Exhibit A

TECHNICAL NARRATIVE

(Response to Form 312 Question 43)

CONTENTS

Section **Page**

1 - GENERAL SYSTEM DESCRIPTION

BSSNET2A-111W will consist of a geostationary satellite located at the110.9° W.L. orbital location and associated ground station equipment. Since this orbital location is slightly off (0.1°) from the presumptive “on-grid” slot at 111° W.L. established in Appendix F of the *BSS R&O*[1] (an “Appendix F slot”), SPECTRUM FIVE proposes to operate at reduced power (which must be more than 0.28 dB due to the offset) and with reduced interference protection, as contemplated in Section 25.262(b) of the Commission’s rules.

BSSNET2A-111W 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 BSSNET2A-111W satellite is capable of supporting 26 "17/24" uplink/downlink "national" transponders (13 LHCP and 13 RHCP channels of 26 MHz nominal bandwidth) providing coverage via a "CONUS+" national beam of all 50 states (CONUS, Alaska and Hawaii), and Puerto Rico. All national

---

[1] *See Establishment of Policies and Service Rules for the Broadcasting Satellite Service at the 17.3-17.7 GHz Frequency Band and at the 17.7-17.8 GHz Frequency Band Internationally, and at the 24.75-25.25 GHz Frequency Band for Fixed Satellite Services Providing Feeder Links to the Broadcasting-Satellite Service and for the Satellite Services Operating Bi-directionally in the 17.3-17.8 GHz Frequency Band, 22 FCC Rcd. 8842 (2007) (“BSS R&O”).*

programming material will be aggregated and uplinked from the SPECTRUM FIVE broadcast center to be located in the Southwest U.S.

The available 400 MHz of spectrum in CONUS on the downlink will be channelized into 26 transponders (13 channels for each polarization) of 26 MHz nominal bandwidth each, with 29.16 MHz spacing between co-polar channel center frequencies. The cross-polar transponders are not offset relative to the co-polar ones in order to provide the maximum utilization of the operating bandwidth. The uplink is also channelized into 26 transponders (13 channels for each polarization) of 26 MHz nominal bandwidth for each polarization, with 29.16 MHz spacing between channel center frequencies. The national broadcast uplink will use the corresponding lowest 400 MHz in the 24.75-25.25 GHz band for distribution of national channels. Full frequency use of both the uplink and downlink spectrum is achieved through the use of the two orthogonal circular polarizations.

2 - SPACE SYSTEM OPERATING CHARACTERISTICS

2.1 FREQUENCY AND POLARIZATION PLAN

Table 2-1 shows the frequency and polarization plan of the BSSNET2A-111W satellite, including the on-station command and TT&C bands for Telemetry and Command. National programming is broadcast using 400 MHz of each polarization, with a frequency translation of 7,450 MHz between the uplink and downlink center frequencies.

Transponder Channel	DL Freq (MHz) LCP	UL Freq (MHz) RCP	Transponder Channel	DL Freq (MHz) RCP	UL Freq (MHz) LCP
Command 1		24,753.00			
Command 2		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
			Telemetry 1	17,303.00	
			Telemetry 2	17,306.00	

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

Table 2-2 below illustrates the connection of each national programming uplink channel to its corresponding downlink channel.

As can be seen from Table 2-1 and Table 2-2, the sixteen transponders that support national coverage are frequency translated from the 24.75-25.15 GHz satellite receive band by 7,450 MHz for re-transmission in the 17.3-17.7 GHz downlink band.

2.2 COMMUNICATIONS PAYLOAD

2.2.1 Transponder Channel Characteristics - Uplink Antennas and Channel Filters

The maximum receive antenna gain, receive system noise temperature, and maximum G/T of the BSSNET2A-111W satellite are specified in the accompanying Schedule S.

Table 2-2. BSSNET2A-111W CONUS+ Coverage Uplink/Downlink Interconnection

Downlink Channel	Freq (MHz)	Downlink Polarization		Uplink Channel	Freq (MHz)	Uplink Polarization	Shift (MHz)
1,2	17,325.00	LCP,RCP		1,2	24,775.00	RCP,LCP	7,450.00
3,4	17,354.16	LCP,RCP		2,4	24,804.16	RCP,LCP	7,450.00
5,6	17,383.32	LCP,RCP		5,6	24,833.32	RCP,LCP	7,450.00
7,8	17,412.48	LCP,RCP		7,8	24,862.48	RCP,LCP	7,450.00
9,10	17,441.64	LCP,RCP		9,10	24,891.64	RCP,LCP	7,450.00

BSSNET2A-111W employs 1.1m diameter uplink receive antennas with a gain of 47.0 dB and a receive G/T of 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. BSSNET2A-111W 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 Downlink Channel Characteristics

The national coverage downlink beam uses "dual" combined output amplifiers (TWTAs) with power amplifier output power of 150 Watts (300 Watts combined). This produces a maximum EIRP in CONUS of 60.2 dBW in the South Florida area. The resultant output power from each of these 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 Transp ERP (dBW)
CONUS⁺ Beam	23.1	300.0	1.7	37.1	60.2

Table 2-4. TWT Powers and ERPs

2.2.3 Transmit Beams and Antennas

2.2.3.1 CONUS+ Beam

BSSNET2A-111W will employ a dual 2.6m diameter multiple-beam transmit antenna system for 17/24 GHz BSS service to provide U.S. national coverage (the CONUS+ beam), and Puerto Rico. The CONUS+ beam will be capable of transmitting across the frequency band 17.3-17.7 GHz using both LCP and RCP. The peak transmit gain of the CONUS+ beam is 37.1dB, and the antenna gain contour of the two polarization beams in GXT format, are given in the accompanying Schedule S. The gain contours for the CONUS+ beam is also graphically depicted in Figure 2-1 below.

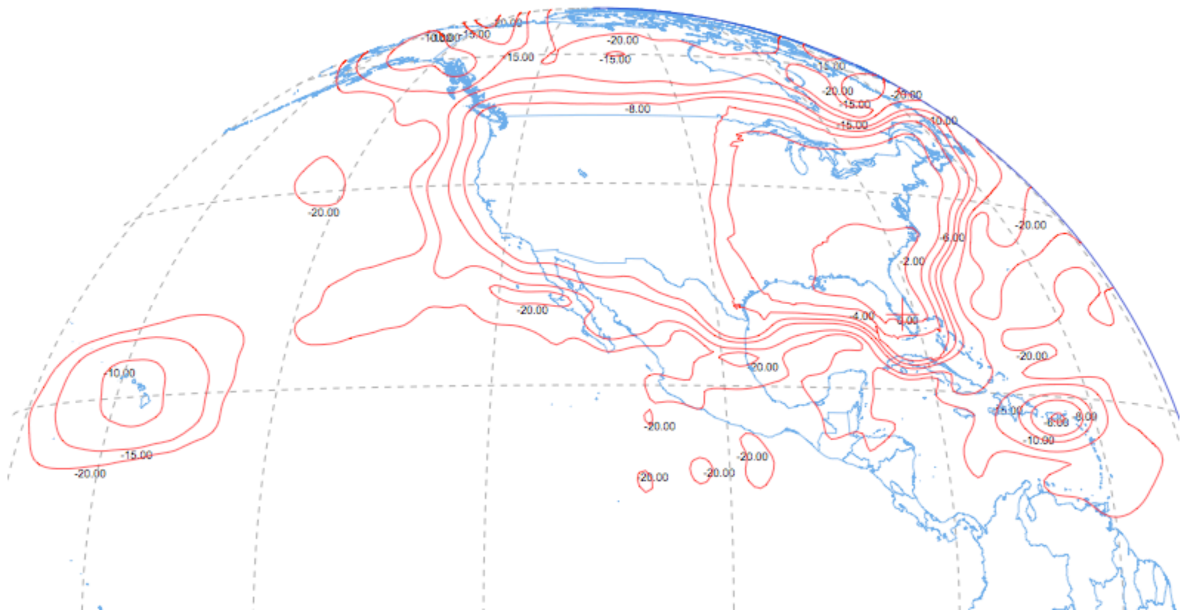

Figure 2-1. CONUS+ Antenna Gain Contours

2.3 TELEMETRY, TRACKING & COMMAND (TT&C) SUBSYSTEM

2.3.1 Command Subsystem

The satellite command function receives, demodulates, processes, decodes, and executes commands. Command signals from the TT&C control center are received via a dual antenna system: (1) a narrow beam antenna located in the Southwest U.S, for GSO operation, and (2) an omni antenna for transfer orbit operations. The outputs of this system are cross-strapped to dual command decoders. The command system performance is given in Tables 2-7 and 2-8.

Parameter	Performance
Modulation	PCM/PSK/FM
Carrier Deviation	± 400 kHz
Command Sub-Carrier Frequency	16 kHz
Bit Rate	≥250 bits per second
Telemetry Verification	Each command verified via telemetry prior to execution
Polarization	RHCP

Table 2-7. Command Subsystem Performance

Parameter	Performance
Frequency Receiver #1 Receiver #2	 24,753 MHz 24,755 MHz
Polarization	RHCP
Carrier Modulation	FM, deviation ±400 kHz
Baseband	16 kHz subcarrier or ranging tones
Dynamic Range	≥ 52 dB
Ranging	Routed to the associated telemetry transmitter on command for turn-around ranging operations

Table 2-8. Command Subsystem Receiver Performance

2.3.2 Telemetry Subsystem

Two redundant telemetry signals can be transmitted from the satellite, with routing of either or both of these signals through the CONUS+ antenna for nominal GSO operation, or through an omni antenna for transfer orbit operations. The telemetry subsystem also includes a ranging mode with multiple ranging tones that can be modulated onto the uplink command carrier, demodulated by the satellite command receiving subsystem, and re-modulated and transmitted to the control facility via the downlink telemetry carriers. The telemetry subsystem performance requirements are summarized in Tables 2-9 and 2-10. Each satellite shall have a unique telemetry address assigned and transmitted in each frame.

Parameter	Performance
Data Word Size	8 bits
Frame Format	256 Words per Frame, 32 Minor Frames
Bit Rate	4800 bits per second
Carrier Stability	≤ ±10 PPM
Subcarrier Stability	≤ =/- 30 ppm
Output Data:	
Nominal Telemetry	Bi-Phase L on 48 kHz Subcarrier
Dwell Telemetry	Bi-Phase L on 72 kHz Subcarrier
Polarization	RHCP

Table 2-9 Telemetry Subsystem Performance

Parameter	Performance
Frequency Transmitter #1 Transmitter #2	 17,303 MHz 17,306 MHz
Modulation Characteristics Type Indices	 Phase 1.0 radian, peak, for single subcarrier 0.7 radians per subcarrier for 2 subcarriers 0.6 radians per subcarrier for 3 subcarriers
Control Functions	Transmitter On/Off Ranging Modulation On/Off Telemetry Modulation On/Off
EIRP Omni (Transfer Orbit) CONUS+ Beam (GSO)	 > 0 dBW > 12 dBW
Spurious Outputs	-62 dBc in-band (excluding DC/DC converter frequencies, < -50 dBc out-of-band
Stability	< 2.0 dB, P-P, over life

Table 2-10 Telemetry Subsystem RF Performance

2.3.3 Link Margins for GSO Operation

The key parameters for the command and telemetry links in normal GSO operation are shown in Appendix B and in the attached Schedule S.

3 - SERVICES

SPECTRUM FIVE will use the BSSNET2A-111W satellite to retransmit digital video and audio entertainment, educational and informational programming to subscribers throughout the United States, including Alaska, Hawaii, and the Puerto Rico.

4 - LINK ANALYSIS

Representative communication link budgets for the BSSNET2A-111W satellite are shown in Appendix A (Tables A-1 to A-4). 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 (Hawaii). These budgets include an entry for adjacent satellite interference ("ASI") from neighboring 17/24 GHz BSS satellites nominally spaced at -8.1°, -4.1, +3.9°, and +7.9° relative to BSSNET2A-111W at 110.9°. The link budgets also take into account station keeping accuracies of +- 0.05° for both satellites which reduces the worst case spacing by 0.1°.

SPECTRUM FIVE will utilize station antennas with equivalent circular diameter in the 65 cm range, providing shows availability exceeding 99.7% over a majority of CONUS, and > 99.5% throughout CONUS when operating the link with a high spectral efficiency modulation scheme. Outside CONUS, a slightly larger antenna may be used. This includes the effects of adjacent satellites operating at maximum power per Commission rules at the four locations discussed above.

5 - EARTH STATIONS

There are three types of earth stations to be used with the BSSNET2A-111W satellite: subscriber terminals with small antennas (45-65cm), large feeder-link stations using for uplinking the video content (9m), and a large TT&C station antenna (9m). Subscriber terminals for reception outside CONUS may need to be somewhat larger, typically 1 meter.

6 - SATELLITE ORBIT CHARACTERISTICS

The BSSNET2A-111W satellite will be maintained in geosynchronous orbit at the 110.9° 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

7.1 CONUS+ OPERATION (NATIONAL BEAMS)

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:

1. 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;

2. 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;

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

4. 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 BSSNET2A-111W will be 60.2 dBW / 25.8 MHz channel. The maximum power flux density/MHz on the Earth's surface from this emission is calculated as follows:

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

where the bandwidth factor BW(dB) corresponds to the allocated bandwidth of the 8PSK downlink emissions for a transponder (25.8 MHz). The maximum EIRP of 60.2 dBW for the CONUS+ beam occurs in South Florida. The maximum allowed PFD in this region for "non-offset" operation is -111.0 dBW/m^2/MHz. This would allow a maximum ERP value of (-111.0 + 162.4 + 10*log(25.8) -0.28dB) = 61.2 dBW for a slot with an offset of 0.1° from the 111° WL grid location. The maximum EIRP of BSSNET2A-111W is 60.2 dBW, well below the FCC maximum value for the offset slot at 110.9° West Longitude.

As discussed in Section 2.2.3.1 above, the downlink national beam antenna gain pattern for BSSNET2A-111W 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 within CONUS defined in the Commission’s rules.

7.2 PFD VALUES OUTSIDE CONUS

Schedule S requires a presentation of PFD maximum values at low elevation angles. These values may be conservatively calculated by using the maximum ERP for the CONUS+ beam and calculating the spreading loss at each elevation angle, as shown in Table 7-1 below. In all cases the maximum PFD values are below the required -115.0 dBW/m^2/MHz limit for operation outside CONUS with elevation angles between 0° and 25°.

25M8G7W (US CONUS+ Beam)						
Elevation Angle (deg)	**0**	**5**	**10**	**15**	**20**	**25**
Peak EIRP (dBW)	**60.2**	**60.2**	**60.2**	**60.2**	**60.2**	**60.2**
Spreading Loss (dB)	**163.4**	**163.3**	**163.2**	**163**	**162.9**	**162.8**
Occupied BW (MHz)	**25.8**	**25.8**	**25.8**	**25.8**	**25.8**	**25.8**
Density (dBW/m2/MHz)	**-117.3**	**-117.2**	**-117.1**	**-116.9**	**-116.8**	**-116.7**
(dBW/m2/MHz)	**-115**	**-115**	**-115**	**-115**	**-115**	**-115**
Margin (dB)	**2.3**	**2.2**	**2.1**	**1.9**	**1.8**	**1.7**

Table 7-1. Maximum PFD Outside CONUS at Low Elevation Angles

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 BSSNET2A-111W satellite. Accordingly, the payload envelope has been estimated to allow more than one spacecraft currently available with extensive heritage and fully qualified technology to serve as the design platform. SPECTRUM FIVE anticipates that the key spacecraft characteristics for BSSNET2A-111W are as summarized in the appropriate sections of the accompanying Schedule S.

9 - SPACECRAFT BUS SUBSYSTEM

As discussed above, SPECTRUM FIVE has not yet contracted with a manufacturer for the construction of the BSSNET2A-111W 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 one a final spacecraft design has been adopted.

10 - SCHEDULE

SPECTRUM FIVE will contract for, begin construction of, and launch and operate BSSNET2A-111W in accordance with the milestones specified in Section 25.164(a) of the Commission's rules.

11 - INTERFERENCE ANALYSIS

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.

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 (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-4 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 "on-grid" at -8.0°, -4.0.°, +4.0°, and +8.0° relative to BSSNET2A-111W (located at 110.9°) to account for station keeping in evaluating whether the system accommodates the various data rates at acceptable C/(N+I) thresholds. The adjacent satellite interference calculated (including +-0.05° station-keeping of the interfering satellites) demonstrates that the BSSNET2A-111W 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

12 - ORBITAL DEBRIS MITIGATION

12.1 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, BSSNET2A-111W, 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 both operators and the SOCs of neighboring satellites.

12.2 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.

12.3 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.

12.4 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.

12.5 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.

13 - SAFE FLIGHT PROFILES

SPECTRUM FIVE will assess and limit the probability of BSSNET2A-111W 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 or near-operational near 111° W.L. (Anik-F2 at 111.1° W.L., Terrastar-1 at 111.0 W.L., and Wild Blue at 111.1 W.L.) SPECTRUM FIVE has also reviewed the list of licensed systems and systems that are under consideration by the Commission near (within +-0.4°) the nominal 111.0° W.L. orbital location it has requested. No existing operational systems would operate within +-0.05 degrees of 111.0.

The ITU has also published requests for coordination for the following satellite networks:

- CANSAT-BSS51 at 111.1° W.L. (Canada)
- CAN-BSS52(111.1W) at 111.1 W.L.
- LUX-G6-40 at 111.1° W.L. (Luxemburg)

SPECTRUM FIVE can find no evidence that satellite construction contracts have been awarded for any of these networks, nor does the most recently available Federal Aviation Administration Commercial Space Station Report show any pending satellite launches for these networks

Given the current absence of a construction contract for BSSNET2A-111W, it is difficult to assess what future satellites will actually be operating at the nominal 111.0° W.L. position at the time that the satellite is to be launched. As such, SPECTRUM FIVE will certainly revisit this issue once a satellite construction contract is in place. However, it does appear at this time that there will not be a need for physical coordination with other satellite systems at the nominal 111.0° W.L .

14 - POST-MISSION DISPOSAL

Consistent with the requirements of Section 25.283(a) of the Commission's rules, at the end of the operational life of the satellite, SPECTRUM FIVE will maneuver BSSNET2A-111W into a disposal orbit with an altitude no less than that calculated using the IADC formula:

$$36{,}021 \text{ km} + (1000 \cdot C_R \cdot A/m).$$

SPECTRUM FIVE anticipates that, once the satellite's actual characteristics have been determined, this calculation will lead to a disposal orbit with a minimum perigee of somewhat less than 300 km above the normal GSO operational orbit. Accordingly, SPECTRUM FIVE currently anticipates that it will maneuver BSSNET2A-111W to an altitude 300 km above GSO orbit at the end of its operational life, which should provide additional margin above the results of the IADC formula.

SPECTRUM FIVE currently intends to allocate and reserve approximately 10 kg of propellant for final orbit raising maneuvers to this altitude. In addition, SPECTRUM FIVE has assessed fuel gauging uncertainty and this budgeted propellant provides an adequate margin of fuel reserve to ensure that the disposal orbit will be achieved despite such uncertainty.

14 - CONCLUSION

The proposed space station will provide SPECTRUM FIVE with a highly capable 17/24 GHz BSS satellite that will enhance its ability to provide high quality multichannel video service to millions of Americans. For these reasons, SPECTRUM FIVE submits that the proposed satellite will serve the public interest and respectfully requests that the Commission expeditiously grant this request

Respectfully submitted,

SPECTRUM FIVE LLC

____

By: /s/

Dr. Thomas E. Sharon

COO

APPENDIX A - SERVICE CHANNELS LINK BUDGETS

Downlink :	LA			CONUS		99.9%	
Satellite Location:	110.9	WL					
Uplink		**Clear**	**Rain**	**Downlink**		**Clear**	**Rain**
UL Freq	GHz	25.0	25.0	DL Freq	GHz	17.5	17.5
ES Ant Dia	m	9.0	9.0	ES Ant Dia	inches	26.0	26.0
ES Ant Gain	dBW	65.2	65.2	Satellite EIRP	dBW	52.6	52.6
ES Tx Power w/ -3dB OBO	dBW	7.4	13.8	ES ptg loss	dB	-0.2	-0.2
ES Output Losses	dBW	1.2	1.2	Free space loss	dB	208.7	208.7
ES ptg loss	dB	0.5	0.5	Atmos/Scint loss	dB	0.5	0.5
ES EIRP	dBW	70.9	77.3	Rain & Other loss	dB	0.0	3.1
Free space loss	dB	211.8	211.8	Wetting loss	dB	0.0	0.5
Sat G/T	dB/K	17.5	17.5	Total loss	dB	0.5	4.2
Atmospheric+Rain Losses	dB	2.0	8.3	ES G/T	dB/K	18.0	15.3
Bandwidth	dB-Hz	73.4	73.4	Bandwidth	dB-Hz	73.4	73.4
C/N (thermal)	dB	29.3	29.4	C/N (thermal)	dB	16.4	10.0
UL Spot Beam Interf C/I	dB	60.0	60.0	DL Spot Beam Interf	dB	50.0	50.0
Adj Carr Interf C/I	dB	30.0	30.0	Adj Carr Interf	dB	30.0	30.0
Adj Sat Interf C/I	dB	49.3	49.3	Adj Sat Interf	dB	23.1	23.1
Cross Pol, NPR C/I	dB	25.0	25.0	Cross Pol	dB	25.0	25.0
Total UL C/I	dB	23.8	23.8	Total DL C/I	dB	20.4	20.4

SUMMARY

Clear			Rain		
UL C/N (thermal)	dB	29.3	UL C/N (thermal)	dB	29.4
DL C/N (thermal)	dB	16.4	DL C/N (thermal)	dB	10.0
Total UL C/I	dB	23.8	Total UL C/I	dB	23.8
Total DL C/I	dB	20.4	Total DL C/I	dB	20.4
Total C/(N+I)	dB	10.1	Total C/(N+I)	dB	9.4
Req'd C/(N+I)	dB	7.5	Req'd C/(N+I)	dB	7.5

Table A-1

Downlink :	New York			CONUS		99.7%	
Satellite Location:	110.9 WL						
Uplink		**Clear**	**Rain**	**Downlink**		**Clear**	**Rain**
UL Freq	GHz	25.0	25.0	DL Freq	GHz	17.5	17.5
ES Ant Dia	m	9.0	9.0	ES Ant Dia	inches	26.0	26.0
ES Ant Gain	dBW	65.2	65.2	Satellite EIRP	dBW	57.2	57.2
ES Tx Power w/ -3dB OBO	dBW	7.4	13.8	ES ptg loss	dB	-0.2	-0.2
ES Output Losses	dBW	1.2	1.2	Free space loss	dB	209.1	209.1
ES ptg loss	dB	0.5	0.5	Atmos/Scint loss	dB	0.7	0.7
ES EIRP	dBW	70.9	77.3	Rain & Other loss	dB	0.0	3.1
Free space loss	dB	211.8	211.8	Wetting loss	dB	0.0	0.5
Sat G/T	dB/K	17.5	17.5	Total loss	dB	0.7	4.3
Atmospheric+Rain Losses	dB	2.0	8.3	ES G/T	dB/K	18.0	14.7
Bandwidth	dB-Hz	73.4	73.4	Bandwidth	dB-Hz	73.4	73.4
C/N (thermal)	dB	29.3	29.4	C/N (thermal)	dB	20.4	11.8
UL Spot Beam Interf C/I	dB	60.0	60.0	DL Spot Beam Interf	dB	50.0	50.0
Adj Carr Interf C/I	dB	30.0	30.0	Adj Carr Interf	dB	30.0	30.0
Adj Sat Interf C/I	dB	49.3	49.3	Adj Sat Interf	dB	23.1	23.1
Cross Pol, NPR C/I	dB	25.0	25.0	Cross Pol	dB	25.0	25.0
Total UL C/I	dB	23.8	23.8	Total DL C/I	dB	20.4	20.4

SUMMARY

Clear			**Rain**		
UL C/N (thermal)	dB	29.3	UL C/N (thermal)	dB	29.4
DL C/N (thermal)	dB	20.4	DL C/N (thermal)	dB	11.8
Total UL C/I	dB	23.8	Total UL C/I	dB	23.8
Total DL C/I	dB	20.4	Total DL C/I	dB	20.4
Total C/(N+I)	dB	16.4	Total C/(N+I)	dB	11.0
Req'd C/(N+I)	dB	7.5	Req'd C/(N+I)	dB	7.5

Table A-2

Downlink :	ORLANDO	CONUS	99.5%
Satellite Location:	110.9 WL		

Uplink		Clear	Rain	Downlink		Clear	Rain
UL Freq	GHz	25.0	25.0	DL Freq	GHz	17.5	17.5
ES Ant Dia	m	9.0	9.0	ES Ant Dia	inches	26.0	26.0
ES Ant Gain	dBW	65.2	65.2	Satellite EIRP	dBW	59.2	59.2
ES Tx Power w/ -3dB OBO	dBW	7.4	13.6	ES ptg loss	dB	-0.2	-0.2
ES Output Losses	dBW	1.2	1.2	Free space loss	dB	208.8	208.8
ES ptg loss	dB	0.5	0.5	Atmos/Scint loss	dB	0.6	0.6
ES EIRP	dBW	70.9	77.1	Rain & Other loss	dB	0.0	6.2
Free space loss	dB	211.8	211.8	Wetting loss	dB	0.0	0.5
Sat G/T	dB/K	17.5	17.5	Total loss	dB	0.6	7.3
Atmospheric+Rain Losses	dB	2.0	8.3	ES G/T	dB/K	18.0	14.4
Bandwidth	dB-Hz	73.4	73.4	Bandwidth	dB-Hz	73.4	73.4
C/N (thermal)	dB	29.2	29.2	C/N (thermal)	dB	22.8	12.4
UL Spot Beam Interf C/I	dB	60.0	60.0	DL Spot Beam Interf	dB	50.0	50.0
Adj Carr Interf C/I	dB	30.0	30.0	Adj Carr Interf	dB	30.0	30.0
Adj Sat Interf C/I	dB	49.2	49.2	Adj Sat Interf	dB	23.2	23.2
Cross Pol, NPR C/I	dB	25.0	25.0	Cross Pol	dB	25.0	25.0
Total UL C/I	dB	23.8	23.8	Total DL C/I	dB	20.5	20.5

SUMMARY

Clear			Rain		
UL C/N (thermal)	dB	29.2	UL C/N (thermal)	dB	29.2
DL C/N (thermal)	dB	22.8	DL C/N (thermal)	dB	12.4
Total UL C/I	dB	23.8	Total UL C/I	dB	23.8
Total DL C/I	dB	20.5	Total DL C/I	dB	20.5
Total C/(N+I)	dB	17.2	Total C/(N+I)	dB	11.4
Req'd C/(N+I)	dB	7.5	Req'd C/(N+I)	dB	7.5

Table A-3

Downlink :	Hawaii			CONUS			99.0%
Satellite Location:	110.9 WL						

Uplink		Clear	Rain	Downlink		Clear	Rain
UL Freq	GHz	25.8	25.8	DL Freq	GHz	17.5	17.5
ES Ant Dia	m	65.2	65.2	ES Ant Dia	inches	36.0	36.0
ES Ant Gain	dBW	0.1	0.1	Satellite EIRP	dBW	50.2	50.2
ES Tx Power w/ -3dB OBO	dBW	7.4	13.6	ES ptg loss	dB	-0.2	-0.2
ES Output Losses	dBW	1.2	1.2	Free space loss	dB	208.9	208.9
ES ptg loss	dB	0.5	0.5	Atmos/Scint loss	dB	0.7	0.7
ES EIRP	dBW	70.9	77.1	Rain & Other loss	dB	0.0	3.3
Free space loss	dB	211.8	211.8	Wetting loss	dB	0.0	0.5
Sat G/T	dB/K	17.5	17.5	Total loss	dB	0.7	4.5
Atmospheric+Rain Losses	dB	2.0	8.3	ES G/T	dB/K	20.9	17.6
Bandwidth	dB-Hz	73.4	73.4	Bandwidth	dB-Hz	73.4	73.4
C/N (thermal)	dB	29.4	29.4	C/N (thermal)	dB	16.3	7.9
UL Spot Beam Interf C/I	dB	60.0	60.0	DL Spot Beam Interf	dB	50.0	50.0
Adj Carr Interf C/I	dB	30.0	30.0	Adj Carr Interf	dB	30.0	30.0
Adj Sat Interf C/I	dB	49.2	49.2	Adj Sat Interf	dB	25.9	25.9
Cross Pol, NPR C/I	dB	25.0	25.0	Cross Pol	dB	25.0	25.0
Total UL C/I	dB	23.8	23.8	Total DL C/I	dB	21.7	21.7

SUMMARY

Clear			Rain		
UL C/N (thermal)	dB	29.4	UL C/N (thermal)	dB	29.4
DL C/N (thermal)	dB	16.3	DL C/N (thermal)	dB	7.9
Total UL C/I	dB	23.8	Total UL C/I	dB	23.8
Total DL C/I	dB	21.7	Total DL C/I	dB	21.7
Total C/(N+I)	dB	14.5	Total C/(N+I)	dB	7.6
Req'd C/(N+I)	dB	7.5	Req'd C/(N+I)	dB	7.5

Table A-4

APPENDIX B - TT&C (ON-STATION) LINK BUDGETS

TELEMETRY LINK MARGIN

SPACE STATION to LA TT&C CENTER	GSO CONUS+
SS Tx Power, dBW	-8.0
OBO	-3.0
Output Loss, dB	-2.0
SS Tx Pwr, dBW	-13.0
SS Tx Pwr, W	0.05
SS Peak Antenna Gain, dBi	28.7
SS Tx EIRP, dBW	15.7
Pointing Loss, dB	-0.5
Eirp, dBW	15.2
Pwr Density, dBW/Hz	-72.0
Spreading Loss, dB	-163.05
PFD, dBW/m^2/MHz,	-148.2
Space Loss, dB	-209.3
Ptg Loss, dB	-0.5
Rain & Atmos Atten, dB, 99.9%	-3.4
Total Loss, dB	-213.2
ES Dia, m	9.0
ES Gain, dB	61.2
ES Rx Temp, deg K	100.0
G/T, peak, dB/K	41.2
C/T, dB/K, Clear	-156.2
Bandwidth,MHz, dB	-1.0
DL C/I, dB (obj)	25.0
DL C/N, dB	13.3
DL C/N+I, dB	13.1
DL C/N (req), dB	10.0
Margin, dB	3.1

Common Parameters	
Freq, GHz	17.30
Wavelength, in	0.68
Bandwidth,MHz	0.80
Bandwidth,dB-Hz	59.03
Slant Range,kM	40,100

TABLE B-1

COMMAND LINK LINK MARGIN

LA TO SPACE STATION	GSO Clear	GSO Rain
ES Transmitter Power,per ch, dBW	30.0	30.0
OBO	-23.0	-4.0
Output Loss, dB	-1.5	-1.5
ES Tx Pwr, dBW	5.5	24.5
ES Tx Pwr, W	3.5	281.8
ES Antenna, meters	9.0	9.0
ES Peak Antenna Gain, dBi	64.4	64.4
ES Tx EIRP, dBW	69.9	88.9
Pointing Loss, dB	-0.5	-0.5
Eirp, dBW	69.4	88.4
Pwr Density, dBW/Hz	-53.5	-34.5
SFD, dBW/m^2,	-83.7	-83.7
Space Loss, dB	-212.4	-212.4
Ptg Loss, dB	-0.5	-0.5
Rain & Atmos Atten, dB, 99.99%	-1.0	-20.0
Total Loss, dB	-212.9	-232.9
G/T, peak, dBi/K	18.7	18.7
Sat. Temp., K	28.1	28.1
Sat Antenna Gain, 1m, dBi	47.7	47.7
C/T, dB/K	-124.3	-125.3
Bandwidth,MHz, dB	-1.0	-1.0
Uplink C/I, dB	50.0	50.0
Uplink CNR, dB	45.2	44.2
Uplink C/N+I, dB	44.0	43.2
Sat Received Signal, dBW	-95.8	-96.8
Rx Losses, dB	-20.0	-20.0
Input to RX, dBm	-85.8	-86.8

Common Parameters	
Freq, GHz	24.75
Wavelength, in	0.48
Bandwidth,MHz	0.80
Bandwidth,dB-I	59.03
Slant Range,kM	40,100

TABLE B-2