

## INTRODUCTION

This report and the accompanying technical exhibits are submitted **seeking a construction permit for a minor modification** to licensed translator W222BZ at Bluhmtown, Tennessee, FCC File No. BLFT-20151230BHR. A change in location, ERP, HAAT and antenna is proposed. The facility will continue to serve as a fill-in rebroadcasting WMOT-FM HD2, 89.5 megahertz at Murfreesboro, Tennessee, FCC Facility ID 41997. The proposed 60 dBu contour remains within the 60 dBu of WMOT. The proposed move is 34.2 kilometers at 267 degrees.

## TECHNICAL ANALYSIS

An overlap study in Figure E-1 shows a portion of the W222BZ modification to channel 222D is within the WJXA channel 225C and WFCM channel 219C3 third adjacent protected contours. Therefore the interfering +40 dBu F50,10 calculated within the WJXA contour is 103.6 dBu and within the WFCM contour is calculated at 104.7 dBu. Using the vertical elevation pattern of the BEXT TFC2K two bay off the shelf directional antenna, the ERP was selected to ensure the lowest point of the interference will not reach the ground i.e. any buildings or population. Using the vertical elevation pattern of the antenna (exhibit E-5) the actual line of sight  $F^2 \times kW$  reduced ERP from the interfering contour to the base of the tower was calculated geometrically relative to the tower site elevation at approximately two degree intervals: Height Above Ground = COR AGL - (Line of Sight Distance  $\times \sin(x)$ ), where (x) is the depression angle from horizontal. Therefore a waiver of section 74.1204 for this facility is requested in accordance with the Living Way Ministries FCC 08-242 ruling.

The W222BZ modification will be located on an existing tower, ASR 1061283, at coordinates N. 35-50-56.0 - W. 86-21-11.0 (NAD83). The directional antenna is rotated at a 200 degree azimuth mounted at a COR AGL of 85.0 meters, 277 meters AMSL and will operate at an ERP of 0.120 kilowatts.

## RF EXPOSURE

The RF contribution is calculated using the formula from OET Bulletin 65:  $S \text{ (rf in microwatts/cm}^2\text{)} = 33.4 \times F^2 \times (H \text{ ERP} + V \text{ ERP in watts}) / R^2$  (height of radiation centers in meters - 2 m). Using the worst case vertical (F) factor of 1.0, the RF is calculated to be well below the 5% of the 200  $\mu\text{W/cm}^2$  maximum permissible for general public exposure, allowing exclusion from consideration.

## CONCLUSION

It is concluded that the proposed minor modification complies with all Commission rules and policies.

PROPOSED												
Middle Tennessee State University												
CH# 222D - 92.3 MHz, Pwr= 0.12 kw DA, HAAT= 81.8 M, COR= 277 M												
Average Protected F(50-50)= 9.79 km												
Standard Directional												
DISPLAY DATES												
DATA 07-13-22												
SEARCH 07-20-22												
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR(kw)	INT(km)	PRO(km)	*IN*	*OUT*	
CITY		STATE		<--	FILE #	LNG	HAAT(M)	COR(M)	LICENSEE	(Overlap in km)		
222C0	WDEF-FM	ALO	___	130.1	122.40	35 08 06.30	100.000	174.6	73.7	-59.6*	22.8	
Chattanooga		TN		310.7		85 19 24.90	450	833	Jackson Telecasters, Inc.			
222C0	WDEF-FM	LIC	_CN	130.1	122.40	35 08 06.30	100.000	164.9	66.3	-50.5*	30.1	
Chattanooga		TN		310.7	BMLH20050831ADG	85 19 24.90	360	743	Jackson Telecasters, Inc.			
222D	W222BZ	LIC	DVN	86.8	34.20	35 51 56.20	0.250		---	Reference---		
Bluhmtown		TN		267.0	BLFT20151230BHR	85 58 29.90		641	Middle Tennessee State Uni			
225C	WJXA	ALO	___	298.8	63.07	36 07 14.20	100.000	13.2	90.3	39.6	-27.8*	
Nashville		TN		118.4		86 58 07.00	600	783	Midwest Communications, In			
225C	WJXA	LIC	_CN	298.8	63.07	36 07 14.20	100.000	9.9	71.3	42.9	-8.9*	
Nashville		TN		118.4	BLH19861204KB	86 58 07.00	321	507	Midwest Communications, In			
219C3	WFCM-FM	LIC	DEN	257.5	24.78	35 48 01.20	2.500	2.4	31.9	12.2	-7.9*	
Murfreesboro		TN		77.3	BLED20050411AAI	86 37 17.00	231	468	The Moody Bible Institute			
221A	AL6637	USE	___	324.3	61.45	36 17 50.19	6.000	50.2	33.2	1.8	15.4	
Goodlettsville		TN		144.1	RM11324	86 45 10.98	100	283	From CDBS			
221A	WQQK	LIC	_CN	324.3	61.45	36 17 50.20	3.500	48.8	32.6	3.2	16.1	
Goodlettsville		TN		144.1	BLH20130125ACM	86 45 11.00	133	319	Cumulus Licensing LLC			
275C1	WBUZ	LIC	_CN	257.5	24.84	35 48 01.20	100.000	0.0	0.0	21.5R	3.3M	
La Vergne		TN		77.3	BMLH20021209ABP	86 37 17.00	291	530	wycq, Inc			
275C1	AL9565	USE	___	257.5	24.84	35 48 01.24	100.000	0.0	0.0	21.5R	3.3M	
La Vergne		TN		77.3	RM10101	86 37 16.99	299	533	From CDBS			
223D	W223BV	LIC	_CN	319.5	60.82	36 15 49.80	0.250	37.7	24.6	13.5	22.7	
Brentwood		TN		139.2	0000177663	86 47 38.90		526	Educational Media Foundati			
222C0	WHHG	ALO	___	272.2	218.89	35 54 06.20	100.000	185.9	82.5	22.4	100.7	
Milan		TN		90.8		88 46 55.20	450	581	Forever South Licenses, L			
221D	W221ED	LIC	_CN	111.1	55.83	35 40 00.00	0.250	12.1	8.5	35.7	34.9	
Mcminnville		TN		291.4	0000156787	85 46 35.00		355	Peg Broadcasting, LLC			
223D	W223CY	LIC	_CN	221.4	58.85	35 27 03.30	0.250	13.8	9.9	35.8	36.0	
Lewisburg		TN		41.1	BLFT20180710ABA	86 46 57.00		270	wjjm, Inc.			
222C0	WHHG	LIC	_CN	272.2	218.89	35 54 06.20	100.000	170.6	71.3	37.7	111.8	
Milan		TN		90.8	BMLH19970129KA	88 46 55.20	302	430	Forever South Licenses, L			
220A	WGBQ	LIC	DCN	180.6	63.74	35 16 32.30	0.900	1.5	17.2	53.3	44.1	
Lynchburg		TN		0.6	BLED20101025AAP	86 21 37.00	107	395	American Family Associatio			

Terrain database is USGS 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.

EXHIBIT NUMBER
----- 1
GARY M. BROWN

W222BZ

07-20-2022

RMS(V)= .813

Graph is Relative Field

Azi	Field	dBk	kw
000	0.545	-12.719	0.053
010	0.539	-12.815	0.052
020	0.540	-12.799	0.052
030	0.543	-12.751	0.053
040	0.551	-12.624	0.055
050	0.570	-12.330	0.058
060	0.603	-11.841	0.065
070	0.651	-11.176	0.076
080	0.707	-10.459	0.090
090	0.781	-09.594	0.110
100	0.864	-08.717	0.134
110	0.932	-08.059	0.156
120	0.974	-07.676	0.171
130	0.991	-07.526	0.177
140	0.985	-07.579	0.175
150	0.962	-07.784	0.167
160	0.929	-08.087	0.155
170	0.893	-08.430	0.144
180	0.862	-08.737	0.134
190	0.842	-08.941	0.128
200	0.837	-08.993	0.126
210	0.845	-08.910	0.129
220	0.868	-08.677	0.136
230	0.901	-08.353	0.146
240	0.936	-08.022	0.158
250	0.972	-07.694	0.170
260	0.994	-07.500	0.178
270	0.999	-07.456	0.180
280	0.979	-07.632	0.173
290	0.935	-08.031	0.157
300	0.864	-08.717	0.134
310	0.779	-09.617	0.109
320	0.702	-10.521	0.089
330	0.645	-11.256	0.075
340	0.593	-11.986	0.063
350	0.561	-12.468	0.057

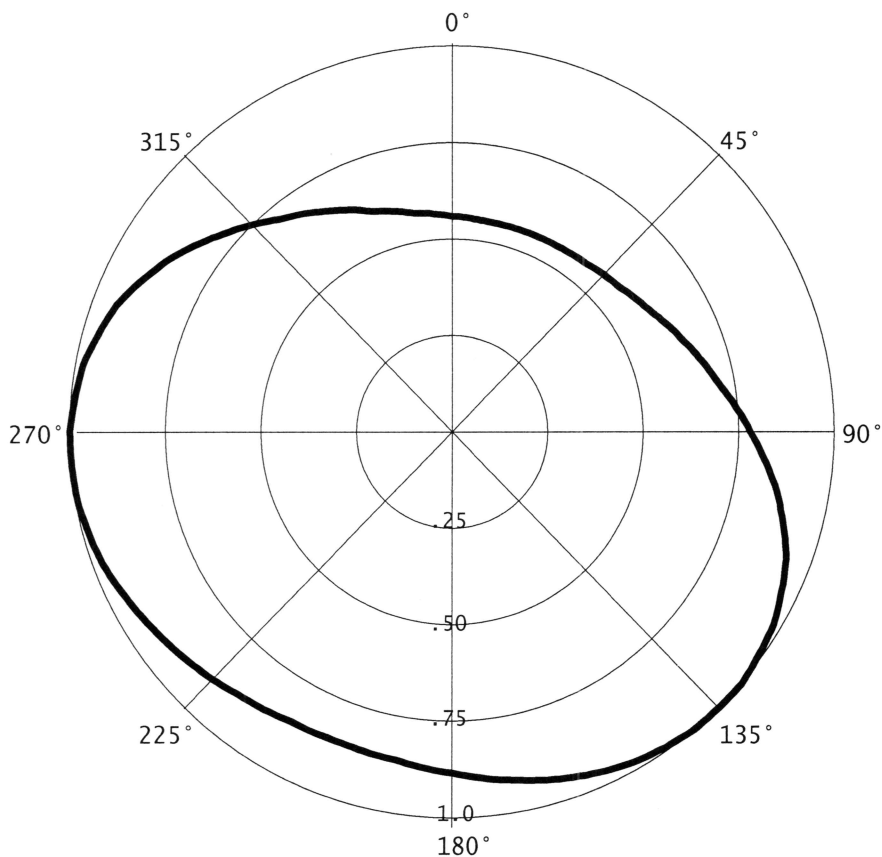


EXHIBIT NUMBER

----- 2

GARY M. BROWN

PROPOSED  
Middle Tennessee State University

Coverage Study - USGS 03 SEC  
07-20-2022

W222BZ CH222 D , 0.12 kW, 81.8m HAAT, 277.0m COR AMSL  
Service Contour = 60 dBu.

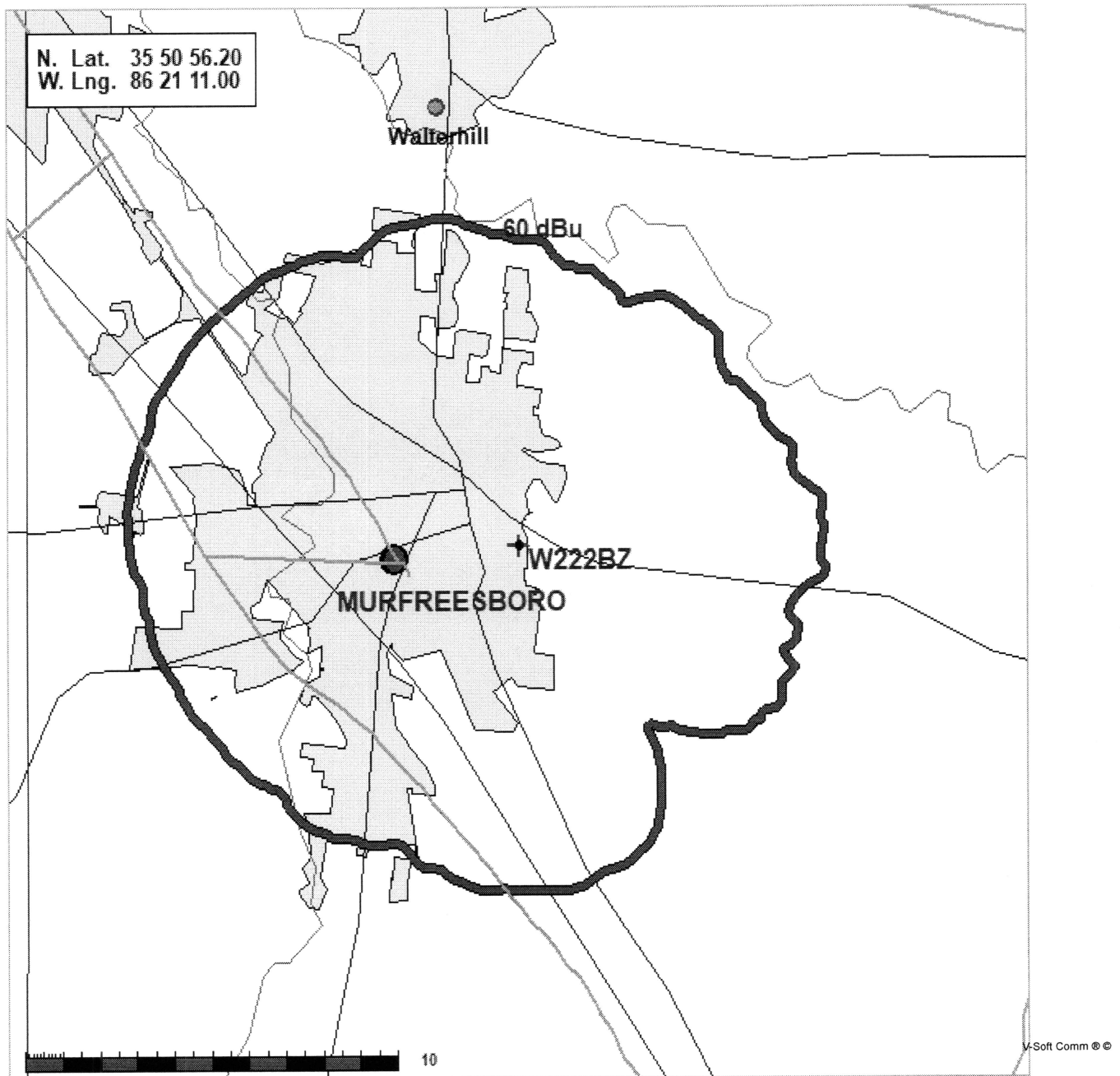


EXHIBIT NUMBER

----- 3

GARY M. BROWN



**Registration 1061283** [Map Registration](#)**Registration Detail**

Reg Number	1061283	Status	Constructed
File Number	A0071760	Constructed	12/01/1971
EMI	No	Dismantled	
NEPA	No		

**Antenna Structure**

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

**Location** (in NAD83 Coordinates)

Lat/Long	35-50-56.0 N 086-21-11.0 W	Address	N. RUTHERFORD BLVD. (AT MTSU 2ND ST. INTERSECTION)
City, State	MURFREESBORO , TN		
Zip	37130	County	RUTHERFORD
Center of AM Array		Position of Tower in Array	

**Heights (meters)**

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
192.0	87.5
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
279.5	87.2

**Painting and Lighting Specifications**

FAA Chapters 3, 4, 5, 13  
Paint and Light in Accordance with FAA Circular Number 70/7460-1H

**FAA Notification**

FAA Study	93-ASO-1751-OE	FAA Issue Date	09/28/1993
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**Owner & Contact Information**

FRN	Owner Entity Type
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**Owner**

MIDDLE TENNESSEE STATE UNIVERSITY DBA = (C/O RADIO STATION WMTS) Attention To: GARY BROWN 1500 GREENLAND DRIVE P.O. Box 3 MURFREESBORO , TN 37132	P: (615)898-2800 F: E: GBROWN@MTSU.EDU
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**Contact**

P:  
F:  
E:

**Last Action Status**

Status	Constructed	Received	02/22/1999
Purpose	New	Entered	02/22/1999
Mode	Interactive		

**Related Applications****EXHIBIT NUMBER**

- - - - 4

GARY M. BROWN

## 2 Bay TFC2K 98.1MHz

October 2015

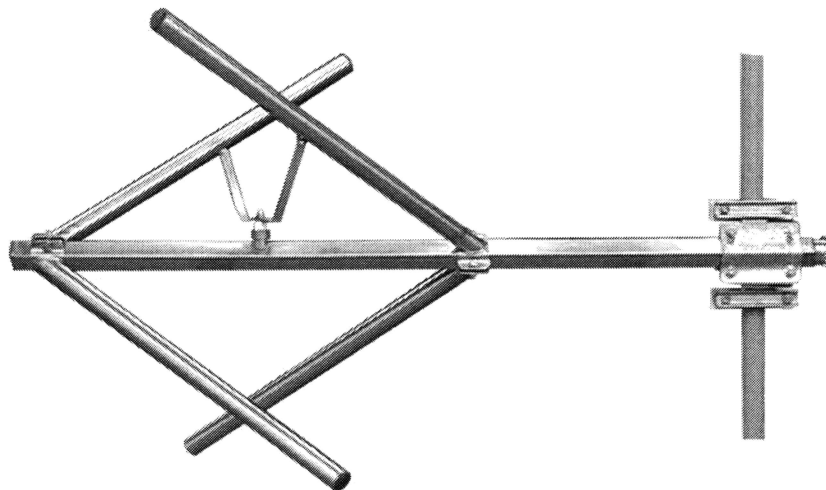


EXHIBIT NUMBER

- - - - - 5

GARY M. BROWN

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### General data of antenna System

TX station	
Site Name	
System of coordinates	WGS84
Longitude	
Latitude	
Ground level a.s.l. (m)	1.0
Antenna system height (m)	20.0
Transmitter power(Watt)	1.000
Carrier wave frequency (MHz)	98.100
Antenna system central frequency (MHz)	98.100
Antenna base diagrams type 1	TFC2K
Polarization (H/V/C/X)	C
Transmitting cable attenuation (dB)	0.0
Additional attenuations(dB)	0.0
Base diagrams sectors (T = All, F = Front)	T
Velocity factor of cables to Antennas (0÷1)	1.00
Coordinate System(C = cartesian, P = polar)	P
Mast side / diameter(cm)	0.0
Mast cross section (T/Q/C)	Q
Structure rotation w.r.t. North (°)	0.0
Mast rotation w.r.t. North (°)	0.0

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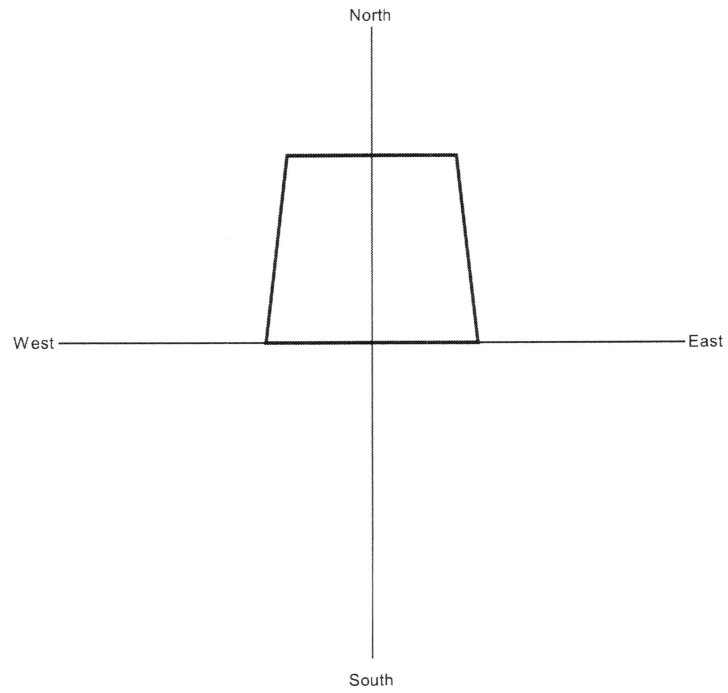
### Information about antennas used in the System

	Antenna
Manufacturer	Telecom
Antenna model	TFC2K
Band start(MHz)	87
Band stop(MHz)	108
diagrams Frequency(MHz)	98.1
Polariz (H/V/C/X)	C
Vertical dist (cm)	320
Height (cm)	250
Width (cm)	170
Thickness (cm)	150
Weight (Kg)	80
Maximum power (KW)	4
Gain (dBd)	-3.4
North E.C. (cm)	70
East E.C. (cm)	0
Return loss (dB)	0
R.C.Phase (°)	0

### Geometrical and electrical data of antenna System

	Power (%)	Tilt (°)	Az. (°/N)	Phase (°)	V dist. (m)	Scr-d (cm)	Scr-Az (°/N)	Rot. (1÷4)	Type (1÷2)	L cables (cm)	Car. phase (°)
1	50.000	0	0	0 +0.0	1.30	0.0	0.0	1	1	0.0	0.0
2	50.000	0	0	0 +0.0	-1.30	0.0	0.0	1	1	0.0	0.0

### Plan of antenna system



### Side of antenna system



### Antennas arrays data

**Note: calculation of single antennas arrays data (without taking into account mutual effects)**

A. Antennas array azimuth (°/N)	0
B. Number of antennas	2
C. Nominal power supply (W)	1.00
D. Losses (addit. + cables) (dB)	0.0
E. Effective power supply (W)	1.00
F. Theor. maximum gain (dBd)	-0.39
G. Distribution losses (dB)	0.00
H. Nominal max gain F - G (dBd)	-0.39
I. Compensation losses (dB)	0.01
J. Effic. max gain H - I (dBd)	-0.40
K. Effic. max gain (times)	0.91
L. Effic. max power E * K (KW)	0.0009
M. Max power depr. angle (°)	-0.5
N. Max power az. angle (°)	66

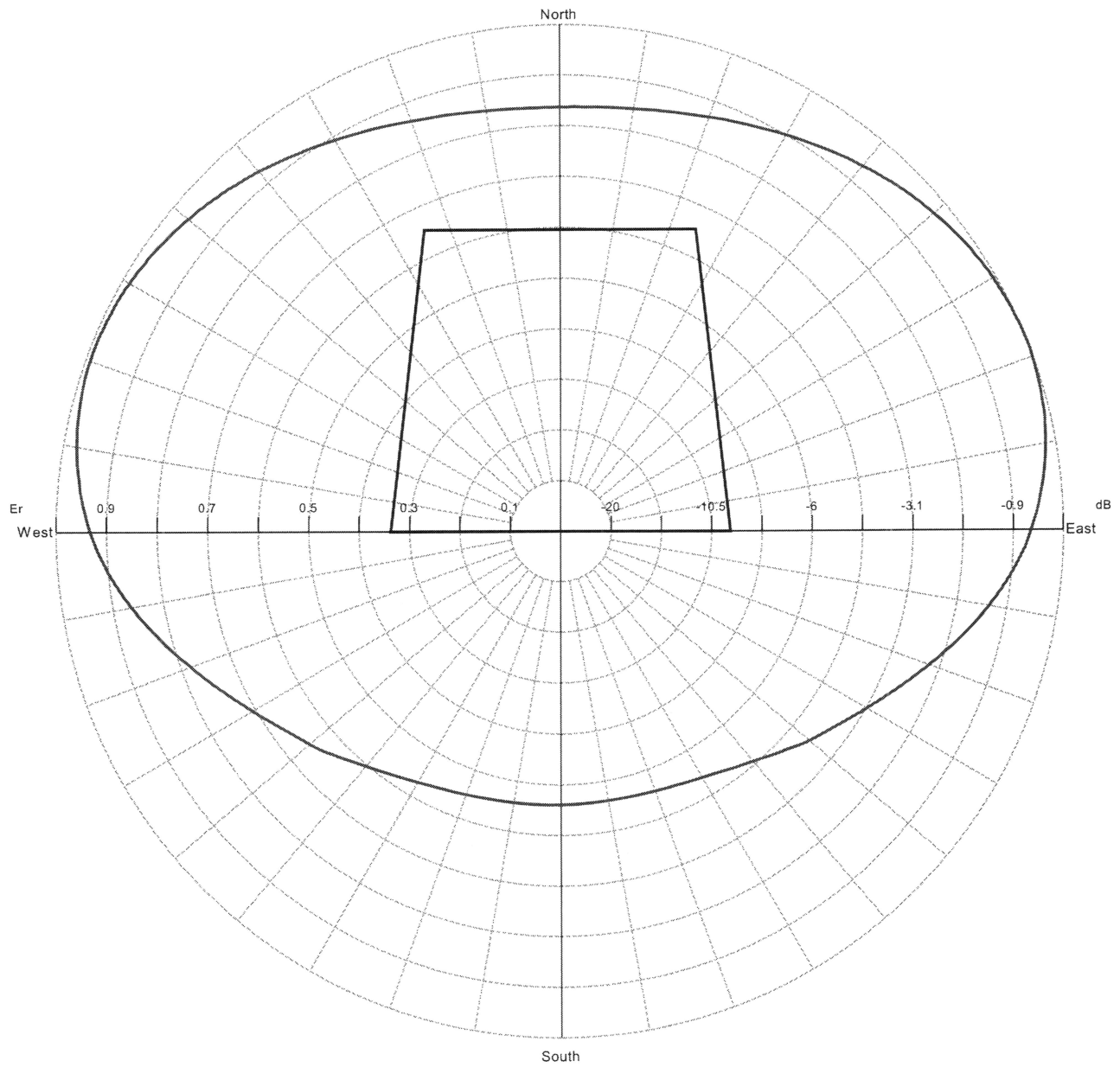
#### Diagram in dBK calculated at horizon

Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK
0	-31.9	90	-31.0	180	-35.8	270	-31.0
10	-31.9	100	-31.7	190	-35.7	280	-30.6
20	-31.6	110	-32.6	200	-35.6	290	-30.5
30	-31.3	120	-33.5	210	-35.3	300	-30.5
40	-31.0	130	-34.2	220	-34.8	310	-30.7
50	-30.6	140	-34.9	230	-34.1	320	-31.0
60	-30.4	150	-35.4	240	-33.4	330	-31.4
70	-30.4	160	-35.7	250	-32.5	340	-31.7
80	-30.6	170	-35.8	260	-31.7	350	-31.9

#### Diagram in dBK calculated at horizon ( without -20dB's lower limit vs maximum power )

Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK
0	-31.9	90	-31.0	180	-35.8	270	-31.0
10	-31.9	100	-31.7	190	-35.7	280	-30.6
20	-31.6	110	-32.6	200	-35.6	290	-30.5
30	-31.3	120	-33.5	210	-35.3	300	-30.5
40	-31.0	130	-34.2	220	-34.8	310	-30.7
50	-30.6	140	-34.9	230	-34.1	320	-31.0
60	-30.4	150	-35.4	240	-33.4	330	-31.4
70	-30.4	160	-35.7	250	-32.5	340	-31.7
80	-30.6	170	-35.8	260	-31.7	350	-31.9

# Horizontal diagram at 0.0° tilt (Total Antenna)



— 0.0° Tilt (Total Antenna), Gain (dBd): -0.4

ERP T.Max(KW): 0.001 ERP E.Max(KW): 0.001

### Horizontal diagram at 0.0° tilt (Total Antenna)

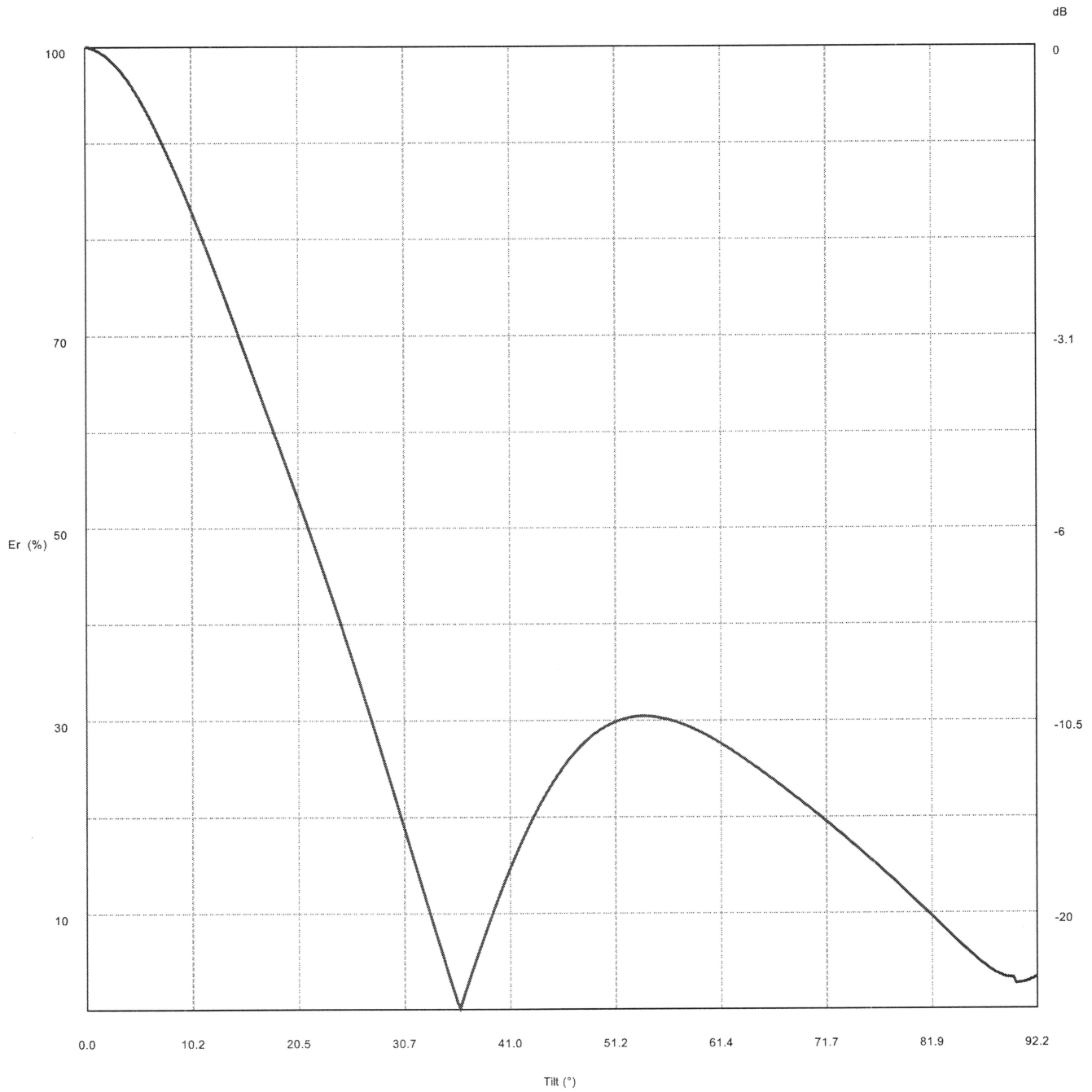
Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)
0.0	83.7	0.6	60.0	99.4	0.9	120.0	70.2	0.4
1.0	83.7	0.6	61.0	99.5	0.9	121.0	69.5	0.4
2.0	83.8	0.6	62.0	99.7	0.9	122.0	68.8	0.4
3.0	83.8	0.6	63.0	99.8	0.9	123.0	68.2	0.4
4.0	83.8	0.6	64.0	99.9	0.9	124.0	67.6	0.4
5.0	83.9	0.6	65.0	99.9	0.9	125.0	67.0	0.4
6.0	84.0	0.6	66.0	100.0	0.9	126.0	66.5	0.4
7.0	84.1	0.6	67.0	100.0	0.9	127.0	66.0	0.4
8.0	84.2	0.6	68.0	100.0	0.9	128.0	65.4	0.4
9.0	84.4	0.7	69.0	100.0	0.9	129.0	64.9	0.4
10.0	84.5	0.7	70.0	99.9	0.9	130.0	64.5	0.4
11.0	84.7	0.7	71.0	99.8	0.9	131.0	63.9	0.4
12.0	84.9	0.7	72.0	99.7	0.9	132.0	63.3	0.4
13.0	85.1	0.7	73.0	99.5	0.9	133.0	62.8	0.4
14.0	85.3	0.7	74.0	99.4	0.9	134.0	62.2	0.4
15.0	85.5	0.7	75.0	99.2	0.9	135.0	61.7	0.3
16.0	85.7	0.7	76.0	99.1	0.9	136.0	61.2	0.3
17.0	86.0	0.7	77.0	98.9	0.9	137.0	60.7	0.3
18.0	86.2	0.7	78.0	98.5	0.9	138.0	60.2	0.3
19.0	86.5	0.7	79.0	98.3	0.9	139.0	59.7	0.3
20.0	86.8	0.7	80.0	97.9	0.9	140.0	59.3	0.3
21.0	87.1	0.7	81.0	97.6	0.9	141.0	58.9	0.3
22.0	87.4	0.7	82.0	97.3	0.9	142.0	58.5	0.3
23.0	87.7	0.7	83.0	96.9	0.9	143.0	58.2	0.3
24.0	88.0	0.7	84.0	96.5	0.8	144.0	57.9	0.3
25.0	88.3	0.7	85.0	96.1	0.8	145.0	57.5	0.3
26.0	88.6	0.7	86.0	95.6	0.8	146.0	57.2	0.3
27.0	88.9	0.7	87.0	95.2	0.8	147.0	56.9	0.3
28.0	89.3	0.7	88.0	94.6	0.8	148.0	56.6	0.3
29.0	89.6	0.7	89.0	94.1	0.8	149.0	56.3	0.3
30.0	90.1	0.7	90.0	93.5	0.8	150.0	56.1	0.3
31.0	90.4	0.7	91.0	93.0	0.8	151.0	55.9	0.3
32.0	90.7	0.7	92.0	92.4	0.8	152.0	55.7	0.3
33.0	91.1	0.8	93.0	91.8	0.8	153.0	55.5	0.3
34.0	91.4	0.8	94.0	91.1	0.8	154.0	55.3	0.3
35.0	91.8	0.8	95.0	90.4	0.7	155.0	55.1	0.3
36.0	92.3	0.8	96.0	89.6	0.7	156.0	55.0	0.3
37.0	92.6	0.8	97.0	88.9	0.7	157.0	54.9	0.3
38.0	93.0	0.8	98.0	88.1	0.7	158.0	54.8	0.3
39.0	93.3	0.8	99.0	87.3	0.7	159.0	54.6	0.3
40.0	93.6	0.8	100.0	86.4	0.7	160.0	54.5	0.3
41.0	94.1	0.8	101.0	85.6	0.7	161.0	54.4	0.3
42.0	94.4	0.8	102.0	84.8	0.7	162.0	54.3	0.3
43.0	94.7	0.8	103.0	83.9	0.6	163.0	54.3	0.3
44.0	95.2	0.8	104.0	83.0	0.6	164.0	54.2	0.3
45.0	95.5	0.8	105.0	82.2	0.6	165.0	54.1	0.3
46.0	95.8	0.8	106.0	81.3	0.6	166.0	54.1	0.3
47.0	96.2	0.8	107.0	80.5	0.6	167.0	54.0	0.3
48.0	96.5	0.8	108.0	79.6	0.6	168.0	54.0	0.3
49.0	96.8	0.9	109.0	78.8	0.6	169.0	53.9	0.3
50.0	97.2	0.9	110.0	77.9	0.6	170.0	53.9	0.3
51.0	97.4	0.9	111.0	77.0	0.5	171.0	53.9	0.3
52.0	97.7	0.9	112.0	76.2	0.5	172.0	53.9	0.3
53.0	97.9	0.9	113.0	75.4	0.5	173.0	53.9	0.3
54.0	98.2	0.9	114.0	74.6	0.5	174.0	53.9	0.3
55.0	98.5	0.9	115.0	73.8	0.5	175.0	53.9	0.3
56.0	98.7	0.9	116.0	73.1	0.5	176.0	53.9	0.3
57.0	98.9	0.9	117.0	72.3	0.5	177.0	53.9	0.3
58.0	99.1	0.9	118.0	71.5	0.5	178.0	53.9	0.3
59.0	99.3	0.9	119.0	70.8	0.5	179.0	53.9	0.3



### Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)
180.0	54.0	0.3	240.0	70.7	0.5	300.0	98.5	0.9
181.0	54.0	0.3	241.0	71.3	0.5	301.0	98.4	0.9
182.0	54.0	0.3	242.0	72.0	0.5	302.0	98.2	0.9
183.0	54.0	0.3	243.0	72.7	0.5	303.0	97.9	0.9
184.0	54.0	0.3	244.0	73.5	0.5	304.0	97.8	0.9
185.0	54.1	0.3	245.0	74.2	0.5	305.0	97.6	0.9
186.0	54.1	0.3	246.0	75.0	0.5	306.0	97.3	0.9
187.0	54.1	0.3	247.0	75.8	0.5	307.0	97.1	0.9
188.0	54.1	0.3	248.0	76.5	0.5	308.0	96.8	0.9
189.0	54.2	0.3	249.0	77.4	0.5	309.0	96.5	0.8
190.0	54.3	0.3	250.0	78.1	0.6	310.0	96.2	0.8
191.0	54.3	0.3	251.0	78.9	0.6	311.0	95.9	0.8
192.0	54.4	0.3	252.0	79.8	0.6	312.0	95.6	0.8
193.0	54.4	0.3	253.0	80.6	0.6	313.0	95.3	0.8
194.0	54.5	0.3	254.0	81.5	0.6	314.0	95.0	0.8
195.0	54.6	0.3	255.0	82.2	0.6	315.0	94.6	0.8
196.0	54.7	0.3	256.0	83.1	0.6	316.0	94.3	0.8
197.0	54.8	0.3	257.0	84.0	0.6	317.0	93.9	0.8
198.0	54.9	0.3	258.0	84.8	0.7	318.0	93.5	0.8
199.0	55.0	0.3	259.0	85.6	0.7	319.0	93.2	0.8
200.0	55.1	0.3	260.0	86.4	0.7	320.0	92.9	0.8
201.0	55.3	0.3	261.0	87.2	0.7	321.0	92.5	0.8
202.0	55.5	0.3	262.0	88.0	0.7	322.0	92.2	0.8
203.0	55.6	0.3	263.0	88.7	0.7	323.0	91.7	0.8
204.0	55.7	0.3	264.0	89.4	0.7	324.0	91.4	0.8
205.0	55.9	0.3	265.0	90.2	0.7	325.0	91.0	0.8
206.0	56.1	0.3	266.0	90.8	0.8	326.0	90.7	0.7
207.0	56.3	0.3	267.0	91.4	0.8	327.0	90.4	0.7
208.0	56.5	0.3	268.0	92.1	0.8	328.0	89.9	0.7
209.0	56.7	0.3	269.0	92.7	0.8	329.0	89.6	0.7
210.0	57.0	0.3	270.0	93.2	0.8	330.0	89.3	0.7
211.0	57.3	0.3	271.0	93.8	0.8	331.0	88.9	0.7
212.0	57.5	0.3	272.0	94.2	0.8	332.0	88.6	0.7
213.0	57.8	0.3	273.0	94.7	0.8	333.0	88.3	0.7
214.0	58.1	0.3	274.0	95.2	0.8	334.0	88.0	0.7
215.0	58.5	0.3	275.0	95.6	0.8	335.0	87.7	0.7
216.0	58.8	0.3	276.0	95.9	0.8	336.0	87.4	0.7
217.0	59.1	0.3	277.0	96.4	0.8	337.0	87.1	0.7
218.0	59.5	0.3	278.0	96.7	0.9	338.0	86.8	0.7
219.0	59.9	0.3	279.0	97.1	0.9	339.0	86.5	0.7
220.0	60.3	0.3	280.0	97.4	0.9	340.0	86.2	0.7
221.0	60.7	0.3	281.0	97.6	0.9	341.0	86.0	0.7
222.0	61.2	0.3	282.0	97.9	0.9	342.0	85.7	0.7
223.0	61.6	0.3	283.0	98.2	0.9	343.0	85.5	0.7
224.0	62.1	0.4	284.0	98.3	0.9	344.0	85.3	0.7
225.0	62.6	0.4	285.0	98.5	0.9	345.0	85.1	0.7
226.0	63.1	0.4	286.0	98.7	0.9	346.0	84.9	0.7
227.0	63.7	0.4	287.0	98.9	0.9	347.0	84.7	0.7
228.0	64.2	0.4	288.0	99.0	0.9	348.0	84.5	0.7
229.0	64.7	0.4	289.0	99.1	0.9	349.0	84.4	0.7
230.0	65.1	0.4	290.0	99.1	0.9	350.0	84.2	0.6
231.0	65.6	0.4	291.0	99.2	0.9	351.0	84.1	0.6
232.0	66.1	0.4	292.0	99.2	0.9	352.0	84.0	0.6
233.0	66.5	0.4	293.0	99.2	0.9	353.0	83.9	0.6
234.0	67.1	0.4	294.0	99.1	0.9	354.0	83.8	0.6
235.0	67.6	0.4	295.0	99.1	0.9	355.0	83.8	0.6
236.0	68.2	0.4	296.0	99.0	0.9	356.0	83.8	0.6
237.0	68.8	0.4	297.0	99.0	0.9	357.0	83.7	0.6
238.0	69.4	0.4	298.0	98.9	0.9	358.0	83.7	0.6
239.0	70.0	0.4	299.0	98.7	0.9	359.0	83.7	0.6

# Vertical diagram at an azimuth of 66.9°



— 66.9° Az. (Total Antenna), Gain (dBd): -0.4

ERP T.Max(KW): 0.001 ERP E.Max(KW): 0.001

### Vertical diagram at an azimuth of 66.9°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.1	0.9	15.4	68.3	0.4	30.7	18.8	0.0
0.3	100.0	0.9	15.6	67.5	0.4	31.0	17.9	0.0
0.5	99.9	0.9	15.9	66.7	0.4	31.2	17.0	0.0
0.8	99.8	0.9	16.1	66.0	0.4	31.5	16.1	0.0
1.0	99.7	0.9	16.4	65.2	0.4	31.7	15.2	0.0
1.3	99.6	0.9	16.6	64.5	0.4	32.0	14.2	0.0
1.5	99.4	0.9	16.9	63.7	0.4	32.3	13.3	0.0
1.8	99.2	0.9	17.2	63.0	0.4	32.5	12.4	0.0
2.0	99.0	0.9	17.4	62.2	0.4	32.8	11.5	0.0
2.3	98.8	0.9	17.7	61.5	0.3	33.0	10.6	0.0
2.6	98.5	0.9	17.9	60.7	0.3	33.3	9.7	0.0
2.8	98.3	0.9	18.2	60.0	0.3	33.5	8.7	0.0
3.1	98.0	0.9	18.4	59.2	0.3	33.8	7.8	0.0
3.3	97.6	0.9	18.7	58.4	0.3	34.0	6.9	0.0
3.6	97.3	0.9	18.9	57.6	0.3	34.3	6.0	0.0
3.8	96.9	0.9	19.2	56.9	0.3	34.6	5.1	0.0
4.1	96.5	0.8	19.5	56.1	0.3	34.8	4.3	0.0
4.4	96.1	0.8	19.7	55.3	0.3	35.1	3.4	0.0
4.6	95.7	0.8	20.0	54.5	0.3	35.3	2.5	0.0
4.9	95.3	0.8	20.2	53.8	0.3	35.6	1.6	0.0
5.1	94.8	0.8	20.5	53.0	0.3	35.8	0.8	0.0
5.4	94.4	0.8	20.7	52.2	0.2	36.1	0.1	0.0
5.6	93.9	0.8	21.0	51.4	0.2	36.4	1.0	0.0
5.9	93.4	0.8	21.2	50.7	0.2	36.6	1.8	0.0
6.1	92.8	0.8	21.5	49.9	0.2	36.9	2.6	0.0
6.4	92.3	0.8	21.8	49.1	0.2	37.1	3.5	0.0
6.7	91.7	0.8	22.0	48.3	0.2	37.4	4.3	0.0
6.9	91.2	0.8	22.3	47.5	0.2	37.6	5.1	0.0
7.2	90.6	0.7	22.5	46.7	0.2	37.9	5.9	0.0
7.4	90.0	0.7	22.8	45.8	0.2	38.1	6.7	0.0
7.7	89.4	0.7	23.0	45.0	0.2	38.4	7.5	0.0
7.9	88.8	0.7	23.3	44.2	0.2	38.7	8.3	0.0
8.2	88.2	0.7	23.6	43.4	0.2	38.9	9.0	0.0
8.4	87.5	0.7	23.8	42.6	0.2	39.2	9.8	0.0
8.7	86.9	0.7	24.1	41.7	0.2	39.4	10.5	0.0
9.0	86.3	0.7	24.3	40.9	0.2	39.7	11.2	0.0
9.2	85.6	0.7	24.6	40.1	0.1	39.9	12.0	0.0
9.5	84.9	0.7	24.8	39.2	0.1	40.2	12.7	0.0
9.7	84.3	0.6	25.1	38.4	0.1	40.4	13.4	0.0
10.0	83.6	0.6	25.3	37.5	0.1	40.7	14.0	0.0
10.2	82.9	0.6	25.6	36.7	0.1	41.0	14.7	0.0
10.5	82.2	0.6	25.9	35.8	0.1	41.2	15.4	0.0
10.8	81.5	0.6	26.1	35.0	0.1	41.5	16.0	0.0
11.0	80.8	0.6	26.4	34.1	0.1	41.7	16.6	0.0
11.3	80.1	0.6	26.6	33.2	0.1	42.0	17.2	0.0
11.5	79.4	0.6	26.9	32.4	0.1	42.2	17.8	0.0
11.8	78.7	0.6	27.1	31.5	0.1	42.5	18.4	0.0
12.0	77.9	0.6	27.4	30.6	0.1	42.8	19.0	0.0
12.3	77.2	0.5	27.6	29.7	0.1	43.0	19.6	0.0
12.5	76.5	0.5	27.9	28.8	0.1	43.3	20.1	0.0
12.8	75.7	0.5	28.2	27.9	0.1	43.5	20.6	0.0
13.1	75.0	0.5	28.4	27.0	0.1	43.8	21.1	0.0
13.3	74.2	0.5	28.7	26.1	0.1	44.0	21.6	0.0
13.6	73.5	0.5	28.9	25.2	0.1	44.3	22.1	0.0
13.8	72.7	0.5	29.2	24.3	0.1	44.5	22.6	0.0
14.1	72.0	0.5	29.4	23.4	0.0	44.8	23.0	0.0
14.3	71.3	0.5	29.7	22.5	0.0	45.1	23.5	0.1
14.6	70.5	0.5	30.0	21.6	0.0	45.3	23.9	0.1
14.8	69.8	0.4	30.2	20.7	0.0	45.6	24.3	0.1
15.1	69.0	0.4	30.5	19.8	0.0	45.8	24.7	0.1

### Vertical diagram at an azimuth of 66.9°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
46.1	25.1	0.1	61.4	27.6	0.1	76.8	14.8	0.0
46.3	25.5	0.1	61.7	27.4	0.1	77.1	14.5	0.0
46.6	25.8	0.1	62.0	27.2	0.1	77.3	14.3	0.0
46.8	26.2	0.1	62.2	27.1	0.1	77.6	14.0	0.0
47.1	26.5	0.1	62.5	26.9	0.1	77.8	13.8	0.0
47.4	26.8	0.1	62.7	26.7	0.1	78.1	13.5	0.0
47.6	27.1	0.1	63.0	26.6	0.1	78.3	13.3	0.0
47.9	27.4	0.1	63.2	26.4	0.1	78.6	13.0	0.0
48.1	27.7	0.1	63.5	26.2	0.1	78.8	12.8	0.0
48.4	27.9	0.1	63.7	26.0	0.1	79.1	12.5	0.0
48.6	28.2	0.1	64.0	25.8	0.1	79.4	12.3	0.0
48.9	28.4	0.1	64.3	25.6	0.1	79.6	12.0	0.0
49.2	28.6	0.1	64.5	25.4	0.1	79.9	11.7	0.0
49.4	28.8	0.1	64.8	25.2	0.1	80.1	11.5	0.0
49.7	29.0	0.1	65.0	25.0	0.1	80.4	11.2	0.0
49.9	29.2	0.1	65.3	24.8	0.1	80.6	11.0	0.0
50.2	29.3	0.1	65.5	24.6	0.1	80.9	10.7	0.0
50.4	29.5	0.1	65.8	24.4	0.1	81.2	10.4	0.0
50.7	29.6	0.1	66.0	24.2	0.1	81.4	10.2	0.0
50.9	29.7	0.1	66.3	24.0	0.1	81.7	9.9	0.0
51.2	29.9	0.1	66.6	23.8	0.1	81.9	9.6	0.0
51.5	30.0	0.1	66.8	23.6	0.1	82.2	9.4	0.0
51.7	30.1	0.1	67.1	23.4	0.0	82.4	9.1	0.0
52.0	30.1	0.1	67.3	23.2	0.0	82.7	8.9	0.0
52.2	30.2	0.1	67.6	23.0	0.0	82.9	8.6	0.0
52.5	30.3	0.1	67.8	22.8	0.0	83.2	8.3	0.0
52.7	30.3	0.1	68.1	22.6	0.0	83.5	8.1	0.0
53.0	30.4	0.1	68.4	22.3	0.0	83.7	7.8	0.0
53.2	30.4	0.1	68.6	22.1	0.0	84.0	7.5	0.0
53.5	30.4	0.1	68.9	21.9	0.0	84.2	7.3	0.0
53.8	30.5	0.1	69.1	21.7	0.0	84.5	7.0	0.0
54.0	30.5	0.1	69.4	21.5	0.0	84.7	6.7	0.0
54.3	30.5	0.1	69.6	21.3	0.0	85.0	6.5	0.0
54.5	30.4	0.1	69.9	21.1	0.0	85.2	6.2	0.0
54.8	30.4	0.1	70.1	20.8	0.0	85.5	6.0	0.0
55.0	30.4	0.1	70.4	20.6	0.0	85.8	5.7	0.0
55.3	30.3	0.1	70.7	20.4	0.0	86.0	5.5	0.0
55.6	30.3	0.1	70.9	20.2	0.0	86.3	5.2	0.0
55.8	30.2	0.1	71.2	20.0	0.0	86.5	5.0	0.0
56.1	30.2	0.1	71.4	19.7	0.0	86.8	4.8	0.0
56.3	30.1	0.1	71.7	19.5	0.0	87.0	4.5	0.0
56.6	30.0	0.1	71.9	19.3	0.0	87.3	4.3	0.0
56.8	29.9	0.1	72.2	19.0	0.0	87.6	4.1	0.0
57.1	29.8	0.1	72.4	18.8	0.0	87.8	3.9	0.0
57.3	29.8	0.1	72.7	18.6	0.0	88.1	3.8	0.0
57.6	29.7	0.1	73.0	18.4	0.0	88.3	3.6	0.0
57.9	29.6	0.1	73.2	18.1	0.0	88.6	3.5	0.0
58.1	29.4	0.1	73.5	17.9	0.0	88.8	3.4	0.0
58.4	29.3	0.1	73.7	17.7	0.0	89.1	3.3	0.0
58.6	29.2	0.1	74.0	17.4	0.0	89.3	3.3	0.0
58.9	29.1	0.1	74.2	17.2	0.0	89.6	3.2	0.0
59.1	28.9	0.1	74.5	17.0	0.0	89.9	3.2	0.0
59.4	28.8	0.1	74.8	16.7	0.0	90.1	2.6	0.0
59.6	28.7	0.1	75.0	16.5	0.0	90.4	2.6	0.0
59.9	28.5	0.1	75.3	16.2	0.0	90.6	2.7	0.0
60.2	28.4	0.1	75.5	16.0	0.0	90.9	2.7	0.0
60.4	28.2	0.1	75.8	15.8	0.0	91.1	2.8	0.0
60.7	28.1	0.1	76.0	15.5	0.0	91.4	2.9	0.0
60.9	27.9	0.1	76.3	15.3	0.0	91.6	3.0	0.0
61.2	27.8	0.1	76.5	15.0	0.0	91.9	3.2	0.0

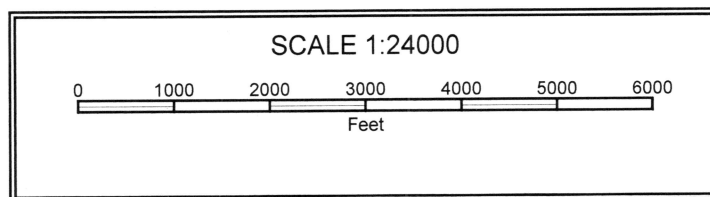
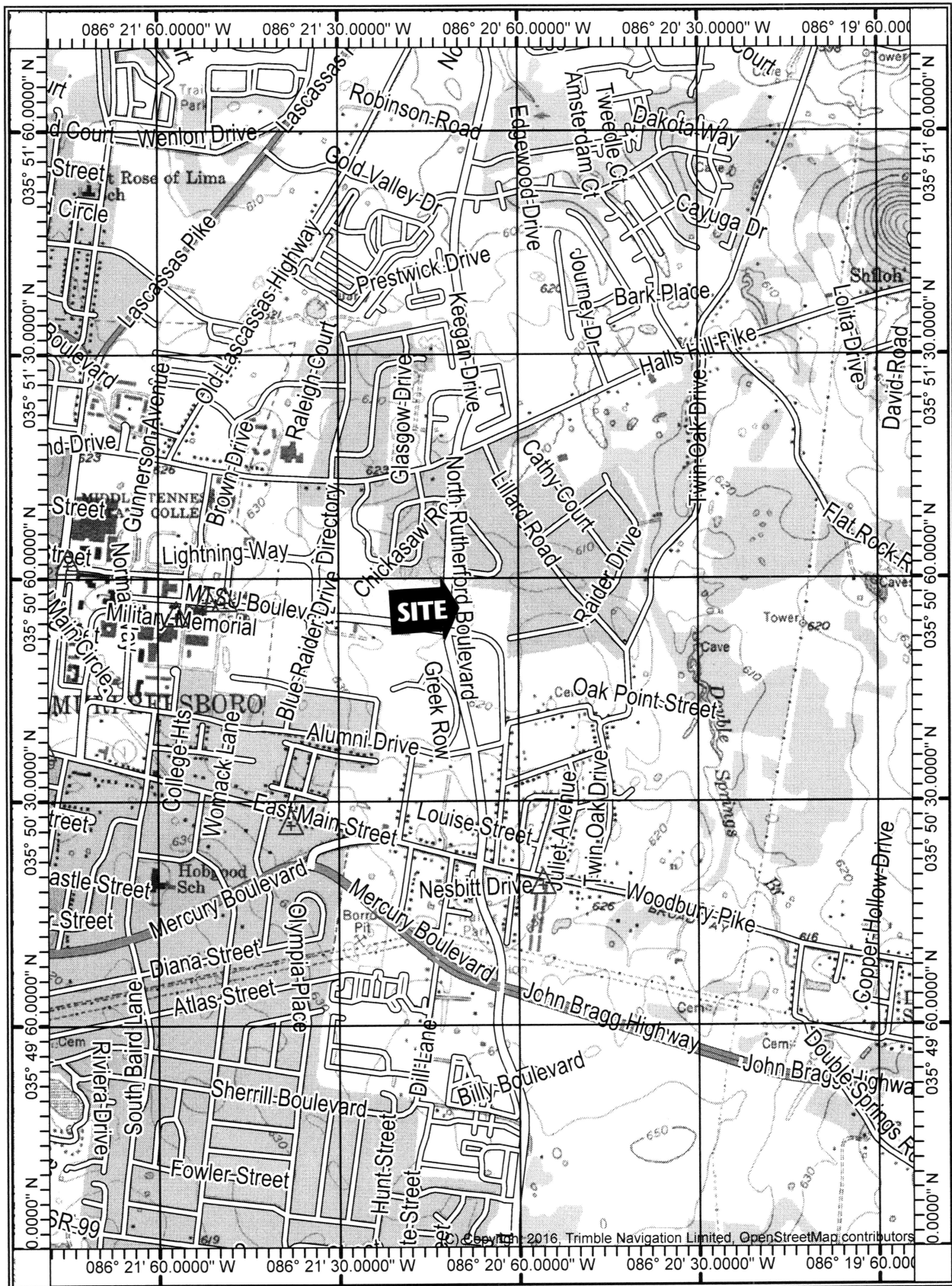


EXHIBIT NUMBER

----- 6

GARY M. BROWN