

# Air-to-air combat ... on the ground

Boeing simulators offer today's military pilots safe, networked and cost-effective aerial combat training



By Alison Sheridan

Photos by Bob Ferguson/Boeing

**Y**ou're the pilot of one of four F-15C Eagle fighters loaded with missiles and headed toward the city you've been ordered to defend. A nearby E-3A Airborne Warning and Control System (AWACS) aircraft surveys the area and alerts you and the other F-15 pilots to several hostile aircraft approaching from various directions. You pick up radar returns from the incoming aircraft and direct your wingman to engage the nearest threat. Suddenly your electronic warning gear screams that you're being fired upon. Your visuals show a puff of smoke in the distance. An enemy MiG 29 fighter is headed toward you! In split seconds, you maneuver to defeat the inbound missile. Your quick thinking and

evasive action saves your life and your aircraft. You continue—safe for now—toward the city you're charged to defend.

You soon land. Pumped up and dripping with sweat, you emerge from the plane. You grab a cold soda, flop down in a chair and relax for a minute, cool air blowing in from the air conditioning vents. You have to shake yourself to remember you're not flying a dangerous mission. Indeed, you've never even left the ground. You're at Langley Air Force Base, Va. You're inside a Mission Training Center, and you've just completed a Distributed Mission Operations exercise.

**PHOTO:** Boeing's Mission Training Centers, which together make up the Distributed Mission Operations network, link flight simulators worldwide. Today, the entire system is considered a standard.

Distributed Mission Operations, a component of the Air Force Training Transformation initiative, consists of network-connected Mission Training Centers (MTCs) that enable pilots from across the United States and around the world to train simultaneously for combat missions in a realistic but virtual environment. Pilots train in coordination with multiple simulators housed in MTCs across the globe. The benefits are obvious. Simulated training saves time, fuel, manpower and money, and troops can train as they “fight”—all from the safety of their home base.

This form of combat training originated about a decade ago when the U.S. Air Force said it needed training that, as closely as possible, mimicked real-life combat missions. It envisioned simulators across the globe connected by a single network. Fulfilling that vision required a lot of work, but Boeing found a way to transform the training that was then available into today's robust MTCs that comprise the Distributed Mission Operations network, linking flight simulators worldwide. Today, the entire system is considered a standard.

## AERIAL COMBAT TRAINING THEN AND NOW

Perhaps no one at Boeing is more familiar with both the Air Force's training needs and Boeing's training capabilities than Bob Boddy, site manager for the F-15C Mission Training Center at Langley Air Force Base, Va. Originally stationed there in 1976 as an Air Force pilot with the initial F-15A Eagle cadre, Boddy has been with Boeing at Langley for 20 years. Having logged nearly 130 combat missions in Vietnam and completed several duty assignments for Air Combat Command, he recognized that both his interests and the future of pilot training lay in flight-simulator technology.

After retiring from the Air Force, Boddy joined McDonnell Douglas Training Systems in 1988 as a simulator instructor at Langley. The training facility consisted of a single F-15 cockpit that had been in use for 12 years. It was motion-based but had no visual system.

In 1989, the system was reconfigured and upgraded to include four cockpit trainers with visual displays. Today, the center houses four high-fidelity cockpits with 360-degree visual systems as well as instructor/operator computer workstations. Here, in addition to loading the simulated missions that are flown, instructors oversee the mission in progress and the brief/debrief stations where pilots who have completed their missions can review them for lessons learned.

At the time it was introduced, all of this technology was considered cutting edge. Evidence showed that training pilots on the ground was more economical and safer than flying live, highly sophisticated sorties. “It's much more complicated and difficult to correct mistakes in real time when you're actually flying,” said Lt. Col. Jonathan Holdaway, active-duty adviser to the 173rd Fighter Wing. “Plus, in the air you can have maintenance issues or weather constraints. In a simulator, the weather's always good!”

“Convincing pilots of the benefits of training in a simulator was another matter. Flying instruments instead of real planes was viewed by skeptical pilots as a necessary evil,” Boddy said, “and not much fun!”

As the Air Force began the transition to Distributed Mission Operations in 1997, starting with the F-15C training site at the



33rd Fighter Wing, at Eglin Air Force Base, Fla., a complete equipment overhaul at the MTCs was required. When the Langley site upgrade was completed in 1999, these two sites were the first to demonstrate the new MTC technology.

Boeing's MTCs now are connected with one another across the globe, improving the scale and fidelity of training operations. Today's tactical training exercises more closely replicate the complexities and realities of flying multi-squadron missions, and pilots actually volunteer for MTC missions.

“Pilots' attitudes toward the simulators have changed dramatically in 10 years,” said Darrell Smith. A Boeing manager for the Training Systems & Services Synthetic Environments Integrated Product Team, Smith helps create the synthetic “bad guys” in the training scenarios. Said Smith: “I know pilots who would rather fly a sim at the end of the day than go get a beer at the Officers' Club.”

## FORWARD GLANCE

Boeing's experience in Distributed Mission training reaches beyond its F-15C platform. F-15E and F-16 trainers were recently added to the network. And this year, Boeing F-22 and C-17 simulators will be added to the global network. The U.S. Army and coalition partners in the United Kingdom are also utilizing the training. Networked Apache Longbow Crew Trainers train helicopter pilots before they face live missions, and the Royal Air Force trains on the Distributed Synthetic Air Land Training network. Boeing is also considering the possibility of Space Command Distributed Mission Operations. ■

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**PHOTO:** Bob Boddy—having flown some 130 combat missions in Vietnam—understands that keeping pilots out of harm's way is the most important reason behind simulated missions.