

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
Uplink Contour G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Uplink SFD (dB/Hz)	-79.9	-79.9	-79.9	-79.9	-79.9	-79.9
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	RUKV	RUKV	RUKV	RUKV	RUKV	RUKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Downlink Contour EIRP (dBW)	45.0	45.0	45.0	46.0	46.0	46.0
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADIJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADIJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	1	1	1	4	4	4
Emission Designation	35MDF3F	35MDF3F	35MDF3F	35MIG7W	35MIG7W	35MIG7W
Information Rate (kbps)	n/a	n/a	n/a	27769.6	27769.6	27769.6
Carrier Modulation	TVPFM	TVPFM	TVPFM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	n/a	n/a	n/a
Code Rate	n/a	n/a	n/a	0.5	0.5	0.5
Occupied Bandwidth (kHz)	36000	36000	36000	30133	30133	30133
Allocated Bandwidth (kHz)	36000	36000	36000	35000	35000	36000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.35	3.35	3.35
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.35	3.35	3.35
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.06	1.06	1.06	1.07	1.07	1.07
Earth Station Gain (dBi)	41.0	41.0	41.0	41.1	41.1	41.1
Earth Station G/T (dB/K)	19.1	19.1	19.2	19.1	19.1	19.2
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
LINK FADE TYPE						
Link Fade Type	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	75.9	75.9	75.9	77.5	77.5	77.5
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	1.0	0.0	0.0	1.0	0.0
Satellite G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-55.0	-56.0	-56.0	-74.8	-74.8	-74.8
Uplink C/N (dB)	31.1	30.1	31.1	24.1	23.1	24.1
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	41.0	41.0	41.0	42.8	42.8	42.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	205.2	205.2	205.2	205.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.6	0.0	0.0	0.6
Earth Station G/T (dB/K)	19.1	19.1	19.2	19.1	19.1	19.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-55.0	-56.0	-56.0	-74.8	-74.8	-74.8
Downlink C/N (dB)	15.9	15.9	14.4	9.0	9.0	7.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	31.1	30.1	31.1	24.1	23.1	24.1
C/N Downlink (dB)	15.9	15.9	14.4	9.0	9.0	7.4
C/N Other Links (Co-channel & IM)	24.0	24.0	24.0	24.0	24.0	24.0
C/N Uplink Adjacent Satellite 1 (dB)	33.4	33.4	33.4	31.4	31.4	31.4
C/N Downlink Adjacent Satellite 1 (dB)	15.6	15.6	15.6	9.9	9.9	9.9
C/N Uplink Adjacent Satellite 2 (dB)	33.4	33.4	33.4	31.4	31.4	31.4
C/N Downlink Adjacent Satellite 2 (dB)	18.6	18.6	18.6	11.9	11.9	11.9
C/N(H) Composite (dB)	11.6	11.7	11.1	5.2	5.1	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	0.7	0.6	0.0	0.7	0.7	0.0
Number of Carriers	1	1	1	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-24.6	-24.8	-24.8	-51.8	-51.8	-51.8
Downlink EIRP Density at Beam Peak	-19.0	-19.0	-19.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-3.0	-3.0	-6.0	-6.0	-6.0	-3.0
Uplink Contour G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Uplink SFD (dBW/m ²)	-79.9	-79.9	-79.9	-79.9	-79.9	-79.9
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	RUKV	RUKV	RUKV	RUKV	RUKV	RUKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	46.0	46.0	45.0	46.0	46.0	46.0
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W
Information Rate (Mbps)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.57	3.57	2.59	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.57	3.57	2.59	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.09	1.09	1.09	1.05	1.05	1.05
Earth Station Gain (dBi)	41.3	41.3	41.3	41.0	41.0	41.0
Earth Station G/T (dB/K)	19.3	19.3	18.4	19.0	19.0	18.1
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	71.1	71.1	71.1	51.6	51.6	51.6
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	1.0	0.0	0.0	1.0	0.0
Satellite G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-63.3	-63.3	-66.3	-48.3	-48.3	-48.3
Uplink C/N (dB)	24.1	23.1	24.1	24.1	23.1	24.1
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	35.3	35.3	35.3	16.8	16.8	16.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.6	0.0	0.0	0.6
Earth Station G/T (dB/K)	19.3	19.3	18.4	19.0	19.0	18.1
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-63.3	-63.3	-66.3	-48.3	-48.3	-48.3
Downlink C/N (dB)	9.1	9.1	7.6	8.8	8.8	7.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	24.1	23.1	24.1	24.1	23.1	24.1
C/N Downlink (dB)	9.1	9.1	7.6	8.8	8.8	7.3
C/N Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	31.4	31.4	31.4	31.4	31.4	31.4
C/N Downlink Adjacent Satellite 1 (dB)	10.7	10.7	10.7	9.3	9.3	9.3
C/N Uplink Adjacent Satellite 2 (dB)	31.4	31.4	31.4	31.4	31.4	31.4
C/N Downlink Adjacent Satellite 2 (dB)	12.6	12.6	12.6	11.3	11.3	11.3
C/N(Hz) Composite (dB)	5.4	5.4	4.7	4.5	4.5	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	0.4	0.7	0.0	0.4	0.6	0.0
Number of Carriers	3	3	3	360	360	360
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-51.8	-51.8	-51.8	-51.8	-51.8	-51.8
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Uplink Beam Name						
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Uplink Contour G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Uplink SFD (dBW/m ²)	-79.9	-79.9	-79.9	-79.9	-79.9	-79.9
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	RUKV	RUKV	RUKV	RUKV	RUKV	RUKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	46.0	46.0	46.0	46.0	46.0	46.0
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	83.15°E	83.15°E	83.15°E	83.15°E	83.15°E	83.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	87.15°E	87.15°E	87.15°E	87.15°E	87.15°E	87.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	7	7	7	8	8	8
Emission Designation	1M45G7W	1M45G7W	1M45G7W	403KG7W	403KG7W	403KG7W
Information Rate (kbps)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A	N/A
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	1.0	1.0	1.0
Earth Station Gain (dBi)	54.6	54.6	54.6	42.0	42.0	42.0
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.05	1.05	1.05	4.50	4.50	4.50
Earth Station Gain (dBi)	41.0	41.0	41.0	53.6	53.6	53.6
Earth Station G/T (dB/K)	19.0	19.0	19.1	31.6	31.6	30.7
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
LINK FADE TYPE	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	63.7	63.7	63.7	40.0	40.0	40.0
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	1.0	0.0	0.0	1.0	0.0
Satellite G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-60.9	-60.9	-64.9	-64.9	-64.9
Uplink C/N (dB)	24.1	23.1	24.1	6.4	6.4	6.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	28.9	28.9	28.9	22.2	22.2	22.2
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.6	0.0	0.0	0.6
Earth Station G/T (dB/K)	19.0	19.0	19.1	31.6	31.6	30.7
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-60.9	-60.9	-64.9	-64.9	-64.9
Downlink C/N (dB)	6.8	8.6	7.3	20.7	20.7	19.2
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	24.1	23.1	24.1	6.4	6.4	6.4
C/N Downlink (dB)	6.8	8.6	7.3	20.7	20.7	19.2
C/N Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	31.4	31.4	31.4	13.6	13.6	13.6
C/N Downlink Adjacent Satellite 1 (dB)	9.3	9.3	9.3	26.5	26.5	26.5
C/N Uplink Adjacent Satellite 2 (dB)	31.4	31.4	31.4	13.6	13.6	13.6
C/N Downlink Adjacent Satellite 2 (dB)	11.2	11.2	11.2	26.1	26.1	26.1
C/N(H) Composite (dB)	4.5	4.5	3.9	4.5	3.8	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	0.9	0.7	0.1	0.0	0.0	0.7
Number of Carriers	24	24	24	90	50	50
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-51.8	-51.8	-51.8	-56.8	-56.8	-56.8
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-26.7	-26.7	-26.7

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Uplink Frequency (MHz)	13750-14500	13750-14500	13750-14500	13750-14500	13750-14500	13750-14500
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Uplink Contour GT (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Uplink SFD (dBW/M ²)	-79.9	-79.9	-79.9	-79.9	-79.9	-79.9
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Downlink Frequency (MHz)	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	46.7	46.7	46.7	46.7	46.7	46.7
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	1	1	1	3	3	3
Emission Designation	35M0F3F	35M0F3F	35M0F3F	72M0G7W	72M0G7W	72M0G7W
Information Rate (kbps)	n/a	n/a	n/a	55539.3	55539.3	55539.3
Carrier Modulation	TV/FM	TV/FM	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	n/a	n/a	n/a
Code Rate	n/a	n/a	n/a	0.5	0.5	0.5
Occupied Bandwidth (MHz)	36000	36000	36000	60266	60266	60266
Allocated Bandwidth (MHz)	36000	36000	36000	72000	72000	72000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.36	3.36	3.36
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.36	3.36	3.36
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.24	1.24	1.24	1.24	1.24	1.24
Earth Station Gain (dBi)	41.7	41.7	41.7	41.7	41.7	41.7
Earth Station GT (dSVK)	19.7	19.7	19.9	19.7	19.7	18.9
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	73.2	73.2	73.2	77.9	77.9	77.9
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	1.0	0.0	0.0	1.0	0.0
Satellite GT (dSVK)	0.0	0.0	0.0	0.0	0.0	0.0
Soltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Uplink C/N (dB)	28.4	27.4	28.4	21.4	20.4	21.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	39.0	39.0	39.0	43.8	43.8	43.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.5	205.5	205.5	205.5	205.5	205.5
Downlink Rain Attenuation (dB)	0.0	0.0	0.5	0.0	0.0	0.5
Earth Station GT (dSVK)	19.7	19.7	19.9	19.7	19.7	18.9
Soltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Downlink C/N (dB)	15.2	15.2	13.9	8.3	6.3	6.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	28.4	27.4	28.4	21.4	20.4	21.4
C/N Downlink (dB)	15.2	15.2	13.9	8.3	6.3	6.9
C/N Other Links (Co-channel & Int)	22.0	22.0	22.0	24.0	24.0	24.0
C/N Uplink Adjacent Satellite 1 (dB)	35.7	35.7	35.7	26.7	26.7	26.7
C/N Downlink Adjacent Satellite 1 (dB)	17.5	17.5	17.5	10.6	10.6	10.6
C/N Uplink Adjacent Satellite 2 (dB)	35.7	35.7	35.7	26.7	26.7	26.7
C/N Downlink Adjacent Satellite 2 (dB)	19.7	19.7	19.7	12.7	12.7	12.7
C/(N+I) Composite (dB)	11.6	11.7	11.1	5.2	5.1	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	0.7	0.6	0.0	0.7	0.7	0.0
Number of Carriers	2	2	2	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-47.5	-47.5	-47.5	-54.5	-54.5	-54.5
Downlink EIRP Density at Beam Peak	-19.0	-19.0	-19.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Uplink Frequency (MHz)	13750-14500	13750-14500	13750-14500	13750-14500	13750-14500	13750-14500
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Uplink Contour G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Uplink SFD (dBW/M ²)	-79.9	-79.9	-79.9	-79.9	-79.9	-79.9
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Downlink Frequency (MHz)	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	46.7	46.7	46.7	46.7	46.7	46.7
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10K3G7W	10K3G7W	10K3G7W
Information Rate (Mbps)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A	N/A
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.57	3.57	2.99	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.57	3.57	2.99	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dB)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.29	1.29	1.29	1.22	1.22	1.22
Earth Station Gain (dB)	42.0	42.0	42.0	41.6	41.6	41.6
Earth Station G/T (dB/K)	20.0	20.0	19.2	19.6	19.6	18.9
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	63.4	63.4	63.4	46.9	46.9	46.9
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	1.0	0.0	0.0	1.0	0.0
Satellite G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-68.3	-68.3	-68.3	-48.9	-48.9	-48.9
Uplink C/N (dB)	21.4	20.4	21.4	21.4	20.4	21.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	34.3	34.3	34.3	14.8	14.8	14.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.5	205.5	205.5	205.5	205.5	205.5
Downlink Rain Attenuation (dB)	0.0	0.0	0.5	0.0	0.0	0.5
Earth Station G/T (dB/K)	20.0	20.0	19.2	19.6	19.6	18.9
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-68.3	-68.3	-68.3	-48.9	-48.9	-48.9
Downlink C/N (dB)	8.5	8.6	7.2	8.1	8.1	6.8
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	21.4	20.4	21.4	21.4	20.4	21.4
C/N Downlink (dB)	8.5	8.6	7.2	8.1	8.1	6.8
CI Other Links (Co-channel & IM)	15.0	15.0	15.0	16.0	16.0	16.0
CI Uplink Adjacent Satellite 1 (dB)	23.7	23.7	23.7	26.7	26.7	26.7
CI Downlink Adjacent Satellite 1 (dB)	12.1	12.1	12.1	9.9	9.9	9.9
CI Uplink Adjacent Satellite 2 (dB)	23.7	23.7	23.7	26.7	26.7	26.7
CI Downlink Adjacent Satellite 2 (dB)	12.6	12.6	12.6	12.2	12.2	12.2
C/(N+I) Composite (dB)	5.4	5.3	4.7	4.5	4.5	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	0.4	0.7	0.0	0.4	0.6	0.0
Number of Carriers	5	5	6	720	720	720
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-54.5	-54.5	-54.5	-54.5	-54.5	-54.5
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Uplink Frequency (MHz)	13750-14500	13750-14500	13750-14500	13750-14500	13750-14500	13750-14500
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
Uplink Contour G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Uplink SFD (dBW/M ²)	-79.9	-79.9	-79.9	-93.9	-93.9	-93.9
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Downlink Frequency (MHz)	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750	10950-11200, 11450-11700, 12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
Downlink Contour EIRP (dBW)	45.7	45.7	45.7	46.7	46.7	46.7
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	7	7	7	6	6	6
Emission Designation	1M45G7W	1M45G7W	1M45G7W	400KG7W	400KG7W	400KG7W
Information Rate (kbp/s)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	8PSK	8PSK	8PSK	8PSK	8PSK	8PSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	1.2	1.2	1.2
Earth Station Gain (dBi)	54.6	54.6	54.6	43.3	43.3	43.3
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.22	1.22	1.22	4.50	4.50	4.50
Earth Station Gain (dBi)	41.5	41.5	41.5	52.9	52.9	52.9
Earth Station G/T (dB/K)	19.6	19.6	19.6	30.9	30.9	30.1
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	61.0	61.0	61.0	40.1	40.1	40.1
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	1.0	0.0	0.0	1.0	0.0
Satellite G/T (dB/K)	0.0	0.0	0.0	0.0	0.0	0.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Uplink C/N (dB)	21.4	20.4	21.4	5.5	5.5	6.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	25.9	25.9	25.9	20.0	20.0	20.0
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.5	205.5	205.5	205.5	205.5	205.5
Downlink Rain Attenuation (dB)	0.0	0.0	0.5	0.0	0.0	0.5
Earth Station G/T (dB/K)	19.6	19.6	19.6	30.9	30.9	20.1
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Downlink C/N (dB)	8.1	8.1	6.6	16.6	16.6	17.2
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	21.4	20.4	21.4	5.5	5.5	6.5
C/N Downlink (dB)	8.1	8.1	6.6	16.6	16.6	17.2
C/N Other Links (Co-channel & IM)	15.0	15.0	15.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	23.7	23.7	23.7	13.3	13.3	13.8
C/N Downlink Adjacent Satellite 1 (dB)	9.8	9.6	9.6	22.6	22.6	22.6
C/N Uplink Adjacent Satellite 2 (dB)	23.7	23.7	23.7	13.3	13.3	13.8
C/N Downlink Adjacent Satellite 2 (dB)	12.1	12.1	12.1	23.1	23.1	23.1
C/N(H) Composite (dB)	4.5	4.5	3.6	4.5	3.9	4.4
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	0.0	0.7	0.0	0.0	0.1	0.6
Number of Carriers	49	49	49	160	160	160
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-54.5	-54.5	-54.5	-58.0	-58.0	-58.0
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-26.9	-26.9	-26.9

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Uplink Frequency (MHz)	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
Uplink Contour G/T (dB/K)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Uplink SFD (dBW/M ²)	-76.6	-76.8	-76.8	-80.8	-80.8	-80.8
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Downlink Frequency (MHz)	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	47.3	47.3	47.3	47.3	47.3	47.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	1	1	1	2	2	2
Emission Designation	3EMDF3F	3EMDF3F	3EMDF3F	112MEG7W	112MEG7W	112MEG7W
Information Rate (kbps)	n/a	n/a	n/a	86394.3	86394.3	86394.3
Carrier Modulation	TVFM	TVFM	TVFM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	n/a	n/a	n/a
Code Rate	n/a	n/a	n/a	0.5	0.5	0.5
Occupied Bandwidth (MHz)	36000	36000	36000	93747	93747	93747
Allocated Bandwidth (MHz)	36000	36000	36000	112000	112000	112000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.35	3.35	3.35
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.35	3.35	3.35
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.7	54.7	54.7	54.7	54.7	54.7
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.26	1.26	1.26	1.26	1.26	1.26
Earth Station Gain (dBi)	41.8	41.8	41.8	41.8	41.8	41.8
Earth Station G/T (dB/K)	19.9	19.9	19.0	19.8	19.8	18.9
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	75.7	75.7	75.7	78.4	78.4	78.4
Uplink Path Loss, Clear Sky (dB)	207.3	207.3	207.3	207.3	207.3	207.3
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-66.0	-66.0	-66.0	-79.7	-79.7	-79.7
Uplink C/N (dB)	29.8	29.8	29.8	18.8	17.8	18.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	39.0	39.0	39.0	45.7	45.7	45.7
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.5	205.5	205.5	205.5	205.5	205.5
Downlink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	19.9	19.9	19.0	19.8	19.8	18.9
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-66.0	-66.0	-66.0	-79.7	-79.7	-79.7
Downlink C/N (dB)	15.4	15.4	13.9	8.4	8.4	6.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	29.8	29.8	29.8	18.8	17.8	18.8
C/N Downlink (dB)	15.4	15.4	13.9	8.4	8.4	6.9
C/N Other Links (Co-channel & IM)	20.0	20.0	20.0	24.0	24.0	24.0
C/N Uplink Adjacent Satellite 1 (dB)	33.2	33.2	33.2	27.2	27.2	27.2
C/N Downlink Adjacent Satellite 1 (dB)	18.2	18.2	18.2	11.1	11.1	11.1
C/N Uplink Adjacent Satellite 2 (dB)	33.2	33.2	33.2	27.2	27.2	27.2
C/N Downlink Adjacent Satellite 2 (dB)	19.6	19.6	19.6	12.6	12.6	12.6
C/N(Hz) Composite (dB)	11.8	11.8	11.1	5.2	5.2	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	0.7	0.7	0.0	0.8	0.7	0.0
Number of Carriers	3	3	3	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.1	-45.1	-45.1	-56.1	-56.1	-56.1
Downlink EIRP Density at Beam Peak	-19.0	-19.0	-19.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Uplink Frequency (MHz)	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
Uplink Contour G/T (dB/K)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Uplink SFD (dBW/M ²)	-76.6	-76.6	-76.6	-76.6	-76.6	-76.6
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Downlink Frequency (MHz)	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	47.3	47.3	47.3	47.3	47.3	47.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W
Information Rate (kbps)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	76	76	76
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.57	3.57	2.99	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.57	3.57	2.99	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.7	54.7	54.7	54.7	54.7	54.7
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.29	1.29	1.29	1.23	1.23	1.23
Earth Station Gain (dBi)	42.0	42.0	42.0	41.6	41.6	41.6
Earth Station G/T (dB/K)	20.0	20.0	19.2	19.6	19.6	18.7
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	70.9	70.9	70.9	51.4	51.4	51.4
Uplink Path Loss, Clear Sky (dB)	207.3	207.3	207.3	207.3	207.3	207.3
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Solomon Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-63.3	-63.3	-63.3	-48.8	-48.8	-48.8
Uplink C/N (dB)	22.6	21.6	22.6	22.8	21.8	22.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	34.3	34.3	34.3	14.3	14.3	14.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.5	205.5	205.5	205.5	205.5	205.5
Downlink Rain Attenuation (dB)	0.0	0.0	0.6	0.0	0.0	0.6
Earth Station G/T (dB/K)	20.0	20.0	19.2	19.6	19.6	18.7
Solomon Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-63.3	-63.3	-63.3	-48.8	-48.8	-48.8
Downlink C/N (dB)	8.6	8.6	7.1	8.1	6.1	6.7
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	22.6	21.6	22.6	22.8	21.8	22.8
C/N Downlink (dB)	8.6	8.6	7.1	8.1	6.1	6.7
C/N Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	31.2	31.2	31.2	31.2	31.2	31.2
C/N Downlink Adjacent Satellite 1 (dB)	12.2	12.2	12.2	10.0	10.0	10.0
C/N Uplink Adjacent Satellite 2 (dB)	31.2	31.2	31.2	31.2	31.2	31.2
C/N Downlink Adjacent Satellite 2 (dB)	12.6	12.6	12.6	12.3	12.3	12.3
C/N(H) Composite (dB)	5.4	5.4	4.7	4.6	4.6	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	0.5	0.5	0.0	0.5	0.7	0.0
Number of Carriers	10	10	10	1120	1120	1120
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.1	-52.1	-52.1	-52.1	-52.1	-52.1
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Uplink Frequency (MHz)	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500	13750-14000, 14250-14500
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
Uplink Contour GT (dB/K)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Uplink SFD (dBW/M ²)	-76.6	-76.6	-76.6	-72.9	-72.9	-72.6
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKH	MEKH	MEKH	MEKH	MEKH	MEKH
Downlink Frequency (MHz)	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700	10950-11200, 11450-11700
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	47.3	47.3	47.3	47.3	47.3	47.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	7	7	7	8	8	8
Emission Designation	1M45G7W	1M45G7W	1M45G7W	400KG7W	400KG7W	400KG7W
Information Rate (kbp/s)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	8PSK	8PSK	8PSK	8PSK	8PSK	8PSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	1.2	1.2	1.2
Earth Station Gain (dBi)	54.7	54.7	54.7	43.4	43.4	43.4
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.22	1.22	1.22	4.50	4.50	4.50
Earth Station Gain (dBi)	41.5	41.5	41.5	52.9	52.9	52.9
Earth Station GT (dBi/K)	19.6	19.6	19.7	30.9	30.9	30.9
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	63.5	63.5	63.5	41.0	41.0	41.0
Uplink Path Loss, Clear Sky (dB)	207.3	207.3	207.3	207.3	207.3	207.3
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite GT (dB/K)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Uplink C/N (dB)	22.6	21.8	22.8	6.2	5.3	6.2
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	25.9	25.9	25.9	20.3	20.3	20.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.5	205.5	205.5	226.5	226.5	205.5
Downlink Rain Attenuation (dB)	0.0	0.0	0.6	0.0	0.0	0.6
Earth Station GT (dBi/K)	19.6	19.6	19.7	30.9	30.9	30.9
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Downlink C/N (dB)	8.1	8.1	6.6	16.9	16.9	17.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	22.6	21.8	22.8	6.2	5.3	6.2
C/N Downlink (dB)	8.1	8.1	6.6	16.9	16.9	17.4
C/I Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
C/I Uplink Adjacent Satellite 1 (dB)	31.2	31.2	31.2	14.6	14.6	14.6
C/I Downlink Adjacent Satellite 1 (dB)	9.8	9.6	9.6	22.9	22.9	22.9
C/I Uplink Adjacent Satellite 2 (dB)	31.2	31.2	31.2	14.6	14.6	14.6
C/I Downlink Adjacent Satellite 2 (dB)	12.0	12.0	12.0	23.5	23.5	23.5
C/(N+I) Composite (dB)	4.5	4.5	3.8	4.5	3.8	4.4
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	0.0	0.7	0.0	0.0	0.0	0.6
Number of Carriers	77	77	77	260	260	260
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.1	-52.1	-52.1	-57.3	-57.3	-57.3
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-26.5	-26.5	-26.5

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	RUKH	RUKH	RUKH	RUKH	RUKH	RUKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Uplink SFD (dBW/M ²)	-80.1	-80.1	-80.1	-79.1	-79.1	-79.1
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	RUKV	RUKV	RUKV	RUKV	RUKV	RUKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	46.0	46.0	46.0	46.0	46.0	46.0
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	83.15°E	83.15°E	83.15°E	83.15°E	83.15°E	83.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	87.15°E	87.15°E	87.15°E	87.15°E	87.15°E	87.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	1	1	1	4	4	4
Emission Designation	3EM0G3F	3EM0G3F	3EM0G3F	3EM0G7W	3EM0G7W	3EM0G7W
Information Rate (kbps)	n/a	n/a	n/a	27769.6	27769.6	27769.6
Carrier Modulation	TV/FM	TV/FM	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	n/a	n/a	n/a
Code Rate	n/a	n/a	n/a	0.5	0.5	0.5
Occupied Bandwidth (kHz)	36000	36000	36000	30133	30133	30133
Allocated Bandwidth (kHz)	36000	36000	36000	35000	36000	36000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.36	3.36	3.36
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.36	3.36	3.36
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.06	1.06	1.06	1.07	1.07	1.07
Earth Station Gain (dBi)	41.0	41.0	41.0	41.1	41.1	41.1
Earth Station G/T (dB/K)	19.1	19.1	19.2	19.1	19.1	19.2
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	75.6	75.6	75.6	76.4	76.4	76.4
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-66.0	-66.0	-66.0	-74.8	-74.8	-74.6
Uplink C/N (dB)	30.7	29.9	30.7	24.7	23.9	24.7
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	41.0	41.0	41.0	42.8	42.8	42.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	19.1	19.1	19.2	19.1	19.1	19.2
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-66.0	-66.0	-66.0	-74.8	-74.8	-74.6
Downlink C/N (dB)	15.9	15.9	14.4	9.0	9.0	7.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	30.7	29.9	30.7	24.7	23.9	24.7
C/N Downlink (dB)	15.9	15.9	14.4	9.0	9.0	7.4
C/N Other Links (Co-channel & IM)	24.0	24.0	24.0	24.0	24.0	24.0
C/N Uplink Adjacent Satellite 1 (dB)	33.1	33.1	33.1	32.1	32.1	32.1
C/N Downlink Adjacent Satellite 1 (dB)	16.6	16.6	16.6	9.9	9.9	9.9
C/N Uplink Adjacent Satellite 2 (dB)	33.1	33.1	33.1	32.1	32.1	32.1
C/N Downlink Adjacent Satellite 2 (dB)	16.6	16.6	16.6	11.9	11.9	11.9
C/N(H) Composite (dB)	11.7	11.7	11.1	5.2	5.2	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	0.6	0.6	0.0	0.7	0.7	0.0
Number of Carriers	1	1	1	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-51.0	-51.0	-51.0
Downlink EIRP Density at Beam Peak	-19.0	-19.0	-19.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	RUKH	RUKH	RUKH	RUKH	RUKH	RUKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Uplink Contour G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Uplink SFD (dBW/M ²)	-78.1	-76.1	-76.1	-76.1	-78.1	-78.1
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	RUKV	RUKV	RUKV	RUKV	RUKV	RUKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Downlink Contour EIRP (dBW)	45.0	45.0	45.0	45.0	45.0	45.0
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10KKG7W	10KKG7W	10KKG7W
Information Rate (kbps)	5240.0	5240.0	5240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.57	3.57	2.99	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.57	3.57	2.99	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.09	1.09	1.09	1.05	1.05	1.05
Earth Station Gain (dBi)	41.3	41.3	41.3	41.0	41.0	41.0
Earth Station G/T (dB/K)	19.3	19.3	18.4	19.0	19.0	18.1
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	72.9	72.9	72.9	53.4	53.4	53.4
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boltzman Constant (dBW/K-Hz)	229.6	229.6	229.6	229.6	229.6	229.6
Carrier Noise Bandwidth (dB-Hz)	-58.3	-58.3	-58.3	-48.8	-48.8	-48.8
Uplink C/N (dB)	25.7	24.9	25.7	25.7	24.9	25.7
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	35.3	35.3	35.3	16.8	16.8	16.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	205.2	205.2	205.2	205.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.6	0.0	0.0	0.5
Earth Station G/T (dB/K)	19.3	19.3	18.4	19.0	19.0	16.1
Boltzman Constant (dBW/K-Hz)	229.6	229.6	229.6	229.6	229.6	229.6
Carrier Noise Bandwidth (dB-Hz)	-58.3	-58.3	-58.3	-48.8	-48.8	-48.8
Downlink C/N (dB)	9.1	9.1	7.6	8.6	6.8	7.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.7	24.9	25.7	25.7	24.9	25.7
C/N Downlink (dB)	9.1	9.1	7.6	8.6	6.8	7.3
C/N Other Links (Co-channel & IM)	15.0	15.0	15.0	15.0	15.0	15.0
C/N Uplink Adjacent Satellite 1 (dB)	33.1	33.1	33.1	33.1	33.1	33.1
C/N Downlink Adjacent Satellite 1 (dB)	10.7	10.7	10.7	9.5	9.3	9.3
C/N Uplink Adjacent Satellite 2 (dB)	33.1	33.1	33.1	33.1	33.1	33.1
C/N Downlink Adjacent Satellite 2 (dB)	12.6	12.6	12.6	11.3	11.3	11.3
C/N(H) Composite (dB)	5.4	5.4	4.7	4.5	4.5	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	0.4	0.7	0.0	0.4	0.6	0.0
Number of Carriers	3	3	3	360	360	360
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density at Beam Peak	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	RUKH	RUKH	RUKH	RUKH	RUKH	RUKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Uplink Contour G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Uplink SFD (dBW/m ²)	-75.1	-75.1	-75.1	-97.1	-97.1	-97.1
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	RUKV	RUKV	RUKV	RUKV	RUKV	RUKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Downlink Contour EIRP (dBW)	46.0	46.0	46.0	46.0	46.0	46.0
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
CARRIER INFORMATION						
Carrier ID	7	7	7	8	8	8
Emission Designation	1M45G7W	1M45G7W	1M45G7W	400KG7W	400KG7W	400KG7W
Information Rate (kbps)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	1.0	1.0	1.0
Earth Station Gain (dBi)	54.6	54.6	54.6	42.0	42.0	42.0
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.05	1.05	1.05	4.50	4.50	4.50
Earth Station Gain (dBi)	41.0	41.0	41.0	53.6	53.6	53.6
Earth Station G/T (dB/K)	19.0	19.0	19.1	31.6	31.6	30.7
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	65.5	65.5	65.5	40.1	40.1	40.1
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Uplink C/N (dB)	25.7	24.9	25.7	5.3	5.5	6.3
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	28.9	28.9	28.9	22.5	22.5	22.5
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	205.2	205.2	205.2	205.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	19.0	19.0	19.1	31.6	31.6	30.7
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Downlink C/N (dB)	6.3	6.6	7.3	21.1	21.1	19.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.7	24.9	25.7	5.3	5.5	6.3
C/N Downlink (dB)	6.3	6.6	7.3	21.1	21.1	19.6
C/N Other Links (Co-channel & Int)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	33.1	33.1	33.1	13.7	13.7	13.7
C/N Downlink Adjacent Satellite 1 (dB)	9.3	9.3	9.3	25.8	25.8	25.8
C/N Uplink Adjacent Satellite 2 (dB)	33.1	33.1	33.1	13.7	13.7	13.7
C/N Downlink Adjacent Satellite 2 (dB)	11.2	11.2	11.2	26.4	26.4	26.4
C/N(H) Composite (dB)	4.5	4.5	3.9	4.5	3.9	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	0.0	0.7	0.1	0.0	0.1	0.7
Number of Carriers	24	24	24	90	90	90
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-56.7	-56.7	-56.7
Downlink EIRP Density at Beam Peak	-25.0	-25.0	-25.0	-26.4	-26.4	-26.4

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	RUKH	RUKH	RUKH	RUKH	RUKH	RUKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Uplink SFD (dBW/m ²)	-78.1	-76.1	-76.1	-78.1	-78.1	-78.1
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	46.7	46.7	46.7	46.7	46.7	46.7
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	1	1	1	4	4	4
Emission Designation	3EMDF3F	3EMDF3F	3EMDF3F	3EMDG7W	3EMDG7W	3EMDG7W
Information Rate (kbps)	n/a	n/a	n/a	27769.6	27769.6	27769.6
Carrier Modulation	TVPFM	TVPFM	TVPFM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	n/a	n/a	n/a
Code Rate	n/a	n/a	n/a	0.5	0.5	0.5
Occupied Bandwidth (kHz)	36000	36000	36000	30133	30133	30133
Allocated Bandwidth (kHz)	36000	36000	36000	36000	36000	36000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.36	3.36	3.36
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.36	3.36	3.36
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.16	1.16	1.16	1.20	1.20	1.20
Earth Station Gain (dBi)	42.0	42.0	42.0	42.1	42.1	42.1
Earth Station G/T (dB/K)	20.0	20.0	19.0	20.2	20.2	19.2
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	74.9	74.9	74.9	76.7	76.7	76.7
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Solizman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-74.8	-74.8	-74.8
Uplink C/N (dB)	30.0	29.2	30.0	23.0	22.2	23.0
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	39.0	39.0	39.0	40.8	40.8	40.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station G/T (dB/K)	20.0	20.0	19.0	20.2	20.2	19.2
Solizman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-74.8	-74.8	-74.8
Downlink C/N (dB)	14.6	14.6	13.1	7.9	7.9	6.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	30.0	29.2	30.0	23.0	22.2	23.0
C/N Downlink (dB)	14.6	14.6	13.1	7.9	7.9	6.3
C/I Other Links (Co-channel & IM)	24.0	24.0	24.0	24.0	24.0	24.0
C/I Uplink Adjacent Satellite 1 (dB)	37.4	37.4	37.4	30.4	30.4	30.4
C/I Downlink Adjacent Satellite 1 (dB)	19.1	19.1	19.1	12.6	12.6	12.6
C/I Uplink Adjacent Satellite 2 (dB)	37.4	37.4	37.4	30.4	30.4	30.4
C/I Downlink Adjacent Satellite 2 (dB)	19.6	19.6	19.6	12.6	12.6	12.6
C/(N+I) Composite (dB)	12.1	12.1	11.1	5.5	5.5	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	1.0	1.0	0.0	1.0	1.0	0.0
Number of Carriers	1	1	1	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.7	-45.7	-45.7	-52.7	-52.7	-52.7
Downlink EIRP Density at Beam Peak	-19.0	-19.0	-19.0	-26.0	-26.0	-26.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	RUKH	RUKH	RUKH	RUKH	RUKH	RUKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Uplink Contour GT (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Uplink SFD (dBW/M ²)	-78.1	-78.1	-78.1	-78.1	-78.1	-78.1
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
Downlink Contour EIRP (dBW)	45.7	45.7	45.7	45.7	45.7	45.7
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W
Information Rate (Mbps)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A	N/A
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.57	3.57	2.59	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.57	3.57	2.59	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.30	1.30	1.30	1.17	1.17	1.17
Earth Station Gain (dBi)	42.6	42.6	42.6	41.9	41.9	41.9
Earth Station GT (dB/K)	20.6	20.6	19.8	19.9	19.9	18.9
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	70.2	70.2	70.2	50.7	50.7	50.7
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite GT (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-53.3	-53.3	-53.3	-48.3	-48.3	-48.3
Uplink C/N (dB)	23.0	22.2	23.0	23.0	22.2	23.0
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	34.3	34.3	34.3	14.8	14.8	14.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station GT (dB/K)	20.6	20.6	19.8	19.9	19.9	18.9
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-53.3	-53.3	-53.3	-48.3	-48.3	-48.3
Downlink C/N (dB)	6.6	6.6	6.9	7.7	7.7	6.0
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	23.0	22.2	23.0	23.0	22.2	23.0
C/N Downlink (dB)	6.6	6.6	6.9	7.7	7.7	6.0
C/N Other Links (Co-channel & Int)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	30.4	30.4	30.4	30.4	30.4	30.4
C/N Downlink Adjacent Satellite 1 (dB)	12.4	12.4	12.4	11.5	11.5	11.5
C/N Uplink Adjacent Satellite 2 (dB)	30.4	30.4	30.4	30.4	30.4	30.4
C/N Downlink Adjacent Satellite 2 (dB)	13.0	13.0	13.0	12.6	12.6	12.6
C/N(H) Composite (dB)	5.6	5.6	4.7	4.8	4.8	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	0.6	0.9	0.9	0.7	0.9	0.0
Number of Carriers	3	3	3	360	360	360
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.7	-52.7	-52.7	-52.7	-52.7	-52.7
Downlink EIRP Density at Beam Peak	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	RUKH	RUKH	RUKH	RUKH	RUKH	RUKH
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Uplink Contour G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Uplink SFD (dBW/M ²)	-78.1	-78.1	-78.1	-84.1	-84.1	-84.1
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	MEKV	MEKV	MEKV	MEKV	MEKV	MEKV
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
Downlink Contour EIRP (dBW)	45.7	45.7	45.7	46.7	46.7	46.7
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	7	7	7	6	6	6
Emission Designation	1M45G7W	1M45G7W	1M45G7W	40DKG7W	40DKG7W	40DKG7W
Information Rate (kbps)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	1.2	1.2	1.2
Earth Station Gain (dBi)	54.6	54.6	54.6	42.8	42.8	42.8
Earth Station Elevation Angle	31.5	31.5	31.5	31.5	31.5	31.5
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.16	1.16	1.16	4.50	4.50	4.50
Earth Station Gain (dBi)	41.8	41.8	41.8	53.6	53.6	53.6
Earth Station G/T (dB/K)	19.8	19.8	19.8	31.6	31.6	30.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	62.6	62.6	62.6	40.2	40.2	40.2
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	0.9	0.0	0.0	0.9	0.0
Satellite G/T (dB/K)	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Uplink C/N (dB)	23.0	22.2	23.0	6.5	5.5	6.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	26.9	26.9	26.9	20.3	20.3	20.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station G/T (dB/K)	19.8	19.8	18.6	31.6	31.6	30.6
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Downlink C/N (dB)	7.6	7.6	5.9	16.8	16.8	17.2
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	23.0	22.2	23.0	6.5	5.5	6.5
C/N Downlink (dB)	7.6	7.6	5.9	16.8	16.8	17.2
C/N Other Links (Co-channel & IM)	15.0	15.0	15.0	15.0	15.0	15.0
C/N Uplink Adjacent Satellite 1 (dB)	30.4	30.4	30.4	13.8	13.8	13.8
C/N Downlink Adjacent Satellite 1 (dB)	11.2	11.2	11.2	23.7	23.7	23.7
C/N Uplink Adjacent Satellite 2 (dB)	30.4	30.4	30.4	13.8	13.8	13.8
C/N Downlink Adjacent Satellite 2 (dB)	12.6	12.6	12.6	24.2	24.2	24.2
C/N+J Composite (dB)	4.7	4.7	3.6	4.5	3.9	4.4
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	0.2	0.9	0.0	0.0	0.1	0.6
Number of Carriers	24	24	24	90	90	90
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.7	-52.7	-52.7	-57.5	-57.5	-57.5
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-26.6	-26.6	-26.6

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	EIKV	EIKV	EIKV	EIKV	EIKV	EIKV
Uplink Frequency (MHz)	14010-14250	14010-14250	14010-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-5.0
Uplink Contour G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Uplink SFDR (dBW/Hz)	-32.2	-32.2	-32.2	-34.2	-34.2	-34.2
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EIKH	EIKH	EIKH	EIKH	EIKH	EIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-5.0
Downlink Contour EIRP (dBW)	40.9	40.9	40.9	40.9	40.9	40.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
CARRIER INFORMATION						
Carrier ID	1	1	1	3	3	3
Emission Designation	3EMDF3F	3EMDF3F	3EMDF3F	72MIG7W	72MIG7W	72MIG7W
Information Rate (Mbps)	N/A	N/A	N/A	55539.3	55539.3	55539.3
Carrier Modulation	TVFM	TVFM	TVFM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	N/A	N/A	N/A
Code Rate	N/A	N/A	N/A	0.5	0.5	0.5
Occupied Bandwidth (kHz)	36000	36000	36000	60265	60265	60265
Allocated Bandwidth (kHz)	36000	36000	36000	72000	72000	72000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.35	3.35	3.35
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.35	3.35	3.35
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.33	2.33	2.33	2.62	2.62	2.62
Earth Station Gain (dBi)	47.9	47.9	47.9	46.9	46.9	46.9
Earth Station G/T (dB/K)	25.8	25.8	22.9	26.8	26.8	25.9
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	74.6	74.6	74.6	78.5	78.5	78.5
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	4.0	0.0	0.0	4.0	0.0
Satellite G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-55.0	-55.0	-55.0	-77.8	-77.8	-77.8
Uplink C/N (dB)	25.4	22.3	25.4	16.4	14.4	16.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	37.1	37.1	37.1	40.9	40.9	40.9
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	205.2	206.2	206.2	205.2
Downlink Rain Attenuation (dB)	0.0	0.0	3.5	0.0	0.0	3.5
Earth Station G/T (dB/K)	25.8	25.8	22.9	26.8	26.8	25.9
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-55.0	-55.0	-55.0	-77.8	-77.8	-77.8
Downlink C/N (dB)	18.6	18.6	12.2	11.7	11.7	5.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.4	22.3	25.4	16.4	14.4	16.4
C/N Downlink (dB)	18.6	18.6	12.2	11.7	11.7	5.3
C/N Other Links (Co-channel & IM)	22.0	22.0	22.0	24.0	24.0	24.0
C/N Uplink Adjacent Satellite 1 (dB)	37.2	37.2	37.2	29.2	29.2	29.2
C/N Downlink Adjacent Satellite 1 (dB)	23.2	23.2	23.2	16.3	16.3	16.3
C/N Uplink Adjacent Satellite 2 (dB)	37.2	37.2	37.2	29.2	29.2	29.2
C/N Downlink Adjacent Satellite 2 (dB)	23.8	23.8	23.8	16.9	16.9	16.9
C/N(H) Composite (dB)	15.0	14.5	11.1	8.8	6.1	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	13.0	3.4	3.4	3.4
Excess Link Margin (dB)	3.9	3.4	0.0	4.3	3.7	0.0
Number of Carriers	2	2	2	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.0	-46.0	-46.0	-53.9	-53.9	-53.9
Downlink EIRP Density at Beam Peak	-23.0	-23.0	-23.0	-30.9	-30.9	-30.9

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	EIKV	EIKV	EIKV	EIKV	EIKV	EIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Uplink SFDR (dB/Hz)	-82.2	-82.2	-82.2	-82.2	-82.2	-82.2
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EIKH	EIKH	EIKH	EIKH	EIKH	EIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	40.9	40.9	40.9	40.9	40.9	40.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10KKG7W	10KKG7W	10KKG7W
Information Rate (kbit/s)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.87	3.87	2.59	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.87	3.87	2.59	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.32	2.32	2.32	2.39	2.39	2.39
Earth Station Gain (dBi)	47.9	47.9	47.9	46.1	46.1	46.1
Earth Station G/T (dB/K)	25.6	25.6	22.9	26.0	26.0	25.1
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	70.5	70.5	70.5	49.9	49.9	49.9
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	4.0	0.0	0.0	4.0	0.0
Satellite G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Solizman Constant (dBW/K-Hz)	226.6	226.6	226.6	226.6	226.6	226.6
Carrier Noise Bandwidth (dB-Hz)	-68.3	-68.3	-68.3	-48.8	-48.8	-48.8
Uplink C/N (dB)	20.0	15.9	20.0	16.9	14.3	16.9
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	32.9	32.9	32.9	12.3	12.3	12.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	3.5	0.0	0.0	3.5
Earth Station G/T (dB/K)	25.6	25.6	22.9	26.0	26.0	25.1
Solizman Constant (dBW/K-Hz)	226.6	226.6	226.6	226.6	226.6	226.6
Carrier Noise Bandwidth (dB-Hz)	-68.3	-68.3	-68.3	-48.8	-48.8	-48.8
Downlink C/N (dB)	12.2	12.2	5.6	11.3	11.3	4.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	20.0	15.9	20.0	16.9	14.3	16.9
C/N Downlink (dB)	12.2	12.2	5.6	11.3	11.3	4.9
CI Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
CI Uplink Adjacent Satellite 1 (dB)	30.7	30.7	30.7	29.7	29.7	29.7
CI Downlink Adjacent Satellite 1 (dB)	16.7	16.7	16.7	16.9	16.9	16.9
CI Uplink Adjacent Satellite 2 (dB)	30.7	30.7	30.7	29.7	29.7	29.7
CI Downlink Adjacent Satellite 2 (dB)	17.3	17.3	17.3	16.5	16.5	16.5
C/(N+I) Composite (dB)	8.6	3.2	4.7	7.9	7.4	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.9	2.8
Excess Link Margin (dB)	3.6	3.5	0.0	3.8	3.5	0.0
Number of Carriers	6	6	6	720	720	720
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.4	-52.4	-52.4	-63.5	-63.5	-63.5
Downlink EIRP Density at Beam Peak	-29.4	-29.4	-29.4	-30.5	-30.5	-30.5

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	EIKV	EIKV	EIKV	EIKV	EIKV	EIKV
Uplink Frequency (MHz)	14030-14250	14030-14250	14030-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Uplink SFD (dBW/m ²)	-92.2	-92.2	-92.2	-92.2	-92.2	-92.2
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EIKH	EIKH	EIKH	EIKH	EIKH	EIKH
Downlink Frequency (MHz)	12530-12750	12530-12750	12530-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	40.9	40.9	40.9	40.9	40.9	40.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	7	7	7	8	8	8
Emission Designation	1M45G7W	1M45G7W	1M45G7W	401KG7W	401KG7W	401KG7W
Information Rate (kbps)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	2.5	2.5	2.5
Earth Station Gain (dBi)	54.6	54.6	54.6	49.5	49.5	49.5
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.50	2.50	2.50	4.50	4.50	4.50
Earth Station Gain (dBi)	49.5	49.5	49.5	53.5	53.5	53.5
Earth Station G/T (dB/K)	25.4	25.4	23.5	31.5	31.5	28.6
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	61.6	61.6	61.6	45.9	45.9	45.9
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	4.0	0.0	0.0	4.0	0.0
Satellite G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-60.9	-60.9	-64.9	-64.9	-64.9
Uplink C/N (dB)	18.4	14.4	18.4	3.8	4.7	6.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	24.0	24.0	24.0	16.3	16.3	16.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	206.2	206.2	206.2	205.2
Downlink Rain Attenuation (dB)	0.0	0.0	3.5	0.0	0.0	3.5
Earth Station G/T (dB/K)	25.4	25.4	23.5	31.5	31.5	28.6
Solzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-60.9	-60.9	-64.9	-64.9	-64.9
Downlink C/N (dB)	11.2	11.2	4.9	16.7	16.7	10.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	18.4	14.4	18.4	3.8	4.7	6.8
C/N Downlink (dB)	11.2	11.2	4.9	16.7	16.7	10.4
C/N Other Links (Co-channel & Int)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	29.2	29.2	29.2	19.6	19.6	19.6
C/N Downlink Adjacent Satellite 1 (dB)	15.9	15.9	15.9	21.7	21.7	21.7
C/N Uplink Adjacent Satellite 2 (dB)	29.2	29.2	29.2	19.6	19.6	19.6
C/N Downlink Adjacent Satellite 2 (dB)	16.5	16.5	16.5	22.3	22.3	22.3
C/N(H) Composite (dB)	7.8	7.3	3.8	5.7	3.8	5.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	3.3	3.5	0.6	2.2	0.0	1.7
Number of Carriers	49	49	49	160	160	160
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-53.9	-53.9	-53.9	-58.4	-58.4	-58.4
Downlink EIRP Density at Beam Peak	-30.9	-30.9	-30.9	-30.5	-30.5	-30.5

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	EIKV	EIKV	EIKV	EIKV	EIKV	EIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Uplink Contour G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Uplink SFD (dBW/km ²)	-32.2	-32.2	-32.2	-34.2	-34.2	-34.2
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	WIKH	WIKH	WIKH	WIKH	WIKH	WIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Downlink Contour EIRP (dBW)	44.3	44.3	44.3	44.3	44.3	44.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
CARRIER INFORMATION						
Carrier ID	1	1	1	3	3	3
Emission Designation	35M0F3F	35M0F3F	35M0F3F	72M0G7W	72M0G7W	72M0G7W
Information Rate (Mbps)	n/a	n/a	n/a	55539.3	55539.3	55539.3
Carrier Modulation	TV/FM	TV/FM	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	n/a	n/a	n/a
Code Rate	n/a	n/a	n/a	0.5	0.5	0.5
Occupied Bandwidth (kHz)	36000	36000	36000	60265	60265	60265
Allocated Bandwidth (kHz)	36000	36000	36000	72000	72000	72000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.35	3.35	3.35
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.35	3.35	3.35
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.10	1.10	1.10	1.17	1.17	1.17
Earth Station Gain (dBi)	41.4	41.4	41.4	41.9	41.9	41.9
Earth Station G/T (dB/K)	19.4	19.4	19.4	19.9	19.9	19.9
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
Link Fade Type	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	74.6	74.6	74.6	76.5	76.5	76.5
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	4.0	0.0	0.0	4.0	0.0
Satellite G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Uplink C/N (dB)	25.4	22.3	25.4	15.4	14.4	15.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	40.5	40.5	40.5	44.3	44.3	44.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station G/T (dB/K)	19.4	19.4	18.4	19.9	19.9	18.9
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Downlink C/N (dB)	15.6	15.6	13.9	3.2	6.2	6.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.4	22.3	25.4	15.4	14.4	15.4
C/N Downlink (dB)	15.6	15.6	13.9	3.2	6.2	6.4
C/I Other Links (Co-channel & Int)	22.0	22.0	22.0	24.0	24.0	24.0
C/I Uplink Adjacent Satellite 1 (dB)	37.2	37.2	37.2	29.2	29.2	29.2
C/I Downlink Adjacent Satellite 1 (dB)	17.7	17.7	17.7	12.2	12.2	12.2
C/I Uplink Adjacent Satellite 2 (dB)	37.2	37.2	37.2	29.2	29.2	29.2
C/I Downlink Adjacent Satellite 2 (dB)	19.9	19.9	19.9	13.1	13.1	13.1
C/(N+I) Composite (dB)	12.0	11.7	11.1	5.5	5.2	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	0.9	0.6	0.0	1.1	0.7	0.0
Number of Carriers	2	2	2	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-25.0	-25.0	-25.0	-53.9	-53.9	-53.9
Downlink EIRP Density at Beam Peak	-19.6	-19.6	-19.6	-27.5	-27.5	-27.5

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	EIKV	EIKV	EIKV	EIKV	EIKV	EIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-5.0	-5.0
Uplink Contour G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Uplink SFD (dBW/m ²)	-82.2	-82.2	-82.2	-82.2	-82.2	-82.2
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	55.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	WIKH	WIKH	WIKH	WIKH	WIKH	WIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-5.0	-5.0
Downlink Contour EIRP (dBW)	44.3	44.3	44.3	44.3	44.3	44.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W
Information Rate (kbps)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.57	3.57	2.99	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.57	3.57	2.99	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.10	1.10	1.10	1.11	1.11	1.11
Earth Station Gain (dBi)	41.4	41.4	41.4	41.5	41.5	41.5
Earth Station G/T (dB/K)	19.4	19.4	19.4	19.5	19.5	19.5
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	70.5	70.5	70.5	49.9	49.9	49.9
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	4.0	0.0	0.0	4.0	0.0
Satellite G/T (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Solizman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.3	-56.3	-56.3	-46.8	-46.8	-46.8
Uplink C/N (dB)	19.9	15.9	19.9	16.9	14.8	16.9
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	35.3	35.3	35.3	15.7	15.7	15.7
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station G/T (dB/K)	19.4	19.4	19.4	19.5	19.5	19.5
Solizman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.3	-56.3	-56.3	-46.8	-46.8	-46.8
Downlink C/N (dB)	9.2	9.2	7.4	8.2	6.2	6.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	19.9	15.9	19.9	16.9	14.8	16.9
C/N Downlink (dB)	9.2	9.2	7.4	8.2	6.2	6.4
C/N Other Links (Co-channel & IM)	15.0	15.0	15.0	15.0	15.0	15.0
C/N Uplink Adjacent Satellite 1 (dB)	30.7	30.7	30.7	29.7	29.7	29.7
C/N Downlink Adjacent Satellite 1 (dB)	11.2	11.2	11.2	10.5	10.5	10.5
C/N Uplink Adjacent Satellite 2 (dB)	30.7	30.7	30.7	29.7	29.7	29.7
C/N Downlink Adjacent Satellite 2 (dB)	13.4	13.4	13.4	12.8	12.8	12.8
C/(N+I) Composite (dB)	5.5	5.3	4.7	4.6	4.5	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	0.6	0.6	0.0	0.7	0.7	0.0
Number of Carriers	6	6	6	720	720	720
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.4	-52.4	-52.4	-53.5	-53.5	-53.5
Downlink EIRP Density at Beam Peak	-25.0	-25.0	-25.0	-27.1	-27.1	-27.1

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	EIKV	EIKV	EIKV	EIKV	EIKV	EIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14300-14250	14300-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour GT (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Uplink SFD (dB/Hz)	-90.2	-90.2	-90.2	-92.2	-92.2	-92.2
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	WIKH	WIKH	WIKH	WIKH	WIKH	WIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	44.3	44.3	44.3	44.3	44.3	44.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	7	7	7	8	8	8
Emission Designation	1M45G7W	1M45G7W	1M45G7W	400KG7W	400KG7W	400KG7W
Information Rate (kbps)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	1.8	1.8	1.8
Earth Station Gain (dBi)	54.6	54.6	54.6	46.6	46.6	46.6
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.80	1.80	1.80	4.50	4.50	4.50
Earth Station Gain (dBi)	45.7	45.7	45.7	53.6	53.6	53.6
Earth Station GT (dB/K)	23.7	23.7	22.6	31.6	31.6	30.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	53.1	53.1	53.1	45.7	45.7	45.7
Uplink Path Loss, Clear Sky (dB)	207.1	207.1	207.1	207.1	207.1	207.1
Uplink Rain Attenuation (dB)	0.0	4.0	0.0	0.0	4.0	0.0
Satellite GT (dB/K)	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5
Solomon Constant (dB/W/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Uplink C/N (dB)	10.0	5.9	10.0	8.6	4.5	6.6
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	27.0	27.0	27.0	21.5	21.5	21.5
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station GT (dB/K)	23.7	23.7	22.6	31.6	31.6	30.6
Solomon Constant (dB/W/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Downlink C/N (dB)	11.5	11.5	9.7	20.0	20.0	16.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	10.0	5.9	10.0	8.6	4.5	6.6
C/N Downlink (dB)	11.5	11.5	9.7	20.0	20.0	16.3
C/N Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	20.6	20.6	20.6	19.4	19.4	19.4
C/N Downlink Adjacent Satellite 1 (dB)	15.7	15.7	15.7	24.9	24.9	24.9
C/N Uplink Adjacent Satellite 2 (dB)	20.6	20.6	20.6	19.4	19.4	19.4
C/N Downlink Adjacent Satellite 2 (dB)	16.3	16.3	16.3	25.4	25.4	25.4
C/(N+I) Composite (dB)	5.9	3.8	5.2	6.9	3.8	6.8
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	1.3	0.0	1.4	2.4	0.0	3.0
Number of Carriers	49	49	49	160	160	160
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.3	-52.3	-52.3	-55.8	-55.8	-55.8
Downlink EIRP Density at Beam Peak	-27.9	-27.9	-27.9	-27.4	-27.4	-27.4

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION	WIKV	WIKV	WIKV	WIKV	WIKV	WIKV
Uplink Beam Name						
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/M ²)	-32.4	-32.4	-32.4	-34.4	-34.4	-34.4
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	WIKH	WIKH	WIKH	WIKH	WIKH	WIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	44.3	44.3	44.3	44.3	44.3	44.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	1	1	1	3	3	3
Emission Designation	35MDF3F	35MDF3F	35MDF3F	72M0G7W	72M0G7W	72M0G7W
Information Rate (Mbps)	n/a	n/a	n/a	55539.3	55539.3	55539.3
Carrier Modulation	TVFM	TVFM	TVFM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	n/a	n/a	n/a
Code Rate	n/a	n/a	n/a	0.5	0.5	0.5
Occupied Bandwidth (kHz)	36000	36000	35000	60265	60265	60265
Allocated Bandwidth (kHz)	36000	36000	35000	72000	72000	72000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.35	3.35	3.35
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.35	3.35	3.35
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.10	1.10	1.10	1.17	1.17	1.17
Earth Station Gain (dBi)	41.4	41.4	41.4	41.9	41.9	41.9
Earth Station G/T (dB/K)	19.4	19.4	18.4	19.9	19.9	18.9
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	74.5	74.5	74.5	76.3	76.3	76.3
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Uplink C/N (dB)	27.5	26.6	27.5	19.5	18.6	19.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	40.5	40.5	40.5	44.3	44.3	44.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	205.2	205.2	205.2	205.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station G/T (dB/K)	19.4	19.4	18.4	19.9	19.9	18.9
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Downlink C/N (dB)	15.6	15.6	13.6	8.2	8.2	6.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	27.5	26.6	27.5	19.5	18.6	19.5
C/N Downlink (dB)	15.6	15.6	13.6	8.2	8.2	6.4
C/N Other Links (Co-channel & I/N)	22.0	22.0	22.0	24.0	24.0	24.0
C/N Uplink Adjacent Satellite 1 (dB)	37.0	37.0	37.0	29.1	29.1	29.1
C/N Downlink Adjacent Satellite 1 (dB)	17.6	17.6	17.6	12.2	12.2	12.2
C/N Uplink Adjacent Satellite 2 (dB)	37.0	37.0	37.0	29.1	29.1	29.1
C/N Downlink Adjacent Satellite 2 (dB)	19.5	19.5	19.5	13.1	13.1	13.1
C/N(H) Composite (dB)	12.0	11.9	11.1	5.6	5.5	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	0.9	0.6	0.0	1.1	1.1	0.0
Number of Carriers	2	2	2	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.1	-46.1	-46.1	-54.1	-54.1	-54.1
Downlink EIRP Density at Beam Peak	-19.6	-19.6	-19.6	-27.5	-27.5	-27.5

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	WIKV	WIKV	WIKV	WIKV	WIKV	WIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/m ²)	-32.4	-32.4	-32.4	-32.4	-32.4	-32.4
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	WIKH	WIKH	WIKH	WIKH	WIKH	WIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	44.3	44.3	44.3	44.3	44.3	44.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W
Information Rate (kbp/s)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.87	3.57	3.57	2.59	2.79	2.79
Minimum C/N, Rain (dB)	3.87	3.57	3.57	2.59	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.10	1.10	1.10	1.11	1.11	1.11
Earth Station Gain (dBi)	41.4	41.4	41.4	41.5	41.5	41.5
Earth Station G/T (dB/K)	19.4	19.4	19.4	19.5	19.5	19.5
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	70.3	70.3	70.3	49.8	49.8	49.8
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-58.3	-58.3	-58.3	-48.3	-48.3	-48.3
Uplink C/N (dB)	21.0	20.1	21.0	20.0	19.1	20.0
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	35.3	35.3	35.3	15.7	15.7	15.7
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.7	0.0	0.0	0.7
Earth Station G/T (dB/K)	19.4	19.4	19.4	19.5	19.5	19.5
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-58.3	-58.3	-58.3	-48.3	-48.3	-48.3
Downlink C/N (dB)	9.2	9.2	7.4	8.2	6.2	6.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	21.0	20.1	21.0	20.0	19.1	20.0
C/N Downlink (dB)	9.2	9.2	7.4	8.2	6.2	6.4
CI Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
CI Uplink Adjacent Satellite 1 (dB)	30.6	30.6	30.6	29.5	29.5	29.5
CI Downlink Adjacent Satellite 1 (dB)	11.2	11.2	11.2	10.5	10.5	10.5
CI Uplink Adjacent Satellite 2 (dB)	30.6	30.6	30.6	29.5	29.5	29.5
CI Downlink Adjacent Satellite 2 (dB)	13.4	13.4	13.4	12.8	12.8	12.8
C/(N+I) Composite (dB)	5.6	5.5	4.7	4.6	4.8	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	0.6	0.9	0.0	0.7	0.9	0.0
Number of Carriers	6	6	6	720	720	720
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-32.6	-32.6	-32.6	-33.6	-33.6	-33.6
Downlink EIRP Density at Beam Peak	-26.0	-26.0	-26.0	-27.1	-27.1	-27.1

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	WIKV	WIKV	WIKV	WIKV	WIKV	WIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Uplink Contour EIRP (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/M ²)	-32.4	-32.4	-32.4	-32.4	-32.4	-32.4
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	WIKH	WIKH	WIKH	WIKH	WIKH	WIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Downlink Contour EIRP (dBW)	44.3	44.3	44.3	44.3	44.3	44.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
CARRIER INFORMATION						
Carrier ID	7	7	7	6	6	6
Emission Designation	1M45G7W	1M45G7W	1M45G7W	400K67W	400K67W	400K67W
Information Rate (kbps)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	1.1	1.1	1.1
Earth Station Gain (dBi)	54.6	54.6	54.6	42.5	42.5	42.5
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.14	1.14	1.14	4.50	4.50	4.50
Earth Station Gain (dBi)	41.7	41.7	41.7	53.5	53.5	53.5
Earth Station G/T (dB/K)	19.7	19.7	19.6	31.5	31.5	30.5
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	61.4	61.4	61.4	41.3	41.3	41.3
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Uplink C/N (dB)	19.5	18.6	19.5	5.9	5.0	5.9
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	27.4	27.4	27.4	21.8	21.8	21.8
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	205.2	205.2	205.2	205.2
Downlink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	19.7	19.7	19.6	31.5	31.5	30.5
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Downlink C/N (dB)	7.9	7.9	6.1	20.3	20.3	18.5
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	19.5	18.6	19.5	5.9	5.0	5.9
C/N Downlink (dB)	7.9	7.9	6.1	20.3	20.3	18.5
C/N Other Links (Co-channel & IM)	15.0	15.0	15.0	15.0	15.0	15.0
C/N Uplink Adjacent Satellite 1 (dB)	29.0	29.0	29.0	15.4	15.4	15.4
C/N Downlink Adjacent Satellite 1 (dB)	10.9	10.9	10.9	25.1	25.1	25.1
C/N Uplink Adjacent Satellite 2 (dB)	29.0	29.0	29.0	15.4	15.4	15.4
C/N Downlink Adjacent Satellite 2 (dB)	13.1	13.1	13.1	25.7	25.7	25.7
C/N(Hz) Composite (dB)	4.8	4.8	3.8	4.5	3.8	4.4
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	0.3	1.0	0.0	0.0	0.0	0.6
Number of Carriers	49	49	49	179	179	179
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-54.1	-54.1	-54.1	-55.7	-55.7	-55.7
Downlink EIRP Density at Beam Peak	-27.5	-27.5	-27.5	-27.1	-27.1	-27.1

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	WIKV	WIKV	WIKV	WIKV	WIKV	WIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-5.0
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/M ²)	-32.4	-32.4	-32.4	-34.4	-34.4	-34.4
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EIKH	EIKH	EIKH	EIKH	EIKH	EIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-5.0
Downlink Contour EIRP (dBW)	40.9	40.9	40.9	40.9	40.9	40.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	1	1	1	3	3	3
Emission Designation	36M0F3F	36M0F3F	36M0F3F	72M0G7W	72M0G7W	72M0G7W
Information Rate (Mbps)	N/A	N/A	N/A	55539.3	55539.3	55539.3
Carrier Modulation	TM/FM	TM/FM	TM/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4.0	4.0	4.0	N/A	N/A	N/A
Code Rate	N/A	N/A	N/A	0.5	0.5	0.5
Occupied Bandwidth (kHz)	36000	36000	36000	60265	60265	60265
Allocated Bandwidth (kHz)	36000	36000	36000	72000	72000	72000
Minimum C/N, Clear Sky (dB)	10.00	10.00	10.00	3.35	3.35	3.35
Minimum C/N, Rain (dB)	10.00	10.00	10.00	3.35	3.35	3.35
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.33	2.33	2.33	2.61	2.61	2.61
Earth Station Gain (dBi)	47.9	47.9	47.9	48.9	48.9	48.9
Earth Station G/T (dB/K)	25.6	25.6	22.9	26.8	26.8	23.9
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
LINK FADE TYPE						
Link Fade Type	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	74.5	74.5	74.5	76.3	76.3	76.3
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Uplink C/N (dB)	27.5	26.6	27.5	19.5	16.6	19.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	37.1	37.1	37.1	40.9	40.9	40.9
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	3.5	0.0	0.0	3.5
Earth Station G/T (dB/K)	25.6	25.6	22.9	26.8	26.8	23.9
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-56.0	-56.0	-56.0	-77.8	-77.8	-77.8
Downlink C/N (dB)	18.6	18.6	12.2	11.7	11.7	5.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	27.5	26.6	27.5	19.5	16.6	19.5
C/N Downlink (dB)	18.6	18.6	12.2	11.7	11.7	5.3
C/N Other Links (Co-channel & IM)	22.0	22.0	22.0	24.0	24.0	24.0
C/N Uplink Adjacent Satellite 1 (dB)	37.0	37.0	37.0	29.1	29.1	29.1
C/N Downlink Adjacent Satellite 1 (dB)	23.2	23.2	23.2	16.3	16.3	16.3
C/N Uplink Adjacent Satellite 2 (dB)	37.0	37.0	37.0	29.1	29.1	29.1
C/N Downlink Adjacent Satellite 2 (dB)	23.7	23.7	23.7	16.9	16.9	16.9
C/(N+I) Composite (dB)	15.0	15.0	11.1	8.9	6.8	4.5
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	10.0	10.0	10.0	3.4	3.4	3.4
Excess Link Margin (dB)	3.9	3.9	0.0	4.4	4.3	0.0
Number of Carriers	2	2	2	1	1	1
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.1	-46.1	-46.1	-54.1	-54.1	-54.1
Downlink EIRP Density at Beam Peak	-23.0	-23.0	-23.0	-20.9	-20.9	-20.9

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	WIKV	WIKV	WIKV	WIKV	WIKV	WIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFDR (dBW/m ²)	-82.4	-82.4	-82.4	-82.4	-82.4	-82.4
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EIKH	EIKH	EIKH	EIKH	EIKH	EIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	40.9	40.9	40.9	40.9	40.9	40.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	5	5	5	6	6	6
Emission Designation	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W	10M3G7W
Information Rate (Mbps)	6240.0	6240.0	6240.0	70.4	70.4	70.4
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	6771	6771	6771	75	75	75
Allocated Bandwidth (kHz)	10300	10300	10300	100	100	100
Minimum C/N, Clear Sky (dB)	3.37	3.37	3.37	2.99	2.79	2.79
Minimum C/N, Rain (dB)	3.37	3.37	3.37	2.99	2.79	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain (dBi)	54.6	54.6	54.6	54.6	54.6	54.6
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.32	2.32	2.32	2.33	2.33	2.33
Earth Station Gain (dBi)	47.9	47.9	47.9	46.1	46.1	46.1
Earth Station G/T (dB/K)	25.6	25.6	22.9	26.0	26.0	23.1
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
LINK FADE TYPE						
	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	70.3	70.3	70.3	49.8	49.8	49.8
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-63.3	-63.3	-63.3	-48.3	-48.3	-48.3
Uplink C/N (dB)	21.0	20.1	21.0	20.0	19.1	20.0
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	32.9	32.9	32.9	12.3	12.3	12.3
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	205.2	205.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	3.5	0.0	0.0	3.5
Earth Station G/T (dB/K)	25.6	25.6	22.9	26.0	26.0	23.1
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-63.3	-63.3	-63.3	-48.3	-48.3	-48.3
Downlink C/N (dB)	12.1	12.1	5.7	11.3	11.3	4.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	21.0	20.1	21.0	20.0	19.1	20.0
C/N Downlink (dB)	12.1	12.1	5.7	11.3	11.3	4.9
C/N Other Links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	30.6	30.6	30.6	29.5	29.5	29.5
C/N Downlink Adjacent Satellite 1 (dB)	16.7	16.7	16.7	15.9	15.9	15.9
C/N Uplink Adjacent Satellite 2 (dB)	30.6	30.6	30.6	29.5	29.5	29.5
C/N Downlink Adjacent Satellite 2 (dB)	17.3	17.3	17.3	16.5	16.5	16.5
C/N(H) Composite (dB)	8.7	8.6	4.7	8.0	7.9	3.9
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.9	3.6	3.6	3.0	2.8	2.8
Excess Link Margin (dB)	3.7	3.9	0.0	3.9	4.0	0.0
Number of Carriers	6	6	6	720	720	720
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-52.6	-52.6	-52.6	-53.6	-53.6	-53.6
Downlink EIRP Density at Beam Peak	-29.4	-29.4	-29.4	-20.5	-20.5	-20.5

EXHIBIT 12: HORIZONS 2 Ku-BAND LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	WIKV	WIKV	WIKV	WIKV	WIKV	WIKV
Uplink Frequency (MHz)	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250	14000-14250
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-5.0
Uplink Contour GTT (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/MHz)	-82.4	-82.4	-82.4	-85.4	-85.4	-85.4
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EIKH	EIKH	EIKH	EIKH	EIKH	EIKH
Downlink Frequency (MHz)	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750	12500-12750
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-5.0	-5.0	-6.0	-6.0	-6.0	-5.0
Downlink Contour EIRP (dBW)	40.9	40.9	40.9	40.9	40.9	40.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E	63.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E	67.15°E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	7	7	7	8	8	8
Emission Designation	1M45G7W	1M45G7W	1M45G7W	40JKG7W	40JKG7W	40JKG7W
Information Rate (kbit/s)	614.5	614.5	614.5	153.5	153.5	153.5
Carrier Modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	n/a	n/a	n/a	n/a	n/a	n/a
Code Rate	0.5	0.5	0.5	0.5	0.5	0.5
Occupied Bandwidth (kHz)	1229	1229	1229	307	307	307
Allocated Bandwidth (kHz)	1450	1450	1450	400	400	400
Minimum C/N, Clear Sky (dB)	3.40	2.70	2.70	3.40	2.70	2.70
Minimum C/N, Rain (dB)	3.40	2.70	2.70	3.40	2.70	2.70
UPLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	4.5	4.5	2.5	2.5	2.5
Earth Station Gain (dBi)	54.6	54.6	54.6	49.4	49.4	49.4
Earth Station Elevation Angle	29.6	29.6	29.6	29.6	29.6	29.6
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.49	2.49	2.49	4.50	4.50	4.50
Earth Station Gain (dBi)	43.6	43.6	43.6	53.6	53.6	53.6
Earth Station GTT (dB/K)	26.4	26.4	23.5	31.5	31.5	28.6
Earth Station Elevation Angle	31.9	31.9	31.9	31.9	31.9	31.9
LINK FADE TYPE						
Link Fade Type	Clear Sky	Up Fade	Down Fade	Clear Sky	Up Fade	Down Fade
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	61.4	61.4	61.4	42.3	42.3	42.3
Uplink Path Loss, Clear Sky (dB)	207.2	207.2	207.2	207.2	207.2	207.2
Uplink Rain Attenuation (dB)	0.0	0.9	0.0	0.0	0.9	0.0
Satellite G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Uplink C/N (dB)	19.5	18.6	19.5	6.5	5.6	6.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	24.0	24.0	24.0	17.9	17.9	17.9
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	206.2	206.2	206.2	206.2	206.2	206.2
Downlink Rain Attenuation (dB)	0.0	0.0	3.5	0.0	0.0	3.5
Earth Station G/T (dB/K)	26.4	26.4	23.5	31.5	31.5	28.6
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-50.9	-50.9	-50.9	-54.9	-54.9	-54.9
Downlink C/N (dB)	11.2	11.2	4.6	16.3	16.3	9.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	19.5	18.6	19.5	6.5	5.6	6.5
C/N Downlink (dB)	11.2	11.2	4.6	16.3	16.3	9.9
C/N Other links (Co-channel & IM)	16.0	16.0	16.0	16.0	16.0	16.0
C/N Uplink Adjacent Satellite 1 (dB)	29.0	29.0	29.0	16.0	16.0	16.0
C/N Downlink Adjacent Satellite 1 (dB)	15.6	15.6	15.6	21.3	21.3	21.3
C/N Uplink Adjacent Satellite 2 (dB)	29.0	29.0	29.0	16.0	16.0	16.0
C/N Downlink Adjacent Satellite 2 (dB)	16.4	16.4	16.4	21.8	21.8	21.8
C/N(H) Composite (dB)	7.9	7.6	3.6	4.7	4.1	3.8
Required System Margin (dB)	1.1	1.1	1.1	1.1	1.1	1.1
Minimum Required C/N (dB)	3.4	2.7	2.7	3.4	2.7	2.7
Excess Link Margin (dB)	3.4	4.0	0.0	0.2	0.3	0.0
Number of Carriers	49	49	49	160	160	160
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-54.1	-54.1	-54.1	-62.0	-62.0	-62.0
Downlink EIRP Density at Beam Peak	-30.9	-30.9	-30.9	-31.0	-31.0	-31.0