B-1 a 'weapon of choice' at 20 years old

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(Editor's Note: This is the third article in a four-part series highlighting the 20th anniversary of the B-1 at Dyess. This week's article focuses on the technological aspects of the B-1. Next week will focus on the B-1 in combat.)

The B-1 Lancer has evolved much since it stood its last nuclear alert in 1997, one of the last vestiges of the Cold War era, and gained its current conventional bomber role.

With its new mission, the bomber went through numerous avionics and software upgrades that have practically transformed the aircraft into a whole new plane.

"It's almost like comparing apples and oranges when comparing the bomber during the Cold War and the bomber now" said Maj Derek Leivestad, 28th Bomb Squadron B-1 instructor pilot. "When the original B-1 was built, it was designed and built specifically for low-altitude penetration of Soviet Cold War defenses to drop nuclear weapons. And that was all it did."

However, "with the collapse of the Berlin wall and the demise of the Soviet threat, (the United States) decided that they didn't need all the bombers to carry nuclear weapons," Leivestad said. "We got rid of the nuclear mission. We basically rewrote the nuclear software into completely different software."

But because of the need to transition the bomber's nuclear mission, the B-1 had to embrace its new conventional mission almost overnight; and for a while the bomber's future seemed questionable.

"The B-1 had to scramble to find a new mission," said Robert Butler, Dyess B-1 site manager. "There were a couple of years where it looked like the B-1 might be cancelled altogether."

However, battlefield commanders have since called the B-1 the military's "weapon of choice," Butler said. "Since its role in (Operation) Desert Fox, the bomber has been the weapon of choice. Battlefield commanders asked for that weapon above any else because of the virtual delicatessen of the weapon bays, the precision weapons we could use."

It's the bomber's "computer intensity" that allows the bomber to "roll in new software that gives us whole new capabilities -- weapons, navigation and defensive capabilities," Butler said.

The Lancer's adaptability to software upgrades and modifications helped transition the bomber into its conventional role and keep it one of the Air Force's major combat assets.

The firsts of the technological upgrades the bomber underwent began in 1994 with the Conventional Munitions Upgrade Program, a program which was a part of making the bomber in compliance with the Strategic Arms Reduction Treaty.

The Conventional Munitions Upgrade Program consists of a four-phase approach to first convert the bomber to a conventional platform and then to increase its conventional capability. The modifications were divided into blocks, starting with Block C in 1995 and then Block D in 1999.

"When we went to Block C and got our conventional mission, it was dumb bombs--no guidance whatsoever," Major Leivestad said. "Once we got to Block D, we got the capability to drop (Global Positioning System)-guided weapons, so now we can drop precision weapons or near-precision weapons on whatever coordinates are given to us."

Block D was a combination of avionics and software upgrades that added the capabilities to use GPS, radios and voice-satellite communications in the B-1.

Because of voice-satellite communications, "we can be anywhere in the world and be talking to somebody else who is anywhere in the world," said Major Leivestad.

The modifications also upgraded the weapons the bomber was able to carry as well. When the bomber first started its conventional mission, it carried Mk-82 non-precision 500-pound gravity bombs. With Block C, the bomber upgraded to Cluster Bomb Units, and with Block D the first GPS-aided Joint Direct Attack Munitions were used.

Then, in 2005 when Block E software was incorporated into the bomber, the new changes and computer upgrades made the B-1's weapon capability even more flexible.

"Now with Block E, we've even taken it a step further," Major Leivestad said. "The jump between Block D and Block E is exponential in terms of the types of weapons we can carry and the mixed load that we can carry."

The B-1 can currently carry 24 GPS-aided JDAMs at one time or a combination of 24 Mk-84 2,000-pound general purpose bombs; 8 Mk-65 naval mines; 84 Mk-82 500-pound general purpose bombs; 84 Mk-62 500-pound naval mines; 30 CBU-87, -89, -97 cluster munitions; 30 CBU-103, -104, -105 Wind Corrected Munitions Dispensor, 24 AGM-158 Joint Air to Surface Standoff Missiles (JASSM) or 12 AGM-154 Joint Standoff Weapons.

"So we got rid of two sets of software, and now it's just one set of software that works for every single weapon," Major Leivestad said. "Now we can carry any weapon in combination with any other weapon. We not only got the ability to mix weapons loads but we also increased the different types of weapons we can carry."

Courtesy Photo

The B-1 bomber may soon add the Sniper XR targeting pod to its list of technological upgrades. The targeting pod, already used by fighter aircraft such as the F-16, F-15E and the A-10, would equip the B-1 with the positive identification capability that would further the technological capabilities of the bomber.

Block E has also expanded the bomber's arsenal so it can now carry both JSOW and JASSM simultaneously.

"There isn't another plane out there that can do what we can do," Major Leivestad said. "(There are) other planes out there that can carry the same types of weapons -- there's no doubt about that -- however, there's nobody out there that can carry as many of them or as mixed a load," Major Leivestad said.

For instance, "if you look at the F-16, they can carry two 2,000-pound weapons where (the B-1) can carry 24," Major Leivestad said. "So we carry as much ordnance as an entire squadron of F-16s on one plane."

In general, the B-1 stands out from the rest of the Air Force aircraft assets in both payload and loiter time, but the bomber also stands out from other bombers because the amount of payload it can carry, Major Leivestad said.

The B-1 can carry 24 JDAMs while the B-2 can carry 16 and the B-52 can carry 12, he said.

The B-1's flexibility, however, doesn't stop at what Block E has enabled. The bomber may be scheduled to undergo even more upgrades in the near future. One of those upgrades may include the addition of the targeting pod, a capability that ground-attack fighter aircraft such as the F-16, F-15E and A-10 are equipped with. The targeting pod would be able give bomber crews the capability for positive target identification.

The B-1 has a very healthy future, Major Leivestad said. "The technological flexibility that we have with that huge payload is what, in my opinion, makes this plane head and shoulders above any other plane. that we have out there."