Davis Wright Tremaine LLP

ORIGINAL

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Federal Communications Commission
Office of the Secretary

April 9, 2009

***VIA HAND DELIVERY***

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W., TW-A325
Washington, D.C. 20554

**Re: Amendment to Pending FCC Form 302-AM**
**KCKK(AM), Littleton, Colorado (FIN-52249)**
**FCC File No. BL-20080717AQB**

Dear Ms. Dortch:

People's Wireless, Inc., licensee of KCKK(AM), Littleton, Colorado, hereby amends the above-referenced pending application on FCC Form 302-AM seeking a covering license for KCKK(AM). *See* FCC File No. BL-20080717AQB. Attached hereto is an amendment to Section III of the pending license application, along with the related supplemental engineering materials. Information is provided herein showing that the directional antenna parameters for both the daytime and nighttime patterns authorized by the underlying construction permit have been determined in accordance with the requirements of 47 C.F.R. §73.151(c). The applicant requests that these materials be associated with the pending KCKK(AM) license application.

Included with this submission is a Certificate of Amendment executed on behalf of the applicant. Please note, as the Form 302-AM is a paper filing and the pending application was filed in paper, this amendment is submitted by letter, rather than electronically *via* CDBS.

If there should be any questions regarding this matter, please contact the undersigned.

Respectfully Submitted,

[signature]

Brendan Holland

Enclosure

cc: Huong F. Chau

**CERTIFICATE OF AMENDMENT**

People's Wireless, Inc., licensee of KCKK(AM), Littleton, Colorado (FIN-52249), hereby amends the pending application for a covering license for KCKK(AM), FCC File No. BL-20080717AQB, with the attached materials.

**PEOPLE'S WIRELESS, INC.**

By: ______________________
Timothy Brown
Chairman of the Board, CEO, Director

Dated: April 9, 2009

## SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
People's Wireless, Inc.

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☑ Station License ☐ Direct Measurement of Power

**1. Facilities authorized in construction permit**

| Call Sign | File No. of Construction Permit (if applicable) | Frequency (kHz) | Hours of Operation | Power in kilowatts Night | Power in kilowatts Day |
|---|---|---|---|---|---|
| KCKK | BP-20041019ACH | 1510 | Unlimited | 25.0 | 10.0 |

**2. Station location**

| State | City or Town |
|---|---|
| Colorado | Littleton |

**3. Transmitter location**

| State | County | City or Town | Street address (or other identification) |
|---|---|---|---|
| CO | Adams | Thornton | 9550 Riverdale Drive |

**4. Main studio location**

| State | County | City or Town | Street address (or other identification) |
|---|---|---|---|
| CO | Denver | Denver | 1201 18th Street #250 |

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

| State | County | City or Town | Street address (or other identification) |
|---|---|---|---|
| CO | Denver | Denver | 1201 18th Street #250 |

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. E-1

**8. Operating constants:**

| RF common point or antenna current (in amperes) without modulation for night system | RF common point or antenna current (in amperes) without modulation for day system |
|---|---|
| 23.0 | 14.5 |

| Measured antenna or common point resistance (in ohms) at operating frequency — Night | Day | Measured antenna or common point reactance (in ohms) at operating frequency — Night | Day |
|---|---|---|---|
| 50 | 50 | -10 | -10 |

Antenna indications for directional operation

| Towers | Antenna monitor Phase reading(s) in degrees Night | Day | Antenna monitor sample current ratio(s) Night | Day | Antenna base currents Night | Day |
|---|---|---|---|---|---|---|
| 1 | +1.6 | +4.9 | 0.363 | 0.747 | --- | --- |
| 2 | 0.0 | 0.0 | 1.000 | 1.000 | --- | --- |
| 3 | -2.0 | --- | 1.010 | --- | --- | --- |
| 4 | -3.9 | +138.5 | 0.341 | 0.267 | --- | --- |
| | | | | | | |
| | | | | | | |

Manufacturer and type of antenna monitor: Potomac Instruments Type 1901

SECTION III - Page 2

9. Description of antenna system (If directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.) See Exhibit E-1

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

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 | 39 ° | 52 ' | 08 " | West Longitude | 104 ° | 55 ' | 37 " |
|---|---|---|---|---|---|---|---|

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. N/A

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

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.

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) | Signature (check appropriate box below) |
|---|---|
| Mark Smith | [signature] |
| Address (include ZIP Code)<br>1201 18th Street<br>Suite 250<br>Denver, CO 80202 | Date<br>4/8/2009<br>Telephone No. (Include Area Code)<br>303-296-7045 |

☐ Technical Director ☐ Registered Professional Engineer

☐ Chief Operator ☐ Technical Consultant

☒ Other (specify) Managing Corporate Chief Engineer

EXHIBIT E-1

APPLICATION FOR LICENSE INFORMATION
RADIO STATION KCKK
LITTLETON, COLORADO

People's Wireless, Inc.

April 6, 2009

1510 kHz 10 kW-D/25 kW-N DA-2

## Executive Summary

This engineering exhibit supports an application for license for the newly-constructed directional antenna system of radio station KCKK in Littleton, Colorado. KCKK operates on 1510 kHz and is presently operating under a Program Test Authority STA with 8.9 kW day and 3.6 kW night from the site specified in the construction permit (BP-20041019ACH).

The towers and ground system were constructed in accordance with the terms of the construction permit and specifications that were provided in the underlying FCC Form 301 application for construction permit.

Information is provided herein showing that the directional antenna parameters for both the daytime and nighttime patterns authorized by the construction permit have been determined in accordance with the requirements of 47 C.F.R. §73.151(c). The system has been adjusted to produce antenna monitor parameters within ±5 percent in ratio and ±3 degrees in phase of the modeled values, as required by the Rules.

<u>Analysis of Tower Impedance Measurements to Verify Method of Moments Model</u>

Tower base impedance measurements were made at the final J-plugs within the Antenna Tuning Units (ATUs) using a Delta OIB-1 operating impedance bridge. The other towers were all open-circuited at the same points where the impedance measurements were made for them. The lighting chokes at the ATU outputs were disconnected from all towers during the base impedance measurements. This arrangement left only the short feed tubing between the ATU outputs and the tower base in series in the impedance measurements.

Expert MININEC Broadcast Professional Version 14.5 was used to model the KCKK array.

A lumped load with a reactance of –j10,000 was modeled at the base of the other towers to simulate an open circuit at each tower base.

The tower heights were adjusted in the model in order to achieve calibration of the model with the measured base impedances. All modeled tower heights were within 75 and 125 percent of the physical tower height as required by the FCC Rules.

The modeled radius for each tower was the physical radius of the tower as determined by the formula $3T/2\pi$, where T is the tower face width in meters. The KCKK radiators are uniform cross-section triangular towers and have face widths of 0.3049 meters. Each tower's radius was modeled at 0.1455 meters.

Each tower is fed with a short length if large-diameter copper tubing that exhibits a small amount of series inductive reactance. This tubing connects to each tower at the elevation of the ATU bowl insulators, which is above the base insulators by some distance in each case. This connection scheme makes it difficult if not impossible to accurately measure the series inductance of the feed tubing, which is normally done by shorting across the base insulator with several low-inductance straps. In the KCKK installation, making measurements in that way would include the tower structure below the feed tubing attach point in the series reactance measurement.

§73.151(c)(1)(vii) permits the use of a lumped series inductance of 10 uH or less between the output port of each antenna tuning unit and the associated tower. A value of lumped series inductance was assumed for all towers except tower 3, which has an elevated base pier and is physically configured somewhat differently at the base than the other three.

The 3-wire lighting chokes, which are strictly used for tower static dissipation because the towers are not lighted per FAA specification, exhibit a manufacturer-specified reactance of +j12,000 at 1510 kHz. Calculations were made to determine the effect of this shunt reactance on the driving point impedances and the operating parameters of the array. As expected, these calculations showed that this high shunt reactance produces minimal change in the impedances and virtually no change in operating parameters.

The modeled and measured base impedances of the ATU output J-plugs with the other towers open-circuited at their ATU output J-plugs agree within ±2 ohms and ±4 percent for resistance, as required by the FCC rules.

**Table 1 - Model Calibration to Measured Base Impedance Matrix**

| Twr. | $Z_{ATU}$ (Measured) | $Z_{BASE}$ (Modeled) | Assumed Series X | Phys. Height (deg.) | Model Height (deg.) | % Phys. Height |
|---|---|---|---|---|---|---|
| 1 | 59.5 +j72.5 | 59.4 +j69.9 | +j2.6 | 89.5 | 98.4 | 109.9 |
| 2 | 57.0 +j75.5 | 56.9 +j61.0 | +j14.5 | 89.5 | 96.9 | 108.3 |
| 3 | 56.0 +j72.5 | 55.9 +j58.1 | +j14.4 | 89.5 | 96.4 | 107.7 |
| 4 | 68.0 +j90.6 | 67.9 +j90.7 | +j0 | 88.4 | 101.8 | 115.2 |

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KCKK Tower 1

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

| wire | caps | Distance | Angle | Z | radius | segs |
|---|---|---|---|---|---|---|
| 1 | none | 0 | 0 | 0 | .1455 | 20 |
| | | 0 | 0 | 98.4 | | |
| 2 | none | 190. | 108.3 | 0 | .1455 | 20 |
| | | 190. | 108.3 | 96.9 | | |
| 3 | none | 380. | 108.3 | 0 | .1455 | 20 |
| | | 380. | 108.3 | 96.4 | | |
| 4 | none | 570. | 108.3 | 0 | .1455 | 20 |
| | | 570. | 108.3 | 101.8 | | |

Number of wires = 4
current nodes = 80

| | minimum | | maximum | |
|---|---|---|---|---|
| Individual wires | wire | value | wire | value |
| segment length | 3 | 4.82 | 4 | 5.09 |
| radius | 1 | .1455 | 1 | .1455 |

ELECTRICAL DESCRIPTION
Frequencies (KHz)

| | frequency | | no. of | segment length (wavelengths) | |
|---|---|---|---|---|---|
| no. | lowest | step | steps | minimum | maximum |
| 1 | 1,510. | 0 | 1 | .0133889 | .0141389 |

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 | 21 | 0 | -10,000. | 0 | 0 | 0 |
| 2 | 41 | 0 | -10,000. | 0 | 0 | 0 |
| 3 | 61 | 0 | -10,000. | 0 | 0 | 0 |

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IMPEDANCE
normalization = 50.

| freq (KHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|---|---|---|---|---|---|---|---|
| source = 1; node 1, sector 1 | | | | | | | |
| 1,510. | 59.409 | 69.896 | 91.732 | 49.6 | 3.3785 | -5.3005 | -1.5187 |

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KCKK Tower 2

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

| wire | caps | Distance | Angle | Z | radius | segs |
|---|---|---|---|---|---|---|
| 1 | none | 0 | 0 | 0 | .1455 | 20 |
| | | 0 | 0 | 98.4 | | |
| 2 | none | 190. | 108.3 | 0 | .1455 | 20 |
| | | 190. | 108.3 | 96.9 | | |
| 3 | none | 380. | 108.3 | 0 | .1455 | 20 |
| | | 380. | 108.3 | 96.4 | | |
| 4 | none | 570. | 108.3 | 0 | .1455 | 20 |
| | | 570. | 108.3 | 101.8 | | |

Number of wires = 4
current nodes = 80

| | minimum | | maximum | |
|---|---|---|---|---|
| Individual wires | wire | value | wire | value |
| segment length | 3 | 4.82 | 4 | 5.09 |
| radius | 1 | .1455 | 1 | .1455 |

ELECTRICAL DESCRIPTION
Frequencies (KHz)

| | frequency | | no. of | segment length (wavelengths) | |
|---|---|---|---|---|---|
| no. | lowest | step | steps | minimum | maximum |
| 1 | 1,510. | 0 | 1 | .0133889 | .0141389 |

Sources

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

Lumped loads

| | | resistance | reactance | inductance | capacitance | passive |
|---|---|---|---|---|---|---|
| load | node | (ohms) | (ohms) | (mH) | (uF) | circuit |
| 1 | 1 | 0 | -10,000. | 0 | 0 | 0 |
| 2 | 41 | 0 | -10,000. | 0 | 0 | 0 |
| 3 | 61 | 0 | -10,000. | 0 | 0 | 0 |

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IMPEDANCE
normalization = 50.

| freq | resist | react | imped | phase | VSWR | S11 | S12 |
|---|---|---|---|---|---|---|---|
| (KHz) | (ohms) | (ohms) | (ohms) | (deg) | | dB | dB |
| source = 1; node 21, sector 1 | | | | | | | |
| 1,510. | 56.938 | 61.047 | 83.479 | 47. | 2.9917 | -6.0387 | -1.2434 |

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KCKK Tower 3

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

| wire | caps | Distance | Angle | Z | radius | segs |
|---|---|---|---|---|---|---|
| 1 | none | 0 | 0 | 0 | .1455 | 20 |
| | | 0 | 0 | 98.4 | | |
| 2 | none | 190. | 108.3 | 0 | .1455 | 20 |
| | | 190. | 108.3 | 96.9 | | |
| 3 | none | 380. | 108.3 | 0 | .1455 | 20 |
| | | 380. | 108.3 | 96.4 | | |
| 4 | none | 570. | 108.3 | 0 | .1455 | 20 |
| | | 570. | 108.3 | 101.8 | | |

Number of wires = 4
current nodes = 80

| | minimum | | maximum | |
|---|---|---|---|---|
| Individual wires | wire | value | wire | value |
| segment length | 3 | 4.82 | 4 | 5.09 |
| radius | 1 | .1455 | 1 | .1455 |

ELECTRICAL DESCRIPTION
Frequencies (KHz)

| | frequency | | no. of | segment length (wavelengths) | |
|---|---|---|---|---|---|
| no. | lowest | step | steps | minimum | maximum |
| 1 | 1,510. | 0 | 1 | .0133889 | .0141389 |

Sources

| source | node | sector | magnitude | phase | type |
|---|---|---|---|---|---|
| 1 | 41 | 1 | 1. | 0 | voltage |

Lumped loads

| load | node | resistance (ohms) | reactance (ohms) | inductance (mH) | capacitance (uF) | passive circuit |
|---|---|---|---|---|---|---|
| 1 | 1 | 0 | -10,000. | 0 | 0 | 0 |
| 2 | 21 | 0 | -10,000. | 0 | 0 | 0 |
| 3 | 61 | 0 | -10,000. | 0 | 0 | 0 |

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IMPEDANCE
normalization = 50.

| freq (KHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|---|---|---|---|---|---|---|---|
| source = 1; node 41, sector 1 | | | | | | | |
| 1,510. | 55.943 | 58.097 | 80.653 | 46.1 | 2.871 | -6.315 | -1.1555 |

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KCKK Tower 4

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

| wire | caps | Distance | Angle | Z | radius | segs |
|---|---|---|---|---|---|---|
| 1 | none | 0 | 0 | 0 | .1455 | 20 |
| | | 0 | 0 | 98.4 | | |
| 2 | none | 190. | 108.3 | 0 | .1455 | 20 |
| | | 190. | 108.3 | 96.9 | | |
| 3 | none | 380. | 108.3 | 0 | .1455 | 20 |
| | | 380. | 108.3 | 96.4 | | |
| 4 | none | 570. | 108.3 | 0 | .1455 | 20 |
| | | 570. | 108.3 | 101.8 | | |

Number of wires = 4
current nodes = 80

| | minimum | | maximum | |
|---|---|---|---|---|
| Individual wires | wire | value | wire | value |
| segment length | 3 | 4.82 | 4 | 5.09 |
| radius | 1 | .1455 | 1 | .1455 |

ELECTRICAL DESCRIPTION
Frequencies (KHz)

| no. | frequency lowest | step | no. of steps | segment length (wavelengths) minimum | maximum |
|---|---|---|---|---|---|
| 1 | 1,510. | 0 | 1 | .0133889 | .0141389 |

Sources

| source | node | sector | magnitude | phase | type |
|---|---|---|---|---|---|
| 1 | 61 | 1 | 1. | 0 | voltage |

Lumped loads

| load | node | resistance (ohms) | reactance (ohms) | inductance (mH) | capacitance (uF) | passive circuit |
|---|---|---|---|---|---|---|
| 1 | 1 | 0 | -10,000. | 0 | 0 | 0 |
| 2 | 21 | 0 | -10,000. | 0 | 0 | 0 |
| 3 | 41 | 0 | -10,000. | 0 | 0 | 0 |

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IMPEDANCE
normalization = 50.

| freq (KHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|---|---|---|---|---|---|---|---|
| source = 1; node 61, sector 1 | | | | | | | |
| 1,510. | 67.912 | 90.739 | 113.34 | 53.2 | 4.286 | -4.1292 | -2.1214 |

## Derivation of Operating Parameters for Daytime Directional Antenna

Once calibrated against the measured individual open-circuited base impedances, the moment method model was utilized for daytime directional antenna calculations. These calculations were made to determine the complex voltage source values to be applied at ground level for each tower of the array to produce the current moment sums for the towers which, when normalized to the reference tower, equate to the theoretical field parameters of the authorized directional pattern. These voltage sources were then applied in the model and the tower currents were calculated.

Twenty segments were used for each tower. The KCKK towers are base sampled, which is permitted for towers of 120 electrical degrees or less. As such, the first (ground) segment of each tower was used to determine the model operating parameters of the array.

A lumped load with a value of +j521.81 was modeled at the base of the unused tower (#3) for the purpose of detuning that array element during daytime operation. The value of this load was determined by calculating the complex voltage source values required to produce the theoretical field parameters with a zero field from tower 3. The predicted impedances produced by the model were then examined, and the conjugate value of the zero-field driving point reactance of tower 3 was used for the lumped load.

Calculations were made to determine the effect of the shunt lighting choke reactance on the ATU output current and phase using the following equations:

$I_{ATU}$ Magnitude $= ((1 + X_B/X_S)^2 + (R_B/X_S)^2)^{1/2}$
$I_{ATU}$ Angle $= \arctan(-R_B/X_S)/(1+X_B/X_S)$

Where:
$I_{ATU}$ = ATU output current for unity base current with no phase shift
$Z_{BASE} = R_B + jX_B$
$X_S$ = Shunt Reactance

This effect was, as expected, negligible, and the results are tabulated in the table below along with the base operating parameters for the daytime array.

| Twr. | Node | Current Magnitude (amperes) | Current Phase (degrees) | Calculated Current Offset for Unity $I_{BASE}$ | Calculated Phase Offset for Unity $Ø_{BASE}$ (degrees) | Antenna Monitor Ratio | Antenna Monitor Phase (degrees) |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 9.1531 | 4.0 | 1.004 | -0.18 | 0.747 | +4.9 |
| 2 | 21 | 12.2499 | 359.1 | 1.004 | -0.19 | 1.000 | 0.0 |
| 3 | 41 | 0.18933 | 347.1 | --- | --- | Nulled | --- |
| 4 | 61 | 3.2638 | 137.4 | 1.005 | -0.31 | 0.267 | +138.5 |

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KCKK Daytime

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

| wire | caps | Distance | Angle | Z | radius | segs |
|---|---|---|---|---|---|---|
| 1 | none | 0 | 0 | 0 | .1455 | 20 |
| | | 0 | 0 | 98.4 | | |
| 2 | none | 190. | 108.3 | 0 | .1455 | 20 |
| | | 190. | 108.3 | 96.9 | | |
| 3 | none | 380. | 108.3 | 0 | .1455 | 20 |
| | | 380. | 108.3 | 96.4 | | |
| 4 | none | 570. | 108.3 | 0 | .1455 | 20 |
| | | 570. | 108.3 | 101.8 | | |

Number of wires = 4
current nodes = 80

| | minimum | | maximum | |
|---|---|---|---|---|
| Individual wires | wire | value | wire | value |
| segment length | 3 | 4.82 | 4 | 5.09 |
| radius | 1 | .1455 | 1 | .1455 |

ELECTRICAL DESCRIPTION
Frequencies (KHz)

| no. | frequency lowest | step | no. of steps | segment length (wavelengths) minimum | maximum |
|---|---|---|---|---|---|
| 1 | 1,510. | 0 | 1 | .0133889 | .0141389 |

Sources

| source | node | sector | magnitude | phase | type |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 798.673 | 55.4 | voltage |
| 2 | 21 | 1 | 1,074.94 | 48.4 | voltage |
| 3 | 61 | 1 | 427.864 | 182.7 | voltage |

Lumped loads

| load | node | resistance (ohms) | reactance (ohms) | inductance (mH) | capacitance (uF) | passive circuit |
|---|---|---|---|---|---|---|
| 1 | 41 | 0 | 521.81 | 0 | 0 | 0 |

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IMPEDANCE
normalization = 50.

| freq (KHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|---|---|---|---|---|---|---|---|
| source = 1; node 1, sector 1 | | | | | | | |
| 1,510. | 38.452 | 48.253 | 61.7 | 51.4 | 2.9403 | -6.1532 | -1.2061 |
| source = 2; node 21, sector 1 | | | | | | | |
| 1,510. | 40.521 | 46.991 | 62.049 | 49.2 | 2.7737 | -6.5576 | -1.0842 |
| source = 3; node 61, sector 1 | | | | | | | |
| 1,510. | 65.534 | 65.559 | 92.697 | 45. | 3.0584 | -5.8966 | -1.2915 |

CURRENT rms
Frequency = 1510 KHz
Input power = 10,000. watts
Efficiency = 100. %
coordinates in degrees

| current no. | X | Y | Z | mag (amps) | phase (deg) | real (amps) | imaginary (amps) |
|---|---|---|---|---|---|---|---|
| GND | 0 | 0 | 0 | 9.1531 | 4. | 9.13122 | .63258 |
| 2 | 0 | 0 | 4.92 | 9.35844 | 2.8 | 9.34696 | .463455 |
| 3 | 0 | 0 | 9.84 | 9.42768 | 2.1 | 9.42113 | .351361 |
| 4 | 0 | 0 | 14.76 | 9.41634 | 1.6 | 9.41286 | .255922 |
| 5 | 0 | 0 | 19.68 | 9.33172 | 1.1 | 9.33013 | .172236 |
| 6 | 0 | 0 | 24.6 | 9.17743 | .6 | 9.1769 | .0983811 |
| 7 | 0 | 0 | 29.52 | 8.95613 | .2 | 8.95607 | .0335186 |
| 8 | 0 | 0 | 34.44 | 8.67 | 359.8 | 8.66997 | -.0227471 |
| 9 | 0 | 0 | 39.36 | 8.32139 | 359.5 | 8.32109 | -.0706083 |
| 10 | 0 | 0 | 44.28 | 7.91279 | 359.2 | 7.91203 | -.110162 |
| 11 | 0 | 0 | 49.2 | 7.44682 | 358.9 | 7.44548 | -.141467 |
| 12 | 0 | 0 | 54.12 | 6.92629 | 358.6 | 6.92433 | -.164571 |
| 13 | 0 | 0 | 59.04 | 6.35419 | 358.4 | 6.35165 | -.179524 |
| 14 | 0 | 0 | 63.96 | 5.73353 | 358.1 | 5.7305 | -.186395 |
| 15 | 0 | 0 | 68.88 | 5.06725 | 357.9 | 5.06386 | -.185259 |
| 16 | 0 | 0 | 73.8 | 4.35795 | 357.7 | 4.35438 | -.176193 |
| 17 | 0 | 0 | 78.72 | 3.60755 | 357.5 | 3.60403 | -.159248 |
| 18 | 0 | 0 | 83.64 | 2.81631 | 357.3 | 2.8131 | -.134399 |
| 19 | 0 | 0 | 88.56 | 1.98059 | 357.1 | 1.978 | -.10139 |
| 20 | 0 | 0 | 93.48 | 1.08613 | 356.9 | 1.08451 | -.0593128 |
| END | 0 | 0 | 98.4 | 0 | 0 | 0 | 0 |
| GND | -59.6586 | -180.391 | 0 | 12.2499 | 359.1 | 12.2484 | -.186509 |
| 22 | -59.6586 | -180.391 | 4.845 | 12.5142 | 358. | 12.5062 | -.446952 |
| 23 | -59.6586 | -180.391 | 9.69 | 12.6004 | 357.2 | 12.5856 | -.611106 |
| 24 | -59.6586 | -180.391 | 14.535 | 12.5805 | 356.6 | 12.5586 | -.742462 |
| 25 | -59.6586 | -180.391 | 19.38 | 12.464 | 356.1 | 12.4351 | -.848789 |
| 26 | -59.6586 | -180.391 | 24.225 | 12.2556 | 355.6 | 12.22 | -.933274 |
| 27 | -59.6586 | -180.391 | 29.07 | 11.9585 | 355.2 | 11.9169 | -.997416 |
| 28 | -59.6586 | -180.391 | 33.915 | 11.5758 | 354.8 | 11.5288 | -1.04207 |
| 29 | -59.6586 | -180.391 | 38.76 | 11.1104 | 354.5 | 11.0589 | -1.0678 |
| 30 | -59.6586 | -180.391 | 43.605 | 10.5655 | 354.2 | 10.5106 | -1.07504 |
| 31 | -59.6586 | -180.391 | 48.45 | 9.94443 | 353.9 | 9.88733 | -1.0642 |
| 32 | -59.6586 | -180.391 | 53.295 | 9.25096 | 353.6 | 9.19281 | -1.03566 |
| 33 | -59.6586 | -180.391 | 58.14 | 8.48881 | 353.3 | 8.4309 | -.989843 |
| 34 | -59.6586 | -180.391 | 62.985 | 7.66187 | 353. | 7.60557 | -.927186 |
| 35 | -59.6586 | -180.391 | 67.83 | 6.77392 | 352.8 | 6.72062 | -.848118 |
| 36 | -59.6586 | -180.391 | 72.675 | 5.82819 | 352.6 | 5.77934 | -.75304 |
| 37 | -59.6586 | -180.391 | 77.52 | 4.82703 | 352.4 | 4.78412 | -.642208 |
| 38 | -59.6586 | -180.391 | 82.365 | 3.77057 | 352.1 | 3.73515 | -.515593 |
| 39 | -59.6586 | -180.391 | 87.21 | 2.65362 | 351.9 | 2.62736 | -.372369 |
| 40 | -59.6586 | -180.391 | 92.055 | 1.45674 | 351.7 | 1.44159 | -.209559 |
| END | -59.6586 | -180.391 | 96.9 | 0 | 0 | 0 | 0 |
| GND | -119.317 | -360.782 | 0 | .189334 | 347.1 | .18452 | -.0424216 |
| 42 | -119.317 | -360.782 | 4.82 | .137926 | 347.1 | .134425 | -.0308806 |
| 43 | -119.317 | -360.782 | 9.64 | .104065 | 347.1 | .10144 | -.023227 |
| 44 | -119.317 | -360.782 | 14.46 | .075355 | 347.2 | .0734846 | -.016685 |
| 45 | -119.317 | -360.782 | 19.28 | .05029 | 347.5 | .0490898 | -.0109213 |
| 46 | -119.317 | -360.782 | 24.1 | .0282725 | 348.1 | .0276697 | -5.81E-03 |
| 47 | -119.317 | -360.782 | 28.92 | 9.05E-03 | 351.8 | 8.96E-03 | -1.29E-03 |
| 48 | -119.317 | -360.782 | 33.74 | 7.66E-03 | 159.7 | -7.18E-03 | 2.66E-03 |
| 49 | -119.317 | -360.782 | 38.56 | .0216783 | 163.8 | -.0208191 | 6.04E-03 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 50 | -119.317 | -360.782 | 43.38 | .0332124 | 164.5 | -.0320084 | 8.86E-03 |
| 51 | -119.317 | -360.782 | 48.2 | .0422709 | 164.8 | -.0407842 | .011112 |
| 52 | -119.317 | -360.782 | 53.02 | .048883 | 164.8 | -.0471801 | .0127901 |
| 53 | -119.317 | -360.782 | 57.84 | .0530811 | 164.8 | -.0512314 | .0138905 |
| 54 | -119.317 | -360.782 | 62.66 | .0549011 | 164.8 | -.0529768 | .0144078 |
| 55 | -119.317 | -360.782 | 67.48 | .0543816 | 164.7 | -.0524578 | .0143368 |
| 56 | -119.317 | -360.782 | 72.3 | .0515612 | 164.6 | -.0497156 | .0136717 |
| 57 | -119.317 | -360.782 | 77.12 | .0464706 | 164.5 | -.0447846 | .0124039 |
| 58 | -119.317 | -360.782 | 81.94 | .0391165 | 164.4 | -.037676 | .0105176 |
| 59 | -119.317 | -360.782 | 86.76 | .0294387 | 164.3 | -.0283369 | 7.98E-03 |
| 60 | -119.317 | -360.782 | 91.58 | .0171877 | 164.1 | -.0165331 | 4.7E-03 |
| END | -119.317 | -360.782 | 96.4 | 0 | 0 | 0 | 0 |
| GND | -178.976 | -541.173 | 0 | 3.2638 | 137.7 | -2.41437 | 2.19618 |
| 62 | -178.976 | -541.173 | 5.09 | 3.37002 | 135.8 | -2.41479 | 2.3507 |
| 63 | -178.976 | -541.173 | 10.18 | 3.417 | 134.6 | -2.39803 | 2.43421 |
| 64 | -178.976 | -541.173 | 15.27 | 3.43136 | 133.6 | -2.36606 | 2.48515 |
| 65 | -178.976 | -541.173 | 20.36 | 3.41641 | 132.8 | -2.31933 | 2.5085 |
| 66 | -178.976 | -541.173 | 25.45 | 3.37372 | 132. | -2.25828 | 2.50643 |
| 67 | -178.976 | -541.173 | 30.54 | 3.30429 | 131.4 | -2.18335 | 2.48019 |
| 68 | -178.976 | -541.173 | 35.63 | 3.209 | 130.8 | -2.09507 | 2.43071 |
| 69 | -178.976 | -541.173 | 40.72 | 3.08872 | 130.2 | -1.99403 | 2.35882 |
| 70 | -178.976 | -541.173 | 45.81 | 2.94441 | 129.7 | -1.8809 | 2.26534 |
| 71 | -178.976 | -541.173 | 50.9 | 2.7771 | 129.2 | -1.75638 | 2.15115 |
| 72 | -178.976 | -541.173 | 55.99 | 2.58792 | 128.8 | -1.62126 | 2.01713 |
| 73 | -178.976 | -541.173 | 61.08 | 2.37802 | 128.4 | -1.47632 | 1.86427 |
| 74 | -178.976 | -541.173 | 66.17 | 2.14867 | 128. | -1.32238 | 1.69355 |
| 75 | -178.976 | -541.173 | 71.26 | 1.90107 | 127.6 | -1.16025 | 1.50595 |
| 76 | -178.976 | -541.173 | 76.35 | 1.63634 | 127.3 | -.990635 | 1.30241 |
| 77 | -178.976 | -541.173 | 81.44 | 1.35535 | 126.9 | -.814113 | 1.08361 |
| 78 | -178.976 | -541.173 | 86.53 | 1.05837 | 126.6 | -.630886 | .849779 |
| 79 | -178.976 | -541.173 | 91.62 | .744218 | 126.3 | -.440312 | .599988 |
| 80 | -178.976 | -541.173 | 96.71 | .407752 | 126. | -.239452 | .330037 |
| END | -178.976 | -541.173 | 101.8 | 0 | 0 | 0 | 0 |

Method of Moments Model Details for Nighttime Directional Antenna

The calibrated moment method model was utilized for nighttime directional antenna calculations. These calculations were made to determine the complex voltage source values to be applied at ground level for each tower of the array to produce the current moment sums for the towers which, when normalized to the reference tower, equated to the theoretical field parameters of the authorized directional pattern. These voltage sources were then applied in the model and the tower currents were calculated.

As with the daytime array, calculations were made on the nighttime array to determine the effect of the shunt lighting choke reactance on the ATU output current and phase using the following equations:

$I_{ATU}$ Magnitude $= ((1 + X_B/X_S)^2 + (R_B/X_S)^2)^{1/2}$
$I_{ATU}$ Angle $= \arctan(-R_B/X_S)/(1+X_B/X_S)$

Where:
$I_{ATU}$ = ATU output current for unity base current with no phase shift
$Z_{BASE} = R_B + jX_B$
$X_S$ = Shunt Reactance

This effect was, as expected, negligible, and the results are tabulated in the table below along with the base operating parameters for the nighttime array.

| Twr. | Node | Current Magnitude (amperes) | Current Phase (degrees) | Calculated Current Offset for Unity $I_{BASE}$ | Calculated Phase Offset for Unity $Ø_{BASE}$ (degrees) | Antenna Monitor Ratio | Antenna Monitor Phase (degrees) |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 6.29289 | 3.4 | 1.004 | -0.15 | 0.363 | +1.6 |
| 2 | 21 | 17.3224 | 1.8 | 1.003 | -0.18 | 1.000 | 0.0 |
| 3 | 41 | 17.4964 | 359.8 | 1.003 | -0.17 | 1.010 | -2.0 |
| 4 | 61 | 5.90201 | 357.9 | 1.005 | -0.18 | 0.341 | -3.9 |

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KCKK Nighttime

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

| wire | caps | Distance | Angle | Z | radius | segs |
|---|---|---|---|---|---|---|
| 1 | none | 0 | 0 | 0 | .1455 | 20 |
| | | 0 | 0 | 98.4 | | |
| 2 | none | 190. | 108.3 | 0 | .1455 | 20 |
| | | 190. | 108.3 | 96.9 | | |
| 3 | none | 380. | 108.3 | 0 | .1455 | 20 |
| | | 380. | 108.3 | 96.4 | | |
| 4 | none | 570. | 108.3 | 0 | .1455 | 20 |
| | | 570. | 108.3 | 101.8 | | |

Number of wires = 4
current nodes = 80

| | minimum | | maximum | |
|---|---|---|---|---|
| Individual wires | wire | value | wire | value |
| segment length | 3 | 4.82 | 4 | 5.09 |
| radius | 1 | .1455 | 1 | .1455 |

ELECTRICAL DESCRIPTION
Frequencies (KHz)

| | frequency | | no. of | segment length (wavelengths) | |
|---|---|---|---|---|---|
| no. | lowest | step | steps | minimum | maximum |
| 1 | 1,510. | 0 | 1 | .0133889 | .0141389 |

Sources

| source | node | sector | magnitude | phase | type |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 483.401 | 56.6 | voltage |
| 2 | 21 | 1 | 1,365.85 | 50. | voltage |
| 3 | 41 | 1 | 1,322.58 | 46.3 | voltage |
| 4 | 61 | 1 | 592.51 | 55.9 | voltage |

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IMPEDANCE
normalization = 50.

| freq (KHz) | resist (ohms) | react (ohms) | imped (ohms) | phase (deg) | VSWR | S11 dB | S12 dB |
|---|---|---|---|---|---|---|---|
| source = 1; node 1, sector 1 | | | | | | | |
| 1,510. | 32.523 | 43.505 | 54.318 | 53.2 | 3.0206 | -5.9761 | -1.2643 |
| source = 2; node 21, sector 1 | | | | | | | |
| 1,510. | 37.158 | 41.567 | 55.754 | 48.2 | 2.64 | -6.9253 | -.98536 |
| source = 3; node 41, sector 1 | | | | | | | |
| 1,510. | 36.758 | 38.805 | 53.451 | 46.6 | 2.5175 | -7.3021 | -.8944 |
| source = 4; node 61, sector 1 | | | | | | | |
| 1,510. | 37.595 | 60.214 | 70.987 | 58. | 3.7436 | -4.7558 | -1.7686 |

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CURRENT rms
Frequency = 1510 KHz
Input power = 25,000. watts
Efficiency = 100. %
coordinates in degrees

| current no. | X | Y | Z | mag (amps) | phase (deg) | real (amps) | imaginary (amps) |
|---|---|---|---|---|---|---|---|
| GND | 0 | 0 | 0 | 6.29289 | 3.4 | 6.28189 | .371883 |
| 2 | 0 | 0 | 4.92 | 6.41818 | 2.4 | 6.41239 | .272626 |
| 3 | 0 | 0 | 9.84 | 6.45545 | 1.8 | 6.45214 | .206817 |
| 4 | 0 | 0 | 14.76 | 6.4392 | 1.3 | 6.43743 | .150764 |
| 5 | 0 | 0 | 19.68 | 6.37404 | .9 | 6.37323 | .101589 |
| 6 | 0 | 0 | 24.6 | 6.26234 | .5 | 6.26207 | .0581696 |
| 7 | 0 | 0 | 29.52 | 6.1058 | .2 | 6.10577 | .0200132 |
| 8 | 0 | 0 | 34.44 | 5.90593 | 359.9 | 5.90591 | -.0131094 |
| 9 | 0 | 0 | 39.36 | 5.66429 | 359.6 | 5.66414 | -.0413078 |
| 10 | 0 | 0 | 44.28 | 5.38255 | 359.3 | 5.38216 | -.0646357 |
| 11 | 0 | 0 | 49.2 | 5.06249 | 359.1 | 5.0618 | -.0831232 |
| 12 | 0 | 0 | 54.12 | 4.70601 | 358.8 | 4.70502 | -.096793 |
| 13 | 0 | 0 | 59.04 | 4.31513 | 358.6 | 4.31383 | -.105672 |
| 14 | 0 | 0 | 63.96 | 3.89184 | 358.4 | 3.89029 | -.109794 |
| 15 | 0 | 0 | 68.88 | 3.43813 | 358.2 | 3.43639 | -.109196 |
| 16 | 0 | 0 | 73.8 | 2.95575 | 358. | 2.95392 | -.103919 |
| 17 | 0 | 0 | 78.72 | 2.44594 | 357.8 | 2.44414 | -.0939851 |
| 18 | 0 | 0 | 83.64 | 1.90889 | 357.6 | 1.90724 | -.0793713 |
| 19 | 0 | 0 | 88.56 | 1.34206 | 357.4 | 1.34072 | -.0599178 |
| 20 | 0 | 0 | 93.48 | .735782 | 357.3 | .734946 | -.0350765 |
| END | 0 | 0 | 98.4 | 0 | 0 | 0 | 0 |
| GND | -59.6586 | -180.391 | 0 | 17.3224 | 1.8 | 17.3136 | .553126 |
| 22 | -59.6586 | -180.391 | 4.845 | 17.6471 | .7 | 17.6456 | .230962 |
| 23 | -59.6586 | -180.391 | 9.69 | 17.7374 | .1 | 17.7374 | .0225086 |
| 24 | -59.6586 | -180.391 | 14.535 | 17.6834 | 359.5 | 17.6828 | -.15017 |
| 25 | -59.6586 | -180.391 | 19.38 | 17.4973 | 359. | 17.4947 | -.296562 |
| 26 | -59.6586 | -180.391 | 24.225 | 17.185 | 358.6 | 17.1799 | -.420472 |
| 27 | -59.6586 | -180.391 | 29.07 | 16.7512 | 358.2 | 16.743 | -.523637 |
| 28 | -59.6586 | -180.391 | 33.915 | 16.1998 | 357.9 | 16.1884 | -.60696 |
| 29 | -59.6586 | -180.391 | 38.76 | 15.535 | 357.5 | 15.5205 | -.670969 |
| 30 | -59.6586 | -180.391 | 43.605 | 14.7612 | 357.2 | 14.7438 | -.716016 |
| 31 | -59.6586 | -180.391 | 48.45 | 13.8831 | 356.9 | 13.8633 | -.742398 |
| 32 | -59.6586 | -180.391 | 53.295 | 12.906 | 356.7 | 12.8841 | -.750389 |
| 33 | -59.6586 | -180.391 | 58.14 | 11.8349 | 356.4 | 11.8117 | -.74027 |
| 34 | -59.6586 | -180.391 | 62.985 | 10.6754 | 356.2 | 10.6516 | -.712361 |
| 35 | -59.6586 | -180.391 | 67.83 | 9.43259 | 355.9 | 9.40898 | -.666971 |
| 36 | -59.6586 | -180.391 | 72.675 | 8.11107 | 355.7 | 8.08852 | -.6044 |
| 37 | -59.6586 | -180.391 | 77.52 | 6.71419 | 355.5 | 6.69364 | -.524842 |
| 38 | -59.6586 | -180.391 | 82.365 | 5.242 | 355.3 | 5.22448 | -.428235 |
| 39 | -59.6586 | -180.391 | 87.21 | 3.68735 | 355.1 | 3.67397 | -.313839 |
| 40 | -59.6586 | -180.391 | 92.055 | 2.02325 | 354.9 | 2.01532 | -.179023 |
| END | -59.6586 | -180.391 | 96.9 | 0 | 0 | 0 | 0 |
| GND | -119.317 | -360.782 | 0 | 17.4964 | 359.8 | 17.4963 | -.063751 |
| 42 | -119.317 | -360.782 | 4.82 | 17.7983 | 358.7 | 17.7939 | -.396085 |
| 43 | -119.317 | -360.782 | 9.64 | 17.8729 | 358.1 | 17.8626 | -.606557 |
| 44 | -119.317 | -360.782 | 14.46 | 17.8051 | 357.5 | 17.7882 | -.776234 |
| 45 | -119.317 | -360.782 | 19.28 | 17.6064 | 357. | 17.5826 | -.915017 |
| 46 | -119.317 | -360.782 | 24.1 | 17.2827 | 356.6 | 17.2521 | -1.02696 |
| 47 | -119.317 | -360.782 | 28.92 | 16.8382 | 356.2 | 16.8014 | -1.11395 |
| 48 | -119.317 | -360.782 | 33.74 | 16.2771 | 355.9 | 16.2345 | -1.17705 |
| 49 | -119.317 | -360.782 | 38.56 | 15.6032 | 355.5 | 15.5556 | -1.21696 |
| 50 | -119.317 | -360.782 | 43.38 | 14.8211 | 355.2 | 14.7696 | -1.23418 |
| 51 | -119.317 | -360.782 | 48.2 | 13.9355 | 354.9 | 13.8811 | -1.22919 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 52 | -119.317 | -360.782 | 53.02 | 12.9513 | 354.7 | 12.8954 | -1.20244 |
| 53 | -119.317 | -360.782 | 57.84 | 11.8739 | 354.4 | 11.8177 | -1.15441 |
| 54 | -119.317 | -360.782 | 62.66 | 10.7087 | 354.2 | 10.6535 | -1.0856 |
| 55 | -119.317 | -360.782 | 67.48 | 9.46061 | 354. | 9.40799 | -.996504 |
| 56 | -119.317 | -360.782 | 72.3 | 8.13426 | 353.7 | 8.0857 | -.887575 |
| 57 | -119.317 | -360.782 | 77.12 | 6.73285 | 353.5 | 6.68992 | -.759114 |
| 58 | -119.317 | -360.782 | 81.94 | 5.25636 | 353.3 | 5.22073 | -.611063 |
| 59 | -119.317 | -360.782 | 86.76 | 3.6975 | 353.1 | 3.67094 | -.442416 |
| 60 | -119.317 | -360.782 | 91.58 | 2.02909 | 352.9 | 2.01368 | -.249585 |
| END | -119.317 | -360.782 | 96.4 | 0 | 0 | 0 | 0 |
| GND | -178.976 | -541.173 | 0 | 5.90201 | 357.9 | 5.89803 | -.216652 |
| 62 | -178.976 | -541.173 | 5.09 | 6.07509 | 356.8 | 6.0655 | -.341181 |
| 63 | -178.976 | -541.173 | 10.18 | 6.14589 | 356.1 | 6.13156 | -.419458 |
| 64 | -178.976 | -541.173 | 15.27 | 6.15939 | 355.5 | 6.14056 | -.481283 |
| 65 | -178.976 | -541.173 | 20.36 | 6.12152 | 355. | 6.0985 | -.530351 |
| 66 | -178.976 | -541.173 | 25.45 | 6.0351 | 354.6 | 6.0083 | -.568153 |
| 67 | -178.976 | -541.173 | 30.54 | 5.90205 | 354.2 | 5.87194 | -.595402 |
| 68 | -178.976 | -541.173 | 35.63 | 5.724 | 353.9 | 5.69114 | -.612506 |
| 69 | -178.976 | -541.173 | 40.72 | 5.50258 | 353.5 | 5.46757 | -.619747 |
| 70 | -178.976 | -541.173 | 45.81 | 5.23952 | 353.2 | 5.20303 | -.617359 |
| 71 | -178.976 | -541.173 | 50.9 | 4.93669 | 353. | 4.89941 | -.605567 |
| 72 | -178.976 | -541.173 | 55.99 | 4.59606 | 352.7 | 4.55872 | -.584608 |
| 73 | -178.976 | -541.173 | 61.08 | 4.21973 | 352.4 | 4.18311 | -.554732 |
| 74 | -178.976 | -541.173 | 66.17 | 3.80985 | 352.2 | 3.77472 | -.516209 |
| 75 | -178.976 | -541.173 | 71.26 | 3.36855 | 352. | 3.33569 | -.469313 |
| 76 | -178.976 | -541.173 | 76.35 | 2.89774 | 351.8 | 2.86797 | -.414302 |
| 77 | -178.976 | -541.173 | 81.44 | 2.39889 | 351.6 | 2.37302 | -.351371 |
| 78 | -178.976 | -541.173 | 86.53 | 1.87241 | 351.4 | 1.85127 | -.280562 |
| 79 | -178.976 | -541.173 | 91.62 | 1.31613 | 351.2 | 1.30062 | -.201501 |
| 80 | -178.976 | -541.173 | 96.71 | .720875 | 351. | .712014 | -.11268 |
| END | -178.976 | -541.173 | 101.8 | 0 | 0 | 0 | 0 |

Summary of Post Construction Certified Array Geometry

With respect to Question 9, Section III, Page 2 of the attached Form 302-AM, the tower information is as follows:

| Tower No. | Height above base insulator (meters) | Height above ground w/o obst. lighting (meters) | Overall height above ground (meters) |
|---|---|---|---|
| 1 | 49.4 | 50.3 | 50.3 |
| 2 | 49.4 | 50.3 | 50.3 |
| 3 | 48.8 | 50.3 | 50.3 |
| 4 | 49.4 | 50.3 | 50.3 |

All towers are uniform cross-section, steel, guyed vertical radiators.

The tower relative distances provided in feet on the Certified Survey drawing attached hereto were converted to electrical degrees at 1510 kHz and used along with the survey tower azimuths relative to True North to calculate the distance in electrical degrees from the location specified in the theoretical directional antenna pattern array geometry. Below is a tabulation showing those distances and other data that is relevant to their determination.

| Twr. | Specified Array Geometry | | | Post-Construction Certification | | Distance From Specified Base Location | |
|---|---|---|---|---|---|---|---|
| | Spacing (degrees) | Spacing (feet) | Azimuth (deg. T.) | Spacing (feet) | Azimuth (deg. T.) | (feet) | (deg.) |
| 1 | Ref. | Ref. | Ref. | Ref. | Ref. | 0.86 | 0.47 |
| 2 | 190 | 343.9 | 108.3 | 343.05 | 107.97 | 0.27 | 0.15 |
| 3 | 380 | 687.9 | 108.3 | 687.31 | 107.99 | 0.19 | 0.10 |
| 4 | 570 | 1031.8 | 108.3 | 1031.46 | 108.00 | 0.20 | 0.11 |

The as-built tower displacements from their specified locations expressed in electrical degrees at 1510 kHz, which corresponds to space phasing differences in the far-field radiation pattern of the array, are well below the ±3 degree operating phase range specified for antenna monitor parameters by the FCC.

## Sampling System

The sampling system consists of Potomac Instruments TCT-1 current transformers installed at the output of each antenna tuning unit, immediately adjacent to the final J-plug. Samples from the current transformers are fed to the antenna monitor via equal lengths of 3/8-inch foam-dielectric coaxial transmission lines. The antenna monitor is a Potomac Instruments Type 1901.

Impedance measurements were made of the antenna monitor sampling system using an Agilent E5061A network analyzer. The measurements were made looking into the antenna monitor ends of the sample lines with the tower ends of the sample lines open-circuited.

The table below shows the frequencies above and below the carrier frequency where resonance, defined as zero reactance corresponding with low resistance, was found. As the length of 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 the resonant frequency below carrier frequency, which is the closest one to the carrier frequency, was found to be 450 electrical degrees. The electrical length at carrier frequency appearing in the table below was calculated by ratioing the frequencies.

| Twr. | Sample Line Open-Circuited Resonance Below 1510 kHz (kHz) | Sample Line Open-Circuited Resonance Above 1510 kHz (kHz) | Sample Line Calculated Electrical Length At 1510 kHz (deg.) |
|---|---|---|---|
| 1 | 1106.0 | 1852.6 | 366.8 |
| 2 | 1106.0 | 1852.6 | 366.8 |
| 3 | 1106.0 | 1852.6 | 366.8 |
| 4 | 1106.0 | 1852.6 | 366.8 |

Because the electrical lengths were determined to be identical, the sample lines meet the requirement in the Rules that they be equal in length within one electrical degree.

To determine the characteristic impedance values of the sample lines, open-circuited measurements were made with frequencies offset to produce ± 45 degrees of electrical length from resonance.

The characteristic impedance was calculated using the following formula, where $R_1 + j X_1$ and $R_2 + j X_2$ are the measured impedances at the +45 and -45 degree offset frequencies, respectively:

$$Z_O = ((R_1^2 + X_1^2)^{1/2} \times (R_2^2 + X_2^2)^{1/2})^{1/2}$$

| Twr. | + 45 Deg. Offset Frequency (kHz) | +45 Deg. Measured Impedance (ohms) | - 45 Deg. Offset Frequency (kHz) | -45 Deg. Measured Impedance (ohms) | Calculated Characteristic Impedance (ohms) |
|---|---|---|---|---|---|
| 1 | 2037.8 | 9.2 +j49.1 | 1667.3 | 7.6 –j49.1 | 49.8 |
| 2 | 2037.8 | 9.1 +j48.8 | 1667.3 | 7.5 –j49.1 | 49.7 |
| 3 | 2037.8 | 9.3 +j48.9 | 1667.3 | 7.4 –j49.1 | 49.7 |
| 4 | 2037.8 | 9.2 +j48.6 | 1667.3 | 7.6 –j49.4 | 49.7 |

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

The antenna monitor for KCKK is a Potomac Instruments model 1901.

The calibration of the Delta TCT-1 current transformers was verified by removing them all from the ATUs and installing them on a test jig so that each was located very close together (spacing of less than two inches). Short transmission lines of equal length were connected between the outputs of all four current transformers and the inputs of the antenna monitor. A single source of RF current on the carrier frequency was fed through a conductor passing through all of the current transformers, and the differential phases and ratios were noted on the antenna monitor as follows:

| Twr. | Ratio | Phase (deg.) |
|---|---|---|
| 1 | 0.992 | +0.1 |
| 2 | Ref. | Ref. |
| 3 | 0.992 | 0.0 |
| 4 | 1.013 | 0.0 |

The requirement that the sample current transformers are accurate to within the manufacturer's specification (±2% ratio and ±2 degrees phase) has thus been demonstrated.

The impedance of each of the sample lines was measured with the sample current transformers attached. These impedances are tabulated below:

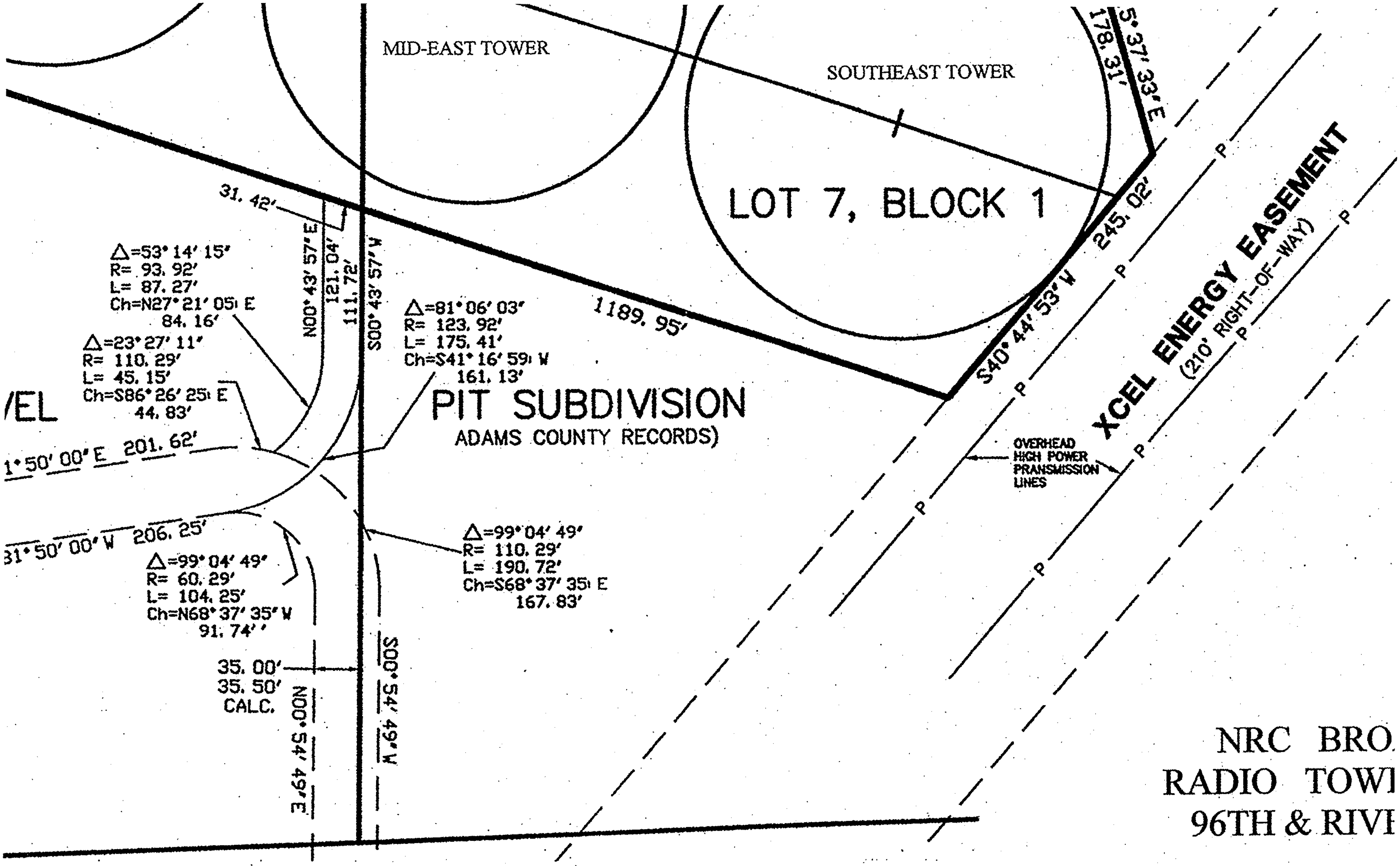
| Twr. | R (ohms) | X (ohms) |
|---|---|---|
| 1 | 49.9 | +j1.51 |
| 2 | 50.0 | +j4.38 |
| 3 | 51.0 | +j3.78 |
| 4 | 49.8 | +j3.78 |

## Direct Measurement of Power

Common point impedance measurements were made using a Delta CPB-1A common point bridge installed in the common point bus of the phasing and coupling system. The resistance value was adjusted to 50 ohms. The reactance value was adjusted to –j10 ohms, which with the series inductance of the tubing in the phasor between the common point and transmitter input results in a 50-ohm non-reactive load to the transmitter on the carrier frequency.

# Appendix A

## Certified Post-Construction Array Geometry Survey




NRC BRO
RADIO TOWI
96TH & RIVI

NORTHW
(PI

| MOD.STATE PLANE | STATE PLANE | L |
|---|---|---|
| N 1742450.88 | 1742075.50 | ⁿ |
| E 3161062.17 | 3160381.18 | |
| | | (AS- |
| N 1742450.54 | 1742075.16 | ] |

CONTROL MONUMENTS

Appendix B

Reference Field Strength Measurements

Reference field strength measurements were made using a Potomac Instruments FIM-41 field intensity meter of known calibration at three locations along radials at the azimuths with radiation values specified on the construction permit and, additionally, on a major lobe radial for each directional pattern. The measured field strengths and descriptions and GPS coordinates for the reference measurement points are shown in the following tables.

| | | | | | |
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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| FIELD STRENGTH MEASUREMENTS DATA | | | DAY RADIAL 6 | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| 550 | 2.56 | 3/31/2009 | 0935 | 39° 53' 31.0" | On Riverdale at Radial |
| | | | | 104° 55' 23.2 | |
| 380 | 3.23 | 3/31/2009 | 0954 | 39° 53' 52.3" | 111th Drivewest of Hudson Place |
| | | | | 104° 55' 20.4 " | |
| 220 | 5.54 | 3/31/2009 | 1007 | 39° 55' 07.0" | In front of 5701 123rd Ave |
| | | | | 104° 55' 10.4" | |

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1510 kHz 10 Kw/ 25 Kw DA2

LITTLETON, COLORADO

FIELD STRENGTH MEASUREMENTS DATA DAY RADIAL 25

| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
|---|---|---|---|---|---|
| 560 | 1.93 | 3/31/2009 | 1047 | 39° 53' 05.0 | On Holly south of 104th |
| | | | | 140° 55' 00.5" | |
| 195 | 5.24 | 3/31/2009 | 1036 | 39° 54' 42.5" | On Riverdale at curve |
| | | | | 104° 54' 01.3" | |
| 107 | 7.3 | 3/31/2009 | 1027 | 39° 55' 42.9 | |
| | | | | 104° 53' 24.4 | |

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1510 kHz 10 Kw/ 25 Kw DA2

LITTLETON, COLORADO

FIELD STRENGTH MEASUREMENTS DATA DAY RADIAL 40.5

| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
|---|---|---|---|---|---|
| 440 | 2.36 | 3/31/2009 | 1054 | 39° 53' 06.8" | On 104th at orange and white |
| | | | | 104° 54' 30.7 | pole # 209 |
| 111.5 | 6.39 | 3/31/2009 | 1106 | 39° 54' 45.8" | On 120th west of Brighton Road |
| | | | | 104° 52' 40.1" | |
| 105 | 7.86 | 3/31/2009 | 1117 | 39° 55' 21.6 | On Henderson Road at east |
| | | | | 104° 51' 59.3" | side of Bridge |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| FIELD STRENGTH MEASUREMENTS DATA | | | DAY RADIAL 86 | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| 30.3 | 3.89 | 3/31/2009 | 1109 | 39° 52' 16.8" | At driveway north of 96th on Alton |
| | | | | 104° 52' 51.3 " | |
| 5.8 | 5.99 | 3/31/2009 | 1100 | 39° 52' 21.6 | At intersection of Eagle Creek Cir. |
| | | | | 104° 51' 23.0" | and Eagle Creek Pky. |
| 5.2 | 10.2 | 3/31/2009 | 1151 | 39° 53' 30.9" | In front of 9844 Chambers |
| | | | | 104° 48' 26.2" | |

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1510 kHz 10 Kw/ 25 Kw DA2

LITTLETON, COLORADO

FIELD STRENGTH MEASUREMENTS DATA DAY RADIAL 130.5

| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
|---|---|---|---|---|---|
| 370 | 2.81 | 3/31/2009 | 1342 | 39° 51' 09.6 | At drive way of 7425 86th Ave. |
| | | | | 104° 54' 04.7 " | |
| 275 | 3.7 | 3/31/2009 | 1348 | 39° 50' 50.6" | At curve on 83rd. Ave south of |
| | | | | 104° 53' 36.9" | Ulster St. |
| 78 | 12.7 | 3/31/2009 | 1436 | 39° 47' 41.2" | In front of 14884 Maxwell Place. |
| | | | | 104° 48' 43.3" | |

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1510 kHz 10 Kw/ 25 Kw DA2

LITTLETON, COLORADO

FIELD STRENGTH MEASUREMENTS DATA DAY RADIAL 141.5

| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
|---|---|---|---|---|---|
| 128 | 2 | 3/31/2009 | 1329 | 39° 51' 17.7" | At drive way of #18 Wikup Drive |
| | | | | 104° 54' 42.2" | |
| 56 | 2.93 | 3/31/2009 | 1355 | 39° 50' 54.9 | In road at 8341 Pontiac St. |
| | | | | 104° 54' 17.6" | |
| 10.3 | 10.5 | 3/31/2009 | 1423 | 39° 47' 41.4" | On Oswego across from |
| | | | | 104° 50' 58.3" | Building 2 Unit E |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| FIELD STRENGTH MEASURMENTS DATA | | | DAY RADIAL 176 | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DISCRIPTION |
| 115 | 5.49 | 3/31/2009 | 1513 | 39° 49' 10.5" | At intersection of 69th way and Holly |
| | | | | 104° 55' 18.8" | |
| 117 | 6.25 | 3/31/2009 | 1508 | 39° 48' 45.8" | At Diamond Shamrock Drive way |
| | | | | 104° 55' 16.1" | just east of Holly on 64th. |
| 105 | 7.49 | 3/31/2009 | 1451 | 39° 48' 06.2" | At drive way of 5660 E. 58th Ave. |
| | | | | 104° 55' 13.0" | |

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1510 kHz 10 Kw/ 25 Kw DA2

LITTLETON, COLORADO

FIELD STRENGTH MEASUREMENTS DATA DAY RADIAL 191.5

| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
|---|---|---|---|---|---|
| 372 | 2.52 | 3/31/2009 | 1543 | 39° 50' 48.1 | On Dalia at turn out as road turns north |
| | | | | 104° 55' 56.0" | |
| 176 | 5.14 | 3/31/2009 | 1533 | 39° 49' 25.0" | Across from 4135 E. 70th Ave. |
| | | | | 104° 56' 18.1" | |
| 102 | 5.84 | 3/31/2009 | 1530 | 39° 49' 02.7 | Brighton Blvd and Colorado Blvd |
| | | | | 104° 56' 24.0 | |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| FIELD STRENGTH MEASUREMENTS DATA | | | DAY RADIAL 211 | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| 380 | 4.94 | 4/1/2009 | 1004 | 39° 49' 51.3' | At west end of driveway of |
| | | | | 104° 57' 22.4" | 2505 E. 74th Ave. |
| 144 | 6.82 | 4/1/2009 | 1015 | 39° 48' 59.0" | At open property East of |
| | | | | 104° 58' 03.1" | 6600 E. 66th Ave. |
| 100 | 7.7 | 4/1/2009 | 1021 | 39° 48' 34.6" | In street at 6221 Downing |
| | | | | 104° 58' 22.0" | |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| FIELD STRENGTH MEASUREMENTS DATA | | | DAY RADIAL 274 | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| 77 | 2.76 | 3/31/2009 | 1641 | 39° 52' 15.0" | On York north of Thornton Pkwy |
| | | | | 104° 57' 30.4" | |
| 69 | 3.51 | 3/31/2009 | 1646 | 39° 52' 16.6 | |
| | | | | 104° 58' 02.0" | |
| 22.7 | 5.9 | 3/31/2009 | 1558 | 39° 52' 21.8" | At 9771 Fred Drive |
| | | | | 104° 59' 42.2" | |

KCKK
PEOPLE'S WIRELESS INC.
1510 kHz 10 Kw/ 25 Kw DA2
LITTLETON, COLORADO

FIELD STRENGTH MEASUREMENTS DATA DAY RADIAL 302.5

| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
|---|---|---|---|---|---|
| 64 | 2.23 | 3/31/2009 | 1633 | 39° 52' 47.1" | In front of 10199 Adams Street |
| | | | | 104° 56' 54.1" | |
| 42.5 | 3.92 | 3/31/2009 | 1625 | 39° 53' 16.5" | In street in front of |
| | | | | 104° 57' 53.8" | 1701 E. 105th Pl. |
| 16.2 | 6 | 3/31/2009 | 1613 | 39° 53' 52.7" | In front of 109 Muriel Dr. |
| | | | | 104° 59' 07.7" | |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
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| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 19 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 550 | 3.89 | 3/23/2009 | 1228 | 39° 54' 07.7 | At east drive way of |
| | | | | 104° 54' 41.4" | 11330 Riverdale |
| | | | | | |
| 350 | 8.23 | 3/23/2009 | 1251 | 39° 56' 20.4" | In street just East of |
| | | | | 104° 53' 41.4" | 7940 E. 136th. Av. |
| | | | | | |
| 345 | 8.7 | 3/23/2009 | 1244 | 39° 56' 35.1 | On 136th Ave at fence line |
| | | | | 104° 53' 35.1" | of white house east of bridge |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
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| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 70.5 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 9.5 | 6.9 | 3/23/2009 | 1343 | 39° 53' 22.3" | Aprox. 100 ft. West of 104th |
| | | | | 104° 51' 01.5" | way on Peoria Parkway |
| | | | | | |
| 7.3 | 8.96 | 3/23/2009 | 1327 | 39° 53' 44.7" | Aprox .5 mi South if 112th |
| | | | | 104° 49' 38.5" | on Potomac |
| | | | | | |
| 6.6 | 10.67 | 3/23/2009 | 1320 | 39° 54' 03.4" | Aprox .1 mi. North of 112th |
| | | | | 104° 48' 30.7" | on Chambers at speed limit sign |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
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| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 91.5 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 157 | 4.97 | 3/23/2009 | 1424 | 39° 52' 03.7" | 300 Meters Sw of 96th on Highway 2 |
| | | | | 104° 52' 05.7" | |
| | | | | | |
| 47.5 | 11.6 | 3/23/2009 | 1412 | 39° 51' 57.8" | On Buckley aprox .3 miles from 96th Av. |
| | | | | 104° 47' 25.7" | across from power pole 7020 5235 |
| | | | | | |
| 55 | 13.24 | 3/23/2009 | 1418 | 39° 51' 56.5" | On Tower road aprox .6 mi |
| | | | | 104° 46' 16.7" | North of 88th. Ave. |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
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| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 125 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 24.9 | 3.81 | 3/23/2009 | 1433 | 39° 50' 57.2" | On Highway 2 |
| | | | | 104° 53' 23.1" | |
| | | | | | |
| 5.8 | 13.68 | 3/24/2009 | 1028 | 39° 47' 53.6" | 100 ft. west of Memphis St. |
| | | | | 104° 47' 43.5" | on 56th Ave. |
| | | | | | |
| 3.3 | 16.09 | 3/24/2009 | 1038 | 39° 47' 08.3" | At power vault on west side of 49th |
| | | | | 104° 46' 18.5" | on Tower Rd. |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 146 | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| 14..5 | 3.93 | 3/23/2009 | 1438 | 39° 50' 22.8" | On Highway 2 |
| | | | | 104° 54' 02.7" | |
| 9.2 | 9.98 | 3/24/2009 | 1001 | 39° 40' 40.6" | At drive way in front of |
| | | | | 104° 51' 40.4" | 10801 E. 54th Ave. |
| 12.5 | 11.39 | 3/24/2009 | 1015 | 39° 47' 02.6 | In front of loading dock at |
| | | | | 104° 51' 07.2" | 4800 Nome St. |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
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| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 197.5 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 11.4 | 9.2 | 3/24/2009 | 1125 | 39° 47' 23.2" | In front of 5151 York St. |
| | | | | 104° 57' 31.6" | |
| | | | | | |
| 18.9 | 11.46 | 3/24/2009 | 1137 | 39° 46' 15.1" | In front of 3843 Gilpin St. |
| | | | | 104° 58' 00.0" | |
| | | | | | |
| 18 | 11.8 | 3/24/2009 | 1141 | 39° 46' 04.2" | In front of 3641 Franklin |
| | | | | 104° 58' 04.5" | Stone front house |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
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| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 248.5 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 12.8 | 7.82 | 3/24/2009 | 1239 | 39° 50' 35.6" | In front of 8086 Wyandot Dr. |
| | | | | 105° 00' 41.2" | |
| | | | | | |
| 6.3 | 8.57 | 3/24/2009 | 1233 | 39° 50' 26.6 | On Fairview Ave. just South of |
| | | | | 105° 01' 10.5" | Valleyview Dr. |
| | | | | | |
| 3.2 | 10.99 | 3/24/2009 | 1221 | 39° 49' 57.8" | 25 ft. West of drive way at |
| | | | | 105° 02' 45.2" | school parking lot |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 268 | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| 58 | 3.23 | 4/1/2009 | 1257 | 39° 51' 30.1" | At driveway of 8921 Race St. |
| | | | | 104° 57' 41.4" | |
| 59 | 4.18 | 4/1/2009 | 1253 | 39° 51' 18.8" | At black fence between |
| | | | | 104° 58' 18.3" | 8731 and 8741 De Soteo |
| 48 | 4.93 | 4/1/2003 | 1247 | 39° 51' 09.8" | 1/2 way between Pearl and |
| | | | | 104° 58' 47.9" | Grant on 86th Ave. |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
| | | | | | |
| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 309 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 18 | 4.49 | 4/1/2009 | 1223 | 39° 53' 39.9" | On street by drive way of |
| | | | | 104° 58' 01.9" | 10918 Murray Dr. |
| | | | | | |
| 16 | 5.98 | 4/1/2009 | 1213 | 39° 54' 10.3" | South of Malley on Grant |
| | | | | 104° 58' 50.7" | By 10 Commandments |
| | | | | | |
| 14 | 7.44 | 4/1/2009 | 1204 | 39° 54' 39.7" | At drive way at 624 W 118th Ave. |
| | | | | 104° 59' 38.4" | |

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| KCKK | | | | | |
| PEOPLE'S WIRELESS INC. | | | | | |
| 1510 kHz | 10 Kw/ 25 Kw DA2 | | | | |
| LITTLETON, COLORADO | | | | | |
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| FIELD STRENGTH MEASUREMENTS DATA | | | NIGHT RADIAL 328 | | |
| | | | | | |
| N-DA (mV/m | DISTANCE (km) | DATE | TIME | LAT/LON | DESCRIPTION |
| | | | | | |
| 47 | 2.7 | 4/1/2009 | 1131 | 39° 53' 22.5" | On street between |
| | | | | 104° 56' 34.9" | 3555 and 3561 E 106th Ave. |
| | | | | | |
| 37 | 5.06 | 4/1/2009 | 1142 | 39° 54' 27.3" | At drive way of 11684 Josephine St. |
| | | | | 104° 57' 27.7" | |
| | | | | | |
| 8.2 | 7.32 | 4/1/2009 | 1142 | 39° 55' 29.4" | On 126th aprox 150 ft. |
| | | | | 104° 58' 18.2" | West of curve |