

Partial Gravity Simulator Facility used for first station tests

The Partial Gravity Simulator in JSC's Space Vehicle Mockup Facility in Bldg. 9 was recently used to support the International Space Station for the first time.

Commonly called the Pogo, the simulator consists of a pneumatic actuator suspended from an overhead air-bearing rail. It can provide both partial gravity and microgravity simulations in the vertical axis for a crewmember or a payload. The crewmember or payload is supported by a gimbal assembly that provides 3-degree of freedom movement.

John Sims, chief of the Mission Operations Directorate's Space Vehicle Mockup Facility, said, "We are excited that the Pogo is beginning to be used by the station program. It has a long history of being a useful training and engineering tool. It also has great potential to be useful for future lunar or Martian exploration programs."

David Ray, a member of the Space Vehicle Mockup Facility Office, is the lead NASA engineer for the Pogo. According to Ray, "The Pogo provides accurate partial gravity and microgravity simulations within two percent of the required lift load.

It is used to support biomechanical research and engineering evaluations of human locomotion in partial gravity and microgravity environments. The Pogo also allows for safe operations of suited crewmembers, while manipulating various payloads required for specific missions."

Lockheed Martin Extravehicular Activity Engineers Stephen Smith and Bill Lynch recently used the Pogo to conduct evaluations of suited exercises. The test subjects were lifted to provide a microgravity simulation, while evaluations were performed on general suit mobility activities involving reach and access to suit controls, tether protocols with and without the Modular Mini-Workstation, Modular Mini-Workstation and tool operations and adjustable portable foot restraint ingress familiarization.

These evaluations were performed since a major component of the mission of the Crew and Thermal Systems Division is the research, design, development, certification, and sustaining engineering support of human life support systems. The objective of the exercises on the Pogo was to initiate CTSD engineers to the suited environment and the physical demands required to be a test subject for future engineering evaluations.

According to Smith and Lynch, the Pogo is a useful simulator that is definitely beneficial for CTSD personnel or anybody requesting spacesuit systems operations, EVA operations and procedures familiarization. They both believe that the Pogo will certainly be used in the future by CTSD engineers to design and develop new procedures and hardware for ISS assembly missions.

The original Pogo was designed and constructed in the 1960s. It was used for Apollo crew training to simulate the one-sixth gravity environment on the moon. "The current Pogo incorporates some of the hardware from the original Pogo. The vertical servo mechanism, piston/cylinder and overhead air-bearing rail were all used in the Apollo program. In fact, the vertical servo mechanism which controls the flow of pressurized air to maintain a constant upward lift force on the test subject or payload was patented by NASA engineers Harold Johnson and Arthur Trader in the 1960s," said Ray.

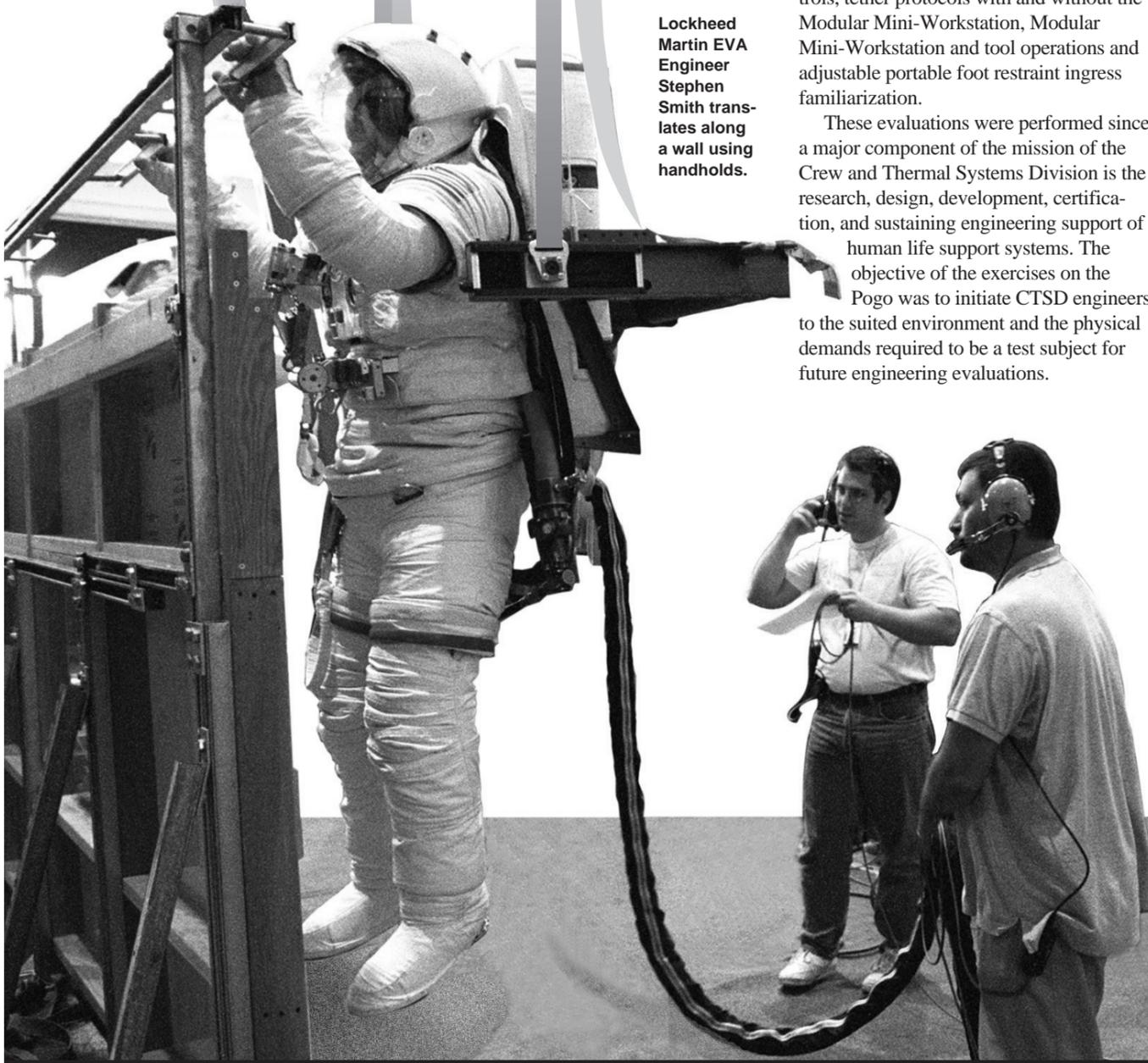
In 1993, Ray modified the Pogo to accommodate microgravity simulations so that it could support training for payload mass handling and crewmember locomotion studies for shuttle and ISS assembly. These modifications included a new control console, a new data acquisition system and hardware changes to increase Pogo sensitivity to provide for microgravity simulations.

The Pogo was used to support mass handling training for the STS-61 Hubble repair mission flown in December 1993 and EVA contingency training for deployment of the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-Shuttle Pallet Satellite during the STS-66 mission in November 1994.

A spin-off of the Pogo technology could be used to build a training device for use in physical therapy for patients who have suffered injuries to the spine and legs. This simulator, or a scaled down version of it, could be used to off-load a patient's weight in varying degrees until the patient is able to walk. ■

For more information on the Pogo or to use the facility to support training or evaluations, contact Ray at (281) 483-5928 or e-mail at dray@ems.jsc.nasa.gov

For more information on Pogo see <https://mod.jsc.nasa.gov/dx/dxhome/dxhome.htm>



Lockheed Martin EVA Engineer Stephen Smith translates along a wall using handholds.

JSC Photo S99-05364

JSC contractor earns international registration

BRSP, the contractor for JSC that provides logistics, facility operations and maintenance services including prime and backup utilities to the Mission Control Center during space launch periods, has earned full certification to the ISO 9001 quality standard, the universal measurement for world-class companies.

ISO stands for the International Organization for Standardization, an independent worldwide federation with representatives from more than 100 countries. Approximately 70 percent of the companies seeking international registration fail, but BRSP achieved certification on the first review. BRSP is a subsidiary of Brown & Root Services, a business unit of Halliburton.

BRSP currently provides center operations support services to JSC

including program management; operations and maintenance of critical facilities, utility plants, and life support systems; engineering, design and construction; logistics support services; environmental operations; security services; grounds maintenance; heavy hauling and lifting capabilities; and custodial services. There are currently more than 500 team members, including subcontractors, working together to provide these services.

BRSP is currently working toward achieving recognition from the Occupational Safety and Health Administration's Voluntary Protection Program for demonstrated safety excellence and ISO 14001, an international standard of environmental operations excellence. ■

'Achieving this certification demonstrates Brown & Root Services' commitment to meeting our customers' expectations and providing quality services and products.'

—Randy Harl, president, Brown & Root Services

Employees' children earn scholarships

This year's winners of the NASA College Scholarship Fund are Minghan Leo Tsay, son of Goddard Space Flight Center employee Dr. Si Chee Tsay; Sonali Mukherjee, daughter of Langley Research Center employee Dr. Vivek Mukhopadhyay; Jennifer Kiessling, daughter of Marshall Space Flight Center employee Edward H. Kiessling III; Megan Madaras, daughter of Langley Research Center employee Eric I. Madaras; Michelle Precourt, daughter of Johnson Space Center employee Charles Precourt; and Yvonne Parisa, daughter of Marshall Space Flight Center employee Roger K. Parisa. This brings the total number of recipients to 84 and 52 of these have graduated.

Applications were restricted to dependents of NASA employees who are planning to major in science or engineering. All NASA centers were well represented among the candidates with 96 eligible applications received. All had exceedingly high grade point averages and all scored well on the SAT (several in the

1,500 and above range) and all were actively involved in their community.

The NASA College Scholarship Fund, Inc. Board of Directors has determined that six scholarships will be awarded next year. Each scholarship will be renewable annually for a maximum of \$8,000 over 6 calendar years.

The scholarship fund was established to award scholarships agencywide to qualified dependents of NASA and former NASA employees. The fund was established as a direct result of a substantial unsolicited gift by the noted Pulitzer Prize-winning author James A. Michener. Many NASA employees have contributed to the fund directly or through the Combined Federal Campaign. Other major contributors include the Freedom Forum (to honor the Hubble crew members in 1994 and again in 1997 to honor Shannon Lucid) and the JSC chapter of the NASA Alumni League.

Information about the Scholarship Fund may be obtained from Teresa Sullivan at x31034. ■