

## Military Assault Rifles

Assault rifles<sup>1</sup> are light, self-loading rifles that are chambered for intermediate-calibre cartridges, such as 5.56 × 45 mm or 7.62 × 39 mm. Designed to engage targets at ranges rarely exceeding 400 metres (around 1,300 feet), they are primarily selective-fire weapons, enabling the user to switch between single-shot, fully automatic, and (in some models) burst-fire modes of operation.

The assault rifle concept arose from experiences in the two World Wars, in which largely conscript armies fought at effective 'combat engagement ranges' in the order of 50–300 metres. Traditional military rifles (see Research Note No. 7, *Anti-materiel Rifles*) were designed for longer-range engagements, generally fired a machine-gun-calibre cartridge (e.g. .303), and proved heavy and cumbersome to transport and operate. The assault rifle, by contrast, fired a smaller cartridge and was designed as a selective-fire weapon, fulfilling two roles: providing automatic fire in the assault and single-shot fire when the user required accuracy rather than volume of fire.

Widespread production began in the 1950s. Assault rifles are now the primary weapon of most infantry forces and many of the world's police forces. For this reason they are certainly the most numerous of military weapons systems. Aggregate figures for total world assault rifle production should, however, be treated with extreme caution. The production span of many weapon types (sometimes in the range of 40–50 years), a plethora of producers of the same or similar products, and the loss of old manufacturing records have resulted in partial or opaque production records.

In the case of AK-47-type assault rifles, for example, while some analysts have suggested that total production exceeds 100 million weapons, others have reviewed numerous sources—including manufacturer records—and come to the (justifiable) conclusion that it is not possible to place a reliable figure on the number of weapons produced (see Table 1 for sources). More than 13 states (and a far greater number of manufacturers) have produced near-identical variants of the AK-47—excluding heavily modified derivatives, such as the Israeli Galil and

### Heckler and Koch G36 assault rifle



One of the latest generations of assault rifle, featuring extensive use of polymer plastics, but retaining the conventional layout of most assault rifles.

Finnish Valmet. The production of other types of assault rifle, such as the M16 and its derivatives, is better documented, although far from precise for many of the same reasons, including licensed/copied production.

The most common assault rifle calibres in service are the NATO-standard 5.56 × 45 mm and the Warsaw Pact 5.45 × 39 mm and 7.62 × 39 mm cartridges, with a growing prevalence of the latter in many developing countries.<sup>2</sup> In recent decades a number of manufacturers have experimented with innovative ammunition types, including 'caseless' ammunition (in which the bullet is embedded in a block of propellant rather than fitted into a cartridge case), and a variety of new calibres, such as the Chinese 5.8 × 42 mm. These calibres have been designed to meet disparate requirements, including reduced weight, extended range, higher velocity, and greater penetration (primarily to defeat body armour). However, at least three factors inhibit many states from adopting new calibres (and new weapons to accommodate them):

1. the durability of weapons and the reluctance of states to replace them (procurement periods longer than 30 years are common among developed countries);<sup>3</sup>
2. the preponderance of very few primary calibres, but a multitude of manufacturers and suppliers (including surplus), which offers economies of scale to states that retain existing calibres; and
3. the need for ammunition interoperability (e.g. among NATO countries), which discourages the widespread introduction of new calibres.

For these reasons, and despite recurrent technological advances, even the wealthiest states continue to deploy assault rifle designs that have changed little in the past 40 or 50 years. The US M16 assault rifle is one example. First deployed as the M16A1 in the early 1960s, the weapon was upgraded in the 1980s to become the M16A2. Since the 2000s the United States has systematically replaced the M16A2 with the M16A4 and a shorter-barrelled version, the M4.<sup>4</sup> M16 variants are expected to remain in use with US armed forces well into the 21<sup>st</sup> century, suggesting a service life of 50–60 years and probably longer. Such design retention is typical of many common assault rifle types. For example, today's Kalashnikov-pattern assault rifles evolved from the AK-47, which first entered service in 1947. Weapons such as the AKM, AK-74, and AK-100 series are the result of progressive technical refinement since 1947, including re-chambering to new calibres in some models.

Table 1 **AK-47 and M16 assault rifle production estimates**

Model	Production dates	Production estimates (units)
AK-47 (and very close derivatives)	1950s onwards	35-100 million*
M16 (and derivatives, including the M4 and C7/8)	1960s onwards	8-12 million

\* Currently unverifiable and plausibly a significant overestimate.

Sources: 1. AK-47: 35-50 million (Hart Ezell, 1995, p. 9; UN, 1997); 80-100 million (Kahaner, 2007, p. 2); 60-80 million (Kalashnikov, 2006, p. xv); 70-100 million (Karp, 2006, p. 55); 2. M16: 12 million (Karp, 2006, p. 55); fewer than 10 million (Chivers, 2010, p. 12); 8 million (Colt Defence LLC, 2011; excludes non-Colt weapons)

The Kalashnikov-pattern assault rifle remains in high demand by many developing nations and its variants (notably the Chinese Type 56 series) are increasingly the most common assault rifle types in many parts of the world.

Despite technological developments and the so-called revolution in military affairs (from the 1990s onwards), basic infantry roles have changed little. Neither doctrines nor tactics have prompted a substantial revision of the assault rifle's military applications, with the result that the weapon has not been replaced and has remained largely unchanged since its development in the 1940s-50s. With the exception of modifications to action-trigger configuration, such as the 'bullpup' design (whereby the magazine and action are placed behind the trigger group),<sup>5</sup> most contemporary assault rifles closely resemble their predecessors.

Many national militaries, rather than replacing assault rifles with newer models, have adapted these weapons with minor modifications and the widespread use of accessories—often commercially manufactured.<sup>6</sup> Accessories include the addition of a variety of optical sight accessories, range finders, lights for house clearance during urban warfare, and other items designed to enhance performance, including custom pistol grips, hand guards, and bipods. While weapons with many such additions may cease to resemble their predecessors, stripped of their accessories they are the same basic weapons underneath.

For the most part, however, the world's military forces appear to favour the least-complicated and most cost-effective weapons designs. Under poor service conditions, harsh environments, and often in the hands of ill-trained personnel, the simplest designs prove the most robust and easy to use. It is for these reasons that 1940s-era weapons, such as the AK-47 and its derivatives, continue to find new markets year after year. ■

## Notes

1. Assault rifles are primarily weapons designed for military use. In US law the term 'assault weapons' is used to describe firearms that include some features of assault rifles.
2. This is arguably due to two factors: the large-scale export of Warsaw Pact-calibre weapons in the period following the end of the cold war (particularly East European and former Soviet states in the 1990s) and the growing influence of China as a source of Warsaw Pact-calibre weapons and ammunition. Each of these factors offered strong economic incentives for developing states to adopt Warsaw Pact calibres in lieu of NATO-standard weapons and ammunition.
3. See, for example, procurement trends analysed by Bevan (2006, pp. 9-11).
4. The M4 is often referred to as a carbine, which is a term that (in contemporary use) refers to a short-barrelled assault rifle rather than another, distinct category of weapon.
5. See, for example, the Austrian AUG, the Chinese Type 95/97 (QBZ-95/97), the British L85 (SA-80), and the French F1 (Famas).
6. See forthcoming Research Note 26 on accessories for small arms and light weapons (Schroeder, forthcoming).

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For more information on assault rifles, please visit: <<http://www.smallarmssurvey.org/weapons-and-markets/products/small-arms.html>>.

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