G4 STATEMENT OF WORK

This Appendix contains a draft Statement of Work (SOW) for Phases A-E of the HMI Program. This program is a collaboration between Stanford University and the Lockheed Martin Solar and Astrophysical Laboratory (LMSAL). This SOW is divided into three sections describing Phase A, Phases B/C/D, and Phase E.

PHASE A – CONCEPT DEFINITION

Scope

Stanford University will develop the HMI concept to the level where detailed mission, science, and instrument development are defined, and spacecraft interfaces and allocations determined. This will permit the establishment of firm costs for all subsequent phases. In addition to LMSAL, Stanford will work in collaboration with the Mullard Space Sciences Laboratory (MSSL) and the Rutherford Appleton Laboratory (RAL) in their definition of the CCD's and cameras, respectively for this mission. Phase A will culminate with a study report of the effort and a cost proposal for all subsequent phases. The E/PO program will be initiated in Phase-A.

Deliverables

- Monthly Progress Reports
- Final Report (Concept Study)
  - Executive Summary
  - Science Investigation Description
  - Instrument Performance Specification
  - Implementation Plan
    - Organization
    - Responsibilities
    - Key Personnel
    - Subcontracting Approach
    - Schedules
    - Risk Management
    - Reporting and Reviews
    - Instrument Design
    - Instrument Fabrication
    - Instrument Testing/Calibration
    - PAIP
    - Interface Definitions
    - Technical Readiness Level Status
    - E/PO
- Preparation for and support of
  - Systems Requirements Review
  - Initial Confirmation Review
- Statements of Work for Phases B-E.
- Cost Proposal for Phases B-E

Government Responsibilities

- Establish a Letter of Agreement between the UK and USA
  - MSSL
  - RAL

PHASE B/C/D – DESIGN & IMPLEMENTATION

Scope

LMSAL, with direction from Stanford will perform a preliminary design, detailed design, and fabricate, test and commission the HMI instrument.

The preliminary design activities will include, but not be limited to, defining both internal and external interfaces, conducting the systems engineering and performance analysis, develop preliminary test plans, define the GSE, and establish the operational concept. Updated and refined schedules for the implementation phase will be established.

The detailed design activities will bring the design to the point where fabrication and procurement activities can start. An instrument integration plan will be developed and the GSE design will be completed. The flight and GSE software architecture will be completed and code implementation initiated.

The implementation phase will commence with the fabrication and procurement of all hardware elements. All of the subsystems will be integrated. This includes the telescopes provided by SAO, the camera from RAL, and the CCD's from MSSL. Test procedures will be developed from the test plans and all flight hardware will be fully tested to the specified

requirements established in the instrument performance specification. Instrument calibrations will be performed. The instrument team will support the launch and the subsequent 30 days of on-orbit commissioning, culminating in the completion of this mission phase.

Stanford will design, implement, and test the ground data processing system.

Stanford and the science team will work with NASA to continue implementation of a comprehensive E/PO program.

Deliverables

- Preparation for and support of:
  - Preliminary Design Review
  - Confirmation review/Non-Advocate Review
  - Critical Design Review
  - Pre-Environmental Review
  - Pre-Ship Review
  - Mission Readiness Review
  - Flight Readiness Review
  - Launch Readiness Review
  - Flight Operations Review
  - Mission Operations Review
- Monthly Reports
  - Progress Report
  - Financial Report
  - Schedules
- Other Reports
  - Education and Public Outreach Report
  - Parts and Materials List
  - Contamination Control Plan
  - Software Development plan
  - Complete Set of Drawings
  - Verification Plan
  - Test Plan
  - Test Procedures
  - Instrument Specification
  - Mission Operations Plan
  - Data Analysis Plan
  - Science Preparation Summary
- Other Items
  - STM
  - Flight Instrument
  - Flight and GSE Software
  - GSE
- Government Responsibilities
  - Augment the Letter of Agreement between the UK and USA to include
    - Imperial College
    - Cambridge University

PHASE E – MISSION OPERATIONS

Scope

The HMI team will support mission operations, data reduction, and data analysis activities for the five year period starting 30 days after launch, and data analysis for a sixth year. The data will be processed and archived. The health and safety of the HMI instrument will be monitored, and on-orbit performance affecting scientific analysis will be characterized.

Deliverables

- Publications in Scientific Journals
- Preparation of Data for Public Use
- Calibrated Data Sets for NASA Archiving
- Education and Public Outreach Report
- Monthly Reports
  - Progress Report
  - Financial Report

Government Responsibilities

Operate SDO and the SDO MOC.