

Subject: X17B3 Laser Interlock Test			
Number: LS-PPS-0038	Revision: A	Effective: 8/12/04	Page 1 of 4

Prepared/ Approved By: M. Buckley	Approved By: S. Buda	Approved By: Quanzhong Guo
-----------------------------------	----------------------	----------------------------

*Approval signatures on file with master copy.

[Revision/Periodic Review Log](#)

Test Reason:	Test Result:	<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
	Test Type:	<input type="checkbox"/> Full	<input type="checkbox"/> Partial
Test Date:	Start Time:	Finish Time:	
Tester 1:	Assistant 1:		
Tester 2:	Assistant 2:		

PREPARATION:

- Inform the experimenter that a test of the laser interlock is being performed.
- A qualified X17B3 laser operator must be available to assist during the test.

1. *[Search]*

Press the Start Search button located inside the hutch.

The start search indicator comes ON

Exit the hutch, close the door, and press the Complete Search Button.

Observe the steady audible warning is a minimum of 13 - 15 seconds.

Both "Laser Interlocked" signs come ON

Area secure indicator is ON

2. Open the door

Interlock drops out (Area secure interlock indicator is OFF)

Intermittent audible alarm sounds for 5 seconds.

Both "Laser Interlocked" signs turn OFF

Interlock fault indicator comes ON

Attempt to secure the hutch

Start search indicator does not latch

Complete search indicator does not latch

Laser interlock does not activate

Reset Interlock fault

3. Press the start search button. Exit the hutch, close the door and wait.

The Start Search indicator turns OFF in 20 seconds or less.

Press Complete Search Button.

Interlock does not activate

4. Press the Start Search button. Exit the hutch and close the door. Press the Complete Search Button. Open the door and close the door within the time-out period and press the Complete Search Button.

The interlock does not activate

Subject: X17B3 Laser Interlock Test			
Number: LS-PPS-0038	Revision: A	Effective: 8/12/04	Page 2 of 4

5. Search and interlock the hutch. Press the interlock OFF button
 The laser interlock drops out _____
 Open the door. _____
 No audible warning sounds. _____
 Interlock fault indicator does not come ON _____

6. [*Door Switches*]
 Place holders on the Main hutch door laser switch and on the two hutch auxiliary door laser switches.
 - Complete this step for all three doors -
 Secure hutch for laser. Leave power supply OFF.

Door #1	Door #2	Door #3
Remove a door switch holder		
Interlock drops out.		
The interlock fault LED comes ON		
Intermittent audible alarm sounds for 5 seconds.		
Interlock fault will only reset when F-300 key is turned		

 Remove the holders from the door switches. Stand inside the laser room and open and close the door.
 The door switches operate freely and each makes a "click" when door is opened _____

7. [*Lockout Switch*]
 Secure hutch for laser. Power Supply remains OFF.
 Switch from "operate" mode to "Lockout" mode.
 Interlock drops out. _____
 Interlock fault LED comes ON _____
 Attempt to open shutter
 Shutter will not Open _____
 Reset interlock fault
 Attempt to secure hutch
 Laser hutch security will not activate _____
 Switch to "Operate" mode

8. [*Laser Shutter Operation*]
 Request that a X17B3 qualified laser operator assist in the completion of the laser interlock test.
 At this time the area should not be secured. _____
 Verify the laser power supply is off. _____
 The laser shutter is closed (Beam output is not observed) _____

9. Attempt to open the shutter.
 The shutter does not Open (Beam output is not observed) _____

Subject: X17B3 Laser Interlock Test			
Number: LS-PPS-0038	Revision: A	Effective: 8/12/04	Page 3 of 4

- Secure the hutch for laser operation (Laser operator remains inside).
- Request the laser operator to turn ON the laser power supply and achieve a 'laser ready' state.
- The Laser power should be at a minimum and the beam path should also be minimized while observing the output.

10. *Conduct this step using both control panels.*

Cycle the shutter Open/Close switch.

The shutter opens (Beam output is observed) and then closes (Beam output is not observed).

Internal Panel	External Panel
_____	_____

11. Open the laser shutter

The shutter opens (Beam output is observed)

A short audible sound followed by a 2-second audible signal is heard

12. [Pass-Through Function]

Press the Internal PASS-Through button. Open the door and exit the hutch.

The PASS Through button indicator comes ON

The shutter Closes (Beam output is not observed)

The power supply remains ON

Close the door within the timeout period.

Press the External PASS-Through button.

The PASS Through button indicator goes out

The shutter remains Closed (Beam output is not observed)

The power supply remains ON

Laser security remains active

13. Open the laser shutter.

Press the External PASS-Through button. Open the door and enter the hutch.

The PASS Through button indicator comes ON

The shutter Closes (Beam output is not observed)

The power supply remains ON

Close the door within the timeout period.

Press the Internal PASS-Through button.

The PASS Through button indicator goes out

The shutter remains Closed (Beam output is not observed)

The power supply remains ON

Laser security remains active

Subject:	X17B3 Laser Interlock Test		
Number:	LS-PPS-0038	Revision:	A
		Effective:	8/12/04
			Page 4 of 4

14. Open the laser shutter and confirm beam output is observed.
 Press the External PASS-Through button and begin timing.
 The shutter closes (Beam output is not observed) _____
 Open the main door to the point where the door comes off of the door switch. _____
 Do not open the door more than a few inches.
 After no more than 45 seconds the following occurs: _____ seconds
- An audible warning sounds for 5 seconds _____
 - The interlock fault LED comes ON _____
 - Interlock drops out _____
 - The power supply turns Off _____
- Interlock fault will only reset when F-300 key is turned _____
15. [*Emergency Stops*]
 Secure hutch with one person remaining inside & turn ON power supply.
 Open laser shutter. Press the internal Emergency Stop button.
 The power Supply Turns OFF _____
 The shutter closes (Beam output is not observed) _____
 Interlock drops out _____
 Interlock fault is ON _____
 Intermittent audible alarm sounds for 5 seconds. _____
 Interlock fault will only reset when F-300 key is turned _____
- Attempt to search hutch.
 Laser security will not activate. _____
- Reset emergency stop. _____
16. Secure hutch & leave power supply OFF.
 Press the external Emergency Stop button.
 Interlock drops out _____
 Interlock fault is ON _____
- Interlock fault will only reset when F-300 key is turned _____
- Reset emergency stop. _____
17. [*Door Switch Reach-Back*]
 Secure hutch for laser and Turn Power Supply ON.
 Open laser shutter.
 Open the Main door
- Interlock drops out. _____
 - Laser shutter Closes (Beam output is not observed) _____
 - Power Supply Turns OFF. _____
 - The interlock fault LED comes ON _____
 - Intermittent audible alarm sounds for 5 seconds. _____
 - Interlock fault will only reset when F-300 key is turned _____