



COPY

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September 28, 2009

Marnie K. Sarver  
202.719.4289  
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**BY HAND VIA COURIER**

Marlene H. Dortch, Secretary  
Federal Communications Commission  
The Portals  
445 Twelfth Street, S.W.  
12<sup>th</sup> Street Lobby, TW-A325  
Washington, DC 20554

ATTN: Media Bureau, Audio Division

Re: **MCC Radio, LLC**  
**Station KGNC, Amarillo, TX (Fac. ID 63159)**  
**Application for License w/ Method of Moments Proof**

Dear Ms. Dortch:

On behalf of MCC Radio, LLC, licensee of AM station KGNC, Amarillo, Texas, we are submitting herewith an original and two copies of an application on FCC Form 302-AM for license to following replacement of a tower and correction of licensed coordinates. A Method of Moments Computer Model proof, as authorized by Section 73.151(c), is provided in support of the application.

Should there be any questions concerning this matter, please contact the undersigned.

Sincerely,

Marnie K. Sarver

Enclosure

FILED/ACCEPTED

SEP 28 2009

Federal Communications Commission  
Office of the Secretary

RECEIVED

SEP 30 P 2:39

AUDIO SERVICES DIVISION

FOR  
FCC  
USE  
ONLY

FILED/ACCEPTED

SEP 28 2009

Federal Communications Commission  
Office of the Secretary

**FCC 302-AM**  
**APPLICATION FOR AM**  
**BROADCAST STATION LICENSE**  
(Please read instructions before filling out form.)

FOR COMMISSION USE ONLY

FILE NO.

*BL-20090928AMH*

SECTION I - APPLICANT FEE INFORMATION

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

MAILING ADDRESS (Line 1) (Maximum 35 characters)

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY

STATE OR COUNTRY (if foreign address)

ZIP CODE

TELEPHONE NUMBER (include area code)

CALL LETTERS  
KGNC

OTHER FCC IDENTIFIER (If applicable)  
63159

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:

Non-feeable application for modified license and coordinates correction.

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 |   |   |   |
| 0            | 0 | 0 | 1 |

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

| FOR FCC USE ONLY |
|------------------|
|                  |

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

| (A) |  |  |
|-----|--|--|
|     |  |  |

| (B)          |   |   |   |
|--------------|---|---|---|
| FEE MULTIPLE |   |   |   |
| 0            | 0 | 0 | 1 |

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

| FOR FCC USE ONLY |
|------------------|
|                  |

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

| TOTAL AMOUNT REMITTED WITH THIS APPLICATION |
|---|
| \$  |

| FOR FCC USE ONLY |
|------------------|
|                  |

|  |             |                   |
|--|-------------|-------------------|
| <b>SECTION II - APPLICANT INFORMATION</b>      |             |                   |
| 1. NAME OF APPLICANT<br>MCC RADIO, LLC         |             |                   |
| MAILING ADDRESS<br>1321 NORTH GENE AUTRY TRAIL |             |                   |
| CITY<br>PALM SPRINGS                           | STATE<br>CA | ZIP CODE<br>92262 |

2. This application is for:
- Commercial       Noncommercial
- AM Directional       AM Non-Directional

|                      |                                      |  |   |  |
|----------------------|--------------------------------------|--|---|--|
| Call letters<br>KGNC | Community of License<br>AMARILLO, TX | Construction Permit File No.<br>BP-20090430ABY | Modification of Construction Permit File No(s).<br>-- | Expiration Date of Last Construction Permit<br>6/18/2012 |
|----------------------|--------------------------------------|--|---|--|

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.

KGNC is a directional AM. Automatic program tests are not authorized. This application is for a modified license following repairs and correction of coordinates.

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.

The only permit involved is the above-referenced CP to correct coordinates. It also renumbered a tower.

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

If No, explain in an Exhibit.

Does not apply

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

Exhibit No.

If Yes, provide particulars as an Exhibit.

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).

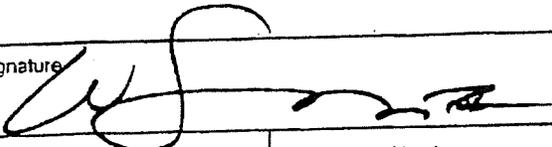
The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in the application.

**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  |                  |
| William S. Morris, IV | Date   | Telephone Number |
| Title                 | 9/28/09  | (706) 823-3333   |
| President             |  |                  |

**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 (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503)**

**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 - 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<br>(5) Uniform cross-section guyed steel towers | Overall height in meters of radiator above base insulator, or above base, if grounded.<br><br>92.4 | Overall height in meters above ground (without obstruction lighting)<br><br>91.5 | Overall height in meters above ground (include obstruction lighting)<br><br>95 | If antenna is either top loaded or sectionalized, describe fully in an Exhibit.<br><br>Exhibit No. DNA |
|---|--|--|--|--|

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 <sup>o</sup> | 25' | 11" | West Longitude | 101 <sup>o</sup> | 33' | 24" |
|----------------|-----------------|-----|-----|----------------|------------------|-----|-----|

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. None

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

Exhibit No.

No change in data on file - BZ-20010906ABX

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

None

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

None

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)<br>Thomas S. Gorton PE  | Signature (check appropriate box below)<br> |
| Address (include ZIP Code)<br>Hatfield & Dawson Consulting Engineers<br>9500 Greenwood Ave N<br>Seattle, WA 98103 | Date<br>September 21, 2009  |
|   | Telephone No. (Include Area Code)<br>206-783-9151   |

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

BENJAMIN F. DAWSON III, PE  
THOMAS M. ECKELS, PE  
STEPHEN S. LOCKWOOD, PE  
DAVID J. PINION, PE

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OAKHURST, NSW  
AUSTRALIA

Engineering Report:  
APPLICATION FOR STATION LICENSE

Proof of Performance

KGNC 710 kHz

10.0 kW DA-2

Facility ID 63159

Amarillo, Texas

MCC Radio, LLC

September 2009

## **Table of Contents**

**Introduction**

**Sample System Description**

**Moment Method Model**

**Reference Points**

**Survey**

**Statement of Engineer**

## **Introduction**

This Engineering Report is part of an application for Direct Measurement of Power by MCC Radio, LLC, licensee of KGNC-AM, Amarillo, TX. The north tower (tower #5) of KGNC's five tower antenna array was found to be structurally unsound, and was replaced in March of 2009. Under Commission policy, replacement of a tower requires completion of a partial proof of performance and application for a new station license on FCC Form 302. The ability to complete a traditional proof or partial proof of performance has been greatly complicated by the recent installation of over 25 wind mill towers within 1.5 miles of the KGNC array, none of which are detuned at KGNC's operating frequency. It was therefore decided that a Method of Moments Computer Model proof, as authorized by §73.151(c) of the Commission's rules was a more suitable option for the re-licensing of KGNC. Additionally, this application corrects the licensed coordinates of the KGNC array by four seconds to match those shown on the site survey included with this report. The tower numbers of the three towers used in the daytime directional array have also been changed to match the numbering scheme used for the nighttime antenna pattern.

All antenna and sample system measurements used in this report were taken by Thomas S. Gorton PE of this office on the evenings of March 31 and April 1, 2009.

## **Sample System Description**

The sample system installed consists of Delta TCT toroidal current transformers installed inside the tuning houses at the base of each tower. Proper operation of the TCT's was verified by placing them side by side on the workbench and comparing the readings on the Potomac Instruments Antenna Monitor while a common RF signal was supplied to all five TCT's. The TCTs are connected to a Potomac Instruments AM-1901 antenna monitor by equal lengths of 3/8 inch Celwave coaxial cable. This cable has a foam dielectric, and solid copper inner and outer conductors. At each end of these cables there is a short (approximately 18") jumper connecting the cable to the antenna monitor or TCT. These lines were verified to have equal electrical lengths by open and short circuit measurements taken with a network analyzer. All excess cable is buried. The antenna monitor was repaired and calibrated at the factory in March of 2009. There is no change to the ground system, so the description contained in the current station license (BZ-20010906ABX) remains accurate.

The measured open circuit sample line impedances and characteristic impedance calculations are shown below:

|               | Resonance Frequency (kHz) | -45° Offset Frequency (kHz) | -45° Offset Impedance ( $R_1 \pm jX_1$ ) (Ohms) | +45° Offset Frequency (kHz) | +45° Offset Impedance ( $R_2 \pm jX_2$ ) (Ohms) | Characteristic Impedance ( $Z_0$ ) |
|---------------|---------------------------|-----------------------------|---|-----------------------------|---|------------------------------------|
| Sample Line 1 | 718.400                   | 685.745                     | 26.403 - j 41.660                               | 751.055                     | 29.966 + j 41.234                               | 50.1 ohms                          |
| Sample Line 2 | 718.250                   | 685.602                     | 26.242 - j 41.658                               | 750.898                     | 29.891 + j 41.174                               | 50.9 ohms                          |
| Sample Line 3 | 718.250                   | 685.602                     | 26.312 - j 41.613                               | 750.898                     | 29.890 + j 41.135                               | 50.4 ohms                          |
| Sample Line 4 | 717.775                   | 685.149                     | 26.435 - j 41.755                               | 750.401                     | 29.830 + j 41.145                               | 50.1 ohms                          |
| Sample Line 5 | 718.275                   | 685.626                     | 26.515 + j 41.247                               | 750.924                     | 29.473 + j 41.538                               | 49.6 ohms                          |

The sample line lengths calculated from the measurements above are:

|               | Length in Electrical Degrees at 710 kHz |
|---------------|---|
| Sample Line 1 | 978.4°                                  |
| Sample Line 2 | 978.6°                                  |
| Sample Line 3 | 978.6°                                  |
| Sample Line 4 | 979.3°                                  |
| Sample Line 5 | 978.6°                                  |

The following table contains measurements at 710 kHz of the sample lines taken from the antenna monitor end, with the TCTs connected. This data is provided for use in periodic sample system verification.

|               | Impedance ( $Z_s$ ) |
|---------------|---------------------|
| Sample Line 1 | 51.2 - j 2.3 ohms   |
| Sample Line 2 | 51.3 - j 2.4 ohms   |
| Sample Line 3 | 51.2 - j 2.4 ohms   |
| Sample Line 4 | 51.3 - j 2.1 ohms   |
| Sample Line 5 | 50.7 - j 2.3 ohms   |

### Moment Method Model

Expert MININEC Broadcast Professional Version 12.5 was used to model the KGNC array. The antenna model was adjusted to match the measured matrix impedances. The physical height of the towers is 78°, the face width of towers 1-4 is 30 inches and the face width of tower 5 is 24 inches. The following adjusted parameters were used:

- antenna electrical height was adjusted to 102.6% of the physical height (80.0°)
  - north tower 103.3% (80.6°)
- wire radius of 0.4 meters
  - north tower 0.23 meters
- 21 segments per antenna element (3.8° per segment)

### Matrix Measurements & Impedance Adjustments

|               | Measured Z<br>(all others open circuit) | MININEC Calculated Z |
|---------------|---|----------------------|
| Tower #1 (S)  | 29.0 - j 28.3                           | 28.5 - j 29.8        |
| Tower #2 (SC) | 29.7 - j 28.5                           | 28.7 - j 29.4        |
| Tower #3 (C)  | 30.6 - j 29.7                           | 28.7 - j 29.3        |
| Tower #4 (NC) | 29.4 - j 29.7                           | 28.7 - j 29.4        |
| Tower #5 (N)  | 31.9 - j 33.6                           | 28.8 - j 32.3        |

Input File:

KGNC - Matrix

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

| wire | caps | Distance | Angle | Z    | radius | segs |
|------|------|----------|-------|------|--------|------|
| 1    | none | 0        | 0     | 0    | .4     | 21   |
|      |      | 0        | 0     | 80.  |        |      |
| 2    | none | 160.     | 5.    | 0    | .4     | 21   |
|      |      | 160.     | 5.    | 80.  |        |      |
| 3    | none | 320.     | 5.    | 0    | .4     | 21   |
|      |      | 320.     | 5.    | 80.  |        |      |
| 4    | none | 480.     | 5.    | 0    | .4     | 21   |
|      |      | 480.     | 5.    | 80.  |        |      |
| 5    | none | 640.     | 5.    | 0    | .23    | 21   |
|      |      | 640.     | 5.    | 80.6 |        |      |

Number of wires = 5  
current nodes = 105

| Individual wires | minimum |         | maximum |        |
|------------------|---------|---------|---------|--------|
|                  | wire    | value   | wire    | value  |
| segment length   | 1       | 3.80952 | 1       | 3.8381 |
| radius           | 5       | .23     | 1       | .4     |

**DAYTIME**

**ELECTRICAL DESCRIPTION**

Frequencies (KHz)

| frequency  |      | no. of steps | segment length (wavelengths) |          |
|------------|------|--------------|------------------------------|----------|
| no. lowest | step |              | minimum                      | maximum  |
| 1          | 710. | 0            | .010582                      | .0106614 |

Sources

| source | node | sector | magnitude | phase | type    |
|--------|------|--------|-----------|-------|---------|
| 1      | 1    | 1      | 480.032   | 145.7 | voltage |
| 2      | 22   | 1      | 832.149   | 238.  | voltage |
| 3      | 43   | 1      | 758.163   | 305.4 | voltage |
| 4      | 64   | 1      | 0.010     | 0.0   | voltage |
| 5      | 85   | 1      | 0.010     | 0.0   | voltage |

Lumped loads

| load | node | resistance (ohms) | reactance (ohms) | inductance (mH) | capacitance (uF) | passive circuit |
|------|------|-------------------|------------------|-----------------|------------------|-----------------|
| 1    | 64   | .01               | 560.84           | 0               | 0                | 0               |
| 2    | 85   | .01               | 644.57           | 0               | 0                | 0               |

**NIGHTTIME**

**ELECTRICAL DESCRIPTION**

Frequencies (KHz)

| frequency  |      | no. of steps | segment length (wavelengths) |          |
|------------|------|--------------|------------------------------|----------|
| no. lowest | step |              | minimum                      | maximum  |
| 1          | 710. | 0            | .010582                      | .0106614 |

Sources

| source | node | sector | magnitude | phase | type    |
|--------|------|--------|-----------|-------|---------|
| 1      | 1    | 1      | 498.576   | 106.8 | voltage |
| 2      | 22   | 1      | 697.252   | 220.5 | voltage |
| 3      | 43   | 1      | 620.847   | 328.4 | voltage |
| 4      | 64   | 1      | 344.74    | 63.3  | voltage |
| 5      | 85   | 1      | 179.706   | 141.  | voltage |

*Daytime Calculated Antenna Monitor Parameters*

|         |              | Base Current from MNEC |           | Antenna Monitor Parameters |           |
|---------|--------------|------------------------|-----------|----------------------------|-----------|
|         |              | Magnitude              | Phase (°) | Ratio                      | Phase (°) |
| Tower 1 | South        | 2.67                   | 190.7     | 0.178                      | -171.4    |
| Tower 2 | South Center | 10.48                  | 274.9     | 0.699                      | -87.2     |
| Tower 3 | Center       | 15.00                  | 2.1       | 1.000                      | 0.0       |
| Tower 4 | North Center | 0.00                   | 0.0       | 0.000                      | 0.0       |
| Tower 5 | North        | 0.00                   | 0.0       | 0.000                      | 0.0       |

*Nighttime Calculated Antenna Monitor Parameters*

|         |              | Base Current from MNEC |           | Antenna Monitor Parameters |           |
|---------|--------------|------------------------|-----------|----------------------------|-----------|
|         |              | Magnitude              | Phase (°) | Ratio                      | Phase (°) |
| Tower 1 | South        | 3.07                   | 131.6     | 0.266                      | 128.3     |
| Tower 2 | South Center | 8.57                   | 245.6     | 0.744                      | -117.7    |
| Tower 3 | Center       | 11.52                  | 3.3       | 1.000                      | 0.0       |
| Tower 4 | North Center | 8.60                   | 121.4     | 0.747                      | 118.3     |
| Tower 5 | North        | 3.05                   | 239.4     | 0.265                      | -123.9    |

**DAYTIME**

## ELECTRICAL DESCRIPTION

## Frequencies (KHz)

| frequency |        |      | no. of<br>steps | segment length (wavelengths) |          |
|-----------|--------|------|-----------------|------------------------------|----------|
| no.       | lowest | step |                 | minimum                      | maximum  |
| 1         | 710.   | 0    | 1               | .010582                      | .0106614 |

## Sources

| source node | sector | magnitude | phase | type    |
|-------------|--------|-----------|-------|---------|
| 1           | 1      | 480.032   | 145.7 | voltage |
| 2           | 22     | 832.149   | 238.  | voltage |
| 3           | 43     | 758.163   | 305.4 | voltage |
| 4           | 64     | 254.057   | 286.3 | voltage |
| 5           | 85     | 147.244   | 143.  | voltage |

**NIGHTTIME**

## ELECTRICAL DESCRIPTION

## Frequencies (KHz)

| frequency |        |      | no. of<br>steps | segment length (wavelengths) |          |
|-----------|--------|------|-----------------|------------------------------|----------|
| no.       | lowest | step |                 | minimum                      | maximum  |
| 1         | 710.   | 0    | 1               | .010582                      | .0106614 |

## Sources

| source node | sector | magnitude | phase | type    |
|-------------|--------|-----------|-------|---------|
| 1           | 1      | 498.576   | 106.8 | voltage |
| 2           | 22     | 697.252   | 220.5 | voltage |
| 3           | 43     | 620.847   | 328.4 | voltage |
| 4           | 64     | 344.74    | 63.3  | voltage |
| 5           | 85     | 179.706   | 141.  | voltage |

# Daytime Calculated Current Distribution

C:\AM\KGNC\MNEC\KGNC-Day 05-05-2009 10:32:12

CURRENT rms

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

| current |         |          |         | mag     | phase | real      | imaginary |
|---------|---------|----------|---------|---------|-------|-----------|-----------|
| no.     | X       | Y        | Z       | (amps)  | (deg) | (amps)    | (amps)    |
| GND     | 0       | 0        | 0       | 2.67474 | 190.7 | -2.628    | -.497838  |
| 2       | 0       | 0        | 3.80952 | 2.55533 | 188.1 | -2.52956  | -.361984  |
| 3       | 0       | 0        | 7.61905 | 2.46894 | 186.4 | -2.45352  | -.275497  |
| 4       | 0       | 0        | 11.4286 | 2.38468 | 184.9 | -2.376    | -.203313  |
| 5       | 0       | 0        | 15.2381 | 2.29816 | 183.5 | -2.29385  | -.140652  |
| 6       | 0       | 0        | 19.0476 | 2.20757 | 182.2 | -2.20591  | -.0856018 |
| 7       | 0       | 0        | 22.8571 | 2.11208 | 181.  | -2.11175  | -.0372468 |
| 8       | 0       | 0        | 26.6667 | 2.01128 | 179.9 | -2.01128  | 4.91E-03  |
| 9       | 0       | 0        | 30.4762 | 1.90498 | 178.8 | -1.90453  | .0411517  |
| 10      | 0       | 0        | 34.2857 | 1.79315 | 177.7 | -1.79172  | .071667   |
| 11      | 0       | 0        | 38.0952 | 1.67584 | 176.7 | -1.67306  | .0965738  |
| 12      | 0       | 0        | 41.9048 | 1.55318 | 175.7 | -1.54884  | .115959   |
| 13      | 0       | 0        | 45.7143 | 1.42532 | 174.8 | -1.41939  | .129888   |
| 14      | 0       | 0        | 49.5238 | 1.29243 | 173.9 | -1.285    | .138414   |
| 15      | 0       | 0        | 53.3333 | 1.15469 | 173.  | -1.14598  | .141579   |
| 16      | 0       | 0        | 57.1429 | 1.01223 | 172.1 | -1.00259  | .139411   |
| 17      | 0       | 0        | 60.9524 | .865103 | 171.2 | -.854986  | .131917   |
| 18      | 0       | 0        | 64.7619 | .713167 | 170.4 | -.703159  | .11906    |
| 19      | 0       | 0        | 68.5714 | .55593  | 169.6 | -.546732  | .100712   |
| 20      | 0       | 0        | 72.381  | .392026 | 168.7 | -.384483  | .0765285  |
| 21      | 0       | 0        | 76.1905 | .218119 | 167.9 | -.213283  | .0456737  |
| END     | 0       | 0        | 80.     | 0       | 0     | 0         | 0         |
| GND     | 159.391 | -13.9449 | 0       | 10.4754 | 274.9 | .890138   | -10.4375  |
| 23      | 159.391 | -13.9449 | 3.80952 | 10.2826 | 273.6 | .648265   | -10.2621  |
| 24      | 159.391 | -13.9449 | 7.61905 | 10.1055 | 272.8 | .494165   | -10.0934  |
| 25      | 159.391 | -13.9449 | 11.4286 | 9.89932 | 272.1 | .365417   | -9.89257  |
| 26      | 159.391 | -13.9449 | 15.2381 | 9.65802 | 271.5 | .253529   | -9.65469  |
| 27      | 159.391 | -13.9449 | 19.0476 | 9.37962 | 270.9 | .155099   | -9.37834  |
| 28      | 159.391 | -13.9449 | 22.8571 | 9.06343 | 270.4 | .0685094  | -9.06317  |
| 29      | 159.391 | -13.9449 | 26.6667 | 8.7096  | 270.  | -7.11E-03 | -8.7096   |
| 30      | 159.391 | -13.9449 | 30.4762 | 8.31866 | 269.5 | -.0722468 | -8.31834  |
| 31      | 159.391 | -13.9449 | 34.2857 | 7.89134 | 269.1 | -.12722   | -7.89031  |
| 32      | 159.391 | -13.9449 | 38.0952 | 7.42878 | 268.7 | -.172222  | -7.42678  |
| 33      | 159.391 | -13.9449 | 41.9048 | 6.932   | 268.3 | -.207382  | -6.9289   |
| 34      | 159.391 | -13.9449 | 45.7143 | 6.40223 | 267.9 | -.232795  | -6.398    |
| 35      | 159.391 | -13.9449 | 49.5238 | 5.84065 | 267.6 | -.248529  | -5.83536  |
| 36      | 159.391 | -13.9449 | 53.3333 | 5.24838 | 267.2 | -.254631  | -5.2422   |
| 37      | 159.391 | -13.9449 | 57.1429 | 4.62628 | 266.9 | -.251122  | -4.61946  |
| 38      | 159.391 | -13.9449 | 60.9524 | 3.97478 | 266.6 | -.237981  | -3.96765  |
| 39      | 159.391 | -13.9449 | 64.7619 | 3.29343 | 266.3 | -.215106  | -3.2864   |
| 40      | 159.391 | -13.9449 | 68.5714 | 2.58001 | 265.9 | -.182227  | -2.57356  |
| 41      | 159.391 | -13.9449 | 72.381  | 1.82813 | 265.6 | -.138678  | -1.82287  |
| 42      | 159.391 | -13.9449 | 76.1905 | 1.02206 | 265.3 | -.0828956 | -1.0187   |
| END     | 159.391 | -13.9449 | 80.     | 0       | 0     | 0         | 0         |
| GND     | 318.782 | -27.8898 | 0       | 15.0425 | 2.1   | 15.0321   | .55771    |
| 44      | 318.782 | -27.8898 | 3.80952 | 14.7912 | 1.6   | 14.7856   | .407013   |
| 45      | 318.782 | -27.8898 | 7.61905 | 14.5497 | 1.2   | 14.5464   | .310894   |
| 46      | 318.782 | -27.8898 | 11.4286 | 14.2622 | .9    | 14.2603   | .230479   |
| 47      | 318.782 | -27.8898 | 15.2381 | 13.9216 | .7    | 13.9206   | .160486   |
| 48      | 318.782 | -27.8898 | 19.0476 | 13.5254 | .4    | 13.525    | .0988013  |

|     |         |          |         |          |       |           |           |
|-----|---------|----------|---------|----------|-------|-----------|-----------|
| 49  | 318.782 | -27.8898 | 22.8571 | 13.0734  | .2    | 13.0733   | .0444304  |
| 50  | 318.782 | -27.8898 | 26.6667 | 12.5659  | 360.  | 12.5659   | -3.15E-03 |
| 51  | 318.782 | -27.8898 | 30.4762 | 12.004   | 359.8 | 12.0039   | -.0442514 |
| 52  | 318.782 | -27.8898 | 34.2857 | 11.3889  | 359.6 | 11.3887   | -.0790346 |
| 53  | 318.782 | -27.8898 | 38.0952 | 10.7224  | 359.4 | 10.7218   | -.107609  |
| 54  | 318.782 | -27.8898 | 41.9048 | 10.0061  | 359.3 | 10.0053   | -.136036  |
| 55  | 318.782 | -27.8898 | 45.7143 | 9.24189  | 359.1 | 9.24073   | -.146355  |
| 56  | 318.782 | -27.8898 | 49.5238 | 8.43145  | 358.9 | 8.43      | -.156587  |
| 57  | 318.782 | -27.8898 | 53.3333 | 7.57663  | 358.8 | 7.57493   | -.160742  |
| 58  | 318.782 | -27.8898 | 57.1429 | 6.67858  | 358.6 | 6.67669   | -.158808  |
| 59  | 318.782 | -27.8898 | 60.9524 | 5.73805  | 358.5 | 5.73607   | -.150748  |
| 60  | 318.782 | -27.8898 | 64.7619 | 4.75439  | 358.4 | 4.75243   | -.136476  |
| 61  | 318.782 | -27.8898 | 68.5714 | 3.72444  | 358.2 | 3.72264   | -.115794  |
| 62  | 318.782 | -27.8898 | 72.381  | 2.639    | 358.1 | 2.63752   | -.0882557 |
| 63  | 318.782 | -27.8898 | 76.1905 | 1.47537  | 357.9 | 1.47442   | -.052836  |
| END | 318.782 | -27.8898 | 80.     | 0        | 0     | 0         | 0         |
| GND | 478.173 | -41.8347 | 0       | .320329  | 16.1  | .307753   | .0888752  |
| 65  | 478.173 | -41.8347 | 3.80952 | .233262  | 16.   | .22417    | .0644895  |
| 66  | 478.173 | -41.8347 | 7.61905 | .177833  | 16.   | .170955   | .0489802  |
| 67  | 478.173 | -41.8347 | 11.4286 | .131568  | 15.9  | .126532   | .0360507  |
| 68  | 478.173 | -41.8347 | 15.2381 | .0914045 | 15.8  | .0879637  | .0248429  |
| 69  | 478.173 | -41.8347 | 19.0476 | .056115  | 15.5  | .0540697  | .0150121  |
| 70  | 478.173 | -41.8347 | 22.8571 | .0251149 | 14.7  | .0242876  | 6.39E-03  |
| 71  | 478.173 | -41.8347 | 26.6667 | 2.02E-03 | 213.2 | -1.69E-03 | -1.1E-03  |
| 72  | 478.173 | -41.8347 | 30.4762 | .0251895 | 197.4 | -.0240361 | -7.53E-03 |
| 73  | 478.173 | -41.8347 | 34.2857 | .0447777 | 196.8 | -.0428696 | -.0129321 |
| 74  | 478.173 | -41.8347 | 38.0952 | .060783  | 196.6 | -.058263  | -.0173201 |
| 75  | 478.173 | -41.8347 | 41.9048 | .07326   | 196.4 | -.0702697 | -.0207169 |
| 76  | 478.173 | -41.8347 | 45.7143 | .0822514 | 196.3 | -.07893   | -.0231375 |
| 77  | 478.173 | -41.8347 | 49.5238 | .0877913 | 196.3 | -.084276  | -.0245943 |
| 78  | 478.173 | -41.8347 | 53.3333 | .0899073 | 196.2 | -.086333  | -.0250986 |
| 79  | 478.173 | -41.8347 | 57.1429 | .088617  | 196.2 | -.0851167 | -.0246598 |
| 80  | 478.173 | -41.8347 | 60.9524 | .083923  | 196.1 | -.0806285 | -.0232832 |
| 81  | 478.173 | -41.8347 | 64.7619 | .0757993 | 196.1 | -.0728415 | -.0209676 |
| 82  | 478.173 | -41.8347 | 68.5714 | .0641626 | 196.  | -.061674  | -.0176963 |
| 83  | 478.173 | -41.8347 | 72.381  | .0487889 | 196.  | -.0469082 | -.0134155 |
| 84  | 478.173 | -41.8347 | 76.1905 | .0291386 | 195.9 | -.0280227 | -7.99E-03 |
| END | 478.173 | -41.8347 | 80.     | 0        | 0     | 0         | 0         |
| GND | 637.565 | -55.7796 | 0       | .161535  | 232.8 | -.0977713 | -.12863   |
| 86  | 637.565 | -55.7796 | 3.8381  | .120522  | 232.7 | -.0730261 | -.0958787 |
| 87  | 637.565 | -55.7796 | 7.67619 | .0925119 | 232.6 | -.0561284 | -.0735395 |
| 88  | 637.565 | -55.7796 | 11.5143 | .0687611 | 232.6 | -.0417611 | -.0546269 |
| 89  | 637.565 | -55.7796 | 15.3524 | .0479129 | 232.6 | -.0291107 | -.0380553 |
| 90  | 637.565 | -55.7796 | 19.1905 | .0294401 | 232.6 | -.017863  | -.0234016 |
| 91  | 637.565 | -55.7796 | 23.0286 | .0130961 | 233.  | -7.87E-03 | -.0104654 |
| 92  | 637.565 | -55.7796 | 26.8667 | 1.27E-03 | 42.7  | 9.32E-04  | 8.59E-04  |
| 93  | 637.565 | -55.7796 | 30.7048 | .0136678 | 51.1  | 8.59E-03  | .010632   |
| 94  | 637.565 | -55.7796 | 34.5429 | .0241906 | 51.3  | .015114   | .0188879  |
| 95  | 637.565 | -55.7796 | 38.381  | .0328424 | 51.3  | .020513   | .0256484  |
| 96  | 637.565 | -55.7796 | 42.219  | .0396333 | 51.3  | .0247845  | .0309277  |
| 97  | 637.565 | -55.7796 | 46.0571 | .0445674 | 51.2  | .027923   | .0347356  |
| 98  | 637.565 | -55.7796 | 49.8952 | .0476452 | 51.1  | .0299198  | .0370793  |
| 99  | 637.565 | -55.7796 | 53.7333 | .0488641 | 51.   | .0307637  | .0379644  |
| 100 | 637.565 | -55.7796 | 57.5714 | .048217  | 50.9  | .0304401  | .0373936  |
| 101 | 637.565 | -55.7796 | 61.4095 | .04569   | 50.7  | .0289291  | .0353651  |
| 102 | 637.565 | -55.7796 | 65.2476 | .0412552 | 50.6  | .0262014  | .0318666  |
| 103 | 637.565 | -55.7796 | 69.0857 | .0348556 | 50.4  | .0222079  | .0268648  |
| 104 | 637.565 | -55.7796 | 72.9238 | .0263663 | 50.3  | .0168554  | .020275   |
| 105 | 637.565 | -55.7796 | 76.7619 | .0154803 | 50.1  | 9.93E-03  | .0118748  |
| END | 637.565 | -55.7796 | 80.6    | 0        | 0     | 0         | 0         |

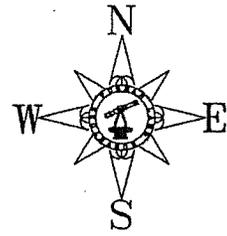
## Reference Points

KGNC Field readings 9-9-09 - 9-16-09  
 GPS Readings WGS84 MS Streets & Trips

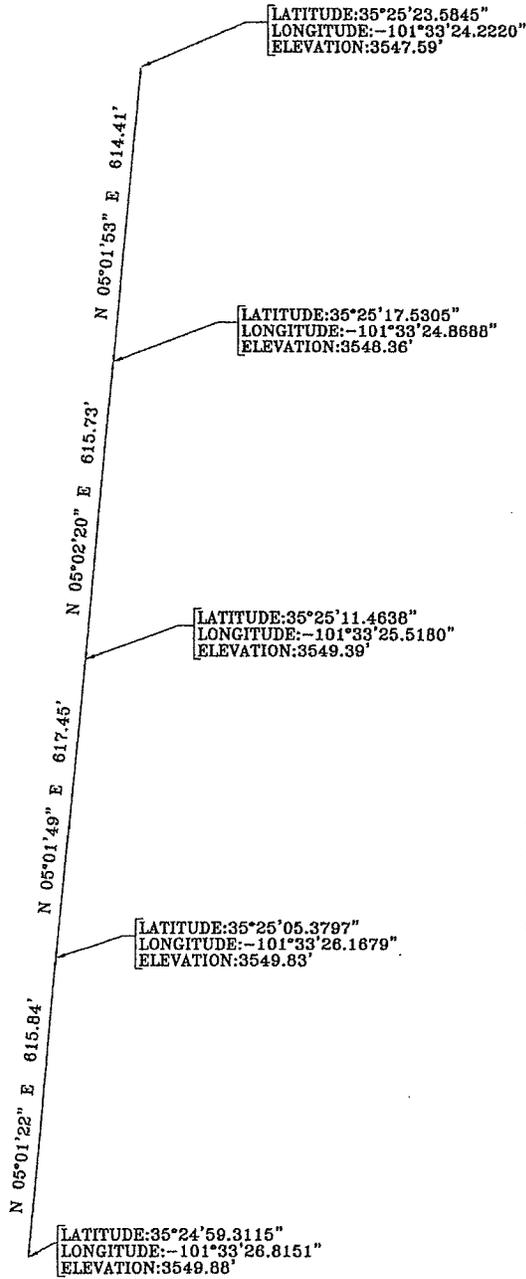
| <u>Radial azimuth</u> | <u>Map Ref</u> | <u>Distance km</u> | <u>Field mV/m</u> | <u>GPS coords</u>     | <u>Pattern</u> | <u>Point description</u>   |
|-----------------------|----------------|--------------------|-------------------|-----------------------|----------------|--|
| 53.00                 | 53-2           | 14.40              | 4.8               | 35-29-52<br>101-25-48 | Night          | Middle of Co Road K. Apx 60yds South of gate/cattle guard                                  |
| 53.00                 | 53-3           | 17.69              | 3.6               | 35-30-56<br>101-24-3  | Night          | East Shoulder Hwy 207 Apx 22yds North of Fence corner of Conoco/Phillips Plant             |
| 53.00                 | 53-6           | 36.04              | 4.7               | 35-36-52<br>101-14-18 | Night          | Apx 10yds South of Double pipe post, West shoulder of 152. Just past the crest of the hill |
| 61.00                 | 61-1           | 6.63               | 68                | 35-26-28<br>101-29-19 | Day            | NW Corner of Red Gate  |
| 61.00                 | 61-3           | 11.80              | 25                | 35-27-28<br>101-26-7  | Day            | middle of Co Rd K just past slight Right bend in road                                      |
| 61.00                 | 61-4           | 29.05              | 23                | 35-28-25<br>101-23-4  | Day            | West shoulder of Hwy 207. No landmarks   |
| 79.00                 | 79-1           | 6.34               | 36                | 35-25-51<br>101-29-18 | Night          | Middle of Co Road H. Pump in the field to SE   |
| 79.00                 | 79-3           | 11.24              | 10                | 35-26-21<br>101-26-7  | Night          | Middle of CO Road K, 42.5 yds North of 3 large wood post                                   |
| 79.00                 | 79-4           | 16.18              | 3.7               | 35-26-51<br>101-22-54 | Night          | West Shoulder of Hwy 207 Midway between Pipe gate and Util Pole                            |
| 129.00                | 129-1          | 11.59              | 92                | 35-21-15<br>101-27-28 | Day            | North Shoulder of Hwy 293, Apx 12' east of Util Pole                                       |
| 129.00                | 129-2          | 16.68              | 72                | 35-19-31<br>101-24-51 | Day            | South shoulder of Hwy 60, apx middle of 2 Util Poles                                       |
| 129.00                | 129-3          | 20.46              | 61                | 35-18-14<br>101-22-54 | Day            | West shoulder of Hwy 207, Pump located apx 100yds West                                     |
| 143.00                | 143-1          | 9.12               | 120               | 35-21-14<br>101-29-50 | Night          | North shoulder Hwy 293, apx 90yds east of Drain ditch under road                           |

| <u>Radial azimuth</u><br>Deg | <u>Map Ref</u> | <u>Distance</u><br>km | <u>Field</u><br>mV/m | <u>GPS coords</u>     | <u>Pattern</u> | <u>Point description</u>  |
|------------------------------|----------------|-----------------------|----------------------|-----------------------|----------------|---|
| 143.00                       | 143-2          | 14.98                 | 100                  | 35-18-41<br>101-27-32 | Night          | South Shoulder Hwy 60, apx 24yds West of Util Pole/ Telco box   |
| 143.00                       | 143-3          | 26.64                 | 72                   | 35-13-37<br>101-22-57 | Night          | West shoulder of hwy 207, apx 5yds North tall fence post, 58.5 yds South of Fence corner  |
| 300.00                       | 300-1          | 8.20                  | 6                    | 35-27-24<br>101-38-8  | Night          | East shoulder of Hwy 136, South of gate to cell site  |
| 300.00                       | 300-2          | 41.97                 | .9                   | 35-36-29<br>101-57-34 | Night          | East side of Hwy 287 N, Midway between road and fence line, apx 7yds North of concrete pillar or apx 20yds' North of North edge of wire gate. |
| 300.00                       | 300-4          | 60.58                 | 1.2                  | 35-41-28<br>102-8-18  |                | North shoulder hwy 354, Apx 18 yds East of large square double wood post  |
| 309.00                       | 309-1          | 9.12                  | 68                   | 35-28-17<br>101-38-8  | Day            | East Side of Hwy 136, on the hill at the fence line. 40mv on shoulder   |
| 309.00                       | 309-3          | 36.44                 | 9.5                  | 35-37-33<br>101-52-14 | Day            | Middle of Cig road, apx 35yds NW of beige armored valve on south side of road.  |
| 309.00                       | 309-6          | 47.34                 | 6.8                  | 35-41-14<br>101-57-53 | Day            | Hwy 287 N, On exit ramp to Hwy's 354/1913, apx 1/2 way of guard rail  |
| 309.00                       | 309-8          | 47.86                 | 6.8                  | 35-41-25<br>101-58-9  | Day            | North shoulder of Hwy 354, apx 17 yds East of Tx Plains Trails sign   |
| 311.00                       | 311-1          | 9.40                  | 13                   | 35-28-31<br>101-38-8  | Night          | East Shoulder Hwy 136, Just South of small wood gate, apx 25yds North of end of Guard Rail  |
| 311.00                       | 311-3          | 34.93                 | 4.5                  | 35-37-34<br>101-50-58 | Night          | middle of Cig road, apx 65yds west of power lines   |
| 311.00                       | 311-5          | 45.86                 | 2.1                  | 35-41-24<br>101-56-26 | Night          | South shoulder of 1913, apx 89yds East of blue/green metal gate on North side of road.  |
| 311.00                       | 311-6          | 48.74                 | 1.65                 | 35-42-25<br>101-57-53 | Night          | Apx center of bridge, East side Hwy 287 N   |

# Tower Survey



SCALE: 1" = 300'



**NOTE**

NAD 83 coordinates are based on NGS station POTTER. Elevation is based on City of Amarillo benchmark on the same station. Elevation is at ground level.

TOWER LOCATION SURVEY  
FOR  
KGNC



*D. R. Furman*  
Daniel R. Furman  
RPLS 5759

FURMAN LAND SURVEYORS, INC.



|                        |                        |
|------------------------|------------------------|
| DARYL R. FURMAN, RPLS  |                        |
| DANIEL R. FURMAN, RPLS | DONALD R. FURMAN, RPLS |
| CASEY A. MANN, RPLS    | LONDON M. STOKES, SI   |
| (806)374-4246          | (806)934-1405          |
| P.O. BOX 1416          | P.O. BOX 464           |
| AMARILLO, TX. 79105    | DUMAS, TEXAS 79029     |

PROJECT NO. 0910064 FILE NO. CARSON CO.  
DRAWING NO. C:\DWG09\CARSON\0910064

**Statement of Engineer**

This Engineering Report regarding the Proof-of-Performance of KGNC, 1150 kHz, Amarillo, Texas has been prepared by myself or under my direct supervision. All representations contained herein are true to the best of my knowledge. I am an experienced radio engineer whose qualifications are a matter of record with the Federal Communications Commission. I am a partner in the firm of Hatfield and Dawson Consulting Engineers and am Registered as a Professional Engineer in the States of Washington and Alaska.

Stephen S. Lockwood, P.E.

21 September 2009

