Xwindows Knobs

Author: Ralph Johnson  
Subsystem: All  
Panel Changes: None  
Documents: Yes  
User Impact: Some  
Help File: Yes

Software knobs are now supported by Xwindows COWs and CALFs. This facility is available from a dedicated knobs panel and permits the use of a mouse or trackball for controlling the setpoint of devices.

Knob Assignment

Prior to selecting the knobs panel, devices may be assigned to knobs using the standard touch panel buttons as before.

Knobs Panel Selection and Return

You may select the knobs panel from any other panel by clicking the center button of the mouse. To return to the previous panel, click on the return button in the upper right hand corner of the panel, or hold down the center button and push the right button. To select the Index panel, hold down the center button and push the left button.

Knob Attachment

There are 8 knobs on the panel. They are the lower 8 rectangles or buttons on the panel and are numbered 0-7. To use the mouse to control one of these knobs you must first attach it to a knob. To attach the mouse, position the cursor in a knob button (rectangle) and click the center button. The cursor will disappear and a small yellow rectangle will appear. The mouse can then be used to control that device. To detach the mouse, click the center button again. The cursor will reappear and you can use it as you normally would. You must detach the cursor to move to another knob or to use any other buttons on the panel. It is a good practice to always detach the mouse when you have finished making a change so that if you accidentally move the ball or attempt to move the cursor, you will not change a device value.

Knob Control

There are several ways to change the value of a knob with a mouse or trackball:

- If the cursor is attached to the left third of a knob button, then moving the mouse will produce a change. Moving it up or to the right increases the knob setting. Moving it down or to the left decreases it.
- If the cursor is attached to the right third of the knob, then pushing the right or left buttons will produce a change. If you hold down a right or left button it will auto repeat producing a continuous change.

- If you attach the cursor to the middle third of the knob button, you can cause a change by either moving the mouse or using the buttons.

An up or down arrow located within the knob rectangle will indicate the last direction of knob change as well as which third of the knob button the mouse is attached to.

Other Panel Buttons
The panel has buttons to set the knob gain and to save and restore knob values. When clicking on these buttons the action will be applied to the last knob which was attached as shown by the arrow to the left of the knobs. To move this arrow to a different knob double click the center button on the knob you wish to select.

Gain Buttons
When a knob is assigned on a panel (e.g. magnets) where you select a device, a gain for that knob is set within the software facility which handles the device. The default value for this gain is 1. You can also select a gain for a knob on the knob panel. This gain is shown to the right of the knob. Presently it is multiplied by the gain selected within the facility (e.g. magnets) when the knob was attached. It is advisable to always use the default gain of 1 when assigning a device to a knob so that it will be more straightforward to use the gains setting on the knobs panel.

Save and Restore Buttons
Knob values are saved under 3 different conditions:
- when a device is assigned to a knob
- when the knobs panel is selected
- when you click the save button on the knobs panel.

There are buttons on the knobs panel to restore a knob to the values that were saved under each of the above conditions.

Help
There is a help button for displaying a help file on the graphics screen.

General Comments
Except while the mouse is attached to a knob you may use either the left or center button to make a selection (click on a button). Remember that while the mouse is attached the cursor is not present and there will be a small yellow arrow or rectangle within the attached knob. When the mouse is not attached to a knob the cursor is visible and there is no yellow rectangle or arrow within a knob.

MacX COWs
At present mouse or trackball movement does not work on MacX COWs as there is an unsolved problem related to the Mac Xwindows server. I would suggest only attaching the mouse to the right third of a knob button and that only the buttons be used for changing knob values.

If there are other problems related to cursor positioning when using the knobs panel, you need to check that the cursor motion control is enabled. After selecting the SCP icon, select the misc. preferences from the edit pulldown window and make sure that the “cursor movement under client control” is enabled.
Online Lattice Matching - Version 2

Author: Allison, Kleban, Woodley
Panel Changes: yes
Subsystem: OPTICS
Documents: yes
User Impact: yes
Help File: yes

The second version of online lattice matching (popular name: beta matching) is now available on MCC. Lattice matching provides online software for performing optical matching and beam parameter optimization for various SLC beam lines. Panels are provided that allow the user to specify desired values for beam and lattice parameters at many locations. Fitting inputs are sent to the modelling program (COMFORT) which then calculates the strengths of the selected set of magnets needed to achieve the desired fit values. Fitting results from the output of COMFORT may then be displayed and used to trim magnets and update the database. Note that lattice matching using DIMAD is not available.

Enhancements in the new release of the software include:

- Implementation of matching results
- Simplification of the user interface
- Addition of helpful information to the fit point, variable, and function displays
- Capability to specify a wire monitor for initial conditions
- Many bug fixes

The lattice matching panels can be reached from either the MODEL APPLICATIONS or OPTICS panel. As in the case of the OPTICS panel, a model sub-system must first be selected on the MODEL APPLICATIONS panel before lattice matching work can be performed. The main LATTICE MATCHING panel provides buttons for specifying canned setups, setting up and initiating a modelling run, and displaying and implementing modelling run results.

The MATCHING SETUP panel is accessed from the main LATTICE MATCHING panel, and it provides buttons for specifying fit point locations for the selected model section and the function value(s) (i.e. Twiss parameter) to be matched at those locations. A summary of fit point locations is determined from the appropriate skeleton deck and displayed when this panel is entered. A summary of all available functions and their current database and design values can also be displayed.

From the MATCHING SETUP panel, the VARIABLE SELECT panel can be brought to specify variables used for fitting. The user may specify all variables in the selected model section that COMFORT will use to achieve the desired function values. A display of available variables, determined from the appropriate skeleton deck, and their minimum, maximum, and current values is shown when the panel is entered.

The most important new feature is the implementation of the matched results after a satisfactory solution has been found. The following steps are performed using output from the last matching run on the current SCP when the IMPL-MENT MATCH button is pressed:

1. The user is queried to verify that implementing the match is truly the action desired. If Twiss parameter discontinuities could result (based on the selected model SUB-SYSTEM), warning messages are provided, and the user is given another chance to abort the implementation.

2. The user is queried for a name, password, and reason for the action. Note that an invalid password aborts any further action.
3. The computed magnet strengths are converted to real power supply set points for each magnet (variable) used for matching. This includes the effects of shunts, trim windings, magnets in series, etc. Subsequently, the set points and KMOD values are updated in the database and trim commands are issued. Note that if there is any error in updating the database for any magnet, no magnets are trimmed and the next step is not performed. Information messages are logged for each model section.

4. The new values of the Twiss parameters are updated in the database for each model section. Informational messages are provided as each model section is processed.

Existing buttons and software on the OPTICS panel can be used to plot Twiss parameters from the matching run, print and save the COMFORT echo file, print the COMFORT output file, and go to the MODEL CHANGE LOG panel.

**Magnet Panel Cleanup**

*Author: Chris Charbonneau*
*Subsystem: Magnets*
*Panel Changes: Many*
*User Impact: Small*
*Documents: Yes*
*Help File: Yes*

February 20, 1991

A major cleanup of the magnet panels is nearing completion. All of the panels for magnets or other analog control devices have been modified so that each panel consistently selects the appropriate set of devices and Display Group. In addition to improving maintainability, this will cause every panel to select the correct devices regardless of the path used to reach it.

These changes should be mostly invisible to the user with a few exceptions. Certain panels forced a selection of ALL* units when the panel was entered causing a user to “lose” the device selection on a return from the Diagnostic Panel. This annoyance has disappeared. Minor software changes now select ALL* only if the currently selected device does not exist in the current Display Group. Problems where the Display Group was not correctly set after a sequence of panel RETURNs should also be eliminated along with other even more obscure pathologies.

With a cleanup of this magnitude, it is inevitable that some errors may occur that are not caught by routine testing. If a problem appears, please notify me immediately (x3316 or CAC@SLACSLC) so it can be corrected.

**Wire Scan Software Update**

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

February 19, 1991

Several improvements have been made to the wire scan software to add flexibility and fully support the new wire installations.

To aid in commissioning and diagnostics, the database for each wire may now specify up to 11 channels of GADC or beamstrahlung data to be read out during a scan. This data may also come from micros other than the micro controlling the wire itself. Previous software allowed readout of three channels, all of which had to be in the same micro. After a single wire scan, all of the readouts are available from the correlation plot panels.
The readout channel which is used for the gaussian fit is selected by an index in the database rather than from the eight-character mnemonics for each channel. This makes it easier to switch channels if a particular signal is not usable. The last characters of the channel names are used to indicate that the data should be normalized to beam intensity. If the channel ends in “.R” then the software normalizes the readout value to the beam intensity and provides the normalized value in the correlation plots with the last two characters of the mnemonic changed to “.N”.

The wire software now fully supports scans for the scavenger electron beam. Separate scan ranges are provided for the scavenger and production electron beams and results for single scans, skew and emittance measurements are saved in distinct database locations.

Some of the new scanners have wires mounted at angles other than 45 degrees from the horizontal. This is now correctly handled by the software.

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**Device HSTA Change Log**

<table>
<thead>
<tr>
<th>Author: Mike Zelasny</th>
<th>Subsystem: Accelerator</th>
<th>User Impact: Small</th>
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<tbody>
<tr>
<td>Panel Changes: None</td>
<td>Documents: No</td>
<td>Help File: No</td>
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</tbody>
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When you mark a device such as a Magnet or Klystron on line, do you wonder why the device was marked off line in the first place? Now, when you toggle the status of a device (for example by pressing the [Magnet Status] button,) the previous state change information is displayed on the message window.

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**History Plots**

<table>
<thead>
<tr>
<th>Author: Ralph Johnson</th>
<th>Subsystem: All</th>
<th>User Impact: Small</th>
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</thead>
<tbody>
<tr>
<td>Panel Changes: None</td>
<td>Documents: No</td>
<td>Help File: Yes</td>
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</tbody>
</table>

Previously one could respond to a prompt for the beginning or ending time of a history plot with “today” or “yesterday”. You may now respond with “today±hh:mm:ss” or “yesterday±hh:mm:ss”. For example entering “today + 2” means 2 o’clock this morning. It is also possible to enter “tomorrow±hh:mm:ss” for the end time of a plot. It should be noted that all times are truncated to minutes.