6378	earth radius (km)				
7158	earth radius & sat. altitude (km)		PARAMETERS FOR A 0°		0.0
			ELEV. ANGLE TO SATELLITE:		63.003
1221	footprint length @ 10° elevation (km)				27.0
200	footprint width @ 10° elevation (km)				63.0
					3249.3
111.3	1° of circumference (km)				
10.0	hub spacing (km) Zone 1	6.2	hub spacing miles		
100.0	hub area (km^2)				
22263	"swath" area (km^2)				
43	no. of hubs in one "swath"				
22	no. of hubs co-frequency/swath				
type	Hub Transmitting station				
29	frequency of operation (GHz)				
20.0	TWTA Saturated Output (dBW)				
-7.0	TWTA Backoff (dBW)				
-16.9	Band split 49 channels (dB)				
-3.9	Hub Xmtr Power/Channel (dBW)				
-1.0	Ant Feed Losses (dB)				
-4.9	Channel power to Antenna (dBW)				
-72.6	18 MHz Power Bandwidth (dBW-Hz)				
5.6	Peaking Factor (dB)				
-71.9	Xmtr spectral density/Hub (dBW/Hz)				
-30.0	Peak Spectral Area Density (dBWi/MHz-km^2)		Io/No (dB)	-20.5	
	"-71.9+60+12+10log(#co frequency channels/22263)"		Interference Margin	7.5	

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9
hub xmit gain (dBi)	10.0	8.1	6.0	2.0	-1.0	-7.0	-10.0	-10.0	-10.0	-10.0	-10.0
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 1	-13.5	-8.2	-5.6	-4.2	-3.2	-2.7	-2.2	-1.9	-1.6	-1.4	-1.3
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
received power density (dBW/Hz)	-228.3	-224.6	-223.8	-226.1	-227.7	-232.9	-235.0	-234.3	-233.6	-233.0	-232.4
received power density (W/Hz)	1.5E-23	3.5E-23	4.2E-23	2.5E-23	1.7E-23	5.2E-24	3.2E-24	3.7E-24	4.4E-24	5.0E-24	5.7E-24
percent total interference/swath	9.2	21.6	26.1	15.5	10.6	3.2	2.0	2.3	2.7	3.2	3.6
total power received (W/Hz)	1.6E-22										
total power received (dBW/Hz)	-218.0										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-20.5										
interference margin (dB)	7.5										

ATTACHMENT G

Interference Analysis - Texas Instruments Hub Transmitters into Iridium™ Space Station Receivers

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 1	-13.5	-8.2	-5.6	-4.2	-3.2	-2.7	-2.2	-1.9	-1.6	-1.4	-1.3
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	18.6	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-226.0	-218.2	-221.2	-222.2	-224.0	-226.2	-228.0	-228.7	-229.4	-230.5	-230.8
received power density (W/Hz)	2.5E-23	1.5E-22	7.5E-23	6.0E-23	3.9E-23	2.4E-23	1.6E-23	1.3E-23	1.1E-23	8.9E-24	8.4E-24
percent total interference/swath	5.8	35.0	17.4	13.9	9.1	5.5	3.6	3.1	2.6	2.0	1.9
total power received (W/Hz)	4.3E-22										
total power received (dBW/Hz)	-213.6										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-16.1										
Interference Margin (dB)	3.1										

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 2	-8.0	-5.0	-3.5	-2.6	-2.1	-1.7	-1.4	-1.2	-1.1	-0.9	-0.8
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-217.0	-218.4	-219.1	-220.6	-222.9	-225.2	-227.2	-228.0	-228.9	-230.0	-230.3
received power density (W/Hz)	2.0E-22	1.4E-22	1.2E-22	8.7E-23	5.1E-23	3.0E-23	1.9E-23	1.6E-23	1.3E-23	1.0E-23	9.4E-24
percent total interference/swath	28.6	20.4	17.5	12.4	7.2	4.3	2.7	2.2	1.8	1.4	1.3
total power received (W/Hz)	7.0E-22										
total power received (dBW/Hz)	-211.5										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-14.1										
Interference Margin	1.1										

TI/3-4 AM

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zones 3-5	-5.2	-3.4	-2.4	-1.9	-1.5	-1.2	-1.1	-0.9	-0.8	-0.7	-0.6
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-214.2	-216.8	-218.0	-219.9	-222.3	-224.7	-226.9	-227.7	-228.6	-229.8	-230.1
received power density (W/Hz)	3.8E-22	2.1E-22	1.6E-22	1.0E-22	5.8E-23	3.4E-23	2.0E-23	1.7E-23	1.4E-23	1.0E-23	9.8E-24
percent total interference/swath	37.7	20.4	15.6	10.1	5.8	3.4	2.0	1.7	1.4	1.0	1.0
total power received (W/Hz)	1.0E-21										
total power received (dBW/Hz)	-209.9										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-12.5										
Interference Margin (dB)	-0.5										

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 1	-13.5	-8.2	-5.6	-4.2	-3.2	-2.7	-2.2	-1.9	-1.6	-1.4	-1.3
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	18.6	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-230.8	-223.0	-226.0	-227.0	-228.8	-231.0	-232.8	-233.5	-234.2	-235.3	-235.6
received power density (W/Hz)	8.3E-24	5.0E-23	2.5E-23	2.0E-23	1.3E-23	8.0E-24	5.2E-24	4.4E-24	3.8E-24	2.9E-24	2.8E-24
percent total interference/swath	5.8	35.0	17.4	13.9	9.1	5.5	3.6	3.1	2.6	2.0	1.9
total power received (W/Hz)	1.4E-22										
total power received (dBW/Hz)	-218.4										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-20.9										
Interference Margin (dB)	7.9										

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 2	-8.0	-5.0	-3.5	-2.6	-2.1	-1.7	-1.4	-1.2	-1.1	-0.9	-0.8
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	18.6	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-225.3	-219.8	-223.9	-225.4	-227.8	-230.0	-232.0	-232.9	-233.8	-234.8	-235.1
received power density (W/Hz)	3.0E-23	1.1E-22	4.0E-23	2.9E-23	1.7E-23	1.0E-23	6.2E-24	5.2E-24	4.2E-24	3.3E-24	3.1E-24
percent total interference/swath	11.7	41.7	15.9	11.4	6.6	3.9	2.5	2.1	1.7	1.3	1.2
total power received (W/Hz)	2.5E-22										
total power received (dBW/Hz)	-216.0										
satellite noise floor (dBW/Hz)	-197.5										
Io maximum (dB)	-210.5										
Io/No (dB)	-18.5										
Interference Margin (dB)	5.5										

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zones 3-5	-5.2	-3.4	-2.4	-1.9	-1.5	-1.2	-1.1	-0.9	-0.8	-0.7	-0.6
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-219.0	-221.6	-222.8	-224.7	-227.1	-229.5	-231.7	-232.5	-233.4	-234.6	-234.9
received power density (W/Hz)	1.3E-22	6.9E-23	5.2E-23	3.4E-23	1.9E-23	1.1E-23	6.7E-24	5.6E-24	4.5E-24	3.5E-24	3.3E-24
percent total interference/swath	37.7	20.4	15.6	10.1	5.8	3.4	2.0	1.7	1.4	1.0	1.0
total power received (W/Hz)	3.4E-22										
total power received (dBW/Hz)	-214.7										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-17.3										
Interference Margin (dB)	4.3										

TI/3-4 WBD

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zones 3-5	-5.2	-3.4	-2.4	-1.9	-1.5	-1.2	-1.1	-0.9	-0.8	-0.7	-0.6
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-224.2	-226.8	-228.0	-229.9	-232.3	-234.7	-236.9	-237.7	-238.6	-239.8	-240.1
received power density (W/Hz)	3.8E-23	2.1E-23	1.6E-23	1.0E-23	5.8E-24	3.4E-24	2.0E-24	1.7E-24	1.4E-24	1.0E-24	9.8E-25
percent total interference/swath	37.7	20.4	15.6	10.1	5.8	3.4	2.0	1.7	1.4	1.0	1.0
total power received (W/Hz)	1.0E-22										
total power received (dBW/Hz)	-219.9										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-22.5										
Interference Margin (dB)	9.5										

TI/2-4 WBD

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8
hub xmit gain (dBI)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 2	-8.0	-5.0	-3.5	-2.6	-2.1	-1.7	-1.4	-1.2	-1.1	-0.9	-0.8
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBI)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	18.6	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-230.5	-225.0	-229.1	-230.6	-232.9	-235.2	-237.2	-238.0	-238.9	-240.0	-240.3
received power density (W/Hz)	9.0E-24	3.2E-23	1.2E-23	8.7E-24	5.1E-24	3.0E-24	1.9E-24	1.6E-24	1.3E-24	1.0E-24	9.4E-25
percent total interference/swath	11.8	41.5	16.0	11.4	6.6	4.0	2.5	2.1	1.7	1.3	1.2
total power received (W/Hz)	7.7E-23										
total power received (dBW/Hz)	-221.2										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-23.7										
Interference Margin (dB)	10.7										

TI/1-4 WBD

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.9	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-89.8	-77.8	-77.8
hub xmit gain (dBi)	15.0	13.7	11.2	8.5	5.3	2.3	-0.4	-1.8	-3.2	-4.9	-5.7
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 1	-13.5	-8.2	-5.6	-4.2	-3.2	-2.7	-2.2	-1.9	-1.6	-1.4	-1.3
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	18.6	22.1	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
received power density (dBW/Hz)	-236.0	-228.2	-231.2	-232.2	-234.0	-236.2	-238.0	-238.7	-239.4	-228.5	-228.8
received power density (W/Hz)	2.5E-24	1.5E-23	7.5E-24	6.0E-24	3.9E-24	2.4E-24	1.6E-24	1.3E-24	1.1E-24	1.4E-23	1.3E-23
percent total interference/swath	3.7	22.0	10.9	8.7	5.7	3.5	2.3	1.9	1.7	20.4	19.2
total power received (W/Hz)	6.9E-23										
total power received (dBW/Hz)	-221.6										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	-24.1										
Interference Margin (dB)	11.1										

INPUT DATA FOR CO-FREQUENCY SHARING ANALYSIS
VIDEOPHONE VERSUS IRIDIUM®
INTERFERENCE/SHARING SCENARIO #6
LMDS HUBS INTO IRIDIUM® SATELLITE RECEIVER

	Digital	FM	AM
TRANSMITTER POWER SPECTRAL DENSITY (DBW/HZ) (INCLUDES REDUCTION FOR POWER CONTROL)	- 83.6	- 83.9	- 83.6
# OF HUBS/SWATH (200KM X 110KM)	8360	8360	8360
FREQUENCY REUSE	1/1	1/1	1/1
PEAK ANTENNA GAIN (DB)	29.7	29.7	29.7

9/9/94

SYSTEM MARGIN
VIDEOPHONE Versus IRIDIUM®
HUB TO SATELLITE
"Quick Look" Program

REGION	Digital dB	FM dB	AM dB
1	-21.9	-21.6	-21.9
2	-25.3	-25.0	-25.3
3,4,5	-27.1	-26.8	-27.1

9/9/94

VP/1 DIG

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6
hub xmit gain (dBi)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 1	-13.5	-8.2	-5.6	-4.2	-3.2	-2.7	-2.2	-1.9	-1.6	-1.4	-1.3
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-195.6	-192.4	-194.8	-198.4	-202.8	-207.7	-210.9	-218.0	-219.1	-220.3	-221.3
received power density (W/Hz)	2.7E-20	5.7E-20	3.3E-20	1.5E-20	5.2E-21	1.7E-21	8.1E-22	1.6E-22	1.2E-22	9.4E-23	7.5E-23
percent total interference/swath	19.5	40.8	23.6	10.4	3.7	1.2	0.5	0.1	0.1	0.1	0.1
total power received (W/Hz)	1.4E-19										
total power received (dBW/Hz)	-188.5										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	8.9										
Interference Margin (dB)	-21.9										

VP/2 DIG

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6
hub xmit gain (dBi)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 2	-8.0	-5.0	-3.5	-2.6	-2.1	-1.7	-1.4	-1.2	-1.1	-0.9	-0.8
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-190.1	-189.2	-192.7	-196.8	-201.7	-206.7	-210.1	-217.3	-218.6	-219.8	-220.8
received power density (W/Hz)	9.7E-20	1.2E-19	5.4E-20	2.1E-20	6.7E-21	2.1E-21	9.8E-22	1.9E-22	1.4E-22	1.0E-22	8.4E-23
percent total interference/swath	32.2	39.6	17.8	7.0	2.2	0.7	0.3	0.1	0.0	0.0	0.0
total power received (W/Hz)	3.0E-19										
total power received (dBW/Hz)	-185.2										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	12.3										
Interference Margin (dB)	-25.3										

VP/3 DIG

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6
hub xmit gain (dBi)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zones 3-5	-5.2	-3.4	-2.4	-1.9	-1.5	-1.2	-1.1	-0.9	-0.8	-0.7	-0.6
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-187.3	-187.6	-191.6	-196.1	-201.1	-206.2	-209.8	-217.0	-218.3	-219.6	-220.6
received power density (W/Hz)	1.8E-19	1.7E-19	6.9E-20	2.5E-20	7.7E-21	2.4E-21	1.0E-21	2.0E-22	1.5E-22	1.1E-22	8.8E-23
percent total interference/swath	39.9	37.3	14.9	5.3	1.7	0.5	0.2	0.0	0.0	0.0	0.0
total power received (W/Hz)	4.6E-19										
total power received (dBW/Hz)	-183.3										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	14.1										
Interference Margin (dB)	-27.1										

VP/1 AM

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6
hub xmit gain (dBi)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 1	-13.5	-8.2	-5.6	-4.2	-3.2	-2.7	-2.2	-1.9	-1.6	-1.4	-1.3
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-195.6	-192.4	-194.8	-198.4	-202.8	-207.7	-210.9	-218.0	-219.1	-220.3	-221.3
received power density (W/Hz)	2.7E-20	5.7E-20	3.3E-20	1.5E-20	5.2E-21	1.7E-21	8.1E-22	1.6E-22	1.2E-22	9.4E-23	7.5E-23
percent total interference/swath	19.5	40.8	23.6	10.4	3.7	1.2	0.6	0.1	0.1	0.1	0.1
total power received (W/Hz)	1.4E-19										
total power received (dBW/Hz)	-188.5										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	8.9										
Interference Margin (dB)	-21.9										

VP/2 AM

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2523	2417	2308	2190	2090
hub xmit power(dBW/Hz)	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6
hub xmit gain (dBi)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 2	-8.0	-5.0	-3.5	-2.6	-2.1	-1.7	-1.4	-1.2	-1.1	-0.9	-0.8
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-190.1	-189.2	-192.7	-196.8	-201.7	-206.7	-210.1	-217.3	-218.6	-219.8	-220.8
received power density (W/Hz)	9.7E-20	1.2E-19	5.4E-20	2.1E-20	6.7E-21	2.1E-21	9.8E-22	1.9E-22	1.4E-22	1.0E-22	8.4E-23
percent total interference/swath	32.2	39.6	17.8	7.0	2.2	0.7	0.3	0.1	0.0	0.0	0.0
total power received (W/Hz)	3.0E-19										
total power received (dBW/Hz)	-185.2										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	12.3										
Interference Margin (dB)	-25.3										

VP/3 AM

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6	-83.6
hub xmit gain (dBi)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zones 3-5	-5.2	-3.4	-2.4	-1.9	-1.5	-1.2	-1.1	-0.9	-0.8	-0.7	-0.6
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-187.3	-187.6	-191.6	-196.1	-201.1	-206.2	-209.8	-217.0	-218.3	-219.6	-220.6
received power density (W/Hz)	1.8E-19	1.7E-19	6.9E-20	2.5E-20	7.7E-21	2.4E-21	1.0E-21	2.0E-22	1.5E-22	1.1E-22	8.8E-23
percent total interference/swath	39.9	37.3	14.9	5.3	1.7	0.5	0.2	0.0	0.0	0.0	0.0
total power received (W/Hz)	4.6E-19										
total power received (dBW/Hz)	-183.3										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	14.1										
Interference Margin (dB)	-27.1										

VP/1 FM

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9
hub xmit gain (dBi)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 1	-13.5	-8.2	-5.6	-4.2	-3.2	-2.7	-2.2	-1.9	-1.6	-1.4	-1.3
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBi)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-195.9	-192.7	-195.1	-198.7	-203.1	-208.0	-211.2	-218.3	-219.4	-220.6	-221.6
received power density (W/Hz)	2.5E-20	5.3E-20	3.1E-20	1.4E-20	4.9E-21	1.6E-21	7.6E-22	1.5E-22	1.1E-22	8.7E-23	7.0E-23
percent total interference/swath	19.5	40.8	23.6	10.4	3.7	1.2	0.6	0.1	0.1	0.1	0.1
total power received (W/Hz)	1.3E-19										
total power received (dBW/Hz)	-188.8										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	8.6										
Interference Margin (dB)	-21.6										

ATTACHMENT H

Interference Analysis - VideoPhone Hub Transmitters into Iridium™ Space Station Receivers

VP/2 FM

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9
hub xmit gain (dBI)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zone 2	-8.0	-5.0	-3.5	-2.6	-2.1	-1.7	-1.4	-1.2	-1.1	-0.9	-0.8
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBI)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-190.4	-189.5	-193.0	-197.1	-202.0	-207.0	-210.4	-217.6	-218.9	-220.1	-221.1
received power density (W/Hz)	9.0E-20	1.1E-19	5.0E-20	2.0E-20	6.3E-21	2.0E-21	9.1E-22	1.7E-22	1.3E-22	9.8E-23	7.8E-23
percent total interference/swath	32.2	39.6	17.8	7.0	2.2	0.7	0.3	0.1	0.0	0.0	0.0
total power received (W/Hz)	2.8E-19										
total power received (dBW/Hz)	-185.5										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	12.0										
Interference Margin (dB)	-25.0										

VP/3 FM

mid swath elevation angle (°)	0.5	1.5	2.6	3.7	4.9	6.1	7.4	8.8	10.2	11.8	13.4
nadir angle (°)	63.0	62.96	62.89	62.76	62.59	62.37	62.07	61.71	61.26	60.72	60.07
interior angle (°)	26.5	25.5	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5
latitude angle (°)	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5
slant range (km)	3194	3082	2971	2860	2749	2638	2528	2417	2308	2198	2090
hub xmit power(dBW/Hz)	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9	-83.9
hub xmit gain (dBI)	29.7	27.3	22.0	16.7	10.9	5.2	1.1	-6.7	-8.5	-10.3	-11.8
path loss (dB)	-191.8	-191.5	-191.2	-190.8	-190.5	-190.1	-189.8	-189.4	-189.0	-188.5	-188.1
atmosph loss (dB) Zones 3-5	-5.2	-3.4	-2.4	-1.9	-1.5	-1.2	-1.1	-0.9	-0.8	-0.7	-0.6
antenna polarization loss(dB)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
satellite receive gain (dBI)	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
no. of hubs in each swath (dB)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
received power density (dBW/Hz)	-187.6	-187.9	-191.9	-196.4	-201.4	-206.5	-210.1	-217.3	-218.6	-219.9	-220.9
received power density (W/Hz)	1.7E-19	1.6E-19	6.4E-20	2.3E-20	7.2E-21	2.3E-21	9.8E-22	1.9E-22	1.4E-22	1.0E-22	8.2E-23
percent total interference/swath	39.9	37.3	14.9	5.3	1.7	0.5	0.2	0.0	0.0	0.0	0.0
total power received (W/Hz)	4.3E-19										
total power received (dBW/Hz)	-183.6										
satellite noise floor (dBW/Hz)	-197.5										
Io/No (dB)	13.8										
Interference Margin (dB)	-26.8										

ATTACHMENT I

Interference Analysis - VideoPhone Subscriber Transmitters into Iridium™ Space Station Receivers