



312 File Number: **SATMPL2021110400144**

Filing Description

Question	Response
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Description	Modification to Grant of U.S. Market Access for the OneWeb V-Band NGSO FSS System (November 2021)
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**Satellite
Information**

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	ONEWEB V-Band
Estimated Lifetime of Satellite(s) From Date of Launch	10 Years
Will the space station(s) operate on a Common Carrier basis?	No

**Operating
Frequency
Bands (6)**

Nature of service	Description	Frequency Band(s)	Mode Type
Fixed-Satellite Service		42500.0 MHz -43500.0 MHz	Receive
Fixed-Satellite Service		81000.0 MHz -86000.0 MHz	Receive
Fixed-Satellite Service		71000.0 MHz -76000.0 MHz	Transmit
Fixed-Satellite Service		37500.0 MHz -42000.0 MHz	Transmit
Fixed-Satellite Service		50400.0 MHz -51400.0 MHz	Receive
Fixed-Satellite Service		47200.0 MHz -50200.0 MHz	Receive

**Orbital
Information For
Non-
Geostationary
Satellites**

Question	Response
Total Number of Satellites in the active constellation	716
Orbit Epoch Date	01/01/2010
Celestial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees
Right Ascension of Ascending Node	315.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	22.5
3	45.0
4	67.5
5	90.0
6	112.5
7	135.0
8	157.5
9	180.0
10	202.5
11	225.0
12	247.5
13	270.0

14	292.5
15	315.0
16	337.5

Orbital Plane 2:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees
Right Ascension of Ascending Node	270.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	22.5
3	45.0
4	67.5
5	90.0
6	112.5
7	135.0
8	157.5
9	180.0

10	202.5
11	225.0
12	247.5
13	270.0
14	292.5
15	315.0
16	337.5

Orbital Plane 3:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees
Right Ascension of Ascending Node	225.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	22.5
3	45.0
4	67.5
5	90.0

6	112.5
7	135.0
8	157.5
9	180.0
10	202.5
11	225.0
12	247.5
13	270.0
14	292.5
15	315.0
16	337.5

Orbital Plane 4:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees
Right Ascension of Ascending Node	180.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

2	22.5
3	45.0
4	67.5
5	90.0
6	112.5
7	135.0
8	157.5
9	180.0
10	202.5
11	225.0
12	247.5
13	270.0
14	292.5
15	315.0
16	337.5

Orbital Plane 5:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees
Right Ascension of Ascending Node	135.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	22.5
3	45.0
4	67.5
5	90.0
6	112.5
7	135.0
8	157.5
9	180.0
10	202.5
11	225.0
12	247.5
13	270.0
14	292.5
15	315.0
16	337.5

Orbital Plane 6:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees
Right Ascension of Ascending Node	90.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km

Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	22.5
3	45.0
4	67.5
5	90.0
6	112.5
7	135.0
8	157.5
9	180.0
10	202.5
11	225.0
12	247.5
13	270.0
14	292.5
15	315.0
16	337.5

Orbital Plane 7:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees

Right Ascension of Ascending Node	45.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	22.5
3	45.0
4	67.5
5	90.0
6	112.5
7	135.0
8	157.5
9	180.0
10	202.5
11	225.0
12	247.5
13	270.0
14	292.5
15	315.0
16	337.5

Orbital Plane 8:

Question	Response
Number of Satellites in Plane	16
Inclination Angle	55.0 degrees
Right Ascension of Ascending Node	0.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-55.0 degrees
Active Service Arc End Angle with respect to Ascending Node	55.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	22.5
3	45.0
4	67.5
5	90.0
6	112.5
7	135.0
8	157.5
9	180.0
10	202.5
11	225.0
12	247.5
13	270.0

14	292.5
15	315.0
16	337.5

Orbital Plane 9:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	0.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	191.02
2	198.37
3	205.71
4	213.06
5	220.41
6	227.76
7	235.1
8	242.45
9	249.8

10	257.14
11	95.51
12	88.16
13	80.82
14	73.47
15	66.12
16	58.78
17	51.43
18	44.08
19	36.73
20	352.65
21	345.31
22	337.96
23	102.86
24	110.2
25	117.55
26	264.49
27	271.84
28	279.18
29	286.53
30	293.88
31	301.22
32	139.59
33	132.24
34	124.9
35	0.0

36	7.35
37	14.69
38	22.04
39	29.39
40	330.61
41	323.27
42	315.92
43	308.57
44	146.94
45	154.29
46	161.63
47	168.98
48	176.33
49	183.67

Orbital Plane 10:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	15.23 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	146.94
2	154.29
3	161.63
4	168.98
5	176.33
6	213.06
7	0.0
8	205.71
9	352.65
10	337.96
11	323.27
12	308.57
13	286.53
14	271.84
15	257.14
16	293.88
17	279.18
18	264.49
19	51.43
20	58.78
21	66.12
22	73.47
23	80.82
24	88.16
25	95.51

26	44.08
27	36.73
28	29.39
29	242.45
30	249.8
31	110.2
32	132.24
33	124.9
34	198.37
35	191.02
36	183.67
37	235.1
38	227.76
39	220.41
40	139.59
41	345.31
42	330.61
43	315.92
44	301.22
45	102.86
46	22.04
47	14.69
48	7.35
49	117.55

Orbital Plane 11:

Question

Response

Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	167.53 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	102.86
2	337.96
3	330.61
4	323.27
5	95.51
6	88.16
7	80.82
8	29.39
9	36.73
10	44.08
11	51.43
12	58.78
13	66.12
14	168.98
15	176.33

16	183.67
17	191.02
18	213.06
19	220.41
20	227.76
21	235.1
22	242.45
23	249.8
24	352.65
25	345.31
26	198.37
27	205.71
28	161.63
29	154.29
30	146.94
31	139.59
32	22.04
33	14.69
34	7.35
35	0.0
36	315.92
37	308.57
38	301.22
39	293.88
40	286.53
41	279.18

42	271.84
43	264.49
44	257.14
45	73.47
46	110.2
47	117.55
48	124.9
49	132.24

Orbital Plane 12:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	152.3 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	345.31
2	352.65
3	279.18
4	205.71

5	213.06
6	220.41
7	227.76
8	235.1
9	146.94
10	154.29
11	271.84
12	249.8
13	242.45
14	257.14
15	264.49
16	337.96
17	330.61
18	286.53
19	293.88
20	301.22
21	308.57
22	315.92
23	323.27
24	139.59
25	132.24
26	80.82
27	88.16
28	95.51
29	102.86
30	110.2

31	117.55
32	124.9
33	161.63
34	168.98
35	176.33
36	183.67
37	191.02
38	198.37
39	73.47
40	66.12
41	58.78
42	51.43
43	44.08
44	36.73
45	29.39
46	22.04
47	14.69
48	7.35
49	0.0

Orbital Plane 13:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	137.07 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds

Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	146.94
2	154.29
3	168.98
4	176.33
5	183.67
6	191.02
7	198.37
8	7.35
9	0.0
10	161.63
11	205.71
12	352.65
13	345.31
14	337.96
15	323.27
16	315.92
17	308.57
18	301.22
19	293.88
20	286.53

21	279.18
22	271.84
23	264.49
24	257.14
25	249.8
26	242.45
27	235.1
28	227.76
29	220.41
30	213.06
31	14.69
32	22.04
33	29.39
34	36.73
35	44.08
36	51.43
37	58.78
38	66.12
39	73.47
40	80.82
41	330.61
42	88.16
43	95.51
44	102.86
45	110.2
46	117.55

47	124.9
48	132.24
49	139.59

Orbital Plane 14:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	121.84 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	88.16
2	80.82
3	73.47
4	66.12
5	330.61
6	323.27
7	352.65
8	183.67
9	176.33

10	168.98
11	161.63
12	154.29
13	146.94
14	139.59
15	132.24
16	124.9
17	117.55
18	110.2
19	102.86
20	58.78
21	51.43
22	44.08
23	36.73
24	29.39
25	22.04
26	14.69
27	337.96
28	345.31
29	315.92
30	308.57
31	301.22
32	293.88
33	286.53
34	7.35
35	0.0

36	191.02
37	198.37
38	205.71
39	213.06
40	220.41
41	227.76
42	235.1
43	242.45
44	249.8
45	257.14
46	264.49
47	271.84
48	279.18
49	95.51

Orbital Plane 15:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	106.61 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	176.33
2	308.57
3	315.92
4	323.27
5	330.61
6	337.96
7	345.31
8	352.65
9	7.35
10	0.0
11	161.63
12	154.29
13	146.94
14	139.59
15	132.24
16	301.22
17	293.88
18	286.53
19	279.18
20	271.84
21	264.49
22	257.14
23	249.8
24	242.45
25	235.1

26	227.76
27	220.41
28	213.06
29	205.71
30	198.37
31	191.02
32	183.67
33	88.16
34	80.82
35	73.47
36	66.12
37	58.78
38	51.43
39	44.08
40	36.73
41	29.39
42	22.04
43	14.69
44	124.9
45	117.55
46	110.2
47	102.86
48	95.51
49	168.98

Orbital Plane 16:

Question

Response

Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	91.38 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	176.33
2	168.98
3	110.2
4	102.86
5	29.39
6	22.04
7	14.69
8	7.35
9	0.0
10	352.65
11	345.31
12	337.96
13	330.61
14	323.27
15	315.92

16	308.57
17	301.22
18	293.88
19	286.53
20	279.18
21	271.84
22	264.49
23	139.59
24	161.63
25	154.29
26	146.94
27	117.55
28	124.9
29	132.24
30	235.1
31	242.45
32	249.8
33	257.14
34	227.76
35	220.41
36	213.06
37	205.71
38	198.37
39	191.02
40	183.67
41	36.73

42	44.08
43	51.43
44	58.78
45	66.12
46	73.47
47	80.82
48	88.16
49	95.51

Orbital Plane 17:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	76.15 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	183.67
2	191.02
3	198.37
4	249.8

5	242.45
6	235.1
7	227.76
8	117.55
9	110.2
10	102.86
11	176.33
12	168.98
13	161.63
14	154.29
15	146.94
16	139.59
17	132.24
18	124.9
19	0.0
20	7.35
21	14.69
22	22.04
23	29.39
24	36.73
25	44.08
26	51.43
27	58.78
28	66.12
29	95.51
30	352.65

31	345.31
32	330.61
33	323.27
34	315.92
35	308.57
36	205.71
37	213.06
38	220.41
39	73.47
40	80.82
41	88.16
42	301.22
43	293.88
44	286.53
45	279.18
46	271.84
47	264.49
48	257.14
49	337.96

Orbital Plane 18:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	60.92 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds

Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	271.84
2	264.49
3	257.14
4	249.8
5	242.45
6	139.59
7	146.94
8	301.22
9	293.88
10	286.53
11	29.39
12	22.04
13	14.69
14	7.35
15	0.0
16	352.65
17	345.31
18	337.96
19	235.1
20	154.29

21	161.63
22	168.98
23	176.33
24	279.18
25	66.12
26	58.78
27	51.43
28	132.24
29	124.9
30	117.55
31	110.2
32	102.86
33	323.27
34	330.61
35	315.92
36	308.57
37	227.76
38	220.41
39	213.06
40	205.71
41	198.37
42	191.02
43	183.67
44	95.51
45	88.16
46	80.82

47	73.47
48	44.08
49	36.73

Orbital Plane 19:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	45.69 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	227.76
2	220.41
3	213.06
4	205.71
5	198.37
6	191.02
7	183.67
8	176.33
9	168.98

10	161.63
11	154.29
12	146.94
13	139.59
14	132.24
15	124.9
16	117.55
17	110.2
18	102.86
19	95.51
20	88.16
21	80.82
22	73.47
23	66.12
24	58.78
25	51.43
26	0.0
27	7.35
28	14.69
29	22.04
30	29.39
31	36.73
32	44.08
33	323.27
34	264.49
35	271.84

36	279.18
37	286.53
38	330.61
39	337.96
40	345.31
41	352.65
42	315.92
43	308.57
44	301.22
45	293.88
46	257.14
47	249.8
48	242.45
49	235.1

Orbital Plane 20:

Question	Response
Number of Satellites in Plane	49
Inclination Angle	87.9 degrees
Right Ascension of Ascending Node	30.46 degrees
Argument of Perigee	0.0 degrees
Orbital Period	6600.0 seconds
Apogee	1200.0 km
Perigee	1200.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-87.9 degrees
Active Service Arc End Angle with respect to Ascending Node	87.9 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	22.04
2	14.69
3	7.35
4	0.0
5	132.24
6	139.59
7	352.65
8	345.31
9	330.61
10	337.96
11	88.16
12	117.55
13	110.2
14	102.86
15	95.51
16	205.71
17	213.06
18	220.41
19	227.76
20	235.1
21	242.45
22	249.8
23	257.14
24	264.49
25	271.84

26	279.18
27	286.53
28	323.27
29	198.37
30	191.02
31	183.67
32	176.33
33	168.98
34	161.63
35	154.29
36	146.94
37	73.47
38	80.82
39	293.88
40	301.22
41	308.57
42	315.92
43	29.39
44	36.73
45	44.08
46	51.43
47	58.78
48	66.12
49	124.9

Receiving Beams 1:

Question	Response
Beam ID	VGR6
Receive Beam Frequency	50400.0 MHz -51400.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	41.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	13.1 dB/K
Min. Saturation Flux Density	-76.8 dBW/m2
Max. Saturation Flux Density	-56.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 and 2 only)

Receiving Beams 2:

Question	Response
Beam ID	VGR1
Receive Beam Frequency	42500.0 MHz -43500.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	41.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees

**Receiving
Beams 3:**

Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	13.1 dB/K
Min. Saturation Flux Density	-76.8 dBW/m2
Max. Saturation Flux Density	-56.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Question	Response
Beam ID	VGR5
Receive Beam Frequency	47200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	41.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	13.1 dB/K
Min. Saturation Flux Density	-76.8 dBW/m2
Max. Saturation Flux Density	-56.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 and 2 only)

Receiving Beams 4:

Question	Response
Beam ID	VGR4
Receive Beam Frequency	42500.0 MHz -43500.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	41.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	13.1 dB/K
Min. Saturation Flux Density	-76.8 dBW/m2
Max. Saturation Flux Density	-56.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Receiving Beams 5:

Question	Response
Beam ID	VGR3
Receive Beam Frequency	50400.0 MHz -51400.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	41.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	13.1 dB/K
Min. Saturation Flux Density	-76.8 dBW/m2
Max. Saturation Flux Density	-56.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global(Beam for Phase 1 and 2)

Receiving Beams 6:

Question	Response
Beam ID	VGR2
Receive Beam Frequency	47200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	41.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	13.1 dB/K
Min. Saturation Flux Density	-76.8 dBW/m2
Max. Saturation Flux Density	-56.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 and 2)

Receiving Beams 7:

Question	Response
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Beam ID	HURL
Receive Beam Frequency	48200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	36.2 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	7.8 dB/K
Min. Saturation Flux Density	-69.5 dBW/m2
Max. Saturation Flux Density	-54.5 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 and 2 only)

Receiving Beams 8:

Question	Response
Beam ID	HURR
Receive Beam Frequency	48200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	36.2 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees

G/T at Max. Gain Point	7.8 dB/K
Min. Saturation Flux Density	-69.5 dBW/m2
Max. Saturation Flux Density	-54.5 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 and 2 only)

Receiving Beams 9:

Question	Response
Beam ID	LURL
Receive Beam Frequency	48200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	26.0 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-2.4 dB/K
Min. Saturation Flux Density	-69.5 dBW/m2
Max. Saturation Flux Density	-54.5 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam Phase 2 Only)

Receiving Beams 10:

Question	Response
Beam ID	LURR

Receive Beam Frequency	48200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	26.0 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-2.4 dB/K
Min. Saturation Flux Density	-69.5 dBW/m2
Max. Saturation Flux Density	-54.5 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Receiving Beams 11:

Question	Response
Beam ID	EGRL
Receive Beam Frequency	81000.0 MHz -86000.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	46.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	18.1 dB/K

Receiving Beams 12:

Min. Saturation Flux Density	-60.2 dBW/m2
Max. Saturation Flux Density	-39.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Question	Response
Beam ID	EGRR
Receive Beam Frequency	81000.0 MHz -86000.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	46.5 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	18.1 dB/K
Min. Saturation Flux Density	-60.2 dBW/m2
Max. Saturation Flux Density	-39.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Receiving Channels (36)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
GUB1	500.0	47450.0	Feeder Link
UUA2	490.0	48965.0	Service Link
EU8	500.0	84750.0	Feeder Link
EU7	500.0	84250.0	Feeder Link
UUA3	490.0	49455.0	Service Link
GUA1	490.0	47495.0	Feeder Link
GUBA	500.0	42750.0	Feeder Link
GUB8	500.0	51150.0	Feeder Link
EU10	500.0	85750.0	Feeder Link
EU1	500.0	81250.0	Feeder Link
EU6	500.0	83750.0	Feeder Link
EU5	500.0	83250.0	Feeder Link
GUB7	500.0	50650.0	Feeder Link
GUBB	500.0	43250.0	Feeder Link
GUB2	500.0	47950.0	Feeder Link
UUB2	500.0	48950.0	Service Link
EU3	500.0	82250.0	Feeder Link
EU4	500.0	82750.0	Feeder Link
GUA8	490.0	51145.0	Feeder Link
EU9	500.0	85250.0	Feeder Link
UUB1	500.0	48450.0	Service Link
UUA4	490.0	49945.0	Service Link
UUB4	500.0	49950.0	Service Link
UUB3	500.0	49450.0	Service Link

UUA1	490.0	48475.0	Service Link
EU2	500.0	81750.0	Feeder Link
GUB6	500.0	49950.0	Feeder Link
GUB5	500.0	49450.0	Feeder Link
GUB4	500.0	48950.0	Feeder Link
GUB3	500.0	48450.0	Feeder Link
GUA7	490.0	50655.0	Feeder Link
GUA2	490.0	47985.0	Feeder Link
GUA3	490.0	48475.0	Feeder Link
GUA4	490.0	48965.0	Feeder Link
GUA5	490.0	49455.0	Feeder Link
GUA6	490.0	49945.0	Feeder Link

Transmitting
Beams 1:

Question	Response
Beam ID	HUTR
Transmit Beam Frequency	40000.0 MHz -42000.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	36.2 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-33.3 dBW/Hz
Max. Transmit EIRP	53.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* (dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):
1.0 MHz	-137.8	-136.2	-134.6	-133.1	-131.6	-105.8

Transmitting
Beams 2:

Question	Response
Beam ID	HUTL
Transmit Beam Frequency	40000.0 MHz -42000.0 MHz

Beam Type	Steerable
Polarization	LHCP
Peak Gain	36.2 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-33.3 dBW/Hz
Max. Transmit EIRP	53.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-137.8	-136.2	-134.6	-133.1	-131.6	-105.8

Transmitting Beams 3:

Question	Response
Beam ID	VGTR
Transmit Beam Frequency	37500.0 MHz -42000.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	40.1 dBi
Antenna Pointing Error	0.02 degrees

Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-44.7 dBW/Hz
Max. Transmit EIRP	52.3 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 and 2 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-146.9	-138.6	-124.5	-123.5	-122.5	-117.3

Transmitting Beams 4:

Question	Response
Beam ID	VGTL
Transmit Beam Frequency	37500.0 MHz -42000.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	40.1 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-44.7 dBW/Hz

Max. Transmit EIRP	52.3 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 1 and 2 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-146.9	-138.6	-124.5	-123.5	-122.5	-117.3

Transmitting Beams 5:

Question	Response
Beam ID	EGTL
Transmit Beam Frequency	71000.0 MHz -76000.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	45.4 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-32.9 dBW/Hz
Max. Transmit EIRP	64.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dbW/m ²	(dbW/m ²	(dbW/m ²	(dbW/m ²	(dbW/m ²	(dbW/m ²
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-135.0	-133.8	-132.7	-131.7	-110.8	-105.5

Transmitting Beams 6:

Question	Response
Beam ID	LUTL
Transmit Beam Frequency	40000.0 MHz -42000.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	26.0 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-33.3 dBW/Hz
Max. Transmit EIRP	53.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dbW/m ²	(dbW/m ²	(dbW/m ²	(dbW/m ²	(dbW/m ²	(dbW/m ²
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):

1.0 MHz	-121.0	-119.0	-116.6	-114.0	-111.2	-105.9
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**Transmitting
Beams 7:**

Question	Response
Beam ID	LUTR
Transmit Beam Frequency	40000.0 MHz -42000.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	26.0 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-33.3 dBW/Hz
Max. Transmit EIRP	53.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Max. Power Flux Density

	* 0° - 5° (dBW/m ² /BW):	* 5° - 10° (dBW/m ² /BW):	* 10° - 15° (dBW/m ² /BW):	* 15° - 20° (dBW/m ² /BW):	* 20° - 25° (dBW/m ² /BW):	* 25° - 90° (dBW/m ² /BW):
1.0 MHz	-121.0	-119.0	-116.6	-114.0	-111.2	-105.9

**Transmitting
Beams 8:**

Question	Response
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Beam ID	UTLH
Transmit Beam Frequency	40000.0 MHz -42000.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	36.2 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-33.3 dBW/Hz
Max. Transmit EIRP	53.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* BW:	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):
1.0 MHz	-135.3	-134.2	-133.1	-118.9	-111.2	-105.8

**Transmitting
Beams 9:**

Question	Response
Beam ID	UTRH
Transmit Beam Frequency	40000.0 MHz -42000.0 MHz
Beam Type	Shapeable
Polarization	RHCP

Peak Gain	36.2 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-33.3 dBW/Hz
Max. Transmit EIRP	53.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* BW:	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):
1.0 MHz	-135.3	-134.2	-133.1	-118.9	-111.2	-105.8

Transmitting Beams 10:

Question	Response
Beam ID	EGTR
Transmit Beam Frequency	71000.0 MHz -76000.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	45.4 dBi
Antenna Pointing Error	0.02 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-32.9 dBW/Hz
Max. Transmit EIRP	64.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global (Beam for Phase 2 only)

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-135.0	-133.8	-132.7	-131.7	-110.8	-105.5

**Transmitting
Channels (38)**

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
ED4	500.0	72750.0	Feeder Link
ED5	500.0	73250.0	Feeder Link
UDA1	490.0	40245.0	Service Link
UDA4	490.0	41715.0	Service Link
GDB1	500.0	37750.0	Feeder Link
UDA3	490.0	41225.0	Service Link
GDB5	500.0	39750.0	Feeder Link
UDA2	490.0	40735.0	Service Link
GDB7	500.0	40750.0	Feeder Link
GDB8	500.0	41250.0	Feeder Link
GDA8	490.0	41225.0	Feeder Link
GDA7	490.0	40735.0	Feeder Link
GDA6	490.0	40245.0	Feeder Link
GDA3	490.0	38775.0	Feeder Link
ED6	500.0	73750.0	Feeder Link
GDA4	490.0	39265.0	Feeder Link
ED9	500.0	75250.0	Feeder Link
GDB2	500.0	38250.0	Feeder Link
GDB3	500.0	38750.0	Feeder Link
GDB4	500.0	39250.0	Feeder Link
UDB2	500.0	40750.0	Service Link
UDB3	500.0	41250.0	Service Link
GDA A	40.0	41980.0	Feeder Link
GDA5	490.0	39755.0	Feeder Link

GDA2	490.0	38285.0	Feeder Link
ED7	500.0	74250.0	Feeder Link
GDB6	500.0	40250.0	Feeder Link
GDA9	490.0	41715.0	Feeder Link
ED8	500.0	74750.0	Feeder Link
UDB1	500.0	40250.0	Service Link
GDB9	500.0	41750.0	Feeder Link
ED3	500.0	72250.0	Feeder Link
ED2	500.0	71750.0	Feeder Link
ED10	500.0	75750.0	Feeder Link
ED1	500.0	71250.0	Feeder Link
UDA5	40.0	41980.0	Service Link
GDA1	490.0	37795.0	Feeder Link
UDB4	500.0	41750.0	Service Link

Certification Questions

Question	Response
Are the applicable service area coverage requirements of 25.143(b)(2) (ii) and (iii), or 25.144(a)(3)(i), or 25.145 (c)(1) and (2), or 25.146(i)(1) and (2), or 25.148(c), or 25.225 met?	Yes
Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?	Yes
Are the cessation of emissions requirements of 25.207 met?	Yes
Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
For NGSO applications, are the applicable equivalent-power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
Are the applicable full-frequency-reuse requirements of 25.210 met?	Yes
If the application is for a 17/24 GHz BSS space station, will it be operated at an offset location with full power and interference protection in accordance with 25.262(b)?	

Attachments

File Name	Beam	Field	Attachment Type	Description
<u>HUTL.gxt</u>	HUTL	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>HUTR.gxt</u>	HUTR	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGTL.gxt</u>	VGTL	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGRL.gxt</u>	VGR1	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGRL.gxt</u>	VGR2	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGRL.gxt</u>	VGR3	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGRR.gxt</u>	VGR4	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGRR.gxt</u>	VGR5	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGRR.gxt</u>	VGR6	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>HURL.gxt</u>	HURL	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>HURR.gxt</u>	HURR	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>VGTR.gxt</u>	VGTR	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>LUTG.gxt</u>	LUTL	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>LUTG.gxt</u>	LUTR	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>LURG.gxt</u>	LURL	NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>LURG.gxt</u>	LURR	NGSO Antenna Gain Data	GXT file (*.gxt)	

<u>HUTL.gxt</u>	UTLH	NGSO Antenna Gain Data	GXT file (*.gxt)
<u>HUTR.gxt</u>	UTRH	NGSO Antenna Gain Data	GXT file (*.gxt)