Fiscal Year:	FY 2008	**Task Last Updated:**	FY 03/06/2009
PI Name:	Perusek, Gail M.S.		
Project Title:	A New Harness For Use with Exercise Countermeasures-Validation of Improved Comfort and Loading with the Center for Space Medicine (CSM) Harness		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Biomedical countermeasures		
Joint Agency Name:		**TechPort:**	Yes
Human Research Program Elements:	(1) **HHC**:Human Health Countermeasures		
Human Research Program Risks:	(1) **Muscle**:Risk of Impaired Performance Due to Reduced Muscle Size, Strength and Endurance		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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PI Web Page:			
City:	Cleveland	**State:**	OH
Zip Code:	44135	**Congressional District:**	10
Comments:			
Project Type:	FLIGHT	**Solicitation / Funding Source:**	Directed Research
Start Date:	02/28/2008	**End Date:**	03/31/2011
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NASA JSC
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Flight Program:	ISS		
Flight Assignment:	ISS NOTE: End date changed to 3/31/2011 (from 9/1/2011) per discussion with PI (Ed., 2/25/2011) NOTE: start/end dates changed per JSC info (3/1/10) NOTE: start/end dates changed per JSC info (4/27/09)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:			
Performance Goal No.:			
Performance Goal Text:			

Task Description:	This Station Development Test Objective (SDTO) assesses whether crewmembers can exercise more comfortably and at higher loads using a new treadmill harness developed through the Center for Space Medicine (CSM) and identified as the CSM Harness, as compared to the existing International Space Station (ISS) treadmill harness. The hypotheses are as follows: i) the CSM Harness will provide greater overall comfort than the current U.S. TVIS harness (hereafter referred to as the ISS treadmill harness); ii) crewmembers will be able to tolerate higher external loads from the subject load device and/or Series Bungee System (SBS) Bungees; iii) load distribution measurements collected with strain-gage-based buckle transducer instrumentation between shoulders and hips will correlate with subjective measures of comfort; and iv) the CSM Harness will provide more effective wear and adjustability (easier adjustments, and adjustments will stay fixed once they are set, breathable biocide outer fabric, etc.). The CSM Harness design has potential to improve comfort, wear, and adjustment effectiveness on-orbit. To support this SDTO, NASA GRC is delivering five (5) flight-certified CSM Harnesses with buckle transducer instrumentation and the instrumentation for 5 ISS treadmill harnesses at the locations shown in Figures 2-1A and B and 2-2, respectively. The buckle transducer instrumentation will converge at a junction box, which shall interface with the Ambulatory Data Acquisition System (ADAS) for data recording. The ADAS has previously flown as payload hardware sponsored by the ISS Medical Project (ISSMP) for the Foot Experiment (Experiment Identifier: #96-E318, ISS Expeditions 6, 8, 11, 12) and will be provided by ISSMP. Subject loading data will be collected for eight total sessions in-flight (4 with each harness) with each of five subjects as part of this SDTO. For these 8 sessions, a unique harness evaluation protocol will be followed for the crewmembers' nominal treadmill exercise session. The SDTO research protocol is aimed at improving comfort, plus increasing consistent loading for crewmembers exercising on the ISS treadmill(s). The CSM Harnesses will be instrumented to allow for objective correlation with subjective ratings of comfort. To provide a direct comparison with the ISS treadmill harness, the load distribution and subject load device loading applied to the ISS treadmill harness will also be measured. The ISS treadmill harnesses will be instrumented by the crew on-orbit during a one-time set up activity. Current monitoring does not allow measurement of inflight load distribution of the harness or the applied external load – these objective data sets may be correlated with subjective comfort data for improved designs and for existing and advanced concept exercise countermeasures systems requiring crewmember harnessing.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2008. [Ed. note: added to Task Book in March 2009 when received information from JSC]
Bibliography Type:	Description: (Last Updated: 08/30/2018)