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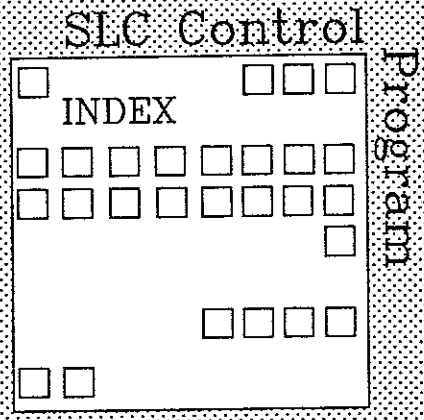
SLAC's Software Engineering Newsletter



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Linac/Injector MPS

March 14, 1990

Author: *MPS Task Force*†
Subsystem: *Accelerator*
User Impact: *Large*
Panel Changes: *Few*
Documents: *Some*
Help File: *Yes*

During this downtime, the status and control of Linac/Injector Machine Protection System (MPS) signals are becoming available on the SLC control system. The status of these signals will continue to be available on the PDP-11 system; however control will only be available from the VAX. Sectors 25 through 30 are currently functional and other sectors are being wired.

There is one new touch panel and a new summary display that allow one to determine the status of the Tone Interrupt Unit (TIU) and its inputs and to perform resets. This panel can be reached by selecting [MPS PPS ACCESS] from the main index panel. Next select [LINAC MPS PANEL] The summary display is automatically generated when the Linac MPS Panel is selected. This display consists of boxes for a geographical region (e.g. LI22). The boxes are color-coded red to indicate that one of the inputs to the TIU contained in that region has faulted or green if all inputs to the TIU are OK. The text below each box displays the state of the TIU for that region. If the TIU for that region is interrupted, the word INTERRPT will appear in red below the associated box. Otherwise the word NO INTR will appear in green below the box.

From the touch panel one can select a region of interest and then display either all the inputs to the TIU for that region [DISPLY ALL INPUTS] or all the faulted inputs to the TIU [DISPLY ALL FAULTS]

There are both hard and soft trips to the TIU. For hard trips one is required to fix the item before the TIU will be made up in that sector. For soft trips to the TIU (VVS and subbooster not OK), one does not need to fix the item for the TIU to be made up; instead, one can reset the input relay for that sector's TIU by using [SB&VVS TIU IN RESET] Select [HELP] for more information on hard and soft trips.

† B. Malamud, J. Silva, N. Spencer, K. Underwood, D. Van Olst.

To reset the Tone Receiver after a fault has been cleared, use the [RESET ILCK PATH]

Currently we do not have status available for all of the items that can trip the TIU in a particular region. Help is available for each region which explains those additional items that can cause the TIU to trip. Select the region of interest while the HELP button is lit.

Linac PPS

March 14,1990

Author: *N. Spencer, B. Malamud* **Subsystem:** *Accelerator* **User Impact:** *Large*
Panel Changes: *Many* **Documents:** *Some* **Help File:** *Yes*

During this downtime, the status and control of Linac/Injector Personnel Protection System (PPS) signals are becoming available on the SLC control system. The status of these signals will continue to be available on the PDP-11 system; however control will only be available from the VAX. Sectors 22 through 30 are currently functional and other sectors are being wired.

There are several new touch panels and a new summary display that allow one to determine the status of the Linac PPS system and its inputs and to perform control operations. The new panels can be reached by selecting [MPS PPS ACCESS] from the main index panel. Next select [LINAC PPS PANEL] The summary display is automatically generated when the Linac PPS Panel is selected. This display consists of boxes for a geographical region (e.g. LI22). The boxes are color-coded red to indicate that one of the inputs to the PPS System in that region has faulted or green if all inputs to PPS are OK. The text below each box displays the state of PPS for that region. If the sector is not secure, the word NOT_SEC will appear in red below the associated box. Otherwise the word SECURE will appear in green below the box.

From the touch panel one can select a region of interest and then display either all the inputs to the PPS for that region [DISPLY ALL INPUTS] or all the faulted inputs [DISPLY ALL FAULTS]

Select [PPS CONTRL PANELS] to access a panel for each region that will allow control of the hatch, fan, keybank release, and panic circuit reset.

Alias Names for Digital Components

March 14, 1990

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

Alias names (also known as "common names") are now available for digital device components. Up until now, digital devices (such as MPS, PPS, PROF, etc.) were allowed to have alias names (like MPS STATUS), but the components that comprised them (such as TIU, FAST_VLV, SLOW_VLV, etc.) were not.

Digital device components may now be given alias names. However, this requires editing of the database and a DBGEN. The component alias names, separated by commas, are added to the current contents of the ALNM secondary of the digital device in question. Everything up to the first comma then becomes the device alias name. Everything between the first and second comma becomes the alias name of the first component in the digital device, etc. (The device alias name is the default component name in case no alias is specified for a component.) Many new names will become available after the next DBGEN.

Digital Device State Changes in Error Log

March 12, 1990

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

Digital device state changes are now being recorded in the error log. This is occurring on a log-only basis (state changes are not reported on COWS or CALFS, unless there is some problem).

The format of the *digital state change* message in the error log is:

```
Command sent to set PRIM MICR UNIT COMPONENT# COMPONENTALIAS to STATE
```

For example:

```
Command sent to set PROF CA11 45 CAMERA 5OPR2 to OFF
```

(Please note that a message of this type appearing in the error log just means that the VAX attempted to send a command to the micro to change a digital component state; it does not guarantee that the micro received the command, or that the micro was able to make the digital device change state).

If you wish to examine the error log for digital device state changes, use ERRLOG with /FACILITY=STAT and /ERRCODE=DOD_SET.

New BPM Micro Software to Support Fast Feedback

March 15, 1990

Author: *Tony Gromme* **Subsystem:** *Micros* **User Impact:** *Small*
Panel Changes: *None* **Documents:** *No* **Help File:** *None*

The BPM software in the micro has been entirely restructured to support the new generation of Fast Feedback. This has been a major project under development for more than a year. With the older version of the software, a feedback micro such as FB31 had to use dedicated BPM processors because when feedback was active, the processors could not be read by any VAX applications. BPM calibration was also very clumsy because the feedback had to be suspended before the calibration and restarted afterwards, with the result that it was never done often.

With the new BPM software, a Fast Feedback loop requests the micro to read data on every pulse of a specified beam code, rather than only on user request (YY). The micro maintains a "Ring Buffer" of data from recent pulses to be processed by feedback. When a VAX request is received, if the requested data is already being read for feedback, then the same data is routed both to feedback and to the VAX. In this way, feedback continues undisturbed regardless of VAX requests, and data from the same pulse may be available to both users. If a VAX application requests data not compatible with the feedback ring buffer (calibration or timing diagnostics or devices not read by feedback), then feedback simply receives no pulses until the VAX request is complete.

This new version of the BPM micro software has been used by the IP micro FB69 for several months and successfully handled both feedback and VAX requests during commissioning of the IP position feedback in November and in January. It is also part of the new PT01 positron target control micro. Recently, it has been tested successfully in an assortment of micros throughout the machine. After final testing next week, it will become the standard version of BPM software in all of the micros. This should have no immediately visible impact on the user but will pave the way for fast feedback development over the next months. Note that FB29 and FB31 will also run the new software but they will not immediately be upgraded to take advantage of it.

Improved BPM Buffered Data Acquisition

March 15, 1990

Author: *N. Phinney, T. Gromme* **Subsystem:** *BPMs* **User Impact:** *Small*
Panel Changes: *Few* **Documents:** *No* **Help File:** *None*

The BPM buffered data acquisition package has proved extremely useful in diagnosing jitter problems throughout the machine. This package has recently been expanded to allow more data points using the new multibuffer message protocol with the micros. Several further enhancements have been added to increase its flexibility and user interface.

1. User Interface: At present, the user pushes the Setup Acq button and enters # of BPMs, # of measurements, and then the Micro and Unit for up to 4 BPMs. To modify any value, the user must Carriage return through all the prompts. The new interface provides a single button to Enter # of measurements, and 8 buttons to select individual units to sample with the selected unit displayed on each button. The Enter unit software incorporates some of the flexibility of the CRR plots and allows the user to change eg. only Micro or only Unit if desired.

2. Support other BPM-like devices: The present software only samples BPMs. It has been expanded to allow the user to select TOROs, BSMDs and Gated ADC (GADC) devices such as SLITs, GAPMs, ARRYs and WIREs. Any of these devices may be selected with the Unit # buttons.

3. Plot vs PulseId: To view the time structure of the signals, the existing software provides a plot of Data vs Sample number. If the acquisition is interrupted by a time-scheduled YY or rate limiting, the Sample number does not reflect the true time base. This has been eliminated by having the running PulseId number returned by the micro and used to define the X axis of the plot. Missing pulses will now show up as such and the correct time structure will be maintained. A new button, Toggle Time Base, allows the user to select either time in Seconds or Pulse Id number as the X axis.

4. Dump to Correlation plots: Tom Mattison requested the capability of dumping data to the Correlation plots for further analysis. The Correlation plots only allows a maximum of 100 data points so only the first 100 samples may be stored. The button Dump Data → CRR will fill up to 60 Correlation sample variables with the buffered data.

Flexible support for all BPM-like devices has required a change in the communication protocol between the VAX and micro software for reading BPMs. This necessitates a coordinated release of VAX software with a reboot of all micros. This will be scheduled with operations at a convenient time early next week, after which the upgraded Buffered Data package will become available.