Item	Command Transfer	Command GSO	Telemetry Transfer	Telemetry GSO	Beacon GSO
Frequency (MHz)	24,755	24,765	17,691	17,695	17,693
Polarization	LHCP	LHCP	LHCP	LHCP	LHCP
Power Into Antenna, dBW	27	27.0 (1)	14	0	-20.4
Bandwidth (dB)	60	60	48.6	51.6	40
Power Density, dBW/Hz	33	-33	-34.6	-51.6	-60.4
Transmit Antenna Gain,	63.4	63.4	-3	16	45.4
Eirp, dBW	90.4	90.4	11	16	25
Eirp Density, dBW/Hz	30.4	30.4	-37.6	-35.6	-15
Slant range (Km)	40,100	40,100	40,100	40,100	40,100
Space Loss (dB)	-212.5	-212.5	-209.4	-209.4	-209.4
Receive Antenna Gain,	-3	19	60.3	60.3	36.7
Receive Antenna Temp.,	28.1	28.1	18	18	20.4
Receive Signal, dBW	-125.1	-103.1	-138.1	-133.1	-147.7
CNR (dB)	15.4	37.4 (1)	23.9	25.9	20.5
Data Rate (Hz)	250	250	2,400	4,800	N/A

(1) Power can be reduced during GSO operation.
(2) TT&C earth station antenna is 7 meters.

TABLE B-1

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Transponder Channel
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Command 2
Telemetry 1
Telemetry 2
Beacon

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National Beam
Spot Beam

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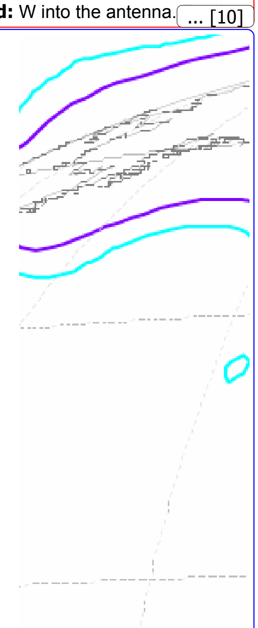

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Exhibit A

TECHNICAL NARRATIVE

(Response to Form 312 Question 43)

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CONTENTS

Section **Page**

1 - GENERAL SYSTEM DESCRIPTION 4

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1 - GENERAL SYSTEM DESCRIPTION

BSSNET119W will consist of a geostationary satellite located at the nominal 119° W.L. orbital location and associated ground station equipment. BSSNET119W is designed to provide DTH service in the "Reverse Band" frequency ranges of 17.3-17.7 GHz (Space-to-Earth) and 24.75-25.15 GHz

(Earth-to-Space). The Telemetry, Tracking and Control ("TT&C") functions will also be provided at the edges of these same frequency bands.

The BSSNET119W satellite is capable of supporting 10 "17/24" uplink/downlink transponders (5 LHCP and 5 RHCP) providing coverage via a "CONUS+" national beam and 16 downlink/uplink transponders (8 LHCP and 8 RHCP) providing coverage via 53 spot beams. The national coverage beam is designed to provide coverage to all 50 states (CONUS, Alaska and Hawaii). The spot beams also provide local/regional programming to this area as well as the Netherlands Antilles, Puerto Rico, and U.S. Virgin Islands. Working in conjunction with SPECTRUM FIVE's Ku BSS satellite to be launched at 119° W.L., the national beams provide additional capacity for improved HDTV programming delivery, and the spot beams carry HD local-into-local programming material into new service areas not served by the Ku BSS system. All national programming material will be aggregated and uplinked from the SPECTRUM FIVE broadcast center in Los Angeles, CA, while regional/local programming material will be uplinked at six selected broadcast sites.

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00 MHz of spectrum in CONUS on both uplink and downlink will be channelized into 26 channels of 24 MHz nominal bandwidth each, with 29.16 MHz spacing between co-polar channel center frequencies, and with the cross-

polar transponders not offset relative to the co-polar ones in order to provide the maximum utilization of the operating bandwidth. Full frequency re-use of both the uplink and downlink spectrum is achieved through the use of orthogonal circular polarization.

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2 - SPACE SYSTEM OPERATING CHARACTERISTICS

2.1 FREQUENCY AND POLARIZATION PLAN

Table 2-1 shows the frequency and polarization plan of the BSSNET119W satellite, including the on-station command, autotrack beacon, and TT&C. The interconnection capability of the BSSNET119W national coverage transponders is shown in Table 2-2 and for the spot transponders is shown in Appendix A, Table A-1. Table 2-2 illustrates the connection of each national programming uplink channel to its corresponding downlink channel. Appendix A, Table A-1 shows the spot beam uplink and downlink channel connectivity. This table includes the uplink site and channel designation and polarization for each uplink channel and illustrates the method of connection between the uplink channel and a specific transmit downlink beam.

Transponder Channel	DL Freq (MHz) LCP	UL Freq (MHz) RCP	Transponder Channel	DL Freq (MHz) RCP	UL Freq (MHz) LCP
			Autotrack Beacon		24,751.00
			Command 1		24,755.00
1	17,325.00	24,775.00	2	17,325.00	24,775.00
3	17,354.16	24,804.16	4	17,354.16	24,804.16
5	17,383.32	24,833.32	6	17,383.32	24,833.32
7	17,412.48	24,862.48	8	17,412.48	24,862.48
9	17,441.64	24,891.64	10	17,441.64	24,891.64
11	17,470.80	24,920.80	12	17,470.80	24,920.80
13	17,499.96	24,949.96	14	17,499.96	24,949.96
15	17,529.12	24,979.12	16	17,529.12	24,979.12
17	17,558.28	25,008.28	18	17,558.28	25,008.28
19	17,587.44	25,037.44	20	17,587.44	25,037.44
21	17,616.60	25,066.60	22	17,616.60	25,066.60
23	17,645.76	25,095.76	24	17,645.76	25,095.76
25	17,674.92	25,124.92	26	17,674.92	25,124.92
Command 2		25,145.00			
Telemetry 1	17,691.00				
Telemetry 2	17,695.00				
Beacon	17,693.00				

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Table 2-1. Frequency Plan for Transponders and TT&C.

Downlink Channel	Freq (MHz)	Downlink Polarization		Uplink Channel	Freq (MHz)	Uplink Polarization
1,2	17,325.00	LCP,RCP		1,2	24,775.00	RCP,LCP
3,4	17,354.16	LCP,RCP		2,4	24,804.16	RCP,LCP
5,6	17,383.32	LCP,RCP		5,6	24,833.32	RCP,LCP
7,8	17,412.48	LCP,RCP		7,8	24,862.48	RCP,LCP
9,10	17,441.64	LCP,RCP		9,10	24,891.64	RCP,LCP

Table 2-2. BSSNET119W CONUS+ Coverage Uplink/Downlink Interconnection

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2.2 COMMUNICATIONS PAYLOAD

2.2.1 Uplink/Downlink Interconnection and Frequency Translation

As can be seen from Table 2-1 and Table 2-2, the first ten transponders that support national coverage are frequency translated from the 24.75-25.15 GHz receive band by 7,450 MHz for re-transmission in the lower portion of the 17.3-

17.7 GHz downlink band. All of these channels are to be uplinked from the national broadcast center in Southern California.

The upper portion of the 24.75

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-25.15 GHz uplink band is also re-used multiple times through transmissions from a number of carefully located and geographically separated regional aggregation broadcast sites, (sites S1 to S7). The transmissions from each of these regional broadcast sites will carry a unique mix of HD regional/local broadcast programming information and other new services provided by the BSSNET119W satellite. These uplink transmissions will be connected to the appropriate downlink spot beams as detailed in Table 2-1 and Appendix A, Table A-1.

2.2.2 Transponder Channel Characteristics

The maximum receive antenna gain, receive system noise temperature, and maximum G/T of the BSSNET119 satellite are all specified in the accompanying Schedule S. BSSNET119W employs 1m diameter uplink receive antennas with a maximum gain of 47.0 dB and a receive G/T pf 17.5 dB^{o}K. Note that the G/T will decrease, dB-for-dB, from the maximum as the uplink location moves away from beam peak. BSSNET119W will employ input multiplexer (“IMUX”) and output multiplexer ("OMUX") filters to limit the bandwidth of received signals. The specified performance for these filters is shown in Table 2-3.

Frequency offset Offset from channel center	Gain relative to channel center frequency (p-p) (dB)		Comments
	Receive	Transmit	
±5 MHz	0.55	0.73	In-Band
±7 MHz	0.8	0.94	
±9 MHz	1.11	1.35	
±11 MHz		2.73	
±12 MHz	1.84	3.56	
±13 MHz	2.47		
±18 MHz	-12	0	Out-of-Band
±21 MHz	-33	-1	
±27 MHz	-38	-10	

Table 2-3. IMUX / OMUX Filtering

2.2.2 Transponder Channel Characteristics

The national coverage downlink beam uses "quad" combined output amplifiers (TWTAs) with a per amplifier output power of 150 Watts (600 Watts combined). This produces a maximum EIRP in CONUS of 61.4 dBW in the South Florida area. The spot downlink beams use single amplifier TWTAs with an output power of 70 Watts to produce the same maximum EIRP. The resultant output power from each of these two types of amplifier assemblies is shown in Table 2-4.

	Transmit Output Power (dBW)	Transmit Output Power (W)	Output Losses (dB)	Transmit Antenna Gain (dBi) Peak	Peak EIRP (dBW)
National Beam	27.5	566.2	2.5	36.4	61.4
Spot Beam	17.4	54.7	2.5	46.5	61.4

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Table 2-4. TWT Powers and ERPs

For the national transponders, each transponder channel requires "quad"

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combining of 150W TWTAs to develop the required 566

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W into the antenna. For the spot beams, each 150W TWTA can drive 3 transponder channels in the saturated mode.

2.2.3 Transmit Beams and Antennas

2.2.3.1 CONUS+ Beam

BSSNET119W will employ a single 2.4m diameter transmit antenna system for 17/24 GHz BSS service to provide U.S. national coverage. This antenna system will cover CONUS+Alaska+Hawaii and will be capable of transmitting across the frequency band 17.3-17.7 GHz using LCP and RCP. The peak transmit gain of 37.7dB, and the antenna gain contour in GXT format, are given in the accompanying Schedule S. The gain contour for CONUS+ beam is also graphically depicted in Figure 2-1 below.

2.2.3.2 Spot Beams

BSSNET119W employs four 2.8x3.5m spot beams antennas to provide maximum spot beam interference reduction, a critical parameter in the performance of these antenna systems. Peak antenna gain is 46.5 dB including antenna losses after the TWTA. Locations of the downlink spot beams are shown in Table 2-5.

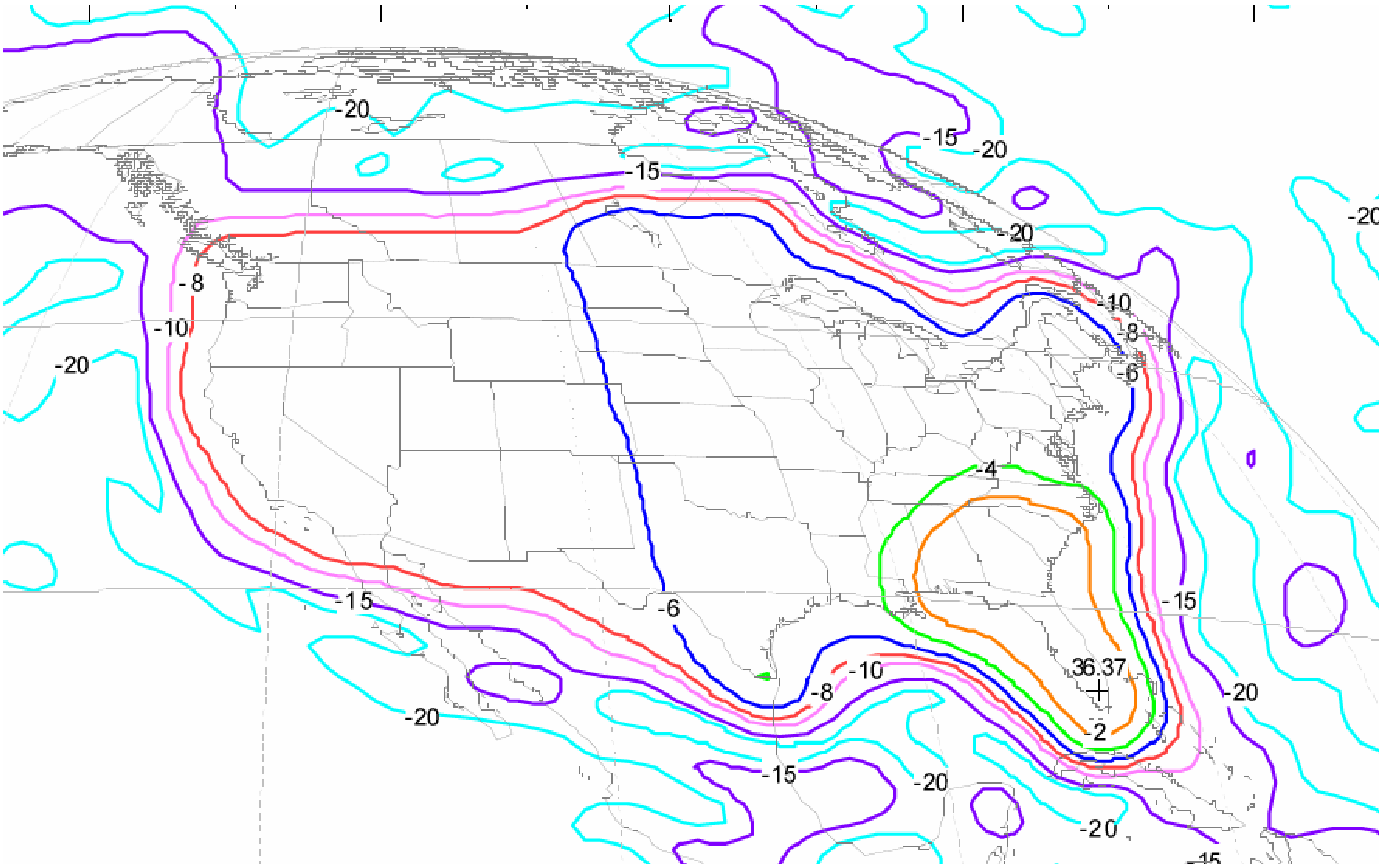

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Figure 2-1. CONUS Antenna Gain Contours

All downlink beams will have a gain of 46.5 dB (including antenna losses) and a minimum cross-polarization isolation of 30 dB, and have essentially identical contours as shown in Figure 2-2.

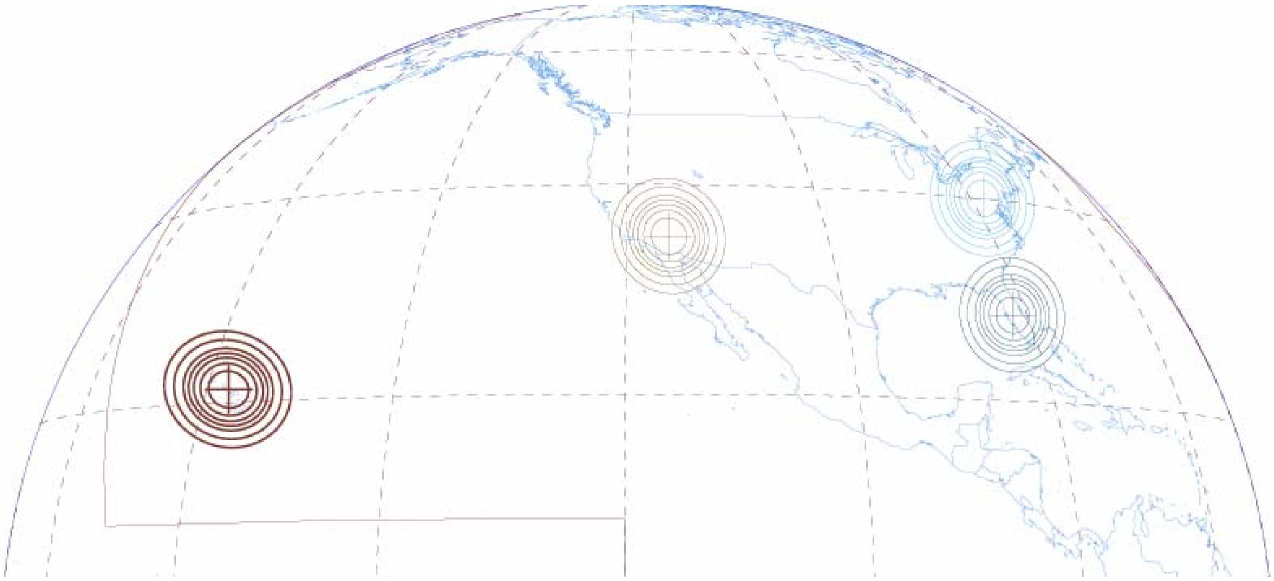

Figure 2-3. Spot Beams (28, 31, 48, 50) Antenna Gain Contours (Contours shown -2dB,-4dB,.-6dB,-8dB,-10dB and -20dB)

Beam No.	Beam Name*	Lat. °N	Long. °W
1	Seattle	48.453	124.53
2	Spokane	48.342	119.03
3	Missoula	48.315	113.585
4	Billings	48.367	108.145
5	Minot	48.51	102.585
6	Fargo	48.749	96.79
7	Duluth	49.098	90.61
8	Marquette	49.586	83.8
9	Portland	43.211	121.03
10	Salt Lake City	43.16	116.123
11	Idaho Falls	43.171	111
12	Denver	43.244	106.96
13	Sioux Falls	43.381	101.245
14	Minneapolis	43.59	95.99
15	Milwaukee	43.88	90.42
16	Detroit	44.274	84.35
17	Buffalo	44.803	77.51
18	Boston	45.546	69.28
19	San Francisco	38.68	122.84
20	Los Angeles	38.616	118.265
21	Phoenix	38.601	113.739
22	Grand	38.632	109.205
23	Colorado	38.713	104.61
24	Lincoln	38.844	99.9
25	Kansas City	39.033	95
26	Chicago	39.286	89.828
27	Cleveland	39.618	84.24
28	New York	40.054	78.01
29	Boston	40.638	70.74
30	Fresno	34.485	120.18
31	San Diego	34.453	115.91
32	Yuma	34.459	111.655
33	Albuquerqu	34.514	106.73
34	Amarillo	34.588	103.02
35	Dallas	34.713	98.55
36	Little Rock	34.877	93.89
37	Nashville	35.112	88.98
38	Atlanta	35.402	83.685
39	Charlotte	35.774	77.85
40	Tucson	30.62	109.76
41	El Paso	30.67	105.66
42	San Antonio	30.76	101.48
43	Houston	30.88	97.18
44	New	31.03	92.71
45	Birmingham	31.24	88
46	Jacksonville	31.49	82.9
47	Harlingen	27.146	99.975
48	Miami	27.819	81.88
49	Anchorage	61.298	149.8
50	Honolulu	21.154	157.25
51	Curacao	12.28	68.611
52	St. Martin	17.909	63.019
53	Juneau	57.998	135

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Table 2-5. Spot Beam Locations

2.3 TELEMETRY, TRACKING & COMMAND, TT&C

Telemetry and command signals are listed in Table 2-6. The command signal will be capable of encryption but with a settable time-out. The 250 bps command signal is bi-phase modulated onto a sub-carrier which frequency modulates the command carrier, using wide deviation FM. The beacon is used to measure rain attenuation and to align subscriber earth stations. Omni directional antennas are used for all transfer orbit operations and also may be used for certain, rare emergency operations during GSO operations. A horn antenna is used for GSO telemetry in order to reduce the required telemetry power and to enable telemetry operations despite incidental attitude errors. The 2,400 bps telemetry rate is bi-phase modulated onto a subcarrier, which phase-modulates the telemetry carrier. Ranging is provided by transmitting tones, 283.4, 3968 and 27,777 Hz, or similar tones, through the satellite from the command to the telemetry system.

Item	Command Transfer	Command GSO	Telemetry Transfer	Telemetry GSO	Beacon GSO
Frequency (MHz)	24,755	24,765	17,691	17,695	17,693
Polarization	LHCP	LHCP	LHCP	LHCP	LHCP
Power Into Antenna, dBW	27	27.0 (1)	14	0	-20.4
Bandwidth (dB)	60	60	48.6	51.6	40
Power Density, dBW/Hz	33	-33	-34.6	-51.6	-60.4
Transmit Antenna Gain,	63.4	63.4	-3	16	45.4
Eirp, dBW	90.4	90.4	11	16	25
Eirp Density, dBW/Hz	30.4	30.4	-37.6	-35.6	-15
Slant range (Km)	40,100	40,100	40,100	40,100	40,100
Space Loss (dB)	-212.5	-212.5	-209.4	-209.4	-209.4
Receive Antenna Gain,	-3	19	60.3	60.3	36.7
Receive Antenna Temp.,	28.1	28.1	18	18	20.4
Receive Signal, dBW	-125.1	-103.1	-138.1	-133.1	-147.7
CNR (dB)	15.4	37.4 (1)	23.9	25.9	20.5
Data Rate (Hz)	250	250	2,400	4,800	N/A

(1) Power can be reduced during GSO operation.
(2) TT&C earth station antenna is 7 meters.

Table 2-6. Telemetry and Command System Link Parameters.

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3 - SERVICES

SPECTRUM FIVE will use the BSSNET119W satellite to retransmit digital video and audio entertainment, educational and informational programming to subscribers throughout the United States, including Alaska, Hawaii, and the Netherlands Antilles.

4 - LINK ANALYSIS

Representative communications link budgets for the BSSNET119W satellite are shown in Appendix A as Tables A-1 to A-8. There is one link budget for a city in each of the CONUS downlink power flux density ("PFD") regions defined by the Commission's rules, and one for a non-CONUS region (Alaska or Hawaii), as well as the same four cities operating with the spot beam transponder. SPECTRUM FIVE is applying for an orbital location that is not offset from the FCC "Appendix F grid", and requests that it be allowed to operate at full power with full protection according to the Commissions' rules. These budgets include an entry for adjacent satellite interference ("ASI") from neighboring 17/24 GHz BSS satellites nominally spaced at -8.0°, -4.0°, +4.0°, and +8.0° relative to BSSNET119W.

The link analysis performed using a 45 cm earth station antenna shows that availability numbers for the spot beam operation exceeds 99.7% across CONUS, and exceeds 99.5% for the national beams when operating the link with a high spectral efficiency modulation scheme (8PSK, Rate 2/3). This includes the effects of adjacent satellites operating at maximum power at the four locations discussed above.

5 - EARTH STATIONS

There are three types of earth stations to be used with the BSSNET119W satellite: subscriber terminals with small antennas (45-65cm), large feeder-link stations using for uplinking the video content (13m), and a large TT&C station antenna (7m). Subscriber terminals for reception outside CONUS may need to be somewhat larger, typically 1 meter. The characteristics of these three terminal types are summarized in the attached Schedule S.

6 - SATELLITE ORBIT CHARACTERISTICS

The BSSNET119W satellite will be maintained in geosynchronous orbit at the 119° W.L. orbital location with a maximum North-South drift of ± 0.05°, and a maximum East-West station keeping of ± 0.05.

7 - POWER FLUX DENSITY

The allowable PFD levels in the 17.3-17.7 GHz band are defined in Section 25.208(w) of the Commission's rules on a regional basis for all conditions, including clear sky, and for all methods of modulation as:

In the region of the contiguous United States, located south of 38º North Latitude and east of 100° West Longitude: -115 dBW/m^2/MHz;

In the region of the contiguous United States, located north of 38º North Latitude and east of 100° West Longitude: -118 dBW/m^2/MHz;

In the region of the contiguous United States, located west of 100° West Longitude: -121 $dBW/m^2/MHz$; and

For all regions outside of the contiguous United States including Alaska and Hawaii: -115 $dBW/m^2/MHz$.

As discussed in Section 2.2.2 above, the maximum downlink EIRP for BSSNET119W will be 61.4dBW/24 MHz channel. The maximum power flux density/MHz on the Earth's surface from this emission is calculated as follows:

Peak PSD (dBW/MHz) = EIRP(dB) - Spreading Loss (dB) - BW Factor(dB)

where Bandwidth Factor (dB) = 10(log(24) for a 24 MHz transponder. The atmospheric loss (which is always present as a link attenuation) provides an additional margin for this calculation.

For the maximum EIRP of 61.4 dBW discussed earlier, PSD = +61.4-162.6 (dB/

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m^2) – 10log(24) = -115.0 $dBW/m^2/MHz$. The atmospheric loss in the South Florida area where this maximum occurs is at least 0.35 dB, providing additional margin This bandwidth allocation applies to the QPSK modulation mode, For the 8PSK modulation mode, the PSD would be -115.3 $dBW/m^2/MHz$ maximum minus the atmospheric loss.

As discussed in Section 2.2.3.1 above, the downlink national beam antenna gain pattern for BSSNET119W shows (1) that the antenna gain north of 38º North latitude and east of 100° W.L. is at least 3 dB below peak gain, and (2) that the antenna gain west of 100° W.L. is at least 6 dB below peak gain. As a result, the maximum PFD for the CONUS+ beam on the earth's surface complies with Section 25.208(w) for the national beams in each of the applicable regions defined in the Commission's rules. For the spot beams, the peak EIRP of each spot beam is adjusted to remain below the appropriate PSD limit depending on what region the beam is in, and cannot exceed -115 dBW/m^2/MHz anywhere outside CONUS for the spot beams as well.

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8 - PHYSICAL CHARACTERISTICS OF THE SPACE STATION

SPECTRUM FIVE has not yet settled upon exact specifications for the physical characteristics of the satellite as it has not yet contracted for the construction of the BSNET119W satellite Accordingly, the payload envelope has been estimated to allow more than one spacecraft currently available with extensive heritage and fully qualified

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technology to serve as the design platform. SPECTRUM FIVE anticipates that the key spacecraft characteristics for BSNET119W are as summarized in the appropriate sections of the accompanying Schedule S.

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9 - SPACECRAFT BUS SUBSYSTEM

As discussed

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above, SPECTRUM FIVE has not yet contracted with a manufacturer for the construction of the BSSNET119W satellite and does not wish to show a preference by providing data specific to any one manufacturer. As such, it is difficult to discuss any specific characteristics of what may comprise the spacecraft bus subsystem beyond that already specified in the accompanying Schedule S.

SPECTRUM FIVE will provide the Commission with full spacecraft physical characteristics once a final spacecraft provider has been selected and a final satellite design has been adopted.

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10 - COMMON CARRIER STATUS

SPECTRUM FIVE intends to operate the BSNET119W satellite on a non-broadcast, non-common carrier basis, as it anticipates

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. SPECTRUM FIVE may sell and/or lease a portion of its capacity on a non-common carrier basis for complementary business purposes.

11 - SCHEDULE

SPECTRUM FIVE will contract for, begin construction of, and launch and operate BSNET119W in accordance with the milestones specified in Section 25.164(a) of the Commission's rules.

12 - INTERFERENCE ANALYSIS

The Commission has established coordination thresholds for earth station off-axis EIRP density and spacecraft PFD in Sections 25.223 and 25.208, respectively. In order to achieve maximum compatibility between diverse networks, the Commission has established coordination thresholds for earth station off-axis EIRP density and spacecraft PFD in Sections 25.223 and 25.208, respectively. In order to achieve maximum compatibility between diverse networks, the Commission has established coordination thresholds for earth station off-axis EIRP density and spacecraft PFD in Sections 25.223 and 25.208, respectively.

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n order to achieve maximum compatibility between diverse networks, the Commission has established coordination thresholds for earth station off-axis EIRP density and spacecraft PFD in Sections 25.223 and 25.208, respectively.

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SPECTRUM FIVE has assumed for the purposes of this application regional maximum downlink PFD values from neighboring systems consistent with Section 25.208(w), maximum feeder link earth station off-axis transmit power density consistent with Section 25.223, and receive earth station compliance with Section 25.224 (

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Recommendation ITU-R BO.1213). The interference analyses that are included in this application were performed in conjunction with the end-to-end link performance analyses. Abbreviated link budgets are presented in Tables A-1 through A-8 in Appendix A, *i.e.* one budget for each of the PFD regions defined in Section 25.208(w). In each case, the analysis includes the effects of adjacent satellite interference from satellites nominally located at -8.0°, -4.0°, +4.0,° and +8.0° relative to BSSNET119W in evaluating whether the system accommodates the various data rates at acceptable C/(N+I) thresholds. Additionally, adjacent satellite interference was calculated assuming 0.05° station-keeping of the interfering satellites. Tables A-1 to A-8 of Appendix A demonstrate that the BSSNET119W satellite design described in this application is compatible with the aforementioned transmission parameters and interference environment. Accordingly, the proposed 17/24 GHz BSS satellite would operate successfully in such an environment.

13 - ORBITAL DEBRIS MITIGATION

13.1 ORBITAL DEBRIS AND ORBITAL STORAGE

This section is consistent with the requirements specified in the FCC's Second Report & Order, IB Docket 02-54, Released June 21, 2004, Part 25.114 of the FCC Rules and Public Notice DA –2698 "Disclosure of Orbital Debris Mitigation Plans, Including Amendment of Pending Applications".

Spectrum Five's spacecraft procurement will be initiated during 2008, and have a construction contract in one year after license award. The new spacecraft, BSSNET119W, a Satellite Operations Center, SOC, Network Operations, Center, NOC and feederlink earth stations will be fully defined by specifications, statement of work, test plans and contract. These documents will contain the FCC requirements and objectives described in the Orbital Debris Second Report and Order. In addition, design reviews will include consideration of these requirements and how they will be specifically implemented by the manufacturer and by the SOC operator, including a requirement to cooperate and exchange vital information with the operator, including a requirement to cooperate and exchange vital information with the SOCs of neighboring satellites.

13.2 SPACECRAFT HARDWARE DESIGN

The Spectrum Five satellites will not be a source of debris either during the launch, drift or operating mode; no debris is planned to be released. All separation and deployment mechanisms, and any other potential source of debris will be retained by the spacecraft or launch vehicle. The spacecraft TT&C system, vital for orbit raising, will be extremely rugged with regard to meteoroids smaller than 1 cm, by virtue of its redundancy, shielding, separation of components and physical characteristics. Omni-directional antennas are mounted on opposite sides of the spacecraft. These antennas, each providing greater than hemispherical coverage patterns are extremely rugged and capable of providing adequate coverage even if struck and bent or otherwise damaged by a small or medium sized particle. Either omni-directional antenna, for either command or telemetry, is sufficient to enable orbit raising. The command receivers and decoders and telemetry encoders and transmitters will be located within a shielded area and will be totally redundant and physically separated. A single rugged thruster and shielded propellant tank provide the energy for orbit raising. Otherwise, there are no single points of failure in the system. Spectrum Five will continue to review these aspects of on-orbit operations with the spacecraft manufacturer and will make such adjustments and improvements as appropriate to assure that its spacecraft will not become sources of debris during operations or become derelicts in space due to a collision with a small, medium or large object. To accomplish these and the following objectives Spectrum five plans to incorporate the material of this document into its satellite Technical Specifications, Statement of Work and Test Plans. The Statement of Work will include provisions to review orbit debris mitigation as part of PDR and CDR and to incorporate its requirements, as appropriate, into its Test Plan, including a formal Failure Mode Verification Analysis, FMVA, for orbital debris mitigation involving particularly the TT&C, propulsion and energy systems.

At the appropriate time, Spectrum Five intends to contract with an appropriate agency which can supply information regarding large orbital debris that may pose a threat to Spectrum Five's satellites. With the situation as described in this paragraph, only normal station-keeping regimens are necessary to avoid collisions. Frequency and physical coordination during orbital drift cannot be undertaken until license authorization and until the spacecraft and launch vehicle manufacturers are selected and a Launch Plan, launch vehicle and launch scenario developed. No pre-operational orbits requiring STA authority are now anticipated.

13.3 LIMITATION ON RELEASE OF ORBITAL DEBRIS DURING NORMAL OPERATIONS AND FROM COLLISIONS WITH SMALL DEBRIS OR METEOROIDS. Spectrum Five has assessed the likelihood of the release of debris during normal operations and, based on the present design, believes that there will not be any planned release of debris during normal operations of the

Spectrum Five satellites. The spacecraft will be designed with full redundancy for all active components, with shielding where appropriate. Location of critical components will minimize exposure to small debris or meteoroids that might cause catastrophic failure of the spacecraft control system or prevent orbital storage at the end of spacecraft life. Spectrum Five will continue to review these aspects of on-orbit operations with the spacecraft manufacturer and will make such adjustments and improvements as appropriate to assure that the spacecraft is not the source of debris during operations or becomes derelict in space due to collision with a small object. The following items are those which will be embodied in the procurement, launch and operational documents.

13.5 MINIMIZING ACCIDENTAL EXPLOSIONS

Spectrum Five will contract for a spacecraft design that limits the probability of accidental explosions that might fragment the satellite during and after completion of mission operations. All batteries and fuel tanks will be monitored for pressure and temperature. Excessive battery charging or discharging will be limited by a monitoring and control system which will automatically limit the possibility of fragmentation. Corrective action, if not automatically undertaken, will be immediately undertaken by the SOC to avoid destruction and fragmentation. Thruster temperatures, impulse and thrust duration are carefully monitored; any thruster may be turned off via redundant valves. Consequently, there is no possibility of explosion during the operating mission.

All TWTAs will be outgassed prior to post-mission disposal. After post-mission disposal all residual fuel is will be consumed, all fuel latch valves will be placed in an "open" position and any pressurized system will be vented. Spacecraft battery trickle charge and all automatic battery charging sequences will be disabled.

Consequently, via its spacecraft documentation, design reviews, FMVA, test plans and testing, Spectrum Five will assess and limit the possibility of accidental explosions during mission operations and assure that all stored energy at the end of the spacecraft's mission operation will be removed.

13.6 SATELLITE COLLISIONS WITH LARGE OBJECTS

Spectrum Five has considered the possibility of its spacecraft becoming a source of debris by collisions with large debris other than spacecraft. Extensive damage may be done, perhaps rendering it inoperative with respect to its communications mission yet enabling the TT&C and propulsion systems to function sufficiently to permit the achievement of a parking orbit. This capability is due to the inherent ruggedness, shielding and redundancy of the TT&C and propulsion system. The preservation of this capability will be emphasized in Spectrum Five's procurement documents, design reviews, test plans and FMVA, as described above. Through these methods, Spectrum Five intends to limit the probability of its spacecraft becoming a source of debris by collisions with large debris or other operational space stations.

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This section is consistent with the requirements specified in the FCC's Second Report & Order, IB Docket 02-54, Released June 21, 2004, Part 25.114 of the FCC Rules and Public Notice DA –2698 "Disclosure of Orbital Debris Mitigation Plans, Including Amendment of Pending Applications". Spectrum Five's spacecraft procurement will be initiated during 2008/2009, with the objective of selecting a spacecraft manufacturer by the end of 2009. The new spacecraft, BSSNET119W, , a Satellite Operations Center, SOC, a Network Operations Center, NOC and feederlink earth stations will be fully defined by specifications, statement of work, test plans and contract. These documents will contain the FCC requirements and objectives described in the Orbital Debris Second Report and Order. In addition, design reviews will include consideration of these requirements and how they will be specifically implemented by the manufacturer and by the SOC operator, including a requirement to cooperate and exchange vital information with the operator, including a requirement to cooperate and exchange vital information with the SOCs of neighboring satellites.

SPECTRUM FIVE will limit the amount of debris released in a planned manner during normal operations. BSSNET119W will not be a source of debris during launch, drift, or operating mode, as SPECTRUM FIVE does not intend to release debris during the planned course of operations of the satellite.

SPECTRUM FIVE will also consider the possibility of BSSNET119W becoming a source of debris by collisions with small debris or meteoroids that could cause loss of control of the spacecraft and prevent post-mission disposal. As such, SPECTRUM FIVE will take steps to address this possibility by incorporating redundancy, shielding, separation of components, and other physical characteristics into the satellite's design. For example, omni-directional antennas will be mounted on opposite sides of the spacecraft, and either will be sufficient to support orbit raising. The command receivers and decoders, telemetry encoders and transmitters, and the bus control electronics will be fully redundant, physically separated, and located within a shielded area to minimize the probability of the spacecraft becoming a source of debris due to a collision. SPECTRUM FIVE will continue to review these aspects of on-orbit operations with the spacecraft manufacturer and will make such adjustments and improvements as appropriate to assure that its spacecraft will not become a source of debris during operations or become derelict in space due to a collision.

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Safe Flight Profiles

SPECTRUM FIVE will assess and limit the probability of BSSNET119W becoming a source of debris by collisions with large debris or other operational space stations through detailed and conscientious mission planning. In addition to reviewing the existing on-orbit operational satellites near 119° W.L. (Direct-7S and Echostar-7 are currrently operating from 119° W.L.) SPECTRUM FIVE has also reviewed the list of licensed systems and systems that are under consideration by the Commission near (within +-0.2°)

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the nominal 119° W.L. orbital location it has requested. In addition, in order to address non-U.S. licensed systems, SPECTRUM FIVE has reviewed the list of satellite networks in the vicinity of 119° W.L. for which a request for coordination has been submitted to the ITU. Only those networks that are operating, or are planned to be operating, within ± 0.4

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° have been taken into account in this review.

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As a consequence of this review, it has been determined that aside from US DBS satellites operating at 118.8° W.L., 119.0° W.L., and 119.2° W.L.,