



RECEIPT

Pillsbury Winthrop Shaw Pittman LLP
1200 Seventeenth Street, NW | Washington, DC 20036 | tel 202.663.8245 | fax 202.663.8007

Christine A. Reilly
tel 202.663.8245
christine.reilly@pillsburylaw.com

August 2, 2016

VIA HAND DELIVERY

Son Nguyen, Supervisory Engineer
Audio Division, Media Bureau
445 12th Street, SW
Federal Communications Commission
Washington, DC 20554

RECEIVED - FCC

AUG - 2 2016

**Federal Communications Commission
Bureau / Office**

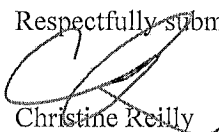
**Re: ACM JCE IV B LLC
FRN: 0024486094
WFTL(AM), West Palm Beach, FL, FAC ID: 29490**

Dear Ms. Dortch:

On behalf of ACM JCE IV B LLC (the "Licensee"), licensee of WFTL(AM), West Palm Beach, Florida, FAC ID 29490 (the "Station"), the instant application seeks to cover the outstanding construction permit - FCC File No. BMP-20031024AAV. The requisite filing fees were paid online. See attached FCC Form 159-E.

Please direct any communications regarding this matter to the undersigned.

Respectfully submitted,



Christine Reilly

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)

ACM JCE IV B LLC

MAILING ADDRESS (Line 1) (Maximum 35 characters)

426 SOUTH RIVER ROAD

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY

Tryon

STATE OR COUNTRY (If foreign address)

NC

ZIP CODE

28782

TELEPHONE NUMBER (include area code)

CALL LETTERS

WFTL(AM)

OTHER FCC IDENTIFIER (If applicable)

29490

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		
M	M	R

(B)

FEE MULTIPLE			
0	0	0	1

(C)

FEE DUE FOR FEE TYPE CODE IN COLUMN (A)
\$ 690.00

FOR FCC USE ONLY

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

(A)

M	O	R
---	---	---

(B)

0	0	0	1
---	---	---	---

(C)

\$ 790.00

FOR FCC USE ONLY

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

TOTAL AMOUNT
REMITTED WITH THIS
APPLICATION

\$ 1480.00

FOR FCC USE ONLY

CLEAR ALL PAGES

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT ACM JCE IV B LLC		
MAILING ADDRESS 426 SOUTH RIVER ROAD		
CITY Tryon	STATE NC	ZIP CODE 28782

2. This application is for:

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

Call letters WFTL(AM)	Community of License West Palm Beach	Construction Permit File No. BMP20031024AAV	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
--------------------------	---	--	--	--

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.
directional PTA

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.

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

☐ Yes
 ☒ No

If Yes, explain in an Exhibit.

Exhibit No.

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

☐ Yes
 ☐ No

If No, explain in an Exhibit.

☒ Does not apply

Exhibit No.

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

☐ Yes
 ☒ No

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

Exhibit No.

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

☐ Yes ☒ No

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 Mark Jorgenson	Signature 
Title Sole Member of Licensee's Sole Member	Date 08/02/2016 Telephone Number 828.859.6982

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.

CLEAR ALL PAGES

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant

ACM JCE IV B 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	
WFTL(AM)	BMP20031024AAV	850	Unlimited	Night 20	Day 50

2. Station location

State Florida	City or Town West Palm Beach
-------------------------	--

3. Transmitter location

State	County	City or Town	Street address (or other identification)
-------	--------	--------------	---

4. Main studio location

State	County	City or Town	Street address (or other identification)
-------	--------	--------------	---

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

State	County	City or Town	Street address (or other identification)
-------	--------	--------------	---

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 eng stmt

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system 20.5	RF common point or antenna current (in amperes) without modulation for day system 32.4
Measured antenna or common point resistance (in ohms) at operating frequency Night 50 Day 50	Measured antenna or common point reactance (in ohms) at operating frequency Night 0 Day 0

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
1	-94.2	-109.6	0.387	0.680		
2	ref 0.0	ref 0.0	ref 1.00	ref 1.00		
3	+107.5	+131.3	0.528	0.477		
4	-116.5	-149.3	0.356	0.428		
5	-26.9	-42.0	1.550	1.279		
6	+81.4	-66.7	0.928	0.756		

Manufacturer and type of antenna monitor:

Potomac Instruments 1901-6

CLEAR ALL PAGES

SECTION III - Page 2

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

Type Radiator	Overall height in meters of radiator above base	Overall height in meters of antenna mounted on tower and associated isolation circuits.	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	See eng str	see eng str	see eng str	see eng str	Exhibit No.

Excitation ☒ Series ☐ Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude 26 ° 32 ' 30 "	West Longitude 80 ° 44 ' 30 "
-------------------------------	-------------------------------

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

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

10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit? none

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

Mom proof

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) Timothy C. Cuthforth	Address (include ZIP Code) Broadcast Engineering Consultants 965 S. Irving Street Denver, CO 80219
Signature (check appropriate box below) <i>Timothy C. Cuthforth</i>	Date July 31, 2016
Telephone No. (include Area Code) 303-912-5474	

☐ Technical Director

☐ Chief Operator

☐ Technical Consultant

☒ Registered Professional Engineer

☐ Other (specify)

Agency Tracking ID:PGA2853454 Authorization Number:ACH Successful Authorization -- Date Paid: 8/2/16 FILE COPY ONLY!!

READ INSTRUCTIONS CAREFULLY BEFORE PROCEEDING (1) LOCKBOX #979089	FEDERAL COMMUNICATIONS COMMISSION REMITTANCE ADVICE FORM 159 PAGE NO 1 OF 1	APPROVED BY OMB 3060-059 SPECIAL USE FCC USE ONLY
SECTION A - Payer Information		
(2) PAYER NAME (if paying by credit card, enter name exactly as it appears on your card) ACM JCE IV B LLC		(3) TOTAL AMOUNT PAID (dollars and cents) \$1480.00
(4) STREET ADDRESS LINE NO. 1 426 South River Road		
(5) STREET ADDRESS LINE NO. 2		
(6) CITY Tryon	(7) STATE NC	(8) ZIP CODE 28782
(9) DAYTIME TELEPHONE NUMBER (INCLUDING AREA CODE) 828-8596982		(10) COUNTRY CODE (IF NOT IN U.S.A.) US
FCC REGISTRATION NUMBER (FRN) AND TAX IDENTIFICATION NUMBER (TIN) REQUIRED		
(11) PAYER (FRN) 0024486094		(12) FCC USE ONLY
IF PAYER NAME AND THE APPLICANT NAME ARE DIFFERENT, COMPLETE SECTION B IF MORE THAN ONE APPLICANT, USE CONTINUATION SHEETS (FORM 159-C)		
(13) APPLICANT NAME ACM JCE IV B LLC		
(14) STREET ADDRESS LINE NO. 1 426 South River Road		
(15) STREET ADDRESS LINE NO. 2		
(16) CITY Tryon	(17) STATE NC	(18) ZIP CODE 28782
(19) DAYTIME TELEPHONE NUMBER (INCLUDING AREA CODE) 828-8596982		(20) COUNTRY CODE (IF NOT IN U.S.A.) US
FCC REGISTRATION NUMBER (FRN) AND TAX IDENTIFICATION NUMBER (TIN) REQUIRED		
(21) APPLICANT (FRN) 0024486094		(22) FCC USE ONLY
COMPLETE SECTION C FOR EACH SERVICE, IF MORE BOXES ARE NEEDED, USE CONTINUATION SHEET		
(23A) FCC Call Sign/Other ID WFTL	(24A) Payment Type Code(PTC) MMR	(25A) Quantity 1
(26A) Fee Due for (PTC) \$690.00	(27A) Total Fee \$690.00	FCC Use Only
(28A) FCC CODE 1 29490	(29A) FCC CODE 2 CDBS20160802	
(23B) FCC Call Sign/Other ID WFTL	(24B) Payment Type Code(PTC) MOR	(25B) Quantity 1
(26B) Fee Due for (PTC) \$790.00	(27B) Total Fee \$790.00	FCC Use Only

(28B) FCC CODE 1	29490	(29B) FCC CODE 2	CDBS20160802
------------------	-------	------------------	--------------

EXHIBIT E-1

APPLICATION FOR LICENSE INFORMATION
RADIO STATION WFTL
WEST PALM BEACH, FLORIDA

ACM JCE IV B LLC

July 31, 2015

850 kHz 50 kW-D/20 kW-N DA-2

EXECUTIVE SUMMARY

This engineering exhibit supports an application to modify the license of WFTL based on Method of Moments analysis for the Daytime and Critical hours directional antenna system of radio station WFTL in West Palm Beach, Florida (FCC FID No. 29490) pursuant to the AM technical rules permitting moment-method modeling of eligible AM directional arrays.

WFTL is a licensed station with a Construction Permit to operate on 850 kHz with directional antenna daytime and a power of 50 kW, directional antenna Nighttime with a power of 20 kW BMP-20031024AAV. The instant application requests license and program test authority based on Method of Moments certification of the daytime and nighttime facilities.

Information is provided herein showing that the directional antenna parameters for the Daytime pattern and Nighttime pattern as authorized by the FCC have been determined in accordance with the requirements of 47 C.F.R. §73.151(c). The system has been adjusted to values computed to produce antenna monitor parameters within ± 5 percent in ratio and ± 3 degrees in phase of the modeled values, as required by the Rules. A station license is requested herewith specifying new daytime and nighttime operating parameters.

Analysis of Tower Impedance Measurements to Verify Method of Moments Model

Tower base impedance measurements were made at the final J-plugs within the Antenna Tuning Units (ATUs) using a Delta OIB-1 operating impedance bridge. The other towers were open-circuited at the same point where the impedance measurements were made for them. The static drain chokes at the ATU outputs are located on the ATU side of the antenna sample and were left connected to all towers when the jplugs are removed for measurements.

The tower lighting chokes also tie to the tower lighting circuitry on the tower side of the sample ahead of the jplugs and were left connected to all towers when the jplugs were removed for measurements. For comparison the tower impedance was measured and then on each tower the static drain choke and the tower lighting chokes were disconnected and the bridge null did not move indicating that the tower impedance is not significantly affected by the chokes. Likewise the null was observed with the Tower lights operating and with the tower lights turned off with no measureable change. The impedance of the static drain coil was measured out of circuit as was the lighting choke so that the exact impedance could be included in the circuit model at the tower bases in the analysis.

ACSMModel (MININEC 3.1 core) was used to model the WFTL array.

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

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

The modeled radius for each tower was the physical radius of the tower as determined by the formula $3T/2\pi$, where T is the tower face width in meters. The WFTL radiators are uniform cross-section triangular towers and have face widths of 0.6098 meters (2 ft) resulting in an apparent radius of 0.291 meter. The tower's radius was modeled at 0.2913 meter for all towers and is within the allowable range of modeled radius providing a good fit to the tower measured impedance characteristic.

Each tower is fed with a short length of large-diameter copper tubing that exhibits a small amount of series inductive reactance. This tubing connects to each tower immediately above the base insulator.

Towers 4 had slightly different impedances likely due to a small difference in the distance from the tower base pier to the tuning unit and also the tower 4 tuning unit was a larger cabinet located slightly further from the tower base resulting in an increased inductance in the feed circuit. The model calibration process was able to compensate for these differences well within the allowable tolerances specified in the rules.

A circuit model was constructed for each tower using the assumed series feed tubing and shunt base region reactances. This model was used with the Westberg Circuit Analysis Program (WCAP) to determine the effects of these reactances on the ATU output impedance at each tower. In each of the WCAP tabulations, node 2 represents the ATU output reference point and node 3 represents the tower base. Node 0 represents ground potential. The ATU output impedances can be found in the "TO NODE IMPEDANCE" column of each WCAP tabulation, following the phantom 1.0 ohm resistor inserted in the model to provide a calculation point for the impedance. The complex base impedance of each tower from the moment method model is represented in each case by the complex load from node 3 to ground.

A value of 80 pF was assumed for the base insulator, and this appears in the WCAP tabulation from node 3 to ground as 0.0001 (microfarads) due to rounding of the printout. The WCAP circuit model tabulation immediately follows the model for each tower along with a printout of the input data for that tower/ATU.

§73.151(c)(1)(vii) permits the use of a lumped series inductance of 10 uH or less between the output port of each antenna tuning unit and the associated tower. In each case, the value of lumped series inductance was below this 10 uH limit.

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

Table 1 – Analysis of Tower Impedance Measurements to Verify Moment Method Model

Twr.	Z_{BASE} (Modeled)	Z_{ATU} (Modeled)	Z_{ATU} (Measured)	Series L (uH)	Shunt C pF	Phys. Height t (deg.)	Model Height (deg.)	% Phys. Height
1(NE)	58.1+j66.1	59.2+j92.7	60.0 +j92.6	5.1	80	92.5	98.0	105.9
2(NC)	84.8+j148.0	90.7+j185.0	90.0 +j185.2	6.3	80	104.6	109.9	105.1
3(NW)	116.4+j187.9	126.8+j230.1	127+j229.4	7.0	80	111.8	116.2	103.9
4(SE)	130.3+j200.7	142.8+j255.0	142 +j254.9	9.2	80	115.0	117.7	102.3
5(SC)	49.2+j60.9	49.9+j92.8	51.0 +j95.1	6.3	80	92.5	96.5	104.3
6(SW)	60.3+j67.6	61.2+j106.4	62.0 +j106.2	7.0	80	92.5	98.6	106.6

Tower numbers and sample line numbers follow the numbering of the Construction Permit.

 ACSModel
 (MININEC 3.1 Core)
 12-15-2015 14:55:34

WFTLCP1
 tower1 cal
 tower1 driven towers2-6 floating

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
0	0	0		-1		
0	0	96.01437	0.2911	0		20
Wire No. 2	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
21.06847	-108.3879	0		-2		
21.06847	-108.3879	107.6733	0.2911	0		21
Wire No. 3	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
32.49215	-205.1474	0		-3		
32.49215	-205.1474	113.8456	0.2911	0		22
Wire No. 4	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-199.4789	108.7594	0		-4		
-199.4789	108.7594	115.3152	0.2911	0		23
Wire No. 5	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-177.6047	-2.790037	0		-5		
-177.6047	-2.790037	94.54477	0.2911	0		20
Wire No. 6	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-164.9511	-97.1636	0		-6		
-164.9511	-97.1636	96.60222	0.2911	0		20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
0		0	0	0.2911	-1	1	1
0		0	4.800719	0.2911	1	1	2
0		0	9.601438	0.2911	1	1	3
0		0	14.40216	0.2911	1	1	4
0		0	19.20288	0.2911	1	1	5
0		0	24.00359	0.2911	1	1	6
0		0	28.80431	0.2911	1	1	7
0		0	33.60503	0.2911	1	1	8
0		0	38.40575	0.2911	1	1	9
0		0	43.20647	0.2911	1	1	10
0		0	48.00719	0.2911	1	1	11
0		0	52.8079	0.2911	1	1	12
0		0	57.60862	0.2911	1	1	13
0		0	62.40934	0.2911	1	1	14
0		0	67.21006	0.2911	1	1	15
0		0	72.01078	0.2911	1	1	16
0		0	76.8115	0.2911	1	1	17
0		0	81.61222	0.2911	1	1	18
0		0	86.41294	0.2911	1	1	19
0		0	91.21365	0.2911	1	0	20

Wire No.	2	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
21.06847		-108.3879	0	0.2911	-2	2	21
21.06847		-108.3879	5.127298	0.2911	2	2	22
21.06847		-108.3879	10.2546	0.2911	2	2	23
21.06847		-108.3879	15.38189	0.2911	2	2	24
21.06847		-108.3879	20.50919	0.2911	2	2	25
21.06847		-108.3879	25.63649	0.2911	2	2	26
21.06847		-108.3879	30.76379	0.2911	2	2	27
21.06847		-108.3879	35.89109	0.2911	2	2	28
21.06847		-108.3879	41.01839	0.2911	2	2	29
21.06847		-108.3879	46.14568	0.2911	2	2	30
21.06847		-108.3879	51.27298	0.2911	2	2	31
21.06847		-108.3879	56.40028	0.2911	2	2	32
21.06847		-108.3879	61.52758	0.2911	2	2	33
21.06847		-108.3879	66.65488	0.2911	2	2	34
21.06847		-108.3879	71.78217	0.2911	2	2	35
21.06847		-108.3879	76.90948	0.2911	2	2	36
21.06847		-108.3879	82.03677	0.2911	2	2	37
21.06847		-108.3879	87.16407	0.2911	2	2	38
21.06847		-108.3879	92.29137	0.2911	2	2	39
21.06847		-108.3879	97.41866	0.2911	2	2	40
21.06847		-108.3879	102.546	0.2911	2	0	41

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2911	-3	3	42
32.49215		-205.1474	5.174801	0.2911	3	3	43
32.49215		-205.1474	10.3496	0.2911	3	3	44
32.49215		-205.1474	15.5244	0.2911	3	3	45
32.49215		-205.1474	20.6992	0.2911	3	3	46
32.49215		-205.1474	25.874	0.2911	3	3	47
32.49215		-205.1474	31.04881	0.2911	3	3	48
32.49215		-205.1474	36.22361	0.2911	3	3	49
32.49215		-205.1474	41.39841	0.2911	3	3	50
32.49215		-205.1474	46.57321	0.2911	3	3	51
32.49215		-205.1474	51.74801	0.2911	3	3	52
32.49215		-205.1474	56.92281	0.2911	3	3	53
32.49215		-205.1474	62.09761	0.2911	3	3	54
32.49215		-205.1474	67.27241	0.2911	3	3	55
32.49215		-205.1474	72.44721	0.2911	3	3	56
32.49215		-205.1474	77.62202	0.2911	3	3	57
32.49215		-205.1474	82.79681	0.2911	3	3	58
32.49215		-205.1474	87.97161	0.2911	3	3	59
32.49215		-205.1474	93.14642	0.2911	3	3	60
32.49215		-205.1474	98.32121	0.2911	3	3	61
32.49215		-205.1474	103.496	0.2911	3	3	62
32.49215		-205.1474	108.6708	0.2911	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		-108.7594	0	0.2911	-4	4	64
-199.4789		108.7594	5.013705	0.2911	4	4	65
-199.4789		108.7594	10.02741	0.2911	4	4	66
-199.4789		108.7594	15.04112	0.2911	4	4	67
-199.4789		108.7594	20.05482	0.2911	4	4	68
-199.4789		108.7594	25.06853	0.2911	4	4	69
-199.4789		108.7594	30.08223	0.2911	4	4	70
-199.4789		108.7594	35.09594	0.2911	4	4	71
-199.4789		108.7594	40.10964	0.2911	4	4	72
-199.4789		108.7594	45.12335	0.2911	4	4	73
-199.4789		108.7594	50.13705	0.2911	4	4	74
-199.4789		108.7594	55.15076	0.2911	4	4	75
-199.4789		108.7594	60.16447	0.2911	4	4	76
-199.4789		108.7594	65.17817	0.2911	4	4	77
-199.4789		108.7594	70.19187	0.2911	4	4	78
-199.4789		108.7594	75.20558	0.2911	4	4	79
-199.4789		108.7594	80.21928	0.2911	4	4	80
-199.4789		108.7594	85.23299	0.2911	4	4	81
-199.4789		108.7594	90.2467	0.2911	4	4	82
-199.4789		108.7594	95.2604	0.2911	4	4	83
-199.4789		108.7594	100.2741	0.2911	4	4	84
-199.4789		108.7594	105.2878	0.2911	4	4	85
-199.4789		108.7594	110.3015	0.2911	4	0	86

Wire No.	5	Coordinates			Connection Pulse		
X		Y	Z	Radius	End1	End2	No.
-177.6047		-2.790037	0	0.2911	-5	5	87
-177.6047		-2.790037	4.727239	0.2911	5	5	88
-177.6047		-2.790037	9.454477	0.2911	5	5	89
-177.6047		-2.790037	14.18172	0.2911	5	5	90
-177.6047		-2.790037	18.90895	0.2911	5	5	91
-177.6047		-2.790037	23.63619	0.2911	5	5	92
-177.6047		-2.790037	28.36343	0.2911	5	5	93
-177.6047		-2.790037	33.09067	0.2911	5	5	94
-177.6047		-2.790037	37.81791	0.2911	5	5	95
-177.6047		-2.790037	42.54515	0.2911	5	5	96
-177.6047		-2.790037	47.27238	0.2911	5	5	97
-177.6047		-2.790037	51.99962	0.2911	5	5	98
-177.6047		-2.790037	56.72686	0.2911	5	5	99
-177.6047		-2.790037	61.4541	0.2911	5	5	100
-177.6047		-2.790037	66.18134	0.2911	5	5	101
-177.6047		-2.790037	70.90858	0.2911	5	5	102
-177.6047		-2.790037	75.63582	0.2911	5	5	103
-177.6047		-2.790037	80.36305	0.2911	5	5	104
-177.6047		-2.790037	85.09029	0.2911	5	5	105
-177.6047		-2.790037	89.81753	0.2911	5	0	106

Wire No.	6	Coordinates			Connection Pulse		
X		Y	Z	Radius	End1	End2	No.
-164.9511		-97.1636	0	0.2911	-6	6	107
-164.9511		-97.1636	4.830111	0.2911	6	6	108
-164.9511		-97.1636	9.660222	0.2911	6	6	109
-164.9511		-97.1636	14.49033	0.2911	6	6	110
-164.9511		-97.1636	19.32044	0.2911	6	6	111
-164.9511		-97.1636	24.15055	0.2911	6	6	112
-164.9511		-97.1636	28.98066	0.2911	6	6	113
-164.9511		-97.1636	33.81078	0.2911	6	6	114
-164.9511		-97.1636	38.64089	0.2911	6	6	115
-164.9511		-97.1636	43.471	0.2911	6	6	116
-164.9511		-97.1636	48.30111	0.2911	6	6	117
-164.9511		-97.1636	53.13122	0.2911	6	6	118
-164.9511		-97.1636	57.96133	0.2911	6	6	119
-164.9511		-97.1636	62.79144	0.2911	6	6	120
-164.9511		-97.1636	67.62155	0.2911	6	6	121
-164.9511		-97.1636	72.45167	0.2911	6	6	122
-164.9511		-97.1636	77.28178	0.2911	6	6	123
-164.9511		-97.1636	82.11189	0.2911	6	6	124
-164.9511		-97.1636	86.942	0.2911	6	6	125
-164.9511		-97.1636	91.77211	0.2911	6	0	126

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 1, 3650.6, 57.5

Number of Loads: 5
Pulse No., Resistance, Reactance: 21 , 0 ,-10000
Pulse No., Resistance, Reactance: 42 , 0 ,-10000
Pulse No., Resistance, Reactance: 64 , 0 ,-10000
Pulse No., Resistance, Reactance: 87 , 0 ,-10000
Pulse No., Resistance, Reactance: 107 , 0 ,-10000

***** SOURCE DATA *****
Pulse 1 Voltage = (1960.5869, 3079.3849j)
Current = (40.9832, 6.3808j)
Impedance = (58.128, 66.088j)
Power = 50000.0 Watts

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-1.cir

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	5.1000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	2	0	.0000	.0000	.0000
L	3184.0000	2	0	.0000	.0000	.0000
R	58.1000	3	0	66.1000	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE		BRANCH CURRENT FROM NODE IMPEDANCE TO NODE IMPEDANCE					
					BRANCH MAG	CURRENT PHASE	FROM NODE RESISTANCE	IMPEDANCE REACTANCE	TO NODE RESISTANCE	IMPEDANCE REACTANCE
1		110.5171	56.9843							
2		109.9754	57.4212							
3		88.8468	47.9196							
					VSWR					
R	1- 2	1.000	1.00	.000	1.00	.000	60.22	92.67	59.22	92.67
L	2- 3	5.100	26.73	90.697	.98	.697	61.49	93.69	61.49	66.45
C	3- 0	.000	88.85	47.920	.04	137.920	.00	-2340.51	.00	.00
L	2- 0	1310.000	109.98	57.421	.02	-32.579	.00	6996.33	.00	.00
L	2- 0	3184.000	109.98	57.421	.01	-32.579	.00	17004.81	.00	.00
R	3- 0	58.100	88.85	47.920	1.01	-.766	58.10	66.10	.00	.00

Copy of file WFTL-1.CIR

0.85 0. 1
I 1 0 1
R 1.0000 1 2
L 5.10 2 3
C 0.00008 3 0
L 1310. 2 0
L 3184 2 0
R 58.1 3 0 +66.1
EX

 ACSModel
 (MININEC 3.1 Core)
 07-19-2016 15:25:16

WFTLCP2
 tower2 cal
 tower2 driven towers1,3-6 floating

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
0	0	0		-1		
0	0	96.01437	0.2913	0		20

Wire No. 2	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
21.06847	-108.3879	0		-2		
21.06847	-108.3879	107.6733	0.2913	0		21

Wire No. 3	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
32.49215	-205.1474	0		-3		
32.49215	-205.1474	113.8456	0.2913	0		22

Wire No. 4	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-199.4789	108.7594	0		-4		
-199.4789	108.7594	115.3152	0.2913	0		23

Wire No. 5	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-177.6047	-2.790037	0		-5		
-177.6047	-2.790037	94.54477	0.2913	0		20

Wire No. 6	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-164.9511	-97.1636	0		-6		
-164.9511	-97.1636	96.60222	0.2913	0		20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection			Pulse
X	Y	Z	Radius	End1	End2	No.		
0	0	0	0.2913	-1	1	1		
0	0	4.800719	0.2913	1	1	2		
0	0	9.601438	0.2913	1	1	3		
0	0	14.40216	0.2913	1	1	4		
0	0	19.20288	0.2913	1	1	5		
0	0	24.00359	0.2913	1	1	6		
0	0	28.80431	0.2913	1	1	7		
0	0	33.60503	0.2913	1	1	8		
0	0	38.40575	0.2913	1	1	9		
0	0	43.20647	0.2913	1	1	10		
0	0	48.00719	0.2913	1	1	11		
0	0	52.8079	0.2913	1	1	12		
0	0	57.60862	0.2913	1	1	13		
0	0	62.40934	0.2913	1	1	14		
0	0	67.21006	0.2913	1	1	15		
0	0	72.01078	0.2913	1	1	16		
0	0	76.8115	0.2913	1	1	17		
0	0	81.61222	0.2913	1	1	18		
0	0	86.41294	0.2913	1	1	19		
0	0	91.21365	0.2913	1	0	20		

Wire No.	2	Coordinates			Connection			Pulse
X	Y	Z	Radius	End1	End2	No.		
21.06847	-108.3879	0	0.2913	2	2	21		
21.06847	-108.3879	5.127298	0.2913	2	2	22		
21.06847	-108.3879	10.2546	0.2913	2	2	23		
21.06847	-108.3879	15.38189	0.2913	2	2	24		
21.06847	-108.3879	20.50919	0.2913	2	2	25		
21.06847	-108.3879	25.63649	0.2913	2	2	26		
21.06847	-108.3879	30.76379	0.2913	2	2	27		
21.06847	-108.3879	35.89109	0.2913	2	2	28		
21.06847	-108.3879	41.01839	0.2913	2	2	29		
21.06847	-108.3879	46.14568	0.2913	2	2	30		
21.06847	-108.3879	51.27298	0.2913	2	2	31		
21.06847	-108.3879	56.40028	0.2913	2	2	32		
21.06847	-108.3879	61.52758	0.2913	2	2	33		
21.06847	-108.3879	66.65488	0.2913	2	2	34		
21.06847	-108.3879	71.78217	0.2913	2	2	35		
21.06847	-108.3879	76.90948	0.2913	2	2	36		
21.06847	-108.3879	82.03677	0.2913	2	2	37		
21.06847	-108.3879	87.16407	0.2913	2	2	38		
21.06847	-108.3879	92.29137	0.2913	2	2	39		
21.06847	-108.3879	97.41866	0.2913	2	2	40		
21.06847	-108.3879	102.546	0.2913	2	0	41		

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2913	-3	3	42
32.49215		-205.1474	5.174801	0.2913	3	3	43
32.49215		-205.1474	10.3496	0.2913	3	3	44
32.49215		-205.1474	15.5244	0.2913	3	3	45
32.49215		-205.1474	20.6992	0.2913	3	3	46
32.49215		-205.1474	25.874	0.2913	3	3	47
32.49215		-205.1474	31.04881	0.2913	3	3	48
32.49215		-205.1474	36.22361	0.2913	3	3	49
32.49215		-205.1474	41.39841	0.2913	3	3	50
32.49215		-205.1474	46.57321	0.2913	3	3	51
32.49215		-205.1474	51.74801	0.2913	3	3	52
32.49215		-205.1474	56.92281	0.2913	3	3	53
32.49215		-205.1474	62.09761	0.2913	3	3	54
32.49215		-205.1474	67.27241	0.2913	3	3	55
32.49215		-205.1474	72.44721	0.2913	3	3	56
32.49215		-205.1474	77.62202	0.2913	3	3	57
32.49215		-205.1474	82.79681	0.2913	3	3	58
32.49215		-205.1474	87.97161	0.2913	3	3	59
32.49215		-205.1474	93.14642	0.2913	3	3	60
32.49215		-205.1474	98.32121	0.2913	3	3	61
32.49215		-205.1474	103.496	0.2913	3	3	62
32.49215		-205.1474	108.6708	0.2913	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		108.7594	0	0.2913	-4	4	64
-199.4789		108.7594	5.013705	0.2913	4	4	65
-199.4789		108.7594	10.02741	0.2913	4	4	66
-199.4789		108.7594	15.04112	0.2913	4	4	67
-199.4789		108.7594	20.05482	0.2913	4	4	68
-199.4789		108.7594	25.06853	0.2913	4	4	69
-199.4789		108.7594	30.08223	0.2913	4	4	70
-199.4789		108.7594	35.09594	0.2913	4	4	71
-199.4789		108.7594	40.10964	0.2913	4	4	72
-199.4789		108.7594	45.12335	0.2913	4	4	73
-199.4789		108.7594	50.13705	0.2913	4	4	74
-199.4789		108.7594	55.15076	0.2913	4	4	75
-199.4789		108.7594	60.16447	0.2913	4	4	76
-199.4789		108.7594	65.17817	0.2913	4	4	77
-199.4789		108.7594	70.19187	0.2913	4	4	78
-199.4789		108.7594	75.20558	0.2913	4	4	79
-199.4789		108.7594	80.21928	0.2913	4	4	80
-199.4789		108.7594	85.23299	0.2913	4	4	81
-199.4789		108.7594	90.2467	0.2913	4	4	82
-199.4789		108.7594	95.2604	0.2913	4	4	83
-199.4789		108.7594	100.2741	0.2913	4	4	84
-199.4789		108.7594	105.2878	0.2913	4	4	85
-199.4789		108.7594	110.3015	0.2913	4	0	86

Wire No.	5	Coordinates			Connection	Pulse
X		Y	Z	Radius	End1	End2 No.
-177.6047		-2.790037	0	0.2913	-5	5 87
-177.6047		-2.790037	4.727239	0.2913	5	5 88
-177.6047		-2.790037	9.454477	0.2913	5	5 89
-177.6047		-2.790037	14.18172	0.2913	5	5 90
-177.6047		-2.790037	18.90895	0.2913	5	5 91
-177.6047		-2.790037	23.63619	0.2913	5	5 92
-177.6047		-2.790037	28.36343	0.2913	5	5 93
-177.6047		-2.790037	33.09067	0.2913	5	5 94
-177.6047		-2.790037	37.81791	0.2913	5	5 95
-177.6047		-2.790037	42.54515	0.2913	5	5 96
-177.6047		-2.790037	47.27238	0.2913	5	5 97
-177.6047		-2.790037	51.99962	0.2913	5	5 98
-177.6047		-2.790037	56.72686	0.2913	5	5 99
-177.6047		-2.790037	61.4541	0.2913	5	5 100
-177.6047		-2.790037	66.18134	0.2913	5	5 101
-177.6047		-2.790037	70.90858	0.2913	5	5 102
-177.6047		-2.790037	75.63582	0.2913	5	5 103
-177.6047		-2.790037	80.36305	0.2913	5	5 104
-177.6047		-2.790037	85.09029	0.2913	5	5 105
-177.6047		-2.790037	89.81753	0.2913	5	0 106

Wire No.	6	Coordinates			Connection	Pulse
X		Y	Z	Radius	End1	End2 No.
-164.9511		-97.1636	0	0.2913	-6	6 107
-164.9511		-97.1636	4.830111	0.2913	6	6 108
-164.9511		-97.1636	9.660222	0.2913	6	6 109
-164.9511		-97.1636	14.49033	0.2913	6	6 110
-164.9511		-97.1636	19.32044	0.2913	6	6 111
-164.9511		-97.1636	24.15055	0.2913	6	6 112
-164.9511		-97.1636	28.98066	0.2913	6	6 113
-164.9511		-97.1636	33.81078	0.2913	6	6 114
-164.9511		-97.1636	38.64089	0.2913	6	6 115
-164.9511		-97.1636	43.471	0.2913	6	6 116
-164.9511		-97.1636	48.30111	0.2913	6	6 117
-164.9511		-97.1636	53.13122	0.2913	6	6 118
-164.9511		-97.1636	57.96133	0.2913	6	6 119
-164.9511		-97.1636	62.79144	0.2913	6	6 120
-164.9511		-97.1636	67.62155	0.2913	6	6 121
-164.9511		-97.1636	72.45167	0.2913	6	6 122
-164.9511		-97.1636	77.28178	0.2913	6	6 123
-164.9511		-97.1636	82.11189	0.2913	6	6 124
-164.9511		-97.1636	86.942	0.2913	6	6 125
-164.9511		-97.1636	91.77211	0.2913	6	0 126

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 21, 5858.2, 65.9

Number of Loads: 5
Pulse No., Resistance, Reactance: 1 , 0 , -10000
Pulse No., Resistance, Reactance: 42 , 0 , -10000
Pulse No., Resistance, Reactance: 64 , 0 , -10000
Pulse No., Resistance, Reactance: 87 , 0 , -10000
Pulse No., Resistance, Reactance: 107 , 0 , -10000

***** SOURCE DATA *****
Pulse 21 Voltage = (2390.9294, 5348.0485j)
Current = (34.1688, 3.4227j)
Impedance = (84.802, 148.024j)
Power = 50000.0 Watts

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-2.cir

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.3000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	84.8000	3	0	148.0000	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE							
1		206.4553	63.6234							
2		206.0130	63.8726							
3		176.4279	59.0550							
		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE		
		MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE	
VSWR										
R	1- 2	1.000	1.00	.000	1.00	.000	91.72	184.96	90.72 184.96	
L	2- 3	6.300	33.65	90.000	1.00	.000	90.72	184.96	90.72 151.32	
C	3- 0	.000	176.43	59.055	.08	149.055	.00	-2340.51	.00 .00	
L	3- 0	1310.000	176.43	59.055	.03	-30.945	.00	6996.33	.00 .00	
L	3- 0	3184.000	176.43	59.055	.01	-30.945	.00	17004.81	.00 .00	
R	3- 0	84.800	176.43	59.055	1.03	-1.133	84.80	148.00	.00 .00	

Copy of file WFTL-2.cir

0.85 0. 1
I 1 0 1
R 1.0000 1 2
L 6.3 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 84.8 3 0 +148.0
EX

 ACSModel
 (MININEC 3.1 Core)
 07-19-2016 15:39:50

WFTLCP3
 tower3 cal
 tower3 driven towers1-2,4-6 floating

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
0	0	0		-1	
0	0	96.01437	0.2913	0	20
Wire No. 2	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
21.06847	-108.3879	0		-2	
21.06847	-108.3879	107.6733	0.2913	0	21
Wire No. 3	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
32.49215	-205.1474	0		-3	
32.49215	-205.1474	113.8456	0.2913	0	22
Wire No. 4	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-199.4789	108.7594	0		-4	
-199.4789	108.7594	115.3152	0.2913	0	23
Wire No. 5	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-177.6047	-2.790037	0		-5	
-177.6047	-2.790037	94.54477	0.2913	0	20
Wire No. 6	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-164.9511	-97.1636	0		-6	
-164.9511	-97.1636	96.60222	0.2913	0	20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
0		0	0	0.2913	-1	1	1
0		0	4.800719	0.2913	1	1	2
0		0	9.601438	0.2913	1	1	3
0		0	14.40216	0.2913	1	1	4
0		0	19.20288	0.2913	1	1	5
0		0	24.00359	0.2913	1	1	6
0		0	28.80431	0.2913	1	1	7
0		0	33.60503	0.2913	1	1	8
0		0	38.40575	0.2913	1	1	9
0		0	43.20647	0.2913	1	1	10
0		0	48.00719	0.2913	1	1	11
0		0	52.8079	0.2913	1	1	12
0		0	57.60862	0.2913	1	1	13
0		0	62.40934	0.2913	1	1	14
0		0	67.21006	0.2913	1	1	15
0		0	72.01078	0.2913	1	1	16
0		0	76.8115	0.2913	1	1	17
0		0	81.61222	0.2913	1	1	18
0		0	86.41294	0.2913	1	1	19
0		0	91.21365	0.2913	1	0	20

Wire No.	2	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
21.06847		-108.3879	0	0.2913	-2	2	21
21.06847		-108.3879	5.127298	0.2913	2	2	22
21.06847		-108.3879	10.2546	0.2913	2	2	23
21.06847		-108.3879	15.38189	0.2913	2	2	24
21.06847		-108.3879	20.50919	0.2913	2	2	25
21.06847		-108.3879	25.63649	0.2913	2	2	26
21.06847		-108.3879	30.76379	0.2913	2	2	27
21.06847		-108.3879	35.89109	0.2913	2	2	28
21.06847		-108.3879	41.01839	0.2913	2	2	29
21.06847		-108.3879	46.14568	0.2913	2	2	30
21.06847		-108.3879	51.27298	0.2913	2	2	31
21.06847		-108.3879	56.40028	0.2913	2	2	32
21.06847		-108.3879	61.52758	0.2913	2	2	33
21.06847		-108.3879	66.65488	0.2913	2	2	34
21.06847		-108.3879	71.78217	0.2913	2	2	35
21.06847		-108.3879	76.90948	0.2913	2	2	36
21.06847		-108.3879	82.03677	0.2913	2	2	37
21.06847		-108.3879	87.16407	0.2913	2	2	38
21.06847		-108.3879	92.29137	0.2913	2	2	39
21.06847		-108.3879	97.41866	0.2913	2	2	40
21.06847		-108.3879	102.546	0.2913	2	0	41

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2913	-3	3	42
32.49215		-205.1474	5.174801	0.2913	3	3	43
32.49215		-205.1474	10.3496	0.2913	3	3	44
32.49215		-205.1474	15.5244	0.2913	3	3	45
32.49215		-205.1474	20.6992	0.2913	3	3	46
32.49215		-205.1474	25.874	0.2913	3	3	47
32.49215		-205.1474	31.04881	0.2913	3	3	48
32.49215		-205.1474	36.22361	0.2913	3	3	49
32.49215		-205.1474	41.39841	0.2913	3	3	50
32.49215		-205.1474	46.57321	0.2913	3	3	51
32.49215		-205.1474	51.74801	0.2913	3	3	52
32.49215		-205.1474	56.92281	0.2913	3	3	53
32.49215		-205.1474	62.09761	0.2913	3	3	54
32.49215		-205.1474	67.27241	0.2913	3	3	55
32.49215		-205.1474	72.44721	0.2913	3	3	56
32.49215		-205.1474	77.62202	0.2913	3	3	57
32.49215		-205.1474	82.79681	0.2913	3	3	58
32.49215		-205.1474	87.97161	0.2913	3	3	59
32.49215		-205.1474	93.14642	0.2913	3	3	60
32.49215		-205.1474	98.32121	0.2913	3	3	61
32.49215		-205.1474	103.496	0.2913	3	3	62
32.49215		-205.1474	108.6708	0.2913	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		108.7594	0	0.2913	-4	4	64
-199.4789		108.7594	5.013705	0.2913	4	4	65
-199.4789		108.7594	10.02741	0.2913	4	4	66
-199.4789		108.7594	15.04112	0.2913	4	4	67
-199.4789		108.7594	20.05482	0.2913	4	4	68
-199.4789		108.7594	25.06853	0.2913	4	4	69
-199.4789		108.7594	30.08223	0.2913	4	4	70
-199.4789		108.7594	35.09594	0.2913	4	4	71
-199.4789		108.7594	40.10964	0.2913	4	4	72
-199.4789		108.7594	45.12335	0.2913	4	4	73
-199.4789		108.7594	50.13705	0.2913	4	4	74
-199.4789		108.7594	55.15076	0.2913	4	4	75
-199.4789		108.7594	60.16447	0.2913	4	4	76
-199.4789		108.7594	65.17817	0.2913	4	4	77
-199.4789		108.7594	70.19187	0.2913	4	4	78
-199.4789		108.7594	75.20558	0.2913	4	4	79
-199.4789		108.7594	80.21928	0.2913	4	4	80
-199.4789		108.7594	85.23299	0.2913	4	4	81
-199.4789		108.7594	90.2467	0.2913	4	4	82
-199.4789		108.7594	95.2604	0.2913	4	4	83
-199.4789		108.7594	100.2741	0.2913	4	4	84
-199.4789		108.7594	105.2878	0.2913	4	4	85
-199.4789		108.7594	110.3015	0.2913	4	0	86

Wire No.	5	Coordinates			Connection Pulse		
X		Y	Z	Radius	End1	End2	No.
-177.6047		-2.790037	0	0.2913	-5	5	87
-177.6047		-2.790037	4.727239	0.2913	5	5	88
-177.6047		-2.790037	9.454477	0.2913	5	5	89
-177.6047		-2.790037	14.18172	0.2913	5	5	90
-177.6047		-2.790037	18.90895	0.2913	5	5	91
-177.6047		-2.790037	23.63619	0.2913	5	5	92
-177.6047		-2.790037	28.36343	0.2913	5	5	93
-177.6047		-2.790037	33.09067	0.2913	5	5	94
-177.6047		-2.790037	37.81791	0.2913	5	5	95
-177.6047		-2.790037	42.54515	0.2913	5	5	96
-177.6047		-2.790037	47.27238	0.2913	5	5	97
-177.6047		-2.790037	51.99962	0.2913	5	5	98
-177.6047		-2.790037	56.72686	0.2913	5	5	99
-177.6047		-2.790037	61.4541	0.2913	5	5	100
-177.6047		-2.790037	66.18134	0.2913	5	5	101
-177.6047		-2.790037	70.90858	0.2913	5	5	102
-177.6047		-2.790037	75.63582	0.2913	5	5	103
-177.6047		-2.790037	80.36305	0.2913	5	5	104
-177.6047		-2.790037	85.09029	0.2913	5	5	105
-177.6047		-2.790037	89.81753	0.2913	5	0	106

Wire No.	6	Coordinates			Connection Pulse		
X		Y	Z	Radius	End1	End2	No.
-164.9511		-97.1636	0	0.2913	-6	6	107
-164.9511		-97.1636	4.830111	0.2913	6	6	108
-164.9511		-97.1636	9.660222	0.2913	6	6	109
-164.9511		-97.1636	14.49033	0.2913	6	6	110
-164.9511		-97.1636	19.32044	0.2913	6	6	111
-164.9511		-97.1636	24.15055	0.2913	6	6	112
-164.9511		-97.1636	28.98066	0.2913	6	6	113
-164.9511		-97.1636	33.81078	0.2913	6	6	114
-164.9511		-97.1636	38.64089	0.2913	6	6	115
-164.9511		-97.1636	43.471	0.2913	6	6	116
-164.9511		-97.1636	48.30111	0.2913	6	6	117
-164.9511		-97.1636	53.13122	0.2913	6	6	118
-164.9511		-97.1636	57.96133	0.2913	6	6	119
-164.9511		-97.1636	62.79144	0.2913	6	6	120
-164.9511		-97.1636	67.62155	0.2913	6	6	121
-164.9511		-97.1636	72.45167	0.2913	6	6	122
-164.9511		-97.1636	77.28178	0.2913	6	6	123
-164.9511		-97.1636	82.11189	0.2913	6	6	124
-164.9511		-97.1636	86.942	0.2913	6	6	125
-164.9511		-97.1636	91.77211	0.2913	6	0	126

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 42, 6476.8, 68.4

Number of Loads: 5
Pulse No., Resistance, Reactance: 1 , 0 ,-10000
Pulse No., Resistance, Reactance: 21 , 0 ,-10000
Pulse No., Resistance, Reactance: 64 , 0 ,-10000
Pulse No., Resistance, Reactance: 87 , 0 ,-10000
Pulse No., Resistance, Reactance: 107 , 0 ,-10000

***** SOURCE DATA *****
Pulse 42 Voltage = (2379.6119, 6023.8164j)
Current = (28.8384, 5.2086j)
Impedance = (116.444, 187.85j)
Power = 50000.0 Watts

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-3.cir

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	7.0000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	116.4000	3	0	187.9000	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE		BRANCH CURRENT FROM NODE IMPEDANCE TO NODE IMPEDANCE					
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1		263.2452	60.9477							
2		262.7610	61.1383							
3		230.7265	56.6525							
VSWR			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
R	1- 2	1.000	1.00	.000	1.00	.000	127.83	230.12	126.83	230.12
L	2- 3	7.000	37.38	90.000	1.00	.000	126.83	230.12	126.83	192.74
C	3- 0	.000	230.73	56.652	.10	146.652	.00	-2340.51	.00	.00
L	3- 0	1310.000	230.73	56.652	.03	-33.348	.00	6996.33	.00	.00
L	3- 0	3184.000	230.73	56.652	.01	-33.348	.00	17004.81	.00	.00
R	3- 0	116.400	230.73	56.652	1.04	-1.570	116.40	187.90	.00	.00

Copy of WFTL-3.cir

```
0.85 0. 1
I 1 0 1
R 1.0000 1 2
L 7 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 116.4 3 0 +187.9
EX
```

 ACSModel
 (MININEC 3.1 Core)
 07-19-2016 15:53:59

WFTLCP4
 tower4 cal
 tower4 driven towers1-3,5-6 floating

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
0	0	0		-1	
0	0	96.01437	0.2913	0	20
Wire No. 2	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
21.06847	-108.3879	0		-2	
21.06847	-108.3879	107.6733	0.2913	0	21
Wire No. 3	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
32.49215	-205.1474	0		-3	
32.49215	-205.1474	113.8456	0.2913	0	22
Wire No. 4	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-199.4789	108.7594	0		-4	
-199.4789	108.7594	115.3152	0.2913	0	23
Wire No. 5	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-177.6047	-2.790037	0		-5	
-177.6047	-2.790037	94.54477	0.2913	0	20
Wire No. 6	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-164.9511	-97.1636	0		-6	
-164.9511	-97.1636	96.60222	0.2913	0	20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
0		0	0	0.2913	-1	1	1
0		0	4.800719	0.2913	1	1	2
0		0	9.601438	0.2913	1	1	3
0		0	14.40216	0.2913	1	1	4
0		0	19.20288	0.2913	1	1	5
0		0	24.00359	0.2913	1	1	6
0		0	28.80431	0.2913	1	1	7
0		0	33.60503	0.2913	1	1	8
0		0	38.40575	0.2913	1	1	9
0		0	43.20647	0.2913	1	1	10
0		0	48.00719	0.2913	1	1	11
0		0	52.8079	0.2913	1	1	12
0		0	57.60862	0.2913	1	1	13
0		0	62.40934	0.2913	1	1	14
0		0	67.21006	0.2913	1	1	15
0		0	72.01078	0.2913	1	1	16
0		0	76.8115	0.2913	1	1	17
0		0	81.61222	0.2913	1	1	18
0		0	86.41294	0.2913	1	1	19
0		0	91.21365	0.2913	1	0	20

Wire No.	2	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
21.06847		-108.3879	0	0.2913	-2	2	21
21.06847		-108.3879	5.127298	0.2913	2	2	22
21.06847		-108.3879	10.2546	0.2913	2	2	23
21.06847		-108.3879	15.38189	0.2913	2	2	24
21.06847		-108.3879	20.50919	0.2913	2	2	25
21.06847		-108.3879	25.63649	0.2913	2	2	26
21.06847		-108.3879	30.76379	0.2913	2	2	27
21.06847		-108.3879	35.89109	0.2913	2	2	28
21.06847		-108.3879	41.01839	0.2913	2	2	29
21.06847		-108.3879	46.14568	0.2913	2	2	30
21.06847		-108.3879	51.27298	0.2913	2	2	31
21.06847		-108.3879	56.40028	0.2913	2	2	32
21.06847		-108.3879	61.52758	0.2913	2	2	33
21.06847		-108.3879	66.65488	0.2913	2	2	34
21.06847		-108.3879	71.78217	0.2913	2	2	35
21.06847		-108.3879	76.90948	0.2913	2	2	36
21.06847		-108.3879	82.03677	0.2913	2	2	37
21.06847		-108.3879	87.16407	0.2913	2	2	38
21.06847		-108.3879	92.29137	0.2913	2	2	39
21.06847		-108.3879	97.41866	0.2913	2	2	40
21.06847		-108.3879	102.546	0.2913	2	0	41

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2913	-3	3	42
32.49215		-205.1474	5.174801	0.2913	3	3	43
32.49215		-205.1474	10.3496	0.2913	3	3	44
32.49215		-205.1474	15.5244	0.2913	3	3	45
32.49215		-205.1474	20.6992	0.2913	3	3	46
32.49215		-205.1474	25.874	0.2913	3	3	47
32.49215		-205.1474	31.04881	0.2913	3	3	48
32.49215		-205.1474	36.22361	0.2913	3	3	49
32.49215		-205.1474	41.39841	0.2913	3	3	50
32.49215		-205.1474	46.57321	0.2913	3	3	51
32.49215		-205.1474	51.74801	0.2913	3	3	52
32.49215		-205.1474	56.92281	0.2913	3	3	53
32.49215		-205.1474	62.09761	0.2913	3	3	54
32.49215		-205.1474	67.27241	0.2913	3	3	55
32.49215		-205.1474	72.44721	0.2913	3	3	56
32.49215		-205.1474	77.62202	0.2913	3	3	57
32.49215		-205.1474	82.79681	0.2913	3	3	58
32.49215		-205.1474	87.97161	0.2913	3	3	59
32.49215		-205.1474	93.14642	0.2913	3	3	60
32.49215		-205.1474	98.32121	0.2913	3	3	61
32.49215		-205.1474	103.496	0.2913	3	3	62
32.49215		-205.1474	108.6708	0.2913	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		108.7594	0	0.2913	-4	4	64
-199.4789		108.7594	5.013705	0.2913	4	4	65
-199.4789		108.7594	10.02741	0.2913	4	4	66
-199.4789		108.7594	15.04112	0.2913	4	4	67
-199.4789		108.7594	20.05482	0.2913	4	4	68
-199.4789		108.7594	25.06853	0.2913	4	4	69
-199.4789		108.7594	30.08223	0.2913	4	4	70
-199.4789		108.7594	35.09594	0.2913	4	4	71
-199.4789		108.7594	40.10964	0.2913	4	4	72
-199.4789		108.7594	45.12335	0.2913	4	4	73
-199.4789		108.7594	50.13705	0.2913	4	4	74
-199.4789		108.7594	55.15076	0.2913	4	4	75
-199.4789		108.7594	60.16447	0.2913	4	4	76
-199.4789		108.7594	65.17817	0.2913	4	4	77
-199.4789		108.7594	70.19187	0.2913	4	4	78
-199.4789		108.7594	75.20558	0.2913	4	4	79
-199.4789		108.7594	80.21928	0.2913	4	4	80
-199.4789		108.7594	85.23299	0.2913	4	4	81
-199.4789		108.7594	90.2467	0.2913	4	4	82
-199.4789		108.7594	95.2604	0.2913	4	4	83
-199.4789		108.7594	100.2741	0.2913	4	4	84
-199.4789		108.7594	105.2878	0.2913	4	4	85
-199.4789		108.7594	110.3015	0.2913	4	0	86

Wire No.	5	Coordinates			Connection	Pulse
X		Y	Z	Radius	End1 End2	No.
-177.6047		-2.790037	0	0.2913	-5 5	87
-177.6047		-2.790037	4.727239	0.2913	5 5	88
-177.6047		-2.790037	9.454477	0.2913	5 5	89
-177.6047		-2.790037	14.18172	0.2913	5 5	90
-177.6047		-2.790037	18.90895	0.2913	5 5	91
-177.6047		-2.790037	23.63619	0.2913	5 5	92
-177.6047		-2.790037	28.36343	0.2913	5 5	93
-177.6047		-2.790037	33.09067	0.2913	5 5	94
-177.6047		-2.790037	37.81791	0.2913	5 5	95
-177.6047		-2.790037	42.54515	0.2913	5 5	96
-177.6047		-2.790037	47.27238	0.2913	5 5	97
-177.6047		-2.790037	51.99962	0.2913	5 5	98
-177.6047		-2.790037	56.72686	0.2913	5 5	99
-177.6047		-2.790037	61.4541	0.2913	5 5	100
-177.6047		-2.790037	66.18134	0.2913	5 5	101
-177.6047		-2.790037	70.90858	0.2913	5 5	102
-177.6047		-2.790037	75.63582	0.2913	5 5	103
-177.6047		-2.790037	80.36305	0.2913	5 5	104
-177.6047		-2.790037	85.09029	0.2913	5 5	105
-177.6047		-2.790037	89.81753	0.2913	5 0	106

Wire No.	6	Coordinates			Connection	Pulse
X		Y	Z	Radius	End1 End2	No.
-164.9511		-97.1636	0	0.2913	-6 6	107
-164.9511		-97.1636	4.830111	0.2913	6 6	108
-164.9511		-97.1636	9.660222	0.2913	6 6	109
-164.9511		-97.1636	14.49033	0.2913	6 6	110
-164.9511		-97.1636	19.32044	0.2913	6 6	111
-164.9511		-97.1636	24.15055	0.2913	6 6	112
-164.9511		-97.1636	28.98066	0.2913	6 6	113
-164.9511		-97.1636	33.81078	0.2913	6 6	114
-164.9511		-97.1636	38.64089	0.2913	6 6	115
-164.9511		-97.1636	43.471	0.2913	6 6	116
-164.9511		-97.1636	48.30111	0.2913	6 6	117
-164.9511		-97.1636	53.13122	0.2913	6 6	118
-164.9511		-97.1636	57.96133	0.2913	6 6	119
-164.9511		-97.1636	62.79144	0.2913	6 6	120
-164.9511		-97.1636	67.62155	0.2913	6 6	121
-164.9511		-97.1636	72.45167	0.2913	6 6	122
-164.9511		-97.1636	77.28178	0.2913	6 6	123
-164.9511		-97.1636	82.11189	0.2913	6 6	124
-164.9511		-97.1636	86.942	0.2913	6 6	125
-164.9511		-97.1636	91.77211	0.2913	6 0	126

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 64, 6629.1, 68.9

Number of Loads: 5
Pulse No., Resistance, Reactance: 1 , 0 , -10000
Pulse No., Resistance, Reactance: 21 , 0 , -10000
Pulse No., Resistance, Reactance: 42 , 0 , -10000
Pulse No., Resistance, Reactance: 87 , 0 , -10000
Pulse No., Resistance, Reactance: 107 , 0 , -10000

***** SOURCE DATA *****
Pulse 64 Voltage = (2385.2937, 6185.0788j)
Current = (27.1066, 5.7142j)
Impedance = (130.307, 200.707j)
Power = 50000.0 Watts

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-4.cir

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	9.2000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	130.3000	3	0	200.7000	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1	292.7169	60.5739										
2	292.2269	60.7447										
3	250.5130	55.2444										
VSWR												
R	1- 2	1.000	1.00	.000	1.00	.000	143.81	254.95	142.81	254.95		
L	2- 3	9.200	49.13	90.000	1.00	.000	142.81	254.95	142.81	205.82		
C	3- 0	.000	250.51	55.244	.11	145.244	.00	-2340.51	.00	.00		
L	3- 0	1310.000	250.51	55.244	.04	-34.756	.00	6996.33	.00	.00		
L	3- 0	3184.000	250.51	55.244	.01	-34.756	.00	17004.81	.00	.00		
R	3- 0	130.300	250.51	55.244	1.05	-1.763	130.30	200.70	.00	.00		

COPY of WFTL-4.cir

0.85 0. 1
I 1 0 1
R 1.0000 1 2
L 9.2 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 130.3 3 0 +200.7
EX

 ACSModel
 (MININEC 3.1 Core)
 07-20-2016 11:18:58

WFTLCP5
 tower5 cal
 tower5 driven towers1-4,6 floating

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
0	0	0			-1	
0	0	96.01437	0.2913		0	20
Wire No. 2	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
21.06847	-108.3879	0			-2	
21.06847	-108.3879	107.6733	0.2913		0	21
Wire No. 3	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
32.49215	-205.1474	0			-3	
32.49215	-205.1474	113.8456	0.2913		0	22
Wire No. 4	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-199.4789	108.7594	0			-4	
-199.4789	108.7594	115.3152	0.2913		0	23
Wire No. 5	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-177.6047	-2.790037	0			-5	
-177.6047	-2.790037	94.54477	0.2913		0	20
Wire No. 6	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-164.9511	-97.1636	0			-6	
-164.9511	-97.1636	96.60222	0.2913		0	20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
0		0	0	0.2913	-1	1	1
0		0	4.800719	0.2913	1	1	2
0		0	9.601438	0.2913	1	1	3
0		0	14.40216	0.2913	1	1	4
0		0	19.20288	0.2913	1	1	5
0		0	24.00359	0.2913	1	1	6
0		0	28.80431	0.2913	1	1	7
0		0	33.60503	0.2913	1	1	8
0		0	38.40575	0.2913	1	1	9
0		0	43.20647	0.2913	1	1	10
0		0	48.00719	0.2913	1	1	11
0		0	52.8079	0.2913	1	1	12
0		0	57.60862	0.2913	1	1	13
0		0	62.40934	0.2913	1	1	14
0		0	67.21006	0.2913	1	1	15
0		0	72.01078	0.2913	1	1	16
0		0	76.8115	0.2913	1	1	17
0		0	81.61222	0.2913	1	1	18
0		0	86.41294	0.2913	1	1	19
0		0	91.21365	0.2913	1	0	20

Wire No.	2	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
21.06847		-108.3879	0	0.2913	-2	2	21
21.06847		-108.3879	5.127298	0.2913	2	2	22
21.06847		-108.3879	10.2546	0.2913	2	2	23
21.06847		-108.3879	15.38189	0.2913	2	2	24
21.06847		-108.3879	20.50919	0.2913	2	2	25
21.06847		-108.3879	25.63649	0.2913	2	2	26
21.06847		-108.3879	30.76379	0.2913	2	2	27
21.06847		-108.3879	35.89109	0.2913	2	2	28
21.06847		-108.3879	41.01839	0.2913	2	2	29
21.06847		-108.3879	46.14568	0.2913	2	2	30
21.06847		-108.3879	51.27298	0.2913	2	2	31
21.06847		-108.3879	56.40028	0.2913	2	2	32
21.06847		-108.3879	61.52758	0.2913	2	2	33
21.06847		-108.3879	66.65488	0.2913	2	2	34
21.06847		-108.3879	71.78217	0.2913	2	2	35
21.06847		-108.3879	76.90948	0.2913	2	2	36
21.06847		-108.3879	82.03677	0.2913	2	2	37
21.06847		-108.3879	87.16407	0.2913	2	2	38
21.06847		-108.3879	92.29137	0.2913	2	2	39
21.06847		-108.3879	97.41866	0.2913	2	2	40
21.06847		-108.3879	102.546	0.2913	2	0	41

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2913	-3	3	42
32.49215		-205.1474	5.174801	0.2913	3	3	43
32.49215		-205.1474	10.3496	0.2913	3	3	44
32.49215		-205.1474	15.5244	0.2913	3	3	45
32.49215		-205.1474	20.6992	0.2913	3	3	46
32.49215		-205.1474	25.874	0.2913	3	3	47
32.49215		-205.1474	31.04881	0.2913	3	3	48
32.49215		-205.1474	36.22361	0.2913	3	3	49
32.49215		-205.1474	41.39841	0.2913	3	3	50
32.49215		-205.1474	46.57321	0.2913	3	3	51
32.49215		-205.1474	51.74801	0.2913	3	3	52
32.49215		-205.1474	56.92281	0.2913	3	3	53
32.49215		-205.1474	62.09761	0.2913	3	3	54
32.49215		-205.1474	67.27241	0.2913	3	3	55
32.49215		-205.1474	72.44721	0.2913	3	3	56
32.49215		-205.1474	77.62202	0.2913	3	3	57
32.49215		-205.1474	82.79681	0.2913	3	3	58
32.49215		-205.1474	87.97161	0.2913	3	3	59
32.49215		-205.1474	93.14642	0.2913	3	3	60
32.49215		-205.1474	98.32121	0.2913	3	3	61
32.49215		-205.1474	103.496	0.2913	3	3	62
32.49215		-205.1474	108.6708	0.2913	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		108.7594	0	0.2913	-4	4	64
-199.4789		108.7594	5.013705	0.2913	4	4	65
-199.4789		108.7594	10.02741	0.2913	4	4	66
-199.4789		108.7594	15.04112	0.2913	4	4	67
-199.4789		108.7594	20.05482	0.2913	4	4	68
-199.4789		108.7594	25.06853	0.2913	4	4	69
-199.4789		108.7594	30.08223	0.2913	4	4	70
-199.4789		108.7594	35.09594	0.2913	4	4	71
-199.4789		108.7594	40.10964	0.2913	4	4	72
-199.4789		108.7594	45.12335	0.2913	4	4	73
-199.4789		108.7594	50.13705	0.2913	4	4	74
-199.4789		108.7594	55.15076	0.2913	4	4	75
-199.4789		108.7594	60.16447	0.2913	4	4	76
-199.4789		108.7594	65.17817	0.2913	4	4	77
-199.4789		108.7594	70.19187	0.2913	4	4	78
-199.4789		108.7594	75.20558	0.2913	4	4	79
-199.4789		108.7594	80.21928	0.2913	4	4	80
-199.4789		108.7594	85.23299	0.2913	4	4	81
-199.4789		108.7594	90.2467	0.2913	4	4	82
-199.4789		108.7594	95.2604	0.2913	4	4	83
-199.4789		108.7594	100.2741	0.2913	4	4	84
-199.4789		108.7594	105.2878	0.2913	4	4	85
-199.4789		108.7594	110.3015	0.2913	4	0	86

Wire No.	5	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-177.6047		-2.790037	0	0.2913	-5	5	87
-177.6047		-2.790037	4.727239	0.2913	5	5	88
-177.6047		-2.790037	9.454477	0.2913	5	5	89
-177.6047		-2.790037	14.18172	0.2913	5	5	90
-177.6047		-2.790037	18.90895	0.2913	5	5	91
-177.6047		-2.790037	23.63619	0.2913	5	5	92
-177.6047		-2.790037	28.36343	0.2913	5	5	93
-177.6047		-2.790037	33.09067	0.2913	5	5	94
-177.6047		-2.790037	37.81791	0.2913	5	5	95
-177.6047		-2.790037	42.54515	0.2913	5	5	96
-177.6047		-2.790037	47.27238	0.2913	5	5	97
-177.6047		-2.790037	51.99962	0.2913	5	5	98
-177.6047		-2.790037	56.72686	0.2913	5	5	99
-177.6047		-2.790037	61.4541	0.2913	5	5	100
-177.6047		-2.790037	66.18134	0.2913	5	5	101
-177.6047		-2.790037	70.90858	0.2913	5	5	102
-177.6047		-2.790037	75.63582	0.2913	5	5	103
-177.6047		-2.790037	80.36305	0.2913	5	5	104
-177.6047		-2.790037	85.09029	0.2913	5	5	105
-177.6047		-2.790037	89.81753	0.2913	5	0	106

Wire No.	6	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-164.9511		-97.1636	0	0.2913	-6	6	107
-164.9511		-97.1636	4.830111	0.2913	6	6	108
-164.9511		-97.1636	9.660222	0.2913	6	6	109
-164.9511		-97.1636	14.49033	0.2913	6	6	110
-164.9511		-97.1636	19.32044	0.2913	6	6	111
-164.9511		-97.1636	24.15055	0.2913	6	6	112
-164.9511		-97.1636	28.98066	0.2913	6	6	113
-164.9511		-97.1636	33.81078	0.2913	6	6	114
-164.9511		-97.1636	38.64089	0.2913	6	6	115
-164.9511		-97.1636	43.471	0.2913	6	6	116
-164.9511		-97.1636	48.30111	0.2913	6	6	117
-164.9511		-97.1636	53.13122	0.2913	6	6	118
-164.9511		-97.1636	57.96133	0.2913	6	6	119
-164.9511		-97.1636	62.79144	0.2913	6	6	120
-164.9511		-97.1636	67.62155	0.2913	6	6	121
-164.9511		-97.1636	72.45167	0.2913	6	6	122
-164.9511		-97.1636	77.28178	0.2913	6	6	123
-164.9511		-97.1636	82.11189	0.2913	6	6	124
-164.9511		-97.1636	86.942	0.2913	6	6	125
-164.9511		-97.1636	91.77211	0.2913	6	0	126

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 87, 3529.4, 52.6

Number of Loads: 5
Pulse No., Resistance, Reactance: 1 , 0 ,-10000
Pulse No., Resistance, Reactance: 21 , 0 ,-10000
Pulse No., Resistance, Reactance: 42 , 0 ,-10000
Pulse No., Resistance, Reactance: 64 , 0 ,-10000
Pulse No., Resistance, Reactance: 107 , 0 ,-10000

***** SOURCE DATA *****
Pulse 87 Voltage = (2144.1646, 2803.4092j)
Current = (45.0598, 1.2073j)
Impedance = (49.216, 60.897j)
Power = 50000.0 Watts

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-5.cir

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.3000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	2	0	.0000	.0000	.0000
L	3184.0000	2	0	.0000	.0000	.0000
R	49.2000	3	0	60.9000	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE			VOLT MAG		VOLT PHASE		BRANCH VOLTAGE				BRANCH CURRENT FROM NODE IMPEDANCE TO NODE IMPEDANCE			
							MAG		PHASE		MAG		PHASE	
1			106.7022		61.5072									
2			106.2288		61.9813									
3			78.8474		50.4174									
VSWR														
R	1-	2	1.000	1.00	.000	1.00	.000	50.90	93.78	49.90	93.78			
L	2-	3	6.300	33.01	90.588	.98	.588	51.84	95.05	51.84	61.41			
C	3-	0	.000	78.85	50.417	.03	140.417	.00	-2340.51	.00	.00			
L	2-	0	1310.000	106.23	61.981	.02	-28.019	.00	6996.33	.00	.00			
L	2-	0	3184.000	106.23	61.981	.01	-28.019	.00	17004.81	.00	.00			
R	3-	0	49.200	78.85	50.417	1.01	-.648	49.20	60.90	.00	.00			

Copy of WFTL-5.cir

0.85 0. 1
I 1 0 1
R 1.0000 1 2
L 6.3 2 3
C 0.00008 3 0
L 1310. 2 0
L 3184 2 0
R 49.2 3 0 +60.9
EX

 ACSModel
 (MININEC 3.1 Core)
 07-20-2016 17:00:32

WFTLCP6
 tower6 cal
 tower6 driven towers1-5 floating

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
0	0	0		-1		
0	0	96.01437	0.2913	0		20
Wire No. 2	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
21.06847	-108.3879	0		-2		
21.06847	-108.3879	107.6733	0.2913	0		21
Wire No. 3	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
32.49215	-205.1474	0		-3		
32.49215	-205.1474	113.8456	0.2913	0		22
Wire No. 4	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-199.4789	108.7594	0		-4		
-199.4789	108.7594	115.3152	0.2913	0		23
Wire No. 5	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-177.6047	-2.790037	0		-5		
-177.6047	-2.790037	94.54477	0.2913	0		20
Wire No. 6	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-164.9511	-97.1636	0		-6		
-164.9511	-97.1636	96.60222	0.2913	0		20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
0		0	0	0.2913	-1	1	1
0		0	4.800719	0.2913	1	1	2
0		0	9.601438	0.2913	1	1	3
0		0	14.40216	0.2913	1	1	4
0		0	19.20288	0.2913	1	1	5
0		0	24.00359	0.2913	1	1	6
0		0	28.80431	0.2913	1	1	7
0		0	33.60503	0.2913	1	1	8
0		0	38.40575	0.2913	1	1	9
0		0	43.20647	0.2913	1	1	10
0		0	48.00719	0.2913	1	1	11
0		0	52.8079	0.2913	1	1	12
0		0	57.60862	0.2913	1	1	13
0		0	62.40934	0.2913	1	1	14
0		0	67.21006	0.2913	1	1	15
0		0	72.01078	0.2913	1	1	16
0		0	76.8115	0.2913	1	1	17
0		0	81.61222	0.2913	1	1	18
0		0	86.41294	0.2913	1	1	19
0		0	91.21365	0.2913	1	0	20

Wire No.	2	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
21.06847		-108.3879	0	0.2913	-2	2	21
21.06847		-108.3879	5.127298	0.2913	2	2	22
21.06847		-108.3879	10.2546	0.2913	2	2	23
21.06847		-108.3879	15.38189	0.2913	2	2	24
21.06847		-108.3879	20.50919	0.2913	2	2	25
21.06847		-108.3879	25.63649	0.2913	2	2	26
21.06847		-108.3879	30.76379	0.2913	2	2	27
21.06847		-108.3879	35.89109	0.2913	2	2	28
21.06847		-108.3879	41.01839	0.2913	2	2	29
21.06847		-108.3879	46.14568	0.2913	2	2	30
21.06847		-108.3879	51.27298	0.2913	2	2	31
21.06847		-108.3879	56.40028	0.2913	2	2	32
21.06847		-108.3879	61.52758	0.2913	2	2	33
21.06847		-108.3879	66.65488	0.2913	2	2	34
21.06847		-108.3879	71.78217	0.2913	2	2	35
21.06847		-108.3879	76.90948	0.2913	2	2	36
21.06847		-108.3879	82.03677	0.2913	2	2	37
21.06847		-108.3879	87.16407	0.2913	2	2	38
21.06847		-108.3879	92.29137	0.2913	2	2	39
21.06847		-108.3879	97.41866	0.2913	2	2	40
21.06847		-108.3879	102.546	0.2913	2	0	41

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2913	-3	3	42
32.49215		-205.1474	5.174801	0.2913	3	3	43
32.49215		-205.1474	10.3496	0.2913	3	3	44
32.49215		-205.1474	15.5244	0.2913	3	3	45
32.49215		-205.1474	20.6992	0.2913	3	3	46
32.49215		-205.1474	25.874	0.2913	3	3	47
32.49215		-205.1474	31.04881	0.2913	3	3	48
32.49215		-205.1474	36.22361	0.2913	3	3	49
32.49215		-205.1474	41.39841	0.2913	3	3	50
32.49215		-205.1474	46.57321	0.2913	3	3	51
32.49215		-205.1474	51.74801	0.2913	3	3	52
32.49215		-205.1474	56.92281	0.2913	3	3	53
32.49215		-205.1474	62.09761	0.2913	3	3	54
32.49215		-205.1474	67.27241	0.2913	3	3	55
32.49215		-205.1474	72.44721	0.2913	3	3	56
32.49215		-205.1474	77.62202	0.2913	3	3	57
32.49215		-205.1474	82.79681	0.2913	3	3	58
32.49215		-205.1474	87.97161	0.2913	3	3	59
32.49215		-205.1474	93.14642	0.2913	3	3	60
32.49215		-205.1474	98.32121	0.2913	3	3	61
32.49215		-205.1474	103.496	0.2913	3	3	62
32.49215		-205.1474	108.6708	0.2913	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		108.7594	0	0.2913	-4	4	64
-199.4789		108.7594	5.013705	0.2913	4	4	65
-199.4789		108.7594	10.02741	0.2913	4	4	66
-199.4789		108.7594	15.04112	0.2913	4	4	67
-199.4789		108.7594	20.05482	0.2913	4	4	68
-199.4789		108.7594	25.06853	0.2913	4	4	69
-199.4789		108.7594	30.08223	0.2913	4	4	70
-199.4789		108.7594	35.09594	0.2913	4	4	71
-199.4789		108.7594	40.10964	0.2913	4	4	72
-199.4789		108.7594	45.12335	0.2913	4	4	73
-199.4789		108.7594	50.13705	0.2913	4	4	74
-199.4789		108.7594	55.15076	0.2913	4	4	75
-199.4789		108.7594	60.16447	0.2913	4	4	76
-199.4789		108.7594	65.17817	0.2913	4	4	77
-199.4789		108.7594	70.19187	0.2913	4	4	78
-199.4789		108.7594	75.20558	0.2913	4	4	79
-199.4789		108.7594	80.21928	0.2913	4	4	80
-199.4789		108.7594	85.23299	0.2913	4	4	81
-199.4789		108.7594	90.2467	0.2913	4	4	82
-199.4789		108.7594	95.2604	0.2913	4	4	83
-199.4789		108.7594	100.2741	0.2913	4	4	84
-199.4789		108.7594	105.2878	0.2913	4	4	85
-199.4789		108.7594	110.3015	0.2913	4	0	86

Wire No.	5	Coordinates			Connection	Pulse
X		Y	Z	Radius	End1	End2
-177.6047		-2.790037	0	0.2913	-5	5
-177.6047		-2.790037	4.727239	0.2913	5	5
-177.6047		-2.790037	9.454477	0.2913	5	5
-177.6047		-2.790037	14.18172	0.2913	5	5
-177.6047		-2.790037	18.90895	0.2913	5	5
-177.6047		-2.790037	23.63619	0.2913	5	5
-177.6047		-2.790037	28.36343	0.2913	5	5
-177.6047		-2.790037	33.09067	0.2913	5	5
-177.6047		-2.790037	37.81791	0.2913	5	5
-177.6047		-2.790037	42.54515	0.2913	5	5
-177.6047		-2.790037	47.27238	0.2913	5	5
-177.6047		-2.790037	51.99962	0.2913	5	5
-177.6047		-2.790037	56.72686	0.2913	5	5
-177.6047		-2.790037	61.4541	0.2913	5	5
-177.6047		-2.790037	66.18134	0.2913	5	5
-177.6047		-2.790037	70.90858	0.2913	5	5
-177.6047		-2.790037	75.63582	0.2913	5	5
-177.6047		-2.790037	80.36305	0.2913	5	5
-177.6047		-2.790037	85.09029	0.2913	5	5
-177.6047		-2.790037	89.81753	0.2913	5	0

Wire No.	6	Coordinates			Connection	Pulse
X		Y	Z	Radius	End1	End2
-164.9511		-97.1636	0	0.2913	-6	6
-164.9511		-97.1636	4.830111	0.2913	6	6
-164.9511		-97.1636	9.660222	0.2913	6	6
-164.9511		-97.1636	14.49033	0.2913	6	6
-164.9511		-97.1636	19.32044	0.2913	6	6
-164.9511		-97.1636	24.15055	0.2913	6	6
-164.9511		-97.1636	28.98066	0.2913	6	6
-164.9511		-97.1636	33.81078	0.2913	6	6
-164.9511		-97.1636	38.64089	0.2913	6	6
-164.9511		-97.1636	43.471	0.2913	6	6
-164.9511		-97.1636	48.30111	0.2913	6	6
-164.9511		-97.1636	53.13122	0.2913	6	6
-164.9511		-97.1636	57.96133	0.2913	6	6
-164.9511		-97.1636	62.79144	0.2913	6	6
-164.9511		-97.1636	67.62155	0.2913	6	6
-164.9511		-97.1636	72.45167	0.2913	6	6
-164.9511		-97.1636	77.28178	0.2913	6	6
-164.9511		-97.1636	82.11189	0.2913	6	6
-164.9511		-97.1636	86.942	0.2913	6	6
-164.9511		-97.1636	91.77211	0.2913	6	0

Sources: 1
Pulse No., Voltage Magnitude, Phase (Degrees): 107, 3687.9, 56.3

Number of Loads: 5
Pulse No., Resistance, Reactance: 1 , 0 , -10000
Pulse No., Resistance, Reactance: 21 , 0 , -10000
Pulse No., Resistance, Reactance: 42 , 0 , -10000
Pulse No., Resistance, Reactance: 64 , 0 , -10000
Pulse No., Resistance, Reactance: 87 , 0 , -10000

***** SOURCE DATA *****
Pulse 107 Voltage = (2047.7828, 3067.0716j)
Current = (40.33, 5.6774j)
Impedance = (60.287, 67.563j)
Power = 50000.0 Watts

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-6.cir

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	7.5000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	2	0	.0000	.0000	.0000
L	3184.0000	2	0	.0000	.0000	.0000
R	60.3000	3	0	67.6000	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
					MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1		123.2774		59.7035						
2		122.7760		60.1064						
3		91.2524		47.4697						
			BRANCH	VOLTAGE						
			MAG	PHASE						
VSWR										
R	1- 2	1.000	1.00	.000	1.00	.000	62.19	106.44	61.19	106.44
L	2- 3	7.500	39.20	90.723	.98	.723	63.90	107.97	63.90	67.92
C	3- 0	.000	91.25	47.470	.04	137.470	.00	-2340.51	.00	.00
L	2- 0	1310.000	122.78	60.106	.02	-29.894	.00	6996.33	.00	.00
L	2- 0	3184.000	122.78	60.106	.01	-29.894	.00	17004.81	.00	.00
R	3- 0	60.300	91.25	47.470	1.01	-.797	60.30	67.60	.00	.00

COPY OF WFTL-6.cir

0.85 0. 1
I 1 0 1
R 1.0000 1 2
L 7.5 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 60.3 3 0 +67.6
EX

Derivation of Operating Parameters for Daytime Directional Antenna

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

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

A circuit model was constructed to determine the effect of the series feed inductance, and shunt base region capacitance on the ATU output current. The circuit model for each tower is essentially the circuit model used for model verification above using the model-predicted operating impedance for each tower. Again, this model was used with the Westberg Circuit Analysis Program (WCAP).

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

Twr.	Node	Current Magnitude (amperes)	Current Phase (degrees)	WCAP Current Offset for Unity I_{BASE}	WCAP Phase Offset for Unity ϕ_{BASE} (degrees)	Antenna Monitor Ratio	Antenna Monitor Phase (degrees)
1	1	15.1554	+11.8	0.975	+1.751	0.680	-109.6
2	21	22.4062	+123.9	0.970	+0.769	1.00ref	0.0ref
3	42	10.8161	-105.9	0.958	+0.402	0.477	+131.3
4	64	9.7406	-23.3	0.956	+2.926	0.428	-149.3
5	87	28.1784	+80.9	0.987	+0.307	1.279	-42.0
6	107	16.6179	-170.1	0.989	-0.061	0.756	-66.7

 ACSModel
 (MININEC 3.1 Core)
 07-20-2016 17:12:15

WFTLCPD
 day OP
 All towers driven

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
0	0	0		-1	
0	0	96.01437	0.2913	0	20
Wire No. 2	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
21.06847	-108.3879	0		-2	
21.06847	-108.3879	107.6733	0.2913	0	21
Wire No. 3	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
32.49215	-205.1474	0		-3	
32.49215	-205.1474	113.8456	0.2913	0	22
Wire No. 4	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-199.4789	108.7594	0		-4	
-199.4789	108.7594	115.3152	0.2913	0	23
Wire No. 5	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-177.6047	-2.790037	0		-5	
-177.6047	-2.790037	94.54477	0.2913	0	20
Wire No. 6	Coordinates			End	No. of
X	Y	Z	Radius	Connection	
Segments					
-164.9511	-97.1636	0		-6	
-164.9511	-97.1636	96.60222	0.2913	0	20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection			Pulse
X		Y	Z	Radius	End1	End2	No.	
0		0	0	0.2913	-1	1	1	
0		0	4.800719	0.2913	1	1	2	
0		0	9.601438	0.2913	1	1	3	
0		0	14.40216	0.2913	1	1	4	
0		0	19.20288	0.2913	1	1	5	
0		0	24.00359	0.2913	1	1	6	
0		0	28.80431	0.2913	1	1	7	
0		0	33.60503	0.2913	1	1	8	
0		0	38.40575	0.2913	1	1	9	
0		0	43.20647	0.2913	1	1	10	
0		0	48.00719	0.2913	1	1	11	
0		0	52.8079	0.2913	1	1	12	
0		0	57.60862	0.2913	1	1	13	
0		0	62.40934	0.2913	1	1	14	
0		0	67.21006	0.2913	1	1	15	
0		0	72.01078	0.2913	1	1	16	
0		0	76.8115	0.2913	1	1	17	
0		0	81.61222	0.2913	1	1	18	
0		0	86.41294	0.2913	1	1	19	
0		0	91.21365	0.2913	1	0	20	

Wire No.	2	Coordinates			Connection			Pulse
X		Y	Z	Radius	End1	End2	No.	
21.06847		-108.3879	0	0.2913	-2	2	21	
21.06847		-108.3879	5.127298	0.2913	2	2	22	
21.06847		-108.3879	10.2546	0.2913	2	2	23	
21.06847		-108.3879	15.38189	0.2913	2	2	24	
21.06847		-108.3879	20.50919	0.2913	2	2	25	
21.06847		-108.3879	25.63649	0.2913	2	2	26	
21.06847		-108.3879	30.76379	0.2913	2	2	27	
21.06847		-108.3879	35.89109	0.2913	2	2	28	
21.06847		-108.3879	41.01839	0.2913	2	2	29	
21.06847		-108.3879	46.14568	0.2913	2	2	30	
21.06847		-108.3879	51.27298	0.2913	2	2	31	
21.06847		-108.3879	56.40028	0.2913	2	2	32	
21.06847		-108.3879	61.52758	0.2913	2	2	33	
21.06847		-108.3879	66.65488	0.2913	2	2	34	
21.06847		-108.3879	71.78217	0.2913	2	2	35	
21.06847		-108.3879	76.90948	0.2913	2	2	36	
21.06847		-108.3879	82.03677	0.2913	2	2	37	
21.06847		-108.3879	87.16407	0.2913	2	2	38	
21.06847		-108.3879	92.29137	0.2913	2	2	39	
21.06847		-108.3879	97.41866	0.2913	2	2	40	
21.06847		-108.3879	102.546	0.2913	2	0	41	

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2913	-3	3	42
32.49215		-205.1474	5.174801	0.2913	3	3	43
32.49215		-205.1474	10.3496	0.2913	3	3	44
32.49215		-205.1474	15.5244	0.2913	3	3	45
32.49215		-205.1474	20.6992	0.2913	3	3	46
32.49215		-205.1474	25.874	0.2913	3	3	47
32.49215		-205.1474	31.04881	0.2913	3	3	48
32.49215		-205.1474	36.22361	0.2913	3	3	49
32.49215		-205.1474	41.39841	0.2913	3	3	50
32.49215		-205.1474	46.57321	0.2913	3	3	51
32.49215		-205.1474	51.74801	0.2913	3	3	52
32.49215		-205.1474	56.92281	0.2913	3	3	53
32.49215		-205.1474	62.09761	0.2913	3	3	54
32.49215		-205.1474	67.27241	0.2913	3	3	55
32.49215		-205.1474	72.44721	0.2913	3	3	56
32.49215		-205.1474	77.62202	0.2913	3	3	57
32.49215		-205.1474	82.79681	0.2913	3	3	58
32.49215		-205.1474	87.97161	0.2913	3	3	59
32.49215		-205.1474	93.14642	0.2913	3	3	60
32.49215		-205.1474	98.32121	0.2913	3	3	61
32.49215		-205.1474	103.496	0.2913	3	3	62
32.49215		-205.1474	108.6708	0.2913	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		108.7594	0	0.2913	-4	4	64
-199.4789		108.7594	5.013705	0.2913	4	4	65
-199.4789		108.7594	10.02741	0.2913	4	4	66
-199.4789		108.7594	15.04112	0.2913	4	4	67
-199.4789		108.7594	20.05482	0.2913	4	4	68
-199.4789		108.7594	25.06853	0.2913	4	4	69
-199.4789		108.7594	30.08223	0.2913	4	4	70
-199.4789		108.7594	35.09594	0.2913	4	4	71
-199.4789		108.7594	40.10964	0.2913	4	4	72
-199.4789		108.7594	45.12335	0.2913	4	4	73
-199.4789		108.7594	50.13705	0.2913	4	4	74
-199.4789		108.7594	55.15076	0.2913	4	4	75
-199.4789		108.7594	60.16447	0.2913	4	4	76
-199.4789		108.7594	65.17817	0.2913	4	4	77
-199.4789		108.7594	70.19187	0.2913	4	4	78
-199.4789		108.7594	75.20558	0.2913	4	4	79
-199.4789		108.7594	80.21928	0.2913	4	4	80
-199.4789		108.7594	85.23299	0.2913	4	4	81
-199.4789		108.7594	90.2467	0.2913	4	4	82
-199.4789		108.7594	95.2604	0.2913	4	4	83
-199.4789		108.7594	100.2741	0.2913	4	4	84
-199.4789		108.7594	105.2878	0.2913	4	4	85
-199.4789		108.7594	110.3015	0.2913	4	0	86

Wire No.	5	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-177.6047		-2.790037	0	0.2913	-5	5	87
-177.6047		-2.790037	4.727239	0.2913	5	5	88
-177.6047		-2.790037	9.454477	0.2913	5	5	89
-177.6047		-2.790037	14.18172	0.2913	5	5	90
-177.6047		-2.790037	18.90895	0.2913	5	5	91
-177.6047		-2.790037	23.63619	0.2913	5	5	92
-177.6047		-2.790037	28.36343	0.2913	5	5	93
-177.6047		-2.790037	33.09067	0.2913	5	5	94
-177.6047		-2.790037	37.81791	0.2913	5	5	95
-177.6047		-2.790037	42.54515	0.2913	5	5	96
-177.6047		-2.790037	47.27238	0.2913	5	5	97
-177.6047		-2.790037	51.99962	0.2913	5	5	98
-177.6047		-2.790037	56.72686	0.2913	5	5	99
-177.6047		-2.790037	61.4541	0.2913	5	5	100
-177.6047		-2.790037	66.18134	0.2913	5	5	101
-177.6047		-2.790037	70.90858	0.2913	5	5	102
-177.6047		-2.790037	75.63582	0.2913	5	5	103
-177.6047		-2.790037	80.36305	0.2913	5	5	104
-177.6047		-2.790037	85.09029	0.2913	5	5	105
-177.6047		-2.790037	89.81753	0.2913	5	0	106

Wire No.	6	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-164.9511		-97.1636	0	0.2913	-6	6	107
-164.9511		-97.1636	4.830111	0.2913	6	6	108
-164.9511		-97.1636	9.660222	0.2913	6	6	109
-164.9511		-97.1636	14.49033	0.2913	6	6	110
-164.9511		-97.1636	19.32044	0.2913	6	6	111
-164.9511		-97.1636	24.15055	0.2913	6	6	112
-164.9511		-97.1636	28.98066	0.2913	6	6	113
-164.9511		-97.1636	33.81078	0.2913	6	6	114
-164.9511		-97.1636	38.64089	0.2913	6	6	115
-164.9511		-97.1636	43.471	0.2913	6	6	116
-164.9511		-97.1636	48.30111	0.2913	6	6	117
-164.9511		-97.1636	53.13122	0.2913	6	6	118
-164.9511		-97.1636	57.96133	0.2913	6	6	119
-164.9511		-97.1636	62.79144	0.2913	6	6	120
-164.9511		-97.1636	67.62155	0.2913	6	6	121
-164.9511		-97.1636	72.45167	0.2913	6	6	122
-164.9511		-97.1636	77.28178	0.2913	6	6	123
-164.9511		-97.1636	82.11189	0.2913	6	6	124
-164.9511		-97.1636	86.942	0.2913	6	6	125
-164.9511		-97.1636	91.77211	0.2913	6	0	126

Sources: 6

Pulse No., Voltage Magnitude, Phase (Degrees): 1, 2838.1, 57.5
Pulse No., Voltage Magnitude, Phase (Degrees): 21, 3874.3, -165.4
Pulse No., Voltage Magnitude, Phase (Degrees): 42, 2038.8, -25.0
Pulse No., Voltage Magnitude, Phase (Degrees): 64, 2879.9, 19.7
Pulse No., Voltage Magnitude, Phase (Degrees): 87, 1779.5, 149.1
Pulse No., Voltage Magnitude, Phase (Degrees): 107, 829.7, -74.7

Number of Loads: 0

***** SOURCE DATA *****

Pulse 1 Voltage = (1524.3059, 2394.0378j)
Current = (14.8338, 3.1054j)
Impedance = (130.813, 134.006j)
Power = 15022.85 Watts

Pulse 21 Voltage = (-3748.3395, -979.8136j)
Current = (-12.4965, 18.5977j)
Impedance = (57.006, 163.244j)
Power = 14309.48 Watts

Pulse 42 Voltage = (1847.2464, -862.6872j)
Current = (-2.9698, -10.4004j)
Impedance = (29.801, 186.123j)
Power = 1743.17 Watts

Pulse 64 Voltage = (2711.3627, 970.6311j)
Current = (8.9489, -3.8467j)
Impedance = (216.378, 201.475j)
Power = 10264.96 Watts

Pulse 87 Voltage = (-1526.609, 914.312j)
Current = (4.4776, 27.8204j)
Impedance = (23.426, 58.644j)
Power = 9300.51 Watts

Pulse 107 Voltage = (218.4142, -800.4364j)
Current = (-16.369, -2.8651j)
Impedance = (-4.642, 49.712j)
Power = -640.956611 Watts

Total Power = 50000.001 Watts

CURRENT DATA

Wire No. 1 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
1	14.8338	3.1054	15.1553	11.824
2	16.0838	2.2724	16.2435	8.0418
3	16.7655	1.727	16.8542	5.8814
4	17.2052	1.2625	17.2514	4.1968
5	17.4424	0.8546	17.4633	2.8051
6	17.4946	0.4939	17.5016	1.6172
7	17.3716	0.1763	17.3725	0.5814
8	17.0802	-0.1002	17.0805	-0.3362
9	16.6261	-0.3364	16.6295	-1.1592
10	16.0149	-0.5327	16.0238	-1.905
11	15.2522	-0.6891	15.2678	-2.5868
12	14.3439	-0.8057	14.3665	-3.2149
13	13.2962	-0.8826	13.3255	-3.7977
14	12.1153	-0.9199	12.1501	-4.3419
15	10.8073	-0.9176	10.8462	-4.8531
16	9.3777	-0.8759	9.4185	-5.3361
17	7.8304	-0.7947	7.8706	-5.7952
18	6.1655	-0.6735	6.2021	-6.2342
19	4.3742	-0.5106	4.4039	-6.6574
20	2.4238	-0.3007	2.4424	-7.0726
E	0.0	0.0	0.0	0.0

Wire No. 2 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
21	-12.4965	18.5977	22.4062	123.8987
22	-13.0135	20.6586	24.4157	122.2081
23	-13.261	21.8548	25.5633	121.2484
24	-13.3743	22.7018	26.3484	120.5036
25	-13.3706	23.2626	26.8314	119.8889
26	-13.2581	23.564	27.0377	119.3639
27	-13.0417	23.6199	26.9812	118.9053
28	-12.7256	23.4395	26.6712	118.498
29	-12.3136	23.0306	26.1158	118.1316
30	-11.8097	22.4005	25.3229	117.7986
31	-11.2184	21.5567	24.3011	117.4931
32	-10.5442	20.5073	23.0593	117.2108
33	-9.7921	19.2612	21.6074	116.948
34	-8.9672	17.8278	19.9559	116.7021
35	-8.0749	16.2167	18.1159	116.4705
36	-7.1204	14.438	16.0983	116.2513
37	-6.1085	12.5006	13.9132	116.0428
38	-5.043	10.4118	11.5688	115.8435
39	-3.9256	8.1743	9.068	115.652
40	-2.7524	5.7792	6.4012	115.4666
41	-1.5052	3.1865	3.5241	115.2842
E	0.0	0.0	0.0	0.0

Wire No. 3 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
42	-2.9698	-10.4004	10.8161	-105.9365
43	-3.4522	-11.4217	11.932	-106.8175
44	-3.7458	-12.0151	12.5855	-107.315
45	-3.9691	-12.4352	13.0533	-107.702
46	-4.1365	-12.7131	13.3691	-108.0234
47	-4.2539	-12.862	13.5472	-108.3008
48	-4.3241	-12.8887	13.5947	-108.5461
49	-4.3487	-12.7981	13.5167	-108.7674
50	-4.329	-12.5939	13.3172	-108.9699
51	-4.2661	-12.2799	12.9998	-109.1577
52	-4.1611	-11.86	12.5688	-109.3336
53	-4.0152	-11.3386	12.0285	-109.5
54	-3.8297	-10.7202	11.3837	-109.6587
55	-3.606	-10.01	10.6397	-109.8111
56	-3.3458	-9.2132	9.8019	-109.9583
57	-3.0506	-8.3356	8.8763	-110.1014
58	-2.7223	-7.3826	7.8685	-110.241
59	-2.3623	-6.3594	6.784	-110.3779
60	-1.9718	-5.2704	5.6272	-110.5127
61	-1.5514	-4.1174	4.3999	-110.6458
62	-1.099	-2.8966	3.0981	-110.778
63	-0.6071	-1.5889	1.7009	-110.9114
E	0.0	0.0	0.0	0.0

Wire No. 4 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
64	8.9489	-3.8467	9.7406	-23.2608
65	9.468	-5.3487	10.8743	-29.4631
66	9.7505	-6.2932	11.605	-32.8389
67	9.9296	-7.0511	12.1785	-35.3789
68	10.0218	-7.6668	12.618	-37.4165
69	10.0341	-8.1581	12.9321	-39.1122
70	9.9709	-8.5333	13.1239	-40.5578
71	9.8349	-8.7972	13.1953	-41.8125
72	9.6287	-8.9529	13.1479	-42.9169
73	9.3551	-9.0027	12.9833	-43.9004
74	9.0165	-8.9491	12.7037	-44.7849
75	8.6161	-8.7946	12.3118	-45.5872
76	8.1569	-8.5419	11.811	-46.3208
77	7.6424	-8.1943	11.205	-46.9961
78	7.0761	-7.7552	10.4983	-47.6218
79	6.4618	-7.2284	9.6956	-48.205
80	5.8033	-6.6178	8.802	-48.7519
81	5.1044	-5.9276	7.8225	-49.2674
82	4.3685	-5.1614	6.7619	-49.7561
83	3.5983	-4.3221	5.6239	-50.2219
84	2.7949	-3.4109	4.4098	-50.6687
85	1.9558	-2.4238	3.1145	-51.1005
86	1.0678	-1.3436	1.7163	-51.5252
E	0.0	0.0	0.0	0.0

Wire No. 5 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
87	4.4776	27.8204	28.1784	80.8569
88	4.9537	28.5566	28.9831	80.1589
89	5.2203	28.8258	29.2947	79.7351
90	5.4016	28.8365	29.338	79.3904
91	5.5126	28.6151	29.1413	79.0958
92	5.5598	28.1751	28.7184	78.8372
93	5.5469	27.5252	28.0785	78.6063
94	5.4762	26.673	27.2294	78.3979
95	5.3498	25.6259	26.1784	78.2079
96	5.1696	24.3915	24.9334	78.0336
97	4.9376	22.978	23.5025	77.8726
98	4.6556	21.3938	21.8945	77.7231
99	4.3257	19.6478	20.1184	77.5837
100	3.9501	17.749	18.1832	77.4532
101	3.5307	15.7059	16.0979	77.3304
102	3.0695	13.5262	13.8701	77.2144
103	2.5676	11.2149	11.5051	77.1045
104	2.0252	8.7721	9.0029	76.9998
105	1.4394	6.1851	6.3504	76.8995
106	0.7992	3.4078	3.5003	76.8017
E	0.0	0.0	0.0	0.0

Wire No. 6 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
107	-16.369	-2.8651	16.6179	-170.072
108	-16.755	-2.9746	17.017	-169.9328
109	-16.8837	-3.0224	17.1521	-169.8509
110	-16.8649	-3.0382	17.1364	-169.7876
111	-16.7129	-3.0261	16.9847	-169.737
112	-16.4351	-2.9879	16.7045	-169.6963
113	-16.0364	-2.9248	16.3009	-169.6637
114	-15.5212	-2.838	15.7785	-169.6382
115	-14.8941	-2.7285	15.142	-169.619
116	-14.1596	-2.5974	14.3959	-169.6053
117	-13.3228	-2.446	13.5455	-169.5966
118	-12.3888	-2.2754	12.5961	-169.5925
119	-11.3632	-2.087	11.5533	-169.5927
120	-10.2514	-1.8821	10.4227	-169.5966
121	-9.0589	-1.6619	9.21	-169.6041
122	-7.7903	-1.4277	7.9201	-169.6147
123	-6.4493	-1.1804	6.5565	-169.6282
124	-5.0363	-0.9203	5.1197	-169.6442
125	-3.5445	-0.6465	3.603	-169.6625
126	-1.9484	-0.3547	1.9804	-169.6831
E	0.0	0.0	0.0	0.0

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-1d.cir

I	14.7830	0	1	13.5750	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	5.1000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	2	0	.0000	.0000	.0000
L	3184.0000	2	0	.0000	.0000	.0000
R	130.8130	3	0	134.0060	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1		3123.5860		62.6225								
2		3113.9170		62.8279								
3		2838.1730		57.5146								
VSWR												
R	1- 2	1.000	14.78	13.576	14.78	13.576	138.49	159.58	137.49	159.58		
L	2- 3	5.100	389.85	105.217	14.31	15.217	146.67	160.69	146.67	133.45		
C	3- 0	.000	2838.17	57.515	1.21	147.515	.00	-2340.51	.00	.00		
L	2- 0	1310.000	3113.92	62.828	.45	-27.172	.00	6996.33	.00	.00		
L	2- 0	3184.000	3113.92	62.828	.18	-27.172	.00	17004.81	.00	.00		
R	3- 0	130.813	2838.17	57.515	15.16	11.824	130.81	134.01	.00	.00		

Copy of FILE WFTL-1D.CIR

```

0.85 0. 1
I 14.783 0 1 13.575
R 1.0000 1 2
L 5.1 2 3
C 0.00008 3 0
L 1310. 2 0
L 3184 2 0
R 130.813 3 0 +134.006
EX

```

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-2d.cir

I	21.7250	0	1	124.6690	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.3000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	2	0	.0000	.0000	.0000
L	3184.0000	2	0	.0000	.0000	.0000
R	57.0000	3	0	163.3000	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1		4544.7550		-162.4659								
2		4538.4020		-162.2038								
3		3875.5170		-165.3420								
VSWR												
R	1- 2	1.000	21.73	124.669	21.73	124.669	61.63	199.91	60.63	199.91		
L	2- 3	6.300	701.55	-144.601	20.85	125.399	65.83	207.47	65.83	173.82		
C	3- 0	.000	3875.52	-165.342	1.66	-75.342	.00	-2340.51	.00	.00		
L	2- 0	1310.000	4538.40	-162.204	.65	107.796	.00	6996.33	.00	.00		
L	2- 0	3184.000	4538.40	-162.204	.27	107.796	.00	17004.81	.00	.00		
R	3- 0	57.000	3875.52	-165.342	22.41	123.900	57.00	163.30	.00	.00		

COPY OF WFTL-2D.cir

```

0.85 0. 1
I 21.734 0 1 123.13
R 1.0000 1 2
L 6.3 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 57.01 3 0 +163.244
EX

```

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-3d.cir

```

I 10.3670 0 1 -105.5350 .0000 .0000
R 1.0000 1 2 .0000 .0000 .0000
L 7.0000 2 3 .0000 .0000 .0000
C .0001 3 0 .0000 .0000 .0000
L 1310.0000 3 0 .0000 .0000 .0000
L 3184.0000 3 0 .0000 .0000 .0000
R 29.8010 3 0 186.1230 .0000 .0000
EX .0000 0 0 .0000 .0000 .0000

```

FREQ = .850

NODE	VOLT MAG	VOLT PHASE	BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1	2424.2430	-23.7635								
2	2422.7810	-23.5209								
3	2039.6800	-25.0336								
VSWR										
R 1- 2	1.000	10.37	-105.535	10.37	-105.535	33.47	231.43	32.47	231.43	
L 2- 3	7.000	387.57	-15.535	10.37	-105.535	32.47	231.43	32.47	194.05	
C 3- 0	.000	2039.68	-25.034	.87	64.966	.00	-2340.51	.00	.00	
L 3- 0	1310.000	2039.68	-25.034	.29	-115.034	.00	6996.33	.00	.00	
L 3- 0	3184.000	2039.68	-25.034	.12	-115.034	.00	17004.81	.00	.00	
R 3- 0	29.801	2039.68	-25.034	10.82	-105.937	29.80	186.12	.00	.00	

COPY OF WFTL-3d.cir

```

0.85 0. 1
I 10.367 0 1 -105.535
R 1.0000 1 2
L 7 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 29.801 3 0 +186.123
EX

```

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-4d.cir

```

I 9.3105 0 1 -20.3350 .0000 .0000
R 1.0000 1 2 .0000 .0000 .0000
L 9.2000 2 3 .0000 .0000 .0000
C .0001 3 0 .0000 .0000 .0000
L 1310.0000 3 0 .0000 .0000 .0000
L 3184.0000 3 0 .0000 .0000 .0000
R 216.3780 3 0 201.4750 .0000 .0000
EX .0000 0 0 .0000 .0000 .0000

```

FREQ = .850

NODE	VOLT MAG	VOLT PHASE	BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1	3199.9060	25.8726								
2	3193.4690	25.9932								
3	2879.9570	19.6960								
VSWR										
R 1- 2	1.000	9.31	-20.335	9.31	-20.335	237.85	248.09	236.85	248.09	
L 2- 3	9.200	457.47	69.665	9.31	-20.335	236.85	248.09	236.85	198.96	
C 3- 0	.000	2879.96	19.696	1.23	109.696	.00	-2340.51	.00	.00	
L 3- 0	1310.000	2879.96	19.696	.41	-70.304	.00	6996.33	.00	.00	
L 3- 0	3184.000	2879.96	19.696	.17	-70.304	.00	17004.81	.00	.00	
R 3- 0	216.378	2879.96	19.696	9.74	-23.261	216.38	201.48	.00	.00	

COPY OF FILE WFTL-4D.cir

```

0.85 0. 1
I 9.3105 0 1 -20.335
R 1.0000 1 2
L 9.2 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 216.378 3 0 +201.475
EX

```

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-5d.cir

I	27.8060	0	1	81.1640	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.3000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	23.4260	3	0	58.6440	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE							
1		2676.7720		156.0765						
2		2669.6700		156.6527						
3		1779.4520		149.0825						
		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE		
		MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE	
VSWR										
R	1- 2	1.000	27.81	81.164	27.81	81.164	25.06	92.95	24.06	92.95
L	2- 3	6.300	935.57	171.164	27.81	81.164	24.06	92.95	24.06	59.30
C	3- 0	.000	1779.45	149.082	.76	-120.918	.00	-2340.51	.00	.00
L	3- 0	1310.000	1779.45	149.082	.25	59.082	.00	6996.33	.00	.00
L	3- 0	3184.000	1779.45	149.082	.10	59.082	.00	17004.81	.00	.00
R	3- 0	23.426	1779.45	149.082	28.18	80.857	23.43	58.64	.00	.00

COPY OF FILE WFTL-5D.cir

```

0.85 0. 1
I 27.806 0 1 81.164
R 1.0000 1 2
L 6.3 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 23.426 3 0 58.644
EX

```

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-6d.cir

I	16.4320	0	1	-170.1330	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	7.5000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	-4.6420	3	0	49.7120	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE							
1		1485.5120		-77.7570						
2		1486.2840		-77.1241						
3		829.7227		-74.7377						
		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE		
		MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE	
VSWR										
R	1- 2	1.000	16.43	-170.133	16.43	-170.133	-3.75	90.33	-4.75	90.33
L	2- 3	7.500	658.19	-80.133	16.43	-170.133	-4.75	90.33	-4.75	50.27
C	3- 0	.000	829.72	-74.738	.35	15.262	.00	-2340.51	.00	.00
L	3- 0	1310.000	829.72	-74.738	.12	-164.738	.00	6996.33	.00	.00
L	3- 0	3184.000	829.72	-74.738	.05	-164.738	.00	17004.81	.00	.00
R	3- 0	-4.642	829.72	-74.738	16.62	-170.072	-4.64	49.71	.00	.00

COPY OF WFTL-6D.cir

```

0.85 0. 1
I 16.432 0 1 -170.133
R 1.0000 1 2
L 7.5 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R -4.642 3 0 +49.712
EX

```

Derivation of Operating Parameters for Nighttime Hours Directional Antenna

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

Twenty segments were used for towers 1, 5, and 6, and the number of segments increasing with the actual tower height so that the segments are similar length for all towers. The WFTL towers are base sampled, which is permitted for towers of 120 electrical degrees or less. As such, the first (ground) segment of each tower was used to determine the model operating parameters of the array.

A circuit model was constructed to determine the effect of the series feed inductance, and shunt base region capacitance on the ATU output current. The circuit model for each tower is essentially the circuit model used for model verification above using the model-predicted operating impedance for each tower. Again, this model was used with the Westberg Circuit Analysis Program (WCAP).

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

Twr.	Node	Current Magnitude (amperes)	Current Phase (degrees)	WCAP Current Offset for Unity I_{BASE}	WCAP Phase Offset for Unity ϕ_{BASE} (degrees)	Antenna Monitor Ratio	Antenna Monitor Phase (degrees)
1	1	5.2584	-66.762	0.9756	+3.37	0.387	-94.2
2	21	13.7168	29.642	0.965	+1.123	1.00ref	0.0ref
3	42	7.2624	137.934	0.962	+0.324	0.528	107.5
4	64	4.983	-89.232	0.947	3.452	0.356	-116.5
5	87	20.806	3.465	0.986	+0.371	1.550	-26.9
6	107	12.456	112.303	0.986	-0.166	0.928	+81.4

 ACSModel
 (MININEC 3.1 Core)
 07-21-2016 17:04:38

WFTLCPN
 Night Operation
 All towers driven

Frequency = 0.850 MHz Wavelength = 352.70587 Meters

No. of Wires: 6

Wire No. 1	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
0	0	0		-1		
0	0	96.01437	0.2913	0		20
Wire No. 2	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
21.06847	-108.3879	0		-2		
21.06847	-108.3879	107.6733	0.2913	0		21
Wire No. 3	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
32.49215	-205.1474	0		-3		
32.49215	-205.1474	113.8456	0.2913	0		22
Wire No. 4	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-199.4789	108.7594	0		-4		
-199.4789	108.7594	115.3152	0.2913	0		23
Wire No. 5	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-177.6047	-2.790037	0		-5		
-177.6047	-2.790037	94.54477	0.2913	0		20
Wire No. 6	Coordinates			Radius	End Connection	No. of
X	Y	Z				
Segments						
-164.9511	-97.1636	0		-6		
-164.9511	-97.1636	96.60222	0.2913	0		20

**** ANTENNA GEOMETRY ****

Wire No.	1	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
0		0	0	0.2913	-1	1	1
0		0	4.800719	0.2913	1	1	2
0		0	9.601438	0.2913	1	1	3
0		0	14.40216	0.2913	1	1	4
0		0	19.20288	0.2913	1	1	5
0		0	24.00359	0.2913	1	1	6
0		0	28.80431	0.2913	1	1	7
0		0	33.60503	0.2913	1	1	8
0		0	38.40575	0.2913	1	1	9
0		0	43.20647	0.2913	1	1	10
0		0	48.00719	0.2913	1	1	11
0		0	52.8079	0.2913	1	1	12
0		0	57.60862	0.2913	1	1	13
0		0	62.40934	0.2913	1	1	14
0		0	67.21006	0.2913	1	1	15
0		0	72.01078	0.2913	1	1	16
0		0	76.8115	0.2913	1	1	17
0		0	81.61222	0.2913	1	1	18
0		0	86.41294	0.2913	1	1	19
0		0	91.21365	0.2913	1	0	20

Wire No.	2	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
21.06847		-108.3879	0	0.2913	-2	2	21
21.06847		-108.3879	5.127298	0.2913	2	2	22
21.06847		-108.3879	10.2546	0.2913	2	2	23
21.06847		-108.3879	15.38189	0.2913	2	2	24
21.06847		-108.3879	20.50919	0.2913	2	2	25
21.06847		-108.3879	25.63649	0.2913	2	2	26
21.06847		-108.3879	30.76379	0.2913	2	2	27
21.06847		-108.3879	35.89109	0.2913	2	2	28
21.06847		-108.3879	41.01839	0.2913	2	2	29
21.06847		-108.3879	46.14568	0.2913	2	2	30
21.06847		-108.3879	51.27298	0.2913	2	2	31
21.06847		-108.3879	56.40028	0.2913	2	2	32
21.06847		-108.3879	61.52758	0.2913	2	2	33
21.06847		-108.3879	66.65488	0.2913	2	2	34
21.06847		-108.3879	71.78217	0.2913	2	2	35
21.06847		-108.3879	76.90948	0.2913	2	2	36
21.06847		-108.3879	82.03677	0.2913	2	2	37
21.06847		-108.3879	87.16407	0.2913	2	2	38
21.06847		-108.3879	92.29137	0.2913	2	2	39
21.06847		-108.3879	97.41866	0.2913	2	2	40
21.06847		-108.3879	102.546	0.2913	2	0	41

Wire No.	3	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
32.49215		-205.1474	0	0.2913	-3	3	42
32.49215		-205.1474	5.174801	0.2913	3	3	43
32.49215		-205.1474	10.3496	0.2913	3	3	44
32.49215		-205.1474	15.5244	0.2913	3	3	45
32.49215		-205.1474	20.6992	0.2913	3	3	46
32.49215		-205.1474	25.874	0.2913	3	3	47
32.49215		-205.1474	31.04881	0.2913	3	3	48
32.49215		-205.1474	36.22361	0.2913	3	3	49
32.49215		-205.1474	41.39841	0.2913	3	3	50
32.49215		-205.1474	46.57321	0.2913	3	3	51
32.49215		-205.1474	51.74801	0.2913	3	3	52
32.49215		-205.1474	56.92281	0.2913	3	3	53
32.49215		-205.1474	62.09761	0.2913	3	3	54
32.49215		-205.1474	67.27241	0.2913	3	3	55
32.49215		-205.1474	72.44721	0.2913	3	3	56
32.49215		-205.1474	77.62202	0.2913	3	3	57
32.49215		-205.1474	82.79681	0.2913	3	3	58
32.49215		-205.1474	87.97161	0.2913	3	3	59
32.49215		-205.1474	93.14642	0.2913	3	3	60
32.49215		-205.1474	98.32121	0.2913	3	3	61
32.49215		-205.1474	103.496	0.2913	3	3	62
32.49215		-205.1474	108.6708	0.2913	3	0	63

Wire No.	4	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-199.4789		108.7594	0	0.2913	-4	4	64
-199.4789		108.7594	5.013705	0.2913	4	4	65
-199.4789		108.7594	10.02741	0.2913	4	4	66
-199.4789		108.7594	15.04112	0.2913	4	4	67
-199.4789		108.7594	20.05482	0.2913	4	4	68
-199.4789		108.7594	25.06853	0.2913	4	4	69
-199.4789		108.7594	30.08223	0.2913	4	4	70
-199.4789		108.7594	35.09594	0.2913	4	4	71
-199.4789		108.7594	40.10964	0.2913	4	4	72
-199.4789		108.7594	45.12335	0.2913	4	4	73
-199.4789		108.7594	50.13705	0.2913	4	4	74
-199.4789		108.7594	55.15076	0.2913	4	4	75
-199.4789		108.7594	60.16447	0.2913	4	4	76
-199.4789		108.7594	65.17817	0.2913	4	4	77
-199.4789		108.7594	70.19187	0.2913	4	4	78
-199.4789		108.7594	75.20558	0.2913	4	4	79
-199.4789		108.7594	80.21928	0.2913	4	4	80
-199.4789		108.7594	85.23299	0.2913	4	4	81
-199.4789		108.7594	90.2467	0.2913	4	4	82
-199.4789		108.7594	95.2604	0.2913	4	4	83
-199.4789		108.7594	100.2741	0.2913	4	4	84
-199.4789		108.7594	105.2878	0.2913	4	4	85
-199.4789		108.7594	110.3015	0.2913	4	0	86

Wire No.	5	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-177.6047		-2.790037	0	0.2913	-5	5	87
-177.6047		-2.790037	4.727239	0.2913	5	5	88
-177.6047		-2.790037	9.454477	0.2913	5	5	89
-177.6047		-2.790037	14.18172	0.2913	5	5	90
-177.6047		-2.790037	18.90895	0.2913	5	5	91
-177.6047		-2.790037	23.63619	0.2913	5	5	92
-177.6047		-2.790037	28.36343	0.2913	5	5	93
-177.6047		-2.790037	33.09067	0.2913	5	5	94
-177.6047		-2.790037	37.81791	0.2913	5	5	95
-177.6047		-2.790037	42.54515	0.2913	5	5	96
-177.6047		-2.790037	47.27238	0.2913	5	5	97
-177.6047		-2.790037	51.99962	0.2913	5	5	98
-177.6047		-2.790037	56.72686	0.2913	5	5	99
-177.6047		-2.790037	61.4541	0.2913	5	5	100
-177.6047		-2.790037	66.18134	0.2913	5	5	101
-177.6047		-2.790037	70.90858	0.2913	5	5	102
-177.6047		-2.790037	75.63582	0.2913	5	5	103
-177.6047		-2.790037	80.36305	0.2913	5	5	104
-177.6047		-2.790037	85.09029	0.2913	5	5	105
-177.6047		-2.790037	89.81753	0.2913	5	0	106

Wire No.	6	Coordinates			Connection		Pulse
X		Y	Z	Radius	End1	End2	No.
-164.9511		-97.1636	0	0.2913	-6	6	107
-164.9511		-97.1636	4.830111	0.2913	6	6	108
-164.9511		-97.1636	9.660222	0.2913	6	6	109
-164.9511		-97.1636	14.49033	0.2913	6	6	110
-164.9511		-97.1636	19.32044	0.2913	6	6	111
-164.9511		-97.1636	24.15055	0.2913	6	6	112
-164.9511		-97.1636	28.98066	0.2913	6	6	113
-164.9511		-97.1636	33.81078	0.2913	6	6	114
-164.9511		-97.1636	38.64089	0.2913	6	6	115
-164.9511		-97.1636	43.471	0.2913	6	6	116
-164.9511		-97.1636	48.30111	0.2913	6	6	117
-164.9511		-97.1636	53.13122	0.2913	6	6	118
-164.9511		-97.1636	57.96133	0.2913	6	6	119
-164.9511		-97.1636	62.79144	0.2913	6	6	120
-164.9511		-97.1636	67.62155	0.2913	6	6	121
-164.9511		-97.1636	72.45167	0.2913	6	6	122
-164.9511		-97.1636	77.28178	0.2913	6	6	123
-164.9511		-97.1636	82.11189	0.2913	6	6	124
-164.9511		-97.1636	86.942	0.2913	6	6	125
-164.9511		-97.1636	91.77211	0.2913	6	0	126

Sources: 6

Pulse No., Voltage Magnitude, Phase (Degrees): 1, 1510.6, -37.9
Pulse No., Voltage Magnitude, Phase (Degrees): 21, 2423.4, 91.3
Pulse No., Voltage Magnitude, Phase (Degrees): 42, 1230.0, -140.2
Pulse No., Voltage Magnitude, Phase (Degrees): 64, 1742.2, -45.6
Pulse No., Voltage Magnitude, Phase (Degrees): 87, 1431.6, 69.2
Pulse No., Voltage Magnitude, Phase (Degrees): 107, 778.4, -146.0

Number of Loads: 0

***** SOURCE DATA *****

Pulse 1 Voltage = (1191.3335, -928.844j)
Current = (2.0747, -4.8318j)
Impedance = (251.698, 138.484j)
Power = 3479.85 Watts

Pulse 21 Voltage = (-54.3984, 2422.8386j)
Current = (11.9218, 6.784j)
Impedance = (83.911, 155.479j)
Power = 7894.02 Watts

Pulse 42 Voltage = (-945.6466, -786.541j)
Current = (-5.3914, 4.8657j)
Impedance = (24.104, 167.641j)
Power = 635.65 Watts

Pulse 64 Voltage = (1219.6184, -1244.0959j)
Current = (0.0668, -4.9825j)
Impedance = (252.928, 241.39j)
Power = 3140.08 Watts

Pulse 87 Voltage = (507.3321, 1338.7336j)
Current = (20.7681, 1.2575j)
Impedance = (28.228, 62.752j)
Power = 6109.88 Watts

Pulse 107 Voltage = (-645.6005, -434.9111j)
Current = (-4.727, 11.5238j)
Impedance = (-12.634, 61.205j)
Power = -980.057513 Watts

Total Power = 20279.416 Watts

CURRENT DATA

Wire No. 1 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
1	2.0747	-4.8318	5.2584	-66.762
2	1.5665	-5.4612	5.6815	-73.9945
3	1.2326	-5.8226	5.9517	-78.0474
4	0.9468	-6.0781	6.1514	-81.1461
5	0.6945	-6.2473	6.2858	-83.6567
6	0.4699	-6.3385	6.3559	-85.7606
7	0.2705	-6.3563	6.3621	-87.5636
8	0.0952	-6.3036	6.3043	-89.1351
9	-0.0565	-6.1826	6.1829	-90.5236
10	-0.1847	-5.9957	5.9986	-91.7642
11	-0.2894	-5.7451	5.7523	-92.8838
12	-0.3707	-5.4328	5.4455	-93.9029
13	-0.4284	-5.0615	5.0796	-94.8379
14	-0.4626	-4.6333	4.6564	-95.7019
15	-0.4733	-4.1508	4.1777	-96.5056
16	-0.4606	-3.6161	3.6453	-97.2583
17	-0.4242	-3.0306	3.0601	-97.9676
18	-0.3639	-2.3945	2.422	-98.6407
19	-0.2786	-1.7044	1.7271	-99.2847
20	-0.1656	-0.9474	0.9618	-99.9123
E	0.0	0.0	0.0	0.0

Wire No. 2 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
21	11.9218	6.784	13.7168	29.6417
22	13.2541	6.7955	14.8946	27.1446
23	14.028	6.7577	15.5708	25.7217
24	14.5765	6.6786	16.0337	24.6161
25	14.9406	6.5596	16.3172	23.7038
26	15.1374	6.4021	16.4356	22.9251
27	15.1759	6.2074	16.3963	22.2458
28	15.0622	5.9769	16.2047	21.6437
29	14.8013	5.7123	15.8653	21.1032
30	14.3977	5.4155	15.3825	20.6131
31	13.8565	5.0885	14.7613	20.1647
32	13.1829	4.7335	14.007	19.7514
33	12.3826	4.3528	13.1253	19.368
34	11.4615	3.9488	12.1227	19.0101
35	10.4262	3.5238	11.0056	18.6741
36	9.2828	3.0803	9.7805	18.3571
37	8.0373	2.6202	8.4536	18.0565
38	6.6944	2.1454	7.0297	17.7699
39	5.2557	1.6566	5.5106	17.4951
40	3.7157	1.1523	3.8903	17.2299
41	2.0487	0.6252	2.142	16.9696
E	0.0	0.0	0.0	0.0

Wire No. 3 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
42	-5.3914	4.8657	7.2624	137.934
43	-5.8237	5.3901	7.9353	137.214
44	-6.0686	5.6988	8.3249	136.8002
45	-6.2346	5.9218	8.5987	136.4741
46	-6.335	6.0751	8.7772	136.2001
47	-6.3756	6.1652	8.869	135.9611
48	-6.3595	6.1957	8.8786	135.7476
49	-6.2889	6.1686	8.8092	135.5532
50	-6.1656	6.0857	8.6631	135.3735
51	-5.9914	5.9486	8.443	135.2054
52	-5.7685	5.7591	8.1513	135.0464
53	-5.4988	5.519	7.7908	134.8948
54	-5.1848	5.2304	7.3647	134.749
55	-4.8288	4.8954	6.8762	134.6078
56	-4.4337	4.5164	6.3289	134.4704
57	-4.002	4.0959	5.7264	134.3359
58	-3.5366	3.6363	5.0724	134.2038
59	-3.0399	3.1399	4.3703	134.0735
60	-2.5141	2.6085	3.6229	133.9447
61	-1.9602	2.0429	2.8312	133.8168
62	-1.3763	1.4408	1.9925	133.6893
63	-0.7535	0.7924	1.0934	133.5604
E	0.0	0.0	0.0	0.0

Wire No. 4 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
64	0.0668	-4.9825	4.983	-89.2322
65	-0.6268	-5.6502	5.6849	-96.3298
66	-1.0733	-6.0515	6.146	-100.0571
67	-1.4429	-6.3534	6.5152	-102.7949
68	-1.7557	-6.5759	6.8063	-104.9486
69	-2.0198	-6.7276	7.0242	-106.7113
70	-2.2388	-6.8125	7.1709	-108.1923
71	-2.4146	-6.8333	7.2474	-109.461
72	-2.5482	-6.7921	7.2543	-110.5645
73	-2.6404	-6.6905	7.1926	-111.5364
74	-2.6918	-6.5304	7.0635	-112.4014
75	-2.7033	-6.3139	6.8682	-113.1786
76	-2.6756	-6.0429	6.6087	-113.8824
77	-2.6097	-5.7199	6.2871	-114.5246
78	-2.5065	-5.3473	5.9057	-115.1145
79	-2.3674	-4.928	5.4671	-115.6598
80	-2.1936	-4.4645	4.9743	-116.1669
81	-1.9865	-3.9597	4.4301	-116.6413
82	-1.7472	-3.4162	3.8371	-117.0875
83	-1.4769	-2.8358	3.1973	-117.5098
84	-1.1757	-2.2194	2.5116	-117.912
85	-0.8424	-1.5646	1.777	-118.2981
86	-0.4707	-0.8606	0.9809	-118.6753
E	0.0	0.0	0.0	0.0

Wire No. 5 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
87	20.7681	1.2575	20.8061	3.4649
88	21.4243	0.9825	21.4468	2.6256
89	21.6919	0.8021	21.7067	2.1176
90	21.7536	0.6476	21.7632	1.7052
91	21.6324	0.5111	21.6384	1.3534
92	21.3395	0.3892	21.3431	1.0449
93	20.8822	0.2806	20.8841	0.7697
94	20.2664	0.1845	20.2673	0.5215
95	19.4979	0.1005	19.4982	0.2954
96	18.5826	0.0285	18.5826	0.0879
97	17.5266	-0.0317	17.5266	-0.1037
98	16.3365	-0.0803	16.3367	-0.2815
99	15.019	-0.1173	15.0194	-0.4474
100	13.5809	-0.1429	13.5817	-0.6029
101	12.0289	-0.1573	12.03	-0.7491
102	10.3688	-0.1606	10.37	-0.8874
103	8.6044	-0.153	8.6058	-1.0185
104	6.7358	-0.1345	6.7372	-1.1436
105	4.7531	-0.1048	4.7543	-1.2636
106	2.6209	-0.0632	2.6217	-1.3807
E	0.0	0.0	0.0	0.0

Wire No. 6 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
107	-4.727	11.5238	12.4557	112.303
108	-4.9486	11.8402	12.8328	112.6824
109	-5.0542	11.9593	12.9835	112.9098
110	-5.1033	11.9696	13.0121	113.0914
111	-5.1033	11.8822	12.9318	113.2432
112	-5.0578	11.703	12.7492	113.3729
113	-4.9688	11.4357	12.4685	113.4852
114	-4.8383	11.0834	12.0934	113.583
115	-4.6677	10.6492	11.6273	113.6685
116	-4.4588	10.1366	11.0739	113.7435
117	-4.2134	9.5488	10.4371	113.8091
118	-3.9332	8.8897	9.7209	113.8665
119	-3.6201	8.1629	8.9296	113.9166
120	-3.2763	7.3724	8.0676	113.9601
121	-2.9034	6.5219	7.139	113.9978
122	-2.5034	5.6147	6.1475	114.0302
123	-2.0774	4.6532	5.0958	114.0579
124	-1.6258	3.6376	3.9843	114.0816
125	-1.1465	2.5629	2.8076	114.1016
126	-0.6314	1.4104	1.5453	114.1188
E	0.0	0.0	0.0	0.0

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-1n.cir

I	5.1301	0	1	-63.3920	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	5.1000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	2	0	.0000	.0000	.0000
L	3184.0000	2	0	.0000	.0000	.0000
R	251.6980	3	0	138.4840	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE							
1		1571.5290	-33.4434							
2		1567.0860	-33.3498							
3		1510.5930	-37.9426							
		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE		
		MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE	
VSWR										
R	1- 2	1.000	5.13	-63.391	5.13	-63.391	265.43	152.93	264.43	152.93
L	2- 3	5.100	135.63	29.759	4.98	-60.241	280.68	142.35	280.68	115.11
C	3- 0	.000	1510.59	-37.943	.65	52.057	.00	-2340.51	.00	.00
L	2- 0	1310.000	1567.09	-33.350	.22	-123.350	.00	6996.33	.00	.00
L	2- 0	3184.000	1567.09	-33.350	.09	-123.350	.00	17004.81	.00	.00
R	3- 0	251.698	1510.59	-37.943	5.26	-66.762	251.70	138.48	.00	.00

COPY OF WFTL-1N.cir

```
0.85 0.1
I 5.1301 0 1 -63.392
R 1.0000 1 2
L 5.1 2 3
C 0.00008 3 0
L 1310. 2 0
L 3184 2 0
R 251.698 3 0 +138.484
EX--
```

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-2n.cir

I	13.2390	0	1	30.7647	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.3000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	83.9110	3	0	155.4790	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE							
1		2825.4900	95.5009							
2		2819.8650	95.7442							
3		2423.5560	91.2858							
		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE		
		MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE	
VSWR										
R	1- 2	1.000	13.24	30.765	13.24	30.765	91.09	193.01	90.09	193.01
L	2- 3	6.300	445.45	120.765	13.24	30.765	90.09	193.01	90.09	159.36
C	3- 0	.000	2423.56	91.286	1.04	-178.714	.00	-2340.51	.00	.00
L	3- 0	1310.000	2423.56	91.286	.35	1.286	.00	6996.33	.00	.00
L	3- 0	3184.000	2423.56	91.286	.14	1.286	.00	17004.81	.00	.00
R	3- 0	83.911	2423.56	91.286	13.72	29.641	83.91	155.48	.00	.00

COPY OF FILE WFTL-2N.cir

```
0.85 0.1
I 13.239 0 1 30.7647
R 1.0000 1 2
L 6.3 2 3
C 0.00008 3 0
L 1310. 3 0
L 3184 3 0
R 83.911 3 0 +155.479
EX
```


WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-3n.cir

I	6.9878	0	1	138.2580	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	7.0000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	24.1040	3	0	167.6410	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE	VOLT MAG	VOLT PHASE	BRANCH VOLTAGE				BRANCH CURRENT FROM NODE IMPEDANCE TO NODE IMPEDANCE			
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1	1489.7070	-139.0274								
2	1488.8370	-138.7606								
3	1229.9710	-140.2478								
VSWR										
R	1- 2	1.000	6.99	138.257	6.99	138.257	27.03	211.47	26.03	211.47
L	2- 3	7.000	261.24	-131.742	6.99	138.258	26.03	211.47	26.03	174.08
C	3- 0	.000	1229.97	-140.248	.53	-50.248	.00	-2340.51	.00	.00
L	3- 0	1310.000	1229.97	-140.248	.18	129.752	.00	6996.33	.00	.00
L	3- 0	3184.000	1229.97	-140.248	.07	129.752	.00	17004.81	.00	.00
R	3- 0	24.104	1229.97	-140.248	7.26	137.934	24.10	167.64	.00	.00

COPY OF FILE WFTL-3N.cir

0.85 0. 1

I 6.9878 0 1 138.258

R 1.0000 1 2

L 7 2 3

C 0.00008 3 0

L 1310. 3 0

L 3184 3 0

R 24.104 3 0 167.641

EX

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-4n.cir

I	4.7189	0	1	-85.7800	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	9.2000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	252.9280	3	0	241.3900	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG		VOLT PHASE		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
						MAG PHASE		MAG PHASE		RESISTANCE REACTANCE		RESISTANCE REACTANCE	
1		1902.9600		-40.3224									
2		1899.6530		-40.2209									
3		1741.6930		-45.5692									
VSWR													
R	1-	2	1.000	4.72	-85.779	4.72	-85.779	282.87	287.42	281.87	287.42		
L	2-	3	9.200	231.86	4.220	4.72	-85.780	281.86	287.42	281.86	238.28		
C	3-	0	.000	1741.69	-45.569	.74	44.431	.00	-2340.51	.00	.00		
L	3-	0	1310.000	1741.69	-45.569	.25	-135.569	.00	6996.33	.00	.00		
L	3-	0	3184.000	1741.69	-45.569	.10	-135.569	.00	17004.81	.00	.00		
R	3-	0	252.928	1741.69	-45.569	4.98	-89.232	252.93	241.39	.00	.00		

COPY OF FILE WFTL-4N.cir

0.850 1
 I 4.7189 0 1 -85.780
 R 1.0000 1 2
 L 9.2 2 3
 C 0.00008 3 0
 L 1310. 3 0
 L 3184 3 0
 R 252.928 3 0 +241.39
 EX

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-5n.cir

I	20.5148	0	1	3.8360	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.3000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	28.2880	3	0	62.7520	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG		VOLT PHASE		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
						MAG PHASE		MAG PHASE		RESISTANCE REACTANCE		RESISTANCE REACTANCE	
1		2085.7430		76.6124									
2		2079.7610		77.1522									
3		1432.3420		69.1998									
VSWR													
R	1-	2	1.000	20.51	3.836	20.51	3.836	30.10	97.11	29.10	97.11		
L	2-	3	6.300	690.25	93.836	20.51	3.836	29.10	97.11	29.10	63.46		
C	3-	0	.000	1432.34	69.200	.61	159.200	.00	-2340.51	.00	.00		
L	3-	0	1310.000	1432.34	69.200	.20	-20.800	.00	6996.33	.00	.00		
L	3-	0	3184.000	1432.34	69.200	.08	-20.800	.00	17004.81	.00	.00		
R	3-	0	28.288	1432.34	69.200	20.81	3.465	28.29	62.75	.00	.00		

Copy of file WFTL-5n.cir

0.850 1
 I 20.5148 0 1 3.836
 R 1.0000 1 2
 L 6.3 2 3
 C 0.00008 3 0
 L 1310. 3 0
 L 3184 3 0
 R 28.288 3 0 +62.752
 EX

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wftl-6n.cir

I	12.2838	0	1	112.1370	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	7.5000	2	3	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
L	1310.0000	3	0	.0000	.0000	.0000
L	3184.0000	3	0	.0000	.0000	.0000
R	-12.6340	3	0	61.2500	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = .850

NODE		VOLT MAG	VOLT PHASE		BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
					MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
1		1263.1080	-151.1667									
2		1264.5990	-150.6140									
3		778.9788	-146.0426									
VSWR												
R	1- 2	1.000	12.28	112.137	12.28	112.137	-11.99	102.13	-12.99	102.13		
L	2- 3	7.500	492.03	-157.863	12.28	112.137	-12.99	102.13	-12.99	62.07		
C	3- 0	.000	778.98	-146.043	.33	-56.043	.00	-2340.51	.00	.00		
L	3- 0	1310.000	778.98	-146.043	.11	123.957	.00	6996.33	.00	.00		
L	3- 0	3184.000	778.98	-146.043	.05	123.957	.00	17004.81	.00	.00		
R	3- 0	-12.634	778.98	-146.043	12.46	112.303	-12.63	61.25	.00	.00		

Copy of WFTL-6n.cir

0.85 0.1
I 12.2838 0 1 112.137
R 1.0000 1 2
L 7.5 2 3
C 0.00008 3 0
L 1310.3 0
L 3184 3 0
R -12.634 3 0 +61.25
EX

Summary of Array Geometry

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

Tower No.	ASRN	Height above base insulator (meters)	Overall height above ground (meters)
1(NE)	1203756	90.5	92.3
2(NC)	1203759	102.5	104.2
3(NW)	1203761	109.6	111.2
4(SE)	1203762	112.7	114.6
5(SC)	1203764	90.5	92.3
6(SW)	1203766	90.5	92.3

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

Sampling System

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

Impedance measurements were made of the antenna sampling system using a Delta OIB-3 in conjunction with a SD31 synthesized frequency generator and a Potomac Instruments FIM-41 Field Strength Meter as a detector. The measurements were made looking into the antenna monitor ends of the sample lines with the tower ends of the sample lines open-circuited.

The table below shows the frequencies above and below the carrier frequency where resonance, defined as zero reactance corresponding with low resistance, was found. As the length of distortionless transmission line is 180 electrical degrees at the difference frequency between adjacent frequencies of resonance, and frequencies of resonance occur at odd multiples of 90 degrees electrical length, the sample line length at the resonant frequency above 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.

Twr.	Sample Line Open-Circuited Resonance Below 850 kHz (kHz)	Sample Line Open-Circuited Resonance Above 850 kHz (kHz)	Sample Line Calculated Electrical Length At 850 kHz (deg.)
1	810	1350	257.3
2	810	1350	257.3
3	810	1351	257.3
4	811	1352	257.6
5	810	1351	257.3
6	809	1349	257.0

Because the greatest variation in electrical lengths was found to be 0.6 degrees, the sample lines meet the requirement in the Rules that they be equal in length within one electrical degree.

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

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

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

Twr.	+ 45 Deg. Offset Frequency (kHz)	+45 Deg. Measured Impedance (ohms)	- 45 Deg. Offset Frequency (kHz)	-45 Deg. Measured Impedance (ohms)	Calculated Characteristic Impedance (ohms)
1	945	8.2 +j63.6	675	5.0 -j44.2	54.8
2	945	8.5 +j64.5	675	5.0 -j44.8	55.6
3	945	8.5 +j63.6	675	5.0 -j45.5	54.2
4	945	8.5 +j64.5	675	5.0 -j44.8	55.6
5	945	9.0 +j64.5	675	5.0 -j45.5	56.0
6	945	8.2 +j63.6	675	5.0 -j45.8	55.1

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

The calibration of the Delta TCT-3 current transformers was verified by removing them all from the ATUs and installing them on a test jig so that each was located very close to the adjacent transformer (spacing of less than two inches). Short transmission lines of equal length were connected between the outputs of all six current transformers and the inputs of the antenna monitor. The Potomac 1901 antenna monitor was calibrated using the internal calibration function. A single source of RF current on the carrier frequency was fed through a conductor passing through all of the current transformers, and the differential phases and ratios were noted on the antenna monitor as follows:

Twr.	Ratio	Phase (deg.)
1	Ref1.00	Ref0.0
2	1.00	-+0.3
3	0.999	+0.3
4	0.999	+0.4
5	1.005	+0.7
6	0.998	+0.6

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

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

Twr.	R (ohms)	X (ohms)
1	49.8	-j2.7
2	48.7	-j2.5
3	49.6	-j2.4
4	50.3	-j2.7
5	49.4	-j2.3
6	49.9	-j2.6

Direct Measurement of Power

Common point impedance measurements were made using a Delta OIB-1 Operating Impedance bridge at the j-plug in the common point bus of the phasing and coupling system. The daytime resistance value was adjusted to 50 ohms and the reactance value close to zero that resulted in the lowest reflected power shown on the transmitter meter. The Daytime Common Point Current for 52,500 Watts common point input is 32.4 Amperes.

The Nighttime resistance value was adjusted to 50 ohms and the reactance value close to zero that resulted in the lowest reflected power shown on the transmitter meter. The nighttime Common Point Current for 21,000 Watts Common Point Input is 20.5 Amperes.

Appendix B

Reference Field Strength Measurements

Reference field strength measurements for the daytime pattern were made on June 29, 2016 between the hours of 1130AM and 300PM using a Potomac Instruments FIM-41 field intensity meter of known calibration at three locations along radials at the azimuths with radiation values specified on the construction permit. The measured field strengths and NAD-83 GPS coordinates for the reference measurement points are shown in the following tables. Measurement point descriptions were omitted as all points were located on unmarked work roads in the Sugar Cane fields surrounding the towers.

DAY Radial 05°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	7.51	26-36-34.4	80-44-28.8	14
2	6.68	26-36-07.1	80-44-29.2	19
3	5.88	26-35-40.7	80-44-28.6	19.5

DAY Radial 22.5°

Point No.	Dist. Km	Latitude	Longitude	Field mV/m
1	4.65	26-34-49.5	80-43-26.8	11
2	7.75	26-36-22.9	80-42-43.6	7.6
3	8.15	26-36-34.6	80-42-38.2	5.4

DAY Radial 138°

Point No.	Dist. Km	Latitude	Longitude	Field mV/m
1	4.03	26-30-53.2	80-42-52.0	67
2	2.96	26-31-19.0	80-43-18.0	101
3	4.01	26-30-53.3	80-42-52.8	65

DAY Radial 173°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	7.04	26-28-42.5	80-43-59.6	26
2	6.23	26-29-09.4	80-44-03.2	33
3	4.62	26-30-00.5	80-44-10.3	42

DAY Radial 196.5°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	4.44	26-30-11.8	80-45-17.1	6.7
2	4.83	26-30-00.4	80-45-21.4	5.0
3	5.67	26-29-33.6	80-45-30.2	4.8

DAY Radial 238°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	9.81	26-29-43.3	80-49-31.7	15
2	5.28	26-31-00.8	80-47-13.2	36
3	4.19	26-31-19.5	80-46-39.9	50

DAY Radial 299.5°

Point No.	Dist. Km	Latitude	Longitude	Field mV/m
1	8.62	26-34-47.7	80-49-00.5	0.5
2	8.14	26-34-40.1	80-48-45.9	0.9
3	7.19	26-34-25.1	80-48-16.1	2.8

Reference field strength measurements for the nighttime pattern were made on January 21, 2016 between the hours of 1000AM and 300PM using a Potomac Instruments FIM-41 field intensity meter of known calibration at three locations along radials at the azimuths with radiation values specified on the construction permit. The measured field strengths and NAD-83 GPS coordinates for the reference measurement points are shown in the following tables. Measurement point descriptions were omitted as all points were located on unmarked work roads in the Sugar Cane fields surrounding the towers.

NIGHT Radial 18.5°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	8.02	26-36-36.0	80-42-58.0	3.1
2	9.28	26-37-18.4	80-42-43.0	2.5
3	18.7	26-39-51.0	80-41-45.0	0.8

NIGHT Radial 122.5°

Point No.	Dist. Km	Latitude	Longitude	Field mV/m
1	4.72	26-31 07.4	80-31 07.4	92
2	5.10	26-30-32.0	80-41-58.0	83
3	9.19	26-29-51.0	80-39-48.0	40

NIGHT Radial 180.5°

Point No.	Dist. Km	Latitude	Longitude	Field mV/m
1	2.09	26-31-21.0	80-44-29.0	48
2	3.71	26-30-49.0	80-46-27.0	44
3	6.21	26-29-10.0	80-44-19.0	29

NIGHT Radial 223°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	2.95	26-31-21.0	80-45-40.0	18
2	4.23	26-30-49.0	80-46-14.0	9.8
3	6.55	26-29-53.0	80-47-11.0	5.5

NIGHT Radial 233.5°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	3.61	26-31-20.0	80-46-12.0	12
2	4.66	26-30-59.0	80-46-45.0	9.1
3	9.06	26-30-41.0	80-47-12.0	5

NIGHT Radial 286.5°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	3.10	26-32-57.0	80-46-17.0	28
2	4.08	26-33-07.0	80-47-55.0	19
3	9.06	26-30-05.0	80-47-12.0	5

NIGHT Radial 325.5°

Point No.	Dist. km	Latitude	Longitude	Field mV/m
1	3.33	26-33-57.0	80-45-36.0	16
2	4.20	26-34-15.0	80-45-50.0	15
3	5.29	26-34-48.0	80-46-16.0	11