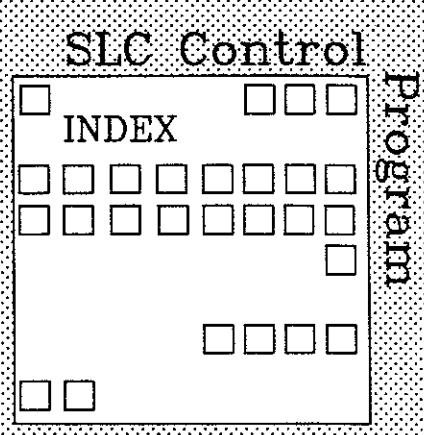
# Index Panel




SLAC's Software Engineering Newsletter

August 12, 1991 | All that Fits is News to Print | Vol. 5, No. 13


## Xwindow Cow Knobs

*July 24, 1991*

**Author:** *Ralph Johnson* **Subsystem:** *All* **User Impact:** *Some*
**Panel Changes:** *None* **Documents:** *No* **Help File:** *No*

### Introduction

For a few months we have had a "knob" panel on the X-COWs which in conjunction with the trackball served as a set of software "knobs". The implementation has now been changed in response to various comments and suggestions from users.

The previous implementation used a single trackball for both cursor control and as a "knob". This required always knowing which mode the trackball was in. It produced confusion at times and one could accidentally change a knob when the intention was to reposition the cursor. A second trackball has now been added for exclusive use as a "knob," permitting the cursor trackball to be used as a standard cursor controller. This also permits attaching and using the trackball without selecting the knob panel.

Additionally, it is now possible to use the keyboard keypad to attach or move the knob trackball to any knob without first detaching it from the current knob. Also, to provide faster switching from knob to knob, a small knob window has been added below the touchpanel to obviate the need to select the knob panel to see the knob status.

The following sections describe how to use the various features.

### Knob Panel

The knob panel functions as it did before with one exception: whenever you attach the knob trackball to a knob, both the ball and the buttons of the knob trackball will always be active. Before, either the buttons, or the ball, or all were active depending on where the cursor was positioned within the knob window when the attachment was made. Furthermore, the left button is now used to attach the trackball to a knob. The center button detaches it.

### Knob Window

The new knob window shows all the knobs and the devices which have been assigned to each one. Whenever the knob trackball is attached to a particular knob, the legend for that knob is shown in large characters along the top of the knob window. If no legend is shown the knob trackball is not attached to any knob.

- You can attach the knob trackball to a knob by positioning the cursor over a knob legend and pushing the left button as is done on the knob panel.
- You can detach the trackball by pushing the center button.
- When the knob trackball is attached to a knob you can move it to another knob without first detaching it by positioning the cursor over the new knob and pushing the left button. This can also be done on the knob panel as before.
- There is a button labeled "RST" which will restore the device value to what it was when the device was selected.
- There is a set of buttons to save and restore a knob value at anytime. Previously one could save and restore one value. Now one can save and restore two different values.
- There is a button to set the gain of the selected knob. It causes a prompt to be issued.

### Keypad

In addition to using the old knob panel and the new knob window, there is now another method to control the knob trackball attachment.

- At anytime you can push a key on the numeric keypad corresponding to number of the knob that you wish to attach to the knob trackball. The trackball will be attached and the legend for the attached knob will be shown in the upper portion of the knob window.
- At anytime you can push the number "9" keypad key and the trackball will be detached from any knob.

### Knob Assignments

The Xwindows cows and calves support the use of 8 knobs. To assign a knob to a device you push one of the assign buttons on a touchpanel as you have always done. However, now you will be prompted for the knob number that to which you wish to assign the device. There are 8 possible knobs. If you respond to the prompt with a carriage return, the number of the knob shown on the button which you pushed will be assigned. If you respond with a value of 0 to 7, that knob will be assigned. This gives you use of knobs 4 thru 7 for which there are no assign buttons on many panels. If you respond with a control-c, no knob is assigned.

### Xwindow Calves

The Xwindows calves continue to work as before.

### Sliders

Sliders have been added along the top of the knob "buttons" to graphically show the device value relative to its minimum and maximum.

## BSY Energy Difference Slow Feedback Loop

*July 17, 1991*

**Author:** *Ed Miller* **Subsystem:** *Accelerator* **User Impact:** *Small*
**Panel Changes:** *Few* **Documents:** *No* **Help File:** *Yes*

Among the Slow Feedback Loops which have (so far) survived the Fast revolution is the BSY e+/e- energy difference loop. This loop has been recently modified with the aim of improving its reliability and usefulness. It can be selected from the Feedback Panel with the [BSY 2BEAM E-P E] button (for which HELP is available).

This loop is designed to adjust the BSY positron-electron energy difference by adjusting the PSK timing. As a consequence, it will change the energy of all the SLC beams in sectors 2-30. We attempt to mitigate this side effect by limiting the magnitude of any single step change the loop makes, with the expectation that other feedback loops will be able to compensate before bad things happen (see description of first scratch parameter below).

The signal for this loop is obtained by uploading the energy measurement information from the (Old) Fast Feedback micro (FB31); specifically, the signal is taken to be

$$\text{signal} = (e^+ \text{ energy} - e^+ \text{ energy setpoint}) - (e^- \text{ energy} - e^- \text{ energy setpoint}) - \text{signal setpoint}$$

Because the magnitude of the command adjustment step may be limited, a large energy difference signal may take multiple loop executions to be corrected. Note also that the signal may be required to be an average of measurements from successive loop executions (see the description of scratch parameters below).

Some of the details of the operation of this loop are controlled by 'scratch' variables, whose function we will now describe.

Input Scratch Parameters:

1. LIM_TPSK

   Specifies a limit on the magnitude of the step change in PSK timing (in nsec) that can be made for any individual feedback correction. It will limit the change in the beam energies and $e^+/e^-$ beam energy difference. A nominal value is LIM_TPSK = 1.0 nsec.

2. SMP_WIND

   Specifies a maximum time window (in seconds) over which sample measurements may be averaged to calculate the value used as the loop signal.

3. SMP_NMIN

   Specifies minimum number of samples which must be available to calculate the signal as an average.

4. SMP_NMAX

   Specifies maximum number of samples which may be used in calculating the signal average. (Value of 0 means no limit.)

   The sample average scheme as follows:

(a) Every scheduled loop execution makes a single measurement which is stored (time-stamped) in a ring buffer (limited to 10 measurements). Measurements accumulate for each loop execution; buffer is cleared if loop actually executes a command.

(b) The signal is calculated as follows:

(i) If SMP_WIND = 0 then only the current measurement is used; no averaging, just as for a normal feedback loop.

(ii) If SMP_WIND > 0 then signal will be calculated as an average of at most SMP_NMAX measurements in the ring buffer; none may be older than SMP_WIND seconds; if at least SMP_NMIN measurements are not available, then no signal is calculated.

Sample averaging only applies to scheduled loop execution; if the loop is single-shot, only the current measurement is used for calculating the signal.

NOTE: if sample averaging is used (SMP_WIND > 0,) care must be taken in selecting values of scheduling times (SAMT and UPDT) and SMP_NMIN to avoid a situation where the signal average is never calculable and hence the control is never executed.

## Slow Feedback Panels Rearranged

*June 25, 1991*

**Author:** *Nan Phinney* **Subsystem:** *Feedback* **User Impact:** *Medium*
**Panel Changes:** *Many* **Documents:** *No* **Help File:** *Yes*

Now that Fast Feedback has successfully replaced many of the old Slow Feedback loops, all of the active Slow loops can conveniently fit on a single Group Select Panel. The panels have been rearranged so that all of the loops which are normally ON in either Feedback or Sample mode are available on the Group Select Panel. Loops which are being commissioned are also included. Obsolete loops have been moved to the second and third select panels in case operations needs to refer to them. They will eventually disappear.

## Fast Feedback Orbit Plots

*July 24, 1991*

**Author:** *Phyllis Grossberg* **Subsystem:** *FBCK* **User Impact:** *Small*
**Panel Changes:** *Few* **Documents:** *No* **Help File:** *No*

Orbit plots (Similar to slow feedback's injection plots) are now available from the fast feedback panels for all loops. These plots display the measured and fitted beam trajectory. Data is obtained through the same acquire-data buttons currently used for obtaining ringbuffer data. The plots are compatible with modelling plots such as steering and injection and once a plot has been displayed, it can be manipulated from the PLOT OPTIONS panel.

Orbit plots are implemented through database-driven buttons, and up to four are available per loop. The scavenger energy display is also implemented using a database-driven button and it is the first plot associated with the EP01 SCAV fast feedback loop. As a result, the user must select the EP01 SCAV LOOP on the fast feedback panel in order to obtain the scavenger energy display (this display is still available from the feed-forward panels). For all the loops, the first database-driven plot appears on the main feedback-select panel; the first three plot buttons appear on the gold orbit panel, and all four plot buttons appear on the canned plot panel.

## Un-LEM

*July 29, 1991*

**Author:** *Tom Himel* **Subsystem:** *Linac* **User Impact:** *Medium*
**Panel Changes:** *One* **Documents:** *No* **Help File:** *Yes*

Several improvements have been made to the Linac Energy Management (LEM) system.

- When you change the LEM Fudge factor, you are no longer prompted for a password or who are you and why are you doing this. These prompts were too burdensome given that changing the fudge factor is a normal part of operating the accelerator.
- To further ease changes of the fudge factor, the SCALE & TRIM MAGNETS button now offers to automatically update the fudge factor to its ideal value (the value which makes the beam energy calculated from klystron energy gains equal to the known BSY beam energy).
- Finally, there is a new button labelled UNDO SCALE & TRIM placed just below the SCALE & TRIM MAGNETS button. This UNDO button sets all the magnet BDES's and EMOD's back to the values they had just before the SCALE & TRIM MAGNETS button was pressed (known as LEMing) and then TRIMs the magnets. The UNDO button must be pressed on the same SCP from which the LEMing was done. UNDO will refuse to do anything if you have not LEMed from the SCP and will issue a warning message if it has been more than 10 minutes since you last scaled and trimmed the magnets. This UNDO button allows graceful recovery in the case where LEMing does something bad like trashing the detector backgrounds.

## New Version of Matlab

*July 16, 1991*

**Author:** *Keith Jobe* **Subsystem:** *Matlab* **User Impact:** *Small*
**Panel Changes:** *None* **Documents:** *Yes* **Help File:** *Yes*

As of Monday, July 22, we have been running the "New and Improved" version of Matlab. Version 3.5g replaces 3.5f with the following features:

- Matlab now supports the "XWindow" graphics protocol. When used on display devices such as Xterminals, VAX workstations or MacXs, the graphs will have a "windowed" flavor. To take advantage of this feature, from inside Matlab, type `xterm` to set your terminal type.
- Several "bugs" have been fixed.
- Matlab function library has been expanded, now matching the libraries available on the Macintosh.
- New tools are available for creation of Fortran or C linkages to existing routines. We use these extensively in attaching to our SLC history and database systems.

Do not throw out your old documents. The existing hard copy VAX Pro-Matlab and Mac-Matlab documentation are substantially correct.

Matlab provides excellent online help. Of special interest is their "post-release" documentation found as help files named README, README2, README3 and README4.

Notes:

- The "old" version of matlab can be reached by executing `@slccom:old_matlab`.
- All the old features should still work.

- The "XWindow" parameters can be set by having a `matlab.dat` file in your login directory. VMS Help for MATLAB DECwindows_Qualifiers gives approximate instructions on the contents of this file. The file is case sensitive, and should contain the fully spelled out commands.

## New Ring RF Displays

*July 2, 1991*

**Author:** *Daniel Van Olst* **Subsystem:** *Damping Ring RF* **User Impact:** *Small*
**Panel Changes:** *Few* **Documents:** *No* **Help File:** *None*

Several displays dealing with the different subsystems in the damping ring RF systems have been added to the NDR and SDR RF panels. Information on these displays is grouped by subsystem rather than by data type. Thus data that was previously scattered across many displays (AMPL, PHAS, digital, and analog) has now been collected into a more coherent format.

From the NDR RF panel, you can choose NDR RF CAVTY DISPLY, NDR RF KLYS DISPLY, NDR RF FBK DISPLY, or NDR RF OTHR DISPLY. Matching displays exist on the SDR RF panel.

See Marc Ross for further details.

## Slcorbit CUD Changes

*July 29, 1991*

**Author:** *Daniel Van Olst* **Subsystem:** *Slcorbit CUD* **User Impact:** *Small*
**Panel Changes:** *None* **Documents:** *None* **Help File:** *None*

There have been many changes to the SLCORBIT display over the course of the last month. Following is a summary of these changes.

- RMS bars are yellow for between 90% and 200% of the tolerance (dotted line) values.
- The display now does not advance to a new region for print requests.
- Emittances and energy spreads have been added to the display. These values are the same as those shown on the Linac emittance display (on the SCP on the main wire scanner panel). Due to insufficient room on the CUD display, the sigmas and timestamps are not shown. One must go to the display on the SCP to see these values.
- The positron yield between TORO:PT01:376 and TORO:DR03:71 is shown.
- The values for the production RTL currents are now taken from toroids instead of from BPMs and should be much more accurate. $e^+$ production is from (TORO:DR03:71), and $e^-$ is from (TORO:DR13:70 - TORO:EP01:175).
- Some people have expressed dissatisfaction with the tolerances for the RMS bars. These tolerances were all specified by physicists. However, in many cases they are 'first-cut' tolerances since this is a new display. Nan Phinney is working to get more useful RMS tolerance values for all areas. Please contact her if you have questions regarding this.

## Exclusion of Access Devices from SDS Displays

*JULY 23, 1991*

**Author:** *Sandra Bes* **Subsystem:** *MCC* **User Impact:** *Large*
**Panel Changes:** *None* **Documents:** *No* **Help File:** *Yes*

The Access Procedures for all regions have been modified to exclude (SIP/DISABLE) from SDS displays devices that are being turned off, and include (SIP/ENABLE) devices that have been turned on.

When a "Turn-off" Access job is submitted, devices that are turned off are also SIP/DISABLED. This will prevent them from appearing as "red" on the SDS CUD display. If a region of the SLC is in access, the only devices appearing behind red boxes are those that have real problems, and not those that have been turned off for access. To see what devices have been SIP/DISABLED select

| DISPLY |
|---|
| DSABLE |
| DEVICS |

on the SDS Control Panel.

Devices are SIP/ENABLED after they are standardized or trimmed. The exceptions to this rule are digital devices which are SIP/ENABLED after they are turned on.

## Beam Scan Software Update

*August 6, 1991*

**Author:** *Linda Hendrickson* **Subsystem:** *FF* **User Impact:** *Small*
**Panel Changes:** *None* **Documents:** *No* **Help File:** *None*

Beam scan software has been updated to improve handling of beamstrahlung and luminosity monitor data.

1. The autocollide display now displays gaussian fit parameters for both beamstrahlung and luminosity monitor data. Previously if luminosity monitor data was used the beamstrahlung fits were not printed.
2. The truncated beamstrahlung width, peak and pedestal have been added to the autocollide display. These parameters are useful for estimating individual spot sizes. The truncated width is determined by taking the spread of the data which is truncated to within 2 sigma of the center.
3. Correlation plot pseudo-secondaries have been added for BSCN variables to support luminosity monitor fit parameters and truncated beamstrahlung values. New beamstrahlung pseudo-secondaries are named EB_TRSIG, EB_TRPK for electrons and similar names for positrons. The new pseudosecondaries for luminosity monitor are EL_OFFST, EL_PEAK, EL_CENTR, EL_WIDTH, EL_WIDSQ, EL_CHISQ, EY_POSIT and similar names for positrons.
4. Currently a south (electron) luminosity monitor is in use, and it is expected that the north (positron) luminosity monitor will soon be available.

## 'BPM CHOOSE NEW GOLD' Button Removed

*July 2, 1991*

**Author:** *Daniel Van Olst* **Subsystem:** *Configurations* **User Impact:** *Small*
**Panel Changes:** *Few* **Documents:** *No* **Help File:** *Yes*

The CHOOSE NEW GOLD button on the BPMO GOLD REFERENCE ORBIT panel has been removed.

This action was prompted by the fact that many people were using this button instead of the more appropriate UPDATE GOLD PARTIAL button. CHOOSE NEW GOLD changed the gold orbit for the ENTIRE region, while UPDATE GOLD PARTIAL does so for only part of a region. It has been rare in the last few months that an entire BPM orbit required regolding, and thus very often a person regolding part of an orbit would erase (or change!) the remainder of the gold orbit by using CHOOSE NEW GOLD instead of UPDATE GOLD PARTIAL.

No functionality has been lost; if in fact an entire gold orbit needs to be replaced, UPDATE GOLD can be used with the entire region explicitly specified. This should reduce the number of unintentional updates of entire regions.

To reflect the fact that the button formerly labeled UPDATE GOLD PARTIAL is now used for full as well as partial updates, it has been relabeled simply UPDATE GOLD.

## Automatic Deletion of Old Scratch Configurations

*July 29, 1991*

**Author:** *Daniel Van Olst* **Subsystem:** *Configurations* **User Impact:** *Small*
**Panel Changes:** *None* **Documents:** *None* **Help File:** *None*

Automatic deleting of old scratch configurations is expected to begin on the MCC VAX in the next couple of months. This will keep the control disk from filling up due to the large number of scratch configurations.

The plan is to begin well after the upcoming SLC shut down. This will allow operations and other concerned parties to move their favorite SCRATCH configs to NORMAL. The exact date when the old scratch configs will begin to be deleted will be announced in an upcoming Index Panel Article.

It is planned that scratch configs older than 1 month (31 days) will be deleted on a nightly basis on both MCC and SLC. Configs are backed up on tape; however, once a config is deleted it is cumbersome to retrieve from backups and insert back into an index, so really important configs should be in NORMAL.

Scratch configs older than 10 months are currently being deleted on the SLC VAX. All those using configs on the SLC VAX should make sure that their favorite configuration files are moved to the NORMAL directory.

## SCP Graphics Font Changes

*August 1, 1991*

**Author:** *Ed Miller* **Subsystem:** *SCP* **User Impact:** *Small*
**Panel Changes:** *None* **Documents:** *No* **Help File:** *No*

Along with the relatively recent support for a number of new graphics options (such as X windows, the Talaris printer, and scaleable printed graphics) have come some unwanted anomalies with graphic text. Some examples of such anomalies are displays developed on an X-windows CALF which don't show properly on COW screens, and printed output which may have truncated or overlapped characters.

We expect to solve most of these problems (without introducing new ones) by a series of co-ordinated changes: adding fonts to X-windows that match the COW font spacing (in x); expanding the X-windows graphics display slightly (in x); changing the default character size for graphics; changing the algorithm for selecting fonts on the Talaris and Tektronix (color) printers to choose the nearest smaller size, rather than the nearest size; and increasing the default aspect ratio (x/y) for printed plots from 1.2100 to 1.3333.

Another change that will be made at the same time is to mix a little black in with the yellow color on the color printer in order to make yellow lines more visible.

We plan to release these software changes on August 6. Those of you who run SCP's on your VAX workstations or MACs are encouraged to load the new expanded set of fonts before that time. The old SCP software should still work fine with the expanded set of fonts. If you do NOT load the new fonts, then running the new SCP software will be accompanied by an error message at startup (repeated twice): "*** UG SDDXWDO: specified font not found". Even so, the SCP displays should still work reasonably well.

On a VAX workstation the fonts can be loaded by rebooting (or, with help from a privileged user, by restarting your DECwindows system).

To update the fonts on a MAC (and get the latest version of MacX as well) carry out the following procedure:

Select the **Chooser** from the apple pull-down menu. Click on the **appleshare** icon and scroll down on the list of apple talk zones until you see **transition bridge**. Click on **transition bridge**. Now double click on the **VAXshare on SLC** file server, click on radio button **guest** and **OK**, and then double click on the **MCC Public** volume. This will cause an **MCC Public** icon to appear on your desktop. You can now exit from the **Chooser**.

To copy the files, open the MacX folder on your machine. Double click on the **MCC Public** icon. Open by double clicking the **MacX SCP** folder. Copy application **MacX** from folder on MCC to folder on MAC containing MacX. Replace item. Pull your existing folder **MacX Fonts** to trash. Empty trash. Copy MCC folder **MacX Fonts** to your MacX folder. Sophisticated users will note that only the **terminal** folder has changed.

Note that a general discussion on the MacX SCP can be found in the February 7, 1991 (vol. 5, no. 3) issue of the Index Panel.