

**September 2016
FM Translator K248CD
Salem, Oregon Channel 228D
Allocation Study**

250 Mile Window Application

This application is being filed as a "250 Mile Window Application" to modify an authorized FM translator for use with an AM station.

AM Station Callsign: KZZD 1390 kHz Salem
AM Station Class: B

Translator Move Distance: 0 kilometers

The applicant is also the licensee of the AM station.

Allocation Study

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study map demonstrates compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

K225BF 225D Turner

The proposed translator transmitter site is located within the 60 dBu protected contour of third-adjacent channel station K225BF Turner, and on the same tower. The two translators will be installed at similar elevations on the tower.

Comparison of the proposed Salem 228D and licensed K225BF ERPs has been made at 1 degree increments around the tower site. (See attached tabular results.) The results of this study show that the proposed Salem 228D facility will exceed the power of K225BF by at most 11.74 dB (at 20 degrees True).

Therefore, in no direction will the proposed facility meet or exceed the -40 dB D/U ratio threshold for third-adjacent channel interference, and therefore no interference will be caused to reception of K225BF.

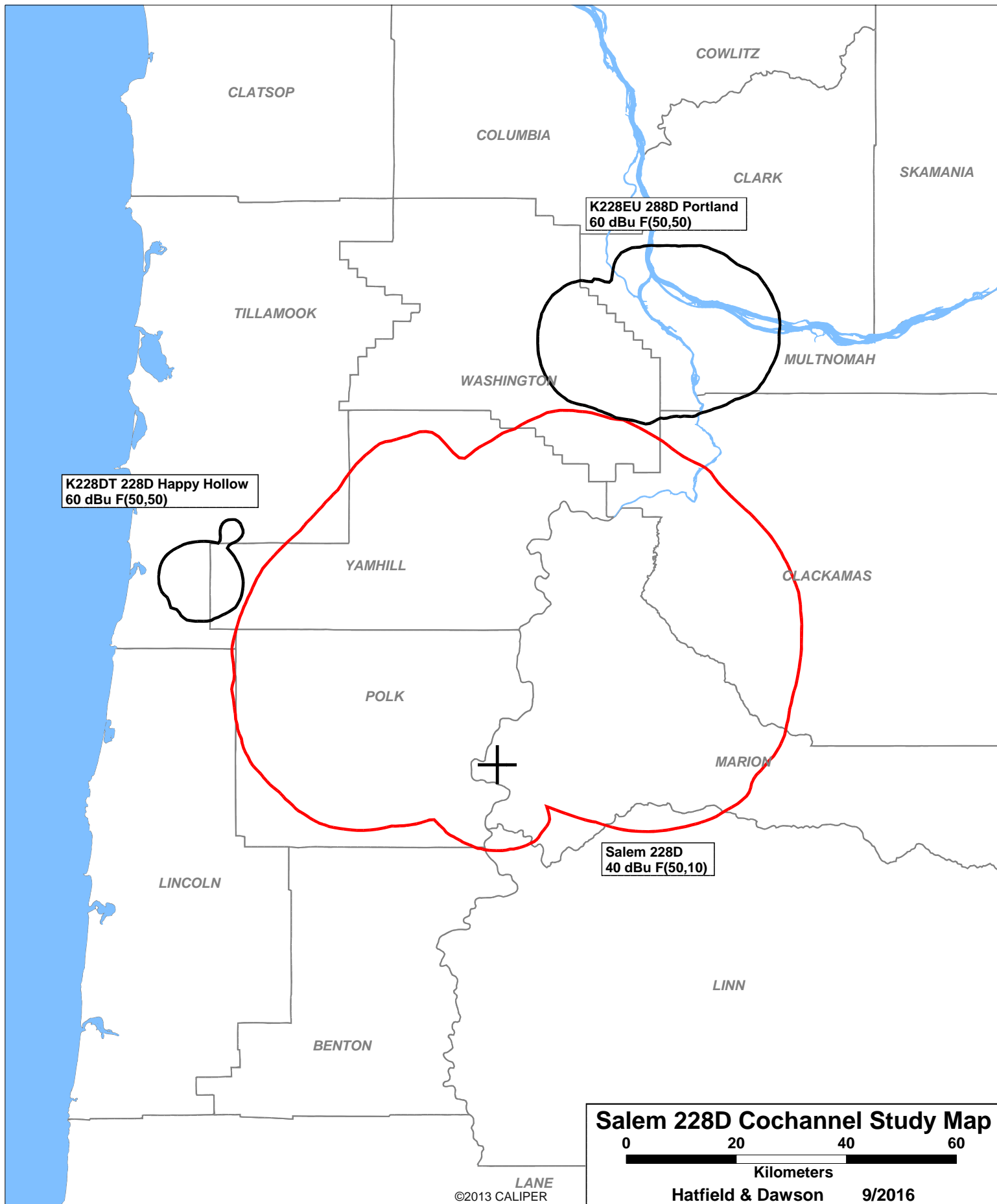
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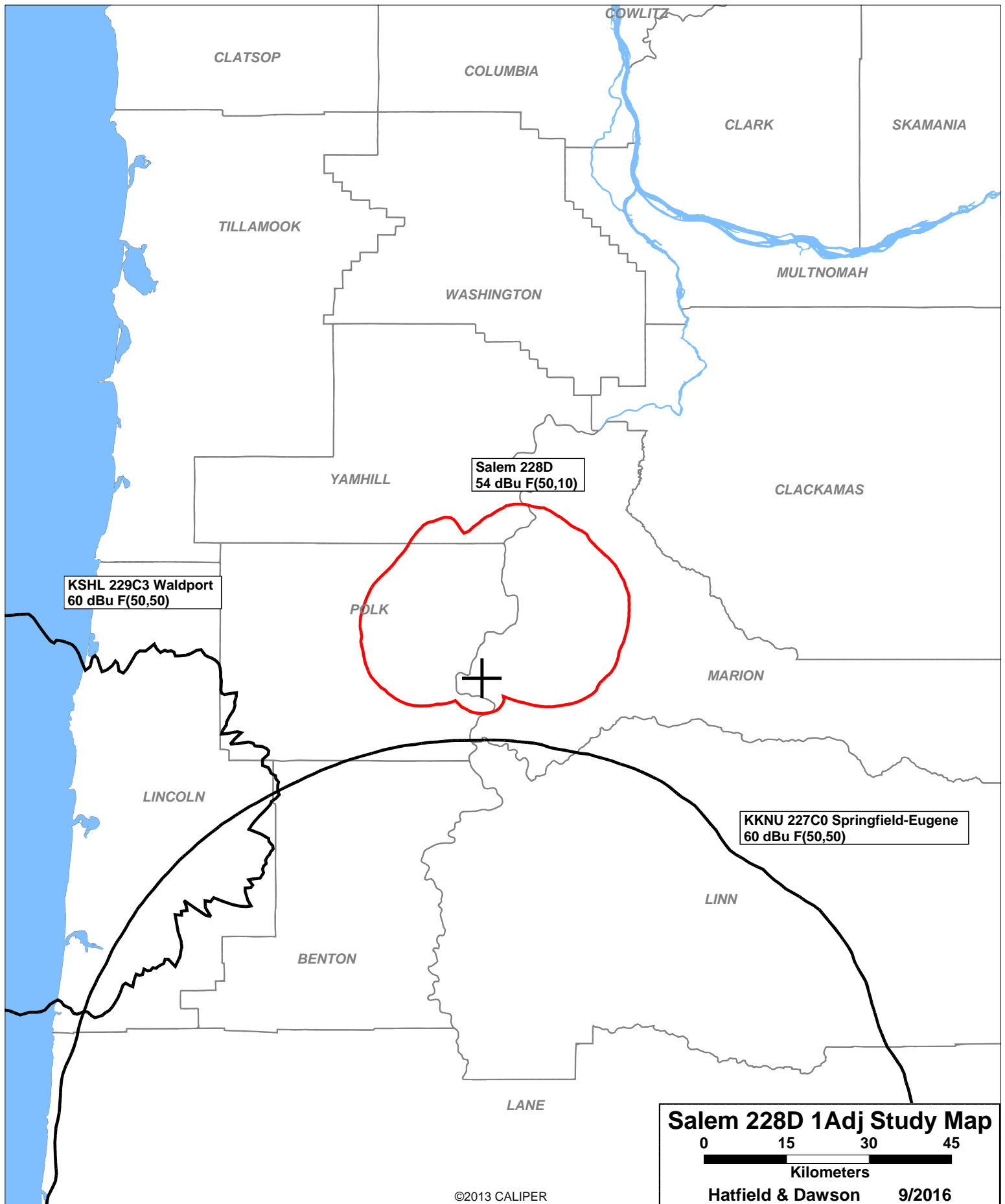
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SEARCH PARAMETERS                               FM Database Date: 160901
Channel: 228A      93.5 MHz                      Page 1
Latitude: 44 51 18
Longitude: 123 7 15
Safety Zone: 50 km
Job Title: SALEM 228
=====

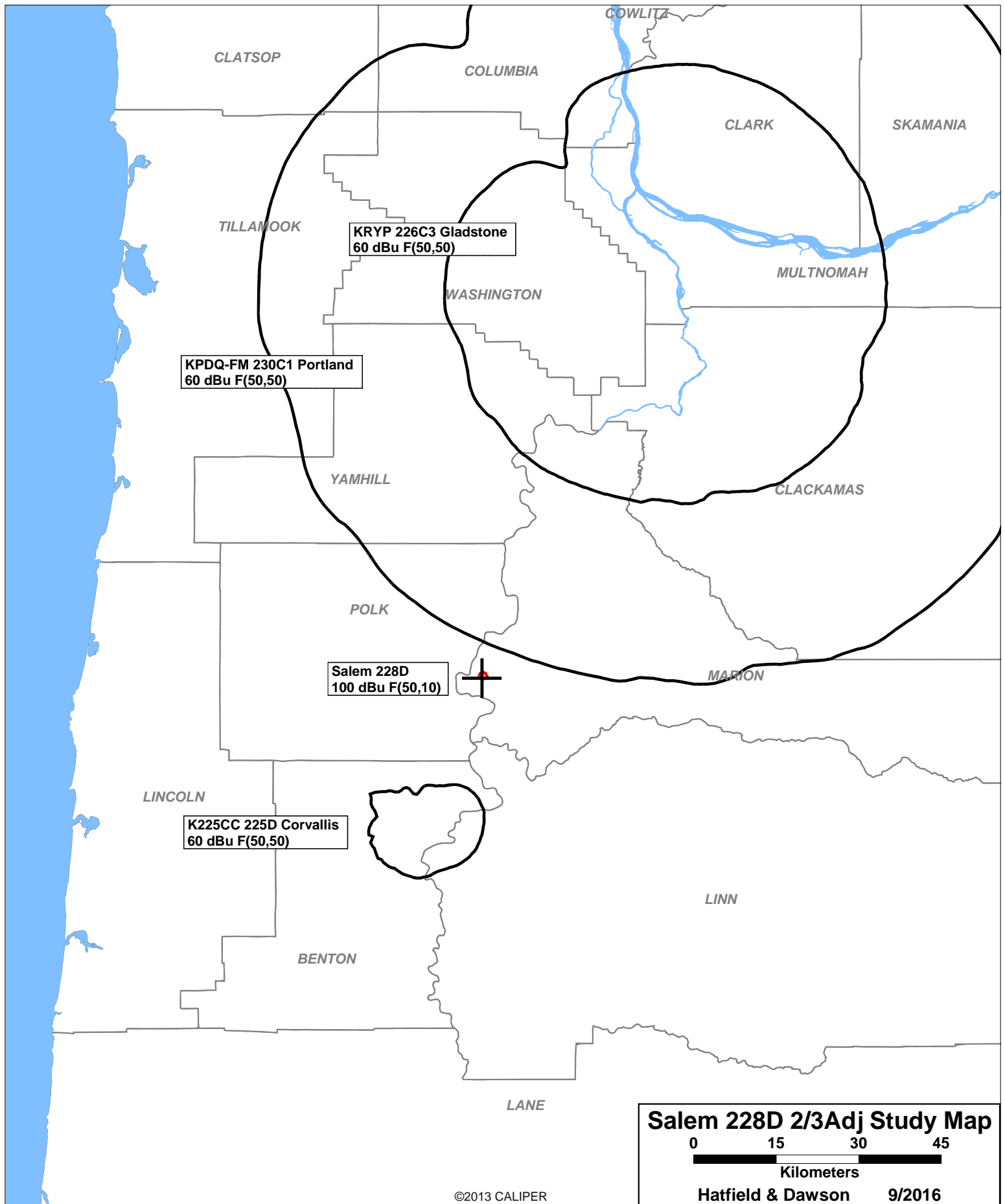
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Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K225CC LIC	CORVALLIS OR	BLFT-50921ACG	225D 92.9	0.016 406.0	44-38-25 123-16-25	206.9	26.75 0.00	0 TRANS
K225BF LIC	TURNER OR	BLFT-60727AEK	225D 92.9	0.023 331.0	44-51-18 123-07-15	0.0	0.00 0.00	0 TRANS
KRYP LIC	GLADSTONE OR	BLH-60208AMG	226C3 93.1	1.600 387.0	45-29-20 122-41-40	25.2	78.01 36.01	42 CLEAR
KEUB CP	GEARHART OR	BPH-60512AAS	227C3 93.3	6.700 45.0	45-57-11 123-56-14	332.7	137.76 48.76	89 CLEAR
KKNU LIC	SPRINGFIELD-EUGENE OR	BLH-60202ABA	227C0 93.3	100.000 395.0	44-00-04 123-06-45	179.6	94.89 -57.11	152 SHORT
K228DT LIC	HAPPY HOLLOW OR	BLFT-00414ACQ	228D 93.5	0.010 833.0	45-12-48 123-45-14	308.9	63.83 0.00	0 TRANS
K228EU LIC	PORTLAND OR	BLFT-10118ABC	228D 93.5	0.099 506.0	45-31-21 122-44-45	21.5	79.82 0.00	0 TRANS
KACI-FM LIC	THE DALLES OR	BLH-20823AAZ	228C2 93.5	2.300 588.0	45-42-44 121-06-49	58.0	184.06 18.06	166 CLEAR
K228FA LIC	LONGVIEW WA	BLFT-31216DXC	228D 93.5	0.100 282.0	46-10-59 122-57-29	4.9	148.15 0.00	0 TRANS
K229DC CP MOD	EUGENE OR	BMPFT-60801AEX	229D 93.7	0.250 0.0	44-00-07 123-06-47	179.6	94.79 0.00	0 TRANS
KSHL LIC	WALDPORT OR	BLH-60202ABJ	229C3 93.7	9.000 132.0	44-38-40 124-00-50	251.9 SS	74.49 -14.51	89 SHORT
KPDQ-FM LIC	PORTLAND OR	BLH-60208AMF	230C1 93.9	52.000 387.0	45-29-20 122-41-40	25.2 SS	78.01 3.01	75 CLOSE
K282BH LIC	PHILOMATH OR	BLFT-41103AAF	282D 104.3	0.016 395.0	44-38-25 123-16-25	206.9	26.75 0.00	0 TRANS

===== END OF FM SPACING STUDY FOR CHANNEL 228 =====







Comparison of Salem 228D and K225BF ERPs At 1 Degree Increments

Salem 228D exceeds K225BF by a maximum of: 11.74 dB

Azimuth (deg T)	K225BF ERP (dBk)	Salem 228D ERP (dBk)	Salem 228D Exceeds K225BF by (dB)
0	-16.95	-6.82	10.13
1	-16.97	-6.77	10.20
2	-17.00	-6.73	10.27
3	-17.03	-6.68	10.35
4	-17.06	-6.64	10.42
5	-17.09	-6.59	10.50
6	-17.13	-6.55	10.58
7	-17.16	-6.50	10.66
8	-17.19	-6.46	10.73
9	-17.22	-6.41	10.81
10	-17.25	-6.37	10.88
11	-17.31	-6.35	10.96
12	-17.38	-6.33	11.05
13	-17.45	-6.32	11.13
14	-17.52	-6.30	11.22
15	-17.58	-6.28	11.30
16	-17.65	-6.27	11.38
17	-17.72	-6.25	11.47
18	-17.79	-6.23	11.56
19	-17.86	-6.22	11.64
20	-17.94	-6.20	11.74
21	-17.89	-6.22	11.67
22	-17.85	-6.25	11.60
23	-17.81	-6.27	11.54
24	-17.77	-6.30	11.47
25	-17.73	-6.32	11.41
26	-17.69	-6.35	11.34
27	-17.65	-6.37	11.28
28	-17.61	-6.40	11.21
29	-17.57	-6.42	11.15
30	-17.53	-6.45	11.08
31	-17.46	-6.45	11.01
32	-17.39	-6.46	10.93
33	-17.32	-6.46	10.86
34	-17.25	-6.46	10.79
35	-17.18	-6.47	10.71
36	-17.11	-6.47	10.64
37	-17.04	-6.48	10.56
38	-16.97	-6.48	10.49
39	-16.90	-6.49	10.41
40	-16.83	-6.49	10.34
41	-16.80	-6.49	10.31
42	-16.77	-6.49	10.28
43	-16.73	-6.49	10.24
44	-16.70	-6.49	10.21
45	-16.66	-6.49	10.17
46	-16.63	-6.49	10.14
47	-16.59	-6.49	10.10
48	-16.56	-6.49	10.07
49	-16.53	-6.49	10.04
50	-16.49	-6.49	10.00
51	-16.47	-6.53	9.94

52	-16.45	-6.56	9.89
53	-16.43	-6.60	9.83
54	-16.40	-6.64	9.76
55	-16.38	-6.67	9.71
56	-16.39	-6.71	9.68
57	-16.40	-6.75	9.65
58	-16.41	-6.78	9.63
59	-16.41	-6.82	9.59
60	-16.42	-6.86	9.56
61	-16.45	-6.93	9.52
62	-16.47	-7.00	9.47
63	-16.49	-7.07	9.42
64	-16.51	-7.15	9.36
65	-16.53	-7.22	9.31
66	-16.56	-7.30	9.26
67	-16.58	-7.37	9.21
68	-16.60	-7.45	9.15
69	-16.62	-7.52	9.10
70	-16.64	-7.60	9.04
71	-16.68	-7.72	8.96
72	-16.71	-7.83	8.88
73	-16.74	-7.95	8.79
74	-16.77	-8.07	8.70
75	-16.80	-8.19	8.61
76	-16.83	-8.32	8.51
77	-16.86	-8.44	8.42
78	-16.89	-8.57	8.32
79	-16.92	-8.70	8.22
80	-16.95	-8.83	8.12
81	-16.97	-8.98	7.99
82	-16.99	-9.14	7.85
83	-17.01	-9.31	7.70
84	-17.03	-9.47	7.56
85	-17.04	-9.64	7.40
86	-17.06	-9.81	7.25
87	-17.08	-9.99	7.09
88	-17.10	-10.17	6.93
89	-17.11	-10.35	6.76
90	-17.13	-10.54	6.59
91	-17.21	-10.74	6.47
92	-17.29	-10.96	6.33
93	-17.36	-11.17	6.19
94	-17.44	-11.40	6.04
95	-17.52	-11.62	5.90
96	-17.60	-11.86	5.74
97	-17.68	-12.10	5.58
98	-17.76	-12.35	5.41
99	-17.84	-12.61	5.23
100	-17.93	-12.87	5.06
101	-18.06	-13.18	4.88
102	-18.20	-13.49	4.71
103	-18.34	-13.82	4.52
104	-18.48	-14.17	4.31
105	-18.63	-14.52	4.11
106	-18.78	-14.90	3.88
107	-18.93	-15.29	3.64
108	-19.08	-15.69	3.39
109	-19.23	-16.12	3.11
110	-19.39	-16.57	2.82
111	-19.61	-17.11	2.50

112	-19.84	-17.68	2.16
113	-20.07	-18.29	1.78
114	-20.30	-18.94	1.36
115	-20.55	-19.65	0.90
116	-20.80	-20.43	0.37
117	-21.05	-21.27	-0.22
118	-21.32	-22.22	-0.90
119	-21.59	-23.27	-1.68
120	-21.88	-24.47	-2.59
121	-22.19	-25.04	-2.85
122	-22.52	-25.64	-3.12
123	-22.86	-26.30	-3.44
124	-23.22	-27.00	-3.78
125	-23.59	-27.77	-4.18
126	-23.98	-28.61	-4.63
127	-24.38	-29.54	-5.16
128	-24.81	-30.58	-5.77
129	-25.25	-31.76	-6.51
130	-25.72	-33.14	-7.42
131	-25.91	-33.14	-7.23
132	-26.10	-33.14	-7.04
133	-26.30	-33.14	-6.84
134	-26.50	-33.14	-6.64
135	-26.71	-33.14	-6.43
136	-26.92	-33.14	-6.22
137	-27.14	-33.14	-6.00
138	-27.36	-33.14	-5.78
139	-27.58	-33.14	-5.56
140	-27.82	-33.14	-5.32
141	-27.90	-33.14	-5.24
142	-27.98	-33.14	-5.16
143	-28.06	-33.14	-5.08
144	-28.15	-33.14	-4.99
145	-28.23	-33.14	-4.91
146	-28.32	-33.14	-4.82
147	-28.40	-33.14	-4.74
148	-28.49	-33.14	-4.65
149	-28.58	-33.14	-4.56
150	-28.67	-33.14	-4.47
151	-28.80	-33.14	-4.34
152	-28.94	-33.14	-4.20
153	-29.09	-33.14	-4.05
154	-29.23	-33.14	-3.91
155	-29.38	-33.14	-3.76
156	-29.52	-33.14	-3.62
157	-29.67	-33.14	-3.47
158	-29.83	-33.14	-3.31
159	-29.99	-33.14	-3.15
160	-30.14	-33.14	-3.00
161	-30.47	-33.14	-2.67
162	-30.80	-33.14	-2.34
163	-31.15	-33.14	-1.99
164	-31.52	-33.14	-1.62
165	-31.90	-33.14	-1.24
166	-32.30	-33.14	-0.84
167	-32.71	-33.14	-0.43
168	-33.15	-33.14	0.01
169	-33.61	-33.14	0.47
170	-34.10	-33.14	0.96
171	-34.28	-33.14	1.14

172	-34.47	-33.14	1.33
173	-34.66	-33.14	1.52
174	-34.85	-33.14	1.71
175	-35.05	-33.14	1.91
176	-35.26	-33.14	2.12
177	-35.47	-33.14	2.33
178	-35.68	-33.14	2.54
179	-35.90	-33.14	2.76
180	-36.12	-33.14	2.98
181	-35.90	-33.14	2.76
182	-35.68	-33.14	2.54
183	-35.47	-33.14	2.33
184	-35.26	-33.14	2.12
185	-35.05	-33.14	1.91
186	-34.85	-33.14	1.71
187	-34.66	-33.14	1.52
188	-34.47	-33.14	1.33
189	-34.28	-33.14	1.14
190	-34.10	-33.14	0.96
191	-33.61	-33.14	0.47
192	-33.15	-33.14	0.01
193	-32.71	-33.14	-0.43
194	-32.30	-33.14	-0.84
195	-31.90	-33.14	-1.24
196	-31.52	-33.14	-1.62
197	-31.15	-33.14	-1.99
198	-30.80	-33.14	-2.34
199	-30.47	-33.14	-2.67
200	-30.14	-33.14	-3.00
201	-29.99	-33.14	-3.15
202	-29.83	-33.14	-3.31
203	-29.67	-33.14	-3.47
204	-29.52	-33.14	-3.62
205	-29.38	-33.14	-3.76
206	-29.23	-33.14	-3.91
207	-29.09	-33.14	-4.05
208	-28.94	-33.14	-4.20
209	-28.80	-33.14	-4.34
210	-28.67	-33.14	-4.47
211	-28.58	-33.14	-4.56
212	-28.49	-33.14	-4.65
213	-28.40	-33.14	-4.74
214	-28.32	-33.14	-4.82
215	-28.23	-33.14	-4.91
216	-28.15	-33.14	-4.99
217	-28.06	-33.14	-5.08
218	-27.98	-33.14	-5.16
219	-27.90	-33.14	-5.24
220	-27.82	-33.14	-5.32
221	-27.58	-33.14	-5.56
222	-27.36	-33.14	-5.78
223	-27.14	-33.14	-6.00
224	-26.92	-33.14	-6.22
225	-26.71	-33.14	-6.43
226	-26.50	-33.14	-6.64
227	-26.30	-33.14	-6.84
228	-26.10	-33.14	-7.04
229	-25.91	-33.14	-7.23
230	-25.72	-33.14	-7.42
231	-25.25	-32.33	-7.08

232	-24.81	-31.58	-6.77
233	-24.38	-30.90	-6.52
234	-23.98	-30.27	-6.29
235	-23.59	-29.68	-6.09
236	-23.22	-29.13	-5.91
237	-22.86	-28.61	-5.75
238	-22.52	-28.12	-5.60
239	-22.19	-27.65	-5.46
240	-21.88	-27.21	-5.33
241	-21.59	-26.24	-4.65
242	-21.32	-25.37	-4.05
243	-21.05	-24.58	-3.53
244	-20.80	-23.85	-3.05
245	-20.55	-23.18	-2.63
246	-20.30	-22.56	-2.26
247	-20.07	-21.98	-1.91
248	-19.84	-21.44	-1.60
249	-19.61	-20.93	-1.32
250	-19.39	-20.44	-1.05
251	-19.23	-20.04	-0.81
252	-19.08	-19.65	-0.57
253	-18.93	-19.28	-0.35
254	-18.78	-18.92	-0.14
255	-18.63	-18.58	0.05
256	-18.48	-18.25	0.23
257	-18.34	-17.93	0.41
258	-18.20	-17.62	0.58
259	-18.06	-17.33	0.73
260	-17.93	-17.04	0.89
261	-17.84	-16.79	1.05
262	-17.76	-16.55	1.21
263	-17.68	-16.32	1.36
264	-17.60	-16.09	1.51
265	-17.52	-15.87	1.65
266	-17.44	-15.65	1.79
267	-17.36	-15.44	1.92
268	-17.29	-15.23	2.06
269	-17.21	-15.03	2.18
270	-17.13	-14.84	2.29
271	-17.11	-14.66	2.45
272	-17.10	-14.49	2.61
273	-17.08	-14.32	2.76
274	-17.06	-14.15	2.91
275	-17.04	-13.99	3.05
276	-17.03	-13.83	3.20
277	-17.01	-13.67	3.34
278	-16.99	-13.51	3.48
279	-16.97	-13.36	3.61
280	-16.95	-13.21	3.74
281	-16.92	-13.09	3.83
282	-16.89	-12.97	3.92
283	-16.86	-12.85	4.01
284	-16.83	-12.73	4.10
285	-16.80	-12.61	4.19
286	-16.77	-12.50	4.27
287	-16.74	-12.38	4.36
288	-16.71	-12.27	4.44
289	-16.68	-12.16	4.52
290	-16.64	-12.05	4.59
291	-16.62	-11.97	4.65

292	-16.60	-11.90	4.70
293	-16.58	-11.82	4.76
294	-16.56	-11.75	4.81
295	-16.53	-11.67	4.86
296	-16.51	-11.60	4.91
297	-16.49	-11.53	4.96
298	-16.47	-11.46	5.01
299	-16.45	-11.38	5.07
300	-16.42	-11.31	5.11
301	-16.41	-11.28	5.13
302	-16.41	-11.25	5.16
303	-16.40	-11.21	5.19
304	-16.39	-11.18	5.21
305	-16.38	-11.14	5.24
306	-16.40	-11.11	5.29
307	-16.43	-11.08	5.35
308	-16.45	-11.04	5.41
309	-16.47	-11.01	5.46
310	-16.49	-10.98	5.51
311	-16.53	-10.98	5.55
312	-16.56	-10.98	5.58
313	-16.59	-10.98	5.61
314	-16.63	-10.98	5.65
315	-16.66	-10.98	5.68
316	-16.70	-10.98	5.72
317	-16.73	-10.98	5.75
318	-16.77	-10.98	5.79
319	-16.80	-10.98	5.82
320	-16.83	-10.98	5.85
321	-16.90	-10.90	6.00
322	-16.97	-10.82	6.15
323	-17.04	-10.74	6.30
324	-17.11	-10.66	6.45
325	-17.18	-10.58	6.60
326	-17.25	-10.50	6.75
327	-17.32	-10.43	6.89
328	-17.39	-10.35	7.04
329	-17.46	-10.27	7.19
330	-17.53	-10.20	7.33
331	-17.57	-10.01	7.56
332	-17.61	-9.83	7.78
333	-17.65	-9.65	8.00
334	-17.69	-9.47	8.22
335	-17.73	-9.30	8.43
336	-17.77	-9.13	8.64
337	-17.81	-8.96	8.85
338	-17.85	-8.80	9.05
339	-17.89	-8.64	9.25
340	-17.94	-8.48	9.46
341	-17.86	-8.37	9.49
342	-17.79	-8.27	9.52
343	-17.72	-8.17	9.55
344	-17.65	-8.06	9.59
345	-17.58	-7.96	9.62
346	-17.52	-7.86	9.66
347	-17.45	-7.76	9.69
348	-17.38	-7.66	9.72
349	-17.31	-7.57	9.74
350	-17.25	-7.47	9.78
351	-17.22	-7.40	9.82

352	-17.19	-7.34	9.85
353	-17.16	-7.27	9.89
354	-17.13	-7.20	9.93
355	-17.09	-7.14	9.95
356	-17.06	-7.07	9.99
357	-17.03	-7.01	10.02
358	-17.00	-6.95	10.05
359	-16.97	-6.88	10.09

**September 2016
FM Translator K248CD
Salem, Oregon Channel 228D
RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 228D (93.5 MHz) with a maximum lobe effective radiated power of 240 watts. Operation is proposed with an antenna to be mounted on an existing tower on Prospect Hill, with FCC Antenna Structure Registration Number 1057524.

The antenna system will be comprised of two Scala CL-FM(V) antennas, one oriented at 45 degrees True at 75% power, and the other oriented at 315 degrees True at 25% power.

RF Exposure Calculations

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 operation of Salem 248D 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 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 outlined in OET Bulletin No. 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. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

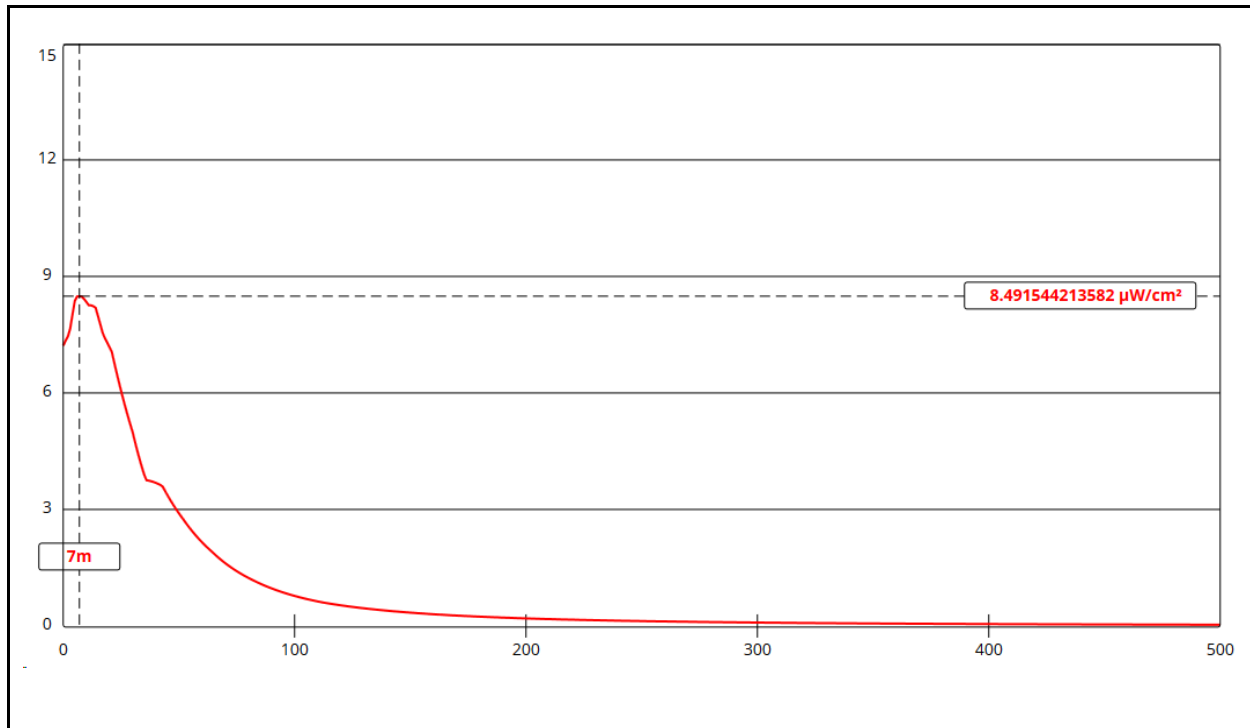
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Hatfield & Dawson Consulting Engineers

Calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the “worst case” element pattern. The highest calculated ground level power density occurs at a distance of 7 meters from the base of the antenna support structure. At this point the power density is calculated to be $8.5 \mu\text{W}/\text{cm}^2$, which is 4.3% of $200 \mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of Salem 228D 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 RF exposure 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 exposure in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

Salem 228D

Antenna Type: Scala CLFMV (Type 1)
No. of Elements: 1
Element Spacing: 1.0 wavelength

Distance: 1000 meters
Horizontal ERP: zero kW
Vertical ERP: 0.240 kW

Antenna Height: 32 meters AGL

Maximum Calculated Power Density is 8.5 $\mu\text{W}/\text{cm}^2$ at 7 meters from the antenna structure.