

| | | |
|---|-------------|-------------------|
| SECTION II - APPLICANT INFORMATION | | |
| 1. NAME OF APPLICANT BERNARD DALLAS, LLC | | |
| MAILING ADDRESS C/O THOMAS G AMON, ESQ. 250 W 57TH STREET, SUITE 316 | | |
| CITY NEW YORK | STATE NY | ZIP CODE 10107 |

2. This application is for:

- ☒ Commercial
 ☐ Noncommercial
☒ AM Directional
 ☐ AM Non-Directional

| | | | | |
|----------------------|--------------------------------------|-------------------------------------|---|---|
| Call letters KFCD | Community of License FARMERSVILLE | Construction Permit File No. N/A | Modification of Construction Permit File No(s). N/A | Expiration Date of Last Construction Permit N/A |
|----------------------|--------------------------------------|-------------------------------------|---|---|

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.
N/A

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.
N/A

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.
N/A

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

N/A

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).

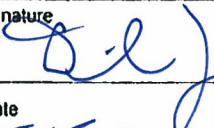
The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

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 DANIEL B. ZWIRN | Signature  | |
| Title MANAGING MEMBER | Date 5-15-2013 | Telephone Number 212-810-2430 |

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

BERNARD DALLAS, LLC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)



Station License



Direct Measurement of Power

1. Facilities authorized in construction permit

| Call Sign | File No. of Construction Permit (if applicable) | Frequency (kHz) | Hours of Operation | Power in kilowatts | |
|-----------|---|-----------------|--------------------|--------------------|------------|
| KFCD | | 990 | Unlimited | Night .920 | Day 7.0 |

2. Station location

| | |
|-----------------------|-------------------------------------|
| State TEXAS | City or Town FARMERSVILLE |
|-----------------------|-------------------------------------|

3. Transmitter location

| | | | |
|--------------------|-----------------------|-------------------------------------|---|
| State TX | County HUNT | City or Town FARMERSVILLE | Street address (or other identification) 1621 CR2730 |
|--------------------|-----------------------|-------------------------------------|---|

4. Main studio location

| | | | |
|--------------------|-----------------------|-------------------------------------|---|
| State TX | County HUNT | City or Town FARMERSVILLE | Street address (or other identification) 1617 CR2730 |
|--------------------|-----------------------|-------------------------------------|---|

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

| | | | |
|--------------------|-----------------------|-------------------------------------|---|
| State TX | County HUNT | City or Town FARMERSVILLE | Street address (or other identification) 1617 CR2730 |
|--------------------|-----------------------|-------------------------------------|---|

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.
SEE TECH EXHIBIT

8. Operating constants:

| | |
|---|--|
| RF common point or antenna current (in amperes) without modulation for night system 4.46 | RF common point or antenna current (in amperes) without modulation for day system 12.14 |
| Measured antenna or common point resistance (in ohms) at operating frequency Night 50 Day 50 | Measured antenna or common point reactance (in ohms) at operating frequency Night 0 Day 0 |

Antenna indications for directional operation

| Towers | Antenna monitor Phase reading(s) in degrees | | Antenna monitor sample current ratio(s) | | Antenna base currents | |
|--------|---|------|---|-----|-----------------------|-----|
| | Night | Day | Night | Day | Night | Day |
| 1 | 0 | 0 | 1.0 | 1.0 | | |
| 2 | 31.4 | 16.1 | .37 | .28 | | |
| 3 | -124.9 | 87.8 | .24 | .31 | | |
| | | | | | | |
| | | | | | | |

Manufacturer and type of antenna monitor:

Potomac Instruments AM-19D (210)

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 UNIFORM CROSS SECTION 24" FACE GUYED TOWER | Overall height in meters of radiator above base insulator, or above base, if grounded. 79.24 | Overall height in meters above ground (without obstruction lighting) 80.2 | Overall height in meters above ground (include obstruction lighting) 81.1 | If antenna is either top loaded or sectionalized, describe fully in an Exhibit. <div>Exhibit No. N/A</div> |
|--|---|---|---|--|

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 33 ° 07 ' 01 " | West Longitude 96 ° 16 ' 47 " |
|--|--|

If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits.

Exhibit No.
SEE TECH EXHIBIT

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

Exhibit No.

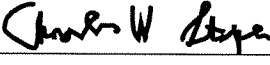
10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit?

N/A - SEE TECH EXHIBIT

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

N/A

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

| | |
|--|---|
| Name (Please Print or Type) Charles W. Staples | Signature (check appropriate box below)  |
| Address (include ZIP Code) 4424 Glenwick Lane University Park, TX 75205-1037 | Date 04/01/2013 |
| | Telephone No. (Include Area Code) 214-5266200 |

☐ Technical Director

☐ Registered Professional Engineer

☐ Chief Operator

☒ Technical Consultant

☐ Other (specify)

**Technical Exhibit
Application For License
Bernard Dallas, LLC
KFCD (AM) 990 kHz
7 kW DA-Day, .920 kW DA-Night
Facility ID 43757
Farmersville, Texas**

**KFCD (AM)
Facility ID 43757
Form 302AM
Application for License
Technical Exhibit
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Tower Self Impedances and Verification of Modeling

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Directional Array Modeling

Modeled Parameters

Base Corrections And New Normalized Parameters

KFCD Exhibit 3

Sampling System

KFCD Exhibit 4

Reference Readings

**Technical Exhibit
Application For License
Bernard Dallas, LLC
KFCD (AM) 990 kHz
7 kW DA-Day, .920 kW DA-Night
Facility ID 43757
Farmersville, Texas**

Background and Purpose of Application

Bernard Dallas, LLC, ("BERNARD") the licensee of KFCD has completed a method of moments proof as authorized under 47 CFR 73.151(c), on this previously licensed facility. This facility was authorized under BMP20041020AED and licensed under BL20046024AEP. The as built facility is identical to the licensed facility with the exception of a 6' grid 950 MHz STL dish BERNARD has added to tower one. The dish is mounted approximately 3 meters below the top of tower one. The towers are three identical cross section 18-inch face, (.457 m) uniform guyed triangular towers. All are 79.24 meter 94.2° height radiators. The STL transmission line on tower one is bonded to the tower every twenty feet and is isolated across the base insulator with a Kintronic isocoupler.

Methodology, Etc.

Self impedances were measured at the ATU with all other towers floated by disconnecting the jumper plugs at the ATU of each of the other towers. There were no other components shunted across the bases of the other towers during the measurements with the exception of the lighting chokes and an isocoupler at tower one. Impedance measurements of the tower base self impedances were measured using a Delta OIB-3 Bridge driven with approximately 200 Watts from the KFCD transmitter. Inductance of each tower feed was measured with this same equipment with the base of the tower under test shorted to obtain a measured value of feed inductance for each individual tower for use in base corrections of the directional towers. Towers in the array were modeled using

computer program "Expert MININEC Broadcast Professional", Version 23. Ten segments were used to represent each of the three towers using the geometry of the array specified in the above referenced construction permit. Each individual tower base impedance was calculated as a driven source with all other towers floating to obtain a modeled self impedance at the tower base. The modeled values of the tower self impedance were then calculated to include the base components, such as stray capacitance of the Austin A4197L base insulator, lighting chokes, and in the case of tower one, the isocoupler. A value of 20 pf or $-j8038.13$ ohms was used for the base insulator, and 15 pf was used for the isocoupler. A total of $-j4593.22$ ohms was used for tower one for base insulator and isocoupler. All modeled values were found to be equivalent to measured values within ± 2 ohms and ± 4 percent for both resistance and reactance of the measured self impedances. The towers are within the limits specified in 73.151C of 82.4% of the radius and no more than +4% more than the physical height. See Exhibit 1 for details of the measurements and model, and verification of modeling.

After verification of the modeling procedure, the above mentioned computer program was used to create a method of moments model of the array for calculation of directional antenna system complex voltage values at ground level under each tower using the theoretical parameters of the day and night parameters in the above referenced construction permit. Using these voltage sources, current magnitudes and phases for each element of the array were derived for the day and night arrays. Using the drive impedances from the array synthesis, the base and feed components were taken into consideration to calculate corrections for parameters at location of the current transformers in the ATU, using the Phasetek, Inc BASENET and BASENETV, computer nodal analysis programs. The base components include the feed inductance, base capacitance, and lighting choke reactance. The lighting chokes utilized are extremely high reactance and in this case were measured to be $j3222.14$ ohms at 990 kHz with an Array Solutions AIM 4170C. These values of current and phase were normalized to the reference tower and corrected with the factors

calculated above for antenna monitor parameters. See Exhibit 2 for details of the modeling and calculations of values at the current transformer sampling point using "Expert MININEC Broadcast Professional", Version 23, and the Phasetek, Inc BASENET and BASENETV, computer nodal analysis programs to reach the final antenna monitor parameters specified on the Form 302AM. After these parameters were calculated, the day and night antenna system were adjusted to within better than ± 3 degrees phase and $\pm 5\%$ ratio of the new values.

The sample lines used are three equal lengths of Andrew LDF4-50 "Helix" coaxial cable. Impedance measurements made of the sampling system were made with an Array Solutions AIM4170C network analyzer in a calibrated measurement system. Measurements were made at the antenna monitor end of the sample lines connected to the sampling transformers at the tower bases while under open circuit conditions. Additionally measurements were made at the antenna monitor end of the sample lines without the sample lines connected to the sampling transformers. Frequencies above and below carrier frequency where resonance occurred were determined with the sample lines disconnected from the transformers. As the length of a distortionless transmission line is 180 electrical degrees at the difference frequency between adjacent frequencies of resonance, and frequencies of resonance occur at odd multiples of 90 degrees electrical length, the sample line length at resonant frequency below or above carrier frequency (closest to carrier frequency) was found to be 270 degrees. The resonant frequency closer to the carrier frequency was approximately 946.8 KHz; the other frequency was approximately 1550.03. The lengths were calculated by the ratio of the frequencies. To determine characteristic impedance values of the lines, open circuit measurements were made with frequencies offset to produce ± 45 degrees of electrical line length at the resonant frequency (approximately 789 KHz and 1104 KHz). The characteristic impedance was calculated (using the equation $Z_0 = (R^2 + X^2)^{1/2}$) the electrical lengths of the sample lines was determined to be within $.3^\circ$ of each other. The characteristic impedance of the sample lines are within $\pm .06$ ohms of each other and within ± 2 ohms of the characteristic impedance. The toroidal sample transformers utilized were three

Delta TCT-3 1.0 V/A. They were removed from the antenna tuning units, and measured utilizing a HP 8752A Network Analyzer. The common signal was a CW signal from the reflection test port (RF Out) at .99 MHz. The output port of each transformer was fed to the transmission test port (RF In) of the analyzer and compared against the reference transformer for phase and magnitude and determined to be within .025% ratio and .09° accuracy. This far exceeds the manufacturer specification of $\pm 2\%$ magnitude and $\pm 3^\circ$ phase. See Exhibit 3 for details of sample system measurements, antenna monitor sample transformer verification.

The Potomac AM-19D (210) SN1343 antenna monitor was operated and calibrated according to the manufacturer's specifications. The unit was tested using a signal generator at 990 KHz to drive the reference and each other tower with equal length cables, and found to be within the stated resolution of .5° and .5% in phase and ratio specified by the manufacturer. The test exceeded the $\pm 1^\circ$ and $\pm 1\%$ accuracy of the manufacturer's specifications. Additionally a newer Potomac AM 1900 was briefly installed at the site for verification. The AM1900 exhibited the identical readings to the AM-19D.

The site utilizes all three existing towers of the originally licensed KFCD license. No survey is required as they were previously constructed and licensed under BL20040624AEP.

Reference readings were performed by the undersigned using Potomac Instruments FIM-41, SN 2263. See Exhibit 4 for reference reading measurements of both day and night patterns.

KFCD EXHIBIT 1
Tower Self Impedances
And
Verification Of Modeling

KFCD TOWER ONE SELF IMPEDANCE

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

| wire | caps | Radius | Angle | Z | radius | segs |
|------|------|--------|-------|------|--------|------|
| 1 | none | 0 | 0 | 0 | .18 | 10 |
| | | 0 | 0 | 98. | | |
| 2 | none | 140. | 30. | 0 | .18 | 10 |
| | | 140. | 30. | 96. | | |
| 3 | none | 77.5 | 180.5 | 0 | .18 | 10 |
| | | 77.5 | 180.5 | 96.5 | | |

Number of wires = 3
current nodes = 30

| | minimum | maximum |
|------------------|------------|------------|
| Individual wires | wire value | wire value |
| segment length | 2 9.6 | 1 9.8 |
| radius | 1 .18 | 1 .18 |

ELECTRICAL DESCRIPTION

Frequencies (MHz)

| no. | frequency | step | no. of steps | segment length (wavelengths) |
|--------|-----------|------|--------------|------------------------------|
| lowest | | | | minimum maximum |
| 1 | .99 | 0 | 1 | .0266667 .0272222 |

Sources

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

Lumped loads

| load | node | resistance (ohms) | reactance (ohms) | inductance (mH) | capacitance (uF) | passive circuit |
|------|------|-------------------|------------------|-----------------|------------------|-----------------|
| 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2 | 11 | 0 | -8,038.13 | 0 | 0 | 0 |
| 3 | 21 | 0 | -8,038.13 | 0 | 0 | 0 |

IMPEDANCE

normalization = 50.

| freq (MHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|------------------------------|---------------|--------------|--------------|-------------|--------|---------|---------|
| source = 1; node 1, sector 1 | | | | | | | |
| .99 | 52.624 | 65.975 | 84.392 | 51.4 | 3.3592 | -5.3329 | -1.5052 |

CURRENT rms

Frequency = .99 MHz

Input power = .00369449 watts

Efficiency = 100. %

coordinates in degrees

| current | | | | mag (amps) | phase (deg) | real (amps) | imaginary (amps) |
|---------|---|---|-----|------------|-------------|-------------|------------------|
| no. | X | Y | Z | | | | |
| GND | 0 | 0 | 0 | 8.38E-03 | 308.6 | 5.22E-03 | -6.55E-03 |
| 2 | 0 | 0 | 9.8 | 8.7E-03 | 306.4 | 5.16E-03 | -7.01E-03 |

| | | | | | | | |
|-----|----------|----------|-------|----------|-------|-----------|-----------|
| 3 | 0 | 0 | 19.6 | 8.68E-03 | 305. | 4.98E-03 | -7.11E-03 |
| 4 | 0 | 0 | 29.4 | 8.38E-03 | 303.9 | 4.68E-03 | -6.95E-03 |
| 5 | 0 | 0 | 39.2 | 7.82E-03 | 303.1 | 4.26E-03 | -6.55E-03 |
| 6 | 0 | 0 | 49. | 7.02E-03 | 302.3 | 3.75E-03 | -5.94E-03 |
| 7 | 0 | 0 | 58.8 | 6.01E-03 | 301.6 | 3.15E-03 | -5.11E-03 |
| 8 | 0 | 0 | 68.6 | 4.79E-03 | 301. | 2.47E-03 | -4.11E-03 |
| 9 | 0 | 0 | 78.4 | 3.41E-03 | 300.5 | 1.73E-03 | -2.94E-03 |
| 10 | 0 | 0 | 88.2 | 1.85E-03 | 300. | 9.25E-04 | -1.61E-03 |
| END | 0 | 0 | 98. | 0 | 0 | 0 | 0 |
| GND | 121.244 | 70. | 0 | 2.77E-05 | 131.5 | -1.83E-05 | 2.07E-05 |
| 12 | 121.244 | 70. | 9.6 | 1.93E-04 | 131.4 | -1.27E-04 | 1.44E-04 |
| 13 | 121.244 | 70. | 19.2 | 2.93E-04 | 131.4 | -1.94E-04 | 2.2E-04 |
| 14 | 121.244 | 70. | 28.8 | 3.59E-04 | 131.3 | -2.37E-04 | 2.7E-04 |
| 15 | 121.244 | 70. | 38.4 | 3.93E-04 | 131.2 | -2.59E-04 | 2.96E-04 |
| 16 | 121.244 | 70. | 48. | 3.97E-04 | 131.1 | -2.61E-04 | 3.E-04 |
| 17 | 121.244 | 70. | 57.6 | 3.73E-04 | 130.9 | -2.44E-04 | 2.82E-04 |
| 18 | 121.244 | 70. | 67.2 | 3.21E-04 | 130.8 | -2.1E-04 | 2.43E-04 |
| 19 | 121.244 | 70. | 76.8 | 2.44E-04 | 130.6 | -1.59E-04 | 1.85E-04 |
| 20 | 121.244 | 70. | 86.4 | 1.4E-04 | 130.4 | -9.1E-05 | 1.07E-04 |
| END | 121.244 | 70. | 96. | 0 | 0 | 0 | 0 |
| GND | -77.4971 | -.676313 | 0 | 4.07E-05 | 186.6 | -4.04E-05 | -4.71E-06 |
| 22 | -77.4971 | -.676313 | 9.65 | 2.84E-04 | 186.7 | -2.82E-04 | -3.34E-05 |
| 23 | -77.4971 | -.676313 | 19.3 | 4.32E-04 | 186.9 | -4.29E-04 | -5.2E-05 |
| 24 | -77.4971 | -.676313 | 28.95 | 5.28E-04 | 187.1 | -5.24E-04 | -6.54E-05 |
| 25 | -77.4971 | -.676313 | 38.6 | 5.78E-04 | 187.4 | -5.73E-04 | -7.4E-05 |
| 26 | -77.4971 | -.676313 | 48.25 | 5.83E-04 | 187.6 | -5.78E-04 | -7.75E-05 |
| 27 | -77.4971 | -.676313 | 57.9 | 5.46E-04 | 188. | -5.41E-04 | -7.56E-05 |
| 28 | -77.4971 | -.676313 | 67.55 | 4.7E-04 | 188.3 | -4.65E-04 | -6.78E-05 |
| 29 | -77.4971 | -.676313 | 77.2 | 3.55E-04 | 188.7 | -3.51E-04 | -5.36E-05 |
| 30 | -77.4971 | -.676313 | 86.85 | 2.04E-04 | 189.1 | -2.02E-04 | -3.22E-05 |
| END | -77.4971 | -.676313 | 96.5 | 0 | 0 | 0 | 0 |

KFCD TOWER TWO SELF IMPEDANCE

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

| wire | caps | Radius | Angle | Z | radius | segs |
|------|------|--------|-------|------|--------|------|
| 1 | none | 0 | 0 | 0 | .18 | 10 |
| | | 0 | 0 | 98. | | |
| 2 | none | 140. | 30. | 0 | .18 | 10 |
| | | 140. | 30. | 96. | | |
| 3 | none | 77.5 | 180.5 | 0 | .18 | 10 |
| | | 77.5 | 180.5 | 96.5 | | |

Number of wires = 3
current nodes = 30

| | minimum | maximum |
|------------------|------------|------------|
| Individual wires | wire value | wire value |
| segment length | 2 9.6 | 1 9.8 |
| radius | 1 .18 | 1 .18 |

ELECTRICAL DESCRIPTION

Frequencies (MHz)

| frequency | no. of | segment length (wavelengths) |
|-----------------|--------|------------------------------|
| no. lowest step | steps | minimum maximum |
| 1 .99 0 | 1 | .0266667 .0272222 |

Sources

| source node | sector | magnitude | phase | type |
|-------------|--------|-----------|-------|---------|
| 1 11 | 1 | 1. | 0 | voltage |

Lumped loads

| load | node | resistance (ohms) | reactance (ohms) | inductance (mH) | capacitance (uF) | passive circuit |
|------|------|-------------------|------------------|-----------------|------------------|-----------------|
| 1 | 1 | 0 | -4,593.22 | 0 | 0 | 0 |
| 2 | 11 | 0 | 0 | 0 | 0 | 0 |
| 3 | 21 | 0 | -8,038.13 | 0 | 0 | 0 |

IMPEDANCE

normalization = 50.

| freq (MHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|-------------------------------|---------------|--------------|--------------|-------------|--------|---------|---------|
| source = 1; node 11, sector 1 | | | | | | | |
| .99 | 51.341 | 54.887 | 75.156 | 46.9 | 2.8196 | -6.4409 | -1.1179 |

CURRENT peak

Frequency = .99 MHz

Input power = .0045447 watts

Efficiency = 100. %

coordinates in degrees

| current | | | | mag (amps) | phase (deg) | real (amps) | imaginary (amps) |
|---------|---|---|------|------------|-------------|-------------|------------------|
| no. | X | Y | Z | | | | |
| GND | 0 | 0 | 0 | 7.75E-05 | 135.7 | -5.54E-05 | 5.41E-05 |
| 2 | 0 | 0 | 9.8 | 3.45E-04 | 135.7 | -2.47E-04 | 2.41E-04 |
| 3 | 0 | 0 | 19.6 | 5.08E-04 | 135.6 | -3.63E-04 | 3.55E-04 |
| 4 | 0 | 0 | 29.4 | 6.13E-04 | 135.5 | -4.37E-04 | 4.29E-04 |

| | | | | | | | |
|-----|----------|----------|-------|----------|-------|-----------|-----------|
| 5 | 0 | 0 | 39.2 | 6.66E-04 | 135.4 | -4.74E-04 | 4.67E-04 |
| 6 | 0 | 0 | 49. | 6.69E-04 | 135.3 | -4.76E-04 | 4.71E-04 |
| 7 | 0 | 0 | 58.8 | 6.26E-04 | 135.1 | -4.44E-04 | 4.41E-04 |
| 8 | 0 | 0 | 68.6 | 5.37E-04 | 135. | -3.8E-04 | 3.8E-04 |
| 9 | 0 | 0 | 78.4 | 4.06E-04 | 134.8 | -2.86E-04 | 2.88E-04 |
| 10 | 0 | 0 | 88.2 | 2.33E-04 | 134.6 | -1.64E-04 | 1.66E-04 |
| END | 0 | 0 | 98. | 0 | 0 | 0 | 0 |
| GND | 121.244 | 70. | 0 | .0133057 | 313.1 | 9.09E-03 | -9.72E-03 |
| 12 | 121.244 | 70. | 9.6 | .013702 | 311. | 8.98E-03 | -.0103468 |
| 13 | 121.244 | 70. | 19.2 | .0135886 | 309.6 | 8.67E-03 | -.0104674 |
| 14 | 121.244 | 70. | 28.8 | .0130652 | 308.6 | 8.14E-03 | -.0102162 |
| 15 | 121.244 | 70. | 38.4 | .0121583 | 307.7 | 7.43E-03 | -9.62E-03 |
| 16 | 121.244 | 70. | 48. | .0108943 | 306.9 | 6.54E-03 | -8.71E-03 |
| 17 | 121.244 | 70. | 57.6 | 9.3E-03 | 306.3 | 5.5E-03 | -7.5E-03 |
| 18 | 121.244 | 70. | 67.2 | 7.42E-03 | 305.6 | 4.32E-03 | -6.03E-03 |
| 19 | 121.244 | 70. | 76.8 | 5.27E-03 | 305.1 | 3.03E-03 | -4.31E-03 |
| 20 | 121.244 | 70. | 86.4 | 2.87E-03 | 304.6 | 1.63E-03 | -2.36E-03 |
| END | 121.244 | 70. | 96. | 0 | 0 | 0 | 0 |
| GND | -77.4971 | -.676313 | 0 | 3.56E-05 | 67.6 | 1.35E-05 | 3.29E-05 |
| 22 | -77.4971 | -.676313 | 9.65 | 2.49E-04 | 67.5 | 9.51E-05 | 2.3E-04 |
| 23 | -77.4971 | -.676313 | 19.3 | 3.8E-04 | 67.3 | 1.46E-04 | 3.5E-04 |
| 24 | -77.4971 | -.676313 | 28.95 | 4.66E-04 | 67.2 | 1.81E-04 | 4.29E-04 |
| 25 | -77.4971 | -.676313 | 38.6 | 5.12E-04 | 67. | 2.E-04 | 4.71E-04 |
| 26 | -77.4971 | -.676313 | 48.25 | 5.19E-04 | 66.7 | 2.05E-04 | 4.77E-04 |
| 27 | -77.4971 | -.676313 | 57.9 | 4.89E-04 | 66.5 | 1.95E-04 | 4.48E-04 |
| 28 | -77.4971 | -.676313 | 67.55 | 4.23E-04 | 66.2 | 1.7E-04 | 3.87E-04 |
| 29 | -77.4971 | -.676313 | 77.2 | 3.22E-04 | 66. | 1.31E-04 | 2.94E-04 |
| 30 | -77.4971 | -.676313 | 86.85 | 1.86E-04 | 65.7 | 7.67E-05 | 1.7E-04 |
| END | -77.4971 | -.676313 | 96.5 | 0 | 0 | 0 | 0 |

KFCD TOWER THREE SELF IMPEDANCE

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

| wire | caps | Radius | Angle | Z | radius | segs |
|------|------|--------|-------|------|--------|------|
| 1 | none | 0 | 0 | 0 | .18 | 10 |
| | | 0 | 0 | 98. | | |
| 2 | none | 140. | 30. | 0 | .18 | 10 |
| | | 140. | 30. | 96. | | |
| 3 | none | 77.5 | 180.5 | 0 | .18 | 10 |
| | | 77.5 | 180.5 | 96.5 | | |

Number of wires = 3
current nodes = 30

| | minimum | maximum |
|------------------|------------|------------|
| Individual wires | wire value | wire value |
| segment length | 2 9.6 | 1 9.8 |
| radius | 1 .18 | 1 .18 |

ELECTRICAL DESCRIPTION

Frequencies (MHz)

| frequency | no. of | segment length (wavelengths) |
|-----------------|--------|------------------------------|
| no. lowest step | steps | minimum maximum |
| 1 .99 0 | 1 | .0266667 .0272222 |

Sources

| source node | sector | magnitude | phase | type |
|-------------|--------|-----------|-------|---------|
| 1 21 | 1 | 1. | 0 | voltage |

Lumped loads

| load | node | resistance (ohms) | reactance (ohms) | inductance (mH) | capacitance (uF) | passive circuit |
|------|------|-------------------|------------------|-----------------|------------------|-----------------|
| 1 | 1 | 0 | -4,593.22 | 0 | 0 | 0 |
| 2 | 11 | 0 | -8,038.13 | 0 | 0 | 0 |
| 3 | 21 | 0 | 0 | 0 | 0 | 0 |

IMPEDANCE

normalization = 50.

| freq (MHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|-------------------------------|---------------|--------------|--------------|-------------|--------|---------|---------|
| source = 1; node 21, sector 1 | | | | | | | |
| .99 | 50.316 | 55.23 | 74.713 | 47.7 | 2.8633 | -6.3336 | -1.1499 |

CURRENT peak

Frequency = .99 MHz

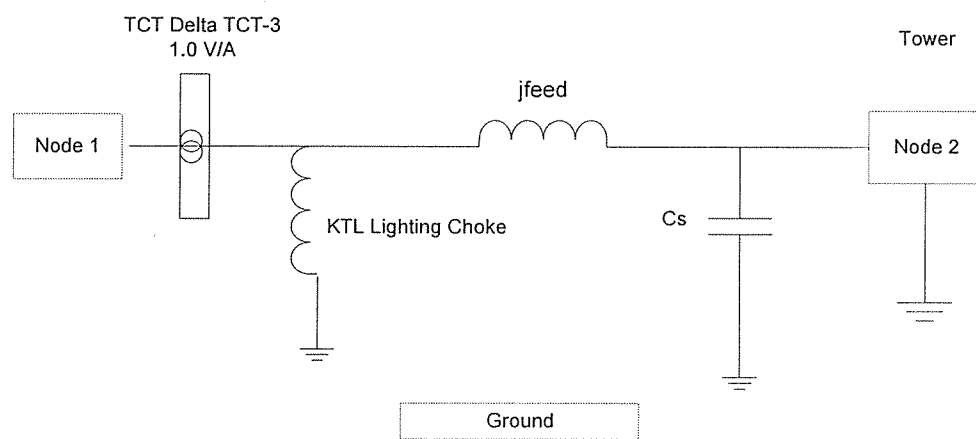
Input power = .00450694 watts

Efficiency = 100. %

coordinates in degrees

| current | | | | mag (amps) | phase (deg) | real (amps) | imaginary (amps) |
|---------|---|---|-----|------------|-------------|-------------|------------------|
| no. | X | Y | Z | | | | |
| GND | 0 | 0 | 0 | 1.15E-04 | 190.1 | -1.13E-04 | -2.01E-05 |
| 2 | 0 | 0 | 9.8 | 5.1E-04 | 190.2 | -5.02E-04 | -9.04E-05 |

| | | | | | | | |
|-----|----------|----------|-------|----------|-------|-----------|-----------|
| 3 | 0 | 0 | 19.6 | 7.5E-04 | 190.4 | -7.38E-04 | -1.35E-04 |
| 4 | 0 | 0 | 29.4 | 9.04E-04 | 190.6 | -8.88E-04 | -1.66E-04 |
| 5 | 0 | 0 | 39.2 | 9.8E-04 | 190.9 | -9.63E-04 | -1.85E-04 |
| 6 | 0 | 0 | 49. | 9.83E-04 | 191.2 | -9.65E-04 | -1.91E-04 |
| 7 | 0 | 0 | 58.8 | 9.17E-04 | 191.5 | -8.99E-04 | -1.83E-04 |
| 8 | 0 | 0 | 68.6 | 7.86E-04 | 191.9 | -7.69E-04 | -1.62E-04 |
| 9 | 0 | 0 | 78.4 | 5.93E-04 | 192.3 | -5.79E-04 | -1.26E-04 |
| 10 | 0 | 0 | 88.2 | 3.4E-04 | 192.7 | -3.31E-04 | -7.45E-05 |
| END | 0 | 0 | 98. | 0 | 0 | 0 | 0 |
| GND | 121.244 | 70. | 0 | 3.58E-05 | 66.8 | 1.41E-05 | 3.29E-05 |
| 12 | 121.244 | 70. | 9.6 | 2.49E-04 | 66.8 | 9.84E-05 | 2.29E-04 |
| 13 | 121.244 | 70. | 19.2 | 3.81E-04 | 66.6 | 1.51E-04 | 3.49E-04 |
| 14 | 121.244 | 70. | 28.8 | 4.67E-04 | 66.5 | 1.86E-04 | 4.28E-04 |
| 15 | 121.244 | 70. | 38.4 | 5.13E-04 | 66.3 | 2.06E-04 | 4.69E-04 |
| 16 | 121.244 | 70. | 48. | 5.2E-04 | 66. | 2.11E-04 | 4.75E-04 |
| 17 | 121.244 | 70. | 57.6 | 4.9E-04 | 65.8 | 2.01E-04 | 4.47E-04 |
| 18 | 121.244 | 70. | 67.2 | 4.23E-04 | 65.5 | 1.75E-04 | 3.85E-04 |
| 19 | 121.244 | 70. | 76.8 | 3.22E-04 | 65.2 | 1.35E-04 | 2.93E-04 |
| 20 | 121.244 | 70. | 86.4 | 1.87E-04 | 64.9 | 7.9E-05 | 1.69E-04 |
| END | 121.244 | 70. | 96. | 0 | 0 | 0 | 0 |
| GND | -77.4971 | -.676313 | 0 | .0133845 | 312.3 | 9.01E-03 | -9.89E-03 |
| 22 | -77.4971 | -.676313 | 9.65 | .013788 | 310.2 | 8.91E-03 | -.0105242 |
| 23 | -77.4971 | -.676313 | 19.3 | .0136763 | 308.9 | 8.59E-03 | -.0106399 |
| 24 | -77.4971 | -.676313 | 28.95 | .0131502 | 307.9 | 8.08E-03 | -.0103788 |
| 25 | -77.4971 | -.676313 | 38.6 | .0122371 | 307. | 7.37E-03 | -9.77E-03 |
| 26 | -77.4971 | -.676313 | 48.25 | .0109638 | 306.3 | 6.49E-03 | -8.84E-03 |
| 27 | -77.4971 | -.676313 | 57.9 | 9.36E-03 | 305.6 | 5.45E-03 | -7.61E-03 |
| 28 | -77.4971 | -.676313 | 67.55 | 7.46E-03 | 305. | 4.28E-03 | -6.11E-03 |
| 29 | -77.4971 | -.676313 | 77.2 | 5.3E-03 | 304.5 | 3.E-03 | -4.37E-03 |
| 30 | -77.4971 | -.676313 | 86.85 | 2.88E-03 | 304. | 1.61E-03 | -2.39E-03 |
| END | -77.4971 | -.676313 | 96.5 | 0 | 0 | 0 | 0 |



BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : KFCD
NETWORK ID : T1 Self

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 16.83 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -4593.22 OHMS
TOWER IMPEDANCE (R,X) : 52.62, 65.97 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 54.16 | 66.30 |
| 1 | | 2 | 0.00 | 16.83 |

| NODE | VOLTAGE | |
|------|-----------|-------|
| | MAGNITUDE | PHASE |
| 1 | 1.00 | 0.00 |
| 2 | 0.86 | -6.16 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|--------|
| INPUT IMPEDANCE (OHMS) : | 51.46 | 81.88 | 96.71 | 57.85 |
| INPUT CURRENT (AMPS) : | 0.01 | -0.01 | 0.01 | -57.85 |
| OUTPUT CURRENT (AMPS) : | 0.01 | -0.01 | 0.01 | -57.58 |

INPUT/OUTPUT CURRENT RATIO = 1.0113
INPUT/OUTPUT PHASE = -0.27 DEGREES

BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : KFCD
NETWORK ID : T2Self

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 22.77 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -8038.12 OHMS
TOWER IMPEDANCE (R,X) : 51.34, 54.89 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 52.05 | 54.93 |
| 1 | | 2 | 0.00 | 22.77 |

| NODE | VOLTAGE | |
|------|-----------|-------|
| | MAGNITUDE | PHASE |
| 1 | 100.00 | 0.00 |
| 2 | 80.91 | -9.64 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|--------|
| INPUT IMPEDANCE (OHMS) : | 49.61 | 76.65 | 91.31 | 57.09 |
| INPUT CURRENT (AMPS) : | 0.60 | -0.92 | 1.10 | -57.09 |
| OUTPUT CURRENT (AMPS) : | 0.59 | -0.90 | 1.08 | -56.55 |

INPUT/OUTPUT CURRENT RATIO = 1.0173
INPUT/OUTPUT PHASE = -0.54 DEGREES

BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : KFCD
NETWORK ID : T3 Self

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 24.65 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -8038.12 OHMS
TOWER IMPEDANCE (R,X) : 50.32, 55.23 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 51.01 | 55.29 |
| 1 | | 2 | 0.00 | 24.65 |

| NODE | VOLTAGE | |
|------|-----------|--------|
| | MAGNITUDE | PHASE |
| 1 | 1.00 | 0.00 |
| 2 | 0.79 | -10.15 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|--------|
| INPUT IMPEDANCE (OHMS) : | 48.56 | 78.76 | 92.52 | 58.34 |
| INPUT CURRENT (AMPS) : | 0.01 | -0.01 | 0.01 | -58.34 |
| OUTPUT CURRENT (AMPS) : | 0.01 | -0.01 | 0.01 | -57.82 |

INPUT/OUTPUT CURRENT RATIO = 1.0179
INPUT/OUTPUT PHASE = -0.52 DEGREES

KFCD SELF IMPEDANCE VERIFICATION OF MODEL

| Tower # | Tower Impedance Measured At ATU J-Plug Om. | ATU Shunt Lighting Choke Om. | Feed Measured Om. | Tower Shunt Base Insulator, ETC, Om. | Tower Modeled Base Impedance Om. | Corrected Model At ATU J-Plug Om. |
|---------|--|------------------------------|-------------------|--------------------------------------|----------------------------------|-----------------------------------|
| 1* | 51.9+j79.2 | j3222.14 | j16.83 | -j4593.22 | 52.624+j65.97 | 51.46+j81.88 |
| 2 | 50+j76.23 | j3222.14 | j22.77 | -j8038.13 | 51.341+j54.887 | 49.612+j76.65 |
| 3 | 52+j76.727 | j3222.14 | j24.65 | -j8038.13 | 50.316+j55.23 | 48.56+j78.76 |

*Tower 1 base shunt reactance includes Kintronic 01 STL Isocoupler 20 pf for base insulator and 15 pf for isocoupler

KFCD EXHIBIT 2
MODELED DIRECTIONAL
ARRAY AND OPERATING PARAMETERS

KFCD DIRECTIONAL DAY

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

| wire | caps | Radius | Angle | Z | radius | segs |
|------|------|--------|-------|------|--------|------|
| 1 | none | 0 | 0 | 0 | .18 | 10 |
| | | 0 | 0 | 98. | | |
| 2 | none | 140. | 30. | 0 | .18 | 10 |
| | | 140. | 30. | 96. | | |
| 3 | none | 77.5 | 180.5 | 0 | .18 | 10 |
| | | 77.5 | 180.5 | 96.5 | | |

Number of wires = 3
current nodes = 30

| | minimum | maximum |
|------------------|------------|------------|
| Individual wires | wire value | wire value |
| segment length | 2 9.6 | 1 9.8 |
| radius | 1 .18 | 1 .18 |

ELECTRICAL DESCRIPTION

Frequencies (MHz)

| no. | frequency | step | no. of steps | segment length (wavelengths) |
|-----|-----------|------|--------------|------------------------------|
| | lowest | | | minimum maximum |
| 1 | .99 | 0 | 1 | .0266667 .0272222 |

Sources

| source | node | sector | magnitude | phase | type |
|--------|------|--------|-----------|-------|---------|
| 1 | 1 | 1 | 1,385.11 | 53.6 | voltage |
| 2 | 11 | 1 | 287.533 | 321.9 | voltage |
| 3 | 21 | 1 | 210.824 | 332.7 | voltage |

IMPEDANCE

normalization = 50.

| freq (MHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|-------------------------------|---------------|--------------|--------------|-------------|--------|---------|---------|
| source = 1; node 1, sector 1 | | | | | | | |
| .99 | 62.201 | 68.792 | 92.743 | 47.9 | 3.2631 | -5.5005 | -1.4376 |
| source = 2; node 11, sector 1 | | | | | | | |
| .99 | 33.608 | -57.8 | 66.861 | 300.2 | 3.891 | -4.5669 | -1.8668 |
| source = 3; node 21, sector 1 | | | | | | | |
| .99 | -22.59 | -38.941 | 45.019 | 239.9 | **** | **** | **** |

CURRENT rms

Frequency = .99 MHz

Input power = 7,000. watts

Efficiency = 100. %

coordinates in degrees

| current | | | | mag | phase | real | imaginary |
|---------|---|---|---|--------|-------|--------|-----------|
| no. | X | Y | Z | (amps) | (deg) | (amps) | (amps) |

| | | | | | | | |
|-----|----------|----------|-------|---------|-------|----------|----------|
| GND | 0 | 0 | 0 | 10.5606 | 5.7 | 10.5082 | 1.05049 |
| 2 | 0 | 0 | 9.8 | 10.9953 | 3.1 | 10.9789 | .599493 |
| 3 | 0 | 0 | 19.6 | 10.9817 | 1.5 | 10.9778 | .291385 |
| 4 | 0 | 0 | 29.4 | 10.6163 | .3 | 10.6162 | .0515331 |
| 5 | 0 | 0 | 39.2 | 9.92217 | 359.3 | 9.92134 | -.12836 |
| 6 | 0 | 0 | 49. | 8.92147 | 358.4 | 8.91796 | -.250308 |
| 7 | 0 | 0 | 58.8 | 7.6395 | 357.6 | 7.633 | -.31507 |
| 8 | 0 | 0 | 68.6 | 6.10448 | 357. | 6.0959 | -.323466 |
| 9 | 0 | 0 | 78.4 | 4.34264 | 356.4 | 4.33384 | -.276458 |
| 10 | 0 | 0 | 88.2 | 2.36374 | 355.8 | 2.35733 | -.173948 |
| END | 0 | 0 | 98. | 0 | 0 | 0 | 0 |
| GND | 121.244 | 70. | 0 | 3.04089 | 21.7 | 2.82491 | 1.12558 |
| 12 | 121.244 | 70. | 9.6 | 2.87575 | 20.2 | 2.69861 | .993704 |
| 13 | 121.244 | 70. | 19.2 | 2.69113 | 19.1 | 2.54261 | .881656 |
| 14 | 121.244 | 70. | 28.8 | 2.46615 | 18.2 | 2.34299 | .769615 |
| 15 | 121.244 | 70. | 38.4 | 2.20144 | 17.3 | 2.10135 | .656249 |
| 16 | 121.244 | 70. | 48. | 1.90081 | 16.6 | 1.8218 | .542308 |
| 17 | 121.244 | 70. | 57.6 | 1.56945 | 15.9 | 1.50964 | .429147 |
| 18 | 121.244 | 70. | 67.2 | 1.21307 | 15.2 | 1.17059 | .31822 |
| 19 | 121.244 | 70. | 76.8 | .836783 | 14.6 | .809814 | .210729 |
| 20 | 121.244 | 70. | 86.4 | .442462 | 14. | .429333 | .106985 |
| END | 121.244 | 70. | 96. | 0 | 0 | 0 | 0 |
| GND | -77.4971 | -.676313 | 0 | 3.31136 | 92.9 | -.165403 | 3.30723 |
| 22 | -77.4971 | -.676313 | 9.65 | 3.17697 | 93.9 | -.213508 | 3.16979 |
| 23 | -77.4971 | -.676313 | 19.3 | 3.00321 | 94.5 | -.236638 | 2.99387 |
| 24 | -77.4971 | -.676313 | 28.95 | 2.77564 | 95. | -.244066 | 2.76489 |
| 25 | -77.4971 | -.676313 | 38.6 | 2.49617 | 95.5 | -.237682 | 2.48483 |
| 26 | -77.4971 | -.676313 | 48.25 | 2.16956 | 95.8 | -.219008 | 2.15848 |
| 27 | -77.4971 | -.676313 | 57.9 | 1.802 | 96. | -.189741 | 1.79198 |
| 28 | -77.4971 | -.676313 | 67.55 | 1.4003 | 96.2 | -.151811 | 1.39205 |
| 29 | -77.4971 | -.676313 | 77.2 | .97068 | 96.3 | -.107214 | .964741 |
| 30 | -77.4971 | -.676313 | 86.85 | .515599 | 96.4 | -.057532 | .512379 |
| END | -77.4971 | -.676313 | 96.5 | 0 | 0 | 0 | 0 |

KFCD DAY
MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = .99 MHz

| | field ratio | |
|-------|-------------|-------------|
| tower | magnitude | phase (deg) |
| 1 | 1. | 0 |
| 2 | .225 | 18. |
| 3 | .255 | 95. |

VOLTAGES AND CURRENTS - rms

| source | voltage | | current | |
|--------|-----------|-------------|-----------|-------------|
| node | magnitude | phase (deg) | magnitude | phase (deg) |
| 1 | 979.419 | 53.6 | 10.5606 | 5.7 |
| 11 | 203.316 | 321.9 | 3.04089 | 21.7 |
| 21 | 149.075 | 332.7 | 3.31136 | 92.9 |

Sum of square of source currents = 263.475

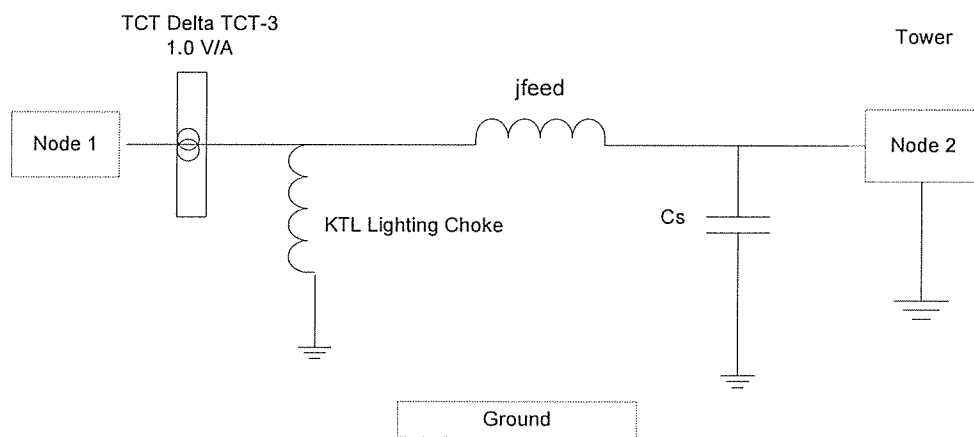
Total power = 7,000. watts

TOWER ADMITTANCE MATRIX

| admittance | real (mhos) | imaginary (mhos) |
|------------|-------------|------------------|
| Y(1, 1) | .00649959 | -.0065181 |
| Y(1, 2) | .00465903 | .000604997 |
| Y(1, 3) | .00396759 | .00358573 |
| Y(2, 1) | .00465902 | .000605158 |
| Y(2, 2) | .0102353 | -.00877377 |
| Y(2, 3) | .00098403 | -.00108337 |
| Y(3, 1) | .00396748 | .00358591 |
| Y(3, 2) | .000984 | -.00108336 |
| Y(3, 3) | .00692573 | -.00856526 |

TOWER IMPEDANCE MATRIX

| impedance | real (ohms) | imaginary (ohms) |
|-----------|-------------|------------------|
| Z(1, 1) | 52.8025 | 65.9718 |
| Z(1, 2) | 1.49583 | -26.4217 |
| Z(1, 3) | 32.9902 | -20.3441 |
| Z(2, 1) | 1.49504 | -26.4217 |
| Z(2, 2) | 51.3128 | 54.77 |
| Z(2, 3) | -19.1577 | -9.08601 |
| Z(3, 1) | 32.9891 | -20.3452 |
| Z(3, 2) | -19.1576 | -9.08609 |
| Z(3, 3) | 50.5712 | 55.4114 |



BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : kfcd
NETWORK ID : T1 DA D

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 16.83 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -4593.22 OHMS
TOWER IMPEDANCE (R,X) : 62.01, 68.79 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 63.90 | 68.96 |
| 1 | | 2 | 0.00 | 16.83 |

| NODE | VOLTAGE | |
|------|-----------|-------|
| | MAGNITUDE | PHASE |
| 1 | 1114.42 | 59.74 |
| 2 | 979.42 | 53.60 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|-------|
| INPUT IMPEDANCE (OHMS) : | 60.60 | 84.74 | 104.18 | 54.43 |
| INPUT CURRENT (AMPS) : | 10.65 | 0.99 | 10.70 | 5.31 |
| OUTPUT CURRENT (AMPS) : | 10.52 | 1.04 | 10.58 | 5.63 |

INPUT/OUTPUT CURRENT RATIO = 1.0115
INPUT/OUTPUT PHASE = -0.32 DEGREES

BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : KFCD
NETWORK ID : T2 DA D

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 22.77 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -8038.13 OHMS
TOWER IMPEDANCE (R,X) : 33.61, -57.80 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 33.13 | -57.52 |
| 1 | | 2 | 0.00 | 22.77 |

| NODE | VOLTAGE | |
|------|-----------|--------|
| | MAGNITUDE | PHASE |
| 1 | 147.06 | -24.41 |
| 2 | 203.32 | 321.90 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|--------|
| INPUT IMPEDANCE (OHMS) : | 33.85 | -34.78 | 48.54 | -45.77 |
| INPUT CURRENT (AMPS) : | 2.82 | 1.10 | 3.03 | 21.36 |
| OUTPUT CURRENT (AMPS) : | 2.82 | 1.13 | 3.04 | 21.72 |

INPUT/OUTPUT CURRENT RATIO = 0.9964
INPUT/OUTPUT PHASE = -0.36 DEGREES

BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : KFCD
NETWORK ID : T3 DA D

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 24.66 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -8038.12 OHMS
TOWER IMPEDANCE (R,X) : -22.59, -38.94 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | -22.37 | -38.82 |
| 1 | | 2 | 0.00 | 24.66 |

| NODE | VOLTAGE | |
|------|-----------|--------|
| | MAGNITUDE | PHASE |
| 1 | 88.09 | -55.02 |
| 2 | 149.07 | 332.70 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|--------|-----------|-----------|---------|
| INPUT IMPEDANCE (OHMS) : | -22.57 | -14.06 | 26.59 | -148.08 |
| INPUT CURRENT (AMPS) : | -0.18 | 3.31 | 3.31 | 93.06 |
| OUTPUT CURRENT (AMPS) : | -0.16 | 3.31 | 3.31 | 92.82 |

INPUT/OUTPUT CURRENT RATIO = 1.0005
INPUT/OUTPUT PHASE = 0.24 DEGREES

KFCD Night

GEOMETRY

Wire coordinates in degrees; other dimensions in meters

Environment: perfect ground

| wire | caps | Radius | Angle | Z | radius | segs |
|------|------|--------|-------|------|--------|------|
| 1 | none | 0 | 0 | 0 | .18 | 10 |
| | | 0 | 0 | 98. | | |
| 2 | none | 140. | 30. | 0 | .18 | 10 |
| | | 140. | 30. | 96. | | |
| 3 | none | 77.5 | 180.5 | 0 | .18 | 10 |
| | | 77.5 | 180.5 | 96.5 | | |

Number of wires = 3
current nodes = 30

| | minimum | | maximum | |
|------------------|---------|-------|---------|-------|
| Individual wires | wire | value | wire | value |
| segment length | 2 | 9.6 | 1 | 9.8 |
| radius | 1 | .18 | 1 | .18 |

ELECTRICAL DESCRIPTION

Frequencies (MHz)

| frequency | | | no. of steps | segment length (wavelengths) | |
|-----------|--------|------|-----------------|------------------------------|----------|
| no. | lowest | step | | minimum | maximum |
| 1 | .99 | 0 | 1 | .0266667 | .0272222 |

Sources

| source | node | sector | magnitude | phase | type |
|--------|------|--------|-----------|-------|---------|
| 1 | 1 | 1 | 418.019 | 52. | voltage |
| 2 | 11 | 1 | 54.0101 | 39.3 | voltage |
| 3 | 21 | 1 | 306.278 | 311.7 | voltage |

IMPEDANCE

normalization = 50.

| freq (MHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|------------------------------|------------------|-----------------|-----------------|----------------|--------|-----------|-----------|
| source = 1; node 1, sector 1 | | | | | | | |
| .99 | 50.33 | 54.372 | 74.091 | 47.2 | 2.8202 | -6.4392 | -1.1184 |

| | | | | | | | |
|-------------------------------|--------|--------|--------|-----|--------|---------|---------|
| source = 2; node 11, sector 1 | | | | | | | |
| .99 | 25.916 | 1.4079 | 25.954 | 3.1 | 1.9314 | -9.9587 | -.46218 |

| | | | | | | | |
|-------------------------------|-------|--------|--------|------|--------|---------|---------|
| source = 3; node 21, sector 1 | | | | | | | |
| .99 | 77.06 | 227.12 | 239.84 | 71.3 | 15.514 | -1.1213 | -6.4291 |

CURRENT rms

Frequency = .99 MHz

Input power = 920. watts

Efficiency = 100. %

coordinates in degrees

| current | | | | mag | phase | real | imaginary |
|---------|---|---|-----|---------|-------|---------|-----------|
| no. | X | Y | Z | (amps) | (deg) | (amps) | (amps) |
| GND | 0 | 0 | 0 | 3.98949 | 4.8 | 3.97563 | .332244 |
| 2 | 0 | 0 | 9.8 | 4.10883 | 2.7 | 4.10439 | .190828 |

| | | | | | | | |
|-----|----------|----------|-------|---------|-------|----------|-----------|
| 3 | 0 | 0 | 19.6 | 4.07445 | 1.3 | 4.07337 | .0937638 |
| 4 | 0 | 0 | 29.4 | 3.91619 | .3 | 3.91615 | .0177488 |
| 5 | 0 | 0 | 39.2 | 3.64229 | 359.4 | 3.64207 | -.039706 |
| 6 | 0 | 0 | 49. | 3.26097 | 358.6 | 3.26001 | -.0790779 |
| 7 | 0 | 0 | 58.8 | 2.78174 | 357.9 | 2.77993 | -.100412 |
| 8 | 0 | 0 | 68.6 | 2.21505 | 357.3 | 2.21262 | -.103745 |
| 9 | 0 | 0 | 78.4 | 1.57066 | 356.7 | 1.56813 | -.0891485 |
| 10 | 0 | 0 | 88.2 | .852303 | 356.2 | .850437 | -.056363 |
| END | 0 | 0 | 98. | 0 | 0 | 0 | 0 |
| GND | 121.244 | 70. | 0 | 1.47148 | 36.1 | 1.18832 | .867832 |
| 12 | 121.244 | 70. | 9.6 | 1.45613 | 35. | 1.19243 | .835715 |
| 13 | 121.244 | 70. | 19.2 | 1.40644 | 34.3 | 1.16227 | .79196 |
| 14 | 121.244 | 70. | 28.8 | 1.32369 | 33.6 | 1.10191 | .733454 |
| 15 | 121.244 | 70. | 38.4 | 1.20972 | 33.1 | 1.01328 | .660822 |
| 16 | 121.244 | 70. | 48. | 1.06697 | 32.6 | .898542 | .575376 |
| 17 | 121.244 | 70. | 57.6 | .898447 | 32.2 | .76026 | .478761 |
| 18 | 121.244 | 70. | 67.2 | .707356 | 31.8 | .601172 | .372754 |
| 19 | 121.244 | 70. | 76.8 | .496601 | 31.4 | .423747 | .258942 |
| 20 | 121.244 | 70. | 86.4 | .267128 | 31.1 | .228795 | .137877 |
| END | 121.244 | 70. | 96. | 0 | 0 | 0 | 0 |
| GND | -77.4971 | -.676313 | 0 | .902991 | 240.4 | -.445757 | -.785299 |
| 22 | -77.4971 | -.676313 | 9.65 | 1.04644 | 237.6 | -.56091 | -.88341 |
| 23 | -77.4971 | -.676313 | 19.3 | 1.11058 | 236.1 | -.619049 | -.922046 |
| 24 | -77.4971 | -.676313 | 28.95 | 1.12206 | 235.1 | -.641569 | -.920547 |
| 25 | -77.4971 | -.676313 | 38.6 | 1.08537 | 234.4 | -.631933 | -.882434 |
| 26 | -77.4971 | -.676313 | 48.25 | 1.00355 | 233.8 | -.592261 | -.810153 |
| 27 | -77.4971 | -.676313 | 57.9 | .879722 | 233.4 | -.524628 | -.706171 |
| 28 | -77.4971 | -.676313 | 67.55 | .717283 | 233. | -.431292 | -.573134 |
| 29 | -77.4971 | -.676313 | 77.2 | .519446 | 232.8 | -.314414 | -.413483 |
| 30 | -77.4971 | -.676313 | 86.85 | .287392 | 232.5 | -.174917 | -.228031 |
| END | -77.4971 | -.676313 | 96.5 | 0 | 0 | 0 | 0 |

KFCD
MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = .99 MHz

| | field ratio | |
|-------|-------------|-------------|
| tower | magnitude | phase (deg) |
| 1 | 1. | 0 |
| 2 | .33 | 33.5 |
| 3 | .285 | -125. |

VOLTAGES AND CURRENTS - rms

| source voltage | | | current | |
|----------------|-----------|-------------|-----------|-------------|
| node | magnitude | phase (deg) | magnitude | phase (deg) |
| 1 | 295.584 | 52. | 3.98949 | 4.8 |
| 11 | 38.1909 | 39.3 | 1.47147 | 36.1 |
| 21 | 216.571 | 311.7 | .902991 | 240.4 |

Sum of square of source currents = 37.7932

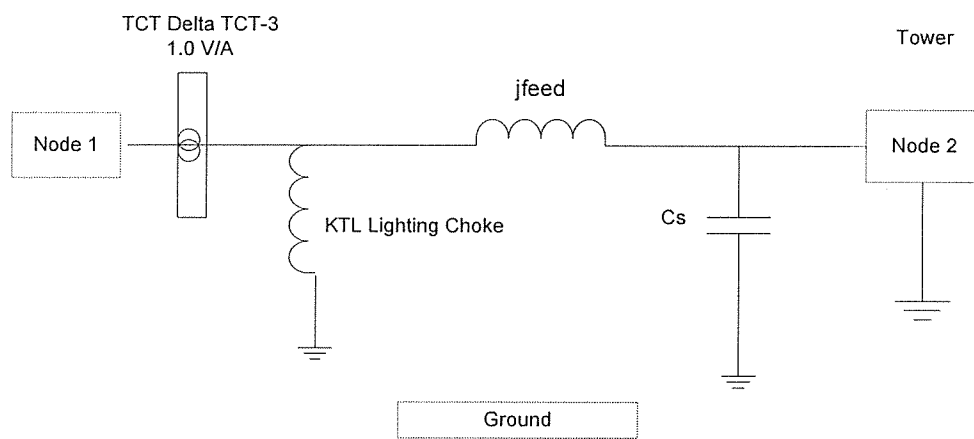
Total power = 920. watts

TOWER ADMITTANCE MATRIX

| admittance | real (mhos) | imaginary (mhos) |
|------------|-------------|------------------|
| Y(1, 1) | .00649959 | -.0065181 |
| Y(1, 2) | .00465903 | .000604997 |
| Y(1, 3) | .00396759 | .00358573 |
| Y(2, 1) | .00465902 | .000605158 |
| Y(2, 2) | .0102353 | -.00877377 |
| Y(2, 3) | .00098403 | -.00108337 |
| Y(3, 1) | .00396748 | .00358591 |
| Y(3, 2) | .000984 | -.00108336 |
| Y(3, 3) | .00692573 | -.00856526 |

TOWER IMPEDANCE MATRIX

| impedance | real (ohms) | imaginary (ohms) |
|-----------|-------------|------------------|
| Z(1, 1) | 52.8025 | 65.9718 |
| Z(1, 2) | 1.49583 | -26.4217 |
| Z(1, 3) | 32.9902 | -20.3441 |
| Z(2, 1) | 1.49504 | -26.4217 |
| Z(2, 2) | 51.3128 | 54.77 |
| Z(2, 3) | -19.1577 | -9.08601 |
| Z(3, 1) | 32.9891 | -20.3452 |
| Z(3, 2) | -19.1576 | -9.08609 |
| Z(3, 3) | 50.5712 | 55.4114 |



BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : KFCD
NETWORK ID : T1 DA Night

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 16.83 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -4593.22 OHMS
TOWER IMPEDANCE (R,X) : 50.33, 54.37 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 51.54 | 54.45 |
| 1 | | 2 | 0.00 | 16.83 |

| NODE | VOLTAGE | |
|------|-----------|-------|
| | MAGNITUDE | PHASE |
| 1 | 346.79 | 59.56 |
| 2 | 295.58 | 52.00 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|-------|
| INPUT IMPEDANCE (OHMS) : | 49.32 | 70.51 | 86.05 | 55.03 |
| INPUT CURRENT (AMPS) : | 4.02 | 0.32 | 4.03 | 4.53 |
| OUTPUT CURRENT (AMPS) : | 3.98 | 0.33 | 3.99 | 4.79 |

INPUT/OUTPUT CURRENT RATIO = 1.0102
INPUT/OUTPUT PHASE = -0.26 DEGREES

BASE NETWORK COMPUTATION
PHASETEK INC.
QUAKERTOWN PA

CUSTOMER : KFCD
NETWORK ID : T2 DA Night

FREQUENCY : 990.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 22.77 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -8038.13 OHMS
TOWER IMPEDANCE (R,X) : 25.92, 1.41 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 25.92 | 1.32 |
| 1 | | 2 | 0.00 | 22.77 |

| NODE | VOLTAGE | |
|------|-----------|-------|
| | MAGNITUDE | PHASE |
| 1 | 52.07 | 79.28 |
| 2 | 38.19 | 39.30 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|-------|
| INPUT IMPEDANCE (OHMS) : | 25.54 | 24.12 | 35.13 | 43.36 |
| INPUT CURRENT (AMPS) : | 1.20 | 0.87 | 1.48 | 35.92 |
| OUTPUT CURRENT (AMPS) : | 1.19 | 0.87 | 1.47 | 36.19 |

INPUT/OUTPUT CURRENT RATIO = 1.0073
INPUT/OUTPUT PHASE = -0.27 DEGREES

BASE NETWORK COMPUTATION
 PHASETEK INC.
 QUAKERTOWN PA

CUSTOMER : KFCD
 NETWORK ID : T3 DA Night

FREQUENCY : 990.00 kHz
 ATU SHUNT IMPEDANCE (R,X) : 0.00, 3222.14 OHMS
 TOWER FEED IMPEDANCE (R,X) : 0.00, 24.65 OHMS
 TOWER SHUNT IMPEDANCE (R,X) : 0.00, -8038.12 OHMS
 TOWER IMPEDANCE (R,X) : 77.06, 227.12 OHMS

| NODE | TO | NODE | IMPEDANCE (OHMS) | |
|------|----|--------|------------------|---------|
| | | | R | X |
| 1 | | GROUND | 0.00 | 3222.14 |
| 2 | | GROUND | 81.60 | 232.92 |
| 1 | | 2 | 0.00 | 24.65 |

| NODE | VOLTAGE | |
|------|-----------|--------|
| | MAGNITUDE | PHASE |
| 1 | 237.09 | -46.57 |
| 2 | 216.57 | 311.70 |

| | REAL | IMAGINARY | MAGNITUDE | PHASE |
|--------------------------|-------|-----------|-----------|---------|
| INPUT IMPEDANCE (OHMS) : | 69.93 | 240.14 | 250.12 | 73.76 |
| INPUT CURRENT (AMPS) : | -0.48 | -0.82 | 0.95 | -120.34 |
| OUTPUT CURRENT (AMPS) : | -0.45 | -0.79 | 0.90 | -119.56 |

INPUT/OUTPUT CURRENT RATIO = 1.0498
 INPUT/OUTPUT PHASE = -0.78 DEGREES

KFCD MODELED PARAMETERS AT ATU FROM MOM

| Day | Modeled Impedance At Tower (Ohm) | Modeled Current At Tower (Amp) | Modeled Phase At Tower (Degrees) | Modeled Current Corrected for ATU TCT | Modeled Phase Corrected For ATU TCT | Normalized Ratio | Normalized Phase (Degrees) |
|---------|---|---|---|---|---|---------------------|----------------------------------|
| Tower 1 | 62.201 +j68.792 | 10.58 | 5.63 | 10.7 | 5.31 | 1 | 0 |
| Tower 2 | 33.608 - j57.8 | 3.04 | 21.72 | 3.03 | 21.37 | 0.2831 | 16.06 |
| Tower 3 | -22.59 - j38.941 | 3.31 | 92.82 | 3.31 | 93.06 | 0.309 | 87.75 |
| Night | | | | | | | |
| Tower 1 | 50.33 +j54.372 | 3.99 | 4.79 | 4.03 | 4.53 | 1 | 0 |
| Tower 2 | 25.916 +j1.4079 | 1.47147 | 36.19 | 1.48 | 35.92 | 0.367 | 31.39 |
| Tower 3 | 77.06 +j227.12 | 0.902991 | -119.6 | 0.95 | -120.34 | 0.235 | -124.87 |

KFCD EXHIBIT 3
Sample System Verification

KFCD Sample System Exhibit

| | Resonance Below 990Khz | Resonance Above 990Khz | Electrical Length° | Impedance w/ TCT at 990 kHz |
|---------|---------------------------|---------------------------|-----------------------|--------------------------------|
| Tower 1 | 946.8 | 1550.3 | 282.32 | 49.8 -j3.2 |
| Tower 2 | 946.5 | 1550.1 | 282.4 | 49.79 -j3.4 |
| Tower 3 | 946.8 | 1550.4 | 282.32 | 49.95 -j3.22 |

| | +45 Degree Offset Frequency (kHz) | Measured Impedance (Ohms) | -45 Degree Offset Frequency (kHz) | -45 Degree Measured Impedance | Characteristic Impedance (Ohms) |
|---------|--------------------------------------|---------------------------------|---|-------------------------------------|---------------------------------------|
| Tower 1 | 1104.6 | 7.52 +j62.66 | 789 | 3.41 -j42.65 | 51.96 |
| Tower 2 | 1104.25 | 7.67+j63 | 788.75 | 3.4 -j42.34 | 51.92 |
| Tower 3 | 1104.6 | 7.54 +j62.7 | 789 | 3.4 -j42.65 | 51.98 |

Maximum Impedance

51.98

Minimum Impedance

51.92

MAXIMUM IMPEDANCE DELTA (Ohms)

0.06

Delta TCT3 Sample Transformer Verification

| Transformer | Serial # | Magnitude | Phase° |
|-------------|----------|-----------|--------|
| Tower 1 | 17595 | 1 | 0 |
| Tower 2 | 17596 | 1 | -0.09 |
| Tower 3 | 17592 | 0.99975 | -0.07 |

KFCD EXHIBIT 4
Reference Readings

42°

| Point | Distance (Km) | Night | Location NAD 27 coordinates | Date | Time |
|-------|---------------|-------|---------------------------------|----------|-------|
| 1 | 3.34 | 78 | CR 2740 33 08 21.33 96 15 20.3 | 03/27/13 | 13:40 |
| 2 | 7.6 | 12.5 | CR 1116 33 10 03.63 96 13 30.44 | " | 13:27 |
| 3 | 10.6 | 8.8 | 10538S Prairie Ave on sidewalk | " | 13:17 |

47°

| Point | Distance (Km) | Day | Location NAD 27 coordinates | Date | Time |
|-------|---------------|-----|--------------------------------|----------|-------|
| 1 | 3.3 | 228 | CR2726 33 08 13.83 96 15 13.76 | 03/27/13 | 12:50 |
| 2 | 8.12 | 93 | FM903 33 10 0.21 96 12 57.3 | " | 13:02 |
| 3 | 11.6 | 71 | FM1569 33 11 17.23 96 11 19 | " | 13:10 |

101°

| Point | Distance (Km) | Day | Location NAD 27 coordinates | Date | Time Day | Time Night |
|-------|---------------|-----|--------------------------------|----------|----------|------------|
| 1 | 3.99 | 215 | FM 36 33 06 36.4 96 14 15.86 | 03/27/13 | 14:30 | 13:50 |
| 2 | 6.81 | 115 | FM 3211 33 06 18.68 96 12 28.8 | " | 14:24 | 13:57 |
| 3 | 9.67 | 98 | CR2114 33 06 01 96 10 40.52 | " | 14:08 | 14:05 |

146°

| Point | Distance (Km) | Day | Location NAD 27 coordinates | Date | Time Day | Time Night |
|-------|---------------|-----|--------------------------------|----------|----------|------------|
| 1 | 2.29 | 280 | CR2720 33 05 59.48 96 15 58.33 | 03/27/13 | 14:42 | 15:23 |
| 2 | 4.82 | 149 | CR2706 33 04 51.5 96 15 03.44 | " | 14:53 | 15:16 |
| 3 | 6.98 | 102 | CR2700 33 03 53.18 96 14 17.48 | " | 15:03 | 15:06 |

208°

| Point | Distance (Km) | Day | Location NAD 27 coordinates | Date | Time |
|-------|---------------|-----|-------------------------------------|----------|-------|
| 1 | 4.91 | 100 | CR695&CR850 33 04 41.25 96 18 16.69 | 03/26/13 | 12:50 |
| 2 | 7.02 | 84 | FM6 33 03 40.7 96 18 16.69 | " | 13:00 |
| 3 | 9.74 | 50 | CR638 33 02 22.82 96 19 43.21 | " | 13:12 |

221°

| Point | Distance (Km) | Night | Location NAD 27 coordinates | Date | Time |
|-------|---------------|-------|-------------------------------|----------|-------|
| 1 | 5.17 | 31.6 | CR547 33 04 41.9 96 19 11.41 | 03/26/13 | 14:13 |
| 2 | 7.8 | 25 | CR596 33 03 50.48 96 20 04.45 | " | 13:59 |
| 3 | 11.1 | 17.2 | FM6 33 02 29.72 96 21 29.16 | " | 14:06 |

253°

| Point | Distance (Km) | Day | Night | Location NAD 27 coordinates | Date | Time Day | Time Night |
|-------|---------------|-----|-------|-------------------------------|----------|----------|------------|
| 1 | 2.42 | 275 | 115 | CR696 33 06 38.36 96 18 16.45 | 03/26/13 | 12:33 | 14:31 |
| 2 | 5.92 | 122 | 44.8 | CR643 33 06 04.7 96 20 25.33 | " | 13:39 | 13:44 |
| 3 | 8.1 | 89 | 32.2 | CR643 33 05 43.7 96 21 45.72 | " | 13:31 | 13:49 |

305°

| Point | Distance (Km) | Day | Night | Location NAD 27 coordinates | Date | Time Day | Time Night |
|-------|---------------|-----|-------|---|----------|----------|------------|
| 1 | 3.96 | 220 | 85 | CR818 33 08 14.1 96 18 52.63 | 03/26/13 | 15:18 | 14:37 |
| 2 | 5.83 | 164 | 64.5 | FM547 33 08 49 96 19 51.79 | " | 15:11 | 14:47 |
| 3 | 9.07 | 78 | 25 | College St at Main 33 09 48.95 96 21 34 | " | 15:03 | 14:58 |

350°

| Point | Distance (Km) | Day | Night | Location NAD 27 coordinates | Date | Time Day | Time Night |
|-------|---------------|-----|-------|-------------------------------|----------|----------|------------|
| 1 | 2.6 | 310 | 57.5 | CR2740 33 08 23.8 96 17 45 | 03/26/13 | 15:25 | 16:23 |
| 2 | 5.05 | 181 | 31 | CR1120 33 09 41.61 96 17 21.7 | " | 15:34 | 16:15 |
| 3 | 10.3 | 88 | 15 | FM2194 33 12 29.8 96 17 58 | " | 15:52 | 16:02 |

All readings in mV/m. All times CDT.

All readings made using Potomac Instruments FIM-41 SN2263. All readings taken by C. Staples