

**RADIOFREQUENCY ELECTROMAGNETIC FIELD
MEASUREMENTS FOR KPCC, PASADENA, CA
MT. WILSON TRANSMITTER SITE**

OCTOBER 2008

**BY: BEEM CO.
ARCADIA, CA
(626) 446-3468**

ENGINEERING STATEMENT OF JOEL T. SAXBERG

On October 28, 2008, radiofrequency electromagnetic field measurements were conducted around the base of KPCC's main and auxiliary FM antennas. The main and auxiliary antennas are mounted on two different towers, one west of the Allcomm building and one east of the Allcomm building.

MATHEMATICAL CALCULATIONS - Before taking readings, a study was made for the auxiliary antenna using equations found in OET-65, the antenna manufacturers vertical plane relative field and the data found in the FCC FM database. Power density was calculated on a flat plane two meters above ground level. The auxiliary antenna contributes a little over 5% of the maximum permissible exposure level for the general public from 12 to 16 meters distance. A summary of the calculations is as follows:

<u>Dist.</u>	<u>S Dist.</u>	<u>Rel Field</u>	<u>S</u>
<u>m</u>	<u>m</u>		<u>mW/cm²</u>
0	22	0.1	0.0008
2	22.1	0.14	0.0016
4	22.4	0.18	0.0026
6	22.8	0.249	0.0048
8	23.4	0.314	0.0072
10	24.2	0.356	0.0067
12	25.1	0.397	0.0101
14	26.1	0.426	0.0107
16	27.2	0.446	0.0108
18	28.4	0.444	0.0098
20	29.7	0.429	0.0083
22	31.1	0.394	0.0054
24	32.6	0.363	0.0050
26	34.1	0.308	0.0033
28	35.6	0.259	0.0021
30	37.2	0.207	0.0012
32	38.8	0.176	0.0008

RF Survey – A ten-foot by ten-foot grid was established using spray chalk on the road in front of and to the east side of the KPCC tower property. This was on Video Road to the south and on Weathervane Drive to the east. A Narda Model 8718-10 radiation survey meter and an 8742

shaped E field probe were used to take power density measurements. A Nardalert XT personal monitor was also used which was purchased new in November 2004. The manufacturer, L3 Communications calibrated these instruments. Calibration was completed on the following dates:

8718-10, s/n 01559, calibrated 8/2006

8732, s/n 06012, calibrated 8/2006

8742, s/n 03004, calibrated 8/2006

Method of Measurement – The survey meter was set to read spatial average values. The survey meter was connected to a shaped E-Field probe. This probe is set to read percent of standard for “controlled environments”, which is the occupational standard. General Public maximum permissible values in the FM and TV broadcast frequencies are 20% of standard. There are both FM and TV facilities at the KPCC transmitter site. The towers are fenced and are entered through a locked gate. Access to the fenced area is for authorized personnel only. The general public may access areas outside the fence and a paved road runs directly in front of the KPCC transmitter building. Spatial average measurements were taken outside the fence around the site at the marked grid locations. The spatial average reading for each marked location was called out and the value was recorded. A set of readings was taken using the KPCC main antenna. A second set of readings was taken using the KPCC auxiliary antenna. A tabulation of the readings follows:

Loc.	Main	Aux.	Loc.	Main.	Aux.	Loc.	Main.	Aux.
A1	4.95	6.206	B1	7.425	9.525	C1	7.725	10.18
A2	7.537	9.15	B2	8.268	11.98	C2	7.20	9.618
A3	5.906	9.562	B3	8.812	13.29	C3	5.962	8.662
A4	5.043	8.118	B4	6.225	10.76	C4	5.325	7.687
A5	5.456	8.062	B5	6.750	11.81	C5	6.506	8.756
A6	6.487	9.225	B6	7.556	11.32	C6	8.606	11.64

A7	5.437	8.362	B7	7.20	10.74	C7	8.587	9.562
A8	5.175	5.343	B8	8.418	9.112	C8	6.693	8.025
A9	6.168	6.243	B9	5.793	6.975	C9	6.881	8.868
A10	5.381	8.643	B10	6.506	9.90	C10	6.506	9.675
A11	6.187	7.837	B11	6.787	9.168	C11	8.343	11.34
A12	8.868	12.33	B12	9.750	15.58	C12	10.93	15.61
A13	11.94	13.08	B13	12.43	12.67	C13	12.61	14.30
A14	6.75	10.42	B14	12.78	10.72	C14	11.34	11.3
A15	8.868	10.31	B15	10.83	10.12	C15	11.10	12.61
A16	8.081	8.325	B16	11.56	10.96	C16	11.06	11.23
A17	4.256	4.425	B17	7.987	8.306	C17	12.16	10.10
D1	6.843	6.356	E1	7.106	7.537			
D2	7.425	7.368	E2	7.687	7.631			
D3	6.468	6.318	E3	7.687	6.918			
D4	6.862	8.250	E4	12.63	13.23			
D5	8.137	9.337	E5	10.36	9.112			
D6	6.956	6.581	E6	11.34	11.26			
D7	9.206	8.700	E7	9.468	8.193			
D8	7.931	6.843	E8	9.806	6.918			
D9	8.081	6.975	E9	10.68	8.306			

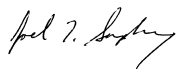
The highest spatial average reading occurred at point C12 using the auxiliary antenna. The reading was 15.61% of the controlled limit or 78% of the uncontrolled (general population limit). No locations outside the fence and in the immediate vicinity of the KPCC site exceeded the MPE level for the general public. There were no “hot spots” or abnormally high readings. Assisting in the site survey was Mr. David Anderson who recorded the readings as they were called out.

ENGINEERING CERTIFICATION

JOEL T. SAXBERG deposes and says:

1. That he is President of Broadcast Engineering and Equipment Maintenance Company, "BEEM CO.", radio engineering consultants. BEEM CO. maintains offices at: 2322 S. Second Avenue, Arcadia, CA 91006. Telephone (626) 446-3468
2. That he was graduated from California State University at Los Angeles, February 1966, with a Bachelor of Science degree in Electronic Engineering. He received a MS degree in Electronic Engineering Technology in August 1996.
3. That he has submitted many applications to the Federal Communications Commission for broadcast and auxiliary broadcast construction permits and licenses.
4. That his experience in broadcast engineering is a matter of record and he has spent over forty years working in the field of radio engineering.
5. That the attached report was prepared by him or under his direction and supervision. That he believes the facts stated therein to be both true and accurate. Statements that are based on information supplied by others are also believed to be true and accurate.
6. That he has performed field work on AM and FM broadcast transmitting systems throughout this country and continues to provide technical consulting services on a daily basis to broadcasters.
7. That he declares under penalty of perjury the foregoing is true and correct.

Executed on Oct 30, 2008



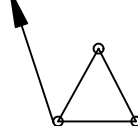
Joel T. Saxberg



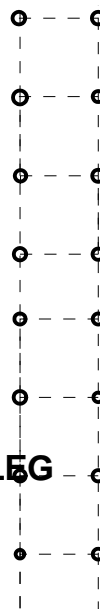
CONTROLLED AREA

CONTROLLED AREA

KPCC AUX. ANT. LEG

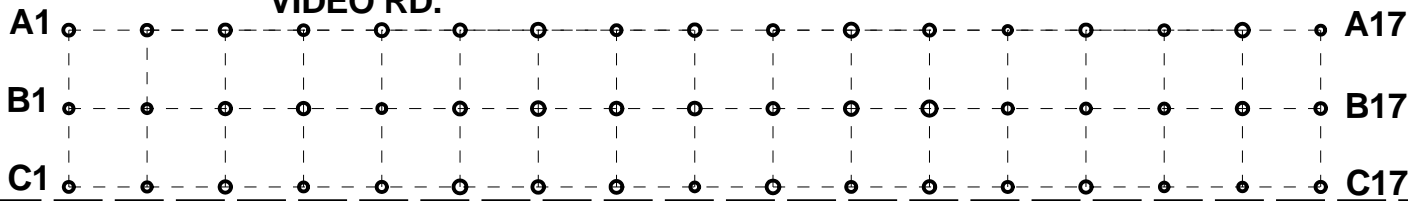


D9 E9



D1 E1

VIDEO RD.



KPCC MEASUREMENT GRID 10' X 10'

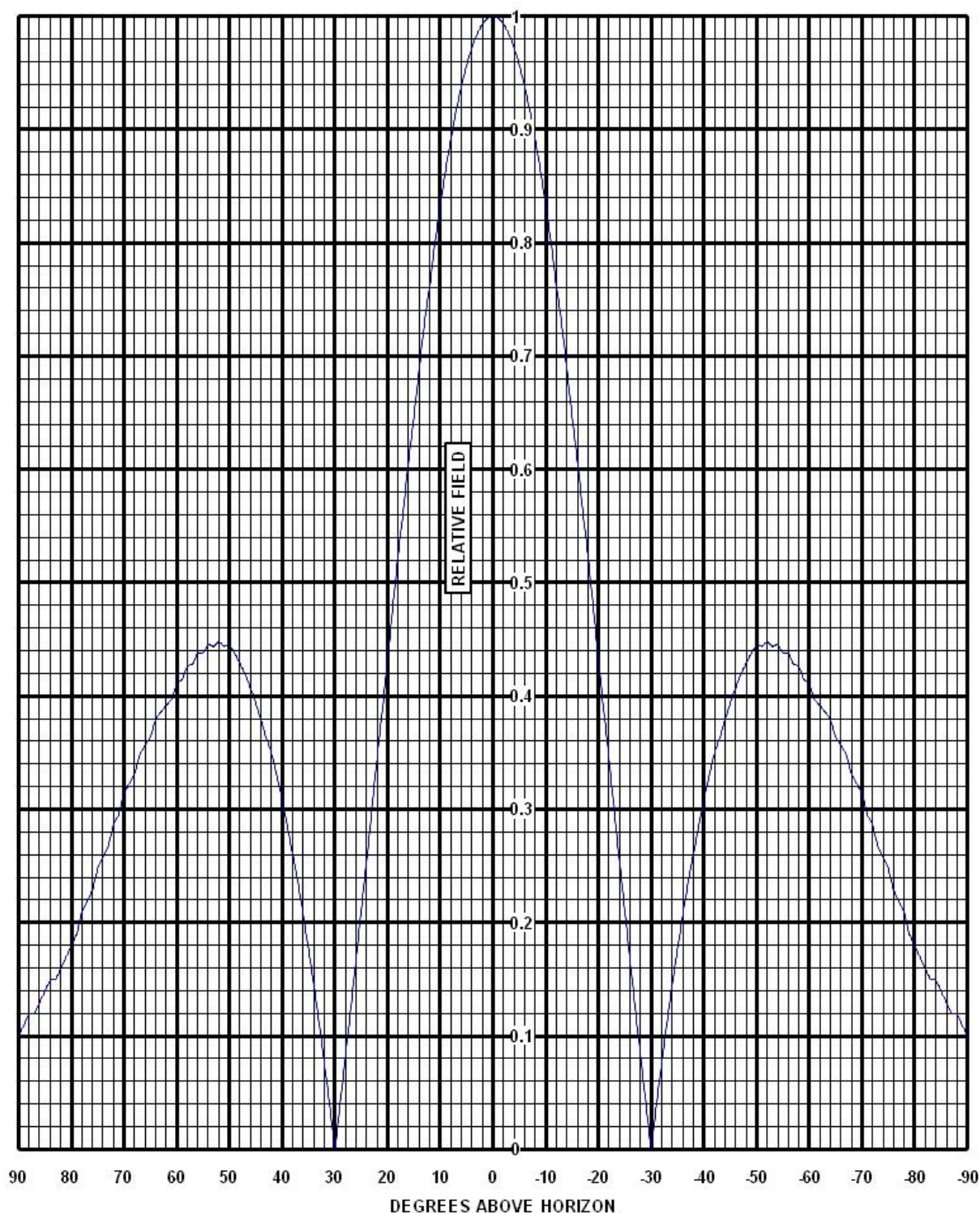
DRAWN Name			
CHECKED Name			
ENGINEER Name			
APPROVED Name	SIZE A	DWG NUMBER 0000-0000	
SCALE 1 : 300	REV -	SHEET 1 OF 1	



6340 Sky Creek Drive
Sacramento, California 95828 USA

Telephone (916) 383-1177
Fax (916) 383-1182

COMPUTED ELEVATION PATTERN



Customer: KPCC-FM

Frequency: 89.3 MHz

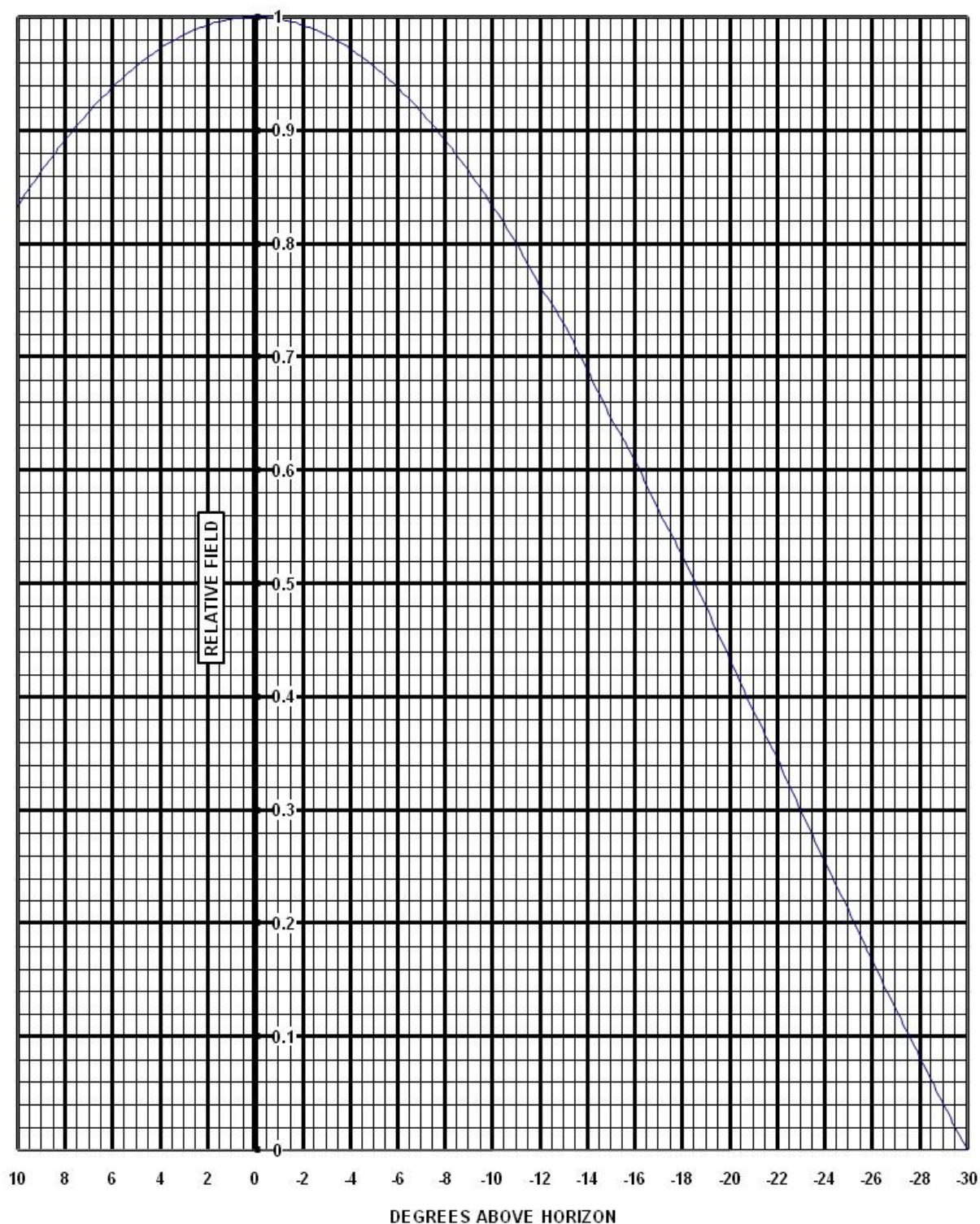
Model: JSCP-2
Description: FM Sidemount Antenna
-0° Beam Tilt, 0% Null Fill



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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				

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