B83 nuclear bomb

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The **B83** thermonuclear weapon is a variable-yield gravity bomb developed by the United States in the late 1970s, entering service in 1983. With a maximum yield of 1.2 megatonnes of TNT (5.0 PJ) (75 times the yield of the atomic bomb "Little Boy" dropped on Hiroshima on 6 August 1945, which had a yield of 16 kilotonnes of TNT (67 TJ)), it is the most powerful nuclear free-fall weapon in the United States arsenal.[1] It was designed at Lawrence Livermore National Laboratory, and the first underground test detonation of the production B83 took place on 15 December 1984.[2]

B83	
Type	Unguided bomb
Service history	
In service	1983–present
Used by	United States
Production history	
Designer	Lawrence Livermore National Laboratory
Number built	650
Specifications	
Weight	1,100 kilograms (2,400 lb)
Length	3.7 meters (12 ft)
Diameter	46 centimeters (18 in)
Blast yield	1.2 megatonnes of TNT (5.0 PJ) (maximum)

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History

The B83 was based partly on the earlier B77 program, which was terminated because of cost overruns. The B77 was designed with an active altitude control and lifting parachute system for supersonic low-altitude delivery from the B-1A bomber. B77 nuclear component test firings were attributed to the Operation Anvil (Nuclear test) series in 1975 and 1976, specifically the "Cheese" test shots in Anvil:

- Anvil Kasseri – 28 October 1975, 1,200 kilotonnes of TNT (5,000 TJ) (B77/B83 full yield)
- Anvil Muenster – 3 January 1976, 800 kilotonnes of TNT (3,300 TJ)
- Anvil Fontina – 12 February 1976, 900 kilotonnes of TNT (3,800 TJ)
- Anvil Colby – 14 May 1976, 800 kilotonnes of TNT (3,300 TJ)[2]

A B83 casing.

The B83 nuclear components have been attributed as the same as the earlier B77.

The B83 replaced several earlier weapons, including the B28, B43, and to some extent the ultra-high-yield B53. It was the first U.S. nuclear weapon designed from the start to avoid accidental detonation, with the use of "insensitive explosives" in the trigger lens system. Its layout is similar to that of the smaller B61, with the warhead mounted in the forward part of the weapon to make the bomb nose-heavy. It was intended for high-speed carriage (up to Mach 2.0) and delivery at high or low altitude. For the latter role, it is equipped with a parachute retardation system, with a 14-meter (46 ft) Kevlar ribbon parachute capable of rapid deceleration. It can be employed in free-fall, retarded, contact, and laydown modes, for air-burst or ground-burst detonation. Security features include next-generation permissive action link (PAL) and a command disablement system (CDS), rendering the weapon tactically useless without a nuclear yield.

The B83 was reportedly test fired in the Grenadier Tierra nuclear weapon test on 15 December 1984, at a reduced yield of 80 kilotonnes due to the Threshold Test Ban Treaty.

As of 2015, the B83 is being considered for reduction in the US nuclear arsenal as a part of a modernization and downsizing program begun in approximately 2010.[3]

Design

The bomb is 3.7 meters (12 ft) long, with a diameter of 460 millimeters (18 in). The actual nuclear explosive package, judging from published drawings, occupies some 0.91 to 1.22 m (3 to 4 ft) in the forward part of the bomb case. The bomb weighs approximately 1,100 kilograms (2,400 lb). The location of the lifting lugs shows that the greater part of the total mass is contained in the nuclear explosive. It has a variable yield: the destructive power is adjustable from somewhere in the low kiloton range up to a maximum of 1.2 megatons (1.2 million tons of TNT). The weapon is protected by a Category "D" Permissive Action Link (PAL)

About 650 B83s were built, and the weapon remains in service as part of the United States "Enduring Stockpile".

Aircraft capable of carrying the B83

The following aircraft are (or were in the case of retired aircraft such as the A-6 Intruder) capable of launching an attack using the B83 bomb:

- B-52
- B-1 Lancer
- B-2
- F-15/E
- F-16
- F/A-18
- FB-111
- A-6 Intruder
- A-7 Corsair II
- AV-8B Harrier II

Nuclear capability has been removed from the B-1B, though it was tested with the B-61 nuclear bomb in the mid-1980s, as well as with the ACM, Advanced Cruise Missile (now being retired).

All A-6, A-7 and FB-111 aircraft have been withdrawn from service and retired.

Novel uses

The B83 is one of the weapons considered for use in the "Nuclear Bunker Buster" project, which for a time was known as the *Robust Nuclear Earth Penetrator*, or *RNEP*. While most efforts have focused on the smaller B61-11 nuclear bomb, Los Alamos National Laboratory was also analyzing the use of the B83 in this role.

The physics package contained within the B83 has been studied for use in asteroid impact avoidance strategies against any seriously threatening near earth asteroids. Six such warheads, configured for the maximum 1.2 Mt yield, would be deployed by maneuvering space vehicles to "knock" an asteroid off course, should it pose a risk to the Earth.[4]

In popular culture

- In the 1996 film *Broken Arrow*, two B83 bombs are stolen.
- In the strategy game *World in Conflict*, a B83 is considered the last resort if the U.S. Army failed to retake Seattle from the Soviet Union before the arrival of the PLA naval forces.
- In the 2007 film *Aliens vs. Predator: Requiem*, a B83 bomb is used to destroy a city.
- In the Charles Stross alternate-history novel *The Revolution Trade*, a version of the post-9/11 U.S. carpet bombs a trans-dimensional enemy state using B83s.

See also

- B61 nuclear bomb
- List of nuclear weapons

References

1. Blaney, Betsy (26 October 2011). "End of an Era: Last of Big Atomic Bombs dismantled". *San Francisco Chronicle*.
2. Sublette, Carey. "Nuclear Weapons Archive - B83". Retrieved 2013-12-23.
3. "As U.S. Modernizes Nuclear Weapons, 'Smaller' Leaves Some Uneasy". New York Times. 11 January 2016. Retrieved 12 January 2015..
4. "NASA plans 'Armageddon' spacecraft to blast asteroid" (http://www.flightglobal.com/articles/2007/08/03/215924/nasa-plans-armageddon-spacecraft-to-blast-asteroid.html) article at Flightglobal.com

External links

- B83 Information Site (http://www.globalsecurity.org/wmd/systems/b83.htm)
- B83 page at nuclearweaponarchive.org (http://nuclearweaponarchive.org/Usa/Weapons/B83.html)
- NASA proposal to attack asteroids (http://science.slashdot.org/science/07/08/07/0052240.shtml)

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