



RunControl Through the Ages (personal experience)

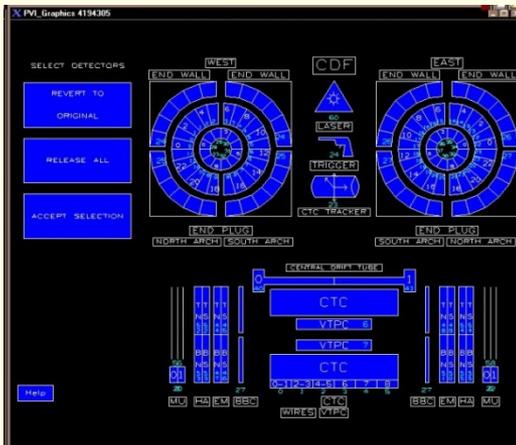


```

QVT/Term - b0dau30 [default]
File Edit Setup Transfer Help
3-JAN-2008 22:43 Run Status: Run Startup ID/Node: 1 B0CCB0TS(#) Status:
Node: Expt DAQ Run Type : Sw/Lin: 0 RTS MOS State:
Output: Trash Can Run Number: 0 Tris No.: 0
          DATA_LOGGER
          Status/Error Viewport
22:43 >RUN-S-MESSAGE, INITIALISE Information sent to MX_PRIMARY_LOADER
22:43 >RUN-S-MESSAGE, INITIALISE Information sent to DATA_LOGGER
22:43 >RUN-S-MESSAGE, Secondary Processes activated OK
          Take Data Menu
1 [BEGIN_RUN]          Begin a Normal Data Acquisition Run
2 [MANUAL_CALIBRATION] Perform Manual Calibration
3 [AUTO_CALIBRATION]   Perform Automatic Calibration
4 [HISTORY_CALIBRATION] Review Calibration History
6 [FINISH]             Finish Data Acquisition & Calibration
7 [PARTITION]         Modify or View Partition Definition
8 [OUTPUT]            Modify Output Destination
Press RETURN for next Page
Run_Cntrl> daq
Run_Cntrl> error hide exit
Run_Cntrl>
24x80 [24,12] Connected Printer: Off Logfile: Off

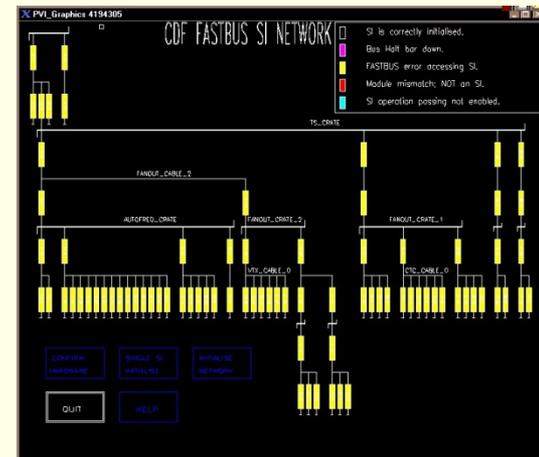
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CDF Run I (0) RunControl designed to run on VT100 terminals
Tightly coupled to Fastbus branch network hardware, tied to VMS operating system
Fortran for low and high level interfaces



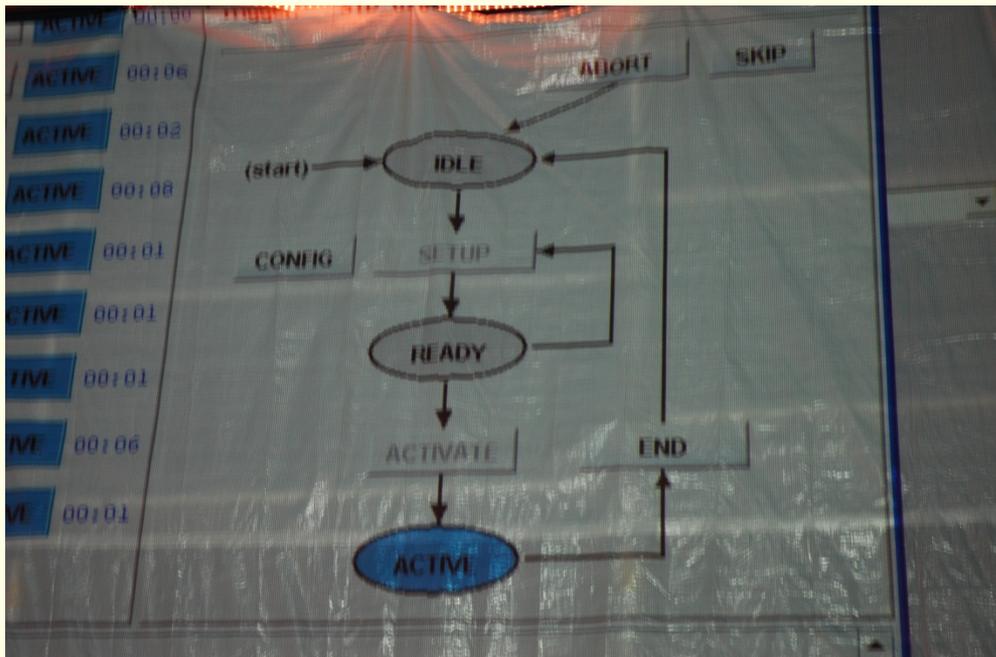
Early GUI attempt for selecting subdetectors – ran on more advanced terminals with graphics capabilities

J.Patrick





RunControl History, Zeus (2)

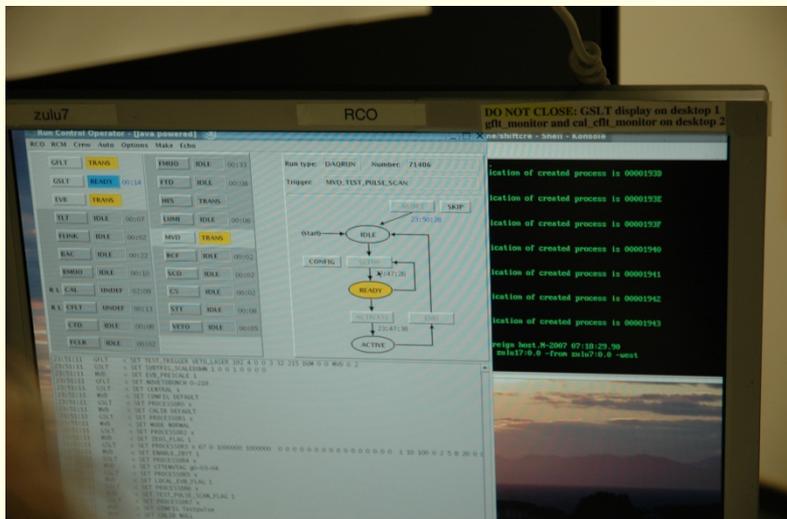


Zeus main RunControl (2) – distributed command with little knowledge of subdetectors

Not coupled to front end hardware at all; ran on VMS but easy to port

TCL/TK for GUI and subdet write their own

C and Occam for front end control of hardware; VME crates processors connected by hypercube of links (inmos transputers)



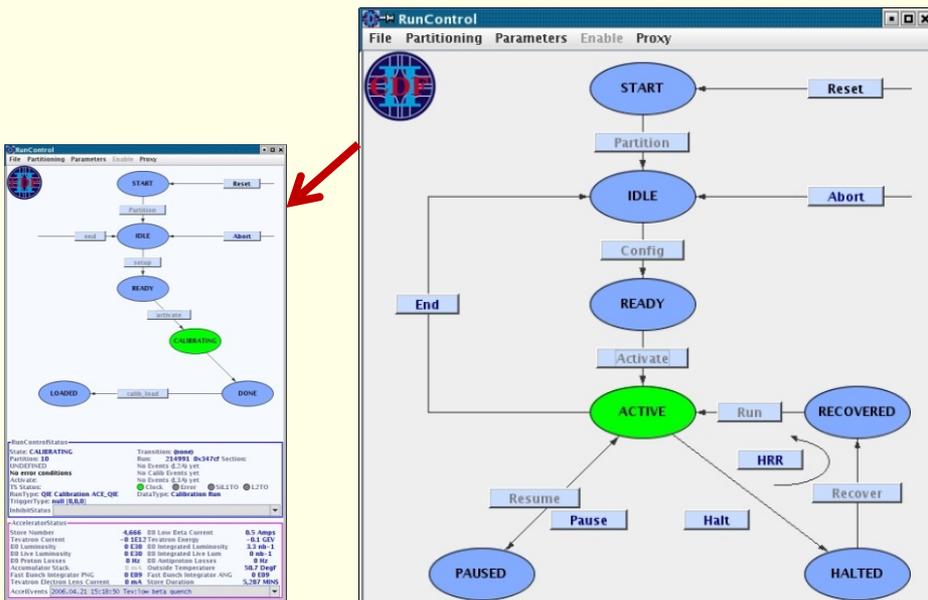
C. Youngman, J. Milewski, D. Boscherini



RunControl History, CDF II



CDF II RunControl – pure Java control and display with OO
 Ran on Linux
 C on VxWorks for front-end control; embedded MVME processor served by ethernet
 Subdetectors inherit and easily extend state machines



InhibitDisplay

InhibitStatus

B Field	BMU East Trip
CES Trip	CLC,MP Trip
CMX HV:PC	CMX HV:iFix
COT03 Trip	COT04 Trip
Hadron LED	IMU HV:iFix
ISL06 Trip	ISL07 Trip
PCAL06 Trip	PCAL07 Trip
SVX HV:iFix	SVX00 Trip
TOF LV:iFix	TOF00 Trip

AcceleratorStatus

Store Number	4,104	B0 Low Beta Current	1,974.2 Amps
Tevatron Current	9.0 IE12	Tevatron Energy	979.7 GEV
B0 Luminosity	36.8 E30	B0 Integrated Luminosity	2,586.4 nb-1
B0 Live Luminosity	36.8 E30	B0 Integrated Live Lum	2,337.9 nb-1
B0 Proton Losses	427.3 Hz	B0 Antiproton Losses	138.6 Hz
Accumulator Stack	34.1 mA	Outside Temperature	79.5 DegF
Fast Bunch Integrator PNG	8,102.3 E09	Fast Bunch Integrator ANG	840.9 E09
Tevatron Electron Lens Current	7.9 mA	Store Duration	781 MINS

AccelEvents 2005.04.19 10:27:54 CIdr:Bgn colliding physics

Partition
 Number: 0 Node: b0control21.fnal.gov

RunStatus
 State: ACTIVE Run: 214995

BSU HV:PC	CENTRAL HV:iFix	CES HV:PC	CES HV:iFix	CES LV:iFix
CMP Trip	CMU HV:PC	CMU HV:iFix	CMU00 West Trip	CMU01 East Trip
COT HV:iFix	COT LV	COT00 Trip	COT01 Trip	COT02 Trip
CPR,CCR Trip	CPR,CCR: PC	CSP CCU HV:PC	CSP CSX:iFix	Flying Wire
ISL01 Trip	ISL02 Trip	ISL03 Trip	ISL04 Trip	ISL05 Trip
PCAL01 Trip	PCAL02 Trip	PCAL03 Trip	PCAL04 Trip	PCAL05 Trip
PCAL11 Trip	PCAL12 Trip	PES LV:iFix	PLUG HV:iFix	RP: PC
SVX04 Trip	SVX05 Trip	SVX06 Trip	SVX07 Trip	TOF HV:iFix
VME Power:iFix	Xenon Off			



RunControl history, CMS



The screenshot shows the RunControl interface with the following components:

- Top Bar:** Status tabs (Status Table, RCMonitor, FED & TTS, HLT Keys, Lock, save, Refresh, Detach, Destroy).
- Running Status:** A green bar indicating the system is running at 00:27.3.
- Control Panel:** Buttons for Connect, Configure, Get Ready, Start, Pause, Resume, Stop, Halt, CoolReset, ForceStop, ForceHalt, Recover, Interrupt, TTCTest, TTCHardReset, TTCTestMade, and TestTTS.
- DCS/LHC flag table:**

DCS/LHC flag	state	force
ES_HV_ON	True	FROM DCS
PIX_HV_ON	True	FROM DCS
TK_HV_ON	N/A	FROM DCS
PHYSICS_DECLARED	True	FROM DCS
LHC_RAMPING	True	FROM DCS
- Configuration:** Run Number 172978, SID 188460, Seq Name GLOBAL_RUN, Global Key /GLOBAL_CONFIGURATION_MAP/CMS/CENTRAL/GLOBAL_RUN, HLT key from trigger mode /odaq/special/Interfill/v11.1/HLT/V3, L1 Trigger Key from trigger mode L1_20110808_074307_5067 => TSC_KEY:TSC_20110808_002643_cosmics_BASE => GT_RS_KEY:grs_2011_cosmics_v5_TTB, Clock source LOCAL => MJ_KEY: bcrf-internal-manual, HWCFG Key cmsreq_110405_0bpr/RUN_2011/fb_all_rev110207/dp_8SLIF_b267_126BU_16SM.0, Level-0 Action Tasks completed, Level-0 Error.
- Subsystem Status Table:**

Subsystem	PIXEL	ES	ECAL	CASTOR	DT	CSC	RPC	TRG	SCAL	DAQ	DCM	DCS
State	Running	Connected										
Time	00:04.0	00:03.1	00:03.8	00:00.5	00:08.3	00:08.6	00:00.2	00:08.6	00:02.0	00:17.5	00:09.9	00:08.0
- Enabled Slices:** A row of green indicators for various subsystems.
- Run Key:** A row of dropdown menus for GR_PhysLowGain, Beam-GR-HighLower, Automatic, and TIER0_TRANSFER_ON.
- Commander:** A row of 'select' buttons with circular icons.
- Subsystem List:** A vertical list of subsystems: TRACKER, ES, ECAL, HCAL, HFLUM, CASTOR, DT, CSC, RPC, TRG, SCAL, DAQ, DCM, DCS.
- Run History:** A log at the bottom showing the start of Run 172978 with various flags.

CMS main RunControl –
 Tomcat/Java backend with
 Javascript/HTML web display
 Runs on any browser, usually
 Firefox on Linux; subdetectors
 inherit and extend for local RC
 C++ for front-end control
 xDAQ; VME crates serviced by
 bridge to PCI on Linux

What is the future?

A. Petrucci, H. Sakulin, A., Oh
 See talks earlier this week