

ENGINEERING EXHIBIT

Displacement Application for Modification of Digital Low Power Television Station

prepared for

Ramar Communications, Inc.

KABI-LD Snyder, TX

Facility ID 55048

Ch. 32 (digital) 1.34 kW

Ramar Communications, Inc. (“*Ramar*”) is the licensee of digital low power television station KABI-LD, Channel 42, Snyder TX, Facility ID 55048. KABI-LD has received a 120 day notice from a 600 MHz licensee that the wireless licensee intends to commence operations and KABI-LD is predicted to cause interference to the wireless operations. Pursuant to the procedures described in DA 17-584,¹ *Ramar* herein seeks a displacement channel for KABI-LD.

The 120 day notice, attached separately, states that wireless operations will commence on February 4, 2018, in advance of the Special Displacement Window. Therefore, *Ramar* requests a waiver of the Displacement Freeze.² A request for Special Temporary Authority is being submitted contemporaneously to operate on the proposed displacement channel pending the final outcome of the Special Displacement Window.

As proposed herein, KABI-LD will operate at its existing antenna location and height on Channel 32 in lieu of the licensed Channel 42. The existing tower structure is associated with FCC Antenna Structure Registration number 1056573. The proposed KABI-LD Channel 32 facility will employ the existing antenna system and no change to the overall structure height is proposed.

¹“*Incentive Auction Task Force and Media Bureau Set Forth Tools Available to LPTV/Translator Stations Displaced Prior to the Special Displacement Window*,” Public Notice, DA 17-584, released June 13, 2017.

²“*Freeze on the Filing of Applications for Digital Replacement Translator Stations and Displacement Applications*,” Public Notice, DA 14-808, released June 11, 2014.

The existing KABI-LD facility is licensed to operate at 1.28 kW effective radiated power (“ERP”) with a directional antenna. Minor changes in ERP and directional antenna pattern will occur, due to the change in channel. KABI-LD will operate at 1.34 kW ERP with a “stringent” out of channel emission mask on Channel 32. A plot of the directional antenna’s azimuthal pattern is supplied in Figure 1. Figure 2 depicts the 51 dBμ coverage contour of the licensed and proposed facilities, demonstrating compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69³ shows that the proposal complies with the FCC’s interference protection requirements toward all digital television, television translator, LPTV, and Class A stations (existing and post-auction). 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.

The nearest FCC monitoring station is 658 km distant at Kingsville, TX. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring coordination with “quiet” zones specified in §73.1030(a) and (b). There are no authorized AM stations within 3 kilometers of the site. The site location is beyond the border areas requiring international coordination.

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 15 percent antenna relative field in downward elevations (pattern data shows less than 15 percent relative field at angles 15 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $0.17 \mu\text{W}/\text{cm}^2$, which is 0.04 percent of the general population/uncontrolled maximum

³FCC 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 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC’s implementation of TVStudy show excellent correlation.

permitted exposure limit. This is well 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.

List of Attachments

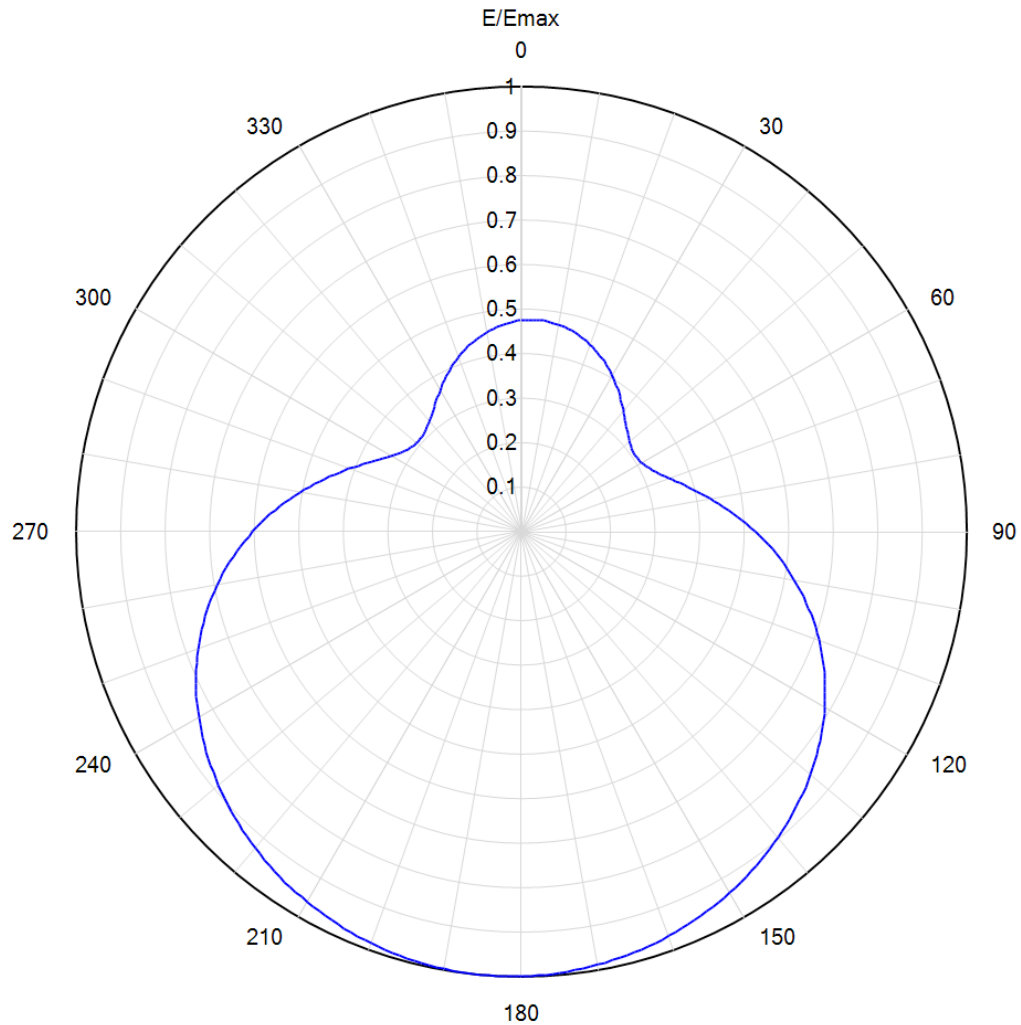
Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Table 1	OET Bulletin 69 Interference Study
Form 2100	Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	January 5, 2018	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



Azimuth Pattern



Model: RD-08RFS(SK)-578704-SL

Location:

Customer:

Date: January 4, 2018

Rotation Angle: 184 degrees

Polarization: Horizontal

Frequency: 581.00 MHz

Directivity: 2.2 (3.39 dB)

Elevation Angle: 0.75 degrees

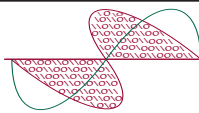
Horizontal Unit Pattern:



Figure 1
Antenna Azimuthal Pattern
KABI-LD Snyder, TX
Facility ID 55048
Ch. 32 (digital) 1.34 kW

prepared for
Ramar Communications, Inc.

January, 2018



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

Figure 2
Coverage Contour Comparison
KABI-LD Snyder, TX
Facility ID 55048
Ch. 32 (digital) 1.34 kW

prepared for
Ramar Communications, Inc.

January, 2018

Proposed Ch. 32
51 dBμ Contour

Licensed Ch. 42
File# 0000016289
51 dBμ Contour

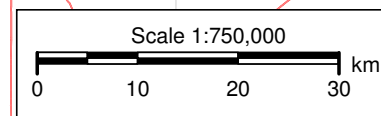


Table 1 KABI-LD OET Bulletin 69 Interference Study
(page 1 of 2)



tvstudy v2.2.4 (Z2Qqz3)
Database: localhost, Study: KABI-LD Prop-32 STR, Model: Longley-Rice
Start: 2018.01.04 12:04:59

Study created: 2018.01.04 12:04:47

Study build station data: LMS TV 2017-01-04 LMSTV

Proposal: KABI-LD D32 LD APP SNYDER, TX
File number: KABI-LD Prop-32 STR
Facility ID: 55048
Station data: User record
Record ID: 1631
Country: U.S.

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

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KJTN-LP	N18z	TX	LIC	ABILENE, TX	BLTTL20051215ABA	115.8 km
No	K31KJ-D	D31	LD	LIC	BIG SPRINGS, TX	BLDTT20121010ABK	78.7
No	KLBK-TV	D31	DT	CP	LUBBOCK, TX	BLANK0000028452	123.2
No	K31LL-D	D31	LD	CP	MIDLAND/ODESSA, TX	BNPDTL20090825AWQ	159.3
No	K31MX-D	D31-	LD	LIC	PLAINVIEW, TX	BLANK0000007435	141.4
No	K31MX-D	D31-	LD	CP	PLAINVIEW, TX	BLANK0000010717	121.6
No	KANG-LP	N31-	TX	LIC	SAN ANGELO, TX	BLTTL19990727JE	146.2
No	K32KU-D	D32	LD	CP	HOBBS, NM	BNPDTL20101012AFB	209.4
No	KENW	D32	DT	LIC	PORTALES, NM	BLEDT20030219ADP	272.1
No	K32FE	N32	TX	LIC	TUCUMCARI, NM	BLTT20000707AEI	368.3
No	K32IC-D	D32	LD	LIC	ALTUS, OK	BLDTT20100709AKE	253.8
No	K32KA-D	D32	LD	CP	CLINTON, OK	BNPDTL20100406ACI	360.4
No	K45JZ-D	D32	LD	APP	ELK CITY, OK	BLANK0000029966	326.0
No	K32KG-D	D32	LD	CP	LAWTON, OK	BNPDTL20100210ABM	296.3
No	K32KS-D	D32	LD	CP	AMARILLO, TX	BNPDTL20100430ABV	296.8
No	KDAF	D32	DT	LIC	DALLAS, TX	BLCDT20010606ABJ	370.8
No	KMYS	D32	DT	LIC	KERRVILLE, TX	BLCDT20060608ACW	399.2
No	K32KF-D	D32	LD	CP	LAMESA, TX	BNPDTL20100323AIO	93.9
No	K32EH-D	D32	LD	LIC	MEMPHIS, TX	BLDTT20101203AAP	229.2
No	KFAW-LD	D32	LD	LIC	MIDLAND, TX	BLDTL20140915ACU	145.6
No	NEW	D32	LD	APP	SHEFFIELD, TX	BNPDTL20100329AFD	239.9
Yes	K32KE-D	D32	LD	CP	SWEETWATER, TX	BNPDTL20100310ACA	64.2
No	K32KT-D	D32	LD	LIC	WICHITA FALLS, TX	BLANK0000001482	254.3
No	K33KX-D	D33	LD	CP	ABILENE, TX	BMPDTL20150120AHI	115.8
Yes	KWAB-TV	D33	DT	LIC	BIG SPRING, TX	BLCDT20090818AAN	76.0
No	KJTV-CD	D33	DC	LIC	WOLFFORTH, TX	BLDTL20101123AOD	121.6

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

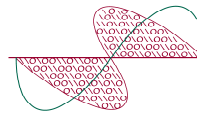
Record parameters as studied:

Channel: D32
Mask: Stringent
Latitude: 32 45 34.00 N (NAD83)
Longitude: 100 54 47.00 W
Height AMSL: 821.2 m
HAAT: 0.0 m
Peak ERP: 1.34 kW
Antenna: RFS RD8SK 184.0 deg
Elev Pattn: Generic
Elec Tilt: 0.75

50.5 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.298 kW	75.5 m	20.3 km
45.0	0.150	119.6	21.5
90.0	0.370	85.0	22.7
135.0	1.02	91.6	28.7
180.0	1.33	115.7	32.6
225.0	1.11	91.7	29.2

Table 1 KABI-LD OET Bulletin 69 Interference Study
(page 2 of 2)



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

270.0 0.487 69.9 22.1
315.0 0.130 67.0 15.4

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 90 m

Distance to Canadian border: 1805.1 km

Distance to Mexican border: 333.0 km

Conditions at FCC monitoring station: Kingsville TX
Bearing: 153.0 degrees Distance: 658.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 336.0 degrees Distance: 903.9 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 BNPDTL20100310ACA CP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K32KE-D	D32	LD	CP	SWEETWATER, TX	BNPDTL20100310ACA	
Undesireds:	KABI-LD	D32	LD	APP	SNYDER, TX	KABI-LD Prop-32 STR	64.2 km
	Service area		Terrain-limited		IX-free, before	IX-free, after	Percent New IX
	1355.2 13,987		1344.1 13,976		1344.1 13,976	1323.1 13,976	1.57 0.00
Undesired			Total IX		Unique IX, before	Unique IX, after	
KABI-LD D32 LD APP		21.1	0		21.1	0	

Interference to BLCDT20090818AAN LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KWAB-TV	D33	DT	LIC	BIG SPRING, TX	BLCDT20090818AAN	
Undesireds:	KABI-LD	D32	LD	APP	SNYDER, TX	KABI-LD Prop-32 STR	76.0 km
	KJTV-CD	D33	DC	LIC	WOLFFORTH, TX	BLDTL20101123AOD	140.2
	Service area		Terrain-limited		IX-free, before	IX-free, after	Percent New IX
	8487.9 50,642		8390.1 50,619		8252.0 50,527	8250.0 50,527	0.02 0.00
Undesired			Total IX		Unique IX, before	Unique IX, after	
KABI-LD D32 LD APP		2.0	0		2.0	0	
KJTV-CD D33 DC LIC		138.1	92		138.1 92	138.1 92	

Interference to proposal scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KABI-LD	D32	LD	APP	SNYDER, TX	KABI-LD Prop-32 STR	
Undesireds:	K32KE-D	D32	LD	CP	SWEETWATER, TX	BNPDTL20100310ACA	64.2 km
	Service area		Terrain-limited		IX-free	Percent IX	
	1912.3 16,780		1898.3 16,780		1895.3 16,780	0.16 0.00	
Undesired			Total IX		Unique IX	Prct Unique IX	
K32KE-D D32 LD CP		3.0	0		3.0 0	0.16 0.00	

**Channel and
Facility
Information**

Section	Question	Response
Proposed Community of License	Facility ID	55048
	State	Texas
	City	SNYDER
	LPT Channel	32

**Antenna Location
Data**

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1056573
Coordinates (NAD83)	Latitude	32° 45' 34.0" N+
	Longitude	100° 54' 47.0" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	97.5 meters
	Support Structure Height	91.4 meters
	Ground Elevation (AMSL)	742.2 meters
Antenna Data	Height of Radiation Center Above Ground Level	79 meters
	Height of Radiation Center Above Mean Sea Level	821.2 meters
	Effective Radiated Power	1.33 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:	RFS
	Model	RD8-SK
	Rotation	184 degrees
	Electrical Beam Tilt	.75
	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:	Stringent

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)
0	1	90	0.565	180	0.476	270	0.565
10	0.994	100	0.467	190	0.465	280	0.659
20	0.976	110	0.380	200	0.433	290	0.743
30	0.950	120	0.322	210	0.386	300	0.813
40	0.914	130	0.309	220	0.337	310	0.868
50	0.868	140	0.337	230	0.309	320	0.914
60	0.813	150	0.386	240	0.322	330	0.950
70	0.743	160	0.433	250	0.380	340	0.976
80	0.659	170	0.465	260	0.467	350	0.994

Additional Azimuths

Degree	V _A
--------	----------------