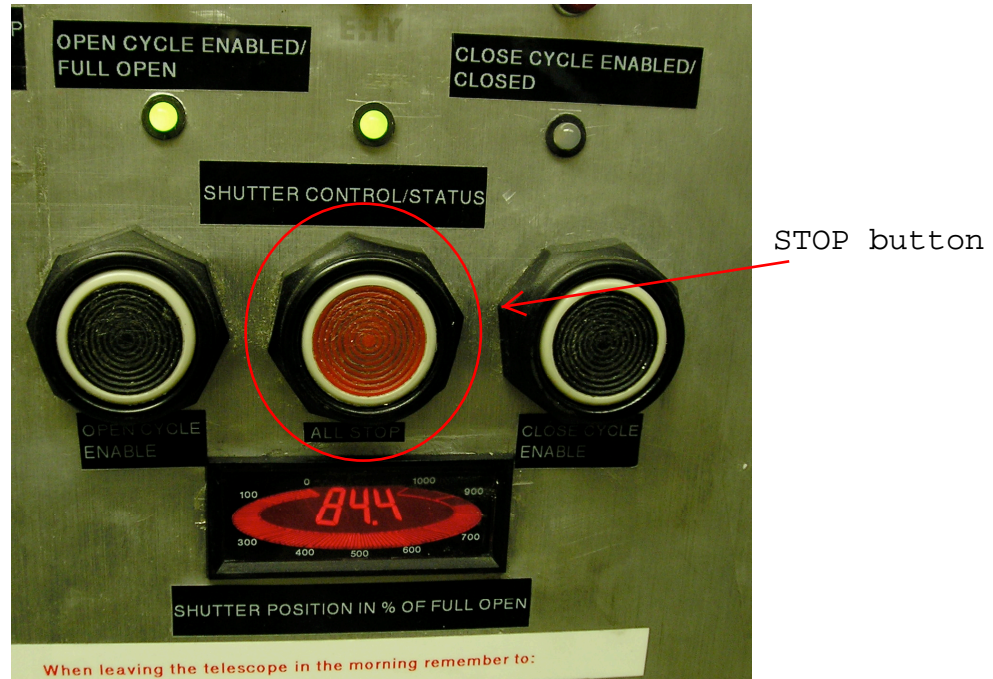


How to close the shutter manually

Step 0. Before you try to control the shutter manually, press “STOP” button on the console panel in the control room. Wait for 20 seconds. Push “OPEN” or “CLOSE” button again and see if it works this time. If you confirm you can’t control the shutter, follow the instructions below.



Step 1. Find the circuit breaker Panel E in the UPS room (directly below the control room) and look for breakers 1, 3 and 5 (these breakers are ganged). Move the switch to the “off” position.

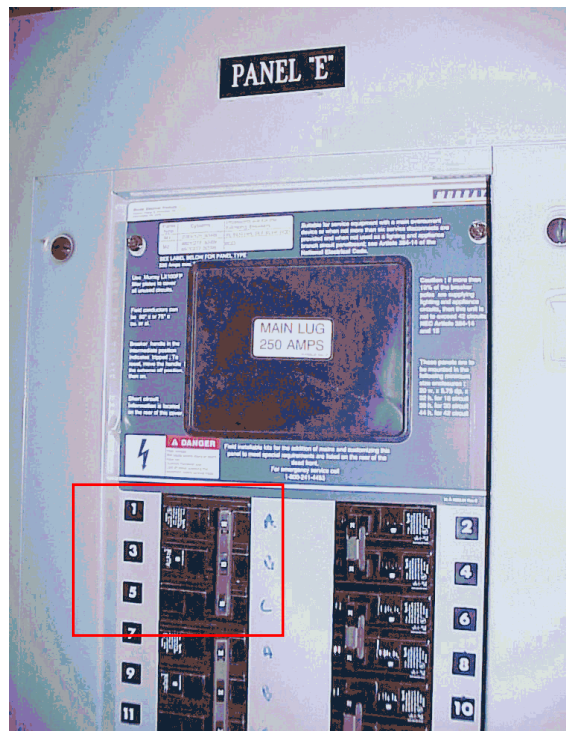


Figure 1 Panel E in the UPS room

Step 2. Remove the shorting plug located on the lower right of the shutter control panel.

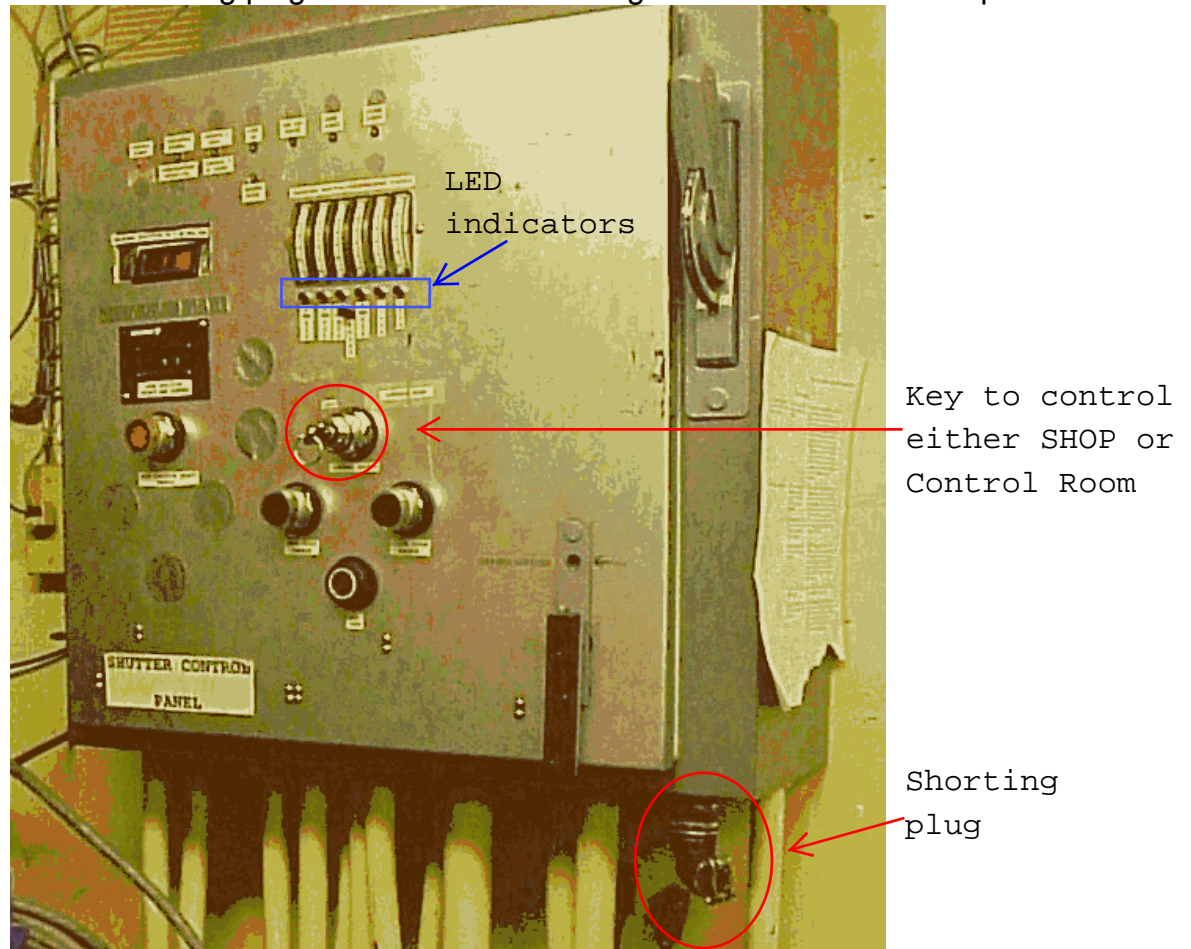


Figure 2 Shutter Control Panel in the machine shop

Step 3. Install the cable end of the hand paddle to where you removed the shorting plug.

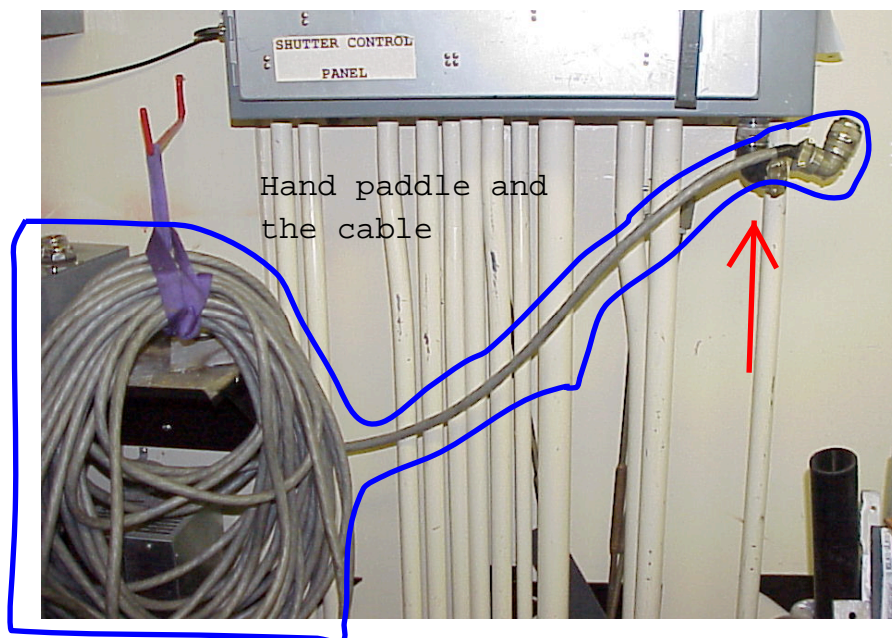


Figure 3 The shorting plug and the cable for hand paddle

Step 4. Turn Panel E circuit breakers 1, 3 and 5 back on.

Step 5. Verify that all six LED indicators are all off. If any of them are on, push the reset button. Turn the key at the middle of the shutter control panel to "SHOP". Check the locations of the LED indicators and the key in Figure 2.

Step 6. Shutter control functions using the hand paddle



Figure 4 Hand Paddle for the shutter

1) Pump Control (top right): Put the toggle switch to the "ON" position. The Yellow light directly above the switch illuminates and you will hear some sound that indicates the pump is on.

2) Warning/Alarm (Left): Not really necessary to use. It is used to activate the alarm that the shutter will be set in motion (just like when press open or close from the control room, when you hit the button an alarm sounds before the shutter actually starts moving).

3) Low Pressure Control (bottom right): It is a good idea to start any move (open or close) in low pressure. From past experience, if you try to start moving in high pressure, an overpressure light on the shutter control panel may illuminate. Once the overpressure indicator turns on, you will have to reset it (by pushing the reset switch

on the shutter control panel below the LED indicators). To put it in Low Pressure, simply put the toggle switch into the "ON" position. If the shutter does not move, you can move the Low Pressure control switch to the off position.

Caution: **Be sure to go back to Low Pressure** (turn the Low Pressure control switch to on), **when you are about 15-20 percent of full open or close.**

4) OPEN, CLOSE, STOP (middle row): self-explanatory. The shutter pump DOES NOT turn off automatically when the shutter reaches full open or full close position. Look at the OPEN LIMIT and CLOSE LIMIT LED on the shutter control panel (upper right). When you reach the full open or close position. The respective LED will illuminate. When either LED illuminates, press "STOP".

Step 7. On the hand paddle, put the PUMP CONTROL switch to ON. Switch the LOW PRESSURE to "ON" next. Then press OPEN or CLOSE button, depending what you want to do. **Be sure you start with low pressure,** and keep it in low pressure for 10 seconds or so. You can change it to high pressure by turning the low-pressure control toggle switch to "OFF". If the shutter doesn't move, put the LOW PRESSURE control switch to the OFF position and press OPEN or CLOSE button.

Also, **make sure that you are in low pressure when you are within 15 – 20 percent of full open or full close.** You can find the shutter position indicator on the shutter control panel in the machine shop room. For example, if you are closing, you can keep it in high pressure up until you reach say 20 percent open. Once you reach 20 percent open, switch to low pressure.

Step 8. Once the shutter reaches the full open or full close position (OPEN LIMIT or CLOSE LIMIT LED on shutter control panel illuminates), press the "STOP" button and turn the PUMP CONTROL toggle switch off.

Step 9. Turn off circuit breaker Panel E, circuit breakers 1, 3 and 5.

Step 10. Remove the shutter hand paddle cable and re-install the shorting plug.

Step 11. Turn on circuit breakers 1, 3 and 5 in Panel E.

Step 12. Reset any OVERPRESSURE LED indicators if any are on.

Step 13. Turn key back to control room position. Now you have the control of the shutter in the control room.

Step 14. Send an email to Richard Chamberlin (cham_at_submm.caltech.edu) to report what happened.