GLAST Tracker Projects

Project ID   1   **Project Name**   Tracker Layout

Project Description   Fix the parameters of the overall Tracker layout.

End Date	Task ID	Task Description	Lead	Notes
5/1/00	2	Fix SSD strip pitch	Hartmut Sadrozinski	This needs sign-off at IPO level.
5/1/00	1	Fix overall Instrument dimensions and fix Tracker SSD size.	Martin Nordby	This needs sign-off at IPO level.
7/1/00	3	Finalize the tracker converter configuration.	Hartmut Sadrozinski	Requires sign-off at IPO level. Affects tower height, tray design, flex cable design.

Project ID   2   **Project Name**   Specify and define SSDs

Project Description   Finalize the SSD design and prepare for production.

End Date	Task ID	Task Description	Lead	Notes
	47	Review detector specifications	Hartmut Sadrozinski	
	46	Prepare detector specifications	Takashi Ohsugi	
	5	Test ST prototype detectors	Hartmut Sadrozinski	
	6	Detector long-term testing.	Gwelen Paliaga	
6/1/00	4	Finalize the detector mask design.	Takashi Ohsugi	Requires completion of tasks 1 (detector size) and 2 (strip pitch).

Project ID   3   **Project Name**   Ladder Assembly

Project Description   Develop the ladder assembly techniques and production equipment.

End Date	Task ID	Task Description	Lead	Notes
	25	Develop and test a procedure for encapsulation of the ladder wire bonds.		
	9	Test methods for applying adhesive to the detector edge. Choose the best.	Eduardo	
	8	Design, prototype, and test the edge-gluing fixture.	Eduardo	
	7	Research adhesive for edge gluing of detectors.		

Project ID 4   **Project Name**   Ladder Placement

Project Description   Develop the techniques and jigs for placement of ladders onto trays. Includes studies of the adhesives and thermal issues.

End Date	Task ID	Task Description	Lead	Notes
	11	Research adhesives for attachment of ladders	Ossie Millican	
	16	Perfect the method for establishing and controlling the space between detectors and bias circuit.		
	12	Design and prototype a precision jig for ladder attachment	Gwelen Paliaga	Reduce ladder spacing to 100um
	30	Design storage/work holder fixture for trays.		Begin with the concept developed for the BTEM.

Project ID 5   **Project Name**   Hybrid PC Board Development

Project Description   Develop techniques and parts for assembly of the hybrid and attachment to the trays.

End Date	Task ID	Task Description	Lead	Notes
	31	Encapsulation or conformal coating method for the hybrid.	Gwelen Paliaga	
	32	Choose an adhesive/spacer material to attach the hybrid to the tray.	Gwelen Paliaga	
	33	Design jigs for storage and work on the hybrids.	Gwelen Paliaga	Start with the BTEM concept.
	34	Design a jig for burn-in of the hybrids.	Gwelen Paliaga	Start with the BTEM design.
	35	Develop a procedure for cleaning of the hybrids before wire bonding.	Gwelen Paliaga	This may be done by the assembly vendor, especially if one vendor does both the surface mount parts and the chips.
	26	Design and prototype the flex circuit to be bonded to the corner piece.	Gwelen Paliaga	
	15	Redo the layout of the hybrid PC board.	Robert Johnson	BJ has a preliminary layout of the new overall dimensions and screw locations.
	42	Test the electronics assembly in vacuum and over the required temperature range.	Gwelen Paliaga	

| | 13 | Prototype and test the new corner scheme for the detector-electronics interconnect | Gwelen Paliaga | |

| **Project ID** | 6 | **Project Name** | Detector Bias Circuit |

Project Description Design and fabricate the bias circuit for the planes of SSD.

End Date	Task ID	Task Description	Lead	Notes
	22	Detailed CAD layout of the Kapton bias circuit		

| **Project ID** | 7 | **Project Name** | Flex Readout Cable |

Project Description Update the design of the tracker flexible readout cables for the flight instrument.

End Date	Task ID	Task Description	Lead	Notes
	27	Detailed layout of each of the 4 flex cables.		
	45	Research flex circuit vendors and determine whether a splice will be needed in the cable.		

| **Project ID** | 8 | **Project Name** | Tray Mechanical Assembly |

Project Description Complete the final design and prototyping of the carbon-fiber based trays for the flight instrument.

End Date	Task ID	Task Description	Lead	Notes
	10	Thermal testing of ladder/face-sheet assemblies	Gwelen Paliaga	
	29	Detail design of face sheets.	Hytec	
	28	Design, prototype, test carbon-tray structure	Hytec	

| **Project ID** | 9 | **Project Name** | Front-end Readout ASIC |

Project Description Final design and prototyping of the GTFE64 chip in the process to be used for flight.

End Date	Task ID	Task Description	Lead	Notes
	17	Convert the layout of GTFE64 cells from Cadence to Tanner.	Vallon Chen	
	21	Update the command decoder design and use Tanner to place and route the layout. Fab and test the command decoder test chip.	Ned Spencer	

End Date	Task ID	Task Description	Lead	Notes
	20	Design an SEU-hard flip-flop cell for the configuration register.	Ned Spencer	
	18	Design and fabricate the front-end and digital block test chip.	Vallon Chen	
	36	Update the schematic design of the GTFE64 and simulate in spice and Viewsim.	Ned Spencer	
	19	Design and fabricate a test board for the front-end and digital block test chip.	Robert Johnson	
	38	Prototype fab and test of the GTFE64 chip in HP0.5um	Wilko Kroeger	
	41	Test the ASICs for single-event-latchup and SEU immunity.	Ned Spencer	
	44	Test and characterize the HP 0.5um amplifier prototype chip	Masa Hirayama	
	55	Design and fab a probe card for GTFE64 testing.		This card should include a GTRC chip close to the probes, plus multilayer layout similar to the hybrid.
	57			
	37	Do the final GTFE64 layout in the HP0.5um process, using Tanner tools	Vallon Chen	

Project ID 10   **Project Name**   Readout Controller ASIC

Project Description   Final design and prototyping of the GTRC chip in the process to be used for flight.

End Date	Task ID	Task Description	Lead	Notes
	60	Update the Verilog model of the GTRC and simulate		
	39	Write new specifications for the GTRC chip	Robert Johnson	
	54	Develop the standard-cell set for the HP 0.5um process (for the GTRC chip layout in Cadence)		

Project ID 11   **Project Name**   Electronics Requirements

Project Description   Complete the specifications and design of the tracker front-end readout system.

End Date	Task ID	Task Description	Lead	Notes

End Date	Task ID	Task Description	Lead	Notes
	24	Make noise measurements on the BTEM tower electronics with and without concurrent readout.	Wilko Kroeger	
	59	Write a publication on the front end electronics	Robert Johnson	
	58	Make detailed noise measurements with a GTFE64 chip mounted on a Liz board.	Masa Hirayama	
	61	Measure delays in tracker Fast-OR chain	Wilko Kroeger	
	53	Complete the tracker electronics requirements document.	Robert Johnson	

Project ID 14   **Project Name** Tracker Converters

Project Description Procurement of the converter foils and development of the procedures for mounting them on trays.

End Date	Task ID	Task Description	Lead	Notes
	23	Prototype and test a carbon-lead-carbon sandwich		
	56	Build and test a multi-layer Carbon-Pb laminate for SuperGLAST layers.	Guido Barbiellini	

Project ID 15   **Project Name** Tracker Tower Design

Project Description Overall tracker tower mechanical and thermal design, including walls, Vectran cables, ACD snubbers, interface to grid.

End Date	Task ID	Task Description	Lead	Notes
	40	Tower thermal analysis and wall design.	Erik Swensen	

Project ID 17   **Project Name** Electronics Review

Project Description Prepare for and hold the electronics design review.

End Date	Task ID	Task Description	Lead	Notes
	48	Prepare hierarchal set of block diagrams	Robert Johnson	
	52	Prepare a list of deliverables	Robert Johnson	
	51	Prepare a grounding and shielding plan	Ned Spencer	
	49	Prepare a system description	Robert Johnson	

	50	Prepare a preliminary interface description	Robert Johnson	

Project ID	20	**Project Name**	Tracker Web Page

Project Description Create and maintain the tracker web pages

End Date	**Task ID**	**Task Description**	**Lead**	**Notes**
	43	Set up the tracker web page at UCSC	Masa Hirayama	