

**Task Order Plan (TOP)**

**Contract Number:** NNM05AB50C  
**TO Title:** *Optical Laboratory Equipment and Testing*  
**TO Number:** 37-030101 **Revision:** 12

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**Period of Performance:** 10/02/2010 to 09/30/2011

**MSFC Initiator:** John Calhoun

(b)(4)

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**Emergency:** No

Revision 12: The purpose of this revision is to adjust the estimates on existing subelements based on changes to the requested support, split a subelement for better tracking, and add subelements for new scope. Revision (12) identifies the following adjustments to the task order estimate and work scope:

1. Subelement -00: Decreased the total estimate from (b)(4) due to funding not being available for the previously estimated work. Minimal support will be provided to this subelement after December 30, 2010.
2. Subelement -02: Decreased the total estimate from (b)(4) due to funding not being available for the previously estimated work. Updated the milestones and deliverables in section 6.0
3. Subelement -03: Decreased the total estimate from (b)(4) Future support to WAVE will be tracked on a new subelement -07, and this subelement will be used only for KSC Telescope support.
4. Subelement -04: Decreased the total estimate from (b)(4) due to funding not being available for the previously estimated work.
5. Subelement -05: Increased the total estimate from (b)(4) to support new tasking on the SXT-S primary bar, mirror clips, and neutron coupons.
6. New Subelement -06, SCAP support, is added with this revision and has an estimated cost of (b)(4)
7. New Subelement -07, WAVE support, is added with this revision and has an estimated cost of (b)(4)
8. New Subelement -08, MaGIXS-2 Fabrication Support, is added with this revision and has an estimated cost of (b)(4)

Revision (12) affects support to these programs and Ares Project Office (APO) elements:

Sub-element Mapping and WBS funding:

Program	Subelement	Previous Subelement	WBS	Status

6-DOF	00	00	833011.02.08.01.VP27.09	<i>Open</i>
ECLSS	JA	01	401769.06.03.03.02.07	<i>Mapped to 37-030101-JA</i>
MaGIXS, CSI	02	02	432938.09.01.08.10.04	<i>Added with Rev 07</i>
KSC Telescope	03	03	197009.10.01.01.10	<i>Added with Rev 09</i>
ART-XC	04	N/A	750271.09.01.08	<i>Added with Rev 11</i>
FOXSI-2, HERO, Micro-X	05	N/A	399131.02.01.02.15 791926.02.03.02.82 399131.02.01.02.71	<i>Added with Rev 11</i>
SCAP	06	N/A	750271.09.01.08 359257.01.04.01	<i>Added with Rev 12</i>
WAVE	07	N/A	652272.03.08 099844.04.03.02	<i>Added with Rev 12</i>
MaGIXS-2	08	N/A	432938.09.01.08.11.04	<i>Added with Rev 12</i>
First Stage	CF	CF	136905.08.01.03	<i>closed administratively on July 3, 2010</i>
Upper Stage	CU	CU	136905.08.05.08.03.08	<i>closed administratively on July 3, 2010</i>

Revision 11: The purpose of this revision is to extend this task into Contract Year 6 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period October 2, 2010 through September 30, 2011. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance. Subelement -01 has been renumbered to -JA to conform to the project/program naming convention that has been established for FY11.

The purpose of Revision (10) is to adjust estimates due to changes in the customer's requirements. Labor was estimated at the request of the customer for anticipated projects which did not materialize. The labor estimate changes below are a result of these changes to work scope.

9. Decrease the labor estimate on Subelement -00 by (b)(4) hours. Increase the other estimate by (b)(4) to support a service call and applications support by an electro-discharge machine (EDM) vendor. Increase the material estimate by (b)(4) to procure fasteners and fabrication supplies.
10. Decrease the labor estimate on Subelement -02 by (b)(4) hours. Add a material estimate of (b)(4) to procure fasteners and supplies for fabrication activities.
11. Decrease the labor estimate on Subelement -03 by (b)(4) hours. Add other estimate of (b)(4) to support telescope refurbishment activities requested by the customer. Add material estimate of (b)(4) to procure fasteners and supplies for the telescope refurbishment activities requested by the customer.
12. Update the milestones and deliverables in section 6.0 for Subelement -00, Subelement -02, and Subelement -03.
13. No changes were made to Subelement -CF or Subelement –CU.

Revision 09: The purpose of this revision (09) is to extend this task into Contract Year (CY) 5 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period October 3, 2009 through October 14, 2010. Task work on Sub-element -03, KSC Telescope Refurbishment Support, has been added for CY5. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance.

Revision (08) identifies the following adjustments to the task order estimate and work scope:

1. Increase the labor estimate on Subelement -00 by (b)(4) hours to account for intern student support. The other estimate was increased by (b)(4) to cover conference and training course fees. The travel estimate was increased by (b)(4) to cover travel expenses to conferences and training courses. The subcontract estimate on Subelement -00 was decreased by (b)(4) since a lower level of effort is required on the KSC Lens Refurbishment project for the remainder of FY09.
2. Decrease the labor estimate on Subelement -02 by (b)(4) hours since (b)(4) task member will be supporting a task in the VP62 directorate during September 2009.
3. No changes were made to Subelement -CF or Subelement –CU.

Revision (07) identifies the following adjustments to the task order estimate and work scope:

1. Decrease the labor estimate on Subelement -00 by (b)(4) hours and move them to the new Subelement -02 to track expended labor on the Hi-C Fabrication Support for the remainder of FY09. These two subelements share common labor resources. The other estimate was increased by (b)(4) and the material estimate was increased by (b)(4) for the remainder of FY09 per the current task requirements. The subcontract estimate on Subelement -00 was decreased by (b)(4) since progress on the KSC Lens Refurbishment has been delayed.
2. Adjust the subcontract estimate on Subelement -01 for team lead oversight. Increase the labor hours on Subelement -01 by (b)(4) hours.
3. Define the Schedule, Performance Plan, and Risk Assessment for the new Subelement -02 (Hi-C Fabrication Support) task activities. Add subcontract estimate to Subelement -02 for team lead oversight.
4. No changes were made to Subelement -CF or Subelement –CU.
5. Change the designation of the MSFC Initiator from John West to John Calhoun.

The purpose of this revision (06) is to identify the following adjustments to the task order estimate and work scope:

1. Increase the subcontract estimate for (b)(4) on Subelement -00 by (b)(4) for ray trace analysis support.
2. Update the Subelement -00 other and material estimates for the remainder of FY09 per current task requirements. The material estimate was increased by (b)(4) and the other

estimate increased by (b)(4) to replace and install a broken coordinate measuring machine (CMM) probe head. The probe head is required by task personnel to perform their task assignments.

For Revision (06), no changes were made to Subelement -CF or Subelement -CU.

The purpose of this revision (05) is to identify the following adjustments to the task order estimate and work scope:

1. Define the Schedule, Performance Plan, and Risk Assessment for the Subelement -01 (ECLSS Fabrication Support) task activities.
2. Reduce the Subelement -00 labor estimate for (b)(4) during the remainder of FY09. This decreased the estimate by (b)(4) hours.
3. Update the Subelement -00 other, material, and travel estimate for the remainder of FY09 per current task requirements. The material estimate was decreased by (b)(4) other estimate of (b)(4) was added, and travel was reduced by (b)(4)
4. Reduce the subcontract estimate on Subelement -00 by (b)(4)

For Revision (05), no changes were made to Subelement -CF or Subelement -CU.

Revision 04: The purpose of this revision (04) is to extend this task into Contract Year 4 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period September 27, 2008 through October 2, 2009. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance. This revision affects the following Ares Project Office (APO) elements: First Stage (subelement CF) and Upper Stage (subelement CU).

The purpose of Revision (03) is to perform the following adjustments to the task estimate:

1. Increase the material procurement estimate on Subelement -00 to account for recent material purchases.
2. Reduce the labor estimate for the (b)(4) on Subelement -00 since the potential candidate will not begin work during FY08.
3. Increase the travel estimate on Subelement -00 to account for travel charges incurred during FY08 for task staff recruiting and training.

For Revision (03), no changes were made to Subelement -CF or Subelement -CU, and no additional budget is required.

The purpose of Revision (02) is to define the Ares First Stage (-CF) and Ares Upper Stage (-CU) task activities. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect the task activities for Sub-Element: CF and Sub-element: CU. Also, the labor estimate for the (b)(4) on Subelement: 00 has been reduced by (b)(4) hours since a candidate has not been hired yet.

The purpose of Revision (01) is to increase the estimated labor hours to include support for (b)(4) to meet the customer's task requirements. Revision 01 also increases the estimated subcontract labor support to (b)(4) for the remainder of CY3 per the agreement of the ES31 and VP62 customers. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect the task activities for Sub-Element: 00.

This Task Order (TO) is a continuation of work being performed on TO 43-060301-00 of the NNM05AB50C ESTS contract. This TO realigns work performed previously in VP63, and now supports ES31 within the new ED organizational structure. This TO defines and estimates work for the period 1 March 2008 through 26 September 2008. For subcontracted efforts, this TO authorizes work

for the same period. Subelement -00 of TO 43-060301 will be revised for closure in March with an effective date of 29 February 2008. Subelement -01 of TO 43-060301 will remain under that TO.

## **1.0 Task Order Description & Objectives**

### ***Sub-Element: 00 (Optical Fabrication, Testing and Assembly)***

Technical, opto-mechanical design, and fabrication support is needed for the Optical Fabrication, Testing and Assembly (OFTA) group to produce the optical and opto-mechanical hardware components for the Six Degree of Freedom (6-DOF), James Webb Space Telescope (JWST), Extreme Universe Space Observatory (EUSO), Advanced Video Guidance System (AVGS), Space Act Agreements, and various optical hardware programs supporting Flight and Non-Flight NASA Operations. This task includes the setup, operation, and maintenance of large and small diamond turning machines for the development of processes and techniques for the fabrication of optical elements including mandrels for x-ray telescopes and Fresnel lenses. Other support areas include the use of optical fabrication techniques that range from the grinding and polishing of glass, metal and ceramic surfaces to optical assembly and testing.

### ***Sub-Element: JA (ECLSS Fabrication Support)***

Technical, engineering design, and fabrication support is needed to build International Space Station Environmental Control and Life Support System (ISS ECLSS) Spares' test (thermal, vibration, environmental, etc.) hardware components. This task includes the setup, operation, and maintenance of precision lathes, computer numerical controlled (CNC) milling machines, manual milling machines, and electro-discharge machining (EDM) machines for the development of processes and techniques to fabricate ISS ECLSS test components. Additional support areas include the setup, operation, and maintenance of grinding and polishing machines for finishing glass, metal, plastic, and ceramic components for the ISS ECLSS.

### ***Sub-Element: 02 (Coronal Imaging Fabrication Support)***

Technical, opto-mechanical design, and fabrication support is needed to build the High Resolution Coronal Imager (Hi-C) and Marshall Grazing Incidence X-ray Spectrograph (MaGIXS) optical system components. This task includes the setup, operation, and maintenance of grinding and polishing machines for finishing glass, metal, plastic, and ceramic components for the development of processes and techniques to fabricate the Hi-C and MaGIXS mirror components. Additional support includes the setup, operation, and maintenance of precision lathes, computer numerical controlled (CNC) milling machines, manual milling machines, and metrology equipment.

### ***Sub-Element: 03 (KSC Telescope Refurbishment Support)***

Technical, opto-mechanical design, and fabrication support is needed to modify and refurbish the KSC Telescope Unit assemblies. This task includes performing ray trace analysis of optical designs using manual calculations or raytrace programs (i.e. ZEMAX, CODE V, etc.).

### ***Sub-Element: 04 (ART-XC Fabrication Support)***

Technical, opto-mechanical design, and fabrication support is needed to accomplish the ART-XC mandrel fabrication, polishing equipment fabrication, tooling fabrication, and mandrel metrology activities. This task includes the setup, operation, and maintenance of machines for polishing and super polishing X-ray mandrels. Additional support includes the setup, operation, and maintenance of precision lathes, computer numerical controlled (CNC) milling machines, manual milling machines, and metrology equipment.

### ***Sub-Element: 05 (X-ray Science Fabrication Support)***

Technical, opto-mechanical design, and fabrication support is needed to accomplish the mandrel fabrication, polishing equipment fabrication, tooling fabrication, and mandrel metrology activities on various x-ray experiment projects (i.e. HERO, FOXSI, FOXSI-2, Micro-X, and Neutron mandrels). Additional support includes performing dynamic analyses of the flight mirror modules based on vibration ground testing data or the loads expected during anticipated flight tests.

#### ***Sub-Element: 06 (Strategic Capabilities Assets Program (SCAP) Support)***

Technical support is needed in operating and maintaining the Strategic Capabilities Assets Program (SCAP) large system vacuum hardware at MSFC. This task includes supporting the ES31 customer in submitting facilities work orders to keep these assets in good working order. This task entails indentifying the correct components and repairing or installing vacuum hardware components such as pumps, valves, connectors, etc. It also includes mentoring potential users in utilizing and operating these assets.

#### ***Sub-Element: 07 (WAVE Support)***

Technical and opto-mechanical design support is needed to analyze dynamic behavior of the WB-57 Ascent Video Experiment (WAVE) assembly benches from flight simulated test data or flight footage image data. This task includes performing ray trace analysis of optical designs using manual calculations or raytrace programs (i.e. ZEMAX, CODE V, etc.). This task may also include refurbishment, modification, or fabrication of new or existing WAVE assembly components.

#### ***Sub-Element: 08 (MaGIXS-2 Fabrication Support)***

Technical, opto-mechanical design, and fabrication support is needed to build the MaGIXS-2 optical system components. This task includes the setup, operation, and maintenance of grinding and polishing machines for finishing glass, metal, plastic, and ceramic components for the development of processes and techniques to fabricate MaGIXS-2 mirror components. Additional support includes the setup, operation, and maintenance of precision lathes, computer numerical controlled (CNC) milling machines, manual milling machines, and metrology equipment.

## **2.0 Technical Approach (Including required input, guidelines & assumptions)**

In order to successfully complete this task the following technical approach will be taken:

#### ***Sub-Element: 00 (Optical Fabrication, Testing and Assembly)***

- 1) Identify customer requirements for the production of optical components (i.e. diamond turning, milling, grinding, or polishing) and the requirements for performance testing.
- 2) Optimize the operation and performance of the diamond turning machines.
- 3) Design and develop manufacturing processes and strategies to produce unique and unusual optical components.
- 4) Acquire necessary materials or other hardware and review the fabrication schedule to coordinate priority with the task lead.
- 5) Produce high quality tooling and fixturing to fabricate specialized components.
- 6) Fabricate optical components according to the customer specifications and requirements.
- 7) Maintain fabrication equipment to maximize utility and availability.
- 8) Create 3D CAD solid models and drawings of opto-mechanical hardware utilizing Solid Edge and Pro-Engineer version Wildfire.
- 9) Deliver products to the task initiator.

#### ***Sub-Element: JA (ECLSS Fabrication Support)***

- 1) Identify customer requirements for the production of test components (i.e. diamond turning, milling, grinding, or polishing) and the requirements for performance testing.

- 2) Design and develop manufacturing processes and strategies to produce test hardware.
- 3) Acquire necessary materials or other hardware and review the fabrication schedule to coordinate priority with the task lead.
- 4) Produce high quality tooling and fixturing to fabricate specialized components.
- 5) Fabricate components according to the customer specifications and requirements.
- 6) Create 3D CAD solid models and drawings of mechanical hardware utilizing Solid Edge and Pro-Engineer version Wildfire.
- 7) Maintain fabrication equipment to maximize utility and availability.
- 8) Deliver products to the task initiator.

***Sub-Element: 02 (Coronal Imaging Fabrication Support)***

- 1) Identify customer requirements for the production of test components (i.e. diamond turning, milling, grinding, or polishing) and the requirements for performance testing.
- 2) Design and develop manufacturing processes and strategies to produce the optical components.
- 3) Acquire necessary materials or other hardware and review the fabrication schedule to coordinate priority with the task lead.
- 4) Produce high quality tooling and fixturing to fabricate specialized components.
- 5) Fabricate components according to the customer specifications and requirements.
- 6) Create 3D CAD solid models and drawings of mechanical hardware utilizing Solid Edge and Pro-Engineer version Wildfire.
- 7) Maintain fabrication equipment to maximize utility and availability.
- 8) Deliver products to the task initiator.

***Sub-Element: 03 (KSC Telescope Refurbishment Support)***

- 1) Identify customer requirements for the refurbishment of telescope components (i.e. diamond turning, milling, grinding, or polishing) and the requirements for performance testing.
- 2) Design and develop manufacturing processes and strategies to produce the refurbished components.
- 3) Acquire necessary materials or other hardware and review the fabrication schedule to coordinate priority with the task lead.
- 4) Produce high quality tooling and fixturing to fabricate specialized components.
- 5) Fabricate or refurbish components according to the customer specifications and requirements.
- 6) Assist customer in inspecting fabricated or procured products for conformance with requirements.
- 7) Initiate procurements to refurbish the telescope unit parts.
- 8) Perform ray trace analysis of optical designs using manual calculations or raytrace programs (i.e. ZEMAX, CODE V, etc.).
- 9) Deliver products to the task initiator.

***Sub-Element: 04 (ART-XC Fabrication Support)***

- 1) Identify customer requirements for the production of X-ray mandrels (i.e. diamond turning, milling, grinding, or polishing) and the requirements for performance verification testing.
- 2) Design and develop manufacturing processes and strategies to produce the X-ray mandrels
- 3) Acquire necessary materials or other hardware and review the fabrication schedule to coordinate priority with the task lead.
- 4) Produce high quality tooling and fixturing to fabricate specialized polishing and metrology equipment. Fabricate these components according to the customer specifications and requirements.
- 5) Insure fabricated or procured products conform to requirements.
- 6) Maintain X-ray mandrel fabrication equipment to maximize utility and availability.
- 7) Create 3D CAD solid models and drawings of opto-mechanical hardware utilizing Solid Edge and Pro-Engineer version Wildfire.

- 8) Deliver products to the task initiator.

#### ***Sub-Element: 05 (X-ray Science Fabrication Support)***

- 1) Identify customer requirements for the production of X-ray mandrels (i.e. diamond turning, milling, grinding, or polishing) and the requirements for performance testing.
- 2) Design and develop manufacturing processes and strategies to produce the X-ray mandrels
- 3) Perform dynamic analyses of the flight mirror modules based on vibration ground testing data or the loads expected during anticipated flight tests.
- 4) Acquire necessary materials or other hardware and review the fabrication schedule to coordinate priority with the task lead.
- 5) Produce high quality tooling and fixturing to fabricate specialized polishing and metrology equipment. Fabricate these components according to the customer specifications and requirements.
- 6) Insure fabricated or procured products conform to requirements.
- 7) Maintain X-ray mandrel fabrication equipment to maximize utility and availability.
- 8) Create 3D CAD solid models and drawings of opto-mechanical hardware utilizing Solid Edge and Pro-Engineer version Wildfire.
- 9) Deliver products to the task initiator.

#### ***Sub-Element: 06 (Strategic Capabilities Assets Program (SCAP) Support)***

- 1) Operating, installing, and maintaining large vacuum components at MSFC.
- 2) Assisting with customer initiated procurements, tracking procured hardware, and scheduling the installation of vacuum system equipment.
- 3) Fabricating, modifying, and assembling large and small components to facilitate the component installations.

#### ***Sub-Element: 07 (WAVE Support)***

- 1) Identify customer requirements for the WAVE bench assemblies.
- 2) Perform dynamic analyses of the bench based on ground based testing data or in flight image data and accelerometers.
- 3) Fabricate components that may improve the image performance of the bench assemblies.
- 4) Perform ray trace analysis of optical designs using manual calculations or raytrace programs (i.e. ZEMAX, CODE V, etc.).
- 5) Deliver products to the task initiator.

#### ***Sub-Element: 08 (MaGIXS-2 Fabrication Support)***

- 1) Identify customer requirements for the production of test components (i.e. diamond turning, milling, grinding, or polishing) and the requirements for performance testing.
- 2) Design and develop manufacturing processes and strategies to produce the optical components.
- 3) Produce high quality tooling and fixturing to fabricate specialized components.
- 4) Fabricate components according to the customer specifications and requirements.
- 5) Create 3D CAD solid models and drawings of mechanical hardware utilizing Solid Edge and Pro-Engineer version Wildfire.
- 6) Maintain fabrication equipment to maximize utility and availability.
- 7) Deliver products to the task initiator.

### **3.0 Discussion of Skills Required**

Senior and junior level engineers experienced in manufacturing technology of optical components/mechanical hardware. Design and drawing experience utilizing 3D CAD modeling is re-

quired. Proficiency with Pro-Engineer version Wildfire and/or Solid Edge creating solid models and drawings is required.

Senior level paraprofessionals experienced in the diamond turning of optical components, which include mandrels for x-ray telescopes and Fresnel lenses. This includes operation, programming and maintenance of high precision diamond turning machines. This task also requires extensive knowledge of the construction, maintenance, operation, and repair of all sizes of precision diamond turning machines and precision lathes.

Senior level paraprofessionals experienced in the operation of lathes, drill presses, and other machine shop tools and equipment with extensive knowledge and experience with fabrication by conventional machining.]

Senior level paraprofessionals experienced in the operation, assembly, and maintenance of large vacuum system components.

Senior level paraprofessionals experienced (b)(4) (b)(4) Optical fabrication for this task requires knowledge of testing advanced optics, as well as experience in the operation of state-of-the-art optical metrology equipment.

Engineer or scientist with a minimum of (b)(4) (b)(4)

Senior level engineer with (b)(4) (b)(4)

#### 4.0 Special Tools Required

None identified.

#### 5.0 Participating Subcontractors

(b)(4)

#### 6.0 Milestones & Deliverables

##### ***Sub-Element: 00 (Optical Fabrication, Testing and Assembly)***

- a. Monthly activity reports.
- b. Various test fixtures.
- c. Verbal or written progress reports.

##### ***Sub-Element: JA (ECLSS Fabrication Support)***

- a. Monthly activity reports
- b. Test fixtures per customer requirements.

- c. Verbal or written progress reports.

***Sub-Element: 02 (Coronal Imaging Fabrication Support)***

- a. Monthly activity reports.
- b. Deliver the Hi-C mirror and parabolic MaGIXS mirror (2<sup>nd</sup> quarter FY2011).
- c. Verbal or written progress reports.

***Sub-Element: 03 (KSC Telescope Refurbishment Support)***

- a. Monthly activity reports.
- b. Refurbish KSC telescope unit components (1<sup>st</sup> and 2<sup>nd</sup> quarters FY2011).
- c. Verbal or written progress reports.

***Sub-Element: 04 (ART-XC Fabrication Support)***

- a. Monthly activity reports.
- b. Assist customer in coordinating the X-ray mandrel fabrication and procurement activities (1st and 2nd quarters FY2011).
- c. Verbal or written progress reports.

***Sub-Element: 05 (X-ray Science Fabrication Support)***

- a. Monthly activity reports.
- b. Assist customer in coordinating the X-ray mandrel fabrication and procurement activities (1st and 2nd quarters FY2011)
- c. Verbal or written progress reports.

***Sub-Element: 06 (Strategic Capabilities Assets Program (SCAP) Support)***

- a. Monthly activity reports.
- b. Assist customer in coordinating the X-ray mandrel fabrication and procurement activities (1st and 2nd quarters FY2011)
- c. Verbal or written progress reports.

***Sub-Element: 07 (WAVE Support)***

- a. Monthly activity reports.
- b. Verbal or written progress reports.

***Sub-Element: 08 (MaGIXS-2 Fabrication Support)***

- a. Monthly activity reports.
- b. Assist customer in fabricating the parabolic/hyperbolic mirror segments (2nd quarter FY2011)
- c. Verbal or written progress reports.

**7.0 Special Considerations (Recruiting, Special Equipment / Material, Safety, etc.)**

***Sub-Element: 00 (Optical Fabrication, Testing and Assembly)***

- a. A material estimate is included for the procurement of technical books, safety equipment, fabrication/metrology equipment, material, and hardware.
- b. An other estimate is included for the procurement of machining services, fabrication services, conference fees, training courses, equipment service agreements, shipping, and recruiting expenses.

**Sub-Element: JA (ECLSS Fabrication Support)**

None identified.

**Sub-Element: 02 (Coronal Imaging Fabrication Support)**

- a. A material estimate is included for the procurement of fasteners and hardware.

**Sub-Element: 03 (KSC Telescope Refurbishment Support)**

- a. A material estimate is included for the procurement of fasteners and hardware.
- b. An other estimate is included for the procurement of the following services: optical coatings, bead blasting, anodizing, painting, and shipping the refurbished parts.

**Sub-Element: 04 (ART-XC Fabrication Support)**

- a. A travel estimate is included for travel to workshops, presenting technical papers at conferences, customer meetings, and on-site meetings with vendors.

**Sub-Element: 05 (X-ray Science Fabrication Support)**

- a. An other estimate is included for the procurement of the following services: service call for the repair of equipment, fabrication services, shipping, and recruiting expenses.

**8.0 Work Shelf**

The following activities could be accomplished as part of the Task Order performance by personnel that are temporarily available due to program or funding delays on other Tasks. Specific assignments will be coordinated with the Task Initiator to ensure appropriate skills and experience.

TO/Subelement	Description	Due Date	Skill
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**9.0 Schedule**

Task Order #	Subelement	Task Work Element	2011															
			Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct		
37-030101	--	<b>Optical Laboratory Equipment and Testing</b>	▼															
37-030101	00	Optical Fabrication, Testing and Assembly	▬															
37-030101	JA	ECLSS Fabrication Support	▬															
37-030101	02	Coronal Imaging Fabrication Support	▬															
37-030101	03	KSC Telescope Refurbishment Support	▬															
37-030101	04	ART-XC Fabrication Support	▬															
37-030101	05	X-ray Science Fabrication Support	▬															
37-030101	06	Strategic Capabilities Assessment (SCAP) Support	▬															
37-030101	07	WAVE Support	▬															
37-030101	08	MaGIXS-2F Fabrication Support	▬															
37-030101	--	Monthly Activity Reports	▬															

# ESTS Contract Task Order Request Performance Plan

Task Order Title: [Optical Laboratory Equipment and Testing](#)

Task Order Number: [37-030101](#) Revision: 12

Category	Weighting Technical %	End of Period Technical Score
<b>Technical Objectives</b>	65%	X <u>65%</u> = <b>Justification</b>
<p>Design and develop manufacturing processes and strategies to produce unique and unusual optical components. Produce high quality tooling and fixturing for the fabrication of specialized components. Identification of requirements and specifications for fabricated optical components including materials, surface finish, performance specifications, and special testing for performance verification. Acquisition of materials and hardware in coordination with the task lead. Fabrication of optical components according to specifications. Performance of component testing to verify compliance with specifications. General maintenance of equipment.</p>		
<b>Schedule Objectives (Milestones)</b>	<b>Weighting Schedule %</b> <u>10%</u> <i>(min 10%)</i>	<b>Schedule Score</b> X <u>10%</u> = <b>Justification</b>
<p>Sub-Element: 00 (Optical Fabrication, Testing and Assembly)</p> <ol style="list-style-type: none"> <li>Monthly activity reports.</li> <li>Various test fixtures.</li> <li>Verbal or written progress reports.</li> </ol> <p>Sub-Element: JA (ECLSS Fabrication Support)</p> <ol style="list-style-type: none"> <li>Monthly activity reports</li> <li>Test fixtures per customer requirements.</li> <li>Verbal or written progress reports.</li> </ol> <p>Sub-Element: 02 (Coronal Imaging Fabrication Support)</p> <ol style="list-style-type: none"> <li>Monthly activity reports.</li> <li>Deliver the Hi-C mirror and parabolic MaGIXS mirror (2nd</li> </ol>		

# ESTS Contract Task Order Request Performance Plan

Task Order Title: [Optical Laboratory Equipment and Testing](#)

Task Order Number: [37-030101](#) Revision: 12

<p>quarter FY2011).</p> <p>c. Verbal or written progress reports.</p> <p>Sub-Element: 03 (KSC Telescope Refurbishment Support)</p> <p>a. Monthly activity reports.</p> <p>b. Refurbish KSC telescope unit components (1st and 2nd quarters FY2011).</p> <p>c. Verbal or written progress reports.</p> <p>Sub-Element: 04 (ART-XC Fabrication Support)</p> <p>a. Monthly activity reports.</p> <p>b. Assist customer in coordinating the X-ray mandrel fabrication and procurement activities (1st and 2nd quarters FY2011).</p> <p>c. Verbal or written progress reports.</p> <p>Sub-Element: 05 (X-ray Science Fabrication Support)</p> <p>a. Monthly activity reports.</p> <p>b. Assist customer in coordinating the X-ray mandrel fabrication and procurement activities (1st and 2nd quarters FY2011)</p> <p>c. Verbal or written progress reports.</p> <p>Sub-Element: 06 (Strategic Capabilities Assets Program (SCAP) Support)</p> <p>a. Monthly activity reports.</p> <p>b. Assist customer in coordinating the X-ray mandrel fabrication and procurement activities (1st and 2nd quarters FY2011)</p> <p>c. Verbal or written progress reports.</p> <p>Sub-Element: 07 (WAVE Support)</p> <p>a. Monthly activity reports.</p> <p>b. Verbal or written progress reports.</p>		
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# ESTS Contract Task Order Request Performance Plan

Task Order Title: [Optical Laboratory Equipment and Testing](#)

Task Order Number: [37-030101](#) Revision: 12

<p>Sub-Element: 08 (MaGIXS-2 Fabrication Support)</p> <p>a. Monthly activity reports.</p> <p>b. Assist customer in fabricating the parabolic/hyperbolic mirror segments (2nd quarter FY2011)</p> <p>c. Verbal or written progress reports.</p>		
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	<b>Weighting</b> <b>Cost%</b> <u>25%</u> <i>(min.25%)</i>	<b>Cost Score</b>  X <u>25%</u> =	
<b><u>Cost (actual vs. negotiated)</u></b>			<b>Justification</b>  <div style="border: 1px solid black; height: 60px; width: 100%;"></div>
	<b>Weighting</b> <b>Total %</b> <u>100.00%</u>	<b>Total Score</b>  <div style="background-color: #cccccc; width: 100%; height: 15px;"></div>	

## Technical, Schedule, and Cost Grading Scale

Score	Description
9.0-10.0	Exceeded TO Performance Plan objectives resulting in major benefit(s)
8.0-8.9	Exceeded TO Performance Plan objectives resulting in modest benefit(s)
7.0-7.9	Met TO Performance Plan objectives
3.0-6.9	Did not meet all TO Performance Plan objectives resulting in minimal impact or requiring additional agency funds
0.0-2.9	Did not meet TO Performance Plan objectives resulting in substantial impact and/or requiring additional agency funds

## ESTS Contract Task Order Request Performance Plan

Task Order Number: [Optical Laboratory Equipment and Testing](#)

Task Order Number: [37-030101](#)      Revision: [12](#)

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**Comments:**

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**Risk Assessment**

**Contract Number:** NNM05AB50C  
**TO Title:** Optical Laboratory Equipment and Testing  
**TO Number:** 37-030101 **Revision:** 12

**Period of Performance:** 10/02/2010 to 09/30/2011

**MSFC Initiator:** John Calhoun

(b)(4)

**Task Order Risk Assessment to Cost, Technical, and Schedule**

**Sub-Element: 00 (Optical Fabrication, Testing and Assembly)**

<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	2	2	Support required for unexpected jobs may be higher than current funding allows for.
Risk C2	Cost			
Risk T1	Technical	2	2	Loss of personnel involved in original design resulting in loss of information on design approach and reasoning.
Risk T2	Technical			
Risk S1	Schedule	2	2	Task personnel may not be available to support unplanned issues or changing project priorities due to commitments to other tasks and funding restraints.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

**Sub-Element: JA (ECLSS Fabrication Support)**

<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	1	1	Meet cost estimate to within 10%.
Risk C2	Cost			
Risk T1	Technical	1	1	Meet all technical objectives and goals.
Risk T2	Technical			
Risk S1	Schedule	1	1	Meet all schedule deadlines to within one week.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

**Sub-Element: 02 (Coronal Imaging Fabrication Support)**

<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	2	2	Support required for MaGIXS and Hi-C jobs is higher than current funding allows for.
Risk C2	Cost			
Risk T1	Technical	2	2	Loss of personnel involved in original fabrication steps resulting in loss of information on fabrication approach and reasoning.
Risk T2	Technical			
Risk S1	Schedule	2	2	Task personnel may not be available to meet end customer delivery dates due to reduced hour work schedules.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

**Sub-Element: 03 (KSC Telescope Refurbishment Support)**

<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	2	2	Support required for unexpected jobs may be higher than current funding allows for.
Risk C2	Cost			
Risk T1	Technical	2	2	Loss of personnel involved in original design resulting in loss of information on refurbishment approach and reasoning.
Risk T2	Technical			
Risk S1	Schedule	2	2	Task personnel may not be available to support unplanned issues or changing project priorities due to commitments to other tasks and funding restraints.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

**Sub-Element: 04 (ART-XC Fabrication Support)**

<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	1	1	Meet cost estimate to within 10%.
Risk C2	Cost			
Risk T1	Technical	1	1	Meet all technical objectives and goals.
Risk T2	Technical			
Risk S1	Schedule	1	1	Meet all schedule deadlines to within one week.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

**Sub-Element: 05 (X-ray Science Fabrication Support)**

<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	2	2	Support required for unexpected anomaly investigations may be higher than current funding allows for.
Risk C2	Cost			
Risk T1	Technical	2	2	Loss of personnel involved in original design resulting in loss of information on design approach and reasoning.
Risk T2	Technical			
Risk S1	Schedule	2	2	Task personnel may not be available to support unplanned issues or changing project priorities due to commitments to other tasks.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

***Sub-Element: 06 (Strategic Capabilities Assets Program (SCAP) Support)***

<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	1	1	Meet cost estimate to within 10%.
Risk C2	Cost			
Risk T1	Technical	1	1	Meet all technical objectives and goals.
Risk T2	Technical			
Risk S1	Schedule	1	1	Meet all schedule deadlines to within one week.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

***Sub-Element: 07 (WAVE Support)***

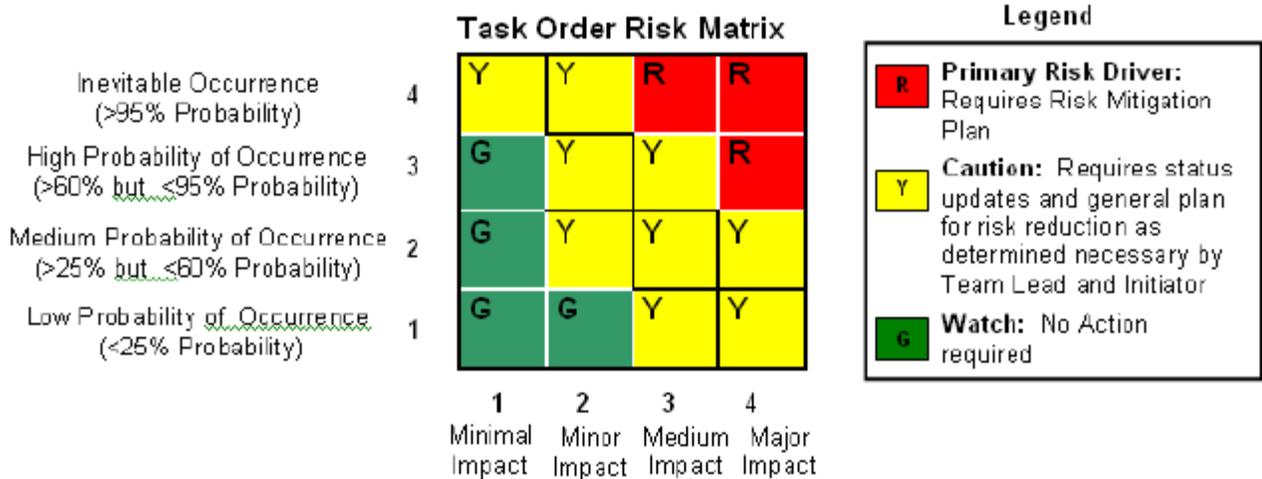
<b>Risk</b>	<b>Risk Type</b>	<b>Probability (1-4)</b>	<b>Impact (1-4)</b>	<b>Risk Description</b>
Risk C1	Cost	1	1	Meet cost estimate to within 10%.
Risk C2	Cost			
Risk T1	Technical	1	1	Meet all technical objectives and goals.
Risk T2	Technical			
Risk S1	Schedule	1	1	Meet all schedule deadlines to within one week.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.

***Sub-Element: 08 (MaGIXS-2 Fabrication Support)***

Risk	Risk Type	Probability (1-4)	Impact (1-4)	Risk Description
Risk C1	Cost	1	1	Meet cost estimate to within 10%.
Risk C2	Cost			
Risk T1	Technical	1	1	Meet all technical objectives and goals.
Risk T2	Technical			
Risk S1	Schedule	1	1	Meet all schedule deadlines to within one week.
Risk S2	Schedule			

\*Note: See page 2 for risk mitigation plan for those risks, which are Primary Risk Drivers.



Impact Level	Cost Impact Definition	Technical Impact Definition	Schedule Impact Definition
(1) Minimal Impact	No significant cost impact	No significant technical impact	No significant schedule impact
(2) Minor Impact	Potential to recover cost	Potential to gain required technology without impact	Minor delay in deliverables but no impact to customer
(3) Medium Impact	>0 but <10% subtask cost overrun	Some technical impact but potential to recover	Delay in subtask deliverables but work arounds available and acceptable to customer
(4) Major Impact	>10% subtask cost overrun	Unable to meet technical requirements to perform subtask	Delay in subtask deliverables with impact to customer

## Risk Mitigation Plan

Complete the following chart for those risks identified on page 1 as "Primary Risk Drivers". The following chart will serve as the Risk Mitigation Plan.

- Daily and weekly tag ups are required for monitoring hours charged by personnel to each subelement, coordinating task assignments, and confirming if new funding is available for 2<sup>nd</sup> quarter FY 2011 efforts.