

# New parameter values

28 March 2001, JV

## 1 FEX and associated data preparation processing times

RoI type	Detector	execution time FEX (ms)	Processor	Reference	4000 MIPs (ms)
em	calorimeter	0.2	300 MHz PII	2000-020, 2000-045, p.7	0.02
	TRT	32	450 MHz PIII	2000-043, fig.17, p.17	4
	SCT + pix	21	400 MHz PII	1999-013 1999-001	2
gamma	calorimeter	0.2	300 MHz PII	2000-020, 2000-045, p.7	0.02
hadron	calorimeter	0.2	300 MHz PII	2000-020, 2000-045, p.7	0.02
	TRT	32	450 MHz PIII	2000-043, fig.17, p.17	4
	SCT + pix	21	400 MHz PII	1999-013 1999-001	2
jet	calorimeter	4.1	500 MHz PII	2000-015, table 10, p. 12	0.5
muon	muon	3.8	10 SpecInt95 ~ 250 Mhz PII	2000-036, fig. 16, p. 16	0.25
	calorimeter	0.2	300 MHz PII	2000-020, 2000-045, p.7	0.02
	TRT	32	450 MHz PIII	2000-043, fig.17, p.17	4
	SCT + pix	21	400 MHz PII	1999-013 1999-001	2
scan	pix	43	450 MHz PII	2000-031, table 27, p. 55	5
	TRT	230			26
	SCT	32			4

The processing time of em, hadron and muon RoI calorimeter data has been rounded to 0.02 ms. Processing times have been rounded up in general, for RoI processing values for high luminosity have been used (in particular the processing times for data from the tracker are sensitive for pile-up). For sequential processing of the calorimeter data the 0.02 ms has to be divided in smaller parts.

RoI type	Detector	New values 4000 MIPS (ms)	Old values 1000 MIPS (ms)
em	calorimeter	0.02	0.05
	TRT	4	0.16
	SCT + pix	2	0.25
gamma	calorimeter	0.02	0.1
hadron	calorimeter	0.02	0.05
	TRT	4	0.16
	SCT + pix	2	0.25
jet	calorimeter	0.5	0.05
muon	muon	0.25	0.05
	calorimeter	0.1	0.05
	TRT	4	0.3
	SCT + pix	2	0.25
scan	pixels	5	20
	TRT	26	25
	SCT	4	included in pixels

The table shows that the estimates previously used analysis of RoI data from the trackers and from the muon detector were much too low, the estimates for the calorimeter (apart from jet RoI processing) and for the scan were about right for 4000 Mips processing and not for 1000 Mips processing !

## 2 Number of seeds from the scan

Each time the scan is running it produces on average 1 electron seed, i.e. 1 RoI for which calorimeter data has to be analysed, and 2.6 muon seeds, i.e. 2.6 RoIs for which calorimeter and muon detector data has to be analysed.

## 3 Other processing times

Communication overheads were 10  $\mu$ s per message. I propose to keep this number until we have better numbers derived from Ethernet measurements. These numbers will then depend on the message rates I guess.

In processing times an overhead of 11.111 % was included (10 % of total time). I think we can get rid of this.

Other processing times require more investigation, but let us first see whether we can agree on the values proposed above.

## 4 Appendix

### Updated version of email sent earlier

DAQ-2000-025 : Pixels

Low luminosity, scan : 35.3 ms, max > 300 ms (fig. 8), assuming Z-reconstruction of vertex

Low luminosity, scan : 72.7 ms, max > 300 ms (fig. 8), assuming no Z-reconstruction of vertex RoI, no pile-up : 3.7 ms, max > 30 ms (fig. 13), b-jet !, eta x phi = 0.4 x 0.4

RoI, high luminosity : 86 ms, max > 400 ms (fig. 15), b-jet !, eta x phi = 0.4 x 0.4

NB : clustering not taken into account

DAQ-2000-015 : Jets, table 10, p.12

eta x phi = 1.0 x 1.0, sliding by 0.2 :

low luminosity		high luminosity	
2s cut (ms)	0s cut (ms)	2s cut (ms)	0s cut (ms)
1.7 (3.4)	1.9 (3.3)	2.3 (3.8)	2.5 (4.1)

Numbers between brackets : 95 % of events

DAQ-2000-045 : em/gamma, high-lumi, p.7

LVL2 calorimeter: ~0.2 ms;

LVL2 SCT/Pixel: ~10 ms

LVL2 TRT: ~100 ms

DAQ-2000-043 : TRT, fig. 17, p. 17

New results : 14 ms (50% of events) and 32 ms (95 % of events) : jets with pile-up, eta x phi = 0.2 x 0.2, Pentium III, 450 M

DAQ-2000-036 : muon detector : Fig. 16, p. 18

Distribution has a sharp peak at 3.7 - 3.8 ms for 10 SpecInt95 -> less than 2 ms for 500 MHz PIII, data from 3 ROBs per RoI used.

DAQ-2000-020 : some numbers on calorimeter FEX, we maybe should stick to those of 2000-045

DAQ-2000-006 : TRT full scan :

153 ms on 600 MHz Athlon, 2.8 ms on FPGA (0.4 ms transmission time to be added)

DAQ-2000-031 : Pixel scan : 22 ms / 43 ms

Si-kalman : 19 ms / 32 ms

TRT full scan : 150 ms / 230 ms on 600 MHz Athlon / 450 P III

TRT - SCT association : 57 ms / 91 ms : "global" processing

(Table 27, page 55)

Average number of seeds : muons : 2.6 electrons : , Source : email John Baines, 22 June 2000

DAQ-1999-013 : SCT + pixels, histogramming method, fig. 6-6, p. 22, 11.6 ms average, 98 % < 20 ms, 400 MHz Pentium II. Detailed info in PhD Thesis Reinier Dankers. This does not include data preparation. Results for jets identified by LVL1 as em RoIs.

DAQ-1999-001 : SCT + pixels, data preparation, 0.55 ms average, 90 % < 0.65 ms, p. 30, table 9.1, 400 MHz Pentium II. Detailed info in PhD Thesis Reinier Dankers. Results for jets identified by LVL1 as em RoIs.

