

The Last Soviet Tanks

The Technology 1: ERA

The concept of explosive reactive armour was first proposed by the Soviet NII Stali (Scientific Research Institute of Steel) as far back as 1949. Unsuccessful trials in the 1960s resulted in the idea being dropped until 1974 when a contest was held to provide the best tank protection system. Note was also made of the German experiments made in the late 1960s. In 1982 captured Israeli Blazer armour was flown from Lebanon to the Soviet Union for analysis.

All versions work on a simple principle, an explosive charge is placed between two layers of armour and formed into a block. A series of these are used to cover the vulnerable parts of a vehicle. When an explosive round hits the armour it explodes disrupting the formation of the penetrating jet.

The Soviets as a result of all the research have produced a number of generations of ERA:

(a) First Generation

This version first deployed in the 1980s is as per the game rules, this is Kontakt-1 ERA blocks. Israeli Blazer armour is treated identically in game terms.



Illustration 1: T72 with Kontakt-1. Imperial War Museum



Illustration 2: T72 with Kontakt-3 - note double layer on hull and turret front.

(b) Second Generation

Introduced to counter the western tandem warheads coming into service in the late 1980s and early 1990s, this Kontakt-3 ERA is identically to Kontakt-1 in game terms but may be layered to provide protection against tandem charges. The second layer is set off against the first charge (assuming it does more than 50 points of damage) on 3+ on 1D10, otherwise it affects the second warhead. On single warheads both layers explode together. As this became rarer it became usual to mix layers of Kontakt-1 and 3

(note that Kontakt-1 will fit on the same points as Kontakt-3 but will not fit to form the second layer).

(c) Third Generation

First seen with the Russian troops supporting the Poles against the Germans in 1996 (although it had been created in 1985), this version of ERA named Kontakt-5 by the Soviets was the most effective used. With the



Illustration 3: T72 with Kontakt-5 - note the change in turret profile

benefit of research into how the earlier generations had performed this was made up of right angles plates that gave the distinctive angular appearance (and making it incompatible with previous versions) and consisted of heavier plates and a large explosive filling. It gave the advantage however that it worked against all types of ammunition, often breaking the penetrating rods of AP rounds. In game terms the armour bonus is given against all types of round hitting the target. This can not be layered.

(d) NERA (Non Explosive Reactive Armour) – Kontakt-R

The biggest disadvantage of ERA was that it explodes and this makes troops somewhat reluctant to go near a vehicle that is covered with explosive charges! As a result efforts were made to develop a version without the explosive filling. The end result was a similar system using rubber as the filler. This absorbs the kinetic energy and disrupts the formation of the penetrating jet. It is however less effective, adding on 25 points of armour. Key advantages however are that it is easier to layer, can be used on lighter vehicles as it does not explode and it resists tandem charged warheads well, giving the bonus against both. It is not common but can be used with the same mounting points as the first and second generation systems. The odd shape of the Kontakt-5 system precludes its use there.

"We had a nasty shock when we first met the 3rd gen ERA. It took me a second to realise that the tank was Soviet with that weird profile. When it fired that gave it away, I ordered Ginny to fire and she hit it head on with a sabot round. It didn't phase it. T72s aren't supposed to survive that. We hit it again, still nothing, it fired back and took out or right track, we hit it again, still nothing, I started to think I was having a nightmare when fortunately Jim in the 12 tank got it. Went up light a volcano. Hard to kill but when you beat that armour...well lets say I preferred the M1. Made me wish we had a 120mm M1A1 that day though!"
Captain Karl Penny
43rd Infantry Division

T86 (Ob'yekt 1299)

As the west started developing composite armour the Soviets took note. An intensive intelligence effort was put into finding the composition. Meanwhile the Soviets started experimenting with the possible formulas they uncovered combined with their own researches. Initially the results were fielded on the T64 using a fibreglass layer between steel sheets (aluminium had also been tried). The resulting fairly ineffective armour was known as Combination K In addition work continued on improved formulas. The result was that very soon they had their own new formula for composite armour, Combination K-4.



The T86 was developed to take advantage of this, whilst the hull was conventional for a Soviet design (and was virtually unchanged from the T72), the turret was a radical departure, being the flat surfaces required for the casting of the K-4 which covered the front and sides. The interior was broadly similar to a late model T72. It was fitted with a

laser range-finder, a 1A42-1 advanced fire control system, 9K120 system allowing the firing of AT11 missiles (Soviet 9M119), a 2A46M gun, a new autoloader developed from the T64, (the 7ETS-8) a new stabilisation system and a 1000hp diesel engine.

Testing showed that this was a formidable opponent, cost however was to be a major issue as it cost about four times as much as a T72 (mainly in armour costs). As a result numbers deployed were never large and they were issued to units that were considered to be elite armoured units (in the same way as the T64 had been).

" We got given a T86AM when we refitted, we thought we were lucky compared to the others who were getting T72s and even a few T55s. I'm starting to doubt that now, so far we've been hit by supposedly friendly troops three times who haven't recognised the odd turret profile we have. They may be jumpy with rumours of Yankee breakthroughs but the next one gets a 125mm shell up his arse!"

Guards Senior Lt Pavel Kunitsov
8th Guards Tank Division
Personal diary

One peculiarity of the Soviet armour was however quickly uncovered once the vehicle entered combat in 1996, unlike most modern armours, the armour was subject to severe stresses if hit by a HESH round (sometimes referred to by Americans as HE-P). As these were only used by the British and by engineer vehicles this had not been tested by the Soviets. The exact reasons why HESH does this appears to be the structure of the crystalline layer but studies have not yet been carried out. Each HESH round hitting the armour will reduce the armour value in that location by 50 permanently. Once it drops below 50, the armour will disintegrate. Fortunately for the Soviets they had fitted the T86 with a spall liner which mitigated the effects of fragmentation but no solution could be found for the weakening other than the fitting of ERA to reduce the effect of the HESH round (if HESH hits ERA it only has a 25% chance of inflicting the permanent loss). Note that other HE type rounds do not cause this effect.

In late 1996 an upgrade programme was introduced improving the autoloader and range finder and points allowing the installation of ERA on the hull front and turret front and sides (some also allowed it to be fitted on the turret deck). Some were also given multi-fuel engines based on that used in the T80. These are known as the T86A (T86AM if fitted with the new engine). Around this time new production T86A1 and T86AM1 tanks were seen that were not capable of firing the AT11 but were otherwise identical. K versions of all of these have been observed. Why this vehicle was kept in production given the known armour fault is subject to conjecture, possibly it was felt that the danger from HESH rounds was low and this was a worthwhile trade for the enhanced armour or possibly it was simply bureaucratic inertia against changing production mid war, the Soviets feeling a tank with faults now is better than a better tank in six months time.

T90 (Ob'yekt 1307)

Sometimes called the FST-1 (follow on Soviet Tank -1) in the West when it was first seen in 1990. This was the first Soviet tank to abandon the manned turret in favour of a crew-



Illustration 4: T90DM1997 with the raised diesel engine deck and late model side skirts

in-hull model. Using an elongated T80 hull with an extra road wheel and return roller, it featured the same 2A46M 125mm gun of its predecessors in a small unmanned turret (with a PKM co-axial). The three crew members were all seated in the forward part of the hull in an armoured crew compartment with each having their . This compartment gives a 6+ saving throw on 1D10 to stop crew injuries. Against catastrophic ammunition explosions it is less effective than the M1s blow out panels, only providing this protection on a role of 7+.

A new Composition K-6 armour was used that could be moulded into the preferred rounded shape. This also did away with the crystalline structure drawback of the K-4 armour but cost more to produce (rumours of T86s with this K-6 armour have never been substantiated). This armour was used on both hull and turret front.

Popular with the crews they were never numerous. Some were fitted with diesel engines when the complex turbine engines were unavailable, these are known as the T90D. K1/2 and 3 versions of both are known to exist. Note that the gun is incapable of firing missiles as the crew have no access to the gun to manually load them.

“ We fell in love with our T90, she was like a wife. At times she was a bitch – when the autoloader jammed there was nothing we could do but fall back. Others she was the best, reliable, dependable although as she got older she needed more work to keep her youthful looks and abilities! She was fast though, Anton said he never would want a sports car again! She gave her life for us, when she was hit she blew and we were just concussed in her armoured womb. Actually I suppose that makes her a mother not a wife. Yes that's it an old doting mother with us fussing around her.”

Sergeant Petr Alexander
20th Tank Division
In conversation with the author

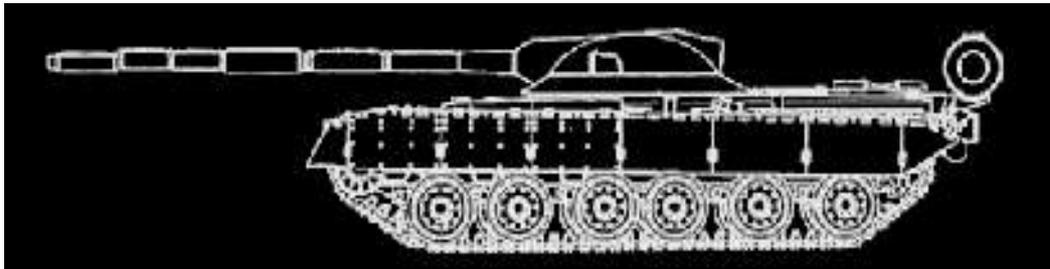


Illustration 5: Prototype T90 with shorter chassis. At least 50 of this type were produced and are usually classified as the T90M1991. Note also slightly different turret rear making this in all probably a T90M1991K1

Technology 2: A new gun

The Soviets had continually upgraded the 125mm 2A46M gun with better projectiles but it was nearing its limits and was less and less use against the uparmoured NATO tanks that were being introduced. As a result the plan was made to develop a new calibre. Two trial weapons were produced, the 135mm 2A57 and the 152mm 2A59.

Trials were held and it was found that the 135mm while superior to the 125mm was not sufficiently advanced to be worthwhile. The report stated that it was expected that the 135m would remain sufficiently advanced assuming newly developed projectile technology (liquid propellant was cited as an example) for 10-20 years at most before becoming obsolete for front line service. As a result it was decided to concentrate on the 152mm gun as it was believed that this would have a lifespan of 15-30 years. The decision was taken to retain smoothbore over rifled as it was considered that the increased barrel life would be an advantage.

Due to the size and two part nature of the ammunition it was decided that an autoloader would be retained. The AT-17 Slingshot (known to the Soviets as the 9M135 “Foxglove”) missile was also developed for the 152mm barrel, using a two part missile that would snap together in the autoloader as the missile was put into the chamber. This was a conventional SACLOS laser-beam riding missile. It is notable that the rounds will fit in the autoloader unlike previous Soviet missiles.

T95 (Ob'yct 1321)

Occasionally referred to as the FST-2 or the T90B in the West, this was an attempt to increase the firepower of the T90 to allow for future developments in Western armour.

Armed with a 2A59 152mm gun and a co-axial 30mm cannon (as fitted to the BMP2). There was however some dissatisfaction with the



external turret as by the time the two *Illustration 6: NATO mock up of the T95. It is actually incorrect as there are only 6 not 7* mounted it was almost the same size *roadwheels*

as a normal turret (in game terms it is not treated as a crew in hull design for hit location). The same hull as the T90 was used and again the composition K-6 was used. The hull compartment was a strengthened version of the one used in the T90 and uses the same rules except that the saving throws are 6+ for both rolls. Diesel engined versions were again produced when there were no turbine engines available.

T96 (Ob'yct 1376)

This was an alternative to the T95, instead of enlarging the turret to accommodate the two weapons, an unusual hull design based on the T80 was used. The angled front hull of the driving compartment was normal for a Soviet tank, although instead of the drivers hatch there was a small unmanned turret with a 30mm cannon. Behind this there was a stepped hull on top of which an unmanned turret that could mount a 125mm or 152mm gun. The main gun had a full 360 degree traverse while the front turret had a traverse of 45 degrees each side of the main axis.

The crew were in a compartment into which they all fitted. They entered and exited the vehicle through two roof hatches on the lower deck (either side of the 30mm turret). It also increased the crew size to 4, driver, commander, main gunner and 30mm gunner.

“ When we first got shown our T96 I was stunned at the two turrets, all I could remember was my grandfather describing the multiple turret tanks in the Great Patriotic War being destroyed by the Hitlerites. This one was better though it killed their grandchildren as well as anything else we had and there was an extra man for maintenance. Very useful when you are in a command tank and your commander is always getting called away to conferences all the time.”

Senior Private Yuri Yuravich
8th Guards Tank Division
Quoted in “Voices from the Other Side” Arms and Armour Press 2031

Either gunner could operate either turret and access the magnification and thermal feature on their display, but each position was the overriding one if conflicting commands were given. The commander could also override both positions but this requires a conscious

decision made by pressing and holding the override button. The commander also had a small independent sight mounted in a small rotating mount on top of the large turret for independent viewing although this did not have any thermal capability. When switching to the gunner's sights he has the same vision enhancements that they do (this was as this was intended as an emergency measure and it was assumed he would use the gunner's sights of thermal was required). It was proposed that the 125mm version would use liquid propellant but with the teething difficulties encountered by this technology (recounted elsewhere) this was never attempted. Regarded as overly complicated it was made in only small numbers with the T95 being preferred. If the war had not caused the production of any vehicle possible then it is unlikely it would have entered service or even production.

The initial production run of 50 used the 125mm gun as no 152mm guns were available. Later production used whichever were available at the time (resulting in about a 50-50 split). The 152mm version is usually known as the T96A although it was identified initially in the West as the T96M1998. Command versions known as the T96(A)K1/K2 and K3 (depending on the radio fit) were produced. In the higher command K3 the 30mm gunner was usually replaced with a radio operator and the gunner's position used to control both turrets. All are functionally identical in game terms except as noted in the stats. Versions made when the gas turbine engines were unavailable and 1000hp diesel engines installed are known as the T96D and T96AD.

T90, T95 and T96 support vehicle

Units that were assigned the crew in hull designs that precluded an ant-aircraft machine gun, were assigned a BMP-2 carrying four SA16 launchers was assigned per company. The vehicle carried four gunners, four no2s and the two crew members (the senior gunner doubled as vehicle commander when aboard). The gunners were all trained mechanics with the no2s as manual labour. When the air threat diminished the unit generally kept the BMP but it was rarely replaced if lost as the loss of all the mechanics for the company was devastating.

SU152A

In order to extend the life of T54/55 hulls a number were converted into assault guns using the 152mm gun (of which there were spares as the complex turret production was lagging). The superstructure was raised at the hull front and the new gun and autoloader were put in a hull mounting. On the hull deck the commander's hatch was fitted with an NSV machine gun for dealing with soft targets.

SU152A Variants

There are a number of variants of the basic SU152, these included:

a. SU152E

This is a standard SU152 fitted with mounting points for ERA. This variant is the most common of the sub-types and production probably exceeded that of the baseline vehicle.

b. SU152B/SU152BE

A number were given front-line depot upgrades with mounting points for an AGS17 mount on the gunner's hatch. Versions without ERA mounting points are known as the SU152B and with ERA as the SU152BE.

c. SU152A1

This was a proposed variant of the SU152 designed to use a simplified autoloader system that did not allow the launching of missiles through the gun tube. It also featured a simpler design of superstructure which provided less armour protection. Never taken into Soviet production it was planned to build this in Czechoslovakia and Poland as an "export" model (although gun production would remain in Russia). This never occurred.

Technology 3: The AT-18 Surfer (9A142 "Rose")

In the late 1980s the Soviets developed a new missile. It was designed to be a cheaper missile than western equivalents (designed to cost about a quarter of the cost) but still have 75% of the effectiveness. Designed only for use on vehicles the AT18 achieved its cheap price by not using a laser seeking head, instead it used a cluster of 4 non-imaging detector heads at the REAR of the missile allowing them to follow the beam (this, whilst not quite as reliable as a seeker head, has the advantage of being harder to stop with countermeasures). The missile used fixed fins (made easier by the larger diameter of the missile) which were protected by plastic inserts which fell away at launch. The missile could optionally also be fitted with a fragmentation sleeve to enhance blast damage at the cost of some speed and therefore range. Control was semi-automatic as the missile followed the beam with each missile only having one control surface to reduce costs. This reduction in accuracy was offset by the Soviet doctrine of firing the missiles in pairs. The AT18B Surfer II (9A142-1) changed this to a normal set of control surfaces for increased accuracy. Software updates for the system were incorporated into the missile allowing its use with original launchers. All versions of the missile were tandem warhead to defeat ERA.

IT-3 "Rocket Tank" (9P-812)

Another attempt to use T54/55 hulls was the IT-3 . This was a standard T54/55 with a small unmanned turret with a cherry picker arm holding 4 (A variant) or 6 (B variant) AT-18 missiles. These could be elevated and controlled by a TV camera (with thermal scope and variable x4-x20 magnification) and laser designator mounted on the arm. Each missile had to be controlled separately or they could be ripple fired at the same target (two can be launched each action). A skilled operator can fire shots and shift targets if required but this requires an Avg(Heavy weapon) skill roll not to loose the missile. Targets can be shifted by 1m per 200m to the target (rounded down) per phase (with each phase needing a separate roll). Once the missiles had been fired the launchers had to be reloaded externally. Secondary armament was an NSV mounted next to the commander's hatch on the hull deck. The vehicle only had a two man crew it was expected that the commander and driver would reload the vehicle out of contact. IT3 platoons were usually accompanied by an MTLB carrying reloads and two mechanics to assist in maintenance work and resupplying the IT-3s. There were command versions but these appear to all be

IT-3AK versions. There is also an M version which used the less effective AT-17 missile in a batch of 4 launchers. This appears to have been primarily designed for export although one source states that this was due to a lack of AT-18 launchers.

IT-4 “Rocket Tank” (9P-825)

The IT-3 tank was regarded as a workable vehicle but the choice of the chassis limited performance. As a result a number of IT-4s were produced. These used an identical turret on a T72 chassis. As above they were found in A, B, M and K versions although they are rarer than the IT-3 as the T72 was felt to still be a viable tank design so less hulls were available.