

ACITS-3 FORM

PART 1 - TASK ORDER INFORMATION

Contract No: NNA13AB88C		Contract Title: ACITS 3 NASA AMES		
Date: 8/18/2016		Task Title: Human Systems Integration Division Research and Laboratory Support		
Task Order No.: T34	Task Mod No.: Original	Service Request No.:	Customer Code: NASA/Ames Research Center	SOW Reference: C.3.1.5
Order Type: Cost Plus		Funding Level: Subtask Level Funding		
Task Requester Email: (b) (6)		Name: Trent Thrush		Phone: (b) (6)
Financial Manager Email: (b) (6)		Name: Edith Peters		Phone: (b) (6)
Computer Security Officer Email: (b) (6)		Name: Jeffrey McCandless		Phone: (b) (6)
Task previously covered by another contract other than predecessor to incumbent? (If YES, provide in SOW)				YES
Does the task require access to government databases? (If YES, indicate in SOW)				NO
SECTION 508, ELECTRONIC AND INFORMATION TECHNOLOGY ACCESSIBILITY COMPLIANCE (EITAC)				
Does the task include EIT items? (Please review the EITAC documentation)				NO
<p>Upon receipt of this task order request, the contractor shall review the task requirement(s) and inform the Government, as part of its task order/modification response, any discrepancies between standards initially cited and those the contractor proposes to deliver to the Government. Examples of discrepancies include ODCs for which some other standard might be or become applicable and, as a result, require citation in the task order, as well as any cited standards that the contractor believes is not applicable (provide rationale). Note: If, by mistake, the task, including and ODC of the task, should not meet an applicable standard not cited by the requester, it is the requester, not the contractor who is a fault; and the requester must find a way (e.g., by modifying the task request) to bring the task into compliance. In such cases the requester shall complete the required agency forms (or equivalent) before the task order/modification is approved.</p>				
GOVERNMENT FURNISHED EQUIPMENT (GFE)				
<p>Government will provide all appropriate equipment and software necessary for the performance of this task unless otherwise noted in this task order. The contractor, in accordance with the contract can acquire equipment not presently available as GFE. Equipment identified as task unique will be expensed to the task in accordance with ASRC Federal Accounting policy, and will be defined as GFE in the Government inventory. All other equipment purchases will be depreciated and become contractor property. The contractor shall follow agency rules regarding assignment of government owned equipment and other government supplied equipment. The contractor shall provide information, such as, Property Assignments, Property Location and Unused Equipment, upon request.</p>				
AFFIRMATIVE PROCUREMENT (See http://www.epa.gov/cpg/products.htm)				
<p>The item(s) being purchased are NOT on any of the EPA's Comprehensive Procurement Guideline lists. - AND -</p> <p>They meet the minimum recycled/recovered content.</p>				
COTR SIGNATURE: Kirsten Nagel (9/17/2016)			CO SIGNATURE: Anjennette Contreras-Rodriguez (9/20/2016)	

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PART 2 - TASK ORDER PLAN PROPOSAL				
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Categories	Current Request	Prior Cumulative Estimate Without Current Request	Total Cumulative Task Estimate	
Onsite Hours	(b) (4)			
Offsite Hours				
Total Hours				
Onsite Labor				
Offsite Labor				
Subtotal ARTS Labor				
Teammate/Subcontractor Labor				
Subtotal Teammate/Sub Labor				
Total Labor				
Materials				
Equipment				
Travel				
Training				
Miscellaneous				
Other Direct Costs Subtotal				
Total Cost				
PMO				
Fee				
Total Price				

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PART 3 - APPROVAL SUMMARY

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Approved By	Name	Date	Email	Phone
1. COTR Thrush	Kirsten Nagel	9/17/2016	(b) (6)	(b) (6)
2. CO Thrush	Anjennette Contreras-Rodriguez	9/20/2016		

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Task Background:

This task will provide support to the Human Systems Integration Division consisting of:

- * Software Support includes all phases of software development, maintenance of existing baseline (legacy or extant) software, integration of developed/modified software, user support, and documentation.

- * Hardware support includes design, installation and integration of audio and video equipment, simulation systems, custom fabrication of research hardware, and support for any other hardware associated within research laboratories. Hardware engineering support includes design, integration and testing for the any upgrades of existing or new equipment.

- * Experiment support includes assistance with pre-experiment specification, study development, domain expertise (pilot) for evaluation, and support during actual experimental runs (as required by experimental schedule).

- * Data Analysis support includes pre-experiment consultation, evaluation of data collection methods, verification of data collection methodology by means of pre-experiment sampling, data reduction, data analysis, and assistance with technical problems (as required by experimental schedule).

The following research projects/laboratories will be supported under this task:

1. Spatial Auditory Displays Laboratory (Wenzel/Adelstein)
2. Human Manual and Operational Control Performance Laboratory (Beutter)
3. HCI Systems Support (Sharpe)
4. Training, Automation, and Operational Decision Making Research (Barshi)
5. Automation Integration Design and Evaluation (AIDE) Laboratory Support (Feary)
6. Project Engineering Integration (Thrush)
7. Fatigue Project (Flynn-Evans)
8. Human Eye Movements and Visual Perception (Stone)

SPECIFIC REQUIREMENTS:

1. Spatial Auditory Displays Laboratory (Wenzel/Adelstein)
 This project supports the NASA Ames Spatial Auditory Displays Laboratory. This lab provides facilities for psychoacoustic research in spatialized audio. Since the lab and the experiments run therein are very technical in nature, technical support is required for almost all lab activities. Tasks include writing experiment software, lab utilities, and demos, maintaining the audio lab environment, updating systems, and configuring equipment. Specific support requirements include:

" Support for the Space Human Factors Engineering sponsored Advanced Multimodal Displays for EVA and Remote Exploration project. Support requirements include: software development,

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software and hardware integration, and support for research simulations/studies.

" Support for the Space Human Factors Engineering sponsored Just-in-Time Training for Teleoperation project. Support requirements include: software development, software and hardware integration, and support for research simulations/studies.

" Support for the Space Human Factors Engineering sponsored Teleoperation Task Difficulty project. Support requirements include: software development, software and hardware integration, and support for research simulations/studies.

" Support for Space Human Factors Engineering sponsored Human Performance Under Lateral and Axial Vibration project. Support requirements include: software development, software and hardware integration, and support for research simulations/studies.

" Develop experiment control software integrating audio-visual displays and various user interface controllers for Technologies for Airplane State Awareness (TASA) and UAS research projects to include audio/visual/controller apps for experiments, and other prototypes/deos/proof-of-concept development.

" The lab equipment should be maintained in a functional state. New equipment should be installed, configured, and tested quickly and efficiently. The contractor should demonstrate technical prowess in maintaining equipment and answering questions. Any required documentation should be clear and concise.

" On an as-needed basis, user-interface prototypes employing lab technology (e.g., communications systems) need to be developed and maintained. These need to be robust and professional in quality as they are frequently demonstrated to and used by outside parties.

2. Human Manual and Operational Control Performance (Beutter)

The general scope for this project includes i) real-time 3D graphics for simulation, ii) man-machine interface designs, and iii) real-time simulation support for man-in-the-loop and other simulation related tasks.

The specific requirements of these tasks are provide support to include"

Statement of Work - Requirements, part 1:

2.a. Future Flight Central (FFC) Upgrade: Provide design expertise, software and systems engineering support to the NASA Ames SIMLABS group for simulators such as VMS and FFC including image generator development and integration support. Update the Future Flight Central (FFC) facility to replace the existing image generators and distortion correction hardware with the NASA developed Reconfigurable Image Generator (RiG) to support the NASA SARDA program as well as the Mars Curiosity program. This update will include driving all 12 (existing) projectors and assisting NASA in the setup and re-hosting of existing visual

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environments as well as assistance in the development of new visual environments as required. Distortion correction setup will be performed in software and will not require any existing distortion correction hardware.

2.b. Provide 2D and 3D model development for terrain databases, moving models, culture and other graphics modeling assignments for NASA and USAF tasks

3. HCI Systems Support (Sharpe)

This project provides support services to the Human-Computer Interaction (HCI) Group in the Human Systems Integration Division.

The Human-Computer Interaction (HCI) Group within the Human-Systems Integration Division (Code TH) design and develops usable technology for operating space vehicles and aircraft in support of NASA mission objectives. This technology includes the Mission Assurance Systems (MAS) data integrations and reporting, Scheduling and Planning Interface for Exploration (SPIFe) and the Ensemble project (with collaborators at Ames, JSC and JPL). The task provides support to production efforts for specific NASA end-user applications projects including:

1. Score, the crew and operations planning tool, part of the Next Generation Planning System (NGPS) tools for the International Space Station, sponsored by NASA Johnson Space Center's Operations Planning Division (DO).
2. Mars Science Laboratory Interface (MSLICE), the Mars Science Laboratory science and operations planning tool, sponsored and in collaboration with the Jet Propulsion Laboratory.
3. Playbook, the mobile schedule and procedure viewer used to simulate longer duration, more autonomous missions using NASA Analog environments such as NEEMO (NASA Extreme Environments Mission Operations and others).
4. Snapshot, the web-based (HTML5) interface which offers a light weight access to plans and certain functions of the underlying SPIFe software.

Marshall Support

The Ames HCI Group provides software design and development leadership to the three programs (SLS, MPCV/Orion, GSDO) supporting Exploration Systems Development. This includes data integration capabilities between the 10 HCI developed applications and a variety of other agency data assets particularly in the area of requirements traceability. Required will be systems support at NASA's Marshall Space Flight Center.

The project will perform development work including: 1) extend the capabilities/features of Mission Assurance Systems (MAS) to store and access engineering risk data (PERL), 2) integrate with existing/legacy systems to provide real time server-to-server connections (using web services) to view and link related data (JAVA), 3) import data from existing/legacy systems (including analyzing delivered data, developing data mappings, and performing

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the import into new systems) (XML, various technologies), research and prototype new technologies for demonstration purposes (various technologies).

Exploration Development Group:

Provide Systems Engineering support to the Johnson Space Center Exploration Development Integration (EDI) group under the Exploration Systems Directorate (ESD) organization within Human Spaceflight and data integration support to the Human-Computer Interaction (HCI) group at Ames. The work covers systems modeling, requirements and verifications development, traceability, and review, architecture analysis, and data integration analysis needed to identify and define required integrations from a systems engineering perspective.

Statement of Work - Requirements, part 2:

4. Training, Automation, and Operational Decision Making (Barshi)

The goal of the project is to develop and evaluate new approaches to training focused on Operational Decision Making (ODM) in increasingly automated aerospace environments. This task will involve developing computer simulation capabilities, designing and developing training concepts and experimental protocols, general laboratory management, data analysis and report preparation. The simulation capability element will include low-fidelity tools development, experimental control programs, and data acquisition and preliminary analysis programs.

Support is also required in analyzing ODM and automation training requirements. Research into these human systems issues, design and conduct of a study of aerospace ODM leading to training requirements, collection and analyses of data, and input and participation in generation of a white paper that summarizes these analyses is required.

5. Automation Integration Design and Evaluation (AIDE) Laboratory Support (Feary)

Support requirements for this project are to provide software development / integration / enhancement / testing, hardware integration, data collection and database management for the development of the Automation Integration Design and Evaluation (AIDE) Lab. Included is support for:

- " Development and Enhancements to the Rapid Automation Prototyping and Integration Development Environment (RAPIDE)
- " Development of experiment control and data collection software
- " Systems engineering (support of servers, software developer tools, libraries, applications, systems builds and configurations)
- " Development of plug-ins for additional displays and interfaces for RAPIDE
- " Flight Management System (FMS) Development in RAPIDE
- " Provide general support for RAPIDE experiments as needed

SOW Deliverables and Milestones (Continued from above):

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This project will require establishment of two new flight simulators to conduct aeronautics human factors research. The contractor will provide hardware and software engineering support for bringing up the new laboratory and flight simulation. Included will be procurement of the following equipment to be used in aeronautics human factors studies: flight simulator visual system. simulation computers and data storage servers, data collection units, monitors for out the window simulation displays, and 3D printer. Additionally, maintenance agreements will need to be set up for new equipment and continued for existing equipment. Software development and hardware engineering will be required to integrated all hardware into the simulation system.

6. Project Engineering Integration (Thrush)

Provide senior level expertise for software and hardware integration for multiple projects/laboratories in the Human Systems Integration Division. This may include determining hardware and software requirements, and upgrades, and integration into the existing laboratories.

Any computers, network and peripheral equipment that is needed for this task is specialized to a laboratory or project and is not available through the ACES catalog. Therefore a waiver is not needed to purchase them. However, the contractor will inquire with SEWP before purchasing any items on this contract.

7. Fatigue Project

Provide support to set up new laboratories for this new project. Procure research/scientific hardware and software for new lab. Software support will be required for software relative to research being performed.

8. Human Eye Movements and Visual Perception (Stone) (adding this back in to task order)

This task will develop, test, and validate software for visual stimulus generation as well as data acquisition and analysis for an eye-movement and visual perception research laboratory (Visuomotor Control Lab). Since the lab and the experiment run are very technical in nature, technical support is required for almost all lab activities. Activities include writing experiment software, lab utilities, and demos, maintaining the lab environment, updating systems, and configuring equipment. Research studies may also be performed in the 20G Centrifuge at NASA Ames.

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Specific Deliverables and Deliverable Dates				
No.	Type of Deliverable	Description of Deliverable		Date Required
1.	Performance	Provide ongoing support to maintain the research laboratories laboratories will be available and equipped for 90% of the time that research studies are scheduled		
2.	Performance	Provide laboratory computers, network and peripherals equipment installation, configuration, and testing to meet all schedules and requirements. Document changes		
3.	Performance	Design, develop and deliver software and enhancements to meet quarterly goals as set by the individual Principle Investigators for each project.		

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Travel, Training, and Materials Requirements				
No.	Type of Requirement	Description		Date Required
1.	Material	Feary Flight simulator in support of AIDE Simulator Project		9/30/2017
2.	Travel	4 trips from Colorado to Ames for 1 person/5 days in support of Planning Systems Project		9/30/2017
3.	Travel	2 trip from Colorado to Florida for 1 person/5 days in support of NEMO		9/30/2017
4.	Travel	1 trip from Colorado to Johnson for 1 person/5 days in support of Planning Systems Project		9/30/2017
5.	Material	Hardware Maintenance agreements in support of the AIDE Simulator Project		9/30/2017

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Charge Points				
Charge Number	Description			
021	Spatial Auditory Displays Laboratory (Wenzel)			
022	Teleoperation Training (Adelstein)			
031	Future Flight Upgrade (Beutter)			
041	Planning Systems Support (Sharpe)			
043	Exploration Development Group Support (Sharpe)			
050	Training, Automation and Operational Decision Making (Barshi)			
090	AIDE Lab (Feary)			
100	Project Engineering Integration (Thrush)			
110	Fatigue Project (Flynn-Evans)			
080	Human Eye Movements and Visual Perception (Stone)			

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IT Security Requirements:

a. Are this task's activities covered under an organizational IT Security Plan?: **YES**

b. Does this task support applications that have been designated as a "Special Management Attention" application?: **YES**

If yes, please describe:

c. Is specialized security training required?: **NO**

If yes, specialized training requirements are described as follows:

d. Is a security clearance needed for any personnel on this task? **YES**

If yes, what level of clearance is required?:

For specific projects, secret clearance may be required.

e. IT Security Deliverables associated with this task:

- IT Risk Assessment: **NO**
- IT Security Plan: **NO**
- IT Contingency Plan: **NO**
- IT Security Vulnerability Test Results: **NO**
- Results of Periodic IT Security Reviews: **NO**
- Other Documentation as Follows: Report of Status of IT Security Plan, Contingency Plan, and Risk Assessment of Critical Services: **NO**
- Other Documentation:

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IT Security Requirements (Continued):

- f. Periodic reviews of IT Security measures are necessary. What is the role of the contractor under this task in areas such as review of user accounts, account management, data backup and restoration, use of warning banner, use of encryption, vulnerability scanning, and security tools?**

All IT security measures for this task are provided by the TH Division Systems Group Task.

- g. In the event of an IT Security incident associated with systems and data under this Task, the Chief Information Security Official, the Security Operations Center (SOC), and the Task Requester are to be notified immediately by the contractor. In order to ensure full coordination, the following individuals also are to be notified:**

Title	Name	Phone
System Owner (Responsible for the applicable IT Security Plan)	Trent Thrush	(b) (6)
Organization's Computer Security Official	Jeffrey McCandless	(b) (6)
Alternate System Owner		