

***COMPREHENSIVE TECHNICAL EXHIBIT
APPLICATION FOR CONSTRUCTION PERMIT***

DIGITAL TELEVISION STATION
KTVO
KIRKSVILLE, MISSOURI
CHANNEL 33 / 174 kW ERP

BARRINGTON KIRKSVILLE LICENSE LLC

FEBRUARY, 2013

APPLICATION FOR CONSTRUCTION PERMIT

The following engineering statement and attached exhibits have been prepared for **Barrington Kirksville License LLC** ("Barrington"), licensee of digital television broadcast station KTVO at Kirksville, Missouri, and are in support of their application for construction permit to modify that facility.¹

This application seeks to increase the effective radiated power of KTVO. All other technical parameters associated with the facility will remain unchanged from those currently authorized to Barrington. At present, KTVO operates with a maximum effective radiated power of 87 kW utilizing a directional antenna at 290 meters above average terrain. This proposed effective radiated power for KTVO is 174 kW.

KTVO will continue to operate on channel 33 as a digital television facility. This channel is the currently authorized channel. In addition, channel 33 is allocated to KTVO under the table of allotments in Section 73.622 of the Commission's Rules.

Since the maximum effective radiated power of the facility would be increased under this application, the noise limited service contour would necessarily increase in radius. By extension, this increase in the distance to the noise limited contour will also increase the population served by the facility within the DTV service area. Exhibit E-1 illustrates the predicted 48 dBu and 41 dBu F(50,90) service contours for the proposed facility. In Exhibit E-2, the predicted DTV service area is illustrated. The calculated interference-free population within the noise limited service contour is

¹ The Facility ID for KTVO at Kirksville, Missouri is 21251.

JEREMY RUCK & ASSOCIATES, INC.

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156,950 residents based on the 2010 Census data. Exhibit E-2 also demonstrates that the city of license, Kirksville, Missouri, would be fully encompassed by the 48 dBu F(50,90) contour.

The requirements of Section 73.1030 of the Commission's Rules are not applicable in this case. The proposed facility is not located within the National Radio Astronomy quiet zone. In addition, since the proposed facility is located within the continental United States, there would be no impact to the Arecibo radio telescope in Puerto Rico. Finally, the proposed facility is located at a sufficient distance from FCC monitoring installations that the predicted field strength at each installation would be well below the level required for notification and coordination.

The proposed facility would comply with the interference protection provisions of Section 73.616 of the Commission's Rules. Exhibit E-3 illustrates the predicted areas of interference that would result from the proposed facility. As indicated in the tabulation in Exhibit E-4, the population affected is not in excess of that permitted under the Commission's Rules.

As previously indicated, there would be no change in the height of the antenna utilized by the facility. Similarly, there would be no change in the directional antenna utilized by the facility. Exhibit E-5, combined with the tabulation in the tech-box portion of the form, contain the requisite directional antenna information for the facility. It should be noted that the current license tabulates the antenna pattern with rotation previously applied. This application modifies this data so that the horizontal plane pattern is based on the manufacturer's published data with the rotation being applied on the form pages.

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The tower utilized by the proposed facility is registered with the Commission, and has been assigned 1007392 as its Antenna Structure Registration Number. The proposed modification to the facility would not constitute a significant environmental impact, and as a result is exempt from environmental processing.

No physical changes to the tower or site requiring excavation would be made. As a result, there would be no additional impact to the surrounding environment above that already present as a result of the existing tower. The proposed facility would also not constitute a radiofrequency radiation exposure hazard to persons at the facility.

No other broadcast facilities utilize this particular tower. Under a worst case scenario, one where the antenna is considered to be isotropic, the predicted power density at ground level is calculated to be $77.4 \mu\text{W}/\text{cm}^2$. This value is considerably less than the upper limit permissible under the uncontrolled environment condition of the applicable safety standard.

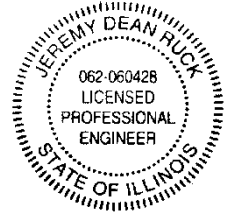
Barrington certifies that it will coordinate with all other users of the site to ensure that workers and personnel are not exposed to levels on radiofrequency radiation in excess of the applicable safety standards. Such coordination will include, but is not necessarily limited to, a reduction in transmitter power or cessation of operation.

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The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature
License Expires November 30, 2013

Jeremy D. Ruck, PE
February 2, 2013

JEREMY RUCK & ASSOCIATES, INC.

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2.2.2013

BLCDT20030604AAC
Latitude: 40-31-47 N
Longitude: 092-26-29 W
ERP: 174.00 kW
Channel: 33
Frequency: 587.0 MHz
AMSL Height: 552.3 m
Elevation: 278.3 m
Horiz. Pattern: Directional
Vert. Pattern: Yes
Elec Tilt: 0.0
Prop Model: None



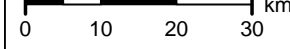
 48 dBu F(50,90) Service Contour
 41 dBu F(50,90) Service Contour

Exhibit E-1
Service Contour Depiction
KTVO - Kirksville, Missouri
Barington Kirksville License LLC
February, 2013

City of License
Kirksville, Misso

Scale 1:1,000,000



KTVO-D.X

BLCDDT20030604AAC

Latitude: 40-31-47 N

Longitude: 092-26-29 W

ERP: 174.00 kW

Channel: 33

Frequency: 587.0 MHz

AMSL Height: 552.3 m

Elevation: 278.3 m

Horiz. Pattern: Directional

Vert. Pattern: Yes

Elec Tilt: 0.0

Prop Model: Longley/Rice

Climate: Cont temperate

Conductivity: 0.0050

Dielec Const: 15.0

Refractivity: 301.0

Receiver Ht AG: 10.0 m

Receiver Gain: 0 dB

Time Variability: 90.0%

Sit. Variability: 50.0%

ITM Mode: Broadcast

Predicted 40.6 dBu
F(50,90) NL Contour

Jeremy Ruck & Associates, Inc.

Interference-Free Population: 156,950
Population based on 2010 Census data

- ☐ KTVO-D.X (33)
- ☐ K33AC-D (33)
- ☐ K33GU (33Z)
- ☐ K33GU-D.C (33)
- ☐ K33IC (33-)
- ☒ K33MN-D.C (33)
- ☐ K34CW (34-)
- ☐ KAAL-D (33)
- ☐ KBIN-D (33)
- ☐ KBIN-TV-D (33)
- ☐ W33AY-D (33)
- ☐ W33DV-D.C (33)
- ☐ WFBN-LP (33-)
- ☐ WQEC-D (34)
- ☐ WQEC-D (34)
- ☒ WTJR-D (32)
- ☒ WTJR-D (32)

Exhibit E-2

DTV Service Area

KTVO - Kirksville, Missouri

Barrington Kirksville License LLC

February, 2013

Scale 1:1,500,000

0 20 40 60 km

KTVO-D.X

BLCDT20030604AAC

Latitude: 40-31-47 N

Longitude: 092-26-29 W

ERP: 174.00 kW

Channel: 33

Frequency: 587.0 MHz

AMSL Height: 552.3 m

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Horiz. Pattern: Directional

Vert. Pattern: Yes

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Receiver Ht AG: 10.0 m

Receiver Gain: 0 dB

Time Variability: 10.0%

Sit. Variability: 50.0%

ITM Mode: Broadcast

Jeremy Ruck & Associates, Inc.

- ☐ KTVO-D.X (33)
- ☐ K25DE.C (25-)
- ☐ K33AC-D (33)
- ☐ K33GU (33Z)
- ☐ K33GU-D.C (33)
- ☐ K33MN-D.C (33)
- ☐ K34CW (34-)
- ☐ KAAL-D (33)
- ☒ KBIN-D (33)
- ☒ KBIN-TV-D (33)
- ☐ W33AY-D (33)
- ☐ W33DV-D.C (33)
- ☐ WQEC-D (34)
- ☐ WQEC-D (34)
- ☐ WTJR-D (32)
- ☒ WTJR-D (32)

**K25DE.C****KTVO-D.X****K34CW****WTJR-D****Exhibit E-3**

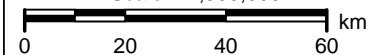
Areas of Predicted Outgoing Interference

KTVO - Kirksville, Missouri

Barrington Kirksville License LLC

February, 2013

Scale 1:1,500,000



Exhbit E-4
Outgoing Interference Population Report

KTVO-D.X (33) Kirksville, MO - BLCDT20030604AAC
Broadcast Type: Digital Service: T
Lat: 40-31-47 N Lng: 092-26-29 W ERP: 174.0 kW AMSL: 552.3 m
TV Outgoing Interference Study
Signal Resolution: 1.0 km
Consider NTSC Taboo: Yes
KWX error points are considered to
be interference free coverage.
Default # of radials computed for contours: 360
Contours calculated using 8 radial HAAT.
LR Profile Spacing Increment: 0.1 km
Masked interference points are being
counted as interference.
Pop Centroid DB: 2010 US Census (PL)

Study Date: 2/2/2013
TV Database Date: 2/1/2013

Primary Terrain: NED 3 Second US Terrain
Secondary Terrain: FCC 30 Second US Database

Population Database: 2010 US Census (PL)

Stations Considered:

Call Letters	City	State	Dist	Azi
K25DE.C (25-)	Ottumwa	IA	44.6	6.2
K33AC-D (33)	Pawnee City	NE	334.3	264.7
K33GU (33Z)	St. Louis	MO	283.3	139.4
K33GU-D.C (33)	St. Louis	MO	283.2	139.4
K33MN-D.C (33)	Jefferson City	MO	206.2	171.6
K34CW (34-)	Kirksville	MO	36.5	203.1
KAAL-D (33)	Mason City	IA	301.5	342.0
KBIN-D (33)	COUNCIL BLUFFS	IA	297.1	286.8
KBIN-TV-D (33)	Council Bluffs	IA	297.1	286.8
W33AY-D (33)	Springfield	IL	255.5	108.1
W33DV-D.C (33)	Peoria	IL	243.4	88.3
WQEC-D (34)	Quincy	IL	114.2	122.1
WQEC-D (34)	QUINCY	IL	114.2	122.1
WTJR-D (32)	QUINCY	IL	113.2	122.8
WTJR-D (32)	Quincy	IL	113.2	122.8

Call	Area	HUnits	Contour	Masked Ix	Unmasked Ix	%
K25DE.C (25-)	0.0	0	13,495	0	0	0.00
K33AC-D (33)	0.0	0	41,239	0	0	0.00
K33GU (33Z)	0.0	0	1,778,408	0	0	0.00

K33GU-D.C (33)	0.0	0	2,357,808	0	0	0.00
K33MN-D.C (33)	0.0	0	293,295	0	0	0.00
K34CW (34-)	0.0	0	23,981	0	0	0.00
KAAL-D (33)	0.0	0	45,539	0	0	0.00
KBIN-D (33)	5.5	6	912,754	0	14	0.00
KBIN-TV-D (33)	5.5	6	912,754	0	14	0.00
W33AY-D (33)	0.0	0	221,961	0	0	0.00
W33DV-D.C (33)	0.0	0	404,682	0	0	0.00
WQEC-D (34)	0.0	0	183,855	0	0	0.00
WQEC-D (34)	0.0	0	183,855	0	0	0.00
WTJR-D (32)	0.0	0	226,307	0	0	0.00
WTJR-D (32)	12.1	12	335,715	0	18	0.01

	Housing Units	Population
Iowa		
Cass County		
Total	6,591	13,956
KBIN-D (33)	3	7
KBIN-TV-D (33)	3	7
Montgomery County		
Total	5,239	10,740
KBIN-D (33)	1	3
KBIN-TV-D (33)	1	3
Pottawattamie County		
Total	39,330	93,158
KBIN-D (33)	2	4
KBIN-TV-D (33)	2	4
Missouri		
Scotland County		
Total	2,369	4,843
WTJR-D (32)	12	18



Date
Call Letters
Location
Customer
Antenna Type

02 Feb 2013
KTVO
Kirkville, MO
Barrington Kirkville
TFU-24DSB-M

Channel 33

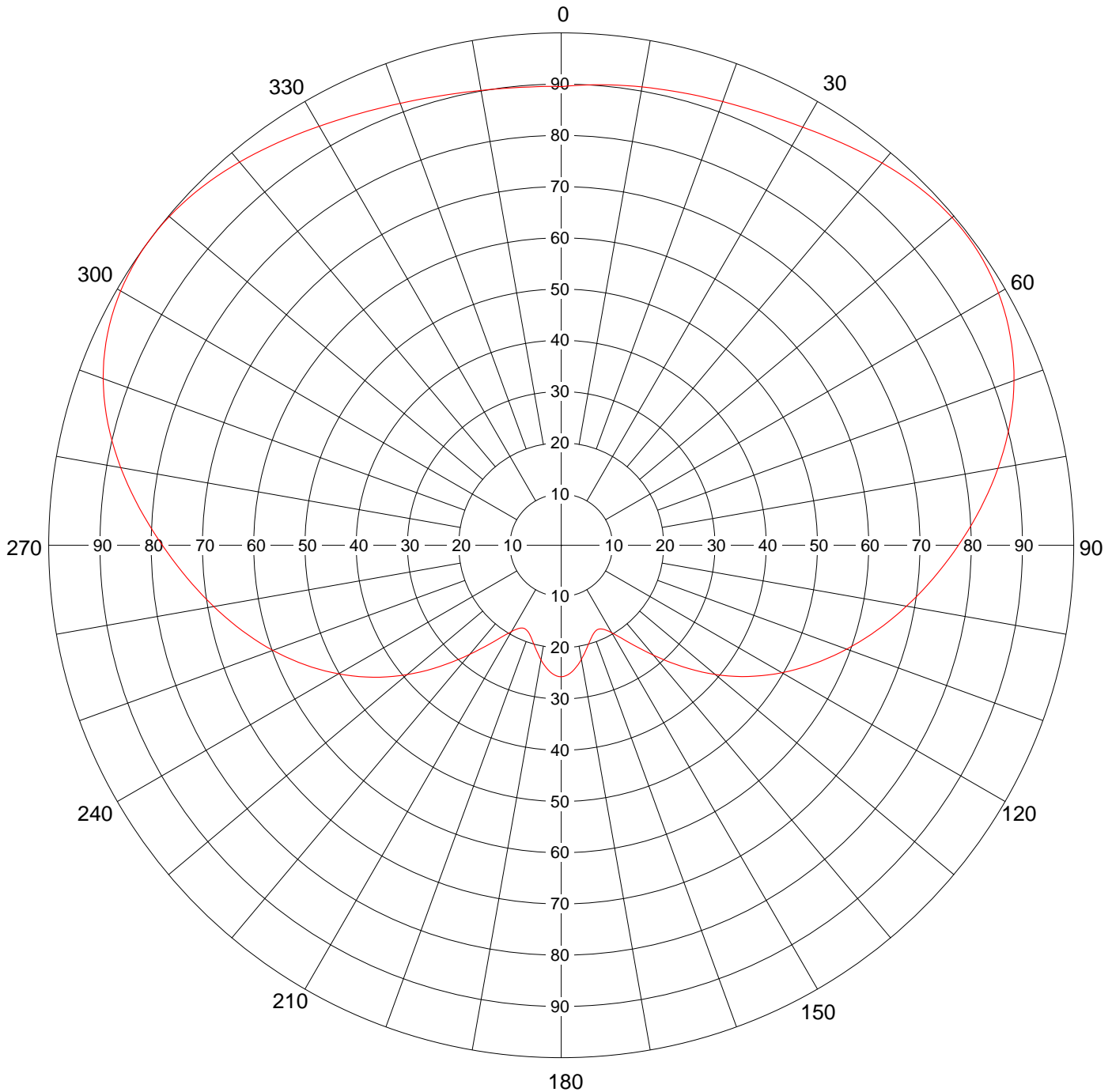
AZIMUTH PATTERN

Gain
Calculated / Measured

1.90 (2.79 dB)
Calculated

Frequency
Drawing #

587 MHz
DSB-M



Remarks:

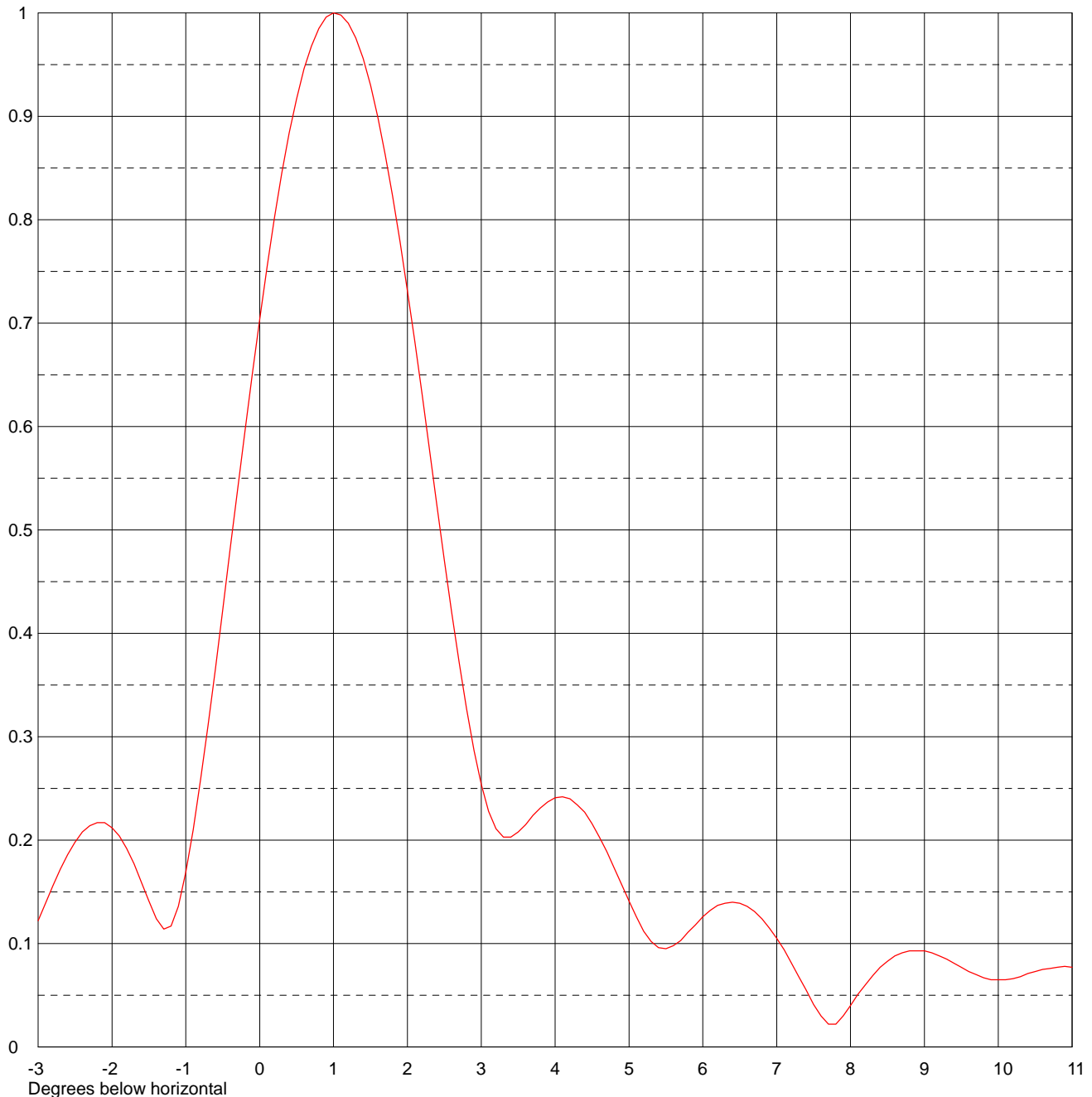


Date
Call Letters
Location
Customer
Antenna Type

02 Feb 2013
KTVO Channel 33
Kirkville, MO
Barrington Kirkville
TFU-24DSB-M

ELEVATION PATTERN

RMS Gain at Main Lobe	24.0 (13.80 dB)	Beam Tilt	1.00 Degrees
RMS Gain at Horizontal	11.9 (10.76 dB)	Frequency	587.00 MHz
Calculated / Measured	Calculated	Drawing #	24B240100



Remarks:



Date
Call Letters
Location
Customer
Antenna Type

02 Feb 2013
KTVO Channel 33
Kirkville, MO
Barrington Kirkville
TFU-24DSB-M

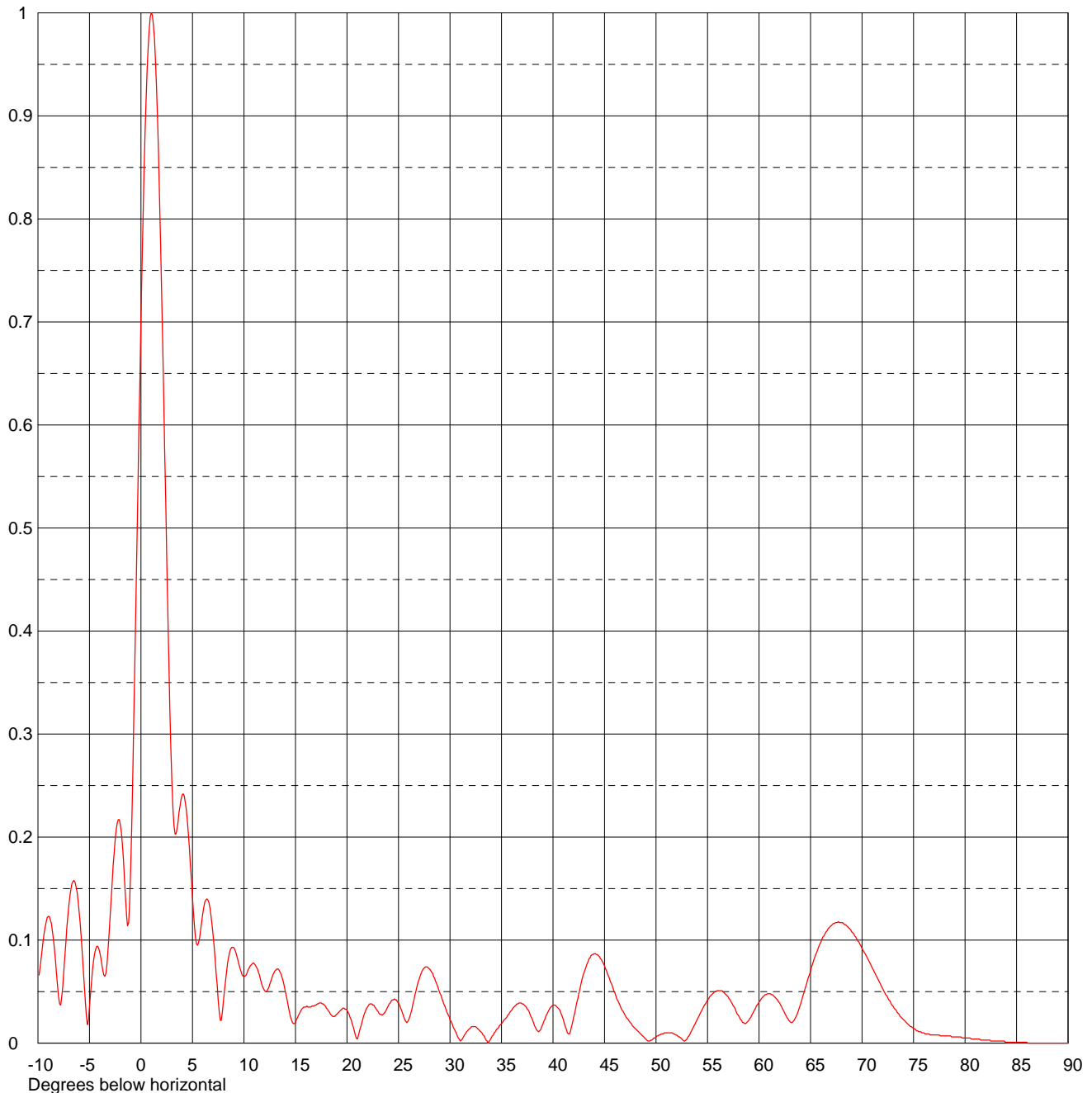
ELEVATION PATTERN

RMS Gain at Main Lobe
RMS Gain at Horizontal
Calculated / Measured

24.0 (13.80 dB)
11.9 (10.76 dB)
Calculated

Beam Tilt
Frequency
Drawing #

1.00 Degrees
587.00 MHz
24B240100-90



Remarks:



Date	02 Feb 2013	
Call Letters	KTVO	Channel 33
Location	Kirkville, MO	
Customer	Barrington Kirkville	
Antenna Type	TFU-24DSB-M	

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **24B240100-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.063	2.4	0.524	10.6	0.075	30.5	0.012	51.0	0.010	71.5	0.063
-9.5	0.099	2.6	0.420	10.8	0.077	31.0	0.002	51.5	0.010	72.0	0.053
-9.0	0.123	2.8	0.327	11.0	0.077	31.5	0.009	52.0	0.008	72.5	0.044
-8.5	0.101	3.0	0.254	11.5	0.066	32.0	0.015	52.5	0.004	73.0	0.036
-8.0	0.045	3.2	0.211	12.0	0.051	32.5	0.016	53.0	0.004	73.5	0.029
-7.5	0.069	3.4	0.203	12.5	0.057	33.0	0.011	53.5	0.013	74.0	0.023
-7.0	0.134	3.6	0.215	13.0	0.070	33.5	0.003	54.0	0.023	74.5	0.018
-6.5	0.158	3.8	0.231	13.5	0.069	34.0	0.005	54.5	0.033	75.0	0.014
-6.0	0.127	4.0	0.241	14.0	0.051	34.5	0.013	55.0	0.042	75.5	0.011
-5.5	0.056	4.2	0.240	14.5	0.026	35.0	0.019	55.5	0.048	76.0	0.010
-5.0	0.035	4.4	0.227	15.0	0.020	35.5	0.025	56.0	0.051	76.5	0.009
-4.5	0.087	4.6	0.203	15.5	0.031	36.0	0.032	56.5	0.050	77.0	0.008
-4.0	0.088	4.8	0.173	16.0	0.035	36.5	0.038	57.0	0.045	77.5	0.008
-3.5	0.065	5.0	0.141	16.5	0.035	37.0	0.038	57.5	0.036	78.0	0.007
-3.0	0.122	5.2	0.112	17.0	0.037	37.5	0.033	58.0	0.027	78.5	0.007
-2.8	0.156	5.4	0.096	17.5	0.039	38.0	0.023	58.5	0.020	79.0	0.006
-2.6	0.186	5.6	0.098	18.0	0.034	38.5	0.012	59.0	0.022	79.5	0.006
-2.4	0.208	5.8	0.111	18.5	0.027	39.0	0.018	59.5	0.031	80.0	0.005
-2.2	0.217	6.0	0.126	19.0	0.028	39.5	0.030	60.0	0.040	80.5	0.005
-2.0	0.212	6.2	0.137	19.5	0.033	40.0	0.037	60.5	0.046	81.0	0.004
-1.8	0.192	6.4	0.140	20.0	0.032	40.5	0.034	61.0	0.048	81.5	0.003
-1.6	0.159	6.6	0.136	20.5	0.019	41.0	0.023	61.5	0.045	82.0	0.003
-1.4	0.124	6.8	0.124	21.0	0.004	41.5	0.009	62.0	0.039	82.5	0.002
-1.2	0.117	7.0	0.105	21.5	0.022	42.0	0.025	62.5	0.029	83.0	0.002
-1.0	0.169	7.2	0.081	22.0	0.035	42.5	0.048	63.0	0.021	83.5	0.002
-0.8	0.259	7.4	0.055	22.5	0.037	43.0	0.068	63.5	0.024	84.0	0.001
-0.6	0.366	7.6	0.030	23.0	0.031	43.5	0.082	64.0	0.037	84.5	0.001
-0.4	0.481	7.8	0.022	23.5	0.028	44.0	0.087	64.5	0.054	85.0	0.001
-0.2	0.595	8.0	0.040	24.0	0.036	44.5	0.084	65.0	0.070	85.5	0.001
0.0	0.704	8.2	0.060	24.5	0.042	45.0	0.075	65.5	0.086	86.0	0.001
0.2	0.802	8.4	0.077	25.0	0.039	45.5	0.062	66.0	0.098	86.5	0.000
0.4	0.884	8.6	0.088	25.5	0.026	46.0	0.049	66.5	0.108	87.0	0.000
0.6	0.946	8.8	0.093	26.0	0.023	46.5	0.037	67.0	0.114	87.5	0.000
0.8	0.985	9.0	0.093	26.5	0.042	47.0	0.027	67.5	0.117	88.0	0.000
1.0	1.000	9.2	0.088	27.0	0.062	47.5	0.020	68.0	0.117	88.5	0.000
1.2	0.990	9.4	0.081	27.5	0.073	48.0	0.014	68.5	0.114	89.0	0.000
1.4	0.956	9.6	0.073	28.0	0.072	48.5	0.009	69.0	0.108	89.5	0.000
1.6	0.899	9.8	0.067	28.5	0.063	49.0	0.004	69.5	0.101	90.0	0.000
1.8	0.823	10.0	0.065	29.0	0.049	49.5	0.003	70.0	0.092		
2.0	0.731	10.2	0.066	29.5	0.036	50.0	0.006	70.5	0.083		
2.2	0.630	10.4	0.071	30.0	0.023	50.5	0.009	71.0	0.073		

Remarks: