

T-72...T-64...T-80??

Why Three Tanks?

Why the Soviets eventually produced three different tanks to what appeared to be the same requirements.

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Since the first of the Soviet Third Generation tanks appeared racing across the steppes in fuzzy, windblown photographs in 1967, a great deal of effort has gone into trying to determine why the Soviets eventually produced three different tanks to what appeared to be the same requirements.¹

Many military analysts searched long and hard to find reasons, especially when they looked at the forces opposing NATO in Europe during the late 1970s and early 1980s. In Germany, NORTH-AG faced T-64-equipped units in the north of Germany (the 2nd Guards Tank, 20th Guards, and 3rd Shock Armies) and T-80 units in the south (1st Guards Tank and 8th Guards Armies). In Czechoslovakia, the units had T-72s, and in Hungary, T-64s. Fleets of each kind of tank awaited in the "second echelon front" armies in the western Soviet Union, and even more lurked behind the Urals. By 1991, they formed the backbone of a fleet which may have reached as many as 77,000 tanks.² But why *three* different tanks?

The Soviets did face a wide variety of tank threats from Europe and on their other borders. The U.S. fielded first M60s and then M1 Abrams tanks; the British, the Centurion and then the Chieftain; the Germans, the M48, Leopard 1 and 2; France, AMX-30; and the rest, a variety of U.S., British, and German tank designs. In the east, the Soviets only faced Chinese copies and variants of their own late second-generation tank designs (T-54, T-55, and T-62). But these tanks could be countered with a single superior main battle tank type, not three.

The answer, in a single word, was the power of the "*Oboronka*." This term was the Russian slang for the Military Industrial Complex, which dominated nearly 50 percent of the Soviet economy for many, many years. With the incestuous relationship among Party leaders, factory heads, designers, and military commanders, this society within a society ran the country. It also made and broke people at will, especially when political influ-

ence was turned all the way up. Few men in the USSR survived being broken by the members of the *Oboronka*, and few ever made their way back into its exalted ranks once expunged.

But in the end, the *Oboronka* was men, and it was men who made the machinery which kept the *Oboronka* in power, and the *Oboronka* kept the Party in power. This was not just the comic opera "KGB knock-at-the-door" threat of power, but wealth, position, and an enormous military force in being, which gave the trappings of power to those who fed it and worked with it. The reason that there were three main battle tanks in simultaneous production was because some men played the *Oboronka* game better than most, and were rewarded for their loyalties and achievements. But in order to see how this worked, our story begins in the 1930s.

The Rise of the Design Bureaus

The Soviet tank industry itself dates back to 1920, when the Soviets made their first direct copies of the Renault FT light tank. Throughout the 1920s, theorists like Marshal Tukhachevskiy saw the need to create armored forces to provide the backbone to the Workers' and Peasants' Red Army (RKKKA). But it was not until 1930, when the Soviets purchased the British Vickers Six Ton Tank, and the U.S. M1931 Christie wheel-and-track tank chassis in 1931, that their industry and their tank corps began to grow.

During that period, the Soviets built tanks in one of two places. They either built them at the Kharkov Steam "Komintern" Locomotive Factory in Kharkov, Ukraine, or they built them at one of three factories in Leningrad. Each factory had a design bureau in charge of the tank design process, headed by a chief designer. The factory leadership was composed of the factory chief, the chief designers of various bureaus in these factories, the chief engineers, the head of the Party political committee at the factory, and the lead workers in charge of mechanical assembly. But of



Mikhail Koshkin organized the project that became the famous T-34 of WWII as chief designer at the Kharkov tank plant.

all of these, the most powerful people were the factory chief and the chief of the design bureau.

The factory chief and design bureau chief were trusted men, and both had to be Party members. The factory chief was usually an engineer with some design experience, but his main function was to ensure that production took place and goals were met on time. The chief of the design bureau was the head of the product design team, and his function was to get the product ready for production, keep it current, and ensure that problems were solved as quickly as possible. While others figured prominently in the day to day affairs of the plants, nothing could take place without the approval of these two men.

By 1938, the Soviet Union had essentially two production centers. Both had experienced a major turnover in staff the previous year. The "*Komintern*" Kharkov Locomotive Works, or less dramatically, Factory No. 183, received a new director and a new chief of the design bureau to replace two individuals who had been purged and shot. The new factory director was Yu.Ye Maksarev, who was a busy man and key to making the tanks roll; but the real driver of Kharkov's production was Mikhail I. Koshkin, the chief designer.

In Leningrad, the three factories were truncated and reorganized during the

mid-1930s, and by 1937 had boiled down to one controlling design bureau which oversaw the activities of the three factories. Of the three factories — *K.Ye. Voroshilov* Factory No. 174; *Bol'shevik* Factory No. 100, or the Prototype Design for Special Machinery; and the Leningrad *Kirov* Factory No. 185 — the Kirov factory was the true power, and its new chief was Izaak M. Zal'tsman. The chief designer of all three plants was Zhosif Ya. Kotin.

Koshkin: Clear Vision and Concepts

Mikhail Koshkin (1898-1940) was one of a rising group of star engineers. A Party member since 1919, he had performed well and impressed influential Party members on his way up. He studied at the Sverdlov Communist University and graduated from the Leningrad Polytechnic Institute in 1934. While there, he met and worked with Sergei M. Kirov, one of the major driving forces in the Leningrad Communist Party. At the Institute, he was also befriended by and came under the wing of a patron, Sergo Ordzhonikidze, one of the major early figures in the Communist Party. This ensured his getting a prime position at the best of the Leningrad factories. Thus, upon graduation he went to Factory No. 185 to work as a designer. In January 1937, he was assigned as acting chief designer of the tank bureau at the KhPZ, replacing A.O. Firsov, who had been denounced. But his joy at receiving the new position was diminished when Sergo died in February 1937, essentially leaving him without support in the higher levels of the Party.

At the KhPZ, Koshkin immediately impressed his contemporaries, and showed a firm grasp of engineering details and what was expected of him. However, the KhPZ was considered only a secondary tank plant, and the jewels in the *Oboronka* crown were all in Leningrad. Koshkin was told that his main mission was simply to make a better BT tank, as the series of fast tanks were the only major military product of the KhPZ. But there was one other ace in the deck; the KhPZ was also home to the diesel engine design bureau, and after six years of work and testing, it was ready to produce the BD-2 high speed diesel engine.

Koshkin saw the value of this at once, and even though the arrest of the engine's designer in December 1937 set things back, the project went forward for test in April 1938. Combined with other projects going on in the factory, such as



The T-34 Model 1941, seen here at the Ordnance Museum, came as a total shock to German intelligence. Its balanced design combined a relatively large cannon, sloped armor, and a diesel engine on a maneuverable, rugged chassis well adapted to Russian terrain.

-Author photos

the BT-IS tank with improved running gear and the BT-SV series tanks with sloped armor protection, Koshkin began to see the need for a better tank design. There was only one minor glitch: a graduate engineering student named Dik managed to solve the problems with the drive train in the BT-IS tank, which would have placed it in production in 1938. This was a warmed-over BT with the same complex and troublesome wheel-and-track driveline which discredited the tanks used in Spain, but that was popular with old line cavalry commanders of the day. After discrediting and overworking Dik, Koshkin began easing his way around the tight restrictions placed on him by the Party and the *Oboronka* leadership to move towards a new concept.

Koshkin had a simple, but unauthorized, plan in mind. Dump the troublesome wheel-and-track drive for a pure tracked drive, build a hull from sloped armor plates, stuff the BD-2 diesel engine in the new tank, and get the largest tank cannon possible to ensure sufficient firepower. Since he couldn't advance his design directly, Koshkin sidled up to it with several interim models: the A-20, which appeared to be an improved BT-SV-2, and the pure tracked A-32, both of which were passed on to the *Oboronka* overseers as simply "improved" BT tanks.

Kotin: Contacts, Contacts, Contacts

Zhosif Kotin (1908-79), on the other hand, was not the gifted designer and latent genius of Mikhail Koshkin. Kotin had simply attended the right schools with the right people at the right times. Kotin attended the Dzerzhinskiy Military

Automotive Technology Institute in Leningrad, where he came under the eyes of Party luminaries such as Kirov, Voroshilov, Blyukher, and Tukhachevskiy, eventually even marrying Kliment Voroshilov's daughter. While it appears that Kotin was a competent, if not spectacu-



Zhosif Kotin, chief designer at the Leningrad Kirov Factory that produced the KV heavy tank. Kotin named the tank after his father-in-law, the powerful Kliment Voroshilov.

lar, engineer, his forte was political wrangling, and with the approval of the powerful, he advanced rapidly.

On 7 May 1937, Ivanov, the chief of the SKB-2 design bureau at the Leningrad Kirov Factory, was denounced as a "Trotskyite" and taken out and shot. On 23 May, Zhosif Kotin took over the factory design bureau, and Isaak Zal'tsman took over as the factory director. For most of their working lives, Zal'tsman



Kotin's KV-1 heavy tank was pressed into production on the basis of very limited employment during the 1939 war with Finland. Unreliable, too heavy, and with no better cannon than the T-34, the KV-1 was an obsolete design.

and Kotin appear to have gotten on well, and worked well as a team. At this point in time, the Kirov works were in turmoil, and the task before them was to design a heavy tank to replace the huge but uninspired T-35 heavy tank, as well as the T-26 infantry escort tank.

Kotin, as the chief designer of three tank factories, placed SKB-1 (the design team at the Voroshilov factory) in competition with SKB-2 at the Kirov works. Both teams produced similar designs; SKB-1 came up with a three-turreted tank called the T-100, and SKB-2 produced a very similar design they named after the factory — SMK, for Sergei M. Kirov, who had been assassinated in 1934.

The designs were only slightly less clumsy than the T-35. When shown two models of the T-100 and SMK, Stalin joked that they were “department store tanks, with a gun for every occasion.” Kotin claimed later he really wanted a single-turreted tank — but most observers claim that it was really Stalin who was responsible for ordering the change. Stalin is reputed by most others to have told Kotin the designers should concentrate on a single-turreted design, and he broke a turret off of one of the two models to show which direction to take.

The Competition for the Single Main Tank of the USSR

In August 1938, Koshkin showed his new designs to Moscow. Koshkin dutifully brought along the modified BT tank concepts, as well as the factory's own A-20 and A-32 design concepts. Koshkin stood up in front of the major

“players” in the *Oboronka* and denigrated the wheel-and-track concept used with the BT, which was beloved of many on the General Staff. He recommended a new concept — a lighter, faster, better armed and better armored full tracked vehicle. Many of the “old guard” were aghast, and since Voroshilov was one of the committee voting, the sleek new A-32 was nearly rejected out of hand as he “felt” the Leningrad team would produce a better tank. Stalin, however, interceded and asked Koshkin to develop both the A-20 and the A-32; however, Stalin himself did not seem to find great favor with the pure tracked tank, and resorted to his legendary tactic of hammering Koshkin at every opportunity on why he was so convinced of its superiority.

One fortuitous event happened on 5 February 1939 while the rivals were building their designs. Vlyacheslav A. Malyshev (1902-1957) was named as the Peoples' Commissar for Medium Machinery Production, which included all tanks. Malyshev was perceptive and intelligent, and a very tactful individual in a society which prized stealth and craftiness. Of all the *apparatchiki* who could have held this position, Stalin had picked one who actually was perfect for the job.

Things came to a head in September 1939. At a meeting in Moscow, the Kirov works showed their three new tank prototypes — the T-100, the SMK, and the single turreted tank model which Stalin appears to have suggested. The third tank was Kotin's push to gain the orders for the only tank he felt was needed — the one which responded to Stalin's advice, and in order to ensure its selection, he named it after his father in

law, Kliment Voroshilov, as the KV tank. This tank was clearly superior to the two obsolete designs, and it showed the most promise of the three.

But in all of the official hoopla over the KV tank, the three tanks from Kharkov — the BT-7M, the A-20, and the A-32, now called T-32 — came as a major shock to the Leningraders. All three had one thing the Leningrad tanks did not — the BD-2 engine, now known by its service designator as the V-2. The T-32 stunned all present as it was clearly on another plane of achievement when compared with the clumsy efforts from Leningrad. Koshkin's T-32 was very impressive. Even Voroshilov himself could not deny its potential, but in a very wily move, gave Koshkin permission to develop the T-32 tank into the T-34.

The Finnish War and the War for Existence

In November 1939, problems with Finland came to a head, and the USSR declared war on its hapless neighbor. But hapless does not mean powerless, and the Finns soon began to show the Soviets that it was going to be a very expensive campaign in both men and materiel. When the conventional tanks of the time, the T-26 light infantry escort tank and the BT fast tanks, were easily knocked out by the Finns and found to be incapable of destroying Finnish positions on the Mannerheim line, the Leningrad Kirov Factory volunteered to send in their three new tanks (T-100, SMK, and KV).

While the first two did poorly — the SMK hit a mine and was knocked out, eventually being abandoned until the Soviets could recover it the following spring — the KV was committed to combat on 17 December 1939. While it apparently did perform reasonably well, the reports from the factory-oriented representatives indicated it could single-handedly win the war. Two days later, the KV was accepted for service, based on this one incident and without extensive testing first.³

The T-34 was also nominally accepted for production on 19 December 1939, but Voroshilov had pulled a fast one on the KhPZ. He had approved the T-32 for production, but since the T-34 was a “new machine,” it had to go back and start all over in the acceptance cycle. Their first obstacle was having to build 11 tanks for factory and service testing before full permission was granted for production. In the meantime, Kotin's de-

sign bureau at Factory No. 174 had produced a new infantry escort tank, the T-126SP, which was accepted for production as the T-50. Kotin, via Voroshilov, now argued that the T-50 and the KV would handle all tank chores and the T-34 was now unnecessary.

The matter came to a head in March 1940. While they were to have 11 tanks finished by 1 April 1940, in the meantime Koshkin's work was interfered with as much as possible. He was finally ordered to show why the T-34 should go into production, and a comparative test was scheduled for Moscow in March 1940.

In one of the truly heroic demonstrations of confidence of all time, Koshkin and a select crew from the Kharkov factory drove from Kharkov to Moscow in twelve days. The two T-34 tanks suffered no major breakdowns, this was in the dead of a very nasty winter, and Mikhail Koshkin arrived in Moscow with the beginnings of pneumonia. The tanks went to Tsarevoi Kokol Square, where representatives from the Defense Council and Stalin awaited them. Also present was one of the KV tank prototypes.

The competition between the two tanks was never in doubt. The nimble T-34 far exceeded any tank in the collective memory of the people there, and impressed Stalin the most. The KV was shown to be clumsy and old-fashioned, and the Kirov factory people were stunned. There would be no denying the T-34 from production. While Voroshilov politely examined the tank from the outside, Malyshev checked both the outside and inside, and was delighted with the new tank. Koshkin was wracked with coughing as he explained the features to Stalin, and Stalin was a bit annoyed with the distraction. Koshkin and his crews then drove back to Kharkov, again with few problems. On 31 March, a resolution was passed ordering the T-34 into full series production.

The Voroshilov faction still dogged the T-34. After the Soviet-Finnish war was over, the prototypes were sent to the Karelian Isthmus to see how they could handle Finnish antitank obstacles; they passed with ease. But like famed British aircraft designer Reginald Mitchell, Koshkin would not live to see his creation prove its true worth. Mikhail Koshkin died on 26 September 1940 from complications brought on by the case of pneumonia he contracted during the ride through the snow. He would later receive a posthumous award of the

State Prize for the T-34 design. In his place, Aleksandr A. Morozov, head of the design bureau transmission team and Koshkin's assistant, was named as the new chief designer at Kharkov.

Like many other men, Morozov was a good engineer, but one sadly possessed of a great deal of jealousy towards Koshkin and the T-34 project. Morozov had been involved in many earlier projects, most of which were swept away by Koshkin when he decided to go for the T-34 tank design.

But at the moment, Morozov had other problems. In September 1940, the chief of the Main Armored Vehicle Directorate — GBTU — was replaced with another former BT tanker and critic of the T-34, D.G. Pavlov. Pavlov was pro-T-50 and anti-T-34, and was among those who "requested" the Kharkov design bureau begin work on an "improved" T-34 which looked more like the T-50 than anything else. Problems with early T-34s did not help their cause, and the demand grew for the new tank, the T-34M. While factory director Maksarev and the head of the Kharkov Communist Party showed what had been done to improve the new tank, a new directive dated 5 May 1941 concentrated its efforts on forcing them to focus on the T-34M. The beginning of Operation Barbarossa by the Germans on 22 June 1941 stopped the plans cold.

The Great Patriotic War and Its Aftermath

When the Germans struck on 22 June 1941, both the LKZ and KhPZ were building their new tank designs as the KV-1 Model 1941 and T-34 Model 1941 respectively. While together less than 2,000 had been completed, early results from the front indicated that they were both a shock to the Germans and more than a match for any German tank. However, Leningrad was one of the German immediate objectives, and as a result on 24 June Stalin met with Zal'tsman and Malyshev to discuss moving the Leningrad plant and its workers to Chelyabinsk in the Urals. This movement began on 23 July 1941. Some 15,000 workers and family members would eventually be moved to that city. As the German drive progressed, Kharkov was warned to prepare to move as well on 15 September 1941. While Morozov and his workers began to move to the Urals on 19 October 1941, settling in Nizhniy Tagil, the Leningraders completed their move on 10 December.

The Leningrad Kirov Factory was co-located with the Chelyabinsk Tractor Factory, which was now ordered to cease production of tractors, switch to tanks, and complete production line expansion. On 6 October 1941, the factory had been renamed the Chelyabinsk Kirov Factory to show its new function. The Kharkov plant did the same, collocating with the Ural Railway Carriage Factory or "*Vagonka*," which was located in Nizhniy Tagil. While the Chelyabinsk plant would call itself "Tankograd" — literally "Tank City" — the *Vagonka* would go on to become the largest tank factory in the world.

Kotin was still trying to eliminate the pesky T-34 from production, but it did not take long before the grandiose over-estimation of the KV-1 began to catch up with it. While numerous reports of KV-1s dying bravely as insurmountable pill-boxes were received, the real problem was the poor overall design of the tank, its low mechanical reliability, and its use of obsolete concepts. A KV-1 Model 1941 sent to the US in 1942 for evaluation was found to be using a 20-year-old American Holt (Caterpillar) transmission design. This transmission was the main stumbling block of the KV-1, and there was some truth to rumors of Soviet drivers having to shift gears with a hand sledge.

Interviews with commanders in the field were even more damning. Kotin was now a major general of technical services (based on his position, not achievement) and when a fact-finding tour visited the front, only senior commanders and certified heroes (who were too valuable as propaganda material) were totally honest on what a dog the KV-1 really was. It was too heavy, too unreliable, and carried no better fire-power than the T-34. The reports on the T-34 were ecstatic, and Kotin's ears burned to hear them heap praise on the hated rival tank. However, Malyshev was there too, and he was the one who would orchestrate production of the T-34.

While the KV was only produced — slowly — at Chelyabinsk, the T-34 was in production at Kharkov (later Nizhniy Tagil) and Stalingrad, and then plants were quickly added in Gor'kiy ("Krasnoye Sormovo"), and later in Omsk. What must have really stung Kotin was that even Chelyabinsk switched part of its production to the T-34 design in 1942-43. Eventually 61,000 T-34s would be built; KV production of all models was around 4,500.

In early 1942, the Chelyabinsk and Vagonka plants were given permission to develop new designs which would bring in a new generation of tanks. The new designs, called KV-13 and T-43 respectively, were quite different. The KV-13 was Kotin's fourth attempt to kill the T-34 (the push for the KV over the T-32, the T-50, the T-34M project, and lastly, the KV-13) as the major Soviet tank. It was an effort to produce a heavy tank using the parameters of a medium; it was a compact KV which would be able

changed to the 122mm D-25T tank gun. While Kotin's team finally had produced a competent heavy tank, he took little joy in it, as it was only an afterthought compared to the sleek T-34. Early models of the IS-2 used the extra cast bow sections from the KV-13 which Kotin had ordered up in anticipation of production, so it is probable that the IS-2 only reminded him of what he could not do.

Morozov did not waste time either, and while the excellent T-34-85 went into large-scale production in February 1944, he began to work on a new tank based on the T-34. This tank was a refined version of its predecessor, using a modified design from the T-34-85 turret and a new flat hull less than a meter thick. This tank, the T-44, emerged from development in late 1944, but was not reliable enough to enter production until the war was over. A more refined version, the T-54, began planning at the same time and was scheduled to begin prototype testing on 1 January 1945.

Four Plants and Four Wills

Thus, when the war ended in 1945, there were four main tank plants in the USSR: Leningrad Kirov works, Chelyabinsk, Nizhniy Tagil, and Kharkov. A fifth plant in Omsk was returned to the Leningrad group as an affiliate plant. This was staffed by personnel from Leningrad who had not been moved to Chelyabinsk, but this plant became controlled by Kotin's bureau and had no basic offerings of its own until the late 1990s.

The first fireworks came between Leningrad and Chelyabinsk before the war was even over, and the fight was over the IS-3 tank design. Tank designs were given factory designators early in the war, based on their working drawing sets, and referred to by the Soviets as "Objects" and a three digit number. The T-34 was "Object 135," the T-44 "Object 136," and the IS-2 was "Object 240." Each factory had a different index number system. Nizhniy Tagil got 1XX numbers, Leningrad Kirov 2XX, Kharkov 4XX, and Chelyabinsk 7XX. Both Leningrad and Chelyabinsk produced designs for the IS-3. The Leningrad design, Object 244, called the IS-3, was a very flat design with a "chopped" IS-2 turret and three steeply angled plates in the bow. It had a notched lower hull to allow more weight to be placed up high as thicker armor protection. The Chelyabinsk tank, Object 703 or the *Pobeda* (Victory) tank, was a very smooth redesign of the IS-2; it used the lower chassis pan of the proven IS design but with a smoothly flowing cast upper hull and a "frying pan" turret with no shot traps whatsoever.

Fights broke out between the design teams, and finally Malyshev "pulled rank" and sorted the problem out. The new tank would use the Chelyabinsk turret and the Leningrad hull; it would be called the IS-3, but the factory index would be Object 703. The IS-3 went into limited production in 1945, with 52 of the new tanks presented at the Berlin Allied Victory Parade in September 1945 and stunning Western observers.

But a tank designed by a committee is just that, and the IS-3 was a dog. The crews hated it for being too cramped, and while the Chelyabinsk turret was ballistically excellent, if a tight squeeze, the Leningrad hull design was flimsy and prone to breaking welds and engine mounts. At one point, tanks were taken straight off the production line in Chelyabinsk and



The T-34-85, with its 85mm cannon, went into production in 1944. The strength of the T-34 design allowed a weight increase of 23 percent without reduced effectiveness.

to best the T-34 and replace it as a "universal" tank. The T-43 was a departure from the past, with a new layout and concept. Dropping the Christie suspension, Morozov's team used torsion bar suspension and a transverse engine mount with a new transmission and final drive arrangement. Both tanks were tested by a state commission, and both were rejected. The KV-13 was found to offer no material advantage over the T-34, and the T-43 was also declined for the same reason. Kotin was crushed, and would often go to the factory warehouse and gaze longingly at the sole preserved KV-13 prototype.

Both factories continued to modify their products, albeit with diminishing returns from the KV-1. Finally, a new team, led by Nikolai Shashmurin, a truly talented designer working for Kotin, began to work on the problem. First, Shashmurin redesigned much of the KV-1 and produced the lighter and more functional KV-1s variant. He then designed a heavy tank with the most powerful gun installed in a production tank during the entire war — the IS. First offered with an 85mm weapon in 1943, when the T-34 upgraded to the 85mm gun as the T-34-85, the IS

At the same time, the Chelyabinsk plant began planning two new heavy tanks, the IS-3 and IS-7. While preliminary planning began, with the lifting of the siege of Leningrad and the recapture of Kharkov, both the original factories began to move back to their previous locations. Kotin immediately returned to Leningrad, but Zal'tsman stayed in Chelyabinsk, with Nikolai Dukhov remaining as the new chief designer at the Chelyabinsk plant. His deputy was M.F. Balzhi.



The IS-3M, with a 122mm cannon, saw some use late in WWII. The appearance of 52 of them in the Berlin victory parade in 1945 greatly impressed the Western Allies.

shipped to Leningrad for a complete depot rebuilding. It took at least three known rebuilding programs until the IS-3 was deemed satisfactory in 1959, but by that time it was obsolete.

Kotin did what he could to cripple the Chelyabinsk design team, moving key personnel and preventing them from acquiring others with good experience in tank design. Still, Chelyabinsk designed and produced the 60 metric ton IS-4 tank on its own in 1948-49, while the IS-5, IS-6, and IS-7 tank designs from Leningrad went nowhere. Admittedly the IS-4 only had a run of around 250 tanks, but it was better than the handful of prototypes coming out of Leningrad, and it did go into production.

The breaking point came in the late 1940s. The State published a requirement for a new heavy tank, and both Leningrad and Chelyabinsk moved to answer the requirement. The only limit was that the new tank could not weigh more than 50 metric tons. Leningrad proposed its model, apparently called Object 262 or IS-8, which was little more than a warmed-over IS-3 design. Chelyabinsk proposed Object 730, which was based on a Chelyabinsk design similar to their original Object 703 proposal. Zal'tsman was not impressed with either concept, as the State order was apparently for the next step beyond the IS-3, and this was little better. Kotin wanted the Leningrad design put forward, and Zal'tsman appeared to be dragging his feet.

Like the unfortunate Ivanov in 1937, suddenly the Party reared its head. In the midst of all this, Zal'tsman was conveniently denounced in 1950 for bribery and the "cult of personality." This was manifested by sending expensive gifts to minor party officials — Zal'tsman's friends — and not sending a present to Stalin on his 70th birthday in December 1949 which was deemed worthy of his stature. Zal'tsman was hauled to Moscow to defend himself — which he did with some success — but he wound up stripped of his position and sent to take over a tiny factory in the hinterlands producing track links for tanks. Kotin's design was later accepted for production as the IS-10, but by that time, it was late 1953 and Stalin was dead. The new tank was built as the more politically astute T-10.

Morozov and the rest of the old Kharkov team split up soon after the end of the war, when many of them returned to Kharkov to set up shop as Factory No. 75. The remainder stayed in Nizhniy

Tagil, with Morozov himself staying until the late 1940s before returning home.

In December 1949, another talented designer arrived at the *Vagonka*. Leontiy Kartsev was soon promoted, and when the Kharkov design team completed its return to that city in 1953, Kartsev was named the Chief Designer of the UVZ tank design bureau. Kartsev, a pragmatic, thoughtful, and blunt man, was a good choice for running the team. However, Kartsev was often running into problems with the Party, and it was only due to his skill and talent that he managed to avoid



The T-54 was Aleksandr Morozov's last product at the Nizhniy Tagil tank plant. Its revolutionary features included a transverse engine mounting, a powerful 100mm gun, torsion bar suspension, and hemispherical turret. Morozov, at right, carried on a life-long rivalry with Koshkin, the T-34's designer.



joining many talented Soviet designers over the years in either the GULAG or at the wall.

1953-1958: The Doldrums

Between Stalin's death in 1953 and the ascension of Nikita S. Khrushchev in 1958, very little real activity occurred in what were now four separate tank design bureaus. Most work in that time frame appears to have been of the "full employment" variety, to keep plants busy while contemplating their next steps. However, while Chelyabinsk remained feisty as long as they produced tanks, Chelyabinsk chief designer Dukhov knew better than to cross Zhosif Kotin, so in essence there were really only three bureaus.

The major changes in Soviet tanks in those years had been not new designs, but technological upgrades and improvements. They introduced their first single-axis stabilizers in 1956 and then two-axis stabilizers in 1957. At the same time, night fighting began to rise in priority, and new sights with IR capabilities

and IR searchlights were fitted to the tanks.

Morozov's last product in Nizhniy Tagil was the T-54, which was a clean break from the past. Entering major series production in 1951, this tank used a transverse engine (worked on since the days of the T-34M), torsion bar suspension, and a powerful 100mm gun in a low-slung hull with a hemispherical turret, far superior to the rehashed IS-3 which was the T-10. But he was still haunted by the fact that Koshkin, not Morozov, was the architect of victory

with the T-34, and wanted to make a tank so unique no one would question its superiority. He turned over his chores at the *Vagonka* to Kartsev.

Like all other designers before him, Kartsev was not pleased with another's designs, and he did not like the T-54. One of the first projects he did was Object 140. This, called T-54M around the factory, used a new six road wheel arrangement with torsion bar suspension and three return rollers, all running on a new rubber bushed single-pin "live" track, which was a major departure from the past Soviet tank designs. However, while the tank was promising, it offered nothing but higher cost over the incumbent T-54 designs then in production at Nizhniy Tagil.

Kartsev then looked at all the incremental changes which were offered for the T-54 series tanks, and decided rather than piecemeal them into the tanks — the T-54, T-54A and T-54B were all current models, and he could see a T-54V, T-54G, T-54D and others coming, which caused unnecessary headaches in the maintenance and rear services units.

Kartsev called his designers together, asked them to merge all the good ideas and changes in one tank, and produce what was essentially a new tank which combined all incremental advances. The result, Object 155, was a refined tank and much better than its parent. On 1 January 1958, it entered full production under the service designator T-55. Its one glaring oversight — corrected twelve years later — was that it did not retain the anti-aircraft machine gun for the loader which was found on the T-54.

The LKZ spent most of those years arguing among itself and with Chelyabinsk over the less than impressive T-10 family. While a T-10A with single axis stabilizer went into production in 1956 and the T-10B with two-axis stabilizer and IR equipment in 1957, the next model, the T-10M, found itself in the unhappy position of being produced under two designators in two places at the same time, and with incompatible parts. The Kirov works produced the tank as Object 272, and the Chelyabinsk plant produced it as Object 734. The Kirov design was not finally accepted as “the” T-10M until 1962.

The T-64

In 1955, Aleksandr Morozov was still eaten at by the fact that he had not been the sole creator of the T-34. He had managed to use his influence to get the names of Koshkin and Kucherenko (the other name officially credited with creating the T-34) removed from all of the histories and documents relating to the tank outside of the classified state archives, but still knew it was not his tank. While good, the T-54 was not a world beater like the T-34, and the fact that Kartsev had turned it into the more successful T-55 design was also not a boost to his ego. Therefore, Morozov gathered his designers around him, and told them he intended to produce a radical new tank which would be superior to anything on the battlefield.

The choice of gun was initially a hypervelocity 100mm gun; later, in the early 1960s, they changed to the new 115mm gun which was undergoing testing. Nizhniy Tagil later used these weapons in their prototypes Object 165 (100mm) and Object 166 (115mm) respectively. The latter was an incremental development of the T-55 which eventually entered production in 1962 as the T-62 tank. But what Morozov wanted was a more thorough departure than the *Vagonka* designs, which were only based on modified T-55 chassis.



The innovative T-64 was powered by a 5-cylinder flat, opposed-piston engine, used an autoloader in lieu of a fourth crewman, and mounted a 125mm gun that was the largest tank cannon in common use at the time. Reliability suffered with all these innovations.

The new tank was a very compact machine, with only a three-man crew and a full-up weight of 36 metric tons. The reason for the three-man crew was the use of an autoloader for the main gun. The hull was very small and very flat — the glacis was sloped at a 68 degree angle on top and 52 degrees below — and the tank used a new design of engine. The engine, a five-cylinder flat engine using an opposed piston design (effectively a flat 10), was called the 5TD and was similar in many ways to a Fairbanks Morse diesel used in railroad engines provided under Lend Lease. It was light and powerful. The tank used lightweight, internally bushed steel wheels with a lightweight steel alloy double-pin “live” track.

The first test model, called Object 430, appeared about 1960. It mounted the 100mm hypervelocity gun. However, due to some problems, and the fact that the British introduced the famous 105mm L7 gun in that time frame, the design was sent back to be redesigned around the 115mm D-68 gun.

The D-68 was similar to the U-5TS in Object 166, now adopted for service in a panic as the T-62, but used combustible case separate loading ammunition which fit in its autoloader. This tank was given a short test period, and Khrushchev ordered it accepted for service as the T-64 in 1962. However, like the T-34 before it, while Morozov essentially had a world-beating tank, it had a plethora of problems. First off was an adamant opposition by senior officers, including the Chief of Tank Troops, Marshal Poluboyarov.

Low volume series production began in 1963. The T-64 suffered from too many innovations adopted too fast. The 5TD engine was notoriously unreliable, and nearly impossible to start in cold weather. The tank was very cramped inside, and the crews did not like the absence of a fourth crew member when maintaining the tank. Lastly, the D-68 gun was highly unreliable, with the exposed autoloader gaining a bad reputa-

tion for grabbing the uniforms of the hapless gunner and commander and stuffing them into the breech. Only a limited number of these tanks were built, and they appear to have been sent to the Far East for long term testing. In December 1967, Morozov retired, and was replaced by N.A. Sholin. Kartsev had been offered the job — no hard feelings — but refused; he liked running things in Nizhniy Tagil, and also had a sickly daughter he did not wish to move.

A vastly improved model, Object 434, appeared in 1969. This used an improved 5TDF engine that was somewhat better than the 5TD, but most crews yearned for the simpler V-2 based engines. The biggest change in the tank was the replacement of the D-68 gun with the 125mm D-81 gun firing separate loading combustible case ammunition. At the time of its introduction, this was the most powerful tank gun in the world, and would remain so for twelve years. The changes were minor and the T-64A tanks weighed between 37 and 38 metric tons, depending upon production lot. It also introduced a laser rangefinder, the TPD-2-49.

These tanks almost did not get into production at all. After the Cuban Missile Crisis of 1962, Khrushchev was determined to change the face of world power and American nuclear domination once and for all. He ordered the *Oboronka* to concentrate on missiles and missile-firing weapons, and was of a mind to eliminate all tanks from the production inventory. The three major tank design bureaus had been given a warning about this in the late 1950s when he requested they examine missile-firing tanks. In 1960, Khrushchev was shown their first efforts:

Kartsev’s Object 150, a missile-firing design which used what would become the T-62 chassis and a flat turret, and which eventually was accepted as the IT-1 tank destroyer; and Kotin’s last new heavy tank design, Object 277, which caused Khrushchev to terminate all heavy tank design work.

This continued to bubble for two years, and at the height of the Cuban problem (22 October 1962) Khrushchev got to see another example of work by the three bureaus. Here Morozov showed Object 430, which he was told to convert into a missile-firing tank. Kartsev showed Object 167, which carried three 9M14 *Malyutka* (AT-3 SAGGER) missiles on a rack at the back of its turret; and Kotin showed Object 282, which was a T-10 with a pop-up missile launcher. Khrushchev roundly criticized all three, but only Kartsev stood up to him and argued back that the army still needed tanks. Morozov went back and worked on two antitank missile-armed versions of Object 430, Kartsev did some more on Object 150, but Kotin was told in no uncertain terms that the production of any more heavy tanks would not be tolerated. That the T-10 remained in production until 1966 is a mark of Kotin's ability to circumvent even the Premier as well as his lack of acumen when it came to future vision.

All was essentially reversed when Khrushchev fell from power in 1964, but the grounds had been laid for developing tanks which could also fire missiles through their main guns.

The T-72

In 1967, the U.S. Army was actively engaged in Vietnam, the Middle East was smarting from the results of the Six-Day War, India and Pakistan were only two years past their last major clash of arms, and the Soviet Red Army had only a handful of new tanks to face what they deemed Third Generation NATO tanks — the Leopard 1, AMX-30, M60A1, and Chieftain. As a result, GABTU sent a team with a T-64A prototype to Nizhniy Tagil and presented Kartsev with the task of finding a way to build a cheaper, simpler, and more reliable T-64.

Kartsev accepted the task, but did not like any of the major innovations of the T-64 design. While Morozov had been developing the T-64, Nizhniy Tagil had been working on a successor tank to the T-62. This tank, called Object 167, used the Object 140 running gear on a T-62 chassis and in its developed version, a V-26 engine, which was a 700 HP version of the reliable V-2 design. Later, it added a launcher for three 9M14 missiles to increase its direct engagement range from 1,700 meters to over 3,000. A final variant used two 350 SHP helicopter turbines linked together to test the feasibility of turbine power in a tank. None of

the designs were accepted for production.

Another design saw an upgrade to the T-62. This tank used the 125mm D-81 gun with a totally new model of auto-loader. Whereas the Kharkov design used a fork which selected the correct munition by index, placed both projectile and charge in a line, and then loaded them, the *Vagonka* design was more elegant, simple, and safer. Kartsev's team used a cassette and a chain hoist and rammer, in which the charge was located in the top slot of the two-section cassette and the projectile in the bottom. The hoist pulled up the selected cassette, loaded the projectile, dropped, loaded the charge, and then dropped the cassette back into the floor carousel. The only drawback was that, unlike the T-64's recovery of the "puck" from the expended round, the UVZ design had a port and ejected the "puck" out of the back of the turret. This compromised its NBC protection, but was simple and reliable.

Kartsev decided to simply borrow the best ideas from the T-64A and the best ideas which had not gone into production from Object 167 and the T-62/D-81 project. The result, which was still called a modified T-64A, had the Object 140/Object 167 suspension on a hull which used the sharply angled glacis and driver's position from the T-64A and little else. The complete T-62/D-81 turret and autoloader were used. The new tank also used a V-45 engine, another V-2 offshoot, producing 780 HP. This tank was readied on 10 January 1968, and received the interim index number Object 172.

When GABTU found out what Kartsev had done, they were furious and severely reprimanded him five days later for not following instructions. Still, this design showed promise, as it used proven technology and did seem that it would be cheaper and easier to produce and operate than the T-64. Kartsev was given permission to proceed with his design. However, in the meantime, I.V. Okuneyev, the factory director of the *Vagonka*, retired and was replaced by one of Kotin's cronies, I.F. Krutyakov. Krutyakov immediately tried to quash the design, calling it a "strategic mistake," as he wanted to make the UVZ subservient to Leningrad and Kotin. Kartsev, who by now had a lot of political clout and was well respected by the Party hierarchy, blistered his ears with a stinging rebuke and forced Krutyakov into insignificance.

However, Kartsev's daughter was getting worse, and he retired in August 1969. V.I. Venediktov, his assistant and lead designer of Object 172, took over as chief designer. After a total of five years of tests, nearly all of which Object 172 passed with flying colors, it was accepted for service as the T-72.

The T-80

By 1974, GABTU was stuck with a problem. They had the T-64A in production, but it was still a handful and somewhat unreliable. The T-72 was going strong, and export models, dubbed T-72M, were being readied for sale and production abroad. But new Fourth Generation U.S. and German tank designs, the XM-1 and Leopard 2, were now undergoing preliminary testing, and the Soviet Union did not have a corresponding tank design. The T-64 was seen as too idiosyncratic, and the T-72 too conventional and old-fashioned. Thus, they turned to the Leningrad Kirov Factory and asked them to produce an advanced version of the T-72.

The design bureau in Leningrad had also seen Kotin retire from the design bureau and the reins handed over to Nikolai S. Popov in 1968. Kotin still held a great deal of influence, and could pull strings when he needed to "adjust" things. Popov had some experience with turbine engines, and he felt that a turbine, as was being tested in the Chrysler version of the XM-1, was the way of the future.

Turbines had been tested nearly twelve years earlier by the LKZ. The *Vagonka* had built a turbine-powered version of Object 167, called Object 167T, and reported the results of their test to Khrushchev in April 1964. The assessment had been that, even using relatively economical helicopter turbine engines, the problems with cold weather starting and fuel expenditure were not worth the reduced weight and increased power the turbine offered.

Still, Popov and his team felt they could do better than both Kharkov and Nizhniy Tagil, and like Kartsev and Object 172, after testing a turbine in a T-72 chassis under the index number Object 219, they designed another tank chassis, using the best elements of the T-72 (hull layout and suspension system) and replacing all the rest. The new tank, called Object 219RD, used a modified turret design based on the T-64A and its auto-loader. This tank was used to develop

Tank Production: Factory Utilization 1939 – 1993

Year	Factory No. 75*	Factory No. 183**	Factory No. 174***	Factory No.185****
1939	V-2 engines	T-34 Model 1940	T-26	KV-1 Model 1940
1940	V-2 engines	T-34 Model 1940	T-50	KV-1 Model 1940
1941	V-2 engines	T-34 Model 1941	T-50	KV-1 Model 1941
1942		T-34 Model 1942		KV-1 Model 1942
1943		T-34 Model 1943		KV-1 Model 1943, KV-1s, T-34 Model 1943
1944		T-34 Model 1943, T-34-85 Model 1945		IS-2
1945		T-34-85 Model 1945	ISU-152	IS-2m, IS-3
1946		T-34-85 Model 1945, T-44	ISU-152	IS-3
1947		T-44, T-54 Model 1947	IS-3	IS-3, IS-4
1948		T-54 Model 1947	IS-3	IS-3
1949		T-54 Model 1949		
1950		T-54 Model 1949		
1951		T-54 Model 1951		
1952		T-54 Model 1951		
1953		T-54 Model 1951	T-10	T-10
1954		T-54 Model 1951	T-10	T-10
1955	Object 430	T-54A	T-10	T-10
1956	Object 430	T-54A	T-10A	T-10A
1957	Object 430	T-54B	T-10B	T-10B
1958	Object 430	T-54B, T-55	T-10M	T-10M
1959	Object 430	T-54B, T-55	T-10M	T-10M
1960	Object 432	T-55	T-10M	T-10M
1961	Object 432	T-55	T-10M	T-10M
1962	Object 432	T-55, T-62	T-10M	T-10M
1963	T-64	T-55A, T-62	T-10M	
1964	T-64	T-55A, T-62	T-10M	
1965	T-64	T-55A, T-62	T-10M	
1966	T-64	T-55A, T-62	T-10M	
1967	T-64	T-55A, T-62		
1968	T-64	T-55A, T-62		
1969	T-64A	T-55A, T-62, Object 172		
1970	T-64A	T-55A, T-62, Object 172		
1971	T-64A	T-55A, T-62, Object 172		
1972	T-64A	T-55A, T-72		
1973	T-64A	T-55A, T-72	Object 219***	Object 219****
1974	T-64A	T-55A, T-72	Object 219	Object 219
1975	T-64A	T-55A, T-72	Object 219	Object 219
1976	T-64B	T-55A, T-72	T-80	T-80
1977	T-64B	T-55A, T-72	T-80	T-80
1978	T-64B	T-55A, T-72	T-80B	T-80B
1979	T-64B	T-55A, T-72A	T-80B	T-80B
1980	T-64B	T-72A	T-80B	T-80B
1981	T-64B	T-72A	T-80B	T-80B
1982	T-64B	T-72A	T-80B	T-80B
1983	T-64BV	T-72A	T-80BV	T-80BV
1984	T-64BV	T-72A	T-80BV	T-80BV
1985	T-64BV	T-72A	T-80U	T-80U
1986		T-72B	T-80U	T-80U
1987	T-80UD	T-72B	T-80U	T-80U
1988	T-80UD	T-72BM	T-80U	T-80U
1989	T-80UD	T-72BM	T-80U	T-80U
1990		T-72BM	T-80U	T-80U
1991		T-90	T-80U	T-80U
1992		T-90	T-80U	T-80U
1993	T-84	T-90	T-80UM	T-80UM

The tanks listed are the main production items at those factories in those years. In the years which are blank, the factories did upgrades and depot level rebuilding of earlier production items.

Notes on the factories

* This plant produced engines until it moved out of Kharkov; on its return, was reformed and given a tank production mission; renamed the "Malyshev" plant on his death in 1957

** This factory was moved to Nizhniy Tagil in 1941 and kept the same designator when it stayed after the war

*** This factory was in Chkalov and used as the core of the reformed Leningrad tank industry in 1945; lost its production tasks in the late 1980s and all current production is performed in Omsk

**** Originally in Leningrad, moved to Chelyabinsk in 1941 and moved to Omsk after 1962

Object 219-2, which was accepted for service in 1976 as the T-80.

But the T-80 had problems, and a T-80B model appeared two years later. Early models had an extremely unreliable and thirsty GTD-1000 turbine engine, which to the dismay of troop commanders, showed itself incapable of moving the tank more than 285 kilometers on highways, even with auxiliary fuel tanks. Any other Soviet tank of the day, like its two competitors, could go from 500 to 700 kilometers on a single fueling. As a result, the very early T-80B tanks came with mounts for three 200 liter auxiliary fuel tanks (two over the rear track flaps and one on the top center of the engine deck).

The Brezhnev Doctrine and Further Developments

After 1979, things began to go downhill for the USSR. Leonid Brezhnev, in a classic example of what the Soviets constantly derided as "adventurism," began direct, overt intervention into Afghanistan, heightening tensions with the West. NATO deployed more tanks to Europe, and new ones to boot — the M1, followed by the M1 IP and M1A1; the Leopard 1A4 and Leopard 2 series; and the late model Chieftain with Stillbrew package and Challenger.

The Soviets became trapped by their own politics. The three factories, all with powerful friends in the Politburo and thousands of workers that had to be kept busy and continued unchecked. New models, aimed not so much at improving the tank park as "one-upmanship" over the other two rivals, appeared at regular intervals. The T-64B, now with the 9M112 *Kobra* (AT-8 SONGSTER) through-the-bore launched ATGM, appeared in 1979; due to shared parts and components, the T-80B picked this feature up shortly afterward. In 1983, the T-64B, T-72A, and T-80B all began to receive reactive armor suites. This came about after the fortuitous 1982 Syrian capture of an Israeli M48 with "Blazer" proved its viability. In 1985, the T-72B and T-80U appeared. Both of them now mounted the 9M119 (AT-11 SNIPER) ATGM system, which used a laser beam riding system rather than the radio command guidance of the 9M112. The T-64, which had run its course, ceased production.

Continued on Page 45

WHY THREE TANKS? *Continued from Page 29*

The T-64 series was essentially terminated in 1985, other than rebuilding of older models as T-64Rs (the R stood for “remontirniy” or rebuilt). The Morozov bureau (now under Sholin) started work on an as yet undisclosed tank prototype called “Molot” (the Hammer). They also put the definitive T-64 family engine, a six cylinder (twelve piston) engine called the 6TDF and producing 1,000 HP, in a modified T-80U chassis and produced the T-80UD in 1987. Leningrad and Nizhniy Tagil continued their upgrade battle. In 1988, the *Vagonka* announced

But tradition continues. In 1997, at an arms display in Omsk, the Omsk tank factory displayed a number of their products, including a new version of the T-80 called the “Black Eagle.” This appeared to use a new turret with a bustle mounted autoloader, which corrects the one fatal flaw of the T-80: when the fighting compartment is penetrated by a projectile, the ammunition detonates and blows the tank apart. This appeared to have some sort of blow-off plate arrangement like that found on the M1A1. And, in Russian tradition, it was done without the knowledge or approval of the Popov bureau in Saint Petersburg.

Conclusions

The Russians have always placed great stock in the “cult of personality.” It was essentially due to that feature of their national personality, plus the sheer power of the *Oboronka*, that three tanks with nearly identical combat capabilities were in production at the same time. However, when compared with Soviet thinking and their artificially generated Military Science, only the T-72 really stands out as the tank which met all their requirements

and needs.

Soviet thinking on tanks was that, while they had to fully flesh out the three qualities of a tank — protection, mobility, and firepower — they also had to be simple, reliable, and capable of moving long distances under their own power. The T-64, which was a true quantum leap forward in tank design in 1962, proved to be too troublesome and difficult to maintain. While the tank never saw combat, its legacy — the awkward autoloader device — was cited by authorities such as Colonel General Sergei Mayev and Colonel General Aleksandr Galkin as being indirectly responsible for the massive destruction among T-80 tanks sent into Chechnya.

The autoloaders in both tanks were quite similar, and extrapolation would show that the T-64 would have been as vulnerable to penetration of the fighting compartment as the T-80 was.

The T-72 was a hybrid; for it combined the best of the past with the best of the new. Its autoloader was not as vulnerable or dangerous, and the tank was far more

mechanically reliable and faithful. However, the T-72 garnered its own share of problems in the Gulf War, as the less capable T-72M and T-72M1 tanks were easily destroyed by first-line US and UK tanks.⁴ This is one of the main reasons that the last model, the T-72BM, was hastily redesignated the T-90 to try and shake off the stigma from Iraq.

The T-80, initially thought to be a world-beating tank, has proven itself to be a dog in service. Still plagued with low mileage — even the most current advertisements for T-80UM do not claim more than about 485 kilometers road range, including the auxiliary tanks — the T-80 was shown in combat to suffer from the problems that Kartsev warned them about in 1964. The tanks burn nearly as much fuel at idle as they do at road speeds, and as a result most of the tanks which made the attack on Grozny on New Year’s Eve 1994 ran out of fuel while awaiting assignments. The Chechens then simply picked them off. While current models have an onboard 18 kW generator set, the ones used in Chechnya were the same T-80BV tanks which once worried commanders in Germany when they sat across the border in the Thuringerwald.

There have been some signs that the Russians are trying to fix the problem which the *Oboronka* left them, and are planning to settle on only one tank for the future. But the squabbling still persists as to whose tank it will be, and whose philosophy will be dominant. The fight today is between “*parketniye generali*” — the armchair generals in Moscow, so named because of the elegant parquet flooring in their offices — who still dream of sweeping across Germany to the English Channel on fleets of tanks, and the reformers, who want first-rate weapons for the scores of local conflicts and regional wars which they see as more likely in the future.

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The T-80 designers unsuccessfully adopted a turbine engine, dropped later for unreliability and poor fuel economy. It also shared the T-72’s autoloader, a major vulnerability.

the T-72BM, using a new generation of reactive armor called “Kontakt-5” and with the first elements of a self-protection system called “Shtora.” This tank was offered for sale abroad. However, due to the poor performance of the export T-72M and T-72M1 tanks in Iraqi hands during 1991, they found no market for their tanks abroad.

They found no market for them at home either. In 1989, when the Berlin Wall came down and the Soviet Union began to break apart, all orders for tank production came to a sudden end. Undaunted, both Leningrad (now producing its tanks in Omsk, as the Leningrad Kirov Factory was now just the “home office” and not a production center) and Nizhniy Tagil continued to produce tanks under the philosophy, “if we built it, they will buy it for the Army.” No longer. The Omsk-produced T-80UM and T-80UK, both which were announced in 1992, have yet to find a buyer. The reborn T-72BM, now called the T-90 or T-90S as an export tank, appeared in 1990 and has likewise found no market yet.

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Notes

¹The Soviets saw tank generations in this manner: 1920-1945, first generation; 1946-1960, second generation; 1961-1980, third generation; and 1981-present, fourth generation. Since the last really new tank design, the T-80, came out in 1976, they feel that they have not produced a true Fourth Generation Tank Design. In comparison, they count the M1, Challenger, and Leopard 2 as Fourth Generation and the LeClerc as Fifth Generation.

²This number reported by Colonel General Dmitriy Volkogonov soon after the breakup of the Union.

³All Soviet-era military equipment went through five developmental stages: conceptual design work, prototype construction work, factory testing, service testing, and series production. The KV was accepted after Step 2.

⁴A recent study pointed out that the T-72 export models, of which eight different ones were produced, were to be made using alternative materials, and not the first-rate materials in the Soviet domestic models. Reports in Russian press articles seem to indicate that the tanks used in Chechnya, T-72A models, were far more survivable than once thought.

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