

TECHNICAL STATEMENT
K284CI DENVER, COLORADO, CH 284D
4-K's, LLLP
FCC FORM 349
JANUARY 2019

This Technical Statement is made in support of a minor change application for FM translator station, K284CI licensed to Denver, Colorado, facility ID 33475.

K284CI seeks to remain a fill-in translator for KDCO(AM) Denver, Colorado, facility ID 34585. K284CI will remain at its current tower site with the same antenna, Scala CA-2/CP at the same height. K284CI seeks to increase its Effective Radiated Power from 140 watts (0.14KW) to 250(0.25KW) watts and rotate the directional pattern by 91 degrees (179° to 90°). The following will show that the new proposed operation of K284CI will meet all of the Commissions technical requirements for an FM translator station.

The new proposed operation of K284CI specifies a maximum Effective Radiated Power of 250 watts. It will operate with a directional antenna using a Scala CA-2CP, dual polarized, composite directional. The antenna is mounted on an existing tower with an overall height of 18 meters above the ground. The antenna is mounted with a Center of Radiation of 14 meters above the ground, and 2259 meters Above Mean Sea Level. The coordinates of this tower are located at N 39° 43' 45", W 105° 14' 08" (NAD 27).

Figure 1 is a detailed interference study conducted on channel 284D with these new proposed facilities. It shows that the new operation of K284CI will not cause any interference to any existing or proposed FM stations, LPFM or other FM translators on any of the pertinent same channel or adjacent channels to channel 284, with the exception

of KXKL-FM Denver, CO, facility ID 59959, on channel 286C, and KKFN(FM) Longmont, Colorado operating on channel 282C1, facility ID 71767. The proposed operation of K284CI on 284D is located within the protected 60 dB μ contour of 2nd adjacent channel stations of KXKL-FM and KKFN(FM).

Figure 2 shows the predicted F(50-50) field strength of KXKL-FM(FM) at the proposed K284CI transmitter site is 104.3 dB μ . Therefore, the respective predicted interfering contour F(50-10) generated by the proposed K284CI on channel 284D is an additional 40 dB μ or 144.3 dB μ .

Figure 3 show the predicted F(50-50) field strength of KKFN(FM) at the proposed K284CI transmitter site is 86.0 dB μ . Therefore, the respective predicted interfering contour F(50-10) generated by the proposed K284CI on channel 284D is an additional 40 dB μ or 126.0 dB μ .

Figure 4 shows the coverage area for the worse case 126.0 dB μ interference contour F(50-10) and shows that there is no population in the area of interference.

Figure 5 is a more detailed interference study conducted in regards to KKFN(FM). It shows the vertical antenna pattern of the Scala CA-2-CP antenna and that the predicted 126.0 dB μ contour will not reach the ground at any point. Thus, there will be no real life interference caused to KKFN.

The applicant, 4-K's, LLLP, respectfully requests a waiver of C.F.R. 74.1204(d) of the Commission's rules based on the fact that there is no population within the area of predicted interference. There are no homes nearby the proposed existing tower site, which is a privately owned 3/4 acre square wooded area, with private access. The transmitter building is uninhabited and does not have indoor plumbing. Should any

unforeseen actual interference be caused, the licensee will immediately reduce power or even cease broadcasting with K284CI until such interference can be eliminated.

Figure 6 is the directional antenna data for the proposed Scala CA-2/CP composite directional antenna system.

Figure 7 shows the proposed 60 db μ of K284CI will be completely contained inside of the current 2mv/m daytime predicted coverage contour of the station being rebroadcast, KDCO(AM) Denver, Colorado on 1340 KHz. The proposed operation of K284CI will be considered a “fill-in” translator for KDCO(AM) Denver, Colorado, facility 34585, thus some of the maximum allowable ERP limits on some of the pertinent radials will be exceeded. However, the maximum ERP on any radial will not exceed 250 watts, thus this proposal is compliance with MERP’s rules, or with 74.1235(a).

Since no change in transmitter site is being proposed, it can be assumed that the current operation of K284CI and the new proposed operation will overlap as required.

It was found that the new proposed operation of K284CI Denver, Colorado on channel 284D, will satisfy all of the required commission rules and regulations for an FM translator station.

FIGURE 1 - DETAILED CHANNEL INTERFERENCE STUDY

K284CI DENVER, CO, CH. 284D

REFERENCE
39 43 45.0 N.
105 14 08.0 W.

CH# 284D - 104.7 MHz, Pwr= 0.25 kW DA, HAAT= 0.0 M, COR= 2259 M
Average Protected F(50-50)= 7.09 km
Standard Directional

DISPLAY DATES
DATA 01-07-19
SEARCH 01-08-19

CH CITY	CALL	TYPE ANT STATE	AZI <--	DI ST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
284C1 Vail	KKVM	LIC _C_ CO	264.6 83.8	104.40 BMLH20031119AII	39 38 05.0 106 26 47.0	100.000 102	171.2 3015	71.9 Rocky Mountain Radio Group	-72.8*	20.9
286C0 Denver	KXKL-FM	LIC ZE_ CO	165.9 345.9	6.38 BLH20161201ADR	39 40 24.4 105 13 02.5	100.000 344	8.7 2364	67.0 Kse Radio Ventures, LLC	-11.7*	-60.7*
284D Denver	K284CI	LIC DC_ CO	0.0 0.0	0.00 BLFT20160421AAK	39 43 45.0 105 14 08.0	0.140	39.9 2259	11.5 4-k's LLP	-42.9*	-25.9*
282C1 Longmont	KKFN	LIC NC_ CO	121.5 301.6	7.09 BLH19991214ABH	39 41 45.0 105 09 54.0	100.000 206	3.2 2081	31.0 Bonneville International C	-20.6*	-24.8*
284D Erie	K284BY	CP DC_ CO	7.4 187.4	31.66 BMPFT20180319AAV	40 00 43.0 105 11 16.0	0.250	9.8 1647	2.7 Mary Medicus	6.4	1.1
284A Calhan	KKCS	LIC NCX CO	135.4 316.0	113.53 BMLH20131204AJQ	38 59 57.0 104 18 47.0	1.550 198	76.9 2192	24.3 United States Cp, LLC	12.8	15.3
284L1 Greeneley	KELS-LP	LIC ____ CO	30.1 210.4	84.33 BLL20100524ACP	40 23 05.0 104 44 11.0	0.061 38	1489	39.6 Plymouth Gathering Inc.		14.2
231D Boulder	K231AA	LIC _CN CO	0.2 180.2	26.18 BLFT19960111TK	39 57 54.0 105 14 05.0	0.205 -133	10.4 1719	2.7 Citicasters Licenses, Inc.	9.5R	16.7M
284C1 Sterling	KNNG	LIC _CN CO	62.4 243.8	210.28 BLH19810402AB	40 34 57.0 103 01 56.0	100.000 198	162.0 1508	64.0 Media Logic LLC	19.2	60.4
284L1 Loveland	KMKZ-LP	LIC ____ CO	11.1 191.2	76.31 BLL20140827ACQ	40 24 12.1 105 03 41.1	0.035 49	1592	36.6 Protecting America's Future		38.4
284L1 Estes Park	KREV-LP	LIC ____ CO	342.4 162.2	74.68 BLL20141014ABN	40 22 11.0 105 30 10.0	0.100	2355	45.2 United Methodist Church Of		58.7
284D Dillon	KKVM-FM3	LIC DV_ CO	261.3 80.8	70.41 BLFTB20090115AFD	39 37 51.0 106 02 47.0	0.175	15.3 2786	4.8 Rocky Mountain Radio Group	49.2	54.3
230D Monument	K230BO	LIC DH_ CO	164.2 344.4	63.83 BLFT20161108AAZ	39 10 33.0 105 02 03.0	0.250	10.4 2823	2.7 Way Media, Inc.	9.5R	54.3M
283C3 Canon City	KSTY	LIC _CX CO	179.2 359.2	157.00 BLH20071003ABD	38 18 54.0 105 12 40.0	8.600 14	84.8 2138	56.2 Royal Gorge Broadcasting,	56.5	97.0
230D Monument	K230BO	CP DC_ CO	157.9 338.1	70.99 BPFT20171026AAS	39 08 11.0 104 55 34.0	0.250	10.4 2558	2.7 Way Media, Inc.	9.5R	61.5M
283D Fort Collins	K283CN	LIC DC_ CO	2.0 182.0	90.79 BLFT20170621AAE	40 32 47.0 105 11 53.0	0.080	7.8 2185	2.0 Brahmin Broadcasting Corpo	66.7	76.9
230A Frisco	KYSL	LIC _CN CO	255.9 75.4	77.87 BLH19940808KA	39 33 22.0 106 06 53.0	0.560 324	10.4 3549	2.7 Krystal Broadcasting, Inco	9.5R	68.4M
230A Loveland	KCWA	LIC ZCX CO	3.1 183.1	85.00 BLH20101214ACL	40 29 37.0 105 10 53.0	0.580 319	10.4 2098	2.7 Way Media, Inc.	9.5R	75.5M

Terrain database is NGDC 30 SEC, 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. Call signs with strikeout need not be protected.
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.

* No actual interference will be caused to second adjacent channel stations KXKL-FM and KKFN(FM) since the worse case 126.0 DBU interference contour will not cover any population. See the Technical Statement for more details.

K284CI

BLFT20160421AAK

Latitude: 39-43-45 N

Longitude: 105-14-08 W

ERP: 0.25 kW

Channel: 284

Frequency: 104.7 MHz

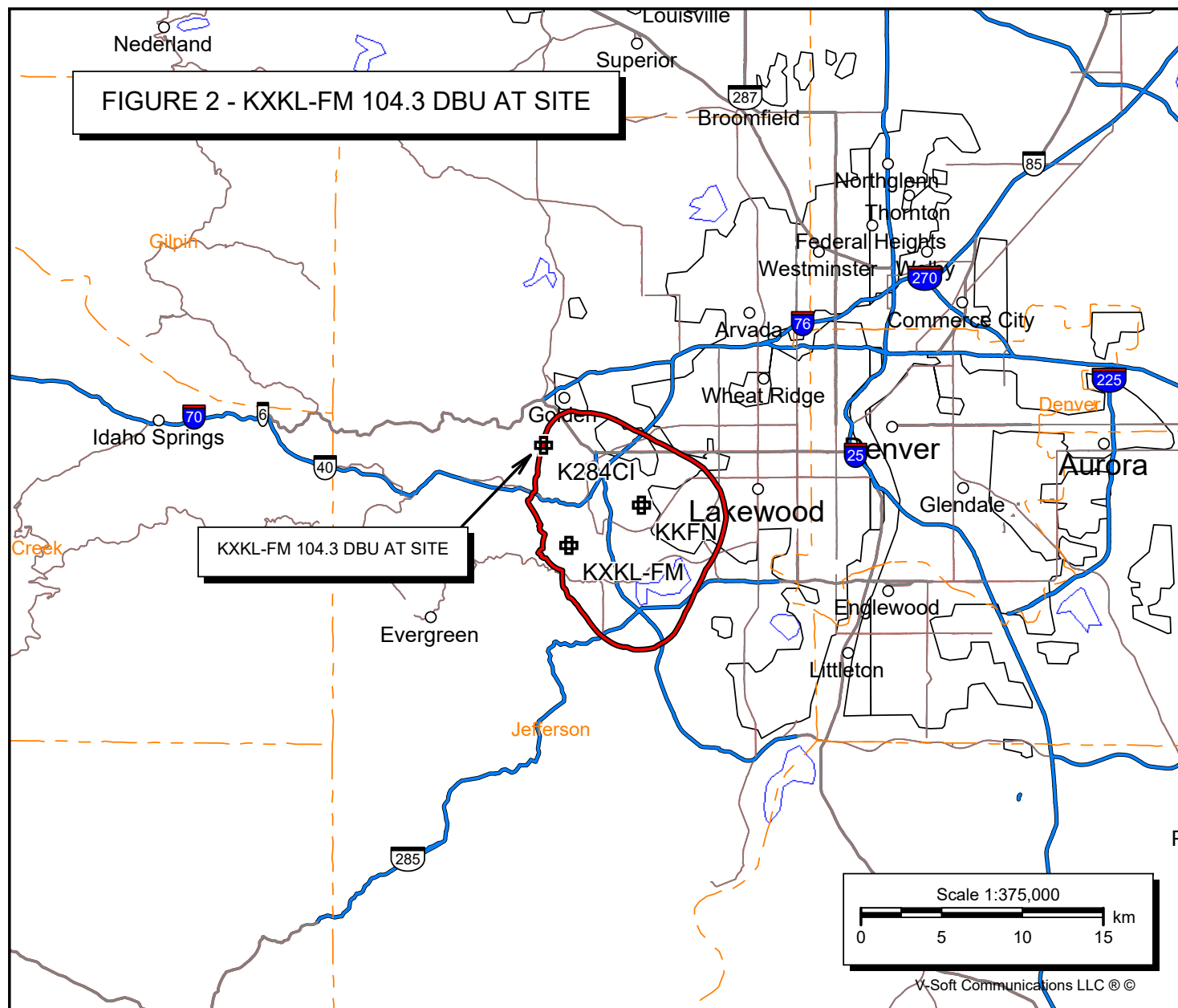
AMSL Height: 2259.0 m

Elevation: 2245.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: None

FIGURE 2 - KXKL-FM 104.3 DBU AT SITE

K284CI

BLFT20160421AAK

Latitude: 39-43-45 N

Longitude: 105-14-08 W

ERP: 0.25 kW

Channel: 284

Frequency: 104.7 MHz

AMSL Height: 2259.0 m

Elevation: 2245.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: None

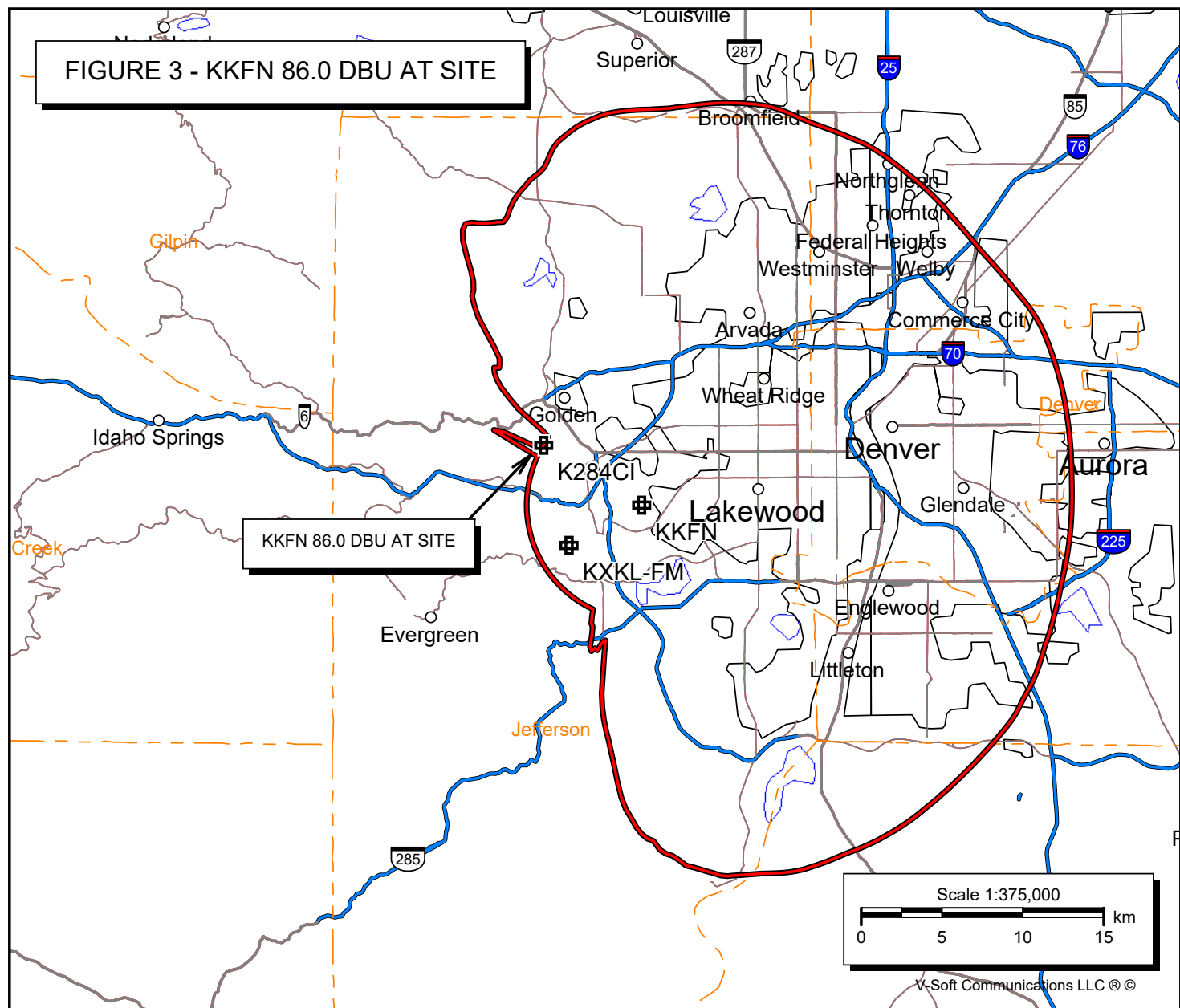
FIGURE 3 - KKFN 86.0 DBU AT SITE

FIGURE 4 - PREDICTED 126.0 DBU INTERFERENCE CONTOUR
K284CI DENVER, CO, CH. 284D

Coverage Study - NGDC 30 SEC
01-08-2019

K284CI CH284 D , 0.25 kW, 0.0M HAAT, 2259.0M COR AMSL
Interference Contour = 126.0 dBu. Population = 0

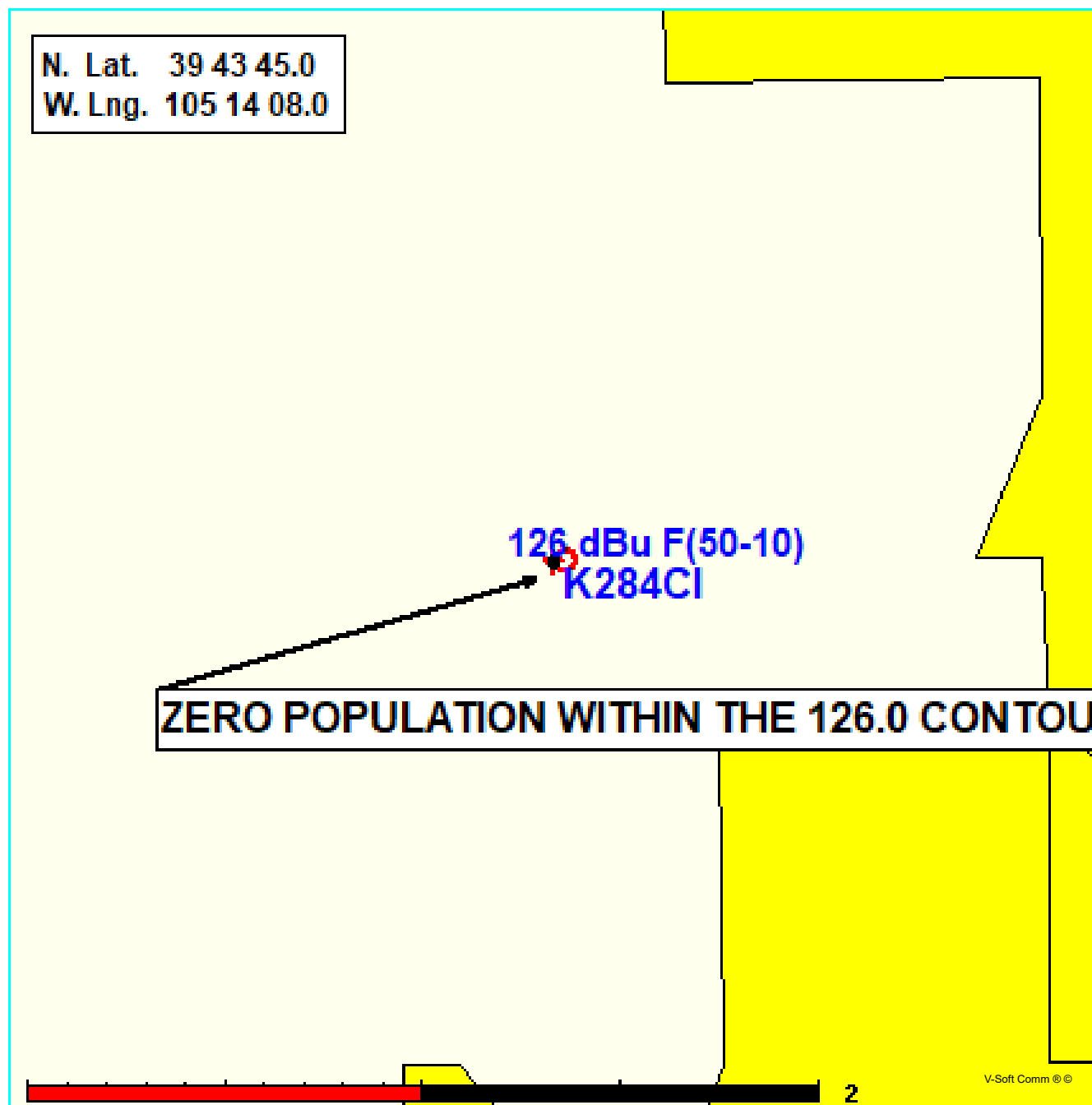


FIGURE 5 - DETAILED INTERFERENCE STUDY WITH KKFN - VERTICAL PATTERN STUDY
XField.out

K284CI Denver, CO, Showing Protection to KKFN
Geographic Coordinates: N.39 43 45.00 W.105 51 08.00
74.1204(d) Study - Using NGDC 30 SEC Terrain Database
Translator or LPFM Maximum Licensed ERP = 0.25
Translator or LPFM Antenna Height AG = 14 Meters
K284CI Antenna Model = CA2-CP

Protected Station's Contour = 86.03224 dBu
Translator's or LPFM's full Interference contour 126.03224

Review Azimuth = 0 Degrees True
Relative Field on the horizon at Review Azimuth = 0.030
Translator/LPFM ERP on the horizon at Review Azimuth = 0.0 kW
Distance between stations = 7.1 km
Protected Station= KKFN, 100 kW, 2081 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	0.03	0.0075	009.5922	009.5922	014.000
05.00	0.993	0.03	0.0074	009.5251	009.4888	013.170
10.00	0.974	0.03	0.0071	009.3428	009.2009	012.378
15.00	0.941	0.03	0.0066	009.0263	008.7187	011.664
20.00	0.897	0.03	0.0060	008.6042	008.0853	011.057
25.00	0.843	0.03	0.0053	008.0862	007.3286	010.583
30.00	0.78	0.03	0.0046	007.4819	006.4795	010.259
35.00	0.709	0.03	0.0038	006.8009	005.5710	010.099
40.00	0.633	0.03	0.0030	006.0719	004.6513	010.097
45.00	0.554	0.03	0.0023	005.3141	003.7576	010.242
50.00	0.473	0.03	0.0017	004.5371	002.9164	010.524
55.00	0.394	0.03	0.0012	003.7793	002.1677	010.904
60.00	0.317	0.03	0.0008	003.0407	001.5204	011.367
65.00	0.245	0.03	0.0005	002.3501	000.9932	011.870
70.00	0.181	0.03	0.0002	001.7362	000.5938	012.369
75.00	0.124	0.03	0.0001	001.1894	000.3078	012.851

				XField.out		
80.00	0.077	0.03	0.0000	000.7386	000.1283	013.273
85.00	0.041	0.03	0.0000	000.3933	000.0343	013.608
90.00	0.016	0.03	0.0000	000.1535	000.0000	013.847

X-Field™ By V-Soft Communications®LLC

FIGURE 6 - DIRECTIONAL ANTENNA DATA

K284CI

01-08-2019

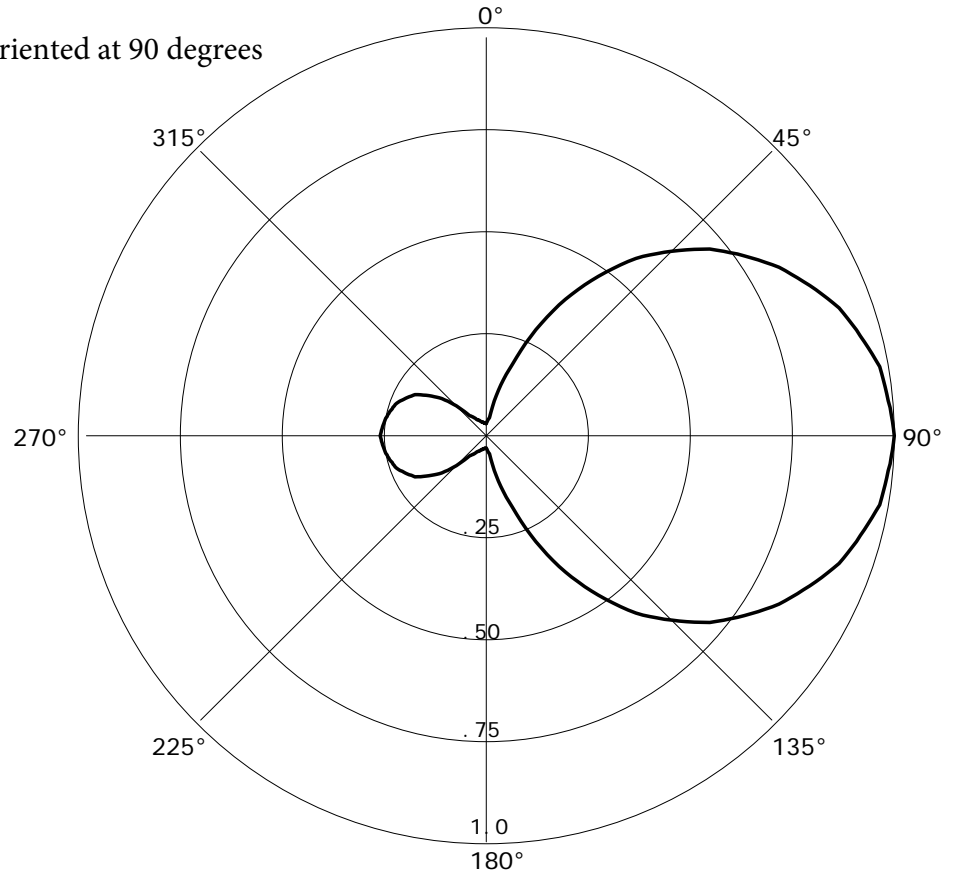
RMS(V) = .484

SCALA CA-2-CP

Graph is Relative Field

Azi	Field	dBk	kW
000	0.030	-36.478	0.000
010	0.045	-32.956	0.001
020	0.187	-20.584	0.009
030	0.388	-14.244	0.038
040	0.570	-10.903	0.081
050	0.715	-08.934	0.128
060	0.829	-07.650	0.172
070	0.920	-06.745	0.212
080	0.979	-06.205	0.240
090	1.000	-06.021	0.250
100	0.979	-06.205	0.240
110	0.920	-06.745	0.212
120	0.829	-07.650	0.172
130	0.715	-08.934	0.128
140	0.570	-10.903	0.081
150	0.388	-14.244	0.038
160	0.187	-20.584	0.009
170	0.045	-32.956	0.001
180	0.030	-36.478	0.000
190	0.032	-35.918	0.000
200	0.037	-34.657	0.000
210	0.046	-32.765	0.001
220	0.065	-29.762	0.001
230	0.142	-22.975	0.005
240	0.202	-19.914	0.010
250	0.234	-18.636	0.014
260	0.250	-18.062	0.016
270	0.260	-17.721	0.017
280	0.250	-18.062	0.016
290	0.234	-18.636	0.014
300	0.202	-19.914	0.010
310	0.142	-22.975	0.005
320	0.065	-29.762	0.001
330	0.046	-32.765	0.001
340	0.037	-34.657	0.000
350	0.032	-35.918	0.000

Oriented at 90 degrees



K284CI

BLFT20160421AAK

Latitude: 39-43-45 N

Longitude: 105-14-08 W

ERP: 0.25 kW

Channel: 284

Frequency: 104.7 MHz

AMSL Height: 2259.0 m

Elevation: 2245.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: None

**FIGURE 7 - FILL-IN MAP
WITH KDCO(AM) DENVER, CO**