



# ALIGO INSTALLATION INSTANCE ACCEPTANCE DOCUMENT

## Title: aLIGO Installation Acceptance Document for WHAM1

This document covers the technical content for acceptance review of a subset of the Advanced LIGO (aLIGO) installation. See document [M1300468](#) for an overview of the aLIGO acceptance process. Acceptance by Systems Engineering is to be indicated in the metadata for this document in the LIGO Document Control Center (DCC).

### 1 Installation Instance/Subset Definition

*Insert a brief description of the subset of the aLIGO equipment which is covered under this installation acceptance document. Complete the entries in the following table. If elements of the table are not applicable, enter "not applicable".*

This installation covers the HAM chamber WHAM1 and all of the equipment within and attached plus associated electronics racks.

<b>Interferometer</b> [ <i>L1 or H1</i> ]:	<b>H1</b>
<b>Building(s)/Room(s)</b> : [ <i>e.g. corner/LVEA</i> ]	<b>LVEA</b>
<b>Vacuum Chamber(s)</b> :	<b>WHAM1</b>
<b>Electronics Rack Designation(s)</b> :	H1-ISC-C1, H1-ISC-C2, H1-ISC-C3, H1-ISC-C4, H1-ISC-R1, H1-ISC-R2, H1-ISC-R4, H1-SEI-C1,
<b>Optics Table(s)/Enclosure(s) Designation(s)</b> , and other equipment/assemblies related to this installation:	H1-ISCT1

### 2 Procedures

If there are any caveats or explanatory notes regarding the procedure documentation cited in the table below, then add these notes to the table entries.

<b>Baseline or initial Installation Procedure(s)</b> : <i>[enter linked DCC document #(s); found under <a href="#">E1200023</a>]</i>	<a href="#">E1200088</a> was the procedure to re-install the passive stack.  <a href="#">E1200092</a> was the hazard analysis for the passive stack re-install.  <a href="#">T1200239</a> has notes on Viewport installation in main document and in attached notes.
<b>As-Built/Installed Procedure(s)</b> , either: a) Enter hyperlinked DCC number for revised or red-lined baseline install procedure, and/or b) Enter hyperlinked DCC number for separate document with installation notes on	The installation of the passive stack was recorded in aLOGs <a href="#">4157</a> and <a href="#">4215</a> <a href="#">E1200088</a> has redlines accruing from this installation.

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<p>deviations, changes in procedure, changes in tooling, etc., and/or</p> <p>c) Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline installation procedure</p>	<p>See also <a href="#">D1200524</a> “AdvLIGO HAM1-H1 ISI Table, Payload &amp; Suspended Mass Assembly” and <a href="#">D0901821</a> “aLIGO Systems, HAM1-H1 Top Level Chamber Assembly”</p>
<p><b>Baseline or initial Alignment Procedure(s):</b>  <i>[enter linked DCC document #(s); found under <a href="#">E1100734</a>]</i></p>	<p><a href="#">E1500014</a> is the filecard for WHAM1.</p> <p>This is just an empty file card since there are no suspensions on this table to align.</p> <p>See also <a href="#">#4131</a>, <a href="#">#4223</a>, <a href="#">#6689</a> and <a href="#">#8057</a>.</p>
<p><b>As-Built/Aligned Procedure(s)</b>, either:</p> <p>a) Enter hyperlinked DCC number for revised or red-lined baseline alignment procedure, and/or</p> <p>b) Enter hyperlinked DCC number for separate document with alignment notes on deviations, changes in procedure, changes in tooling, etc., and/or</p> <p>c) Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline alignment procedure</p>	<p>Components on the table were aligned using interferometer beams.</p>

### 3 Drawings

Enter hyperlinked DCC document number(s) for each drawing in the table below. If elements of the table are not applicable, enter “not applicable”. All chamber-level, assembly drawings can be found listed at [E1200562](#) and found linked under [D0901491](#).

<p>Applicable Building/Room Top-Level Drawing(s):</p>	<p><a href="#">D0901469</a> aLIGO Systems Layout LHO Corner Station</p>
<p>Top-Level Chamber Assembly Drawing(s):</p>	<p><a href="#">D0901821</a> aLIGO Systems, HAM1-H1 Top Level Chamber Assembly</p>
<p>Electronics Rack Drawing(s):</p>	<p>ISC LVEA Equipment Room Racks <a href="#">D1001427</a></p> <p>ISC R1 Drawing <a href="#">D1001460</a></p> <p>ISC R2 Drawing <a href="#">D1001425</a></p> <p>ISC R4 Drawing <a href="#">D1101904</a></p> <p>SEI HAM1&amp;6 System Wiring <a href="#">D1101584</a></p>
<p>Optics Table/Enclosure Drawing(s):</p>	<p>H1-ISCT1 drawing at <a href="#">D1201103</a></p>



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### 4 Serial Number Records

Serial numbers are used to track a subset of the parts, particularly active elements (see [M1000051](#)) and electronics (with S-numbered documents; see [T0900520](#)). Enter the hyperlinked DCC document number(s), and name(s) for the highest level assembly(ies) covered by this installation acceptance document in the table below. Also enter the hyperlink to the ICS entry for the instance of this assembly in the Inventory Control System (ICS). If elements of the table are not applicable, enter "not applicable". If elements of the table are not available/missing, then enter "not available".

Assembly DCC D-Number	Assembly Name	ICS entry.
<a href="#">D0901821</a>	aLIGO Systems, HAM1-H1 Top Level Chamber Assembly	ICS entry click here <a href="#">D0901821</a>
<a href="#">D1000514</a>	HEPI	ICS subentries under <a href="#">D0901821</a>
<a href="#">D1000313</a>	ISC HAM1 Assembly	<a href="#">D1000313-H1</a> is the ICS record.
<a href="#">D1001427</a>	ISC LVEA Equipment Room Rack Layout	DCC <a href="#">E1400219</a>
<a href="#">D1001460</a>	ISC R1	DCC <a href="#">S1301882</a>
<a href="#">D1001425</a>	ISC R2	DCC <a href="#">S1301883</a>
<a href="#">D1101904</a>	ISC R4	DCC <a href="#">S1301884</a>
<a href="#">D1201112</a>	Rack SEI-C1	DCC <a href="#">S1301862</a>
<a href="#">D1201103</a>	Optical Table ISCT1	No ICS record found



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### 5 Testing

All post-installation, stand-alone, in situ, checkout/testing (phases 2 and 3 per [M1000211](#)) must be completed, be successful and be documented:

- phase 2: pre-installed, post-storage, test results for the assembly (testable item)
- phase 3: stand-alone, in situ test results for the assembly (testable item)

Note that integrated testing (phase 4 testing per [M1000211](#)) is covered under the system acceptance review, not this installation acceptance review. In the table below, enter hyperlinked DCC document number(s) for all of the relevant testing for the major subassemblies/subsystems covered within this installation instance/subset. If elements of the table are not applicable, enter "not applicable". If elements of the table are not available/missing, then enter "not available".

Subsystem	Testable Item	DCC document numbers	
		Phase 2	Phase 3
SEI	HEPI	N/A	<a href="#">E1300823</a> aLIGO HEPI H1 HAM1 Assembly Validation Report
AOS/SLC/ Viewports	Leak and pressure testing.	<a href="#">T1200356</a> LHO Viewport Assembly and Preparation Status  Don't see any mention of HAM1	



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### 6 Installation Completeness

If/as applicable, provide a hyperlink reference to a list of remaining tasks to be completed before the installation is finished (i.e. a 'punch' list).

Installation tasks remaining to be completed:	<b>All items are installed.</b>
ICS Assembly Record needs to be updated	

### 7 Installation/Integration Issues and ECRs

If/as applicable, provide a hyperlinked list of integration issues and Engineering Change Requests (ECRs) encountered during installation and which are relevant to the installation subset/instance covered by this acceptance document. See [M1300323](#) for a description of the Integration Issue and ECR Tracker.

The WHAM1 issues are tracked in:

[https://services.ligo-wa.caltech.edu/integrationissues/show\\_bug.cgi?id=985](https://services.ligo-wa.caltech.edu/integrationissues/show_bug.cgi?id=985)