Cerenkov Electronics

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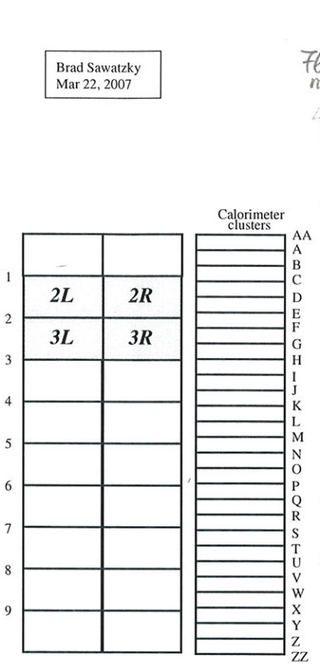


Exploit overlap of clusters with Shower in trigger logic:
1 – A, B, C, D
2 – D, E, F, G
3 – G, H, I, J
4 – J, K, L, M
....

OR groups of 4 shower signals into 9 sets that overlap the Cer clusters.

The Shower clusters are overlapped to avoid any edge effects with the Cerenkov mirror clusters

730ns into ADC

C01L → A PS776 → SPL 0.5/0.5 (50Ω) → ADC "C01L"
C01R → A PS776 → SPL 0.5/0.5 (50Ω) → ADC "C01R"
C02L → A PS776 → SPL 0.5/0.5 → ADC "C02L"
C02R → A PS776 → SPL 0.5/0.5 → ADC "C02R"
C03L → A PS776 → SPL 0.5/0.5 → ADC "C03L"
C03R → A PS776 → SPL 0.5/0.5 → ADC "C03R"

Note: This disc. threshold just above noise level.

Sum8 JLab → D P706 (x5) → TDC "PMT1–2RL"
Coax Ribbon to LEMO

Sum8 JLab → ADC "C01A"
Electronic DT pulser
D P706* → TDC "TC01T"
P757 → P706 (Log. FO)
If use a LC3412 disc. then P757 must be an ECL–NIM module.
used as logic FO
To Cer–only OR

Sum8 JLab → ADC "C02A"
Electronic DT pulser
D P706 (x5) → TDC "PMT2–3RL"
Coax Ribbon to LEMO
D P706* → TDC "TC02T"
P757 → P706 (Log. FO)
To Cer–only OR

Delay to make Coin.
16+10+4 ns (?)

From PS/Sh cluster OR(A,B,C,D) to make overlap with Cer mirrors.
From PS/Sh cluster OR(D,E,F,G) to make overlap with Cer mirrors.

AND P758

OR (CAEN N113 P757) (9 total) → "Electron" Trigger Shower+Cerenkov(d2)
250 ns to end of patch cable to DAQ weldment

From Cer clusters (x9)
'Cer–only' OR (CAEN N113 LC429A) → "Cerenkov–only" Trigger
250 ns

[N] = Line in ns from amplifier input

Beamline
(1–10) PMT → x10 Amp →
(11–20) PMT →
total Δt = 76ns for both sides

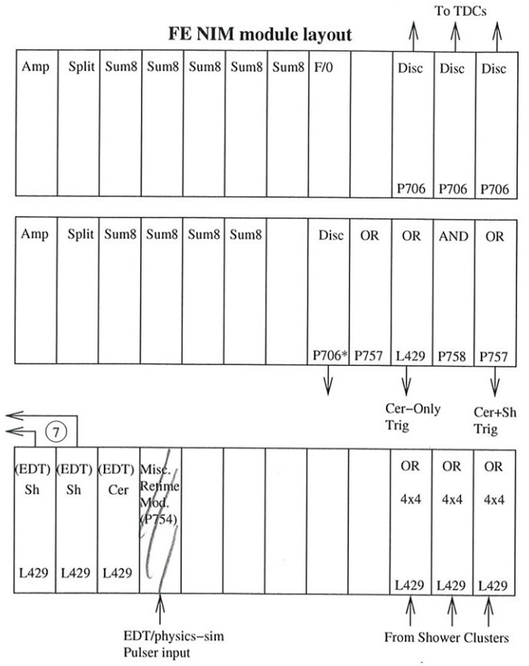
FE Patch Panel to ADC/TDC

250ns
9 SUM TDC out --> Weldment --> NIM–ECL --> TDC input
45 PMT TDC out --> Weldment --> NIM–ECL --> TDC input

250ns 550ns
20 SUM ADC out --> Weldment --> Delay --> ADC input
9 PMT ADC out --> Weldment --> Delay --> ADC input

Group	Length	amount
1	1ns	38
2	2ns	9
3	4ns	54
4	8ns	83
5	16ns	9
7	16ns	26
8	32ns ?	9
9		9

FE NIM module layout



		chan	modules
Amp	PS776	20	2
Sum8	JLab	9x5	9
Discr	P706*	9	1
OR	PS757	9x2	2
AND	PS758	9	1
Splitter (50:50)		20	2
F/I	LC429A	9	1
F/O	LC429A	9	1
Discr	P706	45	3
F/I Sh cluster F/I	LC429A	4x9	3