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TANKS IN UKRAINE 2022



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INTRODUCTION

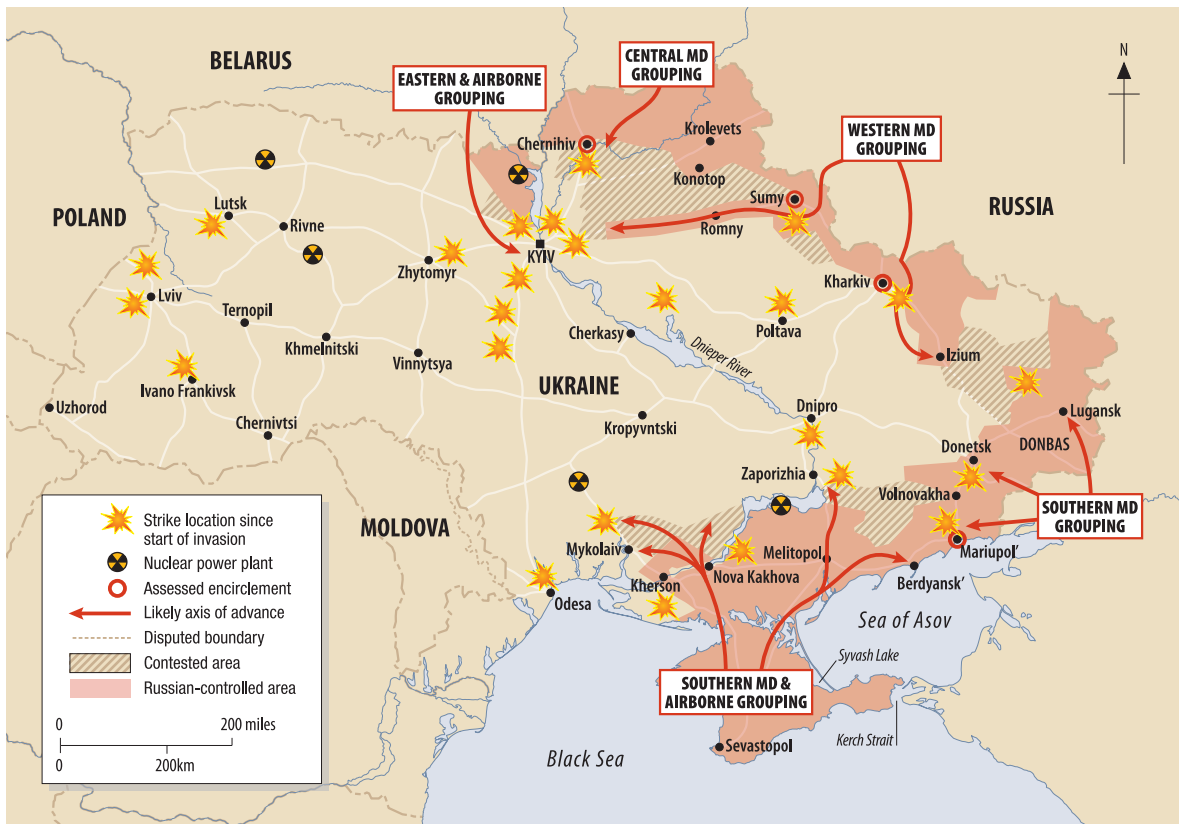
The full-scale invasion of Ukraine in February 2022 saw mechanized war return to Europe. Beyond the Balkan Wars and 2008 invasion of Georgia, European conflicts had been small-scale and ‘hybrid’ (such as in Crimea¹) or scarcely-mechanized (including the undeclared war in the Donbas). While armour played a very limited role in various NATO out-of-area operations in the Middle East and Africa, the closest thing to real tank-on-tank actions involving European forces took place in the context of the 1990–91 Iraq War, some 30 years prior.

Although Russian President Vladimir Putin’s assertion that ‘the true sovereignty of Ukraine is possible only in partnership with Russia... For we are one people’ is one which many Ukrainians fiercely contest, the two countries do share a great deal of history and the two nations did spring from the same Soviet state at the end of 1991. As a result, even 30 years on, they still drew on similar military lessons and traditions, and above all, had inventories of weapons and equipment that came from the same sources and the same design philosophies. Both nations had developed in different ways,

1 See Mark Galeotti, *RAID 59 Putin Takes Crimea 2014* (Osprey, 2023)

Ukraine’s 2013–14 Revolution of Dignity, also known as the Euromaidan, not only toppled a corrupt (albeit elected) leader, it also provoked Vladimir Putin first into annexing Crimea and then an undeclared war, as he was not willing to let Kyiv leave what he regarded as Moscow’s rightful sphere of influence.
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not least in how they upgraded their tank fleets, but it did mean that in 2022, one descendant of the Soviet tank tradition found itself facing another.

The 2014 Revolution of Dignity, which toppled the Moscow-friendly government of President Viktor Yanukovich, led to a dramatic worsening of Russo-Ukrainian relations. Putin denounced this as a Western-backed, if not outright-organized coup, and shortly thereafter annexed the Crimean Peninsula. Risings and protests in Ukraine's predominantly Russian-speaking south-eastern Donbas region were encouraged by Russian nationalists and elements of the government. This turned into a full-scale rebellion that the Kremlin then chose to back, starting an undeclared war that simmered all the way into 2022 when Putin, apparently losing patience with indirect pressure and convinced that the Ukrainians would not resist the imposition of a puppet government, chose to invade.

The war began with air and missile strikes on the morning of 24 February 2022, followed by attacks all around Ukraine's borders with Russia and Belarus. As well as national will and leadership, it also became a test of quite how each side had chosen to upgrade its tanks and its armoured doctrine and tactics. While Moscow chose not to deploy its much-hyped but apparently still-undeployable T-14 Armata, it threw some of its most modern vehicles into the fray, including the T-90M, which first entered service in 2017 and the 2016 version of the heavily upgraded T-72B3. At first, and especially in its over-ambitious attempt to push forces to Kyiv, it faced largely Ukrainian anti-tank systems, from Javelin and NLAWS missiles supplied respectively by the USA and Britain, to Turkish-made Bayraktar TB2 drones and even



improvised roadside bombs. Elsewhere, and especially as the war evolved, coming to focus on the south-east of the country, the defenders' tanks came more to the fore. These included their own distinctive versions of Soviet-era designs, like the T-64BM Bulat and the T-84 Oplot, both products of the post-independence Ukrainian defence industries. The result would be clashes testing not just how the respective sides had built on Soviet-era designs and technologies, but also how

Even more than Russia, Ukraine's armed forces were, until the invasion, dependent on Soviet-legacy weapons, such as these dated BMP-2 IFVs, shown here during an Independence Day parade in Kyiv. (Vitaliy, CC Attribution 3.0 Unported Licence)

they had refined the tactics of armoured warfare they had inherited.

Wars are always forcing houses of innovation and expediency, though, and this one more than most. The Ukrainians in particular proved quick to explore new ways of developing their tank fleet, from battlefield modifications to political outreach to the West for assistance in this specific domain. Although 2022 would not see the introduction of the more advanced Western-built tanks that would arrive later, former Warsaw Pact countries that had become members of NATO were quick to provide their own modernized versions of Soviet designs. These were, after all, easier for the Ukrainians to learn how to crew and maintain and yet also incorporated significantly improved components. Meanwhile the Russians were also beginning to adapt, from the battlefield modifications which would see their vehicles begin to sport additional armour and anti-drone cages, through to tactical innovations which would slowly see them remembering the combined-arms warfare which was meant to have been at the heart of their style of war.

UKRAINIAN TANK FORCES BEFORE THE INVASION

The post-independence Ukrainian army inherited Soviet organizational structures and its tank-heavy way of war, and with it the elements of the Soviet armed forces based on its soil, which left it with an inventory of some 6,500 tanks and 7,000 other armoured vehicles. The 1990s, though, were especially tough for Ukraine, which suffered hyperinflation, a collapse in industrial output, and a consequent steady decline in its Gross Domestic Product (GDP). Military reform was by no means a priority, and although a new State Programme for the Construction and Development of the Armed Forces of Ukraine was adopted at the end of 1996, budgets never met aspirations. The army was substantially shrunk; having inherited a total strength of 800,000 officers and men in 1991, by 1998 it had fallen to 320,000. Divisions were downsized into brigades (many of which were still under-strength): the 28th Guards Motor Rifle Division (Div), for example, became the 28th Mechanized Brigade (Bde), while the 180th Motor Rifle Div was first redesignated the 27th Mechanized Brigade in 1992, and then disbanded altogether in 2004. The defence industrial complex, starved of domestic procurement orders and subsidies, reoriented itself in a desperate quest for export sales. This was reflected in its tank forces, which dwindled at a dramatic rate.

Soviet armies and corps inherited by the Ukrainian Army, 1991

1st Guards Army	became 1st Army Corps, then Northern Territorial Directorate
6th Guards Tank Army	became 6th Army Corps, then Southern Territorial Directorate
8th Tank Army	became 8th Army Corps, dissolved 2015
13th Army	became 13th Army Corps, dissolved 2015
38th Army	dissolved 2003
32nd Army Corps	became Coastal Defence Forces Command 2003, dissolved 2004

Under Yanukovych, the armed forces declined further; conscription was briefly abolished, and by the end of 2013, Ukraine only had some 121,000 active-duty soldiers. After the 2014 Revolution of Dignity and the annexation of Crimea, though, Kyiv moved quickly to address its military weaknesses. Conscription was revived, rates of pay revised upwards and, by the end of that year, the combat strength had risen to 204,000. This would reach almost 300,000 by 2022 including the Territorial Defence Forces and National Guard, with defence spending at around 5 per cent of GDP (compared with, for example, the 2 per cent of GDP which had been the NATO target figure for its members – and which was often not even reached). Meanwhile, a deliberate ‘de-Sovietization’ policy was adopted, with Western-style ranks and uniforms introduced, and the term ‘comrade’ abandoned as a greeting.

The Armoured Troops (TV) was an arm of the Ground Forces, which had experienced particularly significant neglect. By 2014, it had only two remaining brigade-strength formations: the 17th (which had been the 17th Tank Div of the 6th Guards Tank Army) and the 1st (which had been formed in 1997). These were all that remained of the 14 tank divisions which Ukraine had inherited at the end of 1991. However, the new hostility from Moscow led to the formation of three more tank brigades and one independent tank battalion.



With Russia and Ukraine fielding tanks with such similar profiles, both sides took to marking them with recognition symbols that were often later supplemented by national flags, slogans and other embellishments. This Ukrainian T-80U sports not only the cross they used for this purpose but, for good measure, a number of blue-and-yellow Ukrainian flags. (SAMEER AL-DOUMY/AFP via Getty Images)

A Ukrainian tank takes up a firing position in the centre of the contested city of Bakhmut in December 2022. (Andre Luis Alves/Anadolu Agency via Getty Images)



Ukrainian tank units, 2022
1st ‘Severian’ Tank Bde, Honcharivske, Chernihiv Region (est. 1997)
3rd ‘Iron’ Tank Bde, Yarmolinski, Khmelniitski Region (est. 2016)
4th ‘Hetman Ivan Vyhovski’ Tank Bde, Honcharivske, Chernihiv Region (est. 2017)
5th Tank Bde, Kryvyi Rih, Dnipropetrovsk Region (est. 2016)
17th ‘Kostiantyn Pestushko’ Tank Bde, Kryvyi Rih, Dnipropetrovsk Region (formerly 17th Tank Div)
12th Independent Tank Bn, Honcharivske, Chernihiv Region

Each tank brigade has some 120 tanks, as well as infantry and other support elements (see box below). By 2022, most were equipped with the modernized T-64BM and T-64BV models, of which the Russian Army had some 720 in service (with another 570 in storage). Ukraine also fielded more than 200 T-80UDs and at least 40 T-84s. There were also some older 200 T-72s of one variant or the other, although many were no longer operational or were being used as targets and training vehicles or retained to be converted to other uses.

Production and inventory

Ukraine was one of the main producers of tanks in the USSR: the Kharkiv Morozov Machine-Building Construction Bureau (KhMDB) had actually designed the iconic T-34 that was such a mainstay of the Soviet army in World War II and later would build T-55s, T-64s and also design the T-80UD,

UKRAINIAN TANK BRIGADE

- HQ Company (Coy)
- 3 x Tank Bn, each with 3 x Tank Coy of 3 x 4-tank platoons plus a command tank, for a total of 40 tanks
- Mechanized Infantry Battalion (Bn)
- Artillery Regiment (Rgt), with SPG Bn, Rocket Artillery Bn, Anti-Tank Bn, Anti-Air (AA) Bn
- Recon Coy
- Sniper Coy

- Engineer Bn
- Maintenance Bn
- Logistics Bn
- Signals Coy
- Electronic Warfare Coy
- Radar Coy
- Medical Coy



Of all the various recognition symbols used by the Russians, the V and, especially, Z have become widely used as markers of Russian patriotism. Here, frames representing both letters have been set up in front of the Kerch Bridge linking Crimea to the Russian mainland. (AFP via Getty Images)

a diesel-engine version of the gas turbine-powered T-80. Despite the serious economic pressures that followed Ukrainian independence at the end of 1991, it survived and went on to develop a series of local variants of Soviet designs, both for the domestic and export markets.

T-64BM Bulat/T-64BV

The single most common tank design in the Ukrainian inventory at the time of invasion was the T-64 in its various iterations. The original T-64, which ended up being deployed within tank divisions while the less capable T-62 served in mechanized ‘motor rifle’ units, was a ground-breaking tank for the Soviets, with composite armour and a smoothbore 125mm 2A21 gun. The 2A21, at the time the most powerful tank gun in the world, was served by an autoloader, that allowed the crew to be reduced from four to three, and the vehicle’s profile kept low, to increase survivability and keep the weight down to 38 tonnes.² The downside was that it was expensive – which is why it did not supplant the T-62 – and temperamental, such that many of these innovations needed to be refined in later iterations. Its 5TD engine was unreliable, for example, and the autoloader was notorious for trying to insert the gunner into the breech instead of a fresh round. As a result, it was soon succeeded by the T-64A, with a more powerful 125mm 2A46 main gun, and then the T-64B with an improved fire-control system and the 2A46M1 main gun, which could also fire the 9K112-1 Kobra (NATO code AT-8 Songster) anti-tank missile. Nonetheless, the design was still regarded as sufficiently secret and temperamental that it was not exported, even to fellow Warsaw Pact states.

In the newly independent Ukraine, this tradition of incremental redesign continued, with the KhMDB, the Malyshev Factory (ZIM), also based in Kharkiv, and the Kharkiv Tank-Building Factory (KhBTZ) developing a variety of upgrades, both for domestic use and also in the hope of securing exports. Given that even by 1995, Ukraine had more than 2,300 T-64s – far more than it needed or could afford to field – then modernization of old stock rather than construction of new seemed the most logical and cost-effective option.

2 See Steven Zaloga, *NVG 223 T-64 Battle Tank* (Osprey, 2015)

Main Ukrainian MBTs				
Tank	Introduced	Armament	Top Speed	Range
T-64BM Bulat	2010	125mm KBA3 smoothbore 7.62mm PKT coaxial MG 12.7mm NSVT MG	43mph on road 22mph off-road	240 miles (road)
T-64BV	2019	125mm KBA3 smoothbore 7.62mm PKT coaxial MG 12.7mm NSVT MG	40mph on road 22mph off-road	310 miles (road)
T-80UD	1987	125mm 2A46M1 smoothbore 7.62mm PKT coaxial MG 12.7mm NSVT/DShK MG	43mph (50mph for T-80U) on road 30mph cross-country	310 miles (road)
T-84 Oplot	1994	125mm KBA3 smoothbore 7.62mm KT-7.62/PKT coaxial MG 12.7mm KT-12.7/NSVT MG	43mph on road 28mph cross-country	310 miles (road)

By 2010, ZIM was beginning to deliver modernized T-64B tanks to the Ukrainian armed forces in the new T-64BM Bulat variant that was increasingly fitted with domestic systems, as the old Soviet-era defence industrial complex had drawn components from across the USSR. The T-64BM Bulat incorporated the more advanced Nizh (Knife) explosive reactive armour (ERA) as well as the Varta (Sentinel) active protection system, and an automatic fire-suppression system. Its 125mm KBA3 main gun is a locally produced version of the 2A46, and as well as the usual range of rounds can fire the Kombat tandem-warhead laser-guided missile. Although it weighs 45 tonnes, its 850hp 5TDFM multi-fuel diesel engine gives it a top speed of 43mph, with a maximum range of 240 miles, although it proved to be less manoeuvrable than earlier, lighter versions.

The first batch of ten was delivered in 2010, and by 2022, the Ukrainians fielded around a hundred. This was, after all, much cheaper than re-equipping fully with the later version, the T-84. A 2019 upgrade programme led to the T-64BM2 Bulat variant, with an improved fire-control package and TPN-1TPV thermal sight, a more powerful 6TD-1 engine, Lybid-2 radios and the Basalt battlefield information system, and enhancements to the tank's protection including anti-RPG screens over the enlarged engine compartment. The design was undergoing field tests in 2021, but only up to a dozen were definitely in service by the time of the invasion.

A separate programme led to the T-64BV, a modernization programme for the older T-64s led by the KhBTZ. The initial 2017 version lacked the more powerful engine of the T-64BM but did have a range of improvements

A

T-64BM AND T-84 OPLOTT

Various models of the T-64 and its successors formed the backbone of the Ukrainian tank fleet in 2022. The top illustration is a T-64BM of the 1st 'Severia' Tank Brigade's 2nd Battalion, marked with the white crosses that were adopted by the Ukrainians in the early stages of the war to distinguish their vehicles from the often-identical Russian ones. In 2022, the brigade took part in the successful defence of Chernihiv and was then redeployed to the Donbas offensive, earning it the 'For Courage and Bravery' unit award. Below is a T-84 Oplot from the 3rd Tank Brigade's 11th Independent Tank Battalion during the Kharkiv counteroffensive in a distinctive blocky digital camouflage pattern. Note the new Duplet ERA blocks, optimized to resist tandem warheads and

