ENGINEERING STATEMENT CONCERNING

APPLICATION FOR LICENSE INFORMATION

EMPLOYING MOMENT METHOD MODELING

WLCC, 760 KHZ, DA-2

BRANDON, FLORIDA

SEPTEMBER, 2023

PHASETEK INC.

ENGINEERING STATEMENT CONCERNING
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TABLE OF CONTENTS

PHASETEK INC.

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SUMMARY

Adjustment of the Antenna System and a Proof of Performance employing Moment Method Modeling were performed on Radio Station WLCC, 760 KHz, Brandon, Florida. This report was prepared on behalf of Salem Communications Holding Corporation, licensee of Radio Station WLCC.

TRANSMITTER SITE

The WLCC Transmitter site remains as currently licensed. All towers employ guy wire top loading. Towers #1, #2, #3, #5, and #6 are used for Day operation. Towers #1, #2, #3, and #4 are used for Night operation. As there is no change to the currently licensed radiation patterns for WLCC, a survey of the towers is not included. A License Application employing Moment Method Modeling as set forth in Section 73.151(C) has been done for Radio Station WLCC to license under the new rules.

REFERENCE POINTS

Reference Points were measured at pattern minima and maxima for the Directional modes of operation. These Points and their measured field intensity are shown in Figure 15.

TOWER TOP LOADING

The guy wire top loading is configured identical for all towers. Top loading for all towers is modeled at 100% the physical length. The difference in diameter between the guy wire top loading and the tower yields a “warning” message for the model. A convergence test was performed on the tower 1 model to verify. This is shown in Figure 16. All other tower models are similar.

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ENGINEERING STATEMENT CONCERNING
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023

STATION LOCATION

It has been determined that the current licensed coordinates for the center of the WLCC array are incorrect. These differ within 2 seconds, therefore, are being corrected with this application. The actual coordinates of the center of the array, rounded to the nearest second, in NAD27 format are:
N 28° 01’ 30”, W 82° 17’ 00”

METHOD OF MOMENTS DETAIL

All Moment Method Modeling was done with Expert MININEC Broadcast Professional, Version 23. Four wires were used to represent each Tower and it’s top-loading. Towers were driven individually to verify the Model compared to measured impedance data. Once the Model was verified, both the Day and Night Directional Antenna Systems were computed. For Directional modes, the complex voltage values for sources located at ground level were computed. These sources produce current moment sums for each Tower that, when normalized, equate to the Theoretical Field Parameters for each respective Tower. The calculated current moments are shown in Figure 17.

MEASURING EQUIPMENT AND PERSONNEL

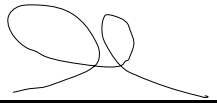
All Tower Resistance and Reactance measurements were made with a HP 8753ES network Analyzer and a Tunwall directional coupler. Before use, tests of known impedances were made to verify operation. All Field Intensity Measurements were made with a Potomac Instruments Field Intensity Meter, model 4100, Serial Number 249, calibrated on January 21, 2016. The meter was calibrated by Potomac Instruments, Frederick, Maryland. The meter was compared to a Potomac Instruments FIM-41, Serial Number 2063, calibrated on March 3, 2023, and agreed. All measurements were taken by Phasetek Inc. personnel supervised by Kurt Gorman of Phasetek Inc.

PHASETEK INC.

ENGINEERING STATEMENT CONCERNING
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023

CONCLUSION

It is believed that the WLCC Antenna System has been adjusted in accordance with all applicable Commission rules and regulations. The foregoing was prepared on behalf of Salem Communications Holding Corporation, under the immediate supervision of Kurt Gorman, Phasetek Inc., Quakertown, Pennsylvania, whose qualifications are a matter of record with the Federal Communications Commission. The statements herein are true and correct of his knowledge, except such statements made on information and belief, and as to these statements he believes them to be true and correct.



Kurt Gorman, President
Phasetek Inc.
Quakertown, Pennsylvania

FIGURE 1

ANTENNA SYSTEM AS ADJUSTED

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023

ANTENNA SYSTEM DESCRIPTION

1. The Antenna System consists of six (6), uniform, guyed, vertical steel transmitting Towers. All towers stand 91.43M (83.45^{o}) above their Base Insulators and have guy wire top loading. The Towers are arranged with Tower 1 as a reference; Tower 2 is spaced 90.0^{o} on a bearing of 202.5^{o}T. Tower 3 is spaced 180.0^{o} on a bearing of 202.5^{o}T. Tower 4 is spaced 270.0^{o} on a bearing of 202.5^{o}T. . Tower 5 is spaced 230.0^{o} on a bearing of 223.5^{o}T. Tower 6 is spaced 251.1^{o} on a bearing of 182.5^{o}T All towers have aviation obstruction lighting. All lighting is isolated at the base with a choke.

2. The Ground System for each Tower remains as currently licensed. No changes have been made. Copper strap connects all Towers to the main Transmitter grounding point.

3. The Sampling System consists of six (6), Delta Electronics Inc. TCT-1, 0.5 V/A Toroidal Current Transformers. All TCT's are at the Output of each Antenna Tuning Unit. These TCT's are connected to a Potomac Instruments 1901-6 Antenna Monitor via six (6) equal lengths of Cablewave, FCC-38-50J, 3/8" phase stabilized foam coaxial cable.

4. Tower registration numbers:
   Tower 1: 1030542
   Tower 2: 1030541
   Tower 3: 1030540
   Tower 4: 1030539
   Tower 3: 1030538
   Tower 4: 1030537

FIGURE 1
ANTENNA SYSTEM AS ADJUSTED

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023
CONTINUED

ANTENNA SYSTEM DESCRIPTION – Continued

DIRECTIONAL OPERATION (DAY)

COMMON POINT

Impedance = 50.0 – j 3.4 Ohms
Current = 14.5 Amperes
Power = 10,500 Watts

DIRECTIONAL OPERATION (NIGHT)

COMMON POINT

Impedance = 50.0 – j 3.4 Ohms
Current = 4.65 Amperes
Power = 1,080 Watts

Directional Antenna Monitor indications are within ±5% and ±3° of the modeled TCT values.

FIGURE 2
WLCC SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023

SAMPLING SYSTEM DESCRIPTION

The Sampling System consists of Delta Electronics Inc. TCT-1 Toroidal Sampling Transformers (0.5 volt/amp) mounted at the base of each Tower. The sampling devices are connected to the Antenna Monitor with equal lengths of Cablewave FCC-38-50J. The Antenna Monitor is a Potomac Instruments Model 1901-6, Serial Number 867.

SAMPLE LINE MEASUREMENTS

Impedance measurements were made of the Antenna Sampling Lines using a HP 8753ES Network Analyzer and Tunwall directional coupler. Measurements were done with the lines open circuited and then connected to the TCT's.

The table below shows the frequencies above and below the carrier frequency where resonance, defined as zero reactance corresponding with low resistance, was found. Frequencies of resonance occur at odd multiples of 90 degrees electrical length, the Sample Line length at the resonant frequency above the carrier frequency, which is the closest one to the carrier frequency, was found to be 270 electrical degrees. The electrical length at carrier frequency appearing in the table below was calculated by ratioing the frequencies.

SAMPLE LINE MEASUREMENTS

	Resonant Frequency (KHz) below 760 KHz	Resonant Frequency (KHz) above 760 KHz	Calculated Electrical Length (deg) at 760 KHz	Measured Impedance (ohms) Connected to TCT @ 760 KHz
Tower 1	352.18	1070.26	191.7	51.7 +j 1.9
Tower 2	352.56	1069.93	191.8	51.2 +j 1.5
Tower 3	352.70	1070.95	191.6	51.2 +j 1.5
Tower 4	353.33	1071.58	191.5	51.2 +j 1.7
Tower 5	353.12	1072.56	191.3	51.3 +j 1.4
Tower 6	353.83	1072.93	191.3	51.0 +j 1.4

FIGURE 2
WLCC SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023
CONTINUED

SAMPLE LINE MEASUREMENTS (CONTINUED)

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 R1 +j X1 and R2 +j X2 are the measured impedances at the +45 and -45 degree offset frequencies, respectively:

$$Z_0 = ((R_1^2 + X_1^2)^{1/2} \bullet (R_2^2 + X_2^2)^{1/2})^{1/2}$$

WLCC TOWER SAMPLE LINE MEASUREMENTS

Tower	+ 45 Degree Offset Frequency (kHz)	+ 45 Degree Measured Impedance (Ohms)	- 45 Degree Offset Frequency (kHz)	- 45 Degree Measured Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)
1	1248.7	8.8 +j 49.4	891.8	6.3 –j 50.7	50.63
2	1248.3	8.7 +j 47.6	891.6	6.4 –j 50.1	49.44
3	1249.5	8.5 +j 47.5	892.4	6.3 –j 49.5	49.07
4	1250.2	8.9 +j 48.5	892.9	6.3 –j 50.0	49.85
5	1251.4	8.6 +j 48.8	893.8	6.1 –j 49.9	49.91
6	1251.8	8.5 +j 48.6	894.1	6.2 –j 49.8	49.76

SAMPLING TCT MEASUREMENTS

Measurements of the Delta Electronics Inc. Model TCT-1, 0.5 V/A Toroidal Current Transformers were performed by a Hewlett Packard 8753ES, Network Analyzer. Measurements are normalized to Tower #2 (reference) and are within the manufacturer's rating of ± 2.0% and ± 2.0°.

FIGURE 2
WLCC SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023
CONTINUED

SAMPLING TCT MEASUREMENTS CONT'D

TOWER	TCT SERIAL #	MAGNITUDE	PHASE
1	17509	1.002	-0.1°
2	17506	1.000	0.0°
3	17508	1.001	-0.3°
4	17510	1.002	-0.1°
5	1214	1.003	-0.2°
6	17511	1.002	-0.1°

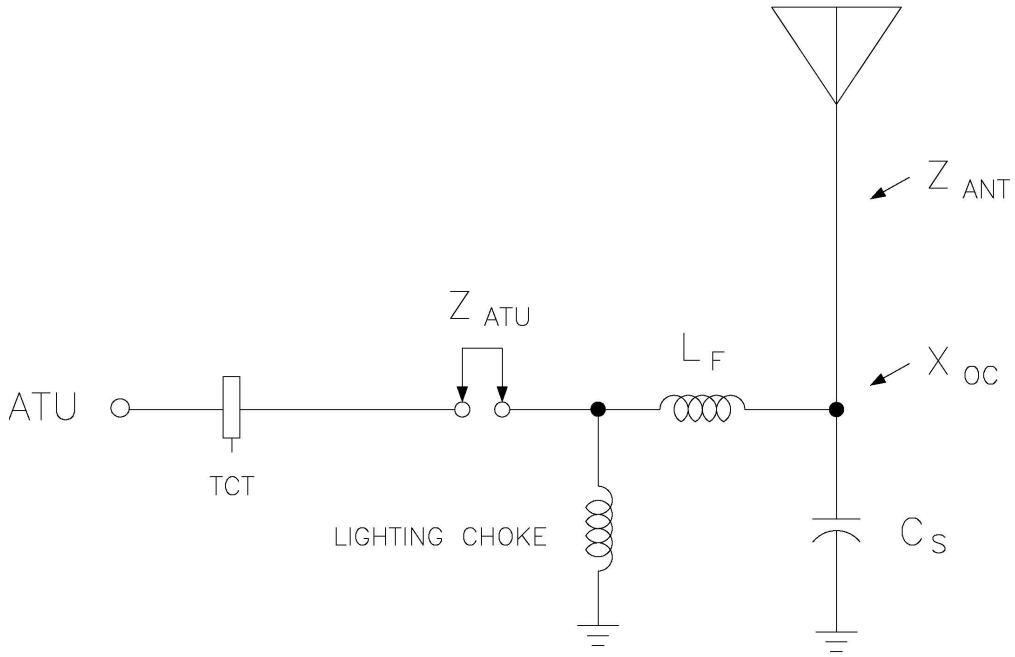
ANTENNA MONITOR MEASUREMENT

Measurement of the Potomac Instruments Model 1901-6 Antenna Monitor was performed to verify calibration. A single RF Voltage was applied to the Reference Input (Tower #2) and each other Input by use of a "T" divider and equal electrical length coaxial cables. This yields the following:

Tower	Ratio	Phase
1	.999	-0.2°
2	1.000	0.0°
3	1.001	-0.1°
4	1.000	0.4°
5	1.000	-0.2°
6	1.001	-0.1°

The above is within the manufacturer's rating of $\pm$ 1.0% and $\pm$ 1.0°.

FIGURE 3
WLCC TOWER IMPEDANCE MEASUREMENTS COMPARED TO METHOD OF MOMENTS MODEL



TOWER	Specified Cs (pf)	Measured L_F (µH)	Measured X_F (Ω)	Modeled Z_{ANT} (Ω)	Modeled Z_{ATU} (Ω)	Measured Z_{ATU} (Ω)
1	15	3.98	+j19.0	50.79 +j 60.25	47.37 +j 77.46	47.3 +j 77.1
2	15	4.61	+j22.0	49.80 +j 60.14	46.32 +j 80.09	46.6 +j 79.6
3	15	3.98	+j19.0	47.46 +j 60.27	44.26 +j 77.36	44.6 +j 77.1
4	15	4.40	+j21.0	46.81 +j 55.51	43.75 +j 74.74	43.5 +j 74.4
5	15	3.35	+j16.0	51.01 +j 64.33	47.55 +j 78.51	47.8 +j 77.6
6	15	3.77	+j18.0	50.18 +j 61.21	46.81 +j 77.41	47.0 +j 77.6

Tower	Calculated X_{OC} (Ω)
1	+j 2,360.3
2	+j 2,364.4
3	+j 2,360.3
4	+j 2,363.1
5	+j 2,356.2
6	+j 2,359.0

FIGURE 4
WLCC MOMENT MODEL PARAMETERS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023

Tower #	Wire #	# of Segments	Base Node
1	1-4	21	1
2	5-8	21	22
3	9-12	21	43
4	13-16	21	64
5	17-20	21	85
6	21-24	21	106

Tower #	Physical Height Degrees	Modeled Height Degrees	Modeled Radius Meters	% of Equivalent Radius
1	83.45 + TL	88.9 + TL	.218	100.0
2	83.45 + TL	88.6 + TL	.218	100.0
3	83.45 + TL	88.8 + TL	.218	100.0
4	83.45 + TL	88.0 + TL	.218	100.0
5	83.45 + TL	89.3 + TL	.218	100.0
6	83.45 + TL	88.8 + TL	.218	100.0

All Towers are uniform cross section, guyed with Base Insulator. All towers are three (3) sided, with a 18" face width. Guy wire top loading is incorporated on all towers. The physical length of "hot" guy wire for each tower is 30.0 ft. (8.34° @ 760 kHz). Top loading is modeled at 100% the physical length.

All Base Insulators are manufactured by Austin Insulators with an assumed capacity of 15pf (-j13,961.0 ohms @ 760 kHz).

All Towers have Phasetek Inc. Model #P600-160-2 Lighting Choke. These measure +j 2,000.0 ohms @ 760 KHz.

FIGURE 5
WLCC MOMENT SUMMARY FOR INDIVIDUAL TOWERS

WLCC TOWER 1 (OTHERS OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	15
		0	0	88.9		
2	none	0	0	88.9	.01	2
		5.9	22.5	83.		
3	none	0	0	88.9	.01	2
		5.9	142.5	83.		
4	none	0	0	88.9	.01	2
		5.9	262.5	83.		
5	none	90.	202.5	0	.218	15
		90.	202.5	88.6		
6	none	90.	202.5	88.6	.01	2
		90.19	198.75	82.7		
7	none	90.	202.5	88.6	.01	2
		95.16	204.28	82.7		
8	none	90.	202.5	88.6	.01	2
		84.94	204.49	82.7		
9	none	180.	202.5	0	.218	15
		180.	202.5	88.8		
10	none	180.	202.5	88.8	.01	2
		177.12	200.85	82.9		
11	none	180.	202.5	88.8	.01	2
		185.9	202.5	82.9		
12	none	180.	202.5	88.8	.01	2
		177.12	204.15	82.9		
13	none	270.	202.5	0	.218	15
		270.	202.5	88.		
14	none	270.	202.5	88.	.01	2
		267.1	201.4	82.1		
15	none	270.	202.5	88.	.01	2
		275.9	202.5	82.1		
16	none	270.	202.5	88.	.01	2
		267.1	203.6	82.1		
17	none	230.	223.5	0	.218	15
		230.	223.5	89.3		
18	none	230.	223.5	89.3	.01	2
		227.11	222.21	83.4		
19	none	230.	223.5	89.3	.01	2
		235.9	223.5	83.4		
20	none	230.	223.5	89.3	.01	2
		227.11	224.79	83.4		
21	none	251.1	182.5	0	.218	15
		251.1	182.5	88.8		
22	none	251.1	182.5	88.8	.01	2
		248.2	181.32	82.9		
23	none	251.1	182.5	88.8	.01	2
		257.	182.5	82.9		
24	none	251.1	182.5	88.8	.01	2
		248.2	183.68	82.9		

Number of wires = 24
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	10	4.16961	17	5.95333
radius	2	.01	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	.76	0	1	.0115822	.016537

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	22	0	2,364.4	0	0	0
2	43	0	2,360.3	0	0	0
3	64	0	2,363.1	0	0	0
4	85	0	2,356.2	0	0	0
5	106	0	2,359.	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							
.76	50.794	60.249	78.804	49.9	3.1078	-5.7957	-1.327

WLCC TOWER 2 (OTHERS OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	15
		0	0	88.9		
2	none	0	0	88.9	.01	2
		5.9	22.5	83.		
3	none	0	0	88.9	.01	2
		5.9	142.5	83.		
4	none	0	0	88.9	.01	2
		5.9	262.5	83.		
5	none	90.	202.5	0	.218	15
		90.	202.5	88.6		
6	none	90.	202.5	88.6	.01	2
		90.19	198.75	82.7		
7	none	90.	202.5	88.6	.01	2
		95.16	204.28	82.7		
8	none	90.	202.5	88.6	.01	2
		84.94	204.49	82.7		
9	none	180.	202.5	0	.218	15
		180.	202.5	88.8		
10	none	180.	202.5	88.8	.01	2
		177.12	200.85	82.9		
11	none	180.	202.5	88.8	.01	2
		185.9	202.5	82.9		
12	none	180.	202.5	88.8	.01	2
		177.12	204.15	82.9		
13	none	270.	202.5	0	.218	15
		270.	202.5	88.		
14	none	270.	202.5	88.	.01	2
		267.1	201.4	82.1		
15	none	270.	202.5	88.	.01	2
		275.9	202.5	82.1		
16	none	270.	202.5	88.	.01	2
		267.1	203.6	82.1		
17	none	230.	223.5	0	.218	15
		230.	223.5	89.3		
18	none	230.	223.5	89.3	.01	2
		227.11	222.21	83.4		
19	none	230.	223.5	89.3	.01	2
		235.9	223.5	83.4		
20	none	230.	223.5	89.3	.01	2
		227.11	224.79	83.4		
21	none	251.1	182.5	0	.218	15
		251.1	182.5	88.8		
22	none	251.1	182.5	88.8	.01	2
		248.2	181.32	82.9		
23	none	251.1	182.5	88.8	.01	2
		257.	182.5	82.9		
24	none	251.1	182.5	88.8	.01	2
		248.2	183.68	82.9		

Number of wires = 24
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	10	4.16961	17	5.95333
radius	2	.01	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	.76	0	1	.0115822	.016537

Sources

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

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	2,360.3	0	0	0
2	43	0	2,360.3	0	0	0
3	64	0	2,363.1	0	0	0
4	85	0	2,356.2	0	0	0
5	106	0	2,359.	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 22, sector 1							
.76	49.798	60.136	78.077	50.4	3.1333	-5.745	-1.3453

WLCC TOWER 3 (OTHERS OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	15
		0	0	88.9		
2	none	0	0	88.9	.01	2
		5.9	22.5	83.		
3	none	0	0	88.9	.01	2
		5.9	142.5	83.		
4	none	0	0	88.9	.01	2
		5.9	262.5	83.		
5	none	90.	202.5	0	.218	15
		90.	202.5	88.6		
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13	none	270.	202.5	0	.218	15
		270.	202.5	88.		
14	none	270.	202.5	88.	.01	2
		267.1	201.4	82.1		
15	none	270.	202.5	88.	.01	2
		275.9	202.5	82.1		
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		230.	223.5	89.3		
18	none	230.	223.5	89.3	.01	2
		227.11	222.21	83.4		
19	none	230.	223.5	89.3	.01	2
		235.9	223.5	83.4		
20	none	230.	223.5	89.3	.01	2
		227.11	224.79	83.4		
21	none	251.1	182.5	0	.218	15
		251.1	182.5	88.8		
22	none	251.1	182.5	88.8	.01	2
		248.2	181.32	82.9		
23	none	251.1	182.5	88.8	.01	2
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24	none	251.1	182.5	88.8	.01	2
		248.2	183.68	82.9		

Number of wires = 24
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	10	4.16961	17	5.95333
radius	2	.01	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	.76	0	1	.0115822	.016537

Sources

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

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	2,360.3	0	0	0
2	22	0	2,364.4	0	0	0
3	64	0	2,363.1	0	0	0
4	85	0	2,356.2	0	0	0
5	106	0	2,359.	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 43, sector 1							
.76	47.46	60.274	76.717	51.8	3.2234	-5.5728	-1.4095

WLCC TOWER 4 (OTHERS OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	15
		0	0	88.9		
2	none	0	0	88.9	.01	2
		5.9	22.5	83.		
3	none	0	0	88.9	.01	2
		5.9	142.5	83.		
4	none	0	0	88.9	.01	2
		5.9	262.5	83.		
5	none	90.	202.5	0	.218	15
		90.	202.5	88.6		
6	none	90.	202.5	88.6	.01	2
		90.19	198.75	82.7		
7	none	90.	202.5	88.6	.01	2
		95.16	204.28	82.7		
8	none	90.	202.5	88.6	.01	2
		84.94	204.49	82.7		
9	none	180.	202.5	0	.218	15
		180.	202.5	88.8		
10	none	180.	202.5	88.8	.01	2
		177.12	200.85	82.9		
11	none	180.	202.5	88.8	.01	2
		185.9	202.5	82.9		
12	none	180.	202.5	88.8	.01	2
		177.12	204.15	82.9		
13	none	270.	202.5	0	.218	15
		270.	202.5	88.		
14	none	270.	202.5	88.	.01	2
		267.1	201.4	82.1		
15	none	270.	202.5	88.	.01	2
		275.9	202.5	82.1		
16	none	270.	202.5	88.	.01	2
		267.1	203.6	82.1		
17	none	230.	223.5	0	.218	15
		230.	223.5	89.3		
18	none	230.	223.5	89.3	.01	2
		227.11	222.21	83.4		
19	none	230.	223.5	89.3	.01	2
		235.9	223.5	83.4		
20	none	230.	223.5	89.3	.01	2
		227.11	224.79	83.4		
21	none	251.1	182.5	0	.218	15
		251.1	182.5	88.8		
22	none	251.1	182.5	88.8	.01	2
		248.2	181.32	82.9		
23	none	251.1	182.5	88.8	.01	2
		257.	182.5	82.9		
24	none	251.1	182.5	88.8	.01	2
		248.2	183.68	82.9		

Number of wires = 24
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	10	4.16961	17	5.95333
radius	2	.01	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	.76	0	1	.0115822	.016537

Sources

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

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	2,360.3	0	0	0
2	22	0	2,364.4	0	0	0
3	43	0	2,360.3	0	0	0
4	85	0	2,356.2	0	0	0
5	106	0	2,359.	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 64, sector 1							
.76	46.81	55.514	72.615	49.9	2.9862	-6.0507	-1.2394

WLCC TOWER 5 (OTHERS OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	15
		0	0	88.9		
2	none	0	0	88.9	.01	2
		5.9	22.5	83.		
3	none	0	0	88.9	.01	2
		5.9	142.5	83.		
4	none	0	0	88.9	.01	2
		5.9	262.5	83.		
5	none	90.	202.5	0	.218	15
		90.	202.5	88.6		
6	none	90.	202.5	88.6	.01	2
		90.19	198.75	82.7		
7	none	90.	202.5	88.6	.01	2
		95.16	204.28	82.7		
8	none	90.	202.5	88.6	.01	2
		84.94	204.49	82.7		
9	none	180.	202.5	0	.218	15
		180.	202.5	88.8		
10	none	180.	202.5	88.8	.01	2
		177.12	200.85	82.9		
11	none	180.	202.5	88.8	.01	2
		185.9	202.5	82.9		
12	none	180.	202.5	88.8	.01	2
		177.12	204.15	82.9		
13	none	270.	202.5	0	.218	15
		270.	202.5	88.		
14	none	270.	202.5	88.	.01	2
		267.1	201.4	82.1		
15	none	270.	202.5	88.	.01	2
		275.9	202.5	82.1		
16	none	270.	202.5	88.	.01	2
		267.1	203.6	82.1		
17	none	230.	223.5	0	.218	15
		230.	223.5	89.3		
18	none	230.	223.5	89.3	.01	2
		227.11	222.21	83.4		
19	none	230.	223.5	89.3	.01	2
		235.9	223.5	83.4		
20	none	230.	223.5	89.3	.01	2
		227.11	224.79	83.4		
21	none	251.1	182.5	0	.218	15
		251.1	182.5	88.8		
22	none	251.1	182.5	88.8	.01	2
		248.2	181.32	82.9		
23	none	251.1	182.5	88.8	.01	2
		257.	182.5	82.9		
24	none	251.1	182.5	88.8	.01	2
		248.2	183.68	82.9		

Number of wires = 24
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	10	4.16961	17	5.95333
radius	2	.01	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	.76	0	1	.0115822	.016537

Sources

source	node	sector	magnitude	phase	type
1	85	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	2,360.3	0	0	0
2	22	0	2,364.4	0	0	0
3	43	0	2,360.3	0	0	0
4	64	0	2,363.1	0	0	0
5	106	0	2,359.	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 85, sector 1							
.76	51.013	64.327	82.099	51.6	3.3217	-5.397	-1.4789

WLCC TOWER 6 (OTHERS OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	15
		0	0	88.9		
2	none	0	0	88.9	.01	2
		5.9	22.5	83.		
3	none	0	0	88.9	.01	2
		5.9	142.5	83.		
4	none	0	0	88.9	.01	2
		5.9	262.5	83.		
5	none	90.	202.5	0	.218	15
		90.	202.5	88.6		
6	none	90.	202.5	88.6	.01	2
		90.19	198.75	82.7		
7	none	90.	202.5	88.6	.01	2
		95.16	204.28	82.7		
8	none	90.	202.5	88.6	.01	2
		84.94	204.49	82.7		
9	none	180.	202.5	0	.218	15
		180.	202.5	88.8		
10	none	180.	202.5	88.8	.01	2
		177.12	200.85	82.9		
11	none	180.	202.5	88.8	.01	2
		185.9	202.5	82.9		
12	none	180.	202.5	88.8	.01	2
		177.12	204.15	82.9		
13	none	270.	202.5	0	.218	15
		270.	202.5	88.		
14	none	270.	202.5	88.	.01	2
		267.1	201.4	82.1		
15	none	270.	202.5	88.	.01	2
		275.9	202.5	82.1		
16	none	270.	202.5	88.	.01	2
		267.1	203.6	82.1		
17	none	230.	223.5	0	.218	15
		230.	223.5	89.3		
18	none	230.	223.5	89.3	.01	2
		227.11	222.21	83.4		
19	none	230.	223.5	89.3	.01	2
		235.9	223.5	83.4		
20	none	230.	223.5	89.3	.01	2
		227.11	224.79	83.4		
21	none	251.1	182.5	0	.218	15
		251.1	182.5	88.8		
22	none	251.1	182.5	88.8	.01	2
		248.2	181.32	82.9		
23	none	251.1	182.5	88.8	.01	2
		257.	182.5	82.9		
24	none	251.1	182.5	88.8	.01	2
		248.2	183.68	82.9		

Number of wires = 24
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	10	4.16961	17	5.95333
radius	2	.01	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	.76	0	1	.0115822	.016537

Sources

source	node	sector	magnitude	phase	type
1	106	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	2,360.3	0	0	0
2	22	0	2,364.4	0	0	0
3	43	0	2,360.3	0	0	0
4	64	0	2,363.1	0	0	0
5	85	0	2,356.2	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 106, sector 1							
.76	50.176	61.212	79.149	50.7	3.1789	-5.6565	-1.3779

FIGURE 6
WLCC MOMENT MODEL ARRAY SYNTHESIS (DIRECTIONAL DAY)

WLCC DAY

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = .76 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	1.86	162.
3	1.3	321.
4	0	0
5	.15	317.
6	.53	13.

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	998.82	103.6	9.37966	357.4
22	1,767.66	242.	17.6262	163.8
43	815.403	30.5	13.089	323.2
64	412.762	336.5	.724846	68.1
85	217.011	328.	1.61163	330.4
106	401.728	55.4	5.41553	18.6

Sum of square of source currents = 1,204.86
Total power = 10,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00703324	-.00813304
Y(1, 2)	.00423297	.00338669
Y(1, 3)	.0013791	-.00015519
Y(1, 4)	5.7747E-05	7.4169E-05
Y(1, 5)	.000517185	-.000573087
Y(1, 6)	.000264577	-.00059409
Y(2, 1)	.00423296	.00338672
Y(2, 2)	.00561189	-.00578998
Y(2, 3)	.00306761	.00496384
Y(2, 4)	.000266506	.000555218
Y(2, 5)	.00200192	.000970443
Y(2, 6)	.00177275	.000392692
Y(3, 1)	.00137911	-.000155174
Y(3, 2)	.0030676	.00496385
Y(3, 3)	.0022657	-.00642378
Y(3, 4)	.000984086	.00402666
Y(3, 5)	.00187733	.00394115
Y(3, 6)	.00199916	.00326156
Y(4, 1)	5.7745E-05	7.419E-05
Y(4, 2)	.000266473	.000555231
Y(4, 3)	.000984069	.00402664
Y(4, 4)	.00474129	-.00752387
Y(4, 5)	.00220936	.00293256
Y(4, 6)	.00244478	.00354531
Y(5, 1)	.000517186	-.000573084
Y(5, 2)	.00200192	.000970429
Y(5, 3)	.00187735	.00394114
Y(5, 4)	.00220939	.00293254
Y(5, 5)	.00552922	-.0071623
Y(5, 6)	.000205234	.000404452
Y(6, 1)	.000264578	-.000594089
Y(6, 2)	.00177275	.000392682
Y(6, 3)	.00199917	.00326155
Y(6, 4)	.00244481	.00354528
Y(6, 5)	.000205232	.000404451
Y(6, 6)	.00606249	-.00738924

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	50.322	59.9694
Z(1, 2)	26.4526	-23.4567
Z(1, 3)	-11.7768	-18.1767
Z(1, 4)	-14.0967	10.622
Z(1, 5)	-18.7533	-1.99733
Z(1, 6)	-16.6476	4.77747
Z(2, 1)	26.4525	-23.4567
Z(2, 2)	49.2973	60.4049
Z(2, 3)	23.497	-19.4319
Z(2, 4)	-13.7901	-16.9687
Z(2, 5)	-2.79687	-23.8327
Z(2, 6)	-9.73127	-19.4339
Z(3, 1)	-11.7769	-18.1764
Z(3, 2)	23.4969	-19.4319
Z(3, 3)	46.0281	60.3619
Z(3, 4)	21.9411	-22.6109
Z(3, 5)	23.7991	-22.0228
Z(3, 6)	17.0903	-24.5926
Z(4, 1)	-14.0968	10.6221
Z(4, 2)	-13.7903	-16.9688
Z(4, 3)	21.9411	-22.611
Z(4, 4)	45.6456	55.6003
Z(4, 5)	19.049	-24.4073
Z(4, 6)	22.4328	-22.555
Z(5, 1)	-18.7533	-1.99721
Z(5, 2)	-2.79681	-23.8327
Z(5, 3)	23.7993	-22.0227
Z(5, 4)	19.0492	-24.4071
Z(5, 5)	50.476	64.6101
Z(5, 6)	-12.1648	-21.8208
Z(6, 1)	-16.6475	4.77763
Z(6, 2)	-9.7313	-19.4339
Z(6, 3)	17.0905	-24.5926
Z(6, 4)	22.433	-22.5548
Z(6, 5)	-12.1648	-21.8209
Z(6, 6)	49.6991	61.4912

FIGURE 7
WLCC MOMENT MODEL SUMMARY FOR DIRECTIONAL DAY MODE

WLCC DAY

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	15
		0	0	88.9		
2	none	0	0	88.9	.01	2
		5.9	22.5	83.		
3	none	0	0	88.9	.01	2
		5.9	142.5	83.		
4	none	0	0	88.9	.01	2
		5.9	262.5	83.		
5	none	90.	202.5	0	.218	15
		90.	202.5	88.6		
6	none	90.	202.5	88.6	.01	2
		90.19	198.75	82.7		
7	none	90.	202.5	88.6	.01	2
		95.16	204.28	82.7		
8	none	90.	202.5	88.6	.01	2
		84.94	204.49	82.7		
9	none	180.	202.5	0	.218	15
		180.	202.5	88.8		
10	none	180.	202.5	88.8	.01	2
		177.12	200.85	82.9		
11	none	180.	202.5	88.8	.01	2
		185.9	202.5	82.9		
12	none	180.	202.5	88.8	.01	2
		177.12	204.15	82.9		
13	none	270.	202.5	0	.218	15
		270.	202.5	88.		
14	none	270.	202.5	88.	.01	2
		267.1	201.4	82.1		
15	none	270.	202.5	88.	.01	2
		275.9	202.5	82.1		
16	none	270.	202.5	88.	.01	2
		267.1	203.6	82.1		
17	none	230.	223.5	0	.218	15
		230.	223.5	89.3		
18	none	230.	223.5	89.3	.01	2
		227.11	222.21	83.4		
19	none	230.	223.5	89.3	.01	2
		235.9	223.5	83.4		
20	none	230.	223.5	89.3	.01	2
		227.11	224.79	83.4		
21	none	251.1	182.5	0	.218	15
		251.1	182.5	88.8		
22	none	251.1	182.5	88.8	.01	2
		248.2	181.32	82.9		
23	none	251.1	182.5	88.8	.01	2
		257.	182.5	82.9		
24	none	251.1	182.5	88.8	.01	2
		248.2	183.68	82.9		

Number of wires = 24
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	10	4.16961	17	5.95333

radius 2 .01 1 .218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	.76	0	1	.0115822	.016537

Sources

source	node	sector	magnitude	phase	type
1	1	1	1,412.55	103.6	voltage
2	22	1	2,499.86	242.	voltage
3	43	1	1,153.15	30.5	voltage
4	85	1	306.9	328.	voltage
5	106	1	568.13	55.4	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	64	0	569.22	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							
.76	-29.559	102.31	106.49	106.1	****	****	****
source = 2; node 22, sector 1							
.76	20.559	98.159	100.29	78.2	12.134	-1.4349	-5.5072
source = 3; node 43, sector 1							
.76	24.126	57.464	62.323	67.2	5.096	-3.4537	-2.608
source = 4; node 85, sector 1							
.76	134.84	-6.2777	134.98	357.3	2.7035	-6.7453	-1.0324
source = 5; node 106, sector 1							
.76	59.491	44.281	74.162	36.7	2.2438	-8.3261	-.69064

CURRENT rms
Frequency = .76 MHz
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	9.37398	357.5	9.36495	-.411291
2	0	0	5.92667	9.84272	358.3	9.8386	-.284771
3	0	0	11.8533	10.055	358.9	10.0531	-.197197
4	0	0	17.78	10.115	359.3	10.1142	-.123299
5	0	0	23.7067	10.0384	359.7	10.0382	-.0597276
6	0	0	29.6333	9.83316	360.	9.83315	-5.33E-03
7	0	0	35.56	9.50497	.2	9.50488	.0402923
8	0	0	41.4867	9.05913	.5	9.0588	.0772798
9	0	0	47.4133	8.50136	.7	8.50071	.105636
10	0	0	53.34	7.83803	.9	7.83702	.125328
11	0	0	59.2667	7.07607	1.1	7.07476	.136328
12	0	0	65.1933	6.22356	1.3	6.22201	.138632
13	0	0	71.12	5.29062	1.4	5.28896	.1323
14	0	0	77.0467	4.29476	1.6	4.29315	.117593
15	0	0	82.9733	3.29389	1.7	3.29249	.095822
J1	0	0	88.9	2.45729	1.7	2.45625	.071527
2J1	0	0	88.9	.810444	1.9	.809992	.0270375
17	2.72545	-1.12892	85.95	.474788	1.9	.474534	.0155386
END	5.45089	-2.25783	83.	0	0	0	0

2J1	0	0	88.9	.82347	1.6	.823166	.0223843
19	-2.34039	-1.79585	85.95	.484567	1.4	.484418	.0120127
END	-4.68079	-3.59169	83.	0	0	0	0
2J1	0	0	88.9	.823392	1.5	.823095	.0221053
21	-.385052	2.92476	85.95	.48451	1.4	.484366	.0118029
END	-.770104	5.84953	83.	0	0	0	0
GND	-83.1492	34.4415	0	17.6162	163.8	-16.9192	4.90601
23	-83.1492	34.4415	5.90667	18.4551	163.2	-17.6705	5.32369
24	-83.1492	34.4415	11.8133	18.8252	162.9	-17.9892	5.54758
25	-83.1492	34.4415	17.72	18.9146	162.6	-18.0455	5.66771
26	-83.1492	34.4415	23.6267	18.7523	162.3	-17.8659	5.69724
27	-83.1492	34.4415	29.5333	18.3526	162.1	-17.4638	5.64211
28	-83.1492	34.4415	35.44	17.7263	161.9	-16.8494	5.50617
29	-83.1492	34.4415	41.3467	16.8832	161.7	-16.0321	5.2927
30	-83.1492	34.4415	47.2533	15.8342	161.6	-15.0224	5.00504
31	-83.1492	34.4415	53.16	14.591	161.4	-13.8313	4.64681
32	-83.1492	34.4415	59.0667	13.1668	161.3	-12.4715	4.22202
33	-83.1492	34.4415	64.9733	11.5763	161.2	-10.9571	3.73532
34	-83.1492	34.4415	70.88	9.83876	161.1	-9.30636	3.19263
35	-83.1492	34.4415	76.7867	7.98679	161.	-7.55024	2.60436
36	-83.1492	34.4415	82.6933	6.12852	160.9	-5.79112	2.0054
J5	-83.1492	34.4415	88.6	4.57723	160.9	-4.32525	1.49773
2J1	-83.1492	34.4415	88.6	1.52507	160.9	-1.44108	.499131
38	-84.2764	31.7161	85.65	.896375	161.	-.847392	.292258
END	-85.4036	28.9906	82.7	0	0	0	0
2J1	-83.1492	34.4415	88.6	1.52742	160.7	-1.44191	.503906
40	-84.946	36.7855	85.65	.897799	160.8	-.847689	.295747
END	-86.7428	39.1294	82.7	0	0	0	0
2J1	-83.1492	34.4415	88.6	1.52475	161.1	-1.44227	.494694
42	-80.2237	34.826	85.65	.896075	161.2	-.848226	.288898
END	-77.2983	35.2106	82.7	0	0	0	0
GND	-166.298	68.883	0	13.0763	323.3	10.4809	-7.81922
44	-166.298	68.883	5.92	13.4181	322.6	10.6539	-8.1571
45	-166.298	68.883	11.84	13.5087	322.1	10.6595	-8.2983
46	-166.298	68.883	17.76	13.4306	321.7	10.5434	-8.31964
47	-166.298	68.883	23.68	13.197	321.4	10.3139	-8.233
48	-166.298	68.883	29.6	12.8157	321.1	9.97641	-8.04452
49	-166.298	68.883	35.52	12.2932	320.9	9.53548	-7.75872
50	-166.298	68.883	41.44	11.6362	320.6	8.9964	-7.38006
51	-166.298	68.883	47.36	10.8518	320.4	8.36473	-6.91316
52	-166.298	68.883	53.28	9.94807	320.2	7.64678	-6.36325
53	-166.298	68.883	59.2	8.93423	320.1	6.84969	-5.73605
54	-166.298	68.883	65.12	7.82039	319.9	5.98133	-5.03808
55	-166.298	68.883	71.04	6.61948	319.7	5.05169	-4.2776
56	-166.298	68.883	76.96	5.35361	319.6	4.07778	-3.46885
57	-166.298	68.883	82.88	4.09546	319.5	3.11511	-2.65874
J9	-166.298	68.883	88.8	3.05597	319.5	2.3244	-1.98397
2J1	-166.298	68.883	88.8	1.0219	319.5	.777208	-.663491
59	-165.91	65.962	85.85	.602843	319.6	.459172	-.390617
END	-165.521	63.041	82.9	0	0	0	0
2J1	-166.298	68.883	88.8	1.01034	319.4	.76737	-.657212
61	-169.024	70.0119	85.85	.593923	319.5	.451611	-.385735
END	-171.749	71.1408	82.9	0	0	0	0
2J1	-166.298	68.883	88.8	1.02374	319.6	.779823	-.663265
63	-163.958	70.6738	85.85	.604198	319.7	.461104	-.390433
END	-161.618	72.4645	82.9	0	0	0	0
GND	-249.448	103.325	0	.726225	66.7	.286769	.667208
65	-249.448	103.325	5.86667	.505126	66.7	.199849	.46391
66	-249.448	103.325	11.7333	.352596	66.5	.140758	.323282
67	-249.448	103.325	17.6	.224256	65.8	.091906	.204559
68	-249.448	103.325	23.4667	.11428	63.6	.0508548	.102341
69	-249.448	103.325	29.3333	.0222528	41.6	.0166439	.0147706
70	-249.448	103.325	35.2	.0598807	259.2	-.0112195	-.0588203
71	-249.448	103.325	41.0667	.123156	254.4	-.0330688	-.118633
72	-249.448	103.325	46.9333	.171866	253.4	-.0491911	-.164676
73	-249.448	103.325	52.8	.205794	253.1	-.059875	-.196891
74	-249.448	103.325	58.6667	.224945	253.1	-.0654301	-.215219
75	-249.448	103.325	64.5333	.229397	253.2	-.0661948	-.219639
76	-249.448	103.325	70.4	.219339	253.4	-.0625448	-.210232
77	-249.448	103.325	76.2667	.195282	253.7	-.0549472	-.187392
78	-249.448	103.325	82.1333	.15949	253.9	-.0443554	-.153198
J13	-249.448	103.325	88.	.119425	253.9	-.033142	-.114735

2J1	-249.448	103.325	88.	.0397436	248.	-.0149138	-.0368392
80	-249.066	100.392	85.05	.0218988	245.5	-9.09E-03	-.0199251
END	-248.685	97.4586	82.1	0	0	0	0
2J1	-249.448	103.325	88.	.0419146	260.1	-7.21E-03	-.0412897
82	-252.173	104.453	85.05	.0235199	262.	-3.28E-03	-.0232902
END	-254.898	105.582	82.1	0	0	0	0
2J1	-249.448	103.325	88.	.0382277	253.2	-.0110171	-.0366057
84	-247.104	105.129	85.05	.020676	252.7	-6.14E-03	-.0197436
END	-244.761	106.933	82.1	0	0	0	0
GND	-166.836	158.322	0	1.6068	330.7	1.40077	-.78718
86	-166.836	158.322	5.95333	1.5988	326.5	1.33365	-.881781
87	-166.836	158.322	11.9067	1.58236	323.7	1.27571	-.936177
88	-166.836	158.322	17.86	1.55465	321.4	1.21467	-.970312
89	-166.836	158.322	23.8133	1.51477	319.3	1.14906	-.987019
90	-166.836	158.322	29.7667	1.46231	317.5	1.07852	-.987492
91	-166.836	158.322	35.72	1.39712	315.9	1.00315	-.972432
92	-166.836	158.322	41.6733	1.31924	314.4	.92323	-.942354
93	-166.836	158.322	47.6267	1.22889	313.1	.839137	-.897781
94	-166.836	158.322	53.58	1.12644	311.8	.751342	-.839258
95	-166.836	158.322	59.5333	1.01239	310.7	.660344	-.767384
96	-166.836	158.322	65.4867	.887415	309.7	.566728	-.682879
97	-166.836	158.322	71.44	.752515	308.8	.471243	-.586692
98	-166.836	158.322	77.3933	.609755	308.	.375277	-.480592
99	-166.836	158.322	83.3467	.466949	307.4	.28377	-.370832
J17	-166.836	158.322	89.3	.347966	307.4	.21141	-.27638
2J1	-166.836	158.322	89.3	.111019	307.6	.0677127	-.0879788
101	-167.527	155.453	86.35	.064426	308.3	.0398891	-.0505921
END	-168.218	152.584	83.4	0	0	0	0
2J1	-166.836	158.322	89.3	.117122	307.4	.0710804	-.0930863
103	-168.976	160.352	86.35	.0690736	307.9	.0424733	-.0544718
END	-171.116	162.383	83.4	0	0	0	0
2J1	-166.836	158.322	89.3	.119826	307.3	.0726168	-.0953153
105	-164.007	159.161	86.35	.0710953	307.8	.0436094	-.0561495
END	-161.179	160.001	83.4	0	0	0	0
GND	-250.861	10.9528	0	5.41395	18.7	5.12697	1.73926
107	-250.861	10.9528	5.92	5.5201	17.	5.27994	1.61053
108	-250.861	10.9528	11.84	5.53751	15.8	5.32828	1.50779
109	-250.861	10.9528	17.76	5.49143	14.8	5.30821	1.40668
110	-250.861	10.9528	23.68	5.38586	14.	5.22557	1.30421
111	-250.861	10.9528	29.6	5.22316	13.3	5.08352	1.19966
112	-250.861	10.9528	35.52	5.00541	12.6	4.88459	1.09313
113	-250.861	10.9528	41.44	4.7349	12.	4.6313	.985068
114	-250.861	10.9528	47.36	4.41419	11.4	4.32637	.876141
115	-250.861	10.9528	53.28	4.04618	10.9	3.9728	.76713
116	-250.861	10.9528	59.2	3.6342	10.4	3.57397	.658898
117	-250.861	10.9528	65.12	3.18203	10.	3.13371	.552387
118	-250.861	10.9528	71.04	2.69458	9.6	2.65695	.4487
119	-250.861	10.9528	76.96	2.18051	9.2	2.15231	.349553
120	-250.861	10.9528	82.88	1.66904	9.	1.64866	.26003
J21	-250.861	10.9528	88.8	1.24572	9.	1.23052	.194002
2J1	-250.861	10.9528	88.8	.415729	8.7	.410941	.0629124
122	-249.498	8.33522	85.85	.244935	8.9	.241976	.0379575
END	-248.134	5.71762	82.9	0	0	0	0
2J1	-250.861	10.9528	88.8	.415709	8.8	.410834	.0634808
124	-253.808	11.0815	85.85	.244988	9.	.241959	.0384034
END	-256.755	11.2102	82.9	0	0	0	0
2J1	-250.861	10.9528	88.8	.414303	9.4	.40875	.0676088
126	-249.275	13.4416	85.85	.243886	9.8	.240326	.0415193
END	-247.688	15.9304	82.9	0	0	0	0

FIGURE 8
WLCC MOMENT MODEL ARRAY SYNTHESIS
(DIRECTIONAL – NIGHT)

WLCC NIGHT

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = .76 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	2.786	243.7
3	2.786	126.6
4	1.	10.2
5	0	0
6	0	0

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	50.8484	72.8	1.36315	1.3
22	244.154	309.3	3.65606	246.5
43	375.515	195.6	3.42522	130.5
64	264.561	95.9	.999156	12.1
85	138.791	122.	.246354	212.4
106	140.675	102.4	.248533	192.6

Sum of square of source currents = 56.1557
Total power = 1,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00703324	-.00813304
Y(1, 2)	.00423297	.00338669
Y(1, 3)	.0013791	-.00015519
Y(1, 4)	5.7747E-05	7.4169E-05
Y(1, 5)	.000517185	-.000573087
Y(1, 6)	.000264577	-.00059409
Y(2, 1)	.00423296	.00338672
Y(2, 2)	.00561189	-.00578998
Y(2, 3)	.00306761	.00496384
Y(2, 4)	.000266506	.000555218
Y(2, 5)	.00200192	.000970443
Y(2, 6)	.00177275	.000392692
Y(3, 1)	.00137911	-.000155174
Y(3, 2)	.0030676	.00496385
Y(3, 3)	.0022657	-.00642378
Y(3, 4)	.000984086	.00402666
Y(3, 5)	.00187733	.00394115
Y(3, 6)	.00199916	.00326156
Y(4, 1)	5.7745E-05	7.419E-05
Y(4, 2)	.000266473	.000555231
Y(4, 3)	.000984069	.00402664
Y(4, 4)	.00474129	-.00752387
Y(4, 5)	.00220936	.00293256
Y(4, 6)	.00244478	.00354531
Y(5, 1)	.000517186	-.000573084
Y(5, 2)	.00200192	.000970429
Y(5, 3)	.00187735	.00394114
Y(5, 4)	.00220939	.00293254
Y(5, 5)	.00552922	-.0071623
Y(5, 6)	.000205234	.000404452
Y(6, 1)	.000264578	-.000594089
Y(6, 2)	.00177275	.000392682
Y(6, 3)	.00199917	.00326155
Y(6, 4)	.00244481	.00354528
Y(6, 5)	.000205232	.000404451
Y(6, 6)	.00606249	-.00738924

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	50.322	59.9694
Z(1, 2)	26.4526	-23.4567
Z(1, 3)	-11.7768	-18.1767
Z(1, 4)	-14.0967	10.622
Z(1, 5)	-18.7533	-1.99733
Z(1, 6)	-16.6476	4.77747
Z(2, 1)	26.4525	-23.4567
Z(2, 2)	49.2973	60.4049
Z(2, 3)	23.497	-19.4319
Z(2, 4)	-13.7901	-16.9687
Z(2, 5)	-2.79687	-23.8327
Z(2, 6)	-9.73127	-19.4339
Z(3, 1)	-11.7769	-18.1764
Z(3, 2)	23.4969	-19.4319
Z(3, 3)	46.0281	60.3619
Z(3, 4)	21.9411	-22.6109
Z(3, 5)	23.7991	-22.0228
Z(3, 6)	17.0903	-24.5926
Z(4, 1)	-14.0968	10.6221
Z(4, 2)	-13.7903	-16.9688
Z(4, 3)	21.9411	-22.611
Z(4, 4)	45.6456	55.6003
Z(4, 5)	19.049	-24.4073
Z(4, 6)	22.4328	-22.555
Z(5, 1)	-18.7533	-1.99721
Z(5, 2)	-2.79681	-23.8327
Z(5, 3)	23.7993	-22.0227
Z(5, 4)	19.0492	-24.4071
Z(5, 5)	50.476	64.6101
Z(5, 6)	-12.1648	-21.8208
Z(6, 1)	-16.6475	4.77763
Z(6, 2)	-9.7313	-19.4339
Z(6, 3)	17.0905	-24.5926
Z(6, 4)	22.433	-22.5548
Z(6, 5)	-12.1648	-21.8209
Z(6, 6)	49.6991	61.4912

FIGURE 9
WLCC MOMENT MODEL SUMMARY FOR DIRECTIONAL NIGHT MODE

```
WLCC NIGHT

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

wire  caps Distance     Angle        Z            radius      segs
 1    none 0            0            0            .218         15
           0            0            88.9
 2    none 0            0            88.9         .01          2
           5.9          22.5         83.
 3    none 0            0            88.9         .01          2
           5.9          142.5        83.
 4    none 0            0            88.9         .01          2
           5.9          262.5        83.
 5    none 90.          202.5        0            .218         15
           90.          202.5        88.6
 6    none 90.          202.5        88.6         .01          2
           90.19        198.75       82.7
 7    none 90.          202.5        88.6         .01          2
           95.16        204.28       82.7
 8    none 90.          202.5        88.6         .01          2
           84.94        204.49       82.7
 9    none 180.         202.5        0            .218         15
           180.         202.5        88.8
 10   none 180.         202.5        88.8         .01          2
           177.12       200.85       82.9
 11   none 180.         202.5        88.8         .01          2
           185.9        202.5        82.9
 12   none 180.         202.5        88.8         .01          2
           177.12       204.15       82.9
 13   none 270.         202.5        0            .218         15
           270.         202.5        88.
 14   none 270.         202.5        88.          .01          2
           267.1        201.4        82.1
 15   none 270.         202.5        88.          .01          2
           275.9        202.5        82.1
 16   none 270.         202.5        88.          .01          2
           267.1        203.6        82.1
 17   none 230.         223.5        0            .218         15
           230.         223.5        89.3
 18   none 230.         223.5        89.3         .01          2
           227.11       222.21       83.4
 19   none 230.         223.5        89.3         .01          2
           235.9        223.5        83.4
 20   none 230.         223.5        89.3         .01          2
           227.11       224.79       83.4
 21   none 251.1        182.5        0            .218         15
           251.1        182.5        88.8
 22   none 251.1        182.5        88.8         .01          2
           248.2        181.32       82.9
 23   none 251.1        182.5        88.8         .01          2
           257.         182.5        82.9
 24   none 251.1        182.5        88.8         .01          2
           248.2        183.68       82.9

Number of wires          =  24
          current nodes  =  126

                         minimum                  maximum
Individual wires      wire    value            wire  value
segment length         10     4.16961           17   5.95333
radius                 2      .01               1    .218
```

ELECTRICAL DESCRIPTION
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	.76	0	1	.0115822	.016537

Sources

source	node	sector	magnitude	phase	type
1	1	1	71.9105	72.8	voltage
2	22	1	345.286	309.3	voltage
3	43	1	531.059	195.6	voltage
4	64	1	374.145	95.9	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	85	0	563.36	0	0	0
2	106	0	566.02	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							
.76	11.833	35.375	37.302	71.5	6.4216	-2.7274	-3.3129
source = 2; node 22, sector 1							
.76	30.525	59.392	66.777	62.8	4.3286	-4.087	-2.1482
source = 3; node 43, sector 1							
.76	46.189	99.427	109.63	65.1	6.1235	-2.8625	-3.1633
source = 4; node 64, sector 1							
.76	28.623	263.56	265.11	83.8	50.835	-.34177	-11.21

CURRENT rms
Frequency = .76 MHz
Input power = 1,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	1.36285	1.3	1.3625	.0307962
2	0	0	5.92667	1.38242	.9	1.38224	.0225891
3	0	0	11.8533	1.38121	.7	1.38111	.0166717
4	0	0	17.78	1.36456	.5	1.36451	.0114396
5	0	0	23.7067	1.33348	.3	1.33346	6.7E-03
6	0	0	29.6333	1.28861	.1	1.2886	2.42E-03
7	0	0	35.56	1.23057	359.9	1.23057	-1.4E-03
8	0	0	41.4867	1.16003	359.8	1.16002	-4.71E-03
9	0	0	47.4133	1.07773	359.6	1.0777	-7.47E-03
10	0	0	53.34	.98448	359.4	.984433	-9.6E-03
11	0	0	59.2667	.881211	359.3	.881142	-.0110379
12	0	0	65.1933	.768954	359.1	.768865	-.0117274
13	0	0	71.12	.649002	359.	.648899	-.0116036
14	0	0	77.0467	.523547	358.8	.523439	-.010624
15	0	0	82.9733	.399721	358.7	.399623	-8.84E-03
J1	0	0	88.9	.298192	358.7	.298119	-6.61E-03
2J1	0	0	88.9	.0984173	358.3	.0983726	-2.96E-03
17	2.72545	-1.12892	85.95	.0579563	358.3	.0579298	-1.75E-03
END	5.45089	-2.25783	83.	0	0	0	0
2J1	0	0	88.9	.0998894	359.	.0998728	-1.82E-03
19	-2.34039	-1.79585	85.95	.0590612	359.1	.0590544	-8.96E-04
END	-4.68079	-3.59169	83.	0	0	0	0
2J1	0	0	88.9	.0998901	359.	.0998735	-1.82E-03

21	-.385052	2.92476	85.95	.0590618	359.1	.059055	-8.96E-04
END	-.770104	5.84953	83.	0	0	0	0
GND	-83.1492	34.4415	0	3.65539	246.5	-1.45751	-3.35225
23	-83.1492	34.4415	5.90667	3.75473	245.6	-1.55118	-3.41934
24	-83.1492	34.4415	11.8133	3.78289	245.	-1.59783	-3.42888
25	-83.1492	34.4415	17.72	3.76349	244.5	-1.61799	-3.39794
26	-83.1492	34.4415	23.6267	3.70037	244.1	-1.61472	-3.32948
27	-83.1492	34.4415	29.5333	3.59568	243.8	-1.58945	-3.2253
28	-83.1492	34.4415	35.44	3.45118	243.4	-1.54315	-3.08696
29	-83.1492	34.4415	41.3467	3.26872	243.1	-1.47668	-2.91615
30	-83.1492	34.4415	47.2533	3.05027	242.9	-1.39094	-2.71467
31	-83.1492	34.4415	53.16	2.79806	242.6	-1.28691	-2.48455
32	-83.1492	34.4415	59.0667	2.51457	242.4	-1.16568	-2.22806
33	-83.1492	34.4415	64.9733	2.20262	242.2	-1.02849	-1.94776
34	-83.1492	34.4415	70.88	1.8658	242.	-.876964	-1.64685
35	-83.1492	34.4415	76.7867	1.51028	241.8	-.713935	-1.33089
36	-83.1492	34.4415	82.6933	1.15655	241.7	-.548977	-1.01795
J5	-83.1492	34.4415	88.6	.863798	241.7	-.410036	-.760274
2J1	-83.1492	34.4415	88.6	.287751	241.7	-.136612	-.253254
38	-84.2764	31.7161	85.65	.169491	241.8	-.0801123	-.149363
END	-85.4036	28.9906	82.7	0	0	0	0
2J1	-83.1492	34.4415	88.6	.289127	242.	-.135897	-.255199
40	-84.946	36.7855	85.65	.170462	242.2	-.079534	-.15077
END	-86.7428	39.1294	82.7	0	0	0	0
2J1	-83.1492	34.4415	88.6	.286928	241.4	-.137527	-.251821
42	-80.2237	34.826	85.65	.16885	241.4	-.0807888	-.148268
END	-77.2983	35.2106	82.7	0	0	0	0
GND	-166.298	68.883	0	3.42444	130.5	-2.22479	2.60329
44	-166.298	68.883	5.92	3.59091	129.2	-2.26857	2.78356
45	-166.298	68.883	11.84	3.66599	128.3	-2.2745	2.87509
46	-166.298	68.883	17.76	3.6864	127.7	-2.25375	2.91721
47	-166.298	68.883	23.68	3.65759	127.1	-2.20823	2.91576
48	-166.298	68.883	29.6	3.58229	126.7	-2.13912	2.87349
49	-166.298	68.883	35.52	3.46248	126.3	-2.04744	2.79227
50	-166.298	68.883	41.44	3.30004	125.9	-1.93425	2.67375
51	-166.298	68.883	47.36	3.09699	125.6	-1.80075	2.51965
52	-166.298	68.883	53.28	2.85556	125.3	-1.64825	2.33184
53	-166.298	68.883	59.2	2.57824	125.	-1.47821	2.1124
54	-166.298	68.883	65.12	2.26792	124.7	-1.29231	1.8637
55	-166.298	68.883	71.04	1.92825	124.5	-1.09265	1.58879
56	-166.298	68.883	76.96	1.56556	124.3	-.882867	1.29288
57	-166.298	68.883	82.88	1.201	124.2	-.674943	.993404
J9	-166.298	68.883	88.8	.896187	124.2	-.503649	.741276
2J1	-166.298	68.883	88.8	.298601	124.	-.166827	.247652
59	-165.91	65.962	85.85	.175442	124.	-.098227	.145367
END	-165.521	63.041	82.9	0	0	0	0
2J1	-166.298	68.883	88.8	.298996	124.6	-.169996	.245968
61	-169.024	70.0119	85.85	.175686	124.9	-.100576	.144049
END	-171.749	71.1408	82.9	0	0	0	0
2J1	-166.298	68.883	88.8	.298604	124.	-.166825	.247657
63	-163.958	70.6738	85.85	.175437	124.	-.0982206	.145364
END	-161.618	72.4645	82.9	0	0	0	0
GND	-249.448	103.325	0	.997713	12.1	.975554	.209108
65	-249.448	103.325	5.86667	1.13201	11.3	1.10992	.222536
66	-249.448	103.325	11.7333	1.20993	10.9	1.18802	.229234
67	-249.448	103.325	17.6	1.25984	10.6	1.23827	.232155
68	-249.448	103.325	23.4667	1.2858	10.4	1.26474	.231738
69	-249.448	103.325	29.3333	1.28953	10.2	1.26918	.228186
70	-249.448	103.325	35.2	1.27206	10.	1.2526	.221638
71	-249.448	103.325	41.0667	1.23421	9.9	1.21582	.212215
72	-249.448	103.325	46.9333	1.17677	9.8	1.15964	.200038
73	-249.448	103.325	52.8	1.1006	9.7	1.0849	.185238
74	-249.448	103.325	58.6667	1.00666	9.6	.992549	.167959
75	-249.448	103.325	64.5333	.89602	9.5	.883651	.148368
76	-249.448	103.325	70.4	.770102	9.5	.759611	.126683
77	-249.448	103.325	76.2667	.631432	9.4	.622923	.103307
78	-249.448	103.325	82.1333	.488459	9.4	.481926	.0796231
J13	-249.448	103.325	88.	.365652	9.4	.360756	.0596383
2J1	-249.448	103.325	88.	.122462	8.9	.120986	.0189547
80	-249.066	100.392	85.05	.0715127	8.8	.0706701	.010946
END	-248.685	97.4586	82.1	0	0	0	0
2J1	-249.448	103.325	88.	.120757	10.4	.118787	.0217247

82	-252.173	104.453	85.05	.070327	10.7	.0691067	.0130438
END	-254.898	105.582	82.1	0	0	0	0
2J1	-249.448	103.325	88.	.122459	8.9	.120982	.0189589
84	-247.104	105.129	85.05	.0715034	8.8	.0706603	.0109482
END	-244.761	106.933	82.1	0	0	0	0
GND	-166.836	158.322	0	.246507	212.	-.209077	-.130585
86	-166.836	158.322	5.95333	.171472	212.	-.145458	-.0907991
87	-166.836	158.322	11.9067	.119615	211.9	-.101542	-.0632208
88	-166.836	158.322	17.86	.0759589	211.7	-.0646228	-.0399205
89	-166.836	158.322	23.8133	.0385113	211.	-.0330022	-.0198488
90	-166.836	158.322	29.7667	6.63E-03	203.5	-6.08E-03	-2.65E-03
91	-166.836	158.322	35.72	.0201964	35.8	.0163834	.0118101
92	-166.836	158.322	41.6733	.0417664	34.3	.0344875	.0235595
93	-166.836	158.322	47.6267	.0582568	34.	.0482824	.0325985
94	-166.836	158.322	53.58	.0696811	33.9	.0578039	.0389122
95	-166.836	158.322	59.5333	.0760636	34.	.0630925	.0424853
96	-166.836	158.322	65.4867	.0774477	34.	.064205	.0433113
97	-166.836	158.322	71.44	.0739131	34.1	.0612279	.0414039
98	-166.836	158.322	77.3933	.0656478	34.1	.0543363	.0368402
99	-166.836	158.322	83.3467	.0534239	34.2	.0441859	.0300287
J17	-166.836	158.322	89.3	.0398246	34.2	.0329227	.0224074
2J1	-166.836	158.322	89.3	.0131636	26.9	.0117392	5.96E-03
101	-167.527	155.453	86.35	7.26E-03	24.	6.63E-03	2.96E-03
END	-168.218	152.584	83.4	0	0	0	0
2J1	-166.836	158.322	89.3	.0127687	41.7	9.53E-03	8.5E-03
103	-168.976	160.352	86.35	6.97E-03	44.6	4.97E-03	4.89E-03
END	-171.116	162.383	83.4	0	0	0	0
2J1	-166.836	158.322	89.3	.0141092	34.3	.011655	7.95E-03
105	-164.007	159.161	86.35	7.94E-03	34.3	6.56E-03	4.47E-03
END	-161.179	160.001	83.4	0	0	0	0
GND	-250.861	10.9528	0	.248571	192.4	-.242748	-.0534871
107	-250.861	10.9528	5.92	.172849	192.4	-.168803	-.0371789
108	-250.861	10.9528	11.84	.12056	192.4	-.117748	-.0258854
109	-250.861	10.9528	17.76	.0765529	192.3	-.0747869	-.0163484
110	-250.861	10.9528	23.68	.0388081	192.1	-.0379454	-8.14E-03
111	-250.861	10.9528	29.6	6.62E-03	189.6	-6.53E-03	-1.1E-03
112	-250.861	10.9528	35.52	.0203079	13.7	.019732	4.8E-03
113	-250.861	10.9528	41.44	.0420549	13.2	.0409453	9.6E-03
114	-250.861	10.9528	47.36	.0586772	13.1	.0571548	.0132791
115	-250.861	10.9528	53.28	.0701973	13.	.0683859	.015844
116	-250.861	10.9528	59.2	.0766417	13.	.0746667	.0172868
117	-250.861	10.9528	65.12	.0780549	13.	.0760431	.0176074
118	-250.861	10.9528	71.04	.0745175	13.	.0725953	.0168158
119	-250.861	10.9528	76.96	.0662197	13.	.06451	.0149501
120	-250.861	10.9528	82.88	.0539426	13.1	.0525479	.0121871
J21	-250.861	10.9528	88.8	.0402678	13.1	.0392207	9.12E-03
2J1	-250.861	10.9528	88.8	.0142289	12.8	.0138765	3.15E-03
122	-249.498	8.33522	85.85	7.99E-03	12.7	7.8E-03	1.76E-03
END	-248.134	5.71762	82.9	0	0	0	0
2J1	-250.861	10.9528	88.8	.0127465	19.6	.01201	4.27E-03
124	-253.808	11.0815	85.85	6.92E-03	22.1	6.41E-03	2.6E-03
END	-256.755	11.2102	82.9	0	0	0	0
2J1	-250.861	10.9528	88.8	.0134429	7.3	.0133343	1.71E-03
126	-249.275	13.4416	85.85	7.42E-03	5.1	7.39E-03	6.63E-04
END	-247.688	15.9304	82.9	0	0	0	0

FIGURE 10
DERIVED DIRECTIONAL PARAMETERS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WLCC, 760 KHZ, DA-2
BRANDON, FLORIDA
SEPTEMBER. 2023

DAY:

	Theoretical		Base Network Input Current		Normalized TCT	
Tower	**Field**	**Phase**	**Amplitude**	**Phase**	**Amplitude**	**Phase**
1 (N)	1.000	0.0°	9.88	-1.83°	.532	-165.2°
2 (NC)	1.860	162.0°	18.56	163.35°	1.000	0.0°
3 (SC)	1.300	321.0°	13.53	-37.29°	.729	159.4°
4 (S)			DETUNED			
5(SW)	.150	317.0°	1.62	-32.62°	.087	164.0°
6(SE)	.530	13.0°	5.57	17.32°	.300	-146.0°

NIGHT:

	Theoretical		Base Network Input Current		Normalized TCT	
Tower	**Field**	**Phase**	**Amplitude**	**Phase**	**Amplitude**	**Phase**
1 (N)	1.000	0.0°	1.40	1.01°	.369	115.2°
2 (NC)	2.786	243.7°	3.79	-114.22°	1.000	0.0°
3 (SC)	2.786	126.6°	3.60	129.44°	.950	-116.3°
4 (S)	1.000	10.2°	1.12	11.47°	.296	125.7°
5(SW)			DETUNED			
6(SE)			DETUNED			

FIGURE 11
WLCC TOWER BASE CIRCUIT ANALYSIS DESCRIPTION

APPLICATION FOR LICENSE INFORMATION
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BRANDON, FLORIDA
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CIRCUIT ANALYSIS

Circuit Analysis was performed on each Tower of the WLCC model. "Phasetek" nodal Circuit Analysis program was used to compute base model Input/Output voltages and currents. For the Directional modes, the calculated Mininec Tower Base Drive Voltage was used to determine the Base Network Input Current. This point is the location of the Sampling TCT. "Z_1" represents the ATU Shunt impedance, "Z_2" represents the Tower Feed impedance, and "Z_3" represents the Tower Base Shunt impedance.

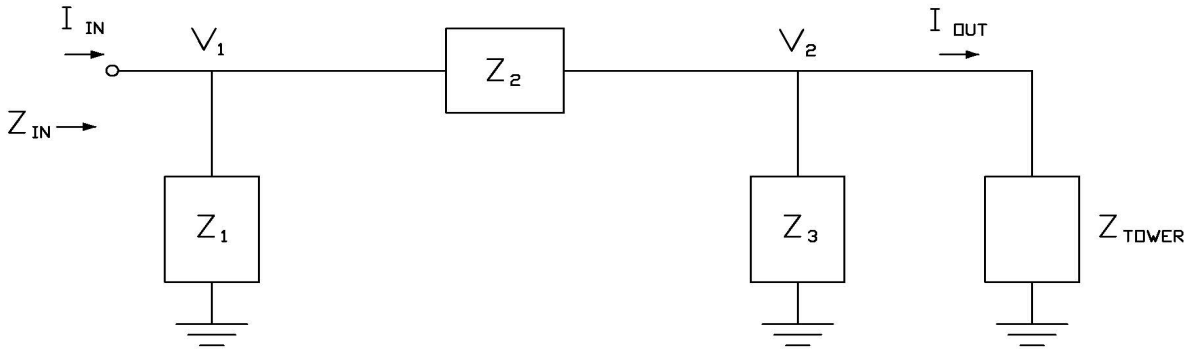

FIGURE 12
WLCC CIRCUIT ANALYSIS FOR INDIVIDUAL TOWERS

CUSTOMER : WLCC
NETWORK ID : TOWER 1 (OTHERS OPEN)

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 19.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 50.79, 60.25 OHMS

NODE	TO NODE	IMPEDANCE (OHMS) R	X
1	GROUND	0.00	2000.00
2	GROUND	51.23	60.32
1	2	0.00	19.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	83.81	-7.48

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	47.37	77.46	90.80	58.56
INPUT CURRENT (AMPS) :	0.57	-0.94	1.10	-58.56
OUTPUT CURRENT (AMPS) :	0.57	-0.90	1.06	-57.35

INPUT/OUTPUT CURRENT RATIO = 1.0355
INPUT/OUTPUT PHASE = -1.20 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 2 (OTHERS OPEN)

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 22.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 49.80, 60.14 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	50.23	60.22
1		2	0.00	22.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	81.39	-8.41

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	46.32	80.09	92.52	59.96
INPUT CURRENT (AMPS) :	0.54	-0.94	1.08	-59.96
OUTPUT CURRENT (AMPS) :	0.54	-0.89	1.04	-58.78

INPUT/OUTPUT CURRENT RATIO = 1.0369
INPUT/OUTPUT PHASE = -1.18 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 3 (OTHERS OPEN)

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 19.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 47.46, 60.27 OHMS

NODE	TO NODE	IMPEDANCE (OHMS) R	X
1	GROUND	0.00	2000.00
2	GROUND	47.87	60.37
1	2	0.00	19.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	83.12	-7.32

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	44.26	77.36	89.13	60.22
INPUT CURRENT (AMPS) :	0.56	-0.97	1.12	-60.22
OUTPUT CURRENT (AMPS) :	0.56	-0.93	1.08	-59.10

INPUT/OUTPUT CURRENT RATIO = 1.0355
INPUT/OUTPUT PHASE = -1.12 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 4 (OTHERS OPEN)

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 21.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 46.81, 55.51 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	47.18	55.57
1		2	0.00	21.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	81.05	-8.69

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	43.75	74.74	86.60	59.66
INPUT CURRENT (AMPS) :	0.58	-1.00	1.15	-59.66
OUTPUT CURRENT (AMPS) :	0.58	-0.95	1.12	-58.55

INPUT/OUTPUT CURRENT RATIO = 1.0344
INPUT/OUTPUT PHASE = -1.11 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 5 (OTHERS OPEN)

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 16.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 51.01, 64.33 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	51.48	64.44
1		2	0.00	16.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	86.36	-6.00

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	47.55	78.51	91.78	58.80
INPUT CURRENT (AMPS) :	0.56	-0.93	1.09	-58.80
OUTPUT CURRENT (AMPS) :	0.56	-0.89	1.05	-57.59

INPUT/OUTPUT CURRENT RATIO = 1.0358
INPUT/OUTPUT PHASE = -1.21 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 6 (OTHERS OPEN)

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 18.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 50.18, 61.21 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	50.62	61.30
1		2	0.00	18.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	84.50	-7.00

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	46.81	77.41	90.46	58.84
INPUT CURRENT (AMPS) :	0.57	-0.95	1.11	-58.84
OUTPUT CURRENT (AMPS) :	0.57	-0.90	1.07	-57.65

INPUT/OUTPUT CURRENT RATIO = 1.0354
INPUT/OUTPUT PHASE = -1.19 DEGREES

FIGURE 13
WLCC CIRCUIT ANALYSIS FOR DIRECTIONAL DAY MODE

CUSTOMER : WLCC
NETWORK ID : TOWER 1 DAY

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 19.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : -29.56, 102.31 OHMS

NODE	TO NODE	IMPEDANCE (OHMS) R	X
1	GROUND	0.00	2000.00
2	GROUND	-30.00	103.00
1	2	0.00	19.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	1169.71	101.18
2	998.82	103.60

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	-26.64	115.36	118.40	103.00
INPUT CURRENT (AMPS) :	9.87	-0.32	9.88	-1.83
OUTPUT CURRENT (AMPS) :	9.37	-0.41	9.38	-2.52

INPUT/OUTPUT CURRENT RATIO = 1.0533
INPUT/OUTPUT PHASE = 0.69 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 2 DAY

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 22.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 20.56, 98.16 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	20.85	98.82
1		2	0.00	22.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	2145.87	-115.88
2	1767.66	242.00

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	18.54	114.12	115.62	80.77
INPUT CURRENT (AMPS) :	-17.78	5.32	18.56	163.35
OUTPUT CURRENT (AMPS) :	-16.93	4.91	17.63	163.83

INPUT/OUTPUT CURRENT RATIO = 1.0530
INPUT/OUTPUT PHASE = -0.48 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 3 DAY

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 19.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 24.13, 57.46 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	24.33	57.66
1		2	0.00	19.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	1047.92	35.77
2	815.40	30.50

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	22.56	74.09	77.45	73.06
INPUT CURRENT (AMPS) :	10.76	-8.20	13.53	-37.29
OUTPUT CURRENT (AMPS) :	10.49	-7.82	13.08	-36.72

INPUT/OUTPUT CURRENT RATIO = 1.0341
INPUT/OUTPUT PHASE = -0.57 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 5 DAY

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 16.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 134.84, -6.28 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	134.71	-7.58
1		2	0.00	16.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	217.09	-25.20
2	217.01	328.00

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	132.98	17.31	134.10	7.41
INPUT CURRENT (AMPS) :	1.36	-0.87	1.62	-32.62
OUTPUT CURRENT (AMPS) :	1.40	-0.79	1.61	-29.33

INPUT/OUTPUT CURRENT RATIO = 1.0070
INPUT/OUTPUT PHASE = -3.28 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 6 DAY

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 18.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 59.49, 44.28 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	59.87	44.16
1		2	0.00	18.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	466.04	65.06
2	401.73	55.40

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	56.27	61.92	83.67	47.74
INPUT CURRENT (AMPS) :	5.32	1.66	5.57	17.32
OUTPUT CURRENT (AMPS) :	5.13	1.74	5.42	18.74

INPUT/OUTPUT CURRENT RATIO = 1.0283
INPUT/OUTPUT PHASE = -1.42 DEGREES

FIGURE 14
WLCC CIRCUIT ANALYSIS FOR DIRECTIONAL NIGHT MODE

CUSTOMER : WLCC
NETWORK ID : TOWER 1 NIGHT

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 19.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 11.83, 35.38 OHMS

NODE	TO NODE	IMPEDANCE (OHMS) R	X
1	GROUND	0.00	2000.00
2	GROUND	11.89	35.46
1	2	0.00	19.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	75.79	79.02
2	50.85	72.80

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	11.27	53.08	54.26	78.02
INPUT CURRENT (AMPS) :	1.40	0.02	1.40	1.01
OUTPUT CURRENT (AMPS) :	1.36	0.03	1.36	1.29

INPUT/OUTPUT CURRENT RATIO = 1.0246
INPUT/OUTPUT PHASE = -0.28 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 2 NIGHT

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 22.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 30.53, 59.39 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	30.79	59.58
1		2	0.00	22.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	317.44	-44.05
2	244.15	309.30

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	28.42	78.80	83.77	70.17
INPUT CURRENT (AMPS) :	-1.55	-3.46	3.79	-114.22
OUTPUT CURRENT (AMPS) :	-1.46	-3.35	3.66	-113.49

INPUT/OUTPUT CURRENT RATIO = 1.0365
INPUT/OUTPUT PHASE = -0.72 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 3 NIGHT

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 19.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 46.19, 99.43 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	2000.00
2		GROUND	46.85	99.99
1		2	0.00	19.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	434.89	-160.79
2	375.52	195.60

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	41.72	113.23	120.67	69.77
INPUT CURRENT (AMPS) :	-2.29	2.78	3.60	129.44
OUTPUT CURRENT (AMPS) :	-2.23	2.60	3.43	130.52

INPUT/OUTPUT CURRENT RATIO = 1.0522
INPUT/OUTPUT PHASE = -1.08 DEGREES

CUSTOMER : WLCC
NETWORK ID : TOWER 4 NIGHT

FREQUENCY : 760.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 2000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 21.00 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00,-13961.00 OHMS
TOWER IMPEDANCE (R,X) : 28.62, 263.56 OHMS

NODE	TO NODE	IMPEDANCE (OHMS) R	X
1	GROUND	0.00	2000.00
2	GROUND	29.73	268.57
1	2	0.00	21.00

NODE	VOLTAGE MAGNITUDE	PHASE
1	285.01	96.35
2	264.56	95.90

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	22.68	253.24	254.25	84.88
INPUT CURRENT (AMPS) :	1.10	0.22	1.12	11.47
OUTPUT CURRENT (AMPS) :	0.98	0.21	1.00	12.10

INPUT/OUTPUT CURRENT RATIO = 1.1233
INPUT/OUTPUT PHASE = -0.62 DEGREES

FIGURE 15
WLCC REFERENCE FIELD INTENSITY MEASUREMENTS
SEPTEMBER, 2023

WLCC DAY REFERENCE POINT MEASUREMENTS – AUGUST 4, 2023

						CO-ORD NAD27			
Radial		**Dist km**	**mV/m**	**Time**		**Deg**	**Min**	**Sec**	**Description**
16.5°	1	1.70	940	1343	N	28	02	22.4	Paved road off Kingsway Rd.
					W	82	16	42.8	
	2	1.81	744	1341	N	28	02	25.8	#3005 Kingsway Rd.
					W	82	16	41.4	
	3	2.69	614	1333	N	28	02	53.3	Thonotosassa Rd.
					W	82	16	32.7	
131.5°	1	0.71	112	1400	N	28	01	15.0	#1733 Kingsway Rd.
					W	82	16	40.6	
	2	2.50	10.6	1308	N	28	00	36.5	US 92 at Darby Lake St.
					W	82	15	51.1	
	3	4.27	11.6	1318	N	27	59	58.1	Intersection Jess Walden/Walden Ridge
					W	82	15	03.2	
207°	1	0.44	2250	1233	N	28	01	17.0	Pruett Rd. at school crossing
					W	82	17	07.9	
	2	1.47	390	1237	N	28	00	47.2	Taylor Rd. South of gate
					W	82	17	25.1	
	3	2.94	222	1259	N	28	00	04.6	#5645 Peach Ave.
					W	82	17	49.4	

FIGURE 15

WLCC REFERENCE FIELD INTENSITY MEASUREMENTS

CONTINUED

WLCC DAY REFERENCE POINT MEASUREMENTS – AUGUST 4, 2023

					CO-ORD NAD27			
Radial		**Dist km**	**mV/m**	**Time**	**Deg**	**Min**	**Sec**	**Description**
255°	1	1.94	151	1225	N 28	01	13.8	Mango Rd. at guardrail
					W 82	18	09.4	
	2	2.69	89.5	1216	N 28	01	07.1	#11306 Broadview Dr.
					W 82	18	35.8	
	3	2.78	134	1213	N 28	01	06.5	Black Dairy Rd. south of Broadview
					W 82	18	39.0	
304°	1	0.82	410	1140	N 28	01	44.5	Taylor Rd.
					W 82	17	25.2	
	2	2.29	207	1153	N 28	02	10.8	Mango Rd. North of Joe Ebert
					W 82	18	10.3	
	3	4.22	91.8	1203	N 28	02	46.0	Timmons Rd. North 108th.
					W 82	19	09.1	

FIGURE 15

WLCC REFERENCE FIELD INTENSITY MEASUREMENTS

CONTINUED

WLCC NIGHT REFERENCE POINT MEASUREMENTS – AUGUST 4, 2023

						CO-ORD NAD27			
Radial		**Dist km**	**mV/m**	**Time**		**Deg**	**Min**	**Sec**	**Description**
4.5°	1	2.75	8.45	1647	N	28	02	58.6	Thonotosassa Rd. East of park
					W	82	16	51.7	
	2	5.70	3.05	1631	N	28	04	33.6	Knights Griffin Rd. at tree farm
					W	82	16	44.1	
	3	6.22	2.09	1637	N	28	04	50.5	US 301, East side
					W	82	16	43.1	
40.5°	1	0.82	50.5	1612	N	28	01	49.7	Kingsway Rd. North of #2433
					W	82	16	40.9	
	2	1.59	26.0	1617	N	28	02	09.1	Collins Ranch Rd. opposite gate
					W	82	16	22.6	
	3	3.22	14.0	1651	N	28	02	49.3	Thonotosassa Rd.
					W	82	15	43.9	
60.5°	1	3.83	8.2	1515	N	28	02	30.3	Macintosh Rd. opposite #10121
					W	82	14	57.7	
	2	4.95	3.14	1509	N	28	02	48.5	#13025 Thonotosassa Rd.
					W	82	14	22.2	
	3	5.28	4.1	1503	N	28	02	54.1	#3310 Gallagher Rd.
					W	82	14	12.1	

FIGURE 15

WLCC REFERENCE FIELD INTENSITY MEASUREMENTS

CONTINUED

WLCC NIGHT REFERENCE POINT MEASUREMENTS – AUGUST 4, 2023

						CO-ORD NAD27			
Radial		**Dist km**	**mV/m**	**Time**		**Deg**	**Min**	**Sec**	**Description**
90.5°	1	1.35	44.5	1442	N	28	01	29.2	#6339 Muck Pond Rd.
					W	82	16	10.8	
	2	3.73	3.05	1450	N	28	01	28.0	Parking lot, Shell station
					W	82	14	17.5	
	3	4.44	5.08	1457	N	28	01	29.4	#13120 Gore Rd.
					W	82	14	17.5	
202.5°	1	0.42	1380	1436	N	28	01	17.0	Pruett Rd. in front of school
					W	82	17	06.1	
	2	1.75	130	1430	N	28	00	37.3	End of Taylor Rd.
					W	82	17	24.9	
	3	2.59	201	1526	N	28	00	12.1	US 92 East of Pine St.
					W	82	17	36.8	
314.5°	1	2.67	8.93	1537	N	28	02	30.4	Mango Rd. by fence
					W	82	18	09.9	
	2	4.07	12.8	1542	N	28	03	02.2	Parking lot off Skewlee Rd.
					W	82	18	46.7	
	3	4.50	6.28	1546	N	28	03	11.8	#10233 Harney Rd.
					W	82	18	58.3	

FIGURE 15

WLCC REFERENCE FIELD INTENSITY MEASUREMENTS

CONTINUED

WLCC NIGHT REFERENCE POINT MEASUREMENTS – AUGUST 4, 2023

						CO-ORD NAD27			
Radial		**Dist km**	**mV/m**	**Time**		**Deg**	**Min**	**Sec**	**Description**
344.5°	1	2.62	24.6	1603	N	28	02	51.4	Taylor Rd.
					W	82	17	25.8	
	2	2.95	14.4	1559	N	28	03	01.9	#11084 Skenlee Rd.
					W	82	17	29.2	
	3	3.78	4.1	1554	N	28	03	27.7	Main St. opposite Post Office
					W	82	17	36.8	

FIGURE 16
WLCC MODEL CONVERGENCE TEST
SEPTEMBER, 2023

WLCC TOWER 1

CONVERGENCE TEST

Frequency = .76 MHz

number of unknowns	conductance (mhos)	susceptance (mhos)	resistance (ohms)	reactance (ohms)
source 1 of sector 1				
21	8.06E-03	-9.51E-03	51.8377	61.1767
31	8.3E-03	-9.6E-03	51.5022	59.6316
42	8.41E-03	-9.64E-03	51.3755	58.9067
53	8.47E-03	-9.66E-03	51.332	58.5539
63	8.49E-03	-9.66E-03	51.322	58.3924
73	8.51E-03	-9.66E-03	51.3304	58.311
84	8.5E-03	-9.66E-03	51.3657	58.3326
95	8.49E-03	-9.65E-03	51.4129	58.4131
105	8.48E-03	-9.64E-03	51.4412	58.4623
115	8.47E-03	-9.63E-03	51.4812	58.5404
126	8.46E-03	-9.63E-03	51.5117	58.6006
137	8.45E-03	-9.62E-03	51.547	58.6802
147	8.43E-03	-9.61E-03	51.5909	58.7897
157	8.42E-03	-9.6E-03	51.6298	58.9042
168	8.4E-03	-9.59E-03	51.6755	59.03
179	8.39E-03	-9.59E-03	51.6931	59.0613
189	8.36E-03	-9.57E-03	51.7504	59.2504
199	8.36E-03	-9.57E-03	51.7657	59.2665
210	8.34E-03	-9.56E-03	51.8029	59.3888
221	8.33E-03	-9.56E-03	51.8303	59.4648

FIGURE 17
WLCC CALCULATED CURRENT MOMENTS
SEPTEMBER, 2023

WLCC DAY
CURRENT MOMENTS(amp-degrees) rms

Frequency = .76 MHz
Input power = 10,000. watts

wire	magnitude	phase (deg)	vertical current moment magnitude	phase (deg)
1	1,061.99	0.0	1,061.99	0.0
2	9.41089	1.9	.301277	181.7
3	9.57603	1.5	.315972	180.6
4	9.57504	1.5	.315892	180.5
5	1,975.45	162.	1,975.45	162.
6	17.7033	160.9	.603984	341.4
7	17.7383	160.7	.605093	340.9
8	17.7011	161.1	.603386	341.9
9	1,380.09	321.1	1,380.09	321.1
10	11.884	319.5	.404283	140.2
11	11.74	319.4	.390089	140.
12	11.9072	319.7	.406245	140.5
13	1.93714	337.3	1.93714	337.3
14	.450965	247.2	.0110761	45.
15	.478015	260.7	.0132245	95.7
16	.431339	253.1	8.17E-03	67.2
17	158.784	317.2	158.784	317.2
18	1.28758	307.8	.0363164	133.
19	1.36539	307.6	.0433203	131.6
20	1.3998	307.5	.0462533	131.
21	562.929	13.1	562.929	13.1
22	4.83495	8.8	.163067	190.2
23	4.83444	8.9	.163365	190.4
24	4.817	9.5	.161676	192.2

Medium wave array vertical current moment (amps-degrees) rms
(Calculation assumes tower wires are grouped together.
The first wire of each group must contain the source.)

tower	magnitude	phase (deg)
1	1,061.06	0.0
2	1,973.63	162.
3	1,378.89	321.1
4	1.9353	338.2
5	158.658	317.2
6	562.442	13.1

WLCC NIGHT
CURRENT MOMENTS(amp-degrees) rms

Frequency = .76 MHz
Input power = 1,000. watts

wire	magnitude	phase (deg)	vertical current moment magnitude	phase (deg)
1	138.735	360.	138.735	360.
2	1.14476	358.3	.0379559	178.2
3	1.16342	359.	.0396191	180.2
4	1.16343	359.	.0396204	180.2
5	386.56	243.7	386.56	243.7
6	3.34261	241.7	.115628	62.6
7	3.36103	242.	.116933	63.5
8	3.33247	241.4	.11457	61.7
9	386.53	126.6	386.53	126.6
10	3.46795	124.	.114883	304.5
11	3.47377	124.7	.115138	306.6
12	3.46794	124.	.11485	304.5
13	138.653	10.2	138.653	10.2
14	1.41597	8.9	.0501677	188.3
15	1.39392	10.5	.048626	192.5
16	1.41588	8.9	.0501332	188.3
17	.205404	120.3	.205404	120.3
18	.150186	26.	3.01E-03	173.7
19	.145209	42.6	2.64E-03	258.2
20	.16202	34.3	3.45E-03	214.3
21	.0641898	95.	.0641898	95.
22	.162953	12.8	3.79E-03	192.
23	.14435	20.4	2.66E-03	231.6
24	.153106	6.6	3.24E-03	164.

Medium wave array vertical current moment (amps-degrees) rms
(Calculation assumes tower wires are grouped together.
The first wire of each group must contain the source.)

tower	magnitude	phase (deg)
1	138.618	360.
2	386.213	243.7
3	386.185	126.6
4	138.504	10.2
5	.205149	122.4
6	.0635409	102.8