

E1200535-v45

TMS WORK TO DO LIST GOING FORWARD

(all items large and small _rough outline, not in order , or standard format)

9-3-2013

NOTE ADD THE NEW ASSEMBLY DRAWINGS TO THE E1200793 DRAWING TREE (TMS)

1. D1101130 ASSEMBLY - UPDATE THIS TO SHOW THE PRODUCTION SET CONTAINING THE REMOVABLE END BRACKETS AND CAPTURED SCREWS, AND NUT PLATE, WITH THE ASSOCIATED HARDWARE - NOTE THE FIRST ARTICLE HAS THE ORIGINAL CONFIGURATION THIS SHOULD BE KEPT AS FIRST ARTICLE CONFIG.

Note: we do not need an access hole in the weldment to access the breadboard screw

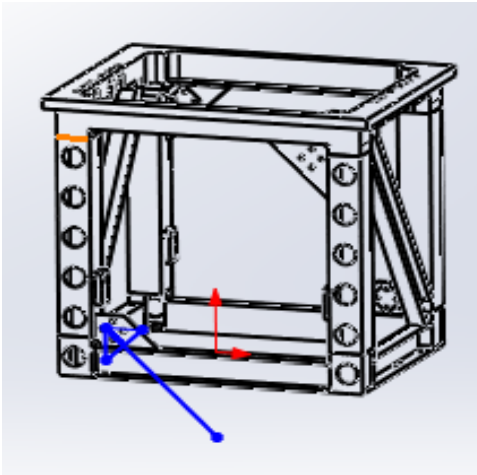
2. D060492 QUAD WELDED FRAME NEEDS TO BE UPDATED IN THE TMS DRAWING AND ASSEMBLIES TO SHOW THE 'UK' STYLE CONSTRUCTION.

THIS CORNER ATTACHMENT FOR THE CHANNEL STIFFENER WELDED IN BRACKET ATTACH POINT (4 PL) RATHER THAN THE NOW SHOWN GUSSET JUST WELDED IN THE CORNER ON THE SURFACE OF THE TUBE.

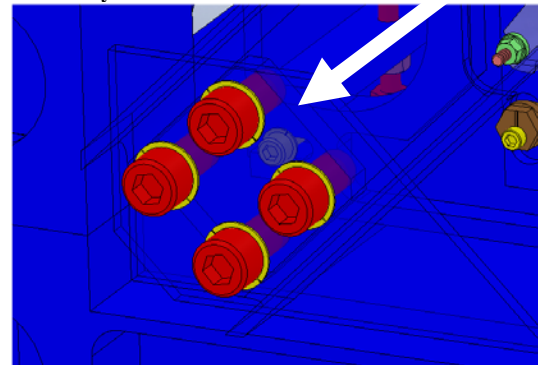
ALSO TO CHECK THE DRAWING FOR THE CHANNEL STIFFENER THAT THE PORT HOLE IS SHOWN FOR THE CONNECTOR CLEARANCE FOR THE BREADBOARD REF. 'UK' PART TD-1084-436

ALSO A NEW TOOL FOR ACCESS TO THE BREAD BOARD CAP SCREW OR THE SCREW IS CHANGED TO A HEX HEAD TO EASE ACCESS.

PICTURES OF THE UK AT CALTECH, AND OUR DRAWING NOTE THE GUSSET



ACCESS TO THIS SCREW (SEE NOTE ABOVE) NOT needed anymore



REF BELOW FOR STIFFENER AND ATTACHMENT GUSSET INFORMATION

Files in Document:

- [D060499-type 3](#) (D060499-type3 aLIGO SUS, QUAD ITM_ETM REM. CROSS MEMBE...pdf, 265.1 kB)
- [Three types of Support Gussets for cross member \(D060499-02\)](#) (D060499-02.PDF, 503.1 kB)

Other Files:

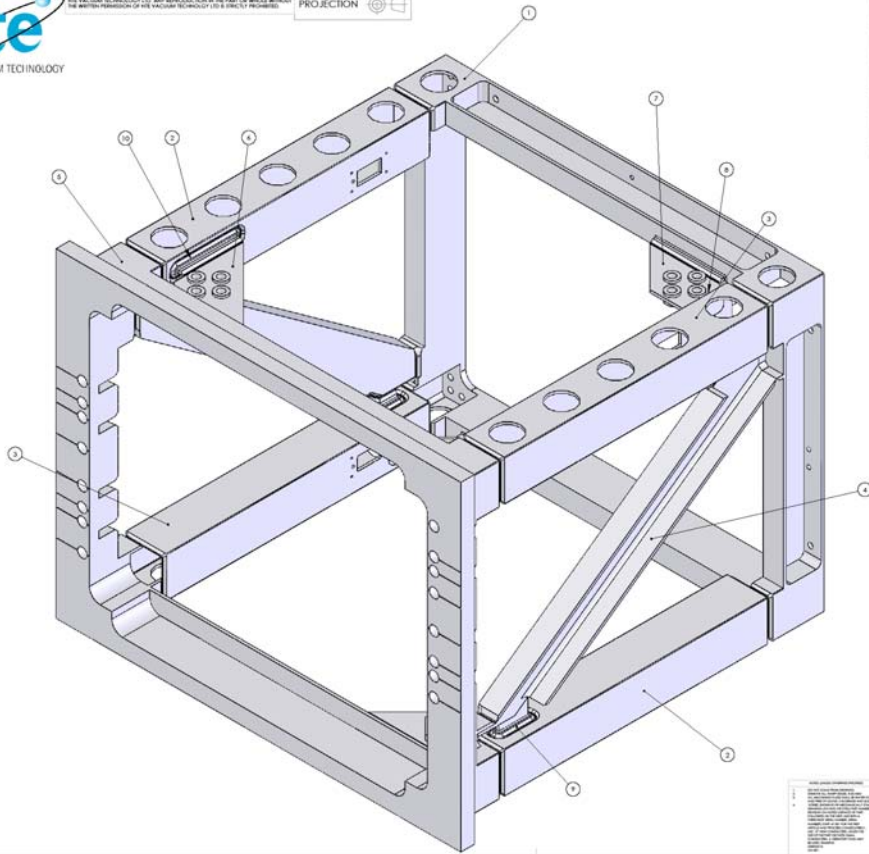
- [D060499-00-K.PDF](#) (498.3 kB)



THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF NTE VACUUM TECHNOLOGY. IT IS TO BE USED FOR THE MANUFACTURE OF THE VACUUM TECHNOLOGY PRODUCTS ONLY. REPRODUCTION OF THIS DRAWING WITHOUT THE WRITTEN PERMISSION OF NTE VACUUM TECHNOLOGY IS STRICTLY PROHIBITED.

PROJECTION

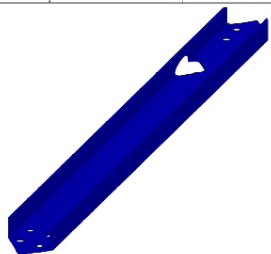
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D06049-00-K	BOTTOM RING	1
2	D06049-00-K	VERTICAL BOX HAT	2
3	D06047-00-K	VERTICAL BOX HAT2	2
4	D06049-00-K	WELDED TRUS MEMBER HAT	2
5	D06049-00-K	TOP RING	1
6	D06049-00-K	FULL GUSSET	2
7	D06049-00-K	SHORT GUSSET	2
8	D06049-02-S0	SHORT GUSSET SUPPORT	2
9	D06049-02-S0	WELDED TRUS MEMBER SUPPORT	4
10	D06049-02-S0	FULL GUSSET SUPPORT	2



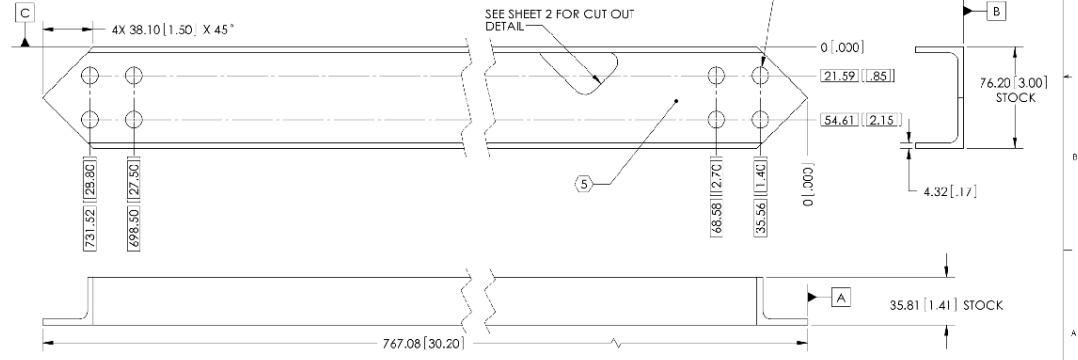
REV	DATE	BY	CHK	APP	DESCRIPTION
v3	12.3.2011	SAR	E1100663		

PARTS LIST LIGO
UPPER STRUCTURE ASSEMBLY
D06049-00-K

- NOTES CONTINUED:
- ALL MACHINING TOLERANCES MUST BE TYPICALLY SYMBIOTIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE AND CHLORINE.
 - SCORE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION AND VARIANT OR IDENTIFY ARTICULALLY ON MATED SURFACE OF PART. FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: D06049-00-K, TYPE-KV, SIZE-KXX.
 - APPROXIMATE WEIGHT = 11.52 GROSS
 - ELECTRO POLISH TO REMOVE OXIDE REMOVE .0005 MIN TO .001 MAX PER SIDE. USE OF ABRASIVE REMOVAL TECHNIQUES (INCLUDING SANDING OR SCOURING FOR FINISH) IS NOT ALLOWED. USE OF SCOTCH-BRITE OR SIMILAR PRODUCTS IS FORBIDDEN.
 - ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION ED900364.
 - ALL MATERIAL IS TO BE VIRGIN MATERIAL (I.E. NOT WELD REPAIRS OR PLUGS) UNLESS APPROVED IN ADVANCE AND IN WRITING BY LIGO. REFER TO LIGO ED900364.
 - NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE AND IN WRITING BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE. THE MATERIAL USED MUST BE VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF AND WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICERS REPRESENTATIVE (COR) THROUGH THE MATERIAL REVIEW BOARD (MRB) PROCESS. REFER TO LIGO ED900364.



REV	DATE	BY	CHK	APP	DESCRIPTION
v3	12.3.2011	SAR	E1100663		



D06049-00-K.DWG, DRAWING POWER, 4.000

REV	DATE	BY	CHK	APP	DESCRIPTION
v3	12.3.2011	SAR	E1100663		

PART NAME: D06049-00-K, CROSS MEMBER, SUP. STG.
 DRAWER: D06049-00-K, REV: 3
 CHECKER: SAR, DATE: 12.3.2011
 APPROVAL: SAR, DATE: 12.3.2011

3. MAKE A ALLEN TOOL FOR THE ADJUSTMENT OF THE SCONDARY MIRROR SCREWS AND THE F1 AND F2 MIRROR ADJUSTORS THRU THE TELESCOPE END PLATE ACCESS HOLE. THIS IS A RIGHT ANGLE BEND ON A SMALL BALL END ALLEN WRENCH. THESE ARE AT CALTECH AND NEED TO BE BENT FOR THE PURPOSE

4. CABLE LAYOUTS FOR THE REMAINING CHAMBERS FOR TMS. NOTE THE NUMBERS ALREADY SELECTED BELOW FOR BSC ASSEMBLIES

TOP ASSEMBLIES:

- Here are the TMS Top Assemblies with their BSC Assemblies (TMS; BSC):
 - D0900411; D0900502 (WBSC5)
 - D0900419; D0900512 (WBSC6)
 - D0902163; D0901150 (WBSC9)
 - D0902168; D0901154 (WBSC10)
 - D0900435; D0900471 (LBSC4)
 - D0900436; D0900506 (LBSC5)

5. REF excel BOM for D1102291 in DCC

6. REF THE 1880 WILL BE: RIGHT / LEFT/ FIRST ARTICLE / PRODUCTION

ITEM NO.	PART NUMBER	REV	DESCRIPTION	MATERIAL	-01 /QTY	-02 /QTY	-03 /QTY	-04 /QTY	SPARE (EACH CONFIG)	-01 /TOTAL	-02 /TOTAL	-03 /TOTAL	-04 /TOTAL
11	D1002460-01	VI	GLIGO TMS TELESCOPE ASSEMBLY, X-ARM	N/A	1	-	1	-	-	1	-	1	-
10	D1002460-02	VI	GLIGO TMS TELESCOPE ASSEMBLY, Y-ARM (FA)	N/A	-	-	-	1	-	-	-	-	1
9	D1000549-02	VI	GLIGO UPPER INTERMEDIATE MASS TOP ASSEMBLY, FA (WBSC6)	N/A	-	-	-	1	-	-	-	-	1
8	D1101130-01	VI	GLIGO TMS TELESCOPE SAFETY SUPPORT BEAM ASSEMBLY, RIGHT	N/A	1	-	-	1	-	1	-	-	1
7	D1000549-01	VI	GLIGO UPPER INTERMEDIATE MASS TOP ASSEMBLY	N/A	1	1	1	-	-	1	1	1	-
6	D1100827	VI	GLIGO TMS VERTICAL SAFETY WIRE ASSEMBLY	N/A	1	1	1	1	-	1	1	1	1
5	D1101130-02	VI	GLIGO TMS TELESCOPE SAFETY SUPPORT BEAM ASSEMBLY, LEFT	N/A	-	1	1	-	-	-	1	1	-
4	U-C COMPONENTS C-2016-NA or equiv		SCREW, SOCKET HEAD, CAP. 1/4-20 UNC-2A X 1 LONG (PER MS16995-52)	AG-PLATED 800 SS316	8	8	8	8	3	11	11	11	11
3	F6861A.600 (McM-Cam) or equiv		VENTED FLAT WASHER 255 ID., .468 O.D., .032 TH	18-8 SS316	16	16	16	16	6	22	22	22	22
2	D1002460-03	VI	GLIGO TMS TELESCOPE ASSEMBLY, Y-ARM	N/A	-	1	-	-	-	-	1	-	-
1	D1101163	VI	GLIGO TMS TELESCOPE SUSPENSION WIRE ASSEMBLY	N/A	2	2	2	2	1	3	3	3	3

PARTS LIST									
ITEM NO.	PART NUMBER	REV	DESCRIPTION	MATERIAL	-01 /QTY	-02 /QTY	-03 /QTY	-04 /QTY	SPARE (EACH CONFIG)
11	D1002460-01	VI	GLIGO TMS TELESCOPE ASSEMBLY, X-ARM	N/A	1	-	1	-	-
10	D1002460-02	VI	GLIGO TMS TELESCOPE ASSEMBLY, Y-ARM (FA)	N/A	-	-	-	1	-
9	D1000549-02	VI	GLIGO UPPER INTERMEDIATE MASS TOP ASSEMBLY, FA (WBSC6)	N/A	-	-	-	1	-
8	D1101130-01	VI	GLIGO TMS TELESCOPE SAFETY SUPPORT BEAM ASSEMBLY, RIGHT	N/A	1	-	-	1	-
7	D1000549-01	VI	GLIGO UPPER INTERMEDIATE MASS TOP ASSEMBLY	N/A	1	1	1	-	-
6	D1100827	VI	GLIGO TMS VERTICAL SAFETY WIRE ASSEMBLY	N/A	1	1	1	1	-
5	D1101130-02	VI	GLIGO TMS TELESCOPE SAFETY SUPPORT BEAM ASSEMBLY, LEFT	N/A	-	1	1	-	-
4	U-C COMPONENTS C-2016-NA or equiv		SCREW, SOCKET HEAD, CAP. 1/4-20 UNC-2A X 1 LONG (PER MS16995-52)	AG-PLATED 800 SS316	8	8	8	8	3
3	F6861A.600 (McM-Cam) or equiv		VENTED FLAT WASHER 255 ID., .468 O.D., .032 TH	18-8 SS316	16	16	16	16	6
2	D1002460-03	VI	GLIGO TMS TELESCOPE ASSEMBLY, Y-ARM	N/A	-	1	-	-	-
1	D1101163	VI	GLIGO TMS TELESCOPE SUSPENSION WIRE ASSEMBLY	N/A	2	2	2	2	1

TRANSMISSION MONITOR SYSTEM									
ITEM NO.	PART NUMBER	REV	DESCRIPTION	MATERIAL	-01 /QTY	-02 /QTY	-03 /QTY	-04 /QTY	SPARE (EACH CONFIG)
1	D0900411		ADVANCED GLIGO AOS	AOS					
2	D0900419		AOS	AOS					
3	D0900435		D0900435						
4	D0900436		D0902163						
5	D0900502		D0902168						

7. SECONDARY MIRROR MOUNT FACE PLATE

8. GENIE REPLACEMENT TOOL FOR ALIGNMENT PHASE

9. ZEMAX RAY TRACE

10. VIEWPORT LOCATION TOOL

11. VIEW PORT FIXTURES

12. CHANGE SAFETY WIRE TO STAINLESS STEEL DUE TO RUST

13. A CAPTIVE SCREW HAS TO BE MADE FOR THE ATTACHMENT OF THE WIRE CLAMP TO THE OPTICAL TABLE

14. look at D1101307_ - - - for updating ---made screw --- have retainer part also

15. look at D1101130_ - - - for updating ---made screw--have retainer part also

16. make 4 sets of viewport window location transfer tooling need asap

17. send back to coater two sets of primary and secondary tms mirrors, we need a coating fix for 'fog' and pin holes - - -have talked to L and L about this , they say they can do the work

18. New or revision modified drawings sent to Lisa for DCN's (follow up and check these by looking at sent emails to Lisa)

19. Keita mirror mount to replace siskiyou

20. complete balloon and bom for assembly drawing of the mirror mount tooling in 19 above

21. shipping boxes maybe the gray's in the highbay - Kurt B has done done some work on this

22. June 12 2012 email to Calum re masses to replace the magnets on TMS sus + items to do on TMS

REF. the mass replacements are on the list of suspension parts to make and should be in process now for all the production units.

i believe the FA has to stand 'as is' due to the lack of attachment holes for the mass
i can recheck this to replace the magnets we should request Norna's group to make a few extra of their design and purchase them from SUS

Note: as of 6-12-12 we have not made all the parts yet for TMS:

1. the secondary mirror mount adapter plate, the tool to replace the genit in setup are two items
2. the boxes for shipping or storing an assembled unit (s)
3. new wire for the front safety pendent

4. i'm not sure on the glass beam dump internal to tele
5. a second set of stabilization tooling Lisa was ordering
6. the comparison of used and not used SUS parts to replace
7. cables

to replace the magnets we should request Norna's group to make a few extra of their design and purchase them from SUS

23.

issue of correct version to order or put in the ICS re. v4 or v3

Notes and Changes:

This v4 is equivalent to A1 on the NTE drawing. This v4 DCC file contains a welded member used on the original NTE upper structure weldment as well as a drawing for 3 types of connectors to attach this welded member to the upper structure weldment assembly.

Note that D060499-type 3 is equivalent to D060499-v3 in the DCC.

for weldment and side channel stiffener

24.

to follow up on checking the correctness of parts ordered and placed in the design as being the correct parts due to last minute revisions are we current on assemblies and part revisions for all TMS

25.

D1200245

Stephany,
either a relief or a radius is ok, on these 3 boss features,
in each case making the minimum, practical, is desired.























































when the vendor chooses which way to go, i would like to enter a redline in the dcc to update the drawing

26. D1200845 / D1200939 NEEDS TO BE COMPLETED

many drawings exist but, this was done in a rush for viewport tooling to the sites asap basis

need to go back to get dcn's / cross referencing between next assembly and proper callouts for purchase parts and new and modified parts look in PDM works for everything. AOS or HAMViewportTargetTool 'Project folder' ref there is a 'large door tool' and a 'Small door tool' some numbers need deletion because the early tool combined the parts ref.

all parts are common just the number of targets changes from one window to two windows on the small tool

Options	Number	Description	Revision	Owner	Project
<input checked="" type="checkbox"/>   	D1200845_aLigo_Ham_ViewPort_Target_Tool_Large_Door.SLDASM	aLigo_Ham_ViewPort_Target_Tool_Assembly	X-004	kmailand	HAMViewportTargetTool
<input type="checkbox"/>   	aligo viewport target fitting 1.25foot_mcmaste9578T620.SLDPRT		X-000	kmailand	AOS
<input type="checkbox"/>   	aligo viewport target crossover fitting 1.25_mcmaster9578T220-1.SLDPRT		X-000	kmailand	AOS
<input type="checkbox"/>   	aligo viewport target mount 1.25 x .12 wall alum tube horiz. SLDPRT		X-000	kmailand	AOS
<input type="checkbox"/>   	aligo viewport target mount 1.25 x .12 wall alum tube flange. SLDPRT		X-000	kmailand	AOS
<input type="checkbox"/>   	aligo viewport target post foot SLDPRT	D1200868 aligo viewport target post foot	X-000	kmailand	AOS
<input type="checkbox"/>   	D1200932 aligo viewport crossover 1 inch to 1.25 inch_9578T210.SLDPRT	D1200932 aligo viewport crossover 1 inch to 1.25	X-000	kmailand	HAMViewportTargetTool
<input type="checkbox"/>   	aligo viewport target tube 1inch.SLDPRT		X-000	kmailand	AOS
<input type="checkbox"/>   	mc master 9578T410.SLDPRT		X-000	kmailand	AOS
<input type="checkbox"/>   	D1200870 aligo viewport target post foot door spacer. SLDPRT.SLDPRT	D1200870 aligo viewport target post foot door spacer	X-001	kmailand	HAMViewportTargetTool
<input type="checkbox"/>   	D1200926 aLigo Viewport target tool post screw mcmast no. 92196A540.SLDPRT	D1200926 aLigo Viewport target tool post screw	X-000	kmailand	HAMViewportTargetTool
<input type="checkbox"/>   	D1200930 aLigo Viewport target post scr washer mcmast no. 90107A013-1.SLDPRT	D1200930 aLigo Viewport target post scr washer	X-000	kmailand	HAMViewportTargetTool
<input checked="" type="checkbox"/>   	D1200935 aLigo_Ham_ViewPort_Target_Ring_Sub.SLDASM	aLigo_Ham_ViewPort_Target_Ring_Assem	X-002	kmailand	HAMViewportTargetTool
<input type="checkbox"/>   	D972610_LIGO_HAM_Support_Tube_Weldment.SLDPRT	LIGO HAM Support Tube Weldment	X-002	esanchez	obsolete_duplicates
<input checked="" type="checkbox"/>   	D1200904 aLigo viewport target ring bracket.SLDPRT	aLigo viewport target ring bracket	X-000		HAMViewportTargetTool
<input checked="" type="checkbox"/>   	D1200906 aligo viewport target ring shaft.SLDPRT	aligo viewport target ring shaft	X-000		HAMViewportTargetTool
<input checked="" type="checkbox"/>   	D1200872 aLigo viewport target ring.SLDPRT	aligo viewport target ring	X-000		HAMViewportTargetTool
<input checked="" type="checkbox"/>   	D1200908 ring bracket screw 90585A226-1.SLDPRT	aLigo viewport tool ring bracket screw	X-000		HAMViewportTargetTool

27. the front support wire needs to be changed to s s wire 304 x .06" diameter see the drawing for this part and bump the material and revision number.

28,

Hi Ken

Thanks for update. Let me know when all assembly drawings with notes of what to do as I want to link them in to the HAM3 and HAM2 chamber level.

Can we discuss cleaning as per Doug / Matt e-mail?

29.

Ken - Great Ken, that sounds good. Good to see drawings on DCC too. ([LIGO-D1200845-v2](#) and [LIGO-D1200939-v1](#)) Is there one for the small door still to be posted?

All - Should these parts to be cleaned to class B or wiped down prior to leaving CIT?

30.

Please come up with a plan like the one you mention below and have approved by customers at site.

Calum

On 6/20/2012 10:48 AM, Ken Mailand wrote:

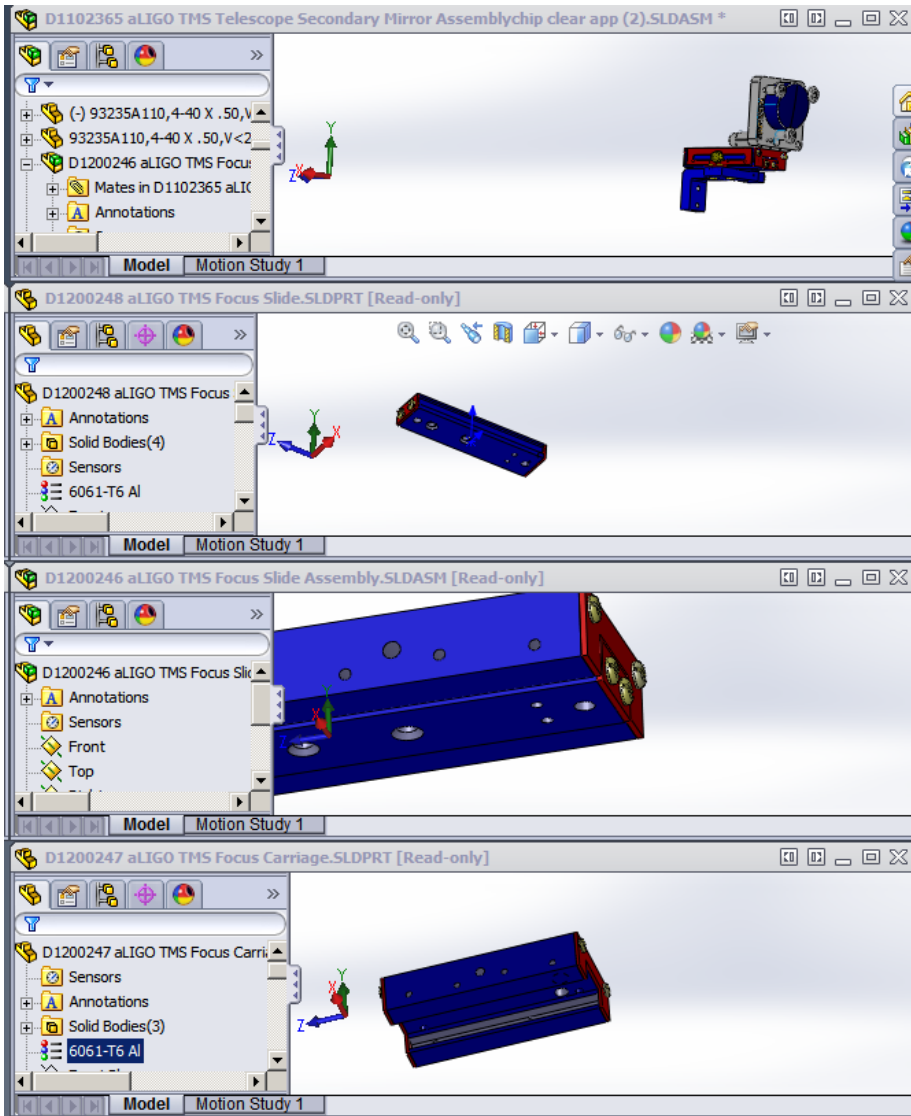
Calum,
after a good initial cleaning to get the mfg. dirt off,
last time we wiped it, with alcohol, while it was attached to the door, before we
attached it to the flanges.

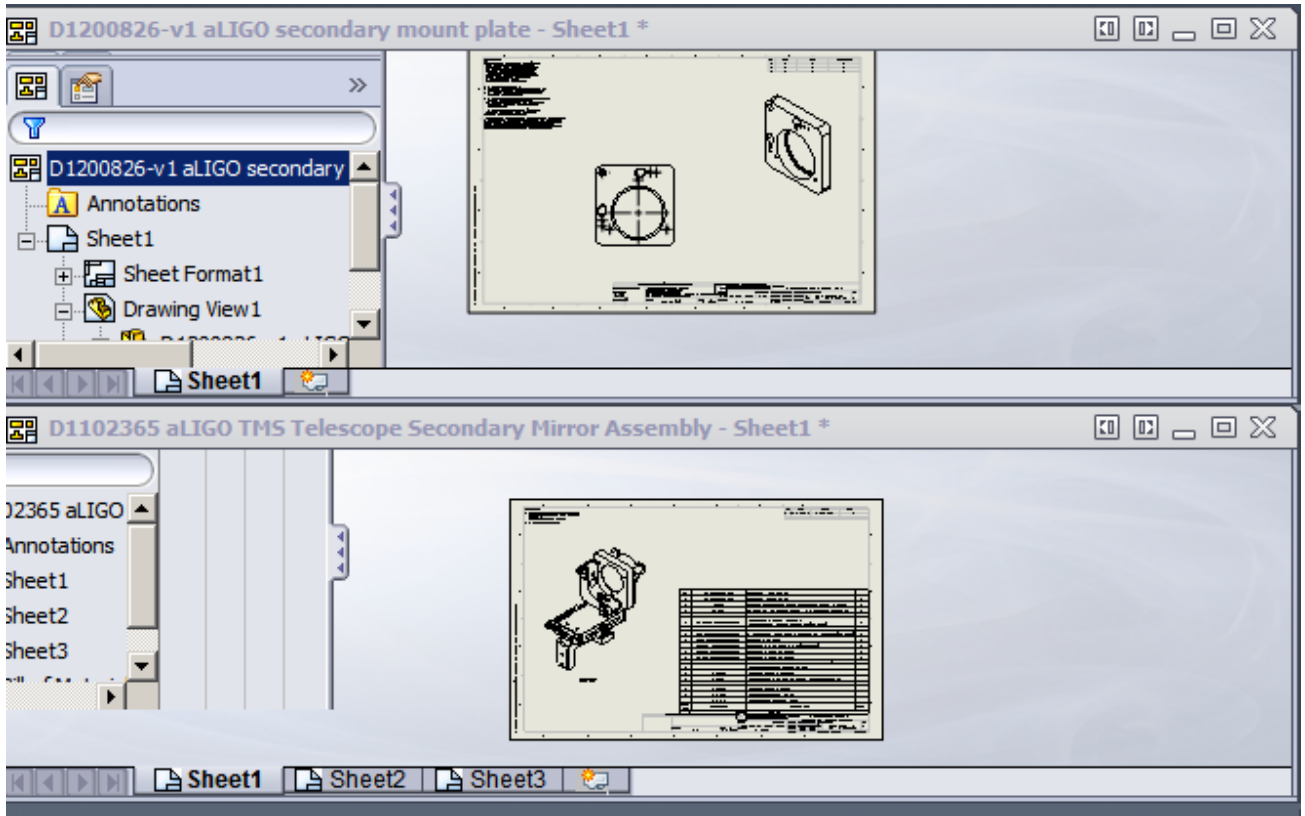
this assembly is really outside, even more than the arm, it never touches anything in vacuum.
except for the tubes, everything is small, can be put in the sonic bath.

ken



31.





32

ORDER QUOTED STRONGER SPRING FOR SECONDARY MIRROR MOUNT

33.

MAKE DRAWING FOR CAPTIVE SCREW FOR THE TMS TELESCOPE WIRE ATTACHMENT BRACKET

34.

COORDINATE THE ACQUISITION OF THE FINE PITCH F1 AND F2 SCREWS FROM ISC

NOTE: ALSO THE 1 INCH MIRROR MOUNTS TO BE USED AS THE SECONDARY MIRROR MOUNT IN THE TMS TELESCOPE

35.

There are measurements done on TMSY at <https://alog.ligo-wa.caltech.edu/aLOG/index.php?callRep=1825>

Are they acceptable?

36. look at email sent to Lisa and Calum approx 5-25- - 6-5, for To Do for TMS

37.

Invar tube update to show turn and not grind od

38.

Hi Ken -from Calum

Lisa is out of town this week but available. Let's do this, can you please review and update as appropriate the following links on the DCC. We can discuss then call Lisa.

- LIGO-D0901880: [aLIGO AOS Transmission Monitor System Assembly](#)
 - is this the top level?
 - is it's top level BOM up to date?
 - does it call all correct children?
 - do the children have bom's?
- LIGO-T1100304: [TMS ASSEMBLY DOCUMENTATION and TOOLING](#)
- LIGO-D1101307-v1: [TOOLING LAYOUT-aLIGO TMS Telescope Cartridge lift Safety Supports](#)
 - which one is it?
- LIGO-D0900419: [AdvLIGO SUS BSC6-H2, XYZ Local CS for TMS ETM Tel Assy](#)
 - **this one looks done**
- LIGO-D0900411: [AdvLIGO SUS BSC5-H2, XYZ Local CS for ETM Tel Assy](#)

- LIGO-D0900435: [AdvLIGO SUS BSC4-L1, XYZ Local CS for ETM Tel Assy](#)
- LIGO-D0900436: [AdvLIGO SUS BSC5-L1, XYZ Local for ETM Tel Assy](#)
- LIGO-D0902163: [AdvLIGO SUS BSC9-H1, XYZ Local CS for ETM Tel Assy](#)
- LIGO-D0902168: [AdvLIGO SUS BSC10-H1, XYZ Local CS for ETM Tel Assy](#)
 - these all need work to get them up to D0900419 level, this is work split between Ed / Eddie and Ken (Ed / Eddie do pdf's etc ... And Ken helps on linking correct documents and review of e.g. TMS position / configurations)

Once we have it to a level we are happy with we can then involve others.

39.

LIGO-D1200525-v1: [aLIGO TMS Mass Base Assembly](#)

check the part v1 and v2 in this assembly re. D1200312

use the V2 version that combines two of the parts in the FA into one but re reference the assembly

40.

CAPTIVE SCREW FOR TELE TO TABLE WIRE CLAMP

D1200988 silver plated

REV.	DATE	DCN #	DRAWING REC #
v1	07-05-12	T O F O L L O W	-
-	-	-	-
-	-	-	-

D1200989

REV.	DATE	DCN #	DRAWING REC #
v1	07-20-2012	T O F O L L O W	-
-	-	-	-
-	-	-	-

DCN'S TO FOLLOW

D1100400
D1200988

D1001164

REV.	DATE	DCN #	DRAWING TREE #
v1	22 DEC 2010	E1000762-v1	-
v2	11 NOV 2011	E1100080-v1	-
v3	24 MAR 2012	E1200317-x0	-
v4	12 JUL 2012	TO FOLLOW	

NOTE ALL SECONDARY MIRROR PARTS
ALL TOOLING FOR VIEWPORTS
OTHERS
ALIGNMENT RING FOR AUTOCOLLIMATOR

41.

D1100400

REV.	DATE	DCN #	DRAWING TREE #
v1	07-05-12	TO FOLLOW	-
v2	07-05-12	TO FOLLOW	-
v3	07-18-12	TO FOLLOW	-

D1100402

REV.	DATE	DCN #
v1	01 JUN 2011	E1100352
v2	07-18-12	TO FOLLOW
-	-	-

D1100403

REV.	DATE	DCN #	DRAWING TREE #
v1	01 JUN 2011	E1100352	-
v2	07-18-12	TO FOLLOW	-
-	-	-	-

D1100414

REV.	DATE	DCN #	DRAWING TREE #
v1	5-12-12	XX	-
v2	07-18-12	TO FOLLOW	-
-	-	-	-

D1100613

REV.	DATE	DCN #	DRAWING TREE #
v1	6/17/2011	E1100352	-
v2	07-18-12	TO FOLLOW	-
-	-	-	-

42.

NOTE:

The screw (4) that holds down the blade spring, the 'clamp' , this screw needs to be silver there is no heli-coil this top mass assembly and the assembly drawing should reference this screw

43.

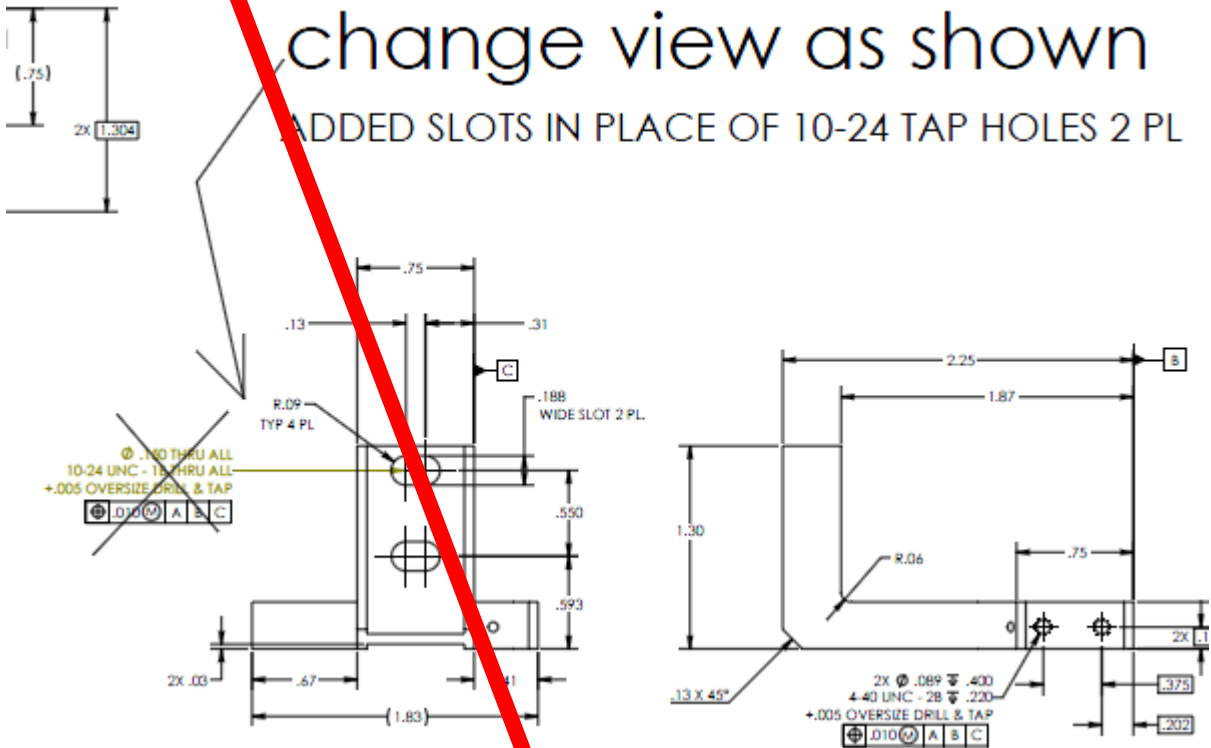
add D1200989 to the proper assembly this is a captive screw for the wire connection for the optical table to the top mass

44. NOTE DIS REGARD this

and revert to the original v1 as built with the tapped holes new layout shows mirror centered

TYPE, SECONDARY MIRROR, MT. BRACKET			
REV.	DWG. NO.	DATE	REV.
v1	E1200321	26 MAR 2012	v2
v2		7 AUG 2012	
SCALE: 2:1	PROJECTION:	UC/US	SHEET 1 OF 1

change view as shown
 ADDED SLOTS IN PLACE OF 10-24 TAP HOLES 2 PL



we need to order 92141a11 washers to work with this
 also longer stainless screws and silver or nickel nuts

45.

dcn's

Tooling / TMS balance CG change for more sensitivity based on feed back from the first article setup at LHO D1102252 / D11002252/ D1200098 / D1100653 /D1101097 / D1100649 / D1101097

samples below:

2		1	
REV.	DATE	DCN #	DESCRIPTION
v1	8-10-12	TO FOLLOW	-
-	-	-	-
-	-	-	-

3000 30000000		PARTNAME LIGO TMS OPTICAL TABLE BALANCE BOLTS PACER		REV.	
0000 AOS	0000 00000000	0000 00000000	0000 00000000	0000 D1102250	0000 v1
APPROVAL		SCALE		PRODUCTION	00000000

D1100653 v1 & v2

REV.	DATE	DCN #
v1	14 JUN 2011	E1100355-v1
v2	8-10-12	to follow
-	-	-

3000 30000000		PARTNAME LIGO TMS OPTICAL TABLE SUSPENSION BRIDGE PIN		REV.	
0000 AOS	0000 00000000	0000 00000000	0000 00000000	0000 D1100653	0000 v2
APPROVAL		SCALE		PRODUCTION	00000000

D1200098

REV. NAME		ALIGOTWS OPTICAL TABLE	
BALANCE BOLT STEP SPACER		REV.	
QTY	DESCRIPTION	DATE	BY
5	D1200098	8-10-12	no follow
	APPROVAL	DATE	BY

REV.	DATE	DESCRIPTION	DATE
v1	8-10-12	no follow	-
-	-	-	-
-	-	-	-

D1100649 added notes for spacers for the cg

PART NAME						ALIGO TMS TELE-OPT TABLE					
						BALANCE BRIDGE ASSY					
DESIGNER	LINER/CHK	DATE	SEE DWG. NO.			REV.					
DATE	LINER/CHK	DATE	B			D1100649			V2		
DESIGNER											
APPROVAL			SCALE: 1:1	PROJECTION:					SHEET 1 OF 2		
2						1					
2						1					
REV.	DATE		BY			DRAWING NUMBER					
V1	10 JUN 2011		E110003 S-wl			-					
V2	8-10-12		no follow			-					
-	-		-			-					

D1101097

PART NAME						ALIGO TMS TELE-OPT TABLE					
						BALANCE BRIDGE CONNECTION					
DESIGNER	LINER/CHK	DATE	SEE DWG. NO.			REV.					
DATE	LINER/CHK	DATE	B			D1101097			V2		
DESIGNER											
APPROVAL			SCALE: 1:1	PROJECTION:					SHEET 1 OF 1		

REV.	DATE	DCN #
v1	6/10/2011	E1100355-v1
v2	8-10-12	TO FOLLOW
-	-	-

46.

on configurations other than the D0900419 - WBSC6


the autocollimator is showing in the drawing model and needs to be taken out

also the ISC table top D1000484 needs to be updated to show the correct periscope and clear up the periscope interference with the adjacent part

47.

dcn updates:

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUN 2011	E1100352-v1	-
v2	8-24-12	to follow	-
-	-	-	-

2	D1100843	ALIGO TMS TELE-OPT TABLE INSTALL TOOL, SUPP YOKE	6061-T6 Al	4		4
1	D1100842	ALIGO TMS TELE-OPT TABLE INSTALL TOOL, SUPP PLATE	6061-T6 Al	1		1
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
PARTS LIST						
UNLESS OTHERWISE SPECIFIED:						
 CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME: ALIGO TMS TELE-OPT TABLE INSTALL TOOL ASSY				
SYSTEM: ADVANCED LIGO SUB-SYSTEM: AOS		DESIGNER: J. J. PEZAKAS 03 MAY 2011	SIZE: B	DWG. NO.: D1100841		REV.: v2
FINISH: N/A μinch		CHECKER:	APPROVAL:	SCALE: 1:2	PROJECTION:	SHEET 1 OF 1
4		3		2		1

48.

dcn updates:

PARTNAME		ALIGO TMB TELE-OPT TABLE	
SUB-SYSTEM		INSTALL TOOL SUPP YOKE	
DESIGNED	LYNNAKE BROWN	SIZE DWG. NO.	REV.
AOS		B	D1100843
DRAWN			v2
CHECKED		SCALE: 1:1	PROJECTION:
APPROVAL			SHEET 1 OF 1

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUN 2011	E1100352-v1	-
v2	8-24-2012	to follow	-
-	-	-	-

49

REV.	DATE	DCN #	DRAWING TREE #
v1	8-24-12	to follow	-
-	-	-	-
-	-	-	-

PARTNAME		a ligo se c. minor mt. fp-fit sub assem with ligo mt pLSDA\$M	
DESIGNED	Lynnake	6-26-12	SIZE DWG. NO.
DRAWN	Lynnake	6-26-12	B
CHECKED			D1201077
APPROVAL		SCALE: 1:1	PROJECTION:


50.

PART NAME				
One inch Siskiyou mount from ISC group				
DESIGNER	t.moland	8-29-12	SIZE	DWG. NO.
DRAFTER	t.moland	8-29-12	B	D1201076
CHECKER				REV. v1
APPROVAL			SCALE: 1:1	PROJECTION:  SHEET 1 OF 1

REV.	DATE	DCN #
v1	8-29-12	to follow
-	-	-
-	-	-

51.

REV.	DATE	DCN #	DRAWING TREE #
v1	09 JUN 2011	E1100522-v1	-
v2	15 FEB 2012	E1200220-v1	-
v3	8-30-12	to follow	-

PART NAME				
aLIGO TMS TELE-OPT TABLE INSTALL, FRAME-PLATE ASSY				
DESIGNER	J. TERRAZAS	27 APR 2011	SIZE	DWG. NO.
DRAFTER	J. TERRAZAS	29 APR 2011	D	D1100807
CHECKER	S. SHANKLE	15 FEB 2012		REV. v3
APPROVAL	ken.moland	8-30-12	SCALE: 1:24	PROJECTION:  SHEET 1 OF 1

52.

REV.	DATE	DCN #
v1	8-30-12	to follow
-	-	-
-	-	-

PART NAME					
swivel leveling pad assem for bosch frame					
DESIGNER	k mailand	8-30-12	SIZE	DWG. NO.	REV.
DRAFTER	k mailand	8-30-12	B	D1201206	v1
CHECKER					
APPROVAL			SCALE: 1:2	PROJECTION:	SHEET 1 OF 1

53.

v1	09 JUNE 2011	E1100522-v1
v2	8-30-12	to follow

PART NAME					
ALIGO TMS TELE / OPT TABLE INSTALL, SUPPORT FRAME ASSY					
DESIGNER	J. TERRAZAS	21 APR 2011	SIZE	DWG. NO.	REV.
DRAFTER	J. TERRAZAS	21 APR 2011	D	D1100759	v2
CHECKER					
APPROVAL			SCALE: 1:24	PROJECTION:	SHEET 1 OF 2

54.

REV.	DATE	DCN #	DRAWING TREE #
v1	8-30-12	to follow	-
-	-	-	-
-	-	-	-

PART NAME					
3842990500_2018.21 BOSCH, 90x90H AL FRAMING EXTRUSION					
DESIGNER	J. TERRAZAS	21 APR 2011	SIZE	DWG. NO.	REV.
DRAFTER	k mailand	8-30-12	B	D1201209	v1
CHECKER					
APPROVAL			SCALE: 1:16	PROJECTION:	SHEET 1 OF 1

55.

REV.	DATE	DCN #	DI
v1	9-7-12	to follow	
-	-	-	

PART NAME				aLigo Bosch Frame Dimensions for TMS Setup	
DESIGNER	6/10/11	6/11/12	SIZE	DWG. NO.	REV.
DRAFTER	6/10/11	6/11/12	D	D1201236	v1
CHECKER					
APPROVAL			SCALE: 1:24	PROJECTION:	SHEET 1 OF 2

56.

REV.	DATE	DCN #
v1	6/10/2011	E1100355-v1
v2	9-11-12	to follow
-	-	-

S LIST					
OGY	PARTNAME aLIGO TMS TELE-OPT TABLE				
NOLOGY	BALANCE BRIDGE CONNECTION				
STEM	BRIDGE ASSY. LAY-OUT				
	DESIGNER	SIZE	DWG. NO.	REV.	
	DRAFTER	M. MILLER	6/13/2011	B	D1101097
	CHECKER				v2
	APPROVAL	SCALE: 1:12	PROJECTION:	SHEET 1 OF 1	

57.

REV.	DATE	DCN #	DRAWING TREE
v1	10 JUN 2011	E1100355-v1	-
v2	8-10-12	to follow	-
-	-	-	-

PART NAME		aLIGO TMS TELE-OPT TABLE			REV.
		BALANCE BRIDGE ASSY			
DESIGNER	J. IERRAZAS	12 APR 2011	SIZE DWG. NO.		
DRAFTER	J. IERRAZAS	17 APR 2011	B	D1100649	v2
CHECKER					
APPROVAL			SCALE: 1:8	PROJECTION:	SHEET 1 OF 2

58.

REV.	DATE	DCN #
v1	14 JUN 2011	E1100355-v1
v2	9-11-12	to follow
-	-	-

PART NAME		aLIGO TMS OPTICAL TABLE			REV.
		SUSPENSION BRIDGE PIN SUPP BAR			
DESIGNER	J. IERRAZAS	12 APR 2011	SIZE DWG. NO.		
DRAFTER	J. IERRAZAS	17 MAY 2011	B	D1100654	v2
CHECKER					
APPROVAL			SCALE: 1:2	PROJECTION:	SHEET 1 OF 1

59

REV.	DATE	DCN #	DRAWING TREE #
v1	9-19-12	to follow	-
-	-	-	-
-	-	-	-

ME		Ligo Spacer Test Tele Mass Wire Clamp			REV.
k mailand	9-17-10	SIZE DWG. NO.			
k mailand	9-19-12	A	D1201301	v1	
k mailand	9-19-12				
AL		SCALE: 2:1	PROJECTION:		SHEET 1 OF 1

60. check this date

REV.	DATE	DCN #
v1	9-19-12	E1000317
-	-	-

PART NAME						
aLIGO_TMS_TEST_MASS_ASEM						
DESIGNER	KMAILAND	08-11-2010	SIZE	DWG. NO.	REV.	
DRAFTER	KMAILAND	08-11-2010	B	D1002097	v1	
CHECKER						
APPROVAL			SCALE: 1:12	PROJECTION:		SHEET 1 OF 1

61.

REV.	DATE	DCN #
v1	9-19-12	E1000317
v2	9-19-12	to follow
-	-	-

NAME						
aLIGO_TMS_TEST_MASS_PLATE						
ER	KMAILAND	08-10-2010	SIZE	DWG. NO.	REV.	
R	Kmailand	8-10-2010	B	D1002098	v2	
ER						

62. Added v1 and date check. . .

REV.	DATE	DCN #
V1	9-19-12	E1000317
-	-	-
-	-	-

PART NAME					
aLIGO_TMS_TEST_MASS_LONGBAR					
DESIGNER	KMAILAND	08-10-2010	SIZE	DWG. NO.	REV.
DRAFTER	KMAILAND	08-10-2010	B	D1002099	v1
CHECKER					

63.

REV.	DATE	DCN #
V1	9-19-12	E1000317
V2	9-19-12	TO FOLLOW
-	-	-

PART NAME					
aLIGO_TMS_TEST_MASS_SHORTBAR					
DESIGNER	KMAILAND	08-10-2010	SIZE	DWG. NO.	REV.
DRAFTER	KMAILAND	08-10-2010	B	D1002100	v2
CHECKER					
APPROVAL		SCALE: 1:2	PROJECTION:	SHEET 1 OF 1	

64.

REV.	DATE	DCN #
V1	9-19-12	E1000317
-	-	-
-	-	-

PART NAME					
aLIGO_TMS_TEST_MASS_DBK					
DESIGNER	KMAILAND	08-10-2010	SIZE	DWG. NO.	REV.
DRAFTER	KMAILAND	08-10-2010	B	D1002101	v1
CHECKER					
APPROVAL		SCALE: 1:2	PROJECTION:	SHEET 1 OF 1	

65.

REV.	DATE	DCN #
V1	9-19-12	E1000317
-	-	-
-	-	-

PART NAME				
aLIGO_TMS_TEST_MASS_RING				
DESIGNER	EMABAND	04-10-2010	SEE DWG. NO.	REV.
DRAWN	EMABAND	04-10-2010	B D1002102	v1
CHECKER				
APPROVAL			SCALE: 1:1	PROJECTION: SHEET 1 OF 1

66.

REV.	DATE	DCN #	DRAWING TREE #
v1	9-20-12	to follow	-
-	-	-	-
-	-	-	-

PART NAME				
aLIGO_TMS_TEST_MASS_RING .25kg _w-scr				
DESIGNER	KMAILAND	09-20-2012	SEE DWG. NO.	REV.
DRAWN	kmailand	9-20-12	B D1201313	v1
CHECKER				
APPROVAL			SCALE: 2:1	PROJECTION: SHEET 1 OF 1

67.

REV.	DATE	DCN #
v1	9-19-12	E1000317
v2	9-25-12	TO FOLLOW
-	-	-

PART NAME				
aLIGO_TMS_TEST_MASS_ASEM				
DESIGNER	KMAILAND	08-11-2010	SEE DWG. NO.	REV.
DRAWN	KMAILAND	08-11-2010	B D1002097	v2
CHECKER				
APPROVAL			SCALE: 1:12	PROJECTION: SHEET 1 OF 2

68.

REV.	DATE	DCN #
v1	9-25-12	to follow
-	-	-

PART NAME			
aLigo TMS Test Mass Balance Ball Dummy Mass			
DESIGNER	r mallana	7-21-2012	SIZE DWG. NO.
DRAFTER	r mallana	7-25-12	B D1201330
CHECKER			REV. v1
APPROVAL		SCALE: 1:1	PROJECTION: SHEET 1 OF 1

69.

.Note to do:

Table [optical] assembly instruction to go with assembly

70.

REV.	DATE	DCN #	DRAWN
v1	03 AUG 2011	E1100351	
v2	10-2-12	to follow	
-	-	-	

PART NAME			
aLIGO TMS TELE SAFETY SUPPORT TURNBUCKLE YOKE			
DESIGNER	J. FERRAZAS	02 AUG 2011	SIZE DWG. NO.
DRAFTER	J. FERRAZAS	03 AUG 2011	B D1101550
CHECKER	r mallana		REV. v2
APPROVAL		SCALE: 1:1	PROJECTION: SHEET 1 OF 1

71, v2

REV.	DATE	DCN #
v1	04 AUG 2011	E110351
v2	10-2-12	to follow
-	-	-

PARTS LIST			
CAUTION: THIS DRAWING IS THE PROPERTY OF TECHNICAL SYSTEMS INC. IT IS TO BE KEPT IN CONFIDENTIALITY.			
PART NAME			
aLIGO TMS TELE SAFETY SUPPORT TURNBUCKLE ASSY. SIDE LONG			
DESIGNED	LIMMAYE BIAZOVII	02 AUG 2011	SIZE DWG. NO.
DRAWN	LIMMAYE BIAZOVII		B D1101559
CHECKED			REV. v2
APPROVAL		SCALE: 1:1	PROJECTION: SHEET 1 OF 1
3	2	1	

72,

REV.	DATE	DCN #
v1	7/26/2011	E1100351
v2	10-2-12	to follow
-	-	-

PART NAME					
αLIGO TMS TELE SAFETY SUPPORT TURNBUCKLE					
DESIGNER	C. MARLAND	SIZE	DWG. NO.	REV.	
DRAFTER	MANNIER	7/26/2011	B	D1101500	v2
CHECKER					
APPROVAL		SCALE: 1:1	PROJECTION:	SHEET 1 OF 1	
2			1		

73.

REV.	DATE	DCN #
v1	04 AUG 2011	E110351
v2	10-2-12	to follow
-	-	-

PART NAME					
αLIGO TMS TELE SAFETY SUPPORT TURNBUCKLE, SIDE, SHORT, THREADED ROD					
DESIGNER	L. HERRERA	04 AUG 2011	SIZE	DWG. NO.	REV.
DRAFTER	L. HERRERA	04 AUG 2011	B	D1101557	v2
CHECKER					
APPROVAL		SCALE: 1:1	PROJECTION:	SHEET 1 OF 1	

74.

REV.	DATE	DCN #
v1	04 AUG 2011	E1100351
v2	10-2-12	to follow
-	-	-

PART NAME					
αLIGO TMS TELE SAFETY SUPPORT TURNBUCKLE, SIDE, LONG, THREADED ROD					
DESIGNER	J. HERRERA	04 AUG 2011	SIZE	DWG. NO.	REV.
DRAFTER	J. HERRERA	04 AUG 2011	B	D1101558	v2
CHECKER					
APPROVAL		SCALE: 1:1	PROJECTION:	SHEET 1 OF 1	

75.

REV.	DATE	DCN #
v1	04 AUG 2011	E1100351
v2	10-2-12	to follow
-	-	-

PART NAME				ALIGO TMS TELE SAFETY SUPPORT			
				TURNBUCKLE ASSY, SIDE, SHORT			
DESIGNER	J. IFFRAGAS	04 AUG 2011	SIZE DWG. NO.			REV.	
DRAFTER	J. IFFRAGAS	04 AUG 2011	B	D1101506		v2	
CHECKER							
APPROVAL							
			SCALE: 1:4	PROJECTION:			SHEET 1 OF 1

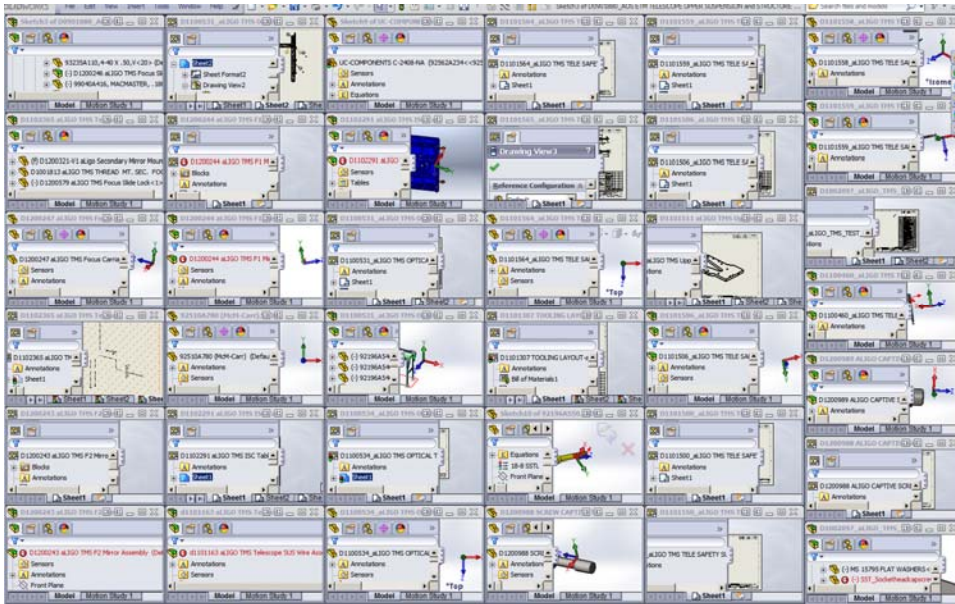
76

REV.	DATE	DCN #	DRAWING TREE #
v1	08 AUG 2011	E1100351	-
v2	10-2-12	to follow	-
-	-	-	-

SITE OF TECHNOLOGY		PART NAME		ALIGO TMS TELE SAFETY SUPPORT	
				TURNBUCKLE, FRONT, THREADED ROD	
30	AOS	DESIGNER	J. IFFRAGAS	04 AUG 2011	SIZE DWG. NO.
365		DRAFTER	J. IFFRAGAS	04 AUG 2011	B
		CHECKER			D1101564
		APPROVAL			v2
			SCALE: 1:3	PROJECTION:	SHEET 1 OF 1

77.

ASSEMBLY UPDATES ON SECONDARY MIRROR CLAMP SCREWS AND SPRINGS
ASSEMBLY UPDATES



77.

REV.	DATE	DCN #
v1	29 MAR 2012	E1200317-x0
V2	10-9-12	TO FOLLOW
-	-	-

PART NAME				
aLIGO TMS F2 MIRROR ASSEMBLY				
DESIGNER	C. CONLEY	17 SEP 2010	SIZE DWG. NO.	REV.
DRAFTER	ESANCHEZ	29 MAR 2012	B	D1200243
CHECKER	SEE DCC	SEE DCC		v2
APPROVAL	SEE DCC	SEE DCC	SCALE: 1:2	PROJECTION: SHEET 1 OF 1

78.

REV.	DATE	DCN #
v1	29 MAR 2012	E1200317-x0
v2	25 JUL 2012	E1200715-x0
v3	10-9-12	to follow

PARTS LIST				
PART NAME				
aLIGO TMS F1 MIRROR ASSEMBLY				
DESIGNER	F. HANNO	04 FEB 2012	SIZE DWG. NO.	REV.
DRAFTER	F. SANCHIZ	24 MAR 2012	B	D1200244
CHECKER	STBCC	STBCC		v3
APPROVAL	STBCC	STBCC	SCALE: 1:1	PROJECTION: SHEET 1 OF 1
			2	1

79

REV.	DATE	DCN #
v1	4/14/2011	E1100355-v1
v2	10-11-12	to follow

PART NAME				
aLIGO TMS OPTICAL TABLE SUPPORT BRIDGE ASSY				
DESIGNER	J. H. REAZAS	28 MAR 2011	SIZE DWG. NO.	REV.
DRAFTER	J. H. REAZAS	2/24/2011	D	D1100531
CHECKER				v2
APPROVAL			SCALE: 1:3	PROJECTION: SHEET 1 OF 2

80 THE V3 IS WIRE CHANGE TO PART 10
 JESSE MADE THE V2 ON THE 'E' BOM CHANGE UNKNOWN

CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DRWG NO. REV GID
E1100721-v3

SHEET 1 OF 1
 ASSEMBLY NO:

D1100827

OVERALL BILL OF MATERIALS

IS VERTICAL SAFETY WIRE ASSEMBLY

OWALS:	DATE:	REV	DCN NO.	BY	CHECK	DCC	DATE
JT	19-Jul-11	v2 V3	<u>E1100351</u> TO FOLLOW	JT			

REV.	DATE	DCN #	BOM #
v1	17 NOV 2011	E1100351	E1100721
V3	10/11/12	TO FOLLOW	-

LIST		PART NAME	
TECHNOLOGY		ALIGO TMS VERTICAL SAFETY WIRE ASSEMBLY	
DESIGNER	K. MALAND	DATE	4/15/2011
DRAWN	M. MILLER	DATE	17 NOV 2011
CHECKER		DCN #	B
APPROVAL		SCALE	1:2
SUB-SYSTEM		PROJECTION	1st Angle
AOS		SHEET	1 OF 2
REV.		REV.	v1

81.

REV.	DATE	DCN #	BOM #
v1	02 APR 2012	E1200317-x0	-
v2	10-11-12	to follow	

LIST		PART NAME	
TECHNOLOGY		ALIGO TMS TELESCOPE SECONDARY MIRROR ASSEMBLY	
DESIGNER	K. MALAND	DATE	16 DEC 2011
DRAWN	E. SANCHEZ	DATE	02 APR 2012
CHECKER		DCN #	B
APPROVAL		SCALE	1:1
SUB-SYSTEM		PROJECTION	1st Angle
AOS		SHEET	1 OF 3
REV.		REV.	v2


82

REV.	DATE	DCN #	D
v-1	04/13/2011	E1100352-v1	
V2	10-11-12	TO FOLLOW	

LIST		PART NAME	
TECHNOLOGY		ALIGO TMS TELE ALIGNMENT SUPPORT BRIDGE ASSY	
DESIGNER	L. HAYES	DATE	4/15/2011
DRAWN	L. HAYES	DATE	4/15/2011
CHECKER		DCN #	B
APPROVAL		SCALE	1:1
SUB-SYSTEM		PROJECTION	1st Angle
AOS		SHEET	1 OF 2
REV.		REV.	v2

83

REV.	DATE	DCN #
v1	14 JUN 2011	E1100352-v1
v2	10-12-12	to follow
-	-	-

 CALIFORNIA INSTITUTE OF TECHNOLOGY 4000 VILLAGE DRIVE, PASADENA, CA 92386-1201		PROJECT NAME: aLIGO TMS TELE-OPT TABLE INSTALL TOOL ASSY	
CUSTOMER: ADVANCED LIGO PROJECT: AOS DRAWN BY: TOOLING	DESIGNER: J. TERRAZAS CHECKED BY: k.malland	LINEWORK: 10-16-12 DWG. NO.: B D1100841	REV.: v2
3	2	1	

84

REV.	DATE	DCN #
v-1	4/13/2011	E1100352
v2	10-16-12	to follow
-	-	-

aLIGO TMS TELE ALIGNMENT SUPPORT BRIDGE SIDE BRACE		PROJECT NAME: aLIGO TMS TELE ALIGNMENT SUPPORT BRIDGE SIDE BRACE	
CUSTOMER: J. TERRAZAS PROJECT: AOS DRAWN BY: k.malland	DESIGNER: J. TERRAZAS CHECKED BY: k.malland	LINEWORK: 10-16-12 DWG. NO.: B D1100464	REV.: v2
SCALE: 1:8		PROJECTION:	SHEET 1 OF 1

85.

REV.	DATE	DCN #
v1	-	-
v2	-	-
v3	10-17-2012	to follow

ART NAME: aLIGO TMS TELE-OPT TABLE BALANCE BRIDGE ASSY		PROJECT NAME: aLIGO TMS TELE-OPT TABLE BALANCE BRIDGE ASSY	
DESIGNER: J. TERRAZAS RAFTER: J. TERRAZAS CHECKER: k.malland	DATE: 12 APR 2011 DATE: 17 APR 2011 DATE: 10-17-12	LINEWORK: 10-17-12 DWG. NO.: B D1100649	REV.: v3
SCALE: 1:8		PROJECTION:	SHEET 1 OF 3

86.

do D1100649 v-3

87.

do D1100460 v-3

88.

do D1100531 v-3

89.

ON THIS: change the S/W drawing and dcn below

REV.	DATE	DCN #
v1	23 JUN 2011	E1100352
v-2	10-25-12	to follow
-	-	-

PART NAME			
NICKEL-COPPER ALLOY 400 .375-16 HEX NUT, MODIFIED			
DESIGNER	J. TERRAZAS 26 MAY 2011	SIZE	DWG. NO.
DRAFTER	J. TERRAZAS 26 MAY 2011	B	D1100993
CHECKER			REV. v-2
APPROVAL		SCALE: 1:1	PROJECTION: SHEET 1 OF 1

2

1

90.

REV.	DATE	DCN #
v1	26 MAY 2011	D1100351
V2	10-25-12	TO FOLLOW
-	-	-

PART NAME			
NICKEL-COPPER ALLOY 400 .312-18 HEX NUT, MODIFIED			
DESIGNER	J. TERRAZAS 25 MAY 2011	SIZE	DWG. NO.
DRAFTER	J. TERRAZAS 25 MAY 2011	B	D1100989
CHECKER	L.MALLAHO 10-25-12		REV. v2
APPROVAL		SCALE: 1:1	PROJECTION: SHEET 1 OF 1

91.

REV.	DATE	DCN #
v1	14 JUN 2011	E1100352-v1
v2	9-2-12	to follow
v3	10-25-12	to follow

PART NAME			
ALIGO TMS TELE-OPT TABLE TOOL ASSY-GENIE FORK CONNECTION			
DESIGNER	J. TERRAZAS 03 MAY 2011	SIZE	DWG. NO.
DRAFTER	J. TERRAZAS 16 MAY 2011	B	D1100908
CHECKER	L.MALLAHO 10-25-12		REV. v3
APPROVAL		SCALE: 1:12	PROJECTION: SHEET 1 OF 2

92.

REV.	DATE	DCN #
v1	25 APR 2011	E1100351-v1
v2	10-26-12	to follow
-	-	-

PART NAME					
TMS, SISKIYOU MOUNT BRACKET, LOWER OUTBOARD					
DESIGNER	L ROMERO	23 SEP 2010	SIZE	DWG. NO.	REV.
DRAFTER	M. MILLER	25 APR 2011	B	D1002504	v2
CHECKER	k malland	10-26-12			
APPROVAL			SCALE: NONE	PROJECTION:	SHEET 1 OF 2

93.

REV.	DATE	DCN #
v1	25 APR 2011	E1100351-v1
v2	10-26-12	to follow
-	-	-

PART NAME					
TMS, SISKIYOU MOUNT BRACKET, LOWER INBOARD					
DESIGNER	L ROMERO	23 SEP 2010	SIZE	DWG. NO.	REV.
DRAFTER	M. MILLER	25 APR 2011	B	D1001435	v2
CHECKER	k malland	10-26-12			
APPROVAL			SCALE: NONE	PROJECTION:	SHEET 1 OF 2

94.

REV.	DATE	DCN #	DRAWING TREE
v1	10-26-12	to follow	-
-	-	-	-
-	-	-	-

IGLO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME			
ADVANCED LIGO		MUSIC WIRE, 1.5mm DIA X 26.29 LG, NON-COILED (PER LIGO-E1100159)			
DESIGNER	J. FRANKAS	29 JULY 2011	SIZE	DWG. NO.	REV.
DRAFTER	k malland	10-26-12	B	D1201436	v1
CHECKER	k malland	10-26-12			
APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

95.

REV.	DATE	DCN #
v1	01 MAR 2012	E1101204
v3	03 APR 2012	E1200317-x0
v4	10-26-12	TO FOLLOW

PART NAME					
ALIGO TMS TELESCOPE FRAME ASSEMBLY					
DESIGNER	K. MALLAND	15 DEC 2011	SIZE	DWG. NO.	REV.
DRAFTER	C. COHLEY	01 MAR 2012	B	D1102361	v4
CHECKER	SEE D-CC	SEE D-CC			
APPROVAL	SEE D-CC	SEE D-CC	SCALE: 1:8	PROJECTION:	SHEET 1 OF 7

96.

REV.	DATE	DCN #
v1	14 JUN 2011	E1100352-v1
v2	10-12-12	to follow
v3	11-1-12	to follow

PART NAME				
aLIGO TMS TELE-OPT TABLE INSTALL TOOL ASSY				
DESIGNER	J. FERRAZAS	06 MAY 2011	SIZE DWG. NO.	REV.
DRAFTER	J. FERRAZAS	10 MAY 2011	B D1100841	v3
CHECKER	C. MALAND	11-1-12		
APPROVAL			SCALE: NONE	PROJECTION:

97.

REV.	DATE	DCN #
V1	11-2-12	TO FOLLOW
-	-	-
-	-	-

PART NAME				
SHAFT GUIDE BUSHING				
DESIGNER	KM	20 DEC 2010	SIZE DWG. NO.	REV.
DRAFTER	K. MALAND	11-2-12	B D1201447	v1
CHECKER	K. MALAND			
APPROVAL			SCALE: 4:1	PROJECTION:

98.

REV.	DATE	DCN #
v1	06 APR 2012	E1101152
v2	11-6-12	to follow
-	-	-

PART NAME				
aLIGO TMS ISC TABLE STRUCTURAL ASSEMBLY				
SIGNER	C. MALAND	06 DEC 2011	SIZE DWG. NO.	REV.
DRAFTER	C. COBLEY	06 APR 2012	B D1102291	v2
CHECKER	SEE DCN			
APPROVAL	SEE DCN		SCALE: NONE	PROJECTION:

99

REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2011	E1000384	E1000458-v1
v2	26 JAN 2012	E1100351	E1000458-v2
v3	06 APR 2012	E1100345	E1000458-v3
v4	06 NOV 2012	TO FOLLOW	TO FOLLOW

PART NAME				
aLIGO TMS SEISMIC SAFETY STOP STRUCTURE				
DESIGNER	C. MALAND	12 AUG 2010	SIZE DWG. NO.	REV.
DRAFTER	M. MILLER	26 MAY 2011	B D1001781	v4
CHECKER	SEE DCN			
APPROVAL	SEE DCN		SCALE: NONE	PROJECTION:

100.

REV.	DATE	DCN #
V1	11-2-12	TO FOLLOW
-	-	-
-	-	-

PART NAME: SHAFT GUIDE BUSHING

DESIGNER	KM	20 DEC 2010	SIZE	DWG. NO.	REV.
DRAFTER	K.MARLAND	11-2-12	B	D1201364	v1
CHECKER	K.MARLAND	11-12-12			
APPROVAL		SCALE: 4:1	PROJECTION:		SHEET 1 OF 1

101.

REV.	DATE	DCN #
V1	06-21-12	TO FOLLOW
V2	11-13-12	to follow
-	-	-

PART NAME: aLIGO secondary mount plate

DESIGNER	L.MARLAND	06-01-2012	SIZE	DWG. NO.	REV.
DRAFTER	L.MARLAND	06-01-2012	B	D1200826	v2
CHECKER	L.MARLAND	06-01-2012			
APPROVAL		SCALE: 2:1	PROJECTION:		SHEET 1 OF 2

102.

add proper SW drawings to dcc by replacing

D1201556

and

D1201557

103

REV.	DATE	DCN #	DRAWING TYPE #
V1	07-05-12	TO FOLLOW	-
v2	1-2-13	to follow	-
-	-	-	-

PART NAME: ALIGO CAPTIVE SCREW, TELE WIRE CLAMP

DESIGNER	ETH MARLAND	05-05-12	SIZE	DWG. NO.	REV.
DRAFTER	ETH MARLAND	05-05-12	B	D1200988	v2
CHECKER	ETH MARLAND	05-05-12			
APPROVAL		SCALE: 2:1	PROJECTION:		SHEET 1 OF 1

104.

REV.	DATE	DCN #	DRAWING TREE #
v1	07-20-2012	TO FOLLOW-	-
v2	1-3-13	to follow	E1200793
-	-	-	-

3	250 Vented washer, Mc Master # 9 68 61 A 600	1	A
2	MC MASTER 98408A122	1	
1	D1200988 Captive Scr	1	
ITEM NO.	PART NUMBER	QTY.	
TECHNOLOGY PART NAME			
TECHNOLOGY ALIGO CAPTIVE SCREW ASSEMBLY, TELE WIRE CLAMP			
SUB-SYSTEM	DESIGNER ETK MAILAND 07-20-2012	SIZE DWG. NO.	REV.
AOS	DRAFTER ETK MAILAND 07-20-2012	B D1200989	v2
TELE WIRE CLAMP	CHECKER ETK MAILAND 07-20-2012	SCALE 2:1	PROJECTION
APPROVAL			SHEET 1 OF 1
	2		1

105.

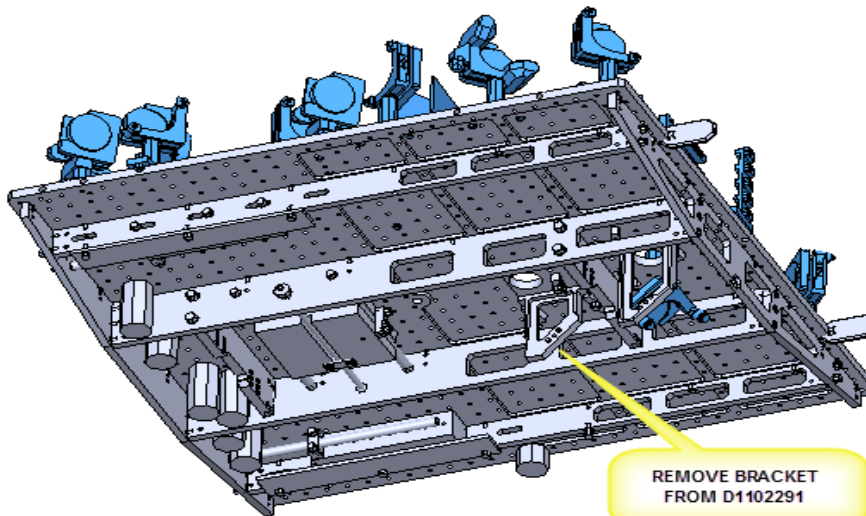
Sam,
were any parts removed from the top of the ICS table, in comparison to the first article.

i will remove the bracket, and sys. mount, and hardware pointed out below, from the table under side of D1102291

ken

On 1/4/2013 11:19 AM, Sam Barnum wrote:

All ICS parts are BLUE, note the Siskiyou mount bracket on the bottom of D1102291 does not have a optic mount attached. That bracket needs to be taken out of the D1102291.



Associated top periscope bracket and associate parts removed

106.

note use drawing tree e1200793

REV.	DATE	DCN #	DRAWING TREE #
v1	1-8-13	to follow	-
-	-	-	-
-	-	-	-

PARTNAME					
aLIGO TMS VERTICAL SAFETY WIRE ASSEMBLY Test					
DESIGNER	K. MAILAND	4/15/2011	SIZE	DWG. NO.	REV.
DRAFTER	k mailand	1-8-13	B	D1300009	v1
CHECKER	k mailand	1-8-13			
APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

107.

D1200579 v2

needs drawing updating

108.

D1300001 need updating re the 'v1-v2'

SCALE 2:1					
LIGO			PARTNAME		
ADVANCED LIGO A08			a ligo secondary mirror carrier plastic sleeve		
DESIGNER	EM-510P	DATE	SIZE	DWG. NO.	REV.
na			B	D1300058	v1
DRAFTER		CHECKER	APPROVAL	SCALE: 1:1	PROJECTION:
					SHEET 1 OF 1

REV.	DATE	DCN #	DRAWING TREE #
v1	1-18-13	to follow	for one!200793
-	-	-	-
-	-	-	-

109.

Calum,

D1002696-v4 update posted to DCC. Parts at LLO have been modified and CB. Sent email to Vargas to work with Guido to have part(s) updated.


On clamps [D1100980, 9421T300 and 60705K46] determined it best to update higher level drawings to implement the change.

1. D1200120 drawing needs to be updated and screws need to be ordered. Only the D1100980 is used in this drawing. This is the one that I ran into the conflict with the D060324 drawing and got stopped. I will follow up and complete.
2. D1102291-v4 updated. McMaster-Carr parts are used in this drawing. C-404-NA ag-plated screws were ordered and have been CB.

Lisa

110.

REV.	DATE	DCN #	DRAWING TREE #
v1	09 APR 2012	E1 200317	-
v2	2-27-13	to follow	E1 200793
-	-	-	-


dALIGO TMS FOCUS SLIDE LOCK			
K. MAILAND	09 APR 2012	SIZE	DWG. NO.
E. SANCHEZ	09 APR 2012	B	D1200579
k mailand	2-27-13		
SEE DCC	SEE DCC	SCALE: 2:1	PROJECTION:  SHEET 1 OF 1

111.

REV.	DATE	DCN #	BOM #
v1	17 NOV 2011	E1100351	E1100721
v2	10-25-12	to follow	-
v3	4-2-13	to Follow	E1200793

RT NAME					
aLIGO TMS VERTICAL SAFETY WIRE ASSEMBLY					
DESIGNER	K. MAILAND	4/15/2011	SIZE	DWG. NO.	REV.
AFTER	M. MILLER	17 NOV 2011	B	D1100827	v3
ECKER	ken mailand	10-25-12			
APPROVAL	SEE DCN	SCALE: 1:8	PROJECTION:	SHEET 1 OF 2	

112.

 D1200244 MODIFIED HOLD DOWN SCREW aLIGO TMS F1 Mirror Assembly.SLDASM

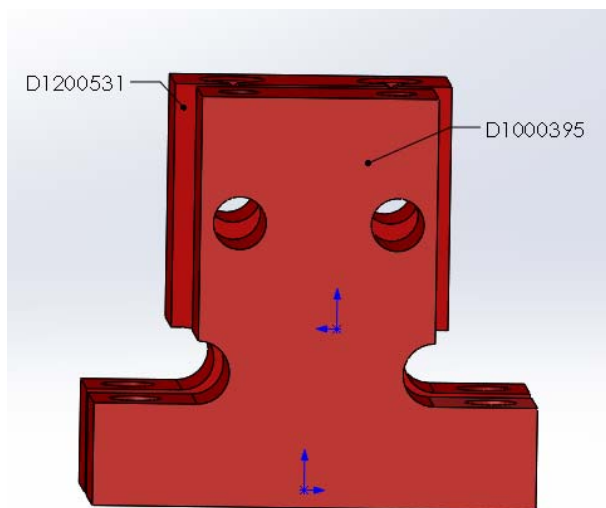
to add a button head or truss head to hold down the adjusting screw
the shcs does not engage reliably.

113.

D1100827 item epoxy removed
D1101487 epoxy removed item 7
D1101109 transparent glass now is mirror

113.

D1000395 & D1200531 below
the '531 has heli coil the '395 does not (silver scr), the center line for the two breather holes is lower
in the '395 no affect,
the 395 has more washer clearance for the hold down screw - good



reference from the DCC i will note to put a drawing in place of none

LIGO Document D1000395-v2

[Home](#) [Reserve Number](#) [Search](#) [Recent Changes](#) [Topics](#) [Events](#) [Public](#) [Login](#) [Help](#)

aLIGO INTERMEDIATE TOP MASS SPACER

Abstract:

Files in Document:
None

ICS/JIRA Record:

- [d1000395](#)

Topics:

- [Conceptual Design](#)
- [Auxiliary Optics](#)

Authors:

- [Ignacio Romero](#)

Notes and Changes:
created v2 in error, s/b D1000396-v2. lca 5/1/12

Referenced by:

- LIGO-D1000442-v1: [aLIGO INTERMEDIATE MASS TOP ASSEMBLY, FIRST ARTICLE](#)
- LIGO-C1204758-v1: [S140579 - TMS Top Mass Machined Components](#)
- LIGO-D1101527-v3: [aLIGO TMS Mass Secondary Assembly](#)

Viewable by:

- [Public](#) [Pen](#)

Modifiable by:

- [LIGO Lab](#)
- [Authors](#)

Other Versions:

[LIGO-D1000395](#)
23 Jul 2010, 10:00

[LIGO-D1000395](#)
22 Feb 2010, 07:00

114.

REV.	DATE	DCN #	DRAWING TREE #
V1	5-1-13	TO FOLLOW	E1200793
-	-	-	-
-	-	-	-

PART NAME					
aLigo Swing Stop Cross Bar Plug					
DESIGNER	L. MALIAND	3-1-13	SIZE	DWG. NO.	REV.
DRAFTER	L. MALIAND	3-1-13	B	D1300378	V1
CHECKER	L. MALIAND	3-1-13			
APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

REV.	DATE	DCN #	DRAWING TREE #
V1	4-30-13	TO FOLLOW	E1200793
-	-	-	-
-	-	-	-

115.

PART NAME					
ALIGO TMS CARTRIDGE SWING STOP TOOL					
DESIGNER	L. MALIAND	4-30-13	SIZE	DWG. NO.	REV.
DRAFTER	L. MALIAND	4-30-13	B	D1300377	V1
CHECKER	L. MALIAND	4-30-13			
APPROVAL			SCALE: 1:2	PROJECTION:	SHEET 1 OF 1

116.

1. Item 32 should be 90810A030, not D1100989.
2. Item 22 should be D1201364, not D1201447. Update D1201364 on the DCC with your wonderful drawing. Do NOT change the revision.
3. Item 1 should be D1102293, not D1001129. If you think we should be using D1001129, then we are going to have a serious problem.

117.

2			1		
REV.	DATE	DCN #	DRAWING TREE #		
V1	5-15-13	to follow	E1200793		
-	-	-	-		
-	-	-	-		

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME aLigo TMS Telescope Ray Trace 5-15-13				
STEM ADVANCED LIGO	SUB-SYSTEM AOS	DESIGNER m.smith	3-13-13	SIZE B	DWG. NO. D1300476	REV. v1
EXT ASSY D1002460		DRAFTER m.smith	3-13-13	SCALE: 1:12 PROJECTION:		SHEET 1 OF 1
		CHECKER				
		APPROVAL				

118.

Comments on the drawings in **DCN E1200317**:

D1001164: threaded holes should be vented where possible

D1001435: needs the DCN# added to the revision box; missing fillet radii dimensions

D1002504: needs the DCN# added to the revision box; there are insufficient dimensions to make the part, unless the part is made from a COTS part, in which that part should be specified (and verified that it is not cast or anodized).

D1001696: OK

D1003162: OK

D1102291: needs the DCN# added to the revision box

D1200310: NOTE 2 should be REMOVE ALL SHARP EDGES .005-.015 (not R.02)

D1201364: Has SYSTEMS approved the use of hardened steel?; delete or X out the notes that don't apply

Jeff

On 6/1/2013 5:28 PM, Lisa Austin wrote:

All,

The following few items need to be addressed to wrap-up all of the open items for the TMS Optic Table:

1. DCN E1200317-v2 approval - Jeff L. and Calum

2. Close ECR E1201113-v1 -

Verify silver plated screws were used on Clamps per Assembly Drawing D1102291-v6 - Chris G.

Confirm part number D1002696 will not be updated to latest revision (reamed holes) and have documented in ICS - Chris G.

Locate spare D1002696 at LLO, verify if it has been updated to latest revision - Nichole W./Lisa A.

3. Assist LHO with build as needed - Chris G. and Ken M.

4. Create assemblies in ICS for LLO builds - Chris

5. Locate rejected part D1001164 at CIT and update ICS appropriately - Lisa A.

6. Status impact of removal of lower periscope and weight shift/change - Calum to discuss with Lisa

119.

1" 50 91795A247 7.62
CAD | Catalog Page | Bookmark

2X
④
19-8 SS Truss Head Slotted Machine Screw 10-24 Thread, 1" Length
Packs of 50
ADD TO ORDER
In stock

UPDATE TO CURRENT VERSION

THIS SCREW IS REPLACED WITH THE ABOVE TRUSS HEAD THIS WILL PROVIDE MORE ENGAGEMENT WITH THE SCREW ASSEMBLY FOR SECURE HOLD DOWN

ISO VIEW

SECTION A-A

ITEM NO.	PART NUMBER	DESCRIPTION	REQ
14	C-2416-N	SCREW, SHC, 10-24 X 1.0 LG.	3
13	SC SUPPLIED	38KYOU 1" LFT. HD. MR. MT. ADJ. SCRASSEMB	3
12	99934A330 (McM-Carr) or equiv	SKT SET SCRW, 4-32 X 1/8 L, SILVER TP	1
11	94035A999 (McM-Carr, special order) or equiv	PRECISION SKT SLDR SCRW 5/32 O.D., 5/8 L, #4-32 X 3/16 THD	3
10	70465 (Century Spring) or equiv	COMPRESSION SPRING 210 O.D., 018 W.D., .63 L, 3.4#/IN	3
9	D1002465	GLUGO ACS TRANSMON F2 MIRROR CLAMP	3
8	D1102334	GLUGO TMS TELESCOPE SECOND FOLD MIRROR	1
7	9529K44 (McM-Carr) or equiv	440C SS BALL 7/32" DIAMETER, GRADE 2H	2
6	94035A614 (McM-Carr) or equiv	SKT SET SCRW, FLAT PT, 1/4-28 X 1/2	1
5	D1002458	GLUGO ACS TRANSMON F2 MIRROR SIDE CLAMP LOWER	2
4	C-2014-N	SCREW, SOCKET HEAD CAP, 1/4-20 UNC-2A X .0875 LONG	6
3	D1002459	GLUGO ACS TRANSMON F2 MIRROR SIDE CLAMP UPPER	1
2	WVY - 25 UC COMP. D1200249	255 ID, .468 OD, .002 TH VENT FL W/SHF	6
1	D1002449	GLUGO TMS F2 MIRROR BASE	1

NOTE AND TOLERANCES (UNLESS OTHERWISE SPECIFIED)

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 SYSTEM: ADVANCED LIGO JOB SYSTEM: AOS
 DESIGNER: C. COHEN DRAWN: T. HANCOCK
 CHECKER: W. SOCC APPROVAL: W. SOCC
 PART NAME: LIGO TMS F2 MIRROR ASSEMBLY
 REV: 4
 D1200243
 D1102261

120.

REV.	DATE	DCN #	DRAWING TREE #
v1	29 MAR 2012	E1200317-x0	-
v2	25 JUL 2012	E1200715-x0	-
v3	10-9-12	to follow	-

COMPLETE TO CURRENT VERSION

1" 50 91785A247 7.62

CAD | Catalog Page | Bookmark

18-8 SS Truss Head Slotted Machine Screw 10-24 Thread, 1" Length

Packs of 50

ADD TO ORDER

In stock

4) 3X
3) 3X
)

THIS SCREW IS REPLACED WITH THE ABOVE TRUSS HEAD THIS WILL PROVIDE MORE ENGAGEMENT WITH THE SCREW ASSEMBLY FOR SECURE HOLD DOWN

ITEM NO.	PART NUMBER	DESCRIPTION	REQ
14	C-2416-N	SCREW, SHC, 10-24 X 1.0 LG.	3
13	ISC SUPPLIED	SISKIYOU 1" LEFT HAND MIRROR MT. ADJ. SCR. ASSEM	3
12	94035A999 (McM-Carr, special order) or equiv	PRECISION SKT SHLDR SCR W 5/32 O.D., 5/8 L, #6-32 X 3/16 THD	3
11	9435K420 (McM-Carr) or equiv	COMPRESSION SPRING .240 O.D., .032 W.D., .63 L, 23.32#/IN	3
10	D1001136	OLIGO ETM F1 MIRROR CLAMP	3
9	D1102335	OLIGO TMS TELESCOPE FIRST FOLD MIRROR	1
8	99934A330 (McM-Carr) or equiv	SKT SET SCR W, 6-32 X 1/8 L, SILVER TIP	1
7	94355A614 (McM-Carr) or equiv	SKT SET SCR W, FLAT PT, 1/4-28 X 1/2	1
6	C-2014-N	SCREW, SOCKET HEAD CAP, 1/4-20 UNC-2A X 0.875 LONG	6
5	9529K44 (McM-Carr) or equiv	440C SS BALL 7/32" DIAMETER, GRADE 24	2
4	D1002336	OLIGO ETM F1 MIRROR SIDE CLAMP LOWER	2
3	D1002337	OLIGO ETM F1 MIRROR SIDE CLAMP UPPER	1
2	WFV-25 UC COMP.	.255 ID, .468 OD, .032 TH VENT FL WSHR	6
1	D1200245	OLIGO TMS F1 MIRROR BASE	1
ITEM NO.	PART NUMBER	DESCRIPTION	REQ

IFIED)

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PART NAME: **OLIGO TMS F1 MIRROR ASSEMBLY**

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **AOS**

DESIGNER: K. MALAND 06 FEB 2012 SIZE DWG. NO. **B D1200244** REV. **v5**

DRAFTER: E. SANCHEZ 29 MAR 2012

CHECKER: SEE DCC SEE DCC

APPROVAL: SEE DCC SEE DCC

FINISH: N/A μinch NEXT ASSY: D1102361

SCALE: 1:4 PROJECTION: SHEET 1 OF 1

121.

REV.	DATE	DCN #	DRAWING TREE #
v1	01 MAR 2012	E1101204	E1101208-v1
v3	03 APR 2012	E1200317-x0	-
V4	10-26-12	TO FOLLOW	-

PART NAME		aLIGO TMS TELESCOPE FRAME ASSEMBLY	
DESIGNER	E. MALAND	13 DEC 2011	SIZE DWG. NO.
DRAFTER	C. CONRY	01 MAR 2012	B D1102361
CHECKER	38 DEC	38 DEC	REV. V6
APPROVAL	38 DEC	38 DEC	SCALE: 1:8 PROJECTION: SHEET 1 OF 7

122.

REV	DATE	DCN #	BOM #	DRAWING TREE #
v1	02 SEP 2011	E1100351	E1100706	E1100735
V2	8-10-12	TO FOLLOW	TO FOLLOW	E1200793
v3	11-28-12	to follow	-	-
v4	4-10-13	to follow	to follow	E1200793
v5	7-9-13	to follow	to follow	E1200793

PART NAME		aLIGO TMS FIRST ARTICAL INSTALLATION AND TOOLING	
DESIGNER	E. MALAND	09 JUN 2011	SIZE DWG. NO.
DRAFTER	C. CONRY	02 SEP 2011	D D1101064
CHECKER	SEE DCN	8-10-12	REV. v5
APPROVAL	SEE DCN		SCALE: NONE PROJECTION: SHEET 1 OF 2

123.

REV.	DATE	DCN #	DRAWING TREE #
v1	9-19-12	E1000317	
v2	9-25-12	TO FOLLOW	
v3	4-19-13	to follow	E1200793
v4	7-9-13		

above for document D12002097-v4

124.

REV.	DATE	DCN #	DRAWING TREE #
V1	27 JUN 2011	E1100351-V1	-
V2	7-30-13	TO FOLLOW	E1200793
-	-	-	-

D

C

B

A

TECHNOLOGY OF TECHNOLOGY	PART NAME aLIGO SUS .500-13 X 1 SHCS MODIFIED				
SUB-SYSTEM SUS	DESIGNER E. MALAND	27 JUN 2011	SEE DWG. NO.	D1101186	REV. v2
	DRAFTER C. CONLEY	27 JUN 2011	B		
	CHECKER		SCALE/NONE	PROJECTION:	SHEET 1 OF 1

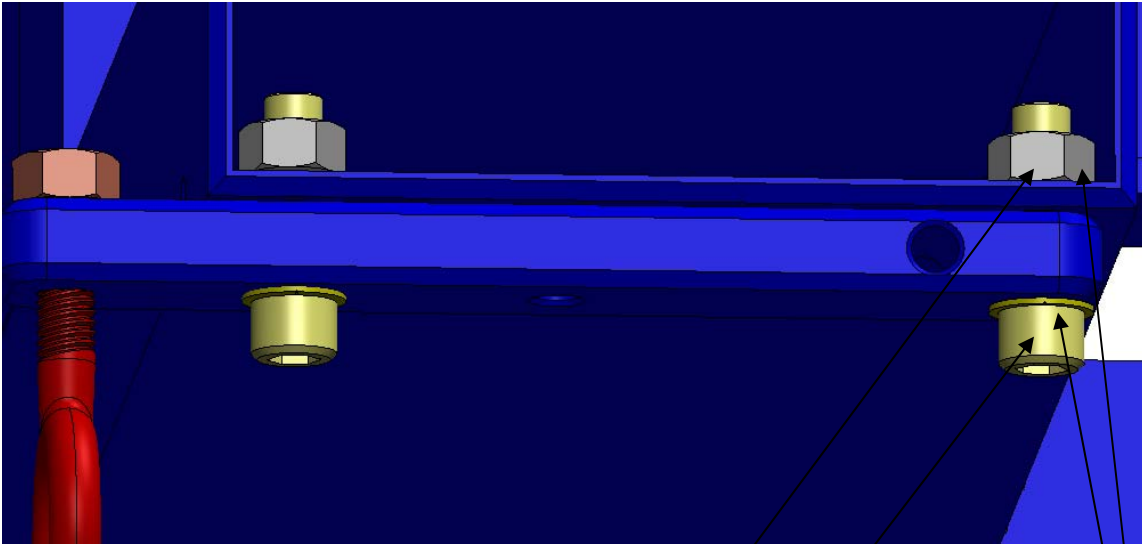
2

1

125.

View of TMS D1901880 Assembly, showing D1101130 tube end config.
not using captured hardware.

9-3-13



- 1.) 5/16-18 x 1.12 lg. SHCS Stainless Typ.
- 2.) SST Flat Washer UC Components part, or McMaster Equiv. 96861A800
- 3.) 5/16-18 AG Hex Nut

This shows Tube end with nut and screw hardware only, minus the D1200752 Nut Plate originally specified.