

# 3-D Scanner Gives Troops Perfect-Fitting Uniforms

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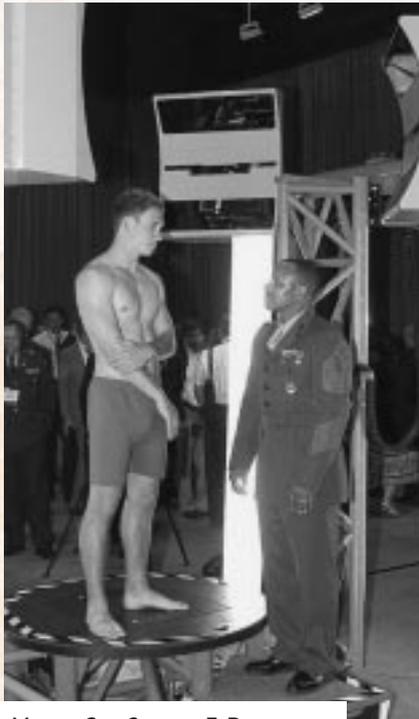
**W**ASHINGTON – With the help of 3-D body scanner technology, scientists and engineers are preparing to step into the future with their clothing and equipment designs.

The 3-D, or Whole Body Digitizer technology was demonstrated here at the Ronald Reagan International Trade Center during DoD's June 9-11 Electronic Commerce Day activities. More than 600 attendees saw how the process determines uniform sizes of basic training recruits at the Marine Corps

Recruit Depot in San Diego. The Marines have been testing the machine there for about a year.

Electronic Commerce Day attendees watched as a male model clad in form-fitting olive-drab bicycle shorts stood erect on a platform as a red eye-safe laser scanned him from head to toe. The machine has four scan heads mounted on a nine-foot frame. A laser beam projected around the model's body was reflected into cameras located in each of the scan heads.

Depot clothing officer Bob Padilla said all recruits have to do is wear exercise shorts and step onto a platform – after a 17-second scan, the Whole Body Digitizer has enough information to produce perfect-fitting, custom-made uniforms. In a matter of min-



MARINE CORPS MASTER SGT. CHARLES E. BROWN DISCUSSES THE 3-D BODY SCANNER WITH MALE MODEL ERIC STROM DURING DoD'S ELECTRONIC COMMERCE DAY ACTIVITIES IN WASHINGTON, D.C., JUNE 10. BROWN DESCRIBED THE 3-D SCANNER AS "A HIGH-TECH, FUTURISTIC SYSTEM THAT WILL BENEFIT ALL BRANCHES OF THE SERVICES."

A MALE MODEL, CLAD IN FORM-FITTING OLIVE-DRAB BICYCLE SHORTS, STANDS LIKE A SHOWROOM MANNEQUIN AS A RED EYE-SAFE LASER SCANS HIM DURING A DEMONSTRATION OF HOW THE MARINES USE 3-D SCANNER TECHNOLOGY TO DETERMINE RECRUITS' UNIFORM SIZES.



Photos by Rudi Williams

utes, the laser data are translated into a 3-D image that can be viewed on a computer screen. The data are printed out in 45 seconds and handed to the recruit to take to the uniform issue point.

“So far, we’ve scanned more than 1,000 recruits,” Padilla noted. “The key is to limit the time it takes to manually tape measure the recruits and do tailored alterations so they can spend more time training.” While manually measuring a recruit’s sleeve length, waist, and chest takes less than a minute, the measurements are not as accurate as the 3-D scanner, he said.

Before the advent of the 3-D scanner, time and manpower were wasted because the fitting process began early in boot camp to ensure recruits’ dress uniforms would be ready for graduation. Because diet and exercise changed recruits’ body shapes, they would often need at least two subsequent fittings and alteration checks.

“The 3-D scanning technology makes it feasible to delay dress uniform issues until after most of the body changes have taken place,” Padilla said. Recruits are now scanned a few days before the end of boot camp, and their dress uniforms are still ready for graduation day.

Scanning is not only faster, but more accurate, he said, and that eliminates the numerous fittings and saves tailoring costs. [Also, recruits] don’t have to spend a lot of time standing in line. For example, he said, “If I have only one person available to measure shirt sizes, the line gets pretty long when you have 350 recruits waiting for service.”

Depot money managers estimate the scanning test project has saved more than \$5.3 million since it started in May 1998. With the scanner, researchers can collect thousands of human body measurements more quickly and comprehensively than with the manual method, Padilla noted. The data, integrated into the supply system, [have] allowed the depot to reduce its uniform inventory by more than 50 per-

cent. That has freed thousands of feet of warehouse space for other uses and means fewer people are needed to measure recruits for uniform sizes, he added.

Padilla said depot employees displaced by the scanner are given other jobs or retrained to operate the scanning equipment.

Using the scanning technology to fit uniforms is just scratching the surface of its capabilities, according to Kathleen Robinette, director of the Computerized Anthropometric Research and Design Lab at the Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. She said the scanner technology has incredible, far-reaching potential for military and industry applications.

In addition to the apparel industry, Robinette said, many uses for the technology will be found in the medical community, automobile industry, and the military. Medical applications include using scanner data to produce better artificial limbs, to create garments that promote healing in burn victims, to determine the progress of wound healing, and to study the relationship between body shapes and diseases.

The automobile industry can use scanner data to design better car seats and improve driver and passenger visibility and instrument panel layouts, she said.

Cyberware Inc., of Monterey, Calif., originally developed the scanner in the mid-1980s for the Air Force Research Laboratory for studies of body measurement variations in the general population worldwide. The results will be used to improve hundreds of goods and services – anything a person wears or uses, according to Robinette.

Scientists and engineers at the Army’s Soldier Systems Center’s laboratory in Natick, Mass., are using the technology to study ways to produce custom-made uniforms and to improve chemical protective equipment and body armor.