

ATF2 Hardware software tasks

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(ATF2 Project meeting, KNU Korea, 01/10/08)

Status of various essential/high priority tasks

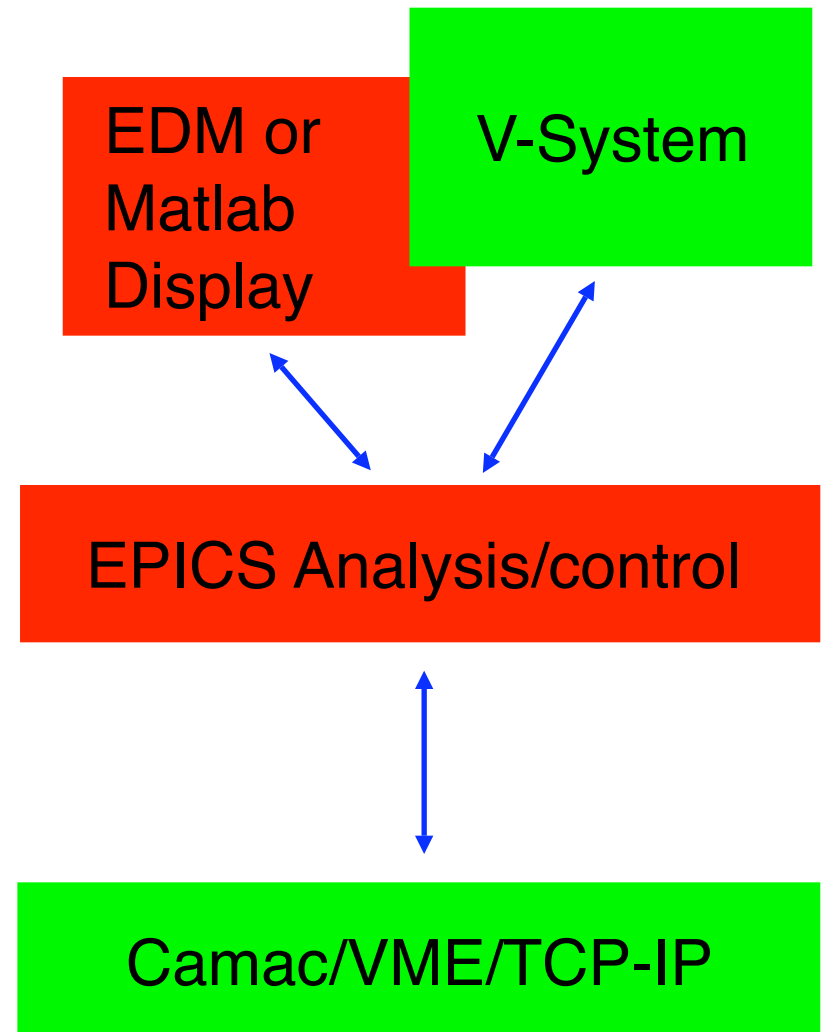
- Magnet movers
- Power supplies
- C/S-Band cavity BPM systems
- Shintake monitor (IP-BSM)

Integrated controls

- Beam based alignment
- Cavity BPM bootstrapping/calibration (alignment)

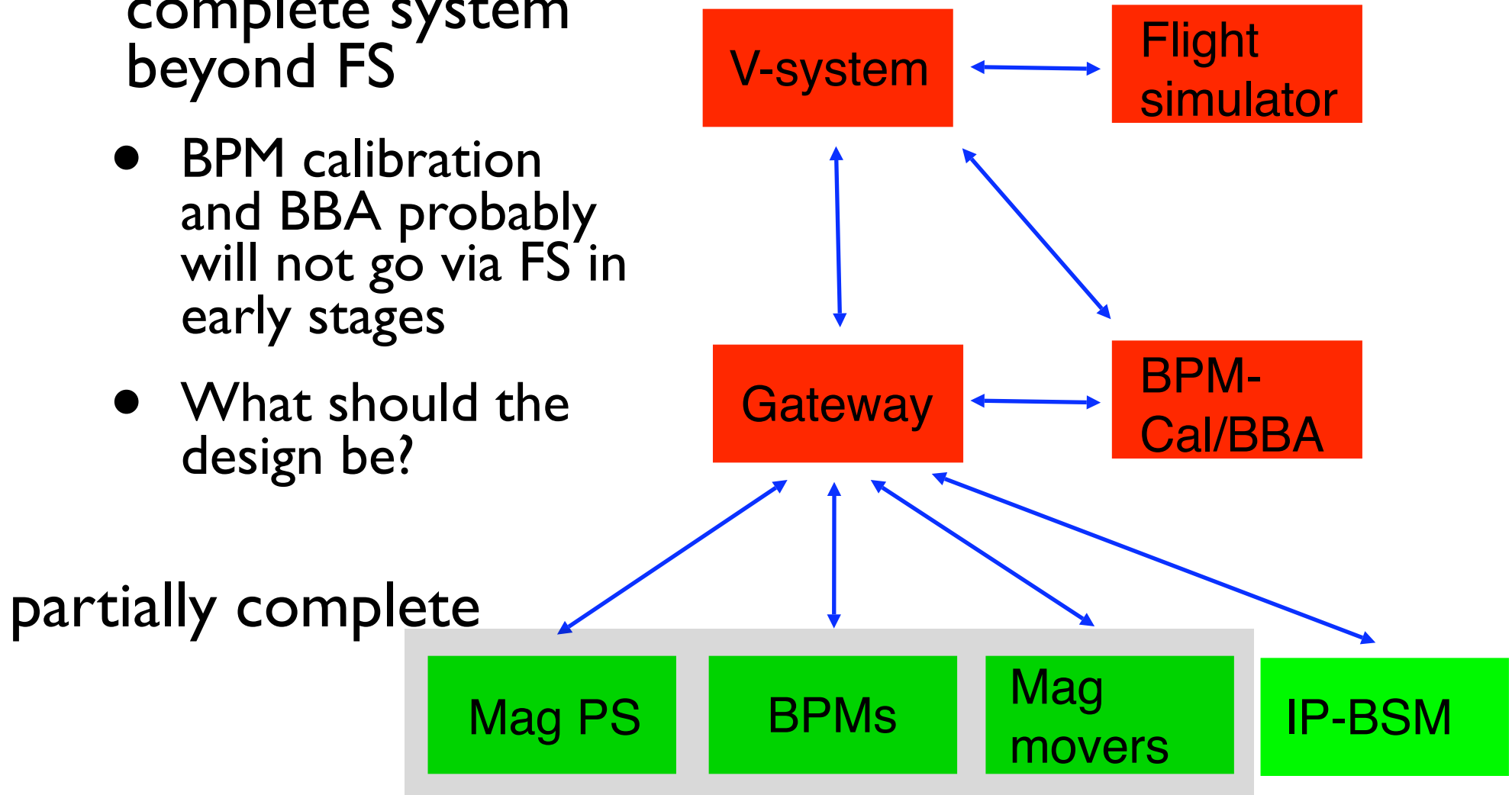
ATF2 Software model

- Evolved from experience on hardware projects (DR-BPM, Laserwire, FONT, nanoBPM)
- EPICS IOC
 - Mixture of linux-soft (quasi-realtime) and vxworks (realtime)
 - Acquisition, control and analysis



ATF2 software model

- Must design complete system beyond FS
- BPM calibration and BBA probably will not go via FS in early stages
- What should the design be?



Magnet mover systems

J. Nelson & G. White

- Toyo Camac-Linux controller
 - Asyn to cam() calls
 - State control?
 - EDM displays
- Advanced panels
 - Constants
 - Diagnostics

The screenshot displays a control interface for magnet movers. At the top, there is a list of movers (QM16 to QF7) with 'Mover Display' buttons. A black arrow points from the 'Mover Display' button for QF9B to a detailed view of 'Crate 1 Mover 10'. This view includes buttons for 'Update Readback' and 'Disable Updating', and a table of sensor data:

Pots (Volts)		LVDTs (Counts, um)	
		Raw	Converted
c1:qmov:m10:pot1	5.00012	c1:qmov:m10:lvdt127	4.77266
c1:qmov:m10:pot2	4.99890	c1:qmov:m10:lvdt224	4.25897
c1:qmov:m10:pot3	5.00146	c1:qmov:m10:lvdt3-43	-7.56171e+00

Below this is a table for 'Calculated X, Y, and Tilt':

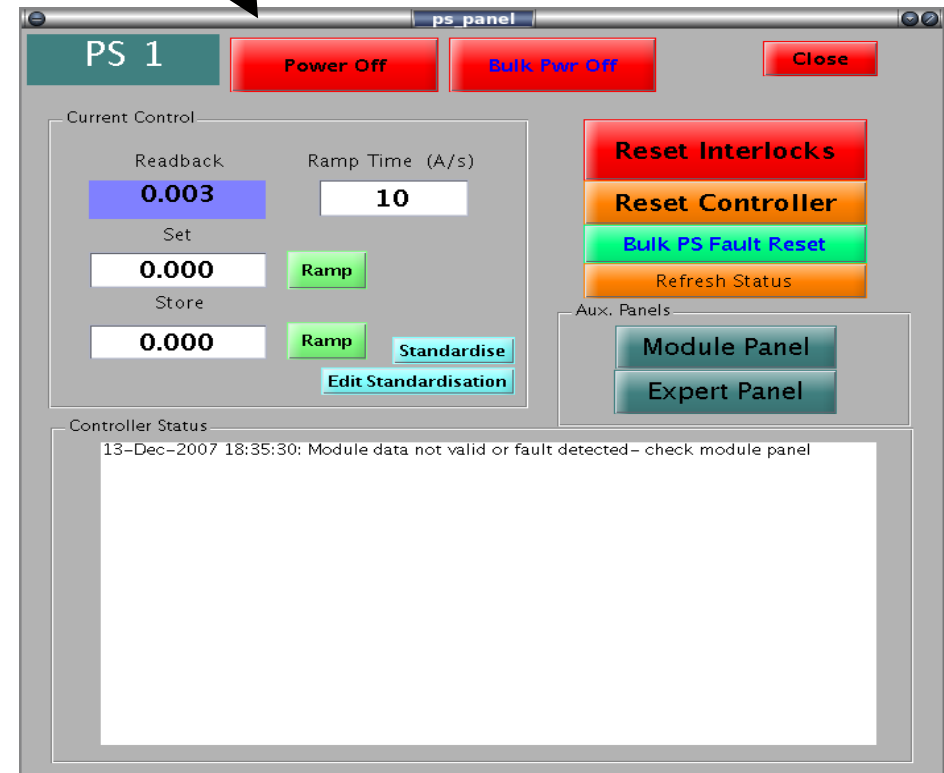
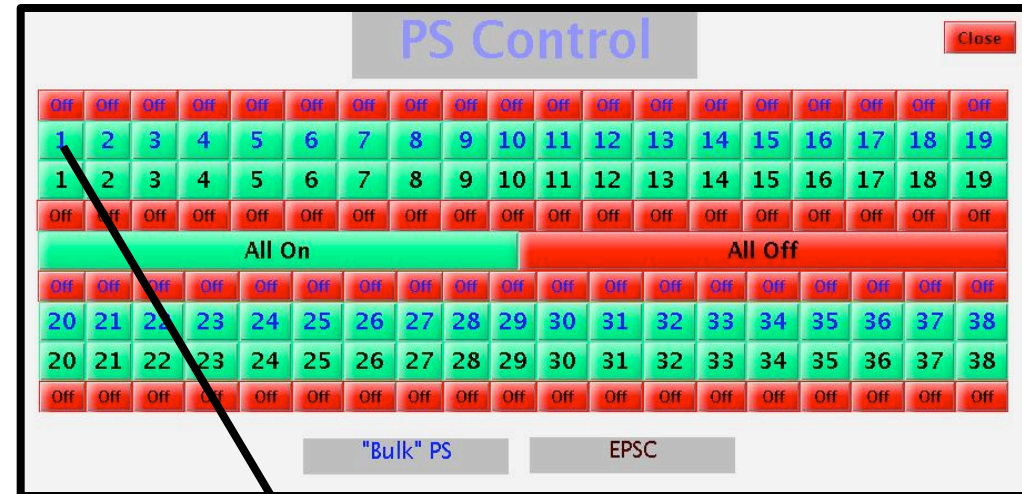
	UsePOTs	TheOtherThing
c1:qmov:m10:x	-1.22351e+00	-7.82248e+00
c1:qmov:m10:y	9.21279e-01	4.51581e+00
c1:qmov:m10:tilt	5.59788e-06	3.13033e-06

Further down, there are fields for 'Desired change to x, y, and tilt from current position' with values of 0.00000e+00 for x, y, and tilt. To the right, 'UseSLC' is set, and 'Calculated Motor Steps' are shown for Motor 1, 2, and 3, all at 0.00000. At the bottom, there are buttons for 'Diagnostics', 'Constants', 'All Movers', 'Crate 1 Motor 10', 'Coords OK', 'Move Movers', 'Done.', and 'Go to 5V'. A 'Calculated Pot Volts' table is also present, showing 0.00000 for Pot 1, 2, and 3.

Magnet power supplies

G. White & B. Lam

- Linux PC IOC
- Asyn to network control of PS controllers
- Matlab based GUI
- Channel access via LabCA
- Advanced panels (restricted access)
- Expert panels, Bulk supplies



Beam position monitors

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- DAQ complete and working well
- Databases complete
 - Links between processing and databases well advanced
 - bpmname**x:pos**
 - bpmname**y:pos**
- Documented at RHUL TWiki
 - www.pp.rhul.ac.uk/twiki/bin/view/JAI/AtfBpmDigital
- Code repository
 - www.pp.rhul.ac.uk/svn/

BPM system controls (EDM)

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McCormick Orbit EXIT
Summary History Save/load
Simulate gateway
SIS settings

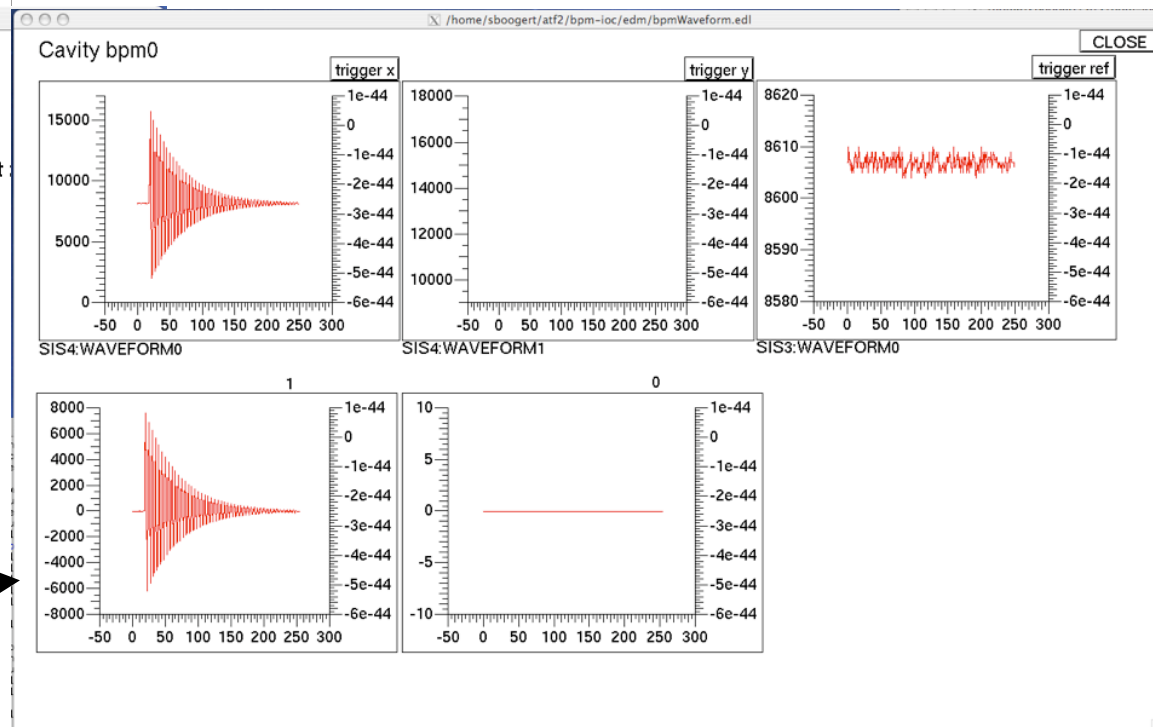
QBPM 0
QBPM 1
QBPM 2
QBPM 3

SIS DIGITIZERS

	NPOINTS	CLOCK	TRIGGER	MULTIEVT	AUTORS	ARM
SIS1	256	100 MHz	soft	1	yes	postTrigger
SIS2	256	100 MHz	soft	1	yes	postTrigger
SIS3	256	100 MHz	FP start/stop	1	yes	postTrigger
SIS4	256	100 MHz	FP start/stop	1	yes	postTrigger
SIS5	256	100 MHz	FP start/stop	1	yes	postTrigger
SIS6	256	100 MHz	FP start/stop	1	yes	postTrigger
SIS7	256	100 MHz	FP start/stop	1	yes	postTrigger
SIS8	256	100 MHz	FP start/stop	1	yes	postTrigger
SIS9	256	100 MHz	soft	1	yes	postTrigger
SIS10	256	100 MHz	soft	1	yes	postTrigger

BPM : bpm0
X : lsis4:waveform0
Y : lsis4:waveform1
Q : lsis3:qwaveform0

	start sample	pedestal	noise	Signal max	Last unsaturated	Above noise	First
X	10	8148.7	1.100	7410.3	0	18	
Y	10	8538.4	1.281	3.6	0	0	
Q	10	8607.0	1.414	3.0	0	0	



BPM calibration

- Synchronization of BPM and Quad-mover systems
 - Sequencing, eg move-data
 - 100 micron move,
 - 10 pulses of BPM data
 - Database? State notation language & sequencing
 - Similarities with other systems BBA, BPM boot strapping etc
 - Should have coherent strategy for these systems

Beam based alignment

J. Nelson et al

- Quad shunting
 - measure orbit, shunt quad 20%, measure orbit, move quad
- Sextuple
 - Move sextuple through beam with mover
 - Measure orbit at IP
 - Move sextuple
- Processing/control databases?
 - See J. Nelson's talk from last weeks ATF2 meeting

Shintake monitor (IP-BSM) status

T.Yamanaka et al.

- Software
 - use EPICS as an interface to the database
 - the actual implementation will be half year later (we need to establish the beam size measurement method at first)
 - the detail of Input/Output for the beam size measurement will be presented at ATF2 weekly meeting on October 8
- Hardware
 - Realignment of the vertical optical table was finished.
 - The optical components need to attach to the table once again
 - construction of laser transport line from the laser hut to the IP is on going

Software infrastructure

S. Boogert, G. White, J. Nelson

- Installed on atfsad.kek.jp
 - Channel archiving
 - State save and restore
- Need naming conventions for control files and archives (also storage location)
 - Propose
 - subsystem_type_yyyymmddhhmmss.dat
 - subsystem = [qmov, qbpm, mag, ipbsm]
 - type = [casr, archive]
 - yyyymmddhhmmss = date string

More ATF2 software model

- Direct invocation of EDM controls from V-system panels
 - Uniform interface?
 - Can make BPM interface more similar to Quad mover
- BPM boot-strapping, den, BBA, other?
 - Control of multiple systems
 - System design, database design (operating on atfsad?)

Summary

- EPICS interfaces ready for first beam
 - Quad movers
 - Magnet power supplies
 - BPM systems
- Need display consistency for users
 - Nice to make integrated beam line display with monitors in EDM?
- Overall structure of the calibration and BBA codes.
 - Will discuss with other interested parties.