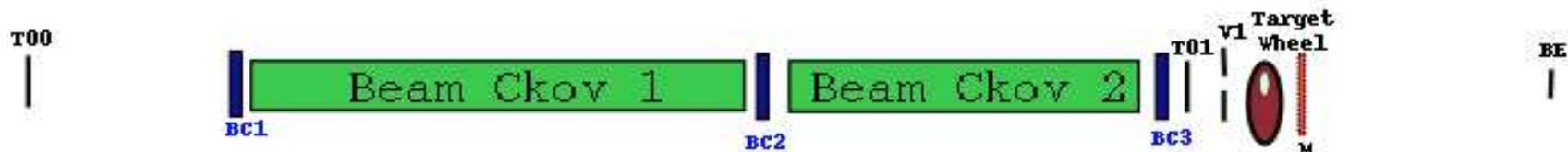


Trigger Detectors

MIPP Trigger Detector Schematic (not to scale)

Ron Soltz
8/6/03



T00/01 = Start Counters (Scintillator)

V = Veto Counter (Scintillator)

BC = Beam Counters (Wire Chamber)

**M = Multiplicity Counter (Scintillator)
under consideration**

BE = BullsEye

- BE represents a virtual detector, DC3, TOF, or scintillator

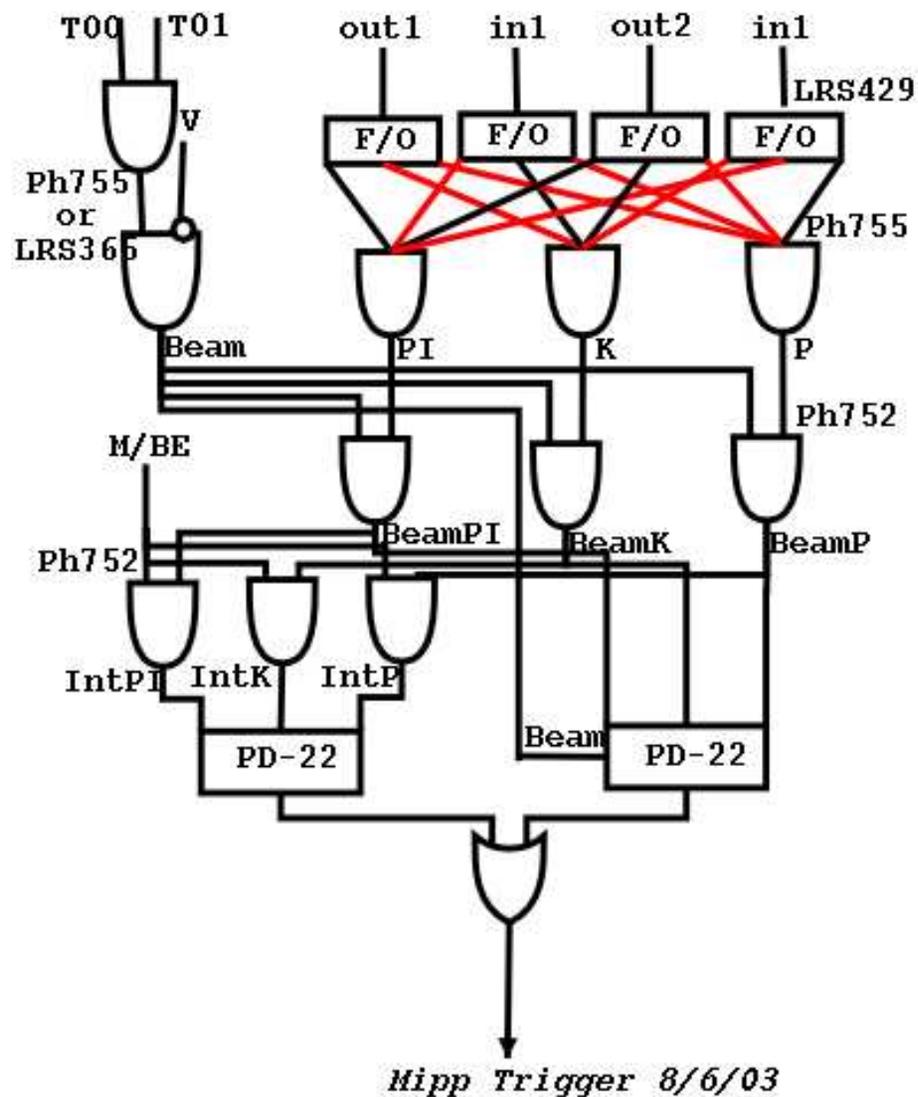
Physics Goals

- Lots of beam
- Approximately equal parts of each species
- High quality interaction triggers for each species
- Anything else?

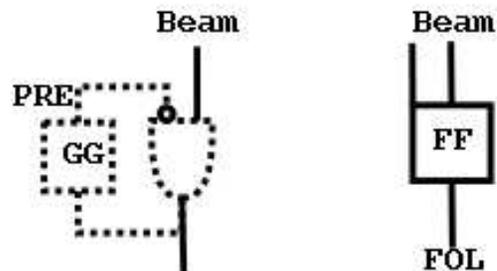
Beam PID and Bullseye Interaction

- Triggering got simpler in two ways (see Trigger web page):
- Online TOF not needed for 10,15 GeV, where Malensik calculation shows near equal survival of K and p
 - With no TOF, we need to run ~6times longer to get equal statistics for Kaon interactions
 - However, TOF separation is much easier here, about 2.4 ns
- Online beam vectoring also no needed
 - T00/T01 combination already gives 0.18 mrad rms
 - BC1-3 achieves 0.09, BC2-3 about 0.26 mrad rms
 - Multiple scattering is about 0.04-0.4 mrad (100-10 GeV/c)

Trigger Logic



Approximate Times:
 ~20 ns for Beam
 +40 ns for BeamPID
 +50 ns for BullsEye



MIPP Trigger Timing

- We need delay for T00, TOF, BCKV, CKOV
- 100 ns good
- 200 ns better

Microsoft Excel - MippTrigger.xls

File Edit View Insert Format Tools Data Window Help

H14

	A	B	C	D	E	F	G	H	I	J	K
1											
2	Cables	Beta	m/ns		Racks			Trig	Logic	Time-ns	Location
3	Beam	1	0.3		RR01	-39.8		Beam	T00*T01*V	63.3	-4
4	FastHard	0.918	0.28		RR02	-16		BmPID	Bm*BCK	83.3	
5	SlowHard	0.81	0.22		RR03	-4		Int1	Bm*M	103.3	
6	Slow	0.6						Int2	Bm*Be	208.6	
7											
8	Element	Position-m	Beam-ns	SigDelay	RR-m	RR-ns	BeamTrig Return-ns	TDC Latency	Diff	Diff (Beint)	
9	Primary Tgt	-95.9	-320								
10	Collimator	-62.2	-207								
11	T00	-59.9	-200	40.0	-4.0	43	63	-10	-30	-175	
12	BC1	-40.4	-135	100.0	-39.8	-32	224	512	256	111	
13	BC2	-16.0	-53	100.0	-16.0	47	117	512	442	297	
14	BCK1	-16.0	-53	40.0	-16.0		117				
15	BC3	-3.3	-11	100.0	-4.0	92	63	512	541	396	
16	BCK2	-3.3	-11	40.0	-4.0		63				
17	T01	-3.0	-10	40.0	-4.0	34	63	-10	-40	-185	
18	Target/M	0.0	0	40.0	-4	55	63				
19	TPC	0.9	3				81	1000			
20	DC1	2.3	8	100.0	3	111	95	512	528	383	
21	CKOV	2.9	10	50.0	2.9	60	94	200	165	20	
22	DC2	3.9	13	100.0	6	122	108	512	526	381	
23	DC3	5.2	17	100.0	6	121	108	512	525	380	
24	BE	5.2	17	100.0	6	120					
25	TOF	5.5	18	50.0	6	71	108	-10	-48	-193	
26	DC4	7.1	24	100.0	10	137	126	512	523	378	
27	PWC5	8.8	29	100.0	10	135	126	400	409	264	
28	RICH -enter	10.5	35	100.0	12	142	135	4000	4007	3862	
29	RICH -exit	21.1	70	0.0							
30	PWC6	21.4	71	0.0	13	109	140	400	369	224	
31	ECAL	21.8	73	500.0							
32	HCAL	23.4	78	500.0	14	620	144	-10	466	321	
33											
34											

Ready