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# 2008 Zap Test Twiki Pages

links: CERN home [↗](#), LHCb home [↗](#), Massi home [↗](#), Zap Test Pictures, Zap Test electronic logbook [↗](#)

## ZAP TEST 2009 GOALS AND MODIFICATIONS

1. Agreement to carry on with zap test setup at PS Booster next year. Use winter shutdown to upgrade.
2. Move Tell1 crate outside: 50m control cables with repeaters.
3. Replace camera with a newer, better one.
4. Add cooling for irradiated module.
5. More diagnostics ?
  - ◆ trigger for bunch arrival ?
  - ◆ fast analog monitor of biasat Silicon and/or LV at the beetle ?
  - ◆ ...

## WORK TO BE DONE (no longer valid... to be updated)

1. make a precise run plan and procedure (Massi)
2. make a Shot Sheet (Massi), to be filled in by the shifters, 1 sheet per shot
3. install labview control for IV scans (Jan)
4. make 'continuous' the labview monitoring for Radmon (Jan)
5. finalize digitization delay scan (and produce optimal parameters) (Olaf)
6. make tell1.cfg file (for tell1\_daq) and/or python script for easy data-taking .
  - ◆ We will take noise runs of ~10k events with a single pulsed channel (last channel, #127) per Beetle.
  - ◆ check that ch127 are never a bad channel
  - ◆ Remember: we power up the 16 R and the 16 Phi chips, but we only read out 8 R (0 to 7) and 8 Phi chips (8 to 15), hence need only to config those (minimize heat dissipation).
  - ◆ Would be handy to have a single command for taking such a file (with a time-stamped filename).
7. make online analysis macro to display average noise vs electronics channel, TP distribution for ch127 (with averages and rms). Any more ideas welcome that could help seeing online if there is an effect of the beam shot in the detector.
8. re-install Tell1+crate and ECS mezzanine (Massi+Jan)
  - ◆ test motion, check camera image
  - ◆ take final pictures of setup
  - ◆ take pictures of LVPS front when module powered
  - ◆ close and strengthen shielding
  - ◆ write down data cable connectivity
9. take and check data during installation
10. take reference IV scans

## MOTIVATION

Study behaviour of one or more VELO modules under exposure to high rates of charged particles and under various HV/LV conditions. See presentations: VELO Workshop 13-14 Dec 07 [↗](#) , VELO meeting 21 Dec 07 [↗](#) , LHCb week /VELO 23 Jan 08 [↗](#)

## GEOMETRY OF SETUP

Module 48 is mounted sideways with Phi-sensor downstream towards dump. It can be moved out of the beam line towards the right when looking downstream. Only two positions are possible: in or out. As of April 14, 2008, the module cannot be moved into the beam line, see here the arrangement. Only the attached extension with alumina view screen can go into the beam line. To see a high resolution picture of setup as of 14 Apr 2008, click on image



Sketch of setup can be found here.

## ZAP TEST DESK

The Zap Test Desk (control desk) is located in some obscure corner of the Booster 'salle electronique' 361-1-012.

## CABLING

Power cables:

- 2717269A => 220VAC for CCPCrepeater, Tell1 and fan, and light bulb for camera.
- 2717270A => 220VAC for LVPS-Phi and LVPS-R

Cat7/RJ45 cables:

- 2717227A => Gbit-card output port1
- 2717228A => CCPCrepeater network
- 2717236A => R-side repeater board temperature cable (check!)
- 2717237A => Radmon

Brown BNC cables:

- 2717267A => Phi sensor high voltage
- 2717268A => R sensor high voltage

Radmon wiring (banana socket number upstairs vs PCB serigraphy):

- Nr ..... PCB serigraphy
- 1 ..... S1 ..... PT100
- 2 ..... GND ..... GND
- 3 ..... D3 ..... BPW34
- 4 ..... D2 ..... CMRP
- 5 ..... IC1-C1 ..... REM
- 6 ..... IC1-C2 ..... LAAS
- 7 ..... IC1-C3 ..... REM
- 8 ..... GND .....GND

Video and pneumatic control (located in rack XXX):

- Two coax cables with N-type connectors used for +/- wires of motion control (switch is indicated)
- Video signal comes through small plastic box with switch (to open/close diaphragm in front of camera)
- Video Monitor sits above the racks

Cables, alumina view screen and camera borrowed from Bernd Dehning's setup.

## DAQ STUFF

### ONLINE / EVENTBUILDING:

- ssh velo@pcvelo01
- less \$ONLINETASKSROOT/options/VeloDatafileLocation.opts
- ls /scratch/velodata/
- cd /home/velo/cmtuser/Online\_v4r6/Online/OnlineTasks/job
- ./hltr.sh
- killall Gaudi.exe logViewer
- sudo tshark -i eth1

### TELL1 / CONFIG - RUN:

- ssh velo@pctell024
- cd /home/velo/massi/tell1daq2.0zaptest/tell1lib\_release\_v2.0/ccpc\_daq
- ./daq\_tell1 ~/massi/anyconfigfile.cfg
- config files: ls -ltr ~/massi/\*.cfg
- relevant C-codes in /home/velo/massi/tell1daq2.0zaptest/tell1lib\_release\_v2.0/tell1lib/velo and common

## DATA ANALYSIS (Sorry, no Toxygen documentation for software)

- ssh lhcbvelo@pcvelo01
- SetupProject Vetra v5r1
- cd cmtuser/Vetra\_v5r1/Velo/Vetra/v5r1/cmt/
- source setup.csh
- cd ../job
- ls -ltr /scratch/velodata/
- vi ../options/ZapTestNZS.opts (set proper input file)
- ../slc4\_amd64\_gcc34/Vetra.exe ../options/ZapTestNZS.opts > mylog
- vi mylog (any severe ERROR messages ?)
- ls \*.root
- root (open a TBrowser)

## RUN INSTRUCTIONS

- Make sure the PSB data is being logged (see below under Machine interface). Make a backup if needed (!!details!!).
- Take an IV scan from 0 to 300 V before and after every action (with LV off, for temperature reproducibility).
- Write down NTC value.
- Read out all Radmon sensors and put back short-circuit.
- Whenever there is a reasonably long access (> 15 minutes), try reading out the LVPS voltages and currents with Beetles configured and unconfigured.
- When taking a beam shot, write down where the shot hits the view screen (using the grid letter-numbering, be as precise as you can)

## TAKING RADMON DATA

- Important: always short the radmon sensors to the GND after your measurement. Some radmon sensors have a very different sensitivity to integrated dose when left floating! They must be short-circuited in order to match the calibration curve!

- By Labview control:
  - ◆ connect the radmon and NTC cat7 cables to the two cat7 Agilent34970A inputs (cables are labeled).
  - ◆ start C:\PH-Radmon-Acq Folder\PH-Radmon-Acq.vi, click up-left white arrow, load Velo\_rad\_ntc.txt (in C:\PH-Radmon-Acq Folder\SM config\TOTEM), press start button. When it is finished, it goes to Cmpl voltage, then press stop.
  - ◆ IMPORTANT: Now you must start another labview program, C:\PH-Radmon-Acq Folder\hp34970a\hp34970a\_all\_CLOSE.vi. Press left-upper white arrow once. This will ensure that the switches in Agilent34970A are all set to ground teh radmon sensors.
  - ◆ The data you have just taken are appended to the files in C:\PH-Radmon-Acq Folder\data\VELO\Board\_160, e.g. PH\_CM RP\_5.txt.
- Manual operation:
  - ◆ connect the radmon cat7 to the radmon banana box, such that all sensors are shorted to GND.
  - ◆ Pt100, C1-REM and C2-LAAS are all done with a fixed source current and quite long powered-up time. Just configure the Keithley to give the desired source current, then connect the corresponding sensor into the Keithley (labeled Radmon) and measure the voltage.
  - ◆ Pt100: 10 s at 1 mA
  - ◆ C1-REM: 2 s at -0.16 mA
  - ◆ C2-LAAS: 2 s at -0.10 mA
  - ◆ D3-BPW34 and D2-CMRP are read out with a fast pulse (about 50 ms), booking the voltage value before, during and after the pulse. The keithley labeled radmon has a programmed 3-point sweep which is ready to use.
  - ◆ Optional: you can inspect (or change, but it's already configured!) the sweep data as follows:
    1. press "I" button under SOURCE
    2. press CONFIG, then SWEEP, then ENTER (on blinking TYPE)
    3. select CUSTOM with L/R arrows, then ENTER.
    4. you can now ENTER on blinking #-POINTS or move to ADJUST-POINTS and play with the arrows to read (or change) values
    5. use EXIT to go up the menu tree
  - ◆ Compulsory: try first the sweep with a cable short between - and +:
    1. press "I" button under SOURCE
    2. set output to ON
    3. start sweep by pressing SWEEP : this takes a very quick sweep, less than 1 s
    4. data is retrieved by pressing RECALL and toggling with the up/down arrows
  - ◆ If the data points look correct (3 points at about 50 to 100 ms intervals) connect the sensor cable and take a real SWEEP. Write down Time, Voltage and Current of each of the three points.
  - ◆ Measure each sensor sequentially, one by one.
  - ◆ IMPORTANT: after your manual measurement of each sensor always connect back the sensor to the GND banana. \* For the NTCs, connect the cat7 to the NTC banana box and trivially measure the resistance of the four NTCs.

## Machine interface

- I defined the alias 'psb' to run the PSBooster Vistar (javaws \_NOCLICK\_http://abwww.cern.ch/ap/dist/psb/psb-fixdisplay/PRO/PSBFixedDisplay.jnlp) which allows to view the machine cycle: it highlights the 'basic period number' (BPNM) that the machine is executing (what beam sent where). This Vistar only works if you login to pvelo01 as velo.
- Every beam that goes to destination BDUMP is ending up in our area (unless the user is called ZERO, in which case there was no beam, only a destination...). When we will be shooting on our module there should be no other beam than ours going to BDUMP (except if ZERO). We will have to synchronize the insertion of the module and its retraction quite carefully.
- There is a fairly fixed and reproducible delay between the Vistar basic period of the machine and the actual arrival of the beam shot. I determined in a test on May 30 that the shot arrives about 1 basic

period **before** the latter is appearing on the Vistar.

- You can also get the display directly via <http://ab-dep-op.web.cern.ch/ab-dep-op/vistar.php?usr=PSB>, but then there is a larger and changing latency between the machine basic period and what you see in the Vistar. On the other hand, the web based display does show the header information (not the case for the console display).
- PS Booster Control Room: 76671 (76672, ..., 76677)
- Beam parameters are logged just for us! Only the 'massi' account has access to ssh `massi@cs-ccr-dev1`. The data are stored in the newest files `/acc/java/data/psb/eqpsurvey/BTM_V*.xml_*` (in fact `BTM_VELO_PICKUP.xml_log*` and `BTM_Velo.xml_log*`), but are not kept permanently. I will take care of casting regularly. I also run a script on `cs-ccr-dev1` which continuously copies the logfile tails to my public directory: `~massi/public/www/tmp`. As `lhcbvelo` you can just type the command `script ~/ZapTest2008/booster` and get these tails to see if it's updating properly.
- A table with the different settings generated on user MDPSB for the VELO high-rate test can be seen [here](#).

-- MassiFL - 30 Sep 2008

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This topic: LHCb > 2008

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