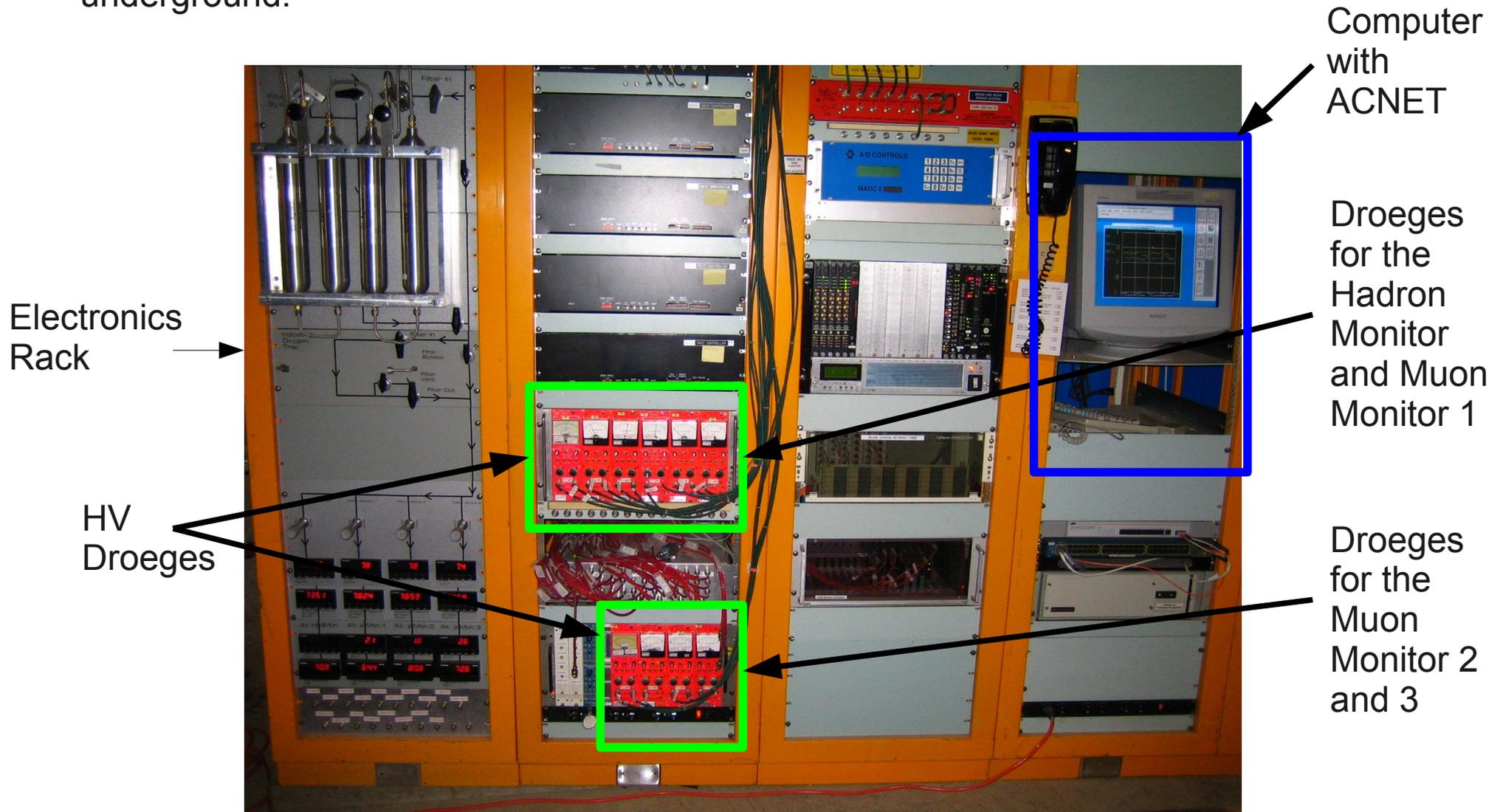


# Instructions for Reseting/Turning ON the Hadron and Muon Monitor High Voltage

- The High Voltage (HV) for the hadron and muon monitors are supplied by Droeges located in the electronics rack at the top of the Absorber Access Tunnel underground.





# 2 HV supplies per Droege

MODEL 6900  
POSITIVE  
DUAL MWPC POWER SUPPLY



E:MM2HV1  
MADC 10

E:MM2HV2  
MADC 11

TRIP AT 80% FULL SCALE  
METER RANGE  
METER SELECT  
HV. ON  
TRIP HOLD  
AUTO RESET

E:MM2HV1  
E:MM2HV2

1V = 100V

CURRENT MONITOR  
TRIP MONITOR  
GROUND ON TRIP

MODEL 6900  
POSITIVE  
DUAL MWPC POWER SUPPLY



10 mV in  
= 1 V out

TRIP AT 80% FULL SCALE  
METER RANGE  
METER SELECT  
HV. ON  
TRIP HOLD  
AUTO RESET

E:MM2HV3

1V = 100V

CURRENT MONITOR  
TRIP MONITOR  
GROUND ON TRIP

MODEL 6900  
POSITIVE  
DUAL MWPC POWER SUPPLY



10 mV in  
= 1 V out

TRIP AT 80% FULL SCALE  
METER RANGE  
METER SELECT  
HV. ON  
TRIP HOLD  
AUTO RESET

E:MM3HV1  
E:MM3HV2

1V = 100V

CURRENT MONITOR  
TRIP MONITOR  
GROUND ON TRIP

MODEL 6900  
POSITIVE  
DUAL MWPC POWER SUPPLY



10 mV in  
= 1 V out

TRIP AT 80% FULL SCALE  
METER RANGE  
METER SELECT  
HV. ON  
TRIP HOLD  
AUTO RESET

E:MM3HV3

1V = 100V

CURRENT MONITOR  
TRIP MONITOR  
GROUND ON TRIP

SPARE  
UNUSED

SPARE  
UNUSED

46960

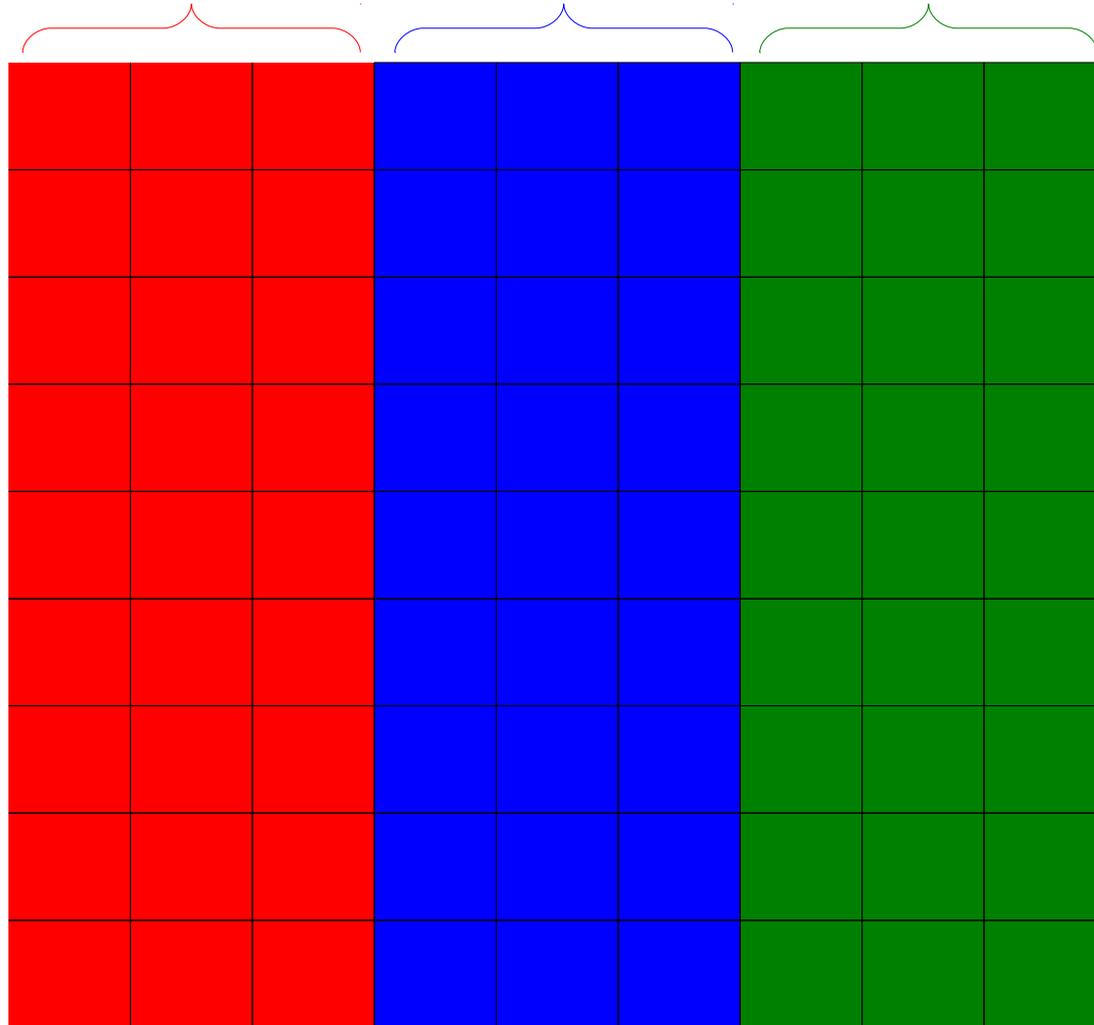


# The Muon Monitors; # = 1,2 and 3

Columns 1, 2 and 3:  
E:MM#HV1

Columns 4, 5 and 6:  
E:MM#HV2

Columns 7, 8 and 9:  
E:MM#HV3





HV indicator lights. Lighted Red means HV is ON. If Light is not lighted means HV has Tripped or HV switch is in the off position.

Toggle for Display to read Droege A or Droege B

Trip/Reset switch for Droege B

Trip Level knob for Droege B

On/Off switch for Droege B

Trip Level knob for Droege A

Trip/Reset switch for Droege A

On/Off switch for Droege A

# Checking the HV Readings

- To check the HV readings, go to page E38 in ACNET.
- Click on MONS and go to page 2
- These are the HV Channels corresponding to the labels on Slides X and Y.
- These are the Settings for each channel.
- These are the current HV readings.

```

PB E38 NuMI Params<NoSets>
E38 HADRON AND MUON MON VOLTS SET D/A A/D Com-U PTools
<PT>+ *SA X-A/D X=TIME Y=N:2FTDSC,N:3PT91 ,N:M1C3CV,N:3LL90
COMMON --- Eng-U I= 0 I= 0 , 20 , 0 , 20
< 2>+ One+ AUTO F= 1800 F= 6 , 28 , 25 , 60
MONS h20 trms kick beam loss bpps horn bnds quad vacu pmpa mtrs

-E:PM101V PM101 Clearing Voltage 0 18.47 Volt * L
-E:PM105V PM105 Clearing Voltage 0 -1.031 Volt * L
-E:PM107V PM107 Clearing Voltage 0 -1.031 Volt * L
-E:PM108V PM108 Clearing Voltage 0 -2.531 Volt * L
-E:PM112V PM112 Clearing Voltage 0 -1.031 Volt * L
-E:PM114V PM114 Clearing Voltage 0 -5.463 Volt * L
-E:PM115V PM115 Clearing Voltage 0 -2.686 Volt * L
-E:PM117V PM117 Clearing Voltage 0 -.854 Volt * L
-E:PM121V PM121 Clearing Voltage 0 -.641 Volt * L
-E:PMTGTV PMTGT Clearing Voltage 0 -.61 Volt * L

-E:MMHV1 HV Supply #1 for Had Mon 90 -90.06 Volt * L
-E:MMHV2 Hadron Mon HV PS 2 90 -89.5 Volt * L
-E:MMHV3 Hadron Mon HV PS 3 90 -88.22 Volt * L
-E:MMHV4 Hadron Mon HV PS 4 90 -87.78 Volt * L
-E:MMHV5 Hadron Mon HV PS 5 90 -90.97 Volt * L
-E:MMHV6 Hadron Mon HV PS 6 90 -90.22 Volt * L
-E:MMHV7 Hadron Mon HV PS 7 90 -89.53 Volt * L
-E:MMHV8 Hadron Mon HV PS 8 0 .094 Volt * L

-E:MM1HV1 Alcvt 1 MMon HV PS 1 300 -295.8 Volt * L
-E:MM1HV2 Alcvt 1 MMon HV PS 2 300 -293.9 Volt * L
-E:MM1HV3 Alcvt 1 MMon HV PS 3 300 -298.5 Volt * L
-E:MM2HV1 Alcvt 2 MMon HV PS 1 300 -299.3 Volt * L
-E:MM2HV2 Alcvt 2 MMon HV PS 2 300 -295.3 Volt * L
-E:MM2HV3 Alcvt 2 MMon HV PS 3 300 -292.3 Volt * L
-E:MM3HV1 Alcvt 3 MMon HV PS 1 300 -296 Volt * L
-E:MM3HV2 Alcvt 3 MMon HV PS 2 300 -295.7 Volt * L
-E:MM3HV3 Alcvt 3 MMon HV PS 3 300 -296.4 Volt * L
    
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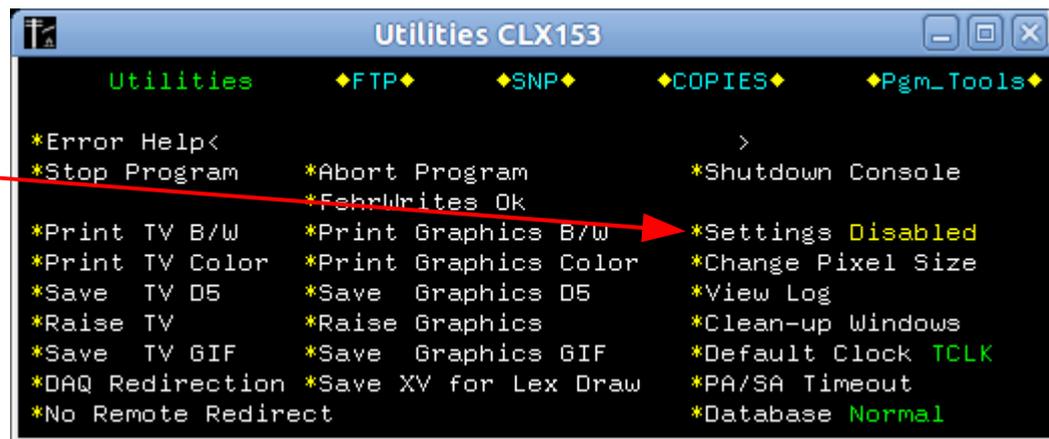
# Procedure for Resetting the HV once tripped

- The HV is set to trip off when a current draw above the trip level setting (knob) is detected. This typically only occurs when there is a power outage. But has been known to occur randomly at other times on individual HV channels.
- **WHEN THE HV HAS TRIPPED YOU MUST GO UNDERGROUND TO RESET IT. YOU MUST HAVE RAD WORKER AND NUMI UNDERGROUND TRAINING and CARRY A POCKET DOSIMETER AND A TLD WITH YOU. CHECK OUT KEYS FROM THE MINERVA CONTROL ROOM.**
- **ALSO, The HV droeges are located in a Radiation Area when the Beam is ON. Resetting the HV and ramping the HV should not normally take longer than 2 hours. However if you believe that your work requires more than two hours of effort, please inform Rad Safety of your presence in the area.**

# Procedure for Reseting the HV once tripped (contd)

- First, check the status of the HV channels using the procedure on slide 8. Then go underground.
- Once underground...
  1. Check the HV indicator lights (see slide 7). If the HV has indeed tripped the HV switch will be in the ON position but the light will not be on.
  2. Once you have confirmed that the HV has tripped, Use the computer in the electronics rack (see slide 1) to access acnet page E38 and find the high voltage Acnet devices (refer to slide 8).
  3. There is a “Utilities” window in the grey rectangular box on the right side of the computer screen. Click on it.

4. Then Click on Settings and select “Enable for 1 Hour”



# Procedure for Resetting the HV once tripped (contd)

5. Set the HV setting (pink box, yellow numbers on slide 8) to 0 Volts. Do this by positioning the cursor over the current setting and just typing over it, press “enter” when done.
6. Now flip the Trip/Reset Switch (see slide 7) down then back up for each tripped Droege. Check that the indicator light lights up.
7. Now ramp the HV up from 0 to 90V for each Hadron Monitor channel and 300V for each muon monitor channel. Note the E:HMHV8 is not used leave this at 0V.
  - Ramp the hadron monitor HV in steps of 10V up to 90V. Enter the setting into the setting column of page E38 just like you did when you set the HV to 0V. After each 10V step check that the reading column (orange box, green numbers on slide 8) is reading close to the setting.
  - Ramp the Muon Monitors in steps of 20V up to 300V. After each 20V step check that the reading column (orange box, green numbers on slide 8) is reading close to the setting.

# Procedure for Resetting the HV once tripped (contd)

- IF THE HV TRIPS WHILE RAMPING. FIRST SET THE SETTING TO 0V on page E38. Then turn the Trip Level knob (see slide 7) to a higher current level. And start over ramping.
  - If the HV trips on this second ramp up, roll back the setting HV to 0 volts again.
  - Then turn the Trip Level knob (see slide 7) to a higher current level. And start over ramping. The maximum setting is at 1 mA, so if the limit is already 1 mA, you cannot increase it any further. Try ramping in smaller Voltage steps < 10V or 20V steps. If the HV trips again then contact an expert for advice in this situation.
8. Once all Hadron monitor channels 1-7 are ramped to 90V(the setting) and are reading back ~-90V and all of the Muon Monitor Channels are ramped to 300V(the setting) and are reading back ~-300V....
- If you increased any of the Trip Levels while ramping turn the knob back to the original level.
  - Disable the Settings in the “Utilities” acnet page.
- You are done.