ENGINEERING STATEMENT

In support of a request for

Minor Modification to a Digital TV Station

KTCI-TV CH23

St. Paul, Minnesota

Facility ID: 68597

PURPOSE

Intelligent Design and Services, Inc. ("iDSi") has been retained by the Twin Cities Public Television, Inc. (TPT), the "Applicant", to prepare this engineering statement in support of a request for a Minor Modification. The Applicant has an existing license, BLEDT-20100326AAI, for KTCI-TV Digital TV Television Station, Facility ID 68597. The Applicant proposes to replace the transmitting antenna.

DISCUSSION

The current transmitting antenna is a wideband antenna shared with KTCA-TV (Facility ID 68594) also owned and operated by the Applicant. The antenna is located on a shared use, multi-tenant tower. The Applicant proposes to replace the antenna with another wideband antenna that will include a vertically polarized component in addition to the horizontal. The vertically polarized component will not exceed the horizontal component at any point in the azimuthal pattern. There are no proposed changes to the transmitting frequency, ERP, or radiation height. The proposed antenna utilizes a directional pattern chosen to produce a coverage contour that closely approximates the existing contour.

A summary of the proposed technical specifications follows:

Location: 45º 03' 30.0" Latitude

93º 07' 28.0" Longitude (NAD83)

ASR 1022899

Height:	413.8 m Radiation Center Above Ground
	690.8 m Radiation Center Above Mean Sea Level
HAAT:	411.1 m
ERP:	325 kW Horizontal Polarization
Antenna:	Directional

An interference study was performed using the proposed location, height, antenna pattern, and ERP utilizing the FCC TVStudy v2.2.5 software. The study result for this proposal indicates no unacceptable interference to others and is 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 total exposure as defined by the ANSI standard computations for occupational/controlled area is 0.07 % of the maximum. The total exposure as defined by the ANSI standard computations for general population/uncontrolled area is 0.33 % of the maximum.

The proposed coverage contour shown in **Exhibit 3**.

The proposed antenna technical information is shown in **Exhibit 4**.

CONCLUSION

It is respectfully requested that the Commission grant this request for Minor Modification for the facility as specified herein.

DECLARATION

David Sanderford, E.I.T., 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. He is President of Intelligent Design and Services, Inc., a Registered Professional Engineering Firm in the State of Texas, and that firm has been retained by TPT, 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.

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

David Sanderford
President - iDSi

Executed this 12th day of June, 2023

EXHIBIT 1

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tvstudy v2.2.5 (4uoc83)
Database: localhost,  Study: KTCI_DIE_TFU_325_App02,  Model: Longley-Rice
Start: 2023.06.11 17:33:16

Study created: 2023.06.11 17:33:16

Study build station data: LMS TV 2023-06-10

    Proposal: KTCI-TV D23 DT LIC ST. PAUL, MN
 File number: KTCI_DIE_TFU_325_App02
 Facility ID: 68597
Station data: User record
   Record ID: 24
     Country: U.S.
        Zone: II

Stations potentially affected by proposal:

IX   Call      Chan       Svc Status  City, State              File Number             Distance
Yes  WUCW      D22        DT  CP      MINNEAPOLIS, MN          BLANK0000185669           1.3 km
Yes  WUCW      D22        DT  LIC     MINNEAPOLIS, MN          BLCDT20060405AAI          1.3
Yes  KCWI-TV   D23        DT  APP     AMES, IA                 BPCDT20130205AAY        361.0
Yes  KCWI-TV   D23        DT  LIC     AMES, IA                 BLCDT20090612AIO        361.0
No   WQPT-TV   D23        DT  LIC     MOLINE, IL               BLANK0000142182         472.0
Yes  KQEG-CD   D23        DC  LIC     LA CRESCENT, MN          BLANK0000001542         205.6
No   WBAY-TV   D23        DT  LIC     GREEN BAY, WI            BLANK0000163423         410.8
No   W23BW-D   D23        DC  LIC     MADISON, WI              BLANK0000194534         366.7
Yes  KIMT      D24        DT  LIC     MASON CITY, IA           BLANK0000067292         179.0
No   KSAX      D24        DT  LIC     ALEXANDRIA, MN           BLANK0000074900         175.4
No   WHRM-TV   D24        DT  LIC     WAUSAU, WI               BLANK0000156044         270.3

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

    Channel: D23
   Latitude:  45  3 30.00 N (NAD83)
  Longitude:  93  7 28.00 W
Height AMSL: 690.8 m
       HAAT: 411.1 m
   Peak ERP: 325 kW
    Antenna: DIE-TFU-24WB-VP-R-C160-23 0.0 deg
Elev Pattrn: DIE-TFU-24WB-VP-R-C160-24W249100-23

39.7 dBu contour:
Azimuth      ERP       HAAT   Distance
  0.0 deg   62.1 kW   415.5 m   87.1 km
 45.0        119      408.8     91.3
 90.0        151      396.8     92.3
135.0        295      409.1     98.4
180.0        279      424.5     99.0
225.0        235      420.2     97.2
270.0        322      418.2     99.8
315.0        223      411.6     96.2

Database HAAT does not agree with computed HAAT
Database HAAT: 411 m   Computed HAAT: 413 m

Proposal 24.66 dBu contour does not cross Canadian border
Distance to Canadian border: 352.5 km

Distance to Mexican border: 1847.1 km

Conditions at FCC monitoring station: Grand Island NE
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Bearing: 225.0 degrees Distance: 630.0 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 245.4 degrees Distance: 1128.5 km

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

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%

Interference to BLANK0000185669 CP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WUCW	D22	DT	CP	MINNEAPOLIS, MN	BLANK0000185669	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	1.3 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	1.3
	WEUX	D21	DT	LIC	CHIPPEWA FALLS, WI	BLANK0000078776	116.2
	KPXR-TV	D22	DT	LIC	CEDAR RAPIDS, IA	BLANK0000063428	323.6

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
38264.4	3,840,287	37724.0	3,829,967	37043.6	3,811,794	37049.7	3,811,904	-0.02	-0.00

Undesired	Total IX		Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	19.1	182	19.1	182		
KTCI-TV D23 DT LIC	13.1	72			13.1	72
WEUX D21 DT LIC	627.1	17,108	618.0	17,042	618.0	17,042
KPXR-TV D22 DT LIC	43.3	949	34.2	883	34.2	883

Interference to BLCDT20060405AAI LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WUCW	D22	DT	LIC	MINNEAPOLIS, MN	BLCDT20060405AAI	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	1.3 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	1.3
	WEUX	D21	DT	LIC	CHIPPEWA FALLS, WI	BLANK0000078776	116.2
	KPXR-TV	D22	DT	LIC	CEDAR RAPIDS, IA	BLANK0000063428	323.6

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
34024.4	3,665,135	33508.0	3,655,132	32872.0	3,637,594	32888.0	3,637,723	-0.05	-0.00

Undesired	Total IX		Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	41.2	490	40.2	441		
KTCI-TV D23 DT LIC	24.1	312			24.1	312
WEUX D21 DT LIC	561.6	16,339	548.5	16,096	549.5	16,145
KPXR-TV D22 DT LIC	46.3	952	34.2	758	34.2	758

Interference to BPCDT20130205AAY APP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KCWI-TV	D23	DT	APP	AMES, IA	BPCDT20130205AAY	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	361.0 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	361.0
	KPXR-TV	D22	DT	LIC	CEDAR RAPIDS, IA	BLANK0000063428	151.7
	WOWT	D22	DT	LIC	OMAHA, NE	BLANK0000188796	208.7
	WQPT-TV	D23	DT	LIC	MOLINE, IL	BLANK0000142182	275.1
	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	197.4

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
48556.0	1,154,479	48262.1	1,153,185	47107.8	1,107,778	47104.8	1,107,773	0.01	0.00

Undesired		Total IX	Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	22.2	1,745	0.0	0		
KTCI-TV D23 DT LIC	39.3	1,794			3.0	5
KPXR-TV D22 DT LIC	658.2	41,802	491.4	35,597	491.4	35,597
WOWT D22 DT LIC	4.0	11	4.0	11	4.0	11
WQPT-TV D23 DT LIC	512.9	8,184	333.0	2,338	330.9	2,318
KIMT D24 DT LIC	152.0	1,272	142.9	1,252	131.9	1,228

Interference to BLCDT20090612AIO LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KCWI-TV	D23	DT	LIC	AMES, IA	BLCDT20090612AIO	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	361.0 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	361.0
	KPXR-TV	D22	DT	LIC	CEDAR RAPIDS, IA	BLANK0000063428	151.7
	WQPT-TV	D23	DT	LIC	MOLINE, IL	BLANK0000142182	275.1
	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	197.4

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
38641.6	1,043,722	38500.3	1,042,870	37931.4	1,039,386	37928.4	1,039,386	0.01	0.00

Undesired		Total IX	Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	8.1	47	0.0	0		
KTCI-TV D23 DT LIC	18.2	54			3.0	0
KPXR-TV D22 DT LIC	291.8	1,304	234.9	1,127	234.9	1,127
WQPT-TV D23 DT LIC	281.5	1,411	209.5	1,177	207.5	1,177
KIMT D24 DT LIC	63.5	994	52.4	946	52.4	946

Interference to BLANK0000001542 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	205.5 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	205.6
	KCWI-TV	D23	DT	APP	AMES, IA	BPCDT20130205AAY	284.9
	WQPT-TV	D23	DT	LIC	MOLINE, IL	BLANK0000142182	281.0
	WBAY-TV	D23	DT	LIC	GREEN BAY, WI	BLANK0000163423	273.2
	W23BW-D	D23	DC	LIC	MADISON, WI	BLANK0000194534	166.0

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
6744.1	227,815	6127.0	198,445	6044.6	197,905	6035.6	197,732	0.15	0.09

Undesired		Total IX	Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	63.3	414	48.2	336		
KTCI-TV D23 DT LIC	70.3	581			57.2	509
KCWI-TV D23 DT APP	5.0	0	2.0	0	2.0	0
WQPT-TV D23 DT LIC	8.0	41	1.0	0	1.0	0
WBAY-TV D23 DT LIC	27.2	167	14.2	126	16.2	132
W23BW-D D23 DC LIC	1.0	0	0.0	0	0.0	0

Interference to BLANK0000001542 LIC scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	205.5 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	205.6
	WQPT-TV	D23	DT	LIC	MOLINE, IL	BLANK0000142182	281.0
	WBAY-TV	D23	DT	LIC	GREEN BAY, WI	BLANK0000163423	273.2
	W23BW-D	D23	DC	LIC	MADISON, WI	BLANK0000194534	166.0

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
6744.1	227,815	6127.0	198,445	6046.6	197,905	6037.6	197,732	0.15	0.09

Undesired		Total IX	Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	63.3	414	48.2	336		

KTCI-TV D23 DT LIC	70.3	581			57.2	509
WQPT-TV D23 DT LIC	8.0	41	1.0	0	1.0	0
WBAY-TV D23 DT LIC	27.2	167	15.2	126	17.2	132
W23BW-D D23 DC LIC	1.0	0	0.0	0	0.0	0

Interference to BLANK0000067292 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	179.0 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	179.0
	KCWI-TV	D23	DT	APP	AMES, IA	BPCDT20130205AAY	197.4
	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	117.5
	KSAX	D24	DT	LIC	ALEXANDRIA, MN	BLANK0000074900	315.1
	WHRM-TV	D24	DT	LIC	WAUSAU, WI	BLANK0000156044	289.1
	KTIN	D25	DT	LIC	FORT DODGE, IA	BLEDT20070822ACB	156.3

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
36115.8	661,130	35770.7	651,849	35498.8	649,060	35497.8	649,048	0.00	0.00

Undesired	Total IX		Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	10.0	97	8.0	46		
KTCI-TV D23 DT LIC	11.0	109			9.0	58
KCWI-TV D23 DT APP	1.0	0	1.0	0	1.0	0
KQEG-CD D23 DC LIC	80.0	531	62.8	412	62.8	412
KSAX D24 DT LIC	16.1	1,099	15.1	1,050	15.1	1,050
WHRM-TV D24 DT LIC	95.6	1,053	77.4	932	77.4	932
KTIN D25 DT LIC	88.3	179	88.3	179	88.3	179

Interference to BLANK0000067292 LIC scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	
Undesireds:	KTCI-TV	D23	DT	BL	ST. PAUL, MN	DTVBL68597	179.0 km
	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	179.0
	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	117.5
	KSAX	D24	DT	LIC	ALEXANDRIA, MN	BLANK0000074900	315.1
	WHRM-TV	D24	DT	LIC	WAUSAU, WI	BLANK0000156044	289.1
	KTIN	D25	DT	LIC	FORT DODGE, IA	BLEDT20070822ACB	156.3

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
36115.8	661,130	35770.7	651,849	35499.9	649,060	35498.8	649,048	0.00	0.00

Undesired	Total IX		Unique IX, before		Unique IX, after	
KTCI-TV D23 DT BL	10.0	97	8.0	46		
KTCI-TV D23 DT LIC	11.0	109			9.0	58
KQEG-CD D23 DC LIC	80.0	531	62.8	412	62.8	412
KSAX D24 DT LIC	16.1	1,099	15.1	1,050	15.1	1,050
WHRM-TV D24 DT LIC	95.6	1,053	77.4	932	77.4	932
KTIN D25 DT LIC	88.3	179	88.3	179	88.3	179

Interference to proposal scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	
Undesireds:	WUCW	D22	DT	CP	MINNEAPOLIS, MN	BLANK0000185669	1.3 km
	KCWI-TV	D23	DT	APP	AMES, IA	BPCDT20130205AAY	361.0
	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	205.6
	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	179.0

Service area		Terrain-limited		IX-free		Percent IX	
28491.4	3,570,121	28160.3	3,566,277	27631.5	3,551,471	1.88	0.42

Undesired	Total IX		Unique IX		Prcnt Unique IX	
WUCW D22 DT CP	472.4	13,708	463.3	13,659	1.65	0.38

KCWI-TV D23 DT APP	38.2	909	30.1	876	0.11	0.02
KQEG-CD D23 DC LIC	27.3	209	21.2	193	0.08	0.01
KIMT D24 DT LIC	3.0	29	2.0	29	0.01	0.00

Interference to proposal scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	
Undesireds:	WUCW	D22	DT	LIC	MINNEAPOLIS, MN	BLCDT20060405AAI	1.3 km
	KCWI-TV	D23	DT	APP	AMES, IA	BPCDT20130205AAY	361.0
	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	205.6
	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	179.0

Service area		Terrain-limited		IX-free		Percent IX	
28491.4	3,570,121	28160.3	3,566,277	27827.3	3,559,689	1.18	0.18

Undesired	Total IX		Unique IX		Prcnt Unique IX	
WUCW D22 DT LIC	275.6	5,490	267.5	5,441	0.95	0.15
KCWI-TV D23 DT APP	38.2	909	30.1	876	0.11	0.02
KQEG-CD D23 DC LIC	27.3	209	22.2	193	0.08	0.01
KIMT D24 DT LIC	3.0	29	2.0	29	0.01	0.00

Interference to proposal scenario 3

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	
Undesireds:	WUCW	D22	DT	CP	MINNEAPOLIS, MN	BLANK0000185669	1.3 km
	KCWI-TV	D23	DT	LIC	AMES, IA	BLCDT20090612AIO	361.0
	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	205.6
	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	179.0

Service area		Terrain-limited		IX-free		Percent IX	
28491.4	3,570,121	28160.3	3,566,277	27656.6	3,552,314	1.79	0.39

Undesired	Total IX		Unique IX		Prcnt Unique IX	
WUCW D22 DT CP	472.4	13,708	467.4	13,687	1.66	0.38
KCWI-TV D23 DT LIC	7.0	38	5.0	33	0.02	0.00
KQEG-CD D23 DC LIC	27.3	209	22.2	193	0.08	0.01
KIMT D24 DT LIC	3.0	29	3.0	29	0.01	0.00

Interference to proposal scenario 4

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KTCI-TV	D23	DT	LIC	ST. PAUL, MN	KTCI_DIE_TFU_325_App02	
Undesireds:	WUCW	D22	DT	LIC	MINNEAPOLIS, MN	BLCDT20060405AAI	1.3 km
	KCWI-TV	D23	DT	LIC	AMES, IA	BLCDT20090612AIO	361.0
	KQEG-CD	D23	DC	LIC	LA CRESCENT, MN	BLANK0000001542	205.6
	KIMT	D24	DT	LIC	MASON CITY, IA	BLANK0000067292	179.0

Service area		Terrain-limited		IX-free		Percent IX	
28491.4	3,570,121	28160.3	3,566,277	27852.5	3,560,532	1.09	0.16

Undesired	Total IX		Unique IX		Prcnt Unique IX	
WUCW D22 DT LIC	275.6	5,490	271.6	5,469	0.96	0.15
KCWI-TV D23 DT LIC	7.0	38	5.0	33	0.02	0.00
KQEG-CD D23 DC LIC	27.3	209	23.2	193	0.08	0.01
KIMT D24 DT LIC	3.0	29	3.0	29	0.01	0.00

INTELLIGENT

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. Population is very scattered and sparse near 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 **KTCI-TV** facility 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. The total exposure attributable to this station as defined by the ANSI standard computations for occupational/controlled area is **0.04 %** of the maximum and is **0.18 %** of the maximum for general population/uncontrolled area. As this is less than the 5% limit set forth by the rules in Section 1.1307(b) for a multi-use tower site, the station is categorically excluded from taking action to bring the site into compliance should the guidelines be exceeded. The proposed facility complies with the Commission's guidelines.

Multiple Use Tower

Location: **KTCI CH23 St. Paul, MN** 6/11/2023

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)
23	KTCI	TV UHF#1	325,000	413.00	0.036	0.183
Total %					**0.036**	**0.183**

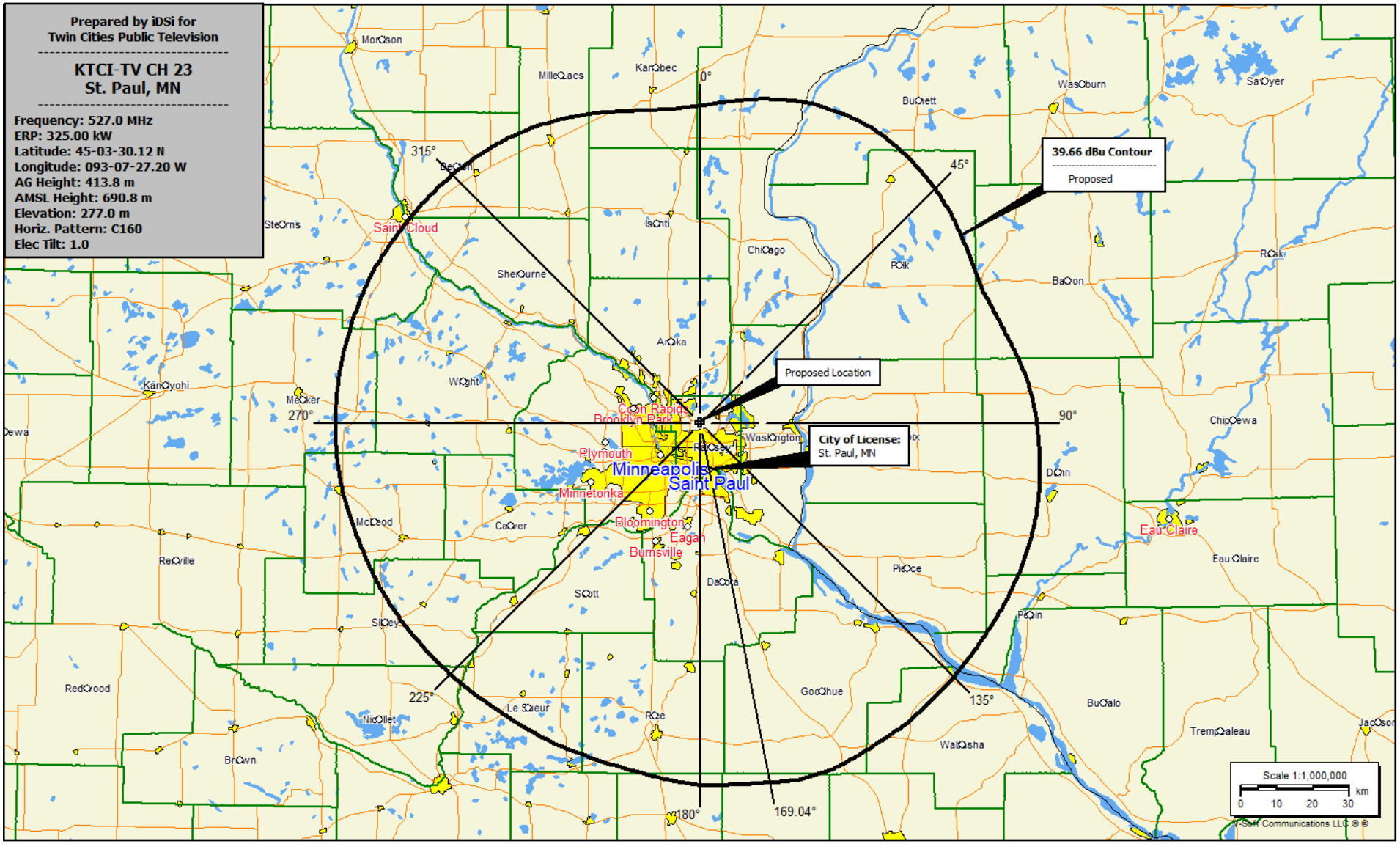
IN COMPLIANCE

The Twin Cities Public Television, Inc. (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.

INTELLIGENT

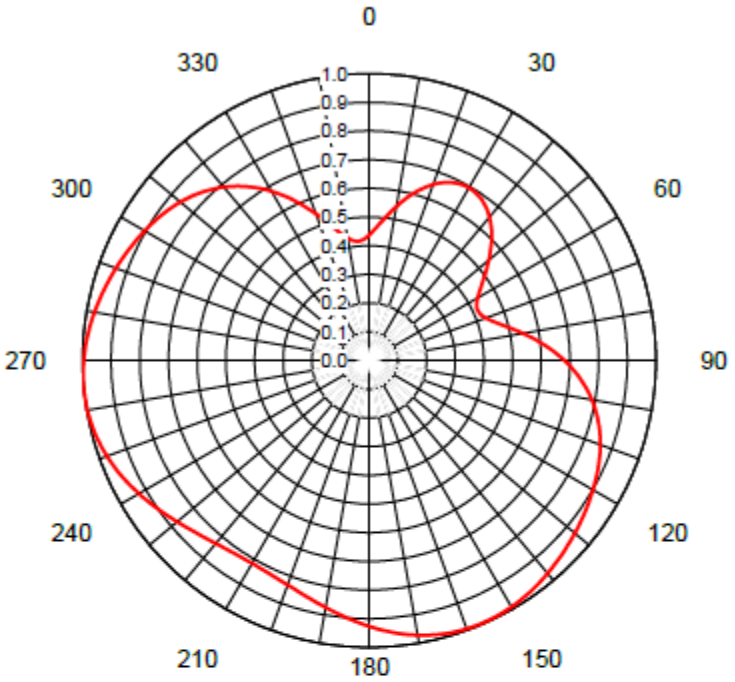
EXHIBIT 3



1957 Reynolds Dr. * Azle, Texas 76020 * (817) 783-5566 * FAX (817) 783-5577

EXHIBIT 4

Dielectric®



AZIMUTH PATTERN
Horizontal Polarization

Proposal No.	C-71856-4
Date	15-Aug-22
Call Letters	KTCI
Channel	23
Frequency	527 MHz
Antenna Type	TFU-24WB/VP-R C160
Gain	1.54 (1.88dB)
	Calculated
Pattern Number	C160-23 Hpol

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.437	36	0.680	72	0.448	108	0.847	144	0.980	180	0.927	216	0.822	252	0.981	288	0.947	324	0.751
1	0.445	37	0.674	73	0.458	109	0.852	145	0.982	181	0.922	217	0.824	253	0.984	289	0.943	325	0.740
2	0.454	38	0.668	74	0.468	110	0.858	146	0.984	182	0.916	218	0.827	254	0.986	290	0.940	326	0.729
3	0.464	39	0.661	75	0.480	111	0.863	147	0.986	183	0.911	219	0.829	255	0.989	291	0.937	327	0.718
4	0.474	40	0.653	76	0.491	112	0.868	148	0.988	184	0.906	220	0.832	256	0.991	292	0.933	328	0.706
5	0.485	41	0.644	77	0.504	113	0.873	149	0.990	185	0.900	221	0.836	257	0.993	293	0.930	329	0.694
6	0.496	42	0.635	78	0.517	114	0.877	150	0.992	186	0.895	222	0.839	258	0.995	294	0.926	330	0.681
7	0.508	43	0.625	79	0.530	115	0.882	151	0.993	187	0.890	223	0.843	259	0.997	295	0.923	331	0.668
8	0.520	44	0.615	80	0.544	116	0.886	152	0.994	188	0.884	224	0.847	260	0.998	296	0.919	332	0.655
9	0.533	45	0.604	81	0.558	117	0.890	153	0.995	189	0.879	225	0.851	261	0.999	297	0.915	333	0.642
10	0.545	46	0.593	82	0.572	118	0.894	154	0.996	190	0.874	226	0.855	262	0.999	298	0.912	334	0.628
11	0.557	47	0.581	83	0.586	119	0.898	155	0.997	191	0.869	227	0.860	263	1.000	299	0.908	335	0.614
12	0.570	48	0.569	84	0.600	120	0.901	156	0.997	192	0.864	228	0.864	264	1.000	300	0.904	336	0.600
13	0.582	49	0.557	85	0.614	121	0.905	157	0.997	193	0.860	229	0.869	265	1.000	301	0.900	337	0.586
14	0.593	50	0.545	86	0.628	122	0.909	158	0.997	194	0.855	230	0.874	266	0.999	302	0.896	338	0.572
15	0.604	51	0.532	87	0.642	123	0.912	159	0.996	195	0.851	231	0.879	267	0.999	303	0.892	339	0.558
16	0.615	52	0.520	88	0.655	124	0.916	160	0.995	196	0.847	232	0.885	268	0.998	304	0.888	340	0.544
17	0.626	53	0.508	89	0.668	125	0.919	161	0.994	197	0.843	233	0.890	269	0.997	305	0.884	341	0.531
18	0.635	54	0.496	90	0.681	126	0.923	162	0.993	198	0.839	234	0.895	270	0.996	306	0.879	342	0.517
19	0.644	55	0.485	91	0.693	127	0.926	163	0.991	199	0.836	235	0.901	271	0.994	307	0.875	343	0.504
20	0.653	56	0.474	92	0.706	128	0.929	164	0.989	200	0.832	236	0.906	272	0.992	308	0.870	344	0.492
21	0.661	57	0.463	93	0.717	129	0.933	165	0.987	201	0.829	237	0.912	273	0.990	309	0.865	345	0.480
22	0.668	58	0.454	94	0.729	130	0.936	166	0.984	202	0.827	238	0.917	274	0.988	310	0.859	346	0.469
23	0.674	59	0.445	95	0.740	131	0.940	167	0.982	203	0.824	239	0.922	275	0.986	311	0.854	347	0.458
24	0.680	60	0.437	96	0.750	132	0.943	168	0.979	204	0.822	240	0.928	276	0.984	312	0.848	348	0.449
25	0.684	61	0.430	97	0.761	133	0.946	169	0.975	205	0.821	241	0.933	277	0.981	313	0.842	349	0.440
26	0.688	62	0.425	98	0.770	134	0.950	170	0.972	206	0.819	242	0.938	278	0.978	314	0.835	350	0.433
27	0.691	63	0.421	99	0.780	135	0.953	171	0.968	207	0.818	243	0.943	279	0.975	315	0.828	351	0.427
28	0.693	64	0.418	100	0.789	136	0.956	172	0.964	208	0.817	244	0.948	280	0.973	316	0.821	352	0.423
29	0.695	65	0.417	101	0.797	137	0.959	173	0.960	209	0.817	245	0.953	281	0.970	317	0.814	353	0.419
30	0.695	66	0.417	102	0.805	138	0.962	174	0.956	210	0.817	246	0.957	282	0.966	318	0.806	354	0.418
31	0.695	67	0.419	103	0.813	139	0.965	175	0.951	211	0.817	247	0.962	283	0.963	319	0.798	355	0.417
32	0.693	68	0.422	104	0.821	140	0.968	176	0.947	212	0.817	248	0.966	284	0.960	320	0.789	356	0.419
33	0.691	69	0.427	105	0.828	141	0.971	177	0.942	213	0.818	249	0.970	285	0.957	321	0.780	357	0.421
34	0.688	70	0.433	106	0.834	142	0.974	178	0.937	214	0.819	250	0.974	286	0.954	322	0.771	358	0.425
35	0.684	71	0.440	107	0.841	143	0.977	179	0.932	215	0.821	251	0.977	287	0.950	323	0.761	359	0.431

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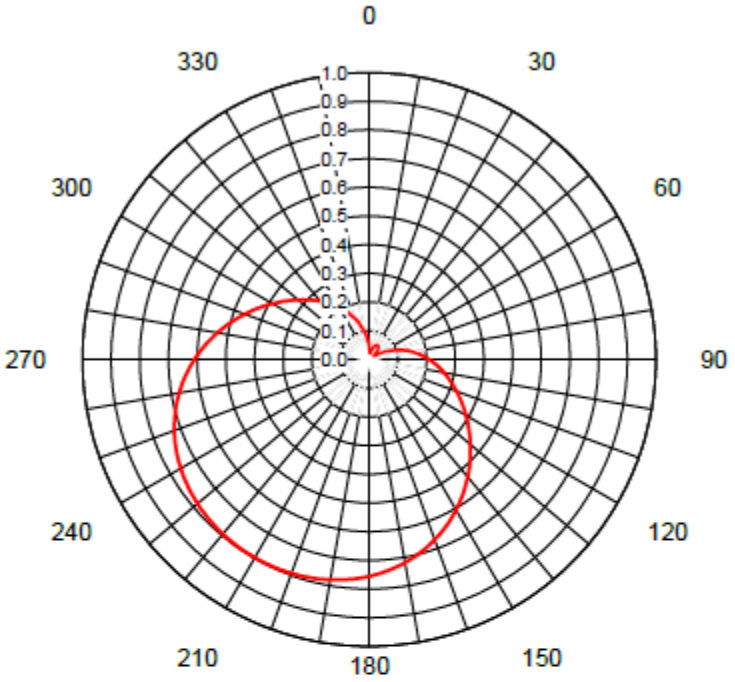


AZIMUTH PATTERN
Vertical Polarization

Proposal No.	C-71856-4
Date	15-Aug-22
Call Letters	KTCI
Channel	23
Frequency	527 MHz
Antenna Type	TFU-24WB/VP-R C160
Gain	2.61 (4.17dB)
	Calculated
Pattern Number	C160-23 Vpol

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.046	36	0.054	72	0.108	108	0.312	144	0.564	180	0.756	216	0.796	252	0.714	288	0.477	324	0.243
1	0.041	37	0.053	73	0.113	109	0.318	145	0.571	181	0.759	217	0.796	253	0.710	289	0.469	325	0.238
2	0.037	38	0.051	74	0.119	110	0.325	146	0.578	182	0.762	218	0.795	254	0.705	290	0.462	326	0.232
3	0.033	39	0.049	75	0.125	111	0.331	147	0.585	183	0.764	219	0.795	255	0.700	291	0.454	327	0.227
4	0.029	40	0.047	76	0.130	112	0.337	148	0.592	184	0.767	220	0.794	256	0.695	292	0.447	328	0.221
5	0.026	41	0.045	77	0.136	113	0.343	149	0.599	185	0.769	221	0.793	257	0.689	293	0.440	329	0.216
6	0.023	42	0.043	78	0.142	114	0.350	150	0.606	186	0.772	222	0.792	258	0.684	294	0.432	330	0.211
7	0.021	43	0.040	79	0.147	115	0.356	151	0.612	187	0.774	223	0.791	259	0.679	295	0.425	331	0.205
8	0.021	44	0.038	80	0.153	116	0.363	152	0.619	188	0.776	224	0.790	260	0.673	296	0.418	332	0.200
9	0.021	45	0.035	81	0.159	117	0.370	153	0.626	189	0.778	225	0.789	261	0.667	297	0.411	333	0.194
10	0.022	46	0.032	82	0.164	118	0.376	154	0.632	190	0.780	226	0.788	262	0.661	298	0.404	334	0.189
11	0.024	47	0.030	83	0.170	119	0.383	155	0.638	191	0.781	227	0.786	263	0.655	299	0.397	335	0.183
12	0.026	48	0.027	84	0.176	120	0.390	156	0.645	192	0.783	228	0.785	264	0.649	300	0.390	336	0.178
13	0.029	49	0.025	85	0.181	121	0.397	157	0.651	193	0.785	229	0.783	265	0.643	301	0.383	337	0.172
14	0.031	50	0.022	86	0.187	122	0.404	158	0.657	194	0.786	230	0.782	266	0.636	302	0.376	338	0.167
15	0.034	51	0.021	87	0.192	123	0.411	159	0.663	195	0.788	231	0.780	267	0.630	303	0.369	339	0.161
16	0.037	52	0.020	88	0.198	124	0.418	160	0.668	196	0.789	232	0.778	268	0.623	304	0.362	340	0.156
17	0.039	53	0.020	89	0.204	125	0.425	161	0.674	197	0.790	233	0.776	269	0.616	305	0.356	341	0.150
18	0.042	54	0.021	90	0.209	126	0.432	162	0.680	198	0.791	234	0.774	270	0.610	306	0.349	342	0.145
19	0.044	55	0.023	91	0.215	127	0.439	163	0.685	199	0.792	235	0.772	271	0.603	307	0.343	343	0.139
20	0.046	56	0.026	92	0.220	128	0.446	164	0.690	200	0.793	236	0.769	272	0.596	308	0.336	344	0.133
21	0.048	57	0.030	93	0.226	129	0.453	165	0.695	201	0.794	237	0.767	273	0.589	309	0.330	345	0.128
22	0.050	58	0.034	94	0.231	130	0.461	166	0.700	202	0.794	238	0.764	274	0.581	310	0.324	346	0.122
23	0.052	59	0.038	95	0.237	131	0.468	167	0.705	203	0.795	239	0.762	275	0.574	311	0.318	347	0.116
24	0.053	60	0.043	96	0.243	132	0.475	168	0.710	204	0.796	240	0.759	276	0.567	312	0.312	348	0.111
25	0.055	61	0.048	97	0.248	133	0.483	169	0.715	205	0.796	241	0.756	277	0.560	313	0.306	349	0.105
26	0.056	62	0.053	98	0.254	134	0.490	170	0.719	206	0.797	242	0.753	278	0.552	314	0.300	350	0.099
27	0.057	63	0.058	99	0.259	135	0.498	171	0.723	207	0.797	243	0.750	279	0.545	315	0.294	351	0.094
28	0.057	64	0.063	100	0.265	136	0.505	172	0.727	208	0.797	244	0.746	280	0.537	316	0.288	352	0.088
29	0.058	65	0.068	101	0.271	137	0.512	173	0.731	209	0.797	245	0.743	281	0.530	317	0.282	353	0.083
30	0.058	66	0.074	102	0.277	138	0.520	174	0.735	210	0.797	246	0.739	282	0.522	318	0.276	354	0.077
31	0.058	67	0.079	103	0.283	139	0.527	175	0.739	211	0.797	247	0.735	283	0.515	319	0.271	355	0.072
32	0.057	68	0.085	104	0.288	140	0.534	176	0.743	212	0.797	248	0.731	284	0.507	320	0.265	356	0.066
33	0.057	69	0.091	105	0.294	141	0.542	177	0.746	213	0.797	249	0.727	285	0.500	321	0.260	357	0.061
34	0.056	70	0.096	106	0.300	142	0.549	178	0.750	214	0.797	250	0.723	286	0.492	322	0.254	358	0.056
35	0.055	71	0.102	107	0.306	143	0.556	179	0.753	215	0.797	251	0.719	287	0.484	323	0.249	359	0.051

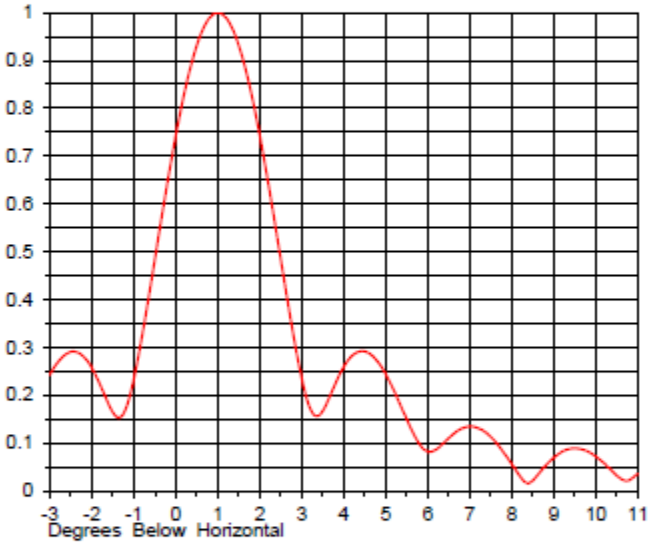
INTELLIGENT

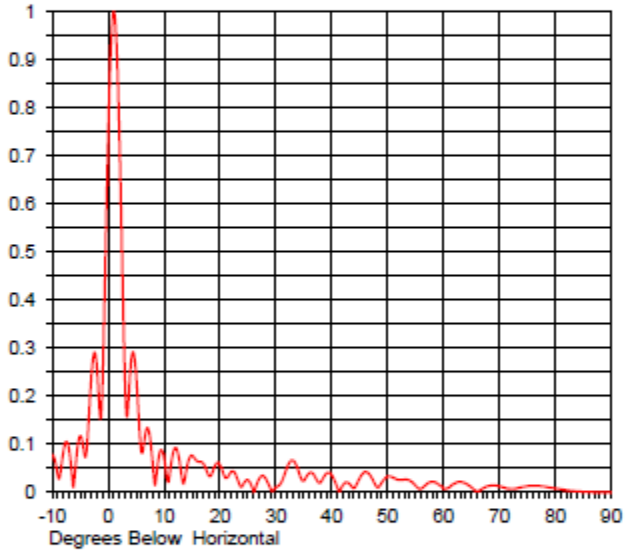
Dielectric®

ELEVATION PATTERN

Proposal No.	C-71856-4
Date	15-Aug-22
Call Letters	KTCI
Channel	23
Frequency	527 MHz
Antenna Type	TFU-24WB/VP-R C160

RMS Directivity at Main Lobe	24.8 (13.94 dB)	Beam Tilt	1.00 deg
RMS Directivity at Horizontal	13.7 (11.37 dB)	Pattern Number	24W249100-23
	Calculated		





Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.077	10.0	0.072	30.0	0.010	50.0	0.033	70.0	0.013
-9.0	0.034	11.0	0.036	31.0	0.021	51.0	0.031	71.0	0.010
-8.0	0.086	12.0	0.093	32.0	0.051	52.0	0.026	72.0	0.007
-7.0	0.089	13.0	0.047	33.0	0.067	53.0	0.027	73.0	0.008
-6.0	0.034	14.0	0.046	34.0	0.047	54.0	0.025	74.0	0.011
-5.0	0.118	15.0	0.077	35.0	0.024	55.0	0.015	75.0	0.013
-4.0	0.076	16.0	0.065	36.0	0.040	56.0	0.007	76.0	0.014
-3.0	0.243	17.0	0.061	37.0	0.033	57.0	0.017	77.0	0.014
-2.0	0.257	18.0	0.035	38.0	0.021	58.0	0.022	78.0	0.013
-1.0	0.234	19.0	0.052	39.0	0.039	59.0	0.018	79.0	0.011
0.0	0.744	20.0	0.058	40.0	0.036	60.0	0.009	80.0	0.008
1.0	1.000	21.0	0.030	41.0	0.011	61.0	0.010	81.0	0.006
2.0	0.743	22.0	0.043	42.0	0.015	62.0	0.019	82.0	0.005
3.0	0.235	23.0	0.032	43.0	0.020	63.0	0.022	83.0	0.003
4.0	0.259	24.0	0.013	44.0	0.009	64.0	0.019	84.0	0.002
5.0	0.244	25.0	0.026	45.0	0.029	65.0	0.011	85.0	0.001
6.0	0.082	26.0	0.004	46.0	0.043	66.0	0.002	86.0	0.001
7.0	0.135	27.0	0.028	47.0	0.034	67.0	0.008	87.0	0.000
8.0	0.056	28.0	0.032	48.0	0.013	68.0	0.013	88.0	0.000
9.0	0.069	29.0	0.009	49.0	0.021	69.0	0.015	89.0	0.000
								90.0	0.000