Accepted / Filed

AUG 18 2016

Federal Communications Commission
Office of the Secretary

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO. BZ-20160818ABS

SECTION I - APPLICANT FEE INFORMATION

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

WORD BROADCASTING NETWORK, INC.

MAILING ADDRESS (Line 1) (Maximum 35 characters)
PO BOX 19229

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
LOUISVILLE	KY	40259

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
(502) 964-3304	WYMM	11127

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

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

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

C. If Yes, provide the following information:

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

(A) FEE TYPE CODE	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
MMR	0001	$ 690.00	

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

(A)	(B)	(C)	FOR FCC USE ONLY
MOR	0001	$ 790.00	

	TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
ADD ALL AMOUNTS SHOWN IN COLUMN C, AND ENTER THE TOTAL HERE. THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED REMITTANCE.	$ 1480.00	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT WORD BROADCASTING NETWORK, INC.		
MAILING ADDRESS PO BOX 19229		
CITY LOUISVILLE	STATE KY	ZIP CODE 40259

2. This application is for:

☑ Commercial ☐ Noncommercial

☑ AM Directional ☐ AM Non-Directional

Call letters	Community of License	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
WYMM	Jacksonville, FL	n/a - DM	n/a -DM	n/a -DM

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. See Tech Ex

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. See Tech Ex

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. See Tech Ex

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

☐ Yes ☐ No

☑ Does not apply

If No, explain in an Exhibit.

Exhibit No.

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

☐ Yes ☑ No

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

Exhibit No.

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

☐ Yes ☑ No

If Yes, provide particulars as an Exhibit.

Exhibit No:

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

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

CERTIFICATION

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

☑ Yes ☐ No

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

Name	Signature	
James M Fraser		
Title	Date	Telephone Number
GM	8/8/16	(302) 968-1220

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 (3060-0[illegible]), 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. 552 [illegible](3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
Word Broadcasting Network, Inc.

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☑ Station License ☐ Direct Measurement of Power

1. Facilities authorized in construction permit

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
				Night	Day
WYMM	N/A	1530	DAYTIME		50.0

2. Station location

State	City or Town
FLORIDA	JACKSONVILLE

3. Transmitter location

State	County	City or Town	Street address (or other identification)
FL	DUVAL	Jacksonville	5900 Pickettville Rd.

4. Main studio location

State	County	City or Town	Street address (or other identification)
FL	DUVAL	Jacksonville	5900 Pickettville Rd.

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

State	County	City or Town	Street address (or other identification)
FL	DUVAL	Jacksonville	5900 Pickettville Rd.

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. ENG.

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system	RF common point or antenna current (in amperes) without modulation for day system
	32.5

Measured antenna or common point resistance (in ohms) at operating frequency		Measured antenna or common point reactance (in ohms) at operating frequency	
Night	Day	Night	Day
	50.0		-8.4

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(SOUTH)		0.0		1.000		
2(NORTH)		100.2		.571		

Manufacturer and type of antenna monitor: Potomac Instruments AM-19(204)

SECTION III - Page 2

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

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
Guyed Tower	114.3	115.2	116.1	Exhibit No. ENG.

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	West Longitude
30 ° 21 ' 50 "	81 ° 44 ' 54 "

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

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

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

N/A

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

Antenna installation

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

Name (Please Print or Type)	Signature (check appropriate box below)
Kurt Gorman	
Address (include ZIP Code)	Date
Phasetek Inc. 550 California Rd., Unit 11 Quakertown, PA 18951	August 15, 2016
	Telephone No. (Include Area Code) 215-536-6648

☐ Technical Director

☐ Registered Professional Engineer

☐ Chief Operator

☑ Technical Consultant

☐ Other (specify)

ENGINEERING STATEMENT CONCERNING

APPLICATION FOR LICENSE INFORMATION

EMPLOYING MOMENT METHOD MODELING

WYMM, 1530 KHZ, DA-D

JACKSONVILLE, FLORIDA

AUGUST, 2016

PHASETEK INC.

ENGINEERING STATEMENT CONCERNING APPLICATION FOR LICENSE INFORMATION EMPLOYING MOMENT METHOD MODELING WYMM, 1530 KHZ, DA-D JACKSONVILLE, FLORIDA AUGUST, 2016

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ENGINEERING STATEMENT CONCERNING
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WYMM, 1530 KHZ, DA-D
JACKSONVILLE, FLORIDA
AUGUST, 2016

SUMMARY

Adjustment of the Antenna System and a Proof of Performance employing Moment Method Modeling were performed on Radio Station WYMM, 1530 KHz, Jacksonville, Florida, after installation of the FM antenna and associated line for FM translator W243DO and changes to the array sampling system. This FM translator is authorized in construction Permit Number: BMPFT-20160505AFS. This report was prepared on behalf of Word Broadcasting Network, Inc. licensee of Radio Station WYMM.

SITE MODIFICATIONS

The WYMM Transmitter site is that as currently licensed. New sampling TCT's have been installed at each tower. Both Towers remain unchanged except for the addition of the FM antenna and line on tower #2 (North). Both towers employ guy wire top-loading. This remains unchanged and current distribution measurements were performed on this in the 1981 full proof of performance. No new current distribution measurements were made. There are no changes to the presently licensed standard radiation pattern, therefore, a site survey is not included. A License Application employing Moment Method Modeling as set forth in Section 73.151(C) has been done to cover the requirement of the FM translator Construction Permit and license under the new rules.

REFERENCE POINTS

Reference Points were measured at pattern minima and maxima for the Directional mode of operation. These Points and their measured field intensity are shown in Figure 12.

PHASETEK INC.

ENGINEERING STATEMENT CONCERNING
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WYMM, 1530 KHZ, DA-D
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METHOD OF MOMENTS DETAIL

All Moment Method Modeling was done with Expert MININEC Broadcast Professional, Version 23. One wire was used to represent each Tower with an additional three wires to represent guy wire top-loading on each tower. Towers were driven individually to verify the Model compared to measured impedance data. Once the Model was verified, the Day Directional Antenna System was computed. For the Directional mode, the complex voltage values for sources located at ground level were computed. These sources produce current moment sums for each Tower that, when normalized, equate to the Theoretical Field Parameters for each respective Tower.

MEASURING EQUIPMENT AND PERSONNEL

All Tower Resistance and Reactance measurements were made with a Delta Electronics OIB-3 Operating Impedance Bridge and HP8753ES network analyzer with a Tunwall directional coupler. Before use, tests of known impedances were made to verify operation. All Field Intensity Measurements were made with a Potomac Instruments Field Intensity Meter, model 4100, Serial Number 249, calibrated on January 21, 2016. The meter was calibrated by Potomac Instruments, Frederick, Maryland. All measurements were taken by Kurt Gorman of Phasetek Inc.

PHASETEK INC.

ENGINEERING STATEMENT CONCERNING
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WYMM, 1530 KHZ, DA-D
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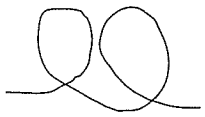
CONCLUSION

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



Kurt Gorman, President
Phasetek Inc.
Quakertown, Pennsylvania

FIGURE 1

ANTENNA SYSTEM AS ADJUSTED

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WYMM, 1530 KHZ, DA-D
JACKSONVILLE, FLORIDA
AUGUST, 2016

ANTENNA SYSTEM DESCRIPTION

1. The Antenna System consists of two (2), uniform, guyed, vertical steel transmitting Towers. Both Towers stand 114.3M (210.0°) above their Base Insulators. The Towers are arranged with Tower 1 as a reference; Tower 2 is spaced 90.0° on a bearing of 0.0°T. Both towers incorporate guy wire top-loading at 23.7° electrical length. Tower 2 supports a FM antenna. The feed for this Antenna is isolated at the base with an isolation inductor. Tower 2 has aviation obstruction lighting. The lighting circuit is isolated at the base with a ring transformer.

2. The Ground System for each Tower remains as currently licensed. No changes have been made.

3. The Sampling System consists of two (2), Delta Electronics TCT-1-HV 0.5V/A toroidal current transformers. These TCT's are at the tower output of each Antenna Tuning Unit. These TCT's are connected to a Potomac Instruments AM-19(204) Antenna Monitor via two (2) equal lengths of Andrew, LDF4-50A, 1/2" phase stabilized foam coaxial cable.

4. Tower registration numbers:
   Tower 1: 1060085
   Tower 2: 1060084

FIGURE 1
ANTENNA SYSTEM AS ADJUSTED

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
CONTINUED
WYMM, 1530 KHZ, DA-D
JACKSONVILLE, FLORIDA
AUGUST, 2016

ANTENNA SYSTEM DESCRIPTION – Continued

DIRECTIONAL OPERATION (DAY)

COMMON POINT

Impedance = 50.0 – j 8.4 Ohms
Current = 32.5 Amperes
Power = 52,650 Watts

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

FIGURE 2
WYMM SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

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WYMM, 1530 KHZ, DA-D
JACKSONVILLE, FLORIDA
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SAMPLING SYSTEM DESCRIPTION

The Sampling System consists of Delta Electronics model number TCT-1-HV toroidal current transformers (TCT) mounted at the base of each Tower. The sampling devices are connected to the Antenna Monitor with equal lengths of Andrew LDF4-50A, ½" foam cable The Antenna Monitor is a Potomac Instruments Model AM-19(204), Serial Number 375.

SAMPLE LINE MEASUREMENTS

Impedance measurements were made of the Antenna Sampling Lines using a HP8753ES Network Analyzer and Tunwall directional coupler. Measurements were done with the lines open circuited and then connected to the TCT's.

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

SAMPLE LINE MEASUREMENTS

	Resonant Frequency (KHz) below 1530 KHz	Resonant Frequency (KHz) above 1530 KHz	Calculated Electrical Length (deg) at 1530 KHz	Measured Impedance (ohms) Connected to TCT @ 1530 KHz
Tower 1	1450.20	2420.04	284.9	48.7 –j 1.6
Tower 2	1453.44	2424.63	284.2	49.0 –j 1.7

FIGURE 2
WYMM SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
CONTINUED
WYMM, 1530 KHZ, DA-D
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SAMPLE LINE MEASUREMENTS (CONTINUED)

To determine the characteristic impedance values of the Sample Lines, open-circuited measurements were made with frequencies offset to produce ± 45 degrees of electrical length from resonance. The characteristic impedance was calculated using the following formula, where R1 +j X1 and R2 +j X2 are the measured impedances at the +45 and -45 degree offset frequencies, respectively:

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

Tower	+ 45 Degree Offset Frequency (kHz)	+ 45 Degree Measured Impedance (Ohms)	- 45 Degree Offset Frequency (kHz)	- 45 Degree Measured Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)
1	1691.9	5.0 +j 50.3	1208.5	3.5 –j 50.0	50.33
2	1695.7	5.1 +j 49.7	1211.2	3.6 –j 49.7	49.90

SAMPLING TCT MEASUREMENTS

Measurements of the Delta Electronics Model TCT-1-HV toroidal current transformers were performed by a Hewlett Packard 8752A, Network Analyzer. Measurements are normalized to Tower #1 (Day reference) and are within the manufacturer's rating of ± 2.0% and ± 2.0°.

FIGURE 2
WYMM SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

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CONTINUED
WYMM, 1530 KHZ, DA-D
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SAMPLING TCT MEASUREMENTS CONT'D

TOWER	TCT SERIAL #	MAGNITUDE	PHASE
1	3456	1.000	0.0^{o}
2	3460	1.002	0.1^{o}

ANTENNA MONITOR MEASUREMENT

Measurement of the Potomac Instruments Model AM-19(204) Antenna Monitor was performed to verify calibration. A single RF Voltage was applied to the Day Reference Input (Tower #1) and each other Input by use of a "T" divider and equal electrical length coaxial cables. This yields the following:

Tower	Ratio	Phase
1	1.000	0.0^{0}
2	1.000	0.0^{0}

The above is within the manufacturer's rating of $\pm$ 1.0% and $\pm$ 1.0^{o}.

FIGURE 3
WYMM TOWER IMPEDANCE MEASUREMENTS COMPARED TO METHOD OF MOMENTS MODEL
APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
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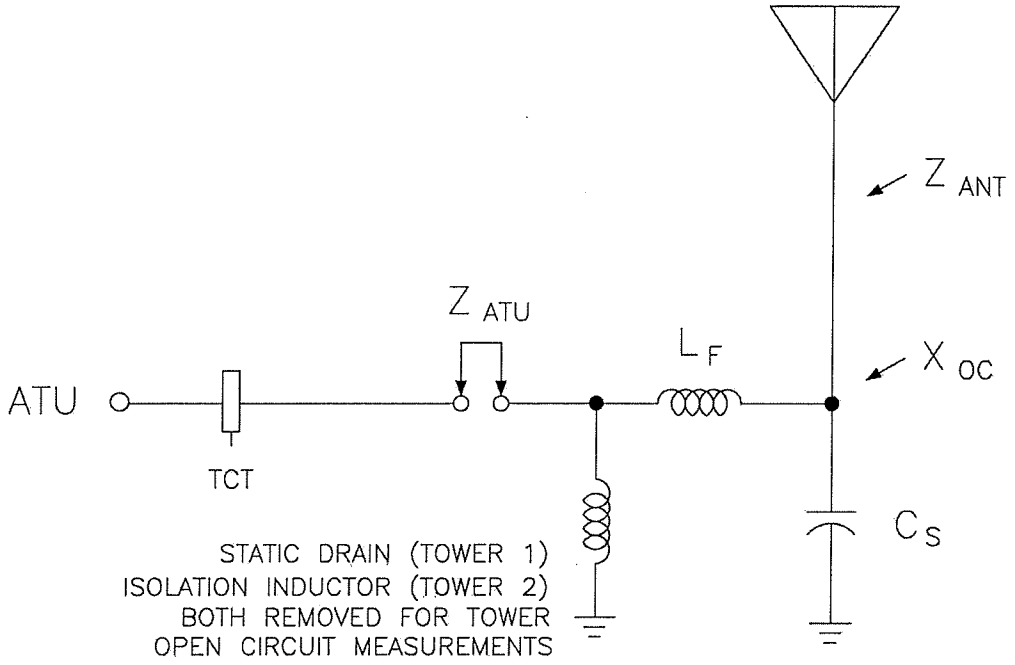

TOWER	Specified	Measured	Measured	Modeled	Modeled	Measured
	Cs (pf)	L_F (µH)	X_F (Ω)	Z_{ANT} (Ω)	Z_{ATU} (Ω)	Z_{ATU} (Ω)
1	15	1.55	+j14.9	37.1 –j 82.2	36.3 –j 66.6	39.5 –j 67.3
2	15	2.65	+j25.5	37.1 –j 82.3	36.3 –j 56.0	39.0 –j 56.8

Tower	Calculated X_{OC} (Ω)
1	- j 6,934.9
2	- j 6,934.9

FIGURE 4
WYMM MOMENT MODEL PARAMETERS

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Tower #	Wire #	# of Segments	Base Node
1	1-4	33	1
2	5-8	33	34

Tower #	Physical Height Degrees	Modeled Height Degrees	Modeled Radius Meters	% of Equivalent Radius
1	210.0 +TL	239.0 +TL	.291	80.0
2	210.0 +TL	239.0 +TL	.291	80.0

Both Towers are uniform cross section, guyed with Base Insulator. Towers are three (3) sided, 30" face width. Base Insulators for both towers are manufactured by Lapp Insulators, with an assumed capacity of 15pf (-j6,934.9 ohms @ 1530 kHz). Guy wire top-loading is modeled at 80% the actual length.

Tower1 has a Phasetek Inc. static drain choke. This measures –j6,700.0 ohms @ 1530 kHz. The FM line at tower 2 is isolated at the base with an isolation inductor. This measures +j1,600.0 ohms @ 1530 kHz.

FIGURE 5
WYMM MOMENT SUMMARY FOR INDIVIDUAL TOWERS

WYMM TOWER 1 (OTHER OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.291	24
		0	0	239.		
2	none	0	0	239.	.03	3
		6.5	60.	221.2		
3	none	0	0	239.	.03	3
		6.5	180.	221.2		
4	none	0	0	239.	.03	3
		6.5	300.	221.2		
5	none	90.	0	0	.291	24
		90.	0	239.		
6	none	90.	0	239.	.03	3
		96.5	0	221.2		
7	none	90.	0	239.	.03	3
		86.93	3.71	221.2		
8	none	90.	0	239.	.03	3
		86.93	356.29	221.2		

Number of wires = 8
current nodes = 66

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	7	6.31626	1	9.95833
radius	2	.03	1	.291

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.53	0	1	.0175452	.027662

Sources

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

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	34	0	-6,934.9	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.53	37.085	-82.242	90.217	294.3	5.5577	-3.1601	-2.8655

WYMM TOWER 2 (OTHER OPEN)

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.291	24
		0	0	239.		
2	none	0	0	239.	.03	3
		6.5	60.	221.2		
3	none	0	0	239.	.03	3
		6.5	180.	221.2		
4	none	0	0	239.	.03	3
		6.5	300.	221.2		
5	none	90.	0	0	.291	24
		90.	0	239.		
6	none	90.	0	239.	.03	3
		96.5	0	221.2		
7	none	90.	0	239.	.03	3
		86.93	3.71	221.2		
8	none	90.	0	239.	.03	3
		86.93	356.29	221.2		

Number of wires = 8
current nodes = 66

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	7	6.31626	1	9.95833
radius	2	.03	1	.291

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.53	0	1	.0175452	.027662

Sources

source	node	sector	magnitude	phase	type
1	34	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-6,934.9	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 34, sector 1							
1.53	37.086	-82.253	90.227	294.3	5.5586	-3.1596	-2.866

FIGURE 6
WYMM MOMENT MODEL ARRAY SYNTHESIS
(DIRECTIONAL – DAY)

APPLICATION FOR LICENSE INFORMATION
EMPLOYING MOMENT METHOD MODELING
WYMM, 1530 KHZ, DA-D
JACKSONVILLE, FLORIDA
AUGUST, 2016

WYMM DA-D

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.53 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	.9	95.

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	2,596.11	102.9	33.3451	160.9
34	2,404.49	177.1	20.1808	262.1

Sum of square of source currents = 3,038.33
Total power = 50,000. watts

TOWER ADMITTANCE MATRIX

admittance	real (mhos)	imaginary (mhos)
Y(1, 1)	.00365485	.0105904
Y(1, 2)	.00124564	-.00317187
Y(2, 1)	.00124563	-.00317187
Y(2, 2)	.00365401	.0105894

TOWER IMPEDANCE MATRIX

impedance	real (ohms)	imaginary (ohms)
Z(1, 1)	37.1684	-82.1744
Z(1, 2)	24.8278	-11.6746
Z(2, 1)	24.8278	-11.6746
Z(2, 2)	37.169	-82.1848

FIGURE 7
WYMM MOMENT MODEL SUMMARY FOR DIRECTIONAL DAY MODE

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.291	24
		0	0	239.		
2	none	0	0	239.	.03	3
		6.5	60.	221.2		
3	none	0	0	239.	.03	3
		6.5	180.	221.2		
4	none	0	0	239.	.03	3
		6.5	300.	221.2		
5	none	90.	0	0	.291	24
		90.	0	239.		
6	none	90.	0	239.	.03	3
		96.5	0	221.2		
7	none	90.	0	239.	.03	3
		86.93	3.71	221.2		
8	none	90.	0	239.	.03	3
		86.93	356.29	221.2		

Number of wires = 8
current nodes = 66

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	7	6.31626	1	9.95833
radius	2	.03	1	.291

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.53	0	1	.0175452	.027662

Sources

source	node	sector	magnitude	phase	type
1	1	1	3,671.45	102.9	voltage
2	34	1	3,400.46	177.1	voltage

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.53	41.193	-66.065	77.856	301.9	3.9004	-4.5555	-1.8729
source = 2; node 34, sector 1							
1.53	10.306	-118.7	119.15	275.	32.37	-.53684	-9.345

CURRENT rms
Frequency = 1.53 MHz
Input power = 50,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	33.3452	160.9	-31.5167	10.8902
2	0	0	9.95833	30.5482	158.2	-28.3635	11.345
3	0	0	19.9167	27.6532	156.	-25.2545	11.2655
4	0	0	29.875	24.1728	153.4	-21.6225	10.807
5	0	0	39.8333	20.1442	150.2	-17.4824	10.0078
6	0	0	49.7917	15.6867	145.4	-12.9135	8.90594
7	0	0	59.75	11.016	136.8	-8.02658	7.54497
8	0	0	69.7083	6.66375	116.3	-2.95073	5.97485
9	0	0	79.6667	4.77504	62.9	2.17491	4.25098
10	0	0	89.625	7.60631	18.7	7.20669	2.43303
11	0	0	99.5833	12.0158	2.8	12.0017	.583077
12	0	0	109.542	16.4687	355.7	16.4222	-1.23613
13	0	0	119.5	20.5553	351.7	20.3406	-2.96312
14	0	0	129.458	24.0744	349.1	23.6425	-4.53953
15	0	0	139.417	26.8888	347.3	26.2308	-5.91185
16	0	0	149.375	28.8974	345.9	28.0284	-7.03306
17	0	0	159.333	30.0282	344.8	28.9802	-7.86402
18	0	0	169.292	30.238	343.9	29.0552	-8.37469
19	0	0	179.25	29.5112	343.2	28.247	-8.54496
20	0	0	189.208	27.8614	342.5	26.5758	-8.3655
21	0	0	199.167	25.3338	342.	24.0904	-7.83927
22	0	0	209.125	22.0202	341.5	20.8827	-6.98577
23	0	0	219.083	18.1867	341.1	17.2094	-5.88143
24	0	0	229.042	14.9498	341.	14.133	-4.87394
J1	0	0	239.	11.933	341.1	11.289	-3.86713
2J1	0	0	239.	3.97994	340.9	3.76038	-1.30363
26	1.08333	-1.87639	233.067	2.98245	341.2	2.82258	-.963362
27	2.16667	-3.75278	227.133	1.6649	341.5	1.57845	-.529516
END	3.25	-5.62917	221.2	0	0	0	0
2J1	0	0	239.	3.9733	341.5	3.76826	-1.25987
29	-2.16667	0	233.067	2.97697	341.9	2.82946	-.925483
30	-4.33333	0	227.133	1.66172	342.3	1.58293	-.505614
END	-6.5	0	221.2	0	0	0	0
2J1	0	0	239.	3.97994	340.9	3.76038	-1.30363
32	1.08333	1.87639	233.067	2.98245	341.2	2.82257	-.963362
33	2.16667	3.75278	227.133	1.6649	341.5	1.57845	-.529516
END	3.25	5.62917	221.2	0	0	0	0
GND	90.	0	0	20.1809	262.1	-2.77589	-19.9891
35	90.	0	9.95833	17.3311	261.3	-2.6285	-17.1306
36	90.	0	19.9167	14.7891	260.3	-2.49548	-14.5771
37	90.	0	29.875	12.0096	258.7	-2.34705	-11.7781
38	90.	0	39.8333	8.99618	256.	-2.18065	-8.72789
39	90.	0	49.7917	5.82727	250.	-1.99603	-5.47475
40	90.	0	59.75	2.75498	229.4	-1.79396	-2.09084
41	90.	0	69.7083	2.06861	139.6	-1.57596	1.33995
42	90.	0	79.6667	4.9154	105.9	-1.34427	4.72801
43	90.	0	89.625	8.058	97.9	-1.10179	7.98232
44	90.	0	99.5833	11.047	94.4	-.852141	11.014
45	90.	0	109.542	13.7527	92.5	-.59962	13.7396
46	90.	0	119.5	16.0871	91.2	-.349169	16.0833
47	90.	0	129.458	17.9802	90.3	-.106277	17.9799
48	90.	0	139.417	19.3768	89.6	.123102	19.3764
49	90.	0	149.375	20.2367	89.1	.332673	20.234
50	90.	0	159.333	20.5353	88.6	.515934	20.5288
51	90.	0	169.292	20.2639	88.1	.666341	20.253
52	90.	0	179.25	19.4305	87.7	.777478	19.4149
53	90.	0	189.208	18.0596	87.3	.843274	18.0399
54	90.	0	199.167	16.1939	87.	.858357	16.1712
55	90.	0	209.125	13.9041	86.6	.818858	13.88
56	90.	0	219.083	11.3693	86.3	.727238	11.346
57	90.	0	229.042	9.30396	86.2	.618218	9.28339
J5	90.	0	239.	7.44694	86.3	.486519	7.43103
2J1	90.	0	239.	2.47241	85.3	.204377	2.46395

59	92.1667	0	233.067	1.86712	85.4	.150403	1.86105
60	94.3333	0	227.133	1.05086	85.5	.0821948	1.04764
END	96.5	0	221.2	0	0	0	0
2J1	90.	0	239.	2.48754	86.7	.141071	2.48354
62	88.9159	-1.87497	233.067	1.88055	87.1	.0956708	1.87812
63	87.8319	-3.74994	227.133	1.05962	87.4	.0477565	1.05855
END	86.7478	-5.62491	221.2	0	0	0	0
2J1	90.	0	239.	2.48755	86.7	.141071	2.48354
65	88.9159	1.87497	233.067	1.88055	87.1	.0956708	1.87812
66	87.8319	3.74995	227.133	1.05962	87.4	.0477567	1.05855
END	86.7478	5.62492	221.2	0	0	0	0

FIGURE 8
DERIVED DIRECTIONAL PARAMETERS

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DAY:

	Theoretical		Base Network Input Current		Normalized TCT	
Tower	Field	Phase	Amplitude	Phase	Amplitude	Phase
1 (S)	1.000	0.0°	33.92	161.64°	1.000	0.0°
2 (N)	.900	95.0°	19.36	-98.16°	.571	100.2°

FIGURE 9
WYMM TOWER BASE CIRCUIT ANALYSIS DESCRIPTION

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CIRCUIT ANALYSIS

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

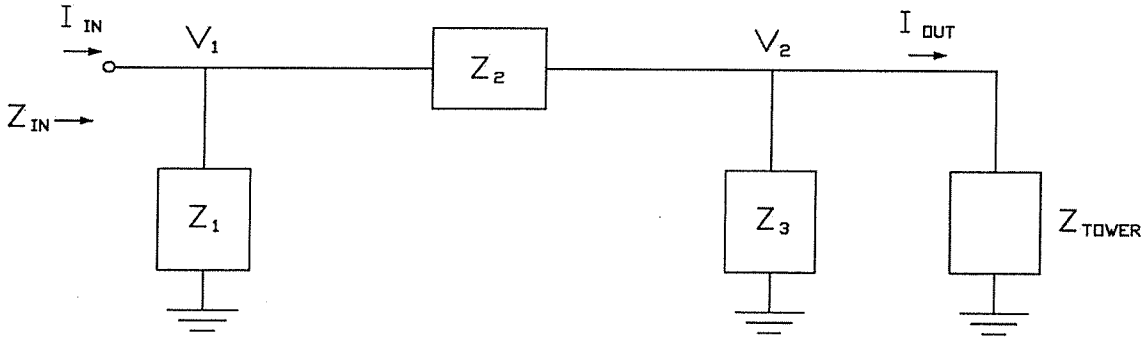

FIGURE 10
WYMM CIRCUIT ANALYSIS FOR INDIVIDUAL TOWERS

CUSTOMER : WYMM
NETWORK ID : TOWER 1(OTHER OPEN)

FREQUENCY : 1530.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00,100000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 14.90 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -6934.90 OHMS
TOWER IMPEDANCE (R,X) : 37.08, -82.24 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	100000.00
2		GROUND	36.22	-81.47
1		2	0.00	14.90

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	117.65	-4.58

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	36.27	-66.60	75.84	-61.43
INPUT CURRENT (AMPS) :	0.63	1.16	1.32	61.43
OUTPUT CURRENT (AMPS) :	0.63	1.14	1.30	61.15

INPUT/OUTPUT CURRENT RATIO = 1.0112
INPUT/OUTPUT PHASE = 0.28 DEGREES

CUSTOMER : WYMM
NETWORK ID : TOWER 2(OTHER OPEN)

FREQUENCY : 1530.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00,100000.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 25.50 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -6934.90 OHMS
TOWER IMPEDANCE (R,X) : 37.09, -82.25 OHMS

NODE	TO NODE	IMPEDANCE (OHMS) R	X
1	GROUND	0.00	100000.00
2	GROUND	36.22	-81.48
1	2	0.00	25.50

NODE	VOLTAGE MAGNITUDE	PHASE
1	100.00	0.00
2	133.73	-8.94

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	36.26	-56.00	66.71	-57.08
INPUT CURRENT (AMPS) :	0.81	1.26	1.50	57.08
OUTPUT CURRENT (AMPS) :	0.81	1.24	1.48	56.79

INPUT/OUTPUT CURRENT RATIO = 1.0113
INPUT/OUTPUT PHASE = 0.28 DEGREES

FIGURE 11
WYMM CIRCUIT ANALYSIS FOR DIRECTIONAL DAY MODE

CUSTOMER : WYMM
NETWORK ID : TOWER 1 DA

FREQUENCY : 1530.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, -6700.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 14.90 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -6934.90 OHMS
TOWER IMPEDANCE (R,X) : 41.19, -66.07 OHMS

NODE	TO	NODE	IMPEDANCE (OHMS) R	X
1		GROUND	0.00	-6700.00
2		GROUND	40.42	-65.68
1		2	0.00	14.90

NODE	VOLTAGE MAGNITUDE	PHASE
1	2184.80	109.81
2	2596.11	102.90

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	39.81	-50.64	64.41	-51.83
INPUT CURRENT (AMPS) :	-32.19	10.69	33.92	161.64
OUTPUT CURRENT (AMPS) :	-31.52	10.88	33.35	160.96

INPUT/OUTPUT CURRENT RATIO = 1.0172
INPUT/OUTPUT PHASE = 0.68 DEGREES

CUSTOMER : WYMM
NETWORK ID : TOWER 2 DA

FREQUENCY : 1530.00 kHz
ATU SHUNT IMPEDANCE (R,X) : 0.00, 1600.00 OHMS
TOWER FEED IMPEDANCE (R,X) : 0.00, 25.50 OHMS
TOWER SHUNT IMPEDANCE (R,X) : 0.00, -6934.90 OHMS
TOWER IMPEDANCE (R,X) : 10.31, -118.70 OHMS

NODE	TO NODE	IMPEDANCE (OHMS) R	X
1	GROUND	0.00	1600.00
2	GROUND	9.96	-116.72
1	2	0.00	25.50

NODE	VOLTAGE MAGNITUDE	PHASE
1	1883.49	178.45
2	2404.49	177.10

	REAL	IMAGINARY	MAGNITUDE	PHASE
INPUT IMPEDANCE (OHMS) :	11.20	-96.66	97.30	-83.39
INPUT CURRENT (AMPS) :	-2.75	-19.16	19.36	-98.16
OUTPUT CURRENT (AMPS) :	-2.76	-19.99	20.18	-97.86

INPUT/OUTPUT CURRENT RATIO = 0.9592
INPUT/OUTPUT PHASE = -0.29 DEGREES

FIGURE 12
WYMM DAY REFERENCE POINT MEASUREMENTS – AUGUST 6, 2016

Radial		Dist km	mV/m	Time	CO-ORD NAD27	Deg	Min	Sec	Description
19°	1	2.10	77.0	0940	N	30	22	50.5	Soutel Drive at plant entrance
					W	81	44	24.9	
	2	4.00	17.5	0954	N	30	23	49.5	#7876 Pipit Ave.
					W	81	44	03.7	
	3	4.35	21.0	1001	N	30	23	59.5	Intersection of Redpoll Ave. and
					W	81	43	57.5	Longspur Ave.
180°	1	1.42	1470	1047	N	30	21	00.6	12th St. East of plant entrance
					W	81	44	51.4	
	2	2.23	558	1054	N	30	20	34.4	5th St. South side, East of RR tracks
					W	81	44	51.2	
	3	3.06	387	1108	N	30	20	07.8	Commonwealth Ave. parking lot for
					W	81	44	51.2	#5700
341°	1	1.31	80.0	1025	N	30	22	26.8	Pritchard Rd., South side
					W	81	45	06.9	
	2	2.24	32.2	1032	N	30	22	55.0	#6765 Barney Rd.
					W	81	45	18.4	
	3	6.18	13.0	1012	N	30	24	56.1	Garden St. and Lancashire Dr.
					W	81	46	05.2	