

# 7.62×51mm NATO

## 7.62×51mm NATO



7.62×51mm NATO rounds compared to AA (LR6) battery.

<b>Type</b>	Rifle		
<b>Place of origin</b>	<span><span><span></span></span><span> </span></span> United States		
<b>Service history</b>			
<b>In service</b>	1954–present		
<b>Used by</b>	United States, NATO, others.		
<b>Wars</b>	Vietnam War, Falklands Conflict, The Troubles, Gulf War, War in Afghanistan, Iraq War, Libyan civil war, among other conflicts		
<b>Specifications</b>			
<b>Parent case</b>	.308 Winchester (derived from the .300 Savage)		
<b>Case type</b>	Rimless, Bottleneck		
<b>Bullet diameter</b>	7.82 mm (0.308 in)		
<b>Neck diameter</b>	8.77 mm (0.345 in)		
<b>Shoulder diameter</b>	11.53 mm (0.454 in)		
<b>Base diameter</b>	11.94 mm (0.470 in)		
<b>Rim diameter</b>	12.01 mm (0.473 in)		
<b>Rim thickness</b>	1.27 mm (0.050 in)		
<b>Case length</b>	51.18 mm (2.015 in)		
<b>Overall length</b>	69.85 mm (2.750 in)		
<b>Rifling twist</b>	1:12"		
<b>Primer type</b>	Large Rifle		
<b>Maximum pressure</b>	415 MPa (60,200 psi)		
<b>Ballistic performance</b>			
<b>Bullet weight/type</b>	<b>Velocity</b>	<b>Energy</b>	
9.53 g (147 gr) M80 FMJ	833.0 m/s (2,733 ft/s)	3,304 J (2,437 ft·lbf)	
11.34 g (175 gr) M118 Long Range BTHP	786.4 m/s (2,580 ft/s)	3,506 J (2,586 ft·lbf)	
<i>Test barrel length: 24"</i> <i>Source(s): M80: Slickguns,<sup>[1]</sup> M118 Long Range: US Armorment<sup>[2]</sup></i>			

The **7.62×51mm NATO** (official NATO nomenclature 7.62 NATO) is a rifle cartridge developed in the 1950s as a standard for small arms among NATO countries. It should not be confused with the similarly named Russian 7.62×54mmR cartridge.

It was introduced in U.S. service in the M14 rifle and M60 machine gun in the late 1950s. The M14 was superseded in U.S. service as the infantry adopted the 5.56×45mm NATO M16. However, the M14 and many other firearms that use the 7.62×51 round remain in service, especially in the case of sniper rifles, machine guns, and as the service weapon chosen by special operations forces. The cartridge is used both by infantry and on mounted and crew-served weapons mounted to vehicles, aircraft and ships.

Although not identical, the 7.62×51mm NATO and the commercial .308 Winchester cartridges are similar, and even though the Sporting Arms and Ammunition Manufacturers' Institute (SAAMI) considers it safe (by not listing it) to fire the NATO round in weapons chambered for the commercial round, there is significant discussion<sup>[3][4][5]</sup> about compatible chamber and muzzle pressures between the two cartridges based on powder loads and wall thicknesses on the military vs. commercial rounds. The debate goes both ways, the ATF recommends checking the stamping on the barrel; if you're unsure, consult the maker of the firearm.<sup>[6][7]</sup>

## Overview

The cartridge itself offers similar ballistic performance in most firearms to the .30-06 Springfield that it replaced in U.S. service. Though shorter, standard loadings fire similar bullet weights with only a slight reduction in velocity. Modern propellants allowed for similar performance from a case with less capacity. The smaller case requires less brass and yields a shorter cartridge. This shorter cartridge allows a slight reduction in the size and weight of firearms that chamber it, and somewhat better cycling in automatic and semi-automatic rifles.

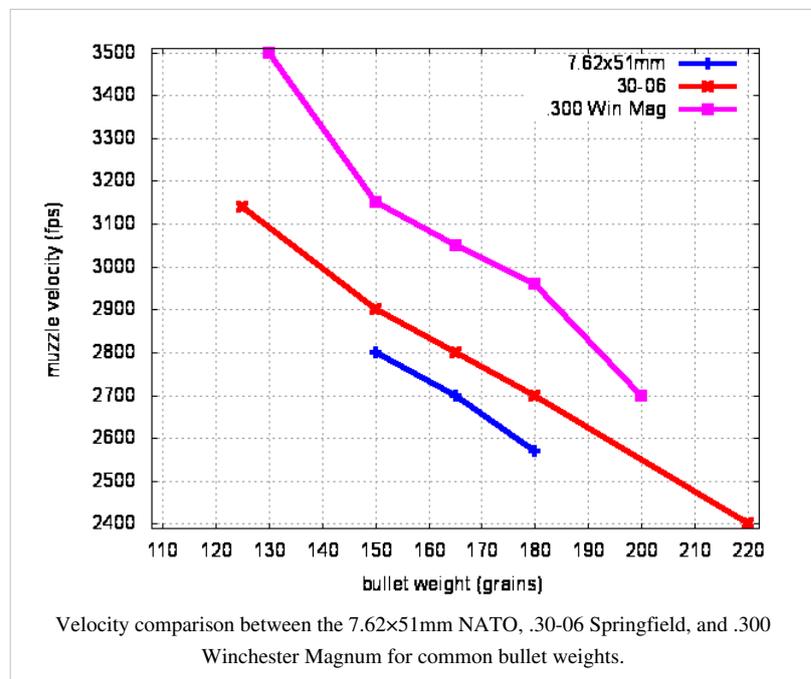
## Development

Work that would eventually develop the 7.62×51mm NATO started just after World War I when the large, powerful .30-06 cartridge proved difficult to adapt to semi-automatic rifles. A less-powerful cartridge would allow a lighter firing mechanism. At the time the most promising design was the .276 Pedersen. When it was eventually demonstrated that the .30-06 was suitable for semi-automatic rifles, the .276 was dropped.

Thus when war appeared to be looming again only a few decades later, the .30-06 was the only round available and the M1 Garand provided US troops with greater firepower than their bolt action-armed opponents. The

Garand performed so well that the US saw little need to replace it during World War II and the .30-06 served well beyond the Korean War and into the mid 1960s.

During the 1940s and early 1950s several experiments were carried out to improve the Garand. One of the most common complaints was the limited capacity 8-round en-bloc clip and many experimental designs modified the



weapon with a detachable box magazine. Springfield Armory's **T20** rifle was a fully automatic version. Though not adopted, experience with a fully automatic Garand laid the groundwork for its replacement.

The test program continued for several years, including both the original .30-06 round and a modified .300 Savage (then known as the **T65**). In the end, the T65 cartridge demonstrated power roughly equal to the original .30-06, firing a 147-grain bullet at 2,750 feet per second (840 m/s) but was approximately half an inch shorter. The eventual result of this competition was the **T44** rifle.

When the United States developed the T65 cartridge, the British military took a different route. They had spent considerable time and effort developing the intermediate-power .280 British (7 mm) cartridge with an eye towards controllable fully automatic fire. The US held to its desire not to reduce the effectiveness of individual aimed shots. The American philosophy was to use automatic fire for emergencies only and continue to use semi-automatic fire the majority of the time. After considerable debate, the Canadian Army announced they would be happy to use the .280 but only if the U.S. did as well. It was clear the U.S. was not going to use the .280. The British did start introducing the .280 along with the "bull-pup" Rifle No. 9, but the process was stopped in the interests of harmonization across NATO. The T65 was chosen as the NATO standard cartridge in 1954.

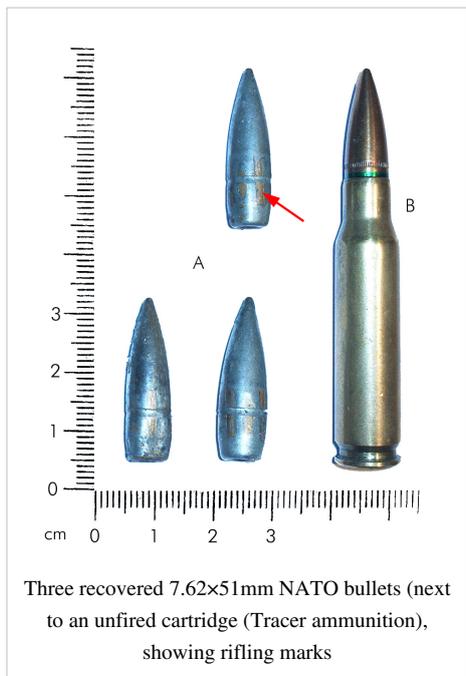
The T44 was adopted as the M14 in 1957. Britain and Canada adopted the Belgian FN FAL around the same time followed by West German army as the G1. The Germans soon transitioned to a modified version of the Spanish CETME rifle, Heckler & Koch G3. With all three of these firearms, it was clear that the 7.62mm NATO could not be fired controllably in fully automatic because of recoil. Both the M14s and FAL would later go through several variations intended to either limit fully automatic selection through semi-auto version or selector locks or to improve control with bipods or heavier barrels.

While this was going on, the U.S. *Project SALVO* concluded that a burst of four rounds into a 20-inch (510 mm) circle would cause twice the number of casualties as a fully automatic burst by one of these rifles, regardless of the size of the round. They suggested using a much smaller .22 caliber cartridge with two bullets per cartridge (a *duplex load*), while other researchers investigated the promising flechette rounds that were lighter but offered better penetration than even the .30-06. These studies were kept secret to prevent the British from using them as evidence in favour of their smaller rounds.

When the M14 arrived in Vietnam, it was found to have a few disadvantages. The rifle's overall length was not well suited for jungle warfare. Also, the weight of 7.62x51mm cartridges limited the total amount of ammunition that could be carried in comparison with the



.50 BMG, .300 Winchester Magnum, .308 WIN (7.62 NATO), 7.62x39mm, 5.56 NATO, and .22 LR.



Three recovered 7.62x51mm NATO bullets (next to an unfired cartridge (Tracer ammunition), showing rifling marks

7.62x39mm cartridge of the Type 56 and AK-47 assault rifles, which the Vietcong and North Vietnamese Army soldiers were equipped with. In addition, the originally issued wooden stocked versions of the M14 were susceptible to warping from moisture in tropical environments, producing "wandering zeroes" and other accuracy problems, which caused the adoption of fiberglass stocks.

Fighting between the big-round and small-round groups reached a peak in the early 1960s, when test after test showed the .223 Remington cartridge fired from the AR-15 allowed an 8-soldier unit to outgun an 11-soldier unit armed with M14s. U.S. troops were able to carry more than twice as much 5.56x45mm ammunition as 7.62x51mm for the same weight, which allowed them an advantage against a typical NVA unit armed with Type 56-1s.



Comparison of 7.62 mm NATO, 5.56 mm NATO and 9 mm NATO.

Rifle	Cartridge	Cartridge weight	Weight of loaded magazine	10 kilogram ammo load
M14	7.62x51mm	393 gr (25.4g)	20 rds @ .68 kg	14 mags / 280 rds
M16	5.56x45mm	183 gr (11.8g)	20 rds @ .3 kg	33 mags / 660 rds
AK-47	7.62x39mm	281 gr (18.2g)	30 rds @ 1.2 kg*[8]	8 mags / 240 rds

(\*AK-47 magazines are much heavier than M14 and M16 magazines)

In 1964, the U.S. Army started replacing their M14s with the M16, incurring another series of complaints from the British. Regardless of the M14 having disadvantages in jungle warfare, 7.62x51mm NATO rifles stayed in military service around the world due to several factors. The 7.62x51mm NATO has proved much more effective than 5.56x45mm at long ranges, and has since found popularity as a sniping round. For instance, M14 variants such as the Mk 14 Enhanced Battle Rifle and M25 are still used in the United States military as designated marksman and sniper rifles. Shorter, easier to handle 7.62mm rifles like the Heckler & Koch G3 stayed in service due to their accuracy, range, cartridge effectiveness and reliability.

The 7.62x51mm NATO round nevertheless met the designer's demands for fully automatic reliability with a full-power round. It remained the main machine gun round for almost all NATO forces well into the 1990s, even being used in adapted versions of older .30-06 machine guns such as the Browning M1919A4 from the WWII era. These have been replaced to a considerable extent in the light machine gun role by 5.56x45mm NATO weapons, such as the widespread use of the M249 SAW, but the 7.62 round is still the standard chambering for most general-purpose machine guns such as the M60E4, the M240 and the German HK21 and MG3, and flexible mountings such as helicopters, jeeps, and tanks.

Winchester Ammunition (a division of the Olin Corporation) saw the market for a civilian model of the T65 cartridge and released it commercially in 1952 as the .308 Winchester, two years prior to adoption of the cartridge by NATO.



The 7.62x51mm NATO and 5.56x45mm NATO cartridges compared to an AA battery.

## Military cartridge types

- **Cartridge, Caliber 7.62mm, NATO, Ball, M59** (*United States*): 150.5-grain 7.62×51mm NATO ball cartridge. A further development of the initial **T65** cartridge.
- **Cartridge, Caliber 7.62mm, NATO, High Pressure Test, M60** (*United States*): 7.62×51mm NATO test cartridge. The cartridge is not for field issue, but is used for proof firing of weapons during manufacture, test, or repair. The cartridge is identified by a stannic-stained (silvered) case.
- **Cartridge, Caliber 7.62mm, NATO, Armor Piercing, M61** (*United States*): 150.5-grain 7.62×51mm NATO armor-piercing round, black cartridge tip.
- **Cartridge, Caliber 7.62mm, NATO, Tracer, M62** (*United States*): 142-grain (9.2 g) tracer cartridge, orange cartridge tip.
- **Cartridge, Caliber 7.62mm, NATO, Dummy, M63** (*United States*): The cartridge is used for practice in loading 7.62mm weapons for simulated firing to detect flinching of personnel during firing and for inspecting and testing the weapon mechanism. The cartridge is identified by six longitudinal corrugations (flutings) on the cartridge case. There is no primer and no vent hole in the primer pocket.
- **Cartridge, Caliber 7.62mm, NATO, Grenade, M64** (*United States*): 7.62×51mm NATO grenade launching blank. The cartridge is identified by a rose-petal (rosette-crimp) closure of the cartridge case mouth and sealed with red lacquer. The cartridge provides pressure upon functioning to project rifle grenade to a desired target when using a grenade projectile adapter and dragon missile launch effect trainer (LET).
- **Cartridge, Caliber 7.62mm, NATO, Ball, M80** (*United States*): 147-grain 7.62×51mm NATO ball cartridge. The US Army's Ballistic Research Laboratory measured a ballistic coefficient (G7 BC) of 0.200 and form factor (G7 *i*) of 1.105 for the M80 ball projectile.<sup>[9]</sup>
- **Cartridge, Caliber 7.62mm, NATO, Ball, M80A1** (*United States*): M80 Lead Free (LF) 7.62×51mm NATO ball cartridge<sup>[10]</sup>
- **Cartridge, Caliber 7.62mm, NATO, Blank, M82** (*United States*): 7.62×51mm NATO cartridge is used in rifles and machine guns equipped with blank firing attachments to simulate firing in training exercises and for saluting purposes. The cartridge is identified by its double tapered (bottle nose) neck and absence of a bullet.
- **Cartridge, Caliber 7.62mm, NATO, Ball, Silent, XM115** (*United States*): Little is known of this round, but it was an attempt to quiet the round. Never adopted.
- **Cartridge, Caliber 7.62mm, NATO, Match, M118** (*United States*): 173-grain 7.62×51mm NATO Full Metal Jacket Boat Tail round specifically designed for Match purposes. The round was introduced as the XM118 match in 1963 and was produced at both Frankford Arsenal and Lake City Army Ammunition Plant. It was standardized as M118 match in mid 1965. Production ceased at Frankford in 1965 but continued at Lake City until the early 1980s. Lake City used dedicated equipment to produce the ammo up until the mid-1970s and during that time the quality of the ammunition was quite good. When they ceased using dedicated machinery the quality of the ammo had a very noticeable decline.<sup>[citation needed]</sup>
- **Cartridge, Caliber 7.62mm, NATO, Ball, Special, M118** (*United States*): 173-grain 7.62×51mm NATO Full Metal Jacket Boat Tail round specifically designed for match purposes. Produced by Lake City Army Ammunition Plant. This is an interim match round which utilized M80 ball brass with the 173-grain (11.2 g)



7.62mm, NATO, Orange-tipped tracer ammunition, M62: 142-grain (9.2 g) tracer cartridge.



The 7.62mm M118 long range cartridge.

FMJBT bullet. During this period in the early to late 1980s the performance of the round declined. Powder, primer, brass, bullets were no longer produced in matching lots.

- **Cartridge, Caliber 7.62mm, NATO, Ball, Special, M118LR** (*United States*): 175-grain 7.62×51mm NATO Hollow Point Boat Tail round specifically designed for long-range sniping. Produced at Lake City Army Ammunition Plant.
- **Cartridge, Caliber 7.62mm Special Ball, Long Range, MK 316 MOD 0** (*United States*): A 175-grain round specifically designed for long-range sniping consisting of Sierra MatchKing Hollow Point Boat Tail projectiles, Federal Cartridge Company match cartridge cases and Gold Medal Match primers. The Propellant has been verified as IMR 4064 (per NSN 1305-01-567-6944 and Federal Cartridge Company Contract/Order Number N0016408DJN28 and has a charge weight per the specs of 41.745 grains).<sup>[11]</sup>
- **Cartridge, Caliber 7.62mm, NATO, Frangible, M160** (*United States*): 108.5-grain 7.62×51mm NATO frangible bullet, upon striking a target, disintegrates, leaving a mark at the point of impact.
- **Cartridge, Caliber 7.62mm, NATO, Dummy, M172** (*United States*): 7.62×51mm NATO cartridge is inert and is used to test the mechanism and metallic link belts of 7.62mm weapons. The cartridge is identified by a black oxide finish over the entire round and has no primer. There is no vent hole in the primer pocket.
- **Cartridge, Caliber 7.62mm, NATO, Ball, Overhead Fire, XM178** (*United States*): 7.62×51mm NATO Overhead Fire Application (OFA) cartridge using a solid, turned, GM bullet. These were developed to supposedly make the OFA cartridges safer since there would be no small pieces of bullet that could separate and fall on the troops. Never Adopted.
- **Cartridge, Caliber 7.62mm, NATO, Tracer, Overhead Fire, XM179** (*United States*): 7.62×51mm NATO Overhead Fire Application (OFA) cartridge using a solid, turned, GM bullet. These were developed to supposedly make the OFA cartridges safer since there would be no small pieces of bullet that could separate and fall on the troops. XM179/XM180 difference is the amount of trace mixture. Never Adopted.
- **Cartridge, Caliber 7.62mm, NATO, Tracer, Overhead Fire, XM180** (*United States*): 7.62×51mm NATO Overhead Fire Application (OFA) cartridge using a solid, turned, GM bullet. These were developed to supposedly make the OFA cartridges safer since there would be no small pieces of bullet that could separate and fall on the troops. XM179/XM180 difference is the amount of trace mixture. Never Adopted.
- **Cartridge, Caliber 7.62mm, NATO, Blank, XM192** (*United States*): 7.62×51mm Short case rose crimped dummy. Never adopted.
- **Cartridge, Caliber 7.62mm, NATO, Duplex, M198** (*United States*): 7.62×51mm NATO duplex round with two 84-grain (5.4 g) bullets. The developmental designation was **T314E3**.
- **Cartridge, Caliber 7.62mm, NATO, Ball, Low Recoil, XM256** (*United States*): 7.62×51mm NATO Single 82 grain bullet from M198 round. Another attempt to control the M14 in full auto mode or for small stature troops. Never adopted.
- **Cartridge, Caliber 7.62mm, NATO, Tracer, M276** (*United States*): 7.62×51mm NATO so-called "Dim Tracer" with reduced effect primarily for use with night vision devices, green cartridge tip with pink ring.
- **Cartridge, Caliber 7.62mm, NATO, Ball, Barrier, T762TNB1 MK319 MOD 0** (*United States*): 7.62×51mm NATO Enhance Behind barrier performance Enhance Function & casualty and muzzle flash requirements in short barrel carbines, 130 grain).<sup>[11]</sup>
- **Cartridge, Caliber 7.62mm, NATO, Match, M852** (*United States*): 168-grain 7.62×51mm NATO Hollow-Point Boat-Tail cartridge, specifically designed for use in National Match competitions, later approved by US Army JAG for combat use by snipers.
- **Cartridge, Caliber 7.62mm, NATO, Saboted Light Armor Penetrator, M948** (*United States*): 7.62×51mm NATO Saboted Light Armor Penetrator cartridge.
- **Cartridge, Caliber 7.62mm, NATO, Saboted Light Armor Penetrator Tracer, M959** (*United States*): 7.62×51mm NATO Saboted Light Armor Penetrator cartridge with tracer element.

- **Cartridge, Caliber 7.62mm, NATO, Ball, Training, M973** (*United States*): 7.62×51mm NATO SRTA ball training round. Has air brake to reduce the range the bullet will fly <sup>[12]</sup>
- **Cartridge, Caliber 7.62mm, NATO, Tracer, Training, M974** (*United States*): 7.62×51mm NATO SRTA tracer training round. Has air brake to reduce the range the bullet will fly <sup>[12]</sup>
- **Cartridge, Caliber 7.62mm, NATO, Armor Piercing, M993** (*United States*): 126.6-grain 7.62×51mm NATO armor-piercing round, black cartridge tip.
- **Cartridge, Grenade, L1A1** (*United Kingdom*): 7.62×51mm grenade-launching cartridge with one subvariant (L1A2).
- **Cartridge, Ball, L2A1** (*United Kingdom*): 7.62×51mm ball cartridge, with three subvariants (A2-A4).
- **Cartridge, Tracer, L5A1** (*United Kingdom*): 7.62×51mm tracer cartridge, designed to last out to 1000 meters. Four subvariants exist, with brighter ignition (A2), tracer reduced to 750 meters (A3), with a pistol powder charge (A4), and with improved ballistics (A5).
- **Cartridge, Ball, L42A1** (*United Kingdom*): 7.62×51mm ball cartridge, 155 grain round
- **Cartridge, Ball, L44A1** (*United Kingdom*): 7.62×51mm ball cartridge, 144 grain round
- **Cartridge, Caliber 7.62mm, NATO, Ball, F4** (*Australia*): 144-grain 7.62×51mm NATO ball cartridge. Australian equivalent to U.S. M80 round. In service with the Australian Defence Force.
- **Patrone AB22, 7.62mm x 51, DM111, Weichkern**, (*Germany*): 147-grain 7.62×51mm NATO ball cartridge, cupronickel-coated steel jacket. German equivalent to U.S. M80 round. In service with the German military. Known for heavy fragmentation in tissue due to thin steel jacket.<sup>[13]</sup>
- **Patrone AM31, 7.62mm x 51, DM28A2, Manöver**, (*Germany*): Blanks, olive colored Plastic with a brass base.
- **Patrone AM32, 7.62mm x 51, DM18A1B1, Übung**, (*Germany*): 10-grain 7.62×51mm NATO plastic training cartridge, plastic case cartridge colored light blue with an extraordinary light 10grain plastic bullet which is fired with a high initial velocity. Extremely accurate (Spot-on up to 300 meters), non-corrosive, steel base with lead free primer. NON-RELOADABLE AMMUNITION

## References

- [1] Slickguns.com M80 data (<http://www.slickguns.com/product/magtech-308-762x51mm-nato-147-grain-m80-fmj-ammo-297313-shipped-after-coupon>)
- [2] .
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- [11] U.S. Navy Small Arms Ammunition Advancements - 7.62MM Special Ball, Long Range, NAVSEA Warfare Centers Crane (<http://www.dtic.mil/ndia/2009infantrysmallarms/tuesdaysessioniii8524.pdf>).
- [12] <http://www.globalsecurity.org/military/systems/munitions/images/srta.jpg> 7.62MM M973 SRTA and M973 SRTA-T

## External links

- Various photos of 7.62×51 NATO ammunition ([http://www.conjay.com/Ammunition for Armor Testing NATO 7.62mm x 51.htm](http://www.conjay.com/Ammunition%20for%20Armor%20Testing%20NATO%207.62mm%20x%2051.htm))

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