



The Leopard 2A6 has a longer gun tube and new ammo.

# Tank Assessment Survey Ranks Leopard 2A6 Tops, With M1A2 the Runner-up

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What's the best tank in the world?

A lot of U.S. tankers would disagree, but a consulting firm called Forecast International, asked to rate the world's tanks, argues that the most recent version of the German Leopard 2 edges out the M1A2 as world's best.

## GERMAN LEOPARD 2A6

"This potent tank has been greatly improved in the latest operational version, the A5 (Improved), maintaining the lead that it has held for some time," the report concluded. It noted that the version of the Leopard 2 that was recently adopted by the Swedish Army after competitive trials is "even better than the A5 as used by Germany. This is due to the incorporation of a new, advanced command and control system and the Galix vehicle protection system. The Leopard 2S also features a new passive armor system."

The German Army's version of the Leopard 2 has also been upgraded with a longer gun tube and new ammunition. This version is called the Leopard 2A6.

**The M1A2 was rated as having the best crew protection of the tanks rated. Its IVIS system also drew high marks for its communication capabilities.**

Other features of the Leopard 2 series that drew high praise were the tank's MB 873 diesel engine, improved turret armor protection, and a new all-electric gun control and stabilization system that eliminates the danger of a hydraulic fluid fire and operates more quietly. New fire control components and some repackaging of the components within the turret have improved the "fightability" of the tanks, making the Leopard's "hunter-killer" target acquisition even more effective.

But the report noted that the Leopard 2's lead over the M1A2 had closed over the years and was now exceedingly small.

Much of the rating hung on the improved cannon.

## U.S. M1A2 ABRAMS

The addition of the Commander's Independent Thermal Viewer, with its target hand-off capability, brought the Abrams to the same level as the Leopard 2 in terms of a "hunter-killer" target acquisition system. Unlike all other tanks, the newest Abrams also has the Inter-Vehicular Information System which, as the report notes, "Adds a significant capability that is lacking in most other tanks; in point of fact, with regard to the vital communications task, due to the



level of interconnectivity, the M1A2 beats out the Leopard 2 hands down."

The Abrams' passive protection (its armor) was rated the best in the world.

The Abrams led the world in adopting the gas turbine engine. One can argue its advantages and disadvantages, the report noted, but few nations are willing to adopt these engines because of their high fuel consumption versus diesels: "The performance of the engine on the M1 is not questioned; many nations feel that the associated support of the vehicular gas turbine-powered Abrams is just too much for them to afford." On that point, an MTU diesel has been integrated into the M1 which is under consideration by the Turkish Army.

The system enhancements recently funded for the Abrams will improve fire control, command and control systems, and other electronics and "will keep this tank at or slightly ahead of the Leopard 2 in the area of electronics," the report said.

While the U.S. has looked at the longer 120mm gun tube being adopted by the Germans, the Germans do not use depleted uranium penetrators and may have needed the additional barrel length to equal the lethality of the U.S. system, according to one U.S. officer familiar with current armament development.

The report stressed that lethality was a major consideration in the Abrams' high ranking, given its overwhelming superiority in the fighting to liberate Kuwait.

## JAPANESE TYPE 90

The third-place finisher is a surprise, coming from a nation never known for its tank technology. The Japanese Type 90, built by Mitsubishi, visually resembles the Leopard 2, uses the 120mm gun originally developed by Rheinmetall, and adds an automatic loader, permitting a three-man crew. Neither the government or the contractor have put out much information on the Type 90, making it a sort of "mystery tank," but the Type 90 is, according to the report, "thoroughly modern and sophisticated, even more advanced in some of the areas of fire control and vehicle electronics than the highly publicized (French) Leclerc, Leopard 2A5, and M1A2.

"It is the fire control suite and advanced vehicle electronics that really make the Type 90 a world-class tank. The well known Japanese prowess in electronics has been exploited to the fullest extent in



The Japanese Type 90 is armed with the same German-developed gun as the U.S. Abrams. Its vehicle electronics reflect the advanced technology of Japanese industry.

the Type 90. While some details remain clouded in secrecy, the fire control suite has an automatic target tracking capability and it has long been rumored that some sort of target recognition/queuing and/or threat prioritization capability is incorporated in the suite."

The Type 90 is powered by a 1,500 hp Mitsubishi diesel that provides a power-to-weight ratio similar to other world-class tanks. At 50 tons, the Type 90 is less heavily armored than designs intended for combat in Western Europe and the crew compartment is thought to be cramped.

"All these things considered, the Type 90 is one of the top operational tanks in the world today," the report concludes.

## FRENCH LECLERC

Close behind the Type 90 in the ratings is the new French MBT, the Leclerc, which is in use by the French Army and, with a German diesel, won the United Arab Emirates competition for a new

tank, edging out the British Challenger 2. The Leclerc features advanced electronics, with a data bus and an advanced fire control system. Its 120mm cannon has an autoloader, permitting a three-man crew, and a 140mm gun is in development and has been demonstrated for an export customer. The turret is all-electric.

One interesting feature of the French MBT is a modular armor system, allowing the protection to be tailored to the threat.

## BRITISH CHALLENGER 2

Aside from a new gearbox, the hull of the new Challenger is similar to the hull of the Challenger 1, but the turret is so vastly improved that the Challenger 2 could be called a new tank, according to the report. "The tank was lacking in the all-important area of fightability, mainly due to the poor design of the turret and some problems in fire control components. These problems have been more than put right in the Challenger 2 turret."



British Challenger 2: A new turret makes a difference.

The new design includes a data buss, new electronic components, and fire control components similar to those on the M1 and the Leclerc. Armor is second-generation Chobham, the layered armor system originally developed by the British. The Challenger 2's high pressure gun is rifled, and all ammunition is stored below the turret ring. The report notes that the Challenger gun claims the longest-distance tank kill in history, a shot of over 4,000 meters in the Gulf War.

## RUSSIAN T-80UM2

The Russians have made a second attempt to apply gas turbine engine technology, and this version is apparently more trouble-free than the first engine, a modified helicopter power plant. This version differs from the earlier T-80U and "differences are so significant that the tank warrants a position all its own in our rankings," the report said.

An all-new turret that resembles the blocky shape of the M1 and Challenger 2 turrets accommodates an automatic loader in the turret bustle, a much safer alternative than the Russian carousel loaders located on the turret floor in earlier tanks. The loader incorporates an automatic fuze setter and the ammunition is now unitary, rather than separately loaded projectile and propellant. It's presumed that this T-80 can also fire antitank guided missiles through the main gun tube, an area of technology that Russia first developed. The fire control system is better, approaching the level of the systems on modern Western MBTs.

The main armament remains the 125mm smoothbore cannon which, with the new loading system, can attain a much higher rate of fire than earlier Russian designs.

The Russians have also invested heavily in novel protective systems, including both explosive reactive armor (the Kaktus system) and the Arena active defense system, another technology in which the Russians lead the world.

Counting against the T-80 in the ratings was the tank's poor reliability in recent action in Chechnya, traced to poor workmanship and quality control. It was also seen as vulnerable to crude weapons in the hands of a fairly primitive foe, leading to questions about the tank's likely performance against a first-line opponent.



The Korean Type 88/120 "Baby M1" has been upgunned to 120mm from 105mm.

## KOREAN TYPE 88/120

Designed by the same team that developed the M1, the Type 88 appears to be a "baby M1." It was recently upgunned by the manufacturer, Hyundai, with the M256 120mm cannon that has become a world standard, and its fire control system has been improved with components the report called "equal to or even superior to those used on the M1." The Type 88 is powered by a diesel engine.

## RUSSIAN T-90

Based on the T-72, but "so different that it warrant a new designation," the report said of this newly standardized Russian MBT. Diesel powered, like the T-72, it is protected by the Kontakt explosive reactive armor system and a laser warning device, along with the Shtora-1 countermeasure system, intended to spoof infrared guidance systems. The 125mm armament can also fire the Refleks laser-guided missile through the gun tube. Questions remain about the tank's sur-

vivability and overall quality control, and the report also notes that the turret is cramped, reducing fightability. The survey rated the Ukrainian T-84 as similar to the T-90 in most respects.

## RUSSIAN T-72

An older design "that can be improved only so far," the report concluded about this 1960s-era design. But its low cost, relative to the competition, is its saving grace. The 125mm cannon in this model is fed by a carousel loader, considered a survivability disadvantage.

## ISRAELI MERKAVA MARK III

Calling this design outside the mainstream of current world tank development, the main reason the Merkava ended up at the bottom of the Top Ten is its poor power to weight ratio, which limits its mobility. The tank received high marks, however, for its 120mm standard cannon, fairly advanced vehicle electronics and fire control, threat warning system, and a level of protection among the best in the world, with its front-mounted engine and modular armor packs.

The survey concluded that in many ways, the Merkava was not comparable to others in the survey because it "reflects the unique requirements and doctrine of Israel; to that nation, the Merkava represents the best balance" of factors, although this might not be the case elsewhere.



The Russian T-90, newly standardized by the Russian Army, features explosive reactive armor protection and a self-defense suite to protect against infrared-guided weapons. This model is based on the T-72 series.