

Anti-gravity treadmill: Therapy that's like a walk on the moon

December 14 2009, By Pete Carey

A treadmill developed at NASA Ames Research Center more than a decade ago for exercising in space has seen more athletes than astronauts lately.

AlterG, a Fremont, Calif., startup, has sold more than 200 of the "anti-gravity" physical therapy and training treadmills, which are based on the NASA prototype, at \$75,000 each. The buyers have mainly been sports teams, college athletic departments and hospitals, but the maker hopes to eventually push prices down to where individuals could own one.

A new model, the M300, costs \$24,500 and is starting to be acquired by physical therapy clinics and nursing homes, where they are used for exercise without the risk of falling.

The company foresees an expanding base of users. "We do believe that eventually you'll see the product being used in people's homes," said AlterG CEO Lars Barfod.

The AlterG, the only machine of its kind on the market, is an exercise treadmill with a waist-high enclosure added on. Zip yourself in and, by inflating the enclosure, you can reduce the force of gravity on your legs from a few percent to 80 percent, which approximates what it would be like to walk or run on the moon.

Air pressure elevates the user's body, counteracting the force of gravity. Athletes use it to continue training after an injury, reducing the impact

of running on injured muscles and tendons. It can also be used for low-impact training, especially useful for runners.

The Oakland Raiders football team has one; the Golden State Warriors basketball team has two, the University of California-Berkeley has several and Stanford University has one. The University of California-San Francisco Medical Center has two at its Mission Bay campus, Walter Reed Army Medical Center has two, and the Palo Alto Veterans Affairs hospital has one. The military uses them to help vets learn to walk with prosthetics and relearn balance caused from [traumatic brain injury](#), Barfod said.

Marathon runner Alberto Salazar, director of the Nike Oregon Project, a group created by the shoe company to promote long-distance running, was an early convert. After checking out a prototype several years ago, Salazar has purchased five for the Nike project for the runners he trains, helping the fledgling startup get off the ground.

"I think it's the best piece of equipment made for running in last 30 years, the most revolutionary piece of equipment, without a doubt," Salazar said.

Scott Touchet, a Raiders assistant athletic trainer, said the team mainly uses it so players can exercise while recovering from lower limb injuries and surgeries. "Our guys love it," he said.

The AlterG's forerunner was developed in the early 1990s at NASA/Ames by researcher Robert Whalen and a colleague, Dr. Alan Hargens, as a space-born exercise machine and also to study the effects of weightlessness on humans. The original machines sucked air out of the chamber, creating a kind of artificial gravity. Later versions pump air in, countering gravity.

Whalen, who holds the original 1992 patent and who continues to be involved in the company, declined a request for an interview.

"We sort of went off on our own separate paths, and we did our own development starting in about 1998," said Hargens, who is a professor of orthopedic surgery at the University of California-San Diego School of Medicine. He has his own versions at the university and has published studies on its therapeutic potential.

The Palo Alto Veterans Affairs hospital collaborated on studies using its own versions of the machine, built at the hospital's rehabilitation research and development center. "We called it the 'differential pressure walking assist,'" said Dr. Charles Burgar, who wrote three studies of subjects using the machine.

"You don't feel it as if somebody's lifting you," Burgar said. "You feel like you are in water that has no viscosity, like you're floating, but when you move your legs there's no resistance. It looked like the person was walking on the moon. You can teach a person to run very, very fast by off-loading their weight, and then building strength and endurance by increasing the weight."

A prototype of the treadmill was stored in Whalen's Los Altos garage for several years, drawing the attention of his son, Sean Whalen, 28. The younger Whalen, who now is AlterG's co-founder and chief technical officer, said his father was never interested in commercializing the device.

When Sean was focused on entrepreneurship in a graduate engineering program at Stanford, he said, he saw the device as a way of "figuring out what it's like to start a company." After Salazar saw it and helped with its early development, "it kind of mushroomed," Whalen said.

ANTI-GRAVITY TREADMILL

What it is:

A [treadmill](#) with a pneumatic "un-weighting" device

Who uses it: Sports teams, hospitals, physical therapists, nursing homes, military

Why: Helps with [physical therapy](#), rehabbing and conditioning.

How it works: Air pressure counteracts body weight during [exercise](#), allowing users to run and walk without impact or pain.

Cost: \$24,500

Who makes it: AlterG, a Fremont company

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