

Exhibit 8

Additional Information on the MicroSat System

File Number: **0356-EX-PL-2015**

Applicant: **Space Exploration Technologies Corp.**



Summary

This exhibit provides additional public information with regard to SpaceX's application for an experimental license.

MicroSat Test Objectives

In addition to proving out the development of the satellite bus and subsequent subsystems, a main objective of the test program is the ability to validate the design of a broadband antenna communications platform (primary payload) that will lead to the final constellation design. Using three broadband array test ground stations positioned along the western coast of the United States, SpaceX intends to test this communication path at every possible opportunity. With the orbit profile provided, broadband array tests (Ku band) will be conducted on average once every 0.9 days for duration of less than 10 minutes.

Broadband Test Operations

Broadband array testing will be enabled using a network of three broadband test ground locations distributed along the western coast of the United States. At each location, two types of ground terminals will be evaluated over the course of the satellites' lifetime, but only one terminal at each location at a given time. Given the limitations of +/- 50 degrees pointing by broadband array on the satellite, ground passes are limited to a minimum of 40 degree elevation angles at each location for testing.

Example test sequence:

1. Satellite turns on X-band telemetry 2 degrees below the horizon from station
2. Receive telemetry on West Coast Telemetry and Command ground station
3. Establish and verify S-band command link to satellite from ground station
4. Wait for broadband station to rise to 40 degrees elevation
5. Initiate broadband test from ground
6. Perform broadband test with West Coast stations (approximately ten minutes). Broadband arrays (TX and RX) will point at each respective ground station as the satellite flies overhead.
7. Final broadband station sets below 40 degrees elevation
8. Satellite disables broadband system
9. Link is lost from X-band telemetry
10. Satellite disables X-band telemetry at 3 degrees below the horizon

As discussed in Exhibit 2, MicroSat will implement GEO arc avoidance to protect from interference into GSO ground terminals. This will be accomplished by reducing Ku transmit power and, in some cases, cessation of Ku downlink emissions. SpaceX shall turn off the transmit beam on the satellite and transmitting earth station whenever $\phi < 12^\circ$. ϕ is the angle between the boresight of a GSO Earth station (assumed to be collocated with the SpaceX Earth Station) and the direction of the SpaceX satellite transmit beam. This ensures the -160dB(W/m²)/40kHz limit is never exceeded.

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Clarification on Collision Avoidance Activities

Before launch, SpaceX will:

1. Work directly with JSpOC in order to assist them with the cataloging of the satellites
2. Appoint a SpaceX employee as a direct point of contact for receiving JSpOC communications
3. Develop procedures for responding to conjunction warnings, incorporating, as appropriate, best practices such as:
 - a. Working directly with JSpOC in order to assist them with the cataloging of the satellites
 - b. Making precise orbital parameters available to JSpOC and other operators
 - c. Spacecraft attitude adjustment of satellite cross-sectional area for purposes of collision risk mitigation.

Ku-band Downlink Satellite Antenna Patterns (see table below)

Theta (deg)	Gain(dB) at Phi=0	Gain(dB) at Phi=90
-180.00	16.57	16.57
-179.75	16.53	16.54
-179.50	16.43	16.45
-179.25	16.28	16.31
-179.00	16.07	16.10
-178.75	15.80	15.83
-178.50	15.48	15.51
-178.25	15.10	15.12
-178.00	14.67	14.68
-177.75	14.19	14.19
-177.50	13.66	13.64
-177.25	13.08	13.03
-177.00	12.47	12.38
-176.75	11.81	11.69
-176.50	11.11	10.96
-176.25	10.39	10.19
-176.00	9.64	9.40
-175.75	8.87	8.59
-175.50	8.08	7.76
-175.25	7.28	6.91
-175.00	6.45	6.06
-174.75	5.60	5.19
-174.50	4.72	4.30
-174.25	3.80	3.38
-174.00	2.83	2.41
-173.75	1.78	1.38
-173.50	0.63	0.25
-173.25	-0.64	-0.99
-173.00	-2.06	-2.38
-172.75	-3.69	-3.97
-172.50	-5.57	-5.82
-172.25	-7.83	-8.04
-172.00	-10.62	-10.80
-171.75	-14.31	-14.47
-171.50	-19.91	-20.03
-171.25	-33.56	-33.66



-171.00	-26.51	-26.58
-170.75	-19.71	-19.76
-170.50	-16.63	-16.66
-170.25	-14.91	-14.92
-170.00	-13.95	-13.95
-169.75	-13.50	-13.49
-169.50	-13.45	-13.42
-169.25	-13.74	-13.70
-169.00	-14.34	-14.30
-168.75	-15.26	-15.21
-168.50	-16.52	-16.48
-168.25	-18.19	-18.15
-168.00	-20.38	-20.35
-167.75	-23.36	-23.34
-167.50	-27.78	-27.77
-167.25	-36.30	-36.31
-167.00	-41.95	-41.98
-166.75	-30.87	-30.93
-166.50	-26.70	-26.80
-166.25	-24.33	-24.46
-166.00	-22.83	-23.01
-165.75	-21.87	-22.10
-165.50	-21.28	-21.55
-165.25	-20.96	-21.29
-165.00	-20.87	-21.25
-164.75	-20.97	-21.39
-164.50	-21.25	-21.70
-164.25	-21.70	-22.18
-164.00	-22.33	-22.82
-163.75	-23.18	-23.67
-163.50	-24.30	-24.78
-163.25	-25.78	-26.24
-163.00	-27.79	-28.22
-162.75	-30.67	-31.06
-162.50	-35.39	-35.75
-162.25	-47.56	-47.87
-162.00	-41.03	-41.31
-161.75	-33.19	-33.42
-161.50	-29.22	-29.42
-161.25	-26.64	-26.80
-161.00	-24.81	-24.92
-160.75	-23.46	-23.55
-160.50	-22.48	-22.53
-160.25	-21.79	-21.81
-160.00	-21.34	-21.34
-159.75	-21.13	-21.10
-159.50	-21.12	-21.07
-159.25	-21.31	-21.25
-159.00	-21.72	-21.64
-158.75	-22.34	-22.25
-158.50	-23.21	-23.11



-158.25	-24.37	-24.26
-158.00	-25.88	-25.76
-157.75	-27.86	-27.74
-157.50	-30.56	-30.44
-157.25	-34.57	-34.45
-157.00	-42.07	-41.97
-156.75	-51.84	-51.75
-156.50	-38.13	-38.06
-156.25	-33.36	-33.31
-156.00	-30.55	-30.53
-155.75	-28.66	-28.67
-155.50	-27.31	-27.35
-155.25	-26.33	-26.41
-155.00	-25.61	-25.73
-154.75	-25.11	-25.27
-154.50	-24.78	-24.97
-154.25	-24.59	-24.83
-154.00	-24.55	-24.81
-153.75	-24.64	-24.92
-153.50	-24.86	-25.17
-153.25	-25.23	-25.55
-153.00	-25.76	-26.09
-152.75	-26.50	-26.82
-152.50	-27.48	-27.79
-152.25	-28.79	-29.09
-152.00	-30.56	-30.85
-151.75	-33.08	-33.34
-151.50	-37.01	-37.24
-151.25	-45.11	-45.33
-151.00	-49.50	-49.69
-150.75	-38.13	-38.29
-150.50	-33.38	-33.51
-150.25	-30.39	-30.50
-150.00	-28.27	-28.35
-149.75	-26.68	-26.74
-149.50	-25.47	-25.50
-149.25	-24.55	-24.56
-149.00	-23.86	-23.85
-148.75	-23.38	-23.35
-148.50	-23.09	-23.03
-148.25	-22.96	-22.88
-148.00	-23.00	-22.90
-147.75	-23.20	-23.08
-147.50	-23.57	-23.43
-147.25	-24.11	-23.95
-147.00	-24.83	-24.66
-146.75	-25.77	-25.58
-146.50	-26.95	-26.75
-146.25	-28.44	-28.22
-146.00	-30.32	-30.10
-145.75	-32.79	-32.55



-145.50	-36.23	-35.98
-145.25	-41.80	-41.53
-145.00	-58.56	-58.29
-144.75	-45.52	-45.24
-144.50	-39.01	-38.73
-144.25	-35.67	-35.38
-144.00	-33.54	-33.25
-143.75	-32.08	-31.79
-143.50	-31.04	-30.75
-143.25	-30.29	-30.01
-143.00	-29.77	-29.50
-142.75	-29.40	-29.14
-142.50	-29.16	-28.92
-142.25	-29.02	-28.80
-142.00	-28.96	-28.75
-141.75	-28.96	-28.76
-141.50	-29.01	-28.83
-141.25	-29.12	-28.95
-141.00	-29.29	-29.13
-140.75	-29.54	-29.38
-140.50	-29.88	-29.73
-140.25	-30.36	-30.19
-140.00	-31.00	-30.82
-139.75	-31.85	-31.66
-139.50	-32.99	-32.79
-139.25	-34.54	-34.33
-139.00	-36.74	-36.51
-138.75	-40.09	-39.84
-138.50	-46.35	-46.08
-138.25	-64.02	-63.74
-138.00	-43.94	-43.65
-137.75	-38.23	-37.92
-137.50	-34.78	-34.45
-137.25	-32.32	-31.98
-137.00	-30.45	-30.09
-136.75	-28.97	-28.60
-136.50	-27.79	-27.40
-136.25	-26.83	-26.43
-136.00	-26.06	-25.65
-135.75	-25.46	-25.03
-135.50	-25.00	-24.56
-135.25	-24.67	-24.22
-135.00	-24.47	-24.00
-134.75	-24.39	-23.90
-134.50	-24.41	-23.91
-134.25	-24.55	-24.04
-134.00	-24.81	-24.27
-133.75	-25.18	-24.63
-133.50	-25.67	-25.11
-133.25	-26.29	-25.72
-133.00	-27.06	-26.47



-132.75	-27.99	-27.39
-132.50	-29.12	-28.50
-132.25	-30.48	-29.84
-132.00	-32.15	-31.49
-131.75	-34.24	-33.57
-131.50	-36.99	-36.31
-131.25	-40.95	-40.25
-131.00	-48.07	-47.35
-130.75	-61.46	-60.72
-130.50	-45.39	-44.64
-130.25	-40.35	-39.59
-130.00	-37.39	-36.61
-129.75	-35.35	-34.56
-129.50	-33.85	-33.05
-129.25	-32.69	-31.88
-129.00	-31.77	-30.96
-128.75	-31.03	-30.22
-128.50	-30.42	-29.61
-128.25	-29.91	-29.11
-128.00	-29.48	-28.70
-127.75	-29.12	-28.35
-127.50	-28.81	-28.05
-127.25	-28.54	-27.81
-127.00	-28.31	-27.60
-126.75	-28.12	-27.43
-126.50	-27.96	-27.30
-126.25	-27.85	-27.21
-126.00	-27.78	-27.17
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-125.50	-27.81	-27.23
-125.25	-27.91	-27.35
-125.00	-28.09	-27.55
-124.75	-28.35	-27.82
-124.50	-28.71	-28.19
-124.25	-29.17	-28.66
-124.00	-29.77	-29.26
-123.75	-30.53	-30.02
-123.50	-31.48	-30.98
-123.25	-32.69	-32.19
-123.00	-34.25	-33.75
-122.75	-36.33	-35.83
-122.50	-39.32	-38.82
-122.25	-44.28	-43.78
-122.00	-58.55	-58.05
-121.75	-48.12	-47.61
-121.50	-40.75	-40.24
-121.25	-36.77	-36.25
-121.00	-34.03	-33.51
-120.75	-31.95	-31.43
-120.50	-30.29	-29.76
-120.25	-28.92	-28.39



-120.00	-27.77	-27.24
-119.75	-26.79	-26.25
-119.50	-25.95	-25.40
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-119.00	-24.60	-24.04
-118.75	-24.06	-23.50
-118.50	-23.60	-23.03
-118.25	-23.20	-22.63
-118.00	-22.88	-22.30
-117.75	-22.61	-22.03
-117.50	-22.40	-21.81
-117.25	-22.24	-21.64
-117.00	-22.12	-21.53
-116.75	-22.06	-21.46
-116.50	-22.04	-21.43
-116.25	-22.07	-21.46
-116.00	-22.13	-21.52
-115.75	-22.24	-21.63
-115.50	-22.40	-21.77
-115.25	-22.59	-21.96
-115.00	-22.83	-22.20
-114.75	-23.11	-22.47
-114.50	-23.43	-22.79
-114.25	-23.80	-23.16
-114.00	-24.21	-23.57
-113.75	-24.68	-24.04
-113.50	-25.20	-24.56
-113.25	-25.78	-25.14
-113.00	-26.42	-25.78
-112.75	-27.14	-26.49
-112.50	-27.94	-27.29
-112.25	-28.83	-28.19
-112.00	-29.84	-29.20
-111.75	-30.99	-30.35
-111.50	-32.32	-31.68
-111.25	-33.90	-33.26
-111.00	-35.81	-35.18
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-110.25	-47.18	-46.56
-110.00	-65.64	-65.03
-109.75	-49.70	-49.09
-109.50	-43.08	-42.48
-109.25	-39.42	-38.83
-109.00	-36.90	-36.31
-108.75	-34.97	-34.39
-108.50	-33.43	-32.85
-108.25	-32.14	-31.57
-108.00	-31.04	-30.48
-107.75	-30.09	-29.53
-107.50	-29.24	-28.70



-107.25	-28.49	-27.95
-107.00	-27.81	-27.28
-106.75	-27.20	-26.68
-106.50	-26.63	-26.12
-106.25	-26.12	-25.61
-106.00	-25.64	-25.15
-105.75	-25.20	-24.71
-105.50	-24.79	-24.31
-105.25	-24.41	-23.94
-105.00	-24.05	-23.59
-104.75	-23.72	-23.26
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-103.75	-22.59	-22.15
-103.50	-22.35	-21.91
-103.25	-22.12	-21.69
-103.00	-21.90	-21.48
-102.75	-21.70	-21.28
-102.50	-21.52	-21.09
-102.25	-21.34	-20.92
-102.00	-21.17	-20.75
-101.75	-21.02	-20.60
-101.50	-20.87	-20.45
-101.25	-20.73	-20.32
-101.00	-20.60	-20.19
-100.75	-20.48	-20.07
-100.50	-20.37	-19.96
-100.25	-20.27	-19.86
-100.00	-20.17	-19.76
-99.75	-20.08	-19.67
-99.50	-20.00	-19.58
-99.25	-19.92	-19.51
-99.00	-19.85	-19.43
-98.75	-19.78	-19.37
-98.50	-19.72	-19.30
-98.25	-19.66	-19.25
-98.00	-19.61	-19.19
-97.75	-19.56	-19.14
-97.50	-19.52	-19.10
-97.25	-19.48	-19.06
-97.00	-19.44	-19.02
-96.75	-19.41	-18.98
-96.50	-19.37	-18.95
-96.25	-19.34	-18.92
-96.00	-19.32	-18.89
-95.75	-19.29	-18.86
-95.50	-19.27	-18.83
-95.25	-19.25	-18.81
-95.00	-19.22	-18.79
-94.75	-19.20	-18.76

-94.50	-19.18	-18.74
-94.25	-19.16	-18.72
-94.00	-19.14	-18.70
-93.75	-19.12	-18.67
-93.50	-19.10	-18.65
-93.25	-19.08	-18.63
-93.00	-19.06	-18.60
-92.75	-19.03	-18.58
-92.50	-19.01	-18.55
-92.25	-18.98	-18.52
-92.00	-18.96	-18.49
-91.75	-18.93	-18.46
-91.50	-18.90	-18.43
-91.25	-18.87	-18.40
-91.00	-18.83	-18.36
-90.75	-18.79	-18.32
-90.50	-18.76	-18.28
-90.25	-18.72	-18.24
-90.00	-18.67	-18.19
-89.75	-18.63	-18.15
-89.50	-18.58	-18.10
-89.25	-18.53	-18.04
-89.00	-18.48	-17.99
-88.75	-18.43	-17.94
-88.50	-18.37	-17.88
-88.25	-18.31	-17.82
-88.00	-18.25	-17.75
-87.75	-18.19	-17.69
-87.50	-18.13	-17.63
-87.25	-18.06	-17.56
-87.00	-18.00	-17.49
-86.75	-17.93	-17.42
-86.50	-17.86	-17.35
-86.25	-17.79	-17.27
-86.00	-17.72	-17.20
-85.75	-17.65	-17.13
-85.50	-17.58	-17.05
-85.25	-17.50	-16.98
-85.00	-17.43	-16.90
-84.75	-17.36	-16.83
-84.50	-17.29	-16.75
-84.25	-17.22	-16.68
-84.00	-17.15	-16.61
-83.75	-17.08	-16.54
-83.50	-17.01	-16.47
-83.25	-16.95	-16.40
-83.00	-16.88	-16.33
-82.75	-16.82	-16.27
-82.50	-16.77	-16.21
-82.25	-16.71	-16.15
-82.00	-16.66	-16.09



-81.75	-16.61	-16.04
-81.50	-16.57	-16.00
-81.25	-16.53	-15.95
-81.00	-16.49	-15.91
-80.75	-16.46	-15.88
-80.50	-16.43	-15.85
-80.25	-16.41	-15.83
-80.00	-16.40	-15.81
-79.75	-16.40	-15.80
-79.50	-16.40	-15.80
-79.25	-16.40	-15.80
-79.00	-16.42	-15.82
-78.75	-16.45	-15.84
-78.50	-16.48	-15.87
-78.25	-16.52	-15.91
-78.00	-16.58	-15.96
-77.75	-16.64	-16.02
-77.50	-16.72	-16.09
-77.25	-16.81	-16.18
-77.00	-16.92	-16.28
-76.75	-17.03	-16.39
-76.50	-17.17	-16.52
-76.25	-17.32	-16.67
-76.00	-17.48	-16.83
-75.75	-17.67	-17.02
-75.50	-17.88	-17.22
-75.25	-18.11	-17.45
-75.00	-18.36	-17.70
-74.75	-18.64	-17.97
-74.50	-18.96	-18.28
-74.25	-19.30	-18.62
-74.00	-19.68	-18.99
-73.75	-20.09	-19.41
-73.50	-20.56	-19.86
-73.25	-21.07	-20.38
-73.00	-21.64	-20.94
-72.75	-22.29	-21.58
-72.50	-23.01	-22.30
-72.25	-23.82	-23.11
-72.00	-24.76	-24.04
-71.75	-25.84	-25.12
-71.50	-27.12	-26.40
-71.25	-28.66	-27.94
-71.00	-30.59	-29.86
-70.75	-33.12	-32.39
-70.50	-36.80	-36.06
-70.25	-43.43	-42.69
-70.00	-59.40	-58.65
-69.75	-40.96	-40.22
-69.50	-35.46	-34.71
-69.25	-32.11	-31.36

-69.00	-29.70	-28.95
-68.75	-27.83	-27.07
-68.50	-26.30	-25.54
-68.25	-25.02	-24.26
-68.00	-23.92	-23.15
-67.75	-22.97	-22.20
-67.50	-22.13	-21.36
-67.25	-21.39	-20.62
-67.00	-20.73	-19.96
-66.75	-20.15	-19.37
-66.50	-19.63	-18.85
-66.25	-19.16	-18.39
-66.00	-18.76	-17.98
-65.75	-18.40	-17.62
-65.50	-18.08	-17.31
-65.25	-17.81	-17.04
-65.00	-17.59	-16.81
-64.75	-17.40	-16.63
-64.50	-17.25	-16.48
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0.75	29.20	29.21
1.00	29.08	29.09
1.25	28.91	28.94
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1.75	28.48	28.52
2.00	28.20	28.26
2.25	27.89	27.96
2.50	27.54	27.63
2.75	27.15	27.25
3.00	26.72	26.84
3.25	26.25	26.39
3.50	25.74	25.89
3.75	25.18	25.35
4.00	24.58	24.77
4.25	23.92	24.14
4.50	23.22	23.45
4.75	22.46	22.71
5.00	21.64	21.91
5.25	20.76	21.05
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6.50	15.11	15.50
6.75	13.65	14.06
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69.00	-29.35	-29.03
69.25	-31.75	-31.44
69.50	-35.09	-34.79
69.75	-40.59	-40.30
70.00	-59.02	-58.74
70.25	-43.05	-42.77
70.50	-36.41	-36.14
70.75	-32.73	-32.48
71.00	-30.19	-29.94



71.25	-28.27	-28.02
71.50	-26.72	-26.49
71.75	-25.44	-25.21
72.00	-24.35	-24.13
72.25	-23.42	-23.20
72.50	-22.60	-22.39
72.75	-21.87	-21.67
73.00	-21.23	-21.03
73.25	-20.65	-20.47
73.50	-20.14	-19.96
73.75	-19.67	-19.50
74.00	-19.25	-19.08
74.25	-18.87	-18.71
74.50	-18.53	-18.37
74.75	-18.22	-18.06
75.00	-17.94	-17.79
75.25	-17.68	-17.54
75.50	-17.45	-17.31
75.75	-17.24	-17.11
76.00	-17.05	-16.92
76.25	-16.89	-16.76
76.50	-16.74	-16.61
76.75	-16.60	-16.49
77.00	-16.49	-16.37
77.25	-16.38	-16.27
77.50	-16.29	-16.19
77.75	-16.22	-16.11
78.00	-16.15	-16.05
78.25	-16.10	-16.00
78.50	-16.05	-15.96
78.75	-16.02	-15.93
79.00	-16.00	-15.91
79.25	-15.98	-15.89
79.50	-15.97	-15.89
79.75	-15.98	-15.89
80.00	-15.98	-15.90
80.25	-16.00	-15.92
80.50	-16.02	-15.94
80.75	-16.05	-15.97
81.00	-16.08	-16.00
81.25	-16.11	-16.04
81.50	-16.16	-16.08
81.75	-16.20	-16.13
82.00	-16.25	-16.18
82.25	-16.31	-16.23
82.50	-16.36	-16.29
82.75	-16.43	-16.35
83.00	-16.49	-16.42
83.25	-16.55	-16.48
83.50	-16.62	-16.55
83.75	-16.69	-16.62



84.00	-16.76	-16.69
84.25	-16.83	-16.76
84.50	-16.91	-16.84
84.75	-16.98	-16.91
85.00	-17.05	-16.98
85.25	-17.13	-17.06
85.50	-17.20	-17.13
85.75	-17.28	-17.21
86.00	-17.35	-17.28
86.25	-17.43	-17.35
86.50	-17.50	-17.42
86.75	-17.57	-17.50
87.00	-17.64	-17.56
87.25	-17.71	-17.63
87.50	-17.78	-17.70
87.75	-17.84	-17.77
88.00	-17.91	-17.83
88.25	-17.97	-17.89
88.50	-18.03	-17.95
88.75	-18.09	-18.01
89.00	-18.14	-18.06
89.25	-18.20	-18.12
89.50	-18.25	-18.17
89.75	-18.30	-18.22
90.00	-18.34	-18.26
90.25	-18.39	-18.31
90.50	-18.43	-18.35
90.75	-18.47	-18.39
91.00	-18.51	-18.43
91.25	-18.55	-18.46
91.50	-18.58	-18.50
91.75	-18.61	-18.53
92.00	-18.64	-18.56
92.25	-18.67	-18.59
92.50	-18.70	-18.62
92.75	-18.73	-18.64
93.00	-18.75	-18.67
93.25	-18.78	-18.69
93.50	-18.80	-18.71
93.75	-18.82	-18.74
94.00	-18.84	-18.76
94.25	-18.86	-18.78
94.50	-18.88	-18.80
94.75	-18.91	-18.82
95.00	-18.93	-18.85
95.25	-18.95	-18.87
95.50	-18.97	-18.89
95.75	-19.00	-18.92
96.00	-19.02	-18.95
96.25	-19.05	-18.97
96.50	-19.08	-19.01

96.75	-19.11	-19.04
97.00	-19.14	-19.07
97.25	-19.18	-19.11
97.50	-19.22	-19.15
97.75	-19.26	-19.20
98.00	-19.31	-19.25
98.25	-19.36	-19.30
98.50	-19.41	-19.36
98.75	-19.47	-19.42
99.00	-19.53	-19.49
99.25	-19.60	-19.56
99.50	-19.68	-19.64
99.75	-19.76	-19.72
100.00	-19.84	-19.81
100.25	-19.93	-19.91
100.50	-20.03	-20.02
100.75	-20.14	-20.13
101.00	-20.25	-20.25
101.25	-20.38	-20.37
101.50	-20.51	-20.51
101.75	-20.65	-20.66
102.00	-20.79	-20.81
102.25	-20.95	-20.98
102.50	-21.12	-21.15
102.75	-21.30	-21.34
103.00	-21.49	-21.54
103.25	-21.70	-21.75
103.50	-21.91	-21.97
103.75	-22.15	-22.21
104.00	-22.39	-22.46
104.25	-22.66	-22.73
104.50	-22.94	-23.02
104.75	-23.24	-23.33
105.00	-23.56	-23.66
105.25	-23.90	-24.01
105.50	-24.27	-24.38
105.75	-24.67	-24.79
106.00	-25.10	-25.22
106.25	-25.57	-25.69
106.50	-26.07	-26.20
106.75	-26.63	-26.75
107.00	-27.23	-27.36
107.25	-27.90	-28.03
107.50	-28.65	-28.78
107.75	-29.48	-29.62
108.00	-30.43	-30.57
108.25	-31.53	-31.66
108.50	-32.81	-32.94
108.75	-34.35	-34.48
109.00	-36.27	-36.39
109.25	-38.80	-38.91



109.50	-42.46	-42.57
109.75	-49.07	-49.17
110.00	-65.02	-65.11
110.25	-46.56	-46.65
110.50	-41.03	-41.11
110.75	-37.65	-37.72
111.00	-35.21	-35.27
111.25	-33.30	-33.35
111.50	-31.73	-31.77
111.75	-30.41	-30.43
112.00	-29.26	-29.28
112.25	-28.26	-28.27
112.50	-27.38	-27.37
112.75	-26.59	-26.57
113.00	-25.89	-25.86
113.25	-25.26	-25.21
113.50	-24.69	-24.63
113.75	-24.18	-24.11
114.00	-23.73	-23.65
114.25	-23.33	-23.23
114.50	-22.97	-22.86
114.75	-22.66	-22.54
115.00	-22.40	-22.26
115.25	-22.18	-22.03
115.50	-22.00	-21.84
115.75	-21.86	-21.69
116.00	-21.77	-21.58
116.25	-21.71	-21.51
116.50	-21.70	-21.49
116.75	-21.74	-21.51
117.00	-21.82	-21.58
117.25	-21.94	-21.69
117.50	-22.12	-21.86
117.75	-22.35	-22.07
118.00	-22.63	-22.35
118.25	-22.97	-22.68
118.50	-23.38	-23.07
118.75	-23.85	-23.54
119.00	-24.41	-24.08
119.25	-25.05	-24.71
119.50	-25.79	-25.44
119.75	-26.64	-26.28
120.00	-27.64	-27.27
120.25	-28.80	-28.42
120.50	-30.18	-29.79
120.75	-31.86	-31.46
121.00	-33.95	-33.54
121.25	-36.70	-36.28
121.50	-40.69	-40.26
121.75	-48.07	-47.63
122.00	-58.52	-58.07



122.25	-44.25	-43.80
122.50	-39.30	-38.84
122.75	-36.32	-35.85
123.00	-34.24	-33.77
123.25	-32.68	-32.21
123.50	-31.48	-31.00
123.75	-30.53	-30.04
124.00	-29.77	-29.28
124.25	-29.17	-28.68
124.50	-28.69	-28.21
124.75	-28.32	-27.84
125.00	-28.05	-27.57
125.25	-27.85	-27.38
125.50	-27.72	-27.27
125.75	-27.65	-27.21
126.00	-27.63	-27.21
126.25	-27.66	-27.26
126.50	-27.73	-27.35
126.75	-27.84	-27.49
127.00	-27.99	-27.66
127.25	-28.18	-27.87
127.50	-28.41	-28.12
127.75	-28.68	-28.42
128.00	-29.01	-28.77
128.25	-29.41	-29.19
128.50	-29.90	-29.69
128.75	-30.49	-30.29
129.00	-31.23	-31.03
129.25	-32.14	-31.95
129.50	-33.31	-33.11
129.75	-34.82	-34.62
130.00	-36.87	-36.67
130.25	-39.84	-39.64
130.50	-44.90	-44.69
130.75	-60.99	-60.77
131.00	-47.62	-47.39
131.25	-40.52	-40.28
131.50	-36.59	-36.33
131.75	-33.86	-33.59
132.00	-31.79	-31.51
132.25	-30.15	-29.86
132.50	-28.81	-28.51
132.75	-27.70	-27.39
133.00	-26.79	-26.47
133.25	-26.05	-25.71
133.50	-25.45	-25.10
133.75	-24.98	-24.62
134.00	-24.63	-24.26
134.25	-24.40	-24.01
134.50	-24.28	-23.88
134.75	-24.27	-23.87



135.00	-24.38	-23.96
135.25	-24.60	-24.17
135.50	-24.95	-24.51
135.75	-25.43	-24.98
136.00	-26.05	-25.59
136.25	-26.83	-26.37
136.50	-27.81	-27.34
136.75	-29.01	-28.54
137.00	-30.51	-30.02
137.25	-32.39	-31.91
137.50	-34.86	-34.37
137.75	-38.33	-37.84
138.00	-44.06	-43.56
138.25	-64.14	-63.66
138.50	-46.48	-46.00
138.75	-40.23	-39.75
139.00	-36.88	-36.42
139.25	-34.68	-34.25
139.50	-33.12	-32.71
139.75	-31.96	-31.59
140.00	-31.09	-30.76
140.25	-30.42	-30.14
140.50	-29.91	-29.69
140.75	-29.51	-29.36
141.00	-29.21	-29.13
141.25	-28.98	-28.97
141.50	-28.82	-28.88
141.75	-28.71	-28.83
142.00	-28.66	-28.84
142.25	-28.69	-28.91
142.50	-28.79	-29.04
142.75	-29.01	-29.28
143.00	-29.36	-29.64
143.25	-29.89	-30.16
143.50	-30.64	-30.90
143.75	-31.69	-31.93
144.00	-33.17	-33.39
144.25	-35.31	-35.52
144.50	-38.67	-38.86
144.75	-45.20	-45.36
145.00	-58.26	-58.40
145.25	-41.52	-41.64
145.50	-35.98	-36.08
145.75	-32.57	-32.65
146.00	-30.12	-30.18
146.25	-28.26	-28.30
146.50	-26.80	-26.83
146.75	-25.64	-25.65
147.00	-24.72	-24.72
147.25	-24.02	-24.01
147.50	-23.50	-23.48



147.75	-23.15	-23.13
148.00	-22.97	-22.94
148.25	-22.95	-22.91
148.50	-23.09	-23.06
148.75	-23.41	-23.37
149.00	-23.90	-23.86
149.25	-24.60	-24.57
149.50	-25.54	-25.51
149.75	-26.76	-26.74
150.00	-28.36	-28.35
150.25	-30.49	-30.50
150.50	-33.49	-33.51
150.75	-38.24	-38.28
151.00	-49.62	-49.68
151.25	-45.23	-45.32
151.50	-37.12	-37.23
151.75	-33.18	-33.33
152.00	-30.66	-30.84
152.25	-28.87	-29.09
152.50	-27.54	-27.79
152.75	-26.53	-26.83
153.00	-25.77	-26.10
153.25	-25.21	-25.57
153.50	-24.81	-25.20
153.75	-24.55	-24.97
154.00	-24.43	-24.87
154.25	-24.45	-24.89
154.50	-24.60	-25.05
154.75	-24.91	-25.35
155.00	-25.40	-25.82
155.25	-26.10	-26.50
155.50	-27.07	-27.45
155.75	-28.42	-28.77
156.00	-30.31	-30.63
156.25	-33.12	-33.41
156.50	-37.91	-38.16
156.75	-51.63	-51.85
157.00	-41.88	-42.07
157.25	-34.39	-34.55
157.50	-30.40	-30.53
157.75	-27.73	-27.83
158.00	-25.76	-25.84
158.25	-24.28	-24.33
158.50	-23.15	-23.18
158.75	-22.30	-22.32
159.00	-21.70	-21.70
159.25	-21.32	-21.31
159.50	-21.15	-21.12
159.75	-21.18	-21.15
160.00	-21.42	-21.39
160.25	-21.89	-21.85



160.50	-22.60	-22.57
160.75	-23.61	-23.58
161.00	-24.97	-24.95
161.25	-26.82	-26.82
161.50	-29.42	-29.44
161.75	-33.40	-33.44
162.00	-41.25	-41.32
162.25	-47.78	-47.89
162.50	-35.61	-35.77
162.75	-30.88	-31.08
163.00	-27.98	-28.23
163.25	-25.96	-26.26
163.50	-24.45	-24.81
163.75	-23.30	-23.70
164.00	-22.41	-22.86
164.25	-21.73	-22.21
164.50	-21.24	-21.75
164.75	-20.92	-21.44
165.00	-20.78	-21.30
165.25	-20.84	-21.35
165.50	-21.12	-21.61
165.75	-21.69	-22.15
166.00	-22.64	-23.07
166.25	-24.13	-24.52
166.50	-26.50	-26.85
166.75	-30.67	-30.98
167.00	-41.75	-42.02
167.25	-36.12	-36.35
167.50	-27.61	-27.81
167.75	-23.20	-23.37
168.00	-20.24	-20.37
168.25	-18.06	-18.17
168.50	-16.42	-16.49
168.75	-15.18	-15.23
169.00	-14.28	-14.31
169.25	-13.70	-13.71
169.50	-13.43	-13.42
169.75	-13.50	-13.48
170.00	-13.97	-13.94
170.25	-14.95	-14.91
170.50	-16.69	-16.64
170.75	-19.79	-19.74
171.00	-26.61	-26.55
171.25	-33.68	-33.63
171.50	-20.04	-19.99
171.75	-14.46	-14.42
172.00	-10.78	-10.76
172.25	-8.00	-8.00
172.50	-5.75	-5.78
172.75	-3.87	-3.92
173.00	-2.24	-2.33



173.25	-0.81	-0.94
173.50	0.47	0.30
173.75	1.63	1.42
174.00	2.71	2.44
174.25	3.71	3.41
174.50	4.67	4.32
174.75	5.59	5.20
175.00	6.47	6.06
175.25	7.34	6.90
175.50	8.18	7.74
175.75	9.00	8.56
176.00	9.79	9.37
176.25	10.56	10.16
176.50	11.30	10.92
176.75	12.00	11.65
177.00	12.66	12.34
177.25	13.27	12.99
177.50	13.84	13.60
177.75	14.36	14.15
178.00	14.83	14.65
178.25	15.24	15.09
178.50	15.60	15.48
178.75	15.91	15.81
179.00	16.15	16.08
179.25	16.34	16.29
179.50	16.48	16.44
179.75	16.55	16.54
180.00	16.57	16.57