# DRAFT
# E-787 Technical Note #X
# High Voltage Control with DeMon

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A new high voltage control program has been written which runs on the E787 Silicon Graphics computers, and controls the individual LeCroy 1440 high voltage mainframes by an Ethernet TCP/IP connection to a terminal server.

## 1 Quick Guide to Use

To start the program and load the default high voltage files, log onto bnlku3 as bnlonl. (The program should run on any of our Silicon Graphics machines, as it uses no special hardware, but we recommend bnlku3 because it is usually fairly free, and we have been doing testing and development on bnlku5.) To start the program with all the mainframes currently controlled by DeMon, just press the "High Voltage" button on the DAQ toolchest you get when you log on as bnlonl, or type

```
dm
```

and the graphical user interface should appear. The "Power" push button is disabled for each mainframe until the initialization is complete. For the older 1445 controllers, this takes about two minutes; for the 1445A, a few seconds.

There are several ways of displaying the voltage information. The mainframe "View" buttons allow display by mainframe and module. The subsystem buttons allow display of individual systems, which are determined from the first field in the channel name. Finally, a list of channels can be assembled from a search string, which ignores spaces and case, and accepts * to match any number of characters, and ? to match any single character.

No matter how the channels are displayed, the leftmost button is used to begin a popup dialog in order to make changes to the demand voltage, the backup voltage (which is not used now, but which provides the mainframe a second set of voltages which can be switched to rapidly), and the tolerance. Typing in the text fields for these entries has no effect until the "Apply" button is pressed; then the appropriate change is made to the running program. No change is made to the permanent data base on disk. We suggest permanent changes be made by editing directly the database files.

# 2 Some Details on How DeMon Works

Each mainframe has a single process which constantly reads back the voltage and passes it to DeMon. A cycle through an entire mainframe takes a few minutes for the 1445, and a few seconds for the 1445A. The initialization consists of identifying the type of controller, 1445 or 1445A, checking which high voltage modules are present in the mainframe, and setting the maximum current limits for the mainframe, and loading the demand voltages from the disk file.

The individual mainframe processes communicate with the mainframes via an Equinox terminal server, where the first 10 serial ports have been mapped to socket numbers 3001 to 3010. The serial ports characteristics have been saved in the servers permanent database, including the baud rate, which is 1200 baud for the old 1445 controllers, and 38,400 baud for the 1445A.

Making a change permanent from the program is not really meaningful now; the file that is updated is the file that was used to initialize the program, which `dm` makes by concatenating subsystem files into a single large file whose name includes the date and time. Thus, a permanent change updates a file which will almost certainly never be loaded again. When we have reached a stable situation in which high voltage data are written to tape with data, it may be desirable to eliminate the date and time stamp on these files, and just initialize from a single, standard file (which still could be concatenated from individual subsystem files).

## 3 Files Used by DeMon

DeMon initializes from a single file of voltages in the directory $DEMON_COMMANDS/data which is concatenated from individual system files by `dm`. The individual files are currently hv.rs, hv.bv, tt_p200, hv.co, and hv.misc.new (but may well change in the future).

You can initialize from any valid file by typing

```
$DEMON_PROGRAMS/demon filename
```

which will initialize only the mainframes used in the file. *DeMon will* **zero** *any channels in those mainframes not declared in the file.*

## 4 When Disaster Strikes

When disaster strikes (network failure, power glitch, etc.), the mainframes and the terminal server may become incommunicado. The easiest way to recover is by direct telnet to the individual mainframes. If the connection can't be made, you can power down the terminal server, or, from the terminal server console type

```
set privilege
Password> system
disconnect port 1
```

if mainframe 1 is the problem. After you've done that, you should be able to telnet to it by typing

```
telnet hv787.phy.bnl.gov 3001
```

and a few carriage returns should get you the mainframe's prompt. If it doesn't, there is no alternative but to power down the mainframe. They are set to "cold reboot'," which means they seek the right baud rate, set all the demand voltages to zero, and turn off the high voltage.

If you need to swap an old controller for a new controller, you need to change the speed of the controller by typing, to the terminal server console

```
set privilege
Password> system
change port 2 speed 1200
```

or 38400 for the new (1445A) controllers. For the old (1445) controllers, you also need to make sure the two PROM's U33 and U34 are both Version 2.19.