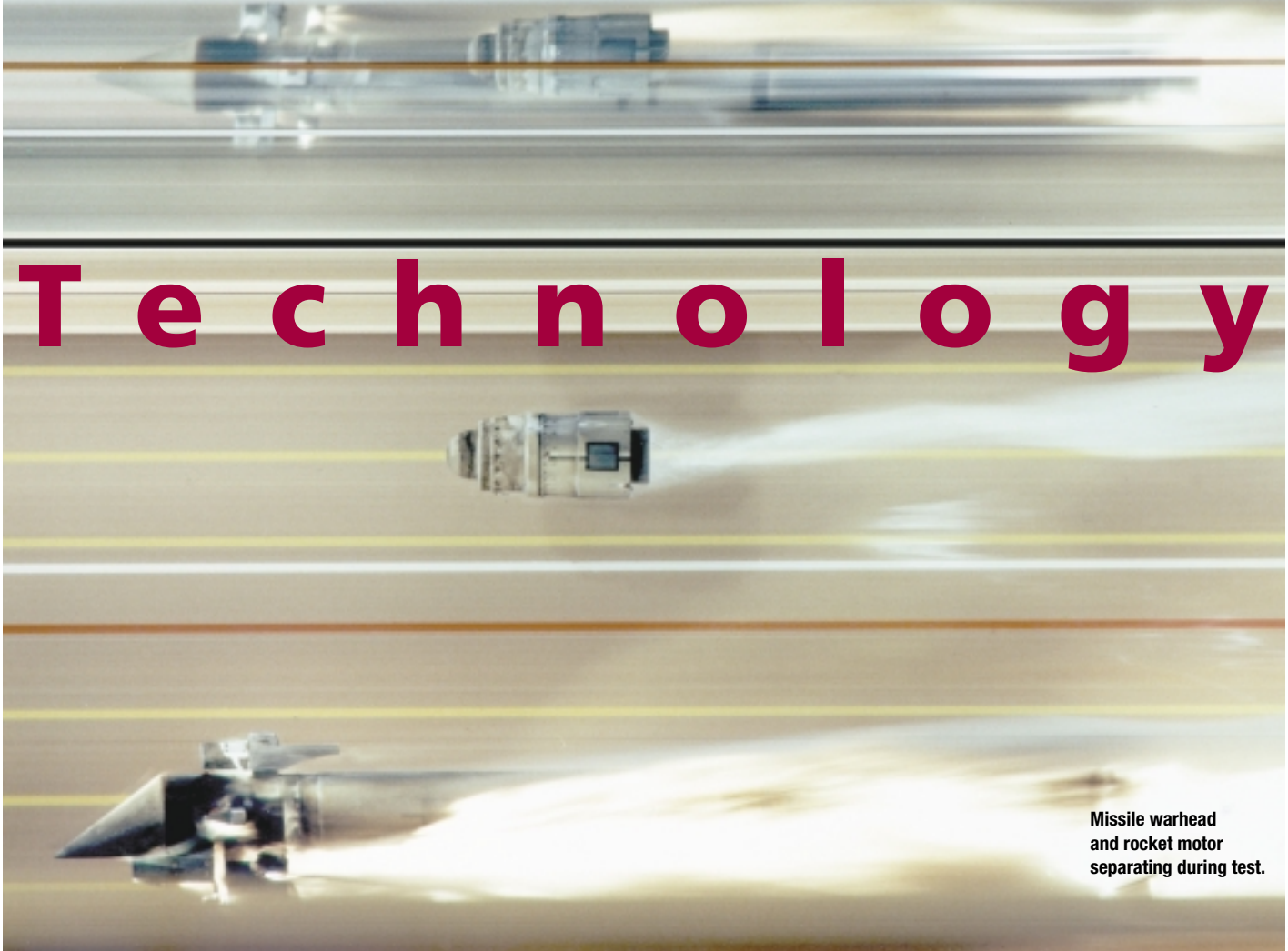


Joint Vision 2010

Technology



Missile warhead
and rocket motor
separating during test.

U.S. Navy

By JOSEPH E. EASH III

As Under Secretary of Defense for Acquisition and Technology, Jacques Gansler, has stated, "The Joint Chiefs of Staff established goals for our acquisition workforce when, in their strategic statement on projected global defense requirements, *Joint Vision 2010*, they called for a revolution in military affairs." How those goals are achieved is

critical. The revolution in military affairs will largely depend on a revolution in business affairs. Acquisition must become faster and cheaper. Today the advanced concept technology demonstration (ACTD) program is facilitating these revolutions and helping change the defense establishment both on and off the battlefield.

Faster, Better, Cheaper

According to *JV 2010*, "We will need a responsive research, development, and acquisition process to incorporate new technology," which is

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DOD (Jason J. Bortz)



Unmanned aerial vehicle, Urban Warrior.

Unmanned surface vehicle, Riverine Insertion Operation.

2nd Marine Division (T.A. Pope)

easy to accept. The current process has taken up to 18 years to field a system. Training and doctrine refinement have taken even longer. However, *JV 2010* seeks to change how we fight in less than a decade and a half. It stresses information superiority, which means acquiring technologies that become obsolete in about 18 months.

The acquisition process must keep pace with change. "Accelerating rates of change will make

the ACTD program is significant because it focuses on the needs of the joint warfighter

the future more unpredictable and less stable," states *JV 2010*. The acquisition process and ultimately our forces will have to meet a wider

range of threats at a quickening pace in an era of rapid technological change. Many dual-use technologies will be readily available in the commercial marketplace, and the advantage will go to the government that can most speedily translate them into military capabilities.

The acquisition process must be cheaper as well as faster. Procurement funding has fallen more than 70 percent in the last decade. The defense budget is likely to remain flat over the next few years, absent a major conflict. The *Report of the Quadrennial Defense Review* indicated what may

happen without any change: "Deterioration and obsolescence in equipment would erode long-term force structure and compromise the technological superiority of future forces. The concepts called for in *JV 2010* could not be realized." It is clear that more money for modernization must go into the product and not the process.

A Vehicle for Innovation

To achieve acquisition reform, DOD initiated the ACTD program. As the *National Science and Technology Strategy* states, it is "the administration's approach to harnessing innovation for military use rapidly and at reduced cost." This program is intended to move technology out of the laboratory and into the hands of operators as fast as possible. To do this, concept demonstrations draw scientists and operators into a closer relationship. Since the demonstrations began in 1994, 46 ACTDs have been initiated. Each has been dedicated to examining the ability of a mature technology to meet an emerging need.

The ACTD program is significant first and foremost because it focuses on the needs of the joint warfighter. In the past, developers would

1st Combat Camera Squadron (Jim Vanney)

Multiple rocket launch system during exercise.

the ACTD program pursues demonstrations that support the operational concepts found in *JV 2010*

produce a system and turn it over to the user, either a single service or the joint community. Perhaps the user had supported the system development, maybe not. Under this program, however, the Office of the Deputy Under Secretary of Defense for Advanced Technology solicits unified commands, services, defense agencies, and industry for candidates at the start of each fiscal year. Preference is given to the highest priority joint need, which then drives ACTD.

One recent demonstration provides an example. The commander in chief of U.S. Forces Korea faced a formidable threat posed by the North Korean 240-mm multiple rocket launchers. Within 24 months, the precision/rapid counter-multiple rocket launch ACTD developed a concept and demonstrated technology to more rapidly counter the weapons. Basic innovations integrated surveillance, command and control, and weapons in a system of systems. This reduced sensor-to-shooter timelines by a factor of three and improved counterfire accuracy. Today that capability is operational on the Korean peninsula. A former commander of the 2^d Infantry Division depicted its success: "Soldiers have had a chance to play with it and influence the outcome. . . . This is all about the user being involved up front."

The ACTD program reduces acquisition risk. Involvement by joint warfighters throughout increases the likelihood of meeting operational requirements. It also ensures a more informed acquisition process should production of a system be necessary. Risk is mitigated by the fact that demonstrations do not develop technologies. Instead they focus on seeking mature or emerging technologies that can be demonstrated within two to four years. In addition, funds are used to integrate, evaluate, or sometimes forsake extant technologies. In the first 11 demonstrations, \$56 million was used to leverage \$2.4 billion in service and defense agency efforts. By investing in a fly-before-buy approach, ACTDs can prevent DOD from becoming locked into multi-billion dollar acquisition programs that may not achieve what warfighters want.

Risk reduction was apparent in the kinetic energy boost phase intercept ACTD, which sought to block ballistic missiles before submunitions and countermeasures could be deployed. Preliminary simulations determined that such an intercept was possible but not operationally feasible. It required an excessive number of aircraft. This assessment saved \$400 million in prototype development.

The ACTD program can shorten the acquisition process but is not a substitute for it. Fielding major systems such as ships and aircraft is still necessary. However, the process can be undertaken at milestone II (engineering and manufacturing development) rather than at milestone 0 (concept evaluation) if a demonstration satisfies a high priority. The medium altitude endurance unmanned aerial vehicle ACTD illustrates how acquisition is expedited. This demonstration enabled the development of the Predator unmanned autonomous vehicle from a concept to an operational system in just 30 months.

Operational Focus

The ACTD program pursues demonstrations that support the operational concepts found in *JV 2010*: dominant maneuver, precision engagement, full-dimensional protection, and focused logistics. Moreover, the Joint Requirements Oversight Council reviews and prioritizes candidates based on military need.

The program's greatest contribution lies in its emphasis on operational concepts. It is not enough to develop technology. Success depends on getting it to the field and fleet and using it wisely. This requires an operational concept, or a context in which technology will be used. As new technologies are integrated into operational concepts, the result can be a revolution in military affairs. When users define such operational concepts, the revolution can come from the trenches.

Experimental combat operation center, Urban Warrior '99.



Fleet Imaging Command, Pacific (Jon Gesch)

The operational concept is at the essence of each demonstration. By participating, joint warriors define the concept. If a joint warfighter has a critical operational need but no solution, the Office of the Deputy Under Secretary of Defense for Advanced Technology helps find one. It may match the need with a number of mature technologies submitted by the research and development community at the beginning of the fiscal year. It may also help the joint warfighter in developing an operational concept which integrates this technology.

Focusing on operational concepts also provides insights into the future. It offers joint warfighters a better understanding of new technology and its military potential. It also helps them explore the training and doctrine implications of new systems, which were often underestimated before. Examining an operational concept can also lead to new ideas, as the cruise missile defense ACTD exemplified. In 1996, an Aegis cruiser and Patriot battery in Hawaii detected, tracked, and engaged simulated cruise missiles beyond radar line of sight. The concept relied on radar located on a mountain in Kauai, which simulated an airborne system. Ever since then an elevated sensor has been central to the development of cruise missile defense.

ACTDs are currently determining the relevance of concepts associated with *JV 2010* and the revolution in military affairs. The following are examples.

- The recently completed synthetic theater of war ACTD supports *JV 2010* goals for enhanced modeling and simulations that are “interconnected globally—creating a near-real time interactive simulation superhighway between forces in every theater.” This advanced distributed simulation is transitioning to service simulations systems and providing many baseline capabilities for the next DOD generation of simulation, the joint simulation system. It may also be used to evaluate other ACTDs as well as for simulation-based acquisition.

- The advanced joint planning ACTD will enable higher level commanders to keep pace in “a more stressful, faster moving decision environment.” It provides enhanced command, control, communications, computers, and intelligence (C⁴I) software, which allows faster and collaborative planning throughout a theater. It can be tailored to the needs of an individual commander. Some software tools have enabled U.S. Atlantic Command to reduce planning time from seven days to several hours.

- The extending the littoral battlespace ACTD demonstrates joint tactical command, control, communications, computers, intelligence, surveillance, and reconnaissance (C⁴ISR) architecture. It will provide “improved targeting information directly to the most effective weapons system,” as *JV 2010* states, and is indicative of network-centric warfare. Moreover, network-centric warfare will help realize not only *JV 2010* but also the promise of a revolution in military affairs.

In October 1998, U.S. Atlantic Command (now known as U.S. Joint Forces Command) was designated as executive agent for joint warfighting experimentation. As the Chief of Staff of the U.S. Army noted about the significance of this initiative: “Joint experimentation and integration offers a mechanism to promote ideas, develop technique, and produce doctrine and systems for a joint force.” This joint experimentation will integrate ideas and systems into an overall concept for *JV 2010*. ACTDs will serve as the building blocks in that pursuit.

Secretary of Defense William Cohen remarked that we “must accelerate the transformation of U.S. military capabilities using savings generated by aggressive business reforms.” The ACTD program enables joint warfighters to transform the Armed Forces from the bottom up. In the near future it will help integrate these efforts into an overarching concept for *JV 2010*. It is providing the means for innovation at a time when it is needed faster and cheaper than ever before. **JFQ**