FILE COPY

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MEMBER, DISTRICT OF COLUMBIA BAR ONLY;
PRACTICE LIMITED TO FEDERAL COURTS AND AGENCIES

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August 27, 2014

Honorable Marlene H. Dortch
Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Attention: Audio Division, Media Bureau

RE: Covenant Network
FRN 0004-7603-77
KHOJ(AM), St. Charles, Missouri
Facility ID # 7114
Application for License to Cover
File No. BP-20130916AAB

Dear Madame Secretary:

On behalf of our client Covenant Network, this is to submit in triplicate an application on FCC Form 302-AM to cover the newly constructed modified facilities for AM Broadcast Station KHOJ, St. Charles, Missouri.

Program test authority to operate the daytime facility with its full 12.0 kW of power is respectfully requested. It is urged that such authority be granted within the next ten days, as the public interest, convenience and necessity would be well served by KHOJ improving its service to St. Charles and the surrounding St. Louis, Missouri metropolitan area.

As the applicant is a non-profit corporation and as Station KHOJ is a "non-commercial, educational" AM station, this application is non-feeable pursuant to Section 1.1116(c) of the Commission's Rules.

Should additional information be desired in connection with the above matter, kindly communicate with this office.

Very truly yours,

Dennis J. Kelly

Federal Communications Commission
Washington, D. C. 20554

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

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO.

SECTION I - APPLICANT FEE INFORMATION

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

COVENANT NETWORK FRN: 0004-7603-77

MAILING ADDRESS (Line 1) (Maximum 35 characters)
4424 Hampton Avenue

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
St. Louis	MO	63109

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
314-752-7000	KHOJ	7114

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
	0001	$	

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
	0001	$	

	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.	$	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT COVENANT NETWORK		
MAILING ADDRESS 4424 Hampton Avenue		
CITY St. Louis	STATE MO	ZIP CODE 63109

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
KHOJ	St. Charles, MO	BP-20130916AAB		February 27, 2017

PROGRAM TEST AUTHORITY REQUESTED

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.

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	
John Anthony Holman		
Title President	Date 08/26/2014	Telephone Number 314-752-7000

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 630 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
Covenant Network

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
KHOJ	BP-20130916AAB	1460	Unlimited	0.21	12

2. Station location

State	City or Town
Missouri	St. Charles

3. Transmitter location

State	County	City or Town	Street address (or other identification)
MO	St. Charles	St. Charles	3713 N. Highway 94

4. Main studio location

State	County	City or Town	Street address (or other identification)
MO	St. Louis City	St. Louis	4424 Hampton Ave.

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

State	County	City or Town	Street address (or other identification)
MO	St. Louis City	St. Louis	4424 Hampton Ave.

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. EE

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
2.13	15.9

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	50	0	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 (N) ASRN 1252338	+123.7°	+118.4°	0.769	0.558	dna	dna
2 (S) ASRN 1252339	0°	-83.8°	1.000	0.480	dna	dna
3 (C) ASRN 1232337	+5.3°	0°	0.252	1.000	dna	dna

Manufacturer and type of antenna monitor: Potomac Instruments AM-19 (204) s/n 873

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.
Vertical steel uniform cross section insulated guyed towers	51.3	53	53	Exhibit No. DNA

Excitation ☑ Series ☐ Shunt This is a method of moments antenna proof.

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
38 ° 50 ' 05 "	90 ° 28 ' 08 "

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. none

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

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.

n/a

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

Name (Please Print or Type)	Signature (check appropriate box below)
Mark A. Mueller	Mark A. Mueller
Address (include ZIP Code) Mueller Broadcast Design 613 S. La Grange Rd. La Grange, IL 60525	Date August 22, 2014 Telephone No. (Include Area Code) (708) 352-2166

mark@muellerbroadcastdesign.com

☐ Technical Director

☐ Registered Professional Engineer

☐ Chief Operator

☑ Technical Consultant

☐ Other (specify)

Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

KHOJ, SAINT CHARLES, MISSOURI
DIRECTIONAL ANTENNA
PROOF OF PERFORMANCE
AUGUST 2014

Exhibit EE
ENGINEERING EXHIBIT
TABLE OF CONTENTS

Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

State of Illinois)
)ss
County of Cook)

Mark Alan Mueller, first being duly sworn, deposes and says that he is a Broadcast Technical Consultant and owner of Mueller Broadcast Design, which has been retained by Covenant Network, permittee of KHOJ (AM), St. Charles, Missouri to prepare the following engineering exhibit. He is a licensed first-class radiotelephone operator, license number P1-18-44514 (renewed: PG-18-21512) and has been engaged in radio broadcast engineering work for a period of over 37 years. During this time he has been responsible for the preparation of many engineering exhibits and reports for submission to the Federal Communications Commission. He was awarded the Bachelor of Science degree from the University of Illinois at Urbana-Champaign.

The following exhibits were prepared by him and they are true and correct to the best of his knowledge and belief.

August 22, 2014

Mark A. Mueller, Affiant

Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

Engineering Report For
Covenant Network
K H O J (A M)
St. Charles, Missouri
August 2014

This engineering report documents the Directional Antenna Performance Verification measurements for KHOJ (AM), FCC facility ID number 7114, St. Charles, Missouri. KHOJ currently operates on 1460 KHz with 5 KW and a three tower directional antenna daytime and a different three tower directional pattern using the same towers with 210 watts at night. This Verification is for the new 12 KW 3 tower daytime antenna pattern authorized by BP-20130916AAB and documents the required "model proof" in order to grant the covering license. All measurements were made personally by the writer in accordance with the FCC rules at 47 CFR 73.151(c). No changes were made to the licensed nighttime operation.

Eligibility for 73.151(c) Processing

The KHOJ antenna system consists of three conventional insulated uniform cross-section triangular 14" face steel guyed towers, series-fed with no top loading. They are 90° tall at the KHOJ frequency (1460 KHz) and are sampled at the base using Delta TCT-3 toroidal current transformers. The ground system is of standard design, consisting of 120 equally-spaced buried bare copper wire radials around each tower 51.4 meters long (90°) except for those which intersect where four inch copper straps terminate the radial intersections. A 4" strap interconnects the towers to each other and to the phasor and transmitter. No physical changes were made to the previously licensed towers or ground system to implement the daytime power increase.

Measurements

The KHOJ antenna system was modeled using Westberg Consulting's Phasor Professional 2.1.1 which calculates the tower matrix values as well as the proper operating parameters. The towers and sample lines were measured and documented using an Array Solutions PowerAIM-

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120 network analyzer serial number 1019 operated in accordance with the manufacturer's instructions. This analyzer has been used in several recent projects and exhibits excellent stability and field performance and since it operates "floating" via battery power and a Bluetooth radio connection to the associated computer no RF ground loop issues arise.

The three KHOJ towers are identical in height and are base sampled using torodial current transformers. Each tower was disconnected from its ATU at the sample transformer and was measured at that point. The other towers were individually shorted and left floating for each measurement as required, plus additional measurements with the subject tower base insulator shorted to measure the feedline impedance and electrical length from the ATU to the tower as well as at the tower itself with the ATU disconnected. These measurements are documented below and show good agreement with the Westberg theoretical numbers.

Prior to tuning the array, the Potomac Instruments AM-19 (204) antenna monitor was calibrated by the writer according to the manufacturer's instructions, with both zero degree and 180 degree phase indications verified as showing 0° and 180° as appropriate using the built-in calibration circuit. Feeding two channels at once from the same source verified that each channel indicated properly (equal ratio and phase) and a 90° delay inserted in each sample line in turn with the same source connected to the reference was used to verify proper mid-scale readings at both +90° and -90°. Finally, the ratio indications were verified using a field intensity meter to read the RF voltage on the sample lines while connected to the monitor, and manual calculations of the ratio confirmed proper operation of the monitor.

United States of America

FEDERAL COMMUNICATIONS COMMISSION

AM BROADCAST STATION CONSTRUCTION PERMIT

Authorizing Official:

Official Mailing Address:

COVENANT NETWORK
4424 HAMPTON AVENUE
ST. LOUIS MO 63109

Son Nguyen
Supervisory Engineer
Audio Division
Media Bureau

Grant Date: February 27, 2014

This permit expires 3:00 a.m. local time, 36 months after the grant date specified above.

Facility Id: 7114

Call Sign: KHOJ

Permit File Number: BP-20130916AAB

Authorization to increase the daytime power and change the daytime antenna theoretical parameters.

Subject to the provisions of the Communications Act of 1934, as amended, subsequent acts and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions set forth in this permit, the permittee is hereby authorized to construct the radio transmitting apparatus herein described. Installation and adjustment of equipment not specifically set forth herein shall be in accordance with representations contained in the permittee's application for construction permit except for such modifications as are presently permitted, without application, by the Commission's Rules.

Commission rules which became effective on February 16, 1999, have a bearing on this construction permit. See Report & Order, Streamlining of Mass Media Applications, MM Docket No. 98-43, 13 FCC RCD 23056, Para. 77-90 (November 25, 1998); 63 Fed. Reg. 70039 (December 18, 1998). Pursuant to these rules, this construction permit will be subject to automatic forfeiture unless construction is complete and an application for license to cover is filed prior to expiration. See Section 73.3598.

Equipment and program tests shall be conducted only pursuant to Sections 73.1610 and 73.1620 of the Commission's Rules.

Hours of Operation: Unlimited

Average hours of sunrise and sunset:
Local Standard Time (Non-Advanced)

Jan.	7:15 AM	5:00 PM	Jul.	4:45 AM	7:30 PM
Feb.	7:00 AM	5:45 PM	Aug.	5:15 AM	7:00 PM
Mar.	6:15 AM	6:15 PM	Sep.	5:45 AM	6:15 PM
Apr.	5:30 AM	6:45 PM	Oct.	6:15 AM	5:30 PM
May	4:45 AM	7:00 PM	Nov.	6:45 AM	4:45 PM
Jun.	4:30 AM	7:30 PM	Dec.	7:15 AM	4:45 PM

Callsign: KHOJ Permit No.: BP-20130916AAB

Name of Permittee: COVENANT NETWORK

Station Location: ST. CHARLES, MO

Frequency (kHz): 1460

Station Class: B

Antenna Coordinates:

		Day			
Latitude:	N	38 Deg	50 Min	05 Sec	
Longitude:	W	90 Deg	28 Min	08 Sec	

		Night			
Latitude:	N	38 Deg	50 Min	05 Sec	
Longitude:	W	90 Deg	28 Min	08 Sec	

Transmitter(s): Type Accepted. See Sections 73.1660, 73.1665 and 73.1670 of the Commission's Rules.

Nominal Power (kW): Day: 12.0 Night: 0.210

Antenna Mode: Day: DA Night: DA

(DA=Directional Antenna, ND=Non-directional Antenna; CH=Critical Hours)

Antenna Registration Number(s):

Day:

Tower No.	ASRN	Overall Height (m)
1	1252338	
2	1252339	
3	1252337	

Night:

Tower No.	ASRN	Overall Height (m)
1	1252338	
2	1252339	
3	1252337	

Callsign: KHOJ Permit No.: BP-20130916AAB

DESCRIPTION OF DIRECTIONAL ANTENNA SYSTEM

Theoretical RMS (mV/m/km): Day: 1108.76 Night: 145.37

Standard RMS (mV/m/km): Day: 1188.34 Night: 153

Augmented RMS (mV/m/km):

Q Factor: Day: Night:

Theoretical Parameters:

Day Directional Antenna:

Tower No.	Field Ratio	Phasing (Deg.)	Spacing (Deg.)	Orientation (Deg.)	Tower Ref Switch *	Height (Deg.)
1	0.5100	121.000	90.0000	32.000	0	90.0
2	0.5100	-91.000	90.0000	212.000	0	90.0
3	1.0000	0.000	20.0000	357.000	0	90.0

* Tower Reference Switch
0 = Spacing and orientation from reference tower
1 = Spacing and orientation from previous tower

Theoretical Parameters:

Night Directional Antenna:

Tower No.	Field Ratio	Phasing (Deg.)	Spacing (Deg.)	Orientation (Deg.)	Tower Ref Switch *	Height (Deg.)
1	0.8200	128.500	90.0000	32.000	0	90.0
2	1.0000	0.000	90.0000	212.000	0	90.0
3	0.2700	2.500	20.0000	357.000	0	90.0

* Tower Reference Switch
0 = Spacing and orientation from reference tower
1 = Spacing and orientation from previous tower

Inverse Distance Field Strength:
The inverse distance field strength at a distance of one kilometer from the above antenna in the directions specified shall not exceed the following values:

Day:

Azimuth:	Radiation:	
39.5	40	mV/m
341.5	86.2	mV/m

Special operating conditions or restrictions:

1 The permittee/licensee must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

2 The permittee must submit a proof of performance as set forth in either Section 73.151(a) or 73.151(c) of the rules before program tests are authorized.
A proof of performance based on field strength measurements, per Section 73.151(a), shall include a complete nondirectional proof of performance, in addition to a complete proof on the day directional antenna system. The nondirectional and directional field strength measurements must be made under similar environmental conditions. The proof(s) of performance submitted to the Commission must contain all of the data specified in Section 73.186 of the rules.
Permittees who elect to submit a moment method proof of performance, as set forth in Section 73.151(c), must use series-fed radiators. In addition, the sampling system must be constructed as described in Section 73.151(c) (2) (i).

3 Permittee shall install a type accepted transmitter, or submit application (FCC Form 301) along with data prescribed in Section 73.1660(b) should non-type accepted transmitter be proposed.

4 Ground system consists of 120 equally spaced, buried, copper radials about the base of each tower, each 51.4 meters in length except where intersecting radials are shortened and bonded to a transverse copper strap midway between adjacent towers,

5 Before program test authority is authorized by the Commission: sufficient radiofrequency (RF) electromagnetic field measurements taken at the tower fence shall be submitted to show that the new power level RF radiation is in compliance with the American National Standards Institute Guidelines (OET Bulletin No. 65. August 1997); or a fence must be erected at such distances and in such a manner as to prevent the exposure human exposure to radiofrequency electromagnetic fields in excess of the FCC Guidelines (OET Bulletin No. 65. Edition 97-01, August 1997). The fence must be of a type which will preclude casual or inadvertent access, and must include warning signs at appropriate intervals which describe the nature of the hazard. Permittee shall submit documentation of compliance with this special operating condition along with the Form 302, application for license and the request for program test authority.

6 A license application (FCC Form 302) to cover this construction permit must be filed with the Commission pursuant to Section 73.3536 of the Rules before the permit expires.

*** END OF AUTHORIZATION ***

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MODEL DATA:

Theoretical Data:

STATION INFORMATION		
Call Letters	No. Towers	Frequency
KHOJ	3	1.4600

TOWER INFORMATION						
	Tower Height (°)	Spacing (°)	Orientation	Face Width (in.)	Radius (in.)	Velocity Factor
Tower 1	90.0000	90.0000	32.0000	13.5000 / 13.5000	6.2354 / 6.2354	0.905000
Tower 2	90.0000	90.0000	212.0000	13.5000 / 13.5000	6.2354 / 6.2354	0.915000
Tower 3	90.0000	20.0000	357.0000	13.5000 / 13.5000	6.2354 / 6.2354	0.900000

Measured Impedance Matrix [47 CFR 73.151(c)(1)]

MATRIX INFORMATION		
	Calculated Impedance (other towers open)	Measured Impedance (other towers open)
Tower 1	57.87 + j73.08	57.94 + j72.55
Tower 2	56.06 + j69.15	57.58 + j68.28
Tower 3	56.22 + j76.78	56.64 + j78.53

The measured lead inductance from the sample element TCT to the tower is 2.8 to 3.1 uH. The Westberg Phasor Professional method-of-moments model fully complies with all FCC requirements for tower radius, height, segment length, and calculation references points. No shunt capacitance was used. Towers were adjusted by varying the propagation velocity as shown above. The corrected measured impedances agree with the model within +/- 2 ohms and +/- 4%. Westberg's Phasor Professional uses a single wire of the desired effective radius divided into segments or no more than 10° electrical length each to model the tower.

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DETUNED TOWER CURRENTS from Westberg Phasor Professional

Tower 1
0.000000 > 0.000000 - 90.00° above ground
0.118817 > 147.204803 - 80.00° above ground
0.180798 > 147.914510 - 70.00° above ground
0.201256 > 148.663787 - 60.00° above ground
0.179825 > 149.579626 - 50.00° above ground
0.116024 > 151.185310 - 40.00° above ground
0.010774 > 179.823030 - 30.00° above ground
0.141237 > -32.643037 - 20.00° above ground
0.338572 > -30.835652 - 10.00° above ground
0.652198 > -29.855428 - 0.00° above ground
Tower 2
0.000000 > 0.000000 - 90.00° above ground
0.117174 > 147.396026 - 80.00° above ground
0.178121 > 148.084209 - 70.00° above ground
0.198101 > 148.789689 - 60.00° above ground
0.176815 > 149.624004 - 50.00° above ground
0.113859 > 151.047812 - 40.00° above ground
0.009975 > 177.581617 - 30.00° above ground
0.139163 > -32.326859 - 20.00° above ground
0.332994 > -30.776503 - 10.00° above ground
0.641224 > -29.956970 - 0.00° above ground
Tower 3
0.000000 > 0.000000 - 90.00° above ground
0.190124 > -111.079814 - 80.00° above ground
0.291452 > -112.054473 - 70.00° above ground
0.327042 > -113.117165 - 60.00° above ground
0.295100 > -114.375362 - 50.00° above ground
0.193658 > -116.424997 - 40.00° above ground
0.023412 > -143.074829 - 30.00° above ground
0.226629 > 68.456893 - 20.00° above ground
0.553173 > 66.200578 - 10.00° above ground
1.075367 > 65.090295 - 0.00° above ground

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MATRIX CALCULATIONS from Westberg Phasor Professional

ZMatrix		
57.87 + j73.08	-16.99 - j21.32	37.17 - j21.34
-16.99 - j21.32	56.06 + j69.15	17.34 - j29.19
37.17 - j21.34	17.34 - j29.19	56.22 + j76.78

YMatrix		
0.005362 - j0.007280	0.001024 - j0.000623	0.003339 + j0.003012
0.001024 - j0.000623	0.007218 - j0.007365	0.003655 + j0.001829
0.003339 + j0.003012	0.003655 + j0.001829	0.004604 - j0.005679
HMatrix - [I] = [H] X [F]		
0.023541 + j0.002401	0.000964 - j0.000434	0.000565 + j0.001629
0.000947 - j0.000424	0.024089 + j0.002364	0.001058 + j0.000952
0.000569 + j0.001645	0.001087 + j0.000980	0.023266 + j0.002423

HMatrix-inverse - [F] = $[H]^{-1}$ X [I]		
41.939435 - j4.187217	-1.522506 + j1.253764	-1.470527 - j2.676869
-1.496471 + j1.227658	41.202821 - j3.982504	-2.041742 - j1.217019
-1.481817 - j2.702601	-2.097607 - j1.253989	42.443924 - j4.107738

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TOWER CURRENTS

Mode 1- Daytime
Tower 1
0.000000 > 0.000000 - 90.00° above ground
1.641007 > 115.118386 - 80.00° above ground
2.991208 > 115.491941 - 70.00° above ground
4.202113 > 115.847218 - 60.00° above ground
5.252025 > 116.192390 - 50.00° above ground
6.113607 > 116.534245 - 40.00° above ground
6.760072 > 116.883541 - 30.00° above ground
7.168089 > 117.258177 - 20.00° above ground
7.317841 > 117.689264 - 10.00° above ground
7.133488 > 118.370437 - 0.00° above ground
Tower 2
0.000000 > 0.000000 - 90.00° above ground
1.900289 > -101.842512 - 80.00° above ground
3.384230 > -100.870223 - 70.00° above ground
4.641277 > -99.799288 - 60.00° above ground
5.652718 > -98.571310 - 50.00° above ground
6.394404 > -97.118466 - 40.00° above ground
6.843732 > -95.336679 - 30.00° above ground
6.982216 > -93.044309 - 20.00° above ground
6.795155 > -89.889705 - 10.00° above ground
6.126766 > -83.793101 - 0.00° above ground
Tower 3
0.000000 > 0.000000 - 90.00° above ground
3.421395 > -7.005702 - 80.00° above ground
6.167393 > -6.576323 - 70.00° above ground
8.562876 > -6.110421 - 60.00° above ground
10.566752 > -5.585724 - 50.00° above ground
12.126903 > -4.978423 - 40.00° above ground
13.192600 > -4.253470 - 30.00° above ground
13.719066 > -3.351461 - 20.00° above ground
13.665168 > -2.161014 - 10.00° above ground
12.773178 > 0.000000 - 0.00° above ground

Mode 2- Nighttime
Tower 1
0.000000 > 0.000000 - 90.00° above ground
0.309157 > 117.932729 - 80.00° above ground
0.556032 > 118.340139 - 70.00° above ground
0.770369 > 118.766079 - 60.00° above ground
0.948629 > 119.228440 - 50.00° above ground
1.086267 > 119.745685 - 40.00° above ground
1.178832 > 120.345430 - 30.00° above ground
1.222349 > 121.074936 - 20.00° above ground
1.213048 > 122.023461 - 10.00° above ground
1.126052 > 123.737582 - 0.00° above ground
Tower 2
0.000000 > 0.000000 - 90.00° above ground
0.370415 > -14.070947 - 80.00° above ground
0.668442 > -13.133356 - 70.00° above ground
0.929996 > -12.129298 - 60.00° above ground
1.151160 > -11.015231 - 50.00° above ground
1.326824 > -9.746324 - 40.00° above ground
1.452060 > -8.257431 - 30.00° above ground
1.522747 > -6.440199 - 20.00° above ground
1.535670 > -4.098045 - 10.00° above ground
1.472142 > 0.000000 - 0.00° above ground
Tower 3
0.000000 > 0.000000 - 90.00° above ground
0.102016 > -12.312441 - 80.00° above ground
0.183369 > -11.421585 - 70.00° above ground
0.253775 > -10.402555 - 60.00° above ground
0.312035 > -9.196065 - 50.00° above ground
0.356686 > -7.735864 - 40.00° above ground
0.386399 > -5.925532 - 30.00° above ground
0.400146 > -3.602894 - 20.00° above ground
0.397233 > -0.465605 - 10.00° above ground
0.371531 > 5.310957 - 0.00° above ground

Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

TOWER DRIVE INFORMATION – DAY

	Field Ratios	Field Phase	Drive Imped. (Ω)	Current	Antenna Monitor*	Power (W)
Tower 1	0.5100	+121.000°	13.05 +j44.12	7.13 ∠ 118.37°	0.558 ∠ +118.4°	664.0667
Tower 2	0.5100	-91.0000°	129.43 + j128.96	6.13 ∠ -83.79°	0.480∠ -83.8°	4858.3504
Tower 3	1.0000	142.0000°	43.82 + j90.92	12.77 ∠ 0.00°	1.000 ∠ 0°	7149.5829

TOWER DRIVE INFORMATION – NIGHT

	Field Ratios	Field Phase	Drive Imped. (Ω)	Current	Antenna Monitor*	Power (W)
Tower 1	0.8200	128.500°	35.00 + j99.59	1.13 ∠ 123.74°	0.769 ∠ 123.7°	44.3826
Tower 2	1.0000	0.0000°	81.88 + j60.47	1.47 ∠ 0.00°	1.000 ∠ 0°	177.4427
Tower 3	0.2700	2.5000°	117.18 + j85.10	0.37 ∠ 5.31°	0.252 ∠ 5.3°	16.1746

(note: no change to licensed nighttime operation)

*** = These are the pattern parameters used to tune the array and are on the Form 302.**

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613 S. La Grange Road
La Grange, Illinois 60525
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Sample System Verification [47 CFR 73.151(c)(2)]

Sample Lines: Andrew 3/8" LDF2-50 Foam Dielectric Heliax

88% velocity factor, 50 ohms +/- 1 ohm

Lines were cut to equal electrical length and terminated with proper connectors at factory. An additional short flexible cable connects the 3/8" Heliax to the antenna monitor. These jumpers are accounted for in the data which follows. No changes to the previously licensed 2010 antenna monitoring system were made to implement the daytime power increase.

Sample Element Type: Delta Electronics TCT-3 Toroidal Current Transformers

Location: At output of antenna tuning network on tower feedline

Operating Potential: Grounded

TCT-3 Serial Numbers & measured impedance at 1460 KHz:

	Serial #	Original 2010	2014
Tower 1:	15103	49.16 +j0.95 ohms	49.31+j1.19 ohms
Tower 2:	15105	49.44 +j0.90 ohms	49.49 +j1.00 ohms
Tower 3:	15104	49.44 +j1.04 ohms	49.33 +j1.19 ohms

TCT-3 Phase and Ratio Test (Tower 2 is reference):

Tower 1:	0.994/+0.2°	0.993/+0.2°
Tower 3:	1.000/ 0.0°	1.000/+0.0°

The phase and ratio calibration test was done with all transformers removed from the ACUs and configured adjacent to each other reading RF current to the nighttime common point buss at 500 watts. The cables used to connect the TCTs to the monitor are identical in electrical length and characteristic impedance, and have been marked as to which tower they apply to and stored in the phasor for use in future tests.

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613 S. La Grange Road
La Grange, Illinois 60525
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Sample Line Length Test:	**Original 2010**	**2014**
Tower 1 Closest Odd ¼ wave Resonance:	1.543418 MHz (420.78 feet)	1.543528 (420.83 feet)
Tower 2 Closest Odd ¼ wave Resonance:	1.538938 MHz (422.16 feet)	1.538574 (422.26 feet)
Tower 3 Closest Odd ¼ wave Resonance:	1.538765 MHz (422.05 feet)	1.539093 (421.58 feet)
Maximum Difference in Electrical Length at 1460 KHz:	**1.38 feet, 0.65°**	**1.43 feet, 0.76°**

Sample Line Impedance Test, using same frequencies as 2010:

Tower 1 (North) Sample Line Mean Zmag:	50.39 ohms	50.56 ohms
Tower 2 (South) Sample Line Mean Zmag:	50.35 ohms	50.37 ohms
Tower 3 (Center) Sample Line Mean Zmag:	50.38 ohms	50.43 ohms
Maximum Variation in Sample Line Impedance:	**0.04 ohms**	**0.19 ohms**

Sample Impedance From Monitor End at 1460 KHz:

Tower 1 (North) Sample Impedance:	52.44 -j0.35 ohms	52.10 –j0.32 ohms
Tower 2 (South) Sample Impedance:	52.23 +j0.27 ohms	52.40 –j0.22ohms
Tower 3 (Center) Sample Impedance:	52.31 +j0.24 ohms	52.17 –j0.22 ohms
Maximum Variation in Sample Resistance:	**0.21 ohms**	**0.30 ohms**
Maximum Variation in Sample Reactance:	**0.11 ohms**	**0.10 ohms**

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613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

KHOJ Daytime Reference Field Strength Measurements

[47 CFR 73.151(c)(3)]

Point	Distance	mv/m	Coordinates (NAD 84)	Description
39.5° True (Mimima-monitor point radial)				
1:	1.07 km	120	38.8422658,-90.4611211	Weidey Road at small bridge
2:	1.99	54	38.8486633,-90.4543807	on SR 94 at driveway to east
3:	2.89	65	38.8548936,-90.4478107	on SR 94 at 55 MPH speed limit sign
220° True (Maxima-major lobe)				
1:	0.99	1560	38.8280171,-90.4762703	3304 Silvertrail Drive
2:	1.22	1275	38.8264016,-90.4780003	30 Goldtrail Drive
3:	1.50	1095	38.8244629,-90.4800776	12 Trailridge Court
341.5° True (Mimima-monitor point radial)				
1:	2.24	57	38.8539907,-90.4771514	4412 Blase Station Road
2:	2.89	51	38.8594833,-90.4794996	Blase Station Rd. at pipeline markers
3:	3.94	53	38.8684585,-90.4833620	2832 Church road at barn
357.5° True (Maxima)				
1:	1.53	84	38.8485815,-90.4697216	on Blase Station Road
2:	3.72	40	38.8683526,-90.4708294	on Church Road
3:	7.04	18	38.8981439,-90.4725044	CR V at "V" sign

Measurements taken August 21, 2014 by Mark A. Mueller using a Potomac Instruments FIM-41 s/n 1655, calibration date June 26, 2013.

Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
(708) 352-2166

KHOJ Nighttime Reference Field Strength Measurements

[47 CFR 73.151(c)(3)]

These measurements were taken to satisfy the 24 month recertification requirement for the nighttime pattern and are included here for reference.

Point	Distance	2010 mv/m	2014 mv/m	Coordinates (NAD 84)	Description
34° True (Maxima)					
1:	4.48 km	22	22.5	38.868062,-90.439887	on Church Rd.
2:	5.16	24.5	26	38.873169,-90.435524	on Church Rd.
3:	5.48	22	22	38.875573,-90.433446	@ electric meter on farm drive
103° True (Minima-monitor point radial)					
1:	9.65 km	1.5	1.4	38.815212,-90.360380	600 Leonard Drive
2:	10.25	1.7	1.6	38.814025,-90.353630	1015 Dewayne Drive
3:	10.56	1.5	1.35	38.813438,-90.350069	Randall Ct. At Danelle Dr.
167° True (Maxima-main lobe)					
1:	5.20	14.5	14	38.789184,-90.455375	Across 13893 Earth City Xpy.
2:	6.50	13	10.5	38.777690,-90.451928	Rock Industrial Park Dr. at fireplug
3:	9.22	7.5	6.9	38.753979,-90.445025	El Ferroll Ct at Spanish Village Dr.
209.3° True (Minima-monitor point radial)					
1:	1.88	86	88	38.819954,-90.479429	720 Clarence Drive
2:	2.45	70	70	38.815541,-90.482693	3034 DePaulia Drive
3:	2.56	62	63	38.814654,-90.483299	3177 Country Bluff Drive
258° True (Maxima-main lobe)					
1:	3.27	62	61	38.828588,-90.505863	Elm Park Industrial Dr. Near FedEx
2:	3.69	60	60	38.827844,-90.510570	Mueller Rd. in parking lot to south
3:	4.44	52	53	38.826528,-90.518599	3779 New Town Blvd. in lot to east
323° True (Minima-monitor point radial)					
1:	3.27	10	10.3	38.858242,-90.491619	on Washeon Rd.
2:	4.74	11.5	11	38.868706,-90.501822	on Church Rd.
3:	5.78	9.5	9.0	38.876166,-90.509213	4977 Seeburger Rd.

Measurements taken August 21, 2014 by Mark A. Mueller using a Potomac Instruments FIM-41 s/n 1655, calibration date June 26, 2013.

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Tower Survey [47 CFR 73.151(c)(1)(ix)]

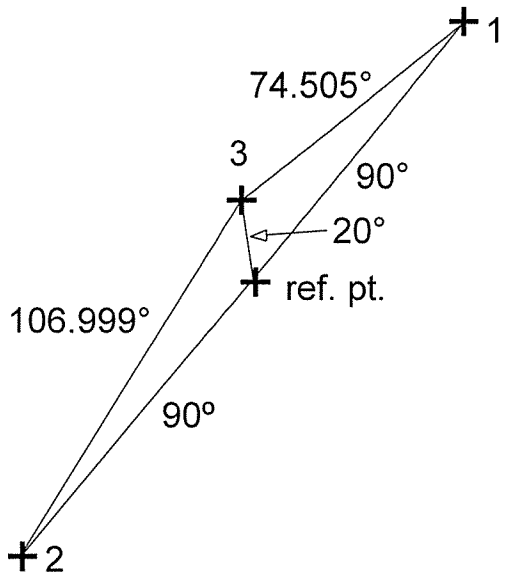
The three KHOJ towers were surveyed on May 19, 2010 by Lee C. Ferrenbach III of Gateway Land Services, Inc., a licensed Professional Land Surveyor in the state of Missouri, and were found to be as follows:

Tower 2 (S) to 1 (N): 336.8 feet (179.901°) at 31.913° True (theo. = 180.0° at 32.0° T)

Tower 3 (C) to 1 (N): 139.1 feet (74.299°) at 40.729° True (theo. = 74.51° at 40.857° T)

Tower 2 (S) to 3 (C): 200.5 feet (107.096°) at 25.808° True (theo. = 107.0° at 25.85° T)

Note: The KHOJ towers are in a 'dogleg' arrangement and the spacing and orientation to/from the center tower (#3) is specified from a reference that is not a tower location. The geometry is approximately illustrated here:



A copy of the survey report is attached. This corresponds to a maximum relative spacing error of less than +0.1°/-0.22° and bearing error of less than +0.0°/-0.13°, well within the allowed tolerances of +/- 1.5°.

Gateway Land Services Inc
1525 Belton Ave.
St. Louis MO 63119
Phone 314.881.9556
Fax 314.961.7336
www.glsstl.com

GEODETIC COORDINATE CERTIFICATION
North Tower
Ground Elevation = 451.0

	DEGREES	MINUTES	SECONDS	
LATITUDE	38°	50'	06.77" N	NAD 83
LONGITUDE	90°	28'	07.10" W	NAD 83

Middle Tower
Ground Elevation = 450.8

	DEGREES	MINUTES	SECONDS	
LATITUDE	38°	50'	05.73" N	NAD 83
LONGITUDE	90°	28'	08.25" W	NAD 83

South Tower
Ground Elevation = 449.1

	DEGREES	MINUTES	SECONDS	
LATITUDE	38°	50'	03.95" N	NAD 83
LONGITUDE	90°	28'	09.35" W	NAD 83

Calculated Geodetic Bearings between towers:

South Tower to Middle Tower - North 25° 48' 27" East, Distance = 200.5'
Middle Tower to North Tower - North 40° 43' 45" East, Distance = 139.1'
South Tower to North Tower - North 31° 54' 45" East, Distance = 336.8'

DATE: May 18, 2010
JOB #: 10-127
RE: Covenant Network
LOCATION: 3713 N. Highway 94, St. Charles, MO 63301

I certify that the Latitude and the Longitude are accurate to within plus or minus 5 feet horizontally; and that the site elevation is accurate to within plus or minus 10 feet vertically. Relative tolerance between points is +\- 0.5 feet The horizontal datum (coordinates) are in terms of the North American Datum of 1983 (NAD83) and are expressed as degrees, minutes and seconds to the nearest hundredth of a second. The vertical datum (heights) are in terms of the North American Vertical Datum of 1988 and are determined to the nearest foot.

Licensed Professional Land Surveyor
State of Missouri # 2310
Lee C Ferrenbach III

5/19/2010
DATE

STATE OF MISSOURI
LEE C. FERRENBACH, III
NUMBER PLS - 2310
PROFESSIONAL LAND SURVEYOR

Mueller Broadcast Design
613 S. La Grange Road
La Grange, Illinois 60525
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Construction Permit Conditions:

1 The permittee/licensee must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

The antenna system is protected by individual tower fences set to greater than the minimum required for 90° towers with 12 KW at 1460 KHz. Warning signs are posted on the fences and the locked gates. An additional locked fence encompasses the antenna site and warning signs are also posted on this gate. Anyone with access to the antenna field is familiar with the facility and does not stay inside the individual tower fence areas for longer than the permitted times.

2 The permittee must submit a proof of performance as set forth in either Section 73.151(a) or 73.151(c) of the rules before program tests are authorized. A proof of performance based on field strength measurements, per Section 73.151(a), shall include a complete nondirectional proof of performance, in addition to a complete proof on the day directional antenna system. The nondirectional and directional field strength measurements must be made under similar environmental conditions. The proof(s) of performance submitted to the Commission must contain all of the data specified in Section 73.186 of the rules. Permittees who elect to submit a moment method proof of performance, as set forth in Section 73.151(c), must use series-fed radiators. In addition, the sampling system must be constructed as described in Section 73.151(c) (2) (i).

The KHOJ antenna system was verified using the "model proof" rules at 47 CFR 73.151(c). The towers are series-fed and the sample system meets the requirements of 47 CFR 73.151(c)(2)(1). This is the required report and filing.

3 Permittee shall install a type accepted transmitter, or submit application (FCC Form 301) along with data prescribed in Section 73.1660(b) should non-type accepted transmitter be proposed.

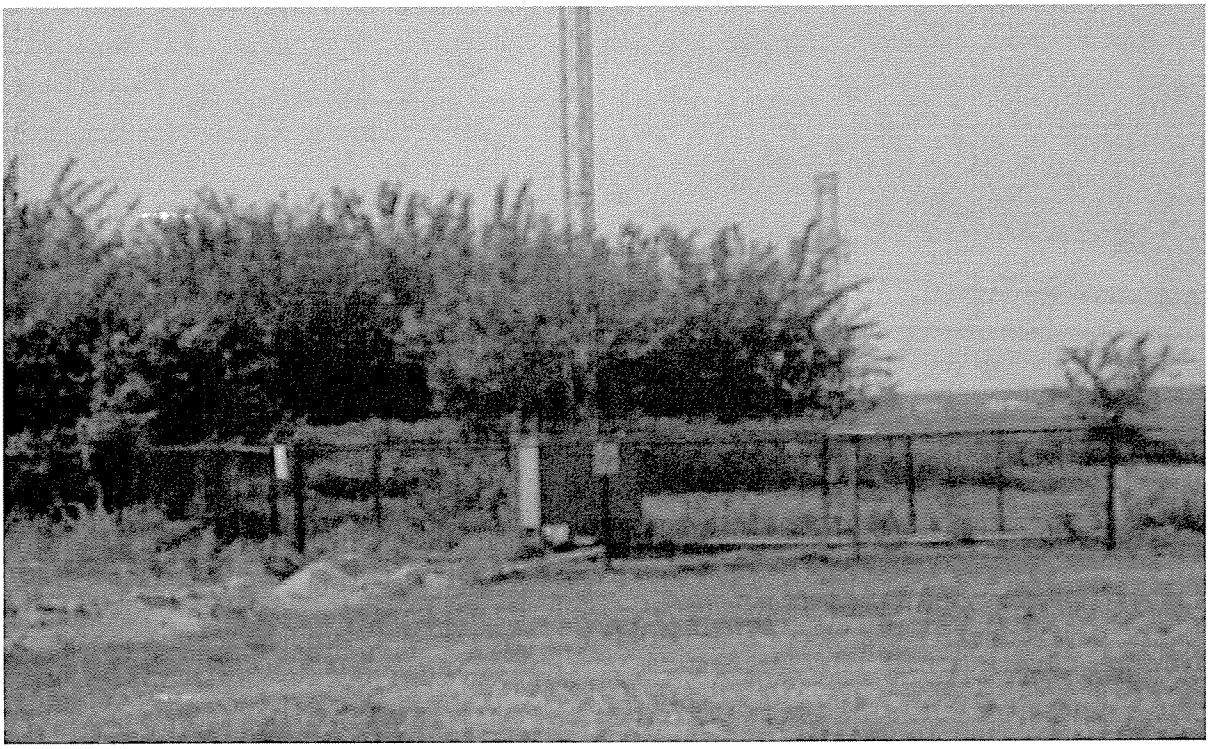
KHOJ has installed a Nautel XR-12 which the transmitter manufacturer states is type accepted for the power levels and intended service.

4 Ground system consists of 120 equally spaced, buried, copper radials about the base of each tower, each 51.4 meters in length except where intersecting radials are shortened and bonded to a transverse copper strap midway between adjacent towers,

The ground system is as described and no changes were made.

5 Before program test authority is authorized by the Commission: sufficient radiofrequency (RF) electromagnetic field measurements taken at the tower fence shall be submitted to show that the new power level RF radiation is in compliance with the American National Standards Institute Guidelines (OET Bulletin No. 65. August 1997); or a fence must be erected at such distances and in such a manner as to prevent the exposure human exposure to radiofrequency electromagnetic fields in excess of the FCC Guidelines (OET Bulletin No. 65. Edition 97-01, August 1997). The fence must be of a type which will preclude casual or inadvertent access, and must include warning signs at appropriate intervals which describe the nature of the hazard. Permittee shall submit documentation of compliance with this special operating condition along with the Form 302, application for license and the request for program test authority.

All three towers are enclosed by fences with warning signs posted at intervals on each side. Additionally, the entire site is enclosed in a fence secured by locked gates which also have signs advising of the potential for EMR exposure inside the fence. A photo of the tower 3 (center) fence and warning signs is shown below. Gate is to the left front. The other towers are similar.



The minimum tower-to-fence distance is 3.6 meters. OET 65 Appendix A table 2 specifies a minimum distance for quarter wavelength tall towers on 1460 KHz at 12 KW at 2.1 meters.

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613 S. La Grange Road
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6 A license application (FCC Form 302) to cover this construction permit must be filed with the Commission pursuant to Section 73.3536 of the Rules before the permit expires.

This is the required FCC form 302-AM filing.

Preparer's Certification

This engineering report was prepared by me from data personally collected on site using equipment owned and maintained by me for this purpose. It is true and correct to the best of my knowledge and belief. The KHOJ antenna system is properly constructed and adjusted and program test authority is hereby requested.

August 22, 2014

Mark A. Mueller