

**DELAUDER COMMUNICATIONS, INC.**

P.O. Box 1095  
Ashburn, Virginia 20146-1095  
(703) 299-9222

**ENGINEERING REPORT**

---

**K296HJ, Richmond, TX, Channel 296D Minor Mod**

**ENGINEERING STATEMENT**

**PROTECTION TO KGLK**

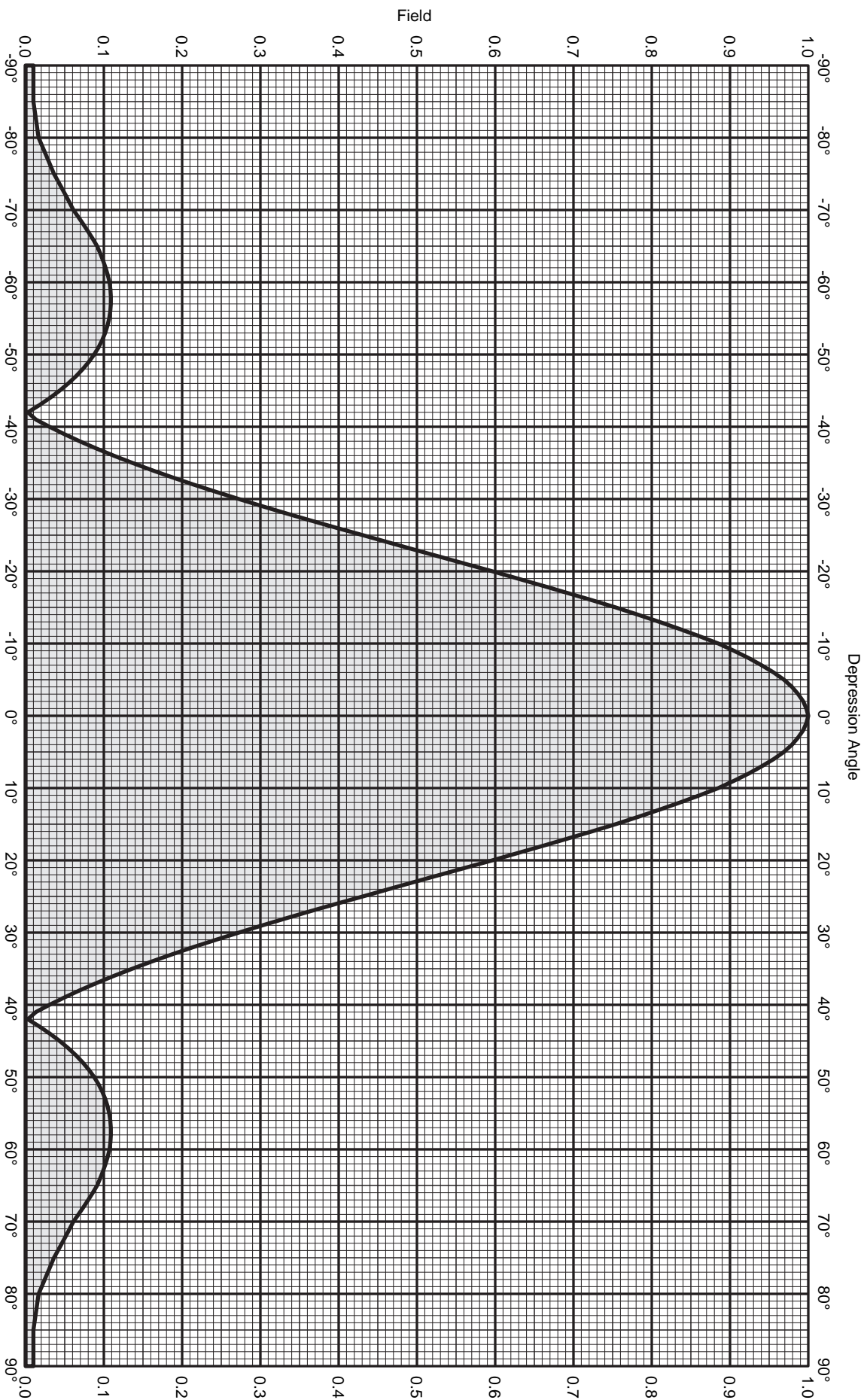
All contour non-overlap protection requirements are met with the exception of KOVE-FM, Galveston, TX (293C) and KGLK, Lake Jackson, TX (298C), discussed below.

KOVE-FM (76 kilometers at 113 degrees True) is third adjacent-channel to the proposed channel 296D facility. KGLK (66 kilometers at 118 degrees True) is second adjacent-channel to the proposed channel 296D facility. The 60 dBu F50,50 service contours of these two stations extend beyond the proposed 296D transmitter site. Using the well-established *Living Way Ministries* Methodology, no actual interference to any population is predicted to exist to KOVE-FM and KGLK.

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 F50,50 signal strength from KOVE-FM at the proposed 296D transmitter site is at least 66 dBu (the "desired" signal of KOVE-FM). The F50,50 signal strength from KGLK at the proposed 296D transmitter site is at least 70 dBu (the "desired" signal of KGLK). 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 the worst-case of KOVE-FM and KGLK from the proposed 296D facility is a signal of greater than or equal to 106 dBu.

The centerline for the proposed Scala CL-FM H-pol 4-bay (half wavelength spaced) antenna is 144 meters above ground level. The attached table (requested for use by the FCC for these studies) demonstrates that the 106 dBu interference signal is predicted to be at least 30 meters above ground level. (A vertical plane pattern tabulation is also attached.) There are no tall buildings near the site. Therefore, KOVE-FM and KGLK are adequately protected by the proposed facility.



**KATHREIN**  
**SCALA DIVISION**

Post Office Box 4580  
Medford, OR 97501 (USA)  
Phone: (541) 779-6500  
Fax: (541) 779-3991  
<http://www.kathrein-scala.com>

Three bay CL-FM/HRM/50N Array

Frequency: 107.1 MHz

Gain: 10.9 dBi (x 12.3)

Horizontal Polarization

Vertical stacked 0.5 wavelength

Vertical plane Pattern



Three bay CL-FM/HRM/50N Array

Frequency: 107.1 MHz

Gain: 10.9 dBd (x 12.3)

Horizontal Polarization

Vertical stacked 0.5 wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
-90	0.010	-40.00	-29.10	0.00	-45	0.043	-27.23	-16.33	0.02
-89	0.010	-40.00	-29.10	0.00	-44	0.031	-30.11	-19.21	0.01
-88	0.010	-40.00	-29.10	0.00	-43	0.018	-35.04	-24.14	0.00
-87	0.010	-40.00	-29.10	0.00	-42	0.010	-40.00	-29.10	0.00
-86	0.010	-40.00	-29.10	0.00	-41	0.013	-37.63	-26.73	0.00
-85	0.010	-40.00	-29.10	0.00	-40	0.031	-30.31	-19.41	0.01
-84	0.011	-38.92	-28.02	0.00	-39	0.049	-26.16	-15.26	0.03
-83	0.013	-37.95	-27.05	0.00	-38	0.069	-23.22	-12.32	0.06
-82	0.014	-37.09	-26.19	0.00	-37	0.090	-20.89	-9.99	0.10
-81	0.015	-36.30	-25.40	0.00	-36	0.113	-18.96	-8.06	0.16
-80	0.017	-35.58	-24.68	0.00	-35	0.136	-17.30	-6.40	0.23
-79	0.021	-33.72	-22.82	0.01	-34	0.161	-15.85	-4.95	0.32
-78	0.025	-32.20	-21.30	0.01	-33	0.187	-14.54	-3.64	0.43
-77	0.028	-30.91	-20.01	0.01	-32	0.215	-13.37	-2.47	0.57
-76	0.032	-29.79	-18.89	0.01	-31	0.243	-12.28	-1.38	0.73
-75	0.036	-28.81	-17.91	0.02	-30	0.273	-11.29	-0.39	0.91
-74	0.041	-27.66	-16.76	0.02	-29	0.303	-10.38	0.52	1.13
-73	0.046	-26.66	-15.76	0.03	-28	0.333	-9.54	1.36	1.37
-72	0.051	-25.78	-14.88	0.03	-27	0.365	-8.75	2.15	1.64
-71	0.056	-24.99	-14.09	0.04	-26	0.398	-8.01	2.89	1.95
-70	0.061	-24.28	-13.38	0.05	-25	0.431	-7.31	3.59	2.28
-69	0.068	-23.40	-12.50	0.06	-24	0.464	-6.68	4.22	2.64
-68	0.074	-22.62	-11.72	0.07	-23	0.496	-6.08	4.82	3.03
-67	0.080	-21.93	-11.03	0.08	-22	0.530	-5.52	5.38	3.45
-66	0.086	-21.32	-10.42	0.09	-21	0.563	-4.99	5.91	3.90
-65	0.091	-20.78	-9.88	0.10	-20	0.596	-4.49	6.41	4.38
-64	0.095	-20.41	-9.51	0.11	-19	0.629	-4.03	6.87	4.86
-63	0.099	-20.09	-9.19	0.12	-18	0.661	-3.60	7.30	5.37
-62	0.102	-19.81	-8.91	0.13	-17	0.692	-3.19	7.71	5.90
-61	0.105	-19.58	-8.68	0.14	-16	0.724	-2.81	8.09	6.44
-60	0.107	-19.39	-8.49	0.14	-15	0.754	-2.45	8.45	6.99
-59	0.108	-19.30	-8.40	0.14	-14	0.782	-2.13	8.77	7.53
-58	0.109	-19.26	-8.36	0.15	-13	0.810	-1.83	9.07	8.07
-57	0.109	-19.26	-8.36	0.15	-12	0.836	-1.56	9.34	8.60
-56	0.108	-19.31	-8.41	0.14	-11	0.861	-1.30	9.60	9.13
-55	0.107	-19.42	-8.52	0.14	-10	0.885	-1.06	9.84	9.64
-54	0.105	-19.61	-8.71	0.13	-9	0.905	-0.87	10.03	10.08
-53	0.102	-19.85	-8.95	0.13	-8	0.924	-0.69	10.21	10.50
-52	0.098	-20.18	-9.28	0.12	-7	0.940	-0.53	10.37	10.88
-51	0.093	-20.61	-9.71	0.11	-6	0.956	-0.39	10.51	11.24
-50	0.088	-21.15	-10.25	0.09	-5	0.969	-0.28	10.62	11.55
-49	0.081	-21.83	-10.93	0.08	-4	0.979	-0.18	10.72	11.79
-48	0.073	-22.71	-11.81	0.07	-3	0.987	-0.11	10.79	11.99
-47	0.064	-23.81	-12.91	0.05	-2	0.994	-0.06	10.84	12.14
-46	0.055	-25.27	-14.37	0.04	-1	0.997	-0.02	10.88	12.24
					0	1.000	0.00	10.90	12.30



Three bay CL-FM/HRM/50N Array

Frequency: 107.1 MHz

Gain: 10.9 dBd (x 12.3)

Horizontal Polarization

Vertical stacked 0.5 wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	10.90	12.30	45	0.043	-27.23	-16.33	0.02
1	0.997	-0.02	10.88	12.24	46	0.055	-25.27	-14.37	0.04
2	0.994	-0.06	10.84	12.14	47	0.064	-23.81	-12.91	0.05
3	0.987	-0.11	10.79	11.99	48	0.073	-22.71	-11.81	0.07
4	0.979	-0.18	10.72	11.79	49	0.081	-21.83	-10.93	0.08
5	0.969	-0.28	10.62	11.55	50	0.088	-21.15	-10.25	0.09
6	0.956	-0.39	10.51	11.24	51	0.093	-20.61	-9.71	0.11
7	0.940	-0.53	10.37	10.88	52	0.098	-20.18	-9.28	0.12
8	0.924	-0.69	10.21	10.50	53	0.102	-19.85	-8.95	0.13
9	0.905	-0.87	10.03	10.08	54	0.105	-19.61	-8.71	0.13
10	0.885	-1.06	9.84	9.64	55	0.107	-19.42	-8.52	0.14
11	0.861	-1.30	9.60	9.13	56	0.108	-19.31	-8.41	0.14
12	0.836	-1.56	9.34	8.60	57	0.109	-19.26	-8.36	0.15
13	0.810	-1.83	9.07	8.07	58	0.109	-19.26	-8.36	0.15
14	0.782	-2.13	8.77	7.53	59	0.108	-19.30	-8.40	0.14
15	0.754	-2.45	8.45	6.99	60	0.107	-19.39	-8.49	0.14
16	0.724	-2.81	8.09	6.44	61	0.105	-19.58	-8.68	0.14
17	0.692	-3.19	7.71	5.90	62	0.102	-19.81	-8.91	0.13
18	0.661	-3.60	7.30	5.37	63	0.099	-20.09	-9.19	0.12
19	0.629	-4.03	6.87	4.86	64	0.095	-20.41	-9.51	0.11
20	0.596	-4.49	6.41	4.38	65	0.091	-20.78	-9.88	0.10
21	0.563	-4.99	5.91	3.90	66	0.086	-21.32	-10.42	0.09
22	0.530	-5.52	5.38	3.45	67	0.080	-21.93	-11.03	0.08
23	0.496	-6.08	4.82	3.03	68	0.074	-22.62	-11.72	0.07
24	0.464	-6.68	4.22	2.64	69	0.068	-23.40	-12.50	0.06
25	0.431	-7.31	3.59	2.28	70	0.061	-24.28	-13.38	0.05
26	0.398	-8.01	2.89	1.95	71	0.056	-24.99	-14.09	0.04
27	0.365	-8.75	2.15	1.64	72	0.051	-25.78	-14.88	0.03
28	0.333	-9.54	1.36	1.37	73	0.046	-26.66	-15.76	0.03
29	0.303	-10.38	0.52	1.13	74	0.041	-27.66	-16.76	0.02
30	0.273	-11.29	-0.39	0.91	75	0.036	-28.81	-17.91	0.02
31	0.243	-12.28	-1.38	0.73	76	0.032	-29.79	-18.89	0.01
32	0.215	-13.37	-2.47	0.57	77	0.028	-30.91	-20.01	0.01
33	0.187	-14.54	-3.64	0.43	78	0.025	-32.20	-21.30	0.01
34	0.161	-15.85	-4.95	0.32	79	0.021	-33.72	-22.82	0.01
35	0.136	-17.30	-6.40	0.23	80	0.017	-35.58	-24.68	0.00
36	0.113	-18.96	-8.06	0.16	81	0.015	-36.30	-25.40	0.00
37	0.090	-20.89	-9.99	0.10	82	0.014	-37.09	-26.19	0.00
38	0.069	-23.22	-12.32	0.06	83	0.013	-37.95	-27.05	0.00
39	0.049	-26.16	-15.26	0.03	84	0.011	-38.92	-28.02	0.00
40	0.031	-30.31	-19.41	0.01	85	0.010	-40.00	-29.10	0.00
41	0.013	-37.62	-26.72	0.00	86	0.010	-40.00	-29.10	0.00
42	0.010	-40.00	-29.10	0.00	87	0.010	-40.00	-29.10	0.00
43	0.018	-35.04	-24.14	0.00	88	0.010	-40.00	-29.10	0.00
44	0.031	-30.11	-19.21	0.01	89	0.010	-40.00	-29.10	0.00
					90	0.010	-40.00	-29.10	0.00

74.1204(d) Showing

Richmond, TX 296D

ERP (kw)  
Height of Antenna above Ground (m)  
Translator's IX Contour

0.25  
144  
106

Scala CL-FM(H) 3 bay (HW)

<u>Depression Angle from Horizon</u>	<u>Antenna Relative Field</u>	<u>ERP (kw) from the Antenna RF</u>	<u>Dist. To IX Contour (m)</u>	<u>Height IX Contour Above Ground (m)</u>
0	1	0.2500	555.8659	144.000
5	0.969	0.2347	538.6340	97.055
10	0.885	0.1958	491.9413	58.575
15	0.754	0.1421	419.1229	35.523
20	0.596	0.0888	331.2961	30.690
25	0.431	0.0464	239.5782	42.750
30	0.273	0.0186	151.7514	68.124
35	0.136	0.0046	75.5978	100.639
40	0.031	0.0002	17.2318	132.924
45	0.043	0.0005	23.9022	127.099
50	0.055	0.0008	30.5726	120.580
55	0.107	0.0029	59.4776	95.279
60	0.107	0.0029	59.4776	92.491
65	0.091	0.0021	50.5838	98.156
70	0.061	0.0009	33.9078	112.137
75	0.036	0.0003	20.0112	124.671
80	0.017	0.0001	9.4497	134.694
85	0.01	0.0000	5.5587	138.462
90	0.01	0.0000	5.5587	138.441

**Note: Input the ERP, Height of the antenna above Ground, the Calculated Translator IX contour, and the specified Antenna Relative Field Pat**