03/21/2003.
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A VME memory map of the controller DP RAM

1. Data Area (grows upward)

0x0: Bits 0..10: Leading word count (word count is inclusive of itself)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not Used					WdCnt10..WdCnt0										

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0xN+1: Data Block;

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Board ID						Hit Address									

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0xN+0x800: End of largest possible Data Block (hit on all channels);

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Board ID						Hit Address									

2. Control and Status Area (grows downward)

0x7FFE: Microcontroller Command Register

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
TBD												Command code			

Command code list:
0x0: Multi-block setup of command sends commands 0x1, 0x5, 0x9, 0xD
0x1: Write thresh block
0x2: Read thresh block
0x3: Write thresh single channel
0x4: Read thresh single channel
0x5: Write enable bits block
0x6: Read enable bits block
0x7: Write channel enable bits single card
0x8: Read channel enable bits single card
0x9: Write pipeline delays block
0xA: Read pipeline delays block
0xB Write pipeline delay single card
0xC Read pipeline delay single card
0xD Write test pulse height block
0xE Read test pulse height block
0xF Write test pulse height single card
0x10 Read test pulse height single card
0x11 Reset boards
0x12 Assign board addresses
(determine # of responding 32 channel boards, assign logical addresses to boards)

0x7FFC: Microcontroller status (read only from VME)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not Used													Busy	Valid Command	Command Completed

0x7FFA: Microcontroller Board Count (read only)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not used											# of Responding Boards				

0x7FF8: Microcontroller Address Specifier (significant only during single operations)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	1	DP Ram Address													

0x7FF6: Board ID (This value is appended to the channel address)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not Used				Clock phase offset 0.9ns/Step 9 steps				Not Used		Board ID					

0x7FF4: Pipeline delay values (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not used								Pipeline delay setting							

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0x7FB6: Pipeline delay values (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not used								Pipeline delay setting							

0x7FB4: Enable bits (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Channel Enable Bits for inputs 15..0															

0x7FB0: Enable bits (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Channel Enable Bits for inputs 31..16															

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0x7F38: Enable bits (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Channel Enable Bits for inputs 15..0															

0x7F36: Enable bits (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Channel Enable Bits for inputs 31..16															

0x7F34: Thresholds (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Threshold for Chan 1								Threshold for Chan 0							

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0x7F16: Thresholds (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Threshold for Chan 1								Threshold for Chan 0							

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0x7B54: Thresholds (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Threshold for Chan 1								Threshold for Chan 0 (8mV/Count)							

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0x7B36: Thresholds (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Threshold for Chan 31								Threshold for Chan 30							

0x7B34: Test pulser magnitude (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
				Test pulse height .6mV/Count											

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0x7AF6: Test pulser magnitude (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
				Test pulse height .6mV/Count											

The following values are updated periodically by the uC (of order 1/15 Hz)

0x7AF4: Power supply readback (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+3.3v Supply Value (20 mV/Count)								+5 Supply Value (20mV/Count)							

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0x7AB6: Power supply readback (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+3.3v Supply Value (20 mV/Count)								+5 Supply Value (20mV/Count)							

0x7AB4: Ambient temperature ADC readback (board 0x1F)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
				°C = (ADC Counts – 1615) · 0.1719											

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0x7A76: Ambient temperature ADC readback (board 0x0)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
				°C = (ADC Counts – 1615) · 0.1719											

Notes:

The starting address for each data type in the control section of the RAM area is fixed. The significant length of each block is dependent on the number of active cards in the control chain.

A Micorcontroller Map of the Readout Card

0x0: DP Ram access with address increment

15	14	13	12	11	10	9	8
Data Byte							

0x1: DP Ram acess without address increments

7	6	5	4	3	2	1	0
Data Byte							

0x2: DP Byte Address Pointer

15	14	13	12	11	10	9	8
0	Upper 7 bits						

0x3: DP Byte Address Pointer

7	6	5	4	3	2	1	0
Lower Byte							

0x4: Command Register

7	6	5	4	3	2	1	0
				Command Code			

0x5: Status Register

7	6	5	4	3	2	1	0
					Status Bits		

0x6: # of Boards found at Initialization

7	6	5	4	3	2	1	0
			# of Responding Boards				

0x7: Board ID

7	6	5	4	3	2	1	0
		Board ID					