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PLEASE STAMP
AND RETURN
THIS COPY TO
FLETCHER, HEALD & HILDRETH

August 20, 2020

Via Commercial Delivery and Email

Marlene H. Dortch, Esq.
Secretary
Federal Communications Commission
9050 Junction Drive
Annapolis Junction, MD 20701

Attn: Media Bureau

**Re: Application for License on FCC Form 302-AM
Music Ministries, Inc.
Station WBGW(AM), Evansville, IN
Facility Identifier Number 24138**

Dear Ms. Dortch:

Transmitted herewith on behalf of Music Ministries, Inc. ("MMI"), the licensee of Station WBGW(AM) identified above, are an original and two copies of its application for modification of the license for its directional antenna system. This Form 302-AM specifies new operating parameters following operation pursuant to special operating authority.

Since MMI operates Station WBGW as a noncommercial educational licensee, no filing fee is included as part of this submission.

If there are any questions about his Application, please contact undersigned counsel for Music Ministries, Inc.

Sincerely,


Mark Lipp
Music Ministries, Inc.

Enclosures

cc: Mr. Jerome Manarchuck, *via email*
Audio Division, Media Bureau, FCC

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Music Ministries Inc.		
MAILING ADDRESS P.O. Box 4164		
CITY Evansville	STATE IN	ZIP CODE 47724

2. This application is for:

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

Call letters WBGW	Community of License Evansville, IN	Construction Permit File No. None	Modification of Construction Permit File No(s). None	Expiration Date of Last Construction Permit None
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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.
N/A

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

☐ Yes ☒ No

If No, state exceptions in an Exhibit.

Exhibit No.
N/A

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).

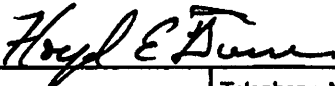
The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

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 Floyd E. Turner	Signature 	
Title President	Date 8/19/2020	Telephone Number 8124579860

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	Music Ministries, 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	
WBGW		1330	U	Night	Day
				1	5
2. Station location					
State			City or Town		
Indiana			Evansville		
3. Transmitter location					
State	County	City or Town	Street address (or other identification)		
IN	Vanderburgh	Evansville	1901 MOHR RD		
4. Main studio location					
State	County	City or Town	Street address (or other identification)		
IN	Gibson	Haubstadt 47639	4463 E 1200S		
5. Remote control point location (specify only if authorized directional antenna)					
State	County	City or Town	Street address (or other identification)		
IN	Gibson	Haubstadt 47639	4463 E 1200S		

 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. III-A

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		
4.47A			8.33A		
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	Night	Day
50	72	j-5	j+55		
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
1(South)	-157	X	0.75	X	2.75A
2(center)	0		1.0		3.55A
3(North)	+161		0.82		2.95A
Manufacturer and type of antenna monitor: Potomac Instruments AM-19 ser# 738 *All readings taken with one common meter used at each tower base.					

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 No Change: Antenna system ID 129423	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. <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Exhibit No.</div>
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Excitation ☒ Series ☐ Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.
See full description in Exhibit III-B

North Latitude NAD 83	38 ° 3 ' 9.3 "	West Longitude NAD 83	87 ° 35 ' 42.7 "
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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.

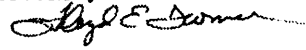
Exhibit No.

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.

Ground system was repaired and rebuilt

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) Floyd E Turner	Signature (check appropriate box below) 
Address (Include ZIP Code) 1837 E SR68 Haubstadt IN 47639	Date 6/2/2020
	Telephone No. (Include Area Code) 812-457-9860

☐ Technical Director

☐ Registered Professional Engineer

☐ Chief Operator

☒ Technical Consultant

☐ Other (specify)

Exhibit 1 — Partial Proof of Performance

Music Ministries Inc., licensee of WBGW, Evansville, IN has recently conducted a Partial Proof of Performance. The station has been operating on an STA since May, 2017, while the station engineers have been restoring the directional antenna system to licensed operation. Work included repairing the ground system, replacing the Antenna Monitor sampling system co-ax, and rebuilding the phasor. As work was completed, it became clear that the station, when adjusted to not exceed the pattern limits, had different operating parameters than proscribed in the license. Also, the original tower designations were transposed on the current license, with the South Tower listed as #3, which is corrected in this filing. (See Exhibit 1F). The daytime tower is the North Tower (#1 for daytime ND pattern), which becomes Tower#3 in the nighttime DAN pattern. The Antenna Monitor values were also reversed and are corrected in this application (see Exhibit 1E).

Measurements were taken along the 5 monitor point radials and included those monitor points specified in the license (as required by CFR 73.154), as well as seven other points taken from the stations original proof data as recorded in a 1969 proof. In analyzing the data, both arithmetic and logarithmic averaging were used to establish current radial values. All of this data is shown in Exhibit 1B, and shows the present configuration to be in compliance with the licensed maximum values.

Also, the ground conductivity at the time of testing was rather low (historical notations often refer to wide swings in conductivity) resulting in average values well below norms. Licensee will monitor this closely so that if and when the signal propagation improves, the station doesn't exceed the established maximum values.

Attached to this exhibit are the following:

1. Summary of operating constraints (Exhibit 1A)
2. Detailed Proof of Performance Data (Exhibit 1B)
3. Map showing all measuring points in Google Earth (Exhibit 1C)

4. Antenna Monitor Sampling System (Exhibit 1D)
5. Copy of Form 302-sec. III submitted with this application (paper)

All the statements, maps and data contained in the following pages are true and correct to the best of my knowledge and belief and were prepared by me or under my supervision.

Floyd E. Turner CBRE, CBNT

FET Engineering

Haubstadt, IN 47639

13MAY2020

Exhibit 1A– Current Operating Constraints

WBGW 1330kHz Evansville IN 12/6/2019

Daytime ND: 5KW ND

Tower 1 (N)	Base I	BaseZ	Power	ATU Input I	ATU InputZ
	8.33 A	72 +j55 As read on OIB-1	4960	10.3 A	50j-4

Nighttime

**Directional Array: 1KW
DAN
Field Ra-**

Tower#	ASR#	tio	Phase	Spacing	Orientation	Day Ref
1(S)	1300020	0.75	-156	0	0	0
2(C)	1300021	1	0	87.5	198	0
3(N)	1300022	0.75	161	87.5	198	1

Operating Parameters

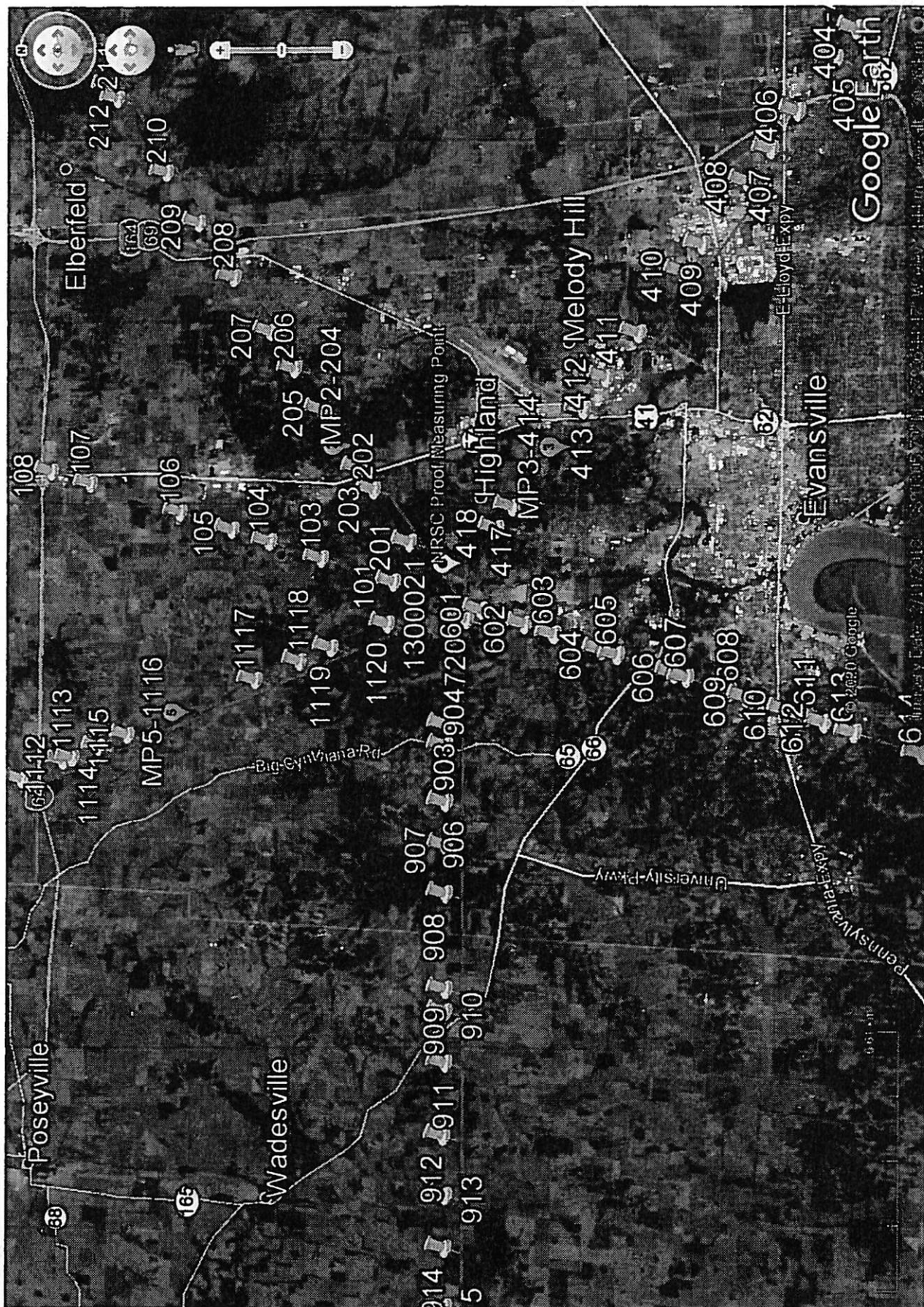
Tower#	Base I	Base Driving Point Z	Power
1(S)	2.9A	20 +j125	168.2
2(C)	4.1A	25 +j128	420.2
3(N)	4.0A	25 +j126	400.0

Common 988.4 Total Power
Point 4.47A 50 -j3 =1.00kW

Ant. Monitor Readings

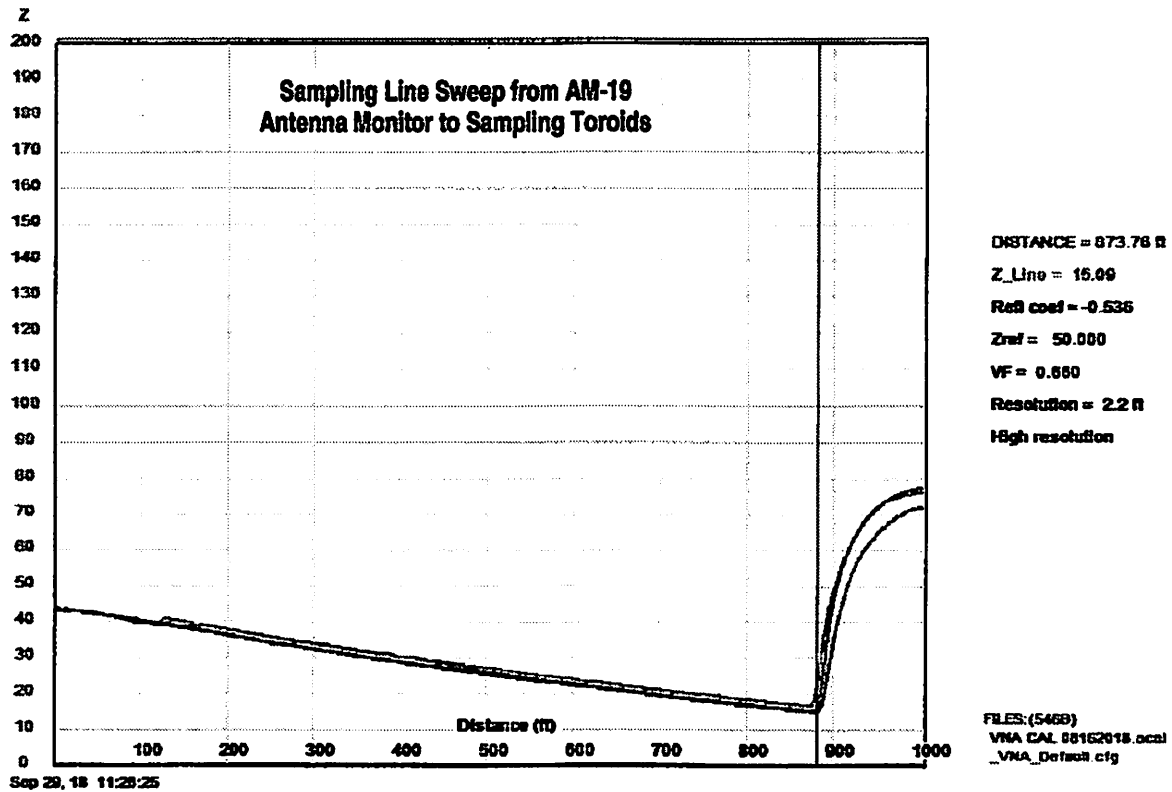
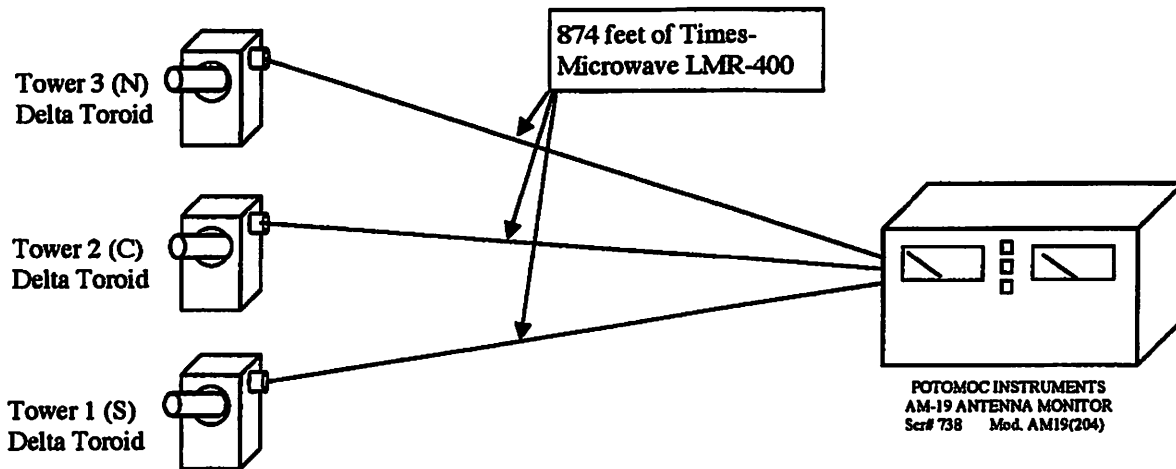
	Phase	Ratio
1(S)	-157	0.7
2(C)	0	1
3(N)	165	0.82

Exhibit 1C- Monitor Point Map



Floyd E. Turner, CBRE, CBNT
 1837 E SR68 Haubstadt IN 47639
 812.457.9860 eng@thyword.org

Exhibit 1D- Antenna Monitor Sampling System





Floyd E. Turner, CBRE, CBNT
1837 E SR68 Haubstadt IN 47639
812.457.9860 eng@thyword.org

Exhibit 1E-- Operating Historical Values

Antenna Monitor Operating Parameters

Field Ratio

Tower	Theoretical	1948	1960	1969	Current
North(3)	0.75	0.84	0.974	0.985	0.82
Center(2)	1	1	1	1	1
South(1)	0.75	0.8	0.787	0.763	0.75

Phasing

Tower	Theoretical	1948	1960	1969	Current
North(3)	161°	134.5°	161°	161°	163°
Center(2)	0°	0°	0°	0°	0°
South(1)	-156	-175.5	-154	-156	-156

Incorrect Data on License

RMS Augmented: 0.00 mV/m at 1 kilometer
RMS Theoretical: 321.87 mV/m at 1 kilometer

WBGW's first license
was granted 12-08-1948.

3 towers in the directional array

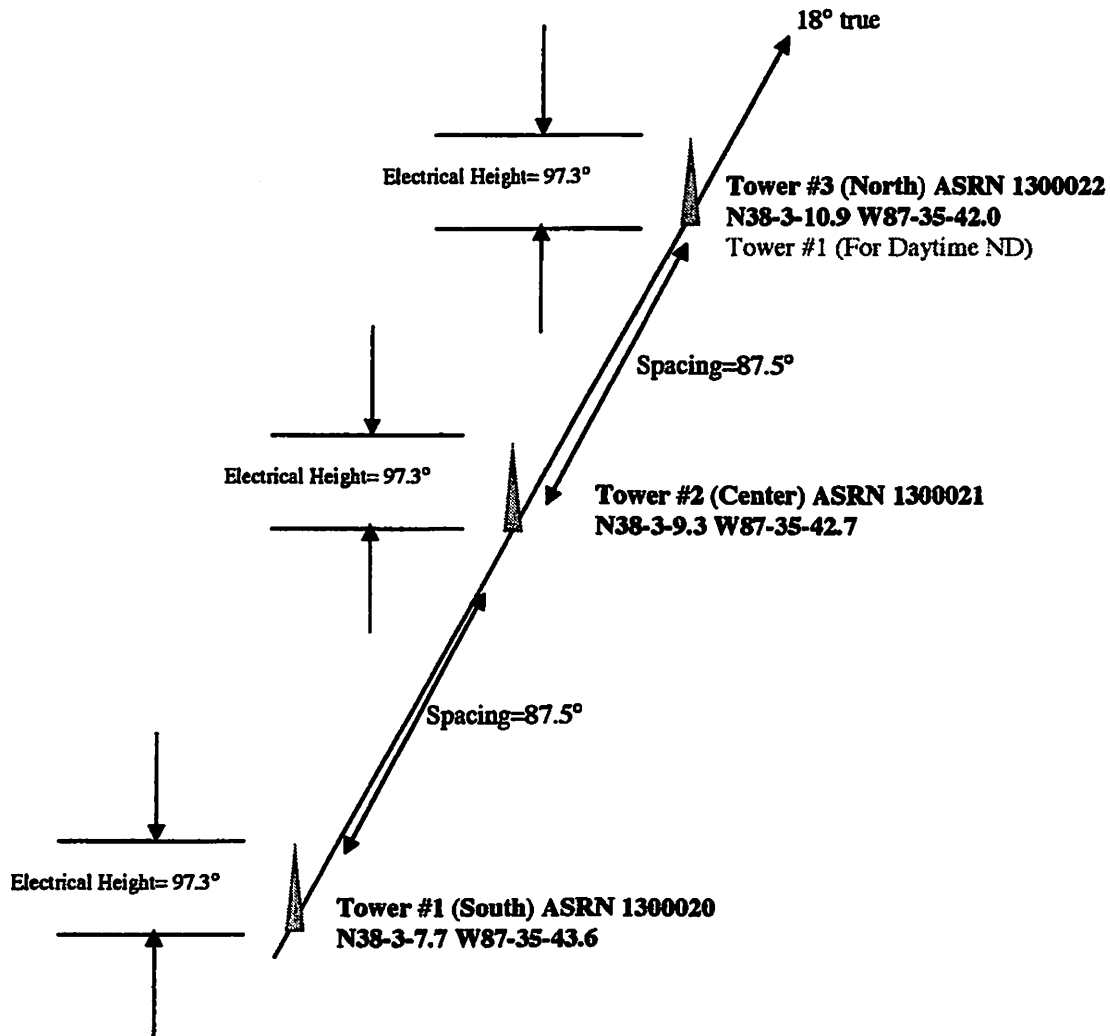
CDBS Ant. System ID: 129423

Tower information:

Tower No.	Field Ratio	Phase (deg)	Spacing (deg)	Orientation (degrees)	Electrical Height (deg)	Twr Ref.	-No Top Loaded or Sectionalized Tower(s)- (#0)	A	B	C	D	Antenna Structure Registration Number
1	0.750	161.00	0.00	0.00	97.30	0	0	0.00	0.00	0.00	0.00	1300020
2	1.000	0.00	87.50	198.00	97.30	0	0	0.00	0.00	0.00	0.00	1300021
3	0.750	-156.00	87.50	198.00	97.30	1	0	0.00	0.00	0.00	0.00	1300022

Values are reversed from original license

Exhibit 1F – Antenna System



WDSW/1360 AM
Evansville, IN
OWNERS: THE CBS

Exhibit 1B Proof of Performance Data w/ Analysis

Station: WBGW 1330kHz Evansville, IN
Date: 12/20/2019
By: Floyd E Turner, FET Engineering



Floyd E. Turner, CBRE, CBNT
1837 E SR68 Haubstadt IN 47639
812.457.9860 eng@thyword.org

Signed _____

Date _____

Floyd E. Turner, CBRE, CBNT
1837 E SR68 Haubstadt IN 47639
812.457.9860 eng@thyword.org

Exhibit III-A – Antenna Monitor Sampling System

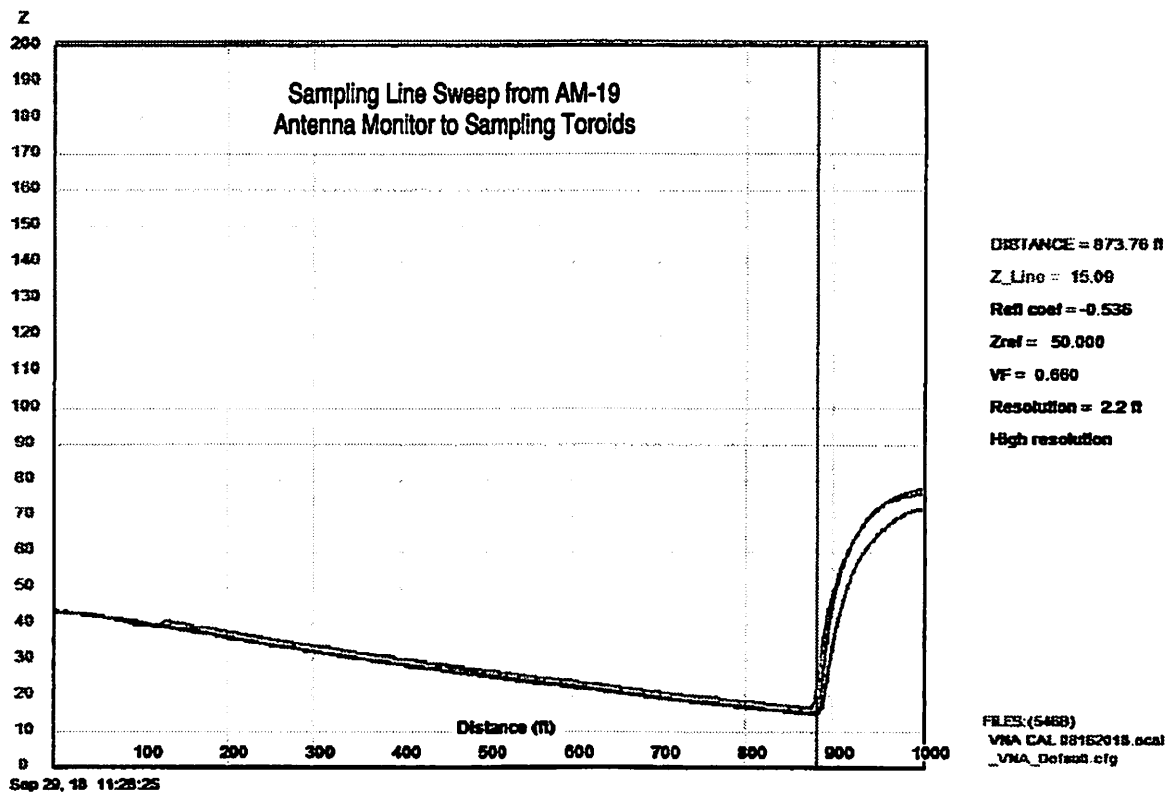
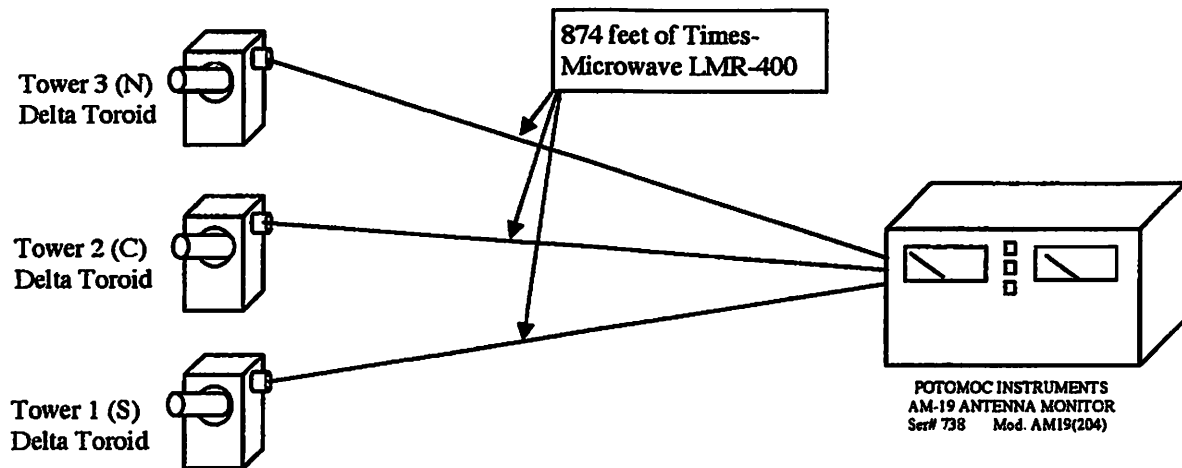


Exhibit III-B – Antenna System

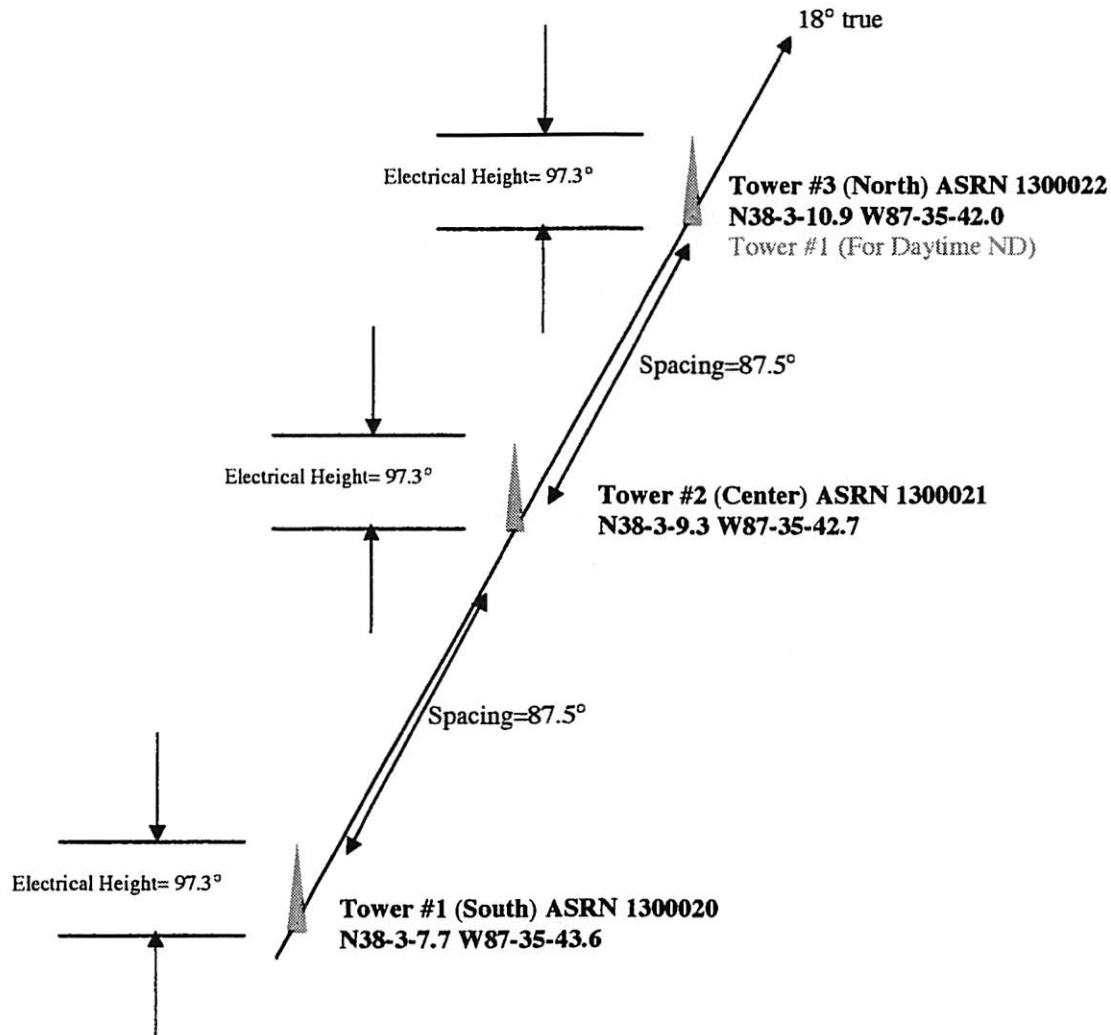


EXHIBIT 1000-AM
Evansville, IN
2007-09-14 14:00:00

Floyd E. Turner, CBRE, CBNT
1837 E SR68 Haubstadt IN 47639
812.457.9860 eng@thyword.org











Exhibit III-C – Antenna System Satellite View

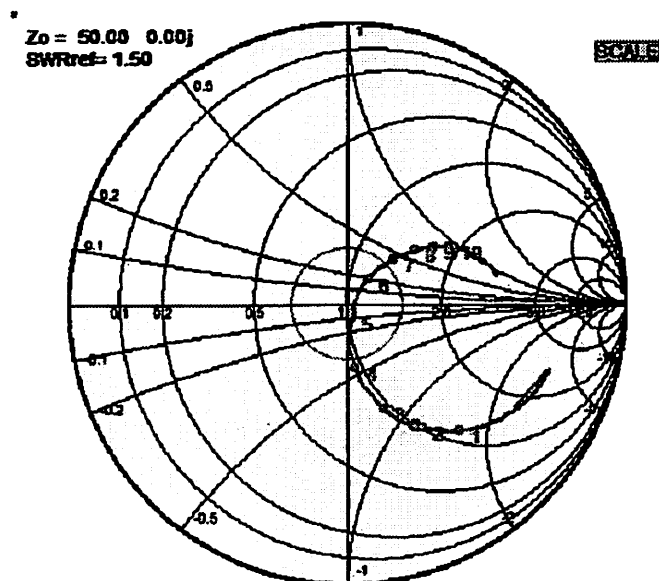


Floyd E. Turner, CBRE, CBNT
 1837 E SR68 Haubstadt IN 47639
 812.457.9860 eng@thyword.org

Exhibit III-D – Common Point Impedance Sweep

Apr 29, 20 13:28:28
 Reference Z = 50 + j 0

Marker	Freq	SWR		Rs	Xs	Zmag	Phase
[1]	1.310000	3.9432		57.054	-78.848	97.325	-54.111
[2]	1.315000	3.1130		50.670	-60.277	78.745	-49.949
[3]	1.320000	2.2821		47.402	-41.236	62.828	-41.021
[4]	1.325000	1.5954		47.306	-22.767	52.500	-25.700
[5]	1.330000	1.1157		50.374	-5.482	50.672	-6.211
[6]	1.335000	1.2513		56.552	9.988	57.427	10.016
[7]	1.340000	1.5947		65.404	22.088	69.033	18.661
[8]	1.345000	1.8898		73.648	31.360	80.046	23.065
[9]	1.350000	2.1765		82.587	39.550	91.569	25.589
[10]	1.355000	2.4412		92.559	46.114	103.410	26.483



Apr 29, 20 13:28:28

18.0 degree radial

Station:WBGW

1330kHz

By:

FET

FIM ser#

944

Licensed ND mV/m @ 1km. 694.52 (5kW, 310.6 mV/m/kW)

Licensed DA mV/m @ 1km. 199.03

Licensed ratio: 0.2866

Date: 12/20/2019

Time: 8:55

Monitor Distance			licensed*	1969			History-mV/m						Current	
Point#	Miles	Km.	mV/m	ND	DA-N	ratio	1948	1965	1971	1978	1997	2005	ND	DA-N
101	0.95	1.5	140.0	410.0	90.0	0.2195	59.6		88.0	61.0	77.0	49.0	300	70
102mp	1.25	2.01125	64	270	61	0.2259	47.6	39	57	14.8	62	41	180	42
103	2.25	3.6	40.0	120.0	28.0	0.2333	27.3	19.10	31.8	14.0	26.0	10.2	90	18
104	3.35	5.4	24.0	90.0	19.0	0.2111	16.3	10.70	15.0	11.0			54	10.5
105	4.05	6.5	19.0	73.0	16.0	0.2192	12.9	8.25	12.5	8.8			61	12
107	6.95	11.2	9.5	36.0	9.1	0.2528	5.83	3.53					26	5.5
108	7.55	12.1	8.5	34.0	8.2	0.2412	3.78	3.48					28	6.2
109	8.8	14.2	7.5	28.0	7.0	0.2500	4.64	2.90					19	4.2
110	9.35	15.0	5.3	28.0	6.9	0.2464	4.07	2.75					21	5
111	9.9	15.9	5.3	26.0	5.8	0.2231	3.69	2.22					18.5	4.2
			calculated	111.5	25.1	0.2323	18.5710							

18.0 degree radial

Station:WBGW

1330kHz

By:

FET

Point#	Miles	KM	1948 DA	Before (1969)			After (Current)		
			mV/m	mV/m	ratio	log ratio	mV/m	ratio	log ratio
101	0.95	1.5	59.6	90.0	1.510	0.179	70	1.174	0.0699
102mp	1.25	2.0113	47.6	61	1.282	0.1077	42	0.882	-0.0544
103	2.25	3.6	27.3	28.0	1.026	0.011	18	0.659	-0.1809
104	3.35	5.4	16.3	19.0	1.166	0.0666	10.5	0.644	-0.1910
105	4.05	6.5	12.9	16.0	1.240	0.0935	12	0.93	-0.0314
107	6.95	11.2	5.83	9.1	1.561	0.1934	5.5	0.943	-0.0253
108	7.55	12.1	3.78	8.2	2.169	0.3363	6.2	1.64	0.2149
109	8.8	14.2	4.64	7.0	1.509	0.1786	4.2	0.905	-0.0433
110	9.35	15.0	4.07	6.9	1.695	0.2293	5	1.229	0.0894
111	9.9	15.9	3.69	5.8	1.572	0.1964	4.2	1.138	0.0562
Average ratio				1.473	0.1592		1.015	-0.0096	
Anti-log:				1.4427			0.9782		

Original (1948) DA Inverse field mV/M

Before Arithmetic Average Ratio

Before Logarithmic Average Ratio

After Arithmetic Average Ratio

After Logarithmic Average Ratio

185

1.473

→

Before DA inverse field mV/m

272.49

1.4427

→

Before DA inverse field mV/m

266.90

1.0146

→

After DA inverse field mV/m

187.70

0.9782

→

After DA inverse field mV/m

180.96

▼

Max Licensed Value:

199.00

56.5 degree radial

Station:WBGW

1330kHz

By:

FET

Point#	Miles	KM	1948 DA	Before (1969)		After (Current)		mV/m	ratio	log ratio
			mV/m	mV/m	ratio	log ratio	mV/m			
201	1.15	1.85	9.10	5.10	0.5604	-0.2515	26	5.098	0.7074	
202	2.25	3.62	5.03	4.90	0.9742	-0.0114	6	1.2245	0.0880	
203	2.75	4.42	4.35	5.00	1.1494	0.0605	4	0.8	-0.0969	
204mp	3.3	5.3097	4.15	3.3	0.7952	-0.0995	4.2	1.2727	0.1047	
205	4	6.44	1.13	1.50	1.3274	0.123	3.5	2.3333	0.3680	
206	4.9	7.88	3.15	1.45	0.4603	-0.3369	1.4	0.9655	-0.0152	
207	5.7	9.17	1.32	1.45	1.0985	0.0408	1.9	1.3103	0.1174	
208	6.85	11.02	0.64	1.35	2.1094	0.3242	1.5	1.1111	0.0458	
209	8.1	13.03	0.35	1.25	3.5714	0.5528	0.8	0.64	-0.1938	
210	9.4	15.12	0.92	0.88	0.9565	-0.0193	1.2	1.3636	0.1347	
Average ratio					1.300	0.0383		1.6119	0.1260	
Anti-log:						1.0921			1.3366	

Original (1948) DA Inverse field mV/M

Before Arithmetic Average Ratio

Before Logarithmic Average Ratio

After Arithmetic Average Ratio

After Logarithmic Average Ratio

29

1.300

→

Before DA inverse field mV/m

1.092

→

Before DA inverse field mV/m

1.6119

→

After DA inverse field mV/m

1.3366

→

After DA inverse field mV/m

37.71

31.67

46.75

38.76

▼

Max Licensed Value:

41.8

126.0 degree radial

Station:WBGW

1330kHz

By:

FET

FIM:

#944

Licensed ND mV/m @1 l (5kW, 310.6 mV/m/kW)

694.5

Licensed DA/N mV/m @ 1km.

32.19

ratio:

0.04635

Date: 12/20/2019

Time: 12:24pm

Monitor Distance			Licensed*	1969			History (mV/m)							Current		
Point#	Miles	Km.	max mV/	ND	DA-N	ratio	1948	1965	1971	1978	1997	2005	ND	DA-N		
418	1.45	2.33	7.42	160	6.90	0.0431	17.00		7.00	9.60	8.00	11.30	125	5.5		
417	1.9	3.06	7.42	160	6.20	0.0388	2.74	2.65	10.00	5.90	3.50	6.00	120	4.7		
416	2.3	3.70	5.24	113	4.10	0.0363	2.90	2.53	3.50	3.60	3.30	2.35	45	2.6		
415	2.75	4.42	4.36	94	3.90	0.0415	3.36	1.55	6.50	3.10	3.50	4.10	64	2.4		
414mp	3.25	5.23	*3.26	72	3.1	0.0431	3.1		3.4	2.58	2.1	3.05	28.5	2.2		
413	3.9	6.28	2.55	55	2.45	0.0445	1.35	1.35		4.40			39	1.4		
412	4.5	7.24	2.41	52	2.85	0.0548	1.58	1.00					24	1.3		
411	5.4	8.69	1.67	36	1.45	0.0403	1.23	1.42					28	1.15		
410	6.55	10.54	1.71	1.95	1.1404	0.5848	1.87	0.79	14.5	0.8			14.5	1.1		
409	7.1	11.42	1.21	1.35	1.1157	0.8264	1.05	0.84	14	1			14	0.9		
			calculated	74.53	3.3206	0.1754										

126.0 degree radial

1330kHz

By: FET

Point#	Miles	KM	1948 DA	Before (1969)		After (Current)		ratio	log ratio	mV/m
			mV/m	mV/m	ratio	log ratio	mV/m			
418	1.15	1.85	17.00	6.90	0.4059	-0.392	5.5	0.3235	-0.4901	
417	2.25	3.62	2.74	6.20	2.2628	0.3546	4.7	1.7153	0.2343	
416	2.75	4.42	2.90	4.10	1.4138	0.1504	2.6	0.8966	-0.0474	
415	3.3	5.3097	3.36	3.90	1.1607	0.0647	2.4	0.7143	-0.1461	
414mp	4	6.44	3.1	3.1	1.0000	0	2.2	0.7097	-0.1489	
413	4.9	7.88	1.35	2.45	1.8148	0.2588	1.4	1.037	0.0158	
412	5.7	9.17	1.58	2.85	1.8038	0.2562	1.3	0.8228	-0.0847	
411	6.85	11.02	1.23	1.45	1.1789	0.0715	1.15	0.935	-0.0292	
410	8.1	13.03	1.87	0.1435	0.0767	-1.115	1.1	0.5882	-0.2304	
409	9.4	15.12	1.05	0.0694	0.0661	-1.18	0.9	0.8571	-0.0669	
Average ratio					1.1183	-0.153		0.86	-0.0994	
Anti-log:						0.7031			0.7955	

Original (1948) DA Inverse field mV/M

Before Arithmetic Average Ratio

Before Logarithmic Average Ratio

After Arithmetic Average Ratio

After Logarithmic Average Ratio

27

1.118

→

Before DA inverse field mV/m

30.20

0.703

→

Before DA inverse field mV/m

18.98

0.8600

→

After DA inverse field mV/m

23.22

0.7955

→

After DA inverse field mV/m

21.48

▼

Max Licensed Value:

32.19

270.0 degree radial

Station:WBGW

1330kHz

By:

FET

FIM ser#

944

Licensed ND mV/m @ 1km. 694.52 (5kW, 310.6 mV/m/kW)

Licensed DA mV/m @ 1km. 32.19

ratio: 0.046349

Date: 12/21/2019

Time: 09:48am

Monitor	Distance		Licensed*	1969			History (mV/m)						Current	
Point#	Miles	Km.	max mV/m	ND	DA-N	ratio	1948	1965	1971	1978	1997	2005	ND	DA-N
904	2.5	4.02	5.79	125.00	5.10	0.0408	7.20	3.70	4.00	3.60	3.20	6.40	61	2.3
905mp	3.2	5.15	4.80	105.00	4.80	0.0457	4.63	4.00	7.20	1.92	5.00	4.60	70	1.2
906	3.45	5.55	2.97	64.00	4.10	0.0641	5.53		7.30	1.50			47	1.7
907	4.2	6.76	3.11	67.00	3.40	0.0507	3.20	3.15	5.30	0.65			37	1.7
908	5	8.05	2.09	45.00	1.60	0.0356	1.67	1.25					22	1.1
909	6.6	10.62	1.25	27.00	1.10	0.0407	1.20	0.82					10	0.5
910	7	11.26	1.14	24.50	0.88	0.0359	1.43	0.35					11	0.5
911	7.9	12.71	1.04	22.50	1.10	0.0489	1.21	0.78					10	0.5
912	9.1	14.64	0.93	20.00	0.81	0.0405	0.89						6.4	0.26
913	10.1	16.20	0.76	16.50	0.91	0.0552	0.61						7.2	0.31
			calculated	51.65	2.38	0.0458								

270.0 degree radial

Station:WBGW

1330kHz

By:

FET

Point#	Miles	KM	1948:DA		Before (1969)		After (Current)		
			mV/m	mV/m	ratio	log ratio	mV/m	ratio	log ratio
904	2.5	4.02	7.2	5.10	0.7083	-0.15	2.3	0.319	-0.4956
905mp	3.2	5.15	4.63	4.80	1.0367	0.016	1.2	0.259	-0.5864
906	3.45	5.55	5.53	4.10	0.7414	-0.13	1.7	0.307	-0.5123
907	4.2	6.76	3.2	3.40	1.0625	0.026	1.7	0.531	-0.2747
908	5	8.05	1.67	1.60	0.9581	-0.019	1.1	0.659	-0.1813
909	6.6	10.62	1.2	1.10	0.9167	-0.038	0.5	0.417	-0.3802
910	7	11.26	1.43	0.88	0.6154	-0.211	0.5	0.35	-0.4564
911	7.9	12.71	1.21	1.10	0.9091	-0.041	0.5	0.413	-0.3838
912	9.1	14.64	0.89	0.81	0.9101	-0.041	0.26	0.292	-0.5344
913	10.1	16.25	0.61	0.91	1.4918	0.174	0.31	0.508	-0.2940
Average ratio					0.9350	-0.041		0.406	-0.4099
Anti-log:						0.909			0.3891

Original (1948) DA Inverse field mV/M

Before Arithmetic Average Ratio

Before Logarithmic Average Ratio

After Arithmetic Average Ratio

After Logarithmic Average Ratio

32

0.935

→

Before DA inverse field mV/m

29.92

0.909

→

Before DA inverse field mV/m

29.09

0.406

→

After DA inverse field mV/m

12.98

0.3891

→

After DA inverse field mV/m

12.45

▼

Max Licensed Value:

32.19

338.0 degree radial

Station:WBGW

1330kHz

By: FET

FIM ser#

944

Licensed ND mV/m @ 1km. 694.52 (5kW, 310.6 mV/m/kW)

Licensed DA mV/m @ 1km. 41.84

Licensed ratio: 0.060243

Date: 12/21/2019

Time: 08:18am

Monitor	Distance		Licensed*	1969			History (mV/m)							Current	
Point#	Miles	Km.	max mV/m	ND	DA-N	ratio	1948	1965	1971	1978	1997	2005	ND	DA-N	
1120	1.1	1.8	21.09	350	21	0.0600	14.6	8.4	2.3	17	17.1	21	240	29	
1119	2.2	3.5	7.23	120	4.9	0.0408	4.93		5.7	7	3.0	4.9	90	1.9	
1118	2.7	4.3	5.66	94	4.5	0.0479	2.58	2.8	4.5	1.3	2.0	4.5	70	1.5	
1117	3.65	5.9	4.22	70	3.5	0.0500	3.79	1.2	2.85	1.7			52	1.6	
1116mp	5.15	8.3	3.20	52	2.9	0.0558	2.28	2.35	2.2	1.2			31	1.6	
1115	6.5	10.5	2.47	41	2.2	0.0537	1.72	2.25					29	1.2	
1114	6.95	11.2	1.99	33	2.1	0.0636	1.55	1					25	0.8	
1113	7.5	12.1	1.99	33	1.8	0.0545	1.28	1.6					22	0.7	
1112	7.9	12.7	1.93	32	1.8	0.0563	0.98	1.3					17	0.6	
1111	8.6	13.8	1.39	23	1.2	0.0522	1.02	1					17.5	0.7	
			calculated	84.8	4.6	0.0535									

338.0 degree radial

Station:WBGW

1330kHz

By:

FET

Point#	Miles	KM	1948 DA		Before (1969)		After (Current)		
			mV/m	mV/m	ratio	log ratio	mV/m	ratio	log ratio
1120	1.25	2.01125	47.6	21	0.4412	-0.355	29	0.609	-0.2152
1119	2.25	3.6	27.3	4.9	0.1795	-0.746	1.9	0.07	-1.1574
1118	3.35	5.4	16.3	4.5	0.2761	-0.559	1.5	0.092	-1.0361
1117	4.05	6.5	12.9	3.5	0.2713	-0.567	1.6	0.124	-0.9065
1116mp	6.95	11.2	5.83	2.9	0.4974	-0.303	1.6	0.274	-0.5615
1115	7.55	12.1	3.78	2.2	0.5820	-0.235	1.2	0.317	-0.4983
1114	8.8	14.2	4.64	2.1	0.4526	-0.344	0.8	0.172	-0.7634
1113	9.35	15.0	4.07	1.8	0.4423	-0.354	0.7	0.172	-0.7645
1112	9.9	15.9	3.69	1.8	0.4878	-0.312	0.6	0.163	-0.7889
1111	8.6	13.8	1.02	1.2	1.1765	0.0706	0.7	0.686	-0.1635
Average ratio					0.4807	-0.37		0.268	-0.6855
Anti-log:					0.4261			0.2063	

Original (1948) DA Inverse field mV/M

Before Arithmetic Average Ratio

Before Logarithmic Average Ratio

After Arithmetic Average Ratio

After Logarithmic Average Ratio

3%

0.481

→

0.4261

→

0.268

→

0.2063

→

Before DA inverse field mV/m

Before DA inverse field mV/m

After DA inverse field mV/m

After DA inverse field mV/m

17.78

15.77

9.916

7.633

▼

Max Licensed Value:

41.84