

## O3b Network Forward Link Analysis - Tier 1 Service For Suva, Fiji

Link Budget Creator - Rev 1.1: July 15, 2010		Tier 1	Tier 1
<b>Ground Parameter</b>		<b>Teleport</b>	<b>Telco</b>
Location		Sunset Beach RHCP, United States	Suva
Latitude	(°)	21.3	-18.1
Longitude (East)	(°)	201.9	178.4
E/S Range to SV	(km)	10383.1	8796.8
E/S Elevation to SV	(°)	27.0	53.7
E/S Altitude	(m)	0.0	0.0
SV Beam Identifier	(#)	12	
Minutes Into Pass (Sample #22)	(Min)	10.2	
Telco Spot Beam Off-Angle	(°)	0.2	
Telco Spot Beam Diameter	(km)	60.1	
Maximum Roundtrip Latency	(msec)	128.0	
<b>Modulation Parameters</b>		<b>Forward</b>	<b>Return</b>
Enter Receiver	Type	DVB-S2	
Available Bandwidth	(Hz)	216,000,000	
Channel Symbol Rate	(sps)	180,000,000	
Channel Modulation Type		QPSK	
Channel FEC Rate		0.25	
Channel Spectral Efficiency	(bits/Hz)	0.50	
Channel Throughput	(bps)	86,143,861.55	
<b>Uplink</b>		<b>Forward</b>	<b>Return</b>
E/S Tx Channels per HPA	(#)	4	
E/S Tx Carrier Frequency	(MHz)	28020.00	
E/S Tx HPA Power Level	(W)	500.00	
E/S Tx OBO	(dB)	-4.00	
E/S Tx Post-HPA Losses	(dB)	-1.50	
E/S Tx Antenna Gain (7.3 meter)	(dB)	64.82	
E/S Tx EIRP Per Channel	(dBW)	80.29	
E/S Tx Pointing Loss	(dB)	-0.50	
E/S Tx RF Link Availability	(%)	99.850	
E/S Tx Atmospheric Losses	(dB)	-28.52	
E/S Tx Spreading Loss	(dB)	-151.32	
<b>Satellite</b>		<b>Forward</b>	<b>Return</b>
SV Number of Channels per HPA	(#)	1	
SV Rx G/T	(dB/K)	4.21	
SV Rx Power Per Tier	(dBW)	-146.25	
SV Rx Flux Density Per Tier	(dBW/m <sup>2</sup> )	-100.06	
SV Tx OBO	(dB)	-3.80	
SV Tx Post-TWTA Losses	(dB)	-1.50	
SV Tx Antenna Gain	(dBi)	30.69	
SV Tx EIRP Per Channel/Carrier	(dBW)	43.52	
SV Tx Pointing Loss	(dB)	0.00	
<b>Downlink</b>		<b>Forward</b>	<b>Return</b>
E/S Rx Carrier Frequency	(MHz)	18220.00	
E/S Rx Spreading Loss	(dB)	-149.88	
E/S Rx RF Link Availability	(%)	99.850	
E/S Rx Atmospheric Losses	(dB)	-13.88	
E/S Rx Pointing Loss	(dB)	-0.50	
E/S Rx Antenna Gain (4 meter)	(dBi)	55.22	
E/S Rx Effective G/T	(dB/K)	28.97	
E/S Rx Power Per Channel	(dBW)	-112.19	
E/S Rx Flux Density Per Channel	(dBW/m <sup>2</sup> )	-120.74	
<b>Total Link</b>		<b>Forward</b>	<b>Return</b>
Carrier / Noise Bandwidth	(dB)	82.55	
Carrier / Noise Uplink	(dB)	-0.20	
Carrier / Noise Downlink	(dB)	7.61	
Carrier / Intermodulation Im (C/Im)	(dB)	25.74	
(C/N) - Total Actual	(dB)	-0.93	
(C/N) - Total Required	(dB)	-1.15	
(E <sub>p</sub> /N <sub>0</sub> ) - Total Actual	(dB)	2.08	
(E <sub>p</sub> /N <sub>0</sub> ) - Total Required	(dB)	1.86	
<b>Excess Margin</b>	<b>(dB)</b>	<b>0.22</b>	
<b>Fade Margin (to loss of link)</b>	<b>(dB)</b>	<b>0.22</b>	