LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY
- LIGO -
CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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LIGO WWW On-line Documents

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LIGO WWW On-line Documents

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The following list of LIGO document numbers and titles includes the latest versions available for each document. Since not all LIGO documents are available in electronic form, documents in this list may not reflect the latest information available on a given subject. To use this list, click on the document number or title to retrieve the listed document.

1 LIGO TOP-LEVEL DOCUMENTS

1.1. Management Documentation

1.1.1. Project Plans and Policies

M950046-A LIGO PROJECT SYSTEM SAFETY PLAN (900 kbyte)
M960076-A LIGO PROJECT QUALITY ASSURANCE PLAN
E960099-B LIGO RELIABILITY PROGRAM PLAN

1.1.2. Annual Reports

M970007-01 Annual Report (December 1995 through November 1996) (900 kbyte)

1.1.3. Quarterly Reports

M960024-00 Quarterly Progress Report (December 1995 through February 1996)
M960055-00 Quarterly Progress Report (March 1996 through May 1996) (600 kbyte)
M970034-00 Quarterly Report (December 1996 through February 1997) (500 kbyte)
M970080-00 Quarterly Report (March 1997 through May 1997) (700 kbyte)
M970138-00 Quarterly Report (June 1997 through August 1997) (700 kbyte)

1.1.4. Monthly Reports

M970017-01 Monthly Progress Report (End of December 1996)
M970033-00 Monthly Progress Report (End of January 1997)
M970042-00 Monthly Progress Report (End of March 1997)

1.1.5. Proposals

M950020-01 LIGO Operations, 1997-2001
M960051-A LETTER OF INTENT FOR A RESEARCH AND DEVELOPMENT PROGRAM FOR ADVANCED LIGO DETECTORS BY THE LIGO MIT/CALTECH GROUPS
M970001-01 Revised Proposal for a Research and Development Program For Advanced Detectors by the LIGO MIT/Caltech Groups - FY 1997 Proposal Budget

1.1.6. Review Presentation Materials

1.1.6.1 NSF Review April 13-17, 1997

G970068-00 LIGO DATA PROCESSING (700 kbyte)
G970071-01 BEAM TUBE BAKEOUT
G970075-01 LIGO Project Cost/Schedule Status
G970091-00 LIGO Control and Data System Control and Monitoring

1.2. Publications

P940008-00 Measurement of Optical Path Fluctuations due to Residual Gas in the LIGO 40 Meter Interferometer
P950017-02 The Laser Interferometer Gravitational-Wave Observatory (LIGO) Project (800 kbyte)
P960024-A PRINCIPLES OF CALCULATING ALIGNMENT SIGNALS IN COMPLEX RESONANT OPTICAL INTERFEROMETERS
P960031-C The Laser Interferometer Gravitational Wave Observatory Project (1 Mbyte)
P960041-02 Recent Research on the LIGO 40 m Interferometer
P960042-00 Development of Laser Interferometers for Gravitational Wave Detection: Abstract and Summary
P970002-00 Modeling LIGO Data Analysis

1.3. System Engineering Documentation

1.3.1. System Requirements

D970307-00 LIGO SYSTEMS FUNCTIONAL BLOCK DIAGRAM
E950018-02 LIGO Science Requirements Document (SRD)
E950111-A LIGO Naming Conventions
E960036-A LIGO EMI CONTROL PLAN AND PROCEDURES
E960099-B LIGO RELIABILITY PROGRAM PLAN
E960010-A LIGO Sites Alignment Requirements
E950083-B Science Requirements for the LIGO Beam Tube Baffles
T970130-B Specification of a Common Data Frame Format for Interferometric Gravitational Wave Detectors (IGWD)

1.3.2. Modeling and Data Analysis

T970159-04 LIGO Data Analysis System Design Requirements
T970211-00 LIGO Data Analysis System Software Specification for C, C++ and Java
T970160-06 LIGO Data Analysis System Conceptual Design (700 kbyte)
G970288-00 LIGO Data Analysis System Design Requirements Review (DRR)
G970064-00 Modeling LIGO Data Analysis (900 kbyte)
G970135-00 What We've Learned About What We've Learned About "FRAMES"
G970156-00 Computer Languages Computer Languages why all the fuss about why all the fuss about C++
G970261-00 LDAS Prototyping & Testing

T970100-A LIGO Data Analysis Software Specification Issues
T970101-A Strain Calibration in LIGO
M970013-02 A Proposal for the First Experiment for Validation of the 40m End-to-End Model
M970065-B White Paper Outlining the Data Analysis System (DAS) for LIGO I (800 kbyte)
T970128-02 Quantization Noise in Ligo Interferometers
T970167-00 LIGO Science Benchmarks
T970166-01 Benchmark tests for inspiraling binary searches for LDAS
T970186-01 Overview of the 40m End-to-End Model

1.3.3. Alignment

E960010-A LIGO Sites Alignment Requirements
T950004-B Derivation of Global and Local Coordinate Axes for the LIGO Sites
T950107-A Orientation of the LIGO Beam Center Lines with respect to foundation slabs
T960176-C Determination of the as-built LIGO Global Coordinate Axes for Hanford, WA
T960042-A Alignment Tolerances and Re-Alignment Criteria for the LIGO Beam Tubes (600 kbyte)
T970117-A LIGO Site-to-Site Separation

1.3.4. Testing, Measurements and Analysis

T960128-00 Radiation Pressure Noise in LIGO
T970054-00 Beam Tube Dynamics
T970216-A Results of the Electromagnetic Survey for the LIGO Site at Hanford, WA

1.3.5. Layout Drawings

T960051-02 INTEGRATED LAYOUT DRAWINGS: USAGE & MAINTENANCE
D970008-A Chamber & Rack Designations - WA (Corner Station)
D970009-A Chamber & Rack Designations - WA (Mid Station)
D970010-A Chamber & Rack Designations - WA (End Station)

2 FACILITIES DOCUMENTATION

2.1. Beam Tube

2.1.1. Design Requirements and Qualification

T960042-A Alignment Tolerances and Re-Alignment Criteria for the LIGO Beam Tubes
T960125-00 Beam Tube Qualification Test

2.1.2. Baffles

E950083-B Science Requirements for the LIGO Beam Tube Baffles
E960037-A COMPONENT SPECIFICATION: MECHANICAL FABRICATION OF BEAM TUBE BAFFLES
T970053-00 Baffle Glaze Shedding

2.1.3. Bakeout

E960123-03 Beam Tube Bakeout Design Requirements Document
E970125-A COMPONENT SPECIFICATION: BEAM TUBE MODULE INSULATION
E970167-A COMPONENT SPECIFICATION: Cryopump for Beam Tube Bakeout
E970184-A COMPONENT SPECIFICATION: Calibrated Leak Assembly
T960124-00 ISSUES AND CONSIDERATIONS ON THE BEAM TUBE BAKE
T960178-01 Beam Tube Bakeout Conceptual Design
T970148-00 Beam Tube Bakeout Preliminary Design
G960181-00 BEAM TUBE BAKEOUT
G960241-00 BEAM TUBE BAKEOUT DESIGN REQUIREMENTS REVIEW (600 kbyte)
G970217-00 BEAM TUBE BAKEOUT PRELIMINARY DESIGN REVIEW

2.1.4. Testing, Measurements and Analysis

T970054-00 Beam Tube Dynamics
T970110-00 Information for the Beam Tube Pumpdown
T970111-00 Data from Beam Tube Pump Down II
L970429-00 Technical Board Meeting to Review Beam Tube HX2 Vacuum Test Results

2.2. Civil Construction

2.2.1. Design Requirements

E950101-00 Telecommunications requirements for Hanford, WA Site.
E950106-00 LIGO Requirements and Options for Facilities Monitoring and Control System (FMCS)

3 DETECTOR DOCUMENTATION

3.1. Detector System Documentation

E960112-05 Detector Subsystems Requirements (600 kbyte)
E960022-03 LIGO Vacuum Compatibility, Cleaning Methods and Qualification Procedures
E960050-A LIGO Vacuum Compatible Materials List
T950065-A Guidelines for Design Requirement Documents

T960083-A Derivation of CDS Rack Acoustic Noise Specifications
E960108-A Recommendation of parameter choices in 2 km interferometer design (600 kbyte)
T960019-00 Frequency, Intensity and Oscillator Noise in the LIGO
T960120-00 Misalignment-Beam Jitter Coupling in LIGO
T960122-00 Proposed initial detector MC and RC baseline lengths
T970068-00 Recycling Cavity and Mode Cleaner Cavity Baseline Dimensions
D970002-00 Recycling Cavity Dimensional Range
D970003-00 Recycling Cavity Layout
T960128-00 Radiation Pressure Noise in LIGO
T960136-00 Estimates for Motions due to Sound Fields
T960140-00 Fast Estimation of Transverse Fields in High Finesse Optical Cavities
T960189-00 LIGO calibration accuracy
T970007-00 Modelling the Performance of an Initial-LIGO Detector with Realistically Imperfect Optics
G960250-00 Modelling the Performance of an Initial-LIGO Interferometer with Realistically-Deformed Optics (500 kbyte)
L970042-00 Internal Modes of Testmasses
T970077-00 Gravitational Deflection of LIGO Optics in a 9-Point Hindle Mount (1.5 Mbyte)
T970091-00 Determination of the Wedge Angles for the Core Optics Components
T952008-00 A Tutorial For the Fast Fourier Transform Interferometer Simulator
G950061-02 A Summary and Future Preview of the FFT Simulation Initiative in LIGO
T960187-01 Effect of Microseismic Noise on a LIGO Interferometer
T970059-01 The Effect of Earth Tides on LIGO Interferometers
T970101-A Strain Calibration in LIGO
T970128-02 Quantization Noise in Ligo Interferometers
T970167-00 LIGO Science Benchmarks
T970166-01 Benchmark tests for inspiraling binary searches for LDAS
T970149-00 Influence of the stray magnetic field generated by the Faraday isolator on SOS mirror actuators
T970174-00 Interferometric Vernier Technique for Measuring the Lengths of LIGO Fabry-Perot Resonators
T970177-00 Doubly Resonant Sideband Control for LIGO
T970212-00 Mirror Thermoelastic Deflection in the LIGO Optical Surface Absorption Measurement System

3.2. Suspensions and Seismic Isolation

3.2.1. Suspensions

T950011-19 Suspension Design Requirements
E970037-00 SMALL OPTICS SUSPENSION ASSEMBLY SPECIFICATION
E970038-00 LARGE OPTICS SUSPENSION SPECIFICATION
E970080-00 SMALL OPTICS SUSPENSION ASSEMBLY QUALITY CONFORMANCE WORKSHEET
E970132-00 LARGE OPTICS SUSPENSION ASSEMBLY QUALITY CONFORMANCE WORKSHEET
T960074-07 Suspension Preliminary Design
T970135-02 Small Optics Suspension Final Design (Mechanical System)
T970158-06 Large Optics Suspension Final Design (Mechanical System)
T960179-00 Small Optics Suspension Prototype Test Results

T960151-01 Large and Small Optics Suspension Electronics Design Requirements
T970113-00 Large and Small Optics Suspension Electronics Preliminary Design
G970219-00 LIGO LOS and SOS Electronics PDR

E970123-A LIGO SUSPENSION SYSTEM RELIABILITY PREDICTION REPORT
L960596-00 Cross-coupling in the suspension controllers
T960040-00 RESPONSE OF PENDULUM TO MOTION OF SUSPENSION POINT
T960126-01 Magnet size considerations; interference and coil power dissipation
T960137-00 Note on Electrostatics in the LIGO suspensions
T970149-00 Influence of the stray magnetic field generated by the Faraday isolator on SOS mirror actuators

3.2.2. Seismic Isolation

T960065-03 Seismic Isolation Design Requirements Document
T960066-00 Seismic Isolation Conceptual Design (700 kbyte)
L970061-01 Specification Guidance for Seismic Component Cleaning, Baking and Shipping Preparation
E970063-01 LIGO Seismic Isolation System: Fabrication Process Specification
E970129-01 Material, Process, Handling, and Shipping Specification for Welded Diaphragm Bellows
E970130-00 Material, Process, Handling, and Shipping Specification for Fluorel Parts
T970069-01 Requirements for Creep Testing of SEI Spring Elements
T970168-00 Viton Spring Seat Vacuum Bake Qualification

3.3. Lasers and Optics

3.3.1. General Documentation

L970042-00 Internal Modes of Testmasses
T970077-00 Gravitational Deflection of LIGO Optics in a 9-Point Hindle Mount (1.5 Mbyte)
T970091-00 Determination of the Wedge Angles for the Core Optics Components
G950061-02 A Summary and Future Preview of the FFT Simulation Initiative in LIGO
T970212-00 Mirror Thermoelastic Deflection in the LIGO Optical Surface Absorption Measurement System

3.3.2. Prestabilized Laser

E950081-06 Nd 3+ Laser Target Specifications
T970080-09 (Infrared) Pre-stabilized Laser (PSL) Design Requirements
T970087-04 (Infrared) Pre-stabilized Laser (PSL) Conceptual Design
M970142-00 Temporary Operational Safety Procedure For The LIGO 10-W Laser
T970145-00 Performance of VCO/AOM frequency shifter

T970115-00 (Infrared) Pre-stabilized Laser (PSL) Electronics Design Requirements
T970114-00 IR PSL CDS CONCEPTUAL DESIGN DOCUMENT

3.3.3. Input Output Optics

T960093-02 Input Output Optics Design Requirements Document
T970143-00 Design Considerations for LIGO Mode-Matching Telescopes
T970144-00 Input Optics Preliminary Design (800 kbyte)
T970149-00 Influence of the stray magnetic field generated by the Faraday isolator on SOS mirror actuators

3.3.4. Core Optics

E950099-04 Core Optics Components Requirements (1064 nm)
T970071-01 Core Optics Support Design Requirements Document
T970072-01 Core Optics Support Conceptual Design
G970067-00 Core Optics Support Design Requirements Review (900 kbyte)
T970109-00 Spectral Analysis of Coated Optic Phase Maps

3.4. Alignment and Length Sensing

3.4.1. Alignment Sensing/Control

T952007-04 Alignment Sensing/Control Design Requirements Document
T960134-00 Alignment Sensing/Control Conceptual Design
T970060-00 Alignment Sensing/Control Preliminary Design
T952013-00 Alignment Design Interfaces
T960103-00 ASC: Environmental Input to Alignment noise (2 Mbyte)
T950049-00 ASC Centering Subsystem Description
T950069-00 Naming and Interface Definition for ASC Wavefront/Centering
T950073-00 Interferometer Requirement Flowdown To ASC
T950074-00 Naming and Interface Definition for ASC Initial Alignment
T970061-00 ASC CDS Design Requirements Document
T970062-00 ASC CDS Conceptual Design
T960138-00 ASC Channel Count

3.4.1.1 Optical Lever

T950106-01 ASC Optical Lever Design Requirement Document
T950112-00 ASC Optical Lever Specification and Design Document
T950070-00 Naming Convention and Interface Definition for Optical Lever

3.4.1.2 Wavefront Sensing

T960111-A WAVEFRONT SENSOR (1.1 Mbyte)
T960113-00 Modal Model Update 1: Interferometer Operators
T960114-B Modal Model Update 2: GW-Sensitivity to Angular Misalignments
T960115-A Modal Model Update 3: Small Angle Regime
T960116-00 Modal Model Update 4: Mode Mismatch
T960191-00 Modal Model Update 5 Large Angle Regime
T960118-00 Modal Model Update 6: Mode Cleaner
T970058-00 Modal Model Update 7 Angular Transfer Functions

3.4.2. Length Sensing/Control

T960058-03 Length Sensing and Control Design Requirements Document
T970138-00 LSC CDS Design Requirements
T970139-00 LSC CDS Conceptual Design (800 kbyte)
T970122-00 Length Sensing and Control Subsystem Preliminary Design (1.4 Mbyte)
T952109-01 LIGO Length Sensing System: Design considerations for a tabletop prototype interferometer
T960067-00 Length Control RMS Deviations from Resonance
T960139-00 Shot noise sensitivity of the length control error signals
T970084-00 Frequency Response of the LIGO Interferometer
T970101-A Strain Calibration in LIGO
G970192-00 Length Sensing and Control Subsystem Preliminary Design Review (1.5 Mbyte)

3.5. Control and Data System

T950054-02 CDS Control and Monitoring Design Requirements Document
T950120-01 CDS Control and Monitoring Conceptual Design (1.1 Mbyte)
T960004-A CDS Software Development Plan and Guidelines
T960009-00 LIGO Data Acquisition System Design Requirements
T960010-00 CDS Data Acquisition System Conceptual Design
T970136-00 CDS Data Acquisition Preliminary Design
T970171-00 CDS Control and Monitoring Final Design
G970289-00 CDS Control & Monitoring Final Design Review (FDR)

T970115-00 (Infrared) Pre-stabilized Laser (PSL) Electronics Design Requirements
T970114-00 IR PSL CDS CONCEPTUAL DESIGN DOCUMENT

T960151-01 Large and Small Optics Suspension Electronics Design Requirements
T970113-00 Large and Small Optics Suspension Electronics Preliminary Design
G970219-00 LIGO LOS and SOS Electronics PDR

T970061-00 ASC CDS Design Requirements Document
T970062-00 ASC CDS Conceptual Design

T970138-00 LSC CDS Design Requirements
T970139-00 LSC CDS Conceptual Design

T970165-00 PEM Data Acquisition Preliminary Design
D970532-00 Hanford PEM Data Acquisition System Preliminary System Layout

T960107-00 LIGO Interferometer Diagnostics System Design Requirements
T960108-00 Interferometer Diagnostics Conceptual Design

T960024-A Vacuum Control and Monitoring System (VCMS) Design Requirements
T960037-00 Vacuum Control and Monitoring System (VCMS) Design
T970001-00 Vacuum Control and Monitoring System (VCMS) Final Design
E970158-00 Hanford EPICS Vacuum Controls Vacuum Gauge Pair (Pirani and Cold Cathode) Test Specifications
E970159-00 Hanford EPICS Vacuum Controls Electric Gate Valve Test Specifications
E970160-00 Hanford EPICS Vacuum Controls Pneumatic Gate Valve Test Specifications
E970161-00 Hanford EPICS Vacuum Controls Cryogenic Pump Test Specifications
E970162-00 Hanford EPICS Vacuum Controls 2500l/s Ion Pump Test Specifications
E970163-00 Hanford EPICS Vacuum Controls 75 l/s Ion Pump Test Specifications
E970001-00 DCN for VCMS Drawings
T970179-00 How to Build the Hanford Left End Station EPICS Vacuum Controls System
T970180-00 How to Build the Hanford Left Mid Station EPICS Vacuum Controls System
T970181-00 How to Build the Hanford Left LVEA-Y Station EPICS Vacuum Controls System

T970182-00 How to Build the Hanford Right LVEA-X Station EPICS Vacuum Controls System
T970183-00 How to Build the Hanford Mechanical Room Station EPICS Vacuum Controls System
T970184-00 How to Build the Hanford Right Mid Station EPICS Vacuum Controls System
T970185-00 How to Build the Hanford Right End Station EPICS Vacuum Controls System

T960014-00 Vacuum Feedthrough and Cabling Conceptual Design

T960177-00 LIGO Cable Numbering and Marking Standard
T970076-00 LIGO CDS VME Mainframe Specification
T960083-A Derivation of CDS Rack Acoustic Noise Specifications
D970595-00 8KHz Instumentation Amplifier/Filter
D970596-00 500Hz Instumentation Amplifier/Filter

3.6. Physical Environment Monitor

T960127-02 Physical Environmental Monitor Design Requirements Document (600 kbyte)
T960145-00 Physical Environmental Monitor Conceptual Design
T970086-00 Physical Environmental Monitor Preliminary Design Document
G970026-00 Physics Environment Monitoring Preliminary Design Review
T970112-00 Physics Environment Monitoring Final Design Document

D970532-00 Hanford PEM Data Acquisition System Preliminary System Layout
T970165-00 PEM Data Acquisition Preliminary Design

4 R&D DOCUMENTATION

D961304-06 OPTICAL LAYOUT - 40m RECYCLING (1.8 Mbyte)

G960172-00 THE FMI ALIGNMENT EFFORT
G970152-01 LIGO@ MIT: Transition to Operations and Advanced Detector R& D

M970013-02 A Proposal for the First Experiment for Validation of the 40m End-to-End Model

T950035-01 Measurement of the Ground Drift at the 40-m Lab
T950137-00 Description of the Electronics for the FMI Wavefront Experiment (1.4 Mbyte)
T960013-02 Calculation of the Modulation Frequency for the 40m Power Recycling Interferometer
T960015-03 Calculation of Optical Parameters for the 40m Power Recycling Interferometer
T960072-00 Beam Splitter and Recycling Mirror Suspension Controller Design Requirements
T960073-00 40 Meter Recycling Electronics Design Requirements
T960162-02 Specifications of the 40m Test Mass Suspension Prototype
T960186-00 Procedure for Attaching the Fins and Hanging the PNI Mirrors
T970085-02 Correlation Function and Power Spectrum of Non-Stationary Shot Noise
T970090-00 Proposal for a table-top prototype resonant sideband extraction interferometer
T970102-00 40 Meter BS and RCM Suspension Controller Test Plan
T970103-00 BS and RCM Suspension Electronics Operator's Manual
T970186-01 Overview of the 40m End-to-End Model