



CALIFORNIA INSTITUTE OF TECHNOLOGY  
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DCN No. E010129-00-W

SHEET 1 OF 1

7/11/01

# DOCUMENT CHANGE NOTICE (DCN)

DOCUMENT No. (DOC-REV-GR. ID)	TITLE	NEW REV.
LIGO-E010001-B-W	LHO Detector, Y-End Station, In-Chamber Installation	C

**CHANGE DESCRIPTION (FROM/TO):**

Rev. B is a procedure written prior to starting the tasks inside WBSC 10.  
 Rev. C is a revision to the procedure based on what was actually done inside WBSC 10, including any deviations from the tasks outlined. All revisions are noted in red italics.

**REASON FOR CHANGE:** Updated for 4k Detector Installation

**ACTION:**  Incorporate change  Attach DCN to drawing(s)  Other action (specify):

DISPOSITION OF HARDWARE (IDENTIFY SERIAL NUMBERS)	DCN DISTRIBUTION (X=incl. docs)															
<input checked="" type="checkbox"/> No hardware affected (record change only)	<table border="0"> <tr> <td></td> <td>Barish</td> <td>Coles</td> </tr> <tr> <td>X Coyne</td> <td>Lazzarini</td> <td>Lindquist</td> </tr> <tr> <td>Raab</td> <td>Sanders</td> <td>Shoemaker</td> </tr> <tr> <td>Stapfer</td> <td>Tyler</td> <td>Weiss</td> </tr> <tr> <td>Whitcomb</td> <td>Scislowitz</td> <td></td> </tr> </table>		Barish	Coles	X Coyne	Lazzarini	Lindquist	Raab	Sanders	Shoemaker	Stapfer	Tyler	Weiss	Whitcomb	Scislowitz	
		Barish	Coles													
X Coyne	Lazzarini	Lindquist														
Raab	Sanders	Shoemaker														
Stapfer	Tyler	Weiss														
Whitcomb	Scislowitz															
<input type="checkbox"/> List S/Ns which comply already:																
<input type="checkbox"/> List S/Ns to be reworked or scrapped:																
<input type="checkbox"/> List S/Ns to be built with this change:																
<input type="checkbox"/> List S/Ns to be retested per this change:																
<input type="checkbox"/>	X Cook															
<input type="checkbox"/>	X Radkins															
<input type="checkbox"/>	X Mike Smith															
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**SAFETY, COST, SCHEDULE, REQUIREMENTS IMPACT?**  No  Yes (if yes, enter Change Request number )

APPROVALS:	DATE	OTHER APPROVALS (specify)	DATE
ORIGINATOR: L. Jones/B. Weaver	<i>[Signature]</i> 7/11/01		
TASK LEADER: D. Coyne	<i>[Signature]</i> 7/11/01		
GROUP LEADER: s. Whitcomb	<i>[Signature]</i> 7/11/01		
DCC RELEASE: <i>[Signature]</i>	7/24/01		



**INSTALLATION SPECIFICATION**

TITLE

**LHO DETECTOR, Y-END STATION, IN-CHAMBER <  
> INSTALLATION**

APPROVALS:	DATE	APPROVALS:	DATE
DRAWN: L. Jones, B. Weaver, D. Coyne	6/22/01	CHECKED:	
CHECKED: Hugh Radkins	7/11/01	CHECKED:	
CHECKED:		DCN NO	APPROVED
CHECKED:		E010122-00-W	Dennis Coyne
		E010129-00-W	6/24/01

**1 SCOPE**

This installation procedure covers the installation, alignment and initial check-out of Detector equipment in the Y End Station, vacuum chambers. The primary tasks are the End Test Mass, y-arm, (ETMy) optic installation, the ETMy telescope and beam dump installation, the arm cavity baffle installation (and moving the baffle out of the way for initial beam alignment checks), optics table access cable installation, alignment of the ETM transmission monitor and viewport installations for photon calibration and a temporary camera (to be removed when the arm cavity baffle is later erected back into position).

**2 APPLICABLE DOCUMENTS**

Listed below are all of the applicable and referenced documents for this task procedure. This list gives the latest revisions of the documents; within the installation steps, only the document number (and not the revision) is quoted.

D000068-A	Access Cable
M990034-B	Contamination Control Plan
E000062-C	LOS Installation Procedures
T970151-C	ASC Initial Alignment Procedures
E000119-A	Hanford Checklist - Vent Isolatable Volumes
M980133-B	Vent Isolatable Volumes
E000121-A	Hanford Checklist - Spool Removal
E000120-A	Hanford Checklist - BSC Door Removal
M980132-B	O-Ring Installation and Flange Assembly Procedure for HAM and BSC Doors
M980101-B	Procedure for Isolatable Volume Pump Down
D970210-B	ASC Monument Locations, Washington Site, End Station, Y-Arm (sheet 5)
E000065-04	Chamber Entry/Exit Checklist
D000462-A	ETMy, ETM Telescope Location, LHO, BSC10



# INSTALLATION SPECIFICATION

TITLE

## LHO DETECTOR, Y-END STATION, IN-CHAMBER INSTALLATION

D990340-A	Arm Cavity Baffle, ETM Assembly Drawing
D990350-A	Arm Cavity Baffle, ITMy/ETM, Glass Support Assembly Drawing
D990491-A	Arm Cavity Baffle, ETM, Outer Support Assembly Drawing
M990316-00	Standard Operating Procedure: COS Infrared Alignment Laser Operation in the Midstation and Endstation
M980047-E-W	Transition to Laser Hazard
M980048-E-W	Transition to Laser Safe
T000065-05	COS 4k IFO Alignment Procedure Except: Adapt for alignment with the PLX as described herein.
T010071-00	Recording Form for Sensor/Actuator Measurements Taken at the Vacuum Feed Throughs using the MIT Breakout Box
D970220-C	ISC Equipment Layout, End Station, Y-Arm, Washington Site (sheet 8)
D980228-00	Naming Convention for Ports on Adapter
D980227-00	Naming Convention, BSC Ports
D980229-00	Naming Convention, BSC Door Ports
D010115-A	Arm Cavity Baffle, 4k ETMy Installation

### 3 PRE-REQUISITES

- 1. Revised satellite boxes: New or modified to handle the higher current requirements of the modified Sensor/Actuator Heads (alias OSEM), D000069-A.
- 2. A BSC cleanroom must be in place over WBSC 10 and operable.
- 3. The vacuum equipment purge air system must be operable before starting the task.
- 4. Perform laser safety walkthroughs per M990316 for unescorted workers in the VEA, as required.
- 5. Quad photo diode and optics for the transmission monitor should be assembled and installed on the ETM transmission tower.
- 6. The optical lever transmitter and receiver should be assembled and installed on the optical lever bench.
- 7. The ETM Large Optic Suspension (LOS) must have the modified chamfer stop tips installed.



# INSTALLATION SPECIFICATION

TITLE

## LHO DETECTOR, Y-END STATION, IN-CHAMBER INSTALLATION

### 4 PREPARATION

All preparation must be in accordance with the Contamination Control Plan (M990034).

- 8. Clean the Y End Station VEA, particularly the floor; Particulates and dust should be removed by mopping with clean water. Clean the BSC chamber (wipe or mop with clean water) from the stiffening ring above the door down, as well as the floor in the vicinity of the chamber well in advance of the opening of the vacuum system.  
Check the clean room HEPA filters; replace is necessary.  
Examine and if necessary clean the top of the BSC chamber and the top of the BSC clean room.  
Allow the dust settle for approximately 1 day prior to performing any clean room activities in an area which has been cleaned.
- 9. Insure that there are no large openings to the exterior or the beam tube enclosure where insects or dust can get into the VEA.



# INSTALLATION SPECIFICATION

TITLE

## LHO DETECTOR, Y-END STATION, IN-CHAMBER INSTALLATION

- 10. Transport the following items to the Y End Station VEA:
  - Appropriate cleanroom garb, including gloves, in-chamber booties
  - Flashlights, radios, batteries
  - Arm Cavity Baffle Installation Tools
  - Arm Cavity Baffle
  - Arm Cavity Baffle hardware
  - Arm Cavity Baffle Target
  - CLASS A Ground Strip (D000068)
  - CLASS A 1/4-20x1/2" SHCS
  - Cloth Door Covers
  - COS Table Clamps
  - COS Tool pan (wrenches and allen keys)
  - Camera and lens
  - CO2 gun and portable bottle and portable N2 gun with ionizer.
  - Precision Bubble level
  - ETMy Height Adaptor
  - ETMy Suspended Optic
  - ETMy Telescope and Beam Dump
  - ETM Telescope Targets
  - BSC work stool
  - LOS Table Clamps and Fasteners
  - LOS Installation Fixtures (Lazy Susan, Lift Truck, Straddle, etc.)
  - Oscilloscope and BNC Cables
  - Sony Nightshot Videocam
  - Foil, Ameristat, and Tape
  - 2 Viewports - VP800 AR 1064 *LHO only had 1 AR coated viewport at the time.*
  - ETM Telescope Steering Mirror and Mount
  - Surveying equipment & laser/autocollimator equipment with LLO laser autocollimator.
  - In-chamber vacuuming system *Didn't have at LHO at the time of this installation.*
  - Viewport copper gaskets, flange bolts and nutplates
  - Flange toolkit
  - Viewport covers
  - PLX Assembly/Stand

## 5 TASK STEPS

All tasks must be in accordance with the Contamination Control Plan (M990034).

- 11. **Assemble the Arm Cavity Baffle** (as much as possible) in the cleanroom outside of the chamber.
- 12. **Vent** the BSC 10 section volume per procedure M980133.