0.558	+61.3
2	1.000	0.0
3	0.443	-74.6

MoM Calculated Base Drive Voltages and Currents for Night Pattern

NOTE: The order of the towers in the model and thus the node numbers at the base of each tower have been modified for analysis of the nighttime operation to place the unused, detuned towers first in the geometry point list. Expert Mininec Broadcast Professional v 14.6 produces anomalous results when unused radiators are placed after driven radiators in the model geometry.

```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCNITEFINALX 09-06-2012   15:03:16

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS
Frequency =  1.3 MHz

       field ratio
tower  magnitude    phase (deg)
 1     .549         -1.5
 2     1.           0
 3     .597         -9.
VOLTAGES AND CURRENTS - rms
source voltage                    current
node   magnitude    phase (deg)  magnitude    phase (deg)
 22    408.591      81.          .668099      14.1
 43    845.034      77.6         1.16503      33.3
 64    490.146      71.2         .602352      20.9
Sum of square of source currents = 4.33296
Total power = 1,000. Watts
```

INPUT FILE

```
C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC
FINAL\KAKCNITEFINALX  09-06-2012   15:04:15

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

wire  caps Distance     Angle        Z            radius      segs
 1    none 123.5        256.         0            .3636        21
           123.5        256.         143.1
 2    none 0            0            0            .3636        21
           0            0            145.5
 3    none 247.         256.         0            .3636        21
           247.         256.         142.9
 4    none 523.4        253.         0            .3636        21
           523.4        253.         146.5

Number of wires          =  4
          current nodes  =  84

                          minimum                  maximum
Individual wires      wire    value              wire  value
segment length         3      6.80476             4    6.97619
radius                 1      .3636               1    .3636

ELECTRICAL DESCRIPTION
Frequencies (MHz)
     frequency                 no. of  segment length (wavelengths)
 no. lowest       step          steps   minimum        maximum
 1   1.3          0              1      .0189021       .0193783

Sources                peak
source node    sector  magnitude      phase          type
 1      22      1       577.835        81.            voltage
 2      43      1       1,195.06       77.6           voltage
 3      64      1       693.171        71.2           voltage
Lumped loads
             resistance    reactance     inductance  capacitance passive
load  node   (ohms)        (ohms)        (mH)        (uF)        circuit
 1     1     0             279.3         0           0            0
```

MoM Calculated Current Distribution for Night Pattern

C:\Users\ccrsdi1stc\Documents\Expert MININEC Broadcast Professional\Work\KAKC FINAL\KAKCNITEFINALX 09-06-2012 15:06:04

CURRENT rms
Frequency = 1.3 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	-29.8773	119.832	0	.845136	35.1	.691675	.485633
2	-29.8773	119.832	6.81429	.635519	35.1	.519972	.365395
3	-29.8773	119.832	13.6286	.500735	35.2	.409223	.28857
4	-29.8773	119.832	20.4429	.382107	35.4	.311421	.22141
5	-29.8773	119.832	27.2571	.27461	35.9	.22248	.160977
6	-29.8773	119.832	34.0714	.176537	37.	.141015	.106207
7	-29.8773	119.832	40.8857	.0876608	40.4	.0667652	.0568051
8	-29.8773	119.832	47.7	.012764	90.5	-1.01E-04	.0127636
9	-29.8773	119.832	54.5143	.0646165	203.5	-.0592383	-.0258093
10	-29.8773	119.832	61.3286	.124933	208.1	-.110246	-.0587726
11	-29.8773	119.832	68.1429	.175282	209.4	-.152737	-.0859941
12	-29.8773	119.832	74.9572	.215094	209.9	-.186378	-.107373
13	-29.8773	119.832	81.7714	.244078	210.2	-.210905	-.122853
14	-29.8773	119.832	88.5857	.26207	210.4	-.226148	-.132431
15	-29.8773	119.832	95.4	.26902	210.4	-.232022	-.136153
16	-29.8773	119.832	102.214	.26498	210.4	-.228533	-.134116
17	-29.8773	119.832	109.029	.250086	210.4	-.215757	-.126459
18	-29.8773	119.832	115.843	.224512	210.3	-.193805	-.113338
19	-29.8773	119.832	122.657	.188391	210.2	-.162749	-.0948895
20	-29.8773	119.832	129.471	.141588	210.2	-.122431	-.0711187
21	-29.8773	119.832	136.286	.0831942	210.	-.0720181	-.0416494
END	-29.8773	119.832	143.1	0	0	0	0
GND	0	0	0	.6681	14.1	.64806	.162404
23	0	0	6.92857	1.00837	6.	1.00281	.105768
24	0	0	13.8571	1.21735	3.3	1.21533	.0700968
25	0	0	20.7857	1.38678	1.6	1.38622	.0395467
26	0	0	27.7143	1.52459	.5	1.52454	.0127125
27	0	0	34.6429	1.6338	359.6	1.63376	-.0109283
28	0	0	41.5714	1.7155	358.9	1.71521	-.0315457
29	**0**	**0**	**48.5**	**1.77011**	**358.4**	**1.76943**	**-.0491819**
30	0	0	55.4286	1.79787	358.	1.79674	-.063834
31	0	0	62.3571	1.79906	357.6	1.79748	-.0754914
32	0	0	69.2857	1.77408	357.3	1.77209	-.0841549
33	0	0	76.2143	1.72354	357.	1.7212	-.089845
34	0	0	83.1429	1.64825	356.8	1.64564	-.092609
35	0	0	90.0714	1.54924	356.6	1.54647	-.0925221
36	0	0	97.	1.42775	356.4	1.42493	-.0896866
37	0	0	103.929	1.28515	356.2	1.28239	-.0842284
38	0	0	110.857	1.12293	356.1	1.12033	-.0762933
39	0	0	117.786	.942485	356.	.940169	-.0660347
40	0	0	124.714	.744923	355.9	.742992	-.0535915
41	0	0	131.643	.530331	355.8	.528892	-.0390346
42	0	0	138.571	.296168	355.7	.295332	-.0222393
END	0	0	145.5	0	0	0	0
GND	-59.7547	239.663	0	1.16503	33.3	.973261	.640359
44	-59.7547	239.663	6.80476	1.75903	15.8	1.69235	.47972
45	-59.7547	239.663	13.6095	2.1566	10.1	2.12342	.376819
46	-59.7547	239.663	20.4143	2.48867	6.6	2.47212	.286585
47	-59.7547	239.663	27.2191	2.76445	4.3	2.75683	.205122
48	-59.7547	239.663	34.0238	2.98764	2.5	2.98477	.131042
49	-59.7547	239.663	40.8286	3.15928	1.2	3.15863	.0639935
50	**-59.7547**	**239.663**	**47.6333**	**3.27957**	**.1**	**3.27957**	**4.02E-03**
51	-59.7547	239.663	54.4381	3.34855	359.2	3.3482	-.0486842
52	-59.7547	239.663	61.2429	3.36642	358.4	3.36511	-.0938613
53	-59.7547	239.663	68.0476	3.33369	357.7	3.33111	-.131272
54	-59.7547	239.663	74.8524	3.25126	357.2	3.24729	-.160714
55	-59.7547	239.663	81.6571	3.12047	356.7	3.11515	-.182042
56	-59.7547	239.663	88.4619	2.94304	356.2	2.93656	-.195179

MoM Calculated Base Drive Voltages and Currents for Night Pattern (cont.)

57	-59.7547	239.663	95.2667	2.72114	355.8	2.71377	-.200121
58	-59.7547	239.663	102.071	2.45717	355.4	2.44926	-.196927
59	-59.7547	239.663	108.876	2.15373	355.1	2.14571	-.185712
60	-59.7547	239.663	115.681	1.81331	354.7	1.80564	-.166613
61	-59.7547	239.663	122.486	1.43779	354.4	1.43098	-.139733
62	-59.7547	239.663	129.291	1.02701	354.1	1.02164	-.104973
63	-59.7547	239.663	136.095	.575774	353.9	.572464	-.0616576
END	-59.7547	239.663	142.9	0	0	0	0
GND	-153.027	500.53	0	.602352	20.9	.56286	.214516
65	-153.027	500.53	6.97619	.97574	4.3	.972943	.0738212
66	-153.027	500.53	13.9524	1.22058	359.3	1.2205	-.0142493
67	-153.027	500.53	20.9286	1.42399	356.4	1.42121	-.0889731
68	-153.027	500.53	27.9048	1.59289	354.5	1.58545	-.153808
69	-153.027	500.53	34.881	1.72997	353.	1.71717	-.210006
70	-153.027	500.53	41.8571	1.83603	351.9	1.81782	-.257936
71	**-153.027**	**500.53**	**48.8333**	**1.91126**	**351.**	**1.88794**	**-.297644**
72	-153.027	500.53	55.8095	1.95571	350.3	1.92783	-.329065
73	-153.027	500.53	62.7857	1.96949	349.7	1.93776	-.352114
74	-153.027	500.53	69.7619	1.95291	349.2	1.91817	-.366738
75	-153.027	500.53	76.7381	1.90652	348.7	1.86969	-.372942
76	-153.027	500.53	83.7143	1.83113	348.3	1.79319	-.370799
77	-153.027	500.53	90.6905	1.72782	348.	1.6898	-.360459
78	-153.027	500.53	97.6667	1.59789	347.6	1.56083	-.342147
79	-153.027	500.53	104.643	1.44288	347.3	1.40781	-.316152
80	-153.027	500.53	111.619	1.2644	347.1	1.23237	-.282809
81	-153.027	500.53	118.595	1.06405	346.8	1.03605	-.242463
82	-153.027	500.53	125.571	.843058	346.6	.820102	-.195393
83	-153.027	500.53	132.548	.601532	346.4	.584624	-.141614
84	-153.027	500.53	139.524	.336586	346.2	.326838	-.0804192
END	-153.027	500.53	146.5	0	0	0	0

MoM Calculated Current Moments for Night Pattern

```
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FINAL\KAKCNITEFINALX  09-06-2012   15:08:04

CURRENT MOMENTS(amp-degrees) rms

Frequency =  1.3 MHz
Input power = 1,000. watts
                                  vertical current moment
wire   magnitude     phase (deg)  magnitude     phase (deg)
 1     1.58665       127.5        1.58665       127.5
 2     170.702       358.5        170.702       358.5
 3     310.931       360.         310.931       360.
 4     185.626       351.         185.626       351.

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     170.702       358.5
 2     310.931       360.
 3     185.626       351.
```

Normalized to Tower 3

```
tower  magnitude     phase (deg)
 1     0.549         -1.5
 3     1.000         0.0
 4     0.597         -9.0
```

Calculated Operating Parameters from Modeled Loop Currents

	Loop Current	Loop Current θ	Ratio	Phase
Day				
Tower 1	2.86768 A	+61.3°	0.549	+61.2°
Tower 2	5.22550 A	+0.1°	1.000	0.0°
Tower 3	2.33055 A	+285.7°	0.446	-74.4°
Tower 4	-	-	-	-
Night				
Tower 1	1.77011 A	+358.4°	0.540	-1.7°
Tower 2	-	-	-	-
Tower 3	3.27957 A	+0.1°	1.000	0.0°
Tower 4	1.91126 A	+351.0°	0.583	-9.1°

Measured and Calculated Sampling Line Characteristics

Measured open circuit resonant frequency at odd multiple of ¼ wavelength nearest to carrier frequency:

Tower 1	1118.69 kHz	7/4λ (630°)
Tower 2	1118.91 kHz	7/4λ (630°)
Tower 3	1120.00 kHz	7/4λ (630°)
Tower 4	1119.16 kHz	7/4λ (630°)

Measured impedance 1/8 wavelength above and below open circuit resonant frequency:

Tower 1	1038.78 kHz	14.15 – j47.62 Ω	-1/8 λ
	1198.60 kHz	17.09 + j47.81 Ω	+1/8 λ
Tower 2	1038.99 kHz	14.26 – j48.43 Ω	-1/8 λ
	1198.83 kHz	16.93 + j47.82 Ω	+1/8 λ
Tower 3	1040.00 kHz	14.15 – j47.71 Ω	-1/8 λ
	1200.00 kHz	16.62 + j47.44 Ω	+1/8 λ
Tower 4	1039.22 kHz	14.20 – j47.90 Ω	-1/8 λ
	1199.10 kHz	16.73 + j47.63 Ω	+1/8 λ

Calculated characteristic impedance using the formula $Z_o = ((R_1^2 + X_1^2)^{1/2} * (R_2^2 + X_2^2)^{1/2})^{1/2}$:

Tower 1	50.22 Ω
Tower 2	50.61 Ω
Tower 3	50.02 Ω
Tower 4	50.22 Ω

Calculated electrical length at $f_{carrier}$:

Tower 1	$L = (f_{carrier} / f_{resonant})*630° = (1300 \text{ kHz} / 1118.69 \text{ kHz})*630° = 732.11°$
Tower 2	$L = (f_{carrier} / f_{resonant})*630° = (1300 \text{ kHz} / 1118.91 \text{ kHz})*630° = 731.96°$
Tower 3	$L = (f_{carrier} / f_{resonant})*630° = (1300 \text{ kHz} / 1120.00 \text{ kHz})*630° = 731.25°$
Tower 4	$L = (f_{carrier} / f_{resonant})*630° = (1300 \text{ kHz} / 1119.16 \text{ kHz})*630° = 731.80°$

Measured and Calculated Sampling Line Characteristics (cont.)

Measured impedance at $f_{carrier}$ at the input of the sampling line with the sampling device connected:

Tower 1 $10.9 - j23.3\ \Omega$

Tower 2 $10.4 - j22.5\ \Omega$

Tower 3 $10.4 - j22.4\ \Omega$

Tower 4 $10.4 - j22.2\ \Omega$

All measurements above made with a Hewlett Packard 8753E vector network analyzer and directional coupler in a calibrated measurement system.

Environmental Statement

The KAKC (AM) radiators are surrounded by a secured fence restricting access by unauthorized personnel. Based on the charts and graphs supplied in Supplement A, Edition 97-01 to OET Bulletin 65, Edition 97-01 the applicant certifies that the distance to the fences from the radiators complies with FCC OET65 regarding human exposure to non-ionizing electromagnetic radiation.

Reference Point Measurements

The applicant respectfully requests a waiver of provisions of 47 CFR 73.151 requiring that reference field strength measurement locations be established in all directions of pattern minima and maxima. The KAKC (AM) nighttime pattern is quite complex and the resulting field work required to be repeated every two years is particularly onerous in this case. For the nighttime pattern, the applicant proposes measurements on the two major lobes and on each minima specified in the current license as a monitored radial. This results in four measured radials in the day pattern and six measured radials in the nighttime pattern. Those measurements are attached to this report.

Questions concerning this exhibit should be directed to:
Tom Cox, P.E.
760-743-2937 office
619-606-8760 cell
tomcox@clearchannel.com

NIGHT FIELD MEASUREMENTS							
Azimuth	**Description**	**Distance (km)**	**Latitude (NAD27)**	**Longitude (NAD27)**	**Date**	**Time**	**Field (mV/m)**
14.5°T							
1	Driveway of 4504 Vandalia	4.41	36-1-58.11	95-50-42.78	8/30/2012	14:30	15.5
2	St. Patrick's Episcopal church - Far NE corner of lot at concrete 'V' divider in corner of lot	6.12	36-2-52.00	95-50-26.40	8/30/2012	14:20	9
3	Garden of Last Supper entrance at Floral Haven cemetary (old MP)	7.94	36-3-49.03	95-50-8.07	8/30/2012	14:10	8
37.5°T							
1	Mailbox of 3504 W. Gary	3.77	36-1-16.79	95-49-54.77	8/30/2012	14:40	26
2	Mailbox of 2506 S. Gardenia Pl.	4.71	36-1-40.87	95-49-32.28	8/30/2012	14:50	17
3	SE Sidewalk corner of Toledo Ct & Dogwood Pl	5.51	36-2-1.68	95-49-13.20	8/30/2012	14:57	15.5
113°T							
1	.1mi S. of E 121st on S 129th E Ave - Entrance to cemetary on S. Side of curve in road	2.41	35-59-9.42	95-49-58.37	8/30/2012	15:10	22.5
2	Across St. from Mailbox of 7411 S. Sycamore Pl	4.44	35-58-43.53	95-48-43.90	8/30/2012	15:25	8
3	SE Corner of S. Park and W. Imperial	5.56	35-58-29.40	95-48-2.50	8/30/2012	15:32	6.5
129°T							
1	NW Corner of S 129th E. Ave and E 127th St. W. corner of brick entrance	2.83	35-58-42.15	95-49-59.48	8/30/2012	15:58	8
2	NE Corner of S. Hemlock & W. Littlerock	3.88	35-58-20.30	95-49-27.0	8/30/2012	15:40	6.5
3	SW corner of intersection of loop that goes around baseball fields (Same corner as concessions stand)	5.26	35-57-53.15	95-48-43.29	8/30/2012	15:50	5.5
163.5°T							
1	Street sign at E 132nd Pl. S. & E. 85th St	2.61	35-58-18.70	95-50-57.40	8/30/2012	16:12	195
2	Approx .3 mi E. of Garnett, approx 100 yds past last electric pole, no sig markers due to fields	4.08	35-57-33.20	95-50-40.65	8/30/2012	16:20	110
3	Approx .3 mi W. of S 129th E. Ave at T in power lines heading north and disconnected service pole on S. Side of road away from lines	5.77	35-56-40.98	95-50-20.75	8/30/2012	16:28	75
342°T							
1	Street light at Island in intersection of Sequoia & Phoenix Ct	2.49	36-0-56.59	95-51-57.27	8/30/2012	16:50	230
2	Street sign, NE Corner of S 96th E. Ave and E. 97th St	3.29	36-1-21.39	95-52-7.86	8/30/2012	16:57	165
3	Mailbox of 9017 S. 92nd E. Place	4.56	36-2-0.50	95-52-23.19	8/30/2012	17:05	115

KAKC (AM) Reference Points

Engineer:	FIM Make/Model:	FIM S/N:	FIM Cal Date:
Brett Gilbert	FIM-41	1948	8/7/2012

DAY FIELD MEASUREMENTS

Azimuth	Description	Distance (km)	Latitude (NAD27)	Longitude (NAD27)	Date	Time	Field (mV/m)
76°T							
1	N. of Tpke on ramp, W. side of road in front of East/West on-ramp signs	2.28	35-59-58.61	95-49-58.42	8/29/2012	14:40	12.5
2	Mailbox of 4800 S. Chestnut	3.68	36-0-8.8	95-49-3.9	8/29/2012	14:46	12.5
3	SE corner of intsct of Oak & Charleston	4.55	36-0-15.37	95-48-30	8/29/2012	14:51	9.2
199°T							
1	Tucson, 2 blocks E. of Mingo, N.W. corner of creek bridge	2.43	35-58-25.70	95-51-58.53	8/29/2012	15:05	380
2	S. Mingo, W. side across from abandonded farmhouse in gravel driveway to field	3.04	35-58-7.04	95-52-6.66	8/29/2012	15:10	205
3	Mailbox of 9400 E 140th St. S.	3.93	35-57-39.8	95-52-18.61	8/29/2012	15:15	220
256°T							
1	Mailbox of 11920 S. 86th E. Ave	2.06	35-59-23.95	95-52-46.83	8/29/2012	15:40	400
2	Bank of Okla pkng lot next to fire hydrant	2.76	35-59-18.65	95-53-14.22	8/29/2012	15:45	265
3	SE corner of lift station fence on S. Sheridan rd	4.43	35-59-5.75	95-54-15.09	8/29/2012	15:55	150
313°T							
1	10629 S. 91st Ave mailbox	2.26	36-0-29.81	95-52-32.98	8/29/2012	16:15	420
2	Starworld theatre, SW corner of north prking lot in corner	3.17	36-0-49.7	95-52-59.97	8/29/2012	16:25	260
3	N. dead-end of S. 74th E. Ave between trees on E. side of rd	4.45	36-1-18.38	95-53-37.30	8/29/2012	16:35	185