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**ENGINEERING REPORT**

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**K226CG, Decatur, TX, Channel 226D Minor Change**

**ENGINEERING STATEMENT**

Hispanic Family Christian Network ("Applicant") proposes this site move change to K226CG, Decatur, TX, 226D. This modification is deemed a minor change pursuant to Section 74.1233(a) of the FCC Rules.

**PROTECTION TO KZPS AND KNOR**

All contour non-overlap protection requirements are met with the exception of KZPS (Dallas 223C) and KNOR (Krum 229C0), discussed below.

KZPS (85.9 kilometers at 140 degrees True bearing from proposed site) and KNOR (36.4 kilometers at 22 degrees True bearing from proposed site) are third adjacent-channel to the proposed channel 226D facility. The 60 dBu F50,50 service contours for each extends beyond the proposed 226D transmitter site. Using the well-established *Living Way Ministries* Methodology, no actual interference to any population is predicted to exist to KZPS or KNOR.

Note that a rule waiver of Section 74.1204 for this second/third adjacent-channel protection using the well-established *Living Way Ministries* Methodology is respectfully requested if such a rule waiver is deemed necessary for protection to any station.

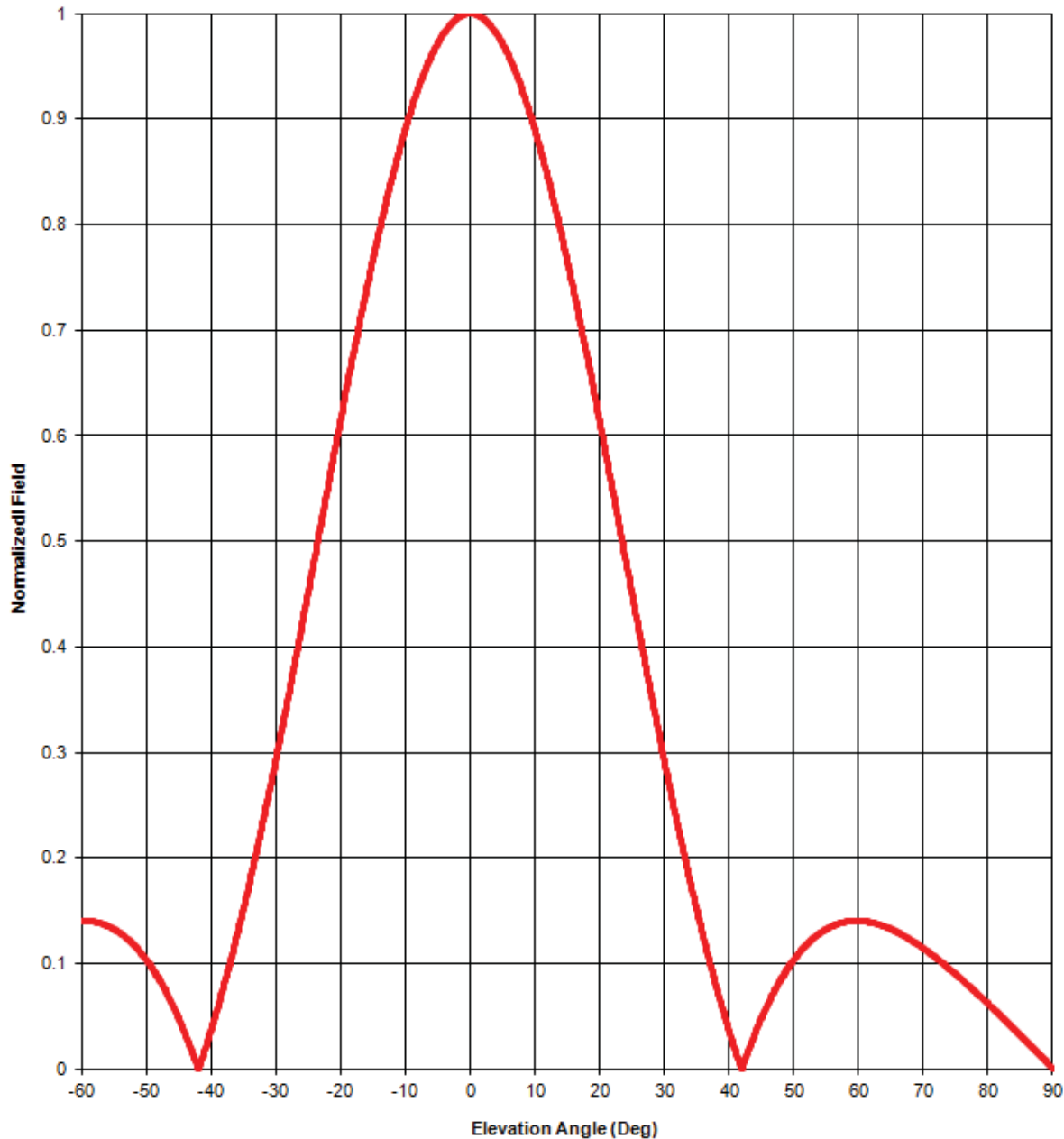
The lowest F50,50 signal strength from either KZPS and KNOR at the proposed 226D transmitter site is at least 61 dBu (the "desired" signal). The second/third adjacent-channel protection of Section 74.1204 is an undesired-to-desired ("U/D") dB signal strength ratio of 40:1. Therefore, predicted interference to KZPS and KNOR from the proposed 226D facility is a signal of greater than or equal to 101 dBu.

Figure EE1 is the vertical plane relative field pattern for the proposed Shively Labs 6812B three-bay halfwave-spaced antenna. By adjusting for the vertical plane downward relative field values of the proposed antenna, it is herein demonstrated that the 101 dBu interfering signal (using a free space field determination) does not exist at any point at ground level. (Actually, the study is made to 2 meters above ground level to account for a person's height.)

Attached as Figure EE2 is a tabulation of various points (at 2 meters above ground level) from the proposed translator tower base. (Column B is the different distances from the tower base to each studied point.) The actual distance from the antenna to each point is listed in Column C, the hypotenuse of the vertical height (Column A) and the horizontal distance (Column B). Also, the vertical distance from the antenna bottom to the calculated interference signal for each studied point is provided in Column K. Because the calculated distance to the free space interfering signal (Column J) is less than the hypotenuse distance (Column C) and the interfering signal vertical distance (Column K) is less than the vertical distance (Column A) for each studied point, the interfering signal does not reach any studied point. (In other words, the interfering signal does not make it to 2 meters any point.) The clearance in all cases is at least 17 meters. Therefore, pursuant to Section 74.1204(d) of the FCC Rules, KZPS and KNOR are adequately protected by the proposed facility.

## Elevation pattern

FIGURE EE1 (1 of 2)



Antenna models: 6014, 6015, 6020, 6510, 6513, 6600, & 68xx except 6832, 3-bay half-wave-spaced

Test frequency: 98.1 MHz

Gain (maximum):

	Power	dB
6014, 6015, 68xx:	1.02	0.08 dB
6510, 6513, 6600:	2.04	3.08 dB

Document No. 68xx 3-bay hw (130701)

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# FIGURE EE1 (2 of 2)

Degrees	Rel. Field	Degrees	Rel. Field	Degrees	Rel. Field	Degrees	Rel. Field	Degrees	Rel. Field
1	0.999	19	0.646	37	0.102	55	0.133	73	0.100
2	0.995	20	0.615	38	0.079	56	0.136	74	0.095
3	0.990	21	0.582	39	0.057	57	0.138	75	0.090
4	0.982	22	0.550	40	0.037	58	0.140	76	0.084
5	0.972	23	0.517	41	0.017	59	0.140	77	0.079
6	0.959	24	0.484	42	0.001	60	0.140	78	0.073
7	0.945	25	0.451	43	0.018	61	0.140	79	0.068
8	0.929	26	0.419	44	0.034	62	0.139	80	0.062
9	0.911	27	0.387	45	0.048	63	0.137	81	0.056
10	0.891	28	0.355	46	0.062	64	0.135	82	0.050
11	0.869	29	0.323	47	0.074	65	0.133	83	0.044
12	0.845	30	0.293	48	0.085	66	0.130	84	0.038
13	0.820	31	0.263	49	0.095	67	0.126	85	0.032
14	0.794	32	0.234	50	0.104	68	0.123	86	0.026
15	0.767	33	0.205	51	0.111	69	0.119	87	0.020
16	0.738	34	0.178	52	0.118	70	0.114	88	0.013
17	0.708	35	0.152	53	0.124	71	0.110	89	0.007
18	0.678	36	0.126	54	0.129	72	0.105	90	0.000

## Elevation Pattern Tabulation

Antenna models: 6014, 6015, 6020, 6510, 6513, 6600, & 68xx except 6832, 3-bay half-wave-spaced.

Relative Field at 0° Depression = 1.000

## FIGURE EE2

### FREE SPACE FIELD STRENGTH AT A DISTANCE STUDY RESULTS

PROJECT: DECATUR, TX, CHANNEL 226D

22-Sep-15

	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J	Column K
	Vert	Horiz	Hypot-	Down-			Pattern	Free	Adjusted	Interf	Vert
	Dist	Dist	enuse	ward			Relative	Space	ERP in	Distance	Interf
	From	From	Dist	Angle			Field at	Inter-	Down-	along	Distance
	Ant	Tower	fr Ant	fr Ant	Max	Max	Down-	ferring	ward	Hypot-	below
	Bottom	Base	Bottom	Bottom	ERP	ERP	ward	Signal	Angle	enuse	Antenna
Pt	(meters)	(meters)	(meters)	(degrees)	(watts)	(dBmw)	Angle	(dBu)	(dBmW)	(meters)	(meters)
1	135	0.1	135.0	<a href="#">90.0</a>	75	<a href="#">48.75</a>	0.007	101.0	<a href="#">5.65</a>	3.8	<a href="#">3.8</a>
2	135	10	135.4	<a href="#">85.8</a>	75	<a href="#">48.75</a>	0.032	101.0	<a href="#">18.85</a>	17.4	<a href="#">17.3</a>
3	135	30	138.3	<a href="#">77.5</a>	75	<a href="#">48.75</a>	0.079	101.0	<a href="#">26.70</a>	42.9	<a href="#">41.9</a>
4	135	50	144.0	<a href="#">69.7</a>	75	<a href="#">48.75</a>	0.119	101.0	<a href="#">30.26</a>	64.7	<a href="#">60.6</a>
5	135	100	168.0	<a href="#">53.5</a>	75	<a href="#">48.75</a>	0.129	101.0	<a href="#">30.96</a>	70.1	<a href="#">56.3</a>
6	135	150	201.8	<a href="#">42.0</a>	75	<a href="#">48.75</a>	0.001	101.0	<a href="#">-11.25</a>	0.5	<a href="#">0.4</a>
7	135	200	241.3	<a href="#">34.0</a>	75	<a href="#">48.75</a>	0.178	101.0	<a href="#">33.76</a>	96.7	<a href="#">54.1</a>
8	135	250	284.1	<a href="#">28.4</a>	75	<a href="#">48.75</a>	0.355	101.0	<a href="#">39.76</a>	192.9	<a href="#">91.6</a>
9	135	300	329.0	<a href="#">24.2</a>	75	<a href="#">48.75</a>	0.484	101.0	<a href="#">42.45</a>	263.0	<a href="#">107.9</a>
10	135	350	375.1	<a href="#">21.1</a>	75	<a href="#">48.75</a>	0.582	101.0	<a href="#">44.05</a>	316.2	<a href="#">113.8</a>
11	135	400	422.2	<a href="#">18.6</a>	75	<a href="#">48.75</a>	0.678	101.0	<a href="#">45.38</a>	368.3	<a href="#">117.8</a>
12	135	450	469.8	<a href="#">16.7</a>	75	<a href="#">48.75</a>	0.738	101.0	<a href="#">46.11</a>	400.9	<a href="#">115.2</a>
13	135	500	517.9	<a href="#">15.1</a>	75	<a href="#">48.75</a>	0.767	101.0	<a href="#">46.45</a>	416.7	<a href="#">108.6</a>
14	135	550	566.3	<a href="#">13.8</a>	75	<a href="#">48.75</a>	0.820	101.0	<a href="#">47.03</a>	445.5	<a href="#">106.2</a>

NOTE: Study point at 2 meters above ground (or rooftop, see write-up) level.

**RESULTS: COLUMN J DISTANCES ARE LESS THAN COLUMN C AND COLUMN K DISTANCES ARE LESS THAN COLUMN A DISTANCES IN ALL INSTANCES; THEREFORE, INTERFERRING SIGNAL DOES NOT EXIST AT ANY LOCATION (TWO METERS OR LESS ABOVE GROUND LEVEL)**