FCC FORM 312 INPUT DATA

ANTENNA

	E28. Site ID	E29. Quantity	E30. Manufacturer	E31. Model	E32. Antenna Size	E41/42. Antenna Gain Tx/Rx	
Antenna Type	.96 KU AVSAT	50	AVL Technologies	960 AvSAT	0.96 meters	39.7	dBi at 11.850 GHz
						41.2	dBi at 14.125 Ghz

Antenna Maximum EIRP	E28. Site ID	E33/34. Diameter Minor/Major (meters)	E35. Above Ground Level (meters)	E36. Above Sea Level (meters)	E37. Building Ht above Grnd Lvl (meters)	E38. Total Input Pwr at Ant Flange (Watts)	E39. Max Ant Ht above Rooftop (meters)	E40. Total EIRP for all carriers (dBW)
	.96 KU AVSAT	0.0/0.0	0	0	0	4.0	0	46.75

FREQUENCY

Carrier No.	E28. Antenna ID	E43/44. Frequency Bands (MHz)	E45. T/R Mode	E46. Ant Polarization	E47. Emission Designator	E48. Max EIRP/Carrier	E49. Max EIRP Density (dBW/4 kHz)
1	.96 KU AVSAT	11700.000 12200.000	R	Horizontal & Vertical		0	0
E50.	Modulation and Services: QPSK Modulation, 8 mbps, FEC Rate 3/4, Digital Carrier						
2	.96 KU AVSAT	14000.000 14500.000	T	Horizontal & Vertical	120KG7D	38.7	24

FREQUENCY COORDINATION

E28. Antenna ID	E51. Satellite Orbit Type	E52/53. Frequency Limits (MHz)	E54/55. Range of Sat Arc East/West Limit	E56. ES Azimuth Angle East Limit	E57. Ant Elevation angle East Limit	E58. ES Azimuth angle West Limit	E59. Ant Elevation angle West Limit	E60. MAX EIRP Density toward Horizon (dBW/4kHz)
.96 KU AVSAT	Geostationary	11700.000 12200.000	60.0/143.0	0.0	10	0.0	10	0.0
	Geostationary	14000.000 14500.000	60.0/143.0	0.0	10	0.0	10	-6.1

SUPPORTING DATA AND CALCULATIONS FOR ABOVE FCC 312 ENTRIES

Summary of EIRP and EIRP Density per Carrier	
	Value
Critical parameter	Carrier 2
Maximum Permissible Feed Power/4 KHz	-15
Calculated Feed Power Density (dBW/4 kHz)	-17.3
Maximum Permissible EIRP Density toward the Horizon (dBW/4kHz)	26.2
Maximum Permissible EIRP/Carrier - Theroetical	41.0

	Calculated Maximum EIRP/Carrier - Link Analysis (AMC1 & AMC4)	**38.7**

Individual Carrier Calculations - Carrier #2

E50	**Carrier 2 - Calculations**				**Instructions for making calculations to the left**
E47	Digital Carrier Emission designator	120KG7D			
	Modulation and Service	QPSK			
	FEC	3/4			
	Data Rate		128	kbps	
	Bandwidth		120	kHz	
	Calculations				
	Carrier Data Rate Conversion (dBW)		50.8		(10 x Log(120000))
	4 KHz conversion (dBW)		36.0		(10 x Log(4000))
	Divide 4 KHz into 120 kHz (subtract Logs)		14.8		Subtracting Logs is same as dividing analog (120000/4000) then converting to logs
	Enter Max Permissible EIRP/4 KHz		26.2	dBW/4kHz	Found by adding antenna gain to maximum feed drive level of -15 dBW.4 kHz
	Maximum Allowed EIRP per Carrier 2		**41.0**	**dBW**	Add quotient on 120/4 in logs (29.8) to Max Permitted Density (26.2)
E48	**Carrier EIRP Required by Link Budget**		**38.7**	dBW	Verify the Total EIRP for this carrier is less than Maximum Allowed
	Maximum Required EIRP/4 kHz		23.9	dBW/4kHz	Subtract the quotient above (14.8) from the total EIRP (38.7)
	Maximum Permitted Feed Power Calculation				
	Maximum feed input power - carrier 2		-0.2	dBW	Subtract Antenna Gain (41.2) from Max EIRP (41)
	Convert to Input power per 4 kHz		-15.0	dBW/4kHz	Subtract Quotient above (14.8 from Feed input EIRP (-0.2)
	Confirm input power is within specifications	**OK**			If equal to or less than -15 dBW/4 kHz "OK"
	Feed input power in Watts		0.95	Watts	Conversion of -0.2 dBW to Watts (antilog -0.2/10)
	Losses between Transmitter and Feed		0.25	dB	
	Maximum allowable Transmitter power		0.0	dBW	Equals feed input power plus losses
	Maximum allowable Transmitter power		1.0	Watts	Conversion of 0.0 dBW to Watts (antilog 0.0/10)
	Link Budget Feed Power Calculation				
	Maximum feed input power - carrier 2		-2.5	dBW	Subtract antenna gain (41.2) from Required EIRP (38.7)
	Convert to Input power per 4 kHz		-17.3	dBW/4kHz	Subtract quotient equivalent of 120/4 (14.8) from Maximum feed input power (-2.5)
	Confirm input power is within specifications	**OK**			If equal to or less than -15 dBW/4 kHz "OK"
	Feed input power in Watts		0.6	Watts	Convert Feed input EIRP to Watts (antilog -2.5/10)
	Losses between Transmitter and Feed		0.25	dB	
	Maximum Transmitter power (dBW)		-2.25	dBW	Equals feed input power plus losses
	Maximum Transmitter power (Watts)		0.60	Watts	Conversion of -2.25 dBW to Watts (antilog -2.25/10)

Off Axis Gain Envelope Mazimum allowed under FCC 25.209 paragraph 2.
Defined by Equation 32 - 25 log T dBi
1° </= Theta </+ 48°
-10 dBi 48° < Theta </= 180°

Calculation of the maximum off-axis EIRP density for the .96M Mobile VSAT antenna systems					**FCC Declaratory Order 3588 Off-Axis EIRP Limits**	
Value of Theta (degrees)	32-25*logT (dBi)	.96M Gain (dBi)	Max EIRP Density (dBW/4kHz)	Off axis Density (dBW/4kHz)	15-25 logT (Max Value in dBW/4kHz)	.96M Off-Axis EIRP Evaluation
1	32.0	41.2	24	14.8	15.0	OK
2	24.5	41.2	24	7.3	7.5	OK
3	20.1	41.2	24	2.9	3.1	OK
4	16.9	41.2	24	-0.3	-0.1	OK
5	14.5	41.2	24	-2.7	-2.5	OK
6	12.5	41.2	24	-4.7	-4.5	OK
7	10.9	41.2	24	-6.3	-6.1	OK
8	9.4	41.2	24	-7.8	-6.1	OK
9.2	7.9	41.2	24	-9.3	-6.1	OK
10	7.0	41.2	24	-10.2		
11	6.0	41.2	24	-11.2		
12	5.0	41.2	24	-12.2		
13	4.2	41.2	24	-13.0		
14	3.3	41.2	24	-13.9		
15	2.6	41.2	24	-14.6		
16	1.9	41.2	24	-15.3		
17	1.2	41.2	24	-16.0		
18	0.6	41.2	24	-16.6		
19	0.0	41.2	24	-17.2		
20	-0.5	41.2	24	-17.7		
25	-2.9	41.2	24	-20.1		
30	-4.9	41.2	24	-22.1		
35	-6.6	41.2	24	-23.8		
40	-8.1	41.2	24	-25.3		
45	-9.3	41.2	24	-26.5		