

Beam Diagram and Service Area for Transmit and Receive Spot Beams

The 54 spot beams will cover the U.S. without gaps. Each spot beam will have a peak gain of 49.4 dB and will provide service within the -4 dB contour. The uplink and downlink spot beams will be identical in size and co-axial. The contours for these beams will be as follows:

Contour level (dB from peak)	Beamwidth (in degrees)
-2	0.48
-3	0.60
-4	0.70
-6	0.84
-8	0.94
-10	1.10
-15	1.34
-20	1.54

The name of each beam and its pointing direction are given by the following table:

Transmit Beam	Receive Beam	Boresight Lat.	Boresight Long.
S01T	S01R	39.7326	-73.4350
S02T	S02R	39.3818	-79.3538
S03T	S03R	44.4408	-73.2442
S04T	S04R	39.1149	-84.7581
S05T	S05R	34.9471	-83.7996
S06T	S06R	44.0125	-79.7035
S07T	S07R	43.6959	-85.5403
S08T	S08R	35.1780	-78.6846
S09T	S09R	43.4649	-90.9781
S10T	S10R	34.7693	-88.5996
S11T	S11R	38.9138	-89.8183
S12T	S12R	30.7078	-95.9889
S13T	S13R	27.4269	-81.5284
S14T	S14R	38.7684	-94.6451
S15T	S15R	45.0306	-65.7457
S16T	S16R	31.0762	-82.7158
S17T	S17R	34.5881	-119.205
S18T	S18R	30.7968	-91.7365
S19T	S19R	34.5426	-97.6093
S20T	S20R	30.9181	-87.3330

S21T	S21R	34.6364	-93.1796
S22T	S22R	38.8428	-122.418
S23T	S23R	48.5269	-119.877
S24T	S24R	23.9452	-80.2460
S25T	S25R	27.0337	-98.4368
S26T	S26R	43.3045	-96.1570
S27T	S27R	48.7613	-125.764
S28T	S28R	30.6085	-108.296
S29T	S29R	48.6133	-92.0421
S30T	S30R	43.3871	-121.131
S31T	S31R	34.5111	-114.815
S32T	S32R	30.6749	-116.499
S33T	S33R	30.6284	-112.374
S34T	S34R	30.6475	-100.140
S35T	S35R	38.6714	-99.3190
S36T	S36R	38.6192	-103.903
S37T	S37R	34.4689	-110.5040
S38T	S38R	48.3834	-14.2470
S39T	S39R	30.6149	-104.2300
S40T	S40R	48.4336	-97.7496
S41T	S41R	43.1820	-111.0390
S42T	S42R	34.4601	-106.2270
S43T	S43R	34.4844	-101.9430
S44T	S44R	48.8897	-86.0240
S45T	S45R	43.2547	-116.0200
S46T	S46R	49.2850	-79.4966
S47T	S47R	38.6424	-113.0190
S48T	S48R	43.1663	-106.1140
S49T	S49R	38.6094	-108.4530
S50T	S50R	48.3382	-103.2830
S51T	S51R	43.2064	-101.1760
S52T	S52R	38.7189	-117.6540
S53T	S53R	48.3221	-108.7490
S54T	S54R	43.5870	-126.4620

Note that the spot beam pattern is described succinctly and efficiently by the spot beam pointing directions in latitude and longitude and spot beam roll-off in space coordinates because each beam, in space coordinates, is a circle and its contours are almost identical. If the spot beam pattern were described in ground coordinates, suitable for a "GXT." file, each spot beam would be different and the spot beam coverage, generally, is not circular but must be described point by point. Each spot beam is further defined as seven contours, i.e., the -2, -4, -6, -8, -10, -15 & -20 dB contours.

Consequently, there would be $7 \times 54 = 378$ "GXT." files. With an assumed 20 points per contour, then $20 \times 378 = 7,560$ points would have to be identified. Pegasus respectfully submits that its concise description of the spot beam pattern is precise and adequate for the Commissions' purposes