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Engineering Statement
Application for Minor Modification of KHCV-DT
Pre- and Post-Transition Channel 44 at Seattle, WA
May 2008

This Engineering Statement has been prepared on behalf of North Pacific International Television, Inc. ("North Pacific"), licensee of television station KHCV at Seattle, Washington. KHCV presently operates on analog Channel 45, with paired digital Channel 44. KHCV will be continuing permanent digital operation on its present digital channel. This material has been prepared in connection with an application for minor modification of KHCV-DT, for both pre-transition and post-transition facilities on digital Channel 44.

The following table lists the KHCV-DT post-transition facilities approved in Appendix B of the DTV Seventh Report and Order MO&O¹, as well as North Pacific's requested facilities as proposed herein:

	DTV Table Appendix B	Proposed Form 301
Channel	44	44
ERP	240 kW	240 kW
HAAT	714 meters	710 meters
Antenna	Bogner BU(l)24N-G directional	ERI ATW24H3-HTC2U-45H directional
Coordinates	47-30-17 121-58-06	47-30-17 121-58-06
DTV Population (thousand)	3,632	3,663 (101%)

¹ See *Advanced Television Systems and their Impact Upon the Existing Television Broadcast Service*, MB Docket No. 87-268, Memorandum Opinion and Order on Reconsideration of the Seventh Report and Order and Eighth Further Notice of Proposed Rulemaking, FCC 08-72, Released March 6, 2008.

I. Allocation Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause impermissible interference (i.e. more than 0.5 percent new interference) to any stations beyond that level listed in the pre-transition DTV Table or in the post-transition DTV Table Appendix B. This study was performed using the SunDTV program from V-Soft Communications and a 2 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

Study has been performed using both the pre-transition and post-transition databases. The results of these studies indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations. Based on this allocation and interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Pre-Transition Analysis

Summary Study

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 06-02-2008 Time: 15:50:29

Record Selected for Analysis

KHCV USERRECORD-03 SEATTLE WA US
Channel 44 ERP 240. kW HAAT 713. m RCAMSL 00945 m
Latitude 047-30-17 Longitude 0121-58-06
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT03 Beam tilt N Ref Azimuth 0.
Last update Cutoff date Docket
Comments
Applicant

Cell Size for Service Analysis 2.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Facility meets maximum height/power limits

Azimuth (Deg)	ERP (kW)	HAAT (m)	41.0 dBu F(50,90) (km)
0.0	204.884	805.4	114.6
45.0	47.543	764.7	99.6
90.0	23.064	689.8	90.8
135.0	11.935	390.7	72.5
180.0	139.721	678.8	106.1
225.0	237.937	787.2	115.3
270.0	183.330	723.1	110.4
315.0	214.264	865.1	117.1

Evaluation toward Class A Stations

No Spacing violations or contour overlap to Class A stations

Class A Evaluation Complete

SPACING VIOLATION FOUND BETWEEN STATION

KHCV 44 SEATTLE WA USERRECORD03

and station

SHORT TO: KHCV-DT 44 SEATTLE WA DTVPLN DTVP1286
47-36-17 122-19-46
Req. separation 223.7 Actual separation 29.4 Short 194.3 km

SHORT TO: KHCV 44 SEATTLE WA BPCDT 19991101AGX
047-30-17 0121-58- 6
Req. separation 223.7 Actual separation 0.0 Short 223.7 km

LANDMOBILE SPACING VIOLATIONS FOUND

NONE

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quite zone

Proposed facility OK toward Table Mountian

Proposed facility is within the Canadian coordination distance
Distance to border = 128.4km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

Start of Interference Analysis

Channel	Proposed Station	ARN
44	Call City/State KHCV SEATTLE WA	USERRECORD03

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
43	KATU	PORTLAND OR	228.7	LIC	BLCDT	-20050407KXN
43	KATU-DT	PORTLAND OR	228.4	PLN	DTVPLN	-DTVP1239
44	KEZI-TV	EUGENE OR	385.0	LIC	BPRM	-20000925APP
44	KEZI	EUGENE OR	385.0	LIC	BLCDT	-20070315ABI
44	KVEW	KENNEWICK WA	266.1	CP MOD	BMPCDT	-20041101ADY
44	KVEW-DT	KENNEWICK WA	266.1	PLN	DTVPLN	-DTVP1285
45	KNMT-DT	PORTLAND OR	228.6	PLN	DTVPLN	-DTVP1311
45	KNMT	PORTLAND OR	228.6	LIC	BLCDT	-20060619AAM
45	KHCV	SEATTLE WA	0.0	LIC	BLCT	-20000906AAM
45	KHCV	SEATTLE WA	0.0	CP	BPCT	-20060126ARD
51	KUNS-TV	BELLEVUE WA	0.0	LIC	BLCT	-19990810KE

%%%

Study of this proposal found the following interference problem(s):

NONE.

Post-Transition Analysis

Summary Study

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 06-02-2008 Time: 15:44:23

Record Selected for Analysis

KHCV USERRECORD-03 SEATTLE WA US
Channel 44 ERP 240. kW HAAT 713. m RCAMSL 00945 m
Latitude 047-30-17 Longitude 0121-58-06
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT03 Beam tilt N Ref Azimuth 0.
Last update Cutoff date Docket
Comments
Applicant

Cell Size for Service Analysis 2.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Facility meets maximum height/power limits

Azimuth (Deg)	ERP (kW)	HAAT (m)	41.0 dBu F(50,90) (km)
0.0	204.884	805.4	114.6
45.0	47.543	764.7	99.6
90.0	23.064	689.8	90.8
135.0	11.935	390.7	72.5
180.0	139.721	678.8	106.1
225.0	237.937	787.2	115.3
270.0	183.330	723.1	110.4
315.0	214.264	865.1	117.1

Evaluation toward Class A Stations

No Spacing violations or contour overlap to Class A stations

Class A Evaluation Complete

SPACING VIOLATION FOUND BETWEEN STATION

KHCV 44 SEATTLE WA USERRECORD03

and station

SHORT TO: KHCV 44 SEATTLE WA BDTV 1712
47 -30-17 121 -58-06
Req. separation 223.7 Actual separation 0.0 Short 223.7 km

LANDMOBILE SPACING VIOLATIONS FOUND

NONE

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quite zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance
Distance to border = 128.4km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

Start of Interference Analysis

	Proposed Station		
Channel	Call	City/State	ARN
44	KHCV	SEATTLE WA	USERRECORD03

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
43	KATU	PORTLAND OR	228.7	LIC	BDTV	-1290
44	KVEW	KENNEWICK WA	266.1	LIC	BDTV	-1702
45	KNMT	PORTLAND OR	228.6	LIC	BDTV	-1291

%%%

Study of this proposal found the following interference problem(s):

NONE.

Furthermore, it has been verified that the proposed facility will not reduce the population served by the KHCV digital facility by more than 5%, compared to the DTV population listed in Appendix B.

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Analysis of Interference to Affected Station 4

Analysis of current record

Channel	Call	City/State	Application Ref. No.
44	KHCV	SEATTLE WA	USERRECORD-03

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
43	KATU	PORTLAND OR	228.7	LIC	BDTV -1290
44	KVEW	KENNEWICK WA	266.1	LIC	BDTV -1702
45	KNMT	PORTLAND OR	228.6	LIC	BDTV -1291

Total scenarios = 1

Result key: 1
 Scenario 1 Affected station 4
 Before Analysis

Results for: 44A WA SEATTLE USERRECORD03 APP

HAAT 713.0 m, ATV ERP 240.0 kW	POPULATION	AREA (sq km)
within Noise Limited Contour	3733008	33479.6
not affected by terrain losses	3663094	29018.1
lost to NTSC IX	0	0.0
lost to additional IX by ATV	0	0.0
lost to ATV IX only	0	0.0
lost to all IX	0	0.0

Potential Interfering Stations Included in above Scenario 1

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II. NIER Study

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . . For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed KHCV-DT operation will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM and TV facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

The power density calculations shown below were made using the techniques and formulas outlined in the OET Bulletin 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower.

Power density levels produced by the proposed KHCV-DT facility were calculated for an elevation of 2 meters above ground (78 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.100 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized ERI ATW25H3-HTC2U-45H antenna proposed in this application. This relative field value yields a worst-case adjusted effective radiated power of 2400 Watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density is calculated to be $13.2 \mu\text{W}/\text{cm}^2$, which is 3% of $435 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 44 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed KHCV-DT operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 et seq and no further analysis of non-ionizing radiation at this site is required in this application.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.

June 2, 2008

Erik C. Swanson

TABLE 1-1B

Electrical Specifications - DTV

<u>Parameter</u>	<u>Value</u>
Channel	44
Frequency Range	650-656 MHZ
Azimuth Pattern No.	CH4445AZH
Elevation Pattern No.	CH44ELH
Azimuthal Directivity	1.80 (2.55 dB)
Elevation Directivity	25.00 (13.98 dBd)
Gain at Horizontal	13.18 (11.20 dBd)
Peak Power Gain	45.00 (16.53 dBd)
Electrical Beam Tilt	1.25 degrees
Input Power Rating (peak visual + 10% aural)	6 kW Average Power Digital
Input Type	6-1/8" EIA 75 OHM
MAX VSWR	1.10 over 6 MHz

NOTE: Measured VSWR provided.



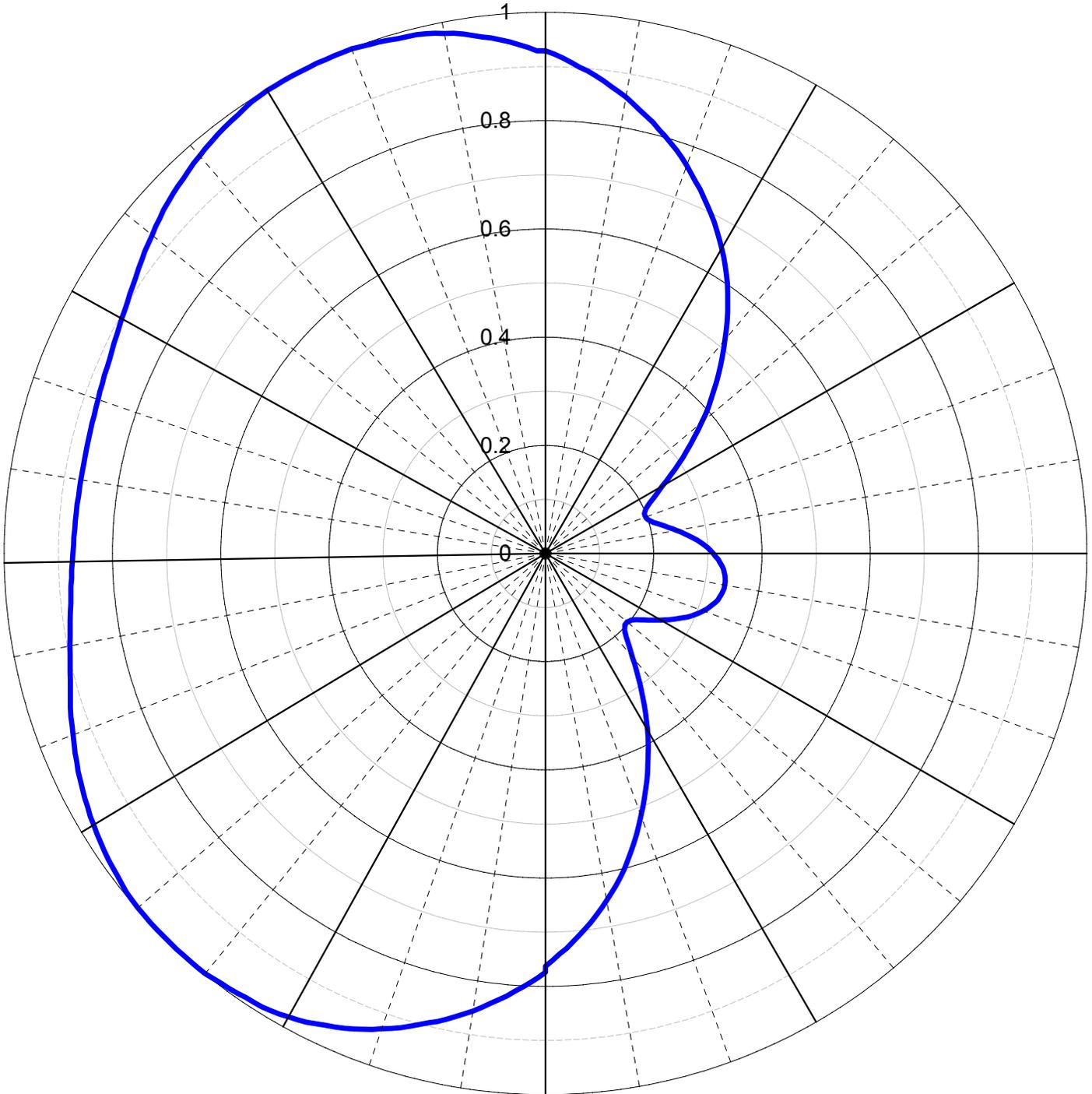
AZIMUTH PATTERN

TYPE: CH4445AZH
Numeric dB

Polarization: Horizontal
Channel: 44 & 45

Directivity:

Location: SEATTLE, WA



Note: Pattern shape and directivity may vary with channel and mounting configuration.



Electronics Research, Inc.
10500 W. 153rd Street
Orland Park, Illinois U.S.A. 60462

TABULATED DATA FOR AZIMUTH PATTERN

TYPE: CH4445AZH

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
0	0.93	-0.64	90	0.31	-10.17	180	0.76	-2.35	270	0.87	-1.17
2	0.92	-0.76	92	0.32	-9.92	182	0.78	-2.11	272	0.87	-1.19
4	0.90	-0.91	94	0.33	-9.71	184	0.80	-1.92	274	0.87	-1.20
6	0.89	-1.03	96	0.33	-9.58	186	0.82	-1.71	276	0.87	-1.21
8	0.87	-1.19	98	0.34	-9.50	188	0.84	-1.54	278	0.87	-1.22
10	0.86	-1.35	100	0.34	-9.47	190	0.86	-1.35	280	0.87	-1.22
12	0.84	-1.54	102	0.34	-9.50	192	0.87	-1.19	282	0.87	-1.22
14	0.82	-1.71	104	0.33	-9.58	194	0.89	-1.03	284	0.87	-1.21
16	0.80	-1.92	106	0.33	-9.71	196	0.90	-0.91	286	0.87	-1.20
18	0.78	-2.11	108	0.32	-9.92	198	0.92	-0.76	288	0.87	-1.19
20	0.76	-2.35	110	0.31	-10.17	200	0.93	-0.64	290	0.87	-1.17
22	0.74	-2.60	112	0.30	-10.46	202	0.94	-0.52	292	0.88	-1.14
24	0.72	-2.85	114	0.29	-10.81	204	0.95	-0.42	294	0.88	-1.11
26	0.70	-3.12	116	0.27	-11.24	206	0.96	-0.34	296	0.88	-1.07
28	0.68	-3.41	118	0.26	-11.70	208	0.97	-0.25	298	0.89	-1.02
30	0.65	-3.73	120	0.25	-12.18	210	0.98	-0.18	300	0.90	-0.96
32	0.63	-4.05	122	0.23	-12.69	212	0.99	-0.12	302	0.90	-0.91
34	0.60	-4.42	124	0.22	-13.15	214	0.99	-0.10	304	0.91	-0.83
36	0.57	-4.84	126	0.21	-13.64	216	0.99	-0.07	306	0.92	-0.74
38	0.55	-5.27	128	0.20	-13.98	218	1.00	-0.04	308	0.93	-0.66
40	0.52	-5.75	130	0.20	-14.11	220	1.00	-0.01	310	0.94	-0.58
42	0.49	-6.23	132	0.20	-14.11	222	1.00	-0.01	312	0.94	-0.50
44	0.46	-6.74	134	0.20	-13.85	224	1.00	0.00	314	0.95	-0.42
46	0.43	-7.29	136	0.22	-13.35	226	1.00	-0.01	316	0.96	-0.35
48	0.41	-7.85	138	0.23	-12.73	228	1.00	-0.01	318	0.97	-0.29
50	0.38	-8.47	140	0.25	-12.08	230	1.00	-0.02	320	0.97	-0.23
52	0.35	-9.14	142	0.27	-11.31	232	1.00	-0.03	322	0.98	-0.18
54	0.32	-9.84	144	0.30	-10.54	234	0.99	-0.09	324	0.99	-0.12
56	0.30	-10.54	146	0.32	-9.84	236	0.99	-0.12	326	0.99	-0.09
58	0.27	-11.31	148	0.35	-9.14	238	0.98	-0.18	328	1.00	-0.03
60	0.25	-12.08	150	0.38	-8.47	240	0.97	-0.23	330	1.00	-0.02
62	0.23	-12.73	152	0.41	-7.85	242	0.97	-0.29	332	1.00	-0.01
64	0.22	-13.35	154	0.43	-7.29	244	0.96	-0.35	334	1.00	-0.01
66	0.20	-13.85	156	0.46	-6.74	246	0.95	-0.42	336	1.00	0.00
68	0.20	-14.11	158	0.49	-6.23	248	0.94	-0.50	338	1.00	-0.01
70	0.20	-14.11	160	0.52	-5.75	250	0.94	-0.58	340	1.00	-0.01
72	0.20	-13.98	162	0.55	-5.27	252	0.93	-0.66	342	1.00	-0.04
74	0.21	-13.64	164	0.57	-4.84	254	0.92	-0.74	344	0.99	-0.07
76	0.22	-13.15	166	0.60	-4.42	256	0.91	-0.83	346	0.99	-0.10
78	0.23	-12.69	168	0.63	-4.05	258	0.90	-0.91	348	0.99	-0.12
80	0.25	-12.18	170	0.65	-3.73	260	0.90	-0.96	350	0.98	-0.18
82	0.26	-11.70	172	0.68	-3.41	262	0.89	-1.02	352	0.97	-0.25
84	0.27	-11.24	174	0.70	-3.12	264	0.88	-1.07	354	0.96	-0.34
86	0.29	-10.81	176	0.72	-2.85	266	0.88	-1.11	356	0.95	-0.42
88	0.30	-10.46	178	0.74	-2.60	268	0.88	-1.14	358	0.94	-0.52



Electronics Research, Inc.

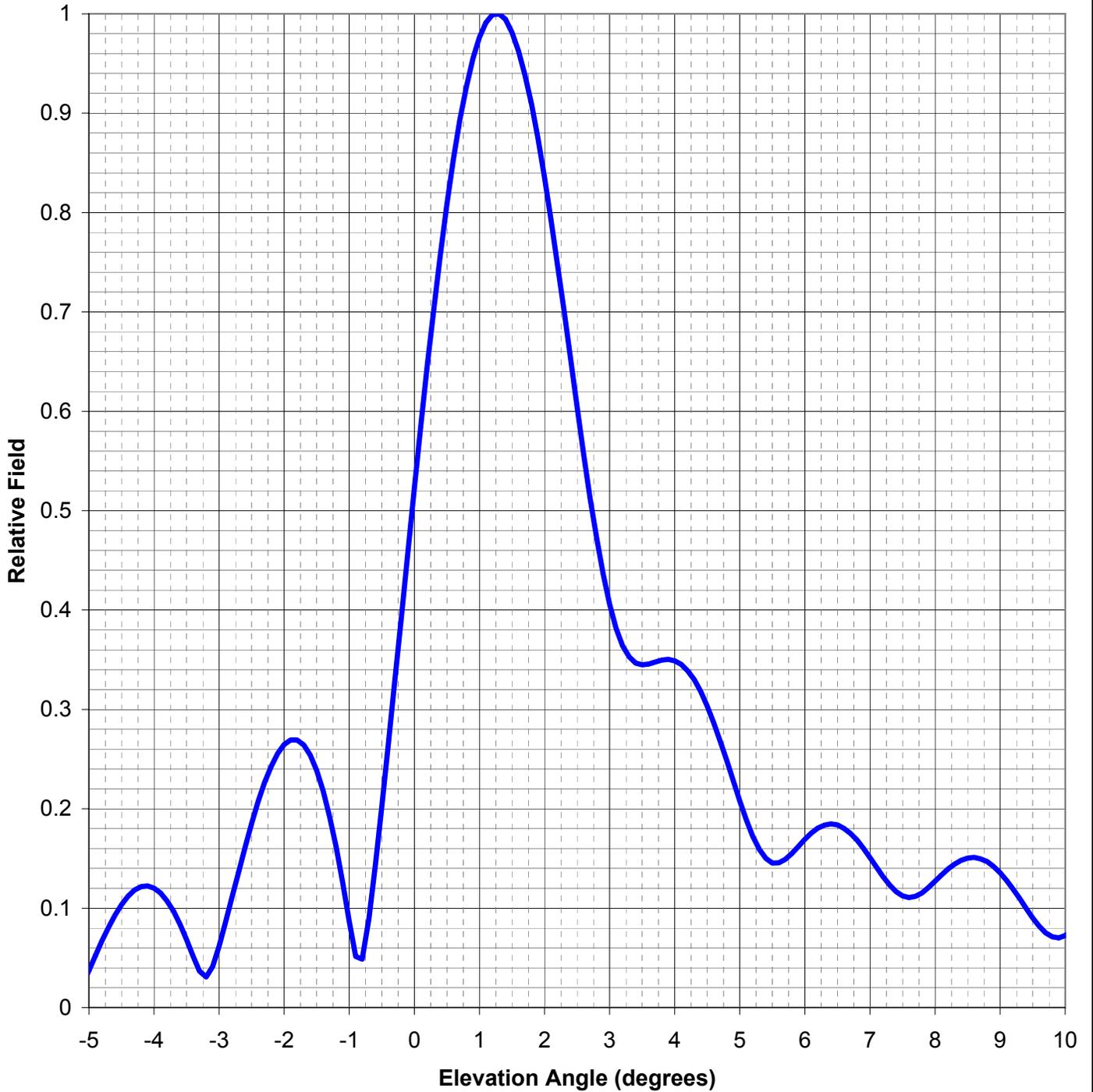
10500 W. 153rd Street

Orland Park, Illinois U.S.A. 60462

ELEVATION PATTERN

TYPE: CH44ELH
Directivity: Numeric dBd
Main Lobe:
Horizontal:

Beam Tilt: _____
Polarization: Horizontal
Channel: 44.00
Location: SEATTLE, WA



Electronics Research, Inc.
10500 W. 153rd Street
Orland Park, Illinois U.S.A. 60462

TABULATED DATA FOR ELEVATION PATTERN

TYPE: CH44ELH

ANGLE	FIELD	dB									
-5.00	0.04	-28.58	-0.50	0.20	-13.88	2.00	0.84	-1.56	6.50	0.18	-14.72
-4.90	0.05	-25.63	-0.40	0.26	-11.55	2.10	0.79	-2.02	6.60	0.18	-14.88
-4.80	0.07	-23.48	-0.30	0.33	-9.67	2.20	0.75	-2.53	6.70	0.18	-15.12
-4.70	0.08	-21.87	-0.20	0.39	-8.10	2.30	0.70	-3.09	6.80	0.17	-15.47
-4.60	0.09	-20.64	-0.10	0.46	-6.78	2.40	0.65	-3.71	6.90	0.16	-15.91
-4.50	0.10	-19.71	0.00	0.52	-5.64	2.50	0.60	-4.37	7.00	0.15	-16.43
-4.40	0.11	-19.02	0.05	0.52	-5.64	2.60	0.56	-5.08	7.10	0.14	-17.00
-4.30	0.12	-18.56	0.10	0.59	-4.65	2.70	0.51	-5.80	7.20	0.13	-17.60
-4.20	0.12	-18.31	0.15	0.59	-4.65	2.80	0.47	-6.51	7.30	0.12	-18.17
-4.10	0.12	-18.25	0.20	0.65	-3.79	2.90	0.44	-7.21	7.40	0.12	-18.66
-4.00	0.12	-18.40	0.25	0.65	-3.79	3.00	0.41	-7.83	7.50	0.11	-18.98
-3.90	0.12	-18.76	0.30	0.70	-3.05	3.10	0.38	-8.37	7.60	0.11	-19.11
-3.80	0.11	-19.37	0.35	0.70	-3.05	3.20	0.36	-8.78	7.70	0.11	-19.02
-3.70	0.10	-20.28	0.40	0.76	-2.40	3.30	0.35	-9.05	7.80	0.12	-18.75
-3.60	0.08	-21.55	0.45	0.76	-2.40	3.40	0.35	-9.20	7.90	0.12	-18.36
-3.50	0.07	-23.30	0.50	0.81	-1.85	3.50	0.34	-9.25	8.00	0.13	-17.92
-3.40	0.05	-25.70	0.55	0.81	-1.85	3.60	0.35	-9.23	8.10	0.13	-17.50
-3.30	0.04	-28.68	0.60	0.85	-1.38	3.70	0.35	-9.18	8.20	0.14	-17.12
-3.20	0.03	-30.27	0.65	0.85	-1.38	3.80	0.35	-9.13	8.30	0.14	-16.80
-3.10	0.04	-27.70	0.70	0.89	-0.98	3.90	0.35	-9.11	8.40	0.15	-16.58
-3.00	0.06	-24.19	0.75	0.89	-0.98	4.00	0.35	-9.15	8.50	0.15	-16.45
-2.90	0.09	-21.33	0.80	0.93	-0.66	4.10	0.35	-9.24	8.60	0.15	-16.42
-2.80	0.11	-19.08	0.85	0.93	-0.66	4.20	0.34	-9.40	8.70	0.15	-16.49
-2.70	0.14	-17.28	0.90	0.95	-0.40	4.30	0.33	-9.63	8.80	0.15	-16.67
-2.60	0.16	-15.83	0.95	0.95	-0.40	4.40	0.32	-9.95	8.90	0.14	-16.96
-2.50	0.19	-14.64	1.00	0.98	-0.21	4.50	0.30	-10.37	9.00	0.14	-17.35
-2.40	0.21	-13.67	1.05	0.98	-0.21	4.60	0.29	-10.86	9.10	0.13	-17.86
-2.30	0.23	-12.90	1.10	0.99	-0.08	4.70	0.27	-11.44	9.20	0.12	-18.48
-2.20	0.24	-12.29	1.15	0.99	-0.08	4.80	0.25	-12.10	9.30	0.11	-19.21
-2.10	0.26	-11.84	1.20	1.00	-0.01	4.90	0.23	-12.84	9.40	0.10	-20.03
-2.00	0.26	-11.55	1.25	1.00	-0.01	5.00	0.21	-13.65	9.50	0.09	-20.89
-1.90	0.27	-11.39	1.30	1.00	0.00	5.10	0.19	-14.47	9.60	0.08	-21.74
-1.80	0.27	-11.40	1.35	1.00	0.00	5.20	0.17	-15.27	9.70	0.08	-22.48
-1.70	0.26	-11.56	1.40	0.99	-0.05	5.30	0.16	-15.97	9.80	0.07	-22.95
-1.60	0.25	-11.90	1.45	0.99	-0.05	5.40	0.15	-16.48	9.90	0.07	-23.06
-1.50	0.24	-12.45	1.50	0.98	-0.16	5.50	0.15	-16.74	10.00	0.07	-22.81
-1.40	0.22	-13.23	1.55	0.98	-0.16	5.60	0.15	-16.74			
-1.30	0.19	-14.34	1.60	0.96	-0.33	5.70	0.15	-16.53			
-1.20	0.16	-15.87	1.65	0.96	-0.33	5.80	0.16	-16.19			
-1.10	0.13	-18.05	1.70	0.94	-0.55	5.90	0.16	-15.80			
-1.00	0.09	-21.24	1.75	0.94	-0.55	6.00	0.17	-15.43			
-0.90	0.05	-25.78	1.80	0.91	-0.83	6.10	0.18	-15.11			
-0.80	0.05	-26.26	1.85	0.91	-0.83	6.20	0.18	-14.87			
-0.70	0.09	-21.00	1.90	0.87	-1.17	6.30	0.18	-14.72			
-0.60	0.14	-16.88	1.95	0.87	-1.17	6.40	0.18	-14.67			



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