

HAMILTON

TABLE C-1

LEPT RATE CHANNELS AND LOGIC CONDITIONS

SPECIES	ENERGY PASSBAND (MEV/NUCLEON)	CHANNEL [†] NUMBER	LOGIC *					
Protons	0.27 - 0.70	32	EO	\overline{EOA}	E2	$\overline{E2A}$	$\overline{E3}$	
	0.48 - 1.4	1	E1	$\overline{E1A}$	E2	$\overline{E2A}$	$\overline{E3}$	$\overline{L12A}$
	1.4 - 3.0	2	E1	$\overline{E1A}$	E2A	$\overline{E2B}$	$\overline{E3}$	$\overline{L12A}$
	4.1 - 10.0	10	E2A	$\overline{E2B}$	E3	$\overline{E3B}$	$\overline{E4}$	
	10.0 - 22.0	11	E2	$\overline{E2A}$	E3A	$\overline{E3B}$	$\overline{E4}$	
Alphas	0.075- 0.15	39	EOA	\overline{EOB}	$\overline{E2}$			
	0.15 - 0.43	33	EOA	\overline{EOB}	E2	$\overline{E2A}$	$\overline{E3}$	
	0.15 - 1.1 #	46	D1F1					
	0.39 - 1.5	3	E1	$\overline{E1A}$	E2	$\overline{E2B}$	$\overline{E3}$	$\overline{L12A}$ $\overline{L12B}$
	1.5 - 3.7	4	E1	$\overline{E1A}$	E2B	$\overline{E3}$	$\overline{L12A}$	$\overline{L12B}$
	4.2 - 8.9	12	E2B	$\overline{E2C}$	E3	$\overline{E4}$	$\overline{L23A}$	
	8.9 - 21.	13	E2	$\overline{E2B}$	E3B	$\overline{E4}$	$\overline{L23A}$	
Light Nuclei (${}^9_4\text{Be}$ typ)	0.12 - 0.4	34	EOB	\overline{EOC}	E2	$\overline{E2A}$	$\overline{E3}$	
	0.6 - 4.2	5	E1	$\overline{E1B}$	E2	$\overline{E3}$	$\overline{L12B}$	$\overline{L12C}$
	5.5 - 33.	14	E2A	$\overline{E2C}$	E3	$\overline{L23A}$	$\overline{L23B}$	$\overline{E4}$
Medium Nuclei (${}^{14}_7\text{N}$ typ)	0.047- 0.125	38	EOB	\overline{EOD}	$\overline{E2}$			
	0.125- 0.26	35	EOC	\overline{EOD}	E2	$\overline{E2A}$	$\overline{E3}$	
	0.13 - 10 #	47	D1F2					
	0.44 - 2.9	6	E1B	$\overline{E1C}$	E2	$\overline{E2C}$	$\overline{E3}$	
	2.9 - 7.8	7	E1	$\overline{E1B}$	E2B	$\overline{L12C}$	$\overline{E3}$	
7.8 - 40.	15	E2B	$\overline{E3A}$	$\overline{L23B}$	$\overline{L23C}$	$\overline{E4}$		
Heavy Nuclei (${}^{56}_{26}\text{Fe}$ typ)	0.062- 0.105	36	EOD	E2	$\overline{E2A}$	$\overline{E3}$		
	0.25 - 2.0	8	E1C	E2	$\overline{E2C}$	$\overline{E3}$		
	2.0 - 13.0	9	E1B	E2C	$\overline{E3}$			
	13.0 - 74.	43	E2A	$\overline{E3A}$	$\overline{L23C}$	$\overline{E4}$		

* For all logic functions anticoincidence with shield detectors is implied.

Derived from separate high speed electronics. Channels 46 and 47 are subcommutated with channels 13 and 17 (respectively) on command.

† Channels listed only for the species expected to dominate the response. For more complete energy range data for all species, see Figure 7 of the main proposal, and Figures C-2, C-6 and C-8. Channels 27 to 31 are bi-directional but are listed only in HEPT (See Table C-2).

TABLE C-2

HEPT RATE CHANNELS AND LOGIC CONDITIONS *

SPECIES	ENERGY PASSBAND (MEV/NUCLEON)		CHANNEL NUMBER †	LOGIC *						
				E5B	E4	L54A	E3	E3A	E2	E2A
Protons	3.0 - 19.0	16	E5B	E4	L54A	E3				
	19.0 - 31.0	23	E5A	E5B	E4A	E4B	E3A	E2		
	31.0 - 150.0	27	E5A	E5B	E4A	E4B	E3A	E3B	E2	E2A
	240. - ∞	31	E4	E4A	E3	E3A				
Alphas	3.0 - 21.	17	E5B	E5C	E4	L54A	L54B	E3		
	21. - 31.	24	E5B	E5C	E4A	E4B	E3A	E2		
	34. - 64.	28	E5B	E5C	E4A	E4B	E3B	E2	E2B	
Light Nuclei (${}^9_4\text{Be}$ typ)	4.0 - 21.	18	E5B	E5C	E4A	L54B	L54C	E3		
Medium Nuclei (${}^{14}_7\text{N}$ typ)	6.3 - 10.	19	E5C	E5D	E4	E4B	L54C	L54D	E3	
	10. - 42.	20	E5B	E5D	E4B	E4C	L54C	L54D	E3	
	42. - 64.	25	E5B	E5C	E4B	E4C	E3B	E2		
	64. - 200.	29	E5B	E5C	E4B	E4C	E3B	E2		
Heavy Nuclei (${}^{56}_{26}\text{Fe}$ typ)	8.6 - 21.	21	E5B	E4A	E4C	L54D	E3			
	21. - 86.	22	E5B	E4C	L54D	E3				
	86. - 125.	26	E5C	E4B	E3B	E2				
	125. - ∞	30	E5C	E4C	E3B	E2				
Electrons	0.5 - 1.0	40	25.8 E5	28 E5A						
	> 6.0	37	60.9 E3C	42 E4	43 E2	28 E5A	47 E4A			
	0.35 - 1.5	44	44.2 E4	43 E2	134 E3	28 E5A	47 E4A			
	> 2.0	45	14.2 E4	46.7 E3A	43 E2	28 E5A	49 E3C			
Singles Rates (ALL)	-	42								
Left and Right Shield Coinc.	-	41								

* For all logic, anticoincidence with shield detectors is implied.

† Channels listed only for the species expected to dominate the response. For more complete energy range data for all species, see Figure 7 of the main proposal, and Figures C-2, C-6 and C-8.

TABLE A6

DEFINITION OF P.H.A. IDENTIFICATION WORDS

<u>RATE CHANNEL</u>	<u>OCTAL VALUE</u>	<u>D1/D5⁺</u>	<u>PRIORITY</u>	
D1D2D3	1 (D1A)	040	1	3
	1 (D1B)	140	1	3
	2 (D1A)*	041	1	3
	2 (D1B)*	141	1	3
	3 (D1A)	042	1	3
	3 (D1B)	142	1	3
	4 (D1A)	043	1	3
	4 (D1B)	143	1	3
	5 (D1A)	020	1	2
	5 (D1B)	120	1	2
	6 (D1A)	021	1	2
	6 (D1B)	121	1	2
	7 (D1A)	022	1	2
	7 (D1B)	122	1	2
	8 (D1A)	060	1	1
	8 (D1B)	160	1	1
	9 (D1A)	061	1	1
	9 (D1B)	161	1	1
D1D2D4	10	X44	5	3
	11	X45	5	3
	12	X46	5	3
	13	X47	5	3
	14	X23	5	2
	15	X24	5	2
	43	062	5	1
D5D4D3	16	340	5	2 3
	17	341	5	2 3
	18	320	5	2 2
	19	321	5	2 2
	20	322	5	2 2
D5D4D3D2	21	360	5	1
	22	361	5	1
	23	342	5	3
	24	343	5	3
	25	325	5	2
	26	364	5	1
	27	351	5	3
D5D4D3D2D1	28	350	5	3
	29	326	5	2
	30	370	5	1
	31	X52	5	3
D1D2D3D4	32	241	5	3
	33	240	1	3
	34	220	1	2
	35	221	1	2
	36	260	1	1

* Channel 2 is not accumulated.

X=Don't care.

+ D1 is readout when logic $D_{11} * D_{21}$ is satisfied, D5 otherwise.

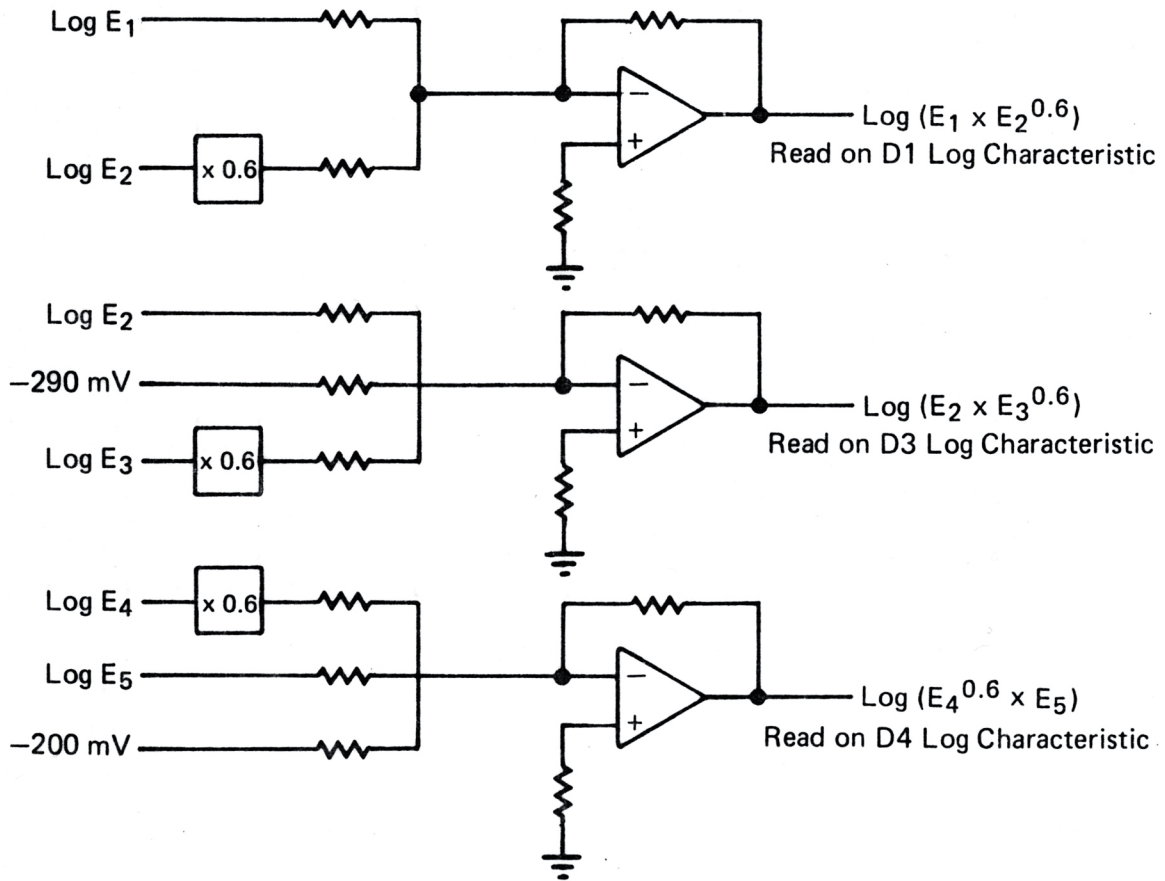


Fig. C-9 CPMS Particle Identifier Block Diagram

Voyager Product Thresholds

10-23-78

D.P. Peletier memo dated 3 Aug., 1977

Voyager 1

		LyX				
		x=20	x=60	x=100	x=140	x=180
L12A	0.39 MeV ^{1.6}	x=20	E1 = .49 515 / 64.4	E = 6.22 130 / 39		
L12B	2.1		3.22 / 92.2	701 / 67.2		
L12C	24.7		31.81 / 135.7	8.25 / 108.0		
L23A	88.					
L23B	555.					
L23C	2460.					
L54A	4.5					
L54B	73					
L54C	325					
L54D	2330					

Voyager 2

		x=20	x=60	x=100	x=140	x=180
		V6				
L12A	0.35	E2 = .0393 2.4402 / 86.3	E2 = .4375 57475 / 62.6	4.8742 13531 / 38.9	E2 = 54.325 03185 / 15.2	604.98 .00750 / -8.4
L12B	4.6	32.0717 / 128.5	7.5539 / 104.8	1.7783 / 81.1	4.1864 / 57.4	0.9856 / 33.7
L12C	27	188.25 / 157.5	44.338 / 133.8	10.438 / 110.1	2.4574 / 86.4	5.9852 / 62.7
L23A	66	E3 = .3888 146.33 / 152.6	E3 = 4.1292 28.185 / 129.1	E3 = 43.856 6.8285 / 105.6	E3 = 465.79 1.6544 / 82.1	E3 = 4947.1 0.4008 / 58.5
L23B	293	516.45 / 177.4	125.13 / 153.8	30.314 / 130.3	7.3444 / 106.8	1.7793 / 83.3
L23C	2220	3913.1 / 211.0	948.05 / 187.4	229.69 / 163.9	55.647 / 140.4	13.482 / 116.9
L54A	5.25	E4 = .4223 8.8062 / 99.2	E4 = 4.6369 2.0913 / 75.2	E4 = 50.918 0.49663 / 51.1	E4 = 559.13 0.11794 / 27.0	E4 = 6139.7 0.2801 / 2.9
L54B	68	114.06 / 142.1	27.088 / 118.0	6.4326 / 94.0	1.5276 / 69.9	36.28 / 45.8
L54C	290	486.44 / 166.4	115.52 / 142.3	27.433 / 118.2	6.5146 / 94.2	1.5471 / 70.1
L54D	2345	3933.4 / 201.4	934.13 / 177.3	221.83 / 153.2	52.679 / 129.2	12.5099 / 105.1

Voyager 1 Thresholds

10-23-78

From D.P. Pelletier Memo dated 5 Aug, 1977

D0 Thresholds

D1 Thresholds

	<u>Level</u>	<u>Energy</u>	<u>Channel</u>		<u>Level</u>	<u>Energy</u>	<u>Channel</u>	
(E) sync	E0	.204 .287/182	52.5/45.0		E1	.287/182	52.5/45.0	142.5
	EOA	.402	58.1		E1A	1.93	83.9	84.0
	EOB	1.15	75.4		E1B	4.28	97.0	97.5
	EOC	2.51	88.2 98.7		E1C	10.7	112.1	112.5
	EOD	5.63	101.5 102.5					

D2 Thresholds

D3 Thresholds

<u>Level</u>	<u>Energy</u>	<u>Channel</u>		<u>Level</u>	<u>Energy</u>	<u>Channel</u>	
E2	.166	43.0	✓	E3	.352	13.4	✓
E2A	1.49	77.5	✓	E3A	2.16	46.7	✓
E2B	6.65	101.1	✓	E3B	22.8	87.4	✓
E2C	87.7	148.0	✓	E3C	4.43	60.9	✓

D4 Thresholds

D5 Thresholds

<u>Level</u>	<u>Energy</u>	<u>Channel</u>		<u>Level</u>	<u>Energy</u>	<u>Channel</u>	
E4	.340	14.2	✓	E5	.167	25.8	✓
E4A	2.26	47.0	✓	E5A	.186	28.0 27.9	
E4B	117.	110.1	✓	E5B	.562	50.1	✓
E4C	760.	139.6	✓	E5C	20.2	110.0 109.9	
D1A	.184	45.2		E5D	190.	146.8 146.4	
D1B	.198	46.4					
E ₀	.204						

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Voyager 2 Thresholds

10-23-78

From D.P. Peletier memo dated 3 Aug, 1977

D0 Thresholds

D1 Thresholds

Level	Energy ^(keV) . ₂₀₉	Channel	Level	Energy	Channel
(E) sync) EO	.271/.169	50.3/42.6 49.7/41.9	E1	.271/.169	50.3/42.6 49.7/41.9
EOA	.363	55.1 54.5	E1A	1.75	80.9 80.6
EOB	.842	68.9 68.5	E1B	3.50	92.2 92.1
EOC	1.34	76.5 76.2	E1C	10.2	109.7 109.9
EOD	5.08	98.3 98.2			

D2 Thresholds

D3 Thresholds

Level	Energy	Channel	Level	Energy	Channel
E2	.126	39.3 39.6	E3	.316	16.5 14.8
E2A	1.22	77.0 76.9	E3A	2.19	49.3 47.6
E2B	6.54	104.9 104.4	E3B	21.3	87.8 86.3
E2C	72.8	144.8 144.2	E3C	4.47	61.3 59.8

D4 Thresholds

D5 Thresholds

Level	Energy	Channel	Level	Energy	Channel
E4	.331	15.9 17.2	E5 ESD	.136	29.4 26.9
E4A	2.18	47.4 48.2	ESA ESB	.141	30.0 27.5
E4B	92.5	110.0 109.9	ESB ESC	.480	50.5 50.1
E4C	697	143.7 143.2	ESC ESD	18.0	111.2 111.3
			ESD	127.	143.9 143.3
D1A	.214	45.8			
D1B	.208	45.3			
E0	.209				

Channels from 25 June 1977 EPOCH

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