

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS

			CLRSKY	DEGRADED	
Carrier	Carrier Type		24MG7W	24MG7W	
	Modulation		QPSK	QPSK	
	Info Rate	Mbit/s	26.65	26.65	
	FEC:		0.67	0.67	
	Noise BW:	MHz	19.988	19.988	
	C/N required	dB	4.1	4.1	
	Total Link Availability	%		99.80	
S/C Loc	Longitude	deg	-99.10	-99.10	
Beam Polarization Frequency	Uplink Beam Name		NRF	NRF	
	Polarization (H, V or, C)		C	C	
	Uplink Frequency	GHz	25	25	
	Downlink Beam Name		NTF	NTF	
TX ES	Polarization (H, V or, C)		C	C	
	Downlink Frequency	GHz	17	17	
	Rain rate exceeded for 0.01% of the year	mm/h	40	40	
	E/S Elevation angle	deg	30.0	30.0	
RX ES	E/S size	m	9.00	9.00	
	Transmit E/S peak gain (Eff=0.6)	dB	66.2	66.2	
	Rain rate exceeded for 0.01% of the year	mm/h	40	40	
	E/S Elevation angle	deg	30.0	30.0	
Uplink Thermal	E/S size	m	0.65	0.65	
	Receive E/S peak gain (Eff=0.6)	dB	39.3	39.3	
	Receive Earth Station G/T	dB/K	16.2	13.5	
	Carrier eirp	dBW	79.2	92.6	
	Uplink PSD	dBW/Hz	-59.0	-45.6	
	Transponder SFD (Beam Peak)	dBW/m2	-86.0	-86.0	
	Input Backoff	dB	0.0	0.0	
	Uplink Path Loss, clear sky	dB	212.7	212.7	
	Uplink gaseous attenuation	dB	0.2	1.3	
	Uplink rain attenuation	dB	0.0	13.4	
Downlink Thermal	Satellite G/T (Beam Peak)	dB/K	6.5	6.5	
	Antenna relative gain towards E/S	dB	-2.0	-2.0	
	C/N thermal uplink	dB	28.5	25.4	
	S/C saturated EIRP (Beam Peak)	dBW	54.0	54.0	
	Carrier Output backoff	dB	0.0	0.0	
	Antenna relative gain towards Earth Station	dB	-2.0	-2.0	
	Carrier EIRP towards Earth Station	dBW	52.0	52.0	
	Downlink Path Loss, clear sky	dB	209.3	209.3	
	Downlink gaseous attenuation	dB	0.1	0.4	
	Downlink rain attenuation	dB	0.0	3.8	
ASI	Antenna Pointing error	dB	-0.3	-0.3	
	Receive Earth Station G/T	dB/K	16.2	13.5	
	C/N thermal downlink	dB	14.0	7.2	
	PFD at Beam Peak	dBW/m2/MHz	-122.0	-122.0	
	Other	C/I (Intra-System Interference)	dB	25.0	25.0
	ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
		Geocentric Separation (w/station keeping)	deg	4.10	4.10
		Interfering Uplink power density	dBW/Hz	-58.5	-58.5
		Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
		C/I ASI uplink	dB	49.8	63.2
C/I ASI downlink (w/Rx antenna pointing error)		dB	16.7	16.7	
Orbital Location for interfering S/C #2		deg	-103.00	-103.00	
Geocentric Separation (w/station keeping)		deg	3.80	3.80	
Interfering Uplink power density		dBW/Hz	-58.5	-58.5	
Interfering D/L eirp density		dBW/Hz	-12.0	-12.0	
Total	C/I ASI uplink	dB	49.3	62.6	
	C/I ASI downlink (w/Rx antenna pointing error)	dB	15.8	15.8	
System Margin	C/(N+I)	dB	10.3	6.1	
	System Margin	dB	6.2	2.0	

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		380KG7W	380KG7W
	Modulation		BPSK	BPSK
	Info Rate	Mbit/s	0.128	0.128
	FEC:		0.50	0.50
	Noise BW:	MHz	0.286	0.286
	C/N required	dB	2.7	2.7
	Total Link Availability	%		99.60
S/C Loc	Longitude	deg	-99.10	-99.10
Beam Polarization Frequency	Uplink Beam Name		NRF	NRF
	Polarization (H, V or, C)		C	C
	Uplink Frequency	GHz	25	25
	Downlink Beam Name		NTF	NTF
	Polarization (H, V or, C)		C	C
	Downlink Frequency	GHz	17	17
TX ES	Rain rate exceeded for 0.01% of the year	mm/h	40	40
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	0.65	0.65
	Transmit E/S peak gain (Eff=0.65)	dB	42.8	42.8
RX ES	Rain rate exceeded for 0.01% of the year	mm/h	40	40
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	9.00	9.00
	Receive E/S peak gain (Eff=0.6)	dB	62.2	62.2
	Receive Earth Station G/T	dB/K	39.0	38.1
Uplink Thermal	Carrier eirp	dBW	40.0	49.7
	Uplink PSD	dBW/Hz	-57.0	-48.3
	Transponder SFD (Beam Peak)	dBW/m2	-99.0	-99.0
	Input Backoff	dB	-26.2	-26.2
	Uplink Path Loss, clear sky	dB	212.7	212.7
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	8.7
	Satellite G/T (Beam Peak)	dB/K	6.5	6.5
	Antenna relative gain towards E/S	dB	-2.0	-2.0
		C/N thermal uplink	dB	6.0
Downlink Thermal	S/C saturated EIRP (Beam Peak)	dBW	54.0	54.0
	Carrier Output backoff	dB	-24.3	-24.3
	Antenna relative gain towards Earth Station	dB	-2.0	-2.0
	Carrier EIRP towards Earth Station	dBW	27.7	27.7
	Downlink Path Loss, clear sky	dB	209.3	209.3
	Downlink gaseous attenuation	dB	0.1	0.4
	Downlink rain attenuation	dB	0.0	4.8
	Antenna Pointing error	dB	-0.3	-0.3
	Receive Earth Station G/T	dB/K	39.0	38.1
		C/N thermal downlink	dB	31.3
	PFD at Beam Peak	dBW/m2/MHz	-127.6	-127.6
Other	C/I (Intra-System Interference)	dB	20.0	20.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	29.3	36.1
	C/I ASI downlink (w/Rx antenna pointing error)	dB	34.8	34.8
	Orbital Location for interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	28.8	37.5
	C/I ASI downlink (w/Rx antenna pointing error)	dB	33.8	33.8
Total	C/(N+I)	dB	5.8	4.7
	System Margin	dB	3.1	2.0

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		24MG7W	24MG7W
	Modulation		QPSK	QPSK
	Info Rate	Mbit/s	28.65	28.65
	FEC:		0.87	0.87
	Noise BW:	MHz	19.988	19.988
	C/N required	dB	4.1	4.1
	Total Link Availability	%	99.60	99.60
S/C Loc	Longitude	deg	-99.10	-99.10
Beam Polarization Frequency	Uplink Beam Name		SRF	SRF
	Polarization (H, V or, C)		C	C
	Uplink Frequency	GHz	25	25
	Downlink Beam Name		STF	STF
TX ES	Polarization (H, V or, C)		C	C
	Downlink Frequency	GHz	17	17
	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
RX ES	E/S size	m	9.00	9.00
	Transmit E/S peak gain (Eff=0.8)	dB	65.2	65.2
	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
Uplink Thermal	E/S size	m	0.45	0.45
	Receive E/S peak gain (Eff=0.8)	dB	36.1	36.1
	Receive Earth Station G/T	dB/K	13.0	9.8
	Carrier eirp	dBW	79.2	64.0
Downlink Thermal	Uplink PSD	dBW/Hz	-59.0	-44.3
	Transponder SFD (Beam Peak)	dBW/m2	-86.0	-86.0
	Input Backoff	dB	0.0	0.0
	Uplink Path Loss, clear sky	dB	212.7	212.7
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	14.7
	Satellite G/T (Beam Peak)	dB/K	6.5	6.5
	Antenna relative gain towards E/S	dB	-2.0	-2.0
	C/N thermal uplink	dB	26.5	25.4
	S/C saturated EIRP (Beam Peak)	dBW	60.0	60.0
	Carrier Output backoff	dB	0.0	0.0
Antenna relative gain towards Earth Station	dB	-2.0	-2.0	
Carrier EIRP towards Earth Station	dBW	58.0	58.0	
Downlink Path Loss, clear sky	dB	209.3	209.3	
Downlink gaseous attenuation	dB	0.1	0.4	
Downlink rain attenuation	dB	0.0	6.5	
Antenna Pointing error	dB	-0.3	-0.3	
Receive Earth Station G/T	dB/K	13.0	9.8	
C/N thermal downlink	dB	16.9	6.8	
PFD at Beam Peak	dBW/m2/MHz	-116.0	-116.0	
Other	C/I (Intra-System Interference)	dB	25.0	25.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	49.9	64.6
	C/I ASI downlink (w/Rx antenna pointing error)	dB	18.1	18.1
	Orbital Location for interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
C/I ASI uplink	dB	49.3	64.0	
C/I ASI downlink (w/Rx antenna pointing error)	dB	18.2	18.2	
Total	C/(N+I)	dB	12.7	6.1
	System Margin	dB	8.6	2.0

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		380KG7W	380KG7W
	Modulation		BPSK	BPSK
	Info Rate	Mbit/s	0.128	0.128
	FEC:		0.50	0.50
	Noise BW:	MHz	0.288	0.288
	C/N required	dB	2.7	2.7
	Total Link Availability	%	99.80	99.80
S/C Loc	Longitude	deg	-99.10	-99.10
Beam Polarization Frequency	Uplink Beam Name		SRF	SRF
	Polarization (H, V or, C)		C	C
	Uplink Frequency	GHz	25	25
	Downlink Beam Name		STF	STF
	Polarization (H, V or, C)		C	C
	Downlink Frequency	GHz	17	17
TX ES	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	0.65	0.65
	Transmit E/S peak gain (Eff=0.85)	dB	42.8	42.8
RX ES	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	0.00	0.00
	Receive E/S peak gain (Eff=0.8)	dB	62.2	62.2
	Receive Earth Station G/T	dB/K	39.0	35.7
Uplink Thermal	Carrier eirp	dBW	40.0	52.8
	Uplink PSD	dBW/Hz	-57.0	-44.2
	Transponder SFD (Beam Peak)	dBW/m2	-99.0	-99.0
	Input Backoff	dB	-26.2	-26.2
	Uplink Path Loss, clear sky	dB	212.7	212.7
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	12.8
	Satellite G/T (Beam Peak)	dB/K	6.5	6.5
	Antenna relative gain towards E/S	dB	-2.0	-2.0
	C/N thermal uplink	dB	6.0	4.9
Downlink Thermal	S/C saturated EIRP (Beam Peak)	dBW	60.0	60.0
	Carrier Output backoff	dB	-24.3	-24.3
	Antenna relative gain towards Earth Station	dB	-2.0	-2.0
	Carrier EIRP towards Earth Station	dBW	33.7	33.7
	Downlink Path Loss, clear sky	dB	209.3	209.3
	Downlink gaseous attenuation	dB	0.1	0.4
	Downlink rain attenuation	dB	0.0	7.2
	Antenna Pointing error	dB	-0.3	-0.3
	Receive Earth Station G/T	dB/K	39.0	35.7
	C/N thermal downlink	dB	37.3	26.4
	PFD at Beam Peak	dBW/m2/MHz	-121.6	-121.6
Other	C/I (Intra-System Interference)	dB	20.0	20.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	29.3	42.2
	C/I ASI downlink (w/Rx antenna pointing error)	dB	40.6	40.6
	Orbital Location for interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	26.8	41.6
	C/I ASI downlink (w/Rx antenna pointing error)	dB	39.8	39.8
Total	C/(N+I)	dB	5.8	4.8
	System Margin	dB	3.1	2.1



## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED	
Carrier	Carrier Type		48MDG7W	48MDG7W	
	Modulation		8PSK	8PSK	
	Info Rate	Mbit/s	100	80	
	FEC:		0.83	0.67	
	Noise BW:	MHz	40.000	40.000	
	C/N required	dB	8.9	9.0	
Total Link Availability	%		99.50		
S/C Loc	Longitude	deg	-99.10	-99.10	
Beam	Uplink Beam Name		SPOT	SPOT	
	Polarization (H, V or, C)		C	C	
	Uplink Frequency	GHz	25	25	
	Downlink Beam Name		SPOT	SPOT	
Frequency	Polarization (H, V or, C)		C	C	
	Downlink Frequency	GHz	17	17	
	TX ES	Rain rate exceeded for 0.01% of the year	mm/h	80	80
		E/S Elevation angle	deg	30.0	30.0
	E/S size	m	9.00	9.00	
	Transmit E/S peak gain (Eff=0.6)	dB	65.2	65.2	
RX ES	Rain rate exceeded for 0.01% of the year	mm/h	80	80	
	E/S Elevation angle	deg	30.0	30.0	
	E/S size	m	0.75	0.75	
	Receive E/S peak gain (Eff=0.6)	dB	40.5	40.5	
	Receive Earth Station G/T	dB/K	17.4	14.1	
Uplink Thermal	Carrier eirp	dBW	73.2	68.4	
	Uplink PSD	dBW/Hz	-88.0	-52.8	
	Transponder SFD (Beam Peak)	dBW/m2	-90.0	-90.0	
	Input Backoff	dB	0.0	0.0	
	Uplink Path Loss, clear sky	dB	212.6	212.6	
	Uplink gaseous attenuation	dB	0.2	1.3	
	Uplink rain attenuation	dB	0.0	15.2	
	Satellite G/T (Beam Peak)	dB/K	16.5	16.5	
	Antenna relative gain towards E/S	dB	0.0	0.0	
	C/N thermal uplink	dB	29.5	28.4	
Downlink Thermal	S/C saturated EIRP (Beam Peak)	dBW	63.0	63.0	
	Carrier Output backoff	dB	0.0	0.0	
	Antenna relative gain towards Earth Station	dB	0.0	0.0	
	Carrier EIRP towards Earth Station	dBW	63.0	63.0	
	Downlink Path Loss, clear sky	dB	209.3	209.3	
	Downlink gaseous attenuation	dB	0.1	0.4	
	Downlink rain attenuation	dB	0.0	6.9	
	Antenna Pointing error	dB	-0.3	-0.3	
	Receive Earth Station G/T	dB/K	17.4	14.1	
	C/N thermal downlink	dB	23.2	12.8	
	PFD at Beam Peak	dBW/m2/MHz	-116.0	-116.0	
Other	C/I (Intra-System Interference)	dB	20.0	20.0	
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00	
	Geocentric Separation (w/station keeping)	deg	4.10	4.10	
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5	
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0	
	C/I ASI uplink	dB	40.8	58.0	
	C/I ASI downlink (w/Rx antenna pointing error)	dB	25.9	25.9	
	Orbital Location for Interfering S/C #2	deg	-103.00	-103.00	
	Geocentric Separation (w/station keeping)	deg	3.80	3.80	
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5	
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0	
C/I ASI uplink	dB	40.2	55.4		
C/I ASI downlink (w/Rx antenna pointing error)	dB	25.1	25.1		
Total	C/(N+I)	dB	16.8	11.8	
	System Margin	dB	7.8	2.0	

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		360KG7W	360KG7W
	Modulation		BPSK	BPSK
	Info Rate	Mbit/s	0.128	0.128
	FEC:		0.50	0.50
	Noise BW:	MHz	0.268	0.268
	C/N required	dB	2.7	2.7
	Total Link Availability	%	99.80	99.80
S/C Loc	Longitude	deg	-99.10	-99.10
Beam	Uplink Beam Name		SPOT	SPOT
	Polarization (H, V or, C)		C	C
Polarization	Uplink Frequency	GHz	25	25
	Downlink Beam Name		SPOT	SPOT
Frequency	Polarization (H, V or, C)		C	C
	Downlink Frequency	GHz	17	17
TX ES	Rain rate exceeded for 0.01% of the year	mm/h	80	80
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	0.45	0.45
	Transmit E/S peak gain (Eff=0.65)	dB	39.5	39.5
RX ES	Rain rate exceeded for 0.01% of the year	mm/h	80	80
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	9.00	9.00
	Receive E/S peak gain (Eff=0.6)	dB	62.1	62.1
	Receive Earth Station G/T	dB/K	38.9	35.5
Uplink Thermal	Carrier eirp	dBW	28.9	43.7
	Uplink PSD	dBW/Hz	-64.8	-50.1
	Transponder SFD (Beam Peak)	dBW/m2	-90.0	-90.0
	Input Backoff	dB	-44.3	-44.3
	Uplink Path Loss, clear sky	dB	212.6	212.6
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	14.8
	Satellite G/T (Beam Peak)	dB/K	16.5	16.5
	Antenna relative gain towards E/S	dB	0.0	0.0
	C/N thermal uplink	dB	7.0	5.9
Downlink Thermal	S/C saturated EIRP (Beam Peak)	dBW	63.0	63.0
	Carrier Output backoff	dB	-42.4	-42.4
	Antenna relative gain towards Earth Station	dB	0.0	0.0
	Carrier EIRP towards Earth Station	dBW	20.6	20.6
	Downlink Path Loss, clear sky	dB	209.3	209.3
	Downlink gaseous attenuation	dB	0.1	0.4
	Downlink rain attenuation	dB	0.0	8.5
	Antenna Pointing error	dB	-0.3	-0.3
	Receive Earth Station G/T	dB/K	38.9	35.5
	C/N thermal downlink	dB	24.2	11.9
	PFD at Beam Peak	dBW/m2/MHz	-136.6	-136.6
Other	C/I (Intra-System Interference)	dB	20.0	20.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	18.3	33.1
	C/I ASI downlink (w/Rx antenna pointing error)	dB	27.5	27.5
	Orbital Location for interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	17.7	32.5
	C/I ASI downlink (w/Rx antenna pointing error)	dB	26.6	26.6
Total	C/(N+I)	dB	6.0	4.7
	System Margin	dB	3.3	2.0

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		48MDG7W	48MDG7W
	Modulation		8PSK	8PSK
	Info Rate	Mbit/s	100	80
	FEC:		0.83	0.67
	Noise BW:	MHz	40.000	40.000
	C/N required	dB	8.9	9.6
	Total Link Availability	%		99.50
S/C Loc	Longitude	deg	-99.10	-99.10
Beam Polarization	Uplink Beam Name		SPOT	SPOT
	Polarization (H, V or, C)		C	C
	Uplink Frequency	GHz	25	25
	Downlink Beam Name		SPOT	SPOT
Frequency	Polarization (H, V or, C)		C	C
	Downlink Frequency	GHz	17	17
TX ES	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	9.00	9.00
	Transmit E/S peak gain (Eff=0.6)	dB	65.2	65.2
RX ES	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	0.75	0.75
	Receive E/S peak gain (Eff=0.6)	dB	40.5	40.5
	Receive Earth Station G/T	dB/K	17.4	14.7
Uplink Thermal	Carrier eirp	dBW	73.2	93.1
	Uplink PSD	dBW/Hz	-88.0	-48.1
	Transponder SFD (Beam Peak)	dBW/m2	-90.0	-90.0
	Input Backoff	dB	0.0	0.0
	Uplink Path Loss, clear sky	dB	212.6	212.6
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	19.9
	Satellite G/T (Beam Peak)	dB/K	16.5	16.5
	Antenna relative gain towards E/S	dB	0.0	0.0
	C/N thermal uplink	dB	29.5	28.4
Downlink Thermal	S/C saturated EIRP (Beam Peak)	dBW	60.0	60.0
	Carrier Output backoff	dB	0.0	0.0
	Antenna relative gain towards Earth Station	dB	0.0	0.0
	Carrier EIRP towards Earth Station	dBW	60.0	60.0
	Downlink Path Loss, clear sky	dB	209.3	209.3
	Downlink gaseous attenuation	dB	0.1	0.4
	Downlink rain attenuation	dB	0.0	3.9
	Antenna Pointing error	dB	-0.3	-0.3
	Receive Earth Station G/T	dB/K	17.4	14.7
	C/N thermal downlink	dB	20.2	13.3
	PFD at Beam Peak	dBW/m2/MHz	-119.0	-119.0
Other	C/I (Intra-System Interference)	dB	20.0	20.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	40.8	60.7
	C/I ASI downlink (w/Rx antenna pointing error)	dB	22.9	22.9
	Orbital Location for interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
C/I ASI uplink	dB	40.2	60.1	
C/I ASI downlink (w/Rx antenna pointing error)	dB	22.1	22.1	
Total	C/(N+I)	dB	14.9	11.6
	System Margin	dB	8.1	2.0



## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		360KG7W	360KG7W
	Modulation		BPSK	BPSK
	Info Rate	Mbit/s	0.128	0.128
	FEC:		0.50	0.50
	Noise BW:	MHz	0.266	0.266
	C/N required	dB	2.7	2.7
	Total Link Availability	%		99.60
S/C Loc	Longitude	deg	-99.10	-99.10
Beam Polarization Frequency	Uplink Beam Name		SPOT	SPOT
	Polarization (H, V or, C)		C	C
	Uplink Frequency	GHz	25	25
	Downlink Beam Name		SPOT	SPOT
Frequency	Polarization (H, V or, C)		C	C
	Downlink Frequency	GHz	17	17
TX ES	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	0.75	0.75
	Transmit E/S peak gain (Eff=0.65)	dB	44.0	44.0
RX ES	Rain rate exceeded for 0.01% of the year	mm/h	50	50
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	9.00	9.00
	Receive E/S peak gain (Eff=0.6)	dB	62.1	62.1
	Receive Earth Station G/T	dB/K	38.9	35.9
Uplink Thermal	Carrier eirp	dBW	29.0	39.5
	Uplink PSD	dBW/Hz	-69.2	-58.7
	Transponder SFD (Beam Peak)	dBW/m2	-90.0	-90.0
	Input Backoff	dB	-44.2	-44.2
	Uplink Path Loss, clear sky	dB	212.6	212.6
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	10.5
	Satellite G/T (Beam Peak)	dB/K	16.5	16.5
	Antenna relative gain towards E/S	dB	0.0	0.0
	C/N thermal uplink	dB	7.1	8.0
Downlink Thermal	S/C saturated EIRP (Beam Peak)	dBW	60.0	60.0
	Carrier Output backoff	dB	-42.3	-42.3
	Antenna relative gain towards Earth Station	dB	0.0	0.0
	Carrier EIRP towards Earth Station	dBW	17.7	17.7
	Downlink Path Loss, clear sky	dB	209.3	209.3
	Downlink gaseous attenuation	dB	0.1	0.4
	Downlink rain attenuation	dB	0.0	5.9
	Antenna Pointing error	dB	-0.3	-0.3
	Receive Earth Station G/T	dB/K	38.9	35.9
	C/N thermal downlink	dB	21.3	12.0
	PFD at Beam Peak	dBW/m2/MHz	-139.6	-139.6
Other	C/I (Intra-System Interference)	dB	20.0	20.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	18.3	28.8
	C/I ASI downlink (w/Rx antenna pointing error)	dB	24.6	24.6
	Orbital Location for interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-58.5	-58.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
C/I ASI uplink		dB	17.8	28.3
	C/I ASI downlink (w/Rx antenna pointing error)	dB	23.7	23.7
Total	C/(N+I)	dB	6.0	4.7
	System Margin	dB	3.3	2.0

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		48MOG7W	48MOG7W
	Modulation		8PSK	8PSK
	Info Rate	Mbit/s	100	60
	FEC:		0.83	0.67
	Noise BW:	MHz	40.000	40.000
	C/N required	dB	8.9	9.6
	Total Link Availability	%		99.60
S/C Loc	Longitude	deg	-99.10	-99.10
Beam	Uplink Beam Name		SPOT	SPOT
	Polarization (H, V or, C)		C	C
	Uplink Frequency	GHz	25	25
	Frequency	Downlink Beam Name		SPOT
Polarization (H, V or, C)			C	C
Downlink Frequency		GHz	17	17
TX ES	Rain rate exceeded for 0.01% of the year	mm/h	20	20
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	9.00	9.00
	Transmit E/S peak gain (Eff=0.8)	dB	65.2	65.2
RX ES	Rain rate exceeded for 0.01% of the year	mm/h	20	20
	E/S Elevation angle	deg	30.0	30.0
	E/S size	m	0.80	0.80
	Receive E/S peak gain (Eff=0.6)	dB	41.1	41.1
	Receive Earth Station G/T	dB/K	17.9	16.2
Uplink Thermal	Carrier eirp	dBW	73.2	81.7
	Uplink PSD	dBW/Hz	-68.0	-58.5
	Transponder SFD (Beam Peak)	dBW/m2	-90.0	-90.0
	Input Backoff	dB	0.0	0.0
	Uplink Path Loss, clear sky	dB	212.6	212.6
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	8.6
	Satellite G/T (Beam Peak)	dB/K	16.5	16.5
	Antenna relative gain towards E/S	dB	0.0	0.0
	C/N thermal uplink	dB	28.5	28.4
Downlink Thermal	S/C saturated EIRP (Beam Peak)	dBW	57.0	57.0
	Carrier Output backoff	dB	0.0	0.0
	Antenna relative gain towards Earth Station	dB	0.0	0.0
	Carrier EIRP towards Earth Station	dBW	57.0	57.0
	Downlink Path Loss, clear sky	dB	209.3	209.3
	Downlink gaseous attenuation	dB	0.1	0.4
	Downlink rain attenuation	dB	0.0	1.6
	Antenna Pointing error	dB	-0.3	-0.3
	Receive Earth Station G/T	dB/K	17.9	16.2
	C/N thermal downlink	dB	17.8	14.2
	PFD at Beam Peak	dBW/m2/MHz	-122.0	-122.0
	Other	C/I (Intra-System Interference)	dB	20.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	40.8	48.3
	C/I ASI downlink (w/Rx antenna pointing error)	dB	20.5	20.5
	Orbital Location for interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
Total	C/I ASI uplink	dB	40.2	48.7
	C/I ASI downlink (w/Rx antenna pointing error)	dB	19.7	19.7
	C/(N+I)	dB	13.2	11.6
	System Margin	dB	4.4	2.0

## EXHIBIT 11: GALAXY BSS-3 LINK BUDGETS (continued)

			CLRSKY	DEGRADED
Carrier	Carrier Type		360KG7W	380KG7W
	Modulation		BPSK	BPSK
	Info Rate	Mbit/s	0.128	0.128
	FEC:		0.50	0.50
	Noise BW:	MHz	0.266	0.266
	C/N required	dB	2.7	2.7
	Total Link Availability	%		99.80
S/C Loc	Longitude	deg	-99.10	-99.10
Beam Polarization Frequency	Uplink Beam Name		SPOT	SPOT
	Polarization (H, V or, C)		C	C
	Uplink Frequency	GHz	25	25
	Downlink Beam Name		SPOT	SPOT
TX ES	Polarization (H, V or, C)		C	C
	Downlink Frequency	GHz	17	17
	Rain rate exceeded for 0.01% of the year	mm/h	20	20
	E/S Elevation angle	deg	30.0	30.0
RX ES	E/S size	m	0.80	0.80
	Transmit E/S peak gain (Eff=0.65)	dB	44.5	44.5
	Rain rate exceeded for 0.01% of the year	mm/h	20	20
	E/S Elevation angle	deg	30.0	30.0
Uplink Thermal	E/S size	m	9.00	9.00
	Receive E/S peak gain (Eff=0.6)	dB	62.1	62.1
	Receive Earth Station G/T	dB/K	38.9	38.8
	Carrier eirp	dBW	29.0	33.5
Downlink Thermal	Uplink PSD	dBW/Hz	-69.8	-65.3
	Transponder SFD (Beam Peak)	dBW/m2	-90.0	-90.0
	Input Backoff	dB	-44.3	-44.3
	Uplink Path Loss, clear sky	dB	212.6	212.6
	Uplink gaseous attenuation	dB	0.2	1.3
	Uplink rain attenuation	dB	0.0	4.5
	Satellite G/T (Beam Peak)	dB/K	18.5	18.5
	Antenna relative gain towards E/S	dB	0.0	0.0
	C/N thermal uplink	dB	7.1	5.9
	S/C saturated EIRP (Beam Peak)	dBW	57.0	57.0
	Carrier Output backoff	dB	-42.4	-42.4
Antenna relative gain towards Earth Station	dB	0.0	0.0	
Carrier EIRP towards Earth Station	dBW	14.6	14.6	
Downlink Path Loss, clear sky	dB	209.3	209.3	
Downlink gaseous attenuation	dB	0.1	0.4	
Downlink rain attenuation	dB	0.0	2.4	
Antenna Pointing error	dB	-0.3	-0.3	
Receive Earth Station G/T	dB/K	38.9	38.8	
C/N thermal downlink	dB	18.2	13.4	
PFD at Beam Peak	dBW/m2/MHz	-142.6	-142.6	
Other	C/I (Intra-System Interference)	dB	20.0	20.0
ASI	Orbital Location for Interfering S/C #1	deg	-95.00	-95.00
	Geocentric Separation (w/station keeping)	deg	4.10	4.10
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
	C/I ASI uplink	dB	18.3	22.8
	C/I ASI downlink (w/Rx antenna pointing error)	dB	21.5	21.5
	Orbital Location for Interfering S/C #2	deg	-103.00	-103.00
	Geocentric Separation (w/station keeping)	deg	3.80	3.80
	Interfering Uplink power density	dBW/Hz	-56.5	-56.5
	Interfering D/L eirp density	dBW/Hz	-12.0	-12.0
C/I ASI uplink	dB	17.8	22.2	
C/I ASI downlink (w/Rx antenna pointing error)	dB	20.7	20.7	
Total	C/(N+1)	dB	5.7	4.7
	System Margin	dB	3.0	2.0