

DTV12 Reverse Frequency Transmit Off-Axis Summary

6/1/2012

OS1 (102.8W) Beam 9

Antenna Gain Relative to +X-axis

The antenna is left or right hand circularly polarized (LHCP, RHCP)

Three frequencies were analyzed, 17.305, 17.500, and 17.695 GHz

Total number of sheets = 6 (2 polarizations x 3 frequencies)

Each sheet has two header lines and four columns

column 1: Elevation angle relative to x-axis in degrees, rotation about z,  $\pm 60^\circ$  every  $5^\circ$  (negative toward

column 2: Azimuth angle relative to x-axis in degrees, rotation about y,  $\pm 30^\circ$  every  $5^\circ$  (negative toward

column 3: Co-polarized antenna gain, dBi (RHCP gain for RHCP port or LHCP gain for LHCP port)

column 4: Cross-polarized antenna gain, dBi (LHCP gain for RHCP port or RHCP gain for LHCP port)

Kevin Clancy

DTV12 Antenna Project Engineer

Boeing S&IS, El Segundo

[kevin.clancy@boeing.com](mailto:kevin.clancy@boeing.com)

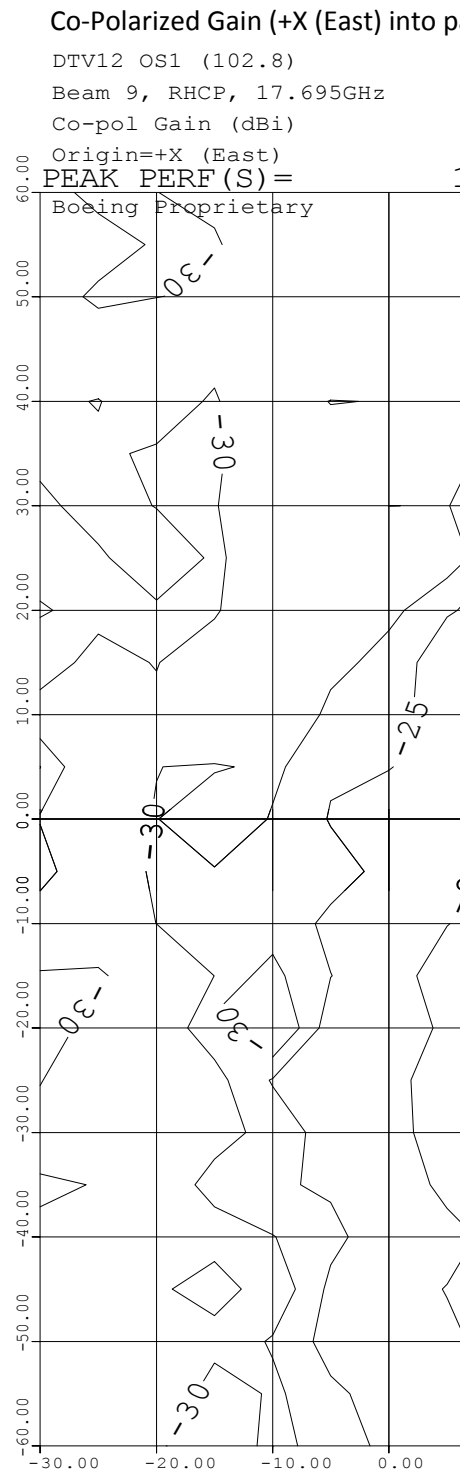
south)  
Earth)

Beam 9 OS1 RHCP 17.695

Z-Rotation (Deg.)	Y-Rotation (Deg.)	Co-pol Gain (dBi)	Cross-pol Gain (dBi)
-60	-30	-36.067	-26.84
-60	-25	-38.067	-24.333
-60	-20	-30.85	-21.284
-60	-15	-25.769	-22.702
-60	-10	-31.54	-19.375
-60	-5	-27.956	-18.471
-60	0	-23.56	-16.686
-60	5	-23.545	-15.447
-60	10	-21.513	-18.534
-60	15	-21.072	-16.578
-60	20	-20.433	-16.32
-60	25	-18.104	-20.515
-60	30	-19.047	-16.655
-55	-30	-35.27	-25.435
-55	-25	-35.709	-26.101
-55	-20	-39.918	-21.813
-55	-15	-25.306	-20.654
-55	-10	-31.114	-19.18
-55	-5	-26.022	-19.018
-55	0	-22.932	-17.412
-55	5	-20.31	-19.192
-55	10	-22.25	-14.374
-55	15	-18.574	-18.32
-55	20	-19.412	-15.193
-55	25	-17.508	-19.846
-55	30	-18.101	-18.971
-50	-30	-37.401	-30.185
-50	-25	-38.234	-25.73
-50	-20	-35.498	-24.1
-50	-15	-33.32	-22.191
-50	-10	-29.46	-19.857
-50	-5	-23.031	-18.705
-50	0	-23.099	-17.112
-50	5	-20.819	-17.013
-50	10	-18.369	-18.856
-50	15	-19.246	-14.759
-50	20	-17.538	-16.785
-50	25	-18.481	-14.027
-50	30	-18.734	-18.491
-45	-30	-46.995	-28.791

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BOTH AXES ARE

-45	-25	-32.263	-33.069
-45	-20	-31.254	-20.784
-45	-15	-26.635	-20.455
-45	-10	-33.927	-18.575
-45	-5	-23.78	-16.755
-45	0	-21.841	-15.916
-45	5	-19.833	-15.965
-45	10	-19.909	-14.986
-45	15	-18.717	-18.034
-45	20	-18.853	-14.263
-45	25	-20.322	-18.426
-45	30	-17.996	-10.363
-40	-30	-34.9	-26.13
-40	-25	-33.135	-29.18
-40	-20	-31.88	-22.632
-40	-15	-32.977	-21.091
-40	-10	-30.2	-20.513
-40	-5	-26.436	-17.188
-40	0	-21.68	-16.199
-40	5	-21.614	-14.451
-40	10	-18.289	-18.225
-40	15	-17.445	-18.247
-40	20	-20.094	-17.581
-40	25	-19.438	-12.141
-40	30	-17.325	-7.913
-35	-30	-26.434	-25.095
-35	-25	-30.943	-33.278
-35	-20	-34.404	-25.978
-35	-15	-27.794	-24.599
-35	-10	-25.662	-18.198
-35	-5	-24.281	-17.09
-35	0	-23.321	-14.58
-35	5	-18.663	-19.068
-35	10	-20.383	-14.37
-35	15	-18.865	-14.052
-35	20	-19.128	-13.668
-35	25	-18.941	-10.586
-35	30	-15.291	-6.67
-30	-30	-43.755	-29.057
-30	-25	-33.887	-26.673
-30	-20	-32.635	-23.727
-30	-15	-32.313	-21.836
-30	-10	-28.016	-17.476
-30	-5	-22.682	-20.72

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-30	20	-20.153	-14.007
-30	25	-16.333	-7.804
-30	30	-12.759	-4.09
-25	-30	-28.403	-33.922
-25	-25	-31.761	-25.358
-25	-20	-39.277	-26.663
-25	-15	-31.615	-20.338
-25	-10	-24.578	-23.09
-25	-5	-21.744	-20.953
-25	0	-20.947	-16.174
-25	5	-18.474	-18.54
-25	10	-19.182	-15.031
-25	15	-20.472	-20.765
-25	20	-18.466	-11.049
-25	25	-14.867	-8.568
-25	30	-11.248	-5.297
-20	-30	-27.341	-38.28
-20	-25	-32.904	-31.632
-20	-20	-32.914	-25.254
-20	-15	-27.502	-27.211
-20	-10	-36.792	-18.872
-20	-5	-21.987	-20.373
-20	0	-23.438	-14.644
-20	5	-18.92	-16.103
-20	10	-17.579	-17.962
-20	15	-20.174	-20.246
-20	20	-18.873	-14.006
-20	25	-14.376	-7.073
-20	30	-10.436	-2.753
-15	-30	-29.138	-38.722
-15	-25	-28.263	-27.421
-15	-20	-38.349	-28.619
-15	-15	-29.94	-20.268
-15	-10	-31.324	-21.391
-15	-5	-25.086	-19.801
-15	0	-21.244	-17.697
-15	5	-18.62	-16.643
-15	10	-19.057	-14.032
-15	15	-18.539	-13.455
-15	20	-18.628	-10.66

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-15	30	-10.641	-2.385
-10	-30	-37.828	-30.877
-10	-25	-39.034	-29.968
-10	-20	-29.931	-31.58
-10	-15	-28.573	-22.468
-10	-10	-28.114	-20.712
-10	-5	-23.849	-20.872
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-10	15	-18.284	-14.932
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-10	25	-15.183	-6.907
-10	30	-10.477	-5.167
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-5	-25	-41.524	-30.666
-5	-20	-27.47	-23.66
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-5	-10	-26.657	-22.834
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-5	0	-23.506	-16.919
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-5	15	-18.542	-13.74
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0	20	-18.021	-12.237
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0	30	-12.636	-7.13
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5	-15	-29.366	-23.894
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5	20	-18.677	-14.566
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15	20	-20.312	-18.939
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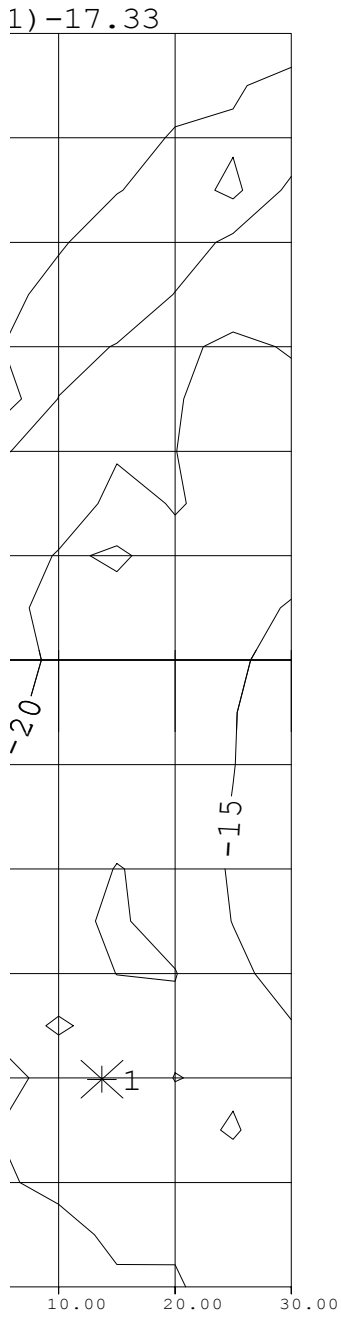
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35	30	-20.246	-18.23



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40	20	-28.02	-17.474
40	25	-23.7	-17.018
40	30	-22.449	-15.611
45	-30	-32.985	-34.071
45	-25	-35.137	-34.169
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45	-15	-33.059	-27.42
45	-10	-32.233	-34.525
45	-5	-55.692	-31.907
45	0	-37.055	-26.258
45	5	-33.959	-23.958
45	10	-32.759	-25.607
45	15	-30.318	-24.145
45	20	-27.328	-23.101
45	25	-31.24	-17.086
45	30	-23.672	-20.199
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50	-20	-28.821	-31.957
50	-15	-37.974	-35.071
50	-10	-30.897	-27.784
50	-5	-33.904	-25.819
50	0	-32.069	-25.795
50	5	-30.428	-22.832
50	10	-38.986	-22.856
50	15	-36.458	-22.367
50	20	-28.673	-27.106
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50	30	-28.702	-19.92
55	-30	-36.094	-29.157
55	-25	-33.289	-28.483
55	-20	-29.211	-27.174
55	-15	-28.182	-30.321
55	-10	-42.03	-29.104

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55	15	-36.637	-24.699
55	20	-34.929	-22.684
55	25	-30.603	-28.401
55	30	-28.087	-27.566
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60	-20	-29.828	-32.905
60	-15	-33.869	-28.105
60	-10	-30.562	-35.983
60	-5	-34.374	-31.435
60	0	-34.684	-30.839
60	5	-32.471	-25.859
60	10	-33.497	-28.374
60	15	-31.387	-23.903
60	20	-32.97	-27.92
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60	30	-33.575	-28.682

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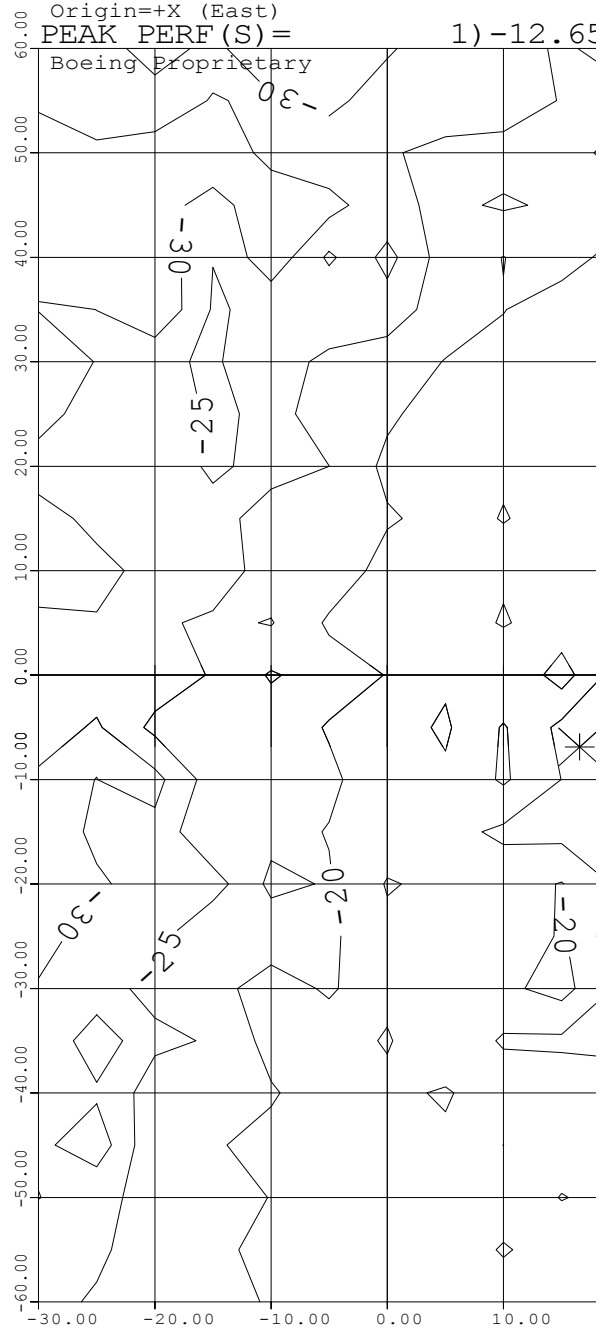


IN DEG

### Cross-Polarized Gain (+X (East) into page)

DTV12 OS1 (102.8)  
Beam 9, RHCP, 17.695GHz  
Cross-pol Gain (dBi)

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BOTH AXES ARE IN DEG







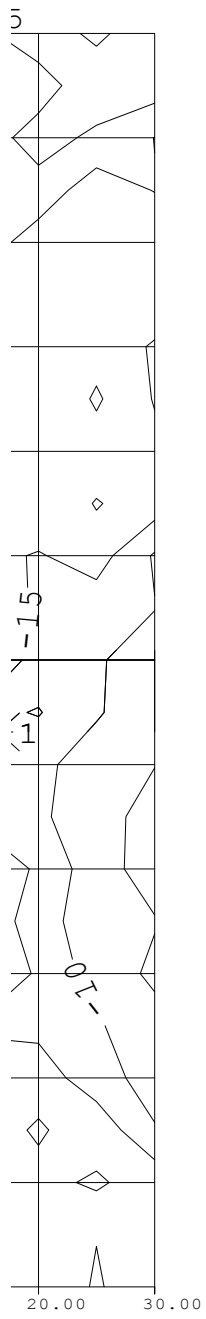












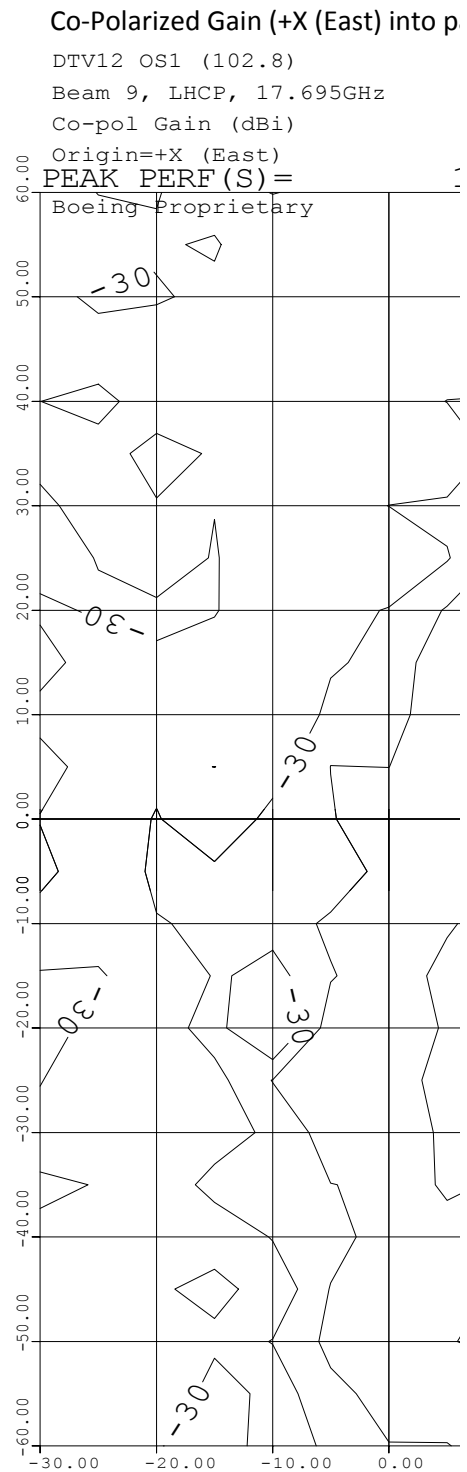
EG

Beam 9 OS1 LHCP 17.695

Z-Rotation (Deg.)	Y-Rotation (Deg.)	Co-pol Gain (dBi)	Cross-pol Gain (dBi)
-60	-30	-37.824	-26.552
-60	-25	-40.4	-24.163
-60	-20	-30.586	-21.293
-60	-15	-25.579	-23.658
-60	-10	-33.511	-19.288
-60	-5	-28.834	-18.403
-60	0	-25.114	-16.974
-60	5	-25.317	-15.606
-60	10	-20.93	-18.247
-60	15	-20.946	-16.602
-60	20	-21.084	-16.578
-60	25	-18.379	-21.009
-60	30	-20.276	-17.35
-55	-30	-33.257	-25.23
-55	-25	-35.322	-26.16
-55	-20	-40.366	-21.454
-55	-15	-25.427	-21.18
-55	-10	-32.946	-19.057
-55	-5	-26.203	-19.077
-55	0	-23.471	-17.492
-55	5	-20.226	-19.419
-55	10	-22.741	-14.403
-55	15	-18.573	-18.416
-55	20	-19.708	-15.398
-55	25	-17.434	-19.154
-55	30	-18.205	-18.536
-50	-30	-35.04	-31.177
-50	-25	-38.09	-25.859
-50	-20	-35.666	-24.065
-50	-15	-32.187	-21.686
-50	-10	-29.827	-19.836
-50	-5	-23.746	-19.006
-50	0	-23.864	-17.185
-50	5	-20.354	-16.76
-50	10	-18.326	-18.87
-50	15	-19.236	-14.717
-50	20	-17.223	-16.373
-50	25	-17.678	-13.933
-50	30	-19.051	-18.31
-45	-30	-44.501	-28.401

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BOTH AXES ARE

-45	-25	-31.928	-33.644
-45	-20	-31.296	-20.491
-45	-15	-27.238	-20.636
-45	-10	-33.964	-18.307
-45	-5	-24.736	-16.98
-45	0	-22.898	-16.107
-45	5	-20.85	-16.372
-45	10	-19.677	-14.988
-45	15	-18.762	-18.214
-45	20	-18.171	-14.249
-45	25	-20.116	-18.871
-45	30	-17.36	-10.251
-40	-30	-34.665	-26.004
-40	-25	-32.08	-30.031
-40	-20	-32.692	-22.607
-40	-15	-34.489	-20.928
-40	-10	-29.661	-20.399
-40	-5	-26.95	-17.243
-40	0	-22.461	-16.472
-40	5	-22.567	-14.594
-40	10	-18.991	-18.648
-40	15	-17.384	-17.904
-40	20	-20.023	-17.818
-40	25	-18.643	-11.957
-40	30	-17.549	-7.826
-35	-30	-26.119	-24.646
-35	-25	-30.814	-34.227
-35	-20	-34.593	-26.032
-35	-15	-27.738	-24.916
-35	-10	-26.423	-18.282
-35	-5	-25.072	-17.217
-35	0	-24.426	-14.704
-35	5	-18.888	-19.301
-35	10	-20.922	-14.555
-35	15	-18.424	-14.056
-35	20	-18.621	-13.389
-35	25	-18.661	-10.433
-35	30	-15.655	-6.621
-30	-30	-42.135	-29.015
-30	-25	-33.522	-26.564
-30	-20	-31.688	-23.6
-30	-15	-33.48	-21.761
-30	-10	-28.514	-17.518
-30	-5	-22.842	-20.89

-30	0	-21.251	-16.338
-30	5	-19.612	-16.855
-30	10	-18.794	-19.16
-30	15	-20.111	-21.888
-30	20	-19.699	-13.788
-30	25	-16.325	-7.777
-30	30	-13.338	-4.149
-25	-30	-28.414	-33.372
-25	-25	-31.355	-25.465
-25	-20	-39.451	-27.011
-25	-15	-31.603	-20.416
-25	-10	-24.839	-23.354
-25	-5	-22.071	-21.181
-25	0	-21.564	-16.279
-25	5	-18.81	-18.695
-25	10	-19.213	-15.156
-25	15	-20.464	-20.691
-25	20	-17.973	-10.949
-25	25	-14.684	-8.508
-25	30	-11.442	-5.388
-20	-30	-27.395	-38.373
-20	-25	-33.012	-30.981
-20	-20	-32.539	-25.534
-20	-15	-27.896	-27.407
-20	-10	-37.971	-19.071
-20	-5	-22.223	-20.274
-20	0	-23.805	-14.728
-20	5	-19.337	-16.262
-20	10	-17.663	-18.131
-20	15	-19.845	-20.153
-20	20	-18.372	-13.796
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-20	30	-10.894	-2.798
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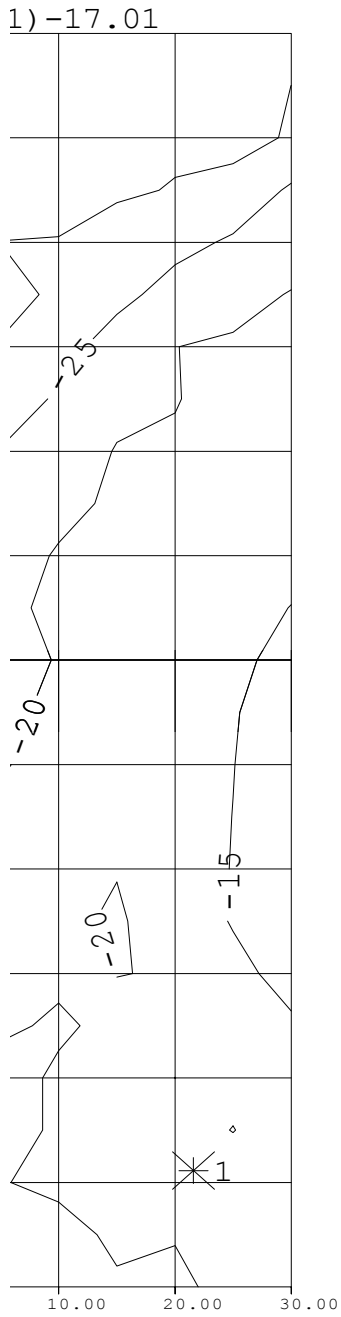


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age)



IN DEG

### Cross-Polarized Gain (+X (East) into page)

DTV12 OS1 (102.8)

Beam 9, LHCP, 17.695GHz

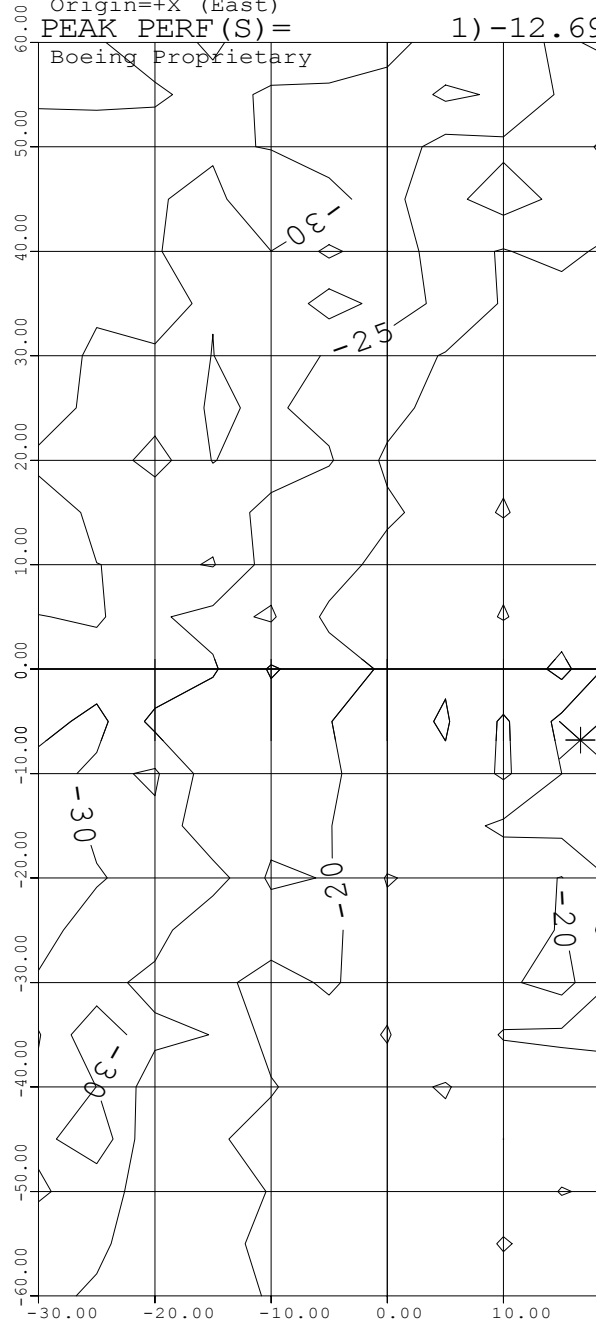
Cross-pol Gain (dBi)

Origin=+X (East)

PEAK PERF(S) =

1) -12.69

qq925b FP: May 31 12 12:24:44P



BOTH AXES ARE IN DEG







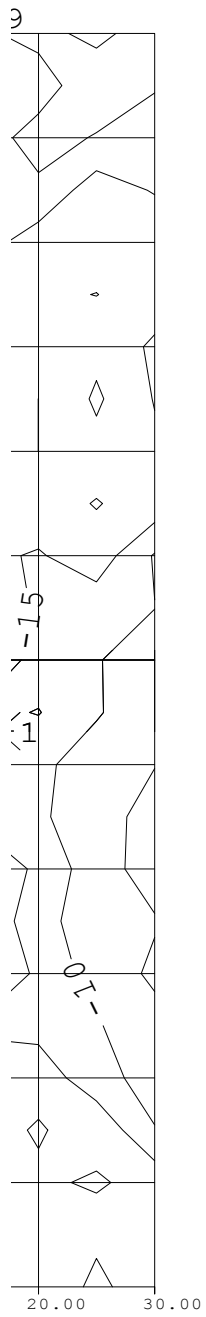










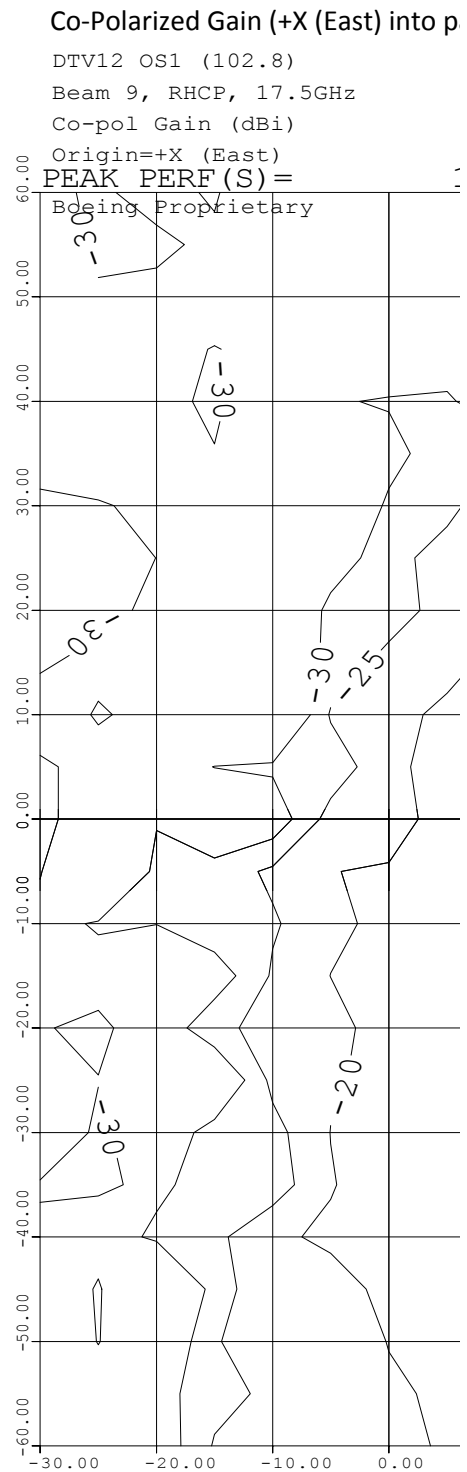


EG

Beam 9 OS1 RHCP 17.5

Z-Rotation (Deg.)	Y-Rotation (Deg.)	Co-pol Gain (dBi)	Cross-pol Gain (dBi)
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-60	-20	-34.019	-20.45
-60	-15	-24.499	-19.009
-60	-10	-24.893	-18.555
-60	-5	-22.982	-19.388
-60	0	-22.595	-16.102
-60	5	-18.963	-17.437
-60	10	-18.743	-14.19
-60	15	-17.034	-15.421
-60	20	-16.947	-14.907
-60	25	-16.234	-14.832
-60	30	-15.706	-19.404
-55	-30	-50.22	-25.72
-55	-25	-33.898	-22.404
-55	-20	-32.175	-20.924
-55	-15	-26.781	-18.001
-55	-10	-23.891	-18.26
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-55	0	-20.707	-17.012
-55	5	-19.208	-15.234
-55	10	-16.448	-17.732
-55	15	-16.667	-15.125
-55	20	-16.068	-18.111
-55	25	-16.22	-14.557
-55	30	-16.653	-16.68
-50	-30	-37.705	-25.364
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-50	25	-17.734	-15.371
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FP: May 31 12:24:28P



BOTH AXES ARE

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40	-5	-30.541	-31.283
40	0	-29.437	-26.997
40	5	-29.623	-21.996
40	10	-31.989	-18.083
40	15	-25.029	-19.166
40	20	-21.731	-17.118
40	25	-19.397	-19.132
40	30	-18.247	-18.788
45	-30	-34.259	-29.986
45	-25	-37.466	-26.695
45	-20	-32.976	-25.896
45	-15	-29.596	-29.275
45	-10	-33.178	-23.648
45	-5	-33.739	-24.032
45	0	-36.261	-26.734
45	5	-31.642	-23.713
45	10	-29.065	-22.061
45	15	-27.566	-21.403
45	20	-23.652	-21.773
45	25	-22.906	-17.122
45	30	-21.709	-18.333
50	-30	-34.402	-31.834
50	-25	-30.644	-33.417
50	-20	-33.82	-31.706
50	-15	-36.225	-26.242
50	-10	-35.878	-28.665
50	-5	-44.095	-30.267
50	0	-36.784	-23.53
50	5	-32.961	-25.475
50	10	-42.694	-21.387
50	15	-35.088	-20.635
50	20	-25.233	-24.862
50	25	-25.732	-21.791
50	30	-23.015	-20.372
55	-30	-34.206	-26.389
55	-25	-28.907	-26.322
55	-20	-26.931	-29.303
55	-15	-33.316	-31.43
55	-10	-34.013	-28.83

55	-5	-30.994	-24.569
55	0	-32.583	-33.582
55	5	-35.448	-24.026
55	10	-37.367	-24.005
55	15	-34.329	-23.793
55	20	-33.143	-21.507
55	25	-27.235	-24.707
55	30	-26.181	-24.287
60	-30	-33.637	-25.505
60	-25	-27.77	-27.419
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60	-15	-28.078	-26.966
60	-10	-48.601	-27.122
60	-5	-38.264	-26.001
60	0	-37.672	-25.918
60	5	-35.341	-30.892
60	10	-33.03	-28.282
60	15	-33.384	-26.75
60	20	-31.444	-30.589
60	25	-31.625	-24.664
60	30	-29.337	-27.262

age)



IN DEG

### Cross-Polarized Gain (+X (East) into page)

DTV12 OS1 (102.8)

Beam 9, RHCP, 17.5GHz

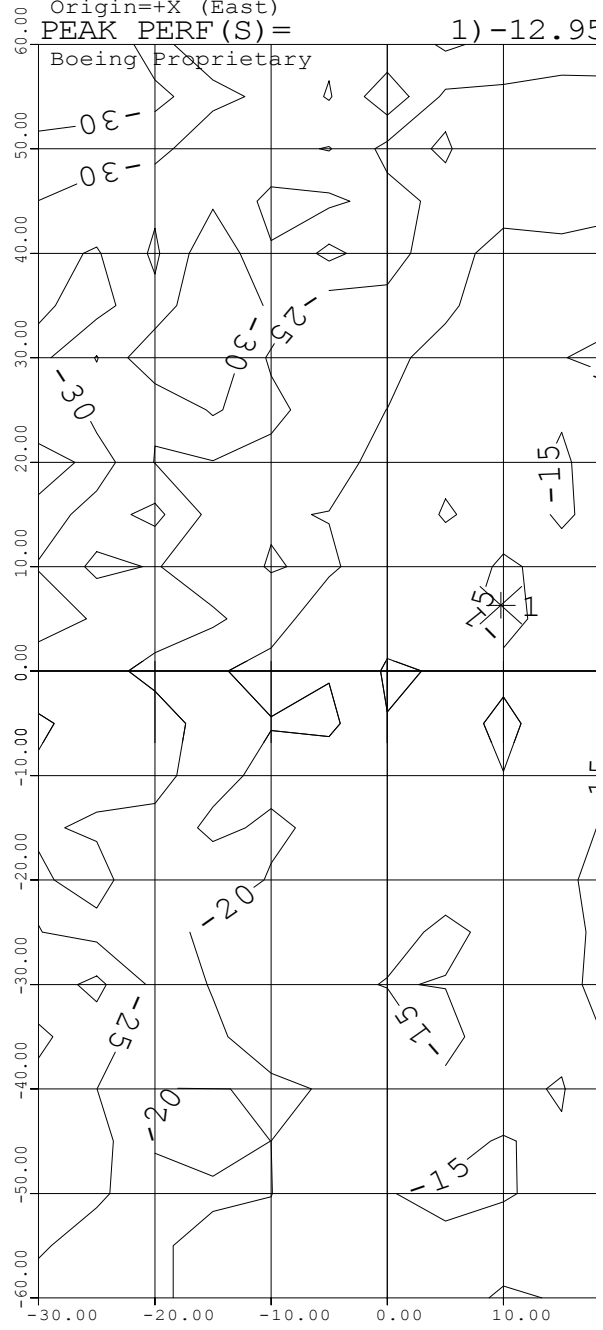
Cross-pol Gain (dBi)

Origin=+X (East)

PEAK PERF(S) =

1) -12.95

qq925b FP: May 31 12 12:24:34P



BOTH AXES ARE IN DEG







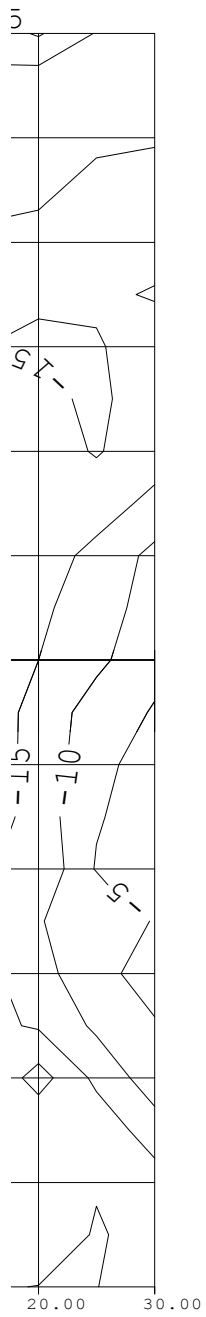










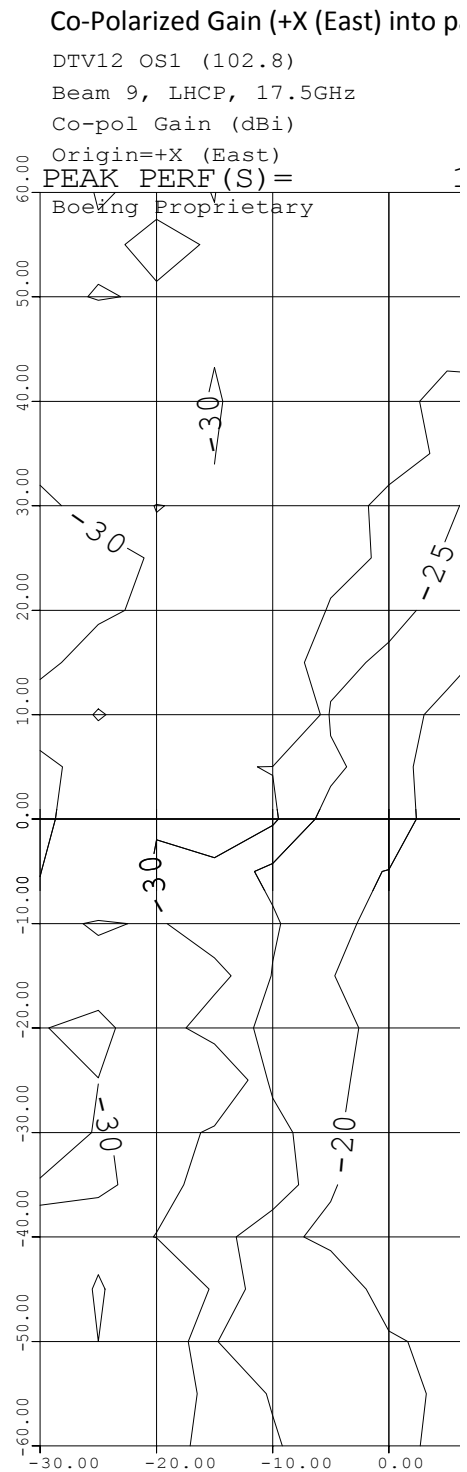


EG

Beam 9 OS1 LHCP 17.5

Z-Rotation (Deg.)	Y-Rotation (Deg.)	Co-pol Gain (dBi)	Cross-pol Gain (dBi)
-60	-30	-43.493	-22.551
-60	-25	-32.498	-22.387
-60	-20	-36.449	-20.433
-60	-15	-25.374	-19.527
-60	-10	-25.544	-18.468
-60	-5	-22.263	-19.13
-60	0	-21.881	-15.758
-60	5	-18.393	-17.076
-60	10	-19.941	-14.544
-60	15	-17.779	-15.867
-60	20	-17.044	-15.021
-60	25	-16.071	-14.628
-60	30	-15.708	-19.141
-55	-30	-46.186	-25.964
-55	-25	-35.666	-22.341
-55	-20	-33.905	-20.739
-55	-15	-28.342	-18.181
-55	-10	-24.594	-18.244
-55	-5	-21.685	-19.064
-55	0	-20.455	-17.011
-55	5	-19.745	-15.367
-55	10	-16.747	-18.378
-55	15	-17.096	-15.25
-55	20	-16.733	-18.848
-55	25	-15.83	-14.347
-55	30	-16.714	-16.69
-50	-30	-37.879	-25.15
-50	-25	-30.001	-26.524
-50	-20	-35.911	-21.384
-50	-15	-25.093	-21.019
-50	-10	-23.471	-20.068
-50	-5	-24.756	-15.214
-50	0	-20.372	-15.187
-50	5	-19.226	-15.159
-50	10	-17.702	-14.579
-50	15	-17.175	-17.069
-50	20	-16.615	-15.41
-50	25	-17.427	-15.579
-50	30	-18.782	-16.561
-45	-30	-45.066	-25.017

qq925b FP: May 31 12:24:18P



BOTH AXES ARE

-45	-25	-28.291	-26.443
-45	-20	-43.433	-19.271
-45	-15	-28.596	-17.936
-45	-10	-21.831	-19.991
-45	-5	-22.285	-15.672
-45	0	-18.53	-16.432
-45	5	-16.631	-15.47
-45	10	-18.135	-15.302
-45	15	-17.265	-15.851
-45	20	-18.058	-16.003
-45	25	-19.593	-18.083
-45	30	-17.892	-12.293
-40	-30	-31.82	-26.456
-40	-25	-34.477	-25.044
-40	-20	-29.733	-20.468
-40	-15	-27.437	-19.338
-40	-10	-20.932	-21.882
-40	-5	-19.184	-19.548
-40	0	-18.484	-15.197
-40	5	-16.721	-16.905
-40	10	-15.573	-16.142
-40	15	-16.205	-14.511
-40	20	-19.524	-21.647
-40	25	-18.037	-13.781
-40	30	-17.268	-7.104
-35	-30	-28.827	-24.382
-35	-25	-28.56	-26.987
-35	-20	-32.842	-21.984
-35	-15	-26.8	-21.568
-35	-10	-28.752	-16.449
-35	-5	-20.393	-17.831
-35	0	-17.034	-17.748
-35	5	-18.574	-13.22
-35	10	-16.808	-19.517
-35	15	-18.474	-16.641
-35	20	-18.235	-14.231
-35	25	-17.011	-9.027
-35	30	-13.479	-5.409
-30	-30	-37.8	-27.207
-30	-25	-28.977	-31.4
-30	-20	-33.891	-24.044
-30	-15	-28.787	-19.594
-30	-10	-27.44	-16.978
-30	-5	-20.434	-16.207

-30	0	-18.254	-14.914
-30	5	-16.64	-15.38
-30	10	-15.711	-16.49
-30	15	-17.475	-16.48
-30	20	-18.554	-11.763
-30	25	-15.748	-6.349
-30	30	-11.436	-3.253
-25	-30	-32.946	-24.859
-25	-25	-30.08	-23.472
-25	-20	-50.953	-22.5
-25	-15	-38.514	-18.613
-25	-10	-23.719	-19.761
-25	-5	-20.811	-17.067
-25	0	-18.422	-16.602
-25	5	-16.715	-14.412
-25	10	-18.123	-16.191
-25	15	-18.117	-18.174
-25	20	-16.94	-10.106
-25	25	-13.099	-8.13
-25	30	-8.876	-4.866
-20	-30	-30.276	-24.279
-20	-25	-28.407	-26.992
-20	-20	-33.792	-21.189
-20	-15	-26.307	-23.55
-20	-10	-24.36	-19.839
-20	-5	-22.562	-15.112
-20	0	-17.273	-17.355
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-20	10	-16.981	-15.286
-20	15	-17.795	-15.116
-20	20	-18.685	-14.301
-20	25	-13.558	-4.627
-20	30	-8.889	-1.613
-15	-30	-33.588	-25.235
-15	-25	-33.132	-24.271
-15	-20	-40.604	-23.282
-15	-15	-32.065	-18.926
-15	-10	-24.797	-21.301
-15	-5	-20.134	-18.575
-15	0	-18.263	-15.782
-15	5	-17.421	-15.616
-15	10	-17.686	-17.324
-15	15	-18.757	-18.346
-15	20	-17.755	-12.472



-15	25	-13.015	-5.511
-15	30	-8.285	-2.329
-10	-30	-32.596	-27.77
-10	-25	-29.067	-27.459
-10	-20	-30.901	-27.255
-10	-15	-26.014	-21.394
-10	-10	-25.541	-18.271
-10	-5	-21.542	-16.525
-10	0	-18.091	-16.856
-10	5	-17.293	-15.587
-10	10	-16.664	-15.178
-10	15	-17.982	-16.968
-10	20	-17.898	-13.442
-10	25	-13.157	-6.038
-10	30	-8.179	-3.324
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-5	-25	-44.78	-26.037
-5	-20	-28.286	-28.105
-5	-15	-27.275	-21.051
-5	-10	-23.96	-19.805
-5	-5	-20.534	-21.057
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-5	5	-16.509	-17.685
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-5	15	-18.502	-18.237
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-5	25	-14.784	-7.867
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0	-15	-37.831	-21.174
0	-10	-30.806	-18.293
0	-5	-22.888	-19.649
0	0	-21.947	-14.386
0	5	-17.807	-15.832
0	10	-16.761	-16.035
0	15	-16.515	-16.698
0	20	-18.74	-14.674
0	25	-16.027	-11.024
0	30	-10.599	-6.292
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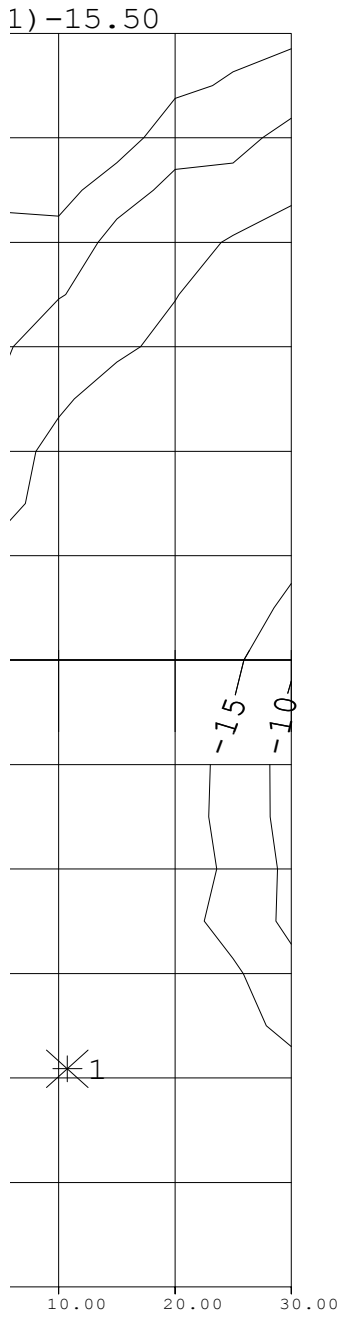
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5	5	-17.714	-16.503
5	10	-17.946	-13.202
5	15	-16.329	-18.111
5	20	-18.645	-15.237
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10	0	-22.889	-17.087
10	5	-18.106	-18.022
10	10	-17.704	-14.085
10	15	-16.367	-16.815
10	20	-17.912	-18.553
10	25	-18.365	-12.766
10	30	-16.621	-8.932
15	-30	-26.738	-29.866
15	-25	-35.569	-29.315
15	-20	-31.488	-31.936
15	-15	-41.583	-23.327
15	-10	-32.932	-20.618
15	-5	-27.568	-19.498
15	0	-23.289	-19.876
15	5	-22.074	-14.473
15	10	-17.17	-17.722
15	15	-17.29	-14.155
15	20	-16.204	-17.521
15	25	-18.381	-18.635
15	30	-19.326	-13.003
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20	5	-21.987	-16.227

20	10	-18.736	-17.379
20	15	-17.526	-14.178
20	20	-16.089	-18.587
20	25	-17.31	-14.236
20	30	-17.988	-20.376
25	-30	-25.909	-31.479
25	-25	-26.839	-30.264
25	-20	-30.856	-27.303
25	-15	-30.909	-27.852
25	-10	-37.194	-26.484
25	-5	-33.129	-21.313
25	0	-28.624	-20.893
25	5	-24.395	-18.535
25	10	-20.68	-15.858
25	15	-18.143	-15.073
25	20	-16.818	-16.775
25	25	-17.057	-13.509
25	30	-17.054	-18.362
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30	5	-25.807	-18.425
30	10	-22.094	-18.2
30	15	-20.764	-15.511
30	20	-18.881	-13.797
30	25	-17.475	-13.64
30	30	-16.044	-19.366
35	-30	-32.734	-31.115
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35	5	-28.466	-21.781
35	10	-25.282	-17.073
35	15	-22.854	-16.844
35	20	-20.154	-16.519
35	25	-17.806	-16.834
35	30	-17.46	-14.157

40	-30	-30.486	-27.129
40	-25	-30.909	-27.834
40	-20	-36.19	-24.743
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40	-10	-35.805	-27.181
40	-5	-31.392	-28.166
40	0	-31.84	-28.257
40	5	-28.334	-21.154
40	10	-27.814	-17.967
40	15	-23.659	-18.505
40	20	-22.291	-17.443
40	25	-19.402	-18.653
40	30	-18.074	-18.091
45	-30	-30.824	-27.707
45	-25	-37.825	-26.142
45	-20	-38.108	-25.969
45	-15	-30.511	-30.984
45	-10	-36.635	-23.983
45	-5	-37.605	-24.808
45	0	-37.12	-25.79
45	5	-31.211	-22.83
45	10	-32.185	-23.312
45	15	-26.686	-20.793
45	20	-24.01	-21.286
45	25	-23.942	-17.75
45	30	-20.805	-17.582
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50	30	-24.047	-20.795
55	-30	-42.61	-26.61
55	-25	-31.828	-27.444
55	-20	-27.833	-31.95
55	-15	-30.726	-28.297
55	-10	-34.569	-29.982

55	-5	-33.257	-26.219
55	0	-32.952	-32.943
55	5	-40.092	-24.804
55	10	-43.271	-24.84
55	15	-33.734	-23.025
55	20	-31.118	-20.975
55	25	-29.385	-25.496
55	30	-26.595	-23.052
60	-30	-41.544	-26.168
60	-25	-29.067	-30.289
60	-20	-32.267	-29.242
60	-15	-29.832	-28.807
60	-10	-37.235	-26.113
60	-5	-42.618	-25.333
60	0	-41.663	-25.908
60	5	-34.419	-31.7
60	10	-33.932	-30.736
60	15	-34.129	-25.093
60	20	-33.512	-30.308
60	25	-31.725	-23.4
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age)



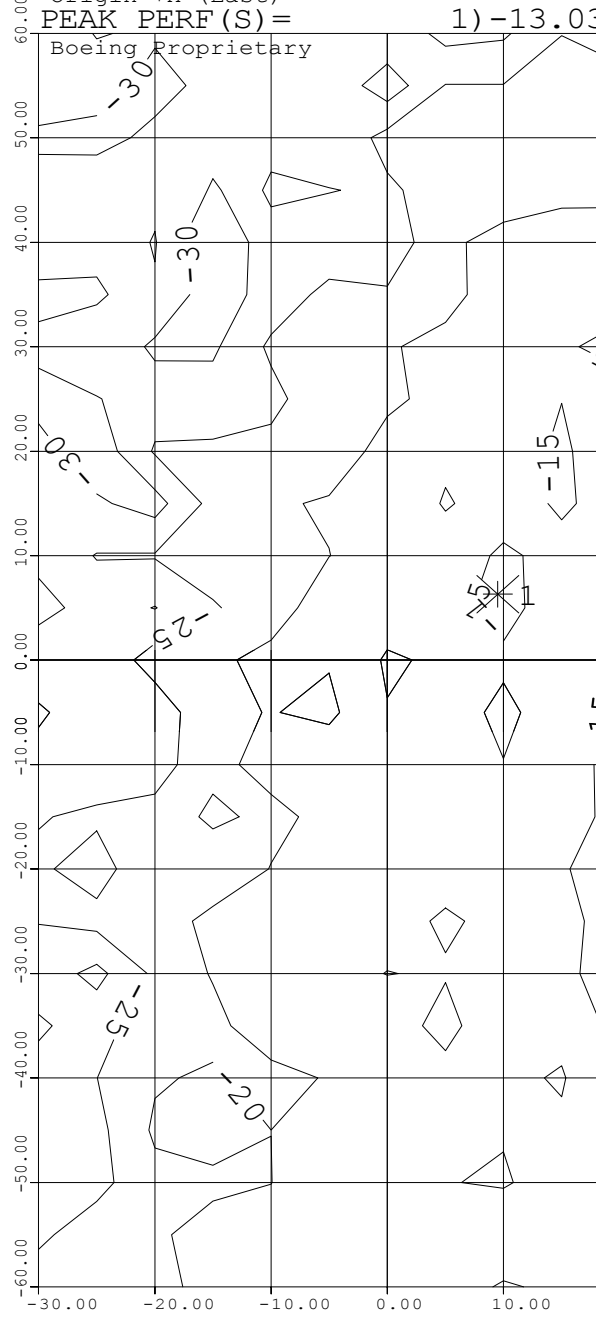
IN DEG

### Cross-Polarized Gain (+X (East) into page)

DTV12 OS1 (102.8)  
Beam 9, LHCP, 17.5GHz  
Cross-pol Gain (dBi)

Origin=+X (East)  
PEAK PERF(S) =

qq925b FP: May 31 12 12:24:23P



BOTH AXES ARE IN DEG







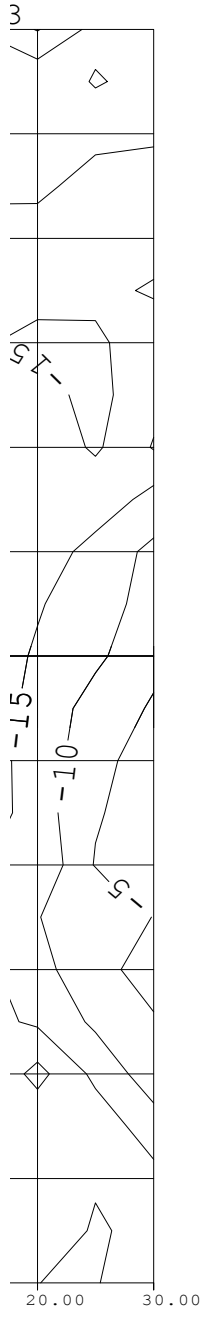












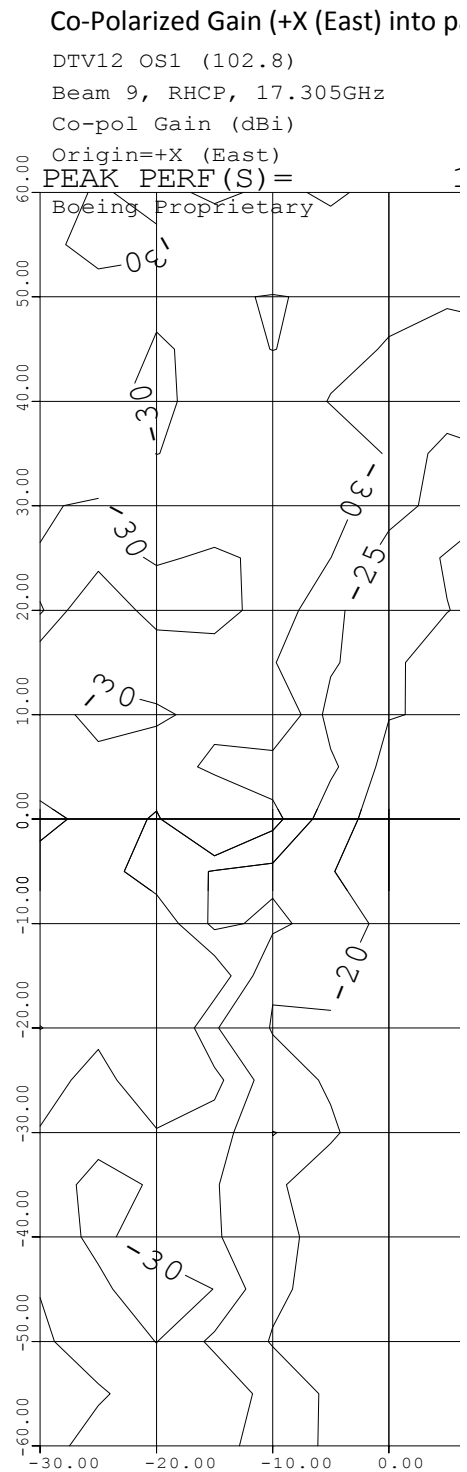
EG

Beam 9 OS1 RHCP 17.305

Z-Rotation (Deg.)	Y-Rotation (Deg.)	Co-pol Gain (dBi)	Cross-pol Gain (dBi)
-60	-30	-33.396	-20.504
-60	-25	-26.646	-20.987
-60	-20	-28.236	-19.791
-60	-15	-26.771	-16.924
-60	-10	-22.633	-17.125
-60	-5	-19.232	-17.955
-60	0	-17.795	-18.082
-60	5	-18.315	-14.766
-60	10	-16.366	-15.645
-60	15	-16.221	-14.697
-60	20	-15.524	-16.344
-60	25	-16.103	-16.416
-60	30	-15.566	-15.318
-55	-30	-38.18	-23.486
-55	-25	-30.99	-20.018
-55	-20	-26.164	-19.868
-55	-15	-29.001	-16.874
-55	-10	-22.884	-16.73
-55	-5	-19.261	-16.344
-55	0	-17.746	-15.837
-55	5	-17.441	-14.206
-55	10	-16.72	-13.421
-55	15	-15.973	-15.383
-55	20	-14.993	-16.259
-55	25	-16.795	-17.46
-55	30	-17.114	-22.604
-50	-30	-31.373	-23.095
-50	-25	-25.762	-25.55
-50	-20	-30.125	-19.901
-50	-15	-23.874	-19.015
-50	-10	-19.683	-19.122
-50	-5	-18.853	-17.198
-50	0	-17.25	-16.798
-50	5	-16.012	-14.796
-50	10	-16.22	-15.084
-50	15	-16.283	-14.531
-50	20	-16.481	-18.931
-50	25	-18.63	-19.71
-50	30	-19.266	-12.941
-45	-30	-29.725	-26.739

FP: May 31 12:24: 8P

qq925b



BOTH AXES ARE

-45	-25	-28.685	-22.26
-45	-20	-33.99	-18.719
-45	-15	-29.887	-16.506
-45	-10	-20.834	-18.098
-45	-5	-18.403	-16.868
-45	0	-17.432	-14.71
-45	5	-17.209	-14.169
-45	10	-14.9	-17.103
-45	15	-15.702	-22
-45	20	-18.789	-20.87
-45	25	-20.406	-13.13
-45	30	-20.761	-11.991
-40	-30	-26.518	-29.1
-40	-25	-31.466	-21.674
-40	-20	-26.663	-18.902
-40	-15	-25.66	-17.32
-40	-10	-20.415	-17.145
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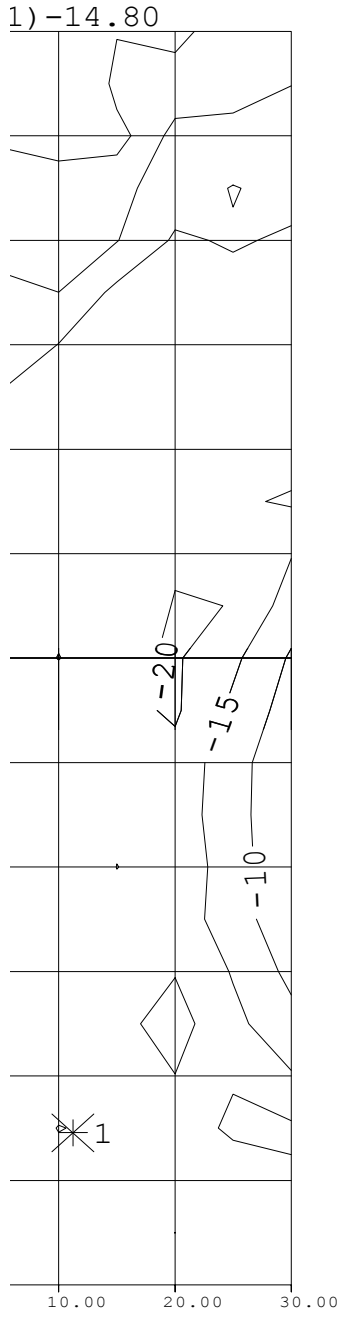
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age)



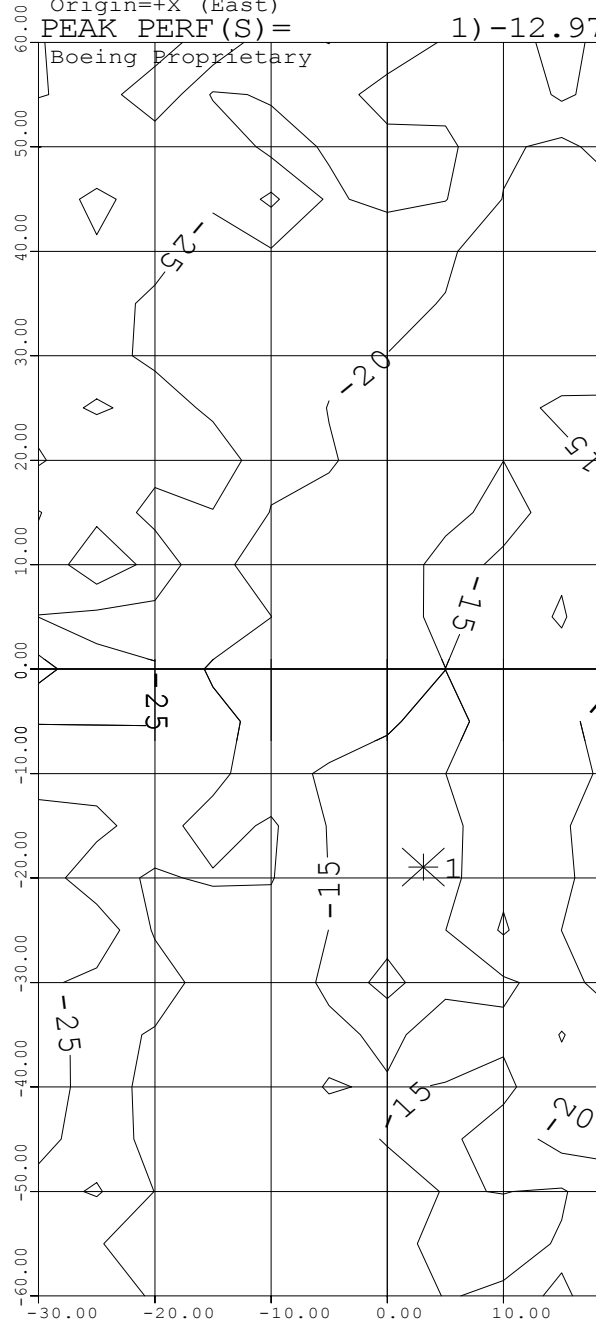
IN DEG

### Cross-Polarized Gain (+X (East) into page)

DTV12 OS1 (102.8)  
Beam 9, RHCP, 17.305GHz  
Cross-pol Gain (dBi)

Origin=+X (East)  
PEAK PERF(S) = 1) -12.95

Boeing Proprietary  
qq925b FP: May 31 12 12:24:13P



BOTH AXES ARE IN DEG







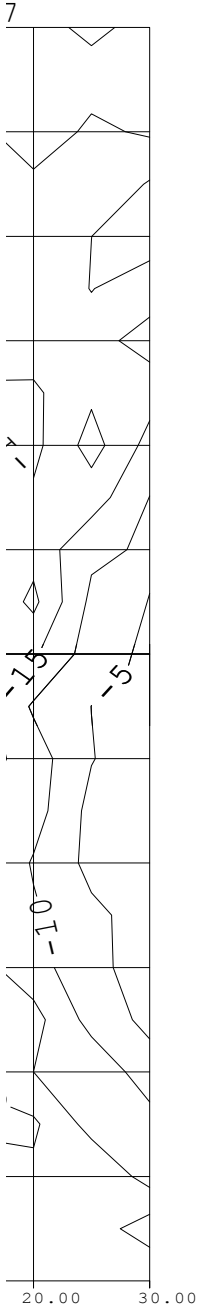










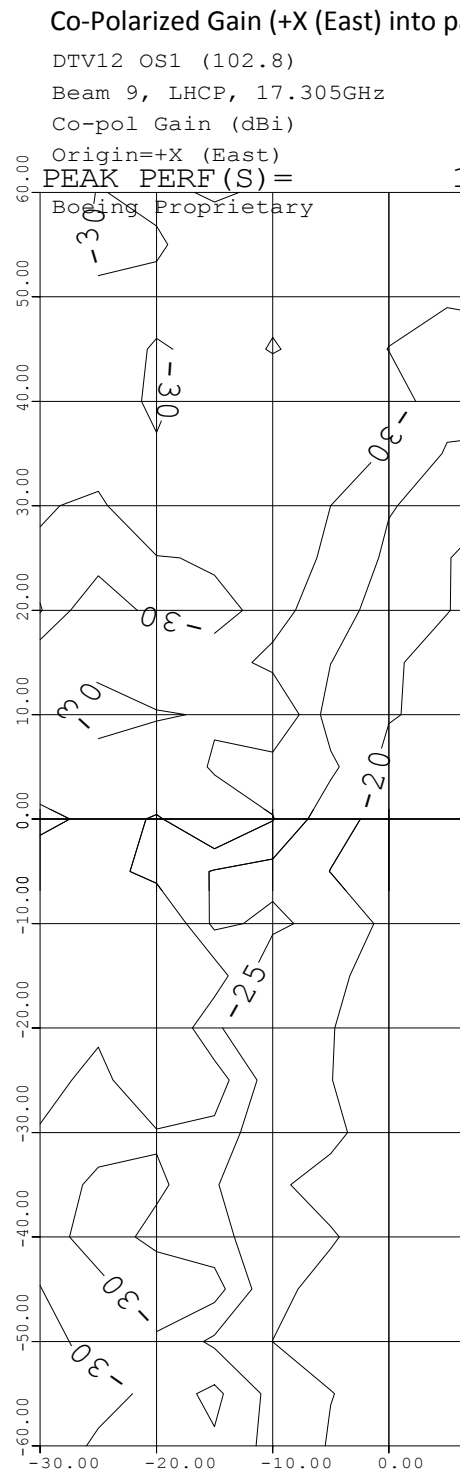


EG

Beam 9 OS1 LHCP 17.305

Z-Rotation (Deg.)	Y-Rotation (Deg.)	Co-pol Gain (dBi)	Cross-pol Gain (dBi)
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-50	25	-18.667	-19.893
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-45	-30	-30.263	-27.212

FP: May 31 12 12:23:58P



BOTH AXES ARE



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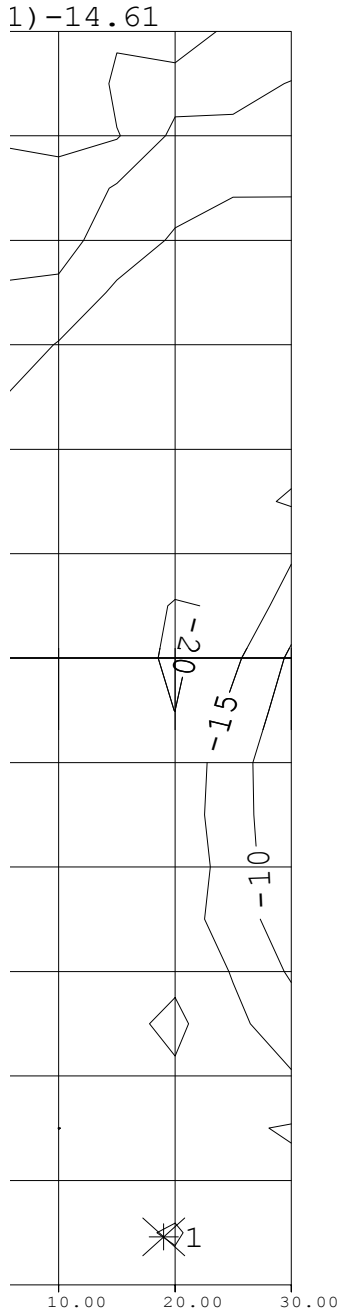
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10	30	-15.667	-8.973
15	-30	-34.15	-24.805
15	-25	-32.146	-27.249
15	-20	-42.483	-23.44
15	-15	-32.811	-24.298
15	-10	-28.445	-19.522
15	-5	-25.072	-18.184
15	0	-20.652	-18.044
15	5	-18.187	-16.423
15	10	-17.385	-13.467
15	15	-15.726	-16.324
15	20	-16.721	-15.662
15	25	-18.668	-18.455
15	30	-20.473	-10.043
20	-30	-24.597	-32.54
20	-25	-35.036	-25.396
20	-20	-27.417	-29.005
20	-15	-27.723	-29.209
20	-10	-32.452	-20.825
20	-5	-26.15	-20.751
20	0	-23.833	-18.149
20	5	-20.153	-15.64

20	10	-17.492	-14.466
20	15	-16.094	-16.014
20	20	-16.466	-13.574
20	25	-17.184	-20.471
20	30	-18.521	-13.703
25	-30	-27.558	-26.171
25	-25	-27.426	-28.038
25	-20	-29.23	-26.06
25	-15	-31.137	-25.429
25	-10	-32.092	-24.41
25	-5	-29.339	-19.679
25	0	-24.058	-20.167
25	5	-20.094	-19.458
25	10	-18.702	-16.485
25	15	-17.38	-14.223
25	20	-16.197	-13.871
25	25	-15.913	-17.809
25	30	-16.71	-17.196
30	-30	-31.651	-25.748
30	-25	-26.768	-29.022
30	-20	-46.807	-23.867
30	-15	-36.414	-23.792
30	-10	-36.034	-23.179
30	-5	-29.991	-20.694
30	0	-25.307	-19.295
30	5	-23.264	-17.843
30	10	-19.671	-17.96
30	15	-17.474	-17.38
30	20	-16.09	-17.054
30	25	-15.498	-16.447
30	30	-16.085	-13.744
35	-30	-31.013	-30.337
35	-25	-38.422	-25.988
35	-20	-31.782	-26.104
35	-15	-40.861	-23.22
35	-10	-35.77	-25.707
35	-5	-34.827	-20.874
35	0	-29.056	-21.805
35	5	-24.609	-20.559
35	10	-24.146	-15.917
35	15	-19.056	-18.572
35	20	-17.728	-16.281
35	25	-17.106	-14.297
35	30	-15.917	-16.179

40	-30	-32.517	-25.301
40	-25	-37.734	-25.226
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40	15	-22.974	-16.054
40	20	-19.382	-18.265
40	25	-18.913	-14.488
40	30	-18.053	-13.259
45	-30	-31.998	-26.196
45	-25	-38.739	-24.861
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45	-15	-34.22	-24.75
45	-10	-29.422	-29.961
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45	30	-20.404	-14.383
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50	-20	-36.256	-25.422
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55	-25	-27.864	-29.028
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55	-5	-32.052	-26.033
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55	10	-43.547	-21.085
55	15	-27.824	-24.135
55	20	-26.922	-20.876
55	25	-26.794	-22.394
55	30	-24.758	-20.458
60	-30	-49.401	-25.44
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60	-20	-35.351	-25.961
60	-15	-27.206	-30.995
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60	5	-38.173	-24.738
60	10	-45.232	-23.068
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60	20	-34.64	-23.549
60	25	-28.133	-25.342
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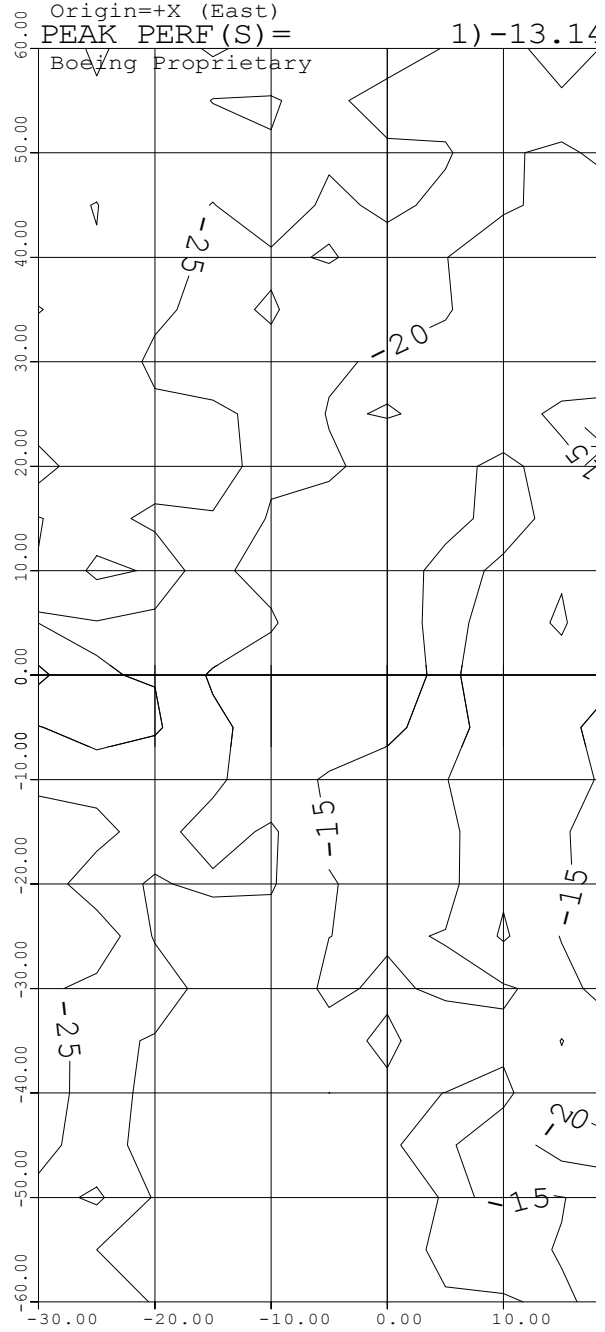
age)



IN DEG

### Cross-Polarized Gain (+X (East) into page)

DTV12 OS1 (102.8)  
Beam 9, LHCP, 17.305GHz  
Cross-pol Gain (dBi)



BOTH AXES ARE IN DEG

qq925b FP: May 31 12 12:24: 3P







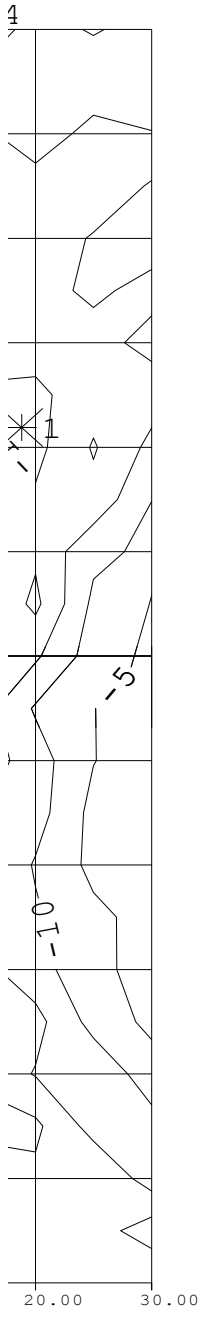












EG