

# Trigger Monitoring and the Good Run List

- ✂ What is the Good Run List?
- ✂ How shall we define a run **good** for the trigger?
- ✂ How shall we define a run **bad** for the trigger?
- ✂ How many checks are sufficient?
- ✂ What monitoring do we have in place now?
  - For shift crew?
  - For experts?
- ✂ Can we improve or simplify our monitoring?

Trigger Meeting  
3/8/2002  
Greg, Peter

# What is the Good Run List?

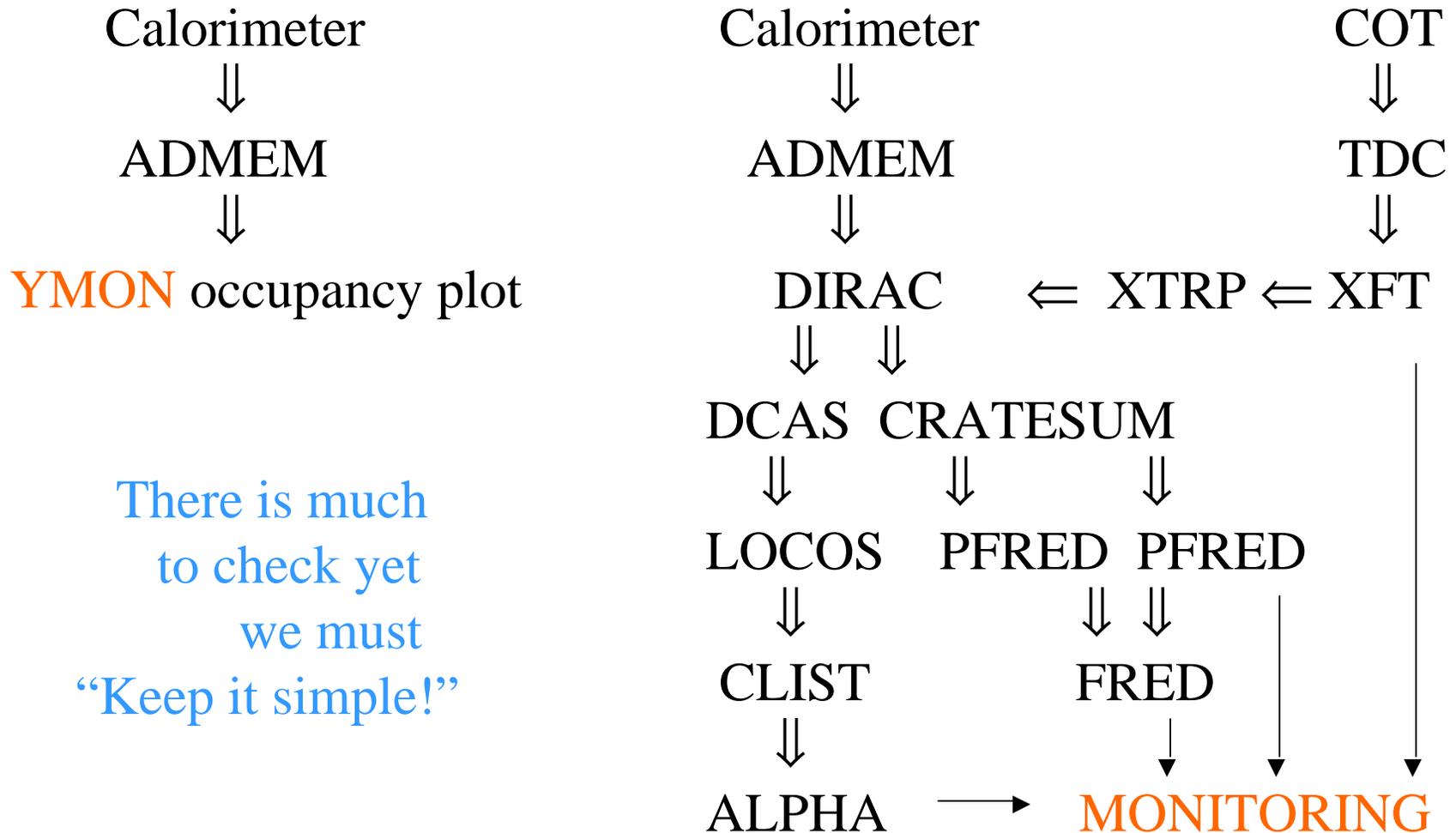
🔦 At the end of a run the shift crew is asked to declare the data good or bad for each of the 18 detector [components](#).

- CLC
- L1 Trigger
- L2 Trigger
- L3 Trigger
- Calorimeter
- COT
- CMU
- CMP
- CMX
- IMU
- SVX
- ISL
- L00
- SVT
- SMX
- TOF
- Mini Plug
- BSC

# What is the Good Run List? (cont.)

- ✦ The shift crew is given a checklist for each **component** and asked to set “bits” for each check on the list.
- ✦ Example #1: **Calorimeter** has 3 bits each for CEM, CHA, PEM, PHA, WHA (for a total of 15 bits)
  - HV on
  - No dead channels seen in YMON (1 slide)
  - Less than 12 hot channels seen in YMON (same 1 slide!)
- ✦ Example #2: **COT** has 2 bits
  - HV on
  - No gaps in SL occupancies seen in YMON (2 slides)
- ✦ The **Trigger** is asked to give a similar, simple list of checks!!

# Comparing calorimeter to calorimeter trigger



There is much  
to check yet  
we must  
“Keep it simple!”

# Proposed Trigger Checklist Hierarchy

## ✂ Level 1 Trigger

- Global Decision
- Calorimeter
  - SUMET
  - Tower triggers
- Muon
  - CMU
  - CMP
  - CMX
- Track
  - XFT
  - XTRP
- CLC \*, BSC \*, TOF \*

## ✂ Level 2 Trigger

- Global Decision
- SVT

Each subsystem must satisfy a series of checks (devised by the experts and approved by the group) before a run can be declared good for trigger!

\* new or not checked

# What do we have now?

- ✖ Currently we ask the CO to monitor the plots in the TrigMon slideshow.
  - 24 slides  $\Rightarrow$  24 bits to be set for trigger.
  - Slides are compared to reference plots carefully crafted by Matt.
- ✖ Most of these slides are historical (?) leftover from the commissioning days.
- ✖ Do these slides contain necessary and sufficient information to declare a run good for the trigger?
  - Probably not . . . Some things are not yet checked at all!
- ✖ Are these slides easy for the average CO to understand?
  - Definitely not!

# What do/can we have at our disposal?

## ✂ TrigMon

- Occupancy plots
- Comparison of data to simulation
- Trigger efficiencies?

## ✂ Xmon

- Check for trigger rates = 0
- Check for trigger rates = crossing rate
- Compare trigger cross sections with expectations

## ✂ L2 alpha error checking code

## ✂ L3 error trigger and error stream

## ✂ Other ?

# Questions and Issues

- ✂ Should SVT be considered a separate component from L2 trigger as it is now? Should L1 be separated from L2?
- ✂ Should we have simulation programs automatically set the good run bits at the end of each run?
  - I'd say no ... dangerous and discourages CO from diligence
- ✂ Should we have monitoring programs alert CO ASAP in a run if something appears to be going wrong?
  - Yes , but they should not report "ignorable" errors!
- ✂ Should we try to distinguish between marking runs **bad** and **good**?
  - e.g: a run is definitely **bad** if the L1 rate is 1.7 MHz ....

# Plan and Wish List

- ✦ We'd like representatives from each sub-system to come over the next couple of weeks and present good run criteria for their components (see Peter's talk for calorimeter)
- ✦ We ask that all plots, predicted cross sections, etc., be filtered through and approved by the trigger group
  - We need to stabilize the number, order and appearance of the checklist plots in the slideshow. Examples: Plot numbering should not change week to week. Subsystem plots should be grouped together ...
  - We'd like to standardize the appearance of trigger plots in the slide show
  - Should keep the total number of trigger checks < 50!
  - We'd like to fully understand all trigger plots in the slideshow!

## Plan and Wish List (cont.)

- ✖ All plots should have **legible** and understandable titles and axis labels. Try to avoid trigger jargon and use physics coordinates ( $\eta$ ,  $\phi$ ,  $E_T$ ) where possible! This will make it easier to correlate trigger problems with detector problems
- ✖ Strict criteria for interpreting plots should accompany each slide
  - COs shouldn't have to guess. They want things in black and white
  - Experts (you!) will be paged before a run is marked bad !

# Plan and Wish List (cont.)

- ✦ All plots should follow guidelines and standards agreed upon and set in this meeting
  - Data vs. simulation should be presented as ratios or scatter plots
  - In data vs. simulation, place data on the “x-axis”
  - Other ... (No more than 4 plots per canvas)
- ✦ Acceptable criteria for declaring a run good will vary and to first order should be set by experts
  - Number of dead/masked towers allowed
  - Number of “over efficient” towers allowed
  - Tolerances in comparing data to simulation
  - Minimum number of required checks required