Battery Reserve							
Column	Α	B*	С	D	E	F	
Table Headings	UTC	Reserve Battery	Battery	Change	Rate of	Time to Criticality	
Table Headings			Kilowotta	Kilowette	Min	Minutes	
Units	24 Hour Clock	70	Kilowatts	Knowatts	IVIII	winutes	
			C= B/100 X	D=	E=	F=	
Calculations	From Data	From Data	24.49**	C -previous C	D/20 (min)	(12.245-D)/E***	
Practice Data	15:00	94	23.02	n/a	n/a	n/a	
							Time to criticality above 60 minutes is considered ideal. Anything
rev	15:20	88	21.55	-1.47	-0.07	126.60	below 30 minutes is considered perilous.
1/22/03	15:40	78	19.10	-2.45	-0.12	55.96	When time to criticality is between 30 and 60 minutes, the Power Team may want to consider managing power consumption closely. The Power Systems Calculator is a tool to help you do this.
eclipse	16:00	85	20.82	1.71	0.09	99.94 (N/A)	When the trend is upward away from criticality, there is no need to calculate time to criticality. (Time to criticality will be a negative number)
eclipse	16:20	63	15.43	-5.39	-0.27	11.80	
•	16:40	66	16.16	0.73	0.04	106.53 (N/A)	Trend is upward, so time to criticality is non-applicable
	17:00	59	14.45	-1.71	-0.09	25.66	Power Team MUST use the Power Systems Calculator to manage power consumption.
	17:20	57	13.96	-0.49	-0.02	69.80	Even though time to criticality is above 60 minutes, the Battery Reserve is dangerously close to the critical value of 12.25. Close monitoring of power consumption is essential.
eclipse	17:40	42	10.29	-3.67	-0.18	10.69 (N/A)	Critical value is 12.25. Power capacity is below 12.25, so we are at and below critical levels. Time to criticality does not apply until we are back above 12.25
eclipse	18:00	25	6.12	-4.16	-0.21	29.44 (N/A)	
	18:20	51	12.49	6.37	0.32	0.75 (N/A)	Trend is upward, so time to criticality is non-applicable
	18:40	71	17.39	4.90	0.24	20.98 (N/A)	Trend is upward, so time to criticality is non-applicable
	19:00	83	20.33	2.94	0.15	54.97 (N/A)	Trend is upward, so time to criticality is non-applicable
eclipse	19:20	66	16.16	-4.16	-0.21	18.80	
eclipse	19:40	52	12.73	-3.43	-0.17	2.83	
	20:00	74	18.12	5.39	0.27	21.80 (N/A)	Trend is upward, so time to criticality is non-applicable

* Graph this column.

** <u>Total Battery Capacity</u> – On any given day, the battery capacity is dependent on the number of solar arrays connected to the main frame. The value on February 14, 2001 is 24.49 kilowatts.

*** <u>Critical Battery Capacity</u> – The station will be in a critical stage if power levels drop below 50% of the total battery capacity. The number is 50% of the Battery Capacity Start Value, or 12.25 kilowatts. Remember, if the Battery Reserve is above 12.25 and the Rate of Change is positive, then Time to Crit does not apply. Also if the Battery Reserve is below 12.25 and the Rate of Change is negative then Time to Crit does not apply.

Note: Column C is Used in the Power Systems Calculator

Solar Array											
Column	Α	B*	с		D		Е	F	G		
		Solar Array					Rate of Charging or	Charging or			
Table Headings	UTC	Efficiency	Power Generation		Current Power Load		Draining	Draining	New Time to Criticality***		
Units	24 Hour Clock	%	Kilowatts/Hour		Kilowatts/Hour		Kilowatts/ Hour		Hours		
Calculations	From Data	From Data	C=B/100 X 24.49**		See Power Systems Calculator (PSC)	Use PSC?	E = C-D	Pos # = Charging Neg # =Draining	G= Abs Value of: <u>Col C from Batt Resv – 12.25****</u> Column E		
					The number in Col D is up to the Power Team to decide. The number used here represents the LOWEST power load recommended.		The results in Cols E, F & G are dependant on the result from Col D, and may vary from mission to mission.		result from Col D, and may vary from		
Practice Data	15:00	100	24.49		24.49	not necessary	0.00	n/a	n/a		
rev	15:20	99	24.25		23.00	optional	1.25	Charging	7.47	Time to criticality above 1 hour is considered ideal. Anything below 0.5 hours is considered perilous.	
1/22/03	15:40	82	20.08		23.00	optional	-2.92	Draining	2.35		
eclipse	16:00	0	0.00		18.00	optional	-18.00	Draining	0.48	When time to criticality is between 0.5 and 1 hour, the Power Team may want to consider managing power consumption closely. The Power Systems Calculator is a tool to help you do this. In this case, 0.5 hour of power is good enough going into the eclipse portion of the orbit.	
eclipse	16:20	0	0.00		18.00	optional	-18.00	Draining	0.18	Data indicates significant power losses, but these are explainable due to being in eclipse. It is recommended to not adjust anything until the station is back in full sun.	
	16:40	30	7.35		18.00	optional	-10.65	Draining	0.37		
	17:00	18	4.41		9.00	yes	-4.59	Draining	0.48	Power Team MUST use the Power Systems Calculator to manage power consumption.	
	17:20	32	7.84		10.00	optional	-2.16	Draining	0.79		
eclipse	17:40	0	0.00		8.00	yes	-8.00	Draining	0.25	If Col C from Batt Resv is below 12.25, the station is below critical power levels. When this is the case, the you should read your time to criticality as if the sign was reversed. In this case, 1.02 should be read as -1.02, meaning that power levels are still dropping.	
										In this case, -0.25 should be read as .25, meaning that power levels are increasing and in	
eclipse	18:00	0	0.00		12.00	yes	-12.00	Draining	0.51	.25 hours they will be restored back above critical levels.	
	18:20	92	22.53		12.00	yes	10.53	Charging	0.02	Trend is upward, so time to criticality is non-applicable	
	18:40	92	22.53		12.00	optional	10.53	Charging	0.49	"	
	19:00	95	23.27		19.00	optional	4.27	Charging	1.89		
eclipse	19:20	0	0.00		21.00	yes	-21.00	Draining	0.19	Data indicates significant power losses, but these are explainable due to being in eclipse. It is recommended to not adjust anything until the station is back in full sun.	
eclipse	19:40	0	0.00		22.00	yes	-22.00	Draining	0.02		
-	20:00	98	24.00		10.00	not necessary	14.00	Charging	0.42	Trend is upward, so time to criticality is non-applicable	
* Graph this column.											
**Total Battery C	<u>'apacity</u> – On ar	y given day, the	battery capacity is de								
***Remember, if	the Battery Res	erve is above 12	2.25 and the Rate of C								
**** Critical Battery Capacity – The station will be in a critical stage if power levels drop below 50% of the total battery capacity. The number is 50% of the Battery Capacity Start Value, or 12.25 kilowatts.											
Note: The Power	Systems Calcul	ator should be u	sed to balance the Pov								
versa. In general,	the Power Load	l should stay abo	ove 15 kilowatts/hour								

Power Team - Practice Data

