CTD HV "what to do when ..."

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July 21, 1999

CTD HV "what to do when ..."

Normally:

- keep the CTD HV OFF during injection and HERA ramping
- near the end of lumi tuning put the CTD HV in the STANDBY state (if problems see section A)
- once HERA declares lumi, and if the background is O.K., put the CTD HV in the HVON state (if problems see section B)
- if the CTD HV trips, see section C
- if the CTD HV program seems to hang, see section D
- at the end of a fill, before HERA dumps the beams, put the CTD HV back into an OFF state.

WARNING

The CTD HV sends signals to the BBL3 interlock system via input 5 (CTD HV injection veto) and bbl3 input 11 (CTD HV OK data taking veto)

Normally these two switches must be to the right. But before and during any program reload or os9 system reboot they must be locked to the left.

Section A - problems in going from OFF to STANDBY

- If the system is still initialising after reload of the program the double height message at the top of the CTD HV screen will read

  ### CTD HV SYSTEM INITIALISING

  In this state no keyboard commands will be acknowledged. Just wait for 3 or 4 minutes until the initialisation is finished. If the initialisation is not finished after that time, perhaps part of the system has hung - see section D.

- It normally takes about one minute to go from OFF to STANDBY. While this is happening the double height line at the top of the CTD HV screen will read

  ### CTD HV SWITCHING ON TO STANDBY

  This is O.K.

- perhaps there are TRIPS?

  If the double height message at the top of the CTD HV screen reads

  ALL CHANNELS OFF (SOME TRIPS)

  then some of the sections of the CTD HV have tripped.

  To clear these trips type

  clear ↩

  on the keyboard. After a few seconds the double height message should change to

  OFF (! BUT NO DATA TAKING VETO !)

  or

  CTD HV OFF (ALL CHANNELS OFF): O.K.

  If this fails to happen in 10 seconds, try

  clear ↩

  again; if it still fails see section C.

- If there are no TRIPS and the system is in an OFF state, perhaps there are ALARMS?

  > Alarms are reported on the CTD HV screen in the line immediately below the double height top line, as white letters on a black background.
  >
  > Any alarm except
  >
  > CALS OPEN/DATA TAKING SWITCH OFF
  >
  > will prevent the change from OFF to STANDBY. Possible alarms which will stop the change from OFF to STANDBY are:

RED_BUTTON -

the emergency off button has been pushed in. To release it go to the rucksack level A. Between rack A2,06 and A2,07 (just above head height) is a red button. Twist it slightly anticlockwise and it should release, and the RED_BUTTON alarm should disappear.

TRIPS -

some part of the CTD HV system has tripped. If the message persists after clearing trips see section C.

UPS_POWER -

means that the AC mains power supply has failed. The CTD HV program will soon exit automatically.

Solution - fix the reason for the loss of power and reboot/reload the program as in section D. The CTD HV system power is taken from the supplies to racks A1,07, A2,06 and A2,14. Make sure that the power buttons for these racks in the corner of the rucksack are ON.

Make sure the "HAGER" switches at the top of racks A1,07, A2,06 and A2,14 are ON (=UP).

Make sure the 3.15 amp "slowblow" fuse on the back of the ups crates at the tops of racks A1,07, A1,11, A2,10 and A2,14 and near the top of rack A2,06 are O.K. Spare fuses are taped to the back of the crates. Also make sure that the VME crate at about shoulder level in A2,06 has power and the os9 computer in this is running. (This has overall control of the AC mains power distribution to the CTD HV). If this computer is not running see section D.

- Perhaps the os9 computer in the CTD HV crate in rack A2,06 has hung (see section D).

Section B - problems in going from STANDBY to HVON.

- this change normally takes about 1 minute during which the double-height top line on the CTD HV screen reads

  CTD HV RAMPING UP TO HVON

  It is possible that trips might happen during this ramping up, or soon afterwards if the HERA background is high. Then the ramp up will be replaced by ramping down to STANDBY (see section C on trips).

  perhaps the system rejects the

  hvon ↩

  command and complains about ALARMS?

  There must be no CTD HV ALARMS for the

  hvon ↩

  command to be accepted; also any CTD HV ALARM newly appearing while in the HVON state will force the system to a STANDBY or even an OFF state.

  CTD HV ALARMS are listed on the CTD HV display on the line immediately below the double height top line, in white letters on a black background.

  Possible CTD HV alarms are:

CALS OPEN/DATA TAKING SWITCH OFF

Before going to the HVON state the cals should be closed (lower background) and it should be the intention to do a data taking run. This signal sometimes fails. This can cause an unexpected ramp down from HVON to STANDBY and data taking veto due to faulty calorimeter hardware, or faulty calorimeter os9.

Solution: check the DATA TAKING switch, and the calorimeter. If necessary, reboot the calorimeter os9.

RED_BUTTON -

the emergency off button has been pushed in. To release it go to the rucksack level A. Between rack A2,06 and A2,07 (just above head height) is a red button. Twist it slightly anticlockwise and it should release, and the RED_BUTTON alarm should disappear.

TRIPS -

some part of the CTD HV system has tripped. If the message persists after clearing trips see section C.

UPS_POWER -

means that the AC mains power supply has failed. The CTD HV program will soon exit automatically.

Solution - fix the reason for the loss of power and reboot/reload the program as in section D. The CTD HV system power is taken from the supplies to racks A1,07, A2,06 and A2,14. Make sure that the power buttons for these racks in the corner of the rucksack are ON.

Make sure the “HAGER” switches at the top of racks A1,07, A2,06 and A2,14 are ON (=UP).

Make sure the 3.15 amp “slowblow” fuse on the back of the ups crates at the tops of racks A1,07, A1,11, A2,10 and A2,14 and near the top of rack A2,06 are O.K. Spare fuses are taped to the back of the crates. Also make sure that the VME crate at about shoulder level in A2,06 has power and the os9 computer in this is running. (This has overall control of the AC mains power distribution to the CTD HV). If this computer is not running see section D.

• perhaps the ramping up from STANDBY to HVON appears to be in progress, but takes much longer than 1 minute?

In this case perhaps some part of the electronics or CTD HV control program has HUNG - see section D.

Section C - problems with TRIPS.

A TRIP is caused when some part of the CTD (usually a group of sense wires close to the beam) has a higher than usual current, even for an instant, usually due to increased background.

The hardware stops data taking within one microsecond, and the HV supplies for the sectors of the CTD affected are switched off. About one second later the supplies for the rest of the CTD HV begin ramping down to STANDBY (if they were in an HVON state). This rampdown takes about one minute.

Normally after all the CTD reaches STANDBY voltages (i.e. between about 20 volts and 40 volts) the trips are automatically cleared by the program. The HV channels which were tripped are automatically switched on again, and the channels which were off rise towards STANDBY voltages. You should then wait about 30 seconds to a minute till all the voltages on the dav display read about 40/20/30 volts.

(Ignore "you may now type HVON" - this message is obsolete).

Then, if it is thought that the backgrounds are O.K. and there are no other known problems, type

hvon ↩

to begin ramping up to the HVON state again (which takes about 1 minute). When the CTD HV program is sure that all parts of the CTD are at their proper working voltages the state changes to

CTD HV ALL ON : O.K.

and data taking will automatically resume. If the rampdown from HVON to STANDBY never finishes (it should not take more than about 1 minute) it may be that some part of the electronic hardware or HV control program has HUNG (see section D).

- If once the rampdown to STANDBY has been finished the trips do not clear automatically, type

  clear ↩

  on the keyboard and wait for a few seconds to see if trips clear successfully. If this is unsuccessful try typing

  clear ↩

  again.

- If this is also unsuccessful try typing

  off ↩

  to go from the STANDBY state to the OFF state (this takes about 1 minute). Then when the OFF state has been reached, type

  clear ↩

and see if trips clear. If still unsuccessful, a program reload is probably required, go to section D.

- if trips are cleared successfully, but the HV will not ramp up to HVON again, see section B.
- if the program repeatedly trips either during HV ramping up, or very soon (a few minutes) after reaching HVON
  - perhaps the HERA background is too high
  - ◦ check that the HERA collimators are in the correct position and that HERA is otherwise operating normally.
  - ◦ check that ZEUS & H1 LPS are at the right position if inserted and that HERA-B wires are “normal”.
    - if this state of repeated trips has developed slowly over several hours and no other malfunction can be seen, it is worth checking that the CTD gas supply (in the gas room on level 8) is O.K.
    - ◦ Has the ethane run out?
    - ◦ Has the alcohol run out?

• As a last resort you should try exiting and reloading the CTD HV program - see section D.

Section D - "HANGING" CTD HV hardware and program.

HANGING -

During normal operation the CTD HV screen in the control room is updated once every few seconds, although there are a few occasions (other than the initialisation phase) when normal updating is suspended for up to 20 seconds.

If the screen is not being updated.

1. Perhaps the os9 program has hung. Go to the CTD HV computer in the VME crate at shoulder height in rack A2,06. The computer is the MVME147S module towards the left end of the crate. The "RUN" light on this module should be flashing continuously on and off. If it is not, the program has hung - see the section on **reboot** below.
2. If the computer is running O.K., look at the red coloured module in the VME crate labelled "model A200 SY127 controller". The "ack" and "data" leds in this module should be pulsing in a slightly irregular rhythm with a period of about 1 second.

   If they are not pulsing then the "caenet" data connexion is not working. Try pressing the "reset" button on the "model A200 SY127 controller" a few times. If this does not restore the regular pulsing rhythm of the "ack" and "data" leds, then an os9 reboot is necessary; go to the **reboot section below.**
3. **If the two sections above are O.K., it may be that the terminal in the control room has hung. Switch off the mains power for the terminal (a black rocker switch on the base of the terminal) for a few seconds, then switch it back on again. If this restores updating of the display the problem is solved (if it happens often, replace the terminal).If this does not restore the updating of the display an os9 reboot is necessary. Go to the "reboot" section below.**

How to exit the CTD HV program

Before trying to exit the program, lock bbl3 switches 5 and 11 by flicking them to the left, otherwise HERA may lose the beams or bad data may be taken

Then to exit the program type

exit ↩

on the keyboard. This will bring down any HV in an orderly fashion and exit. Then proceed to the **program reload** or **reboot** section below as required.

If the program has hung and will not respond to an "exit" command try typing "control-E" on the keyboard (control-C will not work). Then proceed to the **program reload** or **reboot** section below as required.

If the above “exit” and “control-E” both fail, then any HV which is on must be removed by pressing in the red “emergency-off” button between racks A2,06 and A2,07 in the rucksack. (If there is no HV on you do not need to do this).

Then progress to the section below for **program reload** or **os9** reboot as described.

Reloading the CTD HV control program.

Before reloading the program, make sure bbl3 switches 5 and 11 are locked to the left, otherwise HERA may lose the beams or bad data may be taken.

Only one version of the program is allowed to run, so any presently existing versions must be exited, as in the “exiting” section above. If the CTD HV terminal is not logged in to the os9 computer type

$\hookleftarrow$ (= “return key”)

on the keyboard and a login prompt should appear on the screen.

Then type the login name

super $\hookleftarrow$

followed by the password

?????? $\hookleftarrow$

This should be followed by a few lines of login information.

To reload the CTD HV program, just type the program name. The name of the current version of the CTD HV program is on a notice by the CTD HV control room display, together with any backup versions.

These names are typically “ctdhvxyz” where xyz changes with program version. Type

ctdhvxyz $\hookleftarrow$

to start the program.

The hardware initialisation phase takes about 3 minutes with a few different messages appearing on the screen.

No keyboard commands are accepted until this phase is over.

Rebooting the CTD HV os9.

Before rebooting the os9 make sure bbl3 switches 5 and 11 are locked to the left; othrewise HERA may lose the beams and bad data may be taken.

Make sure there is no HV on any part of the CTD then to exit the program type

exit $\hookleftarrow$

on the keyboard. This will bring down any HV in an orderly fashion and exit. Then proceed to the **program reload** or **reboot** section below as required.

If there is AC power O.K. on the CTD HV in VME crate at shoulder height in rack A2,06 then just press the "reset" button on the MVME147S computer module towards the left hand side of this crate.

This initiates a reboot which takes about 30 seconds. When it is finished, log in on the CTD HV terminal in the control room as described in the section "reloading the CTD HV control program" above.

If there is no power in the CTD HV crate in A2,06 check:

- that the power is ON to rack A2,06 on the power control board in the corner of the rucksack (level A).

- make sure that the "Hager trip" at the back of rack A2,06 for the HV VME crate is UP.(This Hager trip is labelled "Battery backup for HV disc).
- make sure the large orange coloured light, on the front of the crate at head height above the HV VME crate, is LIT. If it is not, call a CTD HV expert - see below.
- If this lamp is LIT, press down and release the "local" switch on the "Wiener module" at the right hand side of the HV VME crate. The "local" green led should come on. Then lift up and release the top "power" switch on the Wiener module. This should switch on the power to the VME crate and a reboot should begin automatically.

  Then reload the CTD HV control program as in the section above.

Getting expert assistance

If problems persist you need expert assistance. Call the person whose name appears on the "CTD on-call" list or the "CTD HV expert" lists on the notice board by the control room door.