

# CRB Power and Mechanical Overview

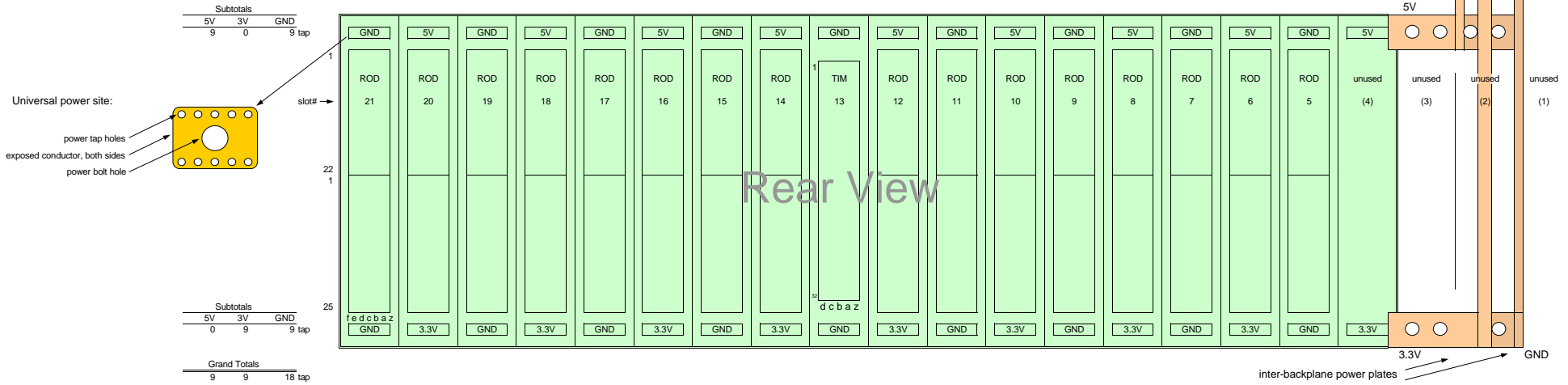
Cables to Power Supply:

GND	1 shown	4+ required
5V	1 shown	2+ required
3.3V	not shown	2+ required

- 5V, 3.3V bus bar
- power tap
- power bolt
- CRB PCB
- Cu/Sn washer
- GND bus bar

inter-backplane power plates

5V GND



Common				
	connector R		14 mohm/pin	measured 14 mohm/pin, includes pin/PCB resistance for both PCB's
	power tap R		0.1 mohm/tap	typical .5 mohm/pin, 10 pins
	max current per connect pin		1 A/pin	max rating for J5/J6 connectors, well below max for J1/J2
Pin Counts		5V 3V GND		
	J1 pins	3 10	24 pin/slot	
	J0 shield	0 0	19 pin/slot	this spreadsheet ignores pass-thru ground pins, which are not connected on the backplane
	J2 pins	3 0	20 pin/slot	
	J5/J6 pins	8 12	36 pin/slot	
	J5/J6 shield	0 0	47 pin/slot	
	J1, J0, J2 total	6 10	63 pin/ROD	
	J5/J6 total	8 12	83 pin/ROD	
	J0, J2 total	3 0	39 pin/TM	
	J5/J6 total	8 12	83 pin/TM	
Plane(s)	VME power plane	0.40 0.40	0.10 mohm/slot	copper plane resistance--calculated: between typical pin and nearest power tap
	CRB power plane	0.40 0.40	0.10 mohm/slot	
Power taps	VME->bus bar	0.18 0.18	0.09 mohm/slot	assume same as CRB (next line)
	CRB->bus bar	0.18 0.18	0.09 mohm/slot	
TM		5V 3V GND		
Connectors	TM->VME	4.67	0.36 mohm/TM	<<< TM design will limit current to these 5V pins
	TM->CRB	1.75 1.17	0.17 mohm/TM	
Total R	TM->VME->bus bar	5.24	0.55 mohm/TM	
	TM->CRB->bus bar	2.33 1.74	0.36 mohm/TM	
	<b>Total R Ratio: VME/CRB</b>	<b>2.25</b>	<b>1.53</b>	
Max allowed I	<b>TM-&gt;VME</b>	<b>3.00 0.00</b>	<b>39.00 A/TM</b>	<<< TM design will limit current to these 5V pins
	<b>TM-&gt;CRB</b>	<b>8.00 12.00</b>	<b>83.00 A/TM</b>	max current based on number of power pins and pin current rating
	<b>TM Total</b>	<b>11.00 12.00</b>	<b>122.00 A/TM</b>	
Expected I	<b>TM-&gt;VME</b>	<b>1.54 0.00</b>	<b>3.32 A/TM</b>	based on R Ratio calculated above
	<b>TM-&gt;CRB</b>	<b>3.46 3.40</b>	<b>5.08 A/TM</b>	based on R Ratio calculated above
	<b>TM Total</b>	<b>5.00 3.40</b>	<b>8.40 A/TM</b>	see SystemPowerWithMGT....xls
ROD		5V 3V GND		
Connectors	ROD->VME	2.33 1.40	0.22 mohm/ROD	
	ROD->CRB	1.75 1.17	0.17 mohm/ROD	
Total R	ROD->VME->bus bar	2.91 1.98	0.41 mohm/ROD	
	ROD->CRB->bus bar	2.33 1.74	0.36 mohm/ROD	
	<b>Total R Ratio: VME/CRB</b>	<b>1.25 1.13</b>	<b>1.15</b>	
Max allowed I	<b>ROD-&gt;VME</b>	<b>6.00 10.00</b>	<b>63.00 A/ROD</b>	max current based on number of power pins and pin current rating
	<b>ROD-&gt;CRB</b>	<b>8.00 12.00</b>	<b>83.00 A/ROD</b>	
	<b>ROD Total</b>	<b>14.00 22.00</b>	<b>146.00 A/ROD</b>	
Expected I	<b>ROD-&gt;VME</b>	<b>3.15 2.02</b>	<b>5.30 A/ROD</b>	based on R Ratio calculated above
	<b>ROD-&gt;CRB</b>	<b>3.95 2.28</b>	<b>6.10 A/ROD</b>	based on R Ratio calculated above
	<b>ROD Total</b>	<b>7.10 4.30</b>	<b>11.40 A/ROD</b>	see SystemPowerWithMGT....xls
<b>Total (16 TM's + 16 ROD's)</b>				
	all ROD slots >> supply	193.60 123.20	316.80 A/subrack	TIM and RCC are not considered
	power supply max	300.00 200.00	500.00 A/subrack	
	<b>all ROD slots &gt;&gt; VME</b>	<b>75.07 32.24</b>	<b>137.92 A/subrack</b>	
	<b>all ROD slots &gt;&gt; CRB</b>	<b>118.53 90.96</b>	<b>178.88 A/subrack</b>	
	<b>CRB bus bar capacity</b>	<b>150.00 150.00</b>	<b>300.00 A/subrack</b>	conservative, estimated from ampacities listed at www.copper.org
<b>Additional Miscellaneous -- not used in above calculations</b>				
	R VME ground system		0.07 mohm	measured, slot 21 to slot 1 -- includes copper sheet and PCB planes
	R VME power systems		0.13 mohm	measured, slot 21 to slot 1 -- includes copper sheets and PCB plane(s)
	R CRB gnd/power bars		-0.10 mohm/bar	calculated, .3"x.3"x17 slots
VME-to-CRB Resistance via Modules		5V 3V GND		
	VME->CRB via TM	6.42 1.17	0.53 mohm/TM	
	VME->CRB via ROD	4.08 2.57	0.39 mohm/ROD	
	VME->CRB via TM&ROD	2.50 0.80	0.22 mohm/slot	
TTC[7-0] termination		5V 3V		
	R pos supply	160 160	ohm	
	R to ground	240 240	ohm	
	Thevinen R	96 96	ohm	
	Thevinen V	2.0 1.3	volt	
	I at driver, 2.5V source	5.2 12.3	mA	
	I at driver, .4V sink	-16.7 -9.6	mA	
	terminator powr dissipation	63 27	mW (per signal)	
	max allowed power	200 200	mW (per signal)	