

Heavy armour heritage: The evolution of the MBT and the search for its successor

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Recent conflicts in Iraq, Syria, and Ukraine have demonstrated the continued effectiveness of MBTs on the twenty-first century battlefield. *Sam Cranny-Evans* explores how tank technology is evolving to ensure these platforms remain relevant

NATO operations in relation to Libya and Syria have widely dispelled the notion that air power alone can be used to decisively influence the outcome of a conflict. The Russian intervention in Syria, meanwhile, has highlighted that ground forces are essential for modern conflicts and will remain so in the future. However, recent engagements have exposed the weaknesses of certain modern main battle tanks (MBTs) and raised questions about where European tank designs should be headed.

The current MBTs of NATO forces all have their design origins in the Second World War. The United States ended the war as the only nation in possession of nuclear weapons and, as a result, the US Air Force received the lion's share of US defence funding. In the Soviet Union, by contrast, where there was no successful atomic weapon test until 1949, the ground forces were given priority for funding. At the same time lessons from the war were fed into Soviet tank design.



Russian T-14 Armata tanks parade through Red Square during the Victory Day military parade in Moscow on 9 May. (Kirill Kudryavtsev/AFP/Getty Images)

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The Soviet Union drew a number of conclusions from the Second World War regarding tank design, including the need for a high/low-capability mixture, which, as one US report explained, is “the concept of simultaneously evolving two parallel tank designs and fielding both tanks in a high-low

force mix". Combat against the Wehrmacht emphasised the need for armour predominantly at the front of the hull, as well as a powerful main weapon. Both of these aspects were embodied at the close of the war in the IS-3 heavy tank and the T-34/85 medium tank.

Subsequent developments continued with the T-54 MBT, which was introduced in 1949 to rationalise the Soviet fleet, and moved to the T-62 MBT in 1962, which was designed to out-gun UK Centurion and US M60 MBTs armed with the 105 mm L7 tank gun. However, by the time the T-62 was operational the British Army had accepted the Chieftain MBT into service, which was armed with a 120 mm gun. In response, Soviet development of the T-64 MBT began, although it did not enter service until 1976, by which time production of the T-72 MBT was under way and some examples of this latter design had already been delivered to Soviet forces. The T-72, in fact, ultimately became the primary combat platform of Russia and many other nations.

The T-80 MBT then followed in 1978, but was more a result of political intrigue within the Soviet Union than a specific response to any Western tank developments.

In the West, meanwhile, trends that were established during the Second World War endured, and the United Kingdom and United States continued to develop well-armoured vehicles with main guns that outmatched their intended opponents. The US M48 and M60 MBTs provided good protection and the L7 gun remained capable against Russian tanks until the late 1970s.

The British Chieftain, which entered service in 1967, was designed to fight hull down and maximise the advantages of its armour and firepower, while the Challenger 1 MBT that followed in 1982 combined the 120 mm Challenger Armament (CHARM) project with advanced Chobham composite armour to ensure that British tank formations were as well armed and armoured as possible.

The US M1 Abrams MBT, which was designed from 1971 and in production by 1980, was intended to provide an answer to the Soviet T-72 and T-80. It carried heavy armour and a gas turbine engine to optimise protection and mobility. The M1A1 upgrade, which introduced the 120 mm M256 smoothbore gun, ensured that the Abrams had the firepower to defeat heavily armoured Soviet-designed platforms.

Elsewhere, French and German developments focused primarily on mobility. The Leopard 1 MBT that equipped West German forces from 1965 combined speed with light armour to provide a platform that could move rapidly around the battlefield. However, this concept was quickly adjusted to enable the tank to carry additional armour. Some underlying design principles were retained in the subsequent Leopard 2, although the newer vehicle embodied a balanced approach to the 'iron triangle' of firepower, protection, and mobility. Meanwhile, the French AMX-30, introduced in 1966, was the lightest NATO MBT and almost identical to the Leopard 1 in capability. It was replaced in 1992 by the Leclerc MBT, which provided a high level of mobility and firepower.

It is clear that the lessons of the Second World War combined with the pressures of the Cold War to influence MBT design. As a consequence current UK and US MBTs are heavily armoured, whereas Russia continues to deploy a mix of high- and low-capability vehicles. Furthermore, Russia still appears to favour quantity over quality, whereas the NATO allies place a greater emphasis on the latter. The question is: Will the history of MBT development in Europe, Russia, and the United States influence future design considerations? Most NATO vehicles will need to be replaced by 2035–40: a time limit that creates challenges and questions for armed forces, industry, and politicians alike.

Enter the Armata

By the early 1990s it seemed that a new Russian tank was unlikely, despite the Battle of Grozny in 1994 revealing weaknesses in Russian tank design and tactics. The T-90 MBT that was introduced in 1992 represented a modest improvement over the T-72 and T-80, although it was intended to signify a departure from the problematic T-80. NATO developments focused instead on the conflicts at hand, which resulted in designs that provided additional protection to absorb fire during urban deployments alongside mission system upgrades to fully exploit advances in technology.

The emergence of the T-14 Armata MBT in 2014, however, broke the calm and prompted considerable concern in the West. It was the first new Russian MBT since the 1980s and its external armament, integral active protection systems, and advanced armour appeared to be more than a match for Western equivalents.

Although many sources have claimed that NATO tanks cannot match the Armata, industry sources have indicated that this may not be the case. Simon Jackson, capture team leader for combat vehicles at BAE Systems Land (UK), told *Jane's*, "I personally don't see a need for NATO forces to develop a bespoke answer to the T-14," adding, "It is possibly a stepping stone on the path to some of the elements that a future tank will have to meet, but not a fundamental game-changer."

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