§1. H1 LUMI system standard shift procedure.
(if all goes smoothly)

1.1 Very short introduction

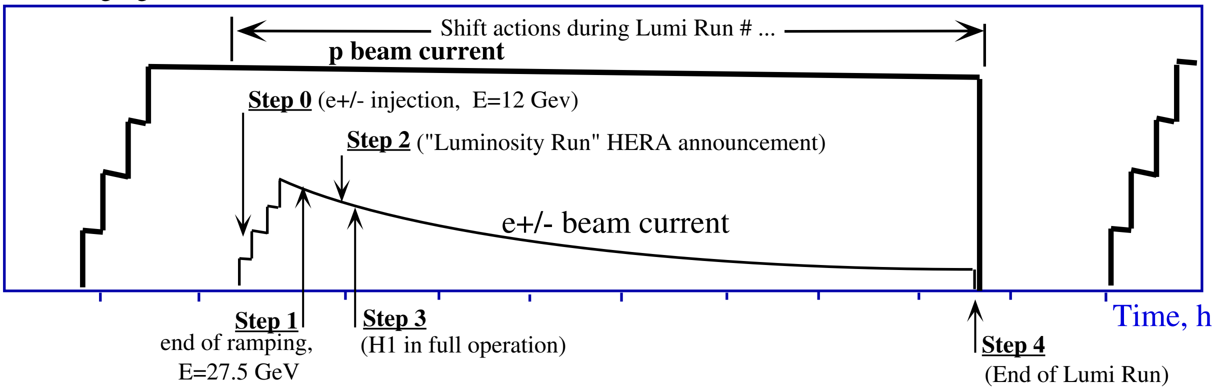
There are 3 subtasks in Lumi procedure:

First - to provide lumi measurements and lumi tuning for HERA. All what you need do for this - to move detectors in working position.

Second - enable or disable lumi data recording for DAQ (button Start/Stop Lumi measurement).

Third - to fix some lumi statistic used for following efficiencies calculations (as well efficiency of your shift ! :-). So push BUTTONs 1-4 in relevant time.

The tasks are implemented in 5 steps (from 0 to 4) of lumi shift procedure displayed in the following figure:



1.2 Lumi Procedure

<u>**Step0** - End of e-injection (Ee = 11.963 Gev, Ie >~ 10 mA)</u>

MAKE sure that the values of e,p-currents are transferring to Lumi system - there must be **no any alarms** on "Current Status " window (see §**4**) or BBL3 <u>"missing beam currents"</u> alarm.

Do not start Lumi measurements until beam currents will be transferred to the Lumi.

CHECK on the **"Run Control"** window that <u>Lumi measurement is disabled</u>.

If not - **click** the blue button **"Stop** Lumi Measurement**"** after that the colour of this button should changed on red and name is replaced by **"Start** Lumi Measurement**"** correspondingly.

Click the button **"Reset ∫∫ Lumi"** in the **"Run Control"** window to be sure that the data accumulated for the previous LumiRun are reseted.

<u>**Step1** - End of e-beam ramping (Ee = 27.51 Gev)</u>

- -> **MOVE** Movable Platforms(MP) up in Working Positions (W) (if need see §**5**)
- -> **Click** the red button **"Start Lumi measurement"**, after that the colour of this button should changed on blue and name is replaced by **"Stop** Lumi Measurement**"** correspondingly.
- -> **Click** on the button **"Go to "Run Summary" window"** and in the "Run Summary" window - fill in the field "Shift person Name"
- -> **Click** the button "Fill Start Collisions" (**Button1**).

<u>**Step2** - "Luminosity Run " is declared on HERA TV screen</u>

- -> Go to "Run Summary " window and **click** button "Fill Start Lumi" (**Button2**)

<u>**Step3** - H1 in full operation (HV CJC2 is on ...), shift leader should inform about it)</u>

- -> Go to "Run Summary " window and **click** button "Fill Start H1 Run" (**Button3**)

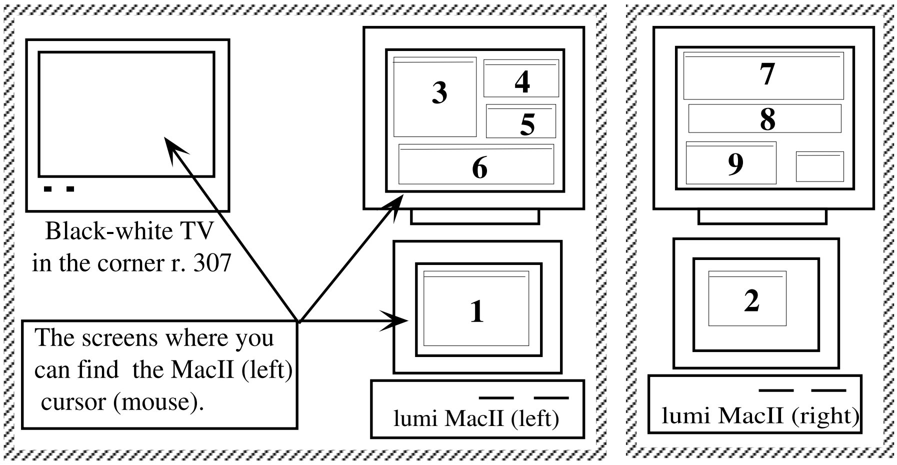
<u>**Step4** - End of Lumi Run (or "Switch your HV OFF")</u>

- -> **Click** the blue button " **Stop Lumi measurement**" on "Run Control" window.
- -> **MOVE** the Platforms down to Parking Positions (P) . (if need see §5)
- -> **Go to** "Run Summary" window " and **click** button "Fill End of Run" (**Button4),** after changing of the message " Wait, run end procedure is need about 30 sec." by " Run end procedure has completed...."
- -> **click** button "**Print Run Summary**" to get print out. During "Page setup" dialogue please set **80% reduction** otherwise, you will have print out distributed on four pages instead one.
- -> **Go to "**Run Control"window and **click** the button **"Reset ∫∫ Lumi"**_

Put all printout in "On-line Lumi History" folder and **relax** till the next LumiRun.

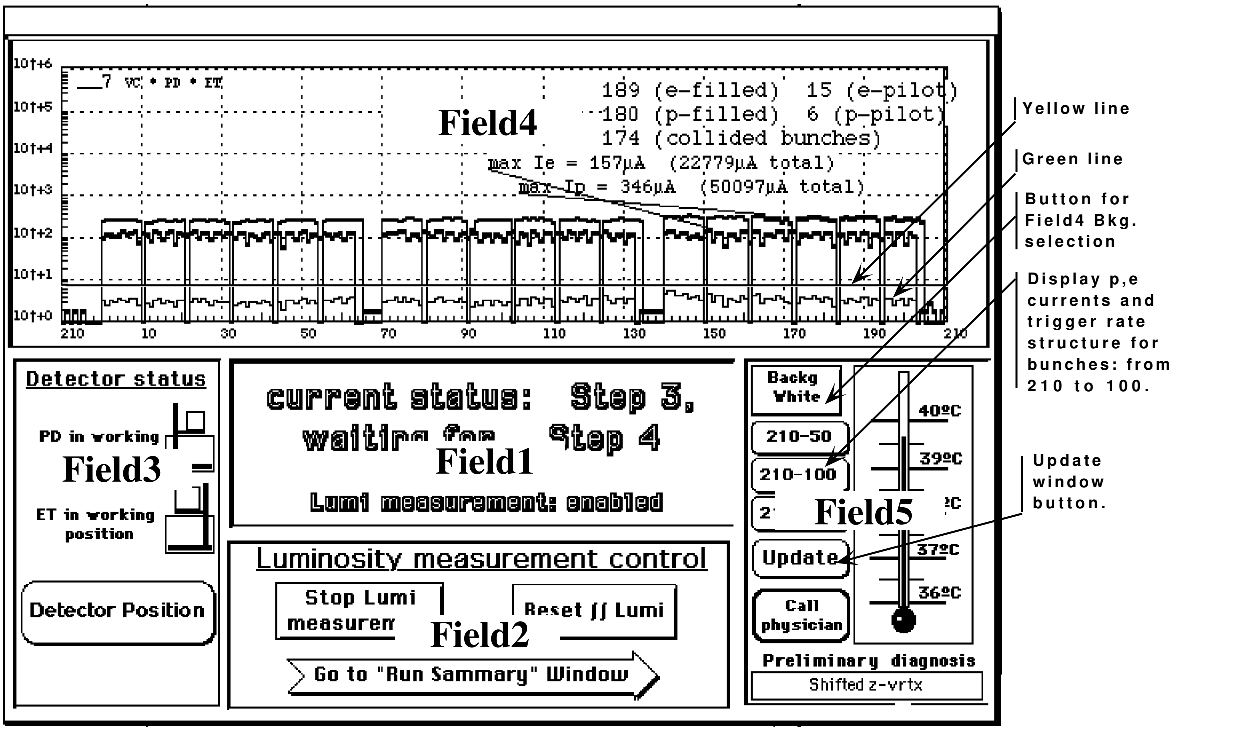
NB. **If beam was lost** on any step starting from step1 , please, complete Lumi procedure by standard way doing **all** the rest steps.

§2. Control , Status and Info windows overview



1- Run control window.
2- DAQ monitor w.
3- Short term info w.
4- Lumi Run info w.
5- Current Status w. All problems are displayed by red colour messages.
6- Long term history w.
7- Bunch currents info.w.
8- Bunch trigger rate w.
9- Photon beam position w.

The "Run Control " window is shown in the following figure:



The window is consists of five functional fields.

Field1 - is used to display current phase of luminosity run evolution and also as a message box to help doing your shift.

Field2 - contains the buttons for Start, Stop lumi measurement, Reset integrated during last run lumi, and button for calling "Run Summary " window ("Go to Run Summary window" button).

Field3 - contains "Detector Position " button to start the movable platform control and display current ET, PD positions.

Field4 - shows e,p beam currents bunch structure and lumi trigger bunch statistic (**green curve**). The green curve should strictly follow by filled and collided e+/- bunches, otherwise something wrong with synchronisation and "rate-current synchronisation problem" alarm message in the "Current Status" window appears. To easy see correlation between trigger bunch statistic and bunch currents use zoom buttons "210-50" , "210-100" in the Field5. The **yellow line** shows the threshold for e,p bunch currents which is used for automatical separation by online program the pilot and collided bunches. Sometimes due to problems with HERA operation an unusual bunch filling forces to readjust value of this threshold for proper collided/pilot bunch separation , it should be done by experts only.

Field5 - contains the tools for preliminary problem diagnosis. The zoom buttons "210-50" , "210-100" , "210-210" are used for more convenient search for bunch currents, bunch trigger statistic uncertainties. The thermometer shows 36.5 ºC only when beam and detector related parameters are very closely to reference values. This very sensitive tool has the main purpose to help an expert as fast as possible fix the problem. Update time for the thermometer is around 2 min. You can try to study a problem by calling "Lumi physician" (button "Call physician").

Please, do not call an expert when the thermometer shows an enormous temperature because of in most of cases this is caused by a small problem which has just a few per cent influence on the precision of measurement.

§3. Restart of Lumi CDAQ and (or) Lumi Processors

In case of crash all Lumi processors are rebooted automatically, but if need you can do it by hand.

3.1 For rebooting of CDAQ processors - select the "DAQ monitor" window on the H1Lumi Mac (right)
-push blue button "Enable Reboot" in the field "Reboot DAQ processors"
-push red button "Reboot" in the same field.

3.2 For rebooting of Lumi processor - select the "DAQ monitor" on the H1Lumi Mac(rigt)
-push blue button "Enable Reboot" in the field "Reboot LUMI processor"
-push red button "Reboot" in the same field.

§4. LAN problems

4.1 If you got BBL3 alarm with message like "H1_LUMI...missing_beam_currents..." on the "ARGUS" panel go to the H1Lumi2Mac (left) and look at the window **"Current Status".**There should be one or two red lines with message **"ep currents not updated"** or/and **"Ctrig-Lumi LAN transmission dead".**

In case of **"ep currents not updated"** - check H1Run status at H1 System Supervisor panel in the room 301, in case of indefinite status (Not Running and not Stopped,e.g. in a case of WarmStart) ,try to get a definite status as soon as possible, otherwise Lumi measurements will be invalid.Sometimes H1 Run is running, but nevertheless currents are not updated => H1Run stop and start helps.

In case of **"Ctrig-Lumi LAN transmission dead"**- check that CT Macintosh in room 301 and H1Lumi Mac (right) are not crashed, CT Monitor is running and the item "Send to Lumi Mac" of "H1LAN" menu has the checkmark and the application **"BeamCurrents"**on the H1Lumi Mac(right) must be running. Try to Quit and Run the application **"BeamCurrents". Remember that rebooting of Macintoshes should be realy extraordinary manipulation.**

4.2 If you got alarm message like "**NO HERA REQUESTS MORE THEN 5 min."** on the window **"Current Status"** of the left H1Lumi2MacII top screen, please phone to the HERA CONTROL room with asking to reboot their Macintosh. If after several minutes the alarm message is not disappeared the following should help: Please, go to room 101 (first floor) find there LUMI MASTER CRATE **(LUMI_DAQ, Rack M05)** then find **SPARC CPU - 3CE/16** board in this crate and push up the RESET switch on this board. The reboot procedure takes ~6 min. so please wait for at least 10 min before call experts if nothing helps.

In case of alarm message**" HERA SERVER TASK IS DEAD "** please follow the same way as just described at this section.

§5. How to operate with Movable Platforms

- sclick the button **"Detector Position"** on the **"Run Control"** window
- click on the two upper red horizontal arrows if you want to move the detectors up (in Working position).
- click on the two lower red horizontal arrows if you want to move the detectors down (in Parking position).
- wait when they stopped ("Stop..." message must change blue flashing arrows)
- do Quit from the application (select menu "Quit" and item "Quit") or button "Quit".
- if you got BBL3 alarm "false_position_of_movable platforms" go to H1Lumi2 Mac (left)
- check position of platforms and status of Lumi measurement they must correspond to current step of shift actions, e.g. at Step1 platforms must be in working positions and Lumi measurements must be enable.

§6. Rates Currents Synchronisation

This item checks the correspondence between bunch currents and bunch Lumi trigger rates. Sometimes (e.g. during injection) "synchronisation problem" is observed when rates change very fast compare to the currents (which are updated only every half minute) - wait some time, don't call experts immediately.

§7. High Voltage (CAEN)

If you got BBL3 alarm and message like "H1_Lumi_HV...CAEN(1)_status" or "H1_Lumi_HV...voltage_NOT_on_CAEN0(1)" go to the H1Lumi Mac (right),

- select item "CAEN" from "Apple" menu or double click on "CAEN" icon on Desktop
- CAEN main control panel with message "Initialisation, please wait" will appears
- Click on the box "OK" and wait about 40 sec
- CAEN control panel will be updated and you can see which crate caused an alarm by colour of the "Status" circle which must be green if HV crate is OK
- Select item **"Read/Set Group"** on menu **"CAEN_HV"**
- fill the field "Crate #" with crate number which caused alarm and click on the button "ON".
- wait a few minutes and then click on "Read" button - all channels should be ON
- Do Quit from the application.