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Simulation Reshaping Military Training

Technology jumping from teenagers' computers to pilots' cockpits

by Harold Kennedy

Driven by ever increasing competition for defense dollars, U.S. military training is in the midst of a revolution led in part by a technology that is perhaps best known for its capacity to entertain teenagers on theme park rides, video games, and personal computers.

The technology is simulation, which is most familiar to millions of teens and their parents as the use of computer equipment to recreate a risk-free experience of doing something exciting—such as driving a race car, flying a space ship or fighting aliens. Some simulations, nicknamed "god games," put players in complete control of a computerized version of, say, the Battle of Gettysburg or the race to build a transcontinental railroad.

Today, simulation technology is assuming a major role in military training. The armed services are turning to simulation equipment for the same reasons that it has long fascinated the nation's young: At its best, military trainers said, simulation can provide a surprisingly true-to-life experience, without endangering either life or equipment. In the field of military training, where weapons are deadly and equipment can cost many millions of dollars apiece, these are attractive attributes.

"Clearly, we need realistic training," Lt. Gen. Joseph Redden, commander of the Air Force's Air University, at Maxwell Air Force Base, Ala., told an industry briefing in Orlando, Fla. "We're using simulation to anticipate critical events as realistically as possible before we actually have to deal with them in real life."

The briefing was conducted in Orlando, because it is the headquarters for the Defense Department's simulation community. Attracted by the presence of Disney World, Universal Studios, a myriad of computer and software companies, and the University of Central Florida, all of the armed services have established training and simulation operations in Orlando.

Among them are the Army's Simulation, Training and Instrumentation Command (STRICOM), the Naval Air Warfare Center Training Systems Division (NAWCTSD) and the Air Force Training Systems Product Group (TSPG).

(ISPG).

Largely through their efforts, simulation now is being employed in almost every arena of military training. For example, simulators are being used to teach:

- Air Force pilots to fly advanced fighters-such as the stealthy F-117.
- Navy submarine officers to navigate in harbors and ship channels.
- Army howitzer crews to execute indirect fire mission operations.
- Marine infantry squads to clear a house during combat conditions.

Perhaps because of widespread experience with electronic games, young military personnel adapt quickly to the new teaching methods, their superiors said.

"Generation X is very comfortable operating in a simulation environment," said Marine Lt. Col. Frank McCallister, a team leader for the Simulator Master Plan at the Naval Air Systems Command (NAVAIR), in Patuxent River, Md.

Simulators also are being used on a broader scale, to train military commanders. Earlier this year, for example, during the 50th anniversary summit of the North Atlantic Treaty Organization (NATO) in Washington, D.C., the United States and Sweden hosted a simulation demonstration for military commanders from 25 Partnership for Peace nations.

Real-World Operations

The demonstration showed how commanders can use computers, teleconferencing and satellite communications to practice real-world operations, such as the recent NATO campaign against Yugoslavia. Operating from an office building in downtown Washington, about 300 officers and senior enlisted men from the 25 nations conducted a simulated peacekeeping operation, orchestrating make-believe ground forces in Hungary, air forces in the Netherlands and maritime forces in Sweden.

"Our objective is to improve the ability of NATO and partner forces to work together in operations for peace support, humanitarian assistance and civil disaster relief," said Army Col. Frank Stech, a spokesman for the demonstration. "This training can be accomplished remotely, without deploying personnel, commercially available hardware and communications."

The minimum amount of hardware to participate in such an operation, Army officials said, is seven to eight personal computers and a simulation model at a total cost of roughly \$15,000.

In today's defense budget-\$267 billion for fiscal year 2000-such figures are insignificant, especially compared to the costs of traditional training. These examples are provided by the National Training Systems Association (NTSA):

- Flying an F-16 fighter costs an estimated \$5,000 an hour, compared to \$500 per hour in a simulator.
- Driving a tank costs \$75 per mile; a tank driver simulator, \$2.50 per mile.
- Operating an Apache helicopter cost \$3,101 per hour; a simulator, \$70 per hour.

Sometimes, existing computer software can be bought off-the-shelf and modified to provide military training at a fraction of the cost of traditional methods.

Ensign Herb Lacy, a 24-year-old preflight student at the Pensacola Naval Air Station, recently bought a copy of a Microsoft game called Flight Simulator for about \$50. He then modified the program to recreate the appearance and controls of a T-34C Turbo Mentor, which the Navy uses for primary flight training. The total cost was less than \$250. Lacy logged 50 hours of flight time on his personal computer before he ever climbed into a real T-34C.

The Navy was so impressed by Lacy's accomplishment that it has begun operating six makeshift T-34C simulators, using the same software, at a cost of \$6,000 each, compared with millions of dollars for conventional simulators.

Another attraction of simulation is that it is safer than traditional forms of military training, officials said. Military training, they noted, is inherently dangerous. In fact, they pointed out, the only U.S. casualties of the air war in Yugoslavia were two Army pilots who were killed when their Apache helicopter went down on a training mission in Albania.

The increasing use of simulation devices is playing a significant role in improving safety in military aviation, according to NTSA. The accident rate for naval aviation has fallen from 20 per 100,000 hours in the 1950s to 2.39 per 100,000 at most recent count.

Even with such accomplishments, simulation will never "replace live training entirely," cautions Air Force Col. Paul Avella, chief of conventional operations and training for the Air Combat Command, Langley Air Force Base, Va. Instead, he predicts, "it will enhance and expand traditional training."