Index Panel

SLC Control Program

INDEX

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Fast Feedback Gold Orbit Upgrade

June 29, 1992

Author: *Hendrickson, Grossberg* **Subsystem:** *Fast Feedback* **User Impact:** *Moderate*
Panel Changes: *One* **Documents:** *No* **Help File:** *Yes*

Recent changes to the fast feedback gold orbit function provide enhanced functionality and fix some problems. Two new buttons have been added to the gold orbit panel: ACQUIR ACTS ONLY and ACQUIR BEAM ONLY. These new buttons are alternatives to the existing ACQUIR GOLD ORBIT function.

ACQUIR ACTS ONLY allows update of actuator values while retaining measurement values of the currently loaded gold orbit. For LINAC and other loops for which gold orbits are not frequently saved, it is recommended that ACTS ONLY orbits be saved and loaded periodically in order to update the actuator values. This will allow the RESET ACTUTR function to restore the beam using recent actuator settings.

ACQUIR BEAM ONLY updates gold orbit measurements associated with one beam while retaining the previously loaded gold orbit for the other beam. This is useful for the LTR energy loop, particularly in cases where the electron beam is present and there are no positrons. The software provides the operator with a list of all beams associated with the loop and requests a yes/no response as to whether or not each beam should be updated. For beams with a yes response, measurement values are updated; for beams with a no response, measurement values of the currently loaded gold orbit are retained. For all beams, actuator values are updated.

Once data is acquired with either of these new buttons, it is displayed and can subsequently be saved as a new gold orbit.

Previously, gold orbit software did not properly handle bad measurement status. In the past, if a gold orbit was saved while there was no beam or while a BPM was OFFLINE, the software would typically save a gold orbit value of 0.0, even though for some feedback loops this would not be an ideal value. The software has been modified so that bad element statuses of acquired (or updated) measurement data are retained when a gold orbit is saved; and subsequently, when the gold orbit is loaded, feedback does not use those measurements with bad statuses. Bad statuses for individual measurement elements are reflected in the PLOT ORBIT displays and on the MEAS GOLD button on the Measurement Vector panel. Furthermore, when a SAVE GOLD request is made, bad statuses are counted and, if the count exceeds the number allowed per beam, the operator is warned and given a chance to abort the save. Should the data be saved despite the bad count, any subsequent loading of that gold orbit will result in a warning message.

LEM Improvement

June 15, 1992

Author: *Tom Himel* **Subsystem:** *Linac* **User Impact:** *Small*
Panel Changes: *None* **Documents:** *No* **Help File:** *No*

LEM calculates the beam energy at each magnet in the Linac and adjusts the quadrupoles to maintain a constant focusing strength. It uses the sub-booster phases in this calculation. Four of these sub-boosters have extra phase shifters which are controlled by fast feedback loops (LI17, LI18, LI27, LI28). The present settings of these phase shifters are read out by the Analog Status system.

In the past, LEM obtained these phase readings from the database. They could be up to 5 minutes old since the analog status job only updates the database once every 5 minutes. Now LEM first forces the analog status job to read the phases and update the database. In this way LEM always has a current phase reading.

Frequently operators remove a klystron from the beam and then immediately run LEM. In the past, LEM wouldn't know about the changes fast feedback made to the phase shifters. It would thus use a wrong fudge factor and get all the quadrupole strengths wrong by about 0.5% which may have been enough to move wake-field tails and change the SLD backgrounds. This should now work better.

The actual change was made to the subroutine KLYS_GET_ENERGY. This is used not only by LEM but by essentially all applications that need to know the energy profile. In particular, the KLYSTRON ENERGY DISPLAY available from the KLYSTRON ALL* DISPLAY panel and all the modelling software (COMFORT, DIMAD, BDES to KMOD, *etc.*) will now perform this analog status update.

Glossary of SLC Acronyms and Terms

July 2, 1992

Author: *Philippe Argouarch* **Subsystem:** *SLC* **User Impact:** *None*
Panel Changes: *Yes* **Documents:** *No* **Help File:** *No*

Online help is now available for a glossary of SLC terms from the SCP. You can examine more than 800 definitions of acronyms and common terms related to the control and operation of the SLC. The setup is similar to the Phone Panel on the SCP, and can be reached with the GLOSSARY PANEL button located at the top of the OPERATOR MAINTENANCE INDEX panel.

Improved Display of Fast Feedback Element Status

June 29, 1992

Author: *Hendrickson, Grossberg* **Subsystem:** *Fast Feedback* **User Impact:** *Small*
Panel Changes: *None* **Documents:** *No* **Help File:** *Yes*

Fast feedback software has been improved to show decoded status strings in addition to hex values for individual elements on the Display Vector. This is especially useful for determining why measurements have been rejected. In addition, new vector element statuses have been defined for fast feedback; these are shown on the **Display Vector** and the **Status** displays. Specific statuses defined for each element type are listed in the following table.

Element	Color	Status	Description
Measurement	yellow	SUMLOW	marginal counts above pedestal
		MESMIS	measurement not received from BPM job
	blue	VETOED	Klystron VETO system (could be SBD)
		BADGLD	bad gold orbit; cannot use measurement
	red	NOGATE	no bpm data available
		SUMLOW	too few counts above pedestal
		OUTLIM	value outside FELB limits
		FILT	rejected by filtering software
		2MNYBD	too many other bad measurements
State	yellow	OUTTOL	value outside FELB tolerance
		NOBEAM	too many bad measurements or missing measurements
Actuator	yellow	OUTTOL	value outside FELB tolerance
	red	OUTLIM	value outside hardware limits
		BADACT	magnet is not owned by feedback or magnet is not calibrated

GOOD, OK, OFFLIN or SICK are still displayed for all element types when a more specific status is not applicable.

New Protection for IP Wires

July 1, 1992

Author: *Hendrickson, Phinney* **Subsystem:** *Final Focus* **User Impact:** *Small*
Panel Changes: *None* **Documents:** *No* **Help File:** *No*

The software which moves the IP wires has been modified to add extra protection against wire breakage. When an IP wire is inserted, the opposite plane waist knobs for both beams are automatically detuned by 2.5 cm. When the wire is moved OUT, the waists are moved back -2.5 cm. The dumpers are fired while an IP wire is moving and the beam rate is limited to 10 Hz after each change of position while the wire is inserted. This allows the user to check that the beam is not parked on the wire before going to high rate. As a result of these modifications, the wire will no longer be inserted automatically if a user requests a scan when the wire is Out. This feature is not normally used, so the change should not cause problems for operation.

The prompts when moving a wire have been modified at user request. There is no longer a "Do you want to do this?" prompt. The user is immediately asked to enter a desired position (IN, OUT, nnnn or PSnnnn) with no default set. On carriage return, no action is taken.