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NASA Promotion



Code adi-vid-01045

Title NASA Promotion

Subtitle Utilizing the APAS in Space

Description ...

Subject APAS;Favorite;NASA;Performance

Analysis;Science;Space

Duration 00:05:04

URL https://arielweb.com/videos/play/adi-vid-01045

Date 2013-01-16 15:40:38

Label Approved **Privacy** Public

NASA's Anthropometry and Biomechanics Lab

NASA's Johnson Space Center houses the Anthropometry and Biomechanics Lab (ABL), a unique facility dedicated to the study of human body measurements and movement mechanics. The lab plays a crucial role in designing protective space gear for astronauts, taking into account the limits of skeletal muscle strength, power, and endurance.

Data Collection

The ABL collects data in various settings, including the controlled one-gravity setting of the lab, the weightless environment training facility, the precision air bearing floor, and the three-dimensional zero-gravity created aboard the KC-135 research aircraft. This data informs the design of spacesuits for extra-vehicular activity, spacecraft interiors, and future space stations.

Suit Design and Testing

The ABL has significantly contributed to the design process for NASA's next-generation space station EVA suit. Both the Mach 3 and the AX5 prototype space station suits have undergone extensive testing by the ABL. The lab is also involved in the development of lunar and Mars space suits.

Biomechanics Data Acquisition System

The ABL uses an integrated biomechanics data acquisition system, consisting of dynamometry, electromyography, force plates, and 3D motion mechanics. A load-cell instrumented treadmill measures impact forces on the skeleton during locomotion, providing valuable data for suit design. Electromyography monitors muscle activity, while force plates register reaction forces and moments exerted around the plate.

Ariel Performance Analysis System

One of the recent additions to the ABL is the Ariel performance analysis system. This computer system works with a video player and monitor to digitize body joints from video recordings, helping determine the reach distance of the subject.

For more information, visit www.beadaholique.com.

Model Id: gpt-4-0613

Created on: 2023-09-19 00:59:28 Processing time: 00:00:25.7580000

Total tokens: 1082

Audio transcription

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1 of the places are another method of testing used at the ADL.		35.	00:02:50	Force plates are another method of testing used at the ABL.



#	Time	Spoken text
36.	00:02:54	They register the X, Y, and Z reaction forces and moments that are exerted around the plate.
37.	00:03:02	This helps determine how factors such as force, vibration, sound, and material strengths
38.	00:03:08	affect design.
39.	00:03:10	All of this is important when determining how strong or how weak a certain piece of equipment



40.	00:03:15	needs to be.
41.	00:03:17	One of the more recent additions to the ABL is the Ariel performance analysis system.
42.	00:03:23	The Ariel is actually a computer that works in conjunction with a video player and monitor.
43.	00:03:29	Through frame-by-frame analysis, body joints are manually digitized from video recordings.
44.	00:03:35	The points can then be graphed and analyzed or used to create an animated figure.



45.	00:03:42	This helps determine how far the subject can stretch his or her arms.
46.	00:03:46	To call this, the distance reach on below.
47.	00:03:50	The anthropometry and biomechanics lab is the only facility of its kind.
48.	00:04:46	For more information, visit www.beadaholique.com to purchase beading supplies and to get design ideas!

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