

## **Appendix 5: Detailed Design Phase Work Plan**

Cassegrain ADC – Detailed Design (DD) Phase  
Project Work Plan: Revision 1.0

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## Introduction

The purpose of the Cassegrain ADC project is to provide an Atmospheric Dispersion Corrector that will fully compensate for effects of atmospheric dispersion down to a 60° zenith angle of the Keck 1 telescope for a wavelength range of 0.31 to 1.1 microns.

In February the Conceptual Design of that Cassegrain ADC was completed and reviewed. The CARA board approved start of the Preliminary Design Study in April 2003 and it was completed and reviewed in October, 2003.

This work plan deals directly with the next stage in a process that would involve: a Detailed Design (CD) will complete the detailed design and fabrication drawings. Following a review and approval the Fabrication phase would complete the instrument followed by the Installation and Commissioning phase. We plan to order the optical glass after approval of the Preliminary Design Phase and the funds to do so.

### 1. Work Scope

#### 1.1. Instrument Specifications and Requirements

The Cassegrain ADC Requirements Document Version 1.2 covers the Instrument Specifications and Requirements to be followed in this phase

#### 1.2. Telescope/Observatory Interface Control Document (ICD)

The Cassegrain ADC ICD covers the Interface

#### 1.3. Optical Glass Purchase

#### 1.4. Detailed Mechanical Design

#### 1.5. Electrical Design

#### 1.6. Software

#### 1.7. Schedule

The schedule will be updated to the end of the project and detailed to the end of the Detailed Design phase.

## 1.8. Budget

The Budget will be updated to the end of the project and detailed to the end of the Detailed Design phase.

## 2. Specifications

Defined in the ADC Requirements Document, Version 1.2

## 3. Project Team

Principle Investigator – Joe Miller  
Project Scientist, Optical Designer, and Deputy PI – Drew Phillips  
Optician – David Hilyard  
Mechanical Engineer – Vern Wallace  
Electronic Design – Barry Alcott  
Software – Will Deich  
Project Management – David Cowley  
CARA Instrument Program Oversight – Sean Adkins

## 4. Decision Matrix

- a. The PI and the Deputy PI will make all performance decisions.
- b. Staffing decisions will be made by the Project Manager in consultation with the PIs and CARA.
- c. Budget decisions within the approved budget will be made by the Project Manager in consultation with the PIs and CARA.
- d. Budget decisions exceeding the approved budget (including any expenditure of the contingency amount) must be approved by the CARA Instrument Program Manager.
- e. Telescope interface decisions will be made by CARA through the Instrument Program Manager.

## 5. Risk and Contingency

The technical and budget risks are considered low at this stage (CD) of the development. There is a 20% project contingency, but we do not expect to use any of this money during this phase.

The major risk at this phase is that a key participant becomes unavailable to the project and that we are unable to proceed until they are available or can be replaced.

## 6. Work Breakdown Structure

### Preliminary Design Phase

1. Optical Glass Purchase
  - 1.1. Finalize optical material properties and specifications
  - 1.2. Receive CARA funds for optical material
  - 1.3. Write, submit, and issue PO
  - 1.4. Optical Material Delivery
2. Detailed Mechanical Design
  - 2.1. Detailed Design and fabrication drawings of attachment points
  - 2.2. Detailed Design and fabrication drawings of static structure
  - 2.3. Detailed Design and fabrication drawings of slides and ball screw translation system, detailed specification of bought parts
  - 2.4. Detailed Design and fabrication drawings of drive system, detailed specification of bought parts
  - 2.5. Detailed Design and fabrication drawings of prism cells and attachments to translation mechanism
  - 2.6. Detailed Design and fabrication drawings of covers
  - 2.7. Detailed Design and fabrication drawings of handling fixture(s), detailed specification of bought parts
  - 2.8. Detailed Design and fabrication drawings of electronics enclosure, detailed specification of bought parts
3. Electrical
  - 3.1. Detailed Specification of motor controller system
  - 3.2. Design of enclosure temperature control
  - 3.3. Control schematics
4. Software
  - 4.1. Specification of keywords
5. Preparation for Preliminary Design Review

## 7. Deliverables

- Detailed Design Report
- Materials for the Critical Design Review
- Fabrication drawings
- Detailed specification of bought parts

## 8. Milestones

- Detailed Design Start            Nov 17/03
- Start of Preparations for CD review   Feb 04
- Critical Design Review March 04

## 9. Schedule

The project schedule is included as part

## 10. Budget

The proposed budget tracking sheet and cost codes are attached (attachment 2). A graph showing the rate of expenditures is also attached. This graph would be updated monthly at the time of the budget report and would include actual expenditures.

## 11. Project Tracking

Monthly reports will be sent to the project team, SSC and CARA on about the 20<sup>th</sup> of each month. The report will include an update of the technical and budgetary status, and the schedule.

Monthly reports will be in a version of the new format requested by CARA as modified by agreement between the Project Manager and the CARA Instrument Program Manager.

## 12. Revision History

Revision 1.0	Sept 16, 2003
Revision 1.1	Sept. 29, 2003
Revision 1.2	Oct 13, 2003