



Discussion: Supply of COILS and ASSOCIATED PARTS FOR THE LASTI CONTROLS PROTOTYPES

Revision 00: 3rd November 2003 (RAJ, CIT)
 Revision 01: Comments in brackets following Weekly SUS Meeting on Tuesday 4th November
 Revision 02: Additional comments (RAJ, CIT)
 Revision 03: Comments: CIT to RAJ

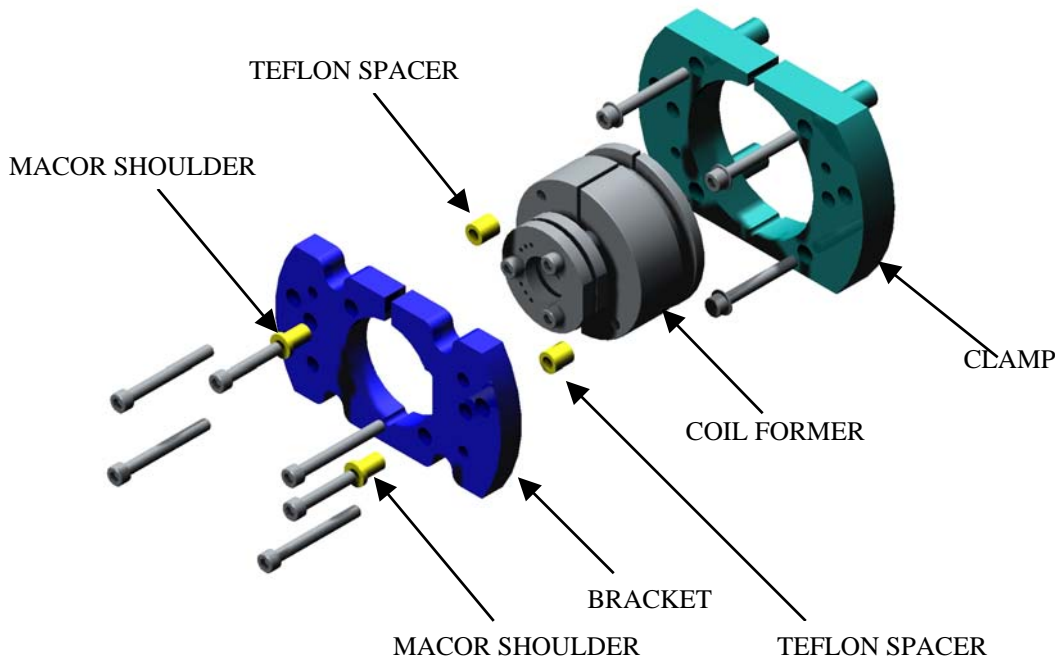
INTRODUCTION

The following is a summary of what is required in order to fulfill the order for the Local Control OSEM assemblies for the Advanced LIGO Controls Prototype Suspensions at LASTI. This document is intended as a source of discussion for the Weekly SUS Meeting on Tuesday 4th November, 2003.

AUTHORS

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THE ASSEMBLY

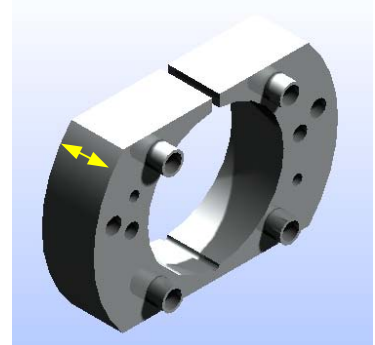


It is important to note that both the BRACKET and the CLAMP used in each assembly must be unique for each suspension, as they incorporate access holes for blade guards and earthquake stops. These holes are in different locations on each suspension.

At the moment, CLAMPS and BRACKETS for the RM, ETM's and 'shelf spares' will all be left without these holes. This means that further machining will be required once the position of these holes is known.

**(SUS Group agreed to this plan – 04/11/03)*

To the right is a rendered view of the COILFORMER CLAMP_ALT in which the thickness (as indicated in yellow) has been increased. Whether these ALT components are required (and if so, how many?) should be discussed.





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Discussion: Supply of COILS and ASSOCIATED PARTS FOR THE LASTI CONTROLS PROTOTYPES*(ALT components chosen to provide additional stability to the assembly during adjustment)***BREAKDOWN OF QUANTITIES: as agreed at ALUK meeting in August 2003****Requirements:**

MC1	9	(6 + 3 spare)
MC2	9	(6 + 3 spare)
RM	9	(6 + 3 spare)
QUAD1	18	(12 + 6 spare)
QUAD2	18	(12 + 6 spare)
Shelf spares	9	
TOTAL assemblies	72	

IMMINENT ORDER OF MECHANICAL COMPONENTS (GLASGOW)

	Number	Rev.	Name	Material	Quantity	NOTES
MC						
	D020188***	09	Coil Former	6061-T6-AI	80*	Same Coil Former used in all prototypes
	D020282	10	Coil Bracket	6061-T6-AI	20*	6 plus 4* spare for both MC1 and MC2
	D030183	04	Coil Clamp	6061-T6-AI	0	- DISCONTINUED - D030710 chosen -
	D030710	02	Coil Clamp_ALT	6061-T6-AI	20*	6 plus 4* spare for both MC1 and MC2
RM						
	D030096	01	Coil Bracket	6061-T6-AI	10*	6 plus 4* spare
	D030702	02	Coil Clamp	6061-T6-AI	0	- DISCONTINUED - D030711 chosen -
	D030711	02	Coil Clamp_ALT	6061-T6-AI	10*	6 plus 4* spare
ETM						
	D030703	01	Coil Bracket	6061-T6-AI	40*	12 plus 8* spare for each quad
	D030704	02	Coil Clamp	6061-T6-AI	0	- DISCONTINUED - D030712 chosen -
	D030712	02	Coil Clamp_ALT	6061-T6-AI	40*	12 plus 8* spare for each quad
SPARES						
	-	-	Coil Bracket	6061-T6-AI	10*	-
	-	-	Coil Clamp	6061-T6-AI	0	- DISCONTINUED -
	-	-	Coil Clamp_ALT	6061-T6-AI	10*	-

Drawings have now been checked and approved. These drawings are to be sent out to our preferred suppliers for quotation following the conclusions from the Weekly SUS Meeting on Tuesday 4th November, 2003.

*(in the table above * indicates changes made following SUS Meeting)*

Given necessary alterations to the COIL/CLAMP/BRACKET drawings (following shorting tests¹ and general feedback) it should be noted that no full (up to date) OSEM assembly has been created thus far. No full assembly has been carried through the Assembly Specification, or the Testing Specification².

¹ LIGO-T030223-00-K: Review of basic shorting tests on COILFORMERS (R.Jones, C.Torrie)



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Therefore it may be wise to cycle the order of the COIL FORMERS (D020188) in particular, for the following reasons:

- To stagger the effort involved in coil/wire preparation at CALTECH
- To test and perfect the use of suggested design enhancements (i.e. Kapton paste/film and alternative wire)

We have currently specified shelf spares at 12.5% of the total requirement, and should discuss whether this is sufficient.

**(SUGGESTIONS:*

It was noted that if there is a faulty component within an assembly it is far easier to switch out the full assembly and replace it with a fully assembled spare. CIT mentioned that perhaps in a future revision the LED / PD could be housed in a removable unit.

Therefore it may be better to increase the part quantities as follows:

Suggestion (04/11/03):		
MC1	10	(6 + 4 spare)
MC2	10	(6 + 4 spare)
RM	10	(6 + 4 spare)
QUAD1	20	(12 + 8 spare)
QUAD2	20	(12 + 8 spare)
Shelf spares	10	
TOTAL assemblies	80	

Also, increase shelf spares from "9" to "10".

This was approved by the IGR.

**Clamps and Brackets for MC/RM/ETM all ordered – 10/12/03. Delivery to Glasgow expected 23/02/04.*

The manufacture (80 off) of D020188-09 (Coil Former) is to be done in the Department of Physics and Astronomy Workshop (Glasgow). Drawings have been submitted, and the necessary tooling purchased.

***Tbd.*

Agree a delivery schedule for these components – as suggested above it may be wise to cycle the manufacture of these parts if they are not all required immediately. For example, deliver the coils in four batches of 20?

² LIGO-E030094-00-D: Hybrid OSEM Testing Specification (J.Romie)



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ENGRAVING

Parts are to be engraved with their individual drawing number, followed by a three digit serial number commencing from 101. (e.g.D020188-101)

	Number	Rev.	Parts to be ENGRAVED with...
	D020188	09	<i>D020188-101 up to D020188-180*</i>
MC	D020282	10	<i>D020282-101 up to D020282-120*</i>
	D030183	04	- DISCONTINUED - D030710 chosen -
	D030710	02	<i>D030710-101 up to D030710-120*</i>
RM	D030096	01	<i>D030096-101 up to D030096-110*</i>
	D030702	01	- DISCONTINUED - D030711 chosen -
	D030711	01	<i>D030711-101 up to D030711-110*</i>
ETM	D030703	01	<i>D030703-101 up to D030703-140*</i>
	D030704	01	- DISCONTINUED - D030712 chosen -
	D030712	01	<i>D030712-101 up to D030712-140*</i>
SPARES	(D030703)	-	<i>*(Shelf Spares shall not be engraved)</i>
	(D030704)	-	- DISCONTINUED - D030712 chosen -
	(D030712)	-	<i>*(Shelf Spares shall not be engraved)</i>

**(ETM drawings will be used to manufacture the Shelf Spares – thus there will be no clearance holes for the Earthquake Stops. These Shelf Spares will not be engraved with any part number)*

**Discussion: Supply of COILS and ASSOCIATED PARTS FOR THE LASTI CONTROLS PROTOTYPES****FURTHER WORK IN THE US**1) Manufacture of TEFLON spacers (D030123) and MACOR shoulders (D030122)

We should discuss whether these parts are still required. It has already been suggested that the spacer be kept to allow the bracket to be offset from the coil head as it provides important clearance for the Kapton coated coil wire.

**(It was previously agreed that these parts would remain in the assembly)*

Tbd. JHR to arrange manufacture of these parts?

2) Winding

Janeen has located a company in the US that will allow winding duties to be transferred over from the GEO 600 Group in Glasgow to the team at the California Institute for Technology.

3) Mounting of LED and PD

This shall remain the responsibility of the team at CALTECH.

4) Wire

Janeen has been looking into alternative wire with a thicker Kapton coating, and may have comments related to this.

**(It was agreed that this 32 QML wire (32 gage, Q = quadruple build, ML = polyimide) would be used for the LASTI Prototypes. This is instead of the 32 HML (32 gage, heavy build, ML = polyimide).*

The wire has been sourced from "MWS Wire Industries" and the specification can be found at:

<http://www.mwswire.com/insdia2.htm>

5) Kapton paste/sleeves

We should discuss the progress regarding the sourcing and testing of this product.

Tbd. Insert short summary of the plan for this (JHR?) Is the use of a Kapton sleeve still part of the plan?...Is it the case that we are keeping the ability to have Kapton sleeve although will probably not use it?

6) Mechanical Assembly

Cleaning, baking and general mechanical assembly shall be performed at CALTECH. Refer to Assembly Specification³.

³ LIGO-E030518-00-D Mode Cleaner Triple Pendulum Suspension Assembly Specification (H. Armandula)