

[ASR Registration Search](#)**Registration 1265362**[✦ Map Registration](#)**Registration Detail**

Reg Number	1265362	Status	Constructed
File Number	A0754204	Constructed	07/05/2011
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

Location (in NAD83 Coordinates)

Lat/Long	42-42-06.9 N 084-24-47.8 W	Address	4101 Dobie Road
City, State	Okemos , MI		
Zip	48864	County	INGHAM
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
259.1	313.3
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
572.4	297.8

Painting and Lighting Specifications

FAA Chapters 3, 4, 5, 12

Paint and Light in Accordance with FAA Circular Number 70/7460-1K

FAA Notification

FAA Study	2011-AGL-4543-OE	FAA Issue Date	12/08/2011
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Owner & Contact Information

FRN	0007619026	Owner Entity Type
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Owner

Board of Trustees, Michigan State University
Attention To: Nancy Gilleo
283 Comm. Arts & Sci. Bldg.
East Lansing , MI 48824-1212

P: (517)432-9527
F:
E: nancy@wkar.msu.edu

Contact

P:
F:
E:

Last Action Status

Status	Constructed	Received	02/06/2012
Purpose	Notification	Entered	02/06/2012
Mode	Interactive		

Related Applications

02/06/2012 A0754204 - Notification (NT)

ENGINEERING REPORT

FM Translator Minor Change to License Application

for

**W286DC – East Lansing, MI
(Facility ID: 156707)**

License:

BLFT-20180306ACV

as a fill-in FM Translator for
WKAR(AM) – East Lansing, MI

October 2019

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MUNN-REESE

Broadcast Engineering Consultants
Coldwater, MI 49036

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Exhibit 17.1 - RF Compliance Study

(Exhibit numbering is in response to FCC Online Form 349, Section III-A)

Discussion

This firm has been retained to prepare the required engineering report in support of a Construction Permit Application for an FM Translator W286DC. This translator is currently authorized to operate with an AMSL of 369 meters and an ERP of 0.250 kW (H&V) on CH286D. This Translator proposal requests an AMSL of 440.4 meters and an ERP of 0.250 kW (H&V) operating on CH286D. The Translator will rebroadcast Primary Station WKAR(AM) – East Lansing, MI; Facility ID No. 41684.

The Translator as proposed will continue to be mounted on a tower bearing Antenna Structure Registration Number 1265362. A copy of the ASR is included in **Exhibit 13.1**.

The proposed fill-in Translator present and proposed service contours vs the WKAR(AM) Contours are shown in **Exhibit 13.2**.

It has been determined the Translator may be used in the area without interference to any existing FM broadcast station or facility. The proposed allocation is included in **Exhibit 13.3**. It is believed sufficient clearance exists precluding the need for additional contour protection showings.

The applicant would like to note the existence of a §74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward W284AH(FM) – Lansing, MI (CH284D) as noted in **Exhibit 13.4**. Protection has been based on the worst case calculated 105.2 dBμ F(50:10) Interference Contour, corresponding to the worst case 65.2 dBμ F(50:50) Protected Contour. Protection has been demonstrated through a downward vertical radiation study. Full protection will be afforded the facility as the interference will not reach a seven meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. The antenna manufacturer's specifications are included in **Exhibit 13.5**.

The applicant certifies the proposed translator 34 dBu F(50:10) Interference contour does not enter Canadian territory. Documentation of the proposed 34 dBu F(50:10) Interference contour will be supplied upon request.

This translator is not within the affected distance of any TV Channel 6 stations.

The applicant would like to note use of the NED 03 second terrain database for terrain based showings contained here-in.

Discussion (continued)

RADIATION PROTECTION: The Commission requires an engineering study regarding compliance with the guidelines for human protection from radiofrequency radiation. This report section is in response to that provision of the Rules. The current Federal Communications Commission guidelines for RF radiation protection are set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01).

The FM Broadcast facility proposed in this application will not produce human exposure to radiofrequency radiation in excess of the applicable safety standards specified in §1.1307(b)(3) of the Commission's rules concerning RF contributors of less than 5%. ***Exhibit 17.1*** provides the details of the study that was made to demonstrate compliance. The facility is properly marked with signs, and entry is restricted by means of fencing with locked doors and/or gates. Any other means as may be required to protect employees and the general public will be employed.

In the event work would be required in proximity to the antenna such that the person or persons working in the area would be potentially exposed to fields in excess of the guidelines set forth in OET Bulletin No. 65 (Edition 97-01), the transmitter power will be reduced or the station will cease operation during the critical period.

Exhibit 13.2 W286DC - Present and Proposed vs AM Contours

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WKAR.L

Latitude: 42-42-19 N
Longitude: 084-28-30 W
Frequency: 870 kHz

W286DC

BLFT20180306ACV
Latitude: 42-42-07 N
Longitude: 084-24-48 W
ERP: 0.10 kW
Channel: 286
Frequency: 105.1 MHz
AMSL Height: 369.0 m
Elevation: 259.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

W286DC.P (595' AGL)

Proposed Operation
Latitude: 42-42-07 N
Longitude: 084-24-48 W
ERP: 0.25 kW
Channel: 286
Frequency: 105.1 MHz
AMSL Height: 440.4 m
Elevation: 259.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

- W286DC (286)
- W286DC.P (286)
- WKAR.L

FCC F(50-50) 60.00 dBu (FCC HAAT)

FCC F(50-50) 60.00 dBu (FCC HAAT)

Circle R = 40.0 km

2.0 mV/m

Scale 1:750,000

0 10 20 30 km

V-Soft Communications LLC ©

Exhibit 13.3

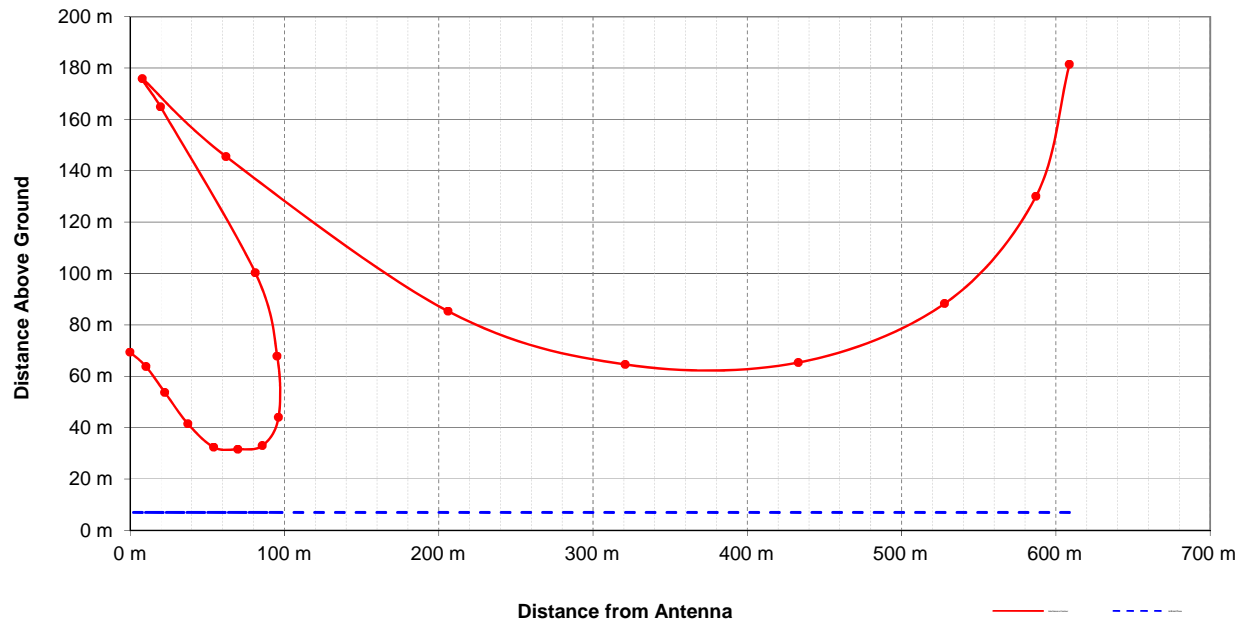
Board Of Trustees Of Michigan State Univ

REFERENCE CH# 286D - 105.1 MHz, Pwr= 0.25 kw DA, HAAT= 173.3 M, COR= 440.4 M DISPLAY DATES
 42 42 07.10 N. DATA 10-10-19
 84 24 47.90 W. SEARCH 10-16-19
 Average Protected F(50-50)= 17.29 km
 Standard Directional

CH CITY	CALL	TYPE STATE	ANT AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
286D East Lansing	W286DC	LIC D MI	0.0 100.6	0.00 BLFT20180306ACV	42 42 07.10 84 24 47.90	0.250	369	---Reference---		Board Of Trustees Of Michi
286B Detroit	WMGC-FM	LIC MI	104.7 285.5	105.95 BMLH20061004AIW	42 27 13.10 83 09 49.70	50.000 150	136.1 349	63.4	-38.3*	4.0 Beasley Media Group Licens
284D Lansing	W284AH	LIC MI	283.3 103.2	8.88 BLFT20160916AAH	42 43 13.10 84 31 08.90	0.250	1.1 349	11.9	-9.8*	-4.2* West Central Michigan Medi
285A Marshall	WBXX	LIC MI	224.6 44.3	60.34 BLH20160527AAL	42 18 52.10 84 55 43.70	6.000 97	42.0 381	27.1	2.9	10.2 Townsquare Media Battle Cr
289B Grand Rapids	WSRW-FM	LIC MI	267.1 86.3	91.19 BLH20071129AJD	42 39 17.50 85 31 38.00	265.000 177	10.2 424	86.0	63.6	3.4 Cc Licenses, LLC
287A Brooklyn	WKHM-FM	LIC MI	179.1 359.1	60.94 BLH19940201KC	42 09 14.10 84 24 06.80	2.200 115	38.3 418	25.3	11.7	21.2 Jackson Radio works, Inc.
285A Alma	WQBX	LIC N MI	348.2 168.1	75.77 BLH20141219ACN	43 22 08.10 84 36 19.00	6.000 100	43.6 327	28.4	17.3	26.1 Jacom, Inc.
288B1 Flint	WWCK-FM	LIC Z MI	60.8 241.3	70.98 BLH19970124KD	43 00 39.10 83 39 03.80	25.000 100	4.2 337	45.3	58.9	25.3 Cumulus Licensing LLC
287B Coopersville	AL6792	RSV-A MI	301.5 120.5	138.29 RM10545	43 20 36.08 85 52 16.18	50.000 150	75.6 382	62.8	45.2	39.4
287B Coopersville	WHTS	LIC MI	299.5 118.5	139.36 BLH20060516ACU	43 18 35.10 85 54 45.20	20.000 242	74.3 469	63.1	47.5	39.8 Radio License Holding Cbc,
286D Kalamazoo	W286AU	LIC MI	246.8 66.0	107.49 BLFT20121121ARS	42 18 52.10 85 36 54.00	0.250 84	38.8 345	11.3	52.0	42.7 Kalamazoo Broadcasting Com
286D Saginaw	W286CI	LIC MI	25.7 206.0	89.89 BLFT20130610AAD	43 25 47.10 83 55 51.90	0.170 37	24.7 219	7.4	53.8	49.3 Plonta Broadcasting Inc.
283A Saginaw	WILZ	LIC N MI	27.2 207.5	86.48 BLH19920825KB	43 23 34.10 83 55 26.90	2.900 126	2.4 309	26.9	72.8	59.2 Radio License Holding Cbc,
285D Grand Rapids	W285FO	LIC MI	285.4 104.5	108.47 BLFT20161021ABE	42 57 13.10 85 41 55.10	0.250	21.6 353	14.3	69.2	67.9 Townsquare Media Of Grand
284B Toledo	WIOT	LIC OH	144.2 324.9	140.39 BMLH20020611AAX	41 40 23.20 83 25 30.80	50.000 165	6.3 345	67.2	125.8	72.7 Citicasters Licenses, Inc.
286B1 Huntertown	WQHK-FM	LIC IN	200.4 19.8	188.36 BLH20120307AAG	41 06 39.20 85 11 43.90	5.700 210	99.7 457	43.9	75.2	96.4 Jam Communications, Inc.
283B Muskegon	WSNX-FM	LIC MI	293.6 112.5	142.86 BLH19880930KC	43 12 16.10 86 01 45.20	32.000 189	5.7 392	63.7	119.5	77.3 Cc Licenses, LLC
288D Southfield	W288DW	CP D MI	104.7 285.4	93.33 BMPFT20180801ABJ	42 29 01.10 83 18 43.80	0.099	0.7 299	5.5	84.5	87.3 Word Broadcasters, Inc.
233C1 Hemlock	WCEN-FM	LIC D MI	352.3 172.2	114.89 BMLH20041124AGB	43 43 36.10 84 36 16.00	100.000 299	169.8 519	84.6	21.5R	93.4M Alpha Media Licensee LLC
288D Rochester Hills	W288BK	LIC MI	91.0 271.8	105.36 BLFT20150305AAO	42 40 43.10 83 07 27.80	0.038 54	0.4 296	4.4	96.7	100.7 Educational Media Foundati

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
 In & Out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.
 All separation margins (if shown) include rounding.
 Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
 "*"affixed to 'IN' or 'OUT' values = site inside restricted contour.
 « = Station meets FCC minimum distance spacing for its class.
 Reference station has protected zone issue: Canada

Exhibit 13.4 - Downward Radiation Study in support of a 74.1204(d) Waiver Request



Proposed Antenna: Nicom BKY/5 2 Bay Antenna Slant 45

Proposed Power: 0.25 kW

Antenna Height AGL: 181.4 meters

Interference Contour: 105.21 dBu f(50:10)

Artificial Ground Plane Height: 7 meters

Distance (Free Space) Equation: $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)) * 1000}$

Field Strength (dBu) Equation: $= 106.92 - (20 * (\text{LOG}_{10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$

Depression				Distance		Field Strength		Field Strength
Angle	Antenna			from Ant.	Distance	in dBu @	Distance	in dBu @
Below	Relative	ERP	ERP	to Interference	from Ant. to	Artificial Plane	from Ant.	Artificial Plane
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level
0°	1	0.250	-6.02	608.79 m	infinite	---	---	---
-5°	0.968	0.234	-6.30	589.31 m	2001.02 m	94.59 dBu	2081.33 m	94.25 dBu
-10°	0.8805	0.194	-7.13	536.04 m	1004.33 m	99.76 dBu	1044.64 m	99.41 dBu
-15°	0.7365	0.136	-8.68	448.38 m	673.83 m	101.67 dBu	700.88 m	101.33 dBu
-20°	0.561	0.079	-11.04	341.53 m	509.91 m	101.73 dBu	530.38 m	101.39 dBu
-25°	0.3735	0.035	-14.57	227.38 m	412.67 m	100.03 dBu	429.23 m	99.69 dBu
-30°	0.118	0.003	-24.58	71.84 m	348.80 m	91.49 dBu	362.80 m	91.14 dBu
-35°	0.016	0.000	-41.94	9.74 m	304.06 m	75.32 dBu	316.26 m	74.98 dBu
-40°	0.0423	0.000	-33.49	25.75 m	271.32 m	84.76 dBu	282.21 m	84.41 dBu
-45°	0.1885	0.009	-20.51	114.76 m	246.64 m	98.56 dBu	256.54 m	98.22 dBu
-50°	0.2435	0.015	-18.29	148.24 m	227.66 m	101.48 dBu	236.80 m	101.14 dBu
-55°	0.2755	0.019	-17.22	167.72 m	212.90 m	103.14 dBu	221.45 m	102.80 dBu
-60°	0.2815	0.020	-17.03	171.38 m	201.38 m	103.81 dBu	209.46 m	103.47 dBu
-65°	0.2715	0.018	-17.35	165.29 m	192.43 m	103.89 dBu	200.15 m	103.55 dBu
-70°	0.2605	0.017	-17.70	158.59 m	185.59 m	103.84 dBu	193.04 m	103.50 dBu
-75°	0.238	0.014	-18.49	144.89 m	180.55 m	103.30 dBu	187.80 m	102.96 dBu
-80°	0.213	0.011	-19.45	129.67 m	177.09 m	102.50 dBu	184.20 m	102.16 dBu
-85°	0.194	0.009	-20.26	118.11 m	175.07 m	101.79 dBu	182.09 m	101.45 dBu
-90°	0.184	0.008	-20.72	112.02 m	174.40 m	101.36 dBu	181.40 m	101.02 dBu

Exhibit 13.4 - W286DC vs. W284AH Signal Strength of W284AH at W286DC in Support of 74.1204(d) waiver request

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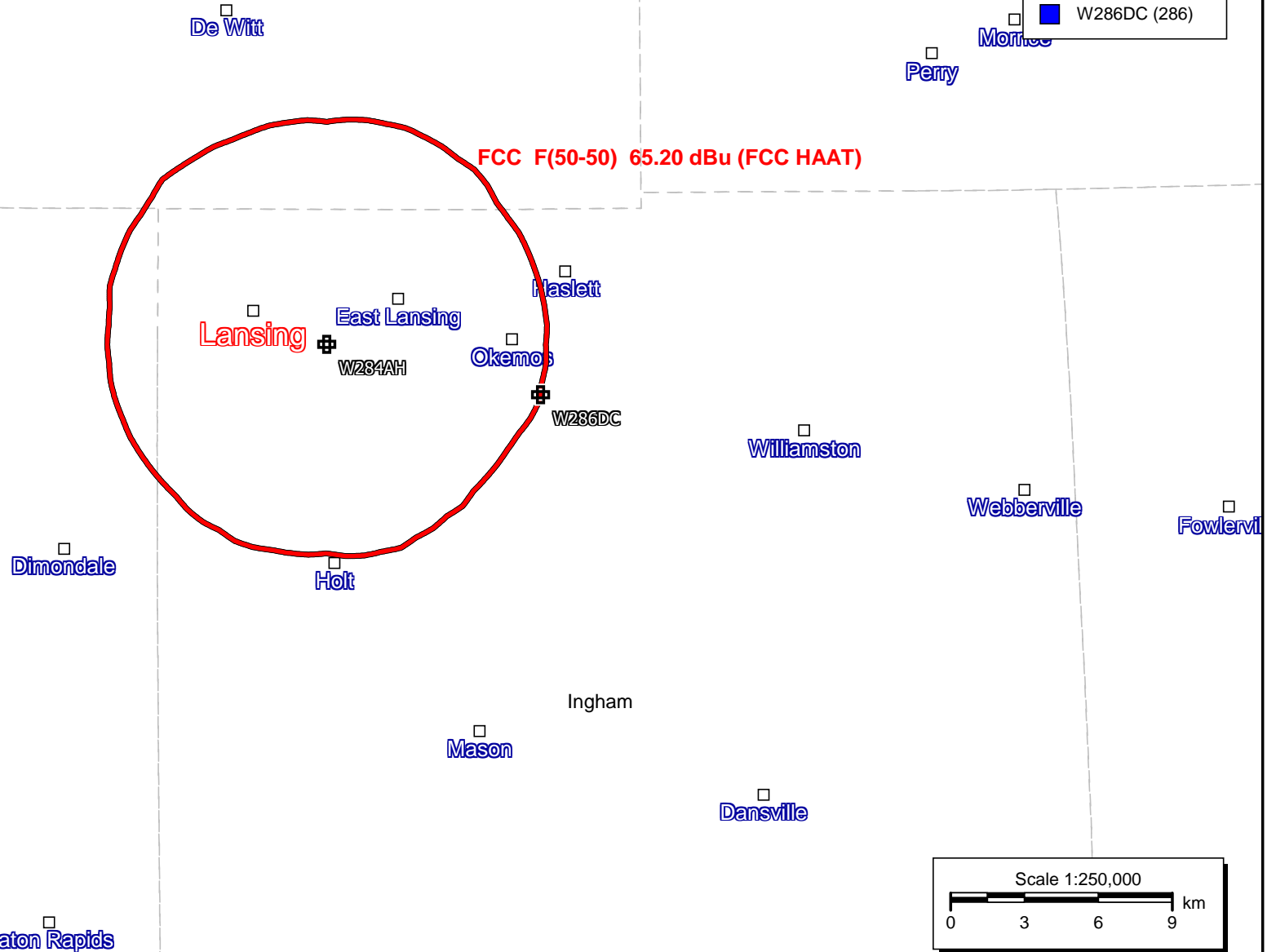
W284AH (284)
W286DC (286)

W286DC

Proposed Operation
Latitude: 42-42-06.97 N
Longitude: 084-24-47.99 W
ERP: 0.25 kW
Channel: 286
Frequency: 105.1 MHz
AMSL Height: 440.4 m
Elevation: 259.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

W284AH

BLFT20160916AAH
Latitude: 42-43-13 N
Longitude: 084-31-09 W
ERP: 0.25 kW
Channel: 284
Frequency: 104.7 MHz
AMSL Height: 349.0 m
Elevation: 254.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

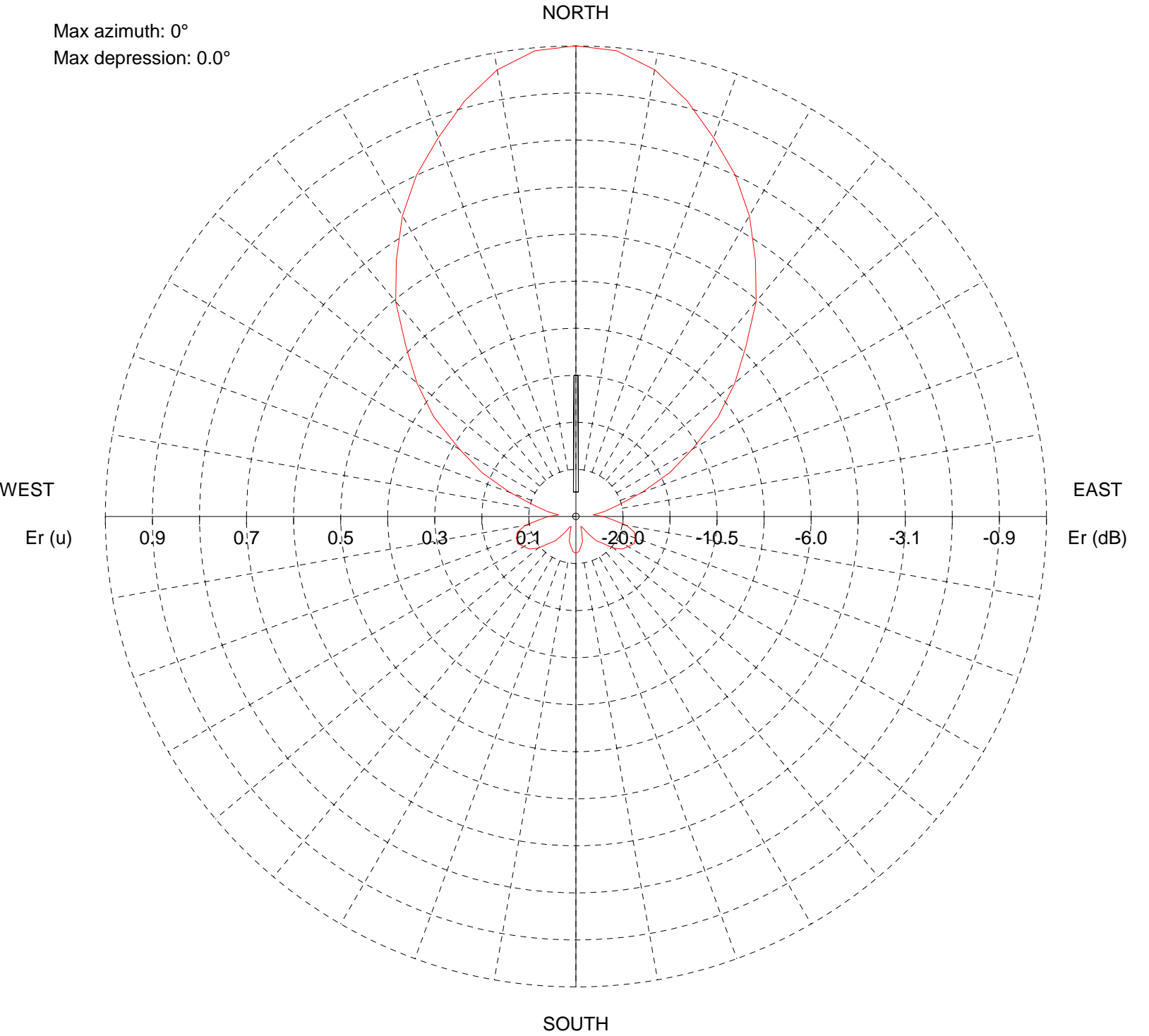


TX station: BLK5 2 BAY HORIZONTAL
Frequency: 100.00 MHz

Site name: 0.85 WAVE SEPARATION

Horizontal diagram of Maxima

Max azimuth: 0°
Max depression: 0.0°



0.0° depres. (Total antenna), Gain (dBd): 9.20 ERP T.max (KW): 8.316 ERP E

TX station: BLK5 2 BAY HORIZONTAL

Site name: 0.85 WAVE SEPARATION

Frequency: 100.00 MHz

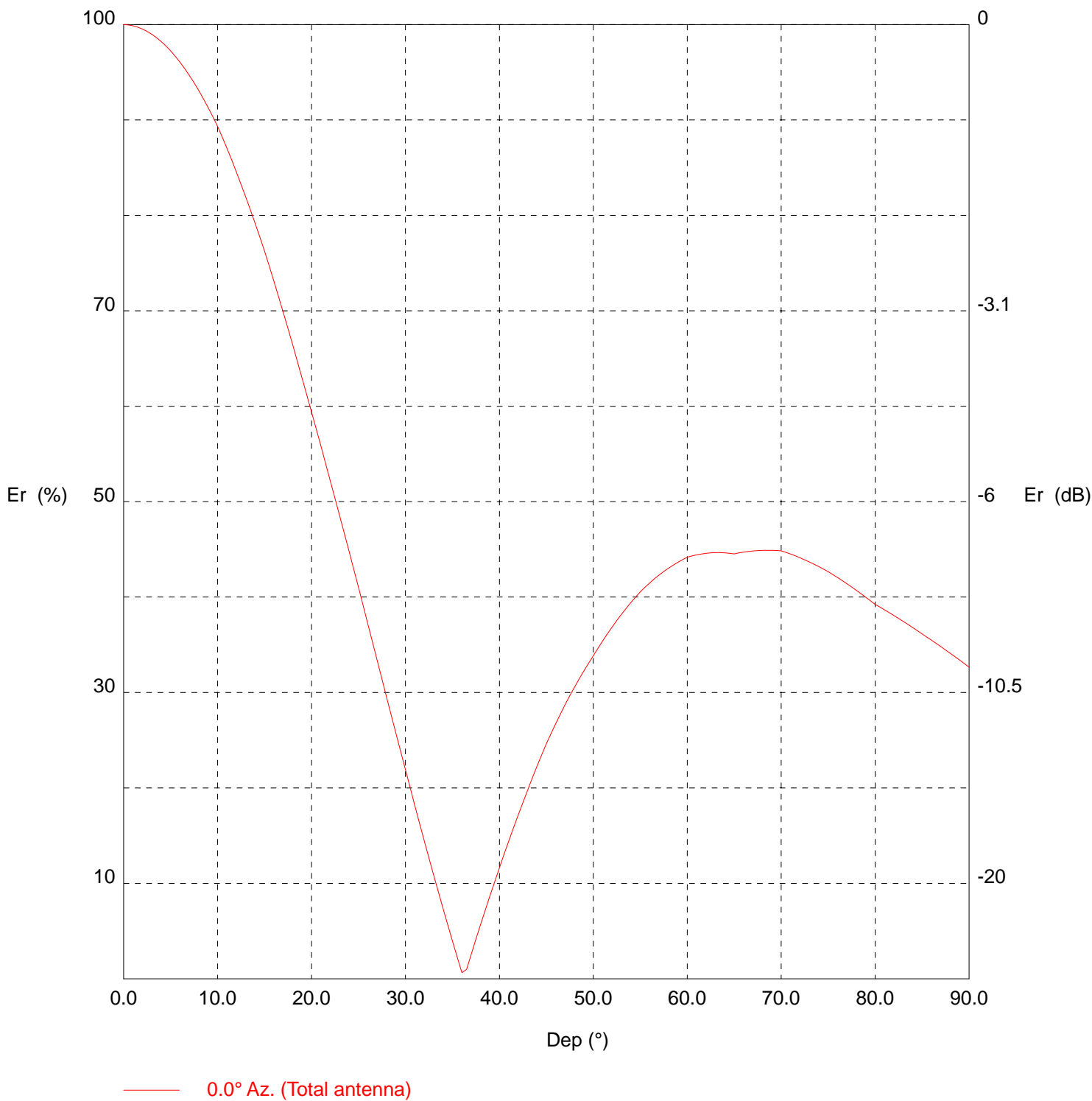
Horizontal diagram of Maxima

Az (°)	Dep (°)	Er (%)	ERP (KW)	Az (°)	Dep (°)	Er (%)	ERP (KW)	Az (°)	Dep (°)	Er (%)	ERP (KW)
0.0	0.0	100.0	7.58	120.0	0.0	12.8	0.12	240.0	0.0	12.8	0.12
5.0	0.0	99.4	7.49	125.0	0.0	12.1	0.11	245.0	0.0	13.7	0.14
10.0	0.0	96.4	7.05	130.0	0.0	10.5	0.08	250.0	0.0	13.4	0.14
15.0	0.0	91.4	6.34	135.0	0.0	8.1	0.05	255.0	0.0	12.9	0.13
20.0	0.0	85.6	5.56	140.0	-0.5	6.7	0.03	260.0	0.0	10.9	0.09
25.0	0.0	80.1	4.87	145.0	-2.5	4.3	0.01	265.0	0.0	7.8	0.05
30.0	0.0	73.7	4.12	150.0	7.5	2.5	0.00	270.0	0.0	5.9	0.03
35.0	0.0	66.5	3.36	155.0	8.5	2.4	0.00	275.0	0.0	3.7	0.01
40.0	0.0	59.6	2.69	160.0	-4.5	3.7	0.01	280.0	0.0	6.2	0.03
45.0	0.0	51.1	1.98	165.0	-2.0	5.5	0.02	285.0	0.0	9.2	0.06
50.0	0.0	44.1	1.47	170.0	-1.0	6.3	0.03	290.0	0.0	15.0	0.17
55.0	0.0	36.9	1.03	175.0	0.0	7.5	0.04	295.0	0.0	22.0	0.37
60.0	0.0	28.5	0.62	180.0	0.0	7.9	0.05	300.0	0.0	28.5	0.62
65.0	0.0	22.0	0.37	185.0	0.0	7.5	0.04	305.0	0.0	36.9	1.03
70.0	0.0	15.0	0.17	190.0	-1.0	6.3	0.03	310.0	0.0	44.1	1.47
75.0	0.0	9.2	0.06	195.0	-2.0	5.5	0.02	315.0	0.0	51.1	1.98
80.0	0.0	6.2	0.03	200.0	-4.5	3.7	0.01	320.0	0.0	59.6	2.69
85.0	0.0	3.7	0.01	205.0	8.5	2.4	0.00	325.0	0.0	66.5	3.36
90.0	0.0	5.9	0.03	210.0	7.5	2.5	0.00	330.0	0.0	73.7	4.12
95.0	0.0	7.8	0.05	215.0	-2.5	4.3	0.01	335.0	0.0	80.1	4.87
100.0	0.0	10.9	0.09	220.0	-0.5	6.7	0.03	340.0	0.0	85.6	5.56
105.0	0.0	12.9	0.13	225.0	0.0	8.1	0.05	345.0	0.0	91.4	6.34
110.0	0.0	13.4	0.14	230.0	0.0	10.5	0.08	350.0	0.0	96.4	7.05
115.0	0.0	13.7	0.14	235.0	0.0	12.1	0.11	355.0	0.0	99.4	7.49

TX station: BLK5 2 BAY HORIZONTAL
Frequency: 100.00 MHz

Site name: 0.85 WAVE SEPARATION

Vertical diagram



TX station: BLK5 2 BAY HORIZONTAL

Site name: 0.85 WAVE SEPARATION

Frequency: 100.00 MHz

Vertical diagram at an azimuth of 0° degrees

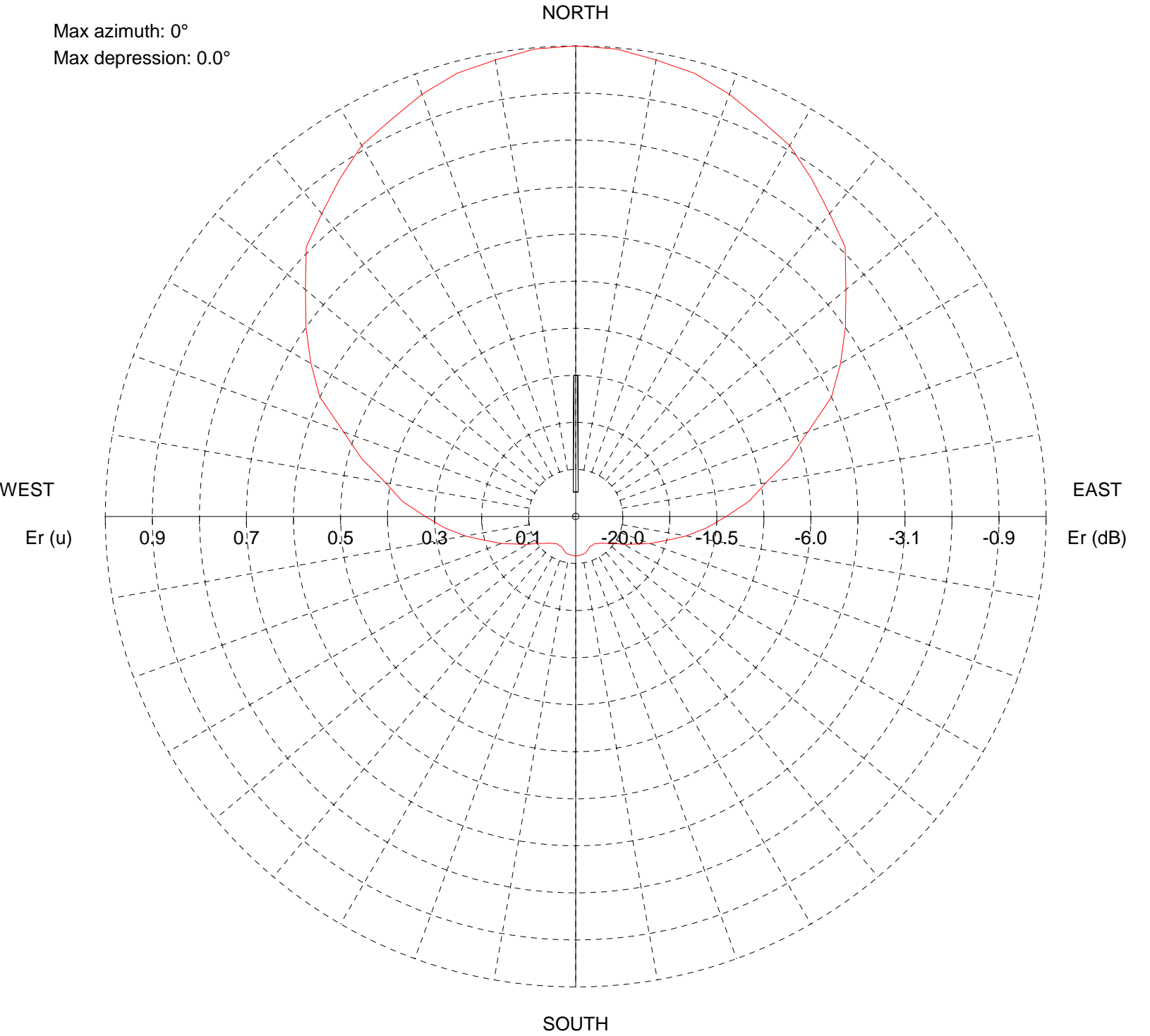
Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
0.0	100.0	7.58	30.0	21.9	0.36	60.0	44.2	1.48
0.5	100.0	7.58	30.5	20.0	0.30	60.5	44.3	1.49
1.0	99.9	7.57	31.0	18.2	0.25	61.0	44.4	1.50
1.5	99.7	7.54	31.5	16.3	0.20	61.5	44.5	1.50
2.0	99.5	7.51	32.0	14.5	0.16	62.0	44.6	1.51
2.5	99.3	7.48	32.5	12.7	0.12	62.5	44.6	1.51
3.0	99.0	7.43	33.0	10.9	0.09	63.0	44.7	1.51
3.5	98.6	7.38	33.5	9.1	0.06	63.5	44.7	1.51
4.0	98.2	7.32	34.0	7.4	0.04	64.0	44.6	1.51
4.5	97.8	7.25	34.5	5.6	0.02	64.5	44.6	1.51
5.0	97.2	7.17	35.0	4.0	0.01	65.0	44.5	1.50
5.5	96.7	7.09	35.5	2.3	0.00	65.5	44.6	1.51
6.0	96.1	7.00	36.0	0.6	0.00	66.0	44.7	1.52
6.5	95.4	6.90	36.5	1.0	0.00	66.5	44.8	1.52
7.0	94.7	6.80	37.0	2.6	0.01	67.0	44.8	1.52
7.5	93.9	6.69	37.5	4.2	0.01	67.5	44.9	1.53
8.0	93.1	6.57	38.0	5.7	0.02	68.0	44.9	1.53
8.5	92.2	6.45	38.5	7.2	0.04	68.5	44.9	1.53
9.0	91.3	6.32	39.0	8.7	0.06	69.0	44.9	1.53
9.5	90.3	6.19	39.5	10.2	0.08	69.5	44.9	1.53
10.0	89.3	6.05	40.0	11.6	0.10	70.0	44.8	1.53
10.5	88.2	5.90	40.5	13.1	0.13	70.5	44.7	1.51
11.0	87.0	5.74	41.0	14.4	0.16	71.0	44.5	1.50
11.5	85.8	5.59	41.5	15.8	0.19	71.5	44.3	1.49
12.0	84.6	5.42	42.0	17.2	0.22	72.0	44.1	1.48
12.5	83.3	5.26	42.5	18.5	0.26	72.5	43.9	1.46
13.0	81.9	5.09	43.0	19.8	0.30	73.0	43.7	1.45
13.5	80.6	4.92	43.5	21.0	0.34	73.5	43.4	1.43
14.0	79.2	4.75	44.0	22.3	0.38	74.0	43.2	1.41
14.5	77.7	4.58	44.5	23.5	0.42	74.5	42.9	1.40
15.0	76.3	4.41	45.0	24.6	0.46	75.0	42.7	1.38
15.5	74.7	4.23	45.5	25.7	0.50	75.5	42.4	1.36
16.0	73.1	4.05	46.0	26.8	0.54	76.0	42.0	1.34
16.5	71.4	3.87	46.5	27.8	0.58	76.5	41.7	1.32
17.0	69.8	3.69	47.0	28.7	0.63	77.0	41.4	1.30
17.5	68.1	3.52	47.5	29.7	0.67	77.5	41.1	1.28
18.0	66.4	3.34	48.0	30.6	0.71	78.0	40.7	1.26
18.5	64.7	3.17	48.5	31.4	0.75	78.5	40.3	1.23
19.0	62.9	3.00	49.0	32.3	0.79	79.0	40.0	1.21
19.5	61.2	2.84	49.5	33.1	0.83	79.5	39.6	1.19
20.0	59.4	2.67	50.0	33.8	0.87	80.0	39.2	1.17
20.5	57.6	2.52	50.5	34.6	0.91	80.5	38.9	1.15
21.0	55.8	2.36	51.0	35.4	0.95	81.0	38.7	1.13
21.5	54.0	2.21	51.5	36.2	0.99	81.5	38.4	1.12
22.0	52.2	2.06	52.0	36.9	1.03	82.0	38.1	1.10
22.5	50.3	1.92	52.5	37.5	1.07	82.5	37.8	1.08
23.0	48.5	1.78	53.0	38.2	1.11	83.0	37.4	1.06
23.5	46.6	1.65	53.5	38.8	1.14	83.5	37.1	1.05
24.0	44.8	1.52	54.0	39.4	1.18	84.0	36.8	1.03
24.5	42.9	1.40	54.5	40.0	1.21	84.5	36.5	1.01
25.0	41.0	1.28	55.0	40.6	1.25	85.0	36.1	0.99
25.5	39.1	1.16	55.5	41.0	1.28	85.5	35.8	0.97
26.0	37.2	1.05	56.0	41.5	1.31	86.0	35.5	0.95
26.5	35.2	0.94	56.5	41.9	1.33	86.5	35.1	0.94
27.0	33.3	0.84	57.0	42.3	1.36	87.0	34.8	0.92
27.5	31.4	0.75	57.5	42.7	1.38	87.5	34.5	0.90
28.0	29.5	0.66	58.0	43.0	1.40	88.0	34.1	0.88
28.5	27.6	0.58	58.5	43.4	1.43	88.5	33.8	0.86
29.0	25.7	0.50	59.0	43.7	1.45	89.0	33.4	0.85
29.5	23.8	0.43	59.5	43.9	1.46	89.5	33.0	0.83

TX station: BLK5 2 BAY VERTICAL
Frequency: 100.00 MHz

Site name: 0.85 WAVE SEPARATION

Horizontal diagram of Maxima

Max azimuth: 0°
Max depression: 0.0°



0.0° depres. (Total antenna), Gain (dBd): 9.21 ERP T.max (KW): 8.337 ERP E

TX station: BLK5 2 BAY VERTICAL

Site name: 0.85 WAVE SEPARATION

Frequency: 100.00 MHz

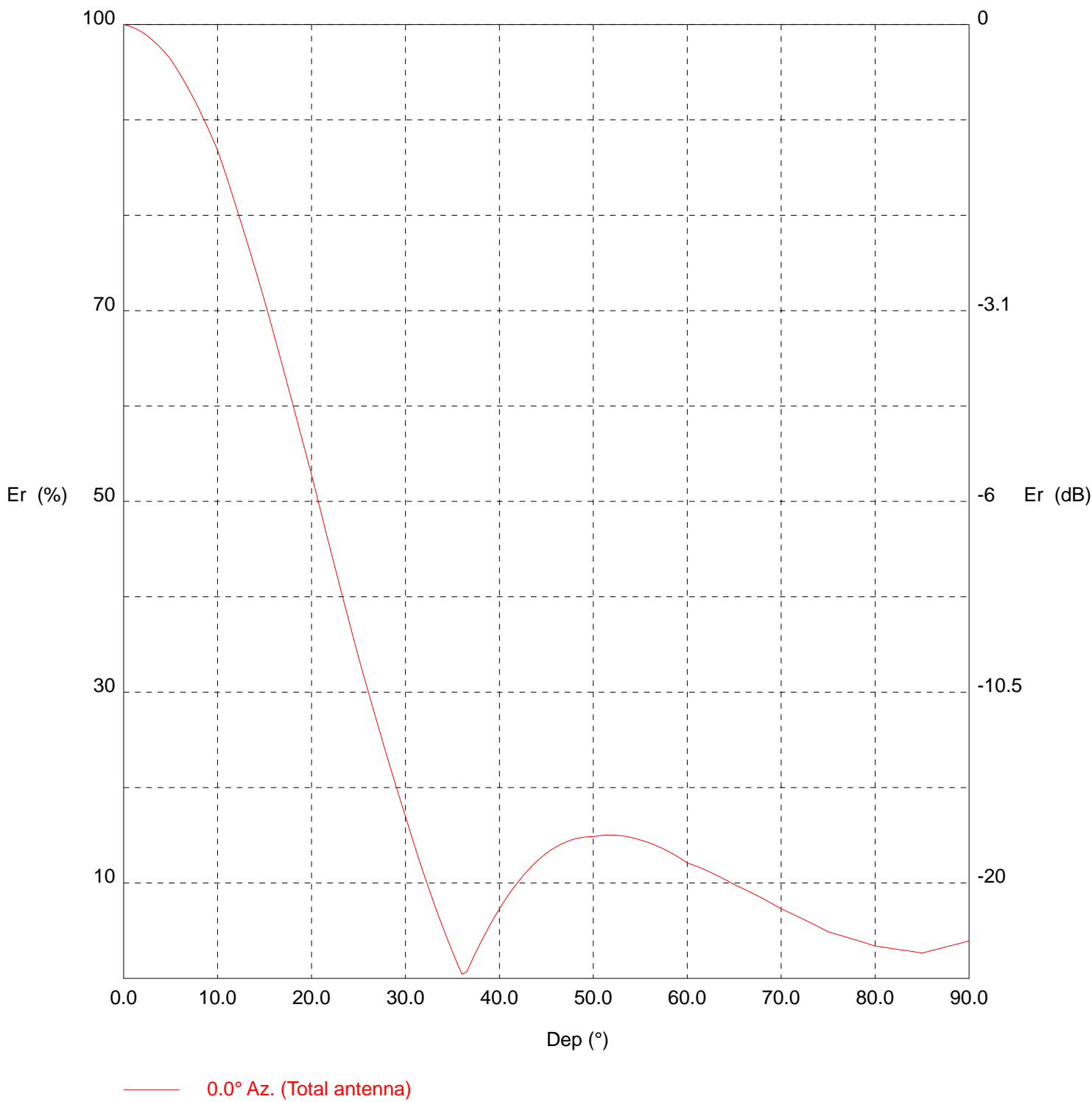
Horizontal diagram of Maxima

Az (°)	Dep (°)	Er (%)	ERP (KW)	Az (°)	Dep (°)	Er (%)	ERP (KW)	Az (°)	Dep (°)	Er (%)	ERP (KW)
0.0	0.0	100.0	7.60	120.0	0.0	11.9	0.11	240.0	0.0	11.9	0.11
5.0	0.0	99.7	7.56	125.0	0.0	9.9	0.08	245.0	0.0	13.9	0.15
10.0	0.0	98.5	7.38	130.0	0.0	9.0	0.06	250.0	0.0	16.8	0.22
15.0	0.0	97.5	7.23	135.0	0.0	8.0	0.05	255.0	0.0	19.8	0.30
20.0	0.0	95.5	6.93	140.0	0.0	7.5	0.04	260.0	0.0	23.9	0.43
25.0	0.0	93.0	6.58	145.0	-0.5	7.1	0.04	265.0	0.0	28.0	0.59
30.0	0.0	91.0	6.30	150.0	-0.5	7.1	0.04	270.0	0.0	32.0	0.78
35.0	0.0	87.5	5.82	155.0	-0.5	7.1	0.04	275.0	0.0	37.0	1.04
40.0	0.0	84.0	5.37	160.0	-0.5	7.6	0.04	280.0	0.0	41.0	1.28
45.0	0.0	81.0	4.99	165.0	0.0	8.0	0.05	285.0	0.0	47.0	1.68
50.0	0.0	75.0	4.28	170.0	0.0	8.2	0.05	290.0	0.0	52.5	2.10
55.0	0.0	70.0	3.73	175.0	0.0	8.3	0.05	295.0	0.0	60.0	2.74
60.0	0.0	65.0	3.21	180.0	0.0	8.4	0.05	300.0	0.0	65.0	3.21
65.0	0.0	60.0	2.74	185.0	0.0	8.3	0.05	305.0	0.0	70.0	3.73
70.0	0.0	52.5	2.10	190.0	0.0	8.2	0.05	310.0	0.0	75.0	4.28
75.0	0.0	47.0	1.68	195.0	0.0	8.0	0.05	315.0	0.0	81.0	4.99
80.0	0.0	41.0	1.28	200.0	-0.5	7.6	0.04	320.0	0.0	84.0	5.37
85.0	0.0	37.0	1.04	205.0	-0.5	7.1	0.04	325.0	0.0	87.5	5.82
90.0	0.0	32.0	0.78	210.0	-0.5	7.1	0.04	330.0	0.0	91.0	6.30
95.0	0.0	28.0	0.59	215.0	-0.5	7.1	0.04	335.0	0.0	93.0	6.58
100.0	0.0	23.9	0.43	220.0	0.0	7.5	0.04	340.0	0.0	95.5	6.93
105.0	0.0	19.8	0.30	225.0	0.0	8.0	0.05	345.0	0.0	97.5	7.23
110.0	0.0	16.8	0.22	230.0	0.0	9.0	0.06	350.0	0.0	98.5	7.38
115.0	0.0	13.9	0.15	235.0	0.0	9.9	0.08	355.0	0.0	99.7	7.56

TX station: BLK5 2 BAY VERTICAL
Frequency: 100.00 MHz

Site name: 0.85 WAVE SEPARATION

Vertical diagram



TX station: BLK5 2 BAY VERTICAL

Site name: 0.85 WAVE SEPARATION

Frequency: 100.00 MHz

Vertical diagram at an azimuth of 0° degrees

Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
0.0	100.0	7.60	30.0	17.0	0.22	60.0	12.1	0.11
0.5	99.9	7.58	30.5	15.4	0.18	60.5	11.9	0.11
1.0	99.7	7.56	31.0	13.8	0.15	61.0	11.7	0.10
1.5	99.5	7.52	31.5	12.3	0.12	61.5	11.5	0.10
2.0	99.2	7.48	32.0	10.8	0.09	62.0	11.3	0.10
2.5	98.8	7.43	32.5	9.4	0.07	62.5	11.1	0.09
3.0	98.4	7.37	33.0	8.0	0.05	63.0	10.9	0.09
3.5	98.0	7.30	33.5	6.6	0.03	63.5	10.6	0.09
4.0	97.5	7.23	34.0	5.3	0.02	64.0	10.4	0.08
4.5	96.9	7.15	34.5	4.0	0.01	64.5	10.1	0.08
5.0	96.4	7.06	35.0	2.8	0.01	65.0	9.8	0.07
5.5	95.6	6.95	35.5	1.6	0.00	65.5	9.6	0.07
6.0	94.8	6.84	36.0	0.4	0.00	66.0	9.4	0.07
6.5	94.0	6.71	36.5	0.7	0.00	66.5	9.1	0.06
7.0	93.1	6.59	37.0	1.7	0.00	67.0	8.9	0.06
7.5	92.2	6.46	37.5	2.8	0.01	67.5	8.6	0.06
8.0	91.2	6.32	38.0	3.7	0.01	68.0	8.4	0.05
8.5	90.2	6.18	38.5	4.7	0.02	68.5	8.1	0.05
9.0	89.1	6.04	39.0	5.6	0.02	69.0	7.8	0.05
9.5	88.0	5.89	39.5	6.5	0.03	69.5	7.6	0.04
10.0	86.8	5.73	40.0	7.3	0.04	70.0	7.3	0.04
10.5	85.4	5.54	40.5	8.1	0.05	70.5	7.1	0.04
11.0	83.9	5.35	41.0	8.8	0.06	71.0	6.8	0.04
11.5	82.4	5.16	41.5	9.5	0.07	71.5	6.6	0.03
12.0	80.8	4.97	42.0	10.1	0.08	72.0	6.4	0.03
12.5	79.3	4.78	42.5	10.7	0.09	72.5	6.1	0.03
13.0	77.7	4.59	43.0	11.3	0.10	73.0	5.9	0.03
13.5	76.0	4.40	43.5	11.8	0.11	73.5	5.6	0.02
14.0	74.4	4.21	44.0	12.3	0.11	74.0	5.4	0.02
14.5	72.7	4.02	44.5	12.7	0.12	74.5	5.1	0.02
15.0	71.0	3.84	45.0	13.1	0.13	75.0	4.9	0.02
15.5	69.3	3.65	45.5	13.5	0.14	75.5	4.7	0.02
16.0	67.5	3.46	46.0	13.8	0.14	76.0	4.6	0.02
16.5	65.7	3.28	46.5	14.0	0.15	76.5	4.4	0.02
17.0	63.8	3.10	47.0	14.3	0.15	77.0	4.3	0.01
17.5	62.0	2.92	47.5	14.5	0.16	77.5	4.1	0.01
18.0	60.2	2.75	48.0	14.6	0.16	78.0	4.0	0.01
18.5	58.3	2.59	48.5	14.7	0.16	78.5	3.8	0.01
19.0	56.5	2.43	49.0	14.8	0.17	79.0	3.7	0.01
19.5	54.6	2.27	49.5	14.8	0.17	79.5	3.5	0.01
20.0	52.8	2.12	50.0	14.9	0.17	80.0	3.4	0.01
20.5	50.8	1.96	50.5	14.9	0.17	80.5	3.3	0.01
21.0	48.9	1.82	51.0	15.0	0.17	81.0	3.2	0.01
21.5	46.9	1.67	51.5	15.0	0.17	81.5	3.2	0.01
22.0	45.0	1.54	52.0	15.0	0.17	82.0	3.1	0.01
22.5	43.1	1.41	52.5	15.0	0.17	82.5	3.0	0.01
23.0	41.2	1.29	53.0	14.9	0.17	83.0	3.0	0.01
23.5	39.3	1.17	53.5	14.9	0.17	83.5	2.9	0.01
24.0	37.4	1.06	54.0	14.8	0.17	84.0	2.8	0.01
24.5	35.5	0.96	54.5	14.7	0.16	84.5	2.7	0.01
25.0	33.7	0.86	55.0	14.5	0.16	85.0	2.7	0.01
25.5	31.9	0.78	55.5	14.4	0.16	85.5	2.8	0.01
26.0	30.2	0.69	56.0	14.2	0.15	86.0	2.9	0.01
26.5	28.5	0.62	56.5	14.0	0.15	86.5	3.0	0.01
27.0	26.7	0.54	57.0	13.8	0.14	87.0	3.2	0.01
27.5	25.1	0.48	57.5	13.5	0.14	87.5	3.3	0.01
28.0	23.4	0.42	58.0	13.3	0.13	88.0	3.4	0.01
28.5	21.8	0.36	58.5	13.0	0.13	88.5	3.5	0.01
29.0	20.1	0.31	59.0	12.7	0.12	89.0	3.7	0.01
29.5	18.6	0.26	59.5	12.4	0.12	89.5	3.8	0.01

Exhibit 17.1

Compliance with Radiofrequency Radiation Guidelines

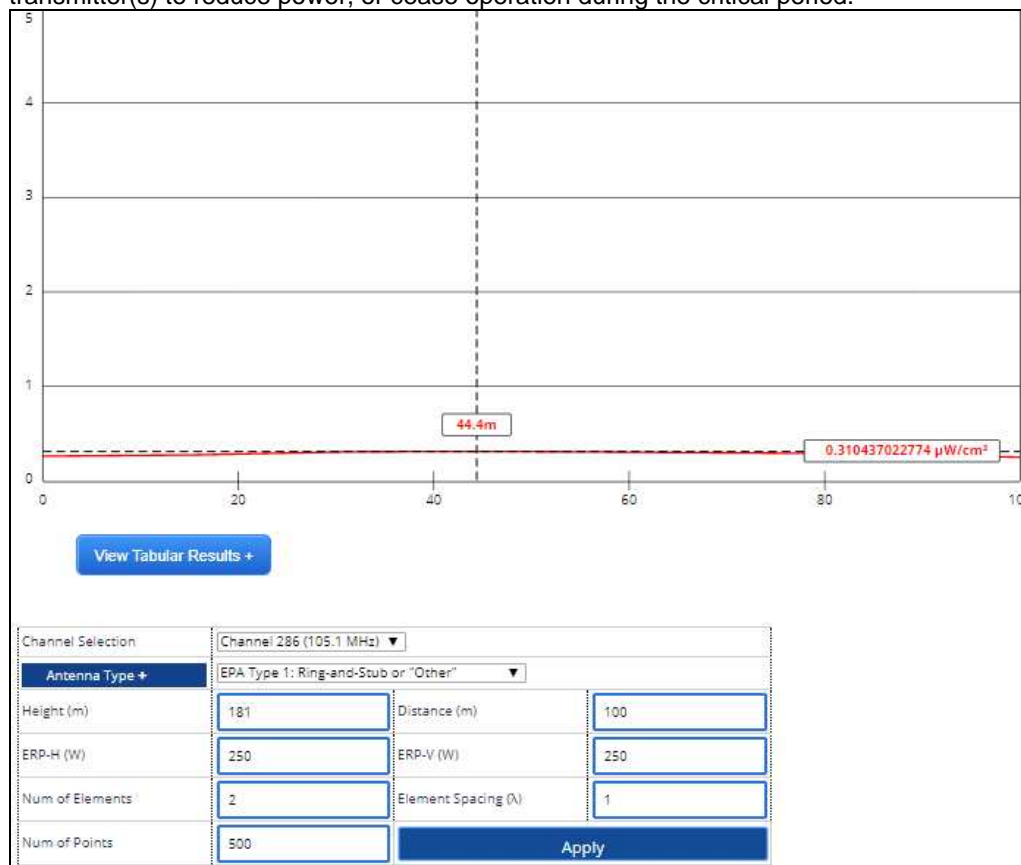
The RF Compliance Study has been evaluated for human exposure to non-ionizing radiofrequency radiation at the transmitter site. The site is intended to house multiple transmitters. The potential for human exposure to non-ionizing radiofrequency radiation at the proposed transmitter site has therefore been evaluated with regards to the §1.1307(b)(3), five percent (5%) contribution rule, for multiple transmitter sites.

The minor change to construction permit application for W286DC – East Lansing, MI, TN analog FM Translator (Facility ID: 156707 will operate on CH286D (105.1 MHz) with 0.25kW ERP circular polarization (H&V). The proposed operation will broadcast from an antenna COR mounted 181 meters above ground level (AGL). The facility will operate with a two bay antenna employing an assumed worst case EPA Type 1 elements as defined by *FM Model - Appendix B* issued March 31, 2016¹. This facility will not operate with HD/IBOC facilities at this time.

To evaluate the total exposure to non-ionizing radio-frequency radiation with regards to the five percent contribution exclusion rule, it is necessary to establish 5.0% of the maximum permissible limit. 5.0% of the 200 $\mu\text{W}/\text{cm}^2$ results in 10 $\mu\text{W}/\text{cm}^2$. Therefore if the resulting contribution is less than or equal to 10 $\mu\text{W}/\text{cm}^2$ or 5.0%, the exposure is concluded to be within the guidelines of OET Bulletin No. 65 (Edition 97-01) and §1.1307(b)(3). Protection of the more restrictive uncontrolled limit implies protection of the controlled limit.

Inspection of the graph below indicates the maximum contribution for the uncontrolled environment is less than the 10 $\mu\text{W}/\text{cm}^2$ (5.0%) limit as set forth by §1.1307(b)(3), therefore the facility is in compliance with FCC guidelines. §1.1307(b)(3) states that facilities contributing less than five percent of the exposure limit at locations with multiple transmitters are categorically excluded from responsibility for taking any corrective action in the areas where its contribution is less than five percent. Since this instant application meets the five percent exclusion test at all ground level areas, the impact of the proposed facility may be considered independently from other facilities operating at or nearby this site. It is believed the impact of the proposed operation should not be considered to be a factor at ground level as defined under §1.1307(b)(3).

In addition to the protection afforded by the proposed antenna height above ground, the facility is or will be properly marked with signs, and entry to the facility will be restricted by means of fencing with locked doors and/or gates if required. Any other means that may be required to protect employees and the general public will also be employed. In the event work is required in proximity to the antenna(s) such that the person or persons working in the area will be potentially exposed to fields in excess of the current guidelines, an agreement signed by all broadcast parties at the site will be in effect for the offending transmitter(s) to reduce power, or cease operation during the critical period.



¹ The current *FM Model* web-based software application employs the standards as detailed in OET Bulletin No. 65 (Edition 97-01). FM radiofrequency radiation levels have been predicted using both the array pattern, the calculations of which are based on the number of bays in the antenna and wavelength spacing between the bays, and the element pattern. The element pattern has been determined by using measured element data prepared by the EPA and published in "An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM and TV Services," by Paul C. Gailey and Richard Tell - April 1985, U.S. Environmental Protection Agency. The results of the evaluation for the FM station have been shown at the end of this RF compliance discussion. To ensure complete protection, the maximum FM contribution has been assumed without regard to any restricted access fencing distance.

