# Glitch shows how much US military relies on GPS

June 1 2010, By DAN ELLIOTT , Associated Press Writer

In this Feb. 25, 2008 photo provided by the U.S. Army, Pvt. Corey Rodriguez pulls the lanyard on the M-777A2 during the first firing of the Army's new GPS-guided Excalibur artillery round. A software glitch that temporarily left as many as 10,000 military GPS receivers unable to lock on to satellite locator signals showed how dependent the U.S. military has become on the Global Positioning System. (AP Photo/U.S. Army, Sgt. Henry Selzer)

A problem that rendered as many as 10,000 U.S. military GPS receivers useless for days is a warning to safeguard a system that enemies would love to disrupt, a defense expert says.

The Air Force has not said how many weapons, planes or other systems

were affected or whether any were in use in Iraq or Afghanistan. But the problem, blamed on incompatible software, highlights the military's reliance on the Global Positioning System and the need to protect technology that has become essential for protecting troops, tracking vehicles and targeting weapons.

"Everything that moves uses it," said John Pike, director of Globalsecurity.org, which tracks military and homeland security news. "It is so central to the American style of war that you just couldn't leave home without it."

The problem occurred when new software was installed in ground control systems for GPS satellites on Jan. 11, the Air Force said.

Officials said between 8,000 at 10,000 receivers could have been affected, out of more than 800,000 in use across the military.

In a series of e-mails to The Associated Press, the Air Force initially blamed a contractor for defective software in the affected receivers but later said it was a compatibility issue rather than a defect. The Air Force didn't immediately respond to a request for clarification.

The Air Force said it hadn't tested the affected receivers before installing the new software in the ground control system.

One program still in development was interrupted but no weapon systems already in use were grounded as a result of the problem, the Air Force said. The Air Force said some applications with the balky receivers suffered no problems from the temporary GPS loss.

An Air Force document said the Navy's X-47B, a jet-powered, carrier-based drone under development, was interrupted by the glitch. Air Force officials would not comment beyond that on what systems were affected.

Navy spokeswoman Jamie Cosgrove confirmed the X-47B's receivers were affected but said it caused no program delays.

At least 100 U.S. defense systems rely on GPS, including aircraft, ships, armored vehicles, bombs and artillery shells.

Because GPS makes weapons more accurate, the military needs fewer warheads and fewer personnel to take out targets. But a leaner, GPS-dependent military becomes dangerously vulnerable if the technology is knocked out.

James Lewis, a senior fellow at the Center for Strategic and International Studies, said the glitch was a warning "in the context where people are every day trying to figure out how to disrupt GPS."

The Air Force said it took less than two weeks for the military to identify the cause and begin devising and installing a temporary fix. It did not say how long it took to install the temporary fix everywhere it was needed but said a permanent fix is being distributed.

All the affected receivers were manufactured by a division of Trimble Navigation Ltd. of Sunnyvale, Calif., according to the Air Force. The military said it ran tests on some types of receivers before it upgraded ground control systems with the new software in January, but the tests didn't include the receivers that had problems.

The Air Force said it traced the problem to the Trimble receivers' software. Trimble said it had no problems when it tested the receivers, using Air Force specifications, before the ground-control system software was updated.

Civilian receivers use different signals and had no problems.

Defense industry consultant James Hasik said it's not shocking that some receivers weren't tested. GPS started as a military system in the 1970s but has exploded into a huge commercial market, and that's where most innovation takes place.

"It's hard to track everything," said Hasik, co-author of "The Precision Revolution: GPS and the Future of Aerial Warfare."

The Air Force said it's acquiring more test receivers for a broader sample of military and civilian models and developing longer and more thorough tests for military receivers to avoid a repeat of the January problem.

The Air Force said the software upgrade was to accommodate a new generation of GPS satellites, called Block IIF. The first of the 12 new satellites was launched from a Delta 4 rocket Thursday after several delays.

In addition to various GPS guided weapons systems, the Army often issues GPS units to squads of soldiers on patrol in Iraq and Afghanistan. In some cases a team of two or three soldiers is issued a receiver so they can track their location using signals from a constellation of 24 satellites.

Space and Missile Systems Center spokesman Joe Davidson said in an e-mail to The Associated Press that the system is safe from hackers or enemy attack.

"We are extremely confident in the safety and security of the GPS system from enemy attack," he said, noting that control rooms are on secure military bases and communications are heavily encrypted.

"Since GPS' inception, there has never been a breach of GPS," Davidson said. He added that Air Force is developing a new generation of

encrypted military receivers for stronger protection.

The military also has tried to limit the potential for human error by making the GPS control system highly automated, Davidson said.

GPS satellites orbit about 12,000 miles above Earth, making them hard to reach with space weapons, said Hasik, the defense industry consultant. And if the GPS master control station at Schriever Air Force Base, Colo., were knocked out, a backup station at Vandenberg Air Force Base, Calif., could step in.

Iraq tried jamming GPS signals during the 2003 U.S. invasion, but the U.S. took out the jammer with a GPS-guided bomb, Hasik said.

The organizational skills required to jam GPS over a broad area are beyond the reach of groups like the Taliban and most Third World nations, Hasik said.

"The harder you try to mess with it, the more energy you need. And the more energy you use, the easier it is for me to find your jammer," Hasik said.

More worrisome, Hasik said, is the potential for an accident within U.S. ranks that can produce anything from an errant bomb to sending troops or weaponry on the wrong course.

In 2001, a GPS-guided bomb dropped by a Navy F-18 missed its target by a mile and landed in a residential neighborhood of Kabul, possibly killing four people. The military said wrong coordinates had been entered into the targeting system.