

The Russian T-90S: Coming into Focus

by James M. Warford

Since the publication of the article "The Russian T-90/T-90S Tank: An Old Dog with Some Dangerous New Tricks" (*ARMOR*, March-April 1995), some new information concerning this mysterious Russian MBT has come to light. Various open sources have confirmed that there are at least three different variants of the T-90. The Russians confirmed the existence of an export variant in June 1996,¹ and Russian promotional materials have discussed both the T-90S (or "C" if you prefer the sometimes-used Cyrillic non-translation) and the T-90SK command variant. There are also occasional references to a T-90E, but these appear to be unsubstantiated. It's possible that the T-90E designation could have been a deliberate piece of disinformation intended to keep the actual T-90 a secret a little bit longer; or maybe it was an attempt to get some quick export sales of the T-72BM MBT prior to the first public appearance of the T-90. Additionally, some of the information and specifications attributed to the T-90 differ from information now known to belong to the T-90S. Ballistic computers, day/night sight systems for the tank commander, and communication systems are some of the areas where a difference can be identified between the T-90S and a third variant of the T-90. Finally, the T-90S that was recently shown to the public for the first time was not fitted with thermal night sights, although thermals are reportedly available as an option if desired. As reported previously in *ARMOR*, the Russians have had thermal sights available for their tanks since at least 1992; and there are reports that the T-90 is fitted with the latest Agava-2 thermal sight. So, based upon the available information, the three T-90 variants are as follows: the **T-90** (non-export MBT), the **T-90S** (export version, and *the focus of this article*), and the **T-90SK** (command variant).

Times have changed since the T-90/T-90S first appeared in 1993. Built upon the poor performance of Iraqi-employed T-72s in Desert Storm, network news footage of turretless M-84A MBTs ablaze in the former Yugoslavia, and the

- Shown for the first time on June 28, 1993 at the Kubinka test center.
- Called "Supertank" with a "perfect" fire control system.
- The best Russian tank vs. the T-80/T-72B.
- 107 T-90s were produced as of Sep '95, all located in Siberia.
- 1 Battalion of T-90s fielded at present.
- 1996-1997 deployment plan is to equip an entire Military District with T-90s.
- Has many features unsurpassed in the world.
- In the same class as the Abrams, Leopard 2, and Leclerc.
- The main vehicle of the Russian Army up to the year 2005.

(As reported by: *Izvestiya*, *Rossiyskaya Gazeta*, *Krasnaya Zvezda*, *Armeyskiy Sbornik*, and *Voyennyye Znaniya*)

misplaced bad press dumped on the T-80BV MBT for its performance in Chechnya, large export orders for modernized T-72s and T-80U MBTs have not materialized. It may have been this very lack of export business that pushed the Russians into finally showing the T-90S to the public. Although certainly related to the tanks that fought those recent battles, the T-90/T-90S was not directly involved and was spared the scrutiny and bad press. In effect, the T-90/T-90S actually benefited from the war in Chechnya.

In February 1997, information was circulated concerning Russia's participation in the bi-yearly IDEX international military exhibition. Originally organized and held in Abu Dhabi in 1993, IDEX has quickly become one of the most significant military exhibitions for ground weapons and hardware in the world. IDEX '97 was conducted from March 16-20 1997, and included over 750 contractors from 42 countries. The delegation from Russia consisted of 350 personnel and about 500 exhibits; including

the T-90S. The following description of the T-90S is based on the most recent open-source information, including the tank's sales brochure distributed at IDEX '97.

The T-90S is armed with the 125mm 2A46M smoothbore main gun firing HVAPFSDS, HEAT-FS, and FRAG-HE ammunition. The T-90S can also fire the 5km range "jam proof" 9k119 RE-FLEKS gun-launched ATGM (AT-11 SNIPER). The tank's autoloader carries 22 ready-to-fire rounds of ammunition. The T-90S is fitted with an integrated fire control system that is capable of engaging targets day and night, from a stationary or moving tank, by both the gunner and commander. The night sighting system is either passive/active IR or thermal. The question to be answered here is which thermal? According to *Jane's Intelligence Review*, it could be either the TPN4-49-23 Buran-PA sight used on the older T-80Us, or the newer Agava-2 sight intended for newer T-80Us and the T-90. With the Agava-2, the commander is provided with a small



video screen which provides the same image as that seen by the gunner.²

The T-90S is powered by the multi-fuel V-84MS 840 hp diesel engine. This gives the tank a maximum road speed of about 60 kph and an operating range of 550-650 km (the higher number with external fuel drums). There have been reports that this engine (a derivative of the V-84-1 that powers the lighter T-72BM) is underpowered for the increased weight and causes the T-90S to be "somewhat more sluggish than either the T-72BM or the T-80U."³

More information is required, however, since the combat weight listed for the T-90S is 46.5 tons, while other sources put the T-90's combat weight at 50 tons. There are reports that the Russians are working on new, more powerful diesel engines providing up to 1,100 hp, which may be incorporated into the T-90/T-90S in the future. The T-90S is capable of deep fording to a depth of 5 meters using a snorkel, and can also be fitted with KMT-7 mine clearing equipment.

The T-90S is one of only three or four tanks (the others being the T-90, the T-80UK/T-80UM Model 1995 MBT, and possibly the Ukrainian T-84 Model 1995 MBT) that is fitted with a "three-tiered" protection system: advanced base armor known as "Combined" or "Sandwich"⁴ armor by the Russians, Kontakt-5 Explosive Reactive Armor (ERA), and the TshU-1-7 Shtora-1 Defensive Aids Suite (DAS). Very little information concerning the advanced base armor of modern Soviet/Russian tanks has been published to date. It is known that the T-64 series, T-72 series, and T-80 series tanks incorporate composite/laminate armor over their 60-degree frontal armor arc; and reportedly, the T-90 is no different. According to *Jane's Intelligence Review*, the T-90 consists of a modified T-72BM turret and hull that incorporates a Russian version of Chobham armor in the turret; consisting of a basic armor shell with an insert of alternating layers of aluminum and plastics and a controlled deformation section.⁵ So far, no specific additional information about the T-90's front-slope or

glacis armor configuration is available. The most likely design would be a much improved version of the 5-layer armor that protected the hulls of Iraqi T-72s in Desert Storm.

Based upon the information currently available, it's not clear if the T-90S is equipped with the same base armor as that attributed to the T-90. Added to this impressive base armor is the second tier of protection, Kontakt-5 ERA. First identified in 1989, and initially shown to the public in September 1994, Kontakt-5 represents a huge jump in capability over previously fielded HEAT warhead-defeating ERA systems. According to the Russians, Kontakt-5 has the ability to significantly degrade the penetrating power of kinetic-energy APFSDS ammunition. To date, Kontakt-5 ERA is used on the T-90/T-90S, T-80U, T-80UM, T-80UM Model 1993, T-80UK/T-80UM Model 1995, T-84 Model 1995, T-80UD, and the T-72BM. Since its introduction, unclassified photographs have also appeared showing a T-55 MBT equipped with this new ERA.

The two SHTORA-1 electro-optical/IR transmitters are arrayed on either side of the main gun, and the receiver is in the center of the turret just above the gun mantlet.



The third tier of protection incorporated into the T-90S is the TshU-1-7 Shtora-1 DAS. The Shtora-1 is an electro-optical countermeasure system designed to reduce the probability of the tank being hit by ATGMs and laser-guided projectiles by three to five times.⁶ The system consists of two electro-optical/IR “dazzlers,” one each mounted to the left and right of the main gun, a set of laser warning receivers mounted on the turret, and smoke grenade launchers using a new type of smoke, which reportedly has the ability to “defeat” lasers and thermal sights. The Shtora-1 can be operated in fully automatic or semi-automatic modes and has the capability to operate continuously for six hours. Against ATGM attack, the electro-optical “dazzlers” each emit an IR light that is intended to confuse the missile IR tracking system used by the ATGM launcher; against laser-guided projectile attack, the system warns the crew that they are being illuminated and either fires the smoke grenades or waits for the tank commander’s decision to fire them. As this article is going to press, Shtora-1 has been seen fitted to the T-90/T-90S, T-80UK/T-80UM Model 1995, and T-84 Model 1995.

In the March-April 1997 issue of *Military Parade* magazine, an article written by Vladimir Seryakov (the Director-General of Uralvagonzavod, the Design Bureau that builds the T-72 series and the T-90 and T-90S) provided an almost unprecedented look at one of the latest products of the Russian military-industrial complex. Titled “T-90S Gun-Missile Tank: New Generation of Russian Tanks,” this article provides a very interesting look at how the Russians present the T-90S to the outside world. Described as incorporating “a number of design innovations and the use of state-of-the-art technologies,” the T-90S “is not only on a par with the best foreign tanks in terms of combat and service

characteristics, but it even surpasses them in terms of a number of vital parameters.”⁷ What some Russians think of the T-90/T-90S, however, is apparently another matter. Reportedly, the T-90 was selected as the “main tank” for the Russian Armed Forces in 1993 after a series of competitive trials with the T-80U. It was also declared in 1996 that the decision was made to “move gradually to the T-90” as the single tank produced for the Russian Army. According to *Jane’s Intelligence Review*, the selection of the T-90 over the most recent versions of the T-80U has not been unanimously supported by the Russian military. Colonel-General Aleksander Galkin, the Chief of the Russian Ministry of Defense’s Main Armor Directorate, told an interviewer in September 1996 that the T-90 decision was “a mistake” and that he still considers the T-80U a superior tank.⁸

While the position occupied by the T-90 in the Russian Army may not be as fully supported as originally thought, the position of the T-90S and its intended role are all too clear. Accompanied by an uncharacteristic flow of technical and sales information from Russia, the T-90S has quickly established itself as a serious competitor on the export market. Russia’s success exporting its modern MBTs in recent years has been minimal at best; and the one real exception to this lack of success has come from another former Soviet State. In July 1996, the Ukrainian and Pakistani governments announced the completion of a deal for the delivery of 300 Ukrainian-produced T-80UDs to Pakistan. According to a variety of open sources, the unit price for a T-80UD is reportedly \$1.8 million, bringing the total value of the deal to about \$550 million. According to Yu. Mirgorodskiy, General Director of the Zavod Imeni Malysheva State Enterprise (tank plant), the T-80UD was selected by the Pakistanis after a long “competitive struggle with other vehicles. “The T-80UD is a

state-of-the-art tank which meets all requirements.”⁹ The first batch of 15 T-80UDs have been shipped and reportedly arrived in Karachi on March 23rd. While this landmark deal provides the Pakistani Army with a significant tank qualitative advantage over Indian armor, it also firmly establishes the Ukraine as the principal exporter of T-80 series tanks. The Russians, of course, are keenly aware of this situation and are looking to the T-90S to achieve a new level of export success. The delivery of a large number of T-90Ss by the Russians to any one of a number of possible customers represents a very serious potential threat. Based upon the appearance of the T-90S at IDEX ’97 and what is now known about the tank’s capabilities, it is unlikely that this significant new armor threat will take long to materialize.

Notes

¹Rynyanov, Mikhail, “Arms Bureau: This is a Bobcat. You can’t tell it to ‘Shoo’! Our Correspondent Visited Secret Firing Ranges,” *Komsomolskaya Pravda*, June 28, 1996.

²Zaloga, Steven, “T-90: the Standard of Russian Expediency,” *Jane’s Intelligence Review*, February 1997, p. 62.

³*Ibid.*, p. 64.

⁴Seryakov, Vladimir, “T-90S Gun-missile Tank: New Generation of Russian Tanks,” *Military Parade*, March-April 1997, p. 40.

⁵Zaloga, Steven, p. 61.

⁶Warford, James M., “The Russian T-90/T-90S Tank: An Old Dog with Some Dangerous New Tricks,” *ARMOR*, March-April 1995, p. 8.

⁷Seryakov, p. 41.

⁸Zaloga, p. 61.

⁹Chepalov, Aleksandr, “Our Tanks by Southern Seas,” *Trud-7, August 16-22, 1996, p. 11.*

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