



**CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 IGR, GLASGOW UNIVERSITY, GEO 600 GROUP**

SYSTEM: **ADVANCED LIGO**
 SUB SYSTEM: **SUSPENSIONS**
 NAME: **D TASKS FOR CONTROLS PROTOTYPE SUSPENSIONS**
 COMMENT: **WORK DETAILED FROM "TO DO LIST" FROM Calum I. Torrie.**

REFERENCE: **SUS. DEV. PLAN** <http://www.ligo.caltech.edu/docs/M/M000202-A.pdf>
 PARTICIPANTS: **CALIFORNIA INSTITUTE OF TECHNOLOGY ; IGR, UNIVERSITY OF GLASGOW GEO 600 GROUP ; GINSTON LAB STANFORD UNIVERSITY**

AUTHOR: Calum I. Torrie
 DATE: Sept 14th 2003
 NUMBER: **T030099**
 REVISION: **T030099-07** update tasks including SUS notes with MC priorities
07

HISTORY: Revision 05 May 28th 2003 / added notes from NAR
 Revision 04 May 27th 2003 / added notes from MPL
 Revision 03 May 27th 2003 / Detailed notes added
 Revision 02 / April 17th 2003 / Addition of Quad work
 Revision 01 / Jan 09th 2003 / Original started to detail visits between CIT and GLA.

NOTES: ^ Current costs only indicates for parts not people
 ? Indicates proposed work not yet officially started
 CIT is used for Calum Iain Torrie and for California Institute of Technology

#	TASK	CURRENT PEOPLE	CURRENT COSTS ^	STATUS	OUTSTANDING	PRIORITY	TIME	DUE
TRIPLES								
1)	OSEMS HEAD	RJ, CIT	GLA	6 anodised heads at CIT 27 May03, for MC.	Total of 32 anodised heads & 2 PEEK heads. (6 MC1, 6 MC2, 6 RM, 4 VAC TEST, 7 SPARE, 3 TEST) 72 heads being manuf. , RFQ proposed Oct 15th. 72 = MC, RM, ETM controls prototypes + spares PEEK parts are in vacuum comp. Testing - 9/11			
	ASSOCIATED PARTS	RJ LC, LZ CIT, RJ	GLA GLA GLA+CIT	alum heads Okd at LSC Several parts already supplied to CIT.	20 coil clamps, D030183-01. To replace D020192. 72 assoc. parts being manuf., RFQ proposed for Oct 15th Individual assemblies required for MC, RM and ETM prototypes			15-Oct-03
	HEAD ASSEMBLY	RJ, CIT HA, BT, RJ BT, JHR, HA JHR	GLA CIT CIT CIT	6 with BT for assembly. 72 new heads Need to check component quantities	These are the anodized alum heads for short term use. Will assy and test at CIT	H		31-Oct-03
	ISOLATION	CIT	CIT	Isolation design included in 6 anodised assemblies for MC.	Decision needed on isolation for set of 72?	M		15-Oct-03
	COIL WINDING	JHR	CIT	Use Pasadena-local vendors				
2)	EXISTING MC STRUCTURE + OTHER (make two MC Controls alike)	JHR	CIT	needs to be completed before Oct7th	structure 1 - would like threaded holes for pigtail strain relief structure 1 - take out masses and glue on magnets structure 2 - need to move side X stiffener holes down structure 2 - open tablecloth bracket mounting holes to dia. 222 structure 2 - would like threaded holes for pigtail strain relief. structure 2 - change out masses for ones in So. Annex w/magnets	H H H H H H	0.5 0.5 0.5 0.5 0.5 0.2	7-Oct-03
	TRANSFER FUNCTION tests	MB		about half done	the other half of the measurements need to be made	H	2	
	ALIGNMENT			i) Coarse wrt suspension ii) Coarse wrt optical table iii) Fine wrt optical table iv) Under Vacuum	OCTOBER Workshop		3	
3)	STRUCTURE * * Redesign of MC for to meet resonant requirement	JHR / CAC?	CIT	Current design has measured 1st mode at 65 Hz. Current requirement is 150 Hz? FEA design can bring to ~130 Hz. ** ** This is a best case as further analysis is required to investigate the elastic support	0) perform more FEA a) tablecloth brackets - redesign b) tablecloth - bracket mounting holes c) earthquake stop crossbars			? 8 weeks total for (a - I)

#	TASK	CURRENT PEOPLE	CURRENT COSTS ^	STATUS	OUTSTANDING	PRIORITY	TIME	DUE
	Updates required to incorporate a catcher for a noise prototype Re-distribution of the lengths of the individual suspension stages	NAR CIT ? JHR	Sta/GLA CIT ?		d) tombstones -lighten up/stiffen up e) face brackets - redesign f) removable bottom 3 crossbars in front i) consider making beam baffles part of structure g) machine top of bottom plate for catcher registration h) any other catcher attachment points redistribution of l_1 and l_2 for non-removal of T-section update top assy in solidworks, redesign new wire fixtures (possibly include adjustable mechanism) new holes for table cloth		3 days 2 days 1 week	
4)	RM SUS MATLAB PARAMETERS INTERACTION WITH MASS ASSEMBLIES INTERACTION WITH BLADE DESIGN SUSPENSION PARTS UPPER MASS PENDULUM INTERMEDIATE MASS ASSEMBLY EDDY CURRENT DAMPERS TABLE CLOTH AND OSEM INTERFACE NON-SUSPENDED PARTS WIRE JIGS STRUCTURE	NAR NAR, MPL NAR, MPL CIT, MPL MPL, CIT RJ? ? CIT JHR ? ?	CIT - CIT ? CIT CIT ? CIT	Drawings of upper mass in CIT workshop. Have layout of a detailed pendulum, completed during MPL's visit in Feb 03. Include ability to have +/- 500g whilw maintaining Moments and staying within footprint ?	Drawings of all parts. Analysis of Structure			
5)	CATCHER MC CATCHER RM IS SUSPENDED ON STEEL WIRES	RJ, CIT, SG	- -	One catcher in Glasgow supplied by Hannover, GEO 600.	Related assembly to be created by RJ Russell is updating a PDR on the MC catcher			1-Aug-03 30-Oct-03
6)	BLADE DESIGN RM BLADES * MC BLADES	MVP, MPL, CIT * * *	- -	Design at Caltech. Design at Caltech.	Discussions required on radius and thickness requirements before RM production.			
7)	ISOLATION and THERMAL NOISE CURVES	NAR, GC		Require MC and RM curves for the conceptual design document being updated (also requested for 20/20/40/40 kg quad) DOCUMENT NOW ON DCC, T010103-03				Finished
8)	SEE SECTION 19							
9)	INSTALLATION			Betsy and Doug to design and discuss possible new designs required for multiply pendulums				
	TRIPLES and QUADRUPLES							
10)	ROTATIONAL ADJUSTER BLADE (at top) TOP BLADE, (MC) TOP BLADE, (RM) TOP BLADE, (ETM) FEA BLADE (in upper mass)	AG, MPL, CIT MPL MPL MPL AG, MPL, CIT	CIT CIT	Parts in CIT workshop. Drawings ready for workshop Design underway Concept developed To do AG considering restrictions wrt footprint	Prototype Tested at CIT July 2003 Drawings etc.. To follow at CIT.			
11)	BLADE DAMPERS	RJ, SG	CIT	One damper in GLA supplied by Hannover, GEO 600.	Drawings etc.. GLA. Parts CIT.			
12)	MATLAB MODELLING TRIPLES (MC) TRIPLES (RM) QUADS (ETM) BS *	NAR, CIT NAR NAR, CIT NAR NAR, CIT NAR	- - - - -	MC designed and files on the web +/- Lengths, l and +/- mass, m RM designed (layout and damping checked) +/- Lengths, l and +/- mass, m ETM design underway (layout and damping undergoing checks) say 3 or 4 stages under consideration	CIT to write quad help file with NAR			
13)	BLADE WIRE CLAMP	MPL, RJ, CIT, CAC						
14)	STRUCTURE ANALYSIS *	JHR, CAC?		Use work on triple to aid step to Quad (see section 3 above)				
15)	BEAM SPLITTER DESIGN	NAR		JHR - To consider layout on Monday at workshop (See section 12 on MATLAB modelling)				

