FLICK of a SWITCH

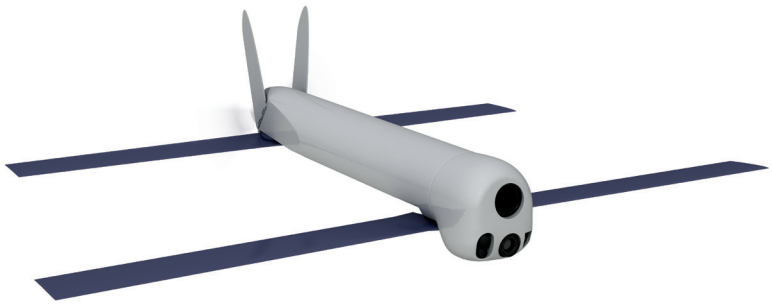
The Switchblade, a portable UAV, changes the face of war

Say you're a warfighter in the early days of the war in Afghanistan. Around the corner from your position, an enemy sniper fires shots from the rooftop of a building filled with civilians. You need to secure the area but have no way of taking out the sniper. You radio in to the base and see if backup firepower from the air is available.

A few scenarios may play out. In one, you wait for backup and, when it doesn't come, you attempt to engage the sniper anyway. You're fired on, and casualties are taken. Another possibility is that the sniper is able to slip away before backup arrives. A third is that an Apache helicopter is available and gets there quickly. The pilot fires a missile into the building where the sniper is located, destroying the building and likely causing civilian casualties.

In the last decade or so, the U.S. military has found that traditional tactics like bombers and Air Force squadrons don't always work in places like Iraq or Afghanistan where adversaries are embedded in urban centers, villages, farms, and caves. In response, the U.S. Department of Defense (DoD) has advanced technological innovations that have fundamentally changed the face of war.

Today, in the scenario described above, you might take a small launch tube that contains a packaged drone—equipped with a munitions payload—out of a backpack, set it on the ground, and push a button on a handheld control device to launch. The drone, an unmanned air vehicle (UAV) called the Switchblade, fires out of the tube. Its wings spring open upon exit



Thanks to support from the SBIR program, the Switchblade UAV and its derivatives have dramatically increased the capabilities of American Warfighters deployed in certain environments.

and it rounds the corner to the designated target, flying toward the sniper even while streaming back live video of what it "sees."

Based on visuals provided by Switchblade, you neutralize the sniper by simply flying the loaded drone into the target. It detonates its small explosive payload without injuring innocent bystanders. Alternatively, if you realize the sniper has vanished, you simply abort the mission.

The first hand-launched reconnaissance drone was used on a limited basis in Operation Desert Storm and in the first Afghanistan operations following the attacks of September 11, 2001. Once soldiers and Marines gained experience with small, unmanned aircraft (UAS) systems in Afghanistan and Iraq, they began to ask for a more rapid and effective way to address threats they could identify from a distance; demand soon grew across the U.S. military for the capability.

The DoD began looking for a small drone that could deliver a payload to a specific target, and AeroVironment was awarded what would become the first of three phases of Small Business Innovation Research (SBIR) contracts to create a prototype for a UAS that would later be termed the Switchblade Loitering Missile system.

Significant testing was involved during the course of the SBIRs, some of it with soldiers in the field, said Todd Hanning, a retired Air Force Lieutenant Colonel and former director of testing and technology for U.S. Air Force Special Operations Command (AFSOC). Hanning reported that successful tests in the field were enough to convince AFSOC to move the prototype forward. In 2011, the Secretary of Defense Science and Technology Group added $6.2 million as an SBIR Phase III to advance Switchblade to a product that could be used widely by the military.

Hanning said testing by the Air Force Research Lab over a period of time was crucial. "It's hard to know how you're going to use something when you've never had it. They'd never had anything like this before. You're not going to put a prototype in everybody's backpack. You're going to find some Special Operations guys to take it downrange [and test it]." He credited the Phase III SBIR as "bringing it across the finish line."

Hanning has moved between the Air Force and private companies a couple of times, including a deployment to Iraq and a stint building innovation labs for U.S. Special Operations Command and the Air Force. When he first encountered the Switchblade technology, working with AFSOC, he said his first thought was, "You've got to be kidding me! This is cool." Then added, "We started brainstorming—you couldn't help but brainstorm. What else could we do with this? It was like nothing else—because it was so small and so flexible. [We thought] let's get this thing solid and get it out to the troops because we know they need it."

The DoD's SBIR Program provides essential support to small businesses through its competitive awards program, but it also supports the military through transitioned technologies. Thanks to the SBIR Program, the Switchblade UAV and subsequent innovations have immeasurably improved the safety and effectiveness of America's warfighters.

AeroVironment, Inc.

Modernization Priorities: Fully Networked Command, Control, and Communications (FNC3); Autonomy

Monrovia, CA • SBIR contract: FA9453-06-C-0202 • Agency: Air Force • Topic: SOCOM05-011, Miniature Unmanned Aerial Vehicle (MUAV)