

**This Month**

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

**Sponsors**

**Training and Simulation**

[✉ Email this article](#) [🖨️ Print this article](#)

## Remote Controllers | Unmanned Vehicle Operators Require Diversity of Skills

December 2011

By John Edwards



As the pilot carefully studies the terrain just 300 feet below, a suspicious vehicle suddenly materializes on the display. Seconds later, nearby troops are alerted to the existence of a possible suicide bomber squad. A potential disaster is averted.

It's not just another day on the job for a seasoned military pilot. These days, a growing number of military missions are being handled by an entirely new breed of pilot, one who never sets foot inside the vehicle he controls.

In today's era of tighter budgets and ever more sophisticated flight control technologies, the military is increasingly relying on remotely piloted, unmanned vehicle systems for a wide range of tasks, including intelligence gathering, remote surveillance and target applications.

Various unmanned vehicles are used in the air, on land, on sea and under the sea for missions that require a high degree of stealth or that could be dangerous for humans onboard a manned vehicle.

"It's the way things are headed across the military," says Paul McDuffee, unmanned aircraft system (UAS) advocacy vice chairman for the Association for Unmanned Vehicle Systems, based in Arlington, Va.

The term "unmanned vehicle system," although widely used, is a misnomer in many cases. While unmanned vehicles don't carry any humans, expert operators are required to remotely control the vehicles. Most operators specialize on no more than a handful of specific systems. "Unmanned vehicles are like snowflakes, there are really no two alike and there's not a one-size-fits-all solution to training or the operation of these platforms," McDuffee says.

While unmanned systems operators are still viewed by many people as ex-video game addicts who have finally managed to find their true calling, there's only a grain of truth in that stereotype. "People come to us with all types of skill sets," says McDuffee, who is also a business development executive at Insitu, an unmanned aircraft system (UAS) manufacturer located in Bingen, Wash. "But they all have the ability to understand computers and software and are able to manipulate those systems."

Most unmanned vehicle operators launch their careers in the military. "Our operators are recruited the same as any other marine," says Capt. Dale Fenton, an assistant operations officer at the Marine Corps Air Station in Cherry Point, N.C. "Basically, you get a cross-section of society."

Training programs and operator qualification requirements vary significantly, depending on the vehicle and service branch (or civilian employer). Recruits applying to the Marine Corps program to learn how to fly the RQ-7 Shadow, made by AAI Corp. of Hunt Valley, Md., must achieve at least a 105 score in the General Technical portion of the Armed Services Vocational Aptitude Battery, the skills test all recruits face. "That's higher than most Military Occupation Specialties but it's not the highest," Fenton says. "They also have to have normal color vision and they have to be able to pass their Class 3 Flight Physical."

Once accepted into the program, the recruits begin a rigorous 22-week training program. "They train alongside the Army at Fort Huachuca," Fenton says. "They go through aviation ground school and they do some classroom training specific to the RQ-7 Shadow."

Army Lt. Col. Pat Sullivan, former commander of the UAS School at Fort Huachuca in Sierra Vista, Ariz., says the training program has two phases. The first phase is approximately nine weeks long. "That's where you become introduced and indoctrinated to aviation, tactical employment, regulation and restriction for the employment of unmanned aircraft systems," Sullivan says. "The 'soldierization' of what a UAS operator needs to do, including Federal Aviation Administration (FAA) ground school."

The second phase, which fills out the program's remaining 13 weeks, requires recruits to obtain FAA certification and to learn a series of critical skills. "You've taught how to both

SHARE [f](#) [t](#) [e](#) ...

**Related Content**

- ▶ [OSD: No New Unmanned Aircraft Programs on the Horizon](#)
- ▶ [Missile Manufacturer Seeks to Capitalize on Booming Killer-Drone Business](#)
- ▶ [Simulation Industry Plays Savings Game](#)
- ▶ [New Training Facilities Force Marines To Experience the Fog of War](#)
- ▶ [Demand for Spy Drones Stretches Army Budget](#)

**Related Meetings**

- ▶ [2380 - 2012 Ground Robotics Capabilities Conference & Exhibition 03/21/2012 - 03/23/2012 San Diego, CA](#)

**Related Divisions**

- ▶ [Robotics](#)

obtain FAA certification and to learn a series of critical skills. "You're taught how to both tactically deploy the unmanned aircraft system and how to support the commander," Sullivan says. "You also learn techniques of how to use the sensors onboard the unmanned aircraft."

Like many UAS operators, Stephen Rayleigh, a former U.S. Army RQ-7 Shadow pilot, didn't originally plan a career in the field. "I'm a musician and one of my main instruments is the trombone, so I tried out for the Army band." But he wasn't accepted. "So I was encouraged to look at the other jobs," Rayleigh says.

A secondary interest in aviation led Rayleigh to UAS operation. "I always wanted to be a pilot and I found, arguably, the coolest job that they allow enlisted people to do." Twenty-two weeks of training resulted in a certificate that allowed him to fly RQ-7 Shadows.

The Shadow weighs about 375 pounds; its wings are 14 feet long. It stays in the air for about five to six hours. Currently it is the Army's most widely used UAS. "We have other systems, but those are more specialized," Rayleigh says.

The Army also has acquired a large Predator-class aircraft, called the Gray Eagle. Another UAS the Army uses is the Hunter. Then there is the little hand-launched ones, such as the Raven.



Rayleigh eventually spent four years in the Army as a UAS operator, including a year in Iraq. "In the states, it was a nine-to-five job," he says. "In Iraq, though, we usually worked six days a week for 12 hours." Rayleigh spent over 1,000 hours operating UAS missions for the Army. For most of his time in Iraq, he scanned the terrain for improvised explosive devices, relying on the Shadow's sophisticated imaging payloads to provide clues to hidden dangers. "We used ... a conventional visible light camera and a heat-detecting infrared camera."

The infrared sensor detected conditions that visible light cameras missed. "Any kind of temperature differences in a road might show where a hole has been dug," Rayleigh explains. Infrared imaging could also be used to pick out camouflaged vehicles. "I could see the vehicle's shadow, because it was cooler," Rayleigh says.

The daily work, vital to saving lives, was simultaneously monotonous and insanely demanding. "There's a propensity to want to do something else to occupy your time, but you have to stay vigilant," Rayleigh says. "I would compare it to watching your screen saver for four hours — but don't look away!"

Once airborne, the RQ-7 Shadow almost flies itself, yet the operator must always remain alert. "I've had in-flight emergencies, and there's not a lot of warning," Rayleigh says. "They've now implemented a system with an auditory alert, which is great," he says. "But for me, unless I was always watching the screen for signs of trouble, something important could go unnoticed."

The Navy, meanwhile, is pushing ahead with the development of unmanned underwater vehicles (UUVs), which perform a wide range of reconnaissance, analysis and surveying missions for both military and civilian organizations.

Because flying unmanned aircraft creates safety challenges — causing the FAA to restrict use of drones in domestic airspace — much of the operator training occurs in classrooms. The Navy and other UUV adopters don't have to contend with the FAA, and they favor hands-on training over extended classroom instruction. "The majority of the training that's done in today's world is done on the job," says Robert Gibson, unmanned systems project manager at the Naval Surface Warfare Center in Panama City, Fla.

While there are scores of different military and civilian unmanned craft, Gibson's training efforts are focused on Hydroid and Bluefin vehicles. Gibson says UUV operators need to be self-motivated. It's not a field for people with casual work habits.

"They have to be an independent person, be able to think on their feet, and have some type of electronics background or sea-worthiness," Gibson says. He also prefers people who are comfortable with computers and who understand how they operate.

"We're not talking in-depth coding, but they should be able to do point and click and have a conceptual knowledge of spacial awareness," he says. "It's important to think outside the box."

Gibson, like most other UUV trainers, likes to get his recruits behind the controls as soon as possible. A five-day introductory course includes an initial day of classroom instruction followed by four days that are split between the classroom and hands-on UUV operation. "This gives you the basic background to verify how the vehicle operates and put it in the water and get it out of the water," Gibson says. Becoming a fully qualified operator requires completing a year-long internship program, working under the supervision of a skilled operator. "The experience gained from that other operator is very valuable," Gibson says.

UUV operation is a demanding job that requires technical and manual skills as well as quick thinking. "The operational tempo for the military [assignments] is pretty high and operators do burn out," Gibson says, noting that commercial work tends to be less stressful. "There's a difference being on the civilian side and being on the military side," he notes.

Gibson says he sees a growing trend toward female UUV operators. "We have more women than men in our facility here," he says. "But in the military at large, there are still generally more men than women." For both sexes, UUV operation is a young person's game. Gibson pegs the average age of a UUV operator at about 24 or 25.

Jason Price is a civilian UUV operator at the Naval Surface Warfare Center in Panama City, Fla. Like his Army UAS counterpart, he never thought about entering the field until the opportunity

presented itself. "I hadn't really planned on becoming involved in unmanned systems at all until my senior year, when I got involved in an unmanned surface vehicle project at Virginia Tech," he says. "Ever since then, one thing has led to another."

Remotely piloting an underwater vehicle is a far different experience from flying any unmanned aircraft, Price says. Unlike an air vehicle, where you usually have a live link, with an underwater vehicle you're just getting breadcrumbs — heartbeat messages every minute or so saying, "I'm still okay," he explains. "You don't get a live video feed or any other kind of data like that."

Like Gibson, Price believes that UUV operators need to be technically savvy. "I think any engineering degree in general helps tune your mind to the kind of person you need to be and to some of the skills you need to succeed in this," he says. "Having a background in electronics, knowing how a computer works and how a robotics system works always helps."

Price also agrees that hands-on experience nearly always trumps classroom instruction. "Most of my training time was spent serving under a more senior operator, gathering experience and helping her out," he says. "Eventually, after six months to a year, I was taking on and leading surveys by myself," he says.

Like the men and women who pilot conventional military aircraft, most UAS operators plan to eventually take their skills into the civilian world. Employment opportunities for UAS operators are growing rapidly, McDuffee says. "Public safety and law enforcement — they've probably been the most aggressive in terms of wanting to deploy smaller systems for tactical use, to protect their officers on the ground, looking for threats," he says.

Other organizations looking to hire UAS operators include oil companies, Customs and Border Protection and a variety of scientific enterprises. "That's just a short sample of the interested parties that really want to see this technology deployed for a variety of uses," McDuffee says. "There are a lot of other applications beyond the traditional DoD apps that everyone is so familiar with."

Gibson notes that UUV operators are also finding themselves in increasing demand, especially for offshore oil exploration. "The oil field is paying a lot of money these days, and they're actually doing more work on these unmanned underwater vehicles than we are," he says.

Former Shadow pilot Rayleigh, now 23, is currently a student at Embry-Riddle Aeronautical University in Prescott, Ariz.

"I'm getting my instrument rating [and] I'm probably going to get the commercial rating," he says, "and that's just going to make me more marketable as a civilian UAS operator." Rayleigh is looking forward to a long and lucrative career. "I can go and get a job and fly UAS [vehicles] as a civilian and make a boatload of money; you can't really do that in the military."

Seeing a growing demand for unmanned vehicle operators, more schools are beginning to offer training and certification programs. Michael Nelson, UAS course manager for the University of North Dakota's Center for UAS research, education and training in Grand Forks, notes that his program currently has 91 students. The first class graduated in May. "All five had jobs waiting for them," Nelson says. "It's like they were star hockey, baseball or football players."

Unmanned vehicle work is often tiring and tedious, but it also has its fair share of perks. Price says that his UUV career included several interesting assignments, such as joining the team searching for a vessel that played a major role in the creation of both the U.S. Navy and the nation. "I was involved in an expedition to try and locate the Bonhomme Richard, John Paul Jones' ship from the Revolutionary War," he says. The assignment required Price to travel to England and help archaeologists search for the wreck in the waters off Yorkshire. "Without this opportunity [of piloting UUVs], I never would have had a chance to do something like that," Price says.

Reflecting on his time spent as an Army Shadow operator, Rayleigh says that he and his colleagues performed important and fulfilling work. "Finding things like weapons caches, scanning the roads for IEDs before a convoy goes out," he says. "We saved a lot of lives while we were out there."

 [Email this article](#)  [Print this article](#)

#### Reader Comments

### Re: Remote Controllers | Unmanned Vehicle Operators Require Diversity of Skills

Check out my website "motionsimulator.com" to see a new way to fly UAV'S

*Ray Woodworth on 12/14/2011 at 12:49*

#### Submit Your Reader's Comment Below

\*Name

\*eMail

The content of this field is kept private and will not be shown publicly.

\*Comments



Please enter the text displayed in the image.  
The picture contains 6 characters.

**\*Characters**

**\*Legal  
Notice**

NDIA is not responsible for screening, policing, editing, or monitoring your or another user's postings and encourages all of its users to use reasonable discretion and caution in evaluating or reviewing any posting. Moreover, and except as provided below with respect to NDIA's right and ability to delete or remove a posting (or any part thereof), NDIA does not endorse, oppose, or edit any opinion or information provided by you or another user and does not make any representation with respect to, nor does it endorse the accuracy,

I have read the Legal Notice.

[Front Page](#) | [Subscribe Now!](#) | [Order Issue](#) | [E-mail the Editor](#) | [Site Map](#)

© 2011 National Defense Industrial Association \ 2111 Wilson Blvd., Suite 400 \ Arlington, VA 22201  
Tel: (703) 522-1820 \ Fax: (703) 522-1885