

**Task Order Plan (TOP)**

**Contract Number:** NNM05AB50C  
**TO Title:** Science Experiment Development Branch  
**TO Number:** 37-060301 **Revision:** 11

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

**MSFC Initiator:** John Brunson

(b)(4)

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**Emergency:** No

**Revision -11**

Due to a change in scope this revision adds subelement –RE providing support for the Solar Instrumentation Test, Design, & Fabrication (SITDF) project. The (b)(4) on subelement –RE and subelement –00 (used for rollup purposes) are increased by a combined (b)(4) resulting in a corresponding (b)(4) increase in cost. Due to a reduction in scope, in that no further support during this period of performance is anticipated on subelements –GA and –36, the (b)(4) on subelements –GA and –36 are reduced by a combined (b)(4) resulting in a corresponding (b)(4) reduction in cost. The Schedule has been revised reflective of the changes in scope to subelements –GA, –36, and –RE.

This revision affects the programs listed in the table below:

Subelement	WBS	Subelement Name/Project
00	There is no WBS associated with this subelement, it is for rollup purposes.	Science Experiment Definition and Development
36	This subelement is being closed.	Hurricane Imaging Radiometer (HIRAD)
GA	This subelement is being closed.	Fast, Affordable Science and Technology SATellite (FAST-SAT)/Science, VP 20 Science Technology
RE	199008.02.08.82	Solar Instrumentation Test, Design, & Fabrication (SITDF)/ Science, VP 60 Science R&A

**Revision -10**

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.

This revision affects the programs listed in the table below:

Subelement	Previous Subelement	WBS	Subelement Name/Project
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00	00	There is no WBS associated with this subelement, it is for rollup purposes.	Science Experiment Definition and Development
33	33	278083.02.50.01	International Lunar Network (ILN)
34	34	943396.05.03.02.08.02	Magnetospheric Multiscale (MMS) Mission
35	35	378289.04.02.04	Advanced Microwave Precipitation Radiometer 2 (AMPR2)
36	36	432938.09.01.08.10.02	Hurricane Imaging Radiometer (HIRAD)
97	97	This task captures low cost short term jobs and is funded by multiple WBS's as required.	Catch All Other Subprojects 3 (CAOS 3)
GA	32	432938.09.01.08.10.11	Fast, Affordable Science and Technology SATellite (FAST-SAT)/Science, VP 20 Science Technology
RA	04	339131.02.01.02.15	High Energy x-ray Replicative Optics (HERO)/Science, VP 60 Science R&A
RB	10	547714.04.14.01.44	Observing Microwave Emissions for Geophysical Applications (OMEGA)/Science, VP 60 Science R&A
RC	18	811073.02.09.02.19	Solar Ultraviolet Magnetograph Investigation (SUMI)/Science, VP 60 Science R&A
RD	31	811073.02.06.01.81	miniature Environmental Scanning Electron Microscope (mE-SEM)/Science, VP 60 Science R&A

The -04, -10, -18, -31 and -32 subelements have been redesignated conforming to the project/program numbering convention that has been established for FY11.

### **Revision -09**

Due to a reduction in scope, in that no further support during this period of performance is anticipated on Subelement -10, the (b)(4) on Subelement -00 (used for rollup purposes) and Subelement -10 are reduced by a combined (b)(4) resulting in a corresponding (b)(4) reduction in cost.

(b)(4) The Schedule has been revised reflective of the reduction in scope to Subelement -10. The Performance Plan and Risk Assessment have not been revised since there are no expected changes in task activities for this period of performance. No additional budget is required.

### **Revision -08**

Due to a change in scope this revision adds subelements -35 and -36 providing support for the Advanced Microwave Precipitation Radiometer 2 (AMPR2) and Hurricane Imaging Radiometer (HIRAD) projects, respectively. The period of performance has been extended from April 2, 2010 through October 14, 2010. This revision increases the resources on this task by (b)(4) with a corresponding increase in cost of (b)(4). The Schedule has been revised to reflect the addition of subelements -35 and -36. The Risk Assessment has been updated. The Performance Plan has not been changed with this revision. The subelement list is as follows:

Subelement 00: Science Experiment Definition and Development

Subelement 04: High Energy x-ray Replicative Optics (HERO)

Subelement 10: Observing Microwave Emissions for Geophysical Applications (OMEGA)

Subelement 18: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement 31: miniature Environmental Scanning Electron Microscope (mESEM)  
Subelement 32: Fast, Affordable Science and Technology SATellite (FASTSAT)  
Subelement 33: International Lunar Network (ILN)  
Subelement 34: Magnetospheric Multiscale (MMS) Mission  
Subelement 35: Advanced Microwave Precipitation Radiometer 2 (AMPR2)  
Subelement 36: Hurricane Imaging Radiometer (HIRAD)  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)

**Revision -07**

The purpose of this revision is to add subelement -34 which provides support for the Magnetospheric Multiscale (MMS) Mission project. The Schedule has been revised to reflect the addition of subelement -34. No additional budget is required as the net change in total hours estimated is unaffected. The Performance Plan and Risk Assessment have not been changed with this revision. The active subelements are now:

Subelement 00: Science Experiment Definition and Development  
Subelement 04: High Energy x-ray Replicative Optics (HERO)  
Subelement 10: Observing Microwave Emissions for Geophysical Applications (OMEGA)  
Subelement 18: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement 31: miniature Environmental Scanning Electron Microscope (mESEM)  
Subelement 32: Fast, Affordable Science and Technology SATellite (FASTSAT)  
Subelement 33: International Lunar Network (ILN)  
Subelement 34: Magnetospheric Multiscale (MMS) Mission  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)

**Revision -06**

The purpose of this revision is to extend this task into Contract Year 5 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period October 3, 2009 through April 2, 2010. 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 also changes the assigned MSFC Initiator. Subelements -14 and -30 no longer require support and have been closed with this revision. This revision affects the following Science programs: (subelement -01) High Energy x-ray Replicative Optics (HERO), (subelement -10) Observing Microwave Emissions for Geophysical Applications (OMEGA), (subelement -18) Solar Ultraviolet Magnetograph Investigation (SUMI), (subelement -31) miniature Environmental Scanning Electron Microscope (mESEM), (subelement -32) Fast, Affordable Science and Technology SATellite (FASTSAT), and (subelement -33) International Lunar Network (ILN). The active subelements are now:

Subelement 00: Science Experiment Definition and Development  
Subelement 04: High Energy x-ray Replicative Optics (HERO)  
Subelement 10: Observing Microwave Emissions for Geophysical Applications (OMEGA)  
Subelement 14: Dusty Plasma Laboratory (DPL)/Gossamer (*This subelement was closed under revision -06.*)  
Subelement 18: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement 30: Advanced Microwave Precipitation Radiometer (AMPR) (*This subelement was closed under revision -06.*)  
Subelement 31: miniature Environmental Scanning Electron Microscope (mESEM)  
Subelement 32: Fast, Affordable Science and Technology SATellite (FASTSAT)  
Subelement 33: International Lunar Network (ILN)  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)

**Revision -05**

The purpose of this revision is to more accurately reflect the effort required during this period of performance. (b)(4) on Subelement -00 was reduced by (b)(4) with a corresponding reduction in cost of (b)(4) The Schedule, Perfor-

mance Plan and Risk Assessment have not been revised since there are no expected changes in task activities for this period of performance. No additional budget is required. The active subelements are now:

Subelement 00: Science Experiment Definition and Development  
Subelement 04: High Energy x-ray Replicative Optics (HERO)  
Subelement 10: Observing Microwave Emissions for Geophysical Applications (OMEGA)  
Subelement 14: Dusty Plasma Laboratory (DPL)/Gossamer  
Subelement 18: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement 30: Advanced Microwave Precipitation Radiometer (AMPR)  
Subelement 31: miniature Environmental Scanning Electron Microscope (mESEM)  
Subelement 32: Fast, Affordable Science and Technology SATellite (FASTSAT)  
Subelement 33: International Lunar Network (ILN)  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)

#### ***Revision -04***

Due to a change in scope this revision adds subelement -32 which provides support for the Fast, Affordable Science and Technology SATellite (FASTSAT) project and subelement -33 which provides support for the International Lunar Network (ILN) project. The Schedule has been revised to reflect the addition of subelements -32 and -33. No additional budget is required as the net change in total hours estimated is unaffected. The Performance Plan and Risk Assessment have not been changed with this revision. The active subelements are now:

Subelement 00: Science Experiment Definition and Development  
Subelement 04: High Energy x-ray Replicative Optics (HERO)  
Subelement 10: Observing Microwave Emissions for Geophysical Applications (OMEGA)  
Subelement 14: Dusty Plasma Laboratory (DPL)/Gossamer  
Subelement 18: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement 30: Advanced Microwave Precipitation Radiometer (AMPR)  
Subelement 31: miniature Environmental Scanning Electron Microscope (mESEM)  
Subelement 32: Fast, Affordable Science and Technology SATellite (FASTSAT)  
Subelement 33: International Lunar Network (ILN)  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)

#### ***Revision -03***

The purpose of this revision is to add subelement -31 which provides support for the miniature Environmental Scanning Electron Microscope (mESEM) project. The Schedule has been revised to reflect the addition of subelement -31. No additional budget is required as the net change in total hours estimated is unaffected. The Performance Plan and Risk Assessment have not been changed with this revision. The active subelements are now:

Subelement 00: Science Experiment Definition and Development  
Subelement 04: High Energy x-ray Replicative Optics (HERO)  
Subelement 10: Observing Microwave Emissions for Geophysical Applications (OMEGA)  
Subelement 14: Dusty Plasma Laboratory (DPL)/Gossamer  
Subelement 18: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement 30: Advanced Microwave Precipitation Radiometer (AMPR)  
Subelement 31: miniature Environmental Scanning Electron Microscope (mESEM)  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)

#### ***Revision -02***

The purpose of this revision 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. The Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance. Additionally, subelements -17, -25, and -28 no longer require support and have been closed. Therefore the active subelements are now:

Subelement 00: Science Experiment Definition and Development  
Subelement 04: High Energy x-ray Replicative Optics (HERO)  
Subelement 10: Observing Microwave Emissions for Geophysical Applications (OMEGA)  
Subelement 14: Dusty Plasma Laboratory (DPL)/Gossamer  
Subelement 17: Radiation Shielding (*This subelement was closed under revision -02.*)  
Subelement 18: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement 25: GLAST Burst Monitor (*This subelement was closed under revision -02.*)  
Subelement 28: Science Systems Technical Support (*This subelement was closed under revision -02.*)  
Subelement 30: Advanced Microwave Precipitation Radiometer (AMPR)  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)

### **Revision -01**

The purpose of this revision is to more accurately reflect the effort required during this period of performance. (b)(4) on Subelement -00 was reduced by (b)(4) with a corresponding reduction in cost of (b)(4). The Schedule, Performance Plan and Risk Assessment have not been revised since there are no expected changes in task activities for this period of performance. No additional budget is required.

### **Revision -00**

This Task Order (TO) is a continuation of work being performed on TO 31-050101 of the NNM05AB50C ESTS contract. This TO realigns work performed previously in EI51, and now supports ES63 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. TO 31-050101 will be revised for closure in March with an effective date of 29 February 2008.

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

This Task Order (TO) provides technical support for the development, fabrication, assembly, and operation of laboratory and flight scientific instruments needed to carry out research programs/projects for the Engineering Directorate. The TO consists of subelements associated with the following specific projects and programs in the Science Experiment Development Branch:

Subelement 00: Science Experiment Definition and Development  
Subelement 04: (*Closed under revision -10 and redesignated as subelement RA*)  
Subelement 10: (*Closed under revision -10 and redesignated as subelement RB*)  
Subelement 14: Dusty Plasma Laboratory (DPL)/Gossamer (*This subelement was closed under revision -06.*)  
Subelement 17: Radiation Shielding (*This subelement was closed under revision -02.*)  
Subelement 18: (*Closed under revision -10 and redesignated as subelement RC*)  
Subelement 25: GLAST Burst Monitor (*This subelement was closed under revision -02.*)  
Subelement 28: Science Systems Technical Support (*This subelement was closed under revision -02.*)  
Subelement 30: Advanced Microwave Precipitation Radiometer (AMPR) (*This subelement was closed under revision -06.*)  
Subelement 31: (*Closed under revision -10 and redesignated as subelement RD*)  
Subelement 32: (*Closed under revision -10 and redesignated as subelement GA*)  
Subelement 33: International Lunar Network (ILN)  
Subelement 34: Magnetospheric Multiscale (MMS) Mission  
Subelement 35: Advanced Microwave Precipitation Radiometer 2 (AMPR2)  
Subelement 36: Hurricane Imaging Radiometer (HIRAD) (*This subelement was closed under revision -11.*)  
Subelement 97: Catch All Other Subprojects 3 (CAOS 3)  
Subelement GA: Fast, Affordable Science and Technology SATellite (FASTSAT) (*This subelement was closed under revision -11.*)  
Subelement RA: High Energy x-ray Replicative Optics (HERO)  
Subelement RB: Observing Microwave Emissions for Geophysical Applications (OMEGA)

Subelement RC: Solar Ultraviolet Magnetograph Investigation (SUMI)  
Subelement RD: miniature Environmental Scanning Electron Microscope (mESEM)  
Subelement RE: Solar Instrumentation Test, Design, & Fabrication (SITDF)

The technical objective is to fabricate Science Experiment Development Branch hardware to user's technical requirements.

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

The general approach includes:

1. Discuss with the principal investigator the technical requirements for the project, schedule and milestone dates.
2. Review drawings and sketches when they are received to insure understanding of the components.
3. Determine hours necessary to complete project.
4. Setup jigs and equipment for fabrication.
5. Fabricate the components to specifications.
6. Design, fabricate, and program electronic circuits and components.
7. Deliver components to the principal investigator.
8. Record hours and other expenses for each project.

## **3.0 Discussion of Skills Required**

The ESTS Group will provide precision machinists, welders, and electronic technicians (b)(4)

(b)(4)

(b)(4) They will be skilled in metal work; reading drawings; setting up jigs; operating lathes, mills, drill presses, and welding equipment; the use of hand tools; the design, layout, and fabrication of printed circuit boards; software programming involving data acquisition, antenna control, and motion control; and will be knowledgeable about NASA procedures and quality control.

## **4.0 Special Tools Required**

Machine shop tools: lathe, drill press, milling machine, etc. located in the Machine Shop in the National Space Sciences and Technology Center (NSSTC). Electronics laboratory equipment: oscilloscope, logic analyzer, spectrum analyzer, printed circuit board rapid prototype machine, etc. located in the Electronics Laboratory at the NSSTC.

## **5.0 Participating Subcontractors**

None.

## **6.0 Milestones & Deliverables**

Complete fabrication tasks within the time required by the end user. Provide monthly reports on work performed on this task.

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

A (b)(4) is included in Subelement -97 to cover the anticipated cost of Personal Protective Equipment (PPE) needed by supporting team members.

## **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.



# ESTS Contract Task Order Request Performance Plan

Task Order Title: [Science Experiment Development Branch](#)

Task Order Number: [37-060301](#)      Revision: 11

Category	Weighting Technical %	End of Period Technical Score
<b>Technical Objectives</b>	65%	X <u>65%</u> = <b>Justification</b>
Fabricate flight and ground hardware to users' technical requirements.		
<b>Schedule Objectives (Milestones)</b>	Weighting Schedule % <u>10%</u> <i>(min 10%)</i>	Schedule Score X <u>10%</u> = <b>Justification</b>
Complete fabrication tasks within the required time required by the end user. Provide mothly reports on work performed on this task.		

# ESTS Contract Task Order Request Performance Plan

Task Order Title: [Science Experiment Development Branch](#)

Task Order Number: [37-060301](#) Revision: 11

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	<b>Weighting</b> <b>Cost%</b> <div style="background-color: #cccccc; padding: 2px; text-align: center;">25%</div> <i>(min.25%)</i>	<b>Cost Score</b>  X 25% =  <b>Justification</b> <div style="border: 1px solid black; height: 60px; width: 100%;"></div>
<b><u>Cost (actual vs. negotiated)</u></b>	<b>Weighting</b> <b>Total %</b> <div style="background-color: #cccccc; padding: 2px; text-align: center;">100.00%</div>	<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: [Science Experiment Development Branch](#)

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**Comments:**

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**Risk Assessment**

**Contract Number:** NNM05AB50C  
**TO Title:** Science Experiment Development Branch  
**TO Number:** 37-060301 **Revision:** 11

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

**MSFC Initiator:** John Brunson

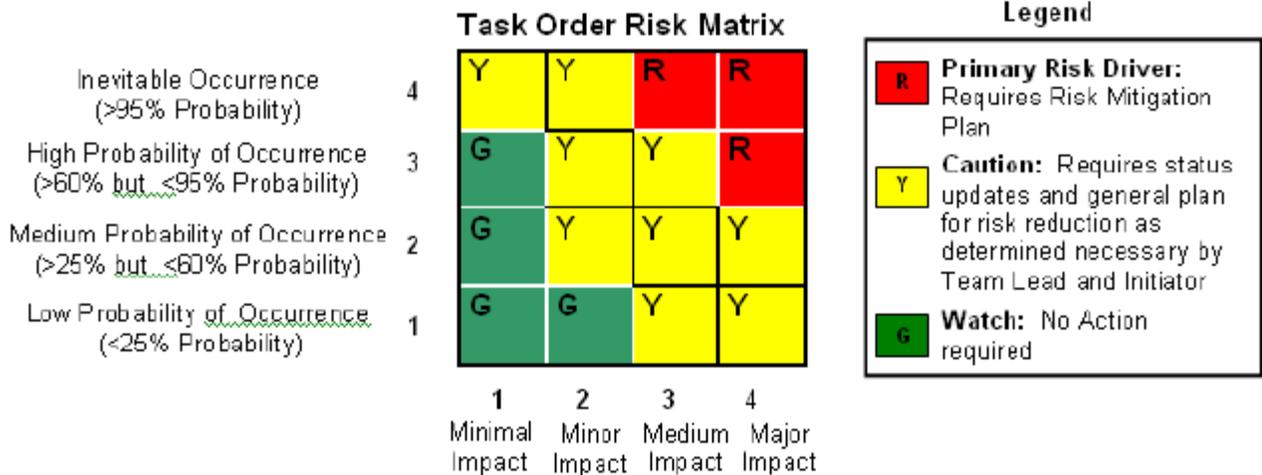
(b)(4)

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

List identified risk associated with Task Order performance as related to task cost, technical, and schedule. Classify the risk(s) according to probability of occurrence and impact as defined below and enter the risk into risk matrix.

Risk	Risk Type	Probability (1-4)	Impact (1-4)	Risk Description
Risk C1	Cost	1	1	Additional costs may occur due to technician overtime due to reduction of personnel in the machine shop from 2 to 1.
Risk C2	Cost			
Risk T1	Technical			No technical risks have been identified for this Task Order.
Risk T2	Technical			
Risk S1	Schedule	3	3	Not being able to meet customer requests for urgent and short lead fabrication requirements due to reduction of personnel in the machine shop from 2 to 1.
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.

Risk No.: S1		
Risk Description: Not being able to meet customer requests for urgent and short lead fabrication requirements due to reduction of personnel in the machine shop from 2 to 1.		
Mitigation Step No.	Planned Completion Date	Mitigation Step Description
1	Already complete	Identify other ESTS technician and customer facility resources to aide in the completion of urgent and short lead fabrication requests and coordinate with team leads, directors, and customer branch chiefs to obtain initial acceptance of off-load plan if needed.
2	As needed when capacity in NSSTC shop cannot meet customer needs.	Coordinate with Task Initiator. Coordinate support requirements and schedule with other ESTS team leads and directors and/or branch chiefs as needed to complete the work under this task using other available ESTS labor and customer facility resources. This effort might entail overtime in support of meeting programmatic schedules.
3	As needed	Execute urgent and short lead fabrication requests via coordination with team leads and directors as required and provide the product back to the customer thru this task.
4	As needed	In the event ESTS technical resources are unavailable for urgent and short lead fabrication requests the customer will be notified promptly for off-loading of work thru local fabrication shops or other means.