Electronics

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Issues

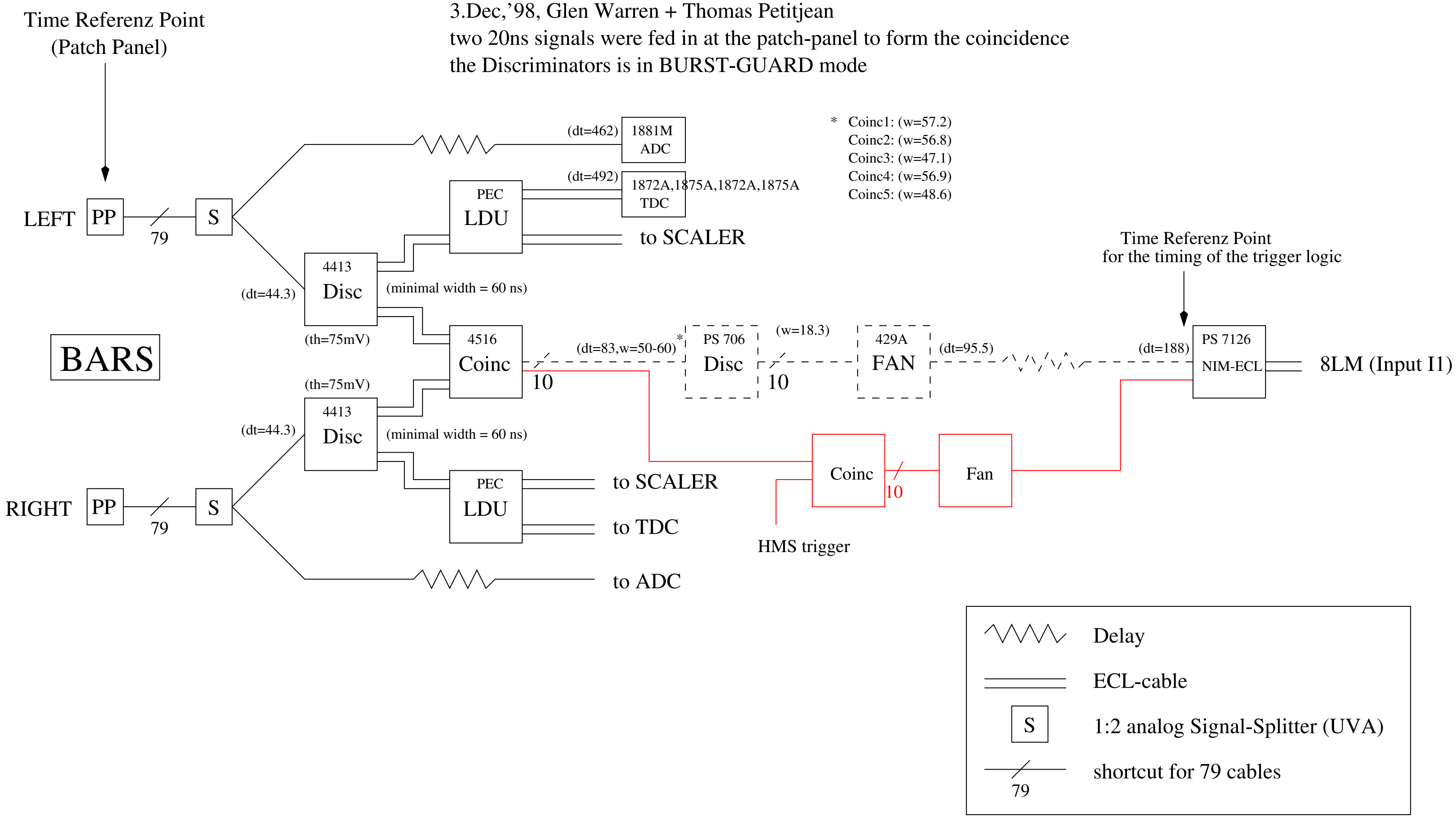
- Electronics Deadtime
- Status of Third Arm Electronics

Electronics Deadtime

- Gen98 used e$\star$B coincidence as main trigger
  - B (OR of all bars) showed huge rates ($\simeq 4MHz$)
  - Rate dependent electronics dead time induced
- Gen01 will use "Open Trigger"
  read out neutron detector for each HMS event
- Measurement of electronics deadtime with pulser
- e$\star$B for diagnostics and as backup
  - OR of coincidences between subsets of bars and the HMS

n-detector-Logic

~cdaq/gen/Documents/Timing/ndet_logic_eoe.ps
3.Dec,'98, Glen Warren + Thomas Petitjean
two 20ns signals were fed in at the patch-panel to form the coincidence
the Discriminators is in BURST-GUARD mode



Third Arm Electronics

- Gen98 cannibalized SOS electronics for the neutron detector, which worked fine for the experiment but it was a pain to restore SOS configuration after the experiment.

- For GeN01: Third Arm Electronics

  - Fastbus Crate with ADC and TDC modules and SFI with CPU
  - VME crate with scalers and CPU
  - Trigger logic (CAMAC and NIM crates and modules)
  - Cables, Splitters, Connectors etc.

Modules	G_E^n	200ch	Order	arrived	HallC	UVA	BS	status
NIM bin plus cooling	7	6	6	6		1		0
CAMAC crate plus cooling	2	2	2	2		5		0
Logic Fan P757/L429	10	10	6	6	4	3		+3
Gate Generator P794	1	1	0	0	1			0
Octal Disc P708/P710 (L4608C)	2	2	7	7				+5
Multiscaler STR2701	13	10	16	16				+3
ECL Disc L3412/L4413	20	14	10	10	4	14		+8
Logic Units L4516	10	7	1	0 (out)	6	7		+3
8ch LDU PEC					8			
16ch LDU Basel	19	13	0		6		15	+2
Logic Unit L622/P752	6	3	3	3				(-3)
Level Translator P726/L4616	5	8	8	8				+3
4fold Logic L365AL/P755	2	2	2	2				0
6ch Disc L821/P711	3	3	3	3				0
16ch Disc P706	1	1	2	2				+1
Dual Delay P792	6	6	6	6				0
Logic Unit P754/P756	1	1	4	4				+3
Logic Matrix L2365	1	1	1	0 (out)				-1
Level Translator P7126	1	1	0		1			0

Cables, Splitters, Connectors etc:

Det-Amp: 300 BNC-Lemo cables (16ns): 250 existing, B. Vulcan

Amp-PP(1): 300 Lemo-BNC cables (?ns): B. Vulcan

300 BNC Barrels: 250 existing, Rest B. Vulcan

Amp-PP(2): 300 BNC cables ($\simeq$260ns): $>$235 existing, Rest B. Vulcan

5 passive splitter boxes: received 6 from UVA

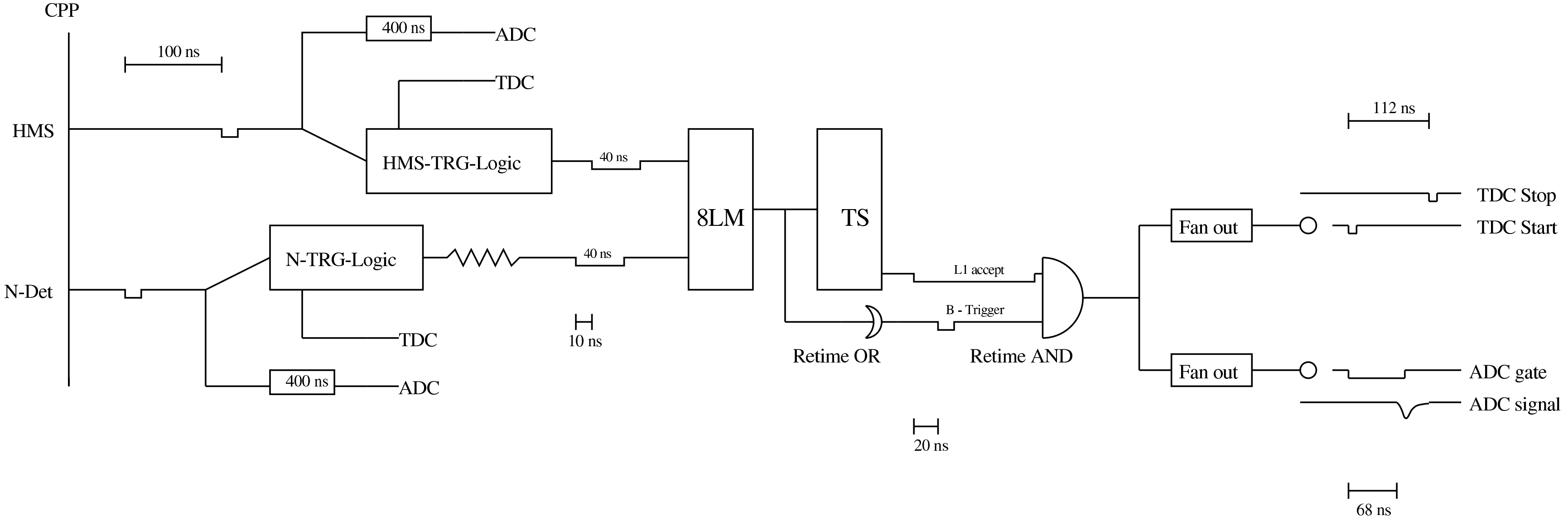
10 Transition boxes: B. Vulcan

300 BNC delay cables (400 ns): B. Vulcan

2$\times$20 Shielded Ribbon Cables (ADC input): some exist, Rest B. Vulcan

Lemo Cables (1-32ns) for logic: most of it exists, Rest B. Vulcan

N-detector-Timing: worst case



HMS	N-detector
TOF to S2 = 87 ns	TOF = 9 to 30 ns
TT in scintillator = 3+3-0 ns	TT in scintillator = 5 +5 -0 ns
PM TT = 20 ± 2 ns	PM TT = 31 ± 2 ns
PM to CPP = 548 ± 2 ns	PM to CPP = 524 ± 1 ns
CPP to splitter = 12 ns	CPP to splitter = 12 ns
670 +7 -4 ns	581 +8 -3 ns

CONCLUSION:

Based on the numbers for HMS and N-detector, the ADC-gate can be opened 60 ns before the signal reaches the ADC. The TDC start comes 125 ns in advance (35 ns get lost in the FB-TDC)