

Technology **Today**

HIGHLIGHTING RAYTHEON'S TECHNOLOGY

2007 Issue 3

**Raytheon's Command, Control,
Communications and Intelligence Core Market**
Delivering Operational Advantages for Our Customers



Raytheon

Customer Success Is Our Mission

Centaur Program Rapidly Calculates Weapon-Firing Data



The Centaur Program answers critical multi-service (U.S. Army, U.S.

Marine Corps) requirements to rapidly calculate cannon and mortar weapon-firing solutions in training and combat. This is possible because of the development, acceptance and deployment of its Centaur Technical Fire Direction (TFD) System.

Using a commercial-off-the-shelf personal digital assistant (PDA), the Centaur program is a modern, lightweight handheld product that safely and accurately calculates firing data for rapid deployment units (airborne, airmobile, light infantry and amphibious forces) during the early phases of forced entry operations and during split-unit operations such as artillery raids or leap-frog movement.

Centaur is also used as an independent means of validating the primary tactical/technical fire control system, TFD solutions. The primary system is Raytheon Advanced Field Artillery Tactical Data System (AFATDS). It calculates weapon and munition-specific aiming information, allowing fire missions to be rapidly and safely fired en route and/or immediately upon occupation of a firing position, prior to the arrival and setup of AFATDS. This additional capability allowed Centaur to replace the 20+ year-old backup computer system (BUCS), which had not been supported for more than a decade.

Centaur is the first and only fielded system to ever calculate both combat and training safety data, then compare individual weapon firing solutions to the safety constraints to identify potential safety violations. Centaur automates the previously manual method of calculating safety information during live-fire training exercise to prevent training accidents. It is unique in its ability to consider nonstandard conditions in all its safety calculations. Further, working closely with customer subject matter experts, Raytheon developed the Digital Safety Computation Rules, which are now being extended and used to evolve published military doctrine and/or unit procedures.

The Next-Generation Centaur

The Centaur contract was initiated in April 2002. Version 1.0 began fielding in February 2004 and is now in use during combat operations by U.S. Army and Marine Corps warfighters in both Iraq and Afghanistan. Version 1.1 is currently being fielded to new and retrofit units, and has become a part of the joint artillery school curriculum. A third version (Version 2.0), which has completed development, has a targeted materiel release of October 2007.

Enhanced capability in Version 2.0 includes digital communications (when using a Ruggedized PDA with a Raytheon TacLink 3000 modem), the latest Digital Safety Computation Rules, and incorporation of additional munitions and the 120 mm Rifled Towed Mortar weapon system. Digital communications includes the reception of the Meteorological MIL-STD-6017 message over a MIL-STD-188-220c network and also TACFIRE communications to the Gun Display Unit (GDU) located on the cannons. Reception of the Centaur system by military units can best be described as "enthusiastic adoption" with some units purchasing their own hardware to get ahead of the official fielding schedule.

Centaur is a model acquisition program that reflects a true government-industry partnership. The "user" representative (TCM FSC3, Fort Sill, Okla.) is responsible for articulating and validating all system requirements. The product manager's office (PM Battle Command, Ft. Monmouth, N.J.) executes the contract options and manages the cradle-to-grave life cycle.

Recognizing Outstanding Performance

During initial Centaur development, all three elements (TCM, PM and Raytheon) collaborated to clearly define the requirements and expectations. As such, the TCM assigned an artillery officer, as part of training with industry, to work for a year on Centaur. This foundation was leveraged into solid control of work scope, cost and schedule. Additionally, active duty soldiers and Marines were brought in to directly influence functionality and test Centaur capabilities during program development.



Jeffrey Weiss (left), U.S. Army product director, Handheld Systems, and Douglas Johnson, Raytheon NCS E/BMS program manager, Handheld Products, accept the DoD Top 5 Program Award for the Centaur Program at the NDIA Systems Engineering Conference.

The end result is a highly regarded and user-friendly product delivered below cost and ahead of schedule. In fact, the government's Customer Performance Assessment Report (CPARS) rated Raytheon's work performance on Centaur (on AFATDS Contract) for 2004 and 2005 as "Exceptional" — a perfect score.

The Centaur Handheld Technical Fire Direction system also received a DoD Top 5 Program Award for 2005. This award recognizes the successful implementation of systems engineering best practices resulting in program success.

The Centaur artillery fire direction system is a valuable addition to the fires and effects capabilities of U.S. forces. It ensures that cannon and mortar delivery systems have available attack options immediately upon insertion into the combat area by land, sea or air. Further, even if the primary tactical and technical computing system is unavailable, cannon and mortar delivery systems remain a viable attack option.

Centaur technology (small form factor, easy-to-use functionality) opens up several opportunities for Raytheon, including direct or foreign military sales of Centaur. Specifically, the adaptation of Centaur technology by Raytheon should enable the capture of adjacent markets (for small form factor computer/communications) such as gun control system, logistics personnel communications, others needing situational awareness/communication on the battlefield, and commercial first responder type applications. ●

*Douglas Johnson
douglas_a_johnson@raytheon.com*

Copyright © 2007 Raytheon Company. All rights reserved.
Approved for public release. Printed in the USA.
Customer Success Is Our Mission is a trademark of Raytheon Company.
Raytheon Six Sigma, MathMovesU and NoDoubt are trademarks of Raytheon Company.
Capability Maturity Model, CMM and CMMI are registered in the U.S. Patent and
Trademark Office by Carnegie Mellon University.

Raytheon
Customer Success Is Our Mission