

ENGINEERING STUDY RESULTS  
REASSIGNMENT OF KEFN-CD TO CHANNEL 20  
(FACILITY ID 9375)  
ST. LOUIS, MISSOURI

This report was prepared concerning a study for a possible reassignment of KEFN-CD to Channel 20. KEFN-CD is licensed for operation on Channel 49 with a maximum directional effective radiated power (ERP) of 15 kW with an antenna height above mean sea level of 377.3 m. As part of the FCC's Incentive Auction channel repack process, KEFN-CD was reassigned to Channel 21 with a replication ERP of 8.52 kW. KEFN-CD holds a construction permit for operation with its replication facility on Channel 21. The FCC engineering database information for the KEFN-CD construction permit facility is attached hereto. Also attached for reference is a map showing the predicted service contour of the KEFN-CD facility.

KEFN-CD was assigned to Phase 9 of the FCC's repack process. This phase has a testing start date of March 14, 2020.

The KEFN-CD facility is part of a linked station set. Specifically, the FCC assigned the KEFN-CD facility to link station set ID 70 due to an interference conflict with station WPXS, Mount Vernon, IL (Facility ID 40861). WPXS is migrating from Channel 21 to Channel 13 through the Incentive Auction repack.

Re-assignment on Channel 20

An interference analysis indicates that KEFN-CD could operate on Channel 20 as its post-auction re-assignment in full compliance with the FCC's 0.5% interference limit. This is based on the replication facility for KEFN-CD, which is for a maximum effective radiated power (ERP) of 8.32 kW on Channel 20. See attached interference analysis results.

The Channel 20 reassignment facility would provide predicted interference-free service to a population of 1,956,681 on a post-repack interference analysis basis. This is an increase of 12,264 compared to the KEFN-CD licensed facility. The KEFN-CD licensed facility provides predicted interference-free service to a population of 1,944,417.

#### Pre-Repack Operation on Channel 20

An interference analysis indicates that KEFN-CD could operate on Channel 20 pre-repack (current allocation environment) in full compliance with the FCC's 0.5% interference limit caused to other licensed and protected facilities. This is based on the replication facility for KEFN-CD, which is for a maximum ERP of 8.32 kW on Channel 20. It is noted that a 'full-service emission mask' is assumed for KEFN-CD for this analysis. See attached interference analysis results for both the caused and received interference cases.

The Channel 20 reassignment facility would provide predicted interference-free service to a population of 1,950,044 under the current allocation environment. This is an increase of 5,627 compared to the KEFN-CD licensed facility. The KEFN-CD licensed facility provides predicted interference-free service to a population of 1,944,417.

#### Re-pack Dependencies

As indicated above, with its reassignment on Channel 21, KEFN-CD is part of a linked station set due its interference conflict with WPXS on Channel 21.

For KEFN-CD on Channel 20 (with a full-service emission mask), it is removed from the linked station set with WPXS on Channel 21. The KEFN-CD assignment on Channel 20 will not create any interference conflicts or new linked station sets. Therefore, the reassignment of KEFN-CD to Channel 20 will eliminate a linked station set case with WPXS and it will not create any new linked station set cases.

# TV Inquiry

du Treil, Lundin, & Rackley, Inc., Sarasota, Florida



**Callsign:** KEFN-CD    **Service:** DC    **Status:** CP    **App. Status:** GRANT    **Border Code:**    **Rec. Type:** C  
**Channel:** 21    **Offset:** Z    **Zone:**    **Docket Number:**    **DTV Type:** POSTTRAN  
**Fac. ID:** 9375    **Assoc. ID:**    **Application File No.:** BLANK-0000027201    **DT Emission Mask:** T  
**City:** ST. LOUIS    **State:** MO    **Country:** US    **CP Expiration Date:**  
**Party Name:** ETERNAL FAMILY NETWORK    **Last Change Date:** 7/20/2017

**Latitude (NAD 27):** 38-25-01    **Height AGL (m):** 141    **Polarization:** H  
**Longitude (NAD 27):** 090-25-59    **Overall Height AGL (m):** 174    **Electrical Tilt (°):** 1.75  
**Latitude (NAD 83):** 038-25-01.2    **ERP (kW):** 8.52    **Mechanical Tilt (°):**  
**Longitude (NAD 83):** 090-25-59.4    **Maximum ERP (kW):**    **Mechanical Tilt Azimuth (°):**  
**RCAMSL (m):** 377.3    **Maximum ERP (dBk):** 9.3    **Degrees True (°):**  
**Site Elevation AMSL (m):** 236.3    **Maximum ERP at any Angle (kW):**    **Antenna Make:**  
**HAAT (m):**    **Antenna Model:**  
**Maximum HAAT (m):**

**Antenna Type:** D    **Antenna ID:** 1001905    **Rotation (°):** 0

0° 1.000    90° 0.316    180° 0.236    270° 0.316  
 10° 0.972    100° 0.269    190° 0.202    280° 0.368  
 20° 0.906    110° 0.221    200° 0.147    290° 0.435  
 30° 0.815    120° 0.168    210° 0.104    300° 0.517  
 40° 0.713    130° 0.120    220° 0.094    310° 0.611  
 50° 0.611    140° 0.094    230° 0.120    320° 0.713  
 60° 0.517    150° 0.104    240° 0.168    330° 0.815  
 70° 0.435    160° 0.147    250° 0.221    340° 0.906  
 80° 0.368    170° 0.202    260° 0.269    350° 0.972

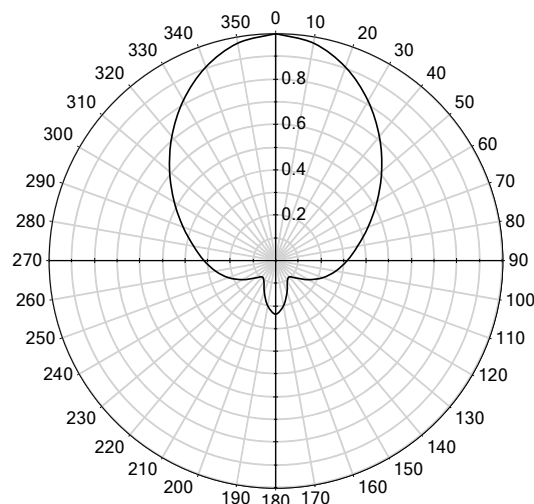
**Standard Pattern:**

**Antenna Make:** ERI

**Antenna Model:** AL8N-21-PL

**Last Change Date:**

**Note:** Rotation or tilt is not applied to the pattern shown



**Type:** TOWER    **ASRN:** 1007157    **FAA Study No.:** 83-ACE-666-OE    **Structure Height (m):** 174.3  
**Latitude (NAD 27):** 038-25-00.8    **Date Received:** 10/31/1996    **Structure Height (ft):** 571.9  
**Longitude (NAD 27):** 090-25-58.6    **Date Entered:** 11/07/1996    **Ground Elevation (m):** 236.3  
**Latitude (NAD 83):** 38-25-01.0    **Date Issued:** 03/04/1997    **Ground Elevation (ft):** 775.3  
**Longitude (NAD 83):** 090-25-59.0    **Date Constructed:** 07/01/1987    **Overall Height AGL (m):** 174.0  
**Struct. Address:**    **Date Dismantled:**    **Overall Height AGL (ft):** 570.9  
 4802 MACHA RD    **Overall Height AMSL (m):** 410.3  
 IMPERIAL    **Overall Height AMSL (ft):** 1346.1  
**Entity Name:** DOUBLE HELIX CORPORATION DBA = KDHX



# INTERFERENCE ANALYSIS FOR KEFN-CD CHANNEL 20 FACILITY UNDER POST-REPACK ALLOCATION ENVIRONMENT

tvstudy v2.2.3 (Dxtpx3)  
Database: localhost, Study: kefn20poll, Model: Longley-Rice  
Start: 2017.09.16 11:13:37

Study created: 2017.09.16 11:12:45

Study build station data: LMS TV 2017-09-13 (51)

Proposal: KEFN20P011 D20z DC APP ST. LOUIS, MO  
File number: kefn20poll  
Facility ID: 9375  
Station data: User record  
Record ID: 1276  
Country: U.S.

Build options:  
Protect LPTV records from Class A

Stations affected by proposal:

Call	Chan	Svc	Status	City, State	File Number	Distance
KPTN-LD	D19	LD	CP	ST. LOUIS, MO	BLANK0000024610	19.8 km
WAND	D20	DT	CP	DECATUR, IL	BLANK0000028607	219.4
KNLJ	D20	DT	LIC	JEFFERSON CITY, MO	BLCDT20110121ACA	147.5

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D20z  
Mask: Full Service  
Latitude: 38 25 1.00 N (NAD83)  
Longitude: 90 25 59.00 W  
Height AMSL: 377.3 m  
HAAT: 0.0 m  
Peak ERP: 8.32 kW  
Antenna: ERI-AL8N-21-PL (ID 1001905) 0.0 deg  
Elev Pattn: Generic  
Elec Tilt: 1.8

49.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	8.32 kW	234.8 m	50.7 km
45.0	3.65	221.6	45.7
90.0	0.831	242.2	39.1
135.0	0.095	242.0	27.7
180.0	0.463	186.1	32.9
225.0	0.095	141.9	22.2
270.0	0.831	181.5	35.7
315.0	3.65	164.9	42.4

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 202 m

Distance to Canadian border: 733.3 km

Distance to Mexican border: 1391.8 km

Conditions at FCC monitoring station: Allegan MI  
Bearing: 37.7 degrees Distance: 599.7 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 283.1 degrees Distance: 1285.3 km

No land mobile station failures found

Study cell size: 1.00 km

# INTERFERENCE ANALYSIS FOR KEFN-CD CHANNEL 20 FACILITY UNDER POST-REPACK ALLOCATION ENVIRONMENT

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 BLANK0000024610 CP, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KPTN-LD	D19	LD	CP	ST. LOUIS, MO	BLANK0000024610	
Undesireds:	KEFN20P011D20z	DC	APP		ST. LOUIS, MO	kefn20po11	19.8 km
	KDKZ-LD	D18	LD	LIC	FARMINGTON, MO	BLANK0000029554	88.7
	W19EE-D	D19	LD	APP	JACKSONVILLE, IL	BLANK0000013745	139.4
	WPSD-TV	D19	DT	CP	PADUCAH, KY	BLANK0000027223	193.7
	KYTV	D19	DT	CP	SPRINGFIELD, MO	BLANK0000025226	277.3
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
5721.1	2,230,384	5531.2	2,220,285	5346.7	2,198,777	5342.7 2,198,610	0.08 0.01

Undesired	Total IX		Unique IX, before		Unique IX, after	
KEFN20P011 D20z DC APP	5.0	274			4.0	167
KDKZ-LD D18 LD LIC	14.1	2,141	6.0	141	6.0	141
W19EE-D D19 LD APP	3.0	367	1.0	46	1.0	46
WPSD-TV D19 DT CP	163.4	20,067	142.3	16,363	141.3	16,256
KYTV D19 DT CP	28.1	3,829	14.1	1,254	14.1	1,254

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Interference to BLANK0000024610 CP, scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KPTN-LD	D19	LD	CP	ST. LOUIS, MO	BLANK0000024610	
Undesireds:	KEFN20P011D20z	DC	APP		ST. LOUIS, MO	kefn20po11	19.8 km
	KDKZ-LD	D18	LD	LIC	FARMINGTON, MO	BLANK0000029554	88.7
	WPSD-TV	D19	DT	CP	PADUCAH, KY	BLANK0000027223	193.7
	KYTV	D19	DT	CP	SPRINGFIELD, MO	BLANK0000025226	277.3
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
5721.1	2,230,384	5531.2	2,220,285	5347.8	2,198,823	5343.7 2,198,656	0.08 0.01

Undesired	Total IX		Unique IX, before		Unique IX, after	
KEFN20P011 D20z DC APP	5.0	274			4.0	167
KDKZ-LD D18 LD LIC	14.1	2,141	6.0	141	6.0	141
WPSD-TV D19 DT CP	163.4	20,067	143.3	16,684	142.3	16,577
KYTV D19 DT CP	28.1	3,829	14.1	1,254	14.1	1,254

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Interference to BLANK0000028607 CP, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WAND	D20	DT	CP	DECATUR, IL	BLANK0000028607	
Undesireds:	KEFN20P011D20z	DC	APP		ST. LOUIS, MO	kefn20po11	219.4 km
	WWME-CD	D20	DC	CP	CHICAGO, IL	BLANK0000028191	236.5
	WTSN-CD	D20	DC	LIC	EVANSVILLE, IN	BLDTL20120328AJA	256.8
	KNLJ	D20	DT	LIC	JEFFERSON CITY, MO	BLCDT20110121ACA	312.5
	WLWT	D20	DT	CP	CINCINNATI, OH	BLANK0000024626	380.8
	WHA-TV	D20	DT	LIC	MADISON, WI	BLEDT20091229ACK	349.9
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
36765.4	1,380,645	36684.7	1,374,425	36571.4	1,370,976	36569.4 1,370,961	0.01 0.00

Undesired	Total IX		Unique IX, before		Unique IX, after	
KEFN20P011 D20z DC APP	2.0	15			2.0	15
WWME-CD D20 DC CP	96.4	2,204	95.4	2,204	95.4	2,204
WTSN-CD D20 DC LIC	2.0	0	2.0	0	2.0	0
KNLJ D20 DT LIC	8.0	968	6.0	1	6.0	1
WLWT D20 DT CP	3.0	67	3.0	67	3.0	67
WHA-TV D20 DT LIC	7.0	1,177	4.0	210	4.0	210

# INTERFERENCE ANALYSIS FOR KEFN-CD CHANNEL 20 FACILITY UNDER POST-REPACK ALLOCATION ENVIRONMENT

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Interference to BLCDT20110121ACA LIC, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KNLJ	D20	DT	LIC	JEFFERSON CITY, MO	BLCDT20110121ACA	
Undesireds:	KEFN20PO11D20z	DC	APP		ST. LOUIS, MO	kefn20pol1	147.5 km
	KYTV	D19	DT	CP	SPRINGFIELD, MO	BLANK0000025226	185.8
	KTEJ	D20	DT	LIC	JONESBORO, AR	BLEDT20110818AAQ	332.4
	WAND	D20	DT	CP	DECATUR, IL	BLANK0000028607	312.5

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
28648.7	655,482	28186.8	646,638	28063.6
				645,310
				28019.5
				644,158
				0.16
				0.18

Undesired	Total IX	Unique IX, before	Unique IX, after
KEFN20PO11 D20z DC APP	73.2	1,440	44.1
			1,152
KYTV D19 DT CP	15.2	162	15.2
		162	162
KTEJ D20 DT LIC	27.3	683	24.2
		683	628
WAND D20 DT CP	81.8	483	54.7
		483	250

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Interference to proposal, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KEFN20PO11D20z	DC	APP		ST. LOUIS, MO	kefn20pol1	
Undesireds:	WAND	D20	DT	CP	DECATUR, IL	BLANK0000028607	219.4 km
	KNLJ	D20	DT	LIC	JEFFERSON CITY, MO	BLCDT20110121ACA	147.5

Service area	Terrain-limited	IX-free	Percent IX
4549.2	1,967,570	4384.6	1,957,961
		4264.2	1,950,044
			2.75
			0.40

Undesired	Total IX	Unique IX	Prcnt Unique IX
WAND D20 DT CP	106.4	7,443	82.3
		6,637	6,637
KNLJ D20 DT LIC	38.2	1,280	14.1
		474	474
			1.88
			0.34
			0.32
			0.02

# INTERFERENCE CAUSED ANALYSIS FOR KEFN-CD CHANNEL 20 FACILITY UNDER CURRENT ALLOCATION ENVIRONMENT

tvstudy v2.2.3 (Dxtpx3)

Database: localhost, Study: kefn20pr10, Model: Longley-Rice

Study build station data: LMS TV 2017-09-13 (51)

Proposal: KEFN20PR10 D20z DC APP ST. LOUIS, MO  
File number: kefn20pr10  
Facility ID: 9375  
Station data: User record  
Record ID: 1274  
Country: U.S.

Build options:

Protect records not on baseline channel  
Protect LPTV records from Class A

Individual records excluded:

0000024610 KPTN-LD D19 LD CP ST. LOUIS, MO BLANK0000024610  
0000028607 WAND D20 DT CP DECATUR, IL BLANK0000028607  
70852 WAND D20 DT BL DECATUR, IL DTVBL70852

Stations affected by proposal:

Call	Chan	Svc	Status	City, State	File Number	Distance
KNLJ	D20	DT	LIC	JEFFERSON CITY, MO	BLCDT20110121ACA	147.5 km
WPXS	D21	DT	LIC	MOUNT VERNON, IL	BLCDT20081103AAG	81.6

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D20z  
Mask: Full Service  
Latitude: 38 25 1.00 N (NAD83)  
Longitude: 90 25 59.00 W  
Height AMSL: 377.3 m  
HAAT: 0.0 m  
Peak ERP: 8.32 kW  
Antenna: ERI-AL8N-21-PL (ID 1001905) 0.0 deg  
Elev Pattn: Generic  
Elec Tilt: 1.8

49.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	8.32 kW	234.8 m	50.7 km
45.0	3.65	221.6	45.7
90.0	0.831	242.2	39.1
135.0	0.095	242.0	27.7
180.0	0.463	186.1	32.9
225.0	0.095	141.9	22.2
270.0	0.831	181.5	35.7
315.0	3.65	164.9	42.4

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 202 m

Distance to Canadian border: 733.3 km

Distance to Mexican border: 1391.8 km

Conditions at FCC monitoring station: Allegan MI  
Bearing: 37.7 degrees Distance: 599.7 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 283.1 degrees Distance: 1285.3 km

No land mobile station failures found



# INTERFERENCE CAUSED ANALYSIS FOR KEFN-CD CHANNEL 20 FACILITY UNDER CURRENT ALLOCATION ENVIRONMENT

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 BLCDT20110121ACA LIC, scenario 1

Desired:	Call KNLJ	Chan D20	Svc DT	Status LIC	City, State JEFFERSON CITY, MO	File Number BLCDT20110121ACA	Distance
Undesireds:	KEFN20PR10D20z	DC	APP		ST. LOUIS, MO	kefn20pr10	147.5 km
	KYTV	D19	DT	CP	SPRINGFIELD, MO	BLANK0000025226	185.8
	KTEJ	D20	DT	LIC	JONESBORO, AR	BLEDT20110818AAQ	332.4

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
28648.7    655,482	28186.8    646,638	28144.4    645,793	28074.2    644,408	0.25    0.21

Undesired	Total IX	Unique IX, before	Unique IX, after
KEFN20PR10 D20z DC APP	73.2    1,440		70.2    1,385
KYTV D19 DT CP	15.2    162	15.2    162	15.2    162
KTEJ D20 DT LIC	27.3    683	27.3    683	24.2    628

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Interference to BLCDT20081103AAG LIC, scenario 1

Desired:	Call WPXS	Chan D21	Svc DT	Status LIC	City, State MOUNT VERNON, IL	File Number BLCDT20081103AAG	Distance
Undesireds:	KEFN20PR10D20z	DC	APP		ST. LOUIS, MO	kefn20pr10	81.6 km
	KGCW	D21	DT	CP	BURLINGTON, IA	BLANK0000028473	292.0
	WMEC	D21	DT	LIC	MACOMB, IL	BLEDT20031031ADO	214.9
	WJKT	D21	DT	CP	JACKSON, TN	BLANK0000027712	324.7
	WUXP-TV	D21	DT	LIC	NASHVILLE, TN	BLCDT20060414AAU	363.5

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
8999.0    1,157,799	8988.9    1,151,418	8979.9    1,147,121	8979.9    1,147,121	0.00    0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
KEFN20PR10 D20z DC APP	1.0    15		0.0    0
KGCW D21 DT CP	6.0    3,306	0.0    0	0.0    0
WMEC D21 DT LIC	9.0    4,297	2.0    47	2.0    47
WJKT D21 DT CP	1.0    944	0.0    0	0.0    0
WUXP-TV D21 DT LIC	1.0    944	0.0    0	0.0    0

# INTERFERENCE RECEIVED ANALYSIS FOR KEFN-CD CHANNEL 20 FACILITY UNDER CURRENT ALLOCATION ENVIRONMENT

Interference to proposal, scenario 1

Desired:	Call KEFN20PR10D20z	Chan DC	Svc APP	Status	City, State ST. LOUIS, MO	File Number kefn20pr10	Distance
Undesireds:	KNLJ	D20	DT	LIC	JEFFERSON CITY, MO	BLCDT20110121ACA	147.5 km
	Service area				Terrain-limited		
	4549.2	1,967,570			4384.6	1,957,961	4346.5
							IX-free
							1,956,681
							Percent IX
							0.87
							0.07
Undesired					Total IX		Unique IX
KNLJ D20 DT LIC					38.2	1,280	38.2
							1,280
							Prct Unique IX
							0.87
							0.07