

APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT

K240ES (FORMERLY K286AR)
ST. LOUIS, MISSOURI
FACILITY ID: 140413
95.9 MHz / 99 W ERP ND

COMMUNITY BROADCASTING, INC.

MAY, 2017

APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT

The following engineering statement and attached exhibits have been prepared for **Community Broadcasting, Inc.** ("CBI"), licensee of FM translator station K286AR, currently at Stover, Missouri, but authorized to change to K240ES and be located at St. Louis, Missouri, and are in support of their application for modification of construction permit.¹ This application seeks to modify the existing construction permit by changing *only* the antenna type associated with the facility.

The current construction permit for the facility specifies operation at St. Louis on FM channel 240 with a maximum effective radiated power of 99 Watts, circularly polarized, at a center of radiation of 320.1 meters AMSL. The authorized antenna type is an Electronics Research, Inc. ("ERI") model LPX-2E. CBI seeks to modify the permit to specify operation with an ERI model LPX-4C. No other changes to the parameters authorized under the construction permit are proposed or requested under this application.

The current construction permit was filed under the Commission's first *AM Revitalization* translator filing window. The application for this construction permit specified KSIV(AM) at Clayton, Missouri as the primary station for the facility.² For reference purposes, Exhibit E-1 has been included to demonstrate that the translator facility would continue to qualify as an AM translator for KSIV. This map illustrates that the translator 60 dBu service contour would be fully contained by both the KSIV 2 mV/m daytime service contour and a 25-mile radius centered on the KSIV transmitter site.

¹ The Facility ID for K286AR (K240ES) at Stover, Missouri (St. Louis, Missouri) is 140413.

² The Facility ID for KSIV at Clayton, Missouri is 6499.

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The translator facility would continue to comply with the provisions of Section 74.1204 of the Commission's Rules. Section 74.1205 is not applicable due to the channel of operation. Exhibits E-2 and E-3 are tabular and contour interference studies for the facility, and demonstrate no change in the situation from that discussed in the original application. A section 74.1204(d) analysis with regard to KNOU at St. Louis, Missouri and WFUN-FM at Bethalto, Illinois continues to be required.³ These two facilities operate second adjacent to the proposed translator.

Although normally prohibited contour overlap would exist between the proposed facility and both KNOU and WFUN-FM, no interference is predicted to occur within any populated region for either facility. Exhibit E-5 illustrates the proposed K286AR transmitter site, which is co-located with KNOU, as well as the WFUN-FM 81.7 dBu service contour. As indicated in Exhibit E-4, this WFUN contour intersects the proposed translator site.

Both facilities operate second adjacent to the proposed translator frequency. No interference to KNOU would result from K286AR due their co-location. The ERP of KNOU is 92 kW, while the translator is 99 Watts. Due to the co-location, no condition would exist where the translator field strength would exceed that of KNOU, let alone be 40 dB above KNOU. In the case of WFUN-FM, interference to that facility would potentially occur in regions where the K286AR field strength is at least 40 dB above that of WFUN. Specifically this would be in regions where the field strength of the translator is at least 121.7 dBu.

³ The Facility ID for KNOU at St. Louis, Missouri is 27022. The Facility ID for WFUN-FM at Bethalto, Illinois is 4948.

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The power density for the interfering field strength is given by the following equation:

$$S = \frac{E^2}{Z_0}$$

In this equation, S represents the calculated power density in Watts per square meter, E is the electric field intensity, and Z_0 is the characteristic impedance of free space of 377 ohms.

The power density is also given by:

$$S = \frac{P}{4\pi R^2}$$

Where S is the same units, P is the total power in Watts and R is the distance from the antenna. Rearranging the terms in the equation, it can be solved for the distance to the desired power density as follows:

$$R^2 = \frac{P}{4\pi S}$$

The results of these calculations for depression angles of 0 degrees to 90 degrees are tabulated in Exhibit E-5. The values listed for the relative field at the various depression angles were obtained from published manufacturer data for the proposed antenna. The listed radii values on this tabulation indicate the boundary of the potential interference region, and as is indicated, the potential interference region is confined to a radius of 57.4 meters from the antenna.

The following satellite image illustrates the tower proposed for use by K286AR. From this image, it can be reasonably inferred that no population would be in any interference region. No structures other than the transmitter building would be located within the 57.4 meter radius, and as

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is indicated in Exhibit E-5, the lowest elevation of the interference region is no closer to the base elevation of the tower than 162 meters above ground level.



The proposed facility would not constitute a significant environmental impact, and is exempt from environmental processing. The translator antenna would utilize an existing structure that is registered with the Commission. The addition of the translator antenna to this tower would not increase the existing environmental impact already present from the structure.

In addition, the proposed facility would not constitute a radiofrequency radiation hazard to persons at the site. The Commission's on-line *FM Model* utility calculates a maximum power density of $0.018 \mu\text{W}/\text{cm}^2$ at a distance of 74 meters from the tower. This value complies with the

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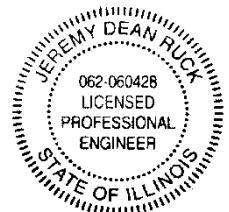
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uncontrolled environment condition of the Commission's safety standard, and is sufficiently low to categorically exclude the facility. The LPX antenna is considered a "type-3" antenna, and was analyzed as such.

CBI certifies that it will coordinate with all other users of the site to ensure that workers and other personnel are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation.

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature
License Expires November 30, 2017

Jeremy D. Ruck, PE
May 18, 2017

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5.18.2017

BPFT20160729ANH
Latitude: 38-34-28 N
Longitude: 090-19-31 W
ERP: 0.099 kW
Channel: 240
Frequency: 95.9 MHz
AMSL Height: 320.0 m
Elevation: 137.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

KSIV 25 mile
Site Radius

Exhibit E-1
Service Contour Comparison
K286AR - St. Louis, Missouri
Community Broadcasting, Inc.
May, 2017

K286AR 60 dBu
Service Contour

KSIV 2 mV/m
Daytime Contour

Scale 1:750,000



Jeremy Ruck & Associates, Inc.
Consulting Engineers - Canton, Illinois

Exhibit E-2 - Tabular Interference Study
K286AR - St. Louis, Missouri
CH# 240D - 95.9 MHz, Pwr= 0.099 kW, HAAT= 0.0 M, COR= 320 M
Average Protected F(50-50)= 5.62 km
Omni-directional

DISPLAY DATES
DATA 05-18-17
SEARCH 05-18-17

REFERENCE
38 34 28.0 N.
90 19 31.0 W.


CH CITY	CALL	TYPE ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
242C1 St. Louis	KNOU	LIC NCX MO	0.0 44.9	0.00 BLH20150318ABQ	38 34 27.7 90 19 31.4	92.000 309	10.1 462	72.3 Emmis Radio License, Lic	-22.7*	-73.0*
240D St. Louis	K286AR	CP _C_ MO	0.0 0.0	0.00 BPFT20160729ANH	38 34 28.0 90 19 31.0	0.099	42.1 320	12.6 Community Broadcasting, Inc	-54.7*	-54.7*
238C3 Bethalto	WFUN-FM	LIC ZCX IL	22.4 202.5	9.35 BLH20121203AQQ	38 39 08.0 90 17 03.0	10.500 155	2.9 312	31.6 Radio One Licenses, Lic	-6.7*	-22.9*
240A Carlinville	WOLG	LIC _C_ IL	25.9 206.2	82.37 BLED20000709AAA	39 14 25.0 89 54 27.0	6.000 99	86.9 287	28.4 Covenant Network	-17.8*	10.1
240C3 Ironton	KYLS-FM	LIC NCX MO	192.4 12.2	103.24 BLH20031121AGE	37 40 02.0 90 34 38.0	3.100 198	88.3 520	31.7 Dockins Broadcast Group, L	1.6	27.2
240A Duquoin	WDQN-FM	LIC _C_ IL	122.2 302.9	112.12 BMLED20150316ABE	38 01 56.0 89 14 30.0	6.000 100	86.7 233	28.1 Three Angels Broadcasting	11.7	38.6
240L1 Sullivan	KSLN-LP	LIC _C_ MO	242.2 61.6	83.03 BLL20150102AAY	38 13 21.2 91 09 56.9	0.041 46	296	45.3 Sullivan Seventh-day Adven	32.5	32.5
239C Mexico	KWWR	LIC NCY MO	296.6 115.5	174.28 BLH20000530ACL	39 15 49.0 92 08 06.0	100.000 360	112.5 608	76.5 Kxeo Radio, Inc.	49.6	80.0

Terrain database is FCC 30 meter, R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. Reference zone= West Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C, H, V, E), Beamtilt (Y, N, X)
"*"affixed to 'IN' or 'OUT' values = site inside restricted contour.

BLFT20110720ABL
Latitude: 38-34-27.70 N
Longitude: 090-19-31.48 W
ERP: 0.099 kW
Channel: 240
Frequency: 95.9 MHz
AMSL Height: 320.1 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- 54 dBu F(50,10) Interference Contour
- 100 dBu F(50,10) Interference Contour

Scale 1:1,000,000



0 10 20 30 km

K286AR.X

BPFT20160729ANH
Latitude: 38-34-27.70 N
Longitude: 090-19-31.48 W
ERP: 0.099 kW
Channel: 240
Frequency: 95.9 MHz
AMSL Height: 320.1 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

KNOU

BLH20150318ABQ
Latitude: 38-34-27.70 N
Longitude: 090-19-31.40 W
ERP: 92.00 kW
Channel: 242
Frequency: 96.3 MHz
AMSL Height: 462.2 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

WFUN-FM

BLH20121203AQQ
Latitude: 38-39-08 N
Longitude: 090-17-03 W
ERP: 10.50 kW
Channel: 238
Frequency: 95.5 MHz
AMSL Height: 312.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

Exhibit E-4
Interference Study
K286AR - St. Louis, Missouri
Community Broadcasting, Inc.
May, 2017

Jeremy Ruck & Associates, Inc.

WFUN 81.7 dBu
Service Contour

FCC F(50-50) 81.70 dBu (FCC HAAT)

Proposed K286AR
and KNOU Site

Scale 1:200,000

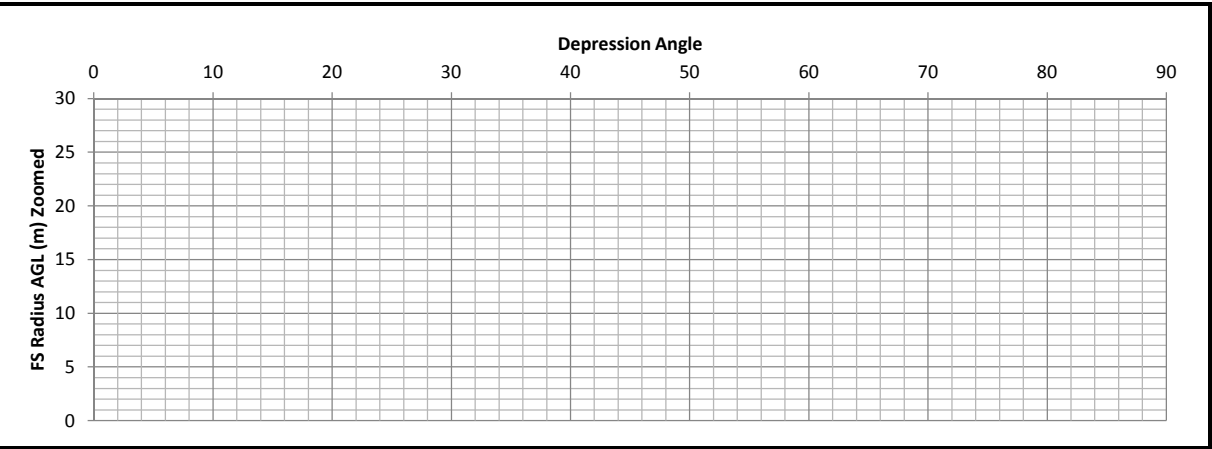
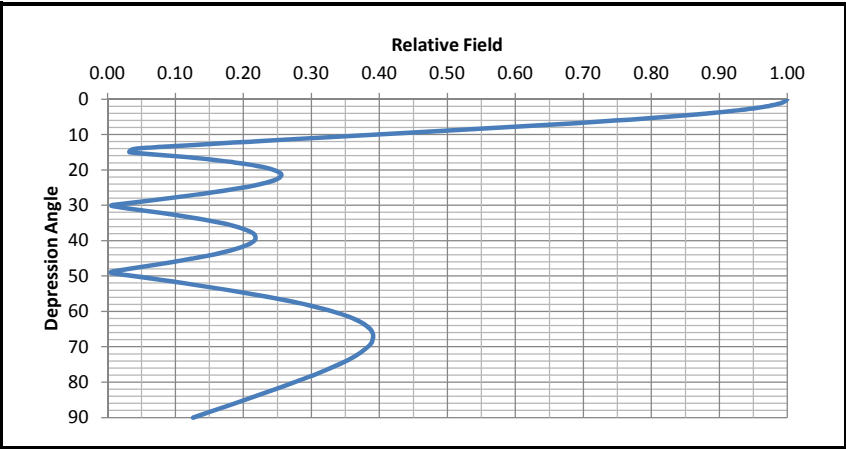
0 2 4 6 km

Exhibit E-5

Proximity Interference Analysis

K286AR - St. Louis, Missouri

Antenna No:	48	⬆	⬆	Center of Radiation:	182.9 m AGL
Manufacturer:	ERI	⬆	⬆	Effective Radiated Power:	99 Watts
Model:	LPX-4C			FS Contour:	121.7 dBu
Number of Bays:	4			E Field Strength:	1.21619 V/m
Bay Spacing:	Lambda			Z0:	377 Ohms
				Power Density:	0.003923364 W/m^2



Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	99.00	57.39	57.39	0.00	182.90
1	0.9920	0.9841	97.42	56.93	56.92	0.99	181.91
2	0.9700	0.9409	93.15	55.66	55.63	1.94	180.96
3	0.9330	0.8705	86.18	53.54	53.47	2.80	180.10
4	0.8830	0.7797	77.19	50.67	50.55	3.53	179.37
5	0.8210	0.6740	66.73	47.11	46.93	4.11	178.79
6	0.7480	0.5595	55.39	42.92	42.69	4.49	178.41
7	0.6670	0.4449	44.04	38.28	37.99	4.66	178.24
8	0.5790	0.3352	33.19	33.23	32.90	4.62	178.28
9	0.4870	0.2372	23.48	27.95	27.60	4.37	178.53
10	0.3930	0.1544	15.29	22.55	22.21	3.92	178.98
11	0.2990	0.0894	8.85	17.16	16.84	3.27	179.63
12	0.2080	0.0433	4.28	11.94	11.68	2.48	180.42
13	0.1210	0.0146	1.45	6.94	6.77	1.56	181.34
14	0.0400	0.0016	0.16	2.30	2.23	0.56	182.34
15	0.0330	0.0011	0.11	1.89	1.83	0.49	182.41
16	0.0970	0.0094	0.93	5.57	5.35	1.53	181.37
17	0.1500	0.0225	2.23	8.61	8.23	2.52	180.38
18	0.1930	0.0372	3.69	11.08	10.53	3.42	179.48
19	0.2250	0.0506	5.01	12.91	12.21	4.20	178.70
20	0.2450	0.0600	5.94	14.06	13.21	4.81	178.09
21	0.2550	0.0650	6.44	14.63	13.66	5.24	177.66
22	0.2540	0.0645	6.39	14.58	13.51	5.46	177.44
23	0.2440	0.0595	5.89	14.00	12.89	5.47	177.43
24	0.2250	0.0506	5.01	12.91	11.80	5.25	177.65
25	0.1980	0.0392	3.88	11.36	10.30	4.80	178.10
26	0.1660	0.0276	2.73	9.53	8.56	4.18	178.72
27	0.1290	0.0166	1.65	7.40	6.60	3.36	179.54
28	0.0890	0.0079	0.78	5.11	4.51	2.40	180.50
29	0.0480	0.0023	0.23	2.75	2.41	1.34	181.56
30	0.0060	0.0000	0.00	0.34	0.30	0.17	182.73
31	0.0360	0.0013	0.13	2.07	1.77	1.06	181.84
32	0.0740	0.0055	0.54	4.25	3.60	2.25	180.65
33	0.1100	0.0121	1.20	6.31	5.29	3.44	179.46
34	0.1420	0.0202	2.00	8.15	6.76	4.56	178.34
35	0.1690	0.0286	2.83	9.70	7.94	5.56	177.34
36	0.1900	0.0361	3.57	10.90	8.82	6.41	176.49
37	0.2050	0.0420	4.16	11.76	9.40	7.08	175.82
38	0.2150	0.0462	4.58	12.34	9.72	7.60	175.30
39	0.2180	0.0475	4.70	12.51	9.72	7.87	175.03
40	0.2160	0.0467	4.62	12.40	9.50	7.97	174.93
41	0.2080	0.0433	4.28	11.94	9.01	7.83	175.07
42	0.1940	0.0376	3.73	11.13	8.27	7.45	175.45
43	0.1760	0.0310	3.07	10.10	7.39	6.89	176.01
44	0.1530	0.0234	2.32	8.78	6.32	6.10	176.80
45	0.1260	0.0159	1.57	7.23	5.11	5.11	177.79

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.1260	0.0159	1.57	7.23	5.11	5.11	177.79
46	0.0960	0.0092	0.91	5.51	3.83	3.96	178.94
47	0.0640	0.0041	0.41	3.67	2.50	2.69	180.21
48	0.0300	0.0009	0.09	1.72	1.15	1.28	181.62
49	0.0050	0.0000	0.00	0.29	0.19	0.22	182.68
50	0.0410	0.0017	0.17	2.35	1.51	1.80	181.10
51	0.0770	0.0059	0.59	4.42	2.78	3.43	179.47
52	0.1130	0.0128	1.26	6.48	3.99	5.11	177.79
53	0.1470	0.0216	2.14	8.44	5.08	6.74	176.16
54	0.1800	0.0324	3.21	10.33	6.07	8.36	174.54
55	0.2110	0.0445	4.41	12.11	6.95	9.92	172.98
56	0.2400	0.0576	5.70	13.77	7.70	11.42	171.48
57	0.2670	0.0713	7.06	15.32	8.34	12.85	170.05
58	0.2920	0.0853	8.44	16.76	8.88	14.21	168.69
59	0.3130	0.0980	9.70	17.96	9.25	15.40	167.50
60	0.3320	0.1102	10.91	19.05	9.53	16.50	166.40
61	0.3480	0.1211	11.99	19.97	9.68	17.47	165.43
62	0.3620	0.1310	12.97	20.77	9.75	18.34	164.56
63	0.3730	0.1391	13.77	21.40	9.72	19.07	163.83
64	0.3810	0.1452	14.37	21.86	9.58	19.65	163.25
65	0.3870	0.1498	14.83	22.21	9.39	20.13	162.77
66	0.3900	0.1521	15.06	22.38	9.10	20.45	162.45
67	0.3910	0.1529	15.14	22.44	8.77	20.65	162.25
68	0.3900	0.1521	15.06	22.38	8.38	20.75	162.15
69	0.3880	0.1505	14.90	22.27	7.98	20.79	162.11
70	0.3830	0.1467	14.52	21.98	7.52	20.65	162.25
71	0.3770	0.1421	14.07	21.63	7.04	20.46	162.44
72	0.3690	0.1362	13.48	21.18	6.54	20.14	162.76
73	0.3610	0.1303	12.90	20.72	6.06	19.81	163.09
74	0.3510	0.1232	12.20	20.14	5.55	19.36	163.54
75	0.3400	0.1156	11.44	19.51	5.05	18.85	164.05
76	0.3280	0.1076	10.65	18.82	4.55	18.26	164.64
77	0.3160	0.0999	9.89	18.13	4.08	17.67	165.23
78	0.3030	0.0918	9.09	17.39	3.62	17.01	165.89
79	0.2890	0.0835	8.27	16.58	3.16	16.28	166.62
80	0.2750	0.0756	7.49	15.78	2.74	15.54	167.36
81	0.2610	0.0681	6.74	14.98	2.34	14.79	168.11
82	0.2460	0.0605	5.99	14.12	1.96	13.98	168.92
83	0.2320	0.0538	5.33	13.31	1.62	13.21	169.69
84	0.2170	0.0471	4.66	12.45	1.30	12.38	170.52
85	0.2020	0.0408	4.04	11.59	1.01	11.55	171.35
86	0.1870	0.0350	3.46	10.73	0.75	10.71	172.19
87	0.1720	0.0296	2.93	9.87	0.52	9.86	173.04
88	0.1560	0.0243	2.41	8.95	0.31	8.95	173.95
89	0.1410	0.0199	1.97	8.09	0.14	8.09	174.81
90	0.1260	0.0159	1.57	7.23	0.00	7.23	175.67

