

Red Star – White Elephant?

Were the IS-3 and T-10 Series Soviet Tanks the Monsters They Seemed in the 1950s?

Not According to Russian Sources...

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One of the eternal symbols of the Cold War in the 1950s was the annual Moscow “October Revolution” Parade, in which hundreds of tanks and armored vehicles would thunder across Red Square every November. Western intelligence scanned for new weapons to be introduced, and high on the list for many years was the IS-3 “Joseph Stalin” series of tanks, ending with the T-10M in the early 1960s. To many people, no other weapon personified the “Evil Empire” and its domination of Eastern Europe than these monstrous tanks. As a point of fact, both the U.S. and the U.K. created and fielded their own heavy tanks specifically to combat these monsters.

But were they really the threat that they seemed? One joy of an open society is open archives, which permit access to a different picture of reality than that once accepted as fact. The archival view of these monsters today is that they were enormously clumsy and disappointing clunkers, armed with obsolete guns and ineffective fire control systems that were marginal at best. Worst of all, more than 10,000 of these heavy tanks were built at enormous cost. Only a small percentage of that number ever found their way into units, and most lived out their lives rusting in Siberian storage depots.

In the land of the “new Socialist man,” how could this happen? As with all things Soviet, in a word: politics. The same machinations that nearly killed the T-34 before WWII were still present after the war and, mixed with the volatile atmosphere of the Khrushchev era, made for some nasty infighting within the Soviet military hierarchy.¹ But while the Kotin Bureau pushed the heavy tank philosophy, the Morozov Bureau fielded its T-54 tank, the Kartsev Bureau refined that into the T-55 and T-62, and the Morozov Bureau finished with the T-64, a true breakthrough in conceptual armor thinking, which spawned the T-72 and T-80.

Background: The Soviet Love Affair with Heavy Tanks

The Soviets were far in advance of the world in the 1930s in the area of armored vehicle design and conceptualization, and in many areas were superior to the Germans in planning for their employment on the battlefield. By the late 1930s, the Soviets determined the following tank types were required:

- Light scouting tanks, preferably amphibious.
- Light fast tanks, capable of rapidly exploiting a breakthrough.



- Light-medium “infantry escort” tanks, mounting a useful gun and moving with the infantry to eliminate nodes of enemy resistance.
- Medium tanks, capable of dealing with enemy resistance and troops under cover.
- Very heavy tanks used for breaking through into the enemy’s rear areas.

To that end, they went from having only one tank design bureau in 1929 to four by 1937. However, there were really only two controlling minds: Zho-sif Ya. Kotin controlled Factories No. 100, 174, and 185 in Leningrad and Mikhail I. Koshkin Factory No. 183 in Khar’kov.

Until the arrival of Koshkin, tank designs were created in Leningrad and sent to other factories, such as Factory No. 183, for production. This had been the case with the ill-starred T-24 medium and the overblown T-35 very heavy tank.

Kotin placed his hopes in intimidating “flagship” tanks that could easily crush the enemy. His bureaus produced the 25 metric ton T-28, a bulky three-turreted medium marred with thin armor. The 54 metric ton T-35 was even worse, possessing the same level of armor protection, but now five turrets and a crew of 11 to 14; fortunately for the Soviets, only two regiments’ worth (61) were built. Undeterred, in 1937 Kotin held a competition between his



This KV-1 Model 1941, has a cast turret and main gun similar to the F-34 gun of the T-34/76 tank. Mechanical failures took more of a toll than the enemy, and many were abandoned due to lack of repair time.



design bureaus in Factories No. 100 and No. 174. Each was to create a new very heavy tank, mounting two 45mm antitank guns and one 76mm cannon. In 1938, each bureau presented their design to Stalin. In the infamous meeting, he laughingly dismissed the designs as “Department store tanks, with a gun for every occasion.” He broke off a turret from one model and suggested they try it that way.

The two bureaus then produced nearly identical tank designs: the T-100 from the Factory No. 100 team, and the SMK from Factory No. 174 (for Sergey M. Kirov, the man for whom the factory was named). Both were long, boxy, and carried two turrets in two tiers, a lower turret with a 45mm gun and a machine gun and an upper turret with a short-barreled 76mm gun and another machine gun. Neither made it past the prototype stage; however, both were used during the Finnish War of 1939-1940.

The only prewar Kotin tank that made it into service, with help from its namesake and Kotin’s father-in-law, Kliment Voroshilov, was the single-turreted KV heavy tank. It was a more conventional design weighing 47 metric tons and carrying three 7.62mm machine guns and a 76mm cannon. In fact, it was ordered off the drawing board; this point was later glossed over by sending the prototypes to the Karelian Isthmus for testing at the end of the Finnish War.

The developed version, the KV-1, entered production in 1940 at nearly the same time as the T-34. Both used similar guns, effective 76mm weapons capable of destroying any tank in the world at that time. But the KV-1 was clunky, using a 1920’s U.S. tractor transmission and an overstressed engine, and while it had thick armored protection, it had poor visibility and crew ergonomics, making it nearly impossible to use effectively in combat. Approximately 2,300 KV-1-series tanks were built between 1940-1942.

Once the war broke out, the KV-1 was soon revealed to be a deathtrap. Fear of angering Kotin prevented many commanders from telling him how bad the tank really was. Finally, after many senior leaders complained about its failings, Kotin ordered the problems fixed. Nikolay Shashmurin, a skilled engineer, redesigned the tank, cutting five tons and adding a new transmission. While still not perfect, it was now functional, and the final production run of KV tanks (around 2,400) was built as the KV-1S (for speedy) heavy tank. A small number were built as KV-85 tanks, which mounted the turret of the IS-85 on a KV-1S chassis.

As a reward for fixing the KV, Shashmurin earned the privilege of designing its successor. His team created two new heavy tanks, the IS-1 (for Iosef Stalin) and IS-2. The IS-1 or IS-85 mounted the 85mm D-5T gun, which also equipped the T-34; the IS-2 or IS-122

mounted a modified version of the 122mm A-19 corps artillery piece as the D-25T tank gun. While the IS-1 was found to be less effective than the T-34/85, the IS-2 with the 122mm was a devastating weapon. By the time that production ended in 1945, 107 IS-1 tanks and 4,392 IS-2 tanks had been built and served with combat units.

Enter the IS-3

While the IS-2 proved itself capable of dealing with most battlefield threats the Germans presented, the old Russian adage of “better is the enemy of good enough” came into play. A group of Soviet engineers extensively studied how and why tanks were knocked out in combat, and came to the conclusion that most “kills” came in the front 60-degree arc of the vehicle. If this area could be made impenetrable to enemy shells, the tank would most likely survive anything encountered in combat. Work was authorized in the late summer of 1944 on a new tank, dubbed “Kirovets-1.”

In 1941, the three tank bureaus from Leningrad were evacuated to the Chelyabinsk Tractor Factory. There, they amalgamated to form Chelyabinsk “Kirov” Factory No. 185 or “Tankograd.” In late 1944, after Leningrad had been liberated, the old Factory No. 100 design bureau returned to the city. Thus, when Kotin decided to work on a new heavy tank, he set up a competition between the old Factory No. 100 group,

led by Kotin himself and his chief assistant A. S. Yermolayev, and the design bureau at Factory No. 185, led by N. L. Dukhov and M. F. Balzhi.

Both bureaus took different approaches to the new vehicle. Kotin's team used a turret similar to that of the IS-2 but on a radical chassis that used three heavy welded armor plates at the front to form its bow and glacis section. While the factory engineers proudly dubbed this very heavily armored section the "eagle's beak," it was called the "pike nose" by the military for its appearance, and later led to the tank's nickname — "Shchuka" (pike). This tank was given a number of interim designators, including Object 240, 240M, 244, 245, and 248.

The Dukhov team preferred castings, and came up with a radical cast hull with an even more avant-garde cast turret design that looked like an inverted frying pan. They called this tank the "Pobeda" (victory) and gave it the factory designator Object 703.

Both bureaus were convinced of the superiority of their design, so Peoples' Commissar for Tank Production V. A. Malyshev was called in to referee. He did so by compromise; the hull of the Leningrad proposal would be used for the new tank, but it would use the turret from Chelyabinsk. The tank would be dubbed the IS-3, but would retain Object 703 as its designator. However, the weight of the new tank could not exceed that of the IS-2 — 46 metric tons. This meant some redesign was required to slim down the new tank.

The designers provided two novel solutions: first, they "notched" the lower hull by cutting away the area between the suspension torsion bar mountings, filling them in with angled armored plates. While it got the weight down, this also weakened the stiffness of the hull — the Achilles' Heel of the IS-3 throughout its life. Second, to get the level of protection needed, they "folded" the upper part of the hull over to get a "keystone" shape providing extra armor protection above the fender level; this was disguised to prying enemy eyes by a flat, sloped steel plate that joined the top of the hull to the edge of the fenders.

The first Object 703 rolled out of Chelyabinsk in October 1944. Using



Above, a column of IS-2s on the Berlin Highway in the spring of 1945. The most successful of the series, the IS-2 helped to keep Soviet heavy tank production alive during the early '40s.

many internal components of the IS-2, it did not require a great deal of major changes in those parts for use on the new tank. After passing its factory, state, and troop tests, it was ordered into production in 1945.

But production ran into problems when the failings of the new tank began to surface. Thanks to the "flex" of its hull, it tended to snap hull welds and motor mounts easily. The flex also damaged the IS-2 road wheel bearings. As a result, while production roared ahead full speed, the amount of unacceptable tanks began to increase. Nevertheless, the Soviets decided to give their allies an unpleasant surprise.

At the September 7, 1945 Victory Parade in Berlin, 52 of the first production series IS-3 tanks, equipping the 71st Independent Heavy Breakthrough Tank Regiment of the 2d Guards Tank Army, formed the final unit in the parade down Charlottenburgerstrasse. While the tanks were not truly operational, they were a total shock to the thunderstruck observers on the reviewing stand. In addition, plans to send them to fight the Japanese in the Far East were shelved, because of the problems with the tanks.

Between 1945 and 1947, the Chelyabinsk Kirov Factory No. 185 built 2,311 IS-3 tanks. While IS-3 tanks were touted as the best in the world by the Soviets, and were paraded at every chance, the fact of the matter is that they were mechanically unreliable. While Western analysts raved about the ballistic shape of the turret and the seemingly invulnerable glacis, in reality the crew worked under cramped and dark conditions. Due to flexing and cracking of the hull welds and road wheel bearings that burned out all too soon, the IS-3 did not meet minimum

Soviet operational standards for reliability.

Consequently, the Soviets found themselves in the embarrassing situation of tanks rolling off the production line in Chelyabinsk onto trains to go to the factory in Leningrad for correction of their defects. Even in 1946 a committee was formed to fix the problems of what had become the flagship Soviet tank, and to prevent Western intelligence agencies from finding out how bad the tank really was. As a result, the IS-3 began a nearly continual cycle of upgrades and repairs, with every single tank receiving three major rebuilds and upgrades between 1948 and 1959.

The first major upgrade cycle took place between 1948 and 1952 as the UKN-703 project (for "Correction of Design Shortcomings in Object 703"). While the IS-3 cost R350,000 (approximately \$549,000) new, for an additional R260,000 (approximately \$408,000) per tank the Soviets added new road wheels, turret race, engine subframe mount, main clutch, oil pump, and radio. However, the additions also brought the tank's weight up to 48.5 metric tons.

Another interim change, introduced during 1953-1955, essentially focused on fixing problems with the weak and short-lived running gear of the tank.

Finally, in 1957, a full-scale upgrade program began, including more stiffening for the belly and engine mounts, new machine guns, new sights and infrared lights, a new and more reliable V-54 type engine (the same as used in the T-54 series tanks, an ironic twist), new air cleaners, a new electrical system, more new road wheels, new auxiliary fuel tanks, another new radio, and externally, new fenders and stowage bins. This time, the tank was redesignated as the IS-3M.

Militarily the IS-3 offered little more than propaganda value, as it was an embarrassment and seldom offered to Soviet allies. Poland held trials with two tanks and rejected them; later the Czechs got one and kept it for parades after it failed their trials. It was only in the 1960s that approximately 100 tanks were sold to North Korea, a small lot to China, and 120 to the Egyptians. While the Russians used the IS-3 in Hungary in 1956, losing a few to the rebels, the

only real combat use of the tank came at the hands of the Egyptians in 1967. Here they were so poorly handled that, coupled with the tank's intrinsic failings, 73 were lost.² The remaining tanks were regrouped into a single regiment, which formed a deep reserve unit during the 1973 Yom Kippur War.

The Soviets quietly converted most of those that did not serve as "hard" targets on ranges into pillboxes along the Chinese border in the 1970s and 1980s, and some still remain in service there today with machine gun artillery units in the Fortified Regions.

The IS-4: Independent Thinking

The Chelyabinsk design bureau quietly began to design another new heavy tank completely on their own, without letting Leningrad know what they were doing. They took their preliminary designs for a product-improved version of the IS-2 and developed a new heavy tank, Object 701-6. They built a prototype, catching Kotin and his team off guard.

The new tank, designed by a team headed by L. S. Troyanov, was done with the knowledge of factory manager Isaak Zal'tsman and chief designer N. L. Dukhov, but was kept out of view of VKP(b) Committee representative N. S. Patolichev (the local party stooge, who would have immediately reported it to Kotin, who would not have tolerated what he deemed a "satellite production facility" of Leningrad building their own tank designs).³

The tank improved on the IS-2, but it also weighed in at 60 metric tons, 10 tons over Stalin's explicit limit for heavy tanks. The tank was enormous and roomy, but because the only way the small V-11 series engine (520 hp) could be made to power the vehicle was to turbocharge it to 750 hp, it also required far better cooling and lower gearing to remain operational. This resulted in a loud screaming when the tank was in operation; troops joked that you could hear this tank long before it got within range of its target.

Once the matter was a fait accompli, the Soviet government formally accepted the tank for service and placed it in production in 1947 as the IS-4. However, behind the scenes, it was the other way around; Chelyabinsk produced 250 tanks between 1945 and 1946, and it was actually taken out of production in 1947.

The tank never served in the West, as it was too heavy for the bridges. Therefore the tanks were sent to the Far East and Transbaikalian Military Districts during the Korean War in case they were needed. With the end of the war, and with changes in thinking and Kotin's desire to get another new tank of his design into service, the IS-4 was pulled from units and placed in long-term storage until scrapped.

The T-10: A Bad Tank Made Worse

By 1948, the Soviets had an unhappy situation regarding heavy tanks; they had three different ones in service (IS-2, IS-3, and IS-4) sharing little except for road wheels and guns, with different levels of reliability. The IS-2s were still the most combat capable as regards functionality, but were falling behind world designs. The IS-3s were "hangar queens" that had little to recommend them, and the orphaned IS-4s were soon condemned to the east, out of sight and out of mind.

Nonplussed, Kotin stepped forward in 1948 to meet a new GBTU (Main Armored Vehicle Directorate) requirement for a heavy tank that again had to better the IS-2 but weigh no more than 50 metric tons. Kotin personally took charge of the design team and proposed his Object 730 to meet the requirement.

The new tank, unofficially designated the IS-8, was a warmed-over version of the IS-3 design. Zhosef Kotin was a firm believer in the formula that "If X is good, and X+Y is better, then X+Y+Z ought to be better still." But here the X was the IS-2 design, and X+Y the ill-starred IS-3; needless to say, X+Y+Z (IS-8) was not an improvement.

The new tank took the suspect components of the IS-3, its flimsy hull and cramped turret, and made them more extreme. The hull now sported a stamped belly plate in a shallow V shape, a larger and heavier turret, and a more heavily stressed engine. The tank replaced the coaxial 7.62mm machine gun with a 12.7mm DShK type, and another DShK was mounted on the loader's hatch ring.

The new tank offered little improvement over the IS-3. Chelyabinsk factory director Zal'tsman was not a fan of the project, which he saw as a waste of time and assets. Kotin, always a venal sort with a long memory and no sense of humor with people who did not agree with him, was not pleased.

There appears to be a direct relationship between Zal'tsman's attempts to stop the IS-8 project and his abrupt denouncement to the NKVD. Zal'tsman was removed from his position and brought to Moscow for questioning. Zal'tsman avoided imprisonment and execution, but was removed from Chelyabinsk and sent to run a small factory that made track shoes. Immediately after his departure, and with a Kotin crony firmly in charge of the plant, the IS-8 program continued.

The IS-8 design underwent two massive revisions before it was ready for production in 1952 as the IS-10, but after Stalin died in March 1953, the tank design was quietly redesignated the T-10 and ordered into production on November 28, 1953.

By 1953, there were no strong advocates of heavy tanks in the Ministry of Defense. The minister at the time, N.A. Bulganin, was more politician than combat leader, and apparently saw no benefit from the new tank. Likewise, Chief of the General Staff V. D. Sokolovskiy, an infantryman, was not interested in the differences between heavy and medium tanks. The T-10 had even more problems than its predecessor, the IS-3, and was placed in very low-rate production based on the hope that, if they solved the problems with the IS-3, the T-10 could be produced without the same flaws.

In the mid-1950s, a movement began to fit Soviet tanks with stabilizers, permitting them to fight on the move. Military theoreticians were now looking at concepts found in the West, and figured that tanks that had to stop to fire would soon be knocked out. As a result, both the T-54 series of tanks (designed by Morozov) and the T-10 were fitted with stabilizers.

The initial stabilizers fitted to these tanks in 1955 were the SPT-1 "Gorizont" (Horizon) in the T-54A and the PUOT-1 "Uragan" (Hurricane) in the T-10A. Both stabilizers worked well in keeping the guns aligned in the vertical plane. But while they made firing from the short halt easier (the gunner no longer had to wait for the gun to stop bouncing before preparing to engage a target), they still did not have the ability to engage targets on the move.

Consequently, both the T-54A and T-10A were produced in small numbers during 1956 and 1957, with the emphasis placed on their follow-on variants. The T-54B was fitted with the STP-2 "Tsiklon" (Cyclone) stabilizer, and the

T-10B with the PUOT-2 “Grom” (Thunder) stabilizer.

Most Soviet tanks at the time used a hinged telescopic gunsight (TSh) coupled to the main gun. The T-54B only required that the gun be stabilized; as its TSh-2-22 gunsight was linked directly to the gun, the gunner simply fired when he had a good stable sight picture of his target.

Instead of using a simple telescopic sight, the T-10 used the TP-2-27 periscopic sight linked to the main gun, requiring both gun and sight be stabilized to work together. With 1950s technologies being what they were, this added more weight, heat, and complexity to the tank. While the T-54B gunner only had to point and shoot — with an estimated success rate of 60 percent — the hapless T-10B gunner had to hold his T2S-2-29 sight on the target and hold the trigger down until the main gun fired. This required the stabilizers to align both sight and gun, and as a result, the gun could “hang” for several seconds before firing. This was not a standard skill task, so most tank gunners of the time could not make use of the bulky — and expensive — stabilization system.⁴

The T-10 now needed changes to stay competitive, and, in 1957, it was reworked into the T-10M. But once again, both Leningrad and Chelyabinsk had different ideas on how to fix the tank’s problems. The Leningrad version, Object 272, was opposed by the Chelyabinsk version, Object 734. The same stalemate that had produced the IS-3 controversy was present. However, as Malyshev had died in 1957, this time it was easier for Kotin to make the decision, and Object 272 won out after five years of arguments. Externally, the two were indistinguishable, but there were a number of internal controls and component locations inside the two tank designs that were incompatible. Overall, the Leningrad model was heavier by 1.5 metric tons and used a different model engine (V-12-6B versus V-12-6), and a different AA cupola.

Both tanks did use a new gun — the M-62T2 — that was essentially a modernized D-25T. It was provided with a small rammer to ease loading, a bore evacuator, and a muzzle brake similar to that fitted to the contemporary 122mm D-30 howitzer. In 1967, the Soviets even created a totally new line of ammunition for this gun, which used



The T-10M heavy tank above has been preserved as a “gate guard” at a Russian base.

Photo by Steve Zaloga

a combustible case charge similar to those used by the 115mm D-68 and 125mm D-81 tank guns from the T-64 and T-72 series tanks. These included an HE-FRAG round, an AP-T round, an APDS round, and two HEAT rounds. The tanks also replaced their DShK machine guns with 14.5mm KPVT weapons to enhance their ability to deal with lightly armored targets; again, the new coaxial gun added weight and took up more space inside the turret.

The biggest red flag to the future of heavy tanks came in 1960. In mid-February, the Council of Ministers of the USSR published Resolution No. 141-5, which prioritized programs for accelerated completion and production. While medium tank programs like the T-64 were covered, nowhere were any heavy tank programs mentioned or described. Even though the T-10 tank had theoretically been in production since 1953, only a few hundred tanks appear to have actually been built by that time.

In July 1960, Khrushchev was presented with a display of the accomplishments of the three design bureau chiefs of the time — Kotin, Kartsev, and Morozov. Kotin showed the T-10M, Kartsev the prototypes of Object 166 (T-62), Object 167, and the missile-firing Object 150 (IT-1), and Morozov the Object 432 production prototype of the T-64. While Khrushchev liked the concept of the latter, and authorized low-rate production, he told them to stop making tanks and design missiles. If tanks were going to remain, they must fire missiles and use a drum-canister inside the tank for storage. Kartsev argued that this was a dumb idea, and that the USSR was more likely to need gun tanks than missiles. While he and Khrushchev argued,

it was apparent that Khrushchev was listening to him. But after seeing the old-fashioned T-10, Khrushchev was adamant: no more heavy tanks. Kotin was told to drop all work on the T-10M and cease production.

Kotin, having been the pampered scion of politicians, apparently felt that both the Council of Ministers’ resolution and Khrushchev’s directive did not apply to him; to hedge his bets, he produced a series of missile armed heavy tanks such as Object 282, a missile armed version of the T-10M. Khrushchev, stinging from the disastrous 1962 Cuban missile crisis, wanted no more tanks, but missiles instead. The flimsy attempt by Kotin to get around Khrushchev’s ban on heavy tanks was not well received: Khrushchev was livid, and gave Kotin a very pointed warning to either find a way to build missiles or prepare to be removed from his office.

But in 1964, when Khrushchev fell from power, Kotin garnered three old-line Soviet commanders as allies. Marshal R. Ya. Malinovskiy (Minister of Defense), Marshal V. I. Chuykov (Chief of the Ground Forces), and Marshal Poluboyarov (Chief of Tank Troops). All three were fans of heavy tanks, so between 1964 and 1966 the majority of the 8,000 T-10 tanks produced rolled off the production lines. But in 1966, Marshal M. V. Zakharov became the Chief of the General Staff. Zakharov, who began his service as an artilleryman in WWI, managed to terminate their production.

The T-10 tanks did serve for some time in heavy tank regiments and independent tank regiments. Slow and short-ranged, they were not popular with maneuver-oriented commanders.

They were shipped off to storage depots in the late 1970s and finally removed from service in 1993 and scrapped. While numbers of IS-3s remain as fixed fortifications in the Fortified Regions, nearly all of the T-10s are gone.

Heavy Organization and Tactics

During WWII Soviet heavy tanks were organized in heavy tank breakthrough regiments of 21-22 tanks each. These regiments were attached as needed to specific units and formations. These regiments remained from 1946-1957 with minor changes to the strength of the units. However, heavy tanks required special training, and in 1956, their sole heavy tank training regiment, the 23rd TTP, was reorganized and enlarged to deal with an increasing demand for heavy tank crews.

From 1947 to 1957, heavy tanks and SP artillery pieces were combined to form heavy self-propelled regiments, assigned to line tank and mechanized divisions. These included at least 20 heavy tanks and 20 ISU-152 SP guns each. They were disestablished when the mechanized divisions were reorganized as motorized rifle divisions and tank divisions converted over to homogenous tank designs.

In 1957, at the order of Minister of Defense Marshal Georgiy K. Zhukov, the Soviets reassigned them to new heavy tank regiments and also created special heavy tank divisions with two heavy tank regiments and one medium tank regiment. This was a response by a military panicked by Khrushchev's force reductions, which cut the overall strength of the armed forces from 4.81 million to 3.62 million, attempting to keep as much heavy combat power as possible.

The new regiments paralleled the postwar medium tank regiments — three battalions of 31 tanks each, plus one or two command tanks. A total of six heavy tank divisions were created: two in GSFG, two in the Byelorussian Military District, and one each in the Kiev and North Caucasus Military Districts. Each division had up to 186 heavy tanks, or a total of around 1,000 IS-3 and T-10 tanks in these special divisions.

The given mission of these heavy tank divisions and regiments was "breakthrough." But by 1965, heavy tanks were recognized as overcome by events. Most divisions were deactivated in 1965, and in 1967, the heavy tank

mission changed to "countertank combat," something they were ill prepared to carry out. Most tanks that remained in the west were reformed into independent tank regiments of around 148-150 tanks, assigned at the ratio of one per army. They were replaced in the 1970s when the T-64 was designated a main battle tank, and only main battle tanks were fielded in forward areas.

The one, and only, time the T-10 regiments saw any action was in 1968. They were part of the invasion of Czechoslovakia, and some T-10M tanks can be seen in photos as roadblocks in Prague and other large Czech cities.

"Minor Details"

What killed the T-10, once the most feared of Soviet tanks?

The T-10 was its own worst enemy, as it was favored only by a very narrow (but influential) group of Soviet officers. Commanders liked the highly reliable and maneuverable T-54 and T-55 tanks, and found the clunky T-10 to be an albatross in the lightning warfare concepts the Soviets envisioned during the 1950s and 1960s.

WWII tactics, and the technological developments of the German army, forced the Soviets to adopt two main types of combat tanks: a medium tank, capable of high-speed maneuver and infantry support, and a heavy tank, capable of taking enemy fire while suppressing their defenses and knocking out their artillery and tanks. While the T-34 and T-34/85 met the first point with stunning success, the KV-1 did not make it as a heavy tank. The only thing that kept the heavy tank alive was introduction of the IS-2.

After the war, commanders who had found success with tank formations spearheaded by IS-2s wanted to ensure they would have the same capabilities. They were willing to put up with its problems (parts, ammunition, crew training, etc.) to keep those capabilities, as the IS-2 was a known quantity: it was reliable, effective, and when used properly, capable of breaking any enemy defense or formation.

Early on, most commanders realized that the impressive looking IS-3 was actually worse than the IS-2 and wanted no part of it. They still remembered 1941: tanks that cannot roll out the gate are of no use to the commander, no matter how great their superiority on paper.

Kotin, unfettered by the reality of changing technologies, still felt that he could "sell" heavy tanks to commanders, thus taking prestige away from Morozov's medium designs. But the changing technologies of the late 1940s and early 1950s doomed his thinking, as the development of HEAT ammunition and antitank missiles doomed tanks using thick, heavy homogenous armor. By the late 1960s, a T-54B with a HEAT round or an AT-3 missile could knock out any tank that a T-10 could, so one of the heavy tank's prime reasons for existence was no longer valid.

The T-10 also had no range. While the T-54 had a range of over 400 kilometers, and the improved T-55 a range of 500 to 700 kilometers with 400 liters of auxiliary fuel, the T-10 was limited to feeble highway ranges of 180 to 280 kilometers. This compared well with the early M48 or Centurion, both of which had ranges of only about 160 kilometers on full internal fuel; but by the time the T-10s were fielded, they were facing the M60 and Chieftain, both with diesel engines and much greater ranges of around 500 kilometers.

One recent observation made by Russian analysts is the tremendous cost of rebuilding and modernization programs, and the T-10 fleet must have been a particularly nasty subject. Objectively, obsolete tanks being given star treatment and having scarce resources drained off to upgrade them must have galled planners on the General Staff. The case of creating high-tech ammunition for the tanks is a clear-cut case of such gold plating. The T-10 tanks probably cost around R1 million new — and with the cost of their annual maintenance, intermediate rebuilding, capital rebuilding, and adherence to updating orders, the 8,000 of them would appear to have cost over R8 billion, plus nearly as much in upkeep over their 40-year service history. Even given the artificiality of the fixed Cold War rate of \$1.57 to the ruble and fantasy Soviet budgets based on those rubles, a waste of over \$25 billion is damaging to any economy.

During these rebuilds and updates, some of the changes included:

- Expanding from only one tank in five being equipped with an AA machine gun to all tanks having AA mounts (1959);
- replacing the balky and difficult eight-speed transmission with a new, simpler six-speed one (1960);

- adding the OPVT underwater crossing equipment to the tank so it could perform the same maneuvers as the medium tanks (1963); and

- providing the tank with a complete new suite of ammunition with combustible case propellants (1967).

Development of high-power smooth-bore guns and APFSDS ammunition in the late 1960s and 1970s also proved that the heavy tank no longer had the ability to dominate the long-range battlefield. Where the AP round of the T-10 could penetrate about five inches (127mm) of RHA at 2,000 meters, the new APFSDS rounds easily blew through twice that thickness at the same range. Even with its 250mm thick armor, the T-10 found itself in the embarrassing position of being vulnerable to U.S. and NATO medium tanks armed with the 105mm L7-series guns, yet unable to knock them out in return at the same combat ranges. To this day, there are some Russian authors who state that the T-10M's M-62T2S gun was finally able to fire a powerful APDS round capable of destroying any NATO tank. Even if the penetration was up to it, the slow loading, poor ergonomics of the tank and poor fire controls made that irrelevant.

The biggest nail in the T-10's coffin came once again from Aleksandr Morozov. In the mid-1960s, he produced a revolutionary tank with a 115mm gun fed by an autoloader, a three-man crew, better armor protection, and weighing only 36 metric tons. While Malinovskiy, Chuikov, and Poluboyarov all hated this machine, Khrushchev and the forward thinkers in the General Staff loved it. This tank, accepted for service as the T-64, was so good in the eyes of the Soviet government that it was dubbed "osnovnoy boyevoy tank" — the main battle tank. While the T-64 later turned out to have nearly as many flaws as it had advantages, it paved the way for the later T-72 and T-80, and with the advent of those tanks, the day of the heavy breakthrough tank appeared to be at its end.

Conjecture

Today there are rumblings from Russian military writers and theoreticians that they should revisit the heavy tank, as the main battle tank today is closer to the old heavy tank designs. Citing 70-ton weights by the M1 Abrams and the Challenger series of tanks, they feel there is a place for a new heavy tank. But they have ignored the problems

these tanks caused in the West, namely the requirement for heavier transport and an inability to rapidly move them anywhere in the world when needed. Also, with the introduction of reactive armor and modern armor arrays, the security of ten or more inches of solid steel armor can be attained with only a few inches of mixed media or explosive plates. It is likely now, with new U.S. Army future combat systems, that tactics should be re-examined, rather than worry about how to build new oversized tanks and other armored vehicles to do missions better performed by lighter, smaller machines.

Notes

¹For the story of the T-34 and the problems among the three tank design bureaus, see "Why Three Tanks?", by the same author, *ARMOR*, July-August 1998; available online at www.knox.army.mil/armormag under "Back Issues."

²The Israelis converted most of the survivors to pillboxes on the Bar-Lev Line along the canal by removing their engines and cutting open the bellies for access from below. The IS-3M on display at Aberdeen Proving Ground was one of these tanks, and was given to the U.S. after the 1973 Yom Kippur War. The engine deck from a T-62 was welded on after its arrival at Aberdeen as it was restored for display. The tanks were not, as reported some places, given T-54 engines and transmissions.

³This same problem existed in the late 1990s, when the production factory at Omsk produced Object 640, the "Black Eagle" tank, without clearing it with the Popov Bureau in St. Petersburg. Russian tank enthusiasts, however, have indicated that the "Black Eagle" is only what happens when tank builders have a lot of parts and time on their hands, and is not a serious effort to produce a new combat tank, as the IS-4 was in the late 1940s.

⁴Soviet tank sights used a standard nomenclature system. They were usually T for tank, followed by either Sh for hinged telescopic or P for periscopic sights. There was often a one-up model identification number, but a two-digit number followed that which indicated which ballistic sight insert was installed, based on a specific ballistic table. For example, the 100m D-10T gun was pattern 22, but the D-10T2S was pattern 32. Here the 122mm D-25T was pattern 27, but the D-25T2S or later 122mm M-62T2S were pattern 29. This may have been due to the introduction of the HEAT round for those guns, which required different tabular settings for firing.

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