

## L1CalTrack Input Specification

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There are three sets of inputs to each L1CalTrack trigger card (called an MTCxx card): L1Cal results, L1CTT results, and L1FPS results. The L1CTT results include L1CPS information.

Each MTCxx card corresponds to a detector octant. Thus each MTCxx card produces trigger decisions for a detector octant. These octant trigger decisions are subsequently combined into physics trigger decisions on the L1CalTrack trigger manager card (called an MTM card).

The number and location of cables input to each MTCxx card is given in Table 1. Three L1Cal cables are used for each octant to provide overlap triggers between octants. Each cable from L1Cal corresponds to 1/8 (4 phi sectors / 32 total) of the calorimeter. Each cable from L1CTT corresponds to 1/80 of the CFT. Each cable from L1FPS corresponds to 1/16 of the FPS detector. Presently we do not plan on sending overlap L1CTT cables to each board. But if these are needed (for isolation for example), their positions are noted below.

Input	MTCxx Input Cable	Number of Cables	Detector Coverage of Each Cable
L1CTT	0-9	10	1/80
L1CTT overlap	10,11	2	1/80
Free	12		
L1Cal	13,14,15	3	1/8
L1FPS	16,17,18,19	4	1/16

**Table 1 Input source, input cable, number of cables, and detector coverage for each MTCxx input.**

Each input cable carries 16 bits x 7 rf strobos for each bunch crossing (BC). The 7<sup>th</sup> word is a longitudinal parity word. Thus each input cable carries 16 x 6 = 96 bits of trigger information. The input information from the L1Cal trigger is given in Table 2. The information from the L1CTT trigger is given in Table 3. The information from the L1FPS trigger is given in Table 4 but is preliminary (i.e. I made it up).

L1Cal Input	Description
Word 1	Not used
Word 2 (Jet and EM object phi slice 0)	Bit 0:6 (jet passing $E_T$ threshold 0:6) Bit 7 (not used) Bit 8:14 (EM passing $E_T$ threshold 0:6)

	Bit 15 (not used) Note: $E_T$ thresholds are inclusive
Word 3 (Jet and EM object phi slice 1)	Same as above
Word 4 (Jet and EM object phi slice 2)	Same as above
Word 5 (Jet and EM object phi slice 3)	Same as above
Word 6	Not used
Word 7	Longitudinal parity

**Table 2 Input specification for L1Cal inputs.**

L1CTT Input	Description
Word 1 Track 1	Bit 0:5 H-layer centroid Bit 6:8 Extended $P_T$ Bit 9:10 $P_T$ Bit 11 Curvature (sign) Bit 12:14 CPS info TBD Bit 15 Valid track
Word 2 Track 2	Same as above
Word 3 Track 3	Same as above
Word 4 Track 4	Same as above
Word 5 Track 5	Same as above
Word 6 Track 6	Same as above
Word 7	Longitudinal parity

**Table 3 Input specification for L1CTT inputs.**

L1FPS Input	Description
Word 1 Cluster 1	Bit 0:7 Cluster address Bit 8 N/S Bit 9 U/V Bit 10 MIP Bit 11:13 Cluster width Bit 14:15 Not used
Word 2 Cluster 2	Same as above
Word 3 Cluster 3	Same as above
Word 4 Cluster 4	Same as above
Word 5 Cluster 5	Same as above
Word 6 Cluster 6	Same as above
Word 7 Cluster 7	Longitudinal parity

**Table 4 Input specification for L1FPS inputs.**