# B61 nuclear bomb

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The **B61** nuclear bomb is the primary thermonuclear weapon in the U.S. Enduring Stockpile following the end of the Cold War. It is an intermediate yield strategic and tactical nuclear weapon featuring a two-stage radiation implosion design.[1]

B61 about to be loaded

## Contents



## Development

The B61, originally known (before 1968) as the **TX-61**, was designed in 1963. It was designed and built by the Los Alamos National Laboratory in New Mexico. It began from a program for a lightweight, streamlined weapon launched in 1961. Production engineering began in 1965, with full production beginning in 1968 following a series of development problems.

A B61 bomb undergoing disassembly.

Total production of all versions was approximately 3,155, of which approximately 1,925 remain in service as of 2002, and some 1,265 are considered to be operational.[*citation needed*] The warhead has changed little over the years, although early versions have been upgraded to improve the safety features.[*citation needed*]

Nine versions (or 'Mods') of the B61 have been produced. Each shares the same 'physics package,' with different yield options.

The newest variant is the **B61 Mod 11**, deployed in 1997, which is a ground-penetrating bunker buster.

The B61 unguided bomb should not be confused with the MGM-1 Matador cruise missile, which originally was developed under the bomber designation **B-61**.

When the B61 was still classified, aircrew were not allowed to use the term "B61". Instead, it was referred to as a "shape", "silver bullet", or even "external delivery".

## Deployment

The B61 has been deployed by a very wide variety of U.S. military aircraft. Aircraft cleared for its use have included the B-58 Hustler, B-1, B-2, B-52, and FB-111 strategic bomber aircraft; the F-100 Super Sabre, F-104 Starfighter, F-105 Thunderchief, F-111 and F-4 Phantom II fighter bombers; the A-4 Skyhawk, A-6 Intruder, and A-7 Corsair II attack aircraft; the F-15 Eagle and F-15E Strike Eagle; F22 Raptor; British, German and Italian Panavia Tornado IDS aircraft. USAF, Belgian and Dutch F-16 Fighting Falcon can also carry the B61. Though exact numbers are hard to establish, research done by the Natural Resources Defense Council suggests approximately 480 are deployed with United States Air Force units in various European countries.[2]

B61 bomb in various stages of assembly. The nuclear component is the smaller silver cylinder behind the nose cone.

## Design

The B61 is a variable yield bomb designed for carriage by high-speed aircraft. It has a streamlined casing capable of withstanding supersonic flight speeds. The weapon is 11 ft 8 in (3.58 m) long, with a diameter of about 13 in (33 cm). Basic weight is about 700 lb (320 kg), although the weights of individual weapons may vary depending on version and fuze/retardation configuration.

The newest variant is the **B61 Mod 11**, a hardened penetration bomb with a reinforced casing (according to some sources, containing depleted uranium) and a delayed-action fuze, allowing it to penetrate several metres into the ground before detonating, damaging fortified structures further underground.[3] The Mod 11 weighs about 1,200 lb (540 kg). Developed from 1994, the Mod 11 went into service in 1997 replacing the older megaton-yield B53 bomb, a limited number of which had been retained for anti-fortification use. About 50 **Mod 11** bombs have been produced, their warheads converted from **Mod 7** bombs. At present, the primary carrier for the B61 Mod 11 is the B-2 Spirit.

Internal nuclear components of the B61 bomb.

Most versions of the B61 are equipped with a parachute retarder (currently a 24-ft (7.3 m) diameter nylon/Kevlar chute) to slow the weapon in its descent. This offers the aircraft a chute to escape the blast, or allows the weapon to survive impact with the ground in laydown mode. The B61 can be set for airburst, ground burst, or laydown detonation, and can be released at speeds up to Mach 2 and altitudes as low as 50 feet (15 m). Fusing for most versions is by radar.

The B61 is a variable yield, kiloton-range weapon called "Full Fuzing Option"(FUFO) or "Dial-a-yield" by many service personnel. Tactical versions (**Mods 3**, **4**, and **10**) can be set to 0.3, 1.5, 5, 10, 60, 80, or 170 kiloton explosive yield (depending on version). The strategic version (**B61 Mod 7**) has four yield options, with a maximum of 340 kilotons. Sources conflict on the yield of the earth-penetrating **Mod 11**; the physics package or bomb core components of the **Mod 11** are apparently unchanged from the earlier strategic **Mod 7**; however, the declassified 2001 Nuclear Posture Review [4] states that the **B-61-11** has only a single yield; some sources indicate 10 kt, others suggest the 340 kiloton maximum yield as the **Mod-7**.

The early Mods 0, 1, 2, and 5 have been retired (Mods 6, 8, and 9 were cancelled before production), and the Mod 10 has been moved to the inactive stockpile, leaving the Mods 3, 4, 7, and 11 as the only variants in active service.

The U.S. intended to refurbish the B61 bombs under its Life Extension Program with the intention that the weapons should remain operational until at least 2025.[5]

However, the United States Congress ordered that this work be stopped pending reports from the National Academy of Sciences and JASON defense advisory panel.[6]

In May 2010 the National Nuclear Security Administration asked Congress for $40 million to enable the Lockheed Martin F-35 Lightning II to carry the weapon by 2017.[7]

## See also

- List of nuclear weapons
- B61 Family
- Weapon Storage Security System (WS3)


B61s on a bomb rack.

## References


1. ^ http://nuclearweaponarchive.org/Usa/Weapons/B61.html
2. ^ Hans M. Kristensen/Natural Resources Defense Council, U.S. Nuclear weapons in Europe (http://www.nrdc.org/nuclear/euro/euro.pdf) (2005), article retrieved December 21, 2007.
3. ^ [1] (http://www.nukestrat.com/us/afn/B61-11.htm)
4. ^ [2] (http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm)
5. ^ Grossman, Elaine M. (September 26, 2008). "U.S. Air Force Might Modify Nuclear Bomb" (http://www.nti.org/d_newswire/issues/2008_9_26.html#B8705677) . GlobalSecurity.org. http://www.nti.org/d_newswire/issues/2008_9_26.html#B8705677.
6. ^ Nuclear Bomb Update Effort Slowed by Posture Review, Science Studies (http://nuclearno.com/text.asp?14260)
7. ^ NNSA Seeks $40M for Nuke Refurbishment Study (http://www.globalsecuritynewswire.org/gsn/nw_20100518_1164.php)


## External links

- Declassified B61 storage facility tour (http://www.wpla.net)
- "Developing and Producing the B-61" (http://www.youtube.com/watch?v=RlH7OuWiPb4) , official AEC film
- B61 information at Carey Sublette's NuclearWeaponArchive.org (http://nuclearweaponarchive.org/Usa/Weapons/B61.html)
- B61 information at GlobalSecurity.org (http://www.globalsecurity.org/wmd/systems/b61.htm)
- B61-11 Concerns and Background (http://www.brook.edu/FP/PROJECTS/NUCWCOST/lasg.htm) from the Los Alamos Study Group, an anti-nuclear weapons organization
- Low-Yield Earth-Penetrating Nuclear Weapons (http://www.fas.org/faspir/2001/v54n1/weapons.htm) by Robert W. Nelson, Federation of American Scientists, January/February 2001, Volume 54, Number 1


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