

Fiscal Year:	FY 2009	Task Last Updated:	FY 06/16/2010
PI Name:	Holden, Kritina Ph.D.		
Project Title:	Human Factors Assessment of Vibration Effects on Visual Performance During Launch		
Division Name:	Human Research		
Program/Discipline:	ADVANCED HUMAN SUPPORT TECHNOLOGIES		
Program/Discipline--Element/Subdiscipline:	ADVANCED HUMAN SUPPORT TECHNOLOGIES--Space human factors engineering		
Joint Agency Name:	TechPort:	No	
Human Research Program Elements:	(1) SHFH :Space Human Factors & Habitability (archival in 2017)		
Human Research Program Risks:	(1) HSIA :Risk of Adverse Outcomes Due to Inadequate Human Systems Integration Architecture		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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PI Organization Type:	NASA CENTER	Phone:	281-483-8829
Organization Name:	Leidos Corporation at NASA Johnson Space Center		
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PI Web Page:			
City:	Houston	State:	TX
Zip Code:	77058-3607	Congressional District:	22
Comments:			
Project Type:	FLIGHT	Solicitation / Funding Source:	Directed Research
Start Date:	05/01/2008	End Date:	09/30/2010
No. of Post Docs:	0	No. of PhD Degrees:	0
No. of PhD Candidates:	0	No. of Master' Degrees:	0
No. of Master's Candidates:	0	No. of Bachelor's Degrees:	0
No. of Bachelor's Candidates:	0	Monitoring Center:	NASA JSC
Contact Monitor:	Woolford, Barbara	Contact Phone:	218-483-3701
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Flight Program:	Shuttle		
Flight Assignment:	STS-119, STS-128 NOTE: Start date is 5/1/2008 (instead of 10/1/2008) per B. Woolford/JSC (5/09) NOTE: End date will be 09/30/2010 (instead of 12/31/2009), per B. Woolford/JSC (4/17/2009) NOTE: End date will be 12/31/2009 (instead of 9/30/2011), per B. Woolford/JSC (4/2009)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Thompson, Shelby (Lockheed Martin, Houston, TX) Ebert, Doug (Wyle Integrated Science and Engineering Group) Adelstein, Bernard (NASA Ames Research Center) Root, Philip (NASA Johnson Space Center) Jones, Jeff (NASA Johnson Space Center)		
Grant/Contract No.:			
Performance Goal No.:			
Performance Goal Text:			

Task Description:	<p>The primary objective of the of Human Factors Short Duration Bioastronautics Investigation (SDBI) 1904 is to determine visual performance limits during operational vibration and g-loads, specifically through the determination of minimal usable font sizes using Orion-type display formats. Currently there is little to no data available to quantify human visual performance under these extreme conditions. Existing data on shuttle vibration magnitude and frequency is incomplete, does not address seat and crew vibration in the current configuration, and does not address human visual performance. There have been anecdotal reports of performance decrements from shuttle crews, but no structured data has been collected.</p> <p>The SDBI is a companion effort to the Detailed Test Objective (DTO) 695, which will measure shuttle seat accelerations (vibration) during ascent. Data from the SDBI will serve an important role in interpreting the DTO vibration data. SDBI 1904 plans to collect data during the ascent phase of three shuttle missions. Both SDBI1904 and DTO 695 are low impact with respect to flight resources, and combined they represent an efficient and focused problem solving approach.</p> <p>The SDBI and DTO data will be correlated to determine the nature of perceived visual performance under varying vibrations and g-loads. This project will provide:</p> <ul style="list-style-type: none">• Immediate data for developing preliminary human performance vibration requirements• Flight validated inputs for ongoing and future ground-based research• Information of functional needs that will drive Orion display format design decisions
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	<p>Data from Visual Performance may provide insight into displays for workers who read displays under extreme vibration such as pilots or race car drivers. The project also offers methodologies for investigating visual performance in situ with real-world constraints.</p>
Task Progress:	<p>In FY09, JSC personnel completed data collection activities associated with the Short Duration Bioastronautics Investigation (SDBI 1904) – Human Factors Assessment of Vibration Effects on Visual Performance During Launch. In collaboration with Detailed Technical Objective (DTO 695), SDBI 1904 collected visual performance data during launch using a spacecraft system display printed on a placard. The goal was to examine the effect of vibration during launch on participants’ ability to perceive different size fonts. Crew comments were also recorded on various characteristics of the display, such as font, case, and display color. Data were collected from two crewmembers onboard STS-119. Data collection will continue in September from three crewmembers onboard STS-128.</p>
Bibliography Type:	Description: (Last Updated: 10/29/2023)