

**Stereo Instrument Resource Estimates**

2002-Nov-13

Instrument	Mass CBE, kg	Mass NTE, kg	Mass Margin, %	Power CBE, W	Power NTE, W	Power Margin, %	bps	Notes
<b>SEP:</b>								
LET	0.87			0.94			557	11/12/2002
LET Bracket	0.60							11/12/2002
HET	0.74			0.40			209	11/12/2002
SEP Common Elec.	2.45			0.40				11/12/2002
SEP LVPS	0.48			2.23				Efficiency 65%
<b>SEP Main Total</b>	<b>5.14</b>	<b>5.70</b>	<b>10%</b>	<b>3.97</b>	<b>4.50</b>	<b>12%</b>	<b>766</b>	
SIT	1.46	1.63	10%	1.36	1.51	10%	418	11/12/2002
SEPT-E	0.67	0.74	10%	0.51	0.57	10%	35	11/12/2002 Use Keil CBE power
SEPT-NS	0.67	1.04	10%	0.51	0.57	10%	35	11/12/2002 Use Keil CBE power
SEP-NS Bracket	0.27							11/12/2002
SEP Operational Heaters				3.75				10/28/2002 Hawk CBE
SEP Blankets	0.12	0.13	10%					2/7/2002
SEP packet headers							53	
<b>SEP Grand Total</b>	<b>8.32</b>	<b>9.23</b>	<b>10%</b>	<b>10.11</b>	<b>7.15</b>	<b>11%</b>	<b>1306</b>	Excludes SEPT harnesses
<b>BOOM:</b>								
<b>SWEA:</b>								
SWEA (CESR)	1.04			0.55			513	Feb-02
SWEA/STE I/F	0.82			0.30				10/16/2002 estimate from Turin
SWEA/STE LVPS	0.20			0.64				Efficiency 60% Turin estimates 735g for SWEA pedestal+STE-D, including PWB but not parts, 5/2002
<b>SWEA Total</b>	<b>2.06</b>			<b>1.49</b>			<b>513</b>	
STE (STE-D)	0.04			0.10			230	Turin, ~1/02
SWEA Op Htr				1.00				Eby CBE 1-2002
STE Op Htr								Eby, 8-2001
MAG Sensor	0.25						398	8Hz 16 bit samples
Mag Op Htr				0.50				Eby, 8-2001
SWEA/STE/MAG Blankets	0.10							Project Allocation, 7/2000
Sunward STE (STE-U)	0.32			0.10				Power on IDPU service
Boom Harness	0.10							Use Ullrich estimate
Boom	9.40							Updated estimate
<b>Boom Totals</b>	<b>12.27</b>	<b>13.57</b>	<b>10%</b>	<b>2.59</b>	<b>1.90</b>	<b>11%</b>	<b>1140</b>	Power less STE-U and Mag Op Htr Margin excludes Op Heaters
<b>IDPU:</b>								
Mag Card	0.30			0.38				
DIB Card (STE)	0.30			0.20				
DPU Card	0.30			2.30				Includes 9Q memory power increase
S/C Interface (on DPU card)				0.50				1553 I/F 0.3 W Estimate based on 1% transmit, UTMC DXE Chip
IDPU LVPS	0.40			1.49				Efficiency 70% Mass update 2002/10/14, increased size
Mag Heater Control	0.07							
BOX	0.65							Heat Bersch, 2002-5-13
<b>IDPU Total:</b>	<b>2.02</b>	<b>2.25</b>	<b>10%</b>	<b>5.47</b>	<b>5.40</b>	<b>10%</b>	<b>113</b>	Power includes STE-U & Mag Op Htr
Total Op Heater				5.25	5.85	10%		
Burst Telemetry							641	
Harness (average of A&B)	1.12	1.25	10%					Excludes Boom portion
<b>TOTAL</b>	<b>23.73</b>	<b>26.30</b>	<b>10%</b>	<b>18.17</b>	<b>20.30</b>	<b>10%</b>	<b>3200</b>	

IDPU:	Packet Header	42
bps	Packet Collect Time	35
	Housekeeping	36

**Other Resource Issues**

Actuator Firing Current	Type	Current@2Time		Who Fires	Type
SWEA Cover	TiNi P5-403	.75A	<100ms	IMPACT	1-time
SIT Cover	TiNi P5-403	.75A	<100ms	S/C	1-time
SEPT Covers	TiNi P5-403	.75A	<100ms	S/C	1-time
STE Cover	SMA	50mA	500ms	IMPACT	Reclosable
BOOM Release	TiNi P50-810-1 3A		<100ms	S/C	1-time

**Survival Heaters**

Circuit	Location	Power, W		
IDPU/MAG	MAG	0.50 (Note 0.75W if in shadow)		
SWEA/STE	SWEA/STE	2.00 Eby estimate 9/2002		
SEP/SEPT-NS/SEPT-E	SEP/SEPT-NS/	10.10	CBE 10/2002; Driven by off-pointing	
Total		12.60	NTE	14.4 Margin 13%

**Changes:**

	<u>Mass, Kg</u>	<u>Power, W</u>
April 1553 1.5W + 0.38W converter		1.88
April Boom added to allocation	0.80	
April SEPT-NS separation penalty	0.24	
May Harness decrease (xfer boom harness)	-0.26	
May SEP increase	0.80	0.47
May Boom decrease	-0.45	
June SEPT increase	0.10	0.56
July SWEA Mass Increase (over original alloc)	0.21	
July IDPU mass decrease	-0.41	
July Thermal Blanket Allocation	0.20	
July SEP/SEPT Bracket	0.86	
July Mag heater control circuit	0.07	
July Increased Telemetry Allocation		
Aug SEPT Bracket Est from APL->270g	0.17	
Aug SEP Bracket, use Tycho rather than APL estimate	0.24	
Aug Use Compromise HET mass	0.37	
Aug Latest SIT numbers (in Phase A Report)	0.09	
December Team Meeting SEP changes	0.02	0.26
FEB Improved Harness definition	-0.22	
Feb SEPT Covers	0.16	
April, Harness lengths from APL	0.33	(.40 for B S/C)
April SEP Peer Review Reconfiguration, SIT TOF	0.48	0.78
May SWEA/STE Operational Heater		1.00
July Power Converter Efficiency		2.15
July Split STE	0.95	0.40 (Added DIB to IDPU, etc.)
August Boom Mass Estimate	-4.28	(12 -> 7.72)
August SEPT-E harness	0.15	
August Boom Reestimate	0.28	7.72->8.0
August 1553 power revision		-1.70 (including conversion overhead)
August SWEA/STE/MAG Op Heater update		
August SEP Power revision		0.46
September SEP Common Growth	0.47	
September SEPT Harness wire count decrease		-0.11
January 2002 Operational Heaters		5.00
Feb 2002 SEP LVPS Increase for separate SEPT secondaries	0.36	
Feb 2002 SEP Heaters	0.10	
Feb 2002 SIT -> Amptek, SEP LVPS -> +/-6V	0.12	0.32 .12+.08 raw (SEP, SIT) W

## Backup Computations

### HARNESS MASSES

#### Unit Masses:

#26 Gauge wire	2.85 g/m	ETFE, 22759/22
#24 Gauge Wire	3.90 g/m	
#26 TSP	20.00 g/m	
RG178	8.00 g/m	Gore CXN-3277
Shield	8.00 g/m	
D Connectors	20.00 g	D15/HD26 with metallic hood
MDM Connector	15.00 g	37-pin, Mueller-Mellin estimate, with hood
SMA Connectors	3.00 g	
SSMC Connectors	4.00 g	Muller-Mellin estimate
Tiny Coax	3.00 g/m	Estimate

Harnesses	Length (m)	#26 Wire	#26 TSP	RG178	SSMC Con	MDM Con.	Shields	D Con.	SMA Con	Total, g		
IDPU to SWEA/STE	1.20			3			1	2		78	APL length estimates, 2001/10/3	
IDPU to Mag	1.20	2	1	4			1	2		119		
STE-U to IDPU	1.20	12		5			1	2		139		
SEP to SIT (b)	0.61	30	4			2	1			106		
IDPU to SEP (b)	2.30			3			1	2		114	Caltech	
SEP to SEPT-E (b)	2.44	14	2	1	2.00	2	1			272	310	
SEP to SEPT-NS (b)	3.48	14	2	1	2.00	2	1			372	430	
SEP to SIT (a)	0.30	30	4			2	1			52		
IDPU to SEP (a)	3.45			3			1	2		150		
SEP to SEPT_E (a)	0.94	14	2	1	2.00	2	1			128	138	
SEP to SEPT-NS (a)	2.13	14	2	1	2.00	2	1			242	275	
Total:										1295	Behind	(using caltech)
										951	Ahead	
										1123	Average	

#### Tiny Coax

Boom Harness	6.00	8	1	7			1	4		511	310.4 Ullrich, 3/11	38.4 g/m
MAG Extension	1.50	2	1	4			2	1		101	89.6	
Total										611	400	

#### IDPU Box Mass Computation

L	20.00 cm	
W	16.00 cm	
H	7.50 cm	
Thickness	0.30 cm	(average, includes webs)
Mass	955.80 g	