E949 K-016
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Experiment 949
Technical Note K-016

Trigger Definitions — 2002

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The definitions of the various triggers used in 2002. This version revised 16-October-2002.

Trigger	TB	AO	PS	Ref	Description
pnn1	0B1	A01	0-0	TB-17	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{(19_{\rm ct})}\cdot\overline{\mathtt{BV}+\mathtt{BVL}+\mathtt{EC}}\cdot\mathtt{HEX}\cdot\mathtt{L1.n}\cdot(\mathtt{L0rr1}(1)\cdot\mathtt{US}+\mathtt{L0rr1}(2)\cdot\mathtt{DS})\cdot\overline{\mathtt{L0_zfrf}}$
pnn2	0B2	A02	0-1	T2-141	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot 3_{\rm ct}\cdot 4_{\rm ct}\cdot 5_{\rm ct}\cdot 6_{\rm ct}\cdot\overline{(13_{\rm ct}+\cdots+18_{\rm ct})}\cdot\overline{(19)}\cdot\overline{\mathtt{BV}+\mathtt{BVL}+\mathtt{EC}}\cdot\mathtt{L0rr2}(1)\cdot\mathtt{HEX}\cdot\mathtt{L1.n}\cdot(\mathtt{ps16}+\overline{\mathtt{C}_\pi})$
prompt	0A2	A03	0-2	TB-32	$\mathtt{KB}\cdot\mathtt{C}_\pi\cdot\ \mathtt{T{\bullet}2}\cdot\overline{\mathtt{BV}+\mathtt{BVL}+\mathtt{EC}}\cdot\mathtt{HEX}\cdot\mathtt{L0rr1}(4)\cdot\mathtt{L1.n}$
km22	0A4	A05	2-2	TB-32	$\mathtt{KB}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot 19_{\rm ct}\cdot\mathtt{BVL}$
kp22	0A6	A06	1-1	TB-32	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{(19_{\rm ct})}\cdot\mathtt{HEX}\cdot\mathtt{L1.n}$
kp23	0A7	A07	4-3	TB-32	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{(19_{\rm ct})}\cdot(\mathtt{BV}+\mathtt{BVL})\cdot\mathtt{HEX}\cdot\mathtt{L0rr1}(3)\cdot\mathtt{L1.n}$
1gamma	0A8	A08	3-2	TB-32	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot(8_{\rm ct}+\cdots+16_{\rm ct})\cdot\overline{(18_{\rm ct})}\cdot\overline{(19_{\rm ct})}\cdot\overline{(20_{\rm ct})}\cdot\overline{(21_{\rm ct})}\cdot\mathtt{BV}\cdot\mathtt{BVL}\cdot\mathtt{HEX}\cdot\overline{\mathtt{EC}}\cdot\mathtt{L1.n}$
kp21	0A5	A09	2-0	TB-32	$\mathtt{KB}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{(19_{\rm ct})}$
pnn1L0	0B1	A12	2-3	TB-17	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{(19_{\rm ct})}\cdot\overline{\mathtt{BV}+\mathtt{BVL}+\mathtt{EC}}\cdot\mathtt{HEX}\cdot(\mathtt{L0rr1}(1)\cdot\mathtt{US}+\mathtt{L0rr1}(2)\cdot\mathtt{DS})\cdot\overline{\mathtt{L0_zfrf}}$
pnn1L0o	0B3	A13	3-0	TB-32	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{(19_{\rm ct})}\cdot\overline{\mathtt{BV}+\mathtt{BVL}+\mathtt{EC}}$
minbias	0B5	A14	1-3	TB-32	$\mathtt{KB}\cdot\mathtt{IC}\cdot\mathtt{DC}\cdot\ \mathtt{T{\bullet}2}$
km21	0A3	A15	2-1	TB-32	$\mathtt{KB}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot(17_{\rm ct}+18_{\rm ct}+19_{\rm ct})$
CEX	0A1	A16	3-3	TB-32	$\mathtt{KB}\cdot\overline{\mathtt{DC}}\cdot 2(\mathtt{T{\bullet}2})\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{\mathtt{EC}+\pi\mathtt{B}}$
piscat	0B4	B01	4-1	TB-16	$\pi\mathtt{B}\cdot\overline{\mathtt{DC}}\cdot\mathtt{IC}\cdot\ \mathtt{T{\bullet}2}\cdot(6_{\rm ct}+7_{\rm ct})\cdot\overline{\mathtt{BV}+\mathtt{BVL}+\mathtt{EC}}\cdot\mathtt{HEX}$
B0	—	D01	4-0		$\mathtt{B0}$
KB	—	D02	1-2		$\mathtt{KB}$
eckmu2	—	D03	4-2		$\mathtt{KB}\cdot(\mathtt{EC}+\mathtt{C0}+\mathtt{MC}+\mathtt{DPV})\cdot\overline{(\mathtt{T{\bullet}2}+\mathtt{BV}+\mathtt{BVL}+\mathtt{RS}+\mathtt{prompt})}$
Xe	—	D04	1-0		Xe Ref PMT: either from predet or pulser
pibeam	—	D06	3-1		$\pi\mathtt{B}$
cosmic	—	D10	—		$\mathtt{T{\bullet}2}\cdot\mathtt{IC}\cdot\overline{\mathtt{BG}}$ or $\mathtt{T{\bullet}2}\cdot\mathtt{IC}$ or $\mathtt{T{\bullet}2}\cdot$(>1 non-adj IC)
pulser	—	D11	1-0		$\mathtt{Prescaler}$
EOS	—	D12	—		end-of-spill from predet
YAlO	—	D13	—		EC Xtal OR
random	—	D14	—		$\mathtt{BVsum}$
rsmon	—	D15	0-3		$\mathtt{Prescaler}\cdot\mathtt{BG}$
tdmon	—	D16	1-0		from either predet or pulser
ref source	—	D18	—		source on rsmon ref PMT with a predet gate
pulser·$\overline{BG}$	—	D19	1-0		$\mathtt{Prescaler}\cdot\overline{\mathtt{BG}}$

Description of elements:

KB	Beam kaon $C_K \cdot B4 \cdot TTsum \cdot spill$
πB	Beam pion $C_\pi \cdot B4 \cdot TTsum \cdot spill$
IC	I counter hit
T•2	Concidence of 1st and 2nd layer of RS in the same sector and IC
DC	Delayed Coincidence (IC timing - KB timing $>$ 2 ns)
EC	Endcap Veto (upstream and downstream)
BV	Barrel Veto discriminated analog sum
6	Hit in 6 layer of RS
6_{ct}	Hit in 6 layer of RS, associated with a T•2 ("charged track")
HEX	1 or 2 adjacent hit hextants
L0rr1(i)	pnn(1) Refined Range using MLU mask, bit i
L0rr2(i)	pnn(2) Refined Range using MLU mask, bit i
US, DS	L0z sign bit: upstream, downstream
NG3	Number of photon clusters must be greater than 2
NG2	Number of photon clusters must be greater than or equal to 2
NTG	Number of hit target elements
TBPS	Trigger board by-16 prescaler; bypassable using EXTCON 24=H
RS	OR of 6 hextant discriminators
prompt	used to veto prompt IC-KB coincidence
L1.n	L1.1 and/or L1.2
L1.1	TD area vs. height cut; select pion
L1.2	FERA energy cut in stopping HEX and Lay(n+1) and/or bad SCF and/or HEX afterburner
L0_zfrf	$13_{ct} \cdot 14_{ct} \cdot \overline{15_{ct}} \cdot$EXTCON(14)

Notes:

— TB = trigger board and channel. Each board is numbered, channel: 0–5.
— Osaka trigger board is board 0.
— AO = and-or board channel = Lev 0 trigger bit: 0–15; or BD board channel
— PS = prescaler board: 0–4 starting at right, and channel: 0–3.
— T•2 includes and IC requirement and a L19 veto option is also included
— L0rr2 mask cuts NTG=15 only.

References:

— TB = TB2A logbook
— Tn = Trigger 2 main logbook, volume n