

## **K223AS MINOR MODIFICATION**

This technical report is submitted in support of an application for a minor modification to the K223AS licensed facility (BLFT-20110913AAI) requesting a change in channel to IF channel 276 (223+53). The proposed facility will serve as a fill in translator for AM station KLTi at Macon, MO (facility ID#43535).

### **Allocations analysis:**

The following allocations exhibits are provided:

- E1 Channel study**
- E1A Interference analysis to the 2<sup>nd</sup> adjacent KCKZ 278C2 CP**
- E1B Aerial photograph showing interference contour**
- E1C Antenna vertical elevation pattern**
- E2 Proposed and licensed K223AS 60 dBu contours and KLTi 2 mV/m**
- E3 Towerair results**

Exhibit E1 demonstrates clearance to all facilities with the exception of 2<sup>nd</sup> adjacent channel station KCKZ CP on channel 278. Exhibit E2 shows that the proposed and licensed K223AS 60 dBu contours overlap in accordance with §74.1233(a)(1), and that the K223AS proposed 60 dBu is contained inside the KLTi(AM) 2 mV/m and 40 km radius.

The proposed K223AS channel 276 facility will be located inside the protected contour of second adjacent channel station KCKZ on channel 278C2. Therefore, an interference analysis has been conducted in accordance with the provisions of *Living Way Ministries* (FCC 02-244) and Commission policies. The actual interference contour is based on the U/D ratio of +40 dB at the proposed site. KCKZ produces an 84.7 dBu contour at that site, and the K223AS interference contour is  $84.7 \text{ dBu} + 40 \text{ dB} = 124.7 \text{ dBu}$  or 64.6 meters. Vertical clearance is demonstrated based on the reduced ERP at appropriate vertical depression angles starting at 33.7 degrees based on the antenna height of 43 meters and the 124.7 dBu distance of 64.6 meters and using the antenna's vertical elevation pattern as summarized below.

Depression Angle (Deg)	F	ERP X F <sup>2</sup> kW	124.7 dBu D (slant) (50, 10) meters	Vertical Clearance above ground in meters
33.7 (1)	0.538	0.072	34.6	23.8
35	0.512	0.066	33.2	25.0
40	0.411	0.042	26.6	27.0
45	0.317	0.025	20.5	28.6
50	0.234	0.014	15.4	31.3
55	0.163	0.007	10.9	34.2
60	0.106	0.003	7.1	36.9
65	0.063	0.001	4.1	39.3
70	0.033	0.0003	2.2	40.9
75	0.014	0.0001	1.3	41.4
80	0.0256	0.0001	1.0	42.0
85	0.000	0.000	0.0	43.0
90	0.000	0.000	0.0	43.0

**(1) Depression angle at first occurrence of 124.7 dBu interference contour.**

An aerial photograph is included as E1B showing the maximum interference radius of 34.6 meters. It is clear that the interfering contour will not reach any buildings, populated area or major highway. Therefore, a waiver of § 74.1204 is requested in accordance with FCC-02-244, paragraph 12 and Commission precedent.

The FCC 30 second terrain database provided by V-Soft Communications has been used throughout this study.

**Antenna System:**

K223AS will utilize a two bay, half wavelength spaced Shively 6812B antenna mounted on an existing communications pole which extends 20 feet above a 125 foot water tower located at N 39-31-01 W 92-36-32 (NAD27). It will operate with 0.250 kW ERP at a COR AGL of 43 meters. A TOWERAIR analysis is included demonstrating that the existing structure does not require registration.

The RF contribution was calculated using the formula from OET Bulletin 65:

$$S \text{ (RF in } \mu\text{watts/cm}^2\text{)} = \frac{33.4 \times F^2 \times (H \text{ ERP} + V \text{ ERP in Watts})}{R^2 \text{ (distance AGL of radiation center in meters - } 2m\text{)}}$$

Using a worst-case vertical (F) factor of 0.615 at the 30 degree depression angle (see E1C) results in an RF value of  $3.76 \mu\text{W}/\text{cm}^2$  at 2 meters above ground which is 1.9% of the maximum general public exposure limit and well below the 5% threshold which requires consideration.

**Conclusion:**

It is concluded that the modification of K223AS complies with all Commission rules and policies.



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# E1 CHANNEL STUDY

REFERENCE CH# 276D - 103.1 MHz, Pwr= 0.25 kW, HAAT= 66 M, COR= 242 M DISPLAY DATES  
 39 31 01.0 N. Average Protected F(50-50)= 7.09 km DATA 12-10-11  
 92 26 32.0 W. Omni-directional SEARCH 12-10-11

CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
223D Macon	K223AS	LIC _C_ MO		343.2 163.2	8.2 BLFT20110913AAI	39 35 16.0 92 28 12.0	0.250	219.4 278	7.1 Best Broadcasting, Inc	9.5R	-1.3M (1)
223D Mexico	636467	APP _C_ MO		126.7 306.9	46.5 BNPFT20030317JFP	39 15 58.9 92 00 31.4	0.250 85	224.4 325	11.9 Radio Assist Ministry, Inc	9.5R	37.0M
278C2 Huntsville	KCKZ	CP _CX MO		118.1 298.2	11.3 BNPED20100224AAR	39 28 09.0 92 19 35.0	50.000 102	4.7 345	43.4 Lake Area Educational Broa	-0.6	-33.3* (2)
223D Macon	K223AS	APP _C_ MO		270.0 90.0	0.0 BPFT20111007ACX	39 31 01.0 92 26 33.0	0.250	10.2 307	10.2 Best Broadcasting, Inc	9.5R	-9.5M (3)
275C1 Marshall	KMMO-FM	LIC _CN MO		237.8 57.4	79.5 BLH19931213KB	39 08 03.0 93 13 19.0	100.000 116	81.7 337	52.4 Missouri Valley Broadcasti	-9.4*	16.8
223A Cairo	NEW	CP _CX MO		309.6 129.6	14.6 BNPH20091019ABJ	39 36 02.0 92 34 24.0	6.000 100	28.6 330	26.8 Moberly/ Macon License Co,	9.5R	5.1M
276D Hannibal	642017	APP _C_ MO		79.3 259.9	94.6 BNPFT20030317JDJ	39 40 13.8 91 21 23.5	0.062 169	36.9 343	11.0 Radio Assist Ministry, Inc	50.6	59.7
274D Monroe City	646589	APP _C_ MO		76.1 256.5	62.5 BNPFT20030317BCB	39 39 00.0 91 44 00.0	0.250 65	1.1 276	9.6 Covenant Network	54.3	51.7
278D Columbia, Etc.	K278BG	LIC _C_ MO		171.1 351.2	63.7 BLFT20060424ADI	38 57 03.0 92 19 44.0	0.250 56	1.1 275	9.3 Billings Broadcasting, Llc	55.5	52.0
276D Hannibal	636145	APP _C_ MO		76.5 257.2	94.3 BNPFT20030314CJJ	39 42 36.0 91 22 13.0	0.250 94	35.1 268	10.3 Covenant Network	52.4	59.9

(1) K223AS licensed facility.

(2) See Technical Report E1A, E1B and discussion showing lack of interference based on *Living Way Ministries* waiver.

(3) Dismissed application.

Terrain database is FCC NGDC 30 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= west Zone, Co to 3rd adjacent.  
 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 protected contour.

**E1A K223AS.A**

Latitude: 39-31-01 N  
Longitude: 092-26-32 W  
ERP: 0.25 kW  
Channel: 276  
Frequency: 103.1 MHz  
AMSL Height: 307.0 m  
Elevation: 264.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: None

K223AS PROPOSED  
CHANNEL 276 124.7 DBU  
(50,10) INTERFERENCE  
CONTOUR AT 33.7 DEGREES  
DEPRESSION ANGLE = 34.6 METERS

DOES NOT INCLUDE ANY  
HOUSES OR MAJOR HIGHWAYS.

KCKZ 84.7 (50,50) DBU

K223AS.A

N Landrum St

Dameron St

N Main St

W Martin St

Case Dr

Goode

E Martin St

Cairo

V-Sol Communications LLC ©

Scale 1:5,000

0 0.07 0.13 0.2 km





## E1C ANTENNA VERTICAL ELEVATION PATTERN

**Antenna Mfg.: Shively Labs**

**Date: 11/23/2011**

**Antenna Type: 6812-2-SS**

**Station: none**

**Beam Tilt 0**

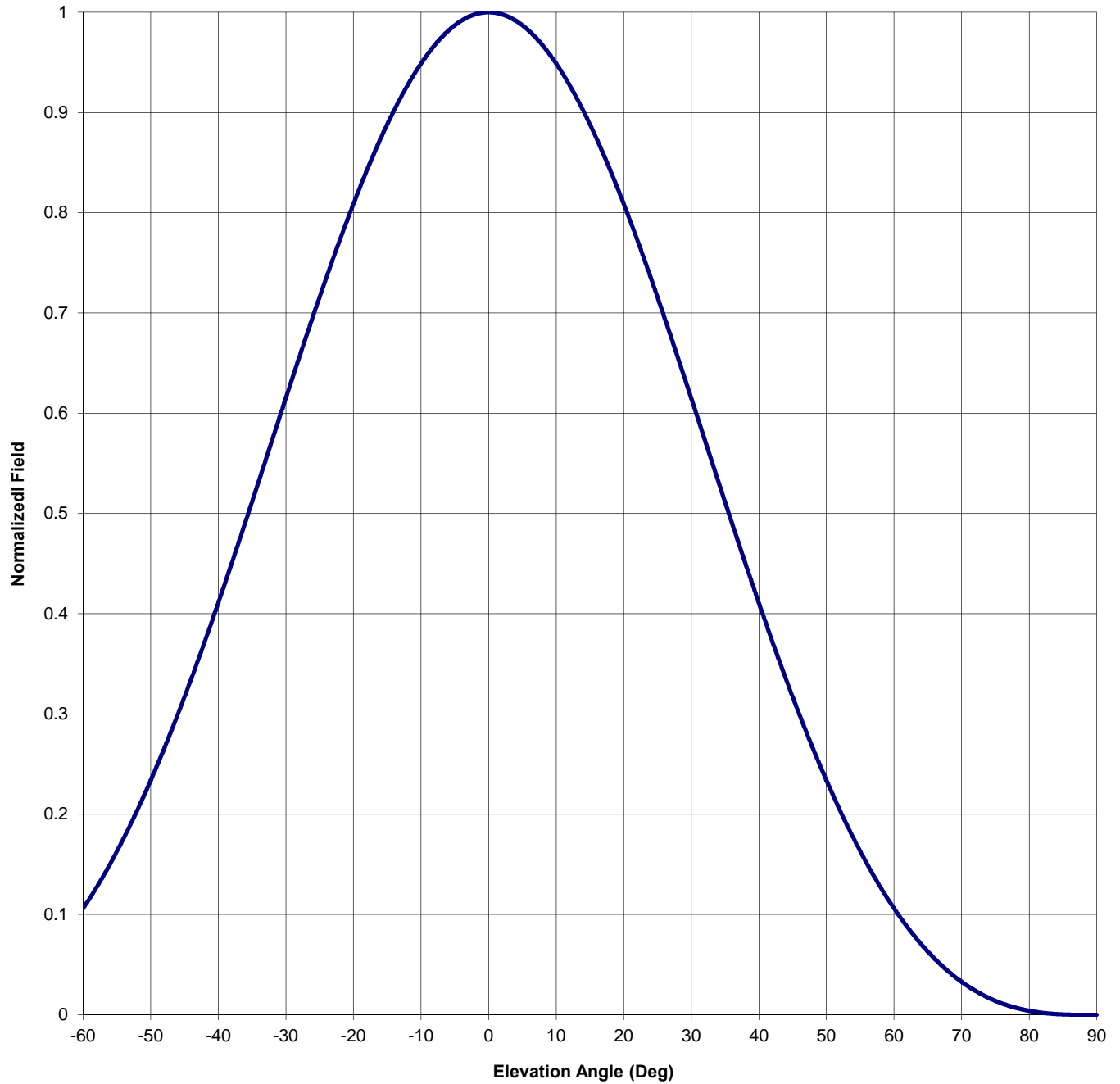
**Frequency: 103.1**

**Gain (Max) 0.700 -1.550 dB**

**Channel #: 276**

**Gain (Horizon) 0.700 -1.550 dB**

**Figure: 3**



## E1C CONTINUED

Antenna Mfg.: Shively Labs

Date: 11/23/2011

Antenna Type: 6812-2-SS

Station: none

Beam Tilt 0

Frequency: 103.1

Gain (Max) 0.700 -1.550 dB

Channel #: 276

Gain (Horizon) 0.700 -1.550 dB

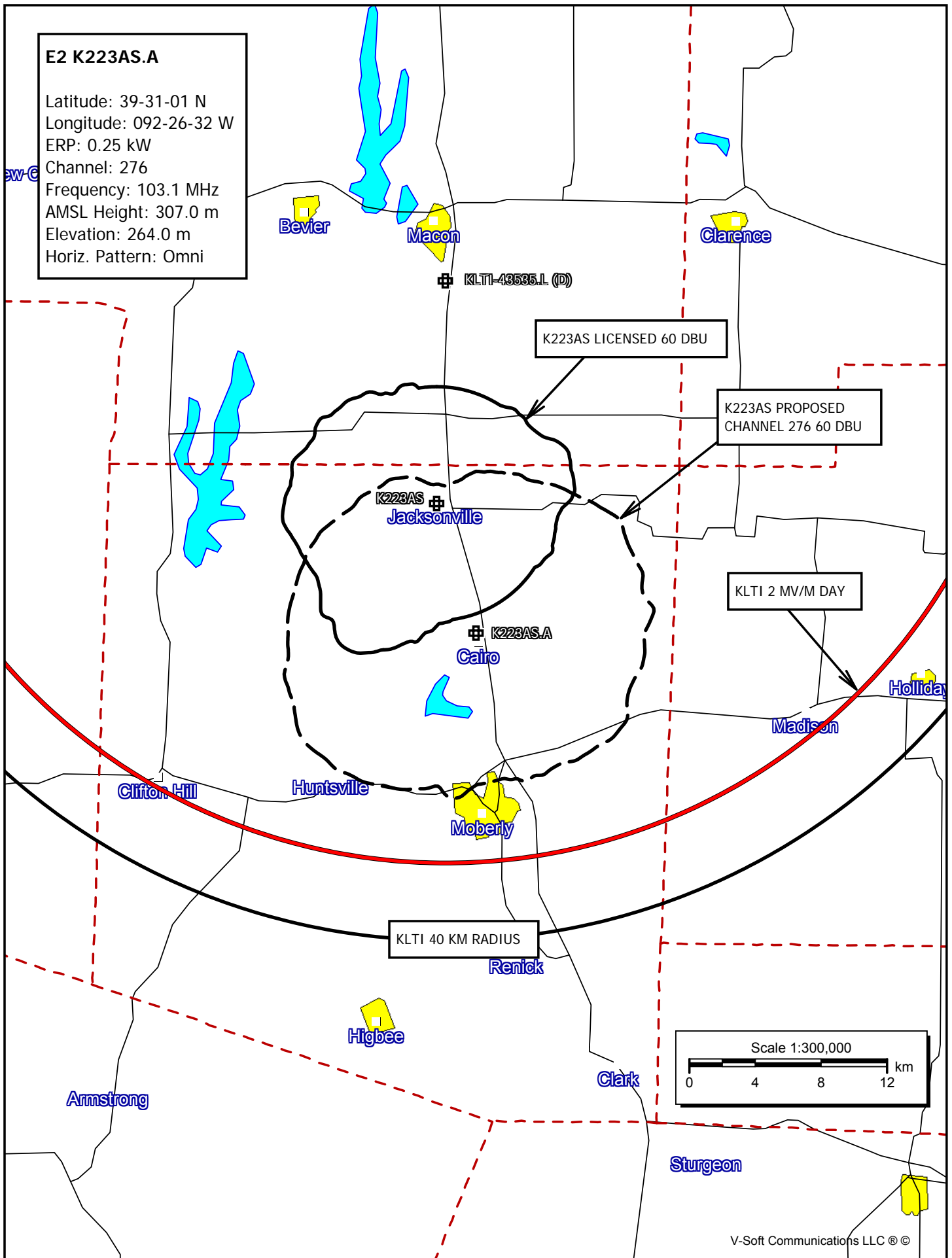
Figure: 3

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.335	0	1.000	46	0.300
-89	0.000	-43	0.353	1	0.999	47	0.282
-88	0.000	-42	0.372	2	0.998	48	0.266
-87	0.000	-41	0.391	3	0.995	49	0.249
-86	0.000	-40	0.411	4	0.992	50	0.234
-85	0.000	-39	0.431	5	0.987	51	0.219
-84	0.001	-38	0.451	6	0.981	52	0.204
-83	0.001	-37	0.471	7	0.975	53	0.190
-82	0.002	-36	0.491	8	0.967	54	0.176
-81	0.003	-35	0.512	9	0.958	55	0.163
-80	0.004	-34	0.532	10	0.949	56	0.151
-79	0.005	-33	0.553	11	0.938	57	0.139
-78	0.007	-32	0.574	12	0.927	58	0.127
-77	0.009	-31	0.594	13	0.915	59	0.116
-76	0.011	-30	0.615	14	0.902	60	0.106
-75	0.014	-29	0.636	15	0.888	61	0.096
-74	0.017	-28	0.656	16	0.874	62	0.087
-73	0.020	-27	0.676	17	0.858	63	0.079
-72	0.024	-26	0.696	18	0.843	64	0.071
-71	0.028	-25	0.716	19	0.826	65	0.063
-70	0.033	-24	0.735	20	0.809	66	0.056
-69	0.038	-23	0.754	21	0.791	67	0.050
-68	0.043	-22	0.773	22	0.773	68	0.043
-67	0.050	-21	0.791	23	0.754	69	0.038
-66	0.056	-20	0.809	24	0.735	70	0.033
-65	0.063	-19	0.826	25	0.716	71	0.028
-64	0.071	-18	0.843	26	0.696	72	0.024
-63	0.079	-17	0.858	27	0.676	73	0.020
-62	0.087	-16	0.874	28	0.656	74	0.017
-61	0.096	-15	0.888	29	0.636	75	0.014
-60	0.106	-14	0.902	30	0.615	76	0.011
-59	0.116	-13	0.915	31	0.594	77	0.009
-58	0.127	-12	0.927	32	0.574	78	0.007
-57	0.139	-11	0.938	33	0.553	79	0.005
-56	0.151	-10	0.949	34	0.532	80	0.004
-55	0.163	-9	0.958	35	0.512	81	0.003
-54	0.176	-8	0.967	36	0.491	82	0.002
-53	0.190	-7	0.975	37	0.471	83	0.001
-52	0.204	-6	0.981	38	0.451	84	0.001
-51	0.219	-5	0.987	39	0.431	85	0.000
-50	0.234	-4	0.992	40	0.411	86	0.000
-49	0.249	-3	0.995	41	0.391	87	0.000
-48	0.266	-2	0.998	42	0.372	88	0.000
-47	0.282	-1	0.999	43	0.353	89	0.000
-46	0.300	0	1.000	44	0.335	90	0.000
-45	0.317			45	0.317		



## E2 K223AS.A

Latitude: 39-31-01 N  
Longitude: 092-26-32 W  
ERP: 0.25 kW  
Channel: 276  
Frequency: 103.1 MHz  
AMSL Height: 307.0 m  
Elevation: 264.0 m  
Horiz. Pattern: Omni



## E3 TOWAIR Determination Results

A routine check of the coordinates, heights, and structure type you provided indicates that this structure does not require registration.

### \*\*\* NOTICE \*\*\*

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

#### DETERMINATION Results

**PASS SLOPE(100:1)NO FAA REQ - 5723.0 Meters (18776.0 Feet)away & below slope by 11.0 Meters (36.0900 Feet)**

Type	C/R	Latitude	Longitude	Name	Address	Lowest Elevation (m)	Runway Length (m)
AIRP	R	39-28-3.00N	092-25-23.00W	OMAR N BRADLEY	RANDOLPH MOBERLY, MO	262.2	1524.3

**PASS SLOPE(100:1)NO FAA REQ - 5607.0 Meters (18395.4 Feet)away & below slope by 10.0 Meters (32.8100 Feet)**

Type	C/R	Latitude	Longitude	Name	Address	Lowest Elevation (m)	Runway Length (m)
AIRP	R	39-28-1.00N	092-25-56.00W	OMAR N BRADLEY	RANDOLPH MOBERLY, MO	262.2	1524.3

#### Your Specifications

##### NAD83 Coordinates

Latitude	39-31-00.6 north
Longitude	092-26-32.6 west

##### Measurements (Meters)

Overall Structure Height (AGL)	44
Support Structure Height (AGL)	44
Site Elevation (AMSL)	264

##### Structure Type

TOWER - Free standing or Guyed Structure used for Communications Purposes  
<http://wireless2.fcc.gov/UlsApp/AsrSearch/towairResult.jsp?printable>

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CLOSE WINDOW