Entercom

2400 Market Street, 4th Floor, Philadelphia, PA 19103

Laura Berman
Senior Counsel

February 4, 2021

***via* EMAIL**
Marlene Dortch, Secretary
Federal Communications Commission
Office of the Secretary
45 L Street NE
Washington, DC 20554
Attn: Audio Division, Media Bureau
james.bradshaw@fcc.gov
nazifa.sawez@fcc.gov

Re: WBEN, Buffalo, New York (Facility ID No. 34381)
FCC Form 302-AM

Dear Ms. Dortch:

Entercom License, LLC ("Entercom"), licensee of WBEN, Buffalo, New York (Facility ID No. 34381), hereby submits an application on Form 302-AM requesting a license employing moment method modeling.

In accordance with the instructions set forth in *Audio Division Announces Procedures Related to Coronavirus*, Public Notice, DA 20-266 (rel. Mar. 13, 2020), Entercom is submitting this application via email. The filing fee for the application was paid via Fee Filer. Enclosed is a copy online payment confirmation.

Please contact me if there are any questions.

Sincerely,

Laura Berman

cc: John Kennedy
Clarence Beverage

Enclosures

ETM:122844

Federal Communications Commission

FCC Registration

Commission Registration System (CORES)

Online Payment Confirmation

Print

Online Payment Information

Total Amount	$1,560.00
Payer FRN	0006113955
Payer Name	Entercom Communications Corp.
Remittance ID	3520432
Treasury Tracking ID	26R6EI4F

Thank you for your payment!

Federal Communications Commission

Commission Registration System (CORES)

FCC Registration

Payment Summary

Remittance ID: 3520432

Bill Number	Applicant FRN	Applicant Name	Call Sign	PTC	Amount	FCC Code 1	FCC Code 2
N/A	0004434866	Entercom License, LLC	WBEN	MMR	$725.00	34381	FCCForm302-AM
N/A	0004434866	Entercom License, LLC	WBEN	MOR	$835.00	34381	FCCForm302-AM
Total Amount Due :					**$1,560.00**		

Payment Method Selection

Pay with ACH from Bank Account
via US Treasury's Pay.Gov System

To pay via electronic debit from a checking or savings account, you must provide the Routing Number and Account Number.

CONTINUE

Pay by Credit or Debit Card
via US Treasury's Pay.Gov System

Pay.gov accepts both credit and debit cards.* We accept Visa, MasterCard, American Express, and Discover credit cards. Debit cards processed through Visa or MasterCard are also accepted; these have the Visa or MasterCard logo on the card. ATM-only cards and debit cards from other processors are not accepted.

CONTINUE

Can't Pay Online?

Pay By Wire Transfer

- A wire transfer is a transaction that you initiate through your bank. It authorizes your bank to wire funds from your account to the U.S. Treasury, New York, NY (TREAS NYC).
- Click Continue to indicate that you will pay by Wire Transfer and view instructions specific to this payment.

Pay By Check/Money Order

- Print the prefilled Form 159.
- Mail the Form 159 along with the check/money order to:
  Federal Communications Commission
  P.O. Box 979089
  St. Louis, MO 63197-9000
- Make the check/money order payable to:
  Federal Communications Commission

CONTINUE

CONTINUE

Customer Service

Help | Frequently Asked Questions | Privacy Statement | FCC Home Page

For assistance, please submit a help request at https://www.fcc.gov/wireless/available-support-services or call 877-480-3201 (Mon.-Fri. 8 a.m.-6 p.m. ET).

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.)

FOR COMMISSION USE ONLY

FILE NO.

SECTION I - APPLICANT FEE INFORMATION

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

Entercom Communications Corp.

MAILING ADDRESS (Line 1) (Maximum 35 characters)

2400 Market Street, 4th Floor

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
Philadelphia	PA	19103

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
6106605610	WBEN	34381

2. A. Is a fee submitted with this application? [✓] Yes [ ] No

B. If No, indicate reason for fee exemption (see 47 C.F.R. Section

[ ] Governmental Entity [ ] Noncommercial educational licensee [ ] Other (Please explain):

C. If Yes, provide the following information:

Enter in Column (A) the correct Fee Type Code for the service you are applying for. Fee Type Codes may be found in the "Mass Media Services Fee Filing Guide." Column (B) lists the Fee Multiple applicable for this application. Enter fee amount due in Column (C).

(A) FEE TYPE CODE	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
M M R	0 0 0 1	$ 725.00	

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

(A)	(B)	(C)	FOR FCC USE ONLY
M O R	0 0 0 1	$ 835.00	

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

TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
$ 1,560.00	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Entercom License, LLC		
MAILING ADDRESS 2400 Market Street, 4th Floor		
CITY Philadelphia	STATE PA	ZIP CODE 19103

2. This application is for:

☑ Commercial ☐ Noncommercial

☑ AM Directional ☐ AM Non-Directional

Call letters	Community of License	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
WBEN	Buffalo, NY	N/A	N/A	N/A

3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620?

☐ Yes ☑ No

If No, explain in an Exhibit.

Exhibit No. BESTA - 20200810AAI

4. Have all the terms, conditions, and obligations set forth in the above described construction permit been fully met?

☐ Yes ☐ No

If No, state exceptions in an Exhibit.

Exhibit No. N/A MoM License

5. Apart from the changes already reported, has any cause or circumstance arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect?

☐ Yes ☑ No

If Yes, explain in an Exhibit.

Exhibit No.

6. Has the permittee filed its Ownership Report (FCC Form 323) or ownership certification in accordance with 47 C.F.R. Section 73.3615(b)?

☐ Yes ☐ No

☑ Does not apply

If No, explain in an Exhibit.

Exhibit No.

7. Has an adverse finding been made or an adverse final action been taken by any court or administrative body with respect to the applicant or parties to the application in a civil or criminal proceeding, brought under the provisions of any law relating to the following: any felony; mass media related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination?

☐ Yes ☑ No

If the answer is Yes, attach as an Exhibit a full disclosure of the persons and matters involved, including an identification of the court or administrative body and the proceeding (by dates and file numbers), and the disposition of the litigation. Where the requisite information has been earlier disclosed in connection with another application or as required by 47 U.S.C. Section 1.65(c), the applicant need only provide: (i) an identification of that previous submission by reference to the file number in the case of an application, the call letters of the station regarding which the application or Section 1.65 information was filed, and the date of filing; and (ii) the disposition of the previously reported matter.

Exhibit No.

8. Does the applicant, or any party to the application, have a petition on file to migrate to the expanded band (1605-1705 kHz) or a permit or license either in the existing band or expanded band that is held in combination (pursuant to the 5 year holding period allowed) with the AM facility proposed to be modified herein?

☐ Yes ☑ No

If Yes, provide particulars as an Exhibit.

Exhibit No.

The APPLICANT hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because use of the same, whether by license or otherwise, and requests and authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended).

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

CERTIFICATION

1. By checking Yes, the applicant certifies, that, in the case of an individual applicant, he or she is not subject to a denial of federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, or, in the case of a non-individual applicant (e.g., corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits that includes FCC benefits pursuant to that section. For the definition of a "party" for these purposes, see 47 C.F.R. Section 1.2002(b).

☑ Yes ☐ No

2. I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Name	Signature	
John Kennedy		
Title	Date	Telephone Number
SVP of Technical Operations	February 4, 2021	617-779-5367

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

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

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

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

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

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
Entercom License, LLC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☑ Station License ☐ Direct Measurement of Power

1. Facilities authorized in construction permit

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
				Night	Day
WBEN	N/A	930	UNLIMITED	5	5

2. Station location

State	City or Town
New York	Buffalo

3. Transmitter location

State	County	City or Town	Street address (or other identification)
NY	Erie	Grand Island	Corner Of Bush Rd & S Parkway

4. Main studio location

State	County	City or Town	Street address (or other identification)
NY	Erie	Buffalo	500 Corporate Pkwy

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

State	County	City or Town	Street address (or other identification)
NY	Erie	Buffalo	500 Corporate Pkwy

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

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

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

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
10.39	10.1

Measured antenna or common point resistance (in ohms) at operating frequency		Measured antenna or common point reactance (in ohms) at operating frequency	
Night	Day	Night	Day
50	49	- J 4	+ J 3.7

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
#1	0	ND	1.0	ND		
#2	+ 78.2		0.58			

Manufacturer and type of antenna monitor: POTOMAC AM-19 SN 185

SECTION III - Page 2

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

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
GUYED UNIFORM CC	143.3	143.8	144.8	Exhibit No. See Engineering

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	42	o	58	'	42	"	West Longitude	78	o	57	'	27	"

If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits. Exhibit No. 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. See Engineering

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

N/A

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
Clarence M. Beverage	
Address (include ZIP Code)	Date
Communications Technologies, Inc. 23 Binsted Drive Medford, NJ 08055	01/29/2021
	Telephone No. (Include Area Code)
	609-451-5296 ext. 11

☐ Technical Director ☐ Registered Professional Engineer

☐ Chief Operator ☐ Technical Consultant

☑ Other (specify) Broadcast Engineering Consultant

ENGINEERING STATEMENT

APPLICATION FOR MOMENT METHOD MODELING LICENSED OPERATION

WBEN(AM) 930 kHz

5 kW ND-D & 5 kW DA-N

BUFFALO, NY

TABLE OF CONTENTS

January 2021

APPLICATION FOR MOMENT METHOD MODELING LICENSED OPERATION

WBEN(AM) 930 kHz

5 kW ND-D & 5 kW DA-N

BUFFALO, NY

January 2021

SUMMARY

The following engineering statement has been prepared on behalf of **Entercom License, LLC** ("Entercom") licensee of standard broadcast station WBEN. The WBEN facilities described herein are currently licensed under FCC File Number BL--13191. This document includes MoM based performance verification for the DA-N, two tower, directional antenna system operation. WBEN is currently operating under STA, BESTA-20200127AAH, which authorizes parameters at variance for MoM implementation purposes. The STA request indicated that a MoM license would be filed.

The applicant requests authorization to operate the WBEN antenna system using computer modeling and sample system verification as provided for in the Second Report and Order in MM Docket No. 93-177 released September 26, 2008 pending grant of the license application submitted herein. The rules specify that the directional antenna parameters be set to the operating parameters determined by the moment method without deviation. That operation has been completed and this statement is being submitted, along with Section III of FCC Form 302-AM, specifying the calculated MoM parameters for licensed operation.

METHOD OF MOMENTS MODEL – SELF IMPEDANCE ANALYSIS

In an effort to model the antenna system as accurately as possible, detailed mechanical data was obtained from the licensee. Neither tower is registered. The data is summarized below:

Tower 1, 470', 143.3 M of steel, square, 72" face, effective radius 1.1643 M
Tower 2, 470', 143.3 M of steel, square, 72" face, effective radius 1.1643 M

Towers, height, face width and effective radius listed above.

The choice of calculating engine and software implementation chosen for this filing is the ACSModel Version 1.03 employing MININEC3. The circuit analysis software employed is WCAP Professional Version 1.1.10.

The wire model data are compiled in Table 1. The values there comply with the 73.151 requirement that the radius of the wire model cylinder be within 80 and 150 percent of the radius of a circle with a circumference equal to the sum of the faces, that the height be between 75 and 125 percent of the physical length and that no segment be greater than 10 electrical degrees.

Table 2 is a summary of measured and calculated self-impedance, circuit model data and calculated tolerances. The tower measured base self-impedances, with all other towers floating, as measured at the J plug, are listed in Table 2. The Mininec tower models for self-impedance determination, with all other towers floating, may be found in *Exhibit I*. Both towers are identical and 159.9 electrical degrees in height with 33 degrees of guy wire top loading. The guy wires are modeled at their physical length of 97 feet, 29.5 meters.

A circuit model has been constructed for each tower to account for shunt and series reactance across the tower base. All calculations have been made employing WCAP Professional version 1.1.10 as seen in *Figures 1 & 2* for self-impedance. The measured and calculated self-impedance values are well within the tolerance specified in 73.151(c)(2)(ii) as seen in Table 2.

METHOD OF MOMENTS MODEL – BASE OPERATING PARAMETERS

The modeled tower array was employed, as constructed for the derivation of self-impedance, for the determination of DA-N directional operating parameters. The FCC theoretical values were converted to base excitation values. The base driving point parameters for the DA-N directional array are on *Exhibit II*. Table 3 Night summarizes the Mininec voltage source values for each tower base.

The calculated base operating parameters and the phase monitor parameters as adjusted are reflected on Form 302-AM, attached, and found on Table 3 Night. The calculated MoM base operating parameters are found on *Exhibit II* for the DA-N directional operation.

DIRECT MEASUREMENT OF POWER

Common point impedance as measured, and common point current are listed in Table 4. This data is found on Section III FCC Form 302-AM attached.

SAMPLING SYSTEM

The sampling system equipment is summarized in Table 5. Phasetek voltage samplers, model P600-206-2L, serial numbers 930-1 and 930-2, were factory tested for accuracy and the documentation is included in Appendix 2.

The sampling device accuracy is well within the manufacturer tolerance of ±2% in magnitude and ±3 degrees in phase. Phase monitor accuracy was confirmed by feeding the tower inputs through a splitter and equal length jumpers to confirm equal magnitude and phase on each tower. There were no observable errors.

Impedance and electrical length for each of the two sample lines were measured. The measurement was made at the transmitter building with the sample lines unterminated on the tuning unit end. The results are in Table 6.

It may be seen that the sample lines are essentially equal in length at the specified frequencies. The sample system meets the rule requirement that the sample lines be equal to within one degree.

The impedance of the sample lines was determined by measuring the open circuit impedance 45 degrees above and below the resonant length of the sample lines. The measured data is presented below. The impedance is determined using the formula:

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

The results are tabulated in Table 7. The characteristic impedance of the transmission lines is within the allowable tolerance of 2 ohms.

Sampling system impedance was measured with each of the sampling lines terminated in its respective voltage sampling device. Impedance was measured by connecting each sample line directly to the measurement device.

GROUND SYSTEM

The ground system consists of 120 equally-spaced, buried, copper wire radials, around the base of each tower, each 129.5 meters in length except where foreshortened at intersecting radials which are then bonded to a transverse copper strap midway between adjacent towers.

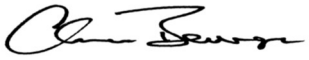
REFERENCE FIELD STRENGTH MEASUREMENTS

All field work, including pattern adjustments and reference field strength measurements, was undertaken by William P. Weeks of Milton, New York whose qualifications are a matter of record with the FCC. A Potomac Instrument FIM-41, serial #1918, calibration checked against FIM-41, serial # 223, calibrated in July of 2020, was used for all field strength measurements. The measurement data appears in *Appendix 1*.

CONCLUSION

Based on the data submitted herein it is believed that the WBEN antenna system has been adjusted to MoM parameters and is ready for licensing.

The foregoing was prepared on behalf of **Entercom License, LLC** by Clarence M. Beverage of *Communications Technologies, Inc.*, Marlton, New Jersey, whose qualifications are a matter of record with the Federal Communications Commission. The statements herein are true and correct of his own knowledge, except such statements made on information and belief, and as to these statements he believes them to be true and correct.



Clarence M. Beverage
for Communications Technologies, Inc.
Marlton, New Jersey

January 29, 2021

EXHIBIT 1

```
****************************************
                ACSModel
          (MININEC 3.1 Core)
      10-31-2020          15:22:34
****************************************

WBEN ND 1
ORIENTATION AS BUILT


Frequency = 0.930 MHz     Wavelength = 322.36559 Meters

No. of Wires: 8

Wire No. 1   Coordinates                              End         No.
of
   X             Y             Z          Radius     Connection
Segments
 0             0             0                       -1
 0             0             150.7059     1.16        0             32

Wire No. 2   Coordinates                              End         No.
of
   X             Y             Z          Radius     Connection
Segments
 0             0             150.7059                  1
 17.73011      0             127.0658     0.0125       0             7

Wire No. 3   Coordinates                              End         No.
of
   X             Y             Z          Radius     Connection
Segments
 0             0             150.7059                  1
-8.865054      15.35472      127.0658     0.0125       0             7

Wire No. 4   Coordinates                              End         No.
of
   X             Y             Z          Radius     Connection
Segments
 0             0             150.7059                  1
-8.865054     -15.35472      127.0658     0.0125       0             7

Wire No. 5   Coordinates                              End         No.
of
   X             Y             Z          Radius     Connection
Segments
-92.60489     -77.70473      0                       -5
-92.60489     -77.70473      161.1828     1.16        0             32
```

Wire No. 6	Coordinates			End	No. of
X	Y	Z	Radius	Connection	Segments
-92.60489	-77.70473	161.1828		5	
-74.87401	-77.70511	137.5426	0.0125	0	7

Wire No. 7	Coordinates			End	No. of
X	Y	Z	Radius	Connection	Segments
-92.60489	-77.70473	161.1828		5	
-101.4704	-62.34936	137.5426	0.0125	0	7

Wire No. 8	Coordinates			End	No. of
X	Y	Z	Radius	Connection	Segments
-92.60489	-77.70473	161.1828		5	
-101.4704	-93.05875	137.5426	0.0125	0	7

**** ANTENNA GEOMETRY ****

Wire No. 1	Coordinates			Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
0	0	0	1.16	-1	1	1
0	0	4.70956	1.16	1	1	2
0	0	9.41912	1.16	1	1	3
0	0	14.12868	1.16	1	1	4
0	0	18.83824	1.16	1	1	5
0	0	23.5478	1.16	1	1	6
0	0	28.25736	1.16	1	1	7
0	0	32.96692	1.16	1	1	8
0	0	37.67648	1.16	1	1	9
0	0	42.38604	1.16	1	1	10
0	0	47.0956	1.16	1	1	11
0	0	51.80516	1.16	1	1	12
0	0	56.51472	1.16	1	1	13
0	0	61.22428	1.16	1	1	14
0	0	65.93384	1.16	1	1	15
0	0	70.6434	1.16	1	1	16
0	0	75.35296	1.16	1	1	17
0	0	80.06252	1.16	1	1	18
0	0	84.77208	1.16	1	1	19
0	0	89.48164	1.16	1	1	20
0	0	94.1912	1.16	1	1	21
0	0	98.90076	1.16	1	1	22
0	0	103.6103	1.16	1	1	23
0	0	108.3199	1.16	1	1	24
0	0	113.0294	1.16	1	1	25
0	0	117.739	1.16	1	1	26
0	0	122.4486	1.16	1	1	27
0	0	127.1581	1.16	1	1	28
0	0	131.8677	1.16	1	1	29

0	0	136.5772	1.16	1	1	30
0	0	141.2868	1.16	1	1	31
0	0	145.9964	1.16	1	0	32

Wire No. 2 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
0	0	150.7059	0.0125	1	2	33
2.532873	0	147.3288	0.0125	2	2	34
5.065745	0	143.9516	0.0125	2	2	35
7.598618	0	140.5744	0.0125	2	2	36
10.13149	0	137.1973	0.0125	2	2	37
12.66436	0	133.8201	0.0125	2	2	38
15.19724	0	130.4429	0.0125	2	0	39

Wire No. 3 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
0	0	150.7059	0.0125	1	3	40
-1.266436	2.193532	147.3288	0.0125	3	3	41
-2.532873	4.387064	143.9516	0.0125	3	3	42
-3.799309	6.580596	140.5744	0.0125	3	3	43
-5.065745	8.774127	137.1973	0.0125	3	3	44
-6.332181	10.96766	133.8201	0.0125	3	3	45
-7.598618	13.16119	130.4429	0.0125	3	0	46

Wire No. 4 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
0	0	150.7059	0.0125	1	4	47
-1.266436	-2.193532	147.3288	0.0125	4	4	48
-2.532873	-4.387064	143.9516	0.0125	4	4	49
-3.799309	-6.580596	140.5744	0.0125	4	4	50
-5.065745	-8.774127	137.1973	0.0125	4	4	51
-6.332181	-10.96766	133.8201	0.0125	4	4	52
-7.598618	-13.16119	130.4429	0.0125	4	0	53

Wire No. 5 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
-92.60489	-77.70473	0	1.16	-5	5	54
-92.60489	-77.70473	5.036963	1.16	5	5	55
-92.60489	-77.70473	10.07393	1.16	5	5	56
-92.60489	-77.70473	15.11089	1.16	5	5	57
-92.60489	-77.70473	20.14785	1.16	5	5	58
-92.60489	-77.70473	25.18481	1.16	5	5	59
-92.60489	-77.70473	30.22178	1.16	5	5	60
-92.60489	-77.70473	35.25874	1.16	5	5	61
-92.60489	-77.70473	40.2957	1.16	5	5	62
-92.60489	-77.70473	45.33266	1.16	5	5	63
-92.60489	-77.70473	50.36963	1.16	5	5	64
-92.60489	-77.70473	55.40659	1.16	5	5	65
-92.60489	-77.70473	60.44355	1.16	5	5	66
-92.60489	-77.70473	65.48051	1.16	5	5	67
-92.60489	-77.70473	70.51747	1.16	5	5	68
-92.60489	-77.70473	75.55444	1.16	5	5	69
-92.60489	-77.70473	80.5914	1.16	5	5	70
-92.60489	-77.70473	85.62836	1.16	5	5	71

-92.60489	-77.70473	90.66533	1.16	5	5	72
-92.60489	-77.70473	95.70229	1.16	5	5	73
-92.60489	-77.70473	100.7393	1.16	5	5	74
-92.60489	-77.70473	105.7762	1.16	5	5	75
-92.60489	-77.70473	110.8132	1.16	5	5	76
-92.60489	-77.70473	115.8501	1.16	5	5	77
-92.60489	-77.70473	120.8871	1.16	5	5	78
-92.60489	-77.70473	125.9241	1.16	5	5	79
-92.60489	-77.70473	130.961	1.16	5	5	80
-92.60489	-77.70473	135.998	1.16	5	5	81
-92.60489	-77.70473	141.0349	1.16	5	5	82
-92.60489	-77.70473	146.0719	1.16	5	5	83
-92.60489	-77.70473	151.1089	1.16	5	5	84
-92.60489	-77.70473	156.1458	1.16	5	0	85

Wire No. 6 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
-92.60489	-77.70473	161.1828	0.0125	5	6	86
-90.07191	-77.70478	157.8056	0.0125	6	6	87
-87.53893	-77.70483	154.4285	0.0125	6	6	88
-85.00594	-77.70489	151.0513	0.0125	6	6	89
-82.47295	-77.70495	147.6741	0.0125	6	6	90
-79.93997	-77.705	144.297	0.0125	6	6	91
-77.40699	-77.70506	140.9198	0.0125	6	0	92

Wire No. 7 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
-92.60489	-77.70473	161.1828	0.0125	5	7	93
-93.87139	-75.5111	157.8056	0.0125	7	7	94
-95.13789	-73.31748	154.4285	0.0125	7	7	95
-96.4044	-71.12386	151.0513	0.0125	7	7	96
-97.6709	-68.93023	147.6741	0.0125	7	7	97
-98.9374	-66.7366	144.297	0.0125	7	7	98
-100.2039	-64.54298	140.9198	0.0125	7	0	99

Wire No. 8 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
-92.60489	-77.70473	161.1828	0.0125	5	8	100
-93.8714	-79.89816	157.8056	0.0125	8	8	101
-95.1379	-82.09159	154.4285	0.0125	8	8	102
-96.40441	-84.28502	151.0513	0.0125	8	8	103
-97.67091	-86.47845	147.6741	0.0125	8	8	104
-98.93742	-88.67188	144.297	0.0125	8	8	105
-100.2039	-90.86532	140.9198	0.0125	8	0	106

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 1, 2681.4, 70.9

Number of Loads: 0

********** SOURCE DATA **********
Pulse 1 Voltage = (878.7828, 2533.2769j)
Current = (-5.5317, 5.8664j)
Impedance = (153.812, -294.837j)
Power = 5000.0 Watts

********** CURRENT DATA **********

Wire No. 1 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
1	-5.5317	5.8664	8.0631	133.3182
2	-2.2211	4.712	5.2093	115.238
3	-0.7399	4.1804	4.2454	100.0371
4	0.6103	3.6826	3.7328	80.5903
5	1.8265	3.2197	3.7017	60.4345
6	2.9532	2.7766	4.0535	43.2346
7	4.0047	2.3487	4.6426	30.3909
8	4.9869	1.9343	5.3489	21.1998
9	5.9016	1.5334	6.0976	14.5646
10	6.748	1.1467	6.8447	9.6441
11	7.5242	0.7755	7.5641	5.8847
12	8.2278	0.4214	8.2386	2.9319
13	8.856	0.086	8.8564	0.5563
14	9.4062	-0.229	9.409	-1.3947
15	9.8759	-0.5219	9.8896	-3.0252
16	10.2628	-0.7912	10.2933	-4.4082
17	10.5654	-1.0352	10.616	-5.5961
18	10.7824	-1.2528	10.8549	-6.6272
19	10.9131	-1.4426	11.0081	-7.5303
20	10.9576	-1.6038	11.0744	-8.3268
21	10.9166	-1.7355	11.0537	-9.0334
22	10.7916	-1.8374	10.9469	-9.6624
23	10.5853	-1.909	10.756	-10.2233
24	10.3013	-1.9506	10.4843	-10.7225
25	9.9449	-1.9627	10.1367	-11.1642
26	9.5236	-1.9462	9.7204	-11.5495
27	9.0471	-1.9026	9.245	-11.8765
28	8.5265	-1.8341	8.7215	-12.14
29	7.9717	-1.7426	8.1599	-12.3311
30	7.3874	-1.6294	7.5649	-12.438
31	6.7701	-1.4939	6.9329	-12.4439
32	6.1181	-1.3369	6.2625	-12.3258
J	5.194	-1.095	5.3081	-11.9048

Wire No. 2 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	1.7355	-0.3688	1.7743	-11.9955
34	1.6269	-0.3398	1.662	-11.7976
35	1.4428	-0.2942	1.4725	-11.5242
36	1.2145	-0.2409	1.2382	-11.2198
37	0.9548	-0.1839	0.9724	-10.9009
38	0.6685	-0.1248	0.6801	-10.5728
39	0.3559	-0.0643	0.3616	-10.2363
E	0.0	0.0	0.0	0.0

Wire No. 3 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	1.7327	-0.3658	1.7709	-11.9207
41	1.6241	-0.3369	1.6587	-11.7186
42	1.4402	-0.2914	1.4694	-11.4389
43	1.2122	-0.2384	1.2354	-11.127
44	0.9529	-0.1818	0.9701	-10.7998
45	0.6671	-0.1232	0.6784	-10.4626
46	0.3551	-0.0634	0.3607	-10.1161
E	0.0	0.0	0.0	0.0

Wire No. 4 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	1.7257	-0.3604	1.763	-11.7975
48	1.6173	-0.3316	1.6509	-11.5882
49	1.4337	-0.2864	1.462	-11.2983
50	1.2063	-0.2339	1.2288	-10.9745
51	0.9479	-0.178	0.9645	-10.6341
52	0.6633	-0.1203	0.6741	-10.2826
53	0.3529	-0.0617	0.3582	-9.9206
E	0.0	0.0	0.0	0.0

Wire No. 5 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
54	1.5593	0.8465	1.7743	28.4959
55	1.5556	0.8461	1.7708	28.5427
56	1.5444	0.8449	1.7604	28.6834
57	1.5259	0.843	1.7432	28.9185
58	1.5003	0.8402	1.7195	29.2489
59	1.4679	0.8365	1.6895	29.6758
60	1.4291	0.8318	1.6536	30.2009
61	1.3844	0.8261	1.6121	30.8258
62	1.3342	0.8193	1.5657	31.5529
63	1.2792	0.8113	1.5148	32.3843
64	1.22	0.8021	1.46	33.3226
65	1.1572	0.7914	1.4019	34.3702
66	1.0914	0.7794	1.3411	35.5295
67	1.0235	0.7657	1.2782	36.8027
68	0.9541	0.7505	1.2139	38.1914

69	0.8838	0.7337	1.1487	39.6964
70	0.8135	0.7151	1.0831	41.3175
71	0.7437	0.6948	1.0178	43.053
72	0.6751	0.6728	0.9531	44.899
73	0.6084	0.649	0.8895	46.8491
74	0.544	0.6235	0.8275	48.8931
75	0.4826	0.5963	0.7672	51.0167
76	0.4247	0.5677	0.709	53.1993
77	0.3707	0.5376	0.653	55.4129
78	0.3211	0.5064	0.5996	57.6189
79	0.2764	0.4743	0.5489	59.7638
80	0.2371	0.4417	0.5013	61.7731
81	0.2036	0.4092	0.4571	63.5441
82	0.1764	0.3773	0.4165	64.9431
83	0.1555	0.3463	0.3796	65.815
84	0.1407	0.3157	0.3456	65.987
85	0.1314	0.2853	0.3141	65.2783
J	0.1267	0.2451	0.2759	62.6598

Wire No. 6 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	0.0306	0.1068	0.1111	74.0202
87	0.0306	0.1019	0.1064	73.2994
88	0.0294	0.0927	0.0973	72.3773
89	0.027	0.0803	0.0847	71.414
90	0.0231	0.065	0.069	70.4726
91	0.0175	0.047	0.0501	69.5728
92	0.0101	0.0258	0.0277	68.7176
E	0.0	0.0	0.0	0.0

Wire No. 7 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	0.0419	0.0864	0.096	64.1056
94	0.0417	0.0818	0.0918	62.9774
95	0.04	0.0736	0.0838	61.4967
96	0.0365	0.063	0.0728	59.9188
97	0.0311	0.0504	0.0592	58.3455
98	0.0235	0.0359	0.043	56.8081
99	0.0135	0.0195	0.0237	55.3133
E	0.0	0.0	0.0	0.0

Wire No. 8 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	0.0542	0.0518	0.075	43.744
101	0.0536	0.0479	0.0719	41.7768
102	0.0509	0.0416	0.0658	39.2604
103	0.046	0.0342	0.0573	36.6464
104	0.0387	0.0262	0.0467	34.1024
105	0.0289	0.0178	0.0339	31.6659
106	0.0163	0.0092	0.0187	29.3353
E	0.0	0.0	0.0	0.0

```
***************************************
               ACSModel
           (MININEC 3.1 Core)
    10-31-2020              15:55:24
***************************************
```

WBEN TOWER #2 ND
ORIENTATION AS BUILT

Frequency = 0.930 MHz   Wavelength = 322.36559 Meters

No. of Wires: 8

Wire No. 1 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
0	0	0		-1	
0	0	150.7059	1.16	0	32

Wire No. 2 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
0	0	150.7059		1	
17.73011	0	127.0658	0.0125	0	7

Wire No. 3 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
0	0	150.7059		1	
-8.865054	15.35472	127.0658	0.0125	0	7

Wire No. 4 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
0	0	150.7059		1	
-8.865054	-15.35472	127.0658	0.0125	0	7

Wire No. 5 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
-92.60489	-77.70473	0		-5	
-92.60489	-77.70473	161.1828	1.16	0	32

Wire No. 6 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
-92.60489	-77.70473	161.1828		5	
-74.87401	-77.70511	137.5426	0.0125	0	7

Wire No. 7 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
-92.60489	-77.70473	161.1828		5	
-101.4704	-62.34936	137.5426	0.0125	0	7

Wire No. 8 Coordinates

X	Y	Z	Radius	End Connection	No. of Segments
-92.60489	-77.70473	161.1828		5	
-101.4704	-93.05875	137.5426	0.0125	0	7

**** ANTENNA GEOMETRY ****

Wire No. 1 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
0	0	0	1.16	-1	1	1
0	0	4.70956	1.16	1	1	2
0	0	9.41912	1.16	1	1	3
0	0	14.12868	1.16	1	1	4
0	0	18.83824	1.16	1	1	5

0	0	23.5478	1.16	1	1	6
0	0	28.25736	1.16	1	1	7
0	0	32.96692	1.16	1	1	8
0	0	37.67648	1.16	1	1	9
0	0	42.38604	1.16	1	1	10
0	0	47.0956	1.16	1	1	11
0	0	51.80516	1.16	1	1	12
0	0	56.51472	1.16	1	1	13
0	0	61.22428	1.16	1	1	14
0	0	65.93384	1.16	1	1	15
0	0	70.6434	1.16	1	1	16
0	0	75.35296	1.16	1	1	17
0	0	80.06252	1.16	1	1	18
0	0	84.77208	1.16	1	1	19
0	0	89.48164	1.16	1	1	20
0	0	94.1912	1.16	1	1	21
0	0	98.90076	1.16	1	1	22
0	0	103.6103	1.16	1	1	23
0	0	108.3199	1.16	1	1	24
0	0	113.0294	1.16	1	1	25
0	0	117.739	1.16	1	1	26
0	0	122.4486	1.16	1	1	27
0	0	127.1581	1.16	1	1	28
0	0	131.8677	1.16	1	1	29
0	0	136.5772	1.16	1	1	30
0	0	141.2868	1.16	1	1	31
0	0	145.9964	1.16	1	0	32

Wire No. 2 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
0	0	150.7059	0.0125	1	2	33
2.532873	0	147.3288	0.0125	2	2	34
5.065745	0	143.9516	0.0125	2	2	35
7.598618	0	140.5744	0.0125	2	2	36
10.13149	0	137.1973	0.0125	2	2	37
12.66436	0	133.8201	0.0125	2	2	38
15.19724	0	130.4429	0.0125	2	0	39

Wire No. 3 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
0	0	150.7059	0.0125	1	3	40
-1.266436	2.193532	147.3288	0.0125	3	3	41
-2.532873	4.387064	143.9516	0.0125	3	3	42
-3.799309	6.580596	140.5744	0.0125	3	3	43
-5.065745	8.774127	137.1973	0.0125	3	3	44
-6.332181	10.96766	133.8201	0.0125	3	3	45
-7.598618	13.16119	130.4429	0.0125	3	0	46

Wire No. 4 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
0	0	150.7059	0.0125	1	4	47
-1.266436	-2.193532	147.3288	0.0125	4	4	48
-2.532873	-4.387064	143.9516	0.0125	4	4	49
-3.799309	-6.580596	140.5744	0.0125	4	4	50
-5.065745	-8.774127	137.1973	0.0125	4	4	51
-6.332181	-10.96766	133.8201	0.0125	4	4	52
-7.598618	-13.16119	130.4429	0.0125	4	0	53

Wire No. 5 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-92.60489	-77.70473	0	1.16	-5	5	54
-92.60489	-77.70473	5.036963	1.16	5	5	55
-92.60489	-77.70473	10.07393	1.16	5	5	56

-92.60489	-77.70473	15.11089	1.16	5	5	57
-92.60489	-77.70473	20.14785	1.16	5	5	58
-92.60489	-77.70473	25.18481	1.16	5	5	59
-92.60489	-77.70473	30.22178	1.16	5	5	60
-92.60489	-77.70473	35.25874	1.16	5	5	61
-92.60489	-77.70473	40.2957	1.16	5	5	62
-92.60489	-77.70473	45.33266	1.16	5	5	63
-92.60489	-77.70473	50.36963	1.16	5	5	64
-92.60489	-77.70473	55.40659	1.16	5	5	65
-92.60489	-77.70473	60.44355	1.16	5	5	66
-92.60489	-77.70473	65.48051	1.16	5	5	67
-92.60489	-77.70473	70.51747	1.16	5	5	68
-92.60489	-77.70473	75.55444	1.16	5	5	69
-92.60489	-77.70473	80.5914	1.16	5	5	70
-92.60489	-77.70473	85.62836	1.16	5	5	71
-92.60489	-77.70473	90.66533	1.16	5	5	72
-92.60489	-77.70473	95.70229	1.16	5	5	73
-92.60489	-77.70473	100.7393	1.16	5	5	74
-92.60489	-77.70473	105.7762	1.16	5	5	75
-92.60489	-77.70473	110.8132	1.16	5	5	76
-92.60489	-77.70473	115.8501	1.16	5	5	77
-92.60489	-77.70473	120.8871	1.16	5	5	78
-92.60489	-77.70473	125.9241	1.16	5	5	79
-92.60489	-77.70473	130.961	1.16	5	5	80
-92.60489	-77.70473	135.998	1.16	5	5	81
-92.60489	-77.70473	141.0349	1.16	5	5	82
-92.60489	-77.70473	146.0719	1.16	5	5	83
-92.60489	-77.70473	151.1089	1.16	5	5	84
-92.60489	-77.70473	156.1458	1.16	5	0	85

Wire No. 6 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
-92.60489	-77.70473	161.1828	0.0125	5	6	86
-90.07191	-77.70478	157.8056	0.0125	6	6	87
-87.53893	-77.70483	154.4285	0.0125	6	6	88
-85.00594	-77.70489	151.0513	0.0125	6	6	89
-82.47295	-77.70495	147.6741	0.0125	6	6	90
-79.93997	-77.705	144.297	0.0125	6	6	91
-77.40699	-77.70506	140.9198	0.0125	6	0	92

Wire No. 7 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
-92.60489	-77.70473	161.1828	0.0125	5	7	93
-93.87139	-75.5111	157.8056	0.0125	7	7	94
-95.13789	-73.31748	154.4285	0.0125	7	7	95
-96.4044	-71.12386	151.0513	0.0125	7	7	96
-97.6709	-68.93023	147.6741	0.0125	7	7	97
-98.9374	-66.7366	144.297	0.0125	7	7	98
-100.2039	-64.54298	140.9198	0.0125	7	0	99

Wire No. 8 Coordinates

X	Y	Z	Radius	Connection End1	End2	Pulse No.
-92.60489	-77.70473	161.1828	0.0125	5	8	100
-93.8714	-79.89816	157.8056	0.0125	8	8	101
-95.1379	-82.09159	154.4285	0.0125	8	8	102
-96.40441	-84.28502	151.0513	0.0125	8	8	103
-97.67091	-86.47845	147.6741	0.0125	8	8	104
-98.93742	-88.67188	144.297	0.0125	8	8	105
-100.2039	-90.86532	140.9198	0.0125	8	0	106

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 54, 2727.7, 72.0

Number of Loads: 0

********** SOURCE DATA **********
Pulse 54 Voltage = (841.9929, 2594.4449j)
Current = (-7.9073, 6.4206j)
Impedance = (96.387, -249.844j)
Power = 5000.0 Watts

********** CURRENT DATA **********

Wire No. 1 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
1	1.5687	0.8929	1.805	29.6482
2	1.565	0.8922	1.8015	29.6862
3	1.5541	0.8901	1.791	29.8004
4	1.5362	0.8866	1.7737	29.9914
5	1.5113	0.8817	1.7497	30.26
6	1.4797	0.8754	1.7193	30.6075
7	1.4419	0.8676	1.6828	31.0356
8	1.3982	0.8584	1.6407	31.5464
9	1.3491	0.8477	1.5933	32.1421
10	1.2951	0.8355	1.5412	32.8256
11	1.2368	0.8217	1.4849	33.5999
12	1.1748	0.8065	1.425	34.4684
13	1.1098	0.7897	1.362	35.4348
14	1.0423	0.7713	1.2967	36.5027
15	0.9731	0.7515	1.2295	37.6759
16	0.9029	0.7301	1.1611	38.9582
17	0.8323	0.7072	1.0922	40.3525
18	0.7621	0.6829	1.0233	41.8614
19	0.6928	0.6571	0.9549	43.4857
20	0.6252	0.6301	0.8876	45.2243
21	0.5598	0.6018	0.8219	47.0729
22	0.4972	0.5725	0.7583	49.0229
23	0.4381	0.5421	0.697	51.0588
24	0.3829	0.5111	0.6386	53.1562
25	0.3323	0.4795	0.5834	55.2771
26	0.2867	0.4477	0.5317	57.3643
27	0.2468	0.4163	0.4839	59.334
28	0.2131	0.3855	0.4405	61.069
29	0.1859	0.356	0.4016	62.4201
30	0.1654	0.3276	0.367	63.2178
31	0.1511	0.3002	0.3361	63.2747
32	0.1428	0.2734	0.3084	62.4103
J	0.1403	0.2382	0.2764	59.5011

Wire No. 2 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	0.0569	0.059	0.082	46.061
34	0.0566	0.0553	0.0791	44.3454
35	0.0541	0.0489	0.0729	42.1514
36	0.0491	0.0411	0.064	39.9146
37	0.0415	0.0322	0.0525	37.7738
38	0.0311	0.0224	0.0384	35.7542
39	0.0177	0.0119	0.0213	33.8486
E	0.0	0.0	0.0	0.0

Wire No. 3 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)

J	0.0512	0.074	0.09	55.3407
41	0.0511	0.07	0.0867	53.9012
42	0.0491	0.0629	0.0798	52.0288
43	0.0449	0.0537	0.07	50.0926
44	0.0382	0.0428	0.0574	48.2184
45	0.0289	0.0304	0.0419	46.4376
46	0.0165	0.0164	0.0233	44.7516
E	0.0	0.0	0.0	0.0

Wire No. 4 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	0.0322	0.1051	0.11	72.9561
48	0.0325	0.1007	0.1058	72.1004
49	0.0317	0.0919	0.0972	70.9956
50	0.0293	0.08	0.0852	69.8568
51	0.0253	0.0651	0.0699	68.76
52	0.0193	0.0472	0.051	67.7272
53	0.0112	0.0261	0.0284	66.7609
E	0.0	0.0	0.0	0.0

Wire No. 5 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
54	-7.9073	6.4206	10.1857	140.9239
55	-4.4512	5.292	6.9151	130.0676
56	-2.8185	4.7415	5.5159	120.7287
57	-1.3166	4.2197	4.4203	107.3282
58	0.063	3.7243	3.7248	89.0311
59	1.3633	3.2416	3.5167	67.1906
60	2.5973	2.7681	3.7958	46.8234
61	3.7689	2.3028	4.4167	31.4252
62	4.8774	1.8468	5.2154	20.7386
63	5.9199	1.4018	6.0836	13.3218
64	6.8919	0.97	6.9599	8.0118
65	7.7886	0.5541	7.8082	4.0694
66	8.6047	0.1566	8.6061	1.0427
67	9.3352	-0.2198	9.3378	-1.3486
68	9.9756	-0.5724	9.9921	-3.2841
69	10.5217	-0.8988	10.56	-4.8827
70	10.9697	-1.1967	11.0348	-6.2257
71	11.3169	-1.4638	11.4111	-7.3701
72	11.561	-1.6983	11.6851	-8.357
73	11.7011	-1.8986	11.8541	-9.2165
74	11.7366	-2.0634	11.9166	-9.971
75	11.6685	-2.1916	11.8726	-10.6372
76	11.4989	-2.2826	11.7233	-11.2277
77	11.2312	-2.3364	11.4716	-11.7514
78	10.8708	-2.3532	11.1226	-12.2142
79	10.4255	-2.334	10.6836	-12.6191
80	9.9063	-2.2808	10.1655	-12.9656
81	9.3272	-2.1961	9.5822	-13.249
82	8.7021	-2.0828	8.9478	-13.4606
83	8.0395	-1.9431	8.271	-13.5877
84	7.3375	-1.7768	7.5496	-13.6125
85	6.594	-1.5843	6.7817	-13.5101
J	5.5531	-1.2932	5.7017	-13.109

Wire No. 6 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	1.8472	-0.4275	1.8961	-13.0297
87	1.7301	-0.3941	1.7745	-12.8329

88	1.534	-0.3419	1.5716	-12.5658
89	1.2908	-0.2807	1.321	-12.2678
90	1.0143	-0.2148	1.0368	-11.9553
91	0.7098	-0.1461	0.7247	-11.6331
92	0.3776	-0.0755	0.3851	-11.302
E	0.0	0.0	0.0	0.0

Wire No. 7 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	1.8506	-0.4302	1.8999	-13.087
94	1.7334	-0.3968	1.7782	-12.8935
95	1.5371	-0.3445	1.5752	-12.6309
96	1.2936	-0.283	1.3242	-12.3381
97	1.0167	-0.2167	1.0396	-12.0313
98	0.7116	-0.1476	0.7268	-11.7152
99	0.3787	-0.0763	0.3863	-11.3907
E	0.0	0.0	0.0	0.0

Wire No. 8 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
J	1.8553	-0.4355	1.9057	-13.2098
101	1.738	-0.402	1.7839	-13.0231
102	1.5415	-0.3494	1.5806	-12.7705
103	1.2975	-0.2874	1.329	-12.4895
104	1.02	-0.2204	1.0435	-12.1957
105	0.7141	-0.1504	0.7297	-11.8939
106	0.3801	-0.0779	0.388	-11.5848
E	0.0	0.0	0.0	0.0

EXHIBIT 2

```
****************************************
               ACSModel
          (MININEC 3.1 Core)
    10-31-2020              14:54:07
****************************************

WBEN DA-D FCC PARAMETERS.DAN
ORIENTATION AS BUILT

Frequency = 0.930 MHz     Wavelength = 322.36559 Meters

No. of Wires: 8

Wire No. 1   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
 0             0             0                          -1
 0             0             150.7059      1.16          0              32

Wire No. 2   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
 0             0             150.7059                    1
 17.73011      0             127.0658      0.0125        0              7

Wire No. 3   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
 0             0             150.7059                    1
-8.865054      15.35472      127.0658      0.0125        0              7

Wire No. 4   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
 0             0             150.7059                    1
-8.865054     -15.35472      127.0658      0.0125        0              7

Wire No. 5   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
-92.60489     -77.70473      0                          -5
-92.60489     -77.70473      161.1828      1.16          0              32

Wire No. 6   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
-92.60489     -77.70473      161.1828                    5
-74.87401     -77.70511      137.5426      0.0125        0              7

Wire No. 7   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
-92.60489     -77.70473      161.1828                    5
-101.4704     -62.34936      137.5426      0.0125        0              7

Wire No. 8   Coordinates                                End         No. of
   X            Y             Z          Radius     Connection     Segments
-92.60489     -77.70473      161.1828                    5
-101.4704     -93.05875      137.5426      0.0125        0              7

                  **** ANTENNA GEOMETRY ****

Wire No.  1  Coordinates                               Connection Pulse
X            Y             Z             Radius        End1 End2  No.
 0             0             0             1.16          -1    1     1
 0             0             4.70956       1.16          1     1     2
 0             0             9.41912       1.16          1     1     3
 0             0             14.12868      1.16          1     1     4
```

0	0	18.83824	1.16	1	1	5
0	0	23.5478	1.16	1	1	6
0	0	28.25736	1.16	1	1	7
0	0	32.96692	1.16	1	1	8
0	0	37.67648	1.16	1	1	9
0	0	42.38604	1.16	1	1	10
0	0	47.0956	1.16	1	1	11
0	0	51.80516	1.16	1	1	12
0	0	56.51472	1.16	1	1	13
0	0	61.22428	1.16	1	1	14
0	0	65.93384	1.16	1	1	15
0	0	70.6434	1.16	1	1	16
0	0	75.35296	1.16	1	1	17
0	0	80.06252	1.16	1	1	18
0	0	84.77208	1.16	1	1	19
0	0	89.48164	1.16	1	1	20
0	0	94.1912	1.16	1	1	21
0	0	98.90076	1.16	1	1	22
0	0	103.6103	1.16	1	1	23
0	0	108.3199	1.16	1	1	24
0	0	113.0294	1.16	1	1	25
0	0	117.739	1.16	1	1	26
0	0	122.4486	1.16	1	1	27
0	0	127.1581	1.16	1	1	28
0	0	131.8677	1.16	1	1	29
0	0	136.5772	1.16	1	1	30
0	0	141.2868	1.16	1	1	31
0	0	145.9964	1.16	1	0	32

Wire No. 2 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
0	0	150.7059	0.0125	1	2	33
2.532873	0	147.3288	0.0125	2	2	34
5.065745	0	143.9516	0.0125	2	2	35
7.598618	0	140.5744	0.0125	2	2	36
10.13149	0	137.1973	0.0125	2	2	37
12.66436	0	133.8201	0.0125	2	2	38
15.19724	0	130.4429	0.0125	2	0	39

Wire No. 3 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
0	0	150.7059	0.0125	1	3	40
-1.266436	2.193532	147.3288	0.0125	3	3	41
-2.532873	4.387064	143.9516	0.0125	3	3	42
-3.799309	6.580596	140.5744	0.0125	3	3	43
-5.065745	8.774127	137.1973	0.0125	3	3	44
-6.332181	10.96766	133.8201	0.0125	3	3	45
-7.598618	13.16119	130.4429	0.0125	3	0	46

Wire No. 4 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
0	0	150.7059	0.0125	1	4	47
-1.266436	-2.193532	147.3288	0.0125	4	4	48
-2.532873	-4.387064	143.9516	0.0125	4	4	49
-3.799309	-6.580596	140.5744	0.0125	4	4	50
-5.065745	-8.774127	137.1973	0.0125	4	4	51
-6.332181	-10.96766	133.8201	0.0125	4	4	52
-7.598618	-13.16119	130.4429	0.0125	4	0	53

Wire No. 5 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-92.60489	-77.70473	0	1.16	-5	5	54
-92.60489	-77.70473	5.036963	1.16	5	5	55

-92.60489	-77.70473	10.07393	1.16	5	5	56
-92.60489	-77.70473	15.11089	1.16	5	5	57
-92.60489	-77.70473	20.14785	1.16	5	5	58
-92.60489	-77.70473	25.18481	1.16	5	5	59
-92.60489	-77.70473	30.22178	1.16	5	5	60
-92.60489	-77.70473	35.25874	1.16	5	5	61
-92.60489	-77.70473	40.2957	1.16	5	5	62
-92.60489	-77.70473	45.33266	1.16	5	5	63
-92.60489	-77.70473	50.36963	1.16	5	5	64
-92.60489	-77.70473	55.40659	1.16	5	5	65
-92.60489	-77.70473	60.44355	1.16	5	5	66
-92.60489	-77.70473	65.48051	1.16	5	5	67
-92.60489	-77.70473	70.51747	1.16	5	5	68
-92.60489	-77.70473	75.55444	1.16	5	5	69
-92.60489	-77.70473	80.5914	1.16	5	5	70
-92.60489	-77.70473	85.62836	1.16	5	5	71
-92.60489	-77.70473	90.66533	1.16	5	5	72
-92.60489	-77.70473	95.70229	1.16	5	5	73
-92.60489	-77.70473	100.7393	1.16	5	5	74
-92.60489	-77.70473	105.7762	1.16	5	5	75
-92.60489	-77.70473	110.8132	1.16	5	5	76
-92.60489	-77.70473	115.8501	1.16	5	5	77
-92.60489	-77.70473	120.8871	1.16	5	5	78
-92.60489	-77.70473	125.9241	1.16	5	5	79
-92.60489	-77.70473	130.961	1.16	5	5	80
-92.60489	-77.70473	135.998	1.16	5	5	81
-92.60489	-77.70473	141.0349	1.16	5	5	82
-92.60489	-77.70473	146.0719	1.16	5	5	83
-92.60489	-77.70473	151.1089	1.16	5	5	84
-92.60489	-77.70473	156.1458	1.16	5	0	85

Wire No. 6 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-92.60489	-77.70473	161.1828	0.0125	5	6	86
-90.07191	-77.70478	157.8056	0.0125	6	6	87
-87.53893	-77.70483	154.4285	0.0125	6	6	88
-85.00594	-77.70489	151.0513	0.0125	6	6	89
-82.47295	-77.70495	147.6741	0.0125	6	6	90
-79.93997	-77.705	144.297	0.0125	6	6	91
-77.40699	-77.70506	140.9198	0.0125	6	0	92

Wire No. 7 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-92.60489	-77.70473	161.1828	0.0125	5	7	93
-93.87139	-75.5111	157.8056	0.0125	7	7	94
-95.13789	-73.31748	154.4285	0.0125	7	7	95
-96.4044	-71.12386	151.0513	0.0125	7	7	96
-97.6709	-68.93023	147.6741	0.0125	7	7	97
-98.9374	-66.7366	144.297	0.0125	7	7	98
-100.2039	-64.54298	140.9198	0.0125	7	0	99

Wire No. 8 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-92.60489	-77.70473	161.1828	0.0125	5	8	100
-93.8714	-79.89816	157.8056	0.0125	8	8	101
-95.1379	-82.09159	154.4285	0.0125	8	8	102
-96.40441	-84.28502	151.0513	0.0125	8	8	103
-97.67091	-86.47845	147.6741	0.0125	8	8	104
-98.93742	-88.67188	144.297	0.0125	8	8	105
-100.2039	-90.86532	140.9198	0.0125	8	0	106

Sources: 2

Pulse No., Voltage Magnitude, Phase (Degrees): 1, 2213.3, 64.2
Pulse No., Voltage Magnitude, Phase (Degrees): 54, 1374.9, 141.6

Number of Loads: 0

********** SOURCE DATA **********
Pulse 1 Voltage = (963.926, 1992.3925j)
          Current = (-4.1179, 6.239j)
          Impedance = (151.412, -254.436j)
          Power = 4230.59 Watts

Pulse 54 Voltage = (-1078.16, 853.1294j)
           Current = (-3.0617, -2.0655j)
           Impedance = (112.817, -354.759j)
           Power = 769.41 Watts

Total Power = 5000.000 Watts

********** BASE OPERATING PARAMETERS **********

Twr.	Ratio	Phase
1	1.000	0.0
2	0.494	-269.4

Table 1: Wire Model Data

Tower	1	2
Actual Radius, Meters	1.1643	1.1643
Model Radius, Meters	1.16	1.16
Percentage of Acual radius	99.6%	99.6%
FCC Height, Meters	143.3	143.3
Model Height, Meters	150.706	161.183
Percentage of Actual Height	105.2%	112.5%
Number of Segments	32	32

Table 2: Measured and Calculated Self Impedances

Tower	1	2
Measured self impedance R at ATU	143.26	68.73
Measured self impedance X at ATU	-281.79	-190.7
Shunt capacitance pf	20	20
Series Inductance uh	0.7	4
Shunt Inductance uh	7.8	7.8
Modeled self impedance R at ATU	143.96	68.17
Modeled self impedance X at ATU	-281.195	-189.94
Resistance Tolerance, ohms, ±	7.73	4.75
Reactance Tolerance, ohms, ±	13.27	9.63

Table 3: DA-Night Current and Phase Calculations
Voltage Sampling

	Tower Model at Base		Circuit Model at Sample Device		Antenna Monitor	
	Ratio	Phase	Ratio	Phase	Ratio	Phase
1	2213.300	64.2	2186.1	64.6	1.000	0.0
2	1374.900	141.6	1268.5	142.8	0.580	78.2

Table 4: Common Point

Common Point Impedance Measured with	Delta CPIB sn 314
Common Point Current Measured with	Delta TCA20 SN0079, tor 349
Measured Night Common Point Resistance	50
Measured Night Common Point Reactance	-4
Night Power, KW	5.4
Night Common Point Current, Amperes	10.39

Table 5: Sample System Devices

Tower	Device	Serial	Ratio	Phase	Impedance at Sample Port	Impedance Through Sample Line
1	Phasetek P600-206-2L	930-1	100	0	50.8 +j1.18	56.3 +j10.5
2	Phasetek P600-206-2L	930-2	100	0	50.3 +j2.1	58 +j9.83
Sample Lines are:	Cablewave FCC 38-50					
Phase Monitor is:	Potomac AM-19 SN 185					

Table 6: Sample Line Lengths

Carrier Frequency, KHz	930	
Velocity Factor	0.81	
Tower	1	2
Odd Quarter Wave Below Carrier	0.75	0.75
Open Circuit Resonant Frequency, KHz	539	539.9
Resultant Length, Feet	1108.51	1106.66
Resultant Length, Degrees at Carrier	465.9	465.1
Odd Quarter Wave Above Carrier	1.25	1.25
Open Circuit Resonant Frequency, KHz	903	905.1
Resultant Length, Feet	1102.78	1100.23
Resultant Length, Degrees at Carrier	463.5	462.4
Average Length at Carrier, Degrees	464.7	463.7
Measured with:	VNA 2180 SN 5036	

Table 7: Sample Line Characteristic Impedance

Tower	+1/8 from 5/4 Wave, Frequency, kHz	Measured Resistance	Measured Reactance	-1/8 from 5/4 wave, Frequency, kHz	Measured Resistance	Measured Reactance	Calculated Impedance by Formula
1	993	11.92	43.31	813	21.75	-69.43	57.17
2	996	12.33	45.05	815	21.4	-70.77	58.76

FIGURE 1

```
WCAP - WBEN TOWER #1 ND

WCAP OUTPUT AT FREQUENCY: 0.930 MHz

NODE VOLTAGES
Node:   1   4738.5624 ∠  -62.8891° V
Node:   2   4792.9767 ∠  -63.2204° V
Node:   3   4738.6307 ∠  -62.8875° V
Node:   4   4792.9767 ∠  -63.2205° V
Node:   5   4793.0433 ∠  -63.2188° V
Node:   6   4129.8883 ∠  -33.5282° V
```

	WCAP PART		CURRENT IN BRANCH VOLTAGE		CURRENT OUT BRANCH CURRENT	
R	3→1	0.01000000	0.15 ∠	0.000° V	15.00 ∠	0.000° A
L	1→5	0.70000000	60.99 ∠	90.225° V	14.91 ∠	0.225° A
R	5→2	0.01000000	0.15 ∠	0.225° V	14.91 ∠	0.225° A
C	4→0	0.00002000	4792.98 ∠	-63.220° V	0.56 ∠	26.780° A
R	2→0	153.81200000	4792.98 ∠	-63.220° V	14.41 ∠	-0.771° A
R	2→4	0.01000000	0.01 ∠	26.780° V	0.56 ∠	26.780° A
C	1→6	0.00000780	2323.36 ∠	-123.528° V	0.11 ∠	-33.528° A
R	6→0	39000.00000000	4129.89 ∠	-33.528° V	0.11 ∠	-33.528° A

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
R	3→1	0.01000000	143.97 - j 281.195	143.96 - j 281.195
L	1→5	0.70000000	143.70 - j 283.423	143.70 - j 287.513
R	5→2	0.01000000	143.70 - j 287.513	143.69 - j 287.513
C	4→0	0.00002000	0.01 - j 8556.717	0.00 + j 0.000
R	2→0	153.81200000	153.81 - j 294.837	0.00 + j 0.000
R	2→4	0.01000000	0.01 - j 8556.717	0.00 - j 8556.717
C	1→6	0.00000780	39000.00 - j 21940.301	39000.00 + j 0.000
R	6→0	39000.00000000	39000.00 + j 0.000	0.00 + j 0.000

```
WCAP INPUT DATA:
      0.9300      0.00000000   0
I       15.00000000   0   3      0.00000000
R        0.01000000   3   1      0.00000000
L        0.70000000   1   5      0.00000000
R        0.01000000   5   2      0.00000000
C        0.00002000   4   0
R      153.81200000   2   0   -294.83700000
R        0.01000000   2   4      0.00000000
C        0.00000780   1   6
R    39000.00000000   6   0      0.00000000
```

Center Frequency: 0.93 MHz

Frequency Range: ±0 kHz

Frequency Step: 0 kHz

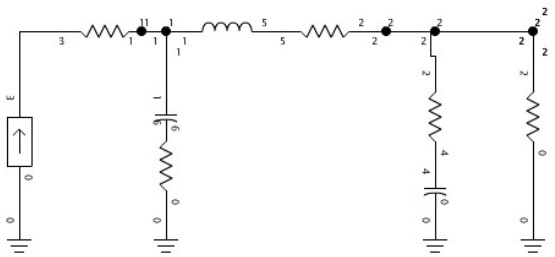


FIGURE 2

WCAP - WBEN TOWER #2 ND

WCAP OUTPUT AT FREQUENCY: 0.930 MHz

NODE VOLTAGES

Node:	1	3358.2727 ∠ -72.2557° V
Node:	2	3027.1132 ∠ -70.2530° V
Node:	3	3358.3178 ∠ -72.2532° V
Node:	4	3358.2727 ∠ -72.2560° V
Node:	5	1484.1954 ∠ -130.8947° V
Node:	6	3358.2727 ∠ -72.2557° V
Node:	7	3027.0626 ∠ -70.2556° V

	WCAP PART		BRANCH VOLTAGE	BRANCH CURRENT
R	2→7	0.01000000	0.15 ∠ 0.000° V	15.00 ∠ 0.000° A
L	7→3	4.00000000	349.41 ∠ 90.170° V	14.95 ∠ 0.170° A
R	3→6	0.01000000	0.15 ∠ 0.170° V	14.95 ∠ 0.170° A
C	1→0	0.00002000	3358.27 ∠ -72.256° V	0.39 ∠ 17.744° A
R	6→0	96.38700000	3358.27 ∠ -72.256° V	12.54 ∠ -3.352° A
R	6→1	0.01000000	0.00 ∠ 17.744° V	0.39 ∠ 17.744° A
C	4→0	0.00011000	3358.27 ∠ -72.256° V	2.16 ∠ 17.744° A
R	6→4	0.01000000	0.02 ∠ 17.744° V	2.16 ∠ 17.744° A
C	5→0	0.00000780	1484.20 ∠ -130.895° V	0.07 ∠ -40.895° A
R	7→5	39000.00000000	2638.23 ∠ -40.895° V	0.07 ∠ -40.895° A

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
R	2→7	0.01000000	68.18 - j 189.940	68.17 - j 189.940
L	7→3	4.00000000	67.84 - j 190.791	67.84 - j 214.164
R	3→6	0.01000000	67.84 - j 214.164	67.83 - j 214.164
C	1→0	0.00002000	0.00 - j 8556.717	0.00 + j 0.000
R	6→0	96.38700000	96.39 - j 249.844	0.00 + j 0.000
R	6→1	0.01000000	0.01 - j 8556.717	0.01 - j 8556.717
C	4→0	0.00011000	-0.00 - j 1555.767	0.00 + j 0.000
R	6→4	0.01000000	0.01 - j 1555.767	0.00 - j 1555.767
C	5→0	0.00000780	-0.00 - j 21940.301	0.00 + j 0.000
R	7→5	39000.00000000	39000.00 - j 21940.301	0.00 - j 21940.301

WCAP INPUT DATA:

	0.9300	0.00000000	0	
I	15.00000000	0	2	0.00000000
R	0.01000000	2	7	0.00000000
L	4.00000000	7	3	0.00000000
R	0.01000000	3	6	0.00000000
C	0.00002000	1	0	
R	96.38700000	6	0	-249.84400000
R	0.01000000	6	1	0.00000000
C	0.00011000	4	0	
R	0.01000000	6	4	0.00000000
C	0.00000780	5	0	
R	39000.00000000	7	5	0.00000000

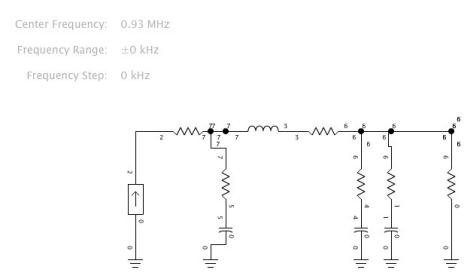


FIGURE 3

```
WCAP - WBEN TOWER #1 DA 11102020

WCAP OUTPUT AT FREQUENCY: 0.930 MHz

NODE VOLTAGES
Node:   1   2213.3355 ∠  -59.6332° V
Node:   2   2240.9149 ∠  -60.0448° V
Node:   3   2213.3751 ∠  -59.6315° V
Node:   4   2240.9149 ∠  -60.0449° V
Node:   5   2240.9536 ∠  -60.0431° V
Node:   6   1929.0299 ∠  -30.2723° V
```

	WCAP PART		CURRENT IN BRANCH VOLTAGE		CURRENT OUT BRANCH CURRENT	
R	3→1	0.01000000	0.08 ∠	0.000° V	7.84 ∠	0.000° A
L	1→5	0.70000000	31.88 ∠	90.183° V	7.79 ∠	0.183° A
R	5→2	0.01000000	0.08 ∠	0.183° V	7.79 ∠	0.183° A
C	4→0	0.00002000	2240.91 ∠	-60.045° V	0.26 ∠	29.955° A
R	2→0	151.41200000	2240.91 ∠	-60.045° V	7.57 ∠	-0.801° A
R	2→4	0.01000000	0.00 ∠	29.955° V	0.26 ∠	29.955° A
C	1→6	0.00000780	1085.22 ∠	-120.272° V	0.05 ∠	-30.272° A
R	6→0	39000.00000000	1929.03 ∠	-30.272° V	0.05 ∠	-30.272° A

	WCAP PART		FROM IMPEDANCE	TO IMPEDANCE
R	3→1	0.01000000	142.77 - j 243.659	142.76 - j 243.659
L	1→5	0.70000000	142.76 - j 245.451	142.76 - j 249.542
R	5→2	0.01000000	142.76 - j 249.542	142.75 - j 249.542
C	4→0	0.00002000	0.00 - j 8556.717	0.00 + j 0.000
R	2→0	151.41200000	151.41 - j 254.436	0.00 + j 0.000
R	2→4	0.01000000	0.01 - j 8556.717	0.01 - j 8556.717
C	1→6	0.00000780	39000.00 - j 21940.301	39000.00 + j 0.001
R	6→0	39000.00000000	39000.00 + j 0.000	0.00 + j 0.000

```
WCAP INPUT DATA:
      0.9300      0.00000000   0
I        7.83750000   0   3      0.00000000
R        0.01000000   3   1      0.00000000
L        0.70000000   1   5      0.00000000
R        0.01000000   5   2      0.00000000
C        0.00002000   4   0
R      151.41200000   2   0   -254.43600000
R        0.01000000   2   4      0.00000000
C        0.00000780   1   6
R    39000.00000000   6   0      0.00000000
```

Center Frequency: 0.93 MHz

Frequency Range: ±0 kHz

Frequency Step: 0 kHz

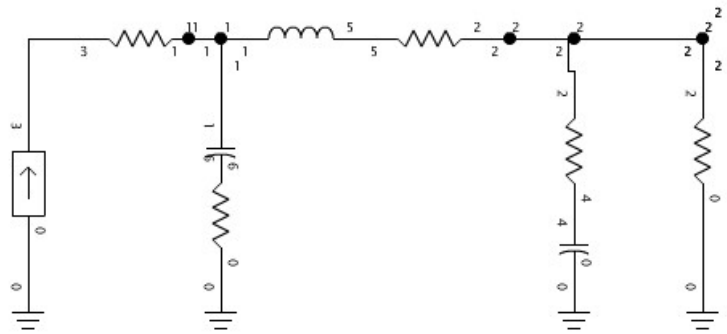


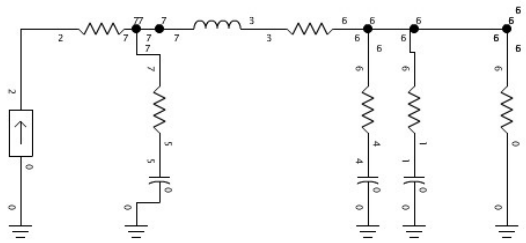
Figure 4

```
WCAP - WBEN TOWER #2 DA

WCAP OUTPUT AT FREQUENCY: 0.930 MHz

NODE VOLTAGES
Node:   1   1374.8814 ∠  -75.9746° V
Node:   2   1268.4991 ∠  -74.7887° V
Node:   3   1374.8926 ∠  -75.9726° V
Node:   4   1374.8814 ∠  -75.9749° V
Node:   5    621.9502 ∠ -135.4299° V
Node:   6   1374.8814 ∠  -75.9745° V
Node:   7   1268.4867 ∠  -74.7907° V

    WCAP PART                    CURRENT IN              CURRENT OUT
    WCAP PART                    BRANCH VOLTAGE          BRANCH CURRENT
R    2→7        0.01000000      0.05 ∠     0.000° V      4.72 ∠     0.000° A
L    7→3        4.00000000    109.84 ∠    90.246° V      4.70 ∠     0.246° A
R    3→6        0.01000000      0.05 ∠     0.246° V      4.70 ∠     0.246° A
C    1→0        0.00002000   1374.88 ∠   -75.975° V      0.16 ∠    14.025° A
R    6→0      112.81700000   1374.88 ∠   -75.975° V      3.69 ∠    -3.616° A
R    6→1        0.01000000      0.00 ∠    14.025° V      0.16 ∠    14.025° A
C    4→0        0.00011000   1374.88 ∠   -75.975° V      0.88 ∠    14.025° A
R    6→4        0.01000000      0.01 ∠    14.025° V      0.88 ∠    14.025° A
C    5→0        0.00000780    621.95 ∠  -135.430° V      0.03 ∠   -45.430° A
R    7→5    39000.00000000   1105.55 ∠   -45.430° V      0.03 ∠   -45.430° A

    WCAP PART                    FROM IMPEDANCE          TO IMPEDANCE
R    2→7        0.01000000     70.53 - j    259.384     70.52 - j    259.384
L    7→3        4.00000000     69.70 - j    260.781     69.70 - j    284.155
R    3→6        0.01000000     69.70 - j    284.155     69.69 - j    284.155
C    1→0        0.00002000      0.00 - j   8556.717      0.00 + j      0.000
R    6→0      112.81700000    112.82 - j    354.759      0.00 + j      0.000
R    6→1        0.01000000      0.01 - j   8556.717      0.00 - j   8556.717
C    4→0        0.00011000      0.00 - j   1555.767      0.00 + j      0.000
R    6→4        0.01000000      0.01 - j   1555.767     -0.01 - j   1555.767
C    5→0        0.00000780      0.00 - j  21940.301      0.00 + j      0.000
R    7→5    39000.00000000  39000.00 - j  21940.301     -0.00 - j  21940.301

WCAP INPUT DATA:
      0.9300      0.00000000   0
I        4.71910000   0   2      0.00000000
R        0.01000000   2   7      0.00000000
L        4.00000000   7   3      0.00000000
R        0.01000000   3   6      0.00000000
C        0.00002000   1   0
R      112.81700000   6   0   -354.75900000
R        0.01000000   6   1      0.00000000
C        0.00011000   4   0
R        0.01000000   6   4      0.00000000
C        0.00000780   5   0
R    39000.00000000   7   5      0.00000000
```

Center Frequency: 0.93 MHz

Frequency Range: ±0 kHz

Frequency Step: 0 kHz



APPENDIX 1

WBEN

5 KW Night

Reference Field Strength Measurements

November 16, 2020

Radial	Point	Distance KM	2020 Tme	2020 Tme	2020 Field mV/m	Coordinates (WGS84)		Description
40°	1	0.51	12:19 PM	9:59 AM	1550	42.9819	78.953212	Driveway #48 The Commons
	2	0.79	12:26 PM	10:03 AM	890	42.9838	78.951067	W side E River Rd opposite #801
	3	1.09	12:30 PM	10:06 AM	530	42.9859	78.948611	#892 N Colony Rd
160°	1	0.74	11:57 AM	9:27 AM	620	42.9721	78.954134	200' os fireplug N side Ferry Rd
	2	2.13	12:05 PM	9:35 AM	190	42.9604	78.948253	At footpath crossing of park road
	3	2.37	12:09 PM	9:39 AM	160	42.9583	78.947285	At shore SE of pavillion
220°	1	0.84	11:49 AM	9:23 AM	220	42.9726	78.963887	E side Baseline 100' S of fireplug
	2	0.94	11:46 AM	9:22 AM	190	42.9719	78.964657	50' E of driveway 2024 Ferry Rd
	3	1.48	11:41 AM	9:17 AM	120	42.9682	78.968972	S shoulder Oakfield Rd 50' W of Park
250°	1	0.60	11:26 AM	9:08 AM	310	42.9765	78.964181	Driveway #541 Baseline Rd
	2	0.97	11:30 AM	9:11 AM	160	42.9754	78.968423	Opposite fireplug near 2115 Bush Rd
	3	1.57	11:35 AM	9:14 AM	96	42.9735	78.975432	Driveway #2406 W Oakfield Rd

Note:

Transmitter North Latitude: 42.978389

Transmitter West Longitude decimal degrees: 78.95725

11/16/2020, cloudy, windy, 40 degrees, FIM41 SN 1918

TN
MN (10.7°W)

Scale 1 : 14,400
1 cm = 144.0 m
Data Zoom 13-7

APPENDIX 2

PHASETEK INC.

VOLTAGE SAMPLER TEST DATA

CUSTOMER: WBEN (ENTERCOM)

FREQUENCY: 930 kHz

PART NUMBER: P600-206-2L

NUMBER OF TOWERS: 2

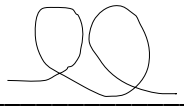
Measured with HP 8753ES network analyzer:

SERIAL NUMBER	INPUT IMPEDANCE (Ω)	OUTPUT MAGNITUDE	OUTPUT PHASE
930-1	39,000 –j 22,000	-49.7 dB	-105.5°
930-2	39,000 –j 22,000	-49.7 dB	-105.4°

Output voltage with 5.0 V_{rms} input and output terminated with 50 ohms

SERIAL NUMBER	OUTPUT VOLTAGE (RMS)
930-1	.016
930-2	.016

TESTED BY: Kurt Gorman

SIGNATURE: 

DATE: 10/7/20