Appendix C.6: The Trigger Quick-Look Operator Manual
20th April 2006

Scripts

There is one basic script for the Trigger System quicklook: **TriggerScan**

The output consists of a postscript file (containing 17 pages of pictures) that describes the performances of the Trigger board and of the 48 PMTs of the ToF System.

Description of "basic" figures:

FIGURE at Page 1

- ◆ **Description:** This histogram shows the **event counter** as function of the CPU time.
- ◆ **NOMINAL/STANDARD**: The plot has a characteristic serration shape. The value goes to 0 for each new run.
- ◆ **NON-STANDARD:**
  - A shape different from the described one could indicate problems in the acquisition.
  - ➔ **ACTION: Call specialist.**

FIGURE at Page 2

- ◆ **Description:** : is composed by 2 plots: the first (top) shows the **acquisition dead time** as function of the CPU time. The second one (bottom) shows the **acquisition live time** as function of the CPU time.
- ◆ **NOMINAL/STANDARD**: First plot: between two different acquisitions, it shows a very high spike: in the most cases, it corresponds to a zero value in the event counter plot. In events with a lot of transferred data, we have a little spike. The characteristic shape is shown in the follow picture.The initial step corresponds to the first 100 seconds of acquisition time. In this time the calorimeter transmits data without any compression.

- ◆ **NON-STANDARD:**
  - Shapes different from those described could indicate problems in the acquisition.
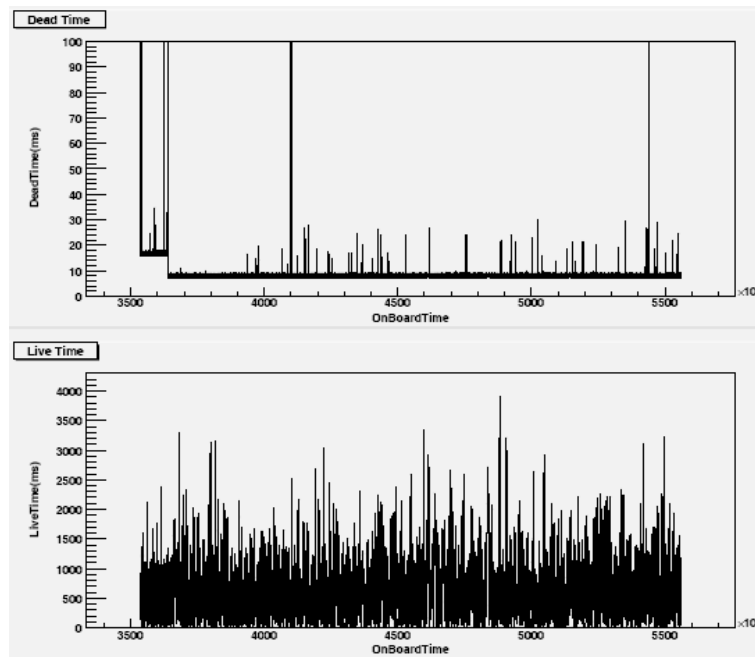 - ➔ **ACTION: Call specialist.**

FIGURE at Page 3

◆ **Description:** (**PMT Plane Counter**) is composed by 3 plots: the first histogram shows the rate of the Boolean function of **S11 AND S12** the second histogram shows the rate of **S21 AND S22** and the third shows the rate of **S31 AND S32**. As an example S11 represents the logic OR of all the PMTs for the first plane of S1 scintillator plane.

◆ **NOMINAL/STANDARD**: The shapes looks like a poissonian distribution. The histogram values depend on the orbital position and PMT settings.

◆ **NON-STANDARD:**
  • Shapes different from those described could indicate problems in the acquisition.
  → **ACTION: Call specialist.**

FIGURE at Page 4 to 6

◆ **Description:** (**Trigger Rate Counters**) : In these histograms are plotted the trigger rate for all the possible PAMELA trigger configurations. The rates are calculated by counting signals in a fixed time window. For the ToF trigger configurations the time window is 1.6 ms wide, while for the Calorimeter and S4 it is 1 s wide. In any case the plotted rates are expressed in Hertz.

◆ **NOMINAL/STANDARD**: Shapes look like poissonian or Gaussian distributions depending on the counting rate. The histogram values depend on the orbital position and PMT settings. The expected Calorimeter and S4 counting rate is very low, so can be also equal to zero.

◆ **NON-STANDARD:**

- Shapes different from those described could indicate problems in the acquisition.
- ➔ **ACTION: Call specialist.**

FIGURE at Page 7 to 10

- ◆ **Description: (ToF Pattern of trigger)** : In these histograms are plotted the pattern of trigger for all the ToF PMTs. The pattern of trigger shows the PMT which generated the trigger signal. In the Appendix C.6.1 are reported the PMT id.
- ◆ **NOMINAL/STANDARD**: The shape of the histograms relative to S3 and S2 pattern is flat while the shape relative to S11 and S12 has two symmetrical peaks corresponding to the center of the half planes. The histogram values depend on the orbital position and PMT settings.
- ◆ **NON-STANDARD:**
  - Shapes different from those described could indicate problems in the acquisition. A missing bin indicates a dead or masked channel.
  - ➔ **ACTION: Call specialist.**

FIGURE at Page 11 to 12

- ◆ **Description: (Calo and S4 Pattern of trigger)** : In these histograms are plotted the pattern of trigger for signals coming from S4 and Calorimeter. The pattern of trigger shows the S4 or Calo sections which generated the trigger signal. In the Appendix C.6.1 are reported the S4 and Calo section id.
- ◆ **NOMINAL/STANDARD**: The shape of the histograms should be flat but its value depend on the orbital position.
- ◆ **NON-STANDARD:**
  - Shapes different from those described could indicate problems in the acquisition.
  - ➔ **ACTION: Call specialist.**

FIGURE at Page 13 to 17

- ◆ **Description: (PMT Rate counters)** : In these histograms are plotted the rate for all the ToF PMTs.
- ◆ **NOMINAL/STANDARD**: Shapes look like poissonian or Gaussian distributions depending on the counting rate. The histogram values depend on the orbital position and PMT settings.
- ◆ **NON-STANDARD:**
  - Shapes different from those described could indicate problems in the acquisition. Histograms with only the zero bin filled can indicate dead or masked channel.
  - ➔ **ACTION: Call specialist.**

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Appendix C.6.1

Calorimeter signal id:

4	3	2	1
Calo4	Calo3	Calo2	Calo1

S4 signal id

3	2	1
S4_3	S4_2	S4_1

S3 signal id

12	11	10	9	8	7	6	5	4	3	2	1
s323b	s322b	s321b	s323a	s322a	s321a	s313b	s312b	s311b	s313a	s312a	s311a

S2 signal id

8	7	6	5	4	3	2	1
s222b	s221b	s222a	s221a	s212b	s211b	s212a	s211a

S12 signal id

12	11	10	9	8	7	6	5	4	3	2	1
s126b	s125b	s124b	s123b	s122b	s121b	s126a	s125a	s124a	s123a	s122a	s121a

S11 signal id

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
s118b	s117b	s116b	s115b	s114b	s113b	s112b	s111b	s118a	s117a	s116a	s115a	s114a	s113a	s112a	s111a