

## **ENGINEERING EXHIBIT**

### **Digital Low Power Television Station Application for Modification of Construction Permit** prepared for

**Gray Television Licensee, LLC**  
KJTB-LD Paragould, AR  
Facility ID 188803  
Ch. 36 5 kW Directional

*Gray Television Licensee, LLC* (“Gray”) is the licensee of digital Low Power Television station KJTB-LD, Channel 36, Facility ID 188803, Paragould AR. KJTB-LD is licensed to operate at 15 kW effective radiated power (“ERP”) with a directional antenna (file# 0000166715, granted November 10, 2021). A Construction Permit (“CP”, file# 0000181647) authorizes use of a nondirectional antenna at the licensed site. *Gray* proposes herein a modification of the CP to specify an alternate site and use of a different directional antenna at decreased ERP.

As proposed herein, KJTB-LD will employ an antenna to be side-mounted on the tower structure associated with FCC Antenna Structure Registration number 1021470, located 42.1 km (26.2 miles) from the licensed site. No change to the overall structure height is proposed.

The proposed antenna is a Dielectric model DLP-8B having horizontal polarization. The proposed ERP is 5 kW using a “full service” out of channel emission mask. A plot of the directional antenna’s azimuthal pattern is supplied in Figure 1. Figure 2 depicts the coverage contour of the proposed facility as well as that of the licensed facility, demonstrating compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69<sup>1</sup> shows that the proposal complies with the FCC’s interference protection requirements toward all digital television, television translator, LPTV, and

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<sup>1</sup>FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 (“OET-69”). This analysis employed the FCC’s current “TVStudy” software with the default application processing template settings, 1 km cell size, and 1.0 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC’s implementation of

Class A stations. The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility.

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10) and considering 25 percent antenna relative field in downward elevations (antenna elevation pattern data shows 25 percent relative field or less for angles 10-90 degrees below the horizontal), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is  $5.5 \mu\text{W}/\text{cm}^2$ , which is 1.4 percent of the general population/uncontrolled maximum permitted exposure limit. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. This exhibit is limited to the evaluation of exposure to RF electromagnetic field. No increase in structure height is proposed.

**Engineering Exhibit**  
**Gray Television Licensee, LLC (KJTB-LD)**  
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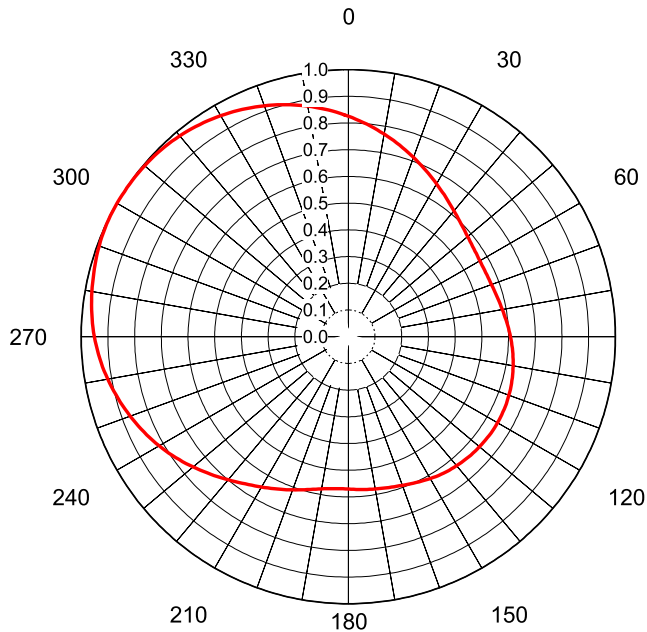


*List of Attachments*

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Table 1	TVStudy Analysis of Proposal
Form 2100	Saved Version of Engineering Sections of FCC Form at Time of Upload

**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.	July 27, 2023	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



## AZIMUTH PATTERN Horizontal Polarization

Proposal No. 20230705jmd  
Date 5-Jul-23  
Call Letters KJTB-LD  
Channel 36  
Frequency 605 MHz  
Antenna Type DLP-8B  
Gain 1.76 (2.45dB)  
Calculated

Pattern Number TLP-B-36 Hpol

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.826	36	0.632	72	0.573	108	0.638	144	0.625	180	0.570	216	0.678	252	0.879	288	0.990
1	0.820	37	0.628	73	0.574	109	0.639	145	0.623	181	0.570	217	0.683	253	0.883	289	0.991
2	0.815	38	0.624	74	0.575	110	0.640	146	0.621	182	0.570	218	0.688	254	0.888	290	0.993
3	0.810	39	0.619	75	0.577	111	0.641	147	0.619	183	0.570	219	0.694	255	0.893	291	0.994
4	0.804	40	0.615	76	0.578	112	0.642	148	0.618	184	0.570	220	0.699	256	0.897	292	0.995
5	0.799	41	0.612	77	0.580	113	0.643	149	0.616	185	0.571	221	0.705	257	0.902	293	0.996
6	0.793	42	0.608	78	0.582	114	0.643	150	0.613	186	0.572	222	0.711	258	0.906	294	0.997
7	0.787	43	0.604	79	0.584	115	0.644	151	0.611	187	0.573	223	0.716	259	0.910	295	0.998
8	0.782	44	0.601	80	0.586	116	0.644	152	0.609	188	0.575	224	0.722	260	0.914	296	0.999
9	0.776	45	0.597	81	0.588	117	0.645	153	0.607	189	0.577	225	0.728	261	0.919	297	0.999
10	0.771	46	0.594	82	0.590	118	0.645	154	0.605	190	0.579	226	0.734	262	0.923	298	0.999
11	0.765	47	0.591	83	0.592	119	0.645	155	0.602	191	0.581	227	0.740	263	0.927	299	1.000
12	0.759	48	0.589	84	0.594	120	0.645	156	0.600	192	0.584	228	0.747	264	0.930	300	1.000
13	0.754	49	0.586	85	0.596	121	0.645	157	0.598	193	0.587	229	0.753	265	0.934	301	1.000
14	0.748	50	0.583	86	0.598	122	0.645	158	0.596	194	0.590	230	0.759	266	0.938	302	0.999
15	0.742	51	0.581	87	0.600	123	0.645	159	0.594	195	0.593	231	0.765	267	0.941	303	0.999
16	0.737	52	0.579	88	0.603	124	0.645	160	0.592	196	0.596	232	0.771	268	0.944	304	0.999
17	0.731	53	0.577	89	0.605	125	0.644	161	0.590	197	0.600	233	0.777	269	0.948	305	0.998
18	0.726	54	0.575	90	0.607	126	0.644	162	0.589	198	0.603	234	0.783	270	0.951	306	0.998
19	0.720	55	0.574	91	0.609	127	0.643	163	0.587	199	0.607	235	0.789	271	0.954	307	0.998
20	0.714	56	0.573	92	0.611	128	0.643	164	0.586	200	0.610	236	0.795	272	0.956	308	0.997
21	0.709	57	0.571	93	0.614	129	0.642	165	0.584	201	0.614	237	0.801	273	0.959	309	0.996
22	0.703	58	0.570	94	0.616	130	0.641	166	0.583	202	0.618	238	0.806	274	0.962	310	0.996
23	0.698	59	0.569	95	0.618	131	0.640	167	0.582	203	0.622	239	0.812	275	0.964	311	0.995
24	0.692	60	0.569	96	0.619	132	0.640	168	0.581	204	0.625	240	0.817	276	0.966	312	0.994
25	0.687	61	0.568	97	0.621	133	0.639	169	0.580	205	0.629	241	0.823	277	0.968	313	0.993
26	0.682	62	0.568	98	0.623	134	0.638	170	0.579	206	0.633	242	0.828	278	0.971	314	0.992
27	0.676	63	0.568	99	0.625	135	0.637	171	0.578	207	0.637	243	0.834	279	0.973	315	0.990
28	0.671	64	0.568	100	0.627	136	0.636	172	0.577	208	0.641	244	0.839	280	0.975	316	0.989
29	0.666	65	0.568	101	0.628	137	0.634	173	0.576	209	0.646	245	0.844	281	0.977	317	0.987
30	0.661	66	0.568	102	0.630	138	0.633	174	0.575	210	0.650	246	0.849	282	0.979	318	0.985
31	0.656	67	0.569	103	0.632	139	0.632	175	0.574	211	0.654	247	0.854	283	0.980	319	0.983
32	0.651	68	0.569	104	0.633	140	0.631	176	0.573	212	0.659	248	0.859	284	0.982	320	0.981
33	0.646	69	0.570	105	0.634	141	0.629	177	0.572	213	0.663	249	0.864	285	0.984	321	0.979
34	0.641	70	0.571	106	0.636	142	0.628	178	0.572	214	0.668	250	0.869	286	0.986	322	0.977
35	0.637	71	0.572	107	0.637	143	0.626	179	0.571	215	0.673	251	0.874	287	0.988	323	0.975

**Figure 1**  
**Antenna Azimuthal Pattern**  
**KJTB-LD Paragould, AR**  
**Facility ID 188803**  
**Ch. 36 5 kW Directional**

prepared for  
**Gray Television Licensee, LLC**

July, 2023

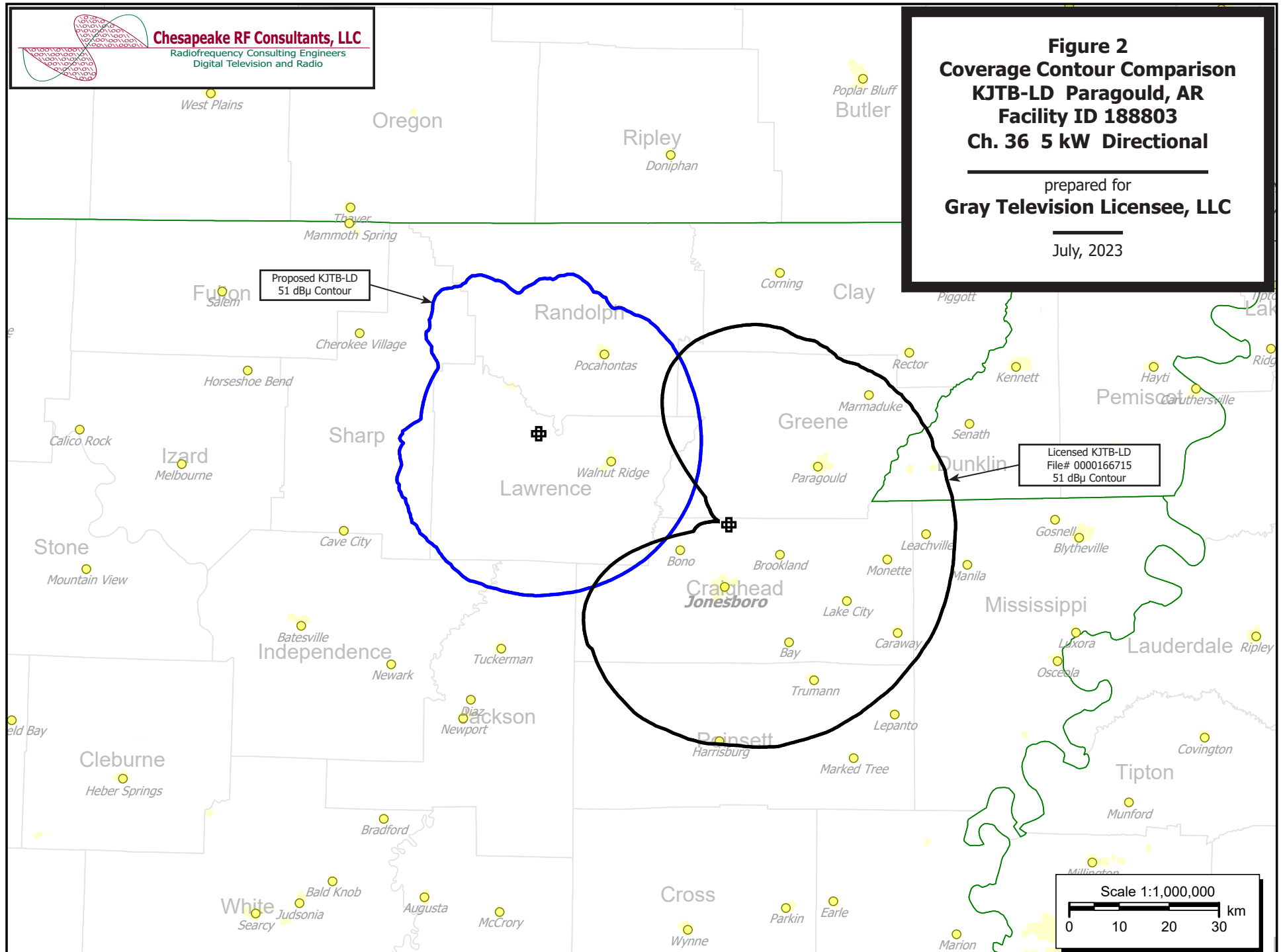


**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 2**  
**Coverage Contour Comparison**  
**KJTB-LD Paragould, AR**  
**Facility ID 188803**  
**Ch. 36 5 kW Directional**

prepared for  
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July, 2023



# **Table 1 KJTB-LD TVStudy Analysis of Proposal** (page 1 of 3)



tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: KJTB-LD 1021470\_DLP-8B, Model: Longley-Rice  
Start: 2023.07.27 13:26:36

Study created: 2023.07.27 13:26:36

Study build station data: LMS TV 2023-07-27

Proposal: KJTB-LD D36 LD APP PARAGOULD, AR  
File number: KJTB-LD 1021470\_DLP-8B  
Facility ID: 188803  
Station data: User record  
Record ID: 40  
Country: U.S.

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

Search options:  
Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KJBW-LD	D35	LD	LIC	PARAGOULD, AR	BLANK0000170679	42.1 km
No	WBBJ-TV	D35	DT	LIC	JACKSON, TN	BLANK0000116047	224.7
No	WSES	D36	DT	LIC	TUSCALOOSA, AL	BLANK0000191494	446.2
No	KLMB-CD	D36z	DC	LIC	EL DORADO, AR	BLANK0000146580	352.8
No	KFFS-CD	D36	DC	LIC	FAYETTEVILLE, AR	BLANK0000055356	275.7
No	KKAP	D36	DT	LIC	LITTLE ROCK, AR	BLEDT20090522AFW	192.6
No	K36MU-D	D36	LD	LIC	TEXARKANA, AR	BLANK0000179477	366.0
No	W36EX-D	D36	DC	LIC	ALTON, IL	BLANK0000132189	323.9
No	WMEC	D36	DT	LIC	MACOMB, IL	BLANK0000113434	476.9
No	WEIN-LD	D36	LD	LIC	EVANSVILLE, IN	BLANK0000164457	377.7
No	KBNS-CD	D36	DC	LIC	BRANSON, MO	BLDTL20100315ADB	195.7
Yes	KBSI	D36	DT	LIC	CAPE GIRARDEAU, MO	BLANK0000115700	199.1
No	KGKM-LD	D36	LD	LIC	COLUMBIA, MO	BLANK0000179478	314.8
No	K36II-D	D36	LD	LIC	JOPLIN, MO	BLDTL20101022ACG	315.0
No	KSHB-TV	D36	DT	LIC	KANSAS CITY, MO	BLANK0000153577	437.8
No	DK36NJ-D	D36	LD	APP	MONETT, MO	BLANK0000058924	266.9
No	KPTN-LD	D36	DC	LIC	ST. LOUIS, MO	BLDTA20111003APE	281.8
Yes	K36NN-D	D36	LD	LIC	WEST PLAINS, MO	BLANK0000059299	97.0
No	WMAV-TV	D36	DT	LIC	OXFORD, MS	BLEDT20090612AAK	240.1
No	WLOO	D36	DT	LIC	VICKSBURG, MS	BLANK0000063959	439.2
No	KDOR-TV	D36	DT	LIC	BARTLESVILLE, OK	BLANK0000067842	419.2
No	WTVF	D36	DT	LIC	NASHVILLE, TN	BLANK0000115766	388.6
No	K27OY-D	N39+	TX	LIC	MEMPHIS, TN	BLTT19930329IE	96.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D36  
Mask: Full Service  
Latitude: 36 7 5.00 N (NAD83)  
Longitude: 91 6 59.00 W  
Height AMSL: 173.7 m  
HAAT: 0.0 m  
Peak ERP: 5.00 kW  
Antenna: DIE TLP-B 300.0 deg  
Elev Pattnr: Generic  
Elec Tilt: 1.00

50.9 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	3.41 kW	67.5 m	31.1 km
45.0	1.79	89.8	31.0
90.0	1.84	94.2	31.7
135.0	2.02	95.1	32.3
180.0	1.62	98.2	31.5
225.0	2.66	72.8	30.7

**Table 1 KJTB-LD TVStudy Analysis of Proposal**  
(page 2 of 3)



270.0      4.52      42.9      27.5  
315.0      4.89      56.7      31.1

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m      Computed HAAT: 77 m

Distance to Canadian border: 943.2 km

Distance to Mexican border: 1183.5 km

Conditions at FCC monitoring station: Powder Springs GA  
Bearing: 111.4 degrees      Distance: 633.6 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 294.1 degrees      Distance: 1309.6 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%

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Interference to BLANK0000115700 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KBSI	D36	DT	LIC	CAPE GIRARDEAU, MO	BLANK0000115700	
Undesireds:	KJTB-LD	D36	LD	APP	PARAGOULD, AR	KJTB-LD 1021470_DLP-8B	199.1 km
	KSDK	D35	DT	LIC	ST. LOUIS, MO	BLANK0000158259	145.7
	W36EX-D	D36	DC	LIC	ALTON, IL	BLANK0000132189	174.8
	WCCU	D36	DT	LIC	URBANA, IL	BLANK0000203559	328.7
	WAVE	D36	DT	LIC	LOUISVILLE, KY	BLANK0000197265	344.4
	WMAV-TV	D36	DT	LIC	OXFORD, MS	BLANK0000115766	346.5
	WTVF	D36	DT	LIC	NASHVILLE, TN	BLANK0000115766	277.3
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	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
35380.9	756,105	34925.6	753,626	34393.6	746,808	34393.6      746,808	0.00      0.00
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Undesired	Total IX		Unique IX, before		Unique IX, after		
KJTB-LD D36 LD APP	1.0	22			0.0	0	
KSDK D35 DT LIC	16.1	33	10.1	33	10.1	33	
W36EX-D D36 DC LIC	49.4	940	43.4	940	43.4	940	
WCCU D36 DT LIC	5.1	12	0.0	0	0.0	0	
WAVE D36 DT LIC	72.7	349	19.2	77	19.2	77	
WMAV-TV D36 DT LIC	2.0	71	1.0	22	0.0	0	
WTVF D36 DT LIC	451.3	5,746	397.8	5,425	397.8	5,425	

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Interference to BLANK0000059299 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K36NN-D	D36	LD	LIC	WEST PLAINS, MO	BLANK0000059299	
Undesireds:	KJTB-LD	D36	LD	APP	PARAGOULD, AR	KJTB-LD 1021470_DLP-8B	97.0 km
	KBNS-CD	D36	DC	LIC	BRANSON, MO	BLDTL20100315ADB	116.1
	KBSI	D36	DT	LIC	CAPE GIRARDEAU, MO	BLANK0000115700	216.8
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	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
5623.4	61,615	5432.8	59,761	5429.8	59,738	5412.7      59,530	0.31      0.35
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Undesired	Total IX		Unique IX, before		Unique IX, after		
KJTB-LD D36 LD APP	17.1	208			17.1	208	
KBNS-CD D36 DC LIC	2.0	23	2.0	23	2.0	23	
KBSI D36 DT LIC	1.0	0	1.0	0	1.0	0	

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Interference to proposal scenario 1

**Table 1 KJTB-LD TVStudy Analysis of Proposal**  
(page 3 of 3)



	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KJTB-LD	D36	LD	APP	PARAGOULD, AR	KJTB-LD 1021470_DLP-8B	
Undesireds:	KBSI	D36	DT	LIC	CAPE GIRARDEAU, MO	BLANK0000115700	199.1 km
	K36NN-D	D36	LD	LIC	WEST PLAINS, MO	BLANK0000059299	97.0
	WMAV-TV	D36	DT	LIC	OXFORD, MS	BLEDT20090612AAK	240.1
Service area		Terrain-limited		IX-free		Percent IX	
2969.6	32,648	2929.3	32,528	2905.1	32,413	0.83	0.35
Undesired		Total IX		Unique IX		Prct Unique IX	
KBSI	D36 DT LIC	8.1	50	3.0	43	0.10	0.13
K36NN-D	D36 LD LIC	16.1	23	11.1	17	0.38	0.05
WMAV-TV	D36 DT LIC	7.1	55	4.0	42	0.14	0.13



**Channel and  
Facility  
Information**

Section	Question	Response
Facility ID	188803	
State	Arkansas	
City	PARAGOULD	
LPD Channel	36	

**Antenna Location  
Data**

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1021470
Coordinates (NAD83)	Latitude	36° 07' 05.0" N+
	Longitude	091° 06' 59.0" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	113.3 meters
	Support Structure Height	113.3 meters
	Ground Elevation (AMSL)	128.0 meters
Antenna Data	Height of Radiation Center Above Ground Level	45.7 meters
	Height of Radiation Center Above Mean Sea Level	173.7 meters
	Effective Radiated Power	5 kW

Antenna  
Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Directional Custom
	Do you have an Antenna ID?	No
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	Dielectric
	Model	DLP-8B
	Rotation	300 degrees
	Electrical Beam Tilt	1.0
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Horizontal
Elevation Radiation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	
	Out-of-Channel Emission Mask:	Full Service

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	Value	Degree	Value	Degree	Value	Degree	Value
0	1.000	90	0.661	180	0.645	270	0.650
10	0.996	100	0.615	190	0.641	280	0.699
20	0.981	110	0.583	200	0.631	290	0.759
30	0.955	120	0.569	210	0.613	300	0.817
40	0.920	130	0.571	220	0.592	310	0.869
50	0.876	140	0.586	230	0.579	320	0.914
60	0.826	150	0.607	240	0.570	330	0.951
70	0.771	160	0.627	250	0.579	340	0.975
80	0.714	170	0.640	260	0.610	350	0.993

Additional Azimuths

Degree	V <sub>A</sub>
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