



COLLECTION · COL-10

THE NUCLEAR AGE

An atomic cannon, a 1950s nuclear bomber still in service, a Mach 3 bomber that never went to war, a megaton test under Alaska, a bomber stripped of its nuclear role, a submarine-launched nuclear missile, the interceptors built to stop warheads, a reactor's blue glow, the first seconds of a nuclear fireball, the corium mass under Chernobyl and the pines its radiation killed.



INSIDE

- | | |
|--|----------------------------------|
| 01 Atomic Annie | 09 Nuclear Fireball |
| 02 B52 Stratofortress | 10 NUCLEAR DISASTER |
| 03 XB-70 Valkyrie | 11 The Red Forest |
| 04 Cannikin Quake | 12 Kiloton |
| 05 Supersonic Striker | 13 The Atomic Gun |
| 06 Ballistic Trident | 14 Nuclear Shadows |
| 07 EKV: Exoatmospheric Kill Vehicle | 15 Fall Marya |
| 08 Cherenkov Glow | ✓ Collection Quiz and Answer Key |

DID YOU KNOW?

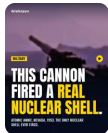
15 case files · 30 quiz questions · by DetailEnjoyer

ABOUT THIS COLLECTION

15 case files on the nuclear era, in order: a 1953 artillery shot, a bomber built in the 1950s for high-altitude nuclear missions and still flying, a Mach 3 nuclear bomber flown only as a 1960s research plane, a 1971 underground blast, a bomber built for nuclear alert and later disarmed under New START, a submarine-launched ballistic missile first deployed in 1990, interceptors aimed at ballistic-missile warheads, the light of a reactor pool, the first seconds of a nuclear explosion, the Elephant's Foot at Chernobyl and the Red Forest. Atomic Annie, the M65 280mm Atomic Cannon, is the only artillery piece ever to fire a nuclear shell. **DD-004** Cannikin (1971) was the largest underground nuclear test in U.S. history, with a yield just under five megatons, set off more than a mile beneath Alaska's Amchitka Island. **DD-026** The blue glow in nuclear reactor pools is Cherenkov radiation: electrons moving faster than light travels in water (about 75% of c). **DD-020**

CONTENTS

01



Atomic Annie

DD-004 · Military / History · The M65 280mm Atomic Cannon, nicknamed Atomic Annie, is the only artillery piece ever to fire a nuclear shell.

02



B52 Stratofortress

DD-708 · Military / History · Built in the 1950s, flying into the 2050s.

03



XB-70 Valkyrie

DD-048 · Military / Tech · A Mach 3 bomber that never went to war.

04



Cannikin Quake

DD-026 · Military / History · America's biggest underground nuke shook the ground like a magnitude 7 quake.

05



Supersonic Striker

DD-036 · Military / History · The B-1 was built to carry nukes but now flies conventional only.

06



Ballistic Trident

DD-627 · Military · Launched from under the sea.

07



EKV: Exoatmospheric Kill Vehicle

DD-011 · Military / Tech · This interceptor kills warheads without any explosives.

08



Cherenkov Glow

DD-020 · Science / Tech · This blue glow is particles outrunning light in water.

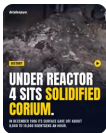
09



Nuclear Fireball

DD-052 · Military / Science · The first seconds of a nuclear explosion.

10



NUCLEAR DISASTER

DD-297 · History / Dark Facts · Under Chernobyl's Reactor 4 sits a mass of solidified corium.

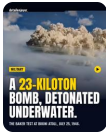
11



The Red Forest

DD-105 · Nature / History · Radiation from Chernobyl turned a pine forest ginger-brown.

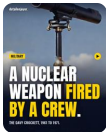
12



Kiloton

DD-270 · Military / History · In July 1946, the US detonated a 23-kiloton bomb underwater at Bikini Atoll.

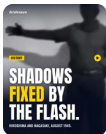
13



The Atomic Gun

DD-083 · Military / History · The U.S.

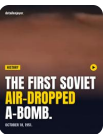
14



Nuclear Shadows

DD-330 · History / Military · The atomic bombings of August 1945 left shadows burned onto surfaces.

15



Fall Marya

DD-412 · History / Military · On October 18, 1951, the Soviet Union air-dropped an atomic bomb for the first time.



Collection Quiz and Answer Key

30 questions from every case file

Every quick fact has a stable ID (for example DD-004-F01) and comes from a case file with its sources listed. Online edition with videos and slides: <https://detailenjoyer.com/collections/nuclear-age/>



DD-004 MILITARY / HISTORY · 1 OF 15

ATOMIC ANNIE

In the Grable test (May 25, 1953, Nevada), the 83-ton M65 Atomic Cannon fired the only nuclear artillery shell in history.

QUICK FACTS

DD-004-F01

Atomic Annie, the M65 280mm Atomic Cannon, is the only artillery piece ever to fire a nuclear shell.

DD-004-F02

The M65 Atomic Cannon, nicknamed Atomic Annie, weighed 83 tons.

DD-004-F03

On May 25, 1953, in Nevada, Atomic Annie fired the only nuclear artillery shell in history during the Grable test.

DD-004-F04

The nuclear shell fired in the 1953 Grable test had a yield of about 15 kilotons.

DD-004-F05

Atomic Annie fired the Grable test's nuclear shell about 7 miles downrange.

DD-004-F06

The 1953 Grable test was part of the U.S. nuclear test series Operation Upshot-Knothole.

THE WRITE-UP

M65 280mm Atomic Cannon. Atomic Annie weighed 83 tons.

The Grable test. On May 25, 1953, in Nevada, it fired the only nuclear artillery shell in history.

15 kilotons. The shell's yield was about 15 kilotons.

About 7 miles. The shell was fired about 7 miles downrange.

Permalink: <https://detailenjoyer.com/case/atomic-annie/> · Last updated Apr 25, 2026



DD-708 MILITARY / HISTORY · 2 OF 15

B52 STRATOFORTRESS

The Boeing B-52 Stratofortress first flew on April 15, 1952, and entered US Air Force service in 1955. Boeing built 744, and the last B-52H was delivered in 1962. Only the B-52H model is still flying. The Air Force fact sheet lists a payload of about 70,000 lb of mixed weapons and a 185 ft wingspan, with eight engines in four paired pods. It was built for high-altitude nuclear missions and was later adapted for low-level flight, conventional bombing and cruise missiles. Under the Commercial Engine Replacement Program, the Air Force plans to fit Rolls-Royce F130 engines and a new radar, rename the aircraft the B-52J and keep it in service into the 2050s. On June 15, 2026, a B-52H radar test aircraft crashed on takeoff at Edwards Air Force Base, killing all eight crew members. As of July 2026, the cause was under investigation.

QUICK FACTS

DD-708-F01

The B-52 first flew on April 15, 1952.

DD-708-F02

The Air Force plans to keep the re-engined B-52J flying into the 2050s.

THE WRITE-UP

Origins. Boeing's design first flew as the YB-52 on April 15, 1952, and the bomber entered service with Strategic Air Command in 1955. Boeing built 744 across eight models, ending with the B-52H in 1962.

The airframe. The B-52 has 35-degree swept wings spanning 185 ft and eight engines (Pratt & Whitney TF33s on the H model) in four paired pods. The Air Force fact sheet lists about 70,000 lb of mixed ordnance.

Changing roles. It was built for high-altitude nuclear bombing. Over time it was adapted for low-level penetration, conventional carpet bombing and standoff cruise missiles, and later for precision-guided weapons.

Toward the B-52J. The Air Force plans to replace the TF33s with Rolls-Royce F130 engines under the Commercial Engine Replacement Program, and to add an AN/APQ-188 radar. Upgraded aircraft will be called B-52Js and are meant to fly into the 2050s. GAO has warned the program is behind schedule.

The 2026 crash. On June 15, 2026, a B-52H fitted for radar testing crashed on takeoff at Edwards Air Force Base, California, and all eight crew members were killed. The Air Force said a second test aircraft was being modified so testing could resume.

REEL VS. RECORD

- **Name:** the official designation is hyphenated, B-52. The title 'B52 Stratofortress' is kept as written.
- **Missing context:** it first flew in 1952. Service entry in 1955 is correct, and the last of 744 aircraft was delivered in 1962.
- **Missing context:** the high-altitude design was later adapted for low-level flight because of Soviet air defenses. Only the B-52H remains in service.
- **Out of date:** the eight TF33 engines are due to be replaced with Rolls-Royce F130s under CERP, and the upgraded aircraft will be called B-52Js. The Air Force plans to fly them into the 2050s.
- **Since the Reel:** a B-52H radar test aircraft crashed at Edwards AFB on June 15, 2026, killing all eight crew members. As of July 2026 the cause was under investigation (DefenseScoop).

SOURCES

1. US Air Force fact sheet: B-52H Stratofortress: <https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104465/b-52h-stratofortress/>
2. DefenseScoop (Jul 27, 2026): Air Force asserts B-52 modernization remains on cost and schedule following June crash: <https://defensescoop.com/2026/07/27/b-52-modernization-program-status-after-june-crash/>
3. Wikipedia: Boeing B-52 Stratofortress: https://en.wikipedia.org/wiki/Boeing_B-52_Stratofortress
4. Air & Space Forces Magazine: GAO warns B-52 modernization is falling behind: <https://www.airandspaceforces.com/gao-warns-b-52-modernization-falling-behind/>

Permalink: <https://detailenjoyer.com/case/b52-stratofortress/> · Last updated Mar 27, 2026



XB-70 VALKYRIE

North American Aviation designed the B-70 in the late 1950s as a six-engine, delta-winged nuclear bomber that would cruise its whole mission at Mach 3 and about 70,000 feet, too fast and high for the Soviet interceptors of the day. Soviet surface-to-air missiles, which shot down Gary Powers's U-2 in 1960, and the rise of ICBMs undercut that idea, and President Kennedy canceled the bomber in March 1961. Two XB-70A prototypes were completed as research aircraft. AV-1 first flew on September 21, 1964. The aircraft rode its own shock wave for 'compression lift', drooped its wingtips up to 65° at speed, and reached Mach 3.08 and 74,000 ft. On June 8, 1966, AV-2 was lost after an F-104 chase plane collided with it during a GE publicity photo flight. NASA pilot Joe Walker and USAF Maj. Carl Cross were killed. AV-1 flew research missions until 1969 and is now at the National Museum of the U.S. Air Force in Dayton, Ohio.

QUICK FACTS

DD-048-F01

The XB-70 Valkyrie was designed to cruise at Mach 3 and 70,000 ft. Only two were built, and neither ever carried a bomb.

DD-048-F02

The XB-70 used its own shock wave for lift, folding its wingtips down by up to 65° to help trap it.

THE WRITE-UP

Built to outrun. The B-70 was designed to cruise at Mach 3 and about 70,000 ft for the entire mission, faster and higher than any Soviet interceptor of the time.

Undone by missiles. Soviet surface-to-air missiles, which downed Gary Powers's U-2 in 1960, and the arrival of ICBMs made a high-flying bomber look vulnerable and costly. Kennedy canceled the B-70 bomber in March 1961.

Two research jets. Only two XB-70A prototypes were completed, AV-1 and AV-2, and they served as research aircraft for supersonic transport and sonic-boom studies. AV-1 first flew on September 21, 1964.

Riding its own shock wave. The XB-70 used compression lift from the shock wave off its engine intake, and lowered its outer wingtips up to 65° to trap that shock and stay stable at speed.

Records. AV-2 reached Mach 3.08 on April 12, 1966, and the program's highest altitude was 74,000 ft. AV-2 first hit Mach 3 on January 3, 1966, and made nine Mach 3 flights by June.

The 1966 collision. On June 8, 1966, during a GE publicity photo flight, NASA's F-104N drifted into AV-2's wing. Pilot Joe Walker and XB-70 co-pilot Maj. Carl Cross were killed, and pilot Al White ejected with serious injuries. AV-1 flew until 1969 and is now at the National Museum of the U.S. Air Force.

REEL VS. RECORD

- **Confirmed from the frames:** the Reel is about North American Aviation's XB-70 Valkyrie (captions at 0.8–11.2 s), a Mach 3, high-altitude nuclear bomber prototype meant to outrun Soviet defenses rather than hide from them. [NASA; NASA TM 1966]
- **Missing context:** it never became a bomber. Kennedy canceled the B-70 bomber in 1961, before the first flight, and the two XB-70As flew from 1964 to 1969 as research aircraft. [Wikipedia; NASA]
- **Slightly off:** 'altitudes above 70,000 feet.' The design cruise altitude was about 70,000 ft, and the highest it ever flew was 74,000 ft. [NASA TM 1966; Wikipedia]
- **Imprecise:** 'in the 1960s.' The design was chosen in 1957 and named in 1958. The 1960s were when the prototypes flew. [Wikipedia]
- **Left out:** one of the two was destroyed. On June 8, 1966, AV-2 was lost after an F-104 chase plane collided with it, killing pilots Joe Walker and Carl Cross. The surviving aircraft is at the National Museum of the U.S. Air Force. [NASA fact sheet; Wikipedia]

SOURCES

1. XB-70 Valkyrie (NASA): <https://www.nasa.gov/aeronautics/xb-70-valkyrie/>
2. XB-70A Valkyrie fact sheet FS-084 (NASA Dryden/Armstrong): https://www.nasa.gov/wp-content/uploads/2021/09/121584main_FS-084-DFRC.pdf
3. Summary of preliminary data derived from the XB-70 airplanes (NASA TM, 1966): <http://hdl.handle.net/2060/19660018723>
4. North American XB-70 Valkyrie (Wikipedia): https://en.wikipedia.org/wiki/North_American_XB-70_Valkyrie

Permalink: <https://detailenjoyer.com/case/xb-70-valkyrie/> · Last updated Dec 7, 2025



CANNIKIN QUAKE

On November 6, 1971, the Atomic Energy Commission set off Cannikin 5,875 feet beneath Amchitka Island in Alaska's Aleutians. The test proved the W71 warhead for the Spartan anti-ballistic missile. Its yield was officially 'less than five megatons', making it the largest underground nuclear test the United States has ever conducted. It shook the ground like a magnitude-7 earthquake, lifted the land and nearby seafloor, and caused rockfalls. Seismometers worldwide recorded it. Protests against the test launched the group that became Greenpeace.

QUICK FACTS

DD-026-F01

Cannikin (1971) was the largest underground nuclear test in U.S. history, with a yield just under five megatons, set off more than a mile beneath Alaska's Amchitka Island.

DD-026-F02

The protest voyage against Cannikin gave Greenpeace its name and founding mission.

THE WRITE-UP

When and where. Cannikin was detonated at 11:00 a.m. Bering Standard Time on November 6, 1971, on Amchitka Island in Alaska's Aleutian chain. It was part of the Atomic Energy Commission's Operation Grommet test series.

America's biggest underground blast. The official yield was 'less than five megatons', with published estimates ranging from about 4.4 to 5.2 Mt. No larger underground nuclear test has been conducted by the United States.

A warhead for missile defense. The test proved Livermore's W71 warhead for the Spartan interceptor, the upper tier of the Safeguard anti-ballistic missile system. Spartan was meant to destroy incoming warheads above the atmosphere with a burst of X-rays.

More than a mile down. The device was emplaced 5,875 feet underground at the bottom of a record-setting shaft about 6,150 feet deep. It was fired from a control point 23 miles away.

Magnitude-7 shaking, worldwide. Livermore says the blast produced the ground motion of a magnitude-7.0 earthquake. Readings from 43 stations in the Worldwide Standard Seismometer Network gave a body-wave magnitude of 6.8 and a surface-wave magnitude of 5.7.

What it did to the island. Hundreds of small aftershocks ended when the explosion cavity collapsed 38 hours later, leaving a subsided area where a new lake formed. The seafloor rose by up to about 56 cm nearby. Rockfalls and turf slides covered about 35,000 square feet. The feared tsunami never happened.

The birth of Greenpeace. Vancouver's Don't Make a Wave Committee sailed the fishing boat Phyllis Cormack, renamed Greenpeace, toward Amchitka to protest the test, but was turned back. In 1972 the group became the Greenpeace Foundation, and the United States ended its tests at Amchitka.

REEL VS. RECORD

- **Confirmed from the frames:** the Reel is about the Cannikin test (caption at 0.9 s: 'The Cannikin Test'). Date, place, U.S. underground record and Spartan purpose are all correct. [AEC D+30 report; LLNL; Wikipedia]
- **Precision:** 'nearly five megatons' matches the official 'less than five megatons'. Estimates range from 4.4 to 5.2 Mt. [AEC D+30 report; BSSA 1972; Wikipedia]
- **Overstated:** 'triggering earthquakes'. The AEC reported that 'no large earthquake was triggered'. The blast itself registered like a magnitude 6.8–7.0 event, and what followed were hundreds of small events (mostly below magnitude 4) tied to cavity collapse and minor local fault slip. [AEC D+30 report; Engdahl, BSSA 1972; LLNL]
- **Clarification:** the 'landslides' were local rockfalls, cliff spalling and turf slides on the island, totaling about 35,000 sq ft. No tsunami resulted. [AEC D+30 report; Wikipedia]
- **Confirmed:** 'detected by seismic instruments around the world'. The AEC report cites 43 stations of the Worldwide Standard Seismometer Network. [AEC D+30 report]

SOURCES

1. Project CANNIKIN D+30 Day Report: Preliminary Operational and Test Results Summary (AEC, via OSTI): <https://doi.org/10.2172/4701483>
2. At the Frontier of Missile Defense, 1971 (Lawrence Livermore National Laboratory history): <https://www.llnl.gov/sites/www/files/1971.pdf>
3. Seismic effects of the MILROW and CANNIKIN nuclear explosions (Engdahl, BSSA, 1972): <https://doi.org/10.1785/bssa0620061411>
4. Long-period water-wave measurements for the MILROW and CANNIKIN nuclear explosions (BSSA, 1972): <https://doi.org/10.1785/bssa0620061559>
5. Cannikin (Wikipedia): <https://en.wikipedia.org/wiki/Cannikin>
6. Our history (Greenpeace USA): <https://www.greenpeace.org/usa/our-history/>
7. Don't Make a Wave Committee (Wikipedia): https://en.wikipedia.org/wiki/Don't_Make_a_Wave_Committee

Permalink: <https://detailenjoyer.com/case/cannikin-quake/> · Last updated Feb 8, 2026



SUPERSONIC STRIKER

The B-1 began as the Mach 2 B-1A, which was canceled in 1977. It was revived in 1981 as the B-1B, a stealthier and heavier interim bomber, while the B-2 was delayed. Rockwell delivered all 100 B-1Bs between 1985 and 1988, and the type reached initial operating capability on nuclear alert in October 1986. Its wings sweep from 15° (137 ft span) back to 67.5° (79 ft). Top speed is about Mach 1.2. The U.S. dropped the B-1's nuclear mission in 1994, and its nuclear hardware was stripped out by March 2011 under New START, with Russian inspectors verifying it. Today it's a conventional-only bomber, nicknamed the 'Bone'.

QUICK FACTS

DD-036-F01

The B-1B's wings swing from 15° to 67.5°, shrinking its wingspan from 137 ft to 79 ft for high-speed flight.

DD-036-F02

The B-1B was stripped of all nuclear capability by 2011 under New START, and Russian inspectors could verify it every year.

THE WRITE-UP

From B-1A to B-1B. The original B-1A was canceled in 1977. The program was revived in 1981 as the B-1B, an interim bomber while the B-2 was delayed. Engineers cut the radar cross-section by an order of magnitude and added 74,000 lb of payload capacity, but the redesigned inlets dropped its top speed to about Mach 1.2.

Into service. The first B-1B was delivered in 1985, and initial operating capability came on October 1, 1986, on nuclear alert with Strategic Air Command. All 100 aircraft were delivered by 1988. It was officially named 'Lancer' in 1990.

Swing wings. The wings pivot from 15° fully forward (a 137-ft span) for takeoff, landing and efficient cruise, back to 67.5° (79 ft) for high-speed dashes.

Muscle. Four GE F101 afterburning turbofans make more than 30,000 lb of thrust each. Maximum takeoff weight is 477,000 lb, and the B-1B can carry up to 84 500-lb bombs or 24 JASSM cruise missiles.

Nukes out. The U.S. eliminated the B-1's nuclear mission in 1994. Under START and then New START, the conversion to conventional-only was completed in March 2011: nuclear pylons were destroyed, arming wiring was removed and hardpoints were modified.

Russians check. New START gave Russia annual inspections at Ellsworth or Dyess AFB, where it could examine up to three B-1Bs to confirm they can't carry nuclear weapons.

The 'Bone'. The nickname comes from an early newspaper article that spelled the plane 'B-ONE' with the hyphen dropped.

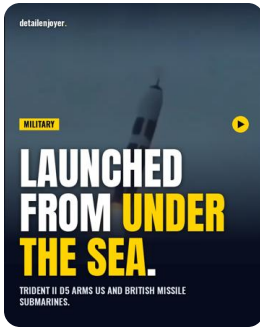
REEL VS. RECORD

- **Confirmed from the frames:** the Reel is about the B-1 Lancer (captions at 0.8–3.9 s). Its 1980s entry into service (IOC October 1986) and variable-sweep wings are correct. [Air Force fact sheet; Wikipedia]
- **Understated:** 'converted primarily for conventional missions.' The B-1B is conventional-only. Its nuclear mission ended in 1994, and its nuclear hardware was removed by March 2011 under New START. [Air Force fact sheet; New START Protocol Part Nine; Wikipedia]
- **Naming:** 'Rockwell' built it, but the program passed to Boeing when it bought Rockwell's defense business in 1996. Later fact sheets call it the Boeing B-1B. [Hill AFB fact sheet; Wikipedia]
- **Nuance:** 'supersonic.' The B-1B tops out around Mach 1.2–1.25 at altitude. The redesign cut it from the B-1A's Mach 2 class. [Air Force fact sheet; Wikipedia]
- **Footage note:** clips come from three accounts (mac1.media, brandonbotts_avifilms, airforcefilms), mixing airshow and Air Force footage. [frames]

SOURCES

1. B-1B Lancer fact sheet (U.S. Air Force): <https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104500/b-1b-lancer/>
2. Rockwell B-1 Lancer (Wikipedia): https://en.wikipedia.org/wiki/Rockwell_B-1_Lancer
3. New START Protocol, Part Nine: Converted B-1B Heavy Bombers (Office of the Assistant Secretary of Defense for Acquisition): <https://www.acq.osd.mil/asda/ssipm/sdc/tc/nst/protocol/PartNine.html>
4. New START Article-by-Article Analysis, Part Nine (OASD Acquisition): <https://www.acq.osd.mil/asda/ssipm/sdc/tc/nst/nst-aa/AAAPartNine.html>
5. B-1B 'Lancer' fact sheet, Hill Aerospace Museum (Hill AFB, archived): <https://web.archive.org/web/20110622070753/www.hill.af.mil/library/factsheets/factsheet.asp?id=5802>

Permalink: <https://detailenjoyer.com/case/supersonic-striker/> · Last updated Mar 14, 2026



DD-627 MILITARY · 6 OF 15

BALLISTIC TRIDENT

The Trident II D5 is a submarine-launched ballistic missile (SLBM) built by Lockheed Martin for the U.S. Navy. It has three solid-propellant stages and inertial guidance. It is 44 ft (13.41 m) long and weighs about 130,000 lb (58,500 kg). The Navy lists its range as 4,000 nautical miles (about 7,360 km), and other sources note that range depends on payload. It can carry several independently targetable reentry vehicles (MIRVs). The missile was first deployed in 1990. Expanding gas pushes it out of the launch tube, and the rocket motors fire once it breaks the surface. Under U.S. Navy listings, each Ohio-class submarine carries 20 D5 missiles and each British Vanguard-class submarine carries 16. The United Kingdom didn't co-develop the missile. It agreed in 1982 to buy Trident II under the Polaris Sales Agreement. According to the UK Parliament, Britain has title to 58 missiles, held in a shared pool with U.S. missiles at Kings Bay, Georgia, while the UK makes its own warheads. A life-extended version (D5LE) joined the fleet in 2017 and is set to arm the next U.S. Columbia-class and UK Dreadnought-class submarines.

QUICK FACTS

DD-627-F01

Trident II D5 was first deployed in 1990.

DD-627-F02

The UK draws its Trident missiles from a shared pool in Georgia.

THE WRITE-UP

Who built it. Lockheed Martin built the D5 for the U.S. Navy. It was first deployed in 1990.

The basics. Three solid-fuel stages, inertial guidance, 44 ft long, and a listed range of 4,000 nautical miles.

Out of the water. Gas pressure pushes the missile out of its tube, and the first-stage motor fires after it breaks the surface.

Britain's share. The UK bought Trident II under a 1982 deal and draws from a shared pool at Kings Bay, Georgia, while fitting its own warheads.

Still serving. Life-extended D5LE missiles entered the fleet in 2017 and are planned for the next U.S. and UK submarines.

REEL VS. RECORD

- **Note:** 'Developed by the US and the UK': Lockheed Martin designed and built the D5 for the U.S. Navy. The UK buys the missile under the Polaris Sales Agreement and draws from a shared pool at Kings Bay, Georgia. It does supply its own warheads.
- **Wording:** 'submarine-launched ballistic missile', not 'submarine launch'.
- **Range:** the Navy lists 4,000 nautical miles (about 7,360 km). The Reel's 'exceeding 7,400 km' matches some published estimates, but range depends on payload and sources differ.
- **Missing:** the D5 entered service in 1990 and is carried by U.S. Ohio-class (20 each) and British Vanguard-class (16 each) submarines.
- **Missing:** the missile is pushed out of its tube by expanding gas, and its rocket motors fire only after it breaks the surface.

SOURCES

1. U.S. Navy fact file: Trident II (D5) Missile: <https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2169285/trident-ii-d5-missile/>
2. Lockheed Martin (Oct 21, 2009): Trident II D5 achieves record 129 successful test flights in a row: <https://news.lockheedmartin.com/2009-10-21-Lockheed-Martin-Built-Trident-II-D5-Missile-Achieves-Record-129-Successful-Test-Flights-in-a-Row-Over-20-Years>
3. UK House of Commons Library: Replacing the UK's 'Trident' nuclear deterrent: <https://commonslibrary.parliament.uk/research-briefings/cbp-7353/>
4. Federation of American Scientists: United Kingdom nuclear forces, Trident D5: <https://nuke.fas.org/guide/uk/slbn/d-5.htm>

Permalink: <https://detailenjoyer.com/case/ballistic-trident/> · Last updated Jul 30, 2025



EKV: EXOATMOSPHERIC KILL VEHICLE

The Exoatmospheric Kill Vehicle (EKV) is the business end of America's Ground-based Midcourse Defense (GMD) system. A three-stage Ground-Based Interceptor rocket lofts it out of the atmosphere. There it separates, picks out the warhead with a multi-color infrared sensor and its own computers, and steers with divert thrusters into a head-on collision. It carries no explosive warhead. Telling warheads from decoys has always been its hardest problem. A planned replacement kill vehicle was cancelled in 2019, and Lockheed Martin is now building the Next Generation Interceptor.

QUICK FACTS

DD-011-F01

The Exoatmospheric Kill Vehicle carries no explosive. It destroys ballistic-missile warheads in space by colliding with them ('hit-to-kill').

DD-011-F02

The EKV rides a three-stage Ground-Based Interceptor rocket out of the atmosphere, then steers itself to the target with onboard sensors and thrusters.

THE WRITE-UP

Part of a bigger system. The EKV is the intercept component of the Ground-Based Interceptor, part of the US Ground-based Midcourse Defense system against long-range ballistic missiles.

Rocket to space. When GMD tracks a threat, it launches a Ground-Based Interceptor. Its three-stage solid-fuel booster carries the EKV out of the atmosphere at near-hypersonic speed.

Hit-to-kill. The EKV destroys its target 'using nothing more than the force of a massive collision'. It carries no warhead, a feat often described as 'a bullet hitting a bullet'.

Its own brain and eyes. The EKV has a multi-color sensor and its own propulsion, communications link, discrimination algorithms, guidance and computers for picking and hitting a target.

Steering thrusters. A liquid-propellant Divert and Attitude Control System, supplied by L3Harris, gives the precise steering needed for impact.

The decoy problem. In a 2014 test the EKV told the target apart from countermeasures. Critics such as MIT's Ted Postol argue that to its sensor, warheads and decoys can look like the same flickering points of light.

What comes next. In 2019 the Pentagon cancelled the Redesigned Kill Vehicle meant to replace the EKV, citing technical design problems. In 2024 it chose Lockheed Martin to build the Next Generation Interceptor.

REEL VS. RECORD

- **Confirmed:** EKV means Exoatmospheric Kill Vehicle. It destroys warheads in space by high-speed collision without explosives, is carried by a ground-based interceptor rocket, and uses onboard sensors, computers and thrusters. [Raytheon; L3Harris]
- **Nuance:** 'identify and track its target among decoys and debris'. Decoy discrimination is the system's most debated weakness. Raytheon reports success in tests; critics argue the sensor can't reliably tell decoys from warheads. [Raytheon 2014; Postol]
- **Nuance:** the Reel uses 'EKVs' as a general term, but the EKV is specifically Raytheon's kill vehicle for the US GMD system. Other hit-to-kill interceptors, such as the SM-3 kinetic warhead, use different names. [Raytheon]
- **Footage:** the clips look like EKV hover tests in a test facility, not intercepts in space. L3Harris shows a similar EKV hover-test image. [L3Harris]

SOURCES

1. Exoatmospheric Kill Vehicle (Raytheon / RTX): <https://www.rtx.com/raytheon/what-we-do/strategic-missile-defense/ekv>
2. Raytheon kill vehicle destroys complex, long-range ballistic missile target in space (Raytheon, Jun 22, 2014): <https://raytheon.mediaroom.com/index.php?item=2586&s=43>
3. Ground-Based Midcourse Defense System (L3Harris): <https://www.l3harris.com/all-capabilities/ground-based-midcourse-defense-system>
4. Why the EKV sensor cannot reliably discriminate decoys from warheads (T. Postol, MIT): https://www.bits.de/NRANEU/BMD/documents/postol_att1.pdf
5. Pentagon terminates program for redesigned kill vehicle (Defense News, Aug 21, 2019): <https://www.defensenews.com/pentagon/2019/08/21/dod-tanks-redesigned-kill-vehicle-program-for-homeland-defense-interceptor/>
6. Lockheed chosen to build new homeland missile defense interceptor (Defense News, Apr 16, 2024): <https://www.defensenews.com/pentagon/2024/04/16/lockheed-chosen-to-build-new-homeland-missile-defense-interceptor/>

Permalink: <https://detailenjoyer.com/case/ekv/> · Last updated May 9, 2026



CHERENKOV GLOW

Cherenkov radiation is light given off when a charged particle moves through a medium like water faster than light travels in that medium, which in water is about 75% of its vacuum speed. Nothing beats light in a vacuum. The particle's wake of polarized molecules builds into a cone-shaped 'shockwave' of light, much like a sonic boom. In reactor pools, high-energy electrons make the water glow blue. The glow isn't radioactive itself, and inspectors use it to check spent fuel.

QUICK FACTS

DD-020-F01

The blue glow in nuclear reactor pools is Cherenkov radiation: electrons moving faster than light travels in water (about 75% of c).

DD-020-F02

Cherenkov radiation is like a sonic boom for light, and IAEA inspectors use the glow to verify spent nuclear fuel.

THE WRITE-UP

Faster than light, but only locally. Cherenkov radiation is emitted when a charged particle, usually an electron, moves through a medium such as water faster than light travels in that medium. Nothing outruns light in a vacuum.

Water slows light to 75%. In water, light travels at only about 75% of its vacuum speed, so energetic particles can move faster than light there while still staying below c .

A wake of polarized molecules. A passing charged particle polarizes the medium around it. Normally those disturbances cancel out and fade. But when the particle is faster than light in the medium, they pile up into a single cone-shaped wavefront (a 'Mach cone').

A sonic boom for light. The effect is the light version of a sonic boom: a 'shockwave' of light from something moving faster than waves can travel in that medium.

Why reactor pools glow. In pool reactors, fission products release beta particles (high-energy electrons) into the surrounding water. Those electrons produce the blue glow. It's not the fuel itself shining, and it's not fluorescence.

Why it's blue. Cherenkov photons are mostly high-frequency, short-wavelength light, which looks blue or violet to the human eye.

The glow itself is harmless light. Cherenkov radiation is just visible light, so the glow itself isn't radioactive.

Used to check spent fuel. Because the glow's intensity tracks how much radioactive decay is going on, IAEA inspectors use Cherenkov viewing devices to verify spent fuel in storage pools.

REEL VS. RECORD

- **Note:** No factual errors found. The 75% figure, the 'faster than light in the medium, not in a vacuum' point, polarization, the cone-shaped wavefront and the sonic-boom analogy are all supported. [DOE; IAEA; Wikipedia; HKO]
- **Nuance:** 'electrons produced by nuclear reactions'. In reactor pools these are mostly beta particles from the decay of fission products. [Wikipedia; IAEA]
- **Nuance:** 'eerie blue glow'. The emission is strongest at short wavelengths, which is why it looks blue or violet. [DOE; Wikipedia]

SOURCES

1. Cherenkov Radiation, Explained (U.S. Department of Energy, Office of Nuclear Energy, 2023): <https://www.energy.gov/ne/articles/cherenkov-radiation-explained>
2. What is Cherenkov Radiation? (IAEA): <http://www.iaea.org/newscenter/news/what-is-cherenkov-radiation>
3. Cherenkov radiation (Wikipedia): https://en.wikipedia.org/wiki/%C4%8Cerenkov_radiation
4. What is Cerenkov Radiation? (Hong Kong Observatory): <https://www.hko.gov.hk/en/education/earth-science/optical-phenomena/00352-what-is-cerenkov-radiation.html>
5. Cherenkov radiation (Heidelberg University, Institute for Theoretical Physics seminar notes): https://www.thphys.uni-heidelberg.de/~wolschin/eds14_3s.pdf

Permalink: <https://detailenjoyer.com/case/cherenkov-glow/> · Last updated Aug 21, 2026



NUCLEAR FIREBALL

A nuclear detonation heats the weapon's residues to several tens of millions of degrees. Within a millionth of a second they give off X-rays that the surrounding air absorbs within a few feet, forming the incandescent fireball. The fireball's rapid early expansion compresses the air into a blast wave. For a low-altitude fission burst, roughly 50% of the energy goes into blast, 35% into thermal radiation and 15% into nuclear radiation.

QUICK FACTS

DD-052-F01

A nuclear fireball's weapon residues reach several tens of millions of degrees.

DD-052-F02

Roughly 50% blast, 35% thermal and 15% nuclear radiation for a low-altitude fission burst.

THE WRITE-UP

Hotter than the Reel says. Glasstone and Dolan put the maximum temperature of fission weapon residues at several tens of millions of degrees, similar to the center of the Sun. A conventional high explosive peaks at about 5,000 °C. The heat turns all the weapon's materials into gas, at pressures probably over a million times atmospheric.

How the fireball forms. Within less than a millionth of a second, the hot residues radiate energy mainly as invisible X-rays. The surrounding sea-level air absorbs them within a few feet, forming an extremely hot, luminous sphere of air and weapon gases. That sphere is the fireball.

Growth, then the blast wave. According to FM 8-9, a 1-megaton air burst's fireball is about 150 m across within a millisecond and reaches a maximum of about 2,200 m within 10 seconds while rising like a hot-air balloon. Its initial rapid expansion compresses the surrounding air, producing the blast wave.

Where the energy goes. As a rule of thumb, for a fission weapon burst below about 40,000 feet, about 50% of the energy goes into blast, 35% into thermal radiation and 15% into nuclear radiation. Of that 15%, about 5% is initial radiation within the first minute and 10% is residual radiation, mostly fallout. The split varies with yield, altitude and weapon design.

The flash. After about a millisecond, the fireball of a 1-megaton weapon would look many times brighter than the noon Sun to an observer 50 miles away. Its infrared component causes widespread burns and fires, at ranges that depend on yield.

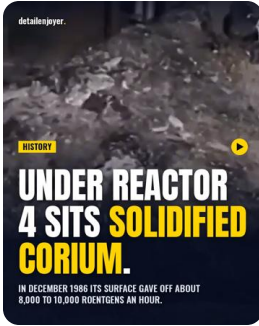
REEL VS. RECORD

- **Temperature:** 'several million degrees' understates it. Glasstone and Dolan, and FM 8-9, give several tens of millions of degrees for the weapon residues at detonation.
- **Omission:** the Reel covers heat and blast but leaves out nuclear radiation. Roughly 15% of the energy goes into it, about 5% as initial radiation and 10% as residual radiation, mostly fallout.
- **Shock wave:** the blast wave comes from the fireball's initial rapid expansion compressing the air. The fireball then slows, reaching a maximum of about 2,200 m for 1 megaton within about 10 seconds, while the blast wave moves on ahead.
- **Mechanism:** the fireball forms because X-rays from the weapon residues are absorbed within a few feet of air in under a millionth of a second, not simply because heat 'ionizes' the air.
- **Note:** 'Miles away': burn ranges depend heavily on yield, burst height and conditions. The energy split itself varies with yield and altitude.

SOURCES

1. Glasstone and Dolan (1977), The Effects of Nuclear Weapons, Chapter I (Atomic Archive): <https://www.atomicarchive.com/resources/documents/effects/glasstone-dolan/chapter1.html>
2. Glasstone and Dolan (1977), The Effects of Nuclear Weapons, Chapter II (Atomic Archive): <https://atomicarchive.com/resources/documents/effects/glasstone-dolan/chapter2.html>
3. US Army FM 8-9, Part I, Chapter 3: Effects of Nuclear Explosions (FAS): <https://nuke.fas.org/guide/usa/doctrine/dod/fm8-9/1ch3.htm>

Permalink: <https://detailenjoyer.com/case/nuclear-fireball/> · Last updated Apr 11, 2025



DD-297 HISTORY / DARK FACTS · 10 OF 15

NUCLEAR DISASTER

On April 26, 1986, Reactor 4 at the Chernobyl Nuclear Power Plant exploded and burned, in the Soviet Union's Ukrainian SSR, now The Ukraine. During the accident, molten fuel, cladding, concrete and sand mixed into a lava-like material called corium that flowed into rooms beneath the reactor. The best-known mass, the Elephant's Foot, was found in December 1986 in a maintenance corridor below the reactor's remains. Measurements then put its surface at roughly 8,000 to 10,000 roentgens per hour, enough to deliver a 50/50 lethal dose in a matter of minutes. Its radioactivity has fallen a great deal since, but it remains hazardous, and the site sits inside the New Safe Confinement arch completed in 2016. The footage shows photos from inside the plant and the corium mass.

QUICK FACTS

DD-297-F01

Chernobyl's Reactor 4 exploded on April 26, 1986.

DD-297-F02

The Elephant's Foot is a mass of corium.

THE WRITE-UP

April 26, 1986. Reactor 4 at Chernobyl exploded on April 26, 1986.

Corium. Molten fuel mixed with concrete and sand into lava-like corium.

Found in December 1986. The Elephant's Foot was found in December 1986 below the reactor.

Lethal in minutes. Its surface then gave off about 8,000 to 10,000 roentgens per hour.

Still hazardous. Its radioactivity has fallen but it remains dangerous.

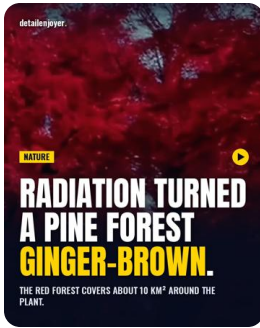
REEL VS. RECORD

- **Note:** The Reel's location line: in 1986 the plant was in the Ukrainian SSR of the Soviet Union; it's now in The Ukraine.
- **Note:** 'Meltdown of reactor 4': I'd say the reactor exploded and burned, which is more precise than meltdown alone.

SOURCES

1. Wikipedia: Elephant's Foot (Chernobyl): [https://en.wikipedia.org/wiki/Elephant%27s_Foot_\(Chernobyl\)](https://en.wikipedia.org/wiki/Elephant%27s_Foot_(Chernobyl))
2. Wikipedia: Chernobyl disaster: https://en.wikipedia.org/wiki/Chernobyl_disaster

Permalink: <https://detailenjoyer.com/case/nuclear-disaster/> · Last updated Aug 12, 2024



THE RED FOREST

The Red Forest is the roughly 10 km² (4 sq mi) area of woodland around the Chernobyl Nuclear Power Plant in the Exclusion Zone, in Polesia in The Ukraine. After reactor 4 exploded on April 26, 1986, the pine trees there absorbed very high doses of radiation and died, turning a ginger-brown color that gave the forest its name. During the cleanup the dead trees were bulldozed and buried in trenches. The area remains among the most contaminated in the zone, and wildfires there have raised concern about radioactive smoke. The footage shows the plant and red-tinted forest imagery.

QUICK FACTS

DD-105-F01

It covers about 10 km² around the Chernobyl plant.

DD-105-F02

Reactor 4 exploded on April 26, 1986.

THE WRITE-UP

Around the plant. It covers about 10 km² around the Chernobyl plant.

April 26, 1986. Reactor 4 exploded on April 26, 1986.

Ginger-brown. The pines died and turned ginger-brown.

Buried trees. Cleanup crews bulldozed and buried the dead trees.

Still contaminated. It remains among the most contaminated areas.

REEL VS. RECORD

- **Note:** 'Turned red': the dead pines were ginger-brown; the Reel's footage is color-tinted. I kept the Reel's own wording for the location in the transcript.

SOURCES

1. Wikipedia: Red Forest: https://en.wikipedia.org/wiki/Red_Forest
2. Wikipedia: Chernobyl disaster: https://en.wikipedia.org/wiki/Chernobyl_disaster

Permalink: <https://detailenjoyer.com/case/the-red-forest/> · Last updated Dec 3, 2023



KILOTON

After World War II, the United States conducted nuclear tests at Bikini Atoll in the Marshall Islands. Operation Crossroads in 1946 included the Baker test on July 25, 1946, in which a 23-kiloton atomic bomb was detonated underwater to study effects on naval vessels. It threw up a huge column of water and caused severe radioactive contamination. Bikini's residents had been relocated before the tests and have not resettled the atoll permanently. The footage shows the Baker test.

QUICK FACTS

DD-270-F01

The US tested at Bikini Atoll after WWII.

DD-270-F02

Operation Crossroads took place in 1946.

THE WRITE-UP

Site. The US tested at Bikini Atoll after WWII.

Crossroads. Operation Crossroads took place in 1946.

Baker. Baker was detonated underwater on July 25, 1946.

Yield. It had a yield of 23 kilotons.

Contamination. It caused severe contamination.

REEL VS. RECORD

- **Note:** The Reel says the test made Bikini uninhabitable; the residents had been moved before the 1946 tests, and later testing and contamination kept the atoll from being permanently resettled.

SOURCES

1. Wikipedia: Operation Crossroads: https://en.wikipedia.org/wiki/Operation_Crossroads
2. Wikipedia: Bikini Atoll: https://en.wikipedia.org/wiki/Bikini_Atoll

Permalink: <https://detailenjoyer.com/case/kiloton/> · Last updated Jul 12, 2024



DD-083 MILITARY / HISTORY · 13 OF 15

THE ATOMIC GUN

The Davy Crockett was a U.S. tactical nuclear weapon system of the Cold War: a recoilless rifle that fired the M388 nuclear projectile. Its W54 warhead had a yield of roughly 10 to 20 tons of TNT, tiny for a nuclear weapon. It was deployed with U.S. Army units, including in West Germany, from 1961 until it was withdrawn by 1971.

QUICK FACTS

DD-083-F01

It was a recoilless rifle.

DD-083-F02

It fired the M388.

THE WRITE-UP

System. It was a recoilless rifle.

Projectile. It fired the M388.

Yield. About 10 to 20 tons of TNT.

Deployed. It entered service in 1961.

Withdrawn. It was withdrawn by 1971.

REEL VS. RECORD

- **Note:** The Reel calls the projectile the 'Atomic Hand Grenade'; I could not confirm that nickname.

SOURCES

1. Wikipedia: Davy Crockett (nuclear device): [https://en.wikipedia.org/wiki/Davy_Crockett_\(nuclear_device\)](https://en.wikipedia.org/wiki/Davy_Crockett_(nuclear_device))
2. Wikipedia: W54: <https://en.wikipedia.org/wiki/W54>

Permalink: <https://detailenjoyer.com/case/the-atomic-gun/> · Last updated Nov 16, 2023



DD-330 HISTORY / MILITARY · 14 OF 15

NUCLEAR SHADOWS

When the United States dropped atomic bombs on Hiroshima on August 6, 1945, and Nagasaki on August 9, 1945, the intense flash of thermal radiation bleached and scorched exposed surfaces. Where a person or object blocked the flash, the surface behind stayed darker, leaving a shadow-like outline. Some of these shadows, on steps, walls and pavements, are preserved; the best known is on the steps of a Hiroshima bank. The footage shows such shadows and a re-enactment of how they form.

QUICK FACTS

DD-330-F01

Hiroshima was bombed on August 6, 1945.

DD-330-F02

Nagasaki was bombed on August 9, 1945.

THE WRITE-UP

Hiroshima. Hiroshima was bombed on August 6, 1945.

Nagasaki. Nagasaki was bombed on August 9, 1945.

Flash. Thermal radiation bleached surfaces.

Shadows. Blocked areas left outlines.

Preserved. Some shadows are preserved.

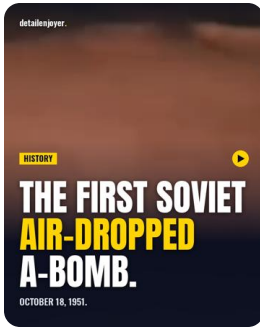
REEL VS. RECORD

- **Note:** The Reel says everything exposed was vaporized; the shadows mostly formed because exposed surfaces were bleached or scorched while blocked areas were not.

SOURCES

1. Wikipedia: Atomic bombings of Hiroshima and Nagasaki: https://en.wikipedia.org/wiki/Atomic_bombings_of_Hiroshima_and_Nagasaki
2. Wikipedia: Effects of nuclear explosions: https://en.wikipedia.org/wiki/Effects_of_nuclear_explosions

Permalink: <https://detailenjoyer.com/case/nuclear-shadows/> · Last updated Sep 24, 2024



FALL MARYA

RDS-3, the Soviet Union's third nuclear test, took place on October 18, 1951, at the Semipalatinsk Test Site in present-day Kazakhstan. It was the first Soviet atomic bomb dropped from an aircraft, a Tupolev Tu-4 bomber, and it detonated about 400 meters above the ground with a yield of about 42 kilotons. The footage shows archival test film.

QUICK FACTS

DD-412-F01

October 18, 1951.

DD-412-F02

Semipalatinsk.

THE WRITE-UP

Date. October 18, 1951.

Site. Semipalatinsk.

Aircraft. Tupolev Tu-4.

Altitude. About 400 m.

Yield. About 42 kt.

REEL VS. RECORD

- **Note:** None needed.

SOURCES

1. Wikipedia: RDS-3: <https://en.wikipedia.org/wiki/RDS-3>
2. Wikipedia: Semipalatinsk Test Site: https://en.wikipedia.org/wiki/Semipalatinsk_Test_Site

Permalink: <https://detailenjoyer.com/case/fall-marya/> · Last updated Dec 8, 2024

COLLECTION QUIZ

Test Your Knowledge: 30 questions from The Nuclear Age. Answers are on the next page.

1. How much did Atomic Annie, the M65 280mm Atomic Cannon, weigh? (DD-004 · Atomic Annie)

- A. 8 tons
- B. 30 tons
- C. 83 tons
- D. 250 tons

2. On what date did Atomic Annie fire its nuclear shell in the Grable test? (DD-004 · Atomic Annie)

- A. May 25, 1953
- B. July 16, 1945
- C. August 6, 1945
- D. October 30, 1961

3. When did the B-52 first fly? (DD-708 · B52 Stratofortress)

- A. 1945
- B. 1952
- C. 1955
- D. 1962

4. How many engines does a B-52 have? (DD-708 · B52 Stratofortress)

- A. Four
- B. Six
- C. Eight
- D. Ten

5. What speed was the XB-70 designed to cruise at? (DD-048 · XB-70 Valkyrie)

- A. Mach 1
- B. Mach 2
- C. Mach 3
- D. Mach 5

6. What helped kill the B-70 bomber program? (DD-048 · XB-70 Valkyrie)

- A. Stealth aircraft
- B. Surface-to-air missiles and ICBMs
- C. A fuel shortage
- D. A treaty ban

7. Where was the Cannikin test conducted? (DD-026 · Cannikin Quake)

- A. Nevada Test Site
- B. Bikini Atoll
- C. Amchitka Island, Alaska
- D. White Sands, New Mexico

8. What was Cannikin's approximate yield? (DD-026 · Cannikin Quake)

- A. 15 kilotons
- B. About 1 megaton
- C. Just under 5 megatons
- D. 50 megatons

9. What is the B-1 Lancer's nickname? (DD-036 · Supersonic Striker)

- A. The Bone
- B. The Buff
- C. The Warthog
- D. The Spirit

10. When did the B-1B reach initial operating capability? (DD-036 · Supersonic Striker)

- A. 1974
- B. 1986
- C. 1997
- D. 2005

11. Who is the prime contractor for Trident II D5? (DD-627 · Ballistic Trident)

- A. Lockheed Martin
- B. Boeing
- C. BAE Systems
- D. Raytheon

12. When was the D5 first deployed? (DD-627 · Ballistic Trident)

- A. 1990
- B. 1965
- C. 1978
- D. 2005

13. What does EKV stand for? (DD-011 · EKV: Exoatmospheric Kill Vehicle)

- A. Explosive Kinetic Vehicle
- B. Exoatmospheric Kill Vehicle
- C. Extended Kill Vector
- D. Exo-Kinetic Validator

14. How does the EKV destroy a warhead? (DD-011 · EKV: Exoatmospheric Kill Vehicle)

- A. A large explosive charge
- B. A laser
- C. A direct high-speed collision
- D. An electromagnetic pulse

15. In water, light travels at roughly what fraction of its speed in a vacuum? (DD-020 · Cherenkov Glow)

- A. About 25%
- B. About 75%
- C. About 99.9%
- D. About 150%

16. Cherenkov radiation is often compared to which everyday effect? (DD-020 · Cherenkov Glow)

- A. A rainbow
- B. An echo
- C. A sonic boom
- D. Static electricity

17. Roughly how hot do a nuclear weapon's residues get at detonation? (DD-052 · Nuclear Fireball)

- A. About 5,000 °C
- B. Several thousand degrees
- C. Several tens of millions of degrees
- D. About 1 million degrees

18. What does the surrounding air absorb to form the fireball? (DD-052 · Nuclear Fireball)

- A. Neutrons
- B. X-rays
- C. Radio waves
- D. Sound

19. When did Reactor 4 explode? (DD-297 · NUCLEAR DISASTER)

- A. April 26, 1986
- B. March 11, 2011
- C. March 28, 1979
- D. August 6, 1945

20. What is corium? (DD-297 · NUCLEAR DISASTER)

- A. Molten fuel mixed with other materials
- B. A type of coolant
- C. A Soviet alloy
- D. A radiation shield

21. About how large is the Red Forest? (DD-105 · The Red Forest)

- A. 10 km²
- B. 1 m²
- C. 1,000 km²
- D. Unknown

22. When did the Chernobyl explosion happen? (DD-105 · The Red Forest)

- A. April 26, 1986
- B. 1976
- C. 2011
- D. 1945

23. Where was the Baker test? (DD-270 · Kiloton)

- A. Bikini Atoll
- B. Nevada
- C. Siberia
- D. Australia

24. When was it? (DD-270 · Kiloton)

- A. July 25, 1946
- B. August 6, 1945
- C. 1962
- D. 1954

25. What kind of weapon was the Davy Crockett? (DD-083 · The Atomic Gun)

- A. A recoilless rifle
- B. A missile
- C. A bomber
- D. A mine

26. What did it fire? (DD-083 · The Atomic Gun)

- A. The M388 projectile
- B. A torpedo
- C. A rocket
- D. Shells only

27. When was Hiroshima bombed? (DD-330 · Nuclear Shadows)

- A. August 6, 1945
- B. December 7, 1941
- C. June 6, 1944
- D. May 8, 1945

28. When was Nagasaki bombed? (DD-330 · Nuclear Shadows)

- A. August 9, 1945
- B. August 15, 1945
- C. July 16, 1945
- D. September 2, 1945

29. When was RDS-3 tested? (DD-412 · Fall Marya)

- A. October 18, 1951
- B. August 29, 1949
- C. July 16, 1945
- D. 1961

30. Where? (DD-412 · Fall Marya)

- A. Semipalatinsk
- B. Nevada
- C. Bikini Atoll
- D. Novaya Zemlya

ANSWER KEY

1. **C. 83 tons** Now You Know: Atomic Annie weighed 83 tons. *(DD-004)*
2. **A. May 25, 1953** Now You Know: The Grable test took place on May 25, 1953, in Nevada. *(DD-004)*
3. **B. 1952** Now You Know: April 15, 1952, as the YB-52. *(DD-708)*
4. **C. Eight** Now You Know: Eight, in four paired pods. *(DD-708)*
5. **C. Mach 3** Now You Know: It was designed to fly the whole mission at Mach 3. *(DD-048)*
6. **B. Surface-to-air missiles and ICBMs** Now You Know: A high-flying bomber no longer looked survivable. *(DD-048)*
7. **C. Amchitka Island, Alaska** Now You Know: Cannikin was fired beneath Amchitka Island in the Aleutians on November 6, 1971. *(DD-026)*
8. **C. Just under 5 megatons** Now You Know: The official yield was 'less than five megatons', the largest U.S. underground test. *(DD-026)*
9. **A. The Bone** Now You Know: An early newspaper wrote 'B-ONE' without the hyphen, and it stuck. *(DD-036)*
10. **B. 1986** Now You Know: IOC was October 1, 1986, on nuclear alert. *(DD-036)*
11. **A. Lockheed Martin** Now You Know: Lockheed Martin builds it for the U.S. Navy. *(DD-627)*
12. **A. 1990** Now You Know: 1990. *(DD-627)*
13. **B. Exoatmospheric Kill Vehicle** Now You Know: Exoatmospheric Kill Vehicle, the intercept part of the Ground-Based Interceptor. *(DD-011)*
14. **C. A direct high-speed collision** Now You Know: It's 'hit-to-kill': no warhead, just the force of the collision. *(DD-011)*
15. **B. About 75%** Now You Know: Light slows to about 75% of its vacuum speed in water, so fast particles can outrun it there. *(DD-020)*
16. **C. A sonic boom** Now You Know: It's a 'shockwave' of light, the optical version of a sonic boom. *(DD-020)*
17. **C. Several tens of millions of degrees** Now You Know: Glasstone and Dolan give several tens of millions of degrees. *(DD-052)*
18. **B. X-rays** Now You Know: X-rays from the residues are absorbed within a few feet of air. *(DD-052)*
19. **A. April 26, 1986** Now You Know: It was in the Soviet Union at the time. *(DD-297)*
20. **A. Molten fuel mixed with other materials** Now You Know: It flowed like lava. *(DD-297)*
21. **A. 10 km²** Now You Know: About 4 sq mi. *(DD-105)*
22. **A. April 26, 1986** Now You Know: Reactor 4. *(DD-105)*
23. **A. Bikini Atoll** Now You Know: Marshall Islands. *(DD-270)*
24. **A. July 25, 1946** Now You Know: Part of Crossroads. *(DD-270)*
25. **A. A recoilless rifle** Now You Know: Fired by a crew. *(DD-083)*

- 26. **A. The M388 projectile** Now You Know: Nuclear. *(DD-083)*
- 27. **A. August 6, 1945** Now You Know: First atomic bombing. *(DD-330)*
- 28. **A. August 9, 1945** Now You Know: Three days later. *(DD-330)*
- 29. **A. October 18, 1951** Now You Know: Third test. *(DD-412)*
- 30. **A. Semipalatinsk** Now You Know: Kazakhstan. *(DD-412)*

NOW YOU KNOW!