



ENGINEERING STATEMENT

IN SUPPORT OF

APPLICATION FOR DISPLACEMENT OF DIGITAL TRANSLATOR

WRJK-LD

ARLINGTON HEIGHTS, IL

Background

Chicago 22, LLC is the licensee of low power television translator station WRJK-LD (BLTT-19991020AAO, Facility ID. 68061) near Arlington Heights, IL. The station currently operates on Ch. 11 (under STA, LMS File No. 0000086734) and has a Construction Permit to displace to Ch. 11 (LMS File No. 0000054928). Chicago 22, LLC is seeking, in its instant application, to displace WRJK-LD to Ch. 36 instead.

Displacement Parameters

Chicago 22, LLC is proposing the following parameters for the WRJK-LD digital operation on Ch. 36:

Coordinates:	41° 52' 44.0" N (NAD83) 87° 38' 08.0" W
ERP:	2.4 kW
RCAMSL:	636.4m
RCAGL:	455.0m
Antenna:	Scala 2x2 UTV-01/X A-207-27 P-3-1
Mask:	Full-Service

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Interference

An interference study was conducted of the proposed facility parameters using the FCC TVStudy software (Version 2.2.5) with the **terrain profile increment set to a higher resolution of 0.1 km** than the default parameter (1 km). The results of the study (copy attached hereto) show that potential interference from the proposed facility is not predicted to exceed 0.49% to any full-service DTV or Class A stations or 1.99% to any low power stations as required by the Commission's Rules.

Environmental/RFR

This report addresses only the conditions specified in 47CFR1.1307 that deal with Radio Frequency Radiation. Any other non-RFR conditions that might require the preparation of an EA are beyond the scope of this report; since the structure is existing and registered, such conditions should not be an issue requiring further consideration.

The location of the proposed facility, Willis Tower, is a multi-user site and it is assumed to currently be "in compliance" with FCC guidelines for human exposure to RFR (as defined in OET-65). The worst case ground level RFR contributed to the site by this proposal is calculated to be 0.000391 mW/cm² at 2m AGL, assuming a worst-case 100% relative field at downward elevation angles. The calculated RFR is much less than 5% of the maximum permissible exposure (MPE) for public areas (0.403 mW/cm²) at Ch. 36 (602-608 MHz). Per Section 1.1307(b) of the FCC Rules, the proposed operation would be categorically excluded from taking corrective action in areas with levels above the MPE limit where the contribution to the RFR from the proposed facility is less than 5%.

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There are areas of Willis Tower that may exceed exposure limits (rooftop, antenna support structures, etc.); however, these areas are strictly controlled by the building owner. Chicago 22, LLC, like all tenants with broadcast facilities on Willis Tower, cooperates with the building owner in its RF safety plans/procedures for protecting workers who need access to areas where high levels of RFR may be present. These areas have been properly identified and access to them is restricted.

Chicago 22, LLC, agrees to comply with the Commission's requirements regarding power adjustments or cessation of operation as may be necessary to ensure a compliant environment for worker access.

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Certification

I hereby certify that the foregoing report or statement was prepared by me but may include work performed by others under my supervision or direction. The statements of fact contained therein are believed to be true and correct based on personal knowledge, information and belief unless otherwise stated; with respect to facts not known of my own personal knowledge, I believe them to be true and correct based on their origin from sources known to me to be generally reliable and accurate. I have prepared this document with due care and in accordance with applicable standards of professional practice.

A handwritten signature in black ink, appearing to read "B. Pidek", is written over a horizontal line.

Benjamin L. Pidek, P.E.
February 11, 2020

Attached:
TVStudy Interference Check Report
Antenna Azimuth and Elevation Pattern Plots and Tabulations

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TVStudy TV Interference Check Report for WRJK-LD on Ch. 36

Study created: 2020.02.11 18:29:43

Study build station data: LMS TV 2020-02-11

Proposal: WRJK-LP D36- LD CP ARLINGTON HEIGHTS, IL
File number: WRJK-Ch36-UTVCust
Facility ID: 68061
Station data: User record
Record ID: 1544
Country: U.S.

Build options:
Protect pre-transition records not on baseline channel

Search options:
Non-U.S. records included

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	WGBO-DT	D35	DT	CP	JOLIET, IL	BLANK0000064403	2.4 km
No	WTVP	D35	DT	CP	PEORIA, IL	BLANK0000028050	213.1
No	WLPD-CD	D35	DC	LIC	PLANO, IL	BLANK0000034510	37.1
No	W19CX	D35-	LD	CP	STERLING-DIXON, IL	BLANK0000099267	147.5
No	WPBY-LD	D35	LD	LIC	LAFAYETTE, IN	BLANK0000058858	176.8
No	WBND-LD	D35	LD	LIC	SOUTH BEND, IN	BLANK0000086891	123.8
No	WOLP-CD	D35	DC	LIC	GRAND RAPIDS, MI	BLANK0000086899	196.6
No	W50CH-D	D36	DC	CP	ALTON, IL	BLANK0000034449	389.6
No	WMEC	D36	DT	CP	MACOMB, IL	BLANK0000087610	307.0
Yes	WQRF-TV	D36	DT	CP	ROCKFORD, IL	BLANK0000027710	134.5
No	W08DP	D36	LD	CP	SPRINGFIELD, IL	BDISDTA20060630AHG	281.2
No	WCCU	D36	DT	LIC	URBANA, IL	BLANK0000099910	202.5
No	WEIN-LD	D36	LD	CP	EVANSVILLE, IN	BLANK0000071909	429.1
No	WODP-LD	D36	LD	LIC	FORT WAYNE, IN	BLANK0000087022	224.7
No	WBXI-CD	D36	DC	LIC	INDIANAPOLIS, IN	BLANK0000088433	251.2
Yes	WHME-TV	D36	DT	LIC	SOUTH BEND, IN	BLANK0000087036	126.3
No	WAVE	D36	DT	LIC	LOUISVILLE, KY	BLANK0000089043	419.2
No	W36FA-D	D36	LD	LIC	HESPERIA, MI	BLANK0000067768	227.0
No	WUHO-LP	N36+	TX	LIC	KALAMAZOO, MI	BLTTL20060103ABT	169.4
No	WAQP	D36	DT	LIC	SAGINAW, MI	BLANK0000096188	329.0
No	W36FH-D	D36	LD	CP	TRAVERSE CITY, MI	BLANK0000071935	356.4
No	KAAL	D36	DT	LIC	AUSTIN, MN	BLCDDT20091110AAF	444.6
No	WTTE	D36	DT	LIC	COLUMBUS, OH	BLCDDT20050701ABA	443.6
No	WRGT-TV	D36	DT	CP	DAYTON, OH	BLANK0000034495	371.8
No	WMNT-CD	D36	DC	LIC	TOLEDO, OH	BLANK0000067041	341.2
No	WACY-TV	D36	DT	LIC	APPLETON, WI	BLANK0000074905	277.0
No	WZCK-LD	D36	LD	LIC	MADISON-MIDDLETON, WI	BLANK0000017350	199.5
Yes	WMKE-CD	D36	DC	CP	MILWAUKEE, WI	BLANK0000105592	137.1
No	WMVS	D36	LD	LIC	MILWAUKEE, WI	BLEDT20120921AAO	137.1
No	W36DH	N36-	TX	LIC	WAUPACA, WI	BLTTT20060824AAL	300.7
No	W36EI-D	D36	LD	CP	WAUSAU, WI	BNPDTL20100507ACQ	379.8

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

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Channel: D36-
Mask: Full Service
Latitude: 41 52 44.00 N (NAD83)
Longitude: 87 38 8.00 W
Height AMSL: 636.4 m
HAAT: 0.0 m
Peak ERP: 2.40 kW
Antenna: Scala UTVC 0.0 deg
Elev Pattern: Generic
Elec Tilt: 2.00

50.9 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.358 kW	459.6 m	40.5 km
45.0	0.602	461.4	43.7
90.0	0.024	461.0	25.1
135.0	0.015	461.3	22.8
180.0	1.07	454.0	47.0
225.0	1.81	453.7	50.2
270.0	0.070	450.8	30.6
315.0	0.005	452.9	17.1

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 457 m

Distance to Canadian border: 371.2 km

Distance to Mexican border: 1825.6 km

Conditions at FCC monitoring station: Allegan MI
Bearing: 59.1 degrees Distance: 160.1 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 268.4 degrees Distance: 1484.9 km

Study cell size: 1.00 km
Profile point spacing: 0.10 km

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

---- Below is IX received by proposal WRJK-Ch36-UTVCCust ----

Proposal receives 55.70% interference from scenario 1
No IX check failures found.

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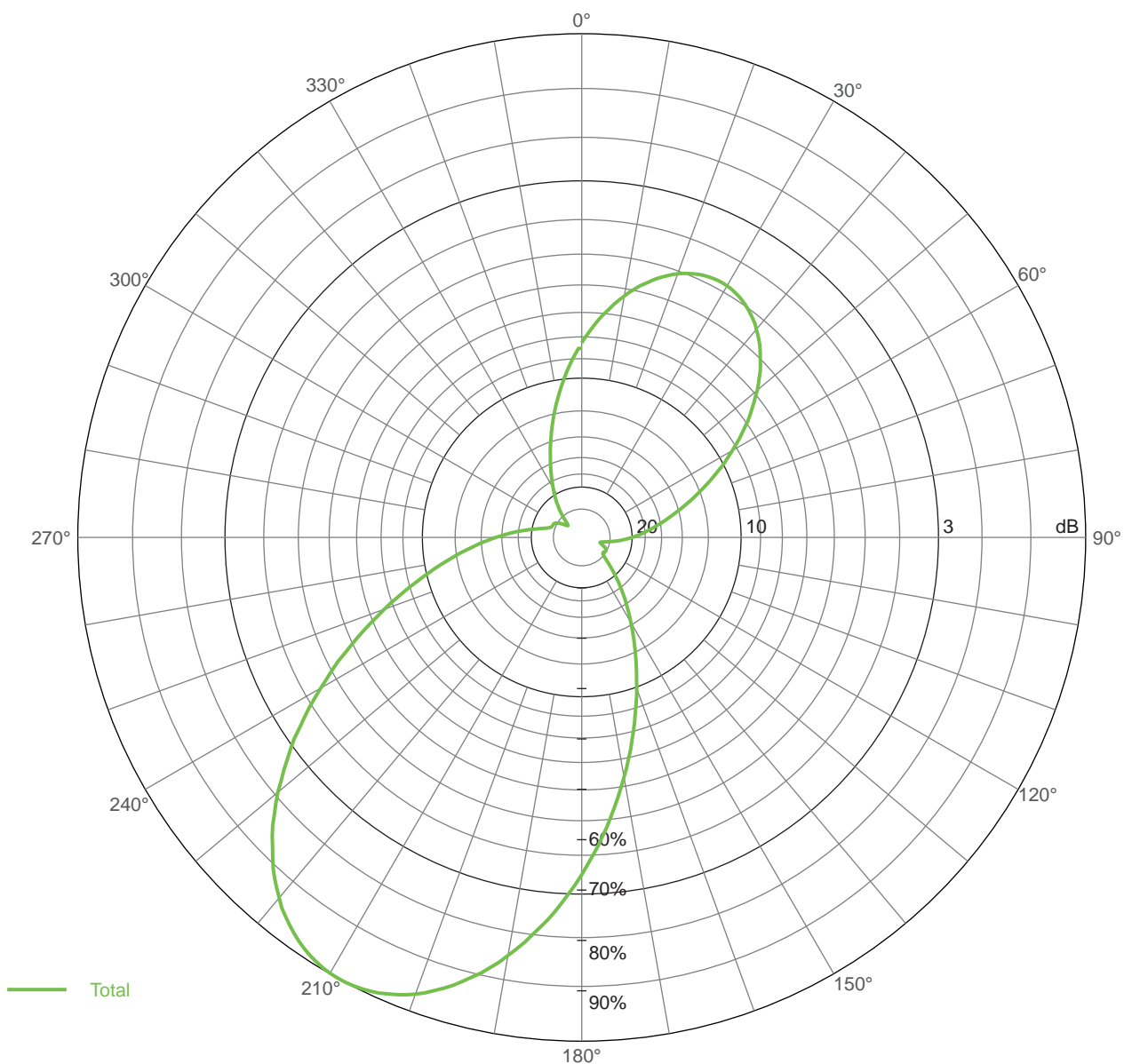
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Azimuthal Pattern (polar-linear)

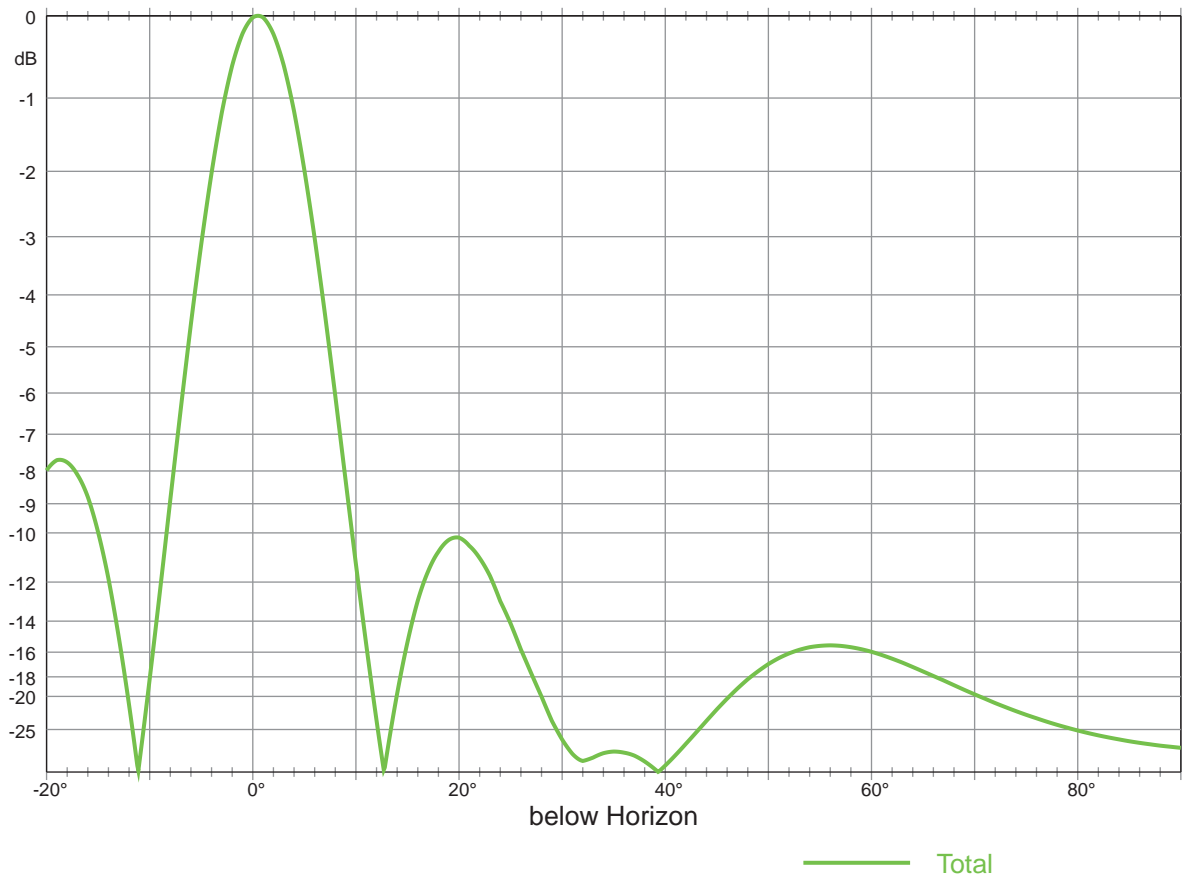


Antenna, Order No. UTVC-01
Panels per Bay: 4

Frequency: 605 MHz
Azimuthal Directivity: 6.82 dB
Directivity: 13.8 dBd

Ant. No.	Azimuth [°]	Radius [mm]	Offset [mm]	Power	Phase [°]
1A	27	165	0	1	90
2A	27	289	0	1	0
1B	207	165	0	3	90
2B	207	289	0	3	0

Elevation Pattern (cartesian-linear)



Antenna, Order No. UTVC-01
Number of Bays: 2

Frequency: 605 MHz
Elevation Directivity: 6.99 dBd
Directivity: 13.8 dBd
Downtilt: 0.5°
Compensation: 100 %

No.	Vert. Distance [mm]	Power	Phase [°]
2	1200	1	12
1	0	1	0

Subject to alternation

Azimuthal Pattern Total

Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB
0	-8.26	45	-6	90	-20	135	-22.08	180	-3.49	225	-1.23	270	-15.34	315	-27.13
1	-8.02	46	-6.14	91	-20.53	136	-21.5	181	-3.25	226	-1.37	271	-15.84	316	-26.48
2	-7.8	47	-6.3	92	-21	137	-20.87	182	-3.03	227	-1.53	272	-16.28	317	-25.78
3	-7.57	48	-6.48	93	-21.54	138	-20.28	183	-2.8	228	-1.72	273	-16.77	318	-25.11
4	-7.35	49	-6.66	94	-22.06	139	-19.71	184	-2.58	229	-1.89	274	-17.22	319	-24.46
5	-7.14	50	-6.84	95	-22.62	140	-19.14	185	-2.37	230	-2.08	275	-17.7	320	-23.82
6	-6.96	51	-7.06	96	-23.3	141	-18.58	186	-2.19	231	-2.3	276	-18.26	321	-23.21
7	-6.78	52	-7.26	97	-23.94	142	-18.06	187	-2.01	232	-2.5	277	-18.78	322	-22.67
8	-6.59	53	-7.48	98	-24.61	143	-17.57	188	-1.82	233	-2.72	278	-19.3	323	-22.17
9	-6.42	54	-7.69	99	-25.36	144	-17.02	189	-1.65	234	-2.92	279	-19.89	324	-21.61
10	-6.26	55	-7.91	100	-26.04	145	-16.51	190	-1.49	235	-3.14	280	-20.42	325	-21.1
11	-6.09	56	-8.18	101	-26.74	146	-16.04	191	-1.32	236	-3.41	281	-20.98	326	-20.65
12	-5.95	57	-8.43	102	-27.33	147	-15.59	192	-1.18	237	-3.66	282	-21.48	327	-20.21
13	-5.81	58	-8.67	103	-27.81	148	-15.09	193	-1.04	238	-3.91	283	-21.96	328	-19.74
14	-5.69	59	-8.96	104	-28.25	149	-14.63	194	-0.92	239	-4.19	284	-22.48	329	-19.31
15	-5.57	60	-9.24	105	-28.39	150	-14.19	195	-0.8	240	-4.47	285	-22.88	330	-18.9
16	-5.45	61	-9.53	106	-28.4	151	-13.75	196	-0.68	241	-4.75	286	-23.23	331	-18.48
17	-5.35	62	-9.8	107	-28.24	152	-13.29	197	-0.58	242	-5.02	287	-23.53	332	-18.05
18	-5.26	63	-10.08	108	-27.92	153	-12.84	198	-0.48	243	-5.3	288	-23.75	333	-17.63
19	-5.16	64	-10.43	109	-27.56	154	-12.42	199	-0.39	244	-5.64	289	-23.92	334	-17.23
20	-5.08	65	-10.74	110	-27.18	155	-11.98	200	-0.31	245	-5.95	290	-24.01	335	-16.8
21	-5.01	66	-11.05	111	-26.8	156	-11.56	201	-0.24	246	-6.26	291	-24.06	336	-16.39
22	-4.96	67	-11.39	112	-26.41	157	-11.15	202	-0.19	247	-6.59	292	-24.09	337	-15.99
23	-4.91	68	-11.73	113	-26.08	158	-10.74	203	-0.14	248	-6.93	293	-24.11	338	-15.59
24	-4.86	69	-12.08	114	-25.81	159	-10.35	204	-0.09	249	-7.27	294	-24.12	339	-15.2
25	-4.83	70	-12.4	115	-25.59	160	-9.92	205	-0.05	250	-7.59	295	-24.16	340	-14.78
26	-4.8	71	-12.74	116	-25.42	161	-9.51	206	-0.03	251	-7.93	296	-24.21	341	-14.37
27	-4.78	72	-13.12	117	-25.31	162	-9.15	207	-0.01	252	-8.31	297	-24.3	342	-14
28	-4.77	73	-13.47	118	-25.25	163	-8.79	208	0	253	-8.66	298	-24.43	343	-13.63
29	-4.77	74	-13.82	119	-25.25	164	-8.39	209	0	254	-9.02	299	-24.6	344	-13.23
30	-4.78	75	-14.21	120	-25.27	165	-8.02	210	-0.01	255	-9.41	300	-24.84	345	-12.86
31	-4.8	76	-14.56	121	-25.34	166	-7.68	211	-0.03	256	-9.76	301	-25.13	346	-12.51
32	-4.83	77	-14.94	122	-25.43	167	-7.3	212	-0.06	257	-10.14	302	-25.44	347	-12.12
33	-4.86	78	-15.28	123	-25.57	168	-6.98	213	-0.09	258	-10.5	303	-25.88	348	-11.8
34	-4.91	79	-15.64	124	-25.62	169	-6.62	214	-0.13	259	-10.87	304	-26.28	349	-11.44
35	-4.96	80	-16.03	125	-25.69	170	-6.32	215	-0.19	260	-11.27	305	-26.77	350	-11.13
36	-5.02	81	-16.4	126	-25.66	171	-6	216	-0.25	261	-11.66	306	-27.24	351	-10.8
37	-5.1	82	-16.76	127	-25.57	172	-5.69	217	-0.32	262	-12.03	307	-27.7	352	-10.48
38	-5.17	83	-17.13	128	-25.43	173	-5.38	218	-0.4	263	-12.42	308	-28.19	353	-10.18
39	-5.25	84	-17.54	129	-25.17	174	-5.09	219	-0.48	264	-12.84	309	-28.56	354	-9.88
40	-5.37	85	-17.94	130	-24.81	175	-4.79	220	-0.59	265	-13.26	310	-28.75	355	-9.57
41	-5.47	86	-18.3	131	-24.39	176	-4.52	221	-0.7	266	-13.63	311	-28.8	356	-9.3
42	-5.58	87	-18.68	132	-23.88	177	-4.24	222	-0.81	267	-14.02	312	-28.65	357	-9.01
43	-5.71	88	-19.14	133	-23.31	178	-3.99	223	-0.94	268	-14.49	313	-28.28	358	-8.77
44	-5.85	89	-19.57	134	-22.73	179	-3.74	224	-1.08	269	-14.92	314	-27.79	359	-8.51

Frequency: 605 MHz

Gain: 13.8 dBd

KATHREIN

Mid-state Consultants BP

ch 36

Date: 2020.02.11

2x2 UTVG-01/X

KBU mj

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Elevation Pattern Total

Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB	Angle	dB
0	-0.02	45	-21.64	90	-29.9	135	-33.07	180	-39.15	225	-35.09	270	-46.24	315	-17.17
1	-0.02	46	-20.26	91	-30.2	136	-34.82	181	-39.66	226	-34.12	271	-45.42	316	-18.28
2	-0.21	47	-19.14	92	-30.49	137	-37.1	182	-40.26	227	-33.33	272	-44.44	317	-19.71
3	-0.59	48	-18.22	93	-30.82	138	-40.07	183	-41.57	228	-32.72	273	-43.31	318	-21.47
4	-1.17	49	-17.51	94	-31.06	139	-44.39	184	-43.05	229	-32.25	274	-42.17	319	-23.75
5	-1.98	50	-16.91	95	-31.3	140	-52.58	185	-45.13	230	-31.86	275	-40.98	320	-26.87
6	-3.03	51	-16.45	96	-31.58	141	-59.73	186	-47.82	231	-31.63	276	-39.76	321	-31.32
7	-4.36	52	-16.09	97	-31.74	142	-47.83	187	-50.82	232	-31.46	277	-38.51	322	-39.73
8	-6.07	53	-15.83	98	-31.91	143	-43.44	188	-53.5	233	-31.3	278	-37.21	323	-47.61
9	-8.27	54	-15.65	99	-32.04	144	-40.78	189	-56.08	234	-31.3	279	-36	324	-36.02
10	-11.22	55	-15.55	100	-32.14	145	-38.97	190	-60.09	235	-31.35	280	-34.75	325	-32.34
11	-15.46	56	-15.52	101	-32.25	146	-37.5	191	-77.84	236	-31.48	281	-33.56	326	-30.61
12	-23.32	57	-15.55	102	-32.27	147	-36.24	192	-58.45	237	-31.63	282	-32.38	327	-29.68
13	-32.59	58	-15.65	103	-32.21	148	-35.11	193	-50.49	238	-31.8	283	-31.24	328	-28.67
14	-19.68	59	-15.79	104	-32.13	149	-34.06	194	-45.65	239	-32.07	284	-30.12	329	-26.72
15	-15.3	60	-15.97	105	-32	150	-33.1	195	-42.23	240	-32.34	285	-29.02	330	-23.95
16	-12.89	61	-16.21	106	-31.8	151	-32.24	196	-39.48	241	-32.65	286	-27.97	331	-21.24
17	-11.52	62	-16.49	107	-31.54	152	-31.44	197	-37.32	242	-32.98	287	-26.95	332	-18.63
18	-10.71	63	-16.79	108	-31.22	153	-30.9	198	-35.61	243	-33.39	288	-25.92	333	-16.22
19	-10.26	64	-17.15	109	-30.95	154	-30.52	199	-34.28	244	-33.78	289	-24.99	334	-14.26
20	-10.17	65	-17.53	110	-30.62	155	-30.26	200	-33.31	245	-34.21	290	-24.04	335	-12.6
21	-10.48	66	-17.92	111	-30.31	156	-30.21	201	-32.54	246	-34.69	291	-23.15	336	-11.19
22	-10.97	67	-18.34	112	-29.97	157	-30.35	202	-32.1	247	-35.24	292	-22.26	337	-9.96
23	-11.72	68	-18.8	113	-29.66	158	-30.75	203	-31.9	248	-35.75	293	-21.42	338	-9.02
24	-12.92	69	-19.28	114	-29.42	159	-31.33	204	-31.78	249	-36.32	294	-20.61	339	-8.41
25	-14.14	70	-19.77	115	-29.15	160	-32.23	205	-31.99	250	-36.95	295	-19.84	340	-7.98
26	-15.81	71	-20.27	116	-28.93	161	-33.38	206	-32.37	251	-37.63	296	-19.11	341	-7.69
27	-17.69	72	-20.8	117	-28.72	162	-34.96	207	-32.91	252	-38.34	297	-18.38	342	-7.76
28	-20.02	73	-21.33	118	-28.48	163	-36.95	208	-33.68	253	-39.1	298	-17.7	343	-8.11
29	-23.39	74	-21.88	119	-28.31	164	-39.53	209	-34.62	254	-39.9	299	-17.1	344	-8.78
30	-27.34	75	-22.42	120	-28.12	165	-43.17	210	-35.85	255	-40.73	300	-16.55	345	-9.98
31	-32.41	76	-22.96	121	-27.98	166	-48.8	211	-37.21	256	-41.65	301	-16	346	-11.84
32	-36.69	77	-23.53	122	-27.82	167	-63.01	212	-38.85	257	-42.57	302	-15.54	347	-14.97
33	-34.38	78	-24.09	123	-27.7	168	-55.2	213	-40.74	258	-43.54	303	-15.14	348	-21.04
34	-32.07	79	-24.64	124	-27.61	169	-48.58	214	-43.18	259	-44.5	304	-14.8	349	-38.03
35	-31.35	80	-25.21	125	-27.56	170	-45.67	215	-46.36	260	-45.43	305	-14.52	350	-18.2
36	-31.83	81	-25.76	126	-27.56	171	-43.9	216	-51.28	261	-46.34	306	-14.31	351	-12.41
37	-33.27	82	-26.29	127	-27.64	172	-42.85	217	-63.85	262	-47.16	307	-14.2	352	-8.87
38	-37.09	83	-26.8	128	-27.81	173	-42.05	218	-56.55	263	-47.76	308	-14.17	353	-6.4
39	-48.65	84	-27.3	129	-28.08	174	-41.36	219	-48.7	264	-48.16	309	-14.22	354	-4.54
40	-41.29	85	-27.81	130	-28.5	175	-40.66	220	-44.47	265	-48.41	310	-14.38	355	-3.12
41	-32.97	86	-28.27	131	-29	176	-40.03	221	-41.54	266	-48.29	311	-14.66	356	-2.02
42	-28.56	87	-28.71	132	-29.69	177	-39.48	222	-39.42	267	-48.15	312	-15.05	357	-1.19
43	-25.61	88	-29.15	133	-30.61	178	-39.09	223	-37.67	268	-47.7	313	-15.58	358	-0.59
44	-23.38	89	-29.51	134	-31.71	179	-39.05	224	-36.22	269	-47.02	314	-16.29	359	-0.21

Frequency: 605 MHz

Gain: 13.8 dBd

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Mid-state Consultants BP

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