

SLP-588-70
August 26, 1970

TO: R. E. Cashion
FROM: C. Cunningham
SUBJECT: Channel Logic Revisions for Charged Particle Measurement
Experiment.

As a result of the recent calibration tests performed on the CPME at SREL, it has been requested that the channel logic be modified to resolve some ambiguities in the outputs and to sharpen the energy pass-band edges where possible.

After consulting with the experimenters, the modifications listed herein have been implemented. These revisions involve both modification of the logic section and changes in some of the discrimination levels. The new channel logic is listed in Figure 1 along with the original logic functions.

The original and new discrimination levels are listed in Figure 2. The new energy pass-bands for the proton channels are listed in Figure 3. A comment is perhaps in order regarding the α^4 channel. The logic requested was $\alpha^4 = B6 \overline{B7} \overline{C1} A3 \overline{M}$; however, with the gates available, it was not possible to implement this function. By using the D₁ D₂ strobe on this channel, it is possible to at least require coincidence between the first and second detectors. In the notation used, A0 implies that the timing strobe on the first detector has been triggered. The threshold level of this strobe is approximately 150 kev. This will sharpen the lower edge of the α^4 pass-band to some degree and will help to eliminate false counts in this channel.

One other comment is in order concerning the logic functions. During the in-flight calibration sequence, the B3 input to channel P9 is disabled so that the logic for this channel becomes $P9 = C3 \overline{C4} \overline{M}$ during the in-flight calibration, allowing this channel to be used to check the C3 and C4 discrimination levels.


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Channel	Original Logic	Strobe	Revised Logic	Strobe
$\alpha 1$	A4 A5 B1 M	D1	N.C.	
$\alpha 2$	A5 B1 M	D1	N.C.	
$\alpha 3$	A4 B1 B6 M	D1 D2	N.C.	
$\alpha 4$	B6 B7 C1 M	D2	B6 B7 C1 A0 M	D1 D2
$\alpha 5$	B7 C1 M	D2	B7 C1 A2 M	D1 D2
$\alpha 6$	C5 B6 M	D2 D3	N.C.	
$\alpha 7$	C5 B6 M	D3	C5 B6 B4 M	D2 D3
P1	A1 B1 M	D1	N.C.	
P2	A2 A3 B1 M	D1	N.C.	
P3	A3 B1 M	D1	N.C.	
P4	A1 B1 B4 C1 M	D1 D2	N.C.	
P5	A1 B4 B5 C1 M	D1 D2	N.C.	
P6	B5 M	D2	B5 A1 M	D1 D2
P7	C4 B4 M	D2 D3	C4 B4 B5 M	D2 D3
P8	C4 B1 B4 M	D2 D3	C4 B3 B4 M	D2 D3
P9	C3 C4 B1 M	D2 D3	C3 C4 B3 M	D2 D3
P10	C2 C3 B1 M	D2 D3	C2 C3 B3 M	D2 D3
P11	C1 B1 C2	D2 D3	C1 B3 C2 B0	D3 D2 ← ?
E4	B1 A1 B5 C2 M	D2	N.C.	
E5	B2 A1 B5 C2 M	D2	N.C.	
E6	B3 A1 B5 C2 M	D2	N.C.	
Z1	A6 B1 M	D1	N.C.	
Z2	A7 B1 M	D1	N.C.	

23
1780

Figure 1
 Channel Logic Revisions - CPME

$$P7 + P8 + P9 + P10 = \# (>B3)(<B5) (>C2) \bar{M} \text{ EVENTS}$$

$$E6 = \# (>B3)(<B5) \bar{>C2} \bar{M} \text{ EVENTS}$$

$$B0 \bar{M} = E6 + P7 + P8 + P9 + P10?$$

2.339/cm³
 4x10
 93019

SIP-588-70

2.9 MeV - C¹² - 0.87 (-2)
 N¹⁴ -
 O¹⁶ - 0.7 MeV/acc
 (.6)

Z2 - 3.5 C¹²
 - 2.3 O¹⁶

0.5 - 2.5 C¹²
 1.8 O¹⁶

Discrimination Levels

	<u>Original Levels</u>	<u>Revised Levels</u>
A1	0.21 Mev	N.C.
A2	0.43	N.C.
A3	0.90	N.C.
A4	2.0	N.C.
A5	3.4	N.C.
A6	8.0	N.C.
A7	32.0	N.C.
B1	0.25 Mev	0.25
B2	0.50	0.46
B3	0.90	0.85
B4	3.2	3.6
B5	7.7	7.7
B6	14.2	14.2
B7	32.0	32.0
C1	1.5 Mev	1.5
C2	2.5	3.0
C3	3.6	4.8
C4	7.0	7.7
C5	30.0	30.0

Figure 2
 Energy Discrimination Levels (Mev)

<u>Channel</u>	<u>Original Pass-Band</u>	<u>New Pass-Band</u>
P1	0.3 - 0.5	0.3 - 0.5
P2	0.5 - 0.9	0.5 - 0.9
P3	0.9 - 1.9	0.9 - 1.9
P4	1.9 - 3.9 Mev	4.2 - 8.0
P6	8.0 - 15.0	8.0 - 15.0
P7	15 - 30	15 - 30
P8	30 - 50	30 - 44
P9	50 - 120	44 - 75
P10	120 - 140	75 - 170
P11	240 - 620	170 - 580

Figure 3
Proton Energy Pass-Bands

SLP-588-70 (a)
August 27, 1970

TO: R. E. Cashion
FROM: C. Cunningham
SUBJECT: Corrections for Memo SLP-588-70, "Channel Logic Revisions for Charged Particle Measurement Experiment", dated August 26, 1970.

There are three errors in the above memo that should be corrected.
These are:

1. In Figure 1, the original strobe for Channel P11 should have been listed as D3, not D2 D3. This D3 strobe is not inhibited by the anticoincidence pulse.
2. The P5 Channel pass-bands were omitted in Figure 3. Please replace with revised Figure 3, attached.
3. The original Channel P10 pass-band was 120-240 Mev not 120-140 as listed.


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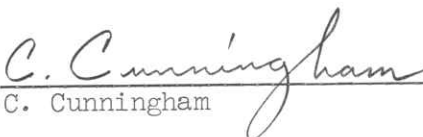
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