

Human Exposure To Radiofrequency Radiation and Environmental Assessment Study

**KEKB, Fruita, Colorado
KMXY, Grand Junction, Colorado
KBKL, Grand Junction, Colorado**

CONTROLLED ENVIRONMENTS

This study is divided into two parts for the controlled (occupational) environments. The first part list the facilities co-located on the same tower and the second part list the facilities located on nearby towers. The assessment of each facility was conducted for this evaluation.

The tenants of the Black Ridge Electronics site have installed a gate across the access road leading to top of the mountain, where the broadcast facilities are located. The gate located on the west side of the hill is locked to prevent casual trespass (general public) to the site. This is the only access to the site due to the nature of the hill. Warning signs are posted in the vicinity of the tower warning of potential radiofrequency radiation hazards at the site.

Facilities Co-Located on Same Tower

The facilities on the same tower were considered as in the first part of the controlled study. KEBB(FM), KBKL(FM) and KMXY(FM) proposes to use a Dielectric DCRM-12B78 antenna (12 element) as a common antenna mounted 98 meters above ground level. The spacing between elements will be 2.32 meters (7.6 feet).

For the KEBB(FM) facility, the Dielectric will be 0.77 wave-length spaced. The Dielectric DCRM antenna with 0.77 wavelength spacing between elements of the FM Model for windows was used to determine the power density considering the antenna being mounted 98 meters above ground level with 79 kw. ERP. The facility will produce $0.143 \mu\text{W}/\text{cm}^2$ at 2 meters from the base of the tower. The highest level of power density ($1.123 \mu\text{W}/\text{cm}^2$) is located at 69 meters from the base of the tower. The higher level was considered for the study.

For the KMXY(FM) facility, the Dielectric will be 0.81 wave-length spaced. The Dielectric DCRM antenna with 0.81 wavelength spacing between elements of the FM Model for windows was used to determine the power density considering the antenna being mounted 98 meters above ground level with 100 kw. ERP. The facility will produce $0.325 \mu\text{W}/\text{cm}^2$ at 2 meters from the base of the tower. The highest level of power density ($1.611 \mu\text{W}/\text{cm}^2$) is located at 53 meters from the base of the tower. The higher level was considered for the study.

For the KBKL(FM) facility, the Dielectric will be 0.83 wave-length spaced. The Dielectric DCRM antenna with 0.83 wavelength spacing between elements of the FM Model for windows was used to determine the power density considering the antenna being mounted 98 meters above ground level with 79 kw. ERP. The facility will produce $0.010 \mu\text{W}/\text{cm}^2$ at 2 meters from the base of the tower. The highest level of power density ($1.735 \mu\text{W}/\text{cm}^2$) is located at 59 meters from the base of the tower. The higher level was considered for the study.

Listed below is the results of the study for the facilities located on the same tower:

Controlled CALL	Service	Channel	Freq.	Polarization	Antenna Height* (AGL)	ERP (kW)	Relative Field Factor	Vertical Predicted Power Density (mW/cm ²)	FCC Controlled Limit (mW/cm ²)	Percent of Limit
KEKB	FM	260	99.9	H&V	98	79.000	1.000	0.0011228	0.200	0.5614%
KMXY	FM	282	104.3	H&V	98	100.000	1.000	0.0016107	0.200	0.8053%
KBKL	FM	300	107.9	H&V	98	100.000	1.000	0.0017352	0.200	0.8676%

Total Percentage of ANSI value (on same tower) = 2.234%

* The antenna height indicated above is 2 meters less than the actual antenna height so that the predicted power density consider the 2 meter human height allowance.

The total percentage of the ANSI values with the combined facilities on the co-located tower is 2.234% of the limit for “controlled” environments.

Facilities Located Nearby Towers

The facilities in the surrounding of the study site were considered as in the second part of the controlled study. The ERP, the relative field, height above ground level, the distance to the tower from the study site was used to determine the power density of the considered facility at the study site.

For KAFM, KPRN, KJYE, KMOZ-FM and KZKS-FM1, the power densities were determined by use the following formula:

$$(33.41 * \text{Total ERP in kW considering the elevation pattern tabulations}) / (\text{COR in meters} - 2 \text{ meter})^2$$

The KLFV facility has a SWR FM3/6 antenna (6 bay, full-waved spaced) mounted 26 meters above ground level with 3.0 kw. ERP and is located at 100 meters from the study site. The Jampro “Double V” (EPA) antenna with full wavelength spacing between elements of the FM Model for window was used to determine the power density. The KLFV facility produces 25.794 $\mu\text{W}/\text{cm}^2$ at 2.0 meters from its tower base. The highest level of power density (38.664 $\mu\text{W}/\text{cm}^2$) is located at 7.0 meters from its tower base. The power density of 1.074 $\mu\text{W}/\text{cm}^2$ at 100 meters (to the study site) level was used for this study.

The KMSA facility has a Shively 6813 antenna (4 bay, full-waved spaced) mounted 35 meters above ground level with 3.0 kw. ERP and is located at 290 meters from the study site. The Shively 6810 antenna with full wavelength spacing between elements of the FM Model for window was used to determine the power density. The KMSA facility produces 1.394 $\mu\text{W}/\text{cm}^2$ at 2.0 meters from its tower base. The highest level of power density (13.514 $\mu\text{W}/\text{cm}^2$) is located at 15.0 meters from its tower base. The power density of 1.153 $\mu\text{W}/\text{cm}^2$ at 290 meters (to the study site) level was used for this study.

The KMGJ facility has a Jampro JHPC-8 antenna (8 bay, full-waved spaced) mounted 59 meters above ground level with 100.0 kw. ERP and is located at 280 meters from the study site. The Jampro “Double V” (EPA) antenna with full wavelength spacing between elements of the FM Model for window was used to determine the power density. The KMGJ facility produces 147.472 $\mu\text{W}/\text{cm}^2$ at 2.0 meters from its tower base. The highest level of power density (204.881 $\mu\text{W}/\text{cm}^2$) is located at 14.0 meters from its tower base. The power density of 3.374 $\mu\text{W}/\text{cm}^2$ at 280 meters (to the study site) level was used for this study.

KRQX (TV channel 4) has a Jampro JHD-LV2-2/3 antenna that operates with 10.7 kilowatts at 47 meters above ground level and is located 160 meters from the study site. Attached is a print out of the elevation pattern to 90 degrees depression provided by Jampro. The highest field between 70 and 90 degrees depression is 0.314 (1.055 kilowatt) which would produce a power density of $0.651 \mu\text{W}/\text{cm}^2$ at the study site. That level was used for the study.

KREX (TV channel 5) has an ERI CH5HEL-B6V3 antenna that operates with 100.0 kilowatts at 51 meters above ground level and is located 160 meters from the study site. Attached is a print out of the elevation pattern to 90 degrees depression provided by ERI. The highest field between 70 and 90 degrees depression is 0.022 (0.048 kilowatt) which would produce a power density of $0.029 \mu\text{W}/\text{cm}^2$ at the study site. That level was used for the study.

KKCO (TV channel 11) has a SWR SWVHP30/11 antenna that operates with 155.0 kilowatts at 83 meters above ground level and is located 210 meters from the study site. Attached is a print out of the elevation pattern to 90 degrees depression provided by SWR. The highest field between 70 and 90 degrees depression is 0.037 (0.212 kilowatt) which would produce a power density of $0.071 \mu\text{W}/\text{cm}^2$ at the study site. That level was used for the study.

KKCO (DTV channel 12) has a SWR SWED4EC/12 antenna that operates with 5.3 kilowatts at 89 meters above ground level and is located 210 meters from the study site. Attached is a print out of the elevation pattern to 90 degrees depression provided by SWR. The highest field between 70 and 90 degrees depression is 0.348 (0.642 kilowatt) which would produce a power density of $0.021 \mu\text{W}/\text{cm}^2$ at the study site. That level was used for the study.

KRQX (DTV channel 15) has a Dielectric TUP-C2-16-1 antenna that operates with 71.5 kilowatts at 30 meters above ground level and is located 160 meters from the study site. Attached is a print out of the elevation pattern to 90 degrees depression provided by Dielectric. The highest field between 70 and 90 degrees depression is 0.014 (0.014 kilowatt) which would produce a power density of $0.009 \mu\text{W}/\text{cm}^2$ at the study site. That level was used for the study.

KRMJ (DTV channel 17) has a Andrew TFU-8DSB-M DC antenna that operates with 50 kilowatts at 45 meters above ground level and is located 220 meters from the study site. Attached is a print out of the elevation pattern to 90 degrees depression provided by Dielectric. The highest field between 70 and 90 degrees depression is 0.095 (0.451 kilowatt) which would produce a power density of $0.152 \mu\text{W}/\text{cm}^2$ at the study site. That level was used for the study.

KRMJ (TV channel 18) has a Andrew TFU-8DSB-M DC antenna that operates with 186 kilowatts at 32 meters above ground level and is located 220 meters from the study site. Attached is a print out of the elevation pattern to 90 degrees depression provided by Dielectric. The highest field between 70 and 90 degrees depression is 0.092 (1.679 kilowatt) which would produce a power density of $0.578 \mu\text{W}/\text{cm}^2$ at the study site. That level was used for the study.

For the following facilities,, Equation (2), found on Page 30 of Supplement A to FCC OET Bulletin No. 65, detail the calculation technique for determining the power density levels at the base of the tower, assuming 100% downward radiation from the individual antennas.

K25FZ operates with 21.4 kilowatts at 40 meters above ground level and is located 290 meters from the study site. The power density was calculated to be $4.228 \mu\text{W}/\text{cm}^2$ at the study site.

K63EI (CP for channel 45) has listed 3.0 kilowatts at 18 meters above ground level and is located 50 meters from the study site. The power density was calculated to be $6.232 \mu\text{W}/\text{cm}^2$ at the study site.

K65CE (CP for channel 47) has listed 3.0 kilowatts at 18 meters above ground level and is located 50 meters from the study site. The power density was calculated to be 6.232 $\mu\text{W}/\text{cm}^2$ at the study site.

K67CJ (CP for channel 49) has listed 3.0 kilowatts at 18 meters above ground level and is located 50 meters from the study site. The power density was calculated to be 6.232 $\mu\text{W}/\text{cm}^2$ at the study site.

K63EI operates on channel 63 with 0.984 kilowatts at 14 meters above ground level and is located 50 meters from the study site. The power density was calculated to be 6.593 $\mu\text{W}/\text{cm}^2$ at the study site.

K65CE operates on channel 65 with 0.122 kilowatts at 14 meters above ground level and is located 50 meters from the study site. The power density was calculated to be 0.818 $\mu\text{W}/\text{cm}^2$ at the study site.

K67CJ operates on channel 67 with 0.122 kilowatts at 14 meters above ground level and is located 50 meters from the study site. The power density was calculated to be 0.818 $\mu\text{W}/\text{cm}^2$ at the study site.

Listed below is the results of the study for the facilities located on the nearby towers:

<u>CALL</u>	<u>Service</u>	<u>Channel</u>	<u>Freq.</u>	<u>Distance</u> <u>(km)</u>	<u>AGL</u> <u>(m)</u>	<u>ERP</u> <u>(kW)</u>	<u>Relative</u> <u>Field</u> <u>Factor</u>	<u>Predicted</u> <u>Power Density</u> <u>(mW/cm²)</u>	<u>FCC</u> <u>Controlled</u> <u>Limit</u> <u>(mW/cm²)</u>	<u>Percent of</u> <u>Controlled</u> <u>Limit</u>
KAFM	FM	201	88.1	0.29	15	0.016	1.000	0.0000129	1.000	0.001%
KPRN	FM	208	89.5	0.17	18	9.900	1.000	0.0233063	1.000	2.331%
KLFV	FM	212	90.3	0.1	26	3	1.000	0.0010736	1.000	0.107%
KMSA	FM	217	91.3	0.29	35	100	1.000	0.0011529	1.000	0.115%
KJYE	FM	222	92.3	0.29	58	100	1.000	0.0789853	1.000	7.899%
KMGJ	FM	226	93.1	0.28	59	100	1.000	0.0845895	1.000	8.459%
KMOZ-FM	FM	264	100.7	0.29	57	42	1.000	0.0331958	1.000	3.320%
KZKS-FM1	FB	212	90.3	0.17	24	20	1.000	0.0468794	1.000	4.688%
KFQX	TV	4	69	0.16	46	10.700	0.300	0.0006512	0.046	1.416%
KREX	TV	5	73	0.16	51	100.000	0.300	0.0000294	0.049	0.060%
KKCO	TV	11	121	0.21	83	155.000	0.300	0.0000707	0.081	0.088%
KKCO	DTV	12	127	0.21	89	5.300	0.300	0.0002097	0.085	0.248%
KFQX	DTV	15	479	0.16	30	71.500	0.300	0.0000091	0.319	0.003%
KRMJ	DTV	17	491	0.22	45	50.000	0.300	0.0001521	0.327	0.046%
KRMJ	TV	18	497	0.22	32	186.000	0.300	0.0005775	0.331	0.174%
K25FZ	TV	25	539	0.29	40	21.400	0.300	0.0042277	0.359	1.177%
K63EI	TV	45	659	0.05	18	0.976	0.300	0.0062319	0.439	1.418%
K65C3	TV	47	671	0.05	18	0.976	0.300	0.0062319	0.447	1.393%
K67CJ	TV	49	683	0.05	18	0.976	0.300	0.0062319	0.455	1.369%
K63EI	TV	63	767	0.05	14	0.984	0.300	0.0065934	0.511	1.289%
K65C3	TV	65	779	0.05	14	0.122	0.300	0.0008175	0.519	0.157%
K67CJ	TV	67	791	0.05	14	0.122	0.300	0.0008175	0.527	0.155%

Total Percentage of ANSI value (on nearby towers) = 33.358%

* The antenna height indicated above is 2 meters less than the actual antenna height so that the predicted power density consider the 2 meter human height allowance.

The total percentage of the ANSI values with the combined facilities on the nearby tower is 33.358% of the limit for “controlled” environments.

The total percentage of the ANSI values with the combined facilities on the co-located tower and nearby towers was computed to be 35.592% of the limit for “controlled” environments.

This study was conducted using the site near the base of the supporting structure for the proposed common antenna of KEKB(FM), KMXY(FM), and KBKL(FM) demonstrates compliance with the controlled environments guidelines of the Commission. This is not to say that the controlled environments guidelines are met for the entire area of the Black Ridge Electronics site.

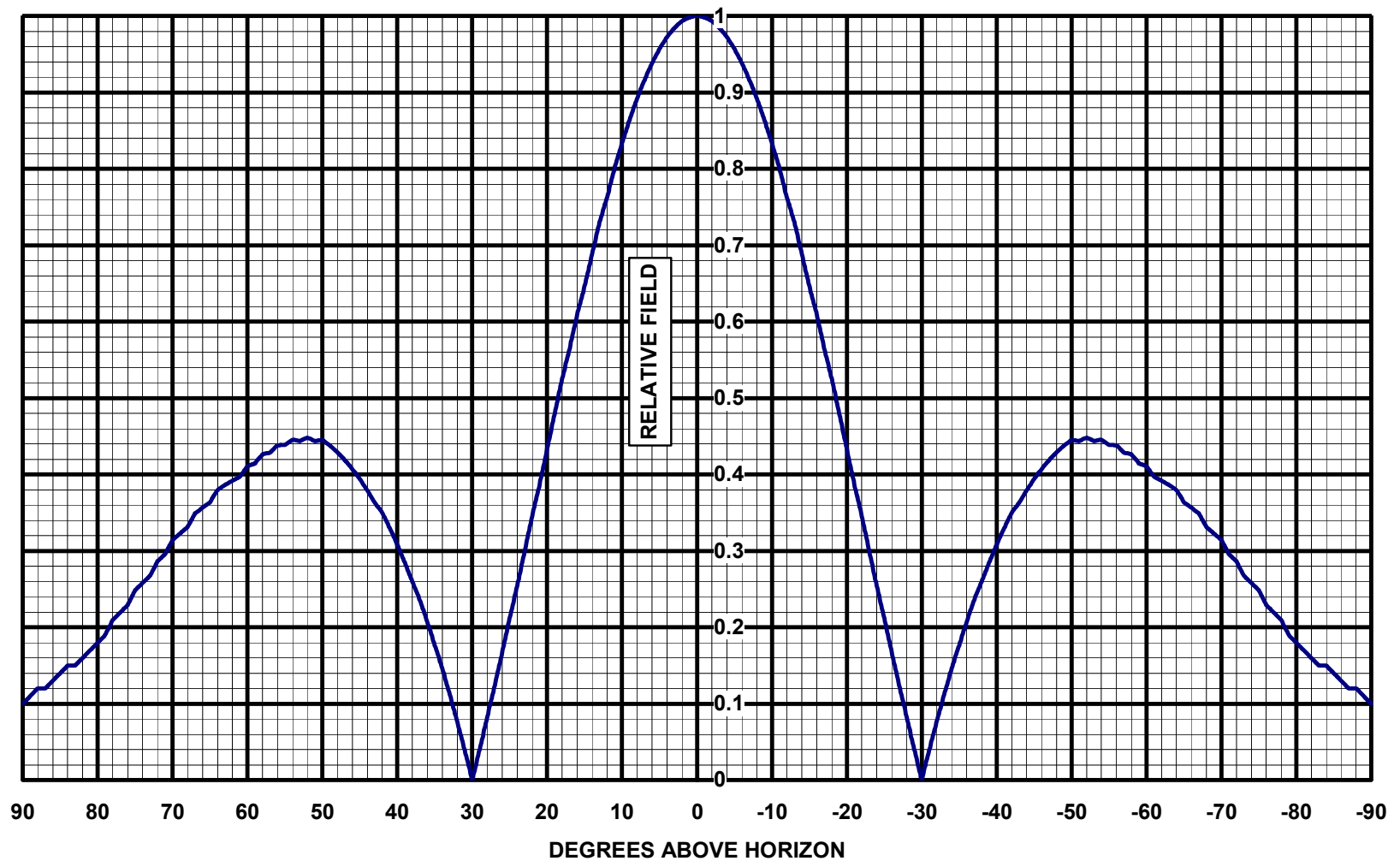
UNCONTROLLED ENVIRONMENTS

A locked gate on the road leading to the site makes it inaccessible to the general public. It is believe that the area outside of the Black Ridge Electronics site is in compliance with guidelines required by the Commission for uncontrolled environments. To conduct a complete study for uncontrolled environments, the exact geographic location of the gate would be required.

CONCLUSION

This study was conducted on behalf of Cumulus Licensing, LCC by Reynolds Technical Associates and All information contained herein was compiled by using documentations provide by various sources and is believed to be accurate to the best of our knowledge.

The following is documentations supporting this study.



ELEVATION PATTERN

Customer: KFQX-TV
Model#: JHD-LV2-2/3

March 15, 2004

Channel: 4 (66-72 MHz)
Gain: 4.5x / 6.5 dBd for Omni

6340 Sky Creek Drive, Sacramento, CA 95829
TEL: 01+916-383-1177

web: www.Jampro.com
FAX: 01+916-383-1182



ELEVATION PATTERN TABULATION

RELATIVE FIELD VS ELEVATION ANGLE

<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>	<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>	<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>
10	0.834	-26	0.167	-61	0.397
9	0.864	-27	0.124	-62	0.392
8	0.891	-28	0.082	-63	0.386
7	0.916	-29	0.041	-64	0.380
6	0.938	-30	0.000	-65	0.364
5	0.957	-31	0.039	-66	0.356
4	0.972	-32	0.076	-67	0.349
3	0.984	-33	0.112	-68	0.331
2	0.993	-34	0.146	-69	0.323
1	0.998	-35	0.176	-70	0.314
0	1.000	-36	0.207	-71	0.296
-1	0.998	-37	0.236	-72	0.287
-2	0.993	-38	0.259	-73	0.267
-3	0.984	-39	0.285	-74	0.258
-4	0.972	-40	0.308	-75	0.249
-5	0.957	-41	0.330	-76	0.229
-6	0.938	-42	0.350	-77	0.219
-7	0.916	-43	0.363	-78	0.210
-8	0.891	-44	0.379	-79	0.190
-9	0.864	-45	0.394	-80	0.180
-10	0.834	-46	0.407	-81	0.170
-11	0.801	-47	0.419	-82	0.160
-12	0.762	-48	0.429	-83	0.150
-13	0.730	-49	0.438	-84	0.150
-14	0.689	-50	0.445	-85	0.140
-15	0.646	-51	0.444	-86	0.130
-16	0.609	-52	0.448	-87	0.120
-17	0.565	-53	0.444	-88	0.120
-18	0.525	-54	0.446	-89	0.110
-19	0.479	-55	0.438	-90	0.100
-20	0.433	-56	0.438		
-21	0.387	-57	0.428		
-22	0.345	-58	0.426		
-23	0.300	-59	0.414		
-24	0.254	-60	0.411		
-25	0.212				

ELEVATION PATTERN

Customer: KFQX-TV
Channel: 4 (66-72 MHz)
Gain: 4.5x / 6.5 dBd for Omni

March 15, 2004
Model#: JHD-LV2-2/3

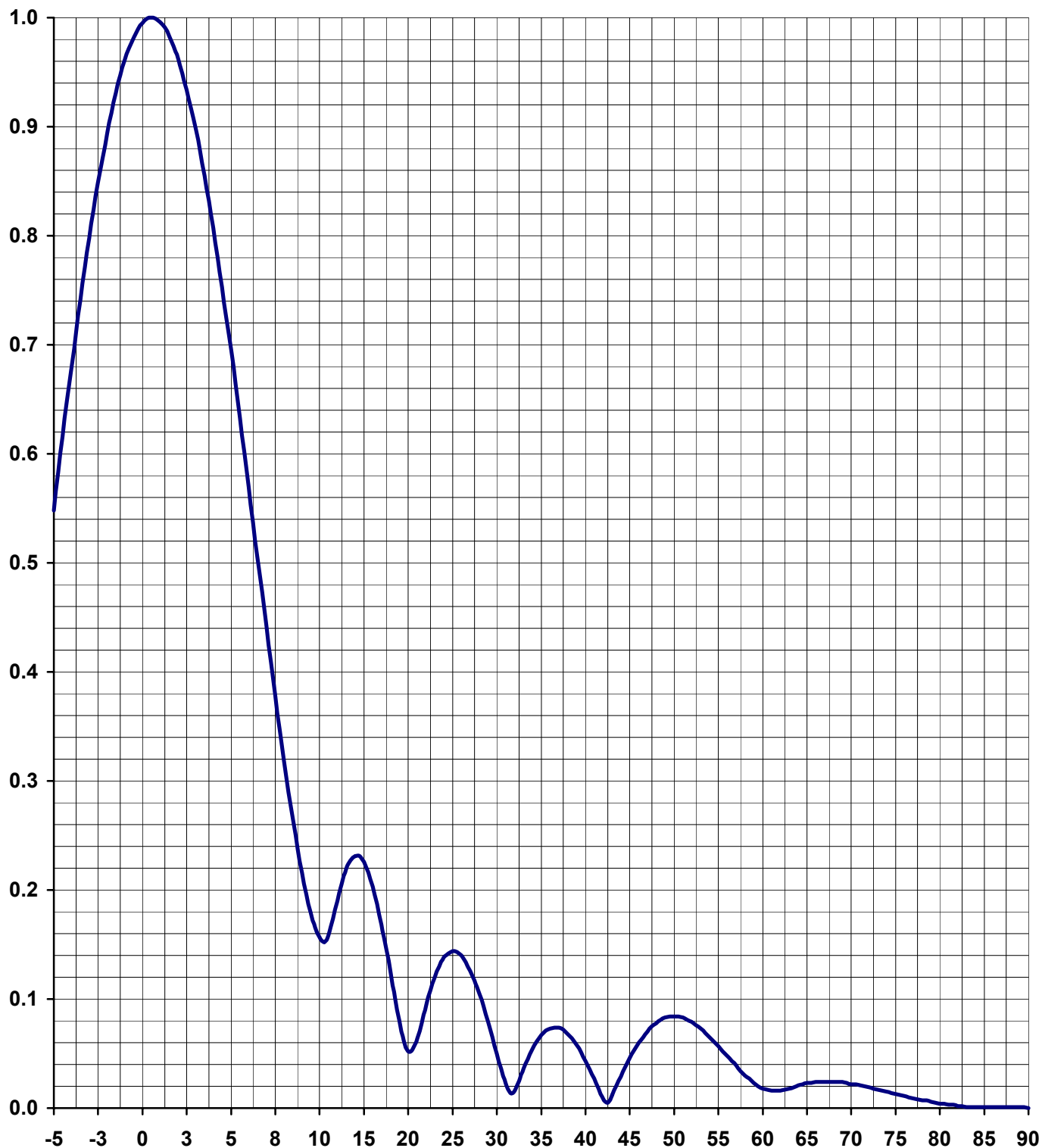
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ELEVATION PATTERN

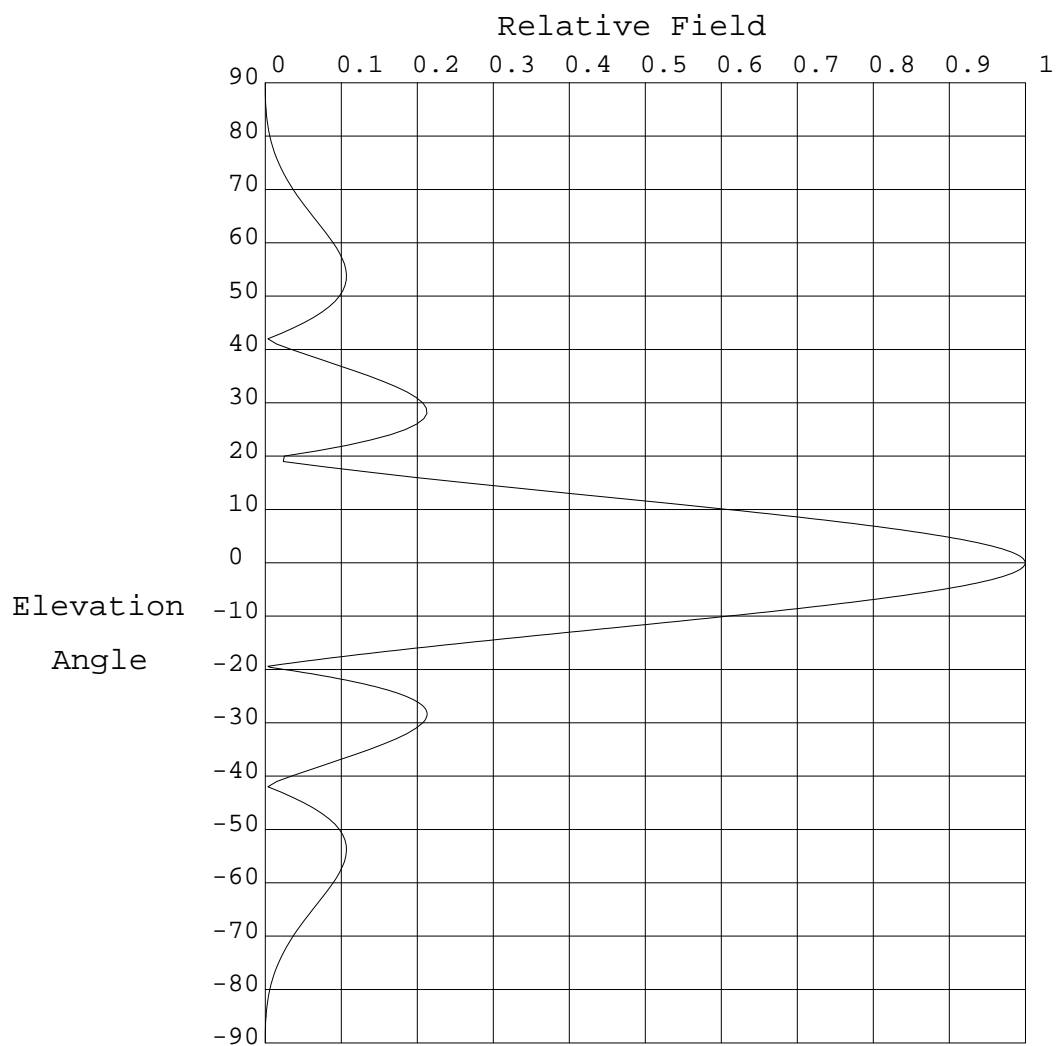
TYPE:	CH5HEL-B6V3	
Directivity:	Numeric	dBd
Main Lobe:	6.00	7.78
Horizontal:	5.94	7.74

Frequency:	5 (Analog)
Location:	Grand Junction, CO
Beam Tilt:	0.5 degrees
Polarization:	Horizontal



TABULATED DATA FOR ELEVATION PATTERN**TYPE: CH5HEL-B6V3****-5 to 10 degrees in 0.25 increments****10 to 90 degrees in 0.50 increments**

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
-5.00	0.548	-5.22	6.75	0.473	-6.51	27.00	0.126	-17.96	50.50	0.084	-21.54	74.00	0.015	-36.42
-4.75	0.583	-4.69	7.00	0.441	-7.12	27.50	0.117	-18.65	51.00	0.083	-21.65	74.50	0.014	-37.02
-4.50	0.616	-4.21	7.25	0.409	-7.77	28.00	0.105	-19.53	51.50	0.081	-21.83	75.00	0.013	-37.65
-4.25	0.649	-3.76	7.50	0.378	-8.46	28.50	0.093	-20.65	52.00	0.079	-22.07	75.50	0.012	-38.34
-4.00	0.681	-3.34	7.75	0.347	-9.19	29.00	0.079	-22.03	52.50	0.076	-22.38	76.00	0.011	-39.09
-3.75	0.712	-2.95	8.00	0.318	-9.96	29.50	0.065	-23.76	53.00	0.073	-22.76	76.50	0.010	-39.91
-3.50	0.742	-2.59	8.25	0.290	-10.76	30.00	0.050	-25.95	53.50	0.069	-23.20	77.00	0.009	-40.72
-3.25	0.771	-2.26	8.50	0.263	-11.60	30.50	0.036	-28.84	54.00	0.065	-23.70	77.50	0.008	-41.62
-3.00	0.798	-1.96	8.75	0.238	-12.46	31.00	0.023	-32.80	54.50	0.061	-24.29	78.00	0.007	-42.50
-2.75	0.824	-1.68	9.00	0.216	-13.33	31.50	0.014	-37.11	55.00	0.057	-24.93	78.50	0.007	-43.54
-2.50	0.849	-1.42	9.25	0.196	-14.16	32.00	0.016	-36.08	55.50	0.052	-25.64	79.00	0.006	-44.58
-2.25	0.872	-1.19	9.50	0.179	-14.92	32.50	0.025	-31.97	56.00	0.048	-26.43	79.50	0.005	-45.76
-2.00	0.894	-0.98	9.75	0.166	-15.57	33.00	0.036	-28.95	56.50	0.043	-27.29	80.00	0.004	-46.94
-1.75	0.913	-0.79	10.00	0.157	-16.07	33.50	0.045	-26.86	57.00	0.039	-28.25	80.50	0.004	-48.29
-1.50	0.931	-0.62	10.50	0.152	-16.39	34.00	0.054	-25.35	57.50	0.034	-29.26	81.00	0.003	-49.63
-1.25	0.947	-0.48	11.00	0.159	-15.99	34.50	0.061	-24.28	58.00	0.030	-30.37	81.50	0.003	-51.06
-1.00	0.961	-0.35	11.50	0.174	-15.21	35.00	0.067	-23.50	58.50	0.027	-31.52	82.00	0.002	-52.77
-0.75	0.972	-0.24	12.00	0.190	-14.40	35.50	0.071	-22.99	59.00	0.023	-32.69	82.50	0.002	-54.66
-0.50	0.982	-0.16	12.50	0.206	-13.71	36.00	0.073	-22.69	59.50	0.020	-33.85	83.00	0.001	-56.48
-0.25	0.990	-0.09	13.00	0.219	-13.20	36.50	0.074	-22.59	60.00	0.018	-34.89	83.50	0.001	-58.79
0.00	0.995	-0.04	13.50	0.227	-12.87	37.00	0.074	-22.65	60.50	0.017	-35.62	84.00	0.001	-60.00
0.25	0.999	-0.01	14.00	0.231	-12.71	37.50	0.072	-22.91	61.00	0.016	-36.03	84.50	0.001	-60.00
0.50	1.000	0.00	14.50	0.231	-12.74	38.00	0.068	-23.32	61.50	0.016	-36.05	85.00	0.001	-60.00
0.75	0.999	-0.01	15.00	0.226	-12.93	38.50	0.064	-23.94	62.00	0.016	-35.76	85.50	0.001	-60.00
1.00	0.996	-0.03	15.50	0.216	-13.30	39.00	0.058	-24.76	62.50	0.017	-35.29	86.00	0.001	-60.00
1.25	0.991	-0.08	16.00	0.203	-13.84	39.50	0.051	-25.84	63.00	0.018	-34.75	86.50	0.001	-60.00
1.50	0.983	-0.15	16.50	0.187	-14.58	40.00	0.043	-27.23	63.50	0.019	-34.20	87.00	0.001	-60.00
1.75	0.974	-0.23	17.00	0.168	-15.52	40.50	0.035	-29.07	64.00	0.021	-33.72	87.50	0.001	-60.00
2.00	0.963	-0.33	17.50	0.146	-16.70	41.00	0.027	-31.54	64.50	0.022	-33.31	88.00	0.001	-60.00
2.25	0.949	-0.45	18.00	0.124	-18.14	41.50	0.018	-35.09	65.00	0.023	-32.96	88.50	0.001	-60.00
2.50	0.934	-0.59	18.50	0.101	-19.88	42.00	0.009	-41.11	65.50	0.023	-32.71	89.00	0.001	-60.00
2.75	0.917	-0.75	19.00	0.080	-21.94	42.50	0.005	-46.02	66.00	0.024	-32.51	89.50	0.001	-60.00
3.00	0.898	-0.93	19.50	0.062	-24.08	43.00	0.012	-38.42	66.50	0.024	-32.38	90.00	0.000	0.00
3.25	0.877	-1.14	20.00	0.052	-25.61	43.50	0.021	-33.64	67.00	0.024	-32.29			
3.50	0.855	-1.36	20.50	0.054	-25.38	44.00	0.029	-30.60	67.50	0.024	-32.29			
3.75	0.832	-1.60	21.00	0.064	-23.88	44.50	0.038	-28.45	68.00	0.024	-32.32			
4.00	0.807	-1.87	21.50	0.078	-22.11	45.00	0.046	-26.80	68.50	0.024	-32.43			
4.25	0.780	-2.16	22.00	0.094	-20.57	45.50	0.053	-25.53	69.00	0.024	-32.58			
4.50	0.753	-2.47	22.50	0.108	-19.35	46.00	0.060	-24.51	69.50	0.023	-32.77			
4.75	0.724	-2.80	23.00	0.120	-18.41	46.50	0.065	-23.70	70.00	0.022	-33.00			
5.00	0.695	-3.17	23.50	0.130	-17.72	47.00	0.070	-23.05	70.50	0.022	-33.29			
5.25	0.664	-3.56	24.00	0.138	-17.23	47.50	0.075	-22.53	71.00	0.021	-33.64			
5.50	0.633	-3.97	24.50	0.142	-16.95	48.00	0.078	-22.14	71.50	0.020	-33.98			
5.75	0.602	-4.41	25.00	0.144	-16.83	48.50	0.081	-21.85	72.00	0.019	-34.38			
6.00	0.570	-4.89	25.50	0.143	-16.88	49.00	0.083	-21.65	72.50	0.018	-34.85			
6.25	0.537	-5.40	26.00	0.140	-17.08	49.50	0.084	-21.53	73.00	0.017	-35.34			
6.50	0.505	-5.94	26.50	0.134	-17.44	50.00	0.084	-21.49	73.50	0.016	-35.86			



Elevation Pattern

Scale: Linear

Systems With Reliability Inc.

Units: Field, Relative

CLIENT: *Bill Varecha*

Date: 3/19/04

ANTENNA TYPE: SWVHP30M/11

FREQUENCY: 201

PATTERN POL.: Horizontal

DIRECTIVITY(Peak) 3.847/5.851 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz) 3.847/5.851 dBd

Null Fill(s)(%) 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)		Elev. Angle	Rel. Fld(dB)		Elev. Angle
3.2	.954 (-0.406)	-4.4	.915 (-0.773)	-12.0	.471 (-6.534)	
3.0	.96 (-0.356)	-4.6	.907 (-0.846)	-12.2	.457 (-6.796)	
2.8	.965 (-0.31)	-4.8	.899 (-0.922)	-12.4	.443 (-7.066)	
2.6	.97 (-0.267)	-5.0	.891 (-1.002)	-12.6	.429 (-7.345)	
2.4	.974 (-0.227)	-5.2	.882 (-1.086)	-12.8	.415 (-7.633)	
2.2	.978 (-0.191)	-5.4	.874 (-1.173)	-13.0	.401 (-7.931)	
2.0	.982 (-0.158)	-5.6	.865 (-1.264)	-13.2	.387 (-8.238)	
1.8	.985 (-0.128)	-5.8	.855 (-1.359)	-13.4	.373 (-8.557)	
1.6	.988 (-0.101)	-6.0	.846 (-1.457)	-13.6	.36 (-8.886)	
1.4	.991 (-0.077)	-6.2	.836 (-1.559)	-13.8	.346 (-9.227)	
1.2	.994 (-0.057)	-6.4	.826 (-1.665)	-14.0	.332 (-9.581)	
1.0	.995 (-0.039)	-6.6	.815 (-1.775)	-14.2	.318 (-9.948)	
.8	.997 (-0.025)	-6.8	.805 (-1.889)	-14.4	.304 (-10.33)	
.6	.998 (-0.014)	-7.0	.794 (-2.007)	-14.6	.291 (-10.727)	
.4	.999 (-0.006)	-7.2	.783 (-2.129)	-14.8	.277 (-11.114)	
.2	1.00 (-0.002)	-7.4	.771 (-2.255)	-15.0	.264 (-11.571)	
.0	1.00 (0)	-7.6	.76 (-2.385)	-15.2	.251 (-12.021)	
-.2	1.00 (-0.002)	-7.8	.748 (-2.52)	-15.4	.237 (-12.492)	
-.4	.999 (-0.006)	-8.0	.736 (-2.659)	-15.6	.224 (-12.986)	
-.6	.998 (-0.014)	-8.2	.724 (-2.802)	-15.8	.211 (-13.505)	
-.8	.997 (-0.025)	-8.4	.712 (-2.95)	-16.0	.198 (-14.051)	
-1.0	.995 (-0.039)	-8.6	.70 (-3.102)	-16.2	.186 (-14.628)	
-1.2	.994 (-0.057)	-8.8	.687 (-3.26)	-16.4	.173 (-15.24)	
-1.4	.991 (-0.077)	-9.0	.674 (-3.422)	-16.6	.161 (-15.89)	
-1.6	.988 (-0.101)	-9.2	.662 (-3.589)	-16.8	.148 (-16.584)	
-1.8	.985 (-0.128)	-9.4	.649 (-3.761)	-17.0	.136 (-17.329)	
-2.0	.982 (-0.158)	-9.6	.635 (-3.938)	-17.2	.124 (-18.133)	
-2.2	.978 (-0.191)	-9.8	.622 (-4.121)	-17.4	.112 (-19.006)	
-2.4	.974 (-0.227)	-10.0	.609 (-4.309)	-17.6	.10 (-19.962)	
-2.6	.97 (-0.267)	-10.2	.595 (-4.503)	-17.8	.089 (-21.02)	
-2.8	.965 (-0.31)	-10.4	.582 (-4.703)	-18.0	.078 (-22.205)	
-3.0	.96 (-0.356)	-10.6	.568 (-4.908)	-18.2	.066 (-23.554)	
-3.2	.954 (-0.406)	-10.8	.555 (-5.12)	-18.4	.055 (-25.123)	
-3.4	.949 (-0.458)	-11.0	.541 (-5.339)	-18.6	.045 (-27.001)	
-3.6	.942 (-0.514)	-11.2	.527 (-5.563)	-18.8	.034 (-29.352)	
-3.8	.936 (-0.574)	-11.4	.513 (-5.795)	-19.0	.024 (-32.512)	
-4.0	.929 (-0.637)	-11.6	.499 (-6.034)	-19.2	.013 (-37.4)	
-4.2	.922 (-0.703)	-11.8	.485 (-6.28)	-19.4	.004 (-49.105)	

Systems With Reliability Inc.

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CLIENT: *Bill Varecha*

Date: 3/19/04

ANTENNA TYPE: SWVHP30M/11

FREQUENCY: 201

PATTERN POL.: Horizontal

DIRECTIVITY(Peak) 3.847/5.851 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz) 3.847/5.851 dBd

Null Fill(s)(%) 0, 0, 0

Relative Field Tabulation

Elev. Angle			Rel. Fld(dB)			Elev. Angle			Rel. Fld(dB)			Elev. Angle		
-19.6	.006	(-44.053)	-27.2	.21	(-13.567)	-54.0	.107	(-19.423)						
-19.8	.016	(-36.007)	-27.4	.211	(-13.525)	-55.0	.106	(-19.491)						
-20.0	.025	(-31.976)	-27.6	.212	(-13.491)	-56.0	.104	(-19.643)						
-20.2	.034	(-29.289)	-27.8	.212	(-13.465)	-57.0	.101	(-19.872)						
-20.4	.043	(-27.283)	-28.0	.213	(-13.447)	-58.0	.098	(-20.175)						
-20.6	.052	(-25.692)	-28.2	.213	(-13.437)	-59.0	.094	(-20.545)						
-20.8	.06	(-24.379)	-28.4	.213	(-13.434)	-60.0	.089	(-20.981)						
-21.0	.069	(-23.268)	-28.6	.213	(-13.439)	-61.0	.084	(-21.48)						
-21.2	.077	(-22.309)	-28.8	.213	(-13.451)	-62.0	.079	(-22.04)						
-21.4	.084	(-21.469)	-29.0	.212	(-13.47)	-63.0	.074	(-22.66)						
-21.6	.092	(-20.724)	-29.2	.211	(-13.496)	-64.0	.068	(-23.339)						
-21.8	.099	(-20.059)	-29.4	.211	(-13.529)	-65.0	.063	(-24.078)						
-22.0	.106	(-19.46)	-29.6	.21	(-13.569)	-66.0	.057	(-24.876)						
-22.2	.113	(-18.917)	-29.8	.209	(-13.615)	-67.0	.052	(-25.735)						
-22.4	.12	(-18.424)	-30.0	.207	(-13.669)	-68.0	.046	(-26.656)						
-22.6	.126	(-17.973)	-31.0	.199	(-14.036)	-69.0	.041	(-27.642)						
-22.8	.132	(-17.56)	-32.0	.187	(-14.57)	-70.0	.037	(-28.695)						
-23.0	.138	(-17.18)	-33.0	.172	(-15.276)	-71.0	.032	(-29.818)						
-23.2	.144	(-16.83)	-34.0	.155	(-16.169)	-72.0	.028	(-31.016)						
-23.4	.149	(-16.508)	-35.0	.137	(-17.273)	-73.0	.024	(-32.294)						
-23.6	.155	(-16.21)	-36.0	.117	(-18.627)	-74.0	.021	(-33.659)						
-23.8	.16	(-15.935)	-37.0	.097	(-20.301)	-75.0	.018	(-35.119)						
-24.0	.164	(-15.681)	-38.0	.076	(-22.412)	-76.0	.015	(-36.684)						
-24.2	.169	(-15.445)	-39.0	.055	(-25.193)	-77.0	.012	(-38.367)						
-24.4	.173	(-15.228)	-40.0	.035	(-29.199)	-78.0	.01	(-40.183)						
-24.6	.177	(-15.027)	-41.0	.015	(-36.412)	-79.0	.008	(-42.151)						
-24.8	.181	(-14.842)	-42.0	.003	(-49.299)	-80.0	.006	(-44.298)						
-25.0	.185	(-14.671)	-43.0	.021	(-33.668)	-81.0	.005	(-46.656)						
-25.2	.188	(-14.514)	-44.0	.037	(-28.727)	-82.0	.003	(-49.271)						
-25.4	.191	(-14.37)	-45.0	.051	(-25.857)	-83.0	.002	(-52.205)						
-25.6	.194	(-14.239)	-46.0	.064	(-23.924)	-84.0	.002	(-55.549)						
-25.8	.197	(-14.119)	-47.0	.075	(-22.537)	-85.0	.001	(-59.442)						
-26.0	.199	(-14.01)	-48.0	.084	(-21.516)	-86.0	.001	(-64.113)						
-26.2	.202	(-13.912)	-49.0	.092	(-20.76)	-87.0	.00	(-69.988)						
-26.4	.204	(-13.824)	-50.0	.098	(-20.21)	-88.0	.00	(-78.01)						
-26.6	.205	(-13.746)	-51.0	.102	(-19.825)	-89.0	.00	(-91.156)						
-26.8	.207	(-13.677)	-52.0	.105	(-19.577)	-90.0	.00	(-50)						
-27.0	.209	(-13.618)	-53.0	.107	(-19.448)	90.0	.00	(-50)						

Systems With Reliability Inc.

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CLIENT: *Bill Varecha*

Date: 3/19/04

ANTENNA TYPE: SWVHP30M/11

FREQUENCY: 201

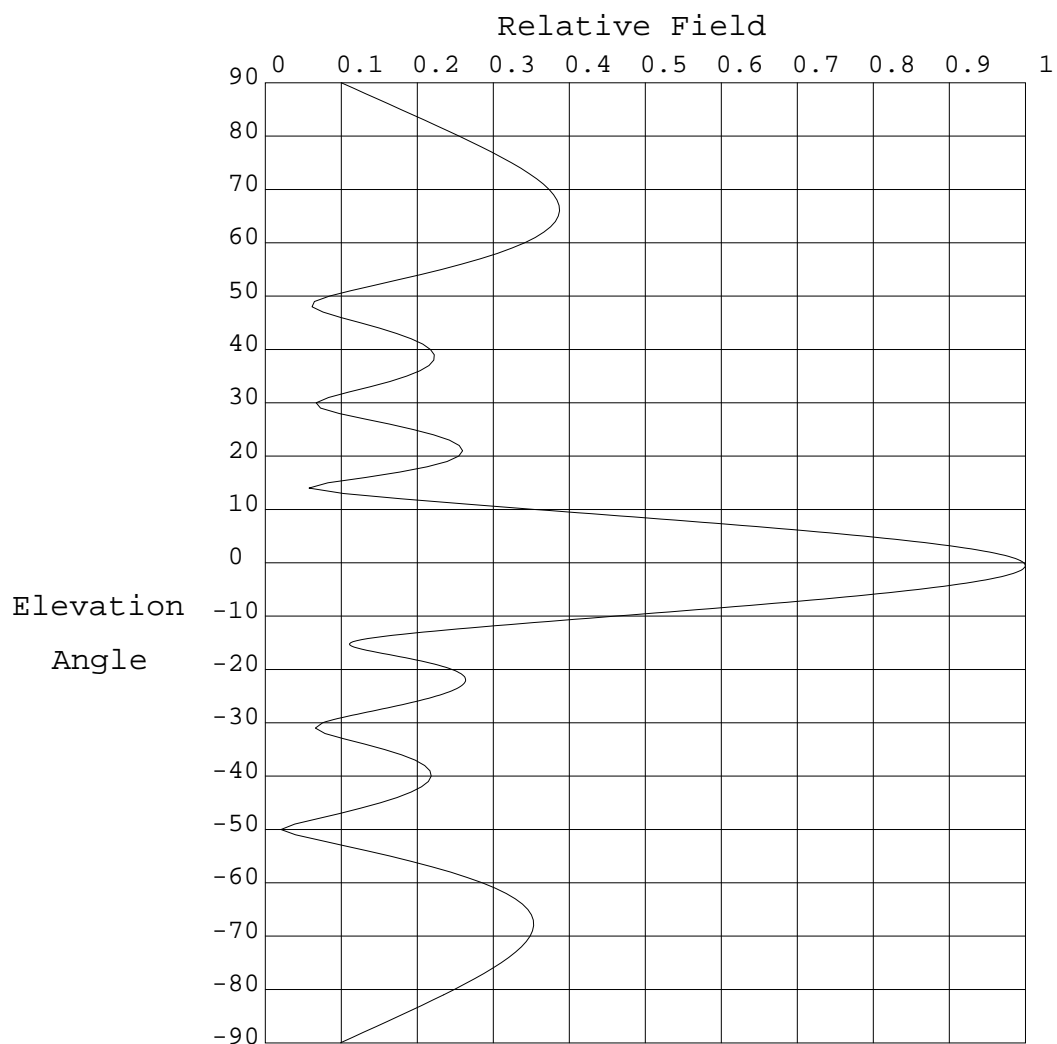
PATTERN POL.: Horizontal

DIRECTIVITY(Peak) 3.847/5.851 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz) 3.847/5.851 dBd

Null Fill(s)(%) 0, 0, 0



Elevation Pattern

Scale: Linear

Systems With Reliability Inc.

Units: Field, Relative

CLIENT: *Bill Varecha*

Date: 3/19/04

ANTENNA TYPE: SWED4EC/12

FREQUENCY: 207

PATTERN POL.: Horizontal

DIRECTIVITY(Peak) 4.016/6.038 dBd

Beam Tilt (Deg.) :- .5

DIRECTIVITY(Horiz) 4.00/6.02 dBd

Null Fill(s)(%) 10, 7, 5

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)		Elev. Angle	Rel. Fld(dB)		Elev. Angle
3.2	.90 (-0.916)	-4.4	.893 (-0.987)	-12.0	.286 (-10.862)	
3.0	.91 (-0.818)	-4.6	.882 (-1.094)	-12.2	.27 (-11.375)	
2.8	.92 (-0.726)	-4.8	.87 (-1.207)	-12.4	.254 (-11.908)	
2.6	.929 (-0.64)	-5.0	.858 (-1.326)	-12.6	.238 (-12.462)	
2.4	.938 (-0.56)	-5.2	.846 (-1.451)	-12.8	.223 (-13.037)	
2.2	.946 (-0.485)	-5.4	.833 (-1.583)	-13.0	.208 (-13.631)	
2.0	.953 (-0.416)	-5.6	.82 (-1.72)	-13.2	.194 (-14.244)	
1.8	.96 (-0.352)	-5.8	.807 (-1.865)	-13.4	.18 (-14.871)	
1.6	.967 (-0.293)	-6.0	.793 (-2.015)	-13.6	.168 (-15.507)	
1.4	.973 (-0.24)	-6.2	.779 (-2.173)	-13.8	.156 (-16.144)	
1.2	.978 (-0.193)	-6.4	.764 (-2.338)	-14.0	.145 (-16.769)	
1.0	.983 (-0.15)	-6.6	.749 (-2.509)	-14.2	.135 (-17.366)	
.8	.987 (-0.113)	-6.8	.734 (-2.688)	-14.4	.127 (-17.912)	
.6	.991 (-0.082)	-7.0	.718 (-2.874)	-14.6	.12 (-18.383)	
.4	.994 (-0.055)	-7.2	.702 (-3.068)	-14.8	.115 (-18.751)	
.2	.996 (-0.034)	-7.4	.686 (-3.269)	-15.0	.112 (-18.995)	
.0	.998 (-0.017)	-7.6	.67 (-3.479)	-15.2	.111 (-19.1)	
-.2	.999 (-0.006)	-7.8	.653 (-3.697)	-15.4	.111 (-19.066)	
-.4	1.00 (-0.001)	-8.0	.637 (-3.923)	-15.6	.113 (-18.906)	
-.6	1.00 (0)	-8.2	.62 (-4.159)	-15.8	.117 (-18.643)	
-.8	.999 (-0.004)	-8.4	.602 (-4.403)	-16.0	.122 (-18.303)	
-1.0	.998 (-0.014)	-8.6	.585 (-4.657)	-16.2	.127 (-17.912)	
-1.2	.997 (-0.029)	-8.8	.568 (-4.92)	-16.4	.133 (-17.491)	
-1.4	.994 (-0.049)	-9.0	.55 (-5.194)	-16.6	.14 (-17.058)	
-1.6	.992 (-0.074)	-9.2	.532 (-5.478)	-16.8	.147 (-16.626)	
-1.8	.988 (-0.104)	-9.4	.514 (-5.773)	-17.0	.155 (-16.202)	
-2.0	.984 (-0.14)	-9.6	.497 (-6.079)	-17.2	.162 (-15.794)	
-2.2	.979 (-0.181)	-9.8	.479 (-6.398)	-17.4	.17 (-15.404)	
-2.4	.974 (-0.227)	-10.0	.461 (-6.729)	-17.6	.177 (-15.034)	
-2.6	.968 (-0.278)	-10.2	.443 (-7.072)	-17.8	.184 (-14.686)	
-2.8	.962 (-0.335)	-10.4	.425 (-7.43)	-18.0	.191 (-14.36)	
-3.0	.955 (-0.397)	-10.6	.407 (-7.801)	-18.2	.198 (-14.055)	
-3.2	.948 (-0.465)	-10.8	.39 (-8.188)	-18.4	.205 (-13.772)	
-3.4	.94 (-0.538)	-11.0	.372 (-8.59)	-18.6	.211 (-13.509)	
-3.6	.932 (-0.616)	-11.2	.354 (-9.008)	-18.8	.217 (-13.266)	
-3.8	.923 (-0.7)	-11.4	.337 (-9.444)	-19.0	.223 (-13.043)	
-4.0	.913 (-0.79)	-11.6	.32 (-9.898)	-19.2	.228 (-12.837)	
-4.2	.903 (-0.885)	-11.8	.303 (-10.37)	-19.4	.233 (-12.65)	

Systems With Reliability Inc.

Page 1 of 2

CLIENT: *Bill Varecha*

Date: 3/19/04

ANTENNA TYPE: SWED4EC/12

FREQUENCY: 207

PATTERN POL.: Horizontal

DIRECTIVITY(Peak) 4.016/6.038 dBd

Beam Tilt (Deg.) :- .5

DIRECTIVITY(Horiz) 4.00/6.02 dBd

Null Fill(s)(%) 10, 7, 5

Relative Field Tabulation

Elev. Angle			Rel. Fld(dB)			Elev. Angle			Rel. Fld(dB)			Elev. Angle		
-19.6	.238	(-12.48)	-27.2	.161	(-15.868)	-54.0	.134	(-17.455)						
-19.8	.242	(-12.326)	-27.4	.154	(-16.233)	-55.0	.164	(-15.691)						
-20.0	.246	(-12.188)	-27.6	.148	(-16.617)	-56.0	.193	(-14.298)						
-20.2	.249	(-12.065)	-27.8	.141	(-17.02)	-57.0	.219	(-13.175)						
-20.4	.252	(-11.957)	-28.0	.134	(-17.444)	-58.0	.244	(-12.258)						
-20.6	.255	(-11.863)	-28.2	.128	(-17.889)	-59.0	.266	(-11.505)						
-20.8	.258	(-11.783)	-28.4	.121	(-18.354)	-60.0	.286	(-10.887)						
-21.0	.26	(-11.717)	-28.6	.114	(-18.838)	-61.0	.303	(-10.383)						
-21.2	.261	(-11.664)	-28.8	.108	(-19.34)	-62.0	.317	(-9.976)						
-21.4	.262	(-11.624)	-29.0	.102	(-19.858)	-63.0	.329	(-9.654)						
-21.6	.263	(-11.597)	-29.2	.096	(-20.388)	-64.0	.339	(-9.408)						
-21.8	.264	(-11.582)	-29.4	.09	(-20.923)	-65.0	.346	(-9.23)						
-22.0	.264	(-11.579)	-29.6	.085	(-21.454)	-66.0	.35	(-9.112)						
-22.2	.263	(-11.588)	-29.8	.08	(-21.968)	-67.0	.353	(-9.05)						
-22.4	.263	(-11.609)	-30.0	.075	(-22.448)	-68.0	.353	(-9.04)						
-22.6	.262	(-11.642)	-31.0	.066	(-23.604)	-69.0	.352	(-9.077)						
-22.8	.26	(-11.686)	-32.0	.079	(-22.075)	-70.0	.348	(-9.158)						
-23.0	.259	(-11.743)	-33.0	.104	(-19.698)	-71.0	.343	(-9.282)						
-23.2	.257	(-11.811)	-34.0	.131	(-17.655)	-72.0	.337	(-9.445)						
-23.4	.254	(-11.891)	-35.0	.157	(-16.089)	-73.0	.329	(-9.647)						
-23.6	.252	(-11.982)	-36.0	.179	(-14.932)	-74.0	.32	(-9.886)						
-23.8	.249	(-12.085)	-37.0	.197	(-14.11)	-75.0	.31	(-10.162)						
-24.0	.245	(-12.201)	-38.0	.21	(-13.571)	-76.0	.299	(-10.473)						
-24.2	.242	(-12.328)	-39.0	.217	(-13.278)	-77.0	.288	(-10.82)						
-24.4	.238	(-12.467)	-40.0	.218	(-13.212)	-78.0	.275	(-11.204)						
-24.6	.234	(-12.619)	-41.0	.215	(-13.365)	-79.0	.262	(-11.625)						
-24.8	.23	(-12.783)	-42.0	.206	(-13.737)	-80.0	.249	(-12.086)						
-25.0	.225	(-12.961)	-43.0	.192	(-14.343)	-81.0	.235	(-12.588)						
-25.2	.22	(-13.151)	-44.0	.174	(-15.212)	-82.0	.22	(-13.135)						
-25.4	.215	(-13.355)	-45.0	.151	(-16.397)	-83.0	.206	(-13.732)						
-25.6	.21	(-13.572)	-46.0	.126	(-17.994)	-84.0	.191	(-14.383)						
-25.8	.204	(-13.804)	-47.0	.098	(-20.177)	-85.0	.176	(-15.096)						
-26.0	.198	(-14.051)	-48.0	.068	(-23.31)	-86.0	.161	(-15.881)						
-26.2	.192	(-14.313)	-49.0	.039	(-28.217)	-87.0	.145	(-16.752)						
-26.4	.186	(-14.59)	-50.0	.021	(-33.673)	-88.0	.13	(-17.725)						
-26.6	.18	(-14.884)	-51.0	.04	(-27.991)	-89.0	.114	(-18.827)						
-26.8	.174	(-15.194)	-52.0	.071	(-23.013)	-90.0	.099	(-20.093)						
-27.0	.167	(-15.522)	-53.0	.103	(-19.774)	90.0	.00	(-50)						

Systems With Reliability Inc.

Page 2 of 2

CLIENT: *Bill Varecha*

Date: 3/19/04

ANTENNA TYPE: SWED4EC/12

FREQUENCY: 207

PATTERN POL.: Horizontal

DIRECTIVITY(Peak) 4.016/6.038 dBd

Beam Tilt (Deg.) :- .5

DIRECTIVITY(Horiz) 4.00/6.02 dBd

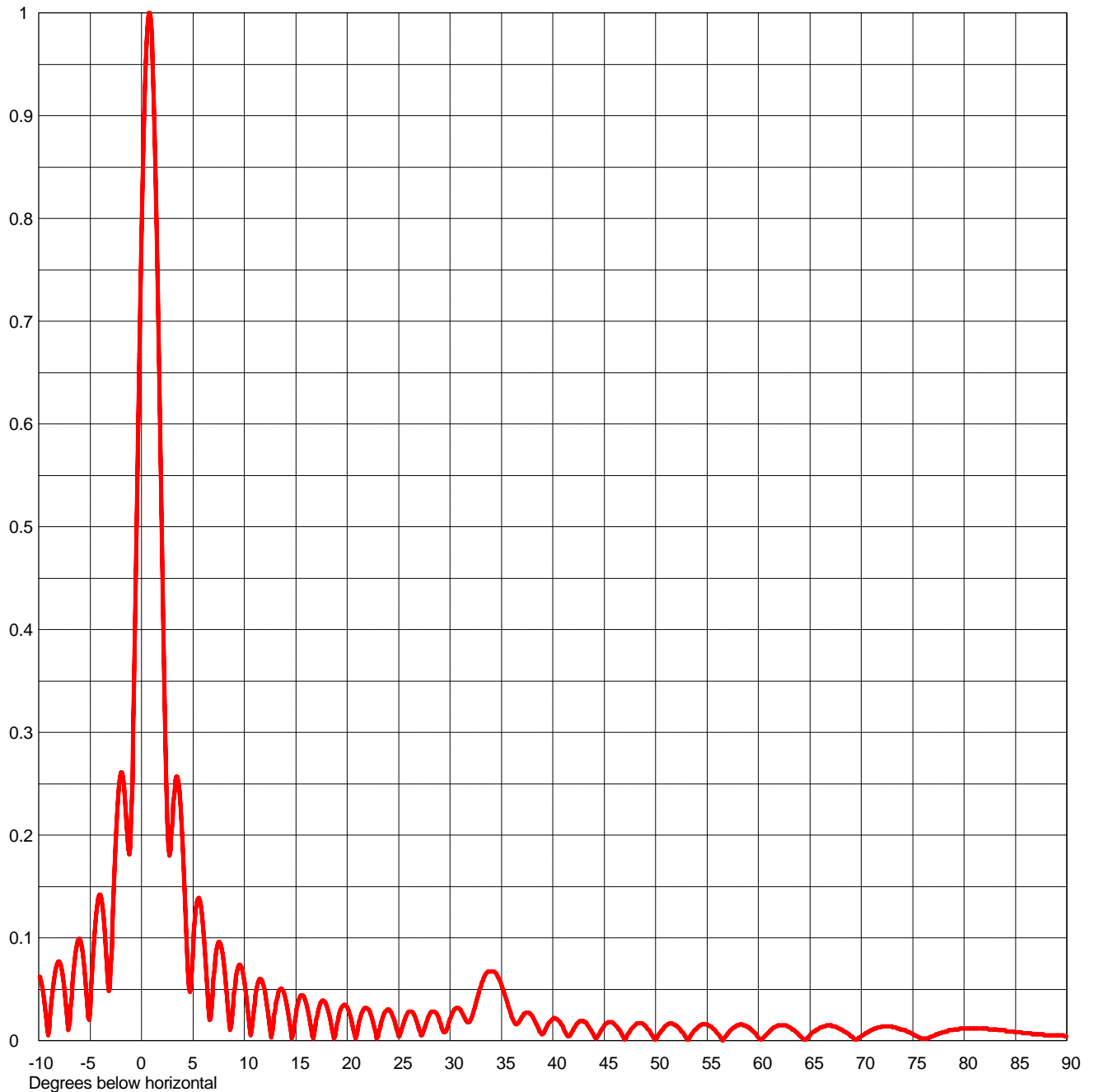
Null Fill(s)(%) 10, 7, 5



Proposal Number			
Date	23 Mar 2004	Revision	
Call Letters	KFQX-DT	Channel	15
Location	Grand Junction, CO		
Customer			
Antenna Type	TUP-C2-16-1		

ELEVATION PATTERN

RMS Gain at Main Lobe	30.1 (14.79 dB)	Beam Tilt	0.75 Degrees
RMS Gain at Horizontal	18.5 (12.67 dB)	Frequency	479.00 MHz
Calculated / Measured	Calculated	Drawing #	16U301075-90



Remarks:



Proposal Number
 Date **23 Mar 2004**
 Call Letters **KFQX-DT** Channel **15**
 Location **Grand Junction, CO**
 Customer
 Antenna Type **TUP-C2-16-1**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **16U301075-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.063	2.4	0.250	10.6	0.005	30.5	0.031	51.0	0.015	71.5	0.012
-9.5	0.041	2.6	0.188	10.8	0.020	31.0	0.030	51.5	0.017	72.0	0.014
-9.0	0.011	2.8	0.185	11.0	0.037	31.5	0.021	52.0	0.015	72.5	0.014
-8.5	0.059	3.0	0.214	11.5	0.060	32.0	0.020	52.5	0.009	73.0	0.014
-8.0	0.077	3.2	0.243	12.0	0.048	32.5	0.036	53.0	0.002	73.5	0.012
-7.5	0.049	3.4	0.257	12.5	0.010	33.0	0.053	53.5	0.006	74.0	0.011
-7.0	0.018	3.6	0.252	13.0	0.031	33.5	0.065	54.0	0.012	74.5	0.009
-6.5	0.077	3.8	0.229	13.5	0.050	34.0	0.067	54.5	0.016	75.0	0.006
-6.0	0.099	4.0	0.191	14.0	0.041	34.5	0.065	55.0	0.016	75.5	0.004
-5.5	0.062	4.2	0.142	14.5	0.010	35.0	0.054	55.5	0.013	76.0	0.002
-5.0	0.032	4.4	0.090	15.0	0.025	35.5	0.040	56.0	0.007	76.5	0.002
-4.5	0.111	4.6	0.051	15.5	0.044	36.0	0.023	56.5	0.000	77.0	0.004
-4.0	0.142	4.8	0.057	16.0	0.037	36.5	0.016	57.0	0.006	77.5	0.006
-3.5	0.092	5.0	0.089	16.5	0.011	37.0	0.023	57.5	0.012	78.0	0.008
-3.0	0.068	5.2	0.118	17.0	0.020	37.5	0.027	58.0	0.015	78.5	0.010
-2.8	0.117	5.4	0.135	17.5	0.038	38.0	0.024	58.5	0.015	79.0	0.011
-2.6	0.169	5.6	0.139	18.0	0.034	38.5	0.014	59.0	0.013	79.5	0.011
-2.4	0.214	5.8	0.130	18.5	0.012	39.0	0.006	59.5	0.009	80.0	0.012
-2.2	0.246	6.0	0.109	19.0	0.015	39.5	0.015	60.0	0.003	80.5	0.012
-2.0	0.261	6.2	0.081	19.5	0.033	40.0	0.021	60.5	0.003	81.0	0.012
-1.8	0.256	6.4	0.048	20.0	0.033	40.5	0.020	61.0	0.008	81.5	0.012
-1.6	0.232	6.6	0.020	20.5	0.015	41.0	0.013	61.5	0.013	82.0	0.012
-1.4	0.200	6.8	0.032	21.0	0.010	41.5	0.004	62.0	0.015	82.5	0.011
-1.2	0.181	7.0	0.059	21.5	0.028	42.0	0.011	62.5	0.015	83.0	0.011
-1.0	0.214	7.2	0.080	22.0	0.031	42.5	0.018	63.0	0.013	83.5	0.010
-0.8	0.299	7.4	0.093	22.5	0.018	43.0	0.019	63.5	0.010	84.0	0.010
-0.6	0.415	7.6	0.096	23.0	0.004	43.5	0.014	64.0	0.005	84.5	0.009
-0.4	0.542	7.8	0.090	23.5	0.023	44.0	0.005	64.5	0.001	85.0	0.008
-0.2	0.668	8.0	0.076	24.0	0.030	44.5	0.006	65.0	0.005	85.5	0.008
0.0	0.783	8.2	0.055	24.5	0.022	45.0	0.015	65.5	0.009	86.0	0.007
0.2	0.880	8.4	0.031	25.0	0.004	45.5	0.018	66.0	0.013	86.5	0.007
0.4	0.951	8.6	0.010	25.5	0.017	46.0	0.016	66.5	0.014	87.0	0.006
0.6	0.992	8.8	0.024	26.0	0.028	46.5	0.010	67.0	0.015	87.5	0.006
0.8	1.000	9.0	0.045	26.5	0.025	47.0	0.001	67.5	0.014	88.0	0.005
1.0	0.975	9.2	0.062	27.0	0.011	47.5	0.009	68.0	0.011	88.5	0.005
1.2	0.918	9.4	0.071	27.5	0.011	48.0	0.015	68.5	0.008	89.0	0.005
1.4	0.833	9.6	0.074	28.0	0.025	48.5	0.017	69.0	0.004	89.5	0.005
1.6	0.726	9.8	0.069	28.5	0.028	49.0	0.015	69.5	0.001	90.0	0.004
1.8	0.604	10.0	0.058	29.0	0.019	49.5	0.008	70.0	0.004		
2.0	0.476	10.2	0.042	29.5	0.008	50.0	0.001	70.5	0.007		
2.2	0.353	10.4	0.023	30.0	0.021	50.5	0.009	71.0	0.010		

Remarks:

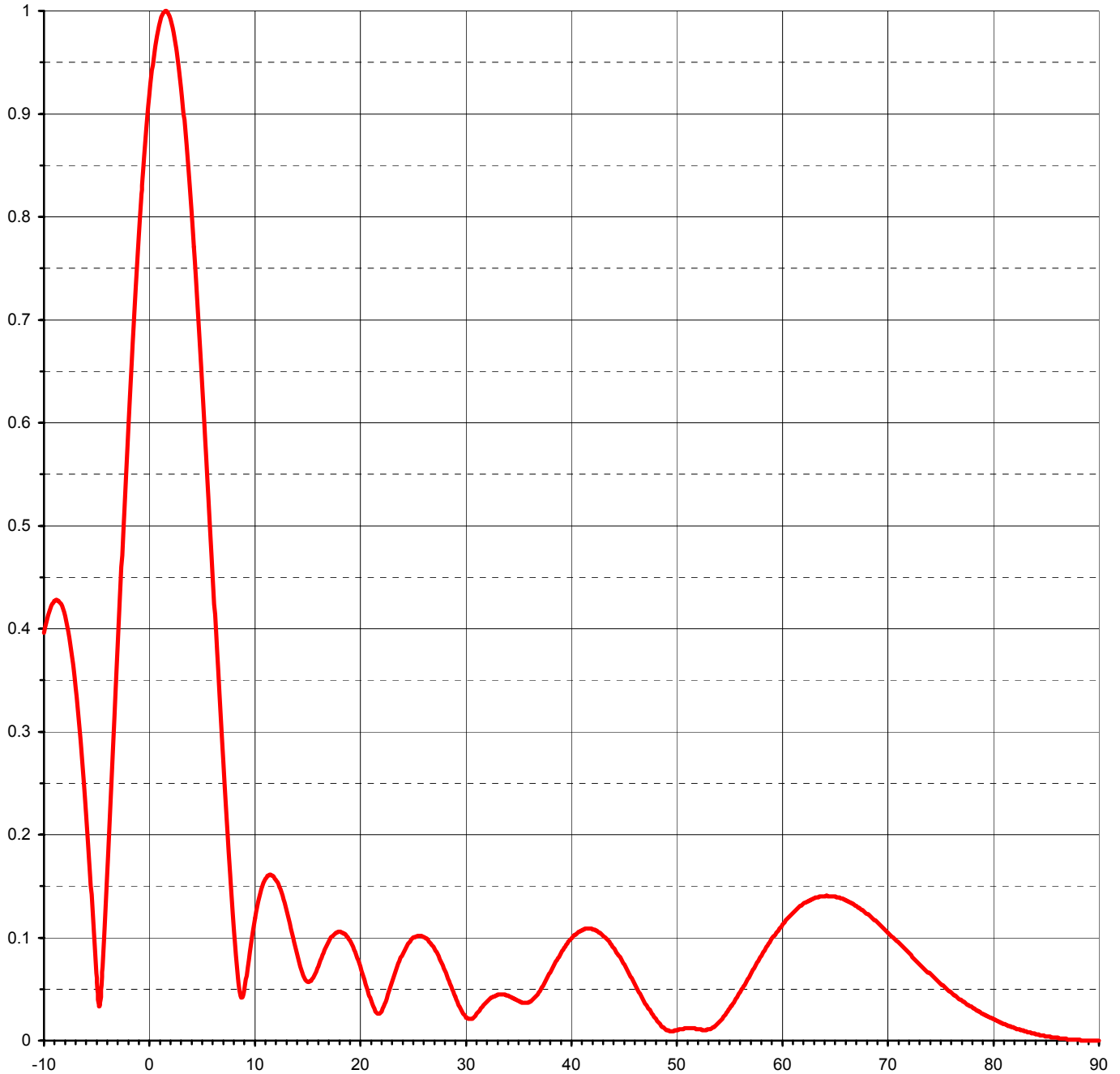


Proposal Number	1046:6:153701		
Date	9-May-03		
Call Letters	KRMJ-DT	Channel	17
Location	Grand Junction , CO		
Customer			
Antenna Type	TFU-8DSB-M DC		

ELEVATION PATTERN

RMS Gain at Main Lobe	8.00	(9.03 dB)
RMS Gain at Horizontal	6.70	(8.26 dB)
Calculated / Measured	Calculated	

Beam Tilt	1.50 deg
Frequency	491.00 MHz
Drawing #	08B080150-90



Degrees Below Horizontal



Proposal Number **1046:6:153701**

Date **9-May-03**

Call Letters **KRMJ-DT** Channel **17**

Location **Grand Junction , CO**

Customer

Antenna Type **TFU-8DSB-M DC**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #: **08B080150-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.396	2.4	0.973	10.6	0.143	30.5	0.021	51.0	0.012	71.5	0.090
-9.5	0.416	2.6	0.960	10.8	0.150	31.0	0.024	51.5	0.012	72.0	0.085
-9.0	0.427	2.8	0.944	11.0	0.155	31.5	0.031	52.0	0.011	72.5	0.079
-8.5	0.425	3.0	0.926	11.5	0.161	32.0	0.037	52.5	0.010	73.0	0.074
-8.0	0.412	3.2	0.905	12.0	0.157	32.5	0.042	53.0	0.011	73.5	0.069
-7.5	0.384	3.4	0.882	12.5	0.147	33.0	0.044	53.5	0.013	74.0	0.065
-7.0	0.343	3.6	0.857	13.0	0.130	33.5	0.045	54.0	0.017	74.5	0.060
-6.5	0.289	3.8	0.830	13.5	0.109	34.0	0.044	54.5	0.023	75.0	0.055
-6.0	0.221	4.0	0.802	14.0	0.088	34.5	0.042	55.0	0.030	75.5	0.051
-5.5	0.142	4.2	0.771	14.5	0.069	35.0	0.039	55.5	0.037	76.0	0.047
-5.0	0.057	4.4	0.740	15.0	0.058	35.5	0.037	56.0	0.046	76.5	0.043
-4.5	0.062	4.6	0.706	15.5	0.060	36.0	0.037	56.5	0.054	77.0	0.039
-4.0	0.163	4.8	0.672	16.0	0.070	36.5	0.041	57.0	0.063	77.5	0.035
-3.5	0.272	5.0	0.637	16.5	0.083	37.0	0.047	57.5	0.072	78.0	0.032
-3.0	0.383	5.2	0.601	17.0	0.094	37.5	0.055	58.0	0.081	78.5	0.029
-2.8	0.427	5.4	0.564	17.5	0.102	38.0	0.065	58.5	0.089	79.0	0.026
-2.6	0.471	5.6	0.527	18.0	0.106	38.5	0.074	59.0	0.097	79.5	0.023
-2.4	0.514	5.8	0.489	18.5	0.104	39.0	0.083	59.5	0.105	80.0	0.021
-2.2	0.556	6.0	0.452	19.0	0.098	39.5	0.091	60.0	0.111	80.5	0.018
-2.0	0.598	6.2	0.414	19.5	0.088	40.0	0.098	60.5	0.118	81.0	0.016
-1.8	0.638	6.4	0.377	20.0	0.075	40.5	0.103	61.0	0.123	81.5	0.014
-1.6	0.677	6.6	0.340	20.5	0.059	41.0	0.107	61.5	0.128	82.0	0.012
-1.4	0.714	6.8	0.304	21.0	0.042	41.5	0.109	62.0	0.132	82.5	0.011
-1.2	0.749	7.0	0.269	21.5	0.028	42.0	0.109	62.5	0.135	83.0	0.009
-1.0	0.783	7.2	0.234	22.0	0.027	42.5	0.107	63.0	0.138	83.5	0.008
-0.8	0.814	7.4	0.201	22.5	0.038	43.0	0.103	63.5	0.139	84.0	0.006
-0.6	0.844	7.6	0.169	23.0	0.054	43.5	0.098	64.0	0.140	84.5	0.005
-0.4	0.871	7.8	0.138	23.5	0.069	44.0	0.091	64.5	0.140	85.0	0.004
-0.2	0.896	8.0	0.109	24.0	0.082	44.5	0.084	65.0	0.140	85.5	0.003
0.0	0.918	8.2	0.083	24.5	0.092	45.0	0.075	65.5	0.138	86.0	0.003
0.2	0.938	8.4	0.061	25.0	0.099	45.5	0.066	66.0	0.136	86.5	0.002
0.4	0.955	8.6	0.046	25.5	0.102	46.0	0.057	66.5	0.134	87.0	0.001
0.6	0.970	8.8	0.042	26.0	0.101	46.5	0.047	67.0	0.131	87.5	0.001
0.8	0.981	9.0	0.049	26.5	0.098	47.0	0.038	67.5	0.127	88.0	0.001
1.0	0.990	9.2	0.063	27.0	0.091	47.5	0.030	68.0	0.123	88.5	0.000
1.2	0.996	9.4	0.078	27.5	0.082	48.0	0.022	68.5	0.119	89.0	0.000
1.4	0.999	9.6	0.093	28.0	0.070	48.5	0.016	69.0	0.115	89.5	0.000
1.6	1.000	9.8	0.100	28.5	0.058	49.0	0.011	69.5	0.110	90.0	0.000
1.8	0.997	10.0	0.113	29.0	0.045	49.5	0.009	70.0	0.105		
2.0	0.992	10.2	0.125	29.5	0.033	50.0	0.010	70.5	0.100		
2.2	0.984	10.4	0.135	30.0	0.024	50.5	0.011	71.0	0.095		

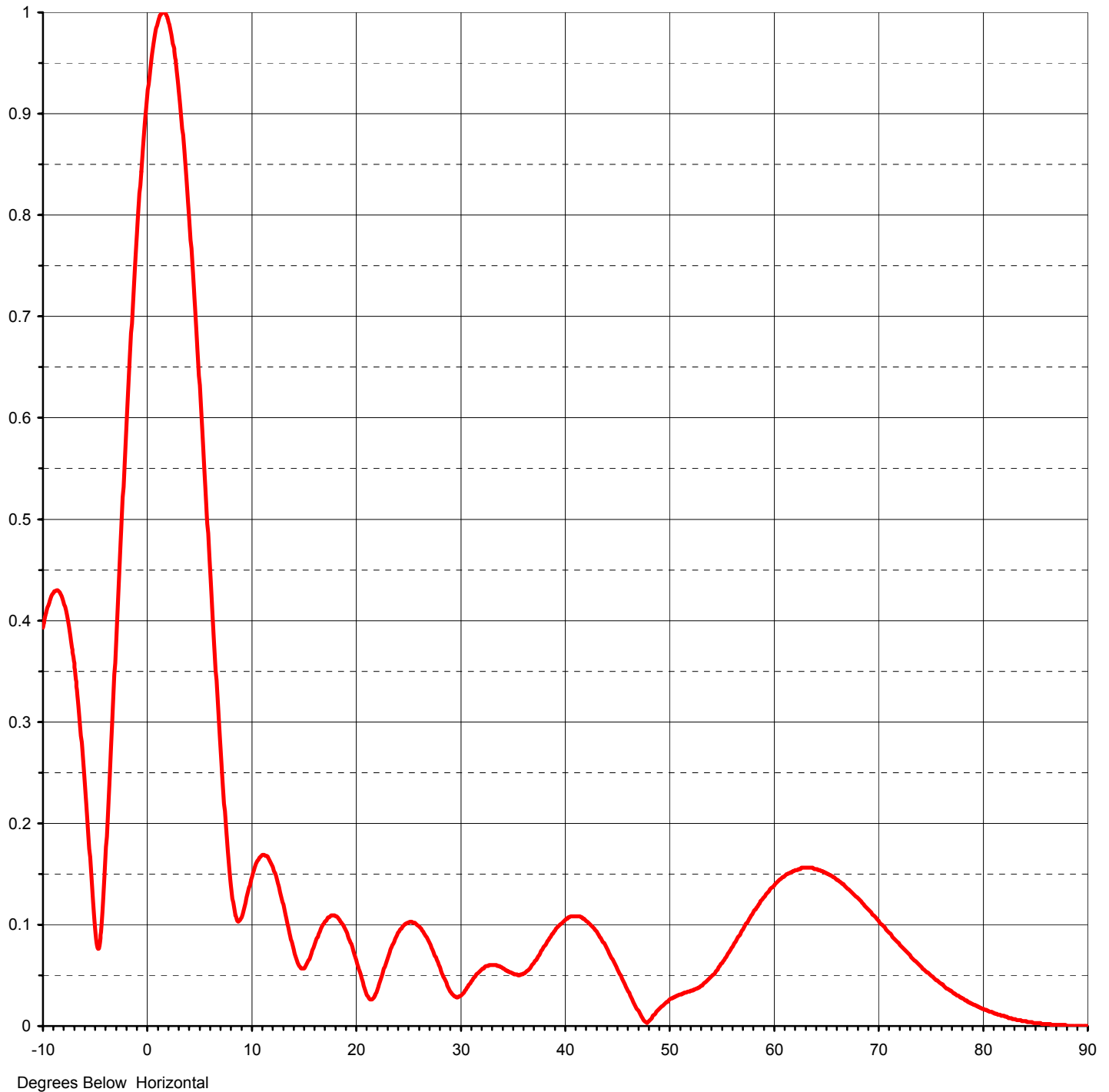


Proposal Number	1046:6:153701		
Date	9-May-03		
Call Letters	KRMJ	Channel	18
Location	Grand Junction , CO		
Customer			
Antenna Type	TFU-8DSB-M DC		

ELEVATION PATTERN

RMS Gain at Main Lobe	7.50	(8.75 dB)
RMS Gain at Horizontal	6.30	(7.99 dB)
Calculated / Measured	Calculated	

Beam Tilt	1.50 deg
Frequency	497.00 MHz
Drawing #	08B075150-90





Proposal Number **1046:6:153701**

Date **9-May-03**

Call Letters **KRMJ** Channel **18**

Location **Grand Junction , CO**

Customer

Antenna Type **TFU-8DSB-M DC**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #: **08B075150-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.393	2.4	0.972	10.6	0.162	30.5	0.035	51.0	0.031	71.5	0.086
-9.5	0.415	2.6	0.958	10.8	0.166	31.0	0.042	51.5	0.033	72.0	0.080
-9.0	0.427	2.8	0.942	11.0	0.168	31.5	0.049	52.0	0.034	72.5	0.075
-8.5	0.429	3.0	0.923	11.5	0.168	32.0	0.055	52.5	0.036	73.0	0.070
-8.0	0.418	3.2	0.902	12.0	0.159	32.5	0.059	53.0	0.039	73.5	0.064
-7.5	0.394	3.4	0.879	12.5	0.144	33.0	0.060	53.5	0.043	74.0	0.059
-7.0	0.356	3.6	0.854	13.0	0.124	33.5	0.060	54.0	0.048	74.5	0.054
-6.5	0.304	3.8	0.827	13.5	0.101	34.0	0.058	54.5	0.054	75.0	0.050
-6.0	0.240	4.0	0.798	14.0	0.079	34.5	0.055	55.0	0.061	75.5	0.045
-5.5	0.167	4.2	0.767	14.5	0.062	35.0	0.052	55.5	0.068	76.0	0.041
-5.0	0.096	4.4	0.735	15.0	0.057	35.5	0.051	56.0	0.077	76.5	0.037
-4.5	0.087	4.6	0.702	15.5	0.064	36.0	0.051	56.5	0.085	77.0	0.034
-4.0	0.167	4.8	0.667	16.0	0.077	36.5	0.055	57.0	0.094	77.5	0.030
-3.5	0.271	5.0	0.632	16.5	0.091	37.0	0.061	57.5	0.102	78.0	0.027
-3.0	0.380	5.2	0.596	17.0	0.101	37.5	0.069	58.0	0.110	78.5	0.024
-2.8	0.424	5.4	0.559	17.5	0.107	38.0	0.077	58.5	0.118	79.0	0.022
-2.6	0.468	5.6	0.523	18.0	0.109	38.5	0.085	59.0	0.125	79.5	0.019
-2.4	0.511	5.8	0.486	18.5	0.105	39.0	0.093	59.5	0.132	80.0	0.017
-2.2	0.553	6.0	0.449	19.0	0.096	39.5	0.099	60.0	0.138	80.5	0.015
-2.0	0.595	6.2	0.412	19.5	0.084	40.0	0.104	60.5	0.143	81.0	0.013
-1.8	0.635	6.4	0.376	20.0	0.068	40.5	0.107	61.0	0.147	81.5	0.011
-1.6	0.674	6.6	0.341	20.5	0.051	41.0	0.108	61.5	0.151	82.0	0.010
-1.4	0.712	6.8	0.307	21.0	0.034	41.5	0.108	62.0	0.153	82.5	0.008
-1.2	0.748	7.0	0.274	21.5	0.026	42.0	0.105	62.5	0.155	83.0	0.007
-1.0	0.781	7.2	0.242	22.0	0.033	42.5	0.100	63.0	0.156	83.5	0.006
-0.8	0.813	7.4	0.212	22.5	0.048	43.0	0.094	63.5	0.156	84.0	0.005
-0.6	0.843	7.6	0.185	23.0	0.064	43.5	0.087	64.0	0.155	84.5	0.004
-0.4	0.871	7.8	0.160	23.5	0.078	44.0	0.078	64.5	0.153	85.0	0.003
-0.2	0.896	8.0	0.139	24.0	0.090	44.5	0.068	65.0	0.151	85.5	0.003
0.0	0.918	8.2	0.122	24.5	0.098	45.0	0.058	65.5	0.148	86.0	0.002
0.2	0.938	8.4	0.110	25.0	0.102	45.5	0.047	66.0	0.144	86.5	0.001
0.4	0.956	8.6	0.104	25.5	0.102	46.0	0.037	66.5	0.140	87.0	0.001
0.6	0.970	8.8	0.104	26.0	0.099	46.5	0.026	67.0	0.136	87.5	0.001
0.8	0.982	9.0	0.107	26.5	0.093	47.0	0.016	67.5	0.131	88.0	0.000
1.0	0.991	9.2	0.114	27.0	0.084	47.5	0.008	68.0	0.126	88.5	0.000
1.2	0.997	9.4	0.122	27.5	0.073	48.0	0.004	68.5	0.121	89.0	0.000
1.4	1.000	9.6	0.131	28.0	0.060	48.5	0.010	69.0	0.115	89.5	0.000
1.6	1.000	9.8	0.135	28.5	0.047	49.0	0.016	69.5	0.109	90.0	0.000
1.8	0.997	10.0	0.144	29.0	0.036	49.5	0.021	70.0	0.104		
2.0	0.991	10.2	0.151	29.5	0.029	50.0	0.025	70.5	0.098		
2.2	0.983	10.4	0.157	30.0	0.029	50.5	0.028	71.0	0.092		