

ENGINEERING STATEMENT**In support of a request for****Minor Modification of a Licensed Facility for DTV Application****KFFV(DT) Ch 16****Seattle, WA****Facility ID: 49264****PURPOSE**

MARSAND, INC. has been retained by OTA Broadcasting (SEA), LLC, the “applicant”, to prepare this engineering statement in support of a request for a Minor Modification of a Licensed Facility for DTV Application pursuant to the Commission’s directive in *Procedures for the Post-Incentive Auction Broadcast Transition*, DA 17-106, released January 27, 2017 and the *Incentive Auction Closing and Channel Reassignment Public Notice*, DA 17-314, released April 13, 2017. The applicant proposes to replace their existing directional side mount antenna with an elliptically polarized side mount antenna, reuse an existing transmission line and install a new transmitter on its reassigned channel 16 to be able to meet the construction deadline for its transition phase 7.

The proposed DTV facility will operate on the DTV channel for this station as established in the post-incentive auction channel reassignment public notice. It will operate post-incentive auction facilities that do not expand the noise-limited service contour in any direction beyond that established by the post-incentive auction channel reassignment public notice and that match or reduce by no more than five percent with respect to predicted population from those defined in the post-incentive auction channel reassignment public notice. The antenna structure to be used by this facility has been registered by the Commission and will not require reregistration.

DISCUSSION

The applicant currently is licensed and operating on channel 44 Digital TV service with 169 kW ERP at 210 m HAAT (BLC DT-20110624ADC). The station has been reassigned channel 16

with 93.1 kW ERP at 210 m HAAT with reference coordinates: 47°-36'-55.35"N, 122°-18'-33.45"W (NAD83). The current tower is owned by American Tower Company (ATC). Due to space availability and minimizing tower modification costs, ATC has provided the station with a location on the tower at 298.3 m RCAMSL, which is 53.8 m higher than the post-incentive auction channel reassignment public notice height of 245 m RCAMSL. The existing station channel 44 will continue to operate at its present height on the tower until the completion deadline of phase 7 on January 17th, 2020. At that time, channel 44 will cease operations and the reassigned channel 16 will begin operations on the new antenna.

The proposed facility would establish service on the reassigned channel at an ERP of 48 kW which is lower than the assigned 93.1 kW ERP and a HAAT of 259 m which is higher than the reference 210 m. Due to the change in height, the station's ERP would be reduced to 48 kW to comply with the reassigned coverage and interference criteria. The proposed service area will remain within the FCC baseline +1% and still maintain a service area population of more than 95% of baseline. The study results of this proposal utilizing the FCC TVStudy v2.2.2 software are included as **Exhibit 1**.

FCC OET Bulletin No. 65 "Evaluating Compliance With FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 97-01, and has been found to comply with the limits set forth in Section 1.1310 of the Rules as shown in **Exhibit 2**. The contribution of the station to exposure as defined by the ANSI standard computations for occupational/controlled area is 0.14 % of the maximum, and exposure as defined by the ANSI standard computations for general population/uncontrolled area is 0.68 % of the maximum.

Proposed coverage contour shown in **Exhibit 3**.

Proposed antenna technical information is shown in **Exhibit 4**.

CONCLUSION


It is respectfully requested that the Commission grant this request for minor modification for these facilities as specified herein.

DECLARATION

David Sanderford, EIT, declares and states that he is a graduate Electrical Engineer with a Bachelor of Science Degree in Electrical Engineering from the Georgia Institute of Technology, and his qualifications are known to the Federal Communications Commission, and that he is Vice-President of MARSAND, INC., a Registered Professional Engineering firm in the State of Texas, and that firm has been retained by OTA Broadcasting (SEA), LLC, to perform the engineering support as contained in this report.

All facts contained herein are true of his own knowledge except where stated to be on information or belief provided by others, and as to those facts, he believes them to be true.

I declare under penalty of perjury that the foregoing is true and correct.



David Sanderford, EIT
Vice-President - MARSAND, INC.

Executed this 7th of July, 2017
State of Texas

EXHIBIT 1

tvstudy v2.2.2
Database: localhost, Study: KFFV_PROPOSED02, Model: Longley-Rice
Start: 2017.07.06 12:34:00

Study created: 2017.07.06 12:33:52

Study build station data: LMS TV 2017-07-01 (9)

Proposal: KFFV D16 DT BL SEATTLE, WA
File number: KFFV_PROPOSED02
Facility ID: 49264
Station data: User record
Record ID: 127
Country: U.S.

Stations potentially affected:

Call	Chan	Svc	Status	City, State	File Number	Distance
KORS-CD	D16	DC	LIC	PORTLAND, OR	BLDTA20100517ABN	235.0 km
KORK-CD	D16	DC	LIC	WALLA WALLA, WA	BLANK0000001386	363.3
KNDO	D16	DT	LIC	YAKIMA, WA	BLCDT20090217ACI	181.8

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D16
Latitude: 47 36 55.00 N (NAD83)
Longitude: 122 18 33.00 W
Height AMSL: 298.3 m
HAAT: 259.0 m
Peak ERP: 48.0 kW
Antenna: TFU-12DSB/VP-R BP290 (C) (ID 18059) 0.0 deg

38.9 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	48.0 kW	210.6 m	70.1 km
45.0	7.68	268.1	64.7
90.0	2.12	247.4	56.7
135.0	1.92	254.2	56.6
180.0	17.3	235.7	66.7
225.0	39.3	279.8	74.1
270.0	7.68	294.4	66.4
315.0	8.27	283.4	66.0

Proposal service area is within baseline plus 1.0%
Proposal service area population is more than 95.0% of baseline

**Proposal is within coordination distance of Canadian border
Distance to Canadian border: 102.1 km

Distance to Mexican border: 1719.2 km

Conditions at FCC monitoring station: Ferndale WA
Bearing: 353.1 degrees Distance: 150.1 km
ERP: 46.7 kW Field strength: 18.7 dBu, 0.0 mV/m

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 115.1 degrees Distance: 1593.2 km

No land mobile station failures found

Study cell size: 2.00 km
Profile point spacing: 1.00 km

Matthew A. Sanderford, Jr., P.E.

Maximum new IX to full-service and Class A: 0.50%

Maximum new IX to LPTV: 2.00%

Interference to BLDTA20100517ABN LIC, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KORS-CD	D16	DC	LIC	PORTLAND, OR	BLDTA20100517ABN	
Undesireds:	KFFV	D16	DT	BL	SEATTLE, WA	DTVBL49264	235.0 km
	KFFV	D16	DT	BL	SEATTLE, WA	KFFV_PROPOSED02	235.0
	KOXO-CD	D15	DC	BL	PORTLAND, OR	DTVBL71080	0.0
	KORX-CD	D16	DC	LIC	WALLA WALLA, WA	BLANK0000001386	358.6
	KNDO	D16	DT	LIC	YAKIMA, WA	BLCDT20090217ACI	206.1
	KMTR	D17	DT	LIC	EUGENE, OR	BLCDT20030618AAY	157.6
	Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX		
	13477.9 2,362,701	11645.4 2,279,443	11629.3 2,279,394	11641.4 2,279,394	-0.10 0.00		
Undesired				Total IX	Unique IX, before	Unique IX, after	
KFFV D16 DT BL				16.1 49	16.1 49		
KFFV D16 DT BL				4.0 49	4.0 49		

Interference to BLDTA20100517ABN LIC, scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KORS-CD	D16	DC	LIC	PORTLAND, OR	BLDTA20100517ABN	
Undesireds:	KFFV	D16	DT	BL	SEATTLE, WA	DTVBL49264	235.0 km
	KFFV	D16	DT	BL	SEATTLE, WA	KFFV_PROPOSED02	235.0
	KOXO-CD	D15	DC	BL	PORTLAND, OR	DTVBL71080	0.0
	KORX-CD	D16	DC	LIC	WALLA WALLA, WA	BLANK0000001386	358.6
	KNDO	D16	DT	LIC	YAKIMA, WA	BLCDT20090217ACI	206.1
	KMTR	D17	DT	LIC	EUGENE, OR	BLCDT20030618AAY	157.6
	Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX		
	13477.9 2,362,701	11645.4 2,279,443	11629.3 2,279,394	11641.4 2,279,394	-0.10 0.00		
Undesired				Total IX	Unique IX, before	Unique IX, after	
KFFV D16 DT BL				16.1 49	16.1 49		
KFFV D16 DT BL				4.0 49	4.0 49		

Interference to BLANK0000001386 LIC, scenario 1

Proposal causes no interference.

Interference to BLCDT20090217ACI LIC, scenario 1

Proposal causes no interference.

Interference to proposal, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KFFV	D16	DT	BL	SEATTLE, WA	KFFV_PROPOSED02	
Undesireds:	KORS-CD	D16	DC	LIC	PORTLAND, OR	BLDTA20100517ABN	235.0 km
	KNDO	D16	DT	LIC	YAKIMA, WA	BLCDT20090217ACI	181.8
	Service area	Terrain-limited	IX-free	Percent IX			
	13442.2 3,793,530	12624.0 3,745,200	12600.0 3,743,369	0.19 0.05			
Undesired				Total IX	Unique IX	Pront Unique IX	
KORS-CD D16 DC LIC				8.0 64	8.0 64	0.06 0.00	
KNDO D16 DT LIC				15.9 1,767	15.9 1,767	0.13 0.05	

EXHIBIT 2
ENVIRONMENTAL STATEMENT

The proposed facility complies in full with the requirements of 47 C.F.R. Section 1.1306 and will have no significant environmental impact. Housing community surrounds the immediate location of the proposed site. The proposed site does not involve any of the conditions specified in Section 1.1307(a)(1)-(6) of the Rules.

The facility of KFFV(DT) has been studied in accordance with the procedures set forth in the FCC OET Bulletin No. 65 "Evaluating Compliance With FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 97-01, and has been found to comply with the limits set forth in Section 1.1310 of the Rules. This determination has been based upon calculations with the total radiated power from all TV & FM co-located broadcast emitters. The total exposure as defined by the ANSI standard computations for occupational/controlled area is **12.43 %** of the maximum. The total exposure as defined by the ANSI standard computations for general population/uncontrolled area is **62.61 %** of the maximum. The proposed facility is in compliance with the Commission's guidelines.

Multiple Use FM/TV Tower						
Location:		KFFV - Seattle, WA			7/7/2017	
Channel Frequency Type	Call Letters	Service	ERP (W) H+V	Ant Center of Radiation AG (m)	% of ANSI/FCC Limit (6min)	% of ANSI/FCC Limit (30 min)
16	KFFV(DT)	TV UHF#1	93,100	119.00	0.14	0.68
36	KZJO(TV)	TV UHF#2	1,000,000	201.00	0.46	2.32
24	KRUM-LD	TV UHF#3	4,000	168.00	0.00	0.01
22	KCPQ(TV)	TV UHF#4	15,000	184.00	0.01	0.04
16	KBTC-TV	TV UHF#5	1,000	100.00	0.00	0.01
11	KSTW(TV)	TV VHF#1	100,000	185.80	0.39	1.95
9	KCTS-TV	TV VHF#2	21,700	159.90	0.11	0.57
8	K08OU-D	TV VHF#3	250	122.00	0.00	0.01
90.3	KEXP-FM	FM #1	9,400	122.00	0.63	3.18
94.9	KUOW-FM	FM #2	200,000	137.00	10.68	53.81
Total %					12.43	62.61
IN COMPLIANCE						

The Applicant agrees to maintain full compliance with the safety precautions to workers on the tower (controlled) and the general public (uncontrolled) by reducing or removing radiated power during the time of construction or maintenance on or near the antenna. The Applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from Radiofrequency Electromagnetic exposure in excess of FCC guidelines

The Applicant is believed to be in full compliance with the Environmental Impact and Commission Rules.

EXHIBIT 3

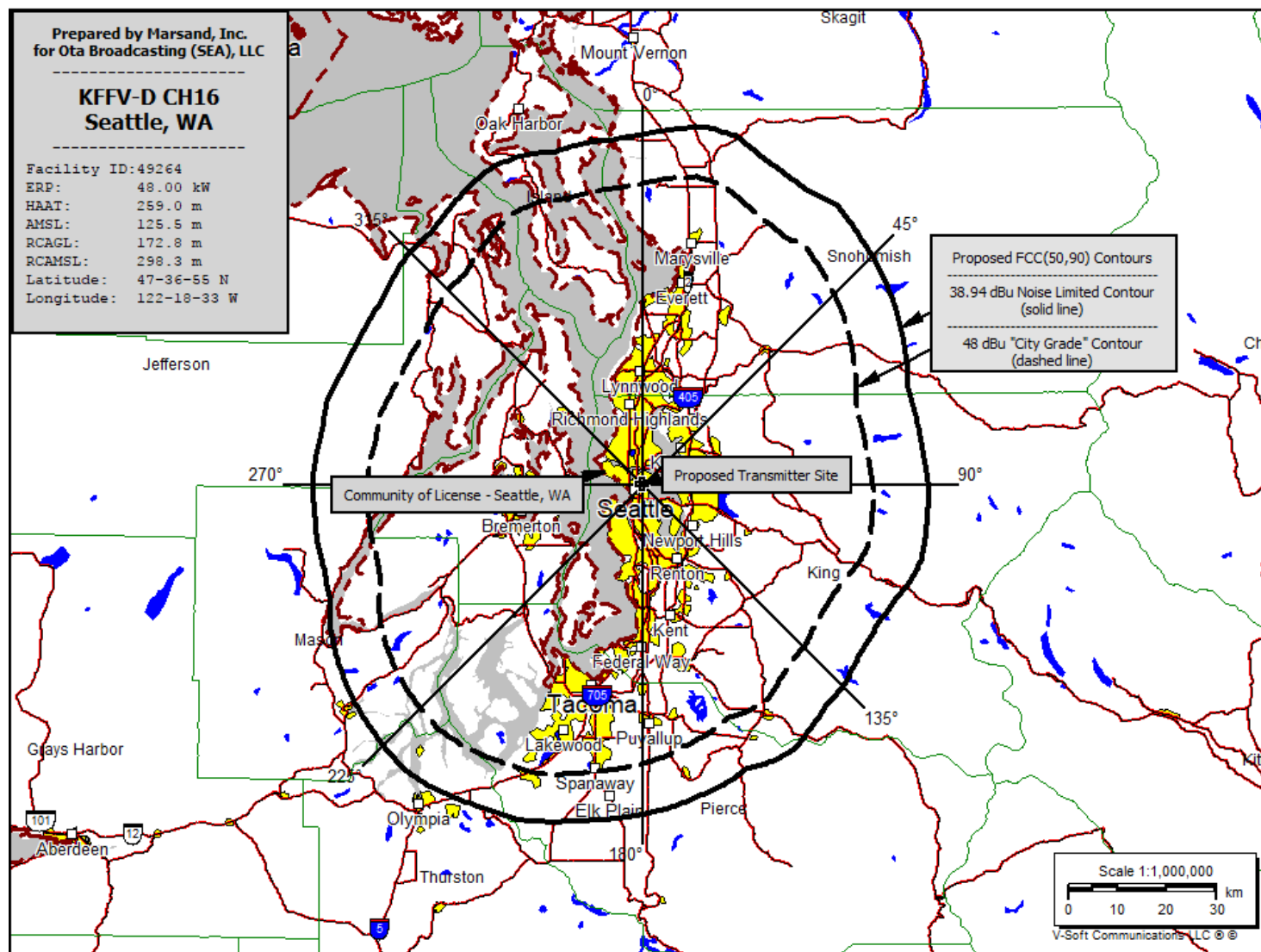
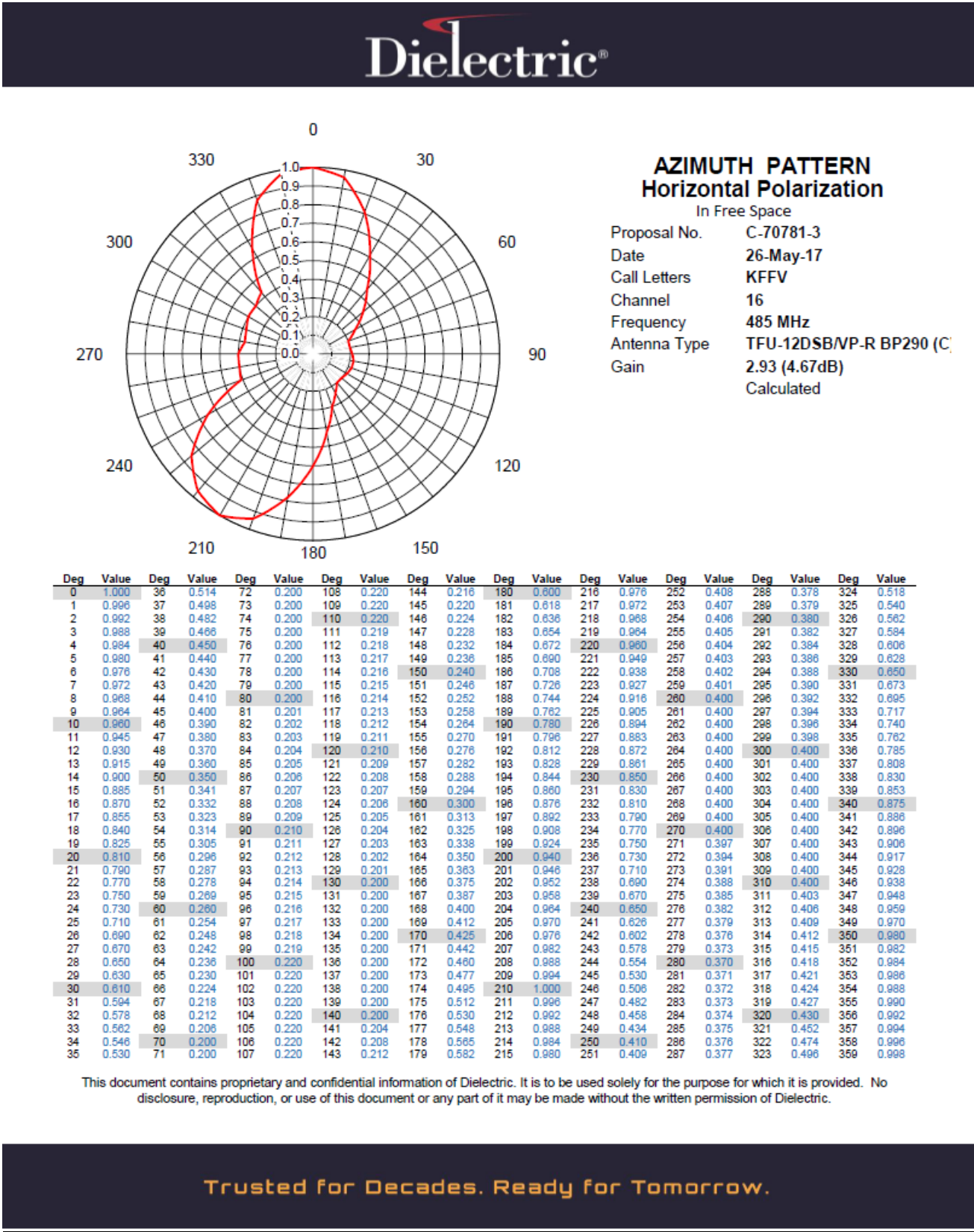
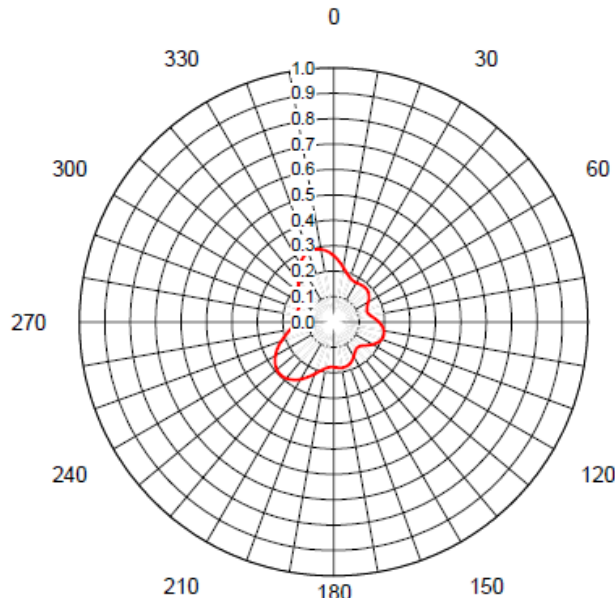


EXHIBIT 4



Dielectric®



AZIMUTH PATTERN Vertical Polarization

In Free Space

Proposal No. C-70781-3
 Date 26-May-17
 Call Letters KFFV
 Channel 16
 Frequency 485 MHz
 Antenna Type TFU-12DSB/VP-R BP290 (C)
 Gain 2.1 (3.22dB)
 Calculated

0	30	60	90	120	150	180	210	240	270	300	330
0	0.261	0.181	0.137	0.108	0.203	0.144	0.178	0.281	0.208	0.148	0.238
1	0.257	0.182	0.137	0.109	0.202	0.145	0.178	0.284	0.203	0.148	0.242
2	0.253	0.182	0.138	0.110	0.201	0.146	0.178	0.286	0.198	0.148	0.247
3	0.249	0.183	0.138	0.111	0.199	0.147	0.178	0.288	0.194	0.148	0.252
4	0.244	0.183	0.140	0.112	0.198	0.148	0.179	0.290	0.189	0.148	0.256
5	0.240	0.183	0.141	0.113	0.196	0.149	0.179	0.292	0.185	0.148	0.260
6	0.236	0.183	0.143	0.114	0.194	0.150	0.180	0.293	0.181	0.148	0.264
7	0.231	0.183	0.145	0.115	0.191	0.151	0.181	0.294	0.177	0.148	0.268
8	0.227	0.183	0.147	0.116	0.189	0.152	0.182	0.295	0.173	0.148	0.272
9	0.223	0.183	0.149	0.117	0.186	0.153	0.184	0.295	0.170	0.149	0.275
10	0.218	0.182	0.152	0.118	0.183	0.154	0.186	0.295	0.167	0.149	0.278
11	0.214	0.181	0.155	0.119	0.180	0.155	0.188	0.295	0.164	0.150	0.281
12	0.210	0.180	0.158	0.120	0.177	0.156	0.190	0.294	0.161	0.151	0.284
13	0.206	0.179	0.161	0.121	0.174	0.157	0.193	0.293	0.159	0.152	0.286
14	0.203	0.178	0.164	0.122	0.171	0.158	0.196	0.292	0.156	0.153	0.289
15	0.199	0.177	0.168	0.123	0.168	0.159	0.199	0.290	0.155	0.156	0.290
16	0.196	0.175	0.171	0.124	0.164	0.160	0.203	0.289	0.153	0.156	0.292
17	0.193	0.173	0.174	0.125	0.161	0.161	0.206	0.288	0.152	0.159	0.293
18	0.190	0.171	0.177	0.126	0.158	0.162	0.210	0.284	0.151	0.161	0.294
19	0.188	0.169	0.180	0.127	0.155	0.163	0.214	0.281	0.150	0.164	0.295
20	0.186	0.167	0.183	0.128	0.152	0.164	0.218	0.278	0.149	0.167	0.295
21	0.184	0.165	0.186	0.129	0.149	0.165	0.223	0.275	0.149	0.170	0.295
22	0.182	0.162	0.189	0.130	0.147	0.166	0.227	0.272	0.148	0.173	0.295
23	0.181	0.160	0.191	0.131	0.145	0.167	0.231	0.268	0.148	0.177	0.294
24	0.180	0.158	0.194	0.132	0.143	0.168	0.236	0.264	0.148	0.181	0.293
25	0.179	0.155	0.196	0.133	0.141	0.169	0.240	0.260	0.148	0.185	0.292
26	0.178	0.153	0.198	0.134	0.140	0.170	0.244	0.256	0.148	0.189	0.290
27	0.178	0.150	0.199	0.135	0.138	0.171	0.249	0.252	0.149	0.194	0.288
28	0.178	0.148	0.201	0.136	0.136	0.172	0.253	0.247	0.148	0.198	0.286
29	0.178	0.146	0.202	0.137	0.137	0.173	0.257	0.242	0.148	0.203	0.284
30	0.178	0.144	0.203	0.138	0.137	0.174	0.261	0.238	0.148	0.208	0.281
31	0.179	0.142	0.203	0.139	0.138	0.175	0.265	0.233	0.149	0.213	0.278
32	0.179	0.141	0.204	0.140	0.138	0.176	0.268	0.228	0.149	0.218	0.275
33	0.180	0.139	0.204	0.141	0.139	0.177	0.272	0.223	0.149	0.223	0.272
34	0.180	0.138	0.204	0.142	0.141	0.178	0.275	0.218	0.149	0.228	0.268
35	0.181	0.138	0.203	0.143	0.142	0.179	0.278	0.213	0.149	0.233	0.265

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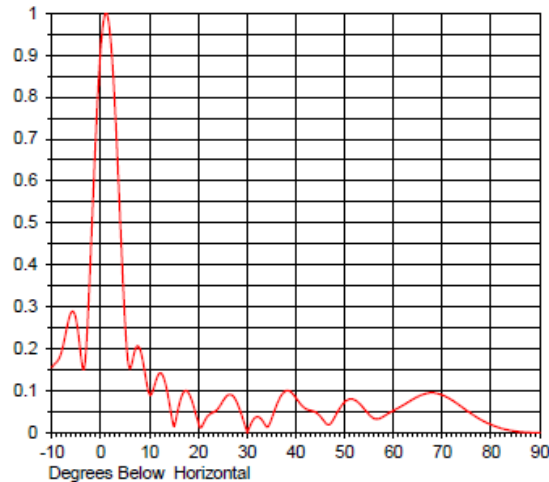
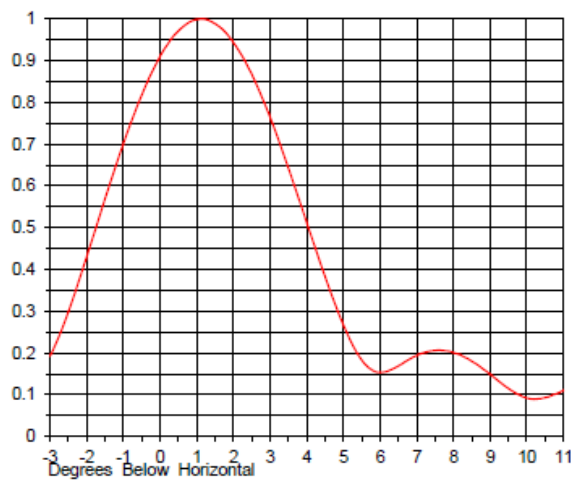
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**ELEVATION PATTERN**

Proposal No. C-70781-3
 Date 26-May-17
 Call Letters KFFV
 Channel 16
 Frequency 485 MHz
 Antenna Type TFU-12DSB/VP-R BP290 (

RMS Directivity at Main Lobe 12.5 (10.97 dB)
 RMS Directivity at Horizontal 10.7 (10.29 dB)
 Calculated

Beam Tilt 1.00 deg
 Pattern Number 12L125100



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.156	10.0	0.080	30.0	0.000	50.0	0.074	70.0	0.080
-9.0	0.170	11.0	0.114	31.0	0.027	51.0	0.080	71.0	0.084
-8.0	0.197	12.0	0.142	32.0	0.038	52.0	0.078	72.0	0.077
-7.0	0.250	13.0	0.125	33.0	0.030	53.0	0.069	73.0	0.069
-6.0	0.288	14.0	0.070	34.0	0.014	54.0	0.056	74.0	0.061
-5.0	0.282	15.0	0.015	35.0	0.034	55.0	0.042	75.0	0.052
-4.0	0.171	16.0	0.066	36.0	0.066	56.0	0.034	76.0	0.044
-3.0	0.211	17.0	0.097	37.0	0.090	57.0	0.034	77.0	0.037
-2.0	0.459	18.0	0.093	38.0	0.100	58.0	0.039	78.0	0.030
-1.0	0.727	19.0	0.062	39.0	0.096	59.0	0.046	79.0	0.024
0.0	0.926	20.0	0.021	40.0	0.082	60.0	0.053	80.0	0.019
1.0	1.000	21.0	0.022	41.0	0.067	61.0	0.059	81.0	0.014
2.0	0.831	22.0	0.041	42.0	0.057	62.0	0.066	82.0	0.010
3.0	0.742	23.0	0.048	43.0	0.053	63.0	0.073	83.0	0.008
4.0	0.486	24.0	0.058	44.0	0.048	64.0	0.080	84.0	0.005
5.0	0.247	25.0	0.076	45.0	0.038	65.0	0.086	85.0	0.003
6.0	0.154	26.0	0.089	46.0	0.023	66.0	0.091	86.0	0.002
7.0	0.198	27.0	0.088	47.0	0.021	67.0	0.094	87.0	0.001
8.0	0.198	28.0	0.068	48.0	0.039	68.0	0.095	88.0	0.000
9.0	0.142	29.0	0.035	49.0	0.059	69.0	0.093	89.0	0.000
								90.0	0.000

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