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. BMML-20111018AYE

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)
Paskvan Media, Inc.

MAILING ADDRESS (Line 1) (Maximum 35 characters)
1387 Summer Court, N.W.

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
Bemidji	MN	56601

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
218-766-7970	KPMI	160495

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	$ 635.00	

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	$ 730.00	

	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.	$ 1,365.00	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Paskvan Media, Inc.		
MAILING ADDRESS 1387 Summer Court, N.W.		
CITY Bemidji	STATE MN	ZIP CODE 56601

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
KPMI	Bemidji, MN	BNP-20050118AFR		10/20/2011

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. 1

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

☐ 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	
Troy Paskvan	Troy Paskvan	
Title	Date	Telephone Number
President	10/7/11	218-766-7970

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

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

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

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

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

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
PASKVAN MEDIA, 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
KPMI	BNP-20050118AFR	1300	UNLIMITED	0.6	2.5

2. Station location

State	City or Town
MN	BEMIDJI

3. Transmitter location

State	County	City or Town	Street address (or other identification)
MN	BELTRAMI	BEMIDJI	2115 WASHINGTON AVE

4. Main studio location

State	County	City or Town	Street address (or other identification)
MN	BELTRAMI	BEMIDJI	2115 WASHINGTON AVE

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 STATEMENT

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
3.6	7.75

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	39	0	41.6

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
1	0		1.0			
2	84.3		1.109			

Manufacturer and type of antenna monitor: POTOMAC 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.
UNIFORM CROSS SECTIONAL STEEL TOWER	54.6	55.2	N/A	Exhibit No. N/A

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
47 ° 26 ' 32 "	94 ° 51 ' 57 "

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.

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

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

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

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)
GARRETT G. LYSIAK, P.E.	Garrett G. Lysiak
Address (include ZIP Code) OWL ENGINEERING, INC 5844 HAMLINE AVE N SHOREVIEW, MN 55126	Date 10-11-2011 Telephone No. (Include Area Code) 651 784-7445

☐ Technical Director

☑ Registered Professional Engineer

☐ Chief Operator

☐ Technical Consultant

☐ Other (specify)

Fletcher, Heald & Hildreth

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ANNE GOODWIN CRUMP
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October 17, 2011

ANNE GOODWIN CRUMP
(703) 812-0426
CRUMP@FHHLAW.COM

BY FEDEX
Federal Communications Commission
Media Bureau
P.O. Box 979089
St. Louis, MO 63197-9000

Re: Application for License to Cover Construction Permit
KPMI(AM), Facility ID No. 160495
Bemidji, Minnesota

Dear Sir or Madam:

Transmitted herewith, on behalf of Paskvan Media, Inc., permittee of KPMI(AM), are an original and two copies of its application for license to cover original construction permit (File No. BNP-20050118AFR), together with FCC Form 159 and a check in the amount of $1,365.00 to cover the filing fees for the above-referenced license application.

Please date-stamp the attached confirmation copy and return it to the courier. Should any questions arise concerning this matter, please communicate with this office.

Very truly yours,

Anne Goodwin Crump

Anne Goodwin Crump
Counsel for Paskvan Media, Inc.

AGC:deb

Enclosures

FCC Form 302-AM
KPMI
Bemidji, Minnesota

EXHIBIT 1

KPMI(AM) is not operating pursuant to program test authority. Please note that the construction permit for this facility, File No. BNP-20050118AFR does not authorize automatic program test authority, but rather requires the submission of proofs of performance before any program test authority can be authorized or operation can begin. Program test authority is hereby requested.

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Radio Station KPMI Bemidji, Minnesota

Paskvan Media, Inc.

1300 kHz 2.5 kW ND .6 kW DA BNP-20050118AFR

Facility ID-160495

October 11, 2011

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Executive Summary

This engineering exhibit supports an application for license for KPMI in Bemidji, Minnesota pursuant to the AM technical rules permitting moment-method modeling of the KPMI nighttime directional array.

The information presented in this application demonstrates that the directional antenna parameters for the night pattern authorized by the FCC (BNP-20050118AFR) has been determined to be in accordance with the requirements of 47 C.F.R. §73.151(c). The system has been tested and adjusted to produce antenna monitor parameters within ±5 percent in power ratio and ±3 degrees in phase of the moment-method modeled values, as required by the Rules. Program Test Authority is hereby requested with the submission.

KPMI is co-located on the three-tower directional antenna system of radio station KKBJ, Bemidji, Minnesota. The day non-directional mode of KPMI utilizes one tower and the night directional pattern is produced utilizing two of the other KKBJ antenna system. Filters were installed on all of the three KKBJ towers to pass it and reject KPMI signals. Measurements were performed at the conclusion of the KPMI construction to demonstrate compliance with the Rules.

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. Towers were driven individually to verify the MININEC Model compared to the measured impedance data. Once the MININEC Model was verified, both the Day Non-Directional and Night Directional Antenna Systems were computed. For Directional modes, the complex voltage values for sources located at ground level were

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computed. These sources produce current moment sums for each Tower that, when normalized, equate to the Theoretical Field Parameters for each respective Tower.

KPMI SAMPLING SYSTEM DESCRIPTION/MEASUREMENTS

SAMPLING SYSTEM DESCRIPTION

The Sampling System consists of Phasetek Inc. P600-203 Toroidal Sampling Transformers (1.0 volt/amp) mounted at the base of each Tower. The sampling devices are connected to the Antenna Monitor with equal lengths of Andrew LDF2-50. The Antenna Monitor is a Potomac Instruments Model AM-19(204), Serial Number 501.

SAMPLE LINE MEASUREMENTS

Impedance measurements were made of the Antenna Sampling Lines using a Hewlett Packard 8751A Network Analyzer and Array Solutions Power Aim 2180 Vector Network Analyzer (VNA). Measurements were done with the lines open circuited and then connected to the TCT's.

The table below shows the frequencies above and below the carrier frequency where resonance, defined as zero reactance corresponding with low resistance, was found. Frequencies of resonance occur at odd multiples of 90 degrees electrical length, the Sample Line length at the resonant frequency above the carrier frequency, which is the closest one to the carrier frequency, was found to be 450 electrical degrees. The electrical length at carrier frequency appearing in the table below was calculated by ratioing the frequencies.

To determine the characteristic impedance values of the Sample Lines, open-circuited measurements were made with frequencies offset to produce $\pm$ 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:

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

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	1518.8	15.25 +j53.1	1242.7	8.18 -j44.0	49.72
2	1517.0	12.7 +j46.9	1241.2	8.93 -j42.4	48.90

KPMI SAMPLE LINES

	Resonant Frequency (kHz) below 1300 kHz	Resonant Frequency (kHz) above 1300 kHz	Calculated Electrical Length (deg.) @ 1300 kHz	Impedance connected to TCT @1300 kHz (Ohms)	
Tower 1	824.9	1380.8	423.7	45.84 -j4.19	
Tower 2	824.3	1379.1	424.2	47.0 -j3.81	

	+45 Degree Offset Frequency (kHz)	+45 Degree Measured Impedance (Ohms)	-45 Degree Offset Frequency (kHz)	-45 Degree Measured Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)
Tower 1	1518.8	15.25 +j53.1	1242.7	8.18 -j44.0	**49.72**
Tower 2	1517.0	12.7 +j46.9	1241.2	8.93 -j42.4	**48.90**
				IMPEDANCE DELTA	0.82

SAMPLING TCT MEASUREMENTS

Measurements of the Phasetek Inc. Model P600-203, 1.0 V/A Toroidal Current Transformers were performed by a Hewlett Packard 8751A, Network Analyzer. Measurements are normalized to Tower #1 (reference).

TOWER	*TCT SERIAL #*	*MAGNITUDE*	*PHASE*
1	901	1.000	0.0°
2	902	.997	0.2°

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ANTENNA MONITOR MEASUREMENT

Measurement of the Potomac Instruments Model AM-19(204), Serial Number 501, Antenna Monitor was performed to verify calibration. A single RF Voltage was applied to the 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	-0.2^0

KPMI MOMENT MODEL PARAMETERS

Tower #	Wire #	# of Segments	Base Node
1	1	10	1
2	2	10	11

Tower #	Physical Height Degrees	Modeled Height Degrees	Modeled Radius Meters	% of Equivalent Radius
1	85.1	89.3	.218	100.0
2	85.1	88.6	.218	100.0

All Towers are uniform cross section, guyed with Base Insulator. All of the towers are three (3) sided, 18" face width. All Base Insulators are manufactured by Lapp Insulators with an assumed capacity of 15pf. All Towers have Phasetek Inc. Model #P600-161-3 Static Drain Chokes installed and these measure –j 14,000 ohms @ 1300 KHz.

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KPMI Tower 1 driven, all others floated

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	10
		0	0	90.		
2	none	86.7	188.	0	.218	10
		86.7	188.	92.1		

Number of wires = 2
current nodes = 20

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	9.	2	9.21
radius	1	.218	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.3	0	1	.025	.0255833

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	11	0	-8,161.8	0	0	0

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IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.3	39.733	18.714	43.919	25.2	1.6071	-12.658	-.24214

CURRENT rms
Frequency = 1.3 MHz
Input power = .0102993 watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	.0161002	334.8	.0145654	-6.86E-03
2	0	0	9.	.0161729	332.9	.0144005	-7.36E-03
3	0	0	18.	.0157883	331.8	.0139093	-7.47E-03
4	0	0	27.	.0150044	330.8	.0131015	-7.31E-03
5	0	0	36.	.0138427	330.	.0119933	-6.91E-03
6	0	0	45.	.0123276	329.4	.010606	-6.28E-03
7	0	0	54.	.0104872	328.7	8.96E-03	-5.44E-03
8	0	0	63.	8.35E-03	328.2	7.1E-03	-4.4E-03
9	0	0	72.	5.94E-03	327.7	5.02E-03	-3.18E-03
10	0	0	81.	3.26E-03	327.2	2.74E-03	-1.77E-03
END	0	0	90.	0	0	0	0
GND	-85.8562	12.0663	0	5.86E-05	204.2	-5.35E-05	-2.4E-05
12	-85.8562	12.0663	9.21	4.55E-04	204.3	-4.14E-04	-1.87E-04
13	-85.8562	12.0663	18.42	6.84E-04	204.5	-6.23E-04	-2.83E-04
14	-85.8562	12.0663	27.63	8.31E-04	204.7	-7.55E-04	-3.47E-04
15	-85.8562	12.0663	36.84	9.05E-04	204.9	-8.21E-04	-3.82E-04
16	-85.8562	12.0663	46.05	9.11E-04	205.2	-8.24E-04	-3.88E-04
17	-85.8562	12.0663	55.26	8.53E-04	205.5	-7.7E-04	-3.68E-04
18	-85.8562	12.0663	64.47	7.35E-04	205.8	-6.61E-04	-3.2E-04
19	-85.8562	12.0663	73.68	5.58E-04	206.2	-5.01E-04	-2.46E-04
20	-85.8562	12.0663	82.89	3.24E-04	206.5	-2.9E-04	-1.45E-04
END	-85.8562	12.0663	92.1	0	0	0	0

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KPMI Tower 2 driven, all others floated

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	10
		0	0	89.3		
2	none	86.7	188.	0	.218	10
		86.7	188.	88.6		

Number of wires = 2
current nodes = 20

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	2	8.86	1	8.93
radius	1	.218	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.3	0	1	.0246111	.0248056

Sources

source	node	sector	magnitude	phase	type
1	11	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-8,161.8	0	0	0

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 11, sector 1							
1.3	37.819	11.465	39.518	16.9	1.4657	-14.476	-.15777

CURRENT rms
Frequency = 1.3 MHz
Input power = .0121082 watts
Efficiency = 100. %

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coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	6.03E-05	213.	-5.06E-05	-3.28E-05
2	0	0	8.93	4.59E-04	213.1	-3.84E-04	-2.5E-04
3	0	0	17.86	6.89E-04	213.3	-5.76E-04	-3.78E-04
4	0	0	26.79	8.36E-04	213.5	-6.97E-04	-4.61E-04
5	0	0	35.72	9.09E-04	213.8	-7.56E-04	-5.05E-04
6	0	0	44.65	9.16E-04	214.1	-7.59E-04	-5.13E-04
7	0	0	53.58	8.58E-04	214.4	-7.08E-04	-4.84E-04
8	0	0	62.51	7.39E-04	214.7	-6.07E-04	-4.21E-04
9	0	0	71.44	5.62E-04	215.1	-4.6E-04	-3.23E-04
10	0	0	80.37	3.27E-04	215.4	-2.66E-04	-1.9E-04
END	0	0	89.3	0	0	0	0
GND	-85.8562	12.0663	0	.0178932	343.1	.0171236	-5.19E-03
12	-85.8562	12.0663	8.86	.0178664	341.4	.016931	-5.71E-03
13	-85.8562	12.0663	17.72	.0173775	340.3	.0163571	-5.87E-03
14	-85.8562	12.0663	26.58	.0164686	339.4	.015413	-5.8E-03
15	-85.8562	12.0663	35.44	.0151605	338.6	.0141168	-5.53E-03
16	-85.8562	12.0663	44.3	.0134784	338.	.0124926	-5.06E-03
17	-85.8562	12.0663	53.16	.0114517	337.4	.0105688	-4.41E-03
18	-85.8562	12.0663	62.02	9.11E-03	336.8	8.37E-03	-3.59E-03
19	-85.8562	12.0663	70.88	6.48E-03	336.3	5.93E-03	-2.6E-03
20	-85.8562	12.0663	79.74	3.56E-03	335.8	3.24E-03	-1.46E-03
END	-85.8562	12.0663	88.6	0	0	0	0

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KPMI Night Directional Model

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

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	10
		0	0	89.3		
2	none	86.7	188.	0	.218	10
		86.7	188.	88.6		

Number of wires = 2
current nodes = 20

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	2	8.86	1	8.93
radius	1	.218	1	.218

ELECTRICAL DESCRIPTION
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.3	0	1	.0246111	.0248056

Sources

source	node	sector	magnitude	phase	type
1	1	1	258.692	37.1	voltage
2	11	1	102.572	69.8	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							
1.3	60.366	36.367	70.474	31.1	1.9648	-9.7509	-.48615
source = 2; node 11, sector 1							
1.3	23.747	-9.0727	25.421	339.1	2.194	-8.5466	-.65374

CURRENT rms
Frequency = 1.3 MHz

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Input power = 600.001 watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	2.5956	6.	2.58143	.270912
2	0	0	8.93	2.64619	3.2	2.64198	.149279
3	0	0	17.86	2.60878	1.6	2.60781	.0710006
4	0	0	26.79	2.49956	.3	2.49953	.0111622
5	0	0	35.72	2.32246	359.2	2.32222	-.0330983
6	0	0	44.65	2.08147	358.3	2.08052	-.0627708
7	0	0	53.58	1.78109	357.5	1.77936	-.0783559
8	0	0	62.51	1.42606	356.8	1.4238	-.0802418
9	0	0	71.44	1.02019	356.1	1.01787	-.0687263
10	0	0	80.37	.562689	355.5	.56099	-.0436967
END	0	0	89.3	0	0	0	0
GND	-85.8562	12.0663	0	2.85311	90.7	-.0331342	2.85292
12	-85.8562	12.0663	8.86	2.80066	89.5	.0225134	2.80057
13	-85.8562	12.0663	17.72	2.69375	88.8	.0564993	2.69316
14	-85.8562	12.0663	26.58	2.52952	88.2	.0803627	2.52824
15	-85.8562	12.0663	35.44	2.31025	87.6	.095342	2.30828
16	-85.8562	12.0663	44.3	2.0396	87.1	.101773	2.03706
17	-85.8562	12.0663	53.16	1.72199	86.7	.0997332	1.7191
18	-85.8562	12.0663	62.02	1.36212	86.2	.089222	1.35919
19	-85.8562	12.0663	70.88	.963684	85.8	.0701451	.961128
20	-85.8562	12.0663	79.74	.526074	85.4	.0420491	.524391
END	-85.8562	12.0663	88.6	0	0	0	0

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KPMI DERIVED DIRECTIONAL PARAMETERS

NIGHT:

	Theoretical		Base Network Input Current		Normalized TCT	
Tower	Field	Phase	Amplitude	Phase	Amplitude	Phase
1 (N)	1.000	0.0°	2.57	+6.7°	1.000	0.0°
2 (S)	1.000	+88.0°	2.85	+91.0°	1.109	+84.3°

KPMI TOWER BASE CIRCUIT ANALYSIS DESCRIPTION

CIRCUIT ANALYSIS

Circuit Analysis was performed on each Tower of the KPMI 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.

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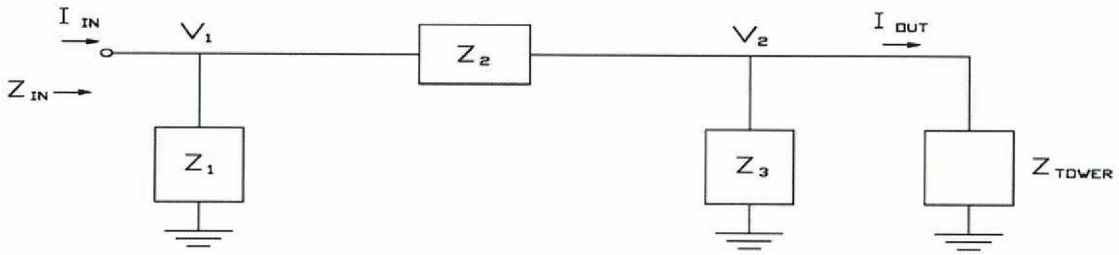

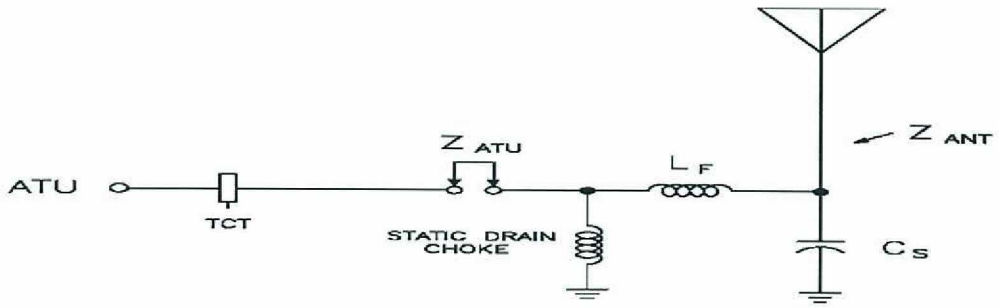

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TOWER	Specified Cs (pf)	Measured L_F (µH)	Measured X_F (Ω)	Modeled Z_{ANT} (Ω)	Modeled Z_{ATU} (Ω)	Measured Z_{ATU} (Ω)
1	15	3.24	+j26.5	38.87 +j15.11	39.25 +j41.47	38.99 +j41.60
2	15	3.76	+j30.7	37.82 +j11.47	38.15 +j42.03	37.54 +j42.23

Direct Measurement of Power - KPMI

Common point impedance measurements were made using a Hewlett-Packard 8751A network analyzer and a Tunwall Radio directional coupler in a calibrated measurement system. The measurements were made at the phasor cabinet input jack adjacent to the common point current meter that is used to determine operating power. The resistance value was adjusted to provide the correct input power with the specified common point current. The reactance value was adjusted to cancel incidental inductance in the circuit between the transmitter output port and the common point in the phasor cabinet, including the main-auxiliary switching contactor, to provide a non-reactive load for the transmitter at carrier frequency.

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Reference Field Strength Measurements

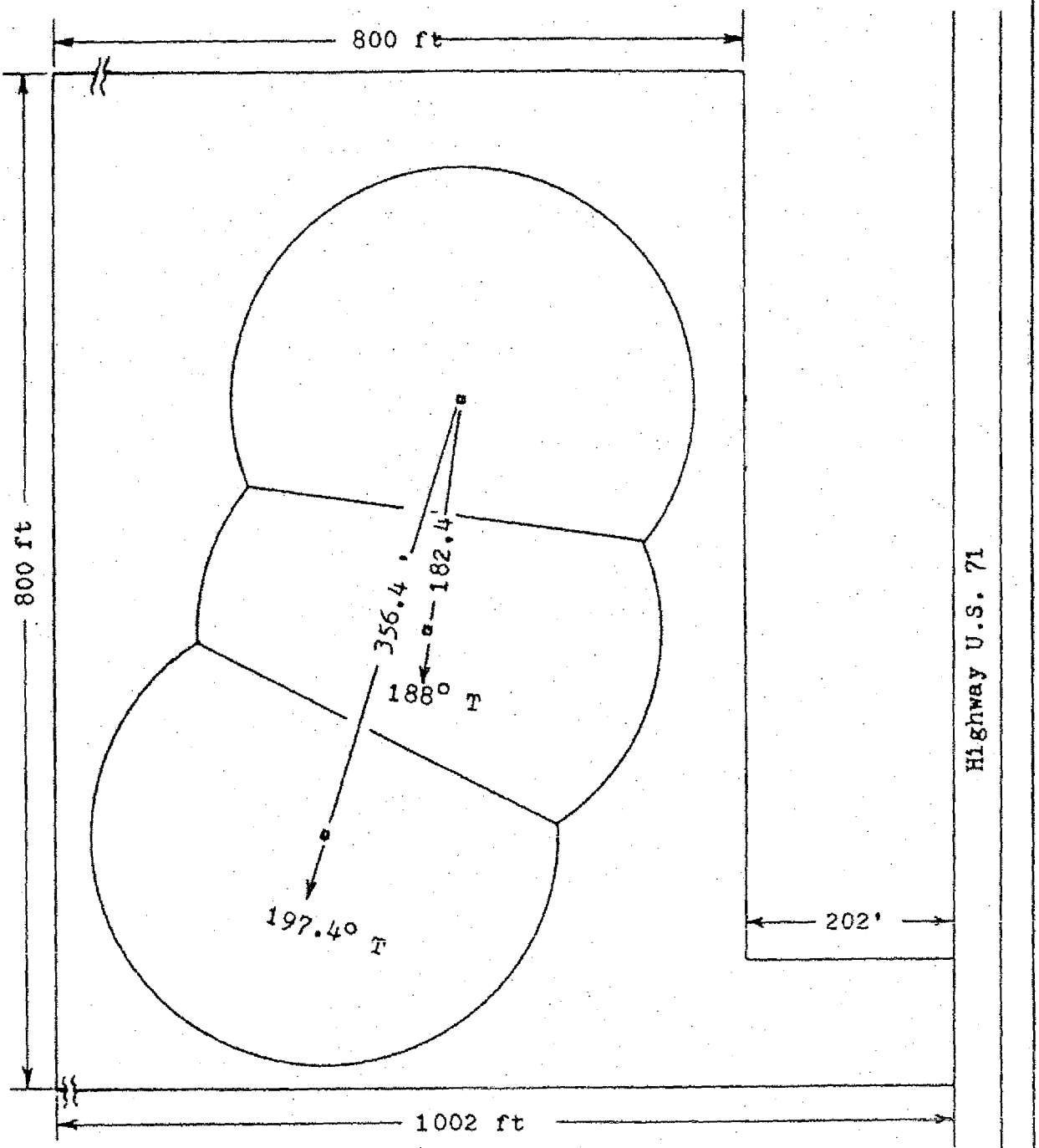
The field measurements were performed by Mr. Roger Paskvan, under my supervision, using a Potomac Field intensity Meter FIM-41 s/n-581 calibrated 5/21/2002 and checked against another meter and found to be within operating specifications. KPMI was confirmed to be operating at the Construction Permit values.

188 degree radial

Point #	Distance to	reading	Lat/long	Description
1	1.5Km	15.6 mv	47-25-43.5/94-52-06.4	.36Km west (271 degrees) the corner of Convenience lane
2	2.0 Km	7.0 mv	47-25-29.5/94-52-10	.44Km west of Oak Hills Rd SW and Hwy 71 South
3	3.57Km	2.5mv	47-24-37/94-52-21	.67Km West of North Plantanginet and Hwy 71 South

8 Degree radial

1	1 Km	85mv	47-26-31.7/94-51-56.6	Corner of Rako and Washington Ave
2	2.0 Km	66mv	47-27-35.2/94-51-43.1	Corner of 2nd street and Wood Ave and Lakeshore Dr. NE (right on beach)
3	2.44Km	61mv	47-27-48.9/94-51-40.2	.07Km at a bearing 330 Degrees from Corner of Central Ave NE and Lakeshore Dr.



Ground System: 120 Copper radials, each 181 ft in length, except where overlapped, equally spaced about each tower, interspaced with 120 radials each 50 ft in length. Radials buried 6-8 inches

C. J. Thomforde Consulting Engineer Grand Forks, No. Dak.	Figure 2 Oct 1977	GROUND LAYOUT K K B J Bemidji, Minn.