W. Badgett
Run Control &
Run Configuration
22-Jan-2003

How to start, configure and operate CDF Run Control

Run Control, main window

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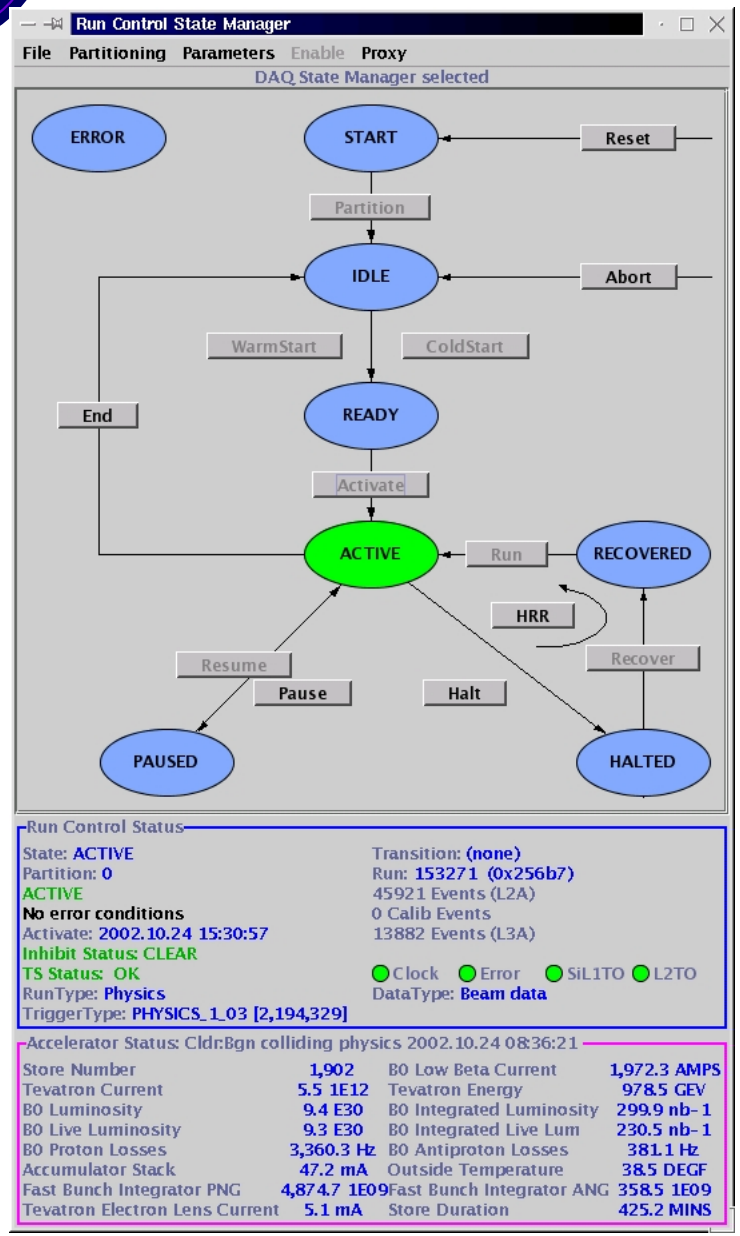

Main Run Control Window: Includes RC State Manager, Configuration pull-down menus, Run Control Status, and Accelerator Status panels

Start Run Control:

setup fer

rc

(ace uses *cdfdaq* account)

Just 3 steps to run!

1. *Select <u>State Manager</u>*
2. *Select <u>Partition</u>*
3. *Select <u>Configuration</u>*

Run!

State Manager Selection

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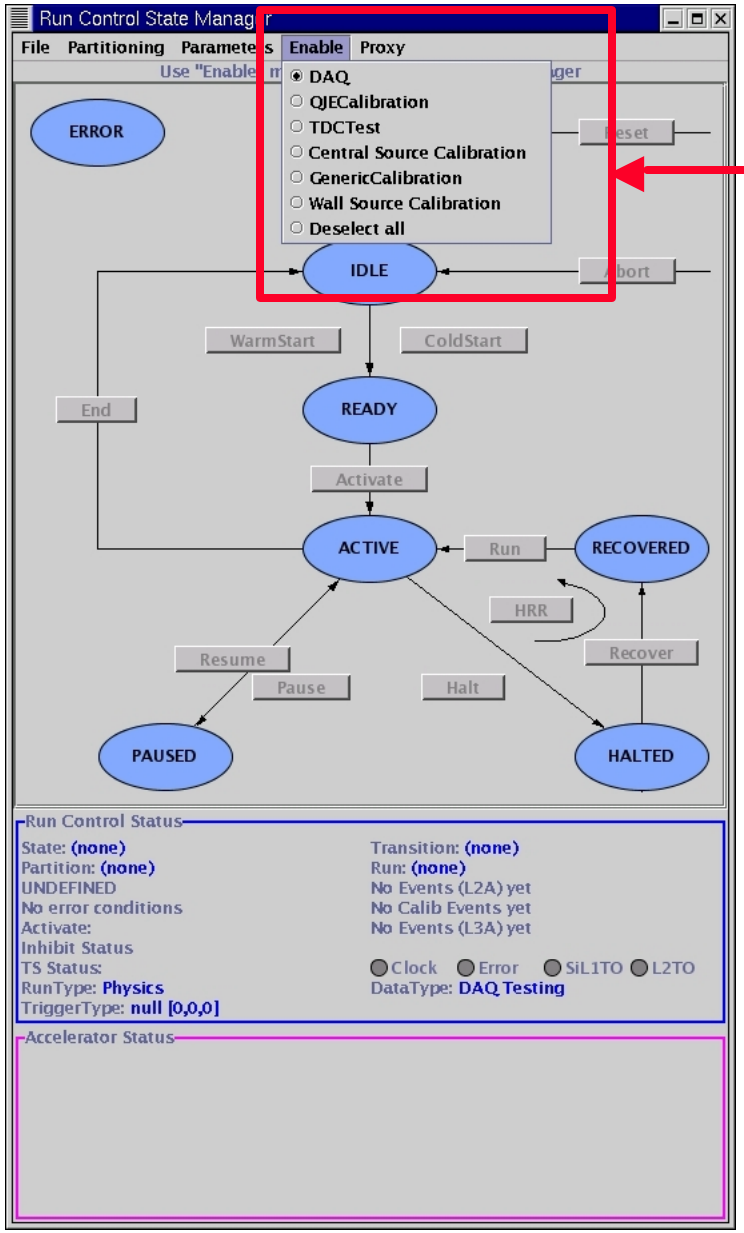
Step 1



Select State Manager:

- Usually **DAQ**
- **GenericCalibration** for calibrations unless specific menu item for given run type: e.g., **QIE Calibration**
- Source, TDC testing are primarily for experts

The State Manager determines the flow of control when cycling through runs

Select Partition

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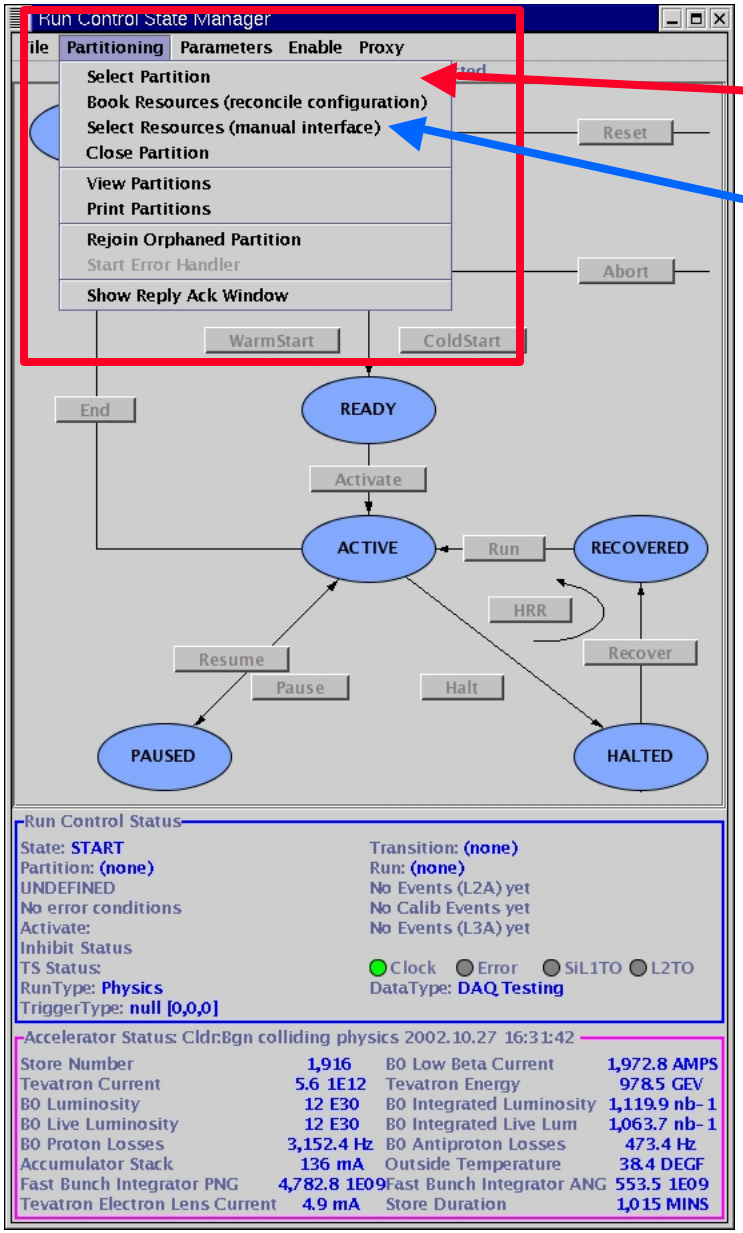
Step 2



Select partition

Select or view resources manually (gui)

Each Run Control Session must be allocate a *Partition*

Each front end crate belongs to no more than one *Partition*

Partitions prevent collisions between sessions

Partition Selector

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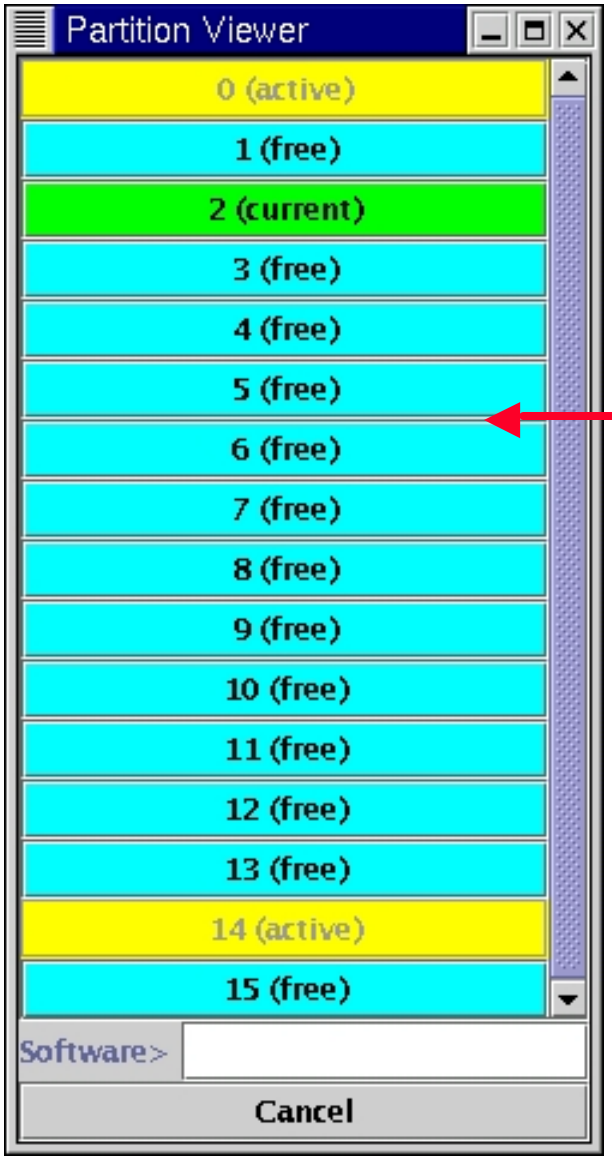
Step 2a



Select Partition:

- Cyan is free
- Yellow is owned by another
- Green is yours
- Mouse over to display owner and hardware/software status

- 0–7 are hardware partitions
- 8–15 are software partitions

Resource Selector

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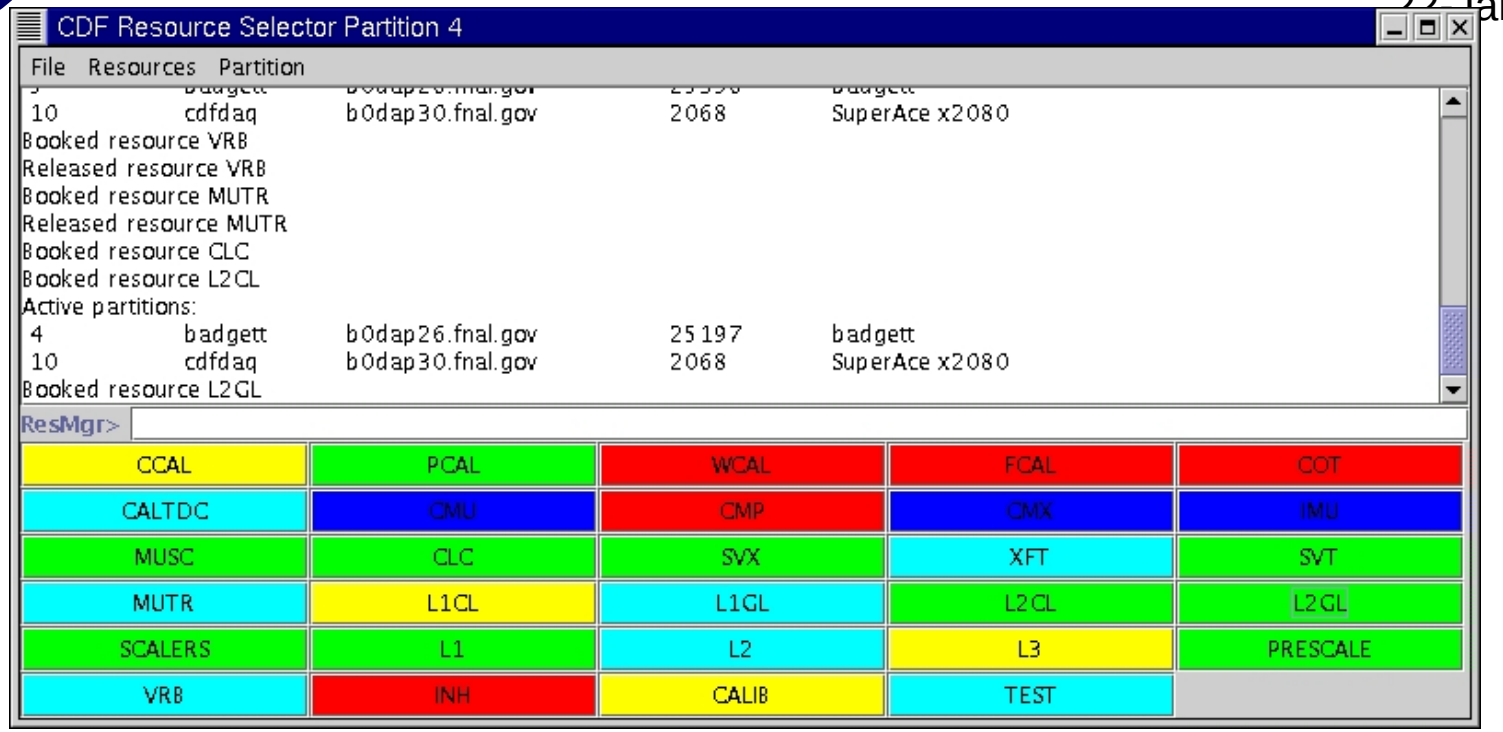

Select Resources:

- Cyan is entirely free
- Red is entirely owned by another partition
- Blue is partially owned by another partition
- Yellow is partially yours
- Green is entirely yours
- Mouse over to display owner
- Click to book/unbook; Right-click for more info

Selecting Run Configuration

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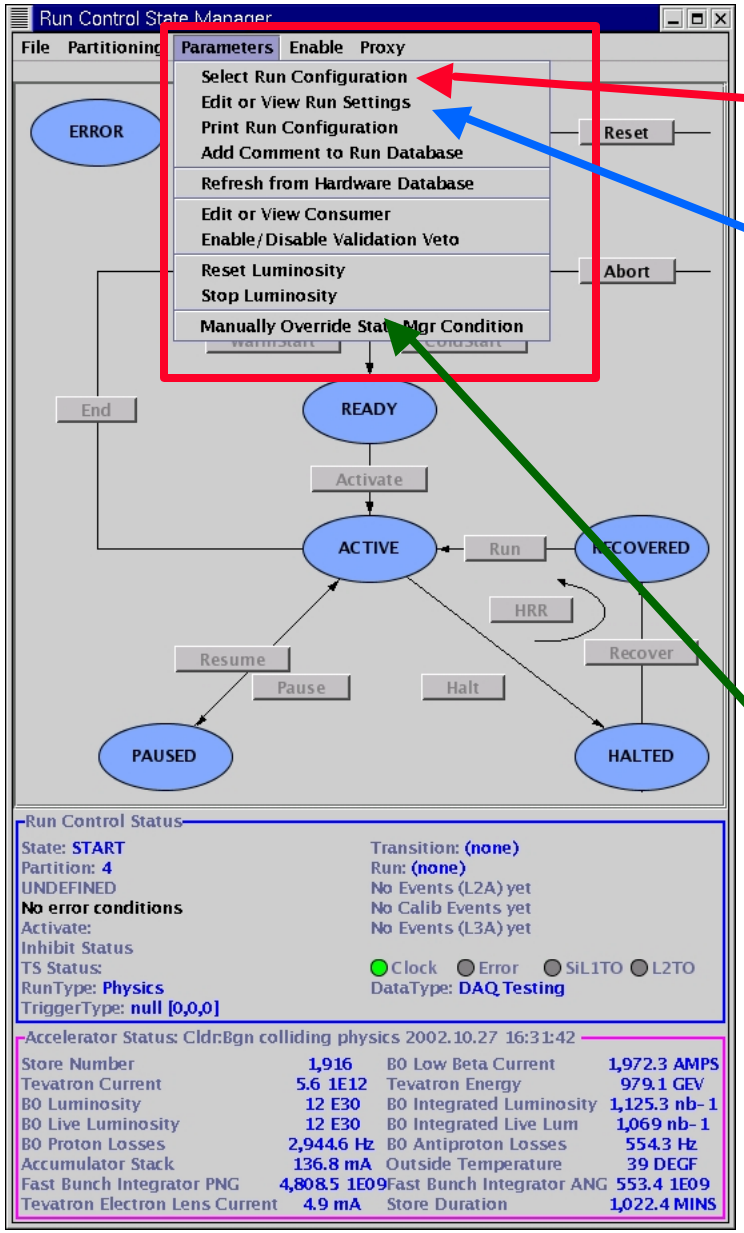
Step 3



Select predefined run configuration

Edit or view run configuration

Frank sez:
"This is the ace's most important duty!"

After selecting a configuration, you're ready to start a run!

Reset or stop luminosity counters at beginning and end of shot -- *only if automatic reset fails!*

Run Configuration Selector

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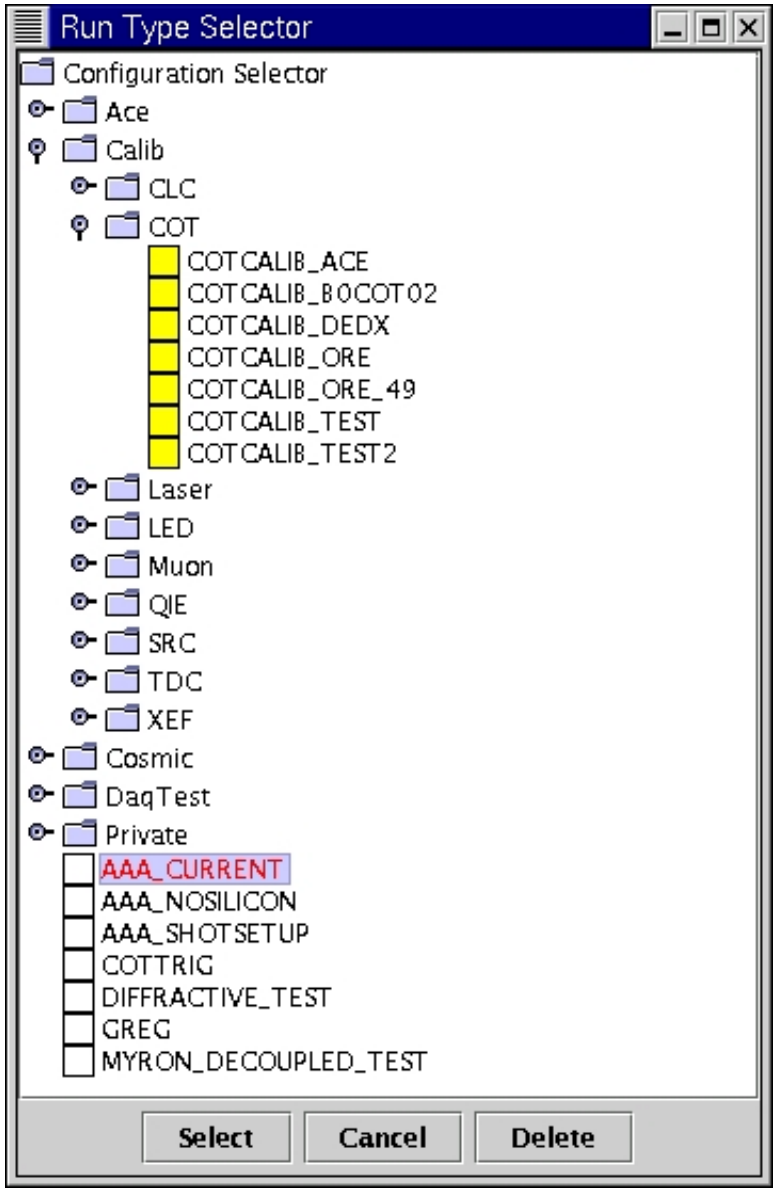

Select from predefined run configurations

- *Ace* directory contains all physics and test runs for the Ace, and is maintained by Ops Managers
- *Cosmic* directory for Cosmic Ray runs
- *Calib* directory contains calibration configurations, and is maintained by component experts in subdirectories
- Other directories for private testing purposes

Or create your own configuration!

Run Settings Window, standard

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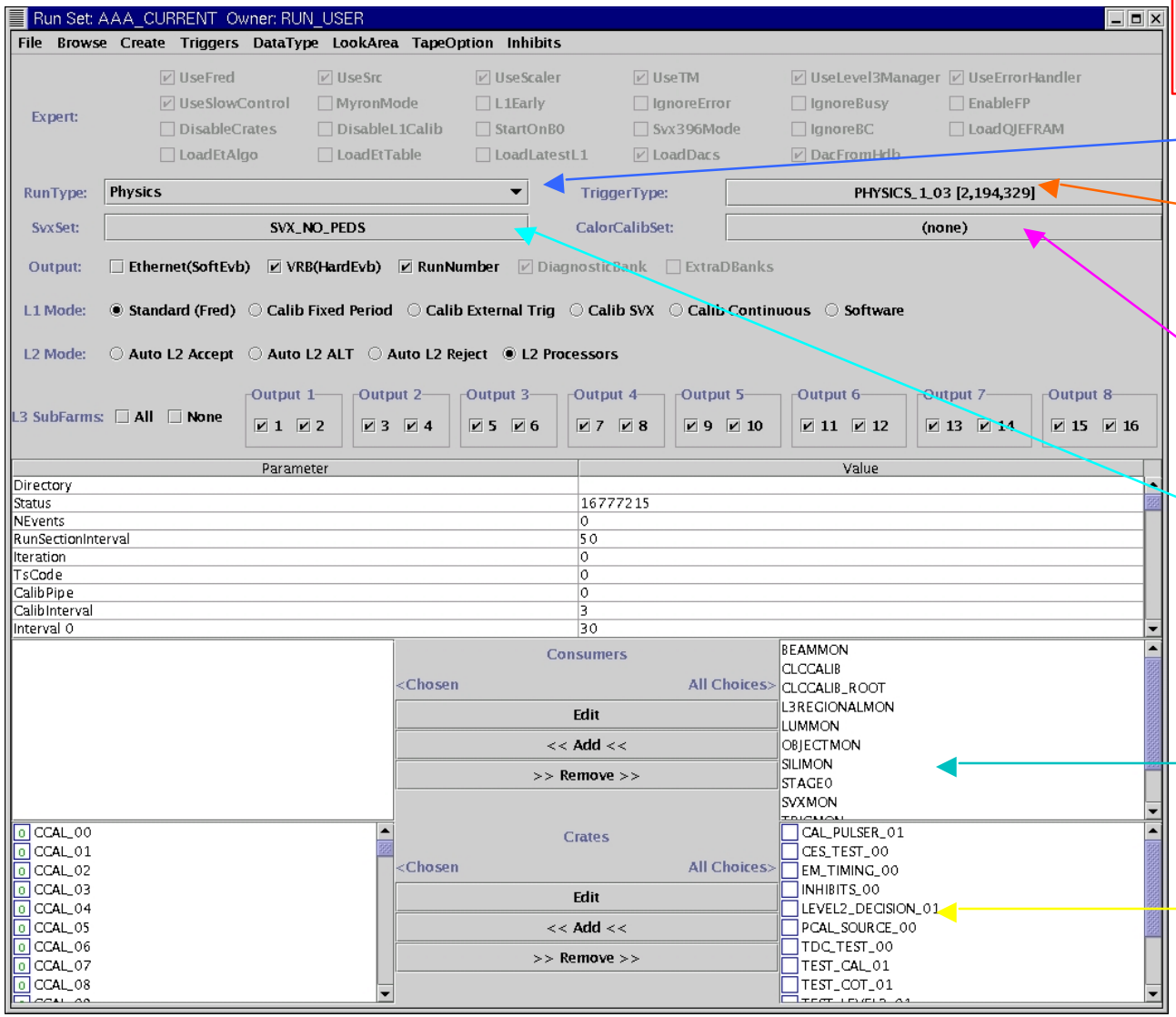

Aces should know all options on this window

Global DAQ RunType

Trigger Table, coupled

CalorCalibSet, when Plug source, LED, Xenon run types

SVX Set, when SVX is used Usually FIBTEST

Consumer Selection (calibration run types only for now)

Front end crate selection Move to left to include

Run Settings, Expert Options

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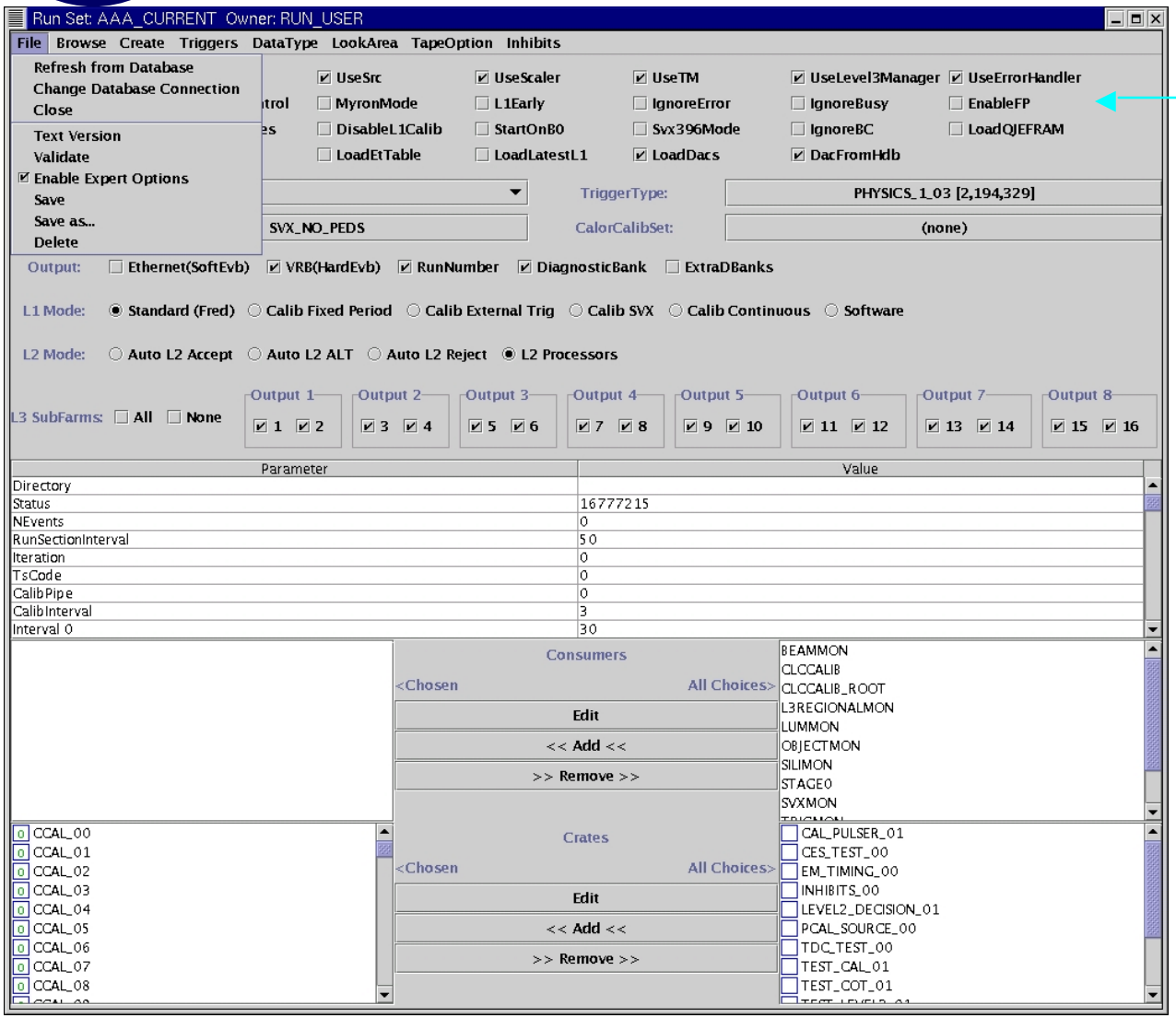

Expert options can be enabled from the File pull-down menu

Many expert options are triggered by the selection of other options or the addition of crates

You may be asked to take special runs, e.g. MyronMode with L1Early, which are only available in the expert options

Trigger Inhibits

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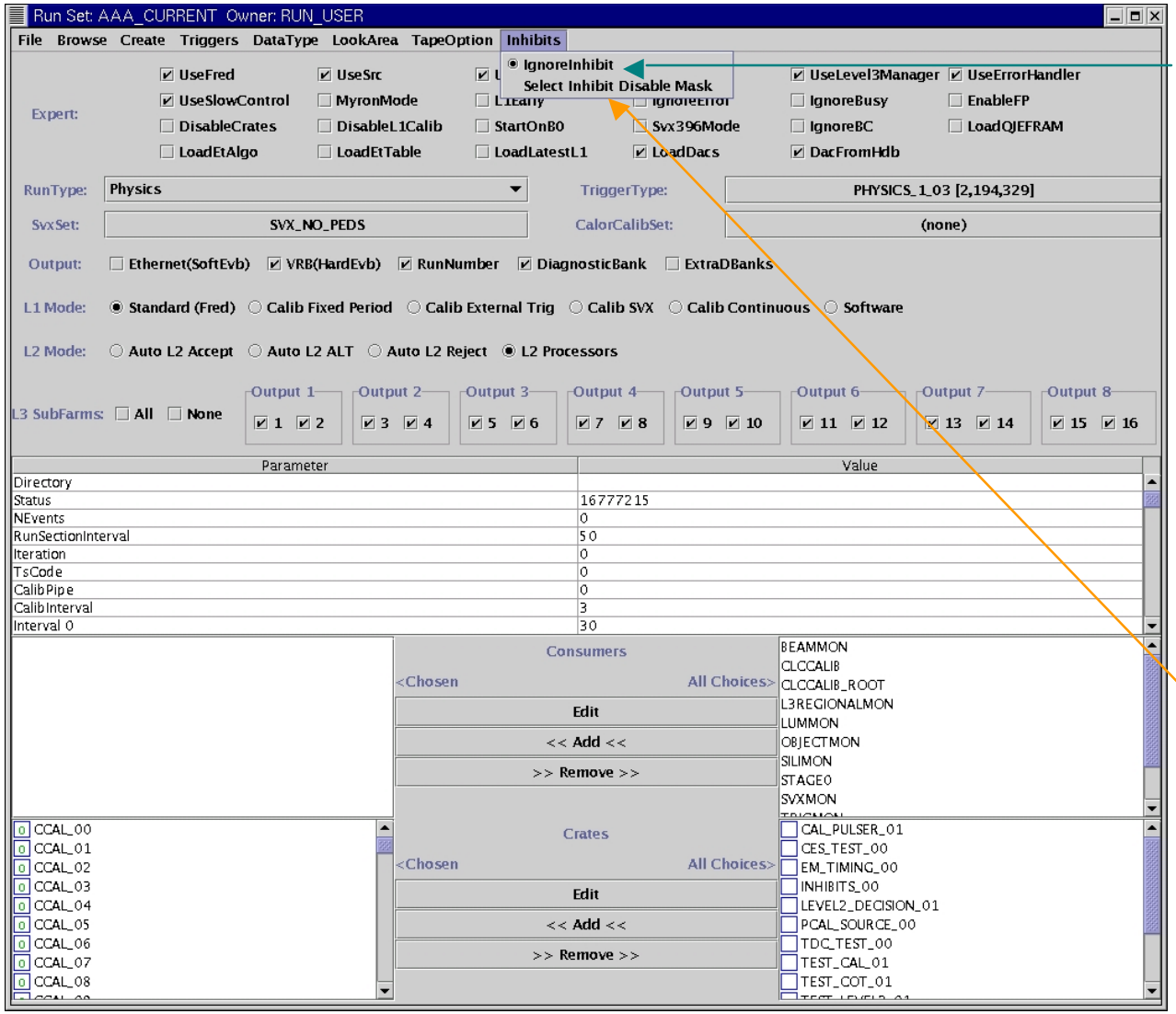

Inhibits normally used only during physics (colliding beam) runs, otherwise set Ignore Inhibit to true

Inhibit sources are tied to the crates and components you have chosen, and are selected automatically

In an emergency, you may have to disable misbehaving inhibit signals

Inhibits cause data taking to stop, watch event rates and Inhibit LEDS

Trigger Inhibit Disable Masking

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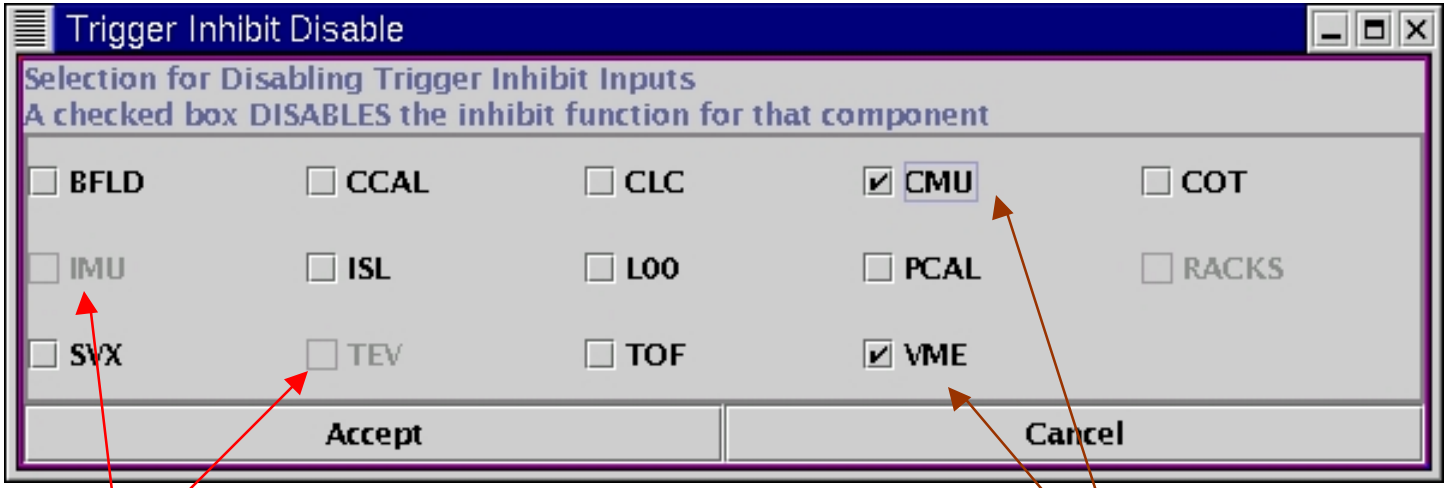

Greyed options are not yet working and do not contribute to inhibits

Select which components should be ***disabled*** from providing an inhibit signal

Jonatron sez:
"Selecting the Inhibitions is the Ace's most important duty!"

Data Type Selection

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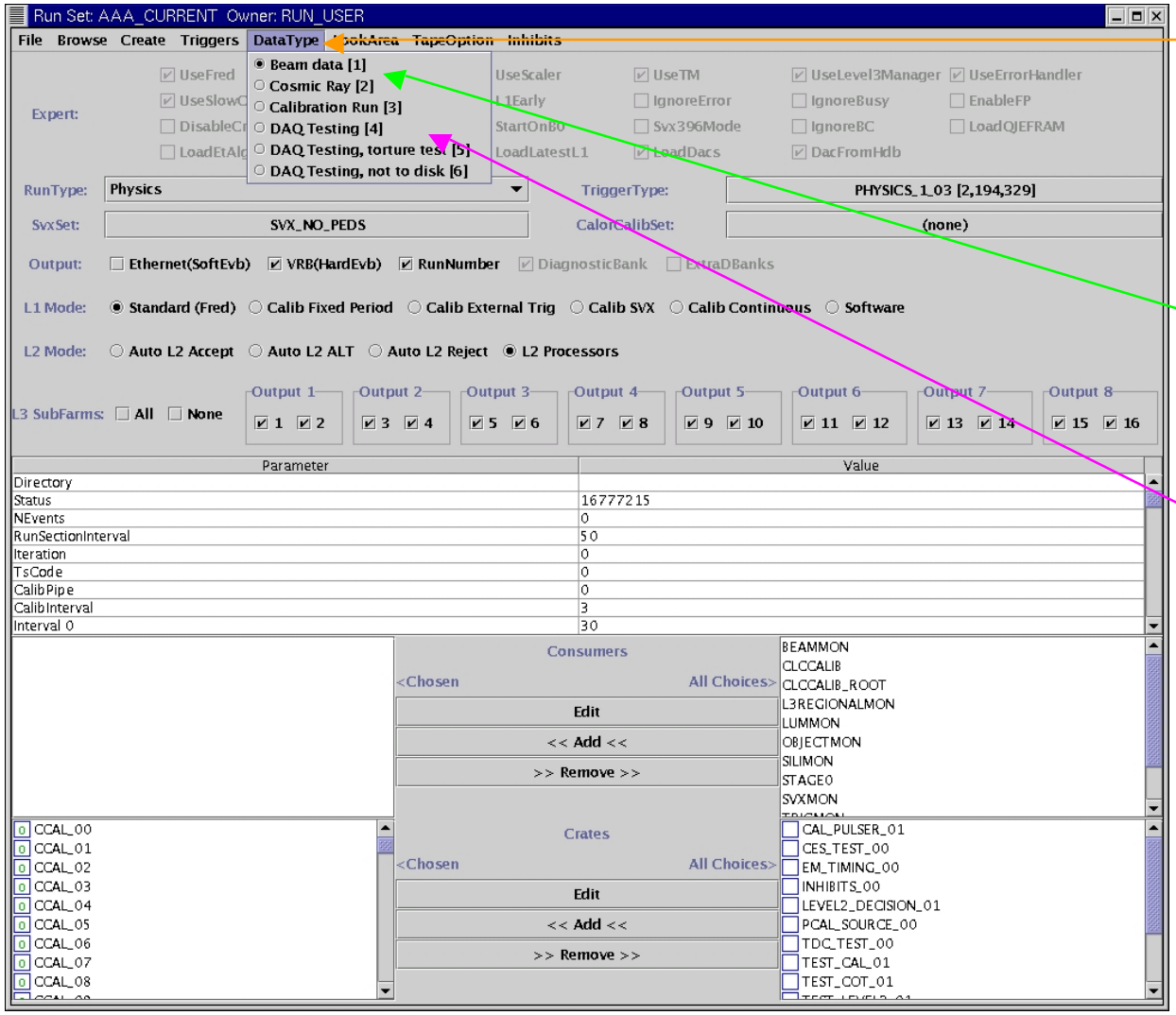

Pull-down menu in Run Settings window selects data types

Select *Beam Data* only when colliding beams are in the Tevatron

Use DAQ Testing when just exercising the system

Tony sez:
"Selecting the Data Type is the Ace's most important Duty"

Data Output Control

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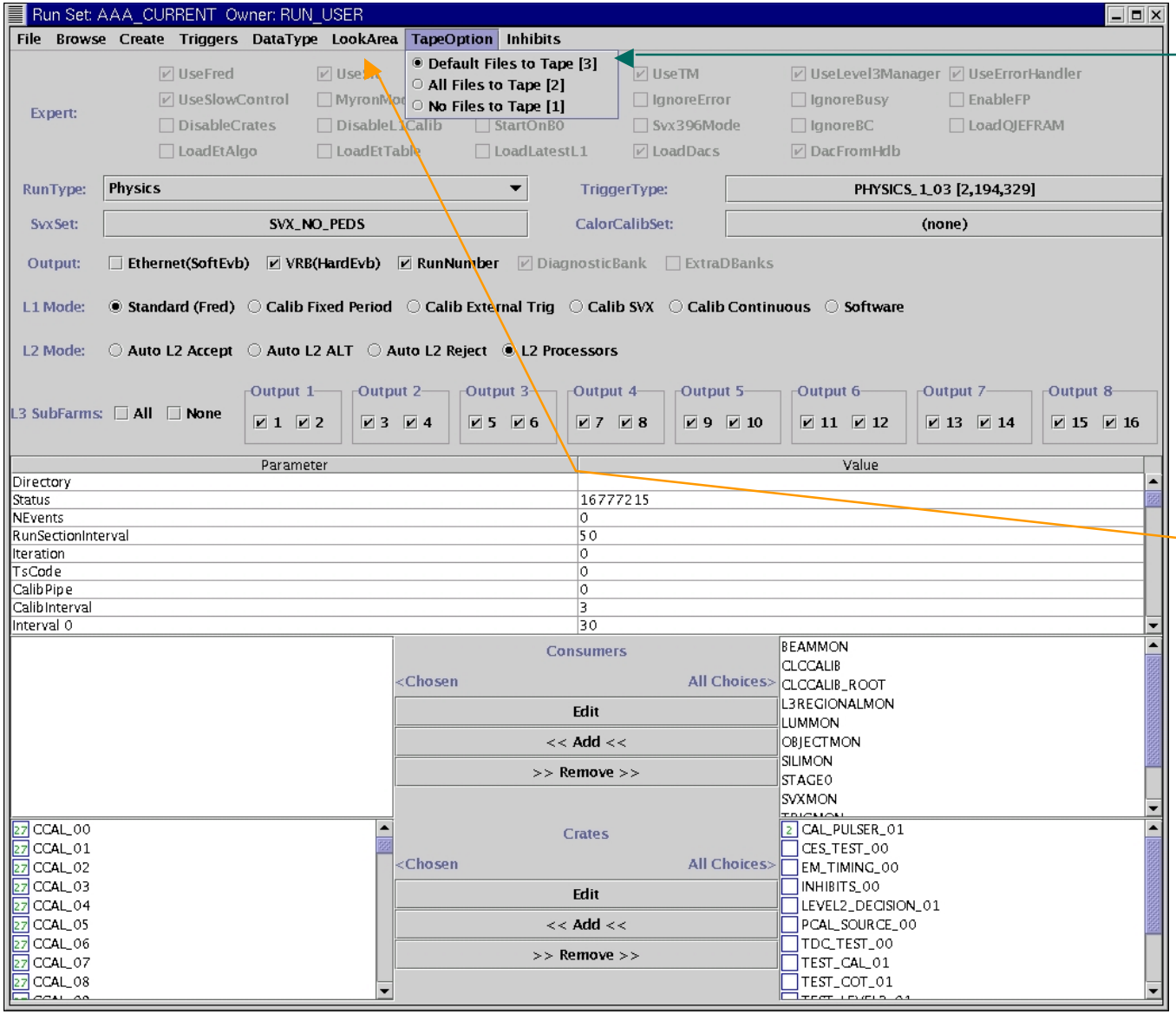

TapeOption:
- How much data goes to tape
- Normally **Default**
- Except special runs request

LookArea:
- How much data goes to disk
- Normally **Default**
- Special runs may have different setting

Trigger Type Selection

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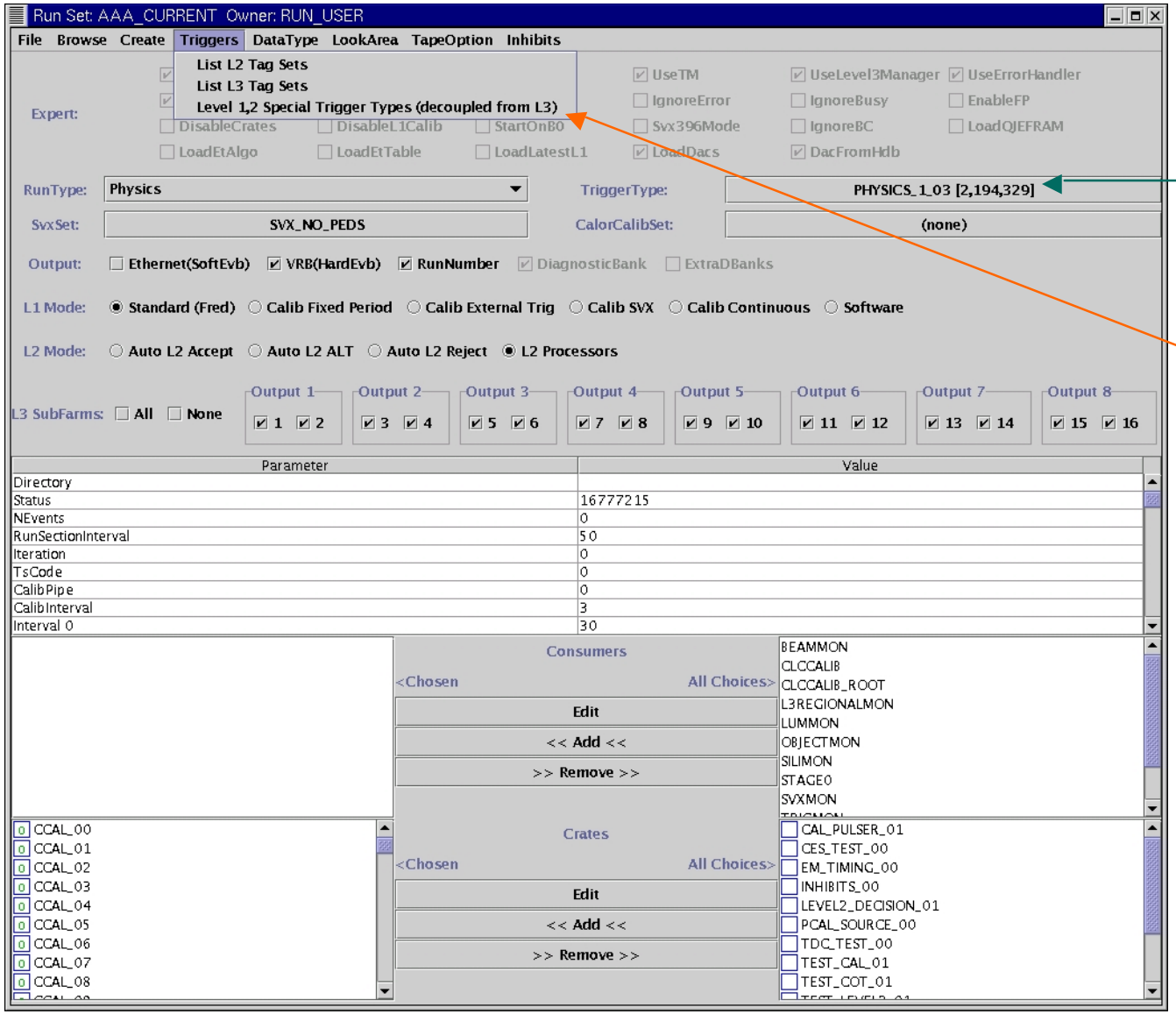

Select *coupled* Trigger Table here for normal physics running

Select decoupled tables here for testing purposes

Coupled tables are fully specified from Level 1, Level 2 through Level 3

Synonyms:
Trigger Type =
Trigger Table =
Physics Table

Decoupled Trigger Tables

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Trigger Type Selector

Select a single row of parameters from the list of choices below

PHYSICSTABLE	TAG	L2	L3	DESCRIPTION	CREATED
COSMICS_TEST_L2INCLUSIVE	3	189	327	NULL v2 replacment	2002.09.11
COSMICS_TEST_L2INCLUSIVE	3	189	318	L3_PASS_ALL_RECO v9	2002.09.11
COSMICS_TEST_L2INCLUSIVE	3	189	316	L3_TEST_ALL_RECO_471 all reco test table	2002.09.11
COSMICS_TEST_L2INCLUSIVE	3	189	311	NULL version 2 built from 4.7.1	2002.09.11
DIFFRACTIVE_TEST_NOSPIKES	5	182	327	NULL v2 replacment	2002.08.30
DIFFRACTIVE_TEST_NOSPIKES	5	182	318	L3_PASS_ALL_RECO v9	2002.08.30
DIFFRACTIVE_TEST_NOSPIKES	5	182	316	L3_TEST_ALL_RECO_471 all reco test table	2002.08.30
DIFFRACTIVE_TEST_NOSPIKES	5	182	311	NULL version 2 built from 4.7.1	2002.08.30
L2_TEST_NEW_ALGORITHMS_NOS...	4	183	327	NULL v2 replacment	2002.10.10
L2_TEST_NEW_ALGORITHMS_NOS...	4	183	318	L3_PASS_ALL_RECO v9	2002.10.10
L2_TEST_NEW_ALGORITHMS_NOS...	4	183	316	L3_TEST_ALL_RECO_471 all reco test table	2002.10.10
L2_TEST_NEW_ALGORITHMS_NOS...	4	183	311	NULL version 2 built from 4.7.1	2002.10.10
L2_TEST_NEW_ALGORITHMS_NOS...	4	179	327	NULL v2 replacment	2002.10.10

Select | None | Cancel

Lots of *decoupled* trigger table options,due to combinatorics of unspecified Level 3 paths

None is a valid option when using the calibration trigger

Kirsten sez:
"Selecting the Level 3 TagSet is the Ace's most important duty!"

Coupled Trigger Tables

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Trigger Type Selector

Select a single row of parameters from the list of choices below

PHYSICSTABLE	TAG	L2	L3	DESCRIPTION	CREATED
PHYSICS_1_03	2	194	329	standard physics table	2002.10.20
PHYSICS_1_03	2	193	329	standard physics table	2002.10.20
PHYSICS_1_03	2	192	329	standard physics table	2002.10.20
PHYSICS_I_1_03	1	199	330	like PHYSICS_1_03[2,...], but with the inclusive stream for...	2002.10.24
PHYSICS_TEST_1_03	8	191	328	Physics_1_03 v8	2002.10.20

Select | None | Cancel

Coupled Trigger Tables are used for real physics (colliding beams) running

Your Ops Manager will tell you which one to use and which are for special test runs

Greg Sez: “Selecting the correct Trigger Table is the Ace’s most important duty!” (plus bringing Greg Krispy Kreme doughnuts)

Crate Editor

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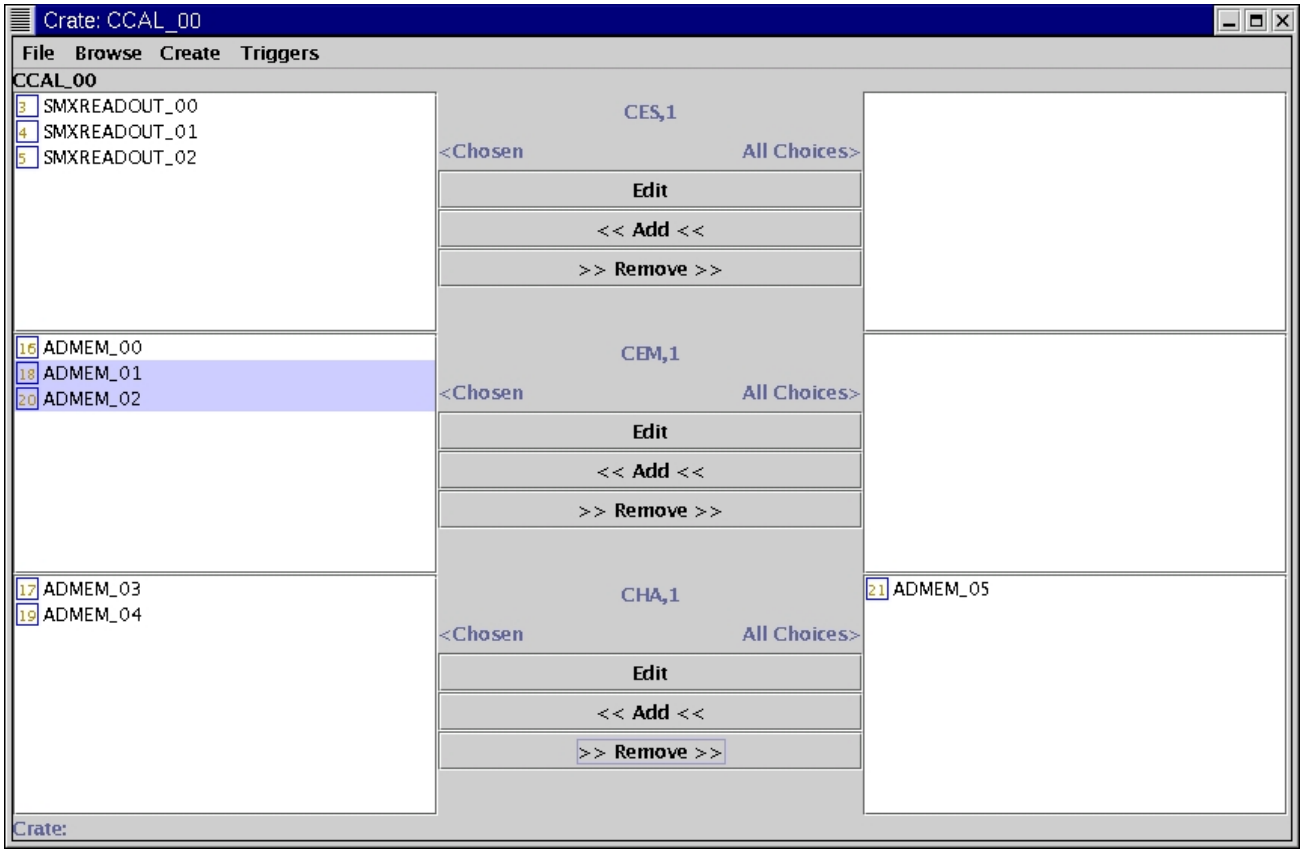

CrateEditor shows which cards will be read out, grouped by bank

Cards can be removed from readout, but only in **emergencies**
Notify expert *immediately* if you remove a card!

Component expert? Select card and press *Edit* for more info on the card
Use caution when changed database connection

Proxy Control Menu

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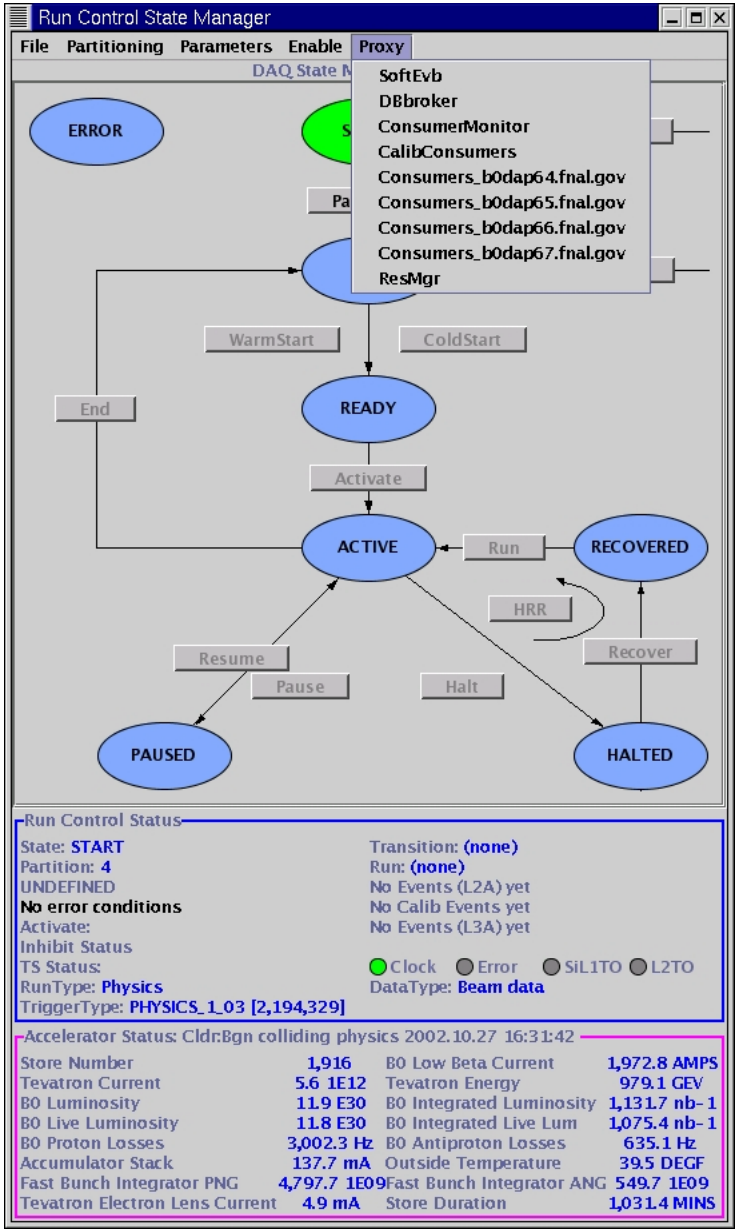

The Proxy gives you control over remote data acquisition processes:

- Software Event Builder
- Database Broker (not yet)
- Consumer Monitor
- Calibration Consumers
- Resource Manager
- Physics Consumers (to be implemented)

SoftEvb Proxy Viewer

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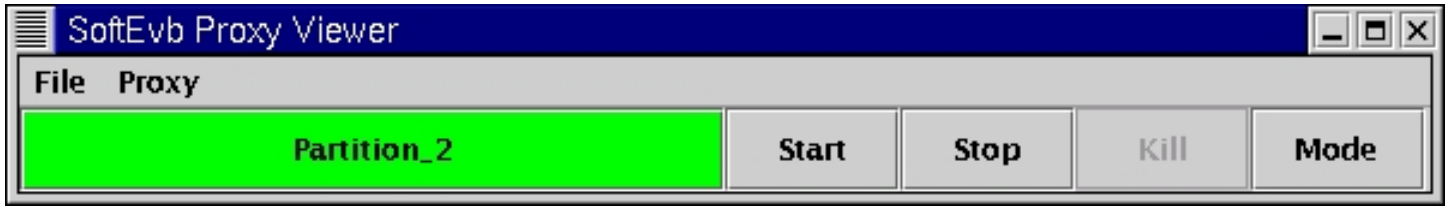

If you don't get responses from the Software Event Builder during transitions, then check the SoftEvb Proxy, and stop and/or restart if needed

Status colors:

- Green: Up and running
- Cyan: not running

Click on main button for detailed information

CalibConsumer Proxy

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Use the Calibration Consumer Proxy to see if your calibration consumer is still running

Resource Manager Proxy

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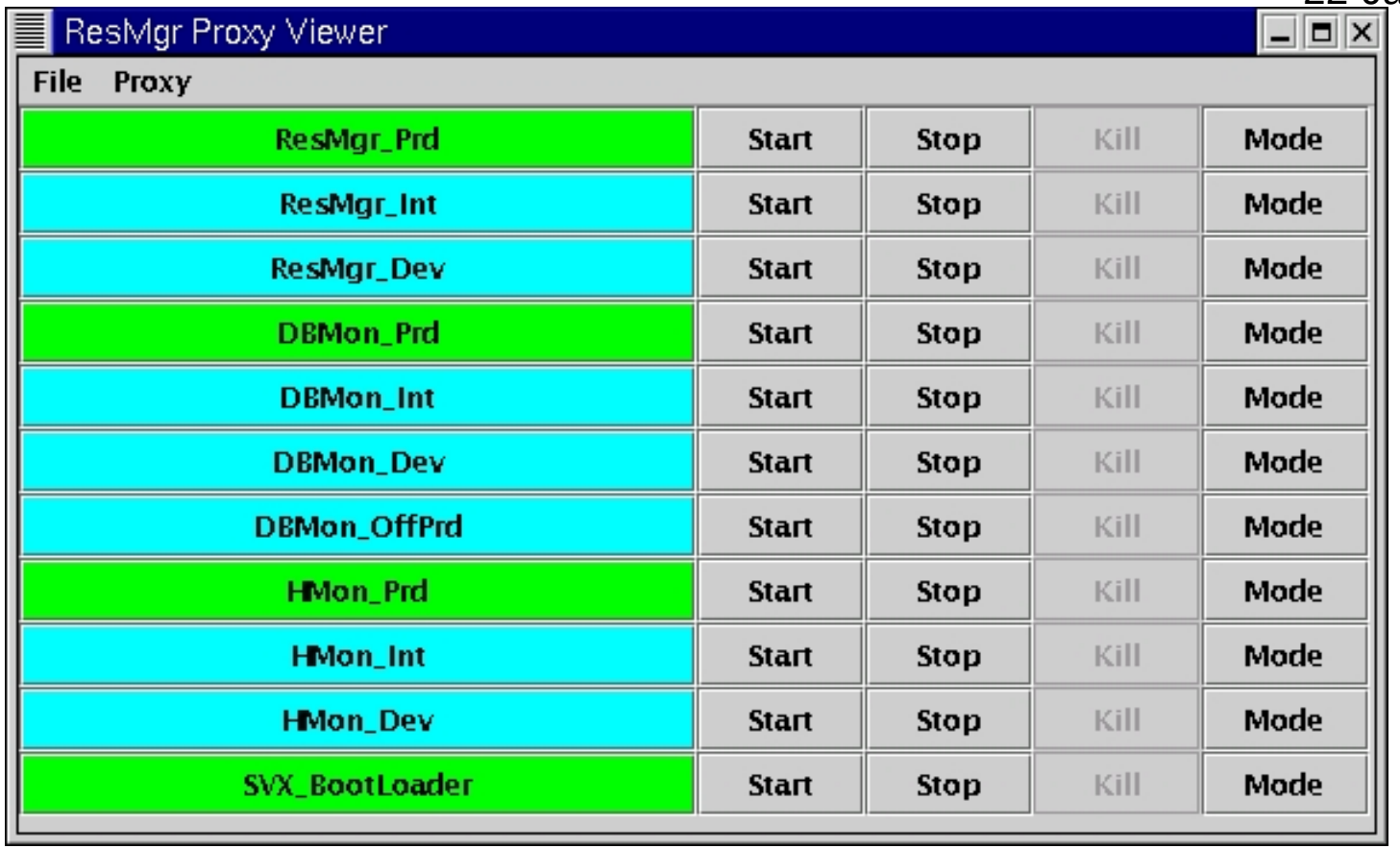

Having a problem with *Sticky Partitions*?
Try restarting the ResMgr_Prd
You can't hurt anything!

Transition Sequencing

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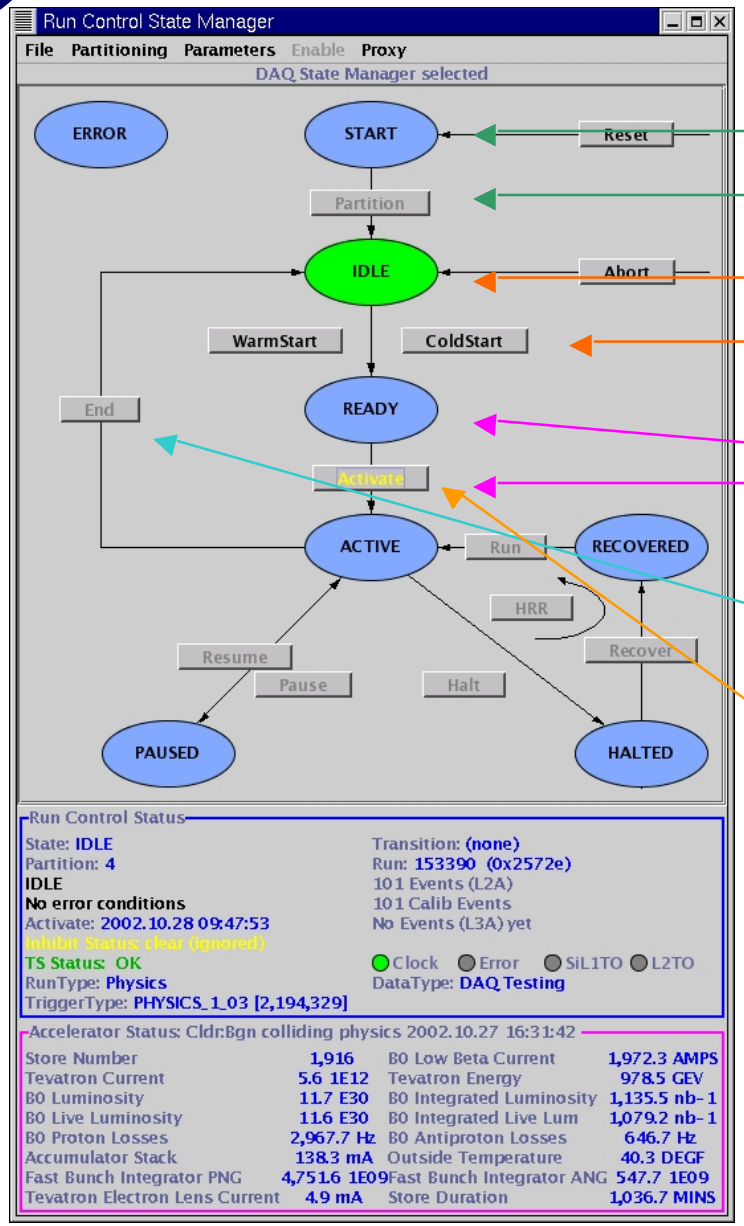

At *Start* state, select all desired clients and *Partition*

At *Idle* state, configuration must be fixed, then *ColdStart*

At *Ready* state, *Activate*

When *Active* and ready to finish run, ***End***
To fix timeouts, try ***Halt Recover Run***

Note use of *click-ahead* (shift key plus mouse click) so that Activate will automagically engage when it becomes available

Abort and *Reset* always available to get you out of sticky situations
Use sparingly!

Transitions

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- **Partition**: Select front end crates and clients for the run; configure trigger and return crosspoints
- **WarmStart**/**ColdStart**: Configure crates and clients with info that could change run by run (slow)
  - **ColdStart**: Full download (when in doubt, ColdStart)
  - **WarmStart**: Selected clients do limited download when no changes
- **Activate**: Final step to enable system to take data (fast)
- **End**: Normal end of run, produces end of run summaries
- **Abort**: Return to Idle when no other option available
- **Pause**: Briefly stop data taking (HV trips, flying wires, inhibits)
- **Halt**/**Recover**/**Run**: Fast system error recovery

Calibration State Managers

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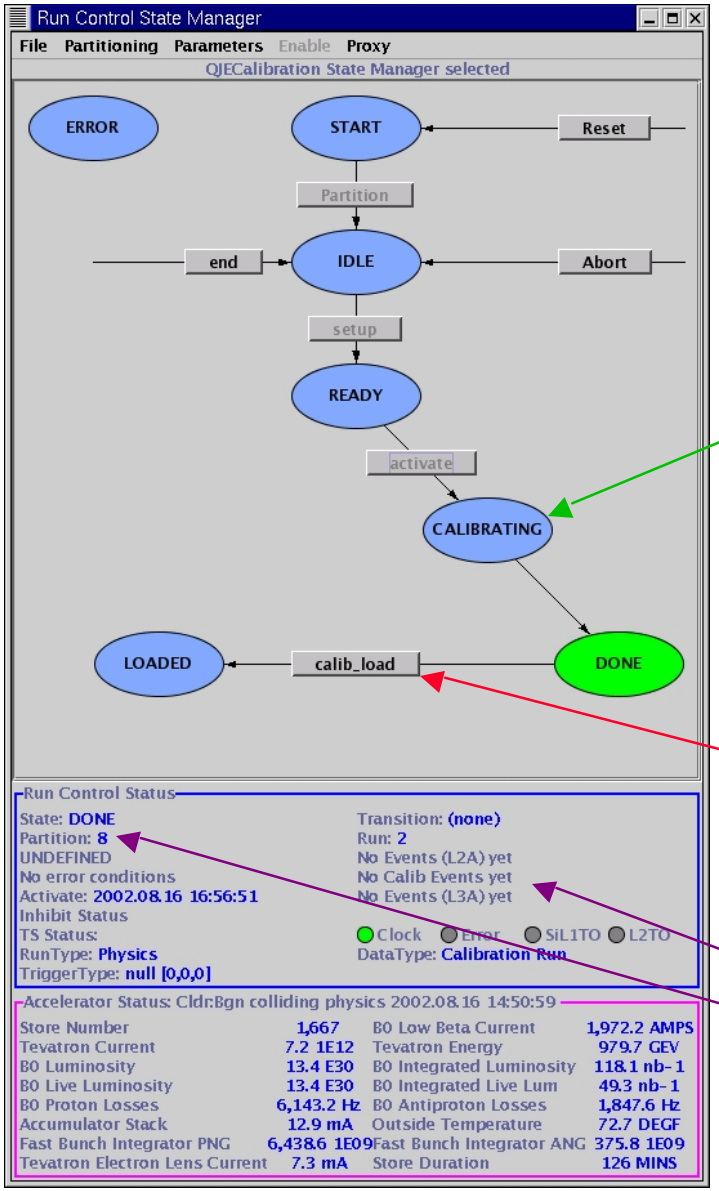

QIE Calibration State Manager

Calibrating: Transitory state, will drop to Done when all front end crates are complete

Know where Calibration Consumer log files are kept: ***~cdfdaq/consumers/log***

CalibLoad special option to do full download of AdMem FRAMs, by expert request only

QIE Calibration may be done in software partition, no hardware triggers are generated

Sample Transition Errors

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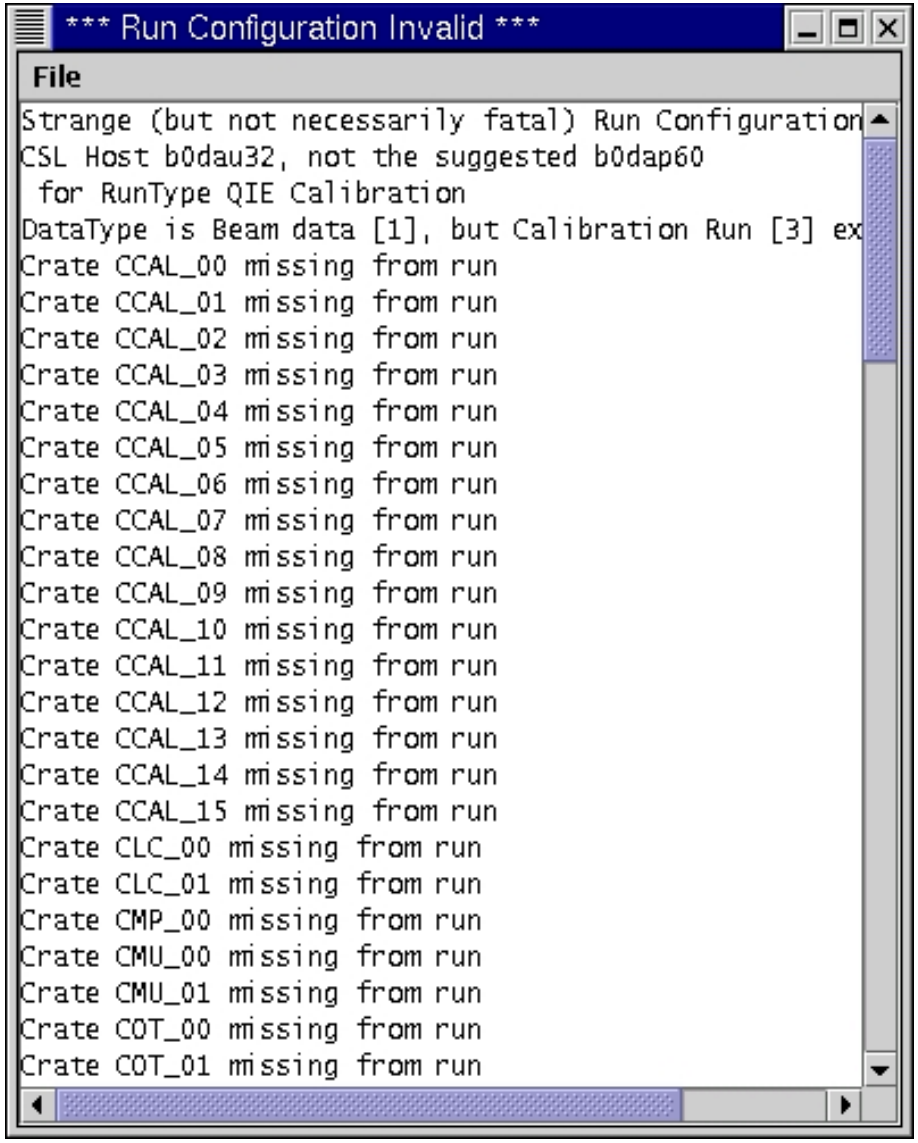

During your Run Control session, you will sometimes see warning messages pop up
This example tells you are missing some important crates during a beam physics run

Do ***NOT*** ignore any of these messages!!!

If you do not understand a message, contact the appropriate expert immediately

Reply & Acknowledgments Window

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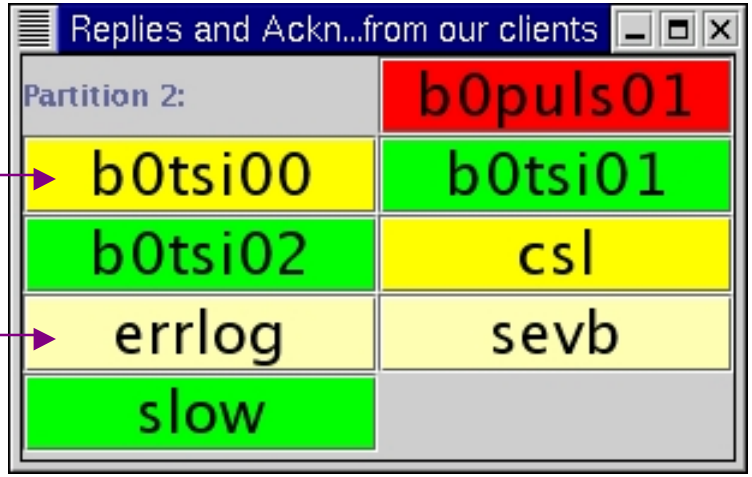

Window should always be visible

Words too small to read? Stretch the window!

This window indicates the transition status of clients:

- Butter yellow: RC has not sent transition
- Margarine yellow: RC has send transition, waiting for acknowledgment
- Green Client sent successful acknowledgment
- Red Client sent error

Click on the client button for more info and the client's *Local Controller*

Local Client Controller

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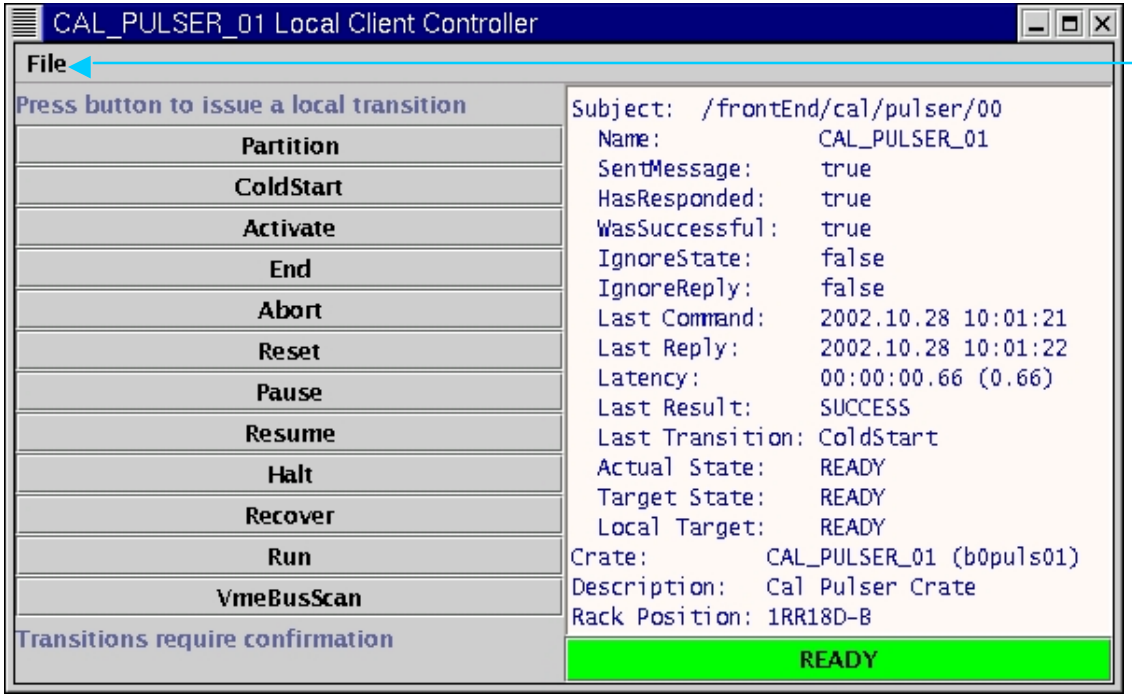

File menu gives you access to the contents of the configuration messages sent to the client

Allows you to **shepherd** individual clients through the transitions
Can be used if one client out of many fail a transition
Be careful to retain the same configuration!!

Avi sez: “We need a mouse click database!”

VmeBusScan Button

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b0wcal00 VmeBusScan

File

```
VmeBusScan message
  PartitionId:        2
  IpAddress:          131.225.237.108
  Ethernet:           08:00:3e:27:c0:ad
  SystemNumber:
  Slot:  2  Id:  0097 001 TRACER__V2.1A
  Slot:  5  Id:  0237 003 ADMEM_V4.0          470
  Slot:  6  Id:  0366 003 ADMEM_V4.0          460
  Slot:  7  Id:  0179 003 ADMEM_V4.0          470
  Slot:  8  Id:  0087 003 ADMEM_V4.0          470
  Slot:  9  Id:  0364 003 ADMEM_V4.0          460
  Slot: 10  Id:  0202 003 ADMEM_V4.0          460
  Slot: 16  Id:  0207 003 ADMEM_V4.0          470
  Slot: 17  Id:  0090 003 ADMEM_V4.0          470
  Slot: 18  Id:  0111 003 ADMEM_V4.0          470
  Slot: 19  Id:  0165 003 ADMEM_V4.0          470
  Slot: 20  Id:  0128 003 ADMEM_V4.0          470
  Slot: 21  Id:  0121 003 ADMEM_V4.0          470
```

Choosing <u>VmeBusScan</u> from the Local Controller window returns a scan of all cards in the front end crate

Useful for verifying the presence and basic functionality of readout cards

End of Run Status Box

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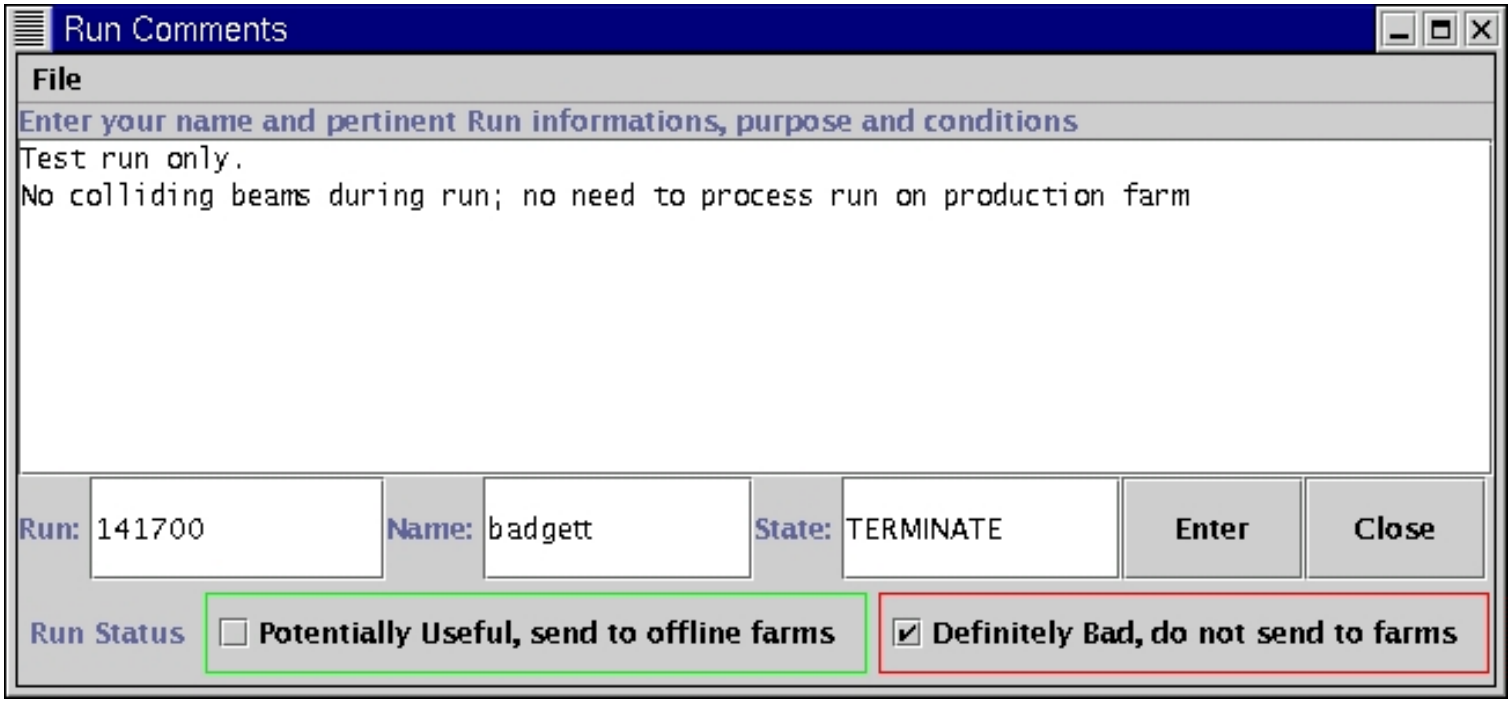

At the end of a run you will be presented with a comment box: enter any pertinent run informations

At the end of a beam physics run, you must also decide the basic run quality. When in doubt, choose *Potentially Good*
Determines whether run is processed offline!

Error Logger

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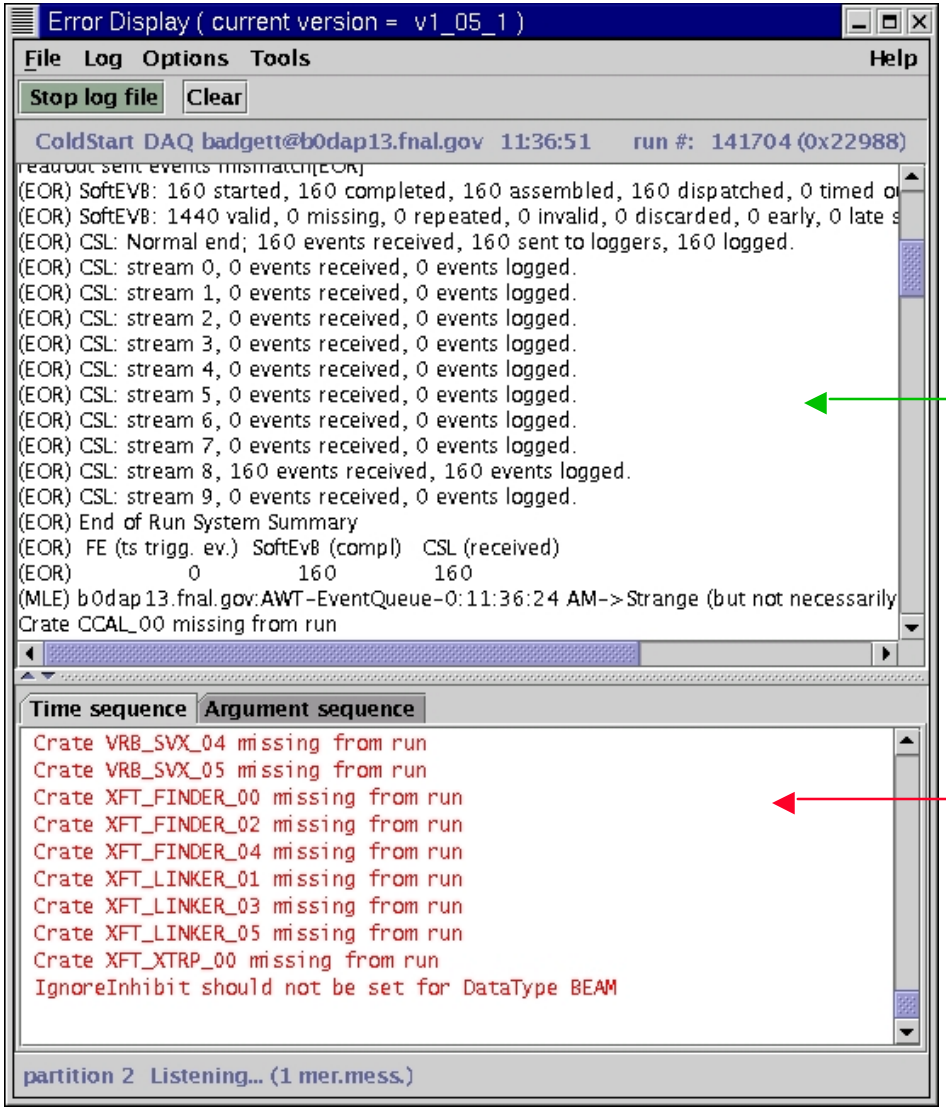
22-Jan-2003



Error Logger receives and interprets status and error messages from front end crates and other clients

Status Messages

Error Messages

Error Logger Control Options

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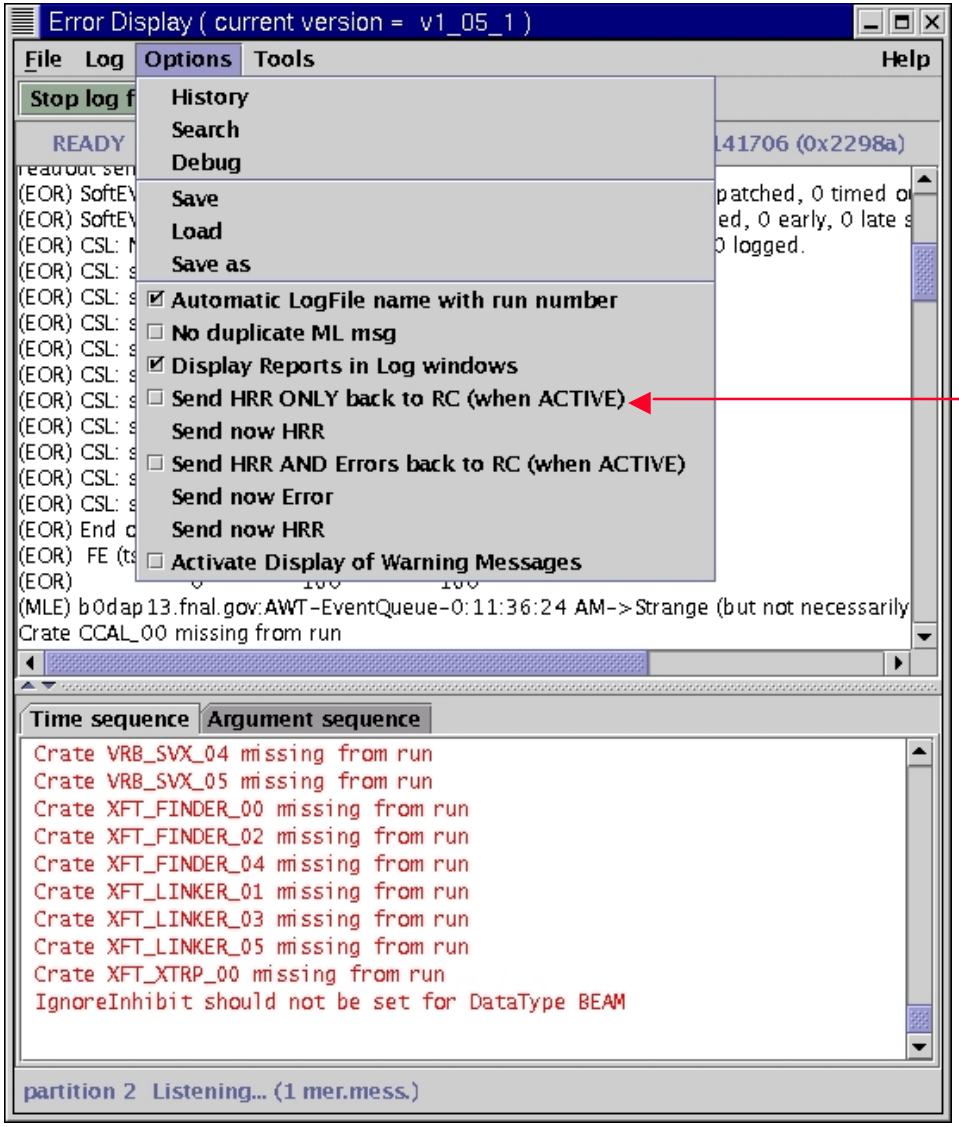

Error Logger can send transition commands to Run Control when specific problems are encountered

Enable automatic HRR here

Error Logger sends orange and red warning windows to Run Control

DaqMon

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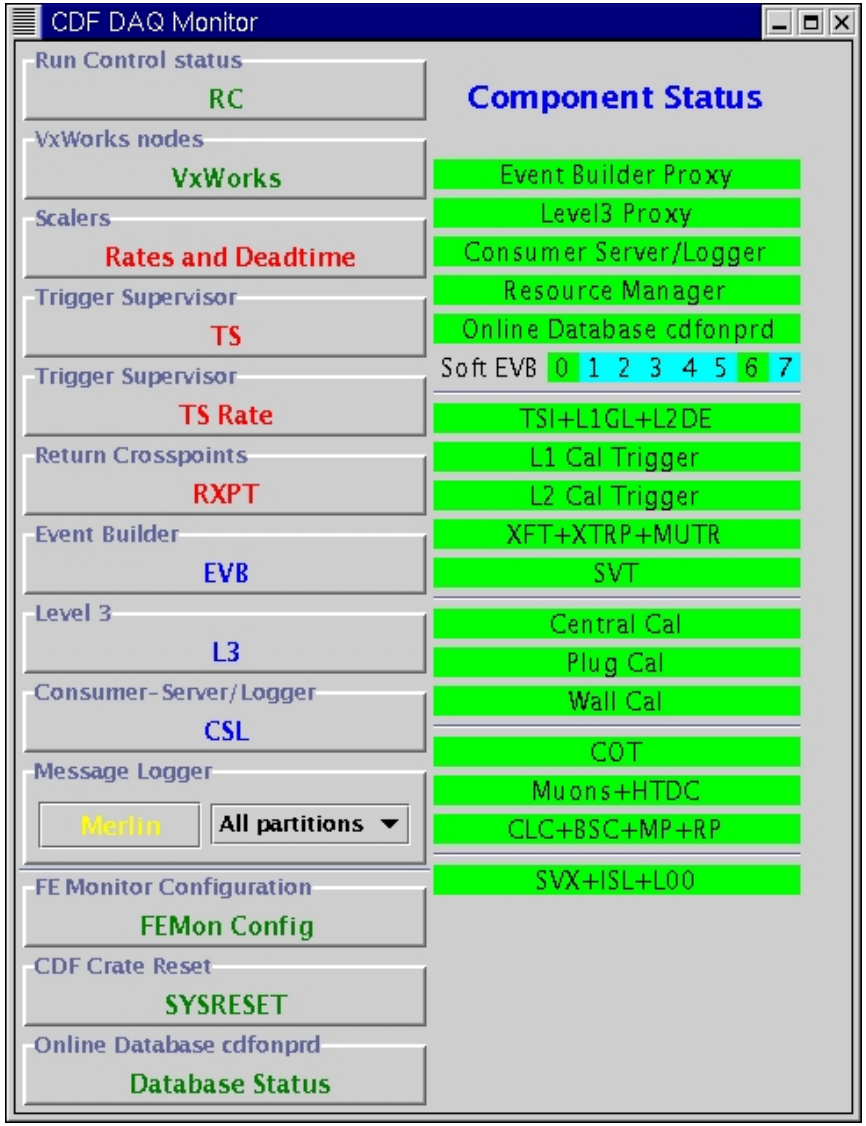

Watching Run Control status is your first line of defense
Plus, many monitoring tools are available

DaqMon is your gateway to many monitors:

setup fer

daqmon

And provides a quick glimpse status of all systems

VxMon

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At-a-glance summary of all front end crates in the system

Arnd sez: “Monitoring the Front End crates is the Ace’s most important job”

ScalerMonitor

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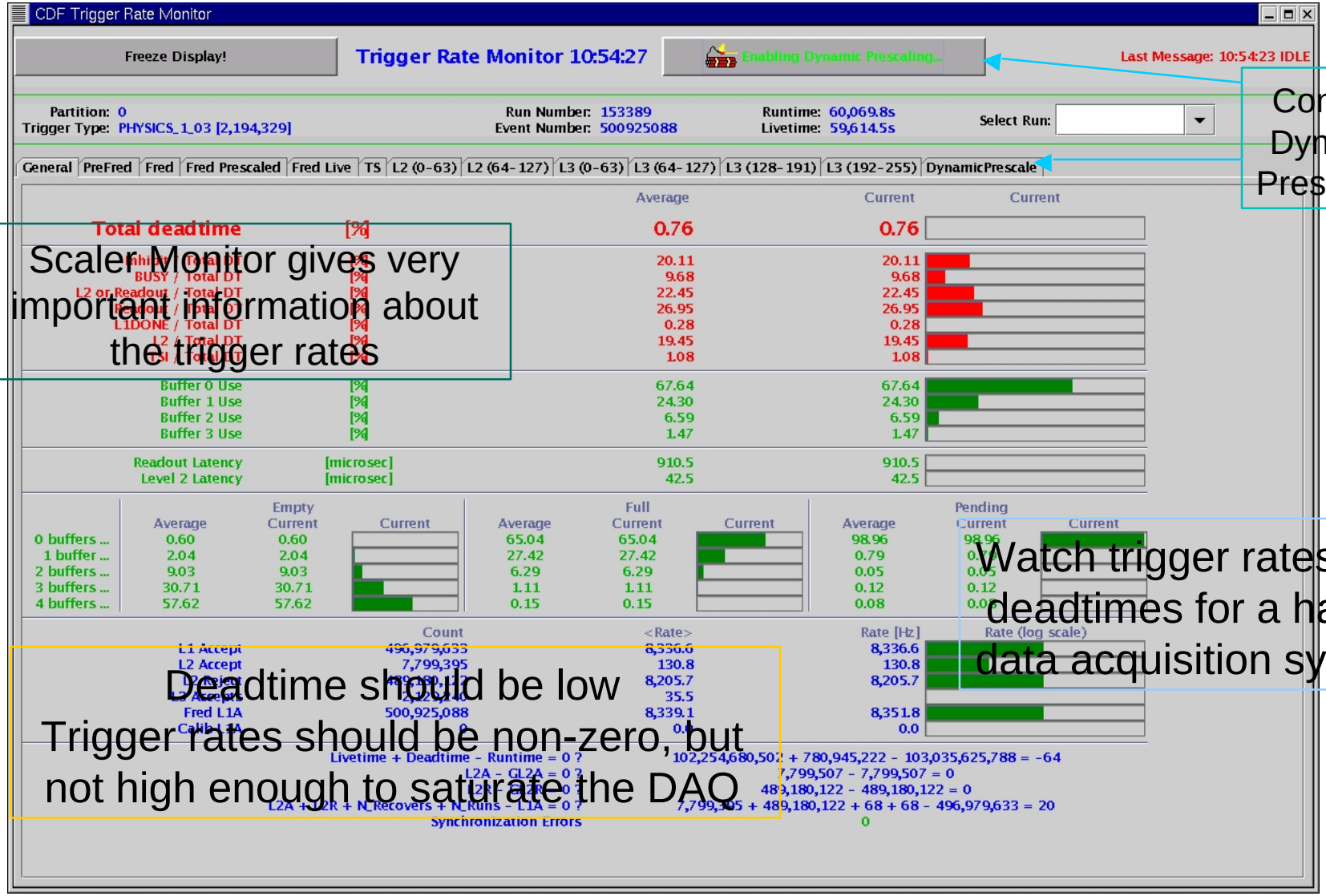

Controls Dynamic Prescaling

Scaler Monitor gives very important information about the trigger rates

Watch trigger rates and deadtimes for a happy data acquisition system

Deadtime should be low

Trigger rates should be non-zero, but not high enough to saturate the DAQ

Conclusion

- DAQ Ace's main responsibility is operation of Run Control
- Before your shift, come to CDF control room and try out Run Control features, learn from experienced Aces and other DAQ experts
- Don't understand a feature or warning? Don't ignore! Find out! Page experts if necessary!