

FlyPast Spotlight

Lavochkin La-7

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This month our *Spotlight* focuses on one of the deadliest Soviet fighters of World War Two, the Lavochkin La-7. A robust, piston-engined single-seater, the La-7 was a development of the successful La-5, itself a refined version of the company's earlier LaGG-3. Like its predecessor, the La-7 was fitted with the powerful Shvetsov ASh-82 radial engine. It was usually armed with two cowl-mounted cannon. In the right hands it was a fighter that packed a serious punch, as many Luftwaffe airmen found out to their cost. Popular with its own pilots, the Russian machine was a quick and effective dogfighter. The Soviets' top ace of World War Two, Ivan Kozhedub, scored his last 17 'kills' at the controls of a La-7. We examine the aircraft's history through exclusive artwork and features, as well as providing a selection of rarely seen images.

Main picture

A new Lavochkin La-7 awaits collection from the factory airfield at Gorky. The first examples of the type began to roll off the production line in June 1944.

VLADIMIR KOTELNIKOV COLLECTION

The Beast from the East

Below
Lavochkin La-7 'White 50' was one of the first examples following the approval of series production in 1944. Rolled out at Factory 21 soon after, the aircraft awaits testing with the AFSTI.
ALL VLADIMIR KOTELNIKOV COLLECTION

While conflict erupted across the world in 1939, several young and upcoming Soviet aircraft designers – Vladimir Gorbunov, Mikhail Gudkov, and Semyon Lavochkin – put forward blueprints for a high-speed, monoplane fighter.

Its principal characteristic lay in the use of an impregnated wood or 'delta-wood' in the areas and components expected to experience the highest g-loadings. This was a wood infused with plastic-like synthetic resin, which was then cured under pressure in a specially designed kiln. It resulted in a significantly stronger material that didn't catch fire, but simply charred instead.

Starting out as the I-301, this new type first flew in March 1940 with test pilot Aleksei Nikashin before entering series production at Gorky's Factory 21 in western Russia soon after. Manufacture was also undertaken at Factory 31 in Taganrog, in the southwest of the country as the Lavochkin-Gorbunov-Gudkov (LaGG) 1 and later the LaGG-3.

Labour intensive fighter

The I-301 was a completely fresh aircraft with smooth skin, fully retractable undercarriage, an enclosed cockpit and powerful armament. Technologically, however, it reflected the typical traits of the Soviet aircraft manufacturing





“The I-301 was a completely fresh aircraft with smooth skin, fully retractable undercarriage, an enclosed cockpit and powerful armament”

industry at the time. It was built almost exclusively using this new wood, which required huge amounts of manual labour, specifically when constructing the fuselage. Although the designers realised the transition to aluminium would have a positive

effect on the flight/performance characteristics, there was a shortage of light alloys in the country. The same could be said for the necessary equipment as well as qualified specialists needed for metal aircraft production.

Vladimir Kotelnikov details the story of the Lavochkin La-7, a type that was said to better most of its German opponents during World War Two

One of the most significant shortcomings of the LaGG-3 lay in its inadequate power-to-weight ratio. The I-301 was originally built around a liquid-cooled M-106 engine rated at 1,350hp (1,007kW), but suffered from incredibly poor reliability. In production fighters, the M-105P rated at 1,100hp (820kW) was initially used, followed by the slightly more powerful 1,260hp (940kW) M-105PF.

An alternative powerplant was sought from the end of 1941, the most successful candidate being the 14-cylinder air-cooled M-82A producing 1,700hp (1,268kW), which boosted the maximum speed by some 26-32kts (50-60km/h). But to accommodate it the fuselage required several extensions, while the nose ➔

Left
A Lavochkin-Gorbunov-Gudkov LaGG-3 powered by an M-105P engine of 1,100hp. Beginning life as the I-301 in late 1939, the aircraft was continually modified to eventually become the basis of the La-5 and -7 fighters.





Above
Lavochkin La-5FN 'White 72' featured an upgraded M-82FN powerplant developing almost 1,850hp. The type's distinctive strake on top of the engine cowling is evident.



Right
This modified La-5 became one of the aircraft used in the development of the La-7. It was delivered to the Flight Research Institute's airfield southeast of Moscow for evaluation.

Right
The M-82FN powerplant was a 14-cylinder, air-cooled radial capable of producing 1,850hp. Despite being used as standard in the La-7, its service life was just 100 hours.

section was altered to house a radial engine. From June 1942 this new variant was manufactured at Gorky, initially as the LaGG-5, then LaG-5 and finally La-5. Armament consisted of a pair of 20mm synchronised ShVAK cannon mounted on top of the fuselage in front of the cockpit, with capacity for 340 rounds.

The aircraft, however, was continually modified. The M-82F engine was trialled soon after, followed later by the M-82FN (designated the Ash-82FN from April 1944) capable of developing almost 1,850hp (1,380kW). Other modifications included lowering the spine behind the cockpit and changing the canopy to improve rearward visibility.

Changes in metal availability enabled the introduction of steel alloy flanges and components throughout the wing's main spar to be constructed from aluminium. Several La-5s were manufactured with these modifications from March 1944 and identified as the Type 41, while the rest remained the Type 39.

The slog continues

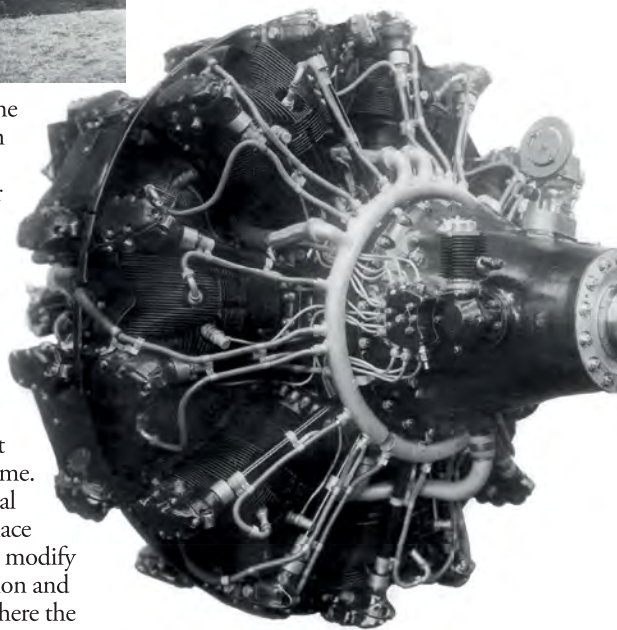
Experimental work carried out by several bodies led to the creation of the new La-7. Shortly after the La-5 was evaluated, scientists at TsAGI (The Central Aerohydrodynamic Institute) in Moscow Oblast suggested

moving the oil cooler to the wing's trailing edge, which would improve sealing within the cowling. Other small changes were also recommended. This new variant was manufactured and tested with TsAGI's on-site wind tunnel and although the new oil cooler arrangement reduced drag, it increased the intensity at which heat was released at the same time. Subsequently, an additional proposal was made to replace the engine cowling's flaps, modify the mainplane centre section and smooth out the fairings where the wing joined the fuselage.

Meanwhile the Lavochkin OKB (Design Bureau) continued its work and in August 1943 unveiled a new variant at Gorky, which combined some of TsAGI's proposals with the designer's own concepts. The engine air intake was moved under the cowling, which removed the characteristic 'strake' and improved forward visibility while the mainwheels were, when retracted, now completely covered by a pair of doors. Of note was that the middle part of the cockpit glazing folded to the side instead of sliding back.

During official trials at the Air

Force Scientific Testing Institute (AFSTI), this new fighter demonstrated a speed of 340kts (630km/h). Although the new canopy format was rejected, the rest of the modifications were accepted for future use.



In January 1944, another modified La-5FN was delivered to the Flight Research Institute's airfield southeast of Moscow. With a top speed of 369kts (684km/h), this version featured a revised wing and engine cowling, while the oil cooler was moved further aft. However, during February it caught fire while in flight, forcing test pilot Nikolai Adamovich to abandon the stricken machine.

The final step towards the La-7, was the La-5FN 'standard for 1944'. Initial plans called for this version to be fitted with an improved M-82FNA engine, but

this was not delivered on time and a stock M-82FN was employed instead. Overall the airframe design corresponded to the Type 41, but at the same time several previously tested modifications were introduced, along with new concepts.

The aircraft featured an upgraded engine cowling, while the oil cooler had been moved even further back. Modernised wing fairings and individual exhaust pipes were also incorporated. One of the more obvious changes was the shortened undercarriage legs and a three-bladed automatic VISH-105-V4 propeller with a diameter of just over 10ft (3m). Air for the engine was provided through a gap



in the wing's leading edge, while the electrical system used single-wire circuits. Armament for this configuration comprised three 20mm B-20 cannon, which used elements of the famous UB machine gun in its design. With an increased rate of fire, it was almost half the weight of the SP-20 – a variant of the well-known ShVAK cannon. Overall the aircraft's empty weight was 156lb (71kg) lighter, while minor changes within the fuselage included a compressed air bottle and the primitive radio set being moved to the rear.

It's not perfect

From February 1944 onwards this variant underwent state testing with the AFSTI. Flown by noted test pilot Aleksey Kubyshkin, its maximum speed was 367kts (680km/h). Despite decent performance, a decree issued by the State Defence Committee on March 15, 1944, stipulating the speed be increased to 370kts (685km/h), meant this result did not satisfy their needs.

Problems occurred frequently. First, a connecting rod in the engine failed, destroying the unit. This was followed by one of the test examples breaking apart in flight due to poor

construction. Despite the issues, the AFSTI believed the aircraft presented was "on a par with the best modern fighters".

Naturally, numerous inadequacies had also been noted during testing. The effort needed to control the rudder was considerable, while the movement of the centre of gravity (CoG) aft led to deterioration in overall stability, particularly evident when climbing. Two of the biggest concerns were how hot the cockpit became and that pilots could smell exhaust fumes in flight.

But the failings did not outweigh the advantages and in the course of testing, the Soviet government took the decision to launch series

production under the designation La-7. It became the apogee of Lavochkin's fighter development in the course of World War Two. The La-9 and La-11 aircraft produced later, although externally similar were completely different – they were all metal.

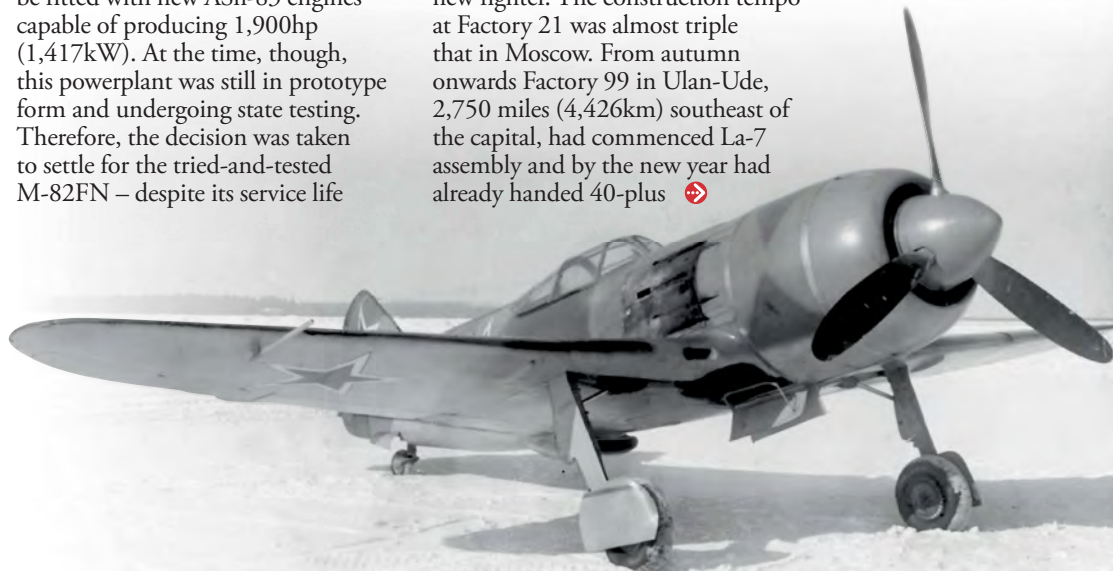
The decree issued by the State Defence Committee announced production would begin in May at two sites – Factories 381 and 21. Plans called for each workshop to gradually shift manufacture across from the La-5FN.

Initially, production La-7s were to be fitted with new ASh-83 engines capable of producing 1,900hp (1,417kW). At the time, though, this powerplant was still in prototype form and undergoing state testing. Therefore, the decision was taken to settle for the tried-and-tested M-82FN – despite its service life

being limited to just 100hrs. To make matters worse, the B-20 cannon was yet to undergo testing. This limited the armament to the same as the La-5FN, which included two DZ-40 bomb racks designed for eight 220lb (100kg) bombs with an ASI-40 mechanical release system.

Production La-7s gained metal fairings between the wing and its centre section, a roll-cage under the canopy, an armoured glass windscreen and extra toughened glazing behind the pilot. The main undercarriage legs were lengthened, while the tailwheel was shortened to reduce the tendency to nose over. A new tailwheel retraction mechanism was introduced to prevent it from deploying in flight or folding on landing, an issue that dogged the La-5FN. The clutch for the automobile starter was removed from the propeller hub, meaning the engine could then only be started using compressed air. In the cockpit a new control column appeared minus the 'spade grip', while the basic instrument panel was rearranged and fitted with ultraviolet illumination for nocturnal flying. Externally, the number of access doors for maintenance was increased, while covers were placed over the control surface bracket cut-outs.

With the completion of testing and evaluation meeting Moscow's deadline, the first batch of the new fighters were handed over for military acceptance trials in late May 1944. At Gorky however, assembly was behind schedule, meaning manufacture of La-7 (designated Type 45 by the plant) did not start in earnest until June. Built alongside the La-5FN to begin with, from November that year manufacture switched solely to the new fighter. The construction tempo at Factory 21 was almost triple that in Moscow. From autumn onwards Factory 99 in Ulan-Ude, 2,750 miles (4,426km) southeast of the capital, had commenced La-7 assembly and by the new year had already handed 40-plus ➔



Left
A test pilot noted only as 'Strizhak' experienced an engine failure while undertaking an evaluation flight in an Ulan-Ude-built La-7 during September 1945. He successfully force-landed the aircraft.

Below
One of the modified La-5s tested by the Flight Research Institute at Chkalovskaya airfield between trial sorties in February 1944.

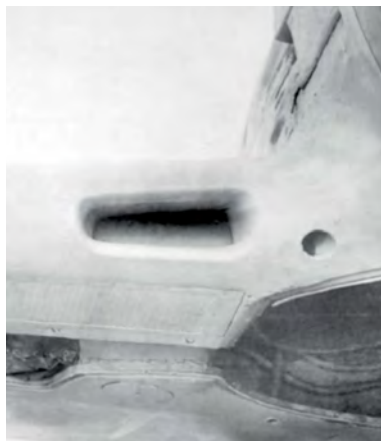
Right and centre right

The air filter design used on machines produced at Factory 21 (left) compared with that used on aircraft rolling out of Factory 381.



Below right

The La-7R-2 after its rocket engine exploded on March 27, 1945 while being flown by test pilot Georgiy Shiyanov. The aircraft was returned to flight despite the damage.



Below

The prototype La-7UTI shortly after being rolled out of the factory at Gorky in March 1945.

airframes over. At its height, all three sites produced nearly 20 aircraft each, per day. In 1944 alone, some 2,200 examples were delivered to the VVS (Red Air Force).

Compared to the carefully built prototypes, in-service machines were showing manufacturing issues, slacker flight characteristics and poorer performance figures. During testing in August 1944, factory-built La-7s struggled to fly faster than 355kts (658km/h). Furthermore, pilots still complained about the unbearable heat in the cockpit. At the time, labour within the factories consisted primarily of unskilled workers, which led to numerous defects. This forced the AFSTI to return airframes regularly for investigation and corrective work. A vicious cycle ensued.

Modification mayhem

The La-7 was steadily improved during series production. From July 1944, aircraft built in Moscow were fitted with anti-dust filters, which extended the engine's service life – a huge factor towards the end of the war. During take-off and landing the intake door was closed mechanically by a link attached to the undercarriage retraction system, forcing air to enter through holes in the wing's leading edge.

From March 1945 onwards filters also appeared on Gorky-produced examples, but the openings were on



the upper surfaces of the fuselage where the air was cleaner; the drive mechanism was hydraulic. The oil system was modified around that time to prevent leaks through its drainage system.

In late March, Factory 381 began producing the type with its planned nose-mounted B-20 cannon. Fitted in a row asymmetrically (two to the left of the longitudinal axis and one to the right) this allowed any accessible space to be used for ammunition boxes – some of which were different shapes but held 130-rounds each. In total, 368 airframes were produced. The other factories continued

constructing La-7s with the original armament until manufacture ended in 1946.

Trials were continually made with different armament layouts, including three 20mm SSh-20 cannon and others with two 23mm NS-23S cannon. However, both variants were rejected on the grounds of poor reliability.

During summer 1944, an airframe appeared with an ASh-83 engine fitted for evaluation. In August this machine flew at speeds in excess of 378kts (700km/h) and although

housed in several other test machines, the powerplant did not enter full production. Shortly after, a single airframe received an 18-cylinder M-71 engine rated at 2,000hp (1,491kW), but again this did not enter series production.

Following the war La-7s gained enhanced thermal insulation in the cockpit; the loadings needed on the rudder pedals were reduced and the unsynchronised deployment of the leading-edge slats was eliminated – all were issues inherited from the LaGG-3.

In August 1945, plans called for the type to be fitted with the ASh-82FN powerplant, which had an in-service life of just 150 hours –



something deemed unacceptable in peacetime. However, production of the La-7 soon began to decrease, and by the end of the year had stopped completely in Moscow and Ulan-Ude. At Gorky, just 45 examples were produced during 1946 as the plant's focus shifted towards the two-seat La-7UTI.

Tandem teacher

With the La-5FN gaining a two-seat modification for training purposes, the intention was to create a similar blueprint for the La-7. Considered a straightforward adaption, a second cockpit for the instructor was added with a full set of flight controls and basic instrumentation. The tailwheel was also fixed and the doors deleted. The initial La-7UTI was rolled out in March 1945 and five months later was handed over to the AFSTI.

Once there, attention was immediately drawn to the fact that the aircraft's CoG had shifted significantly aft, making the aircraft very difficult to control. To address the issue, two wrought iron bars weighing a total of 55lb (25kg) were fitted underneath the engine cowlings. While stability became easier, the instructor was in no way fully in control. For example, he could not lower the undercarriage in an emergency. As before the cockpit was still incredibly hot, even more so in the rear. The second example was delivered with additional insulation, which eased the discomfort slightly.

During 1946, four prototype La-7UTIs with various adaptations were produced, but they too were rejected. It wasn't until the fifth version of the two-seat aircraft, slated for testing in June, that everyone thought it a workable aeroplane. Changes included the oil cooler being placed under the engine cowlings as it had been on the La-5FN, meaning the extra ballast was not required. A few other shortcomings were also discovered, but despite the negative feedback from the AFSTI, Factory 21 was chosen to begin series production in mid-1946. By the end of the year, some 207 examples had been built and delivered to VVS Training Aviation Regiments and Reserve Aviation Brigades. A number also joined frontline units to train pilots, undertake flying assessments and perform 'hack' duties.

When the La-7 was phased out in 1947, the total number of aircraft manufactured sat at 5,905 airframes, including 582 two-seat trainers.

In terms of its intended role, the La-7 was a frontline fighter. Designer Semyon Lavochkin, however, worked on several variants for numerous VVS Air Defence System requirements. For most of these, the aircraft's high-altitude characteristics, service ceiling and rate of climb needed to be much improved. This was addressed in two notable ways. First the engine was fitted with a turbocharger. Designated the La-7TK, the first flights took place in July 1944, but the aeroplane did not achieve the required results. It was also said that reliability of

internal fuel capacity had to be reduced slightly.

The first example of the La-7R was presented for testing towards the end of October 1944, but only a handful of flights were completed as most of the time was spent repairing it – the nitric acid dissolving anything it touched. The engine was again unreliable and the entire system did not function properly or safely. On numerous occasions the rocket failed to start in flight.

A second example flew from January 1945 onwards, designated



Left
A Moscow-built La-7, 'Black 69', is crowded at an airshow near Leningrad sometime in 1946. The unit to which the aircraft belonged is unknown.

the turbochargers left much to be desired. While undertaking a test flight in late 1945, the first prototype crashed, leading to the project being cancelled. The second was to use a liquid-fuelled rocket engine, which for a short time would increase the aircraft's speed and rate of climb. This would enable the type to be used as a 'targeted interceptor'. Sitting at an airfield on alert, when enemy aircraft appeared, it would scramble and then gain altitude rapidly, negating the need to fly laborious patrols.

Rocket revolution

Designated the La-7R, it featured an RD-1 rocket motor in the tail. Airframe changes included the vertical fin being raised and the rudder altered. Special pumps connected to the ASH-82FN powerplant supplied the rocket with fuel, which consisted of kerosene and nitric acid – just over three minutes' worth could be carried. The 40 imp gal (180 lit) acid tank was added in the wing centre section, while the 20 imp gal (90 lit) kerosene reservoir was in the right wing. These modifications meant the aircraft's

the La-7R-2. An additional rocket engine was added, providing a short burst of acceleration to boost the speed by almost 54kts (100km/h). On March 27 that year, test pilot Georgiy Shiyonov was unable to start the rocket in flight. Trying again with no luck, the aircraft was rocked by an explosion. Despite significant damage to the airframe's elevators and the lower part of the rudder, he managed to safely land with some difficulty.

Although the OKB undertook massive refinement of the system and changed the rocket engine for the upgraded RD-1KhZ, it offered little improvement. Despite the La-7R-2 managing to attain a maximum speed of 429kts (795km/h) and delivering promising results, it did not provide any real value to the Russians following the end of hostilities. The project was ultimately cancelled, although the aircraft was demonstrated during an airshow at Tushino, Moscow on August 19, 1946. The La-7R marked the end for mixed power options explored by some Soviet designers – the future lay in the fast approaching jet age. ●

Spotlight

Lavochkin
La-7

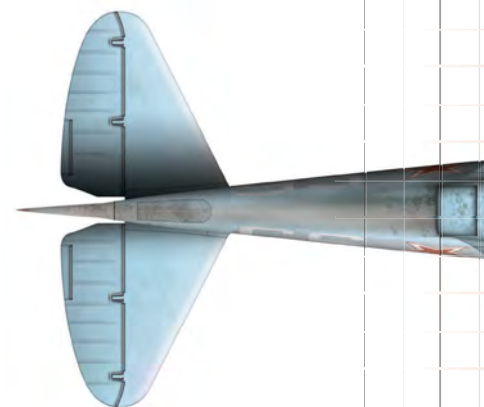


Hero of the Soviet Union

Red Air Force Lavochkin La-7s were notable for their often-attractive colour schemes. This month's **Andy Hay** artwork represents the machine flown by a well-known ace

White 93' was the mount of Maj Sergei Fedorovich Dolgushin who, despite falling just outside the top 100 list of Soviet air aces, still made his mark in aerial combat history – and forged a long career after World War Two. After graduating from the Kacha Higher Military Aviation School in 1940, he flew I-16s, MiG-3s, Hawker Hurricanes, Yak-7Bs and

La-5Ns with different units before 'strapping on' the La-7 in 1945. His aircraft 'White 93' is seen here as it was during missions over Germany, bearing 28 victory markings, the gold star of the Hero of the Soviet Union award on the engine cowling and the red and white tail stripes of the 156 IAP. He continued to serve in the air force after the war and retired in 1976 as a Lieutenant-General. ●



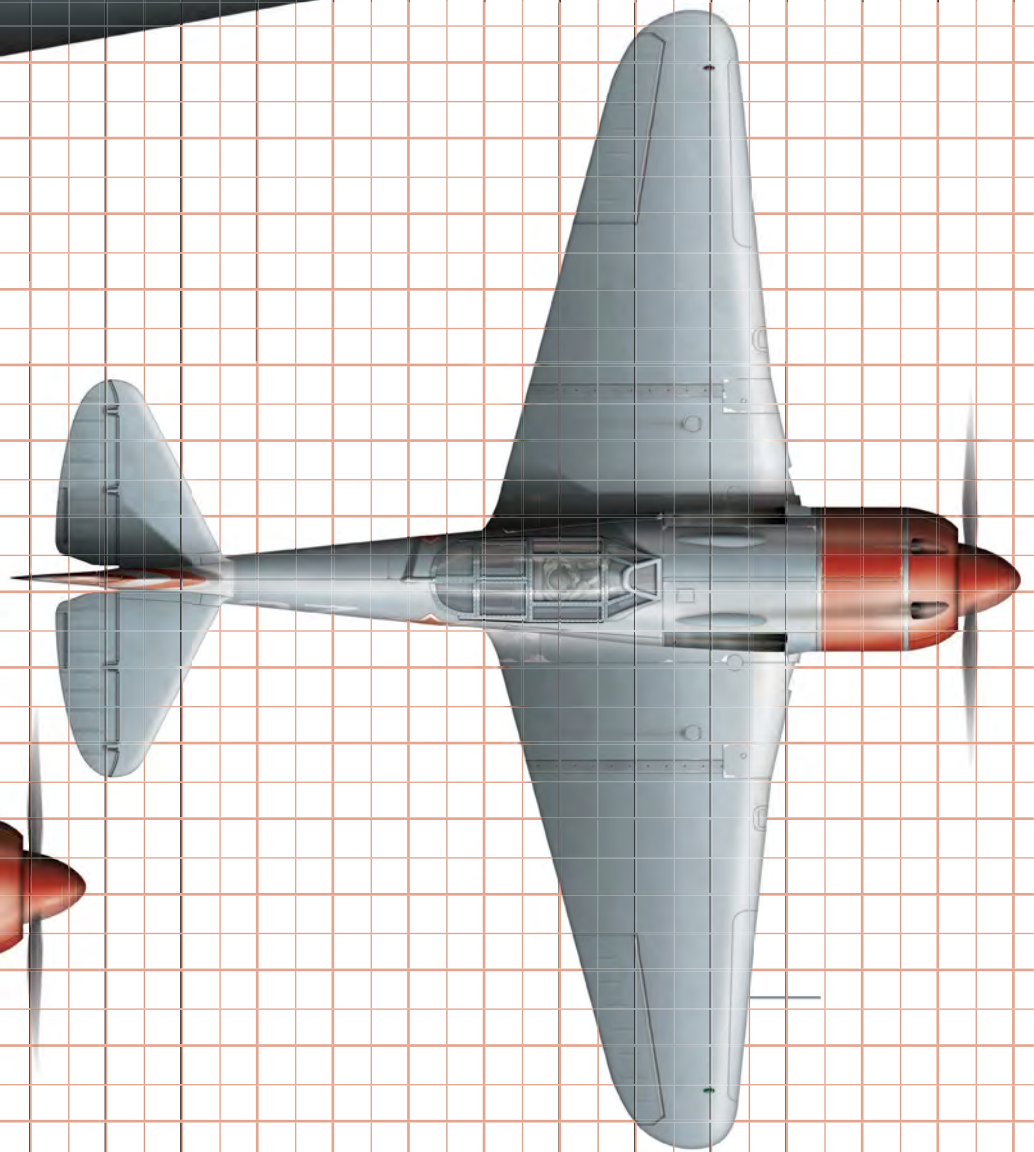
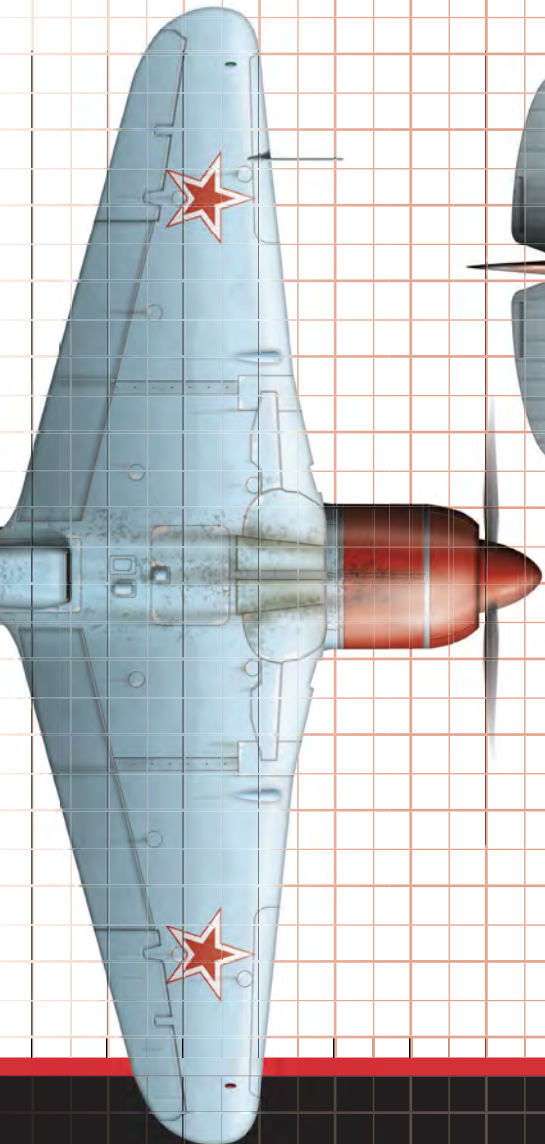
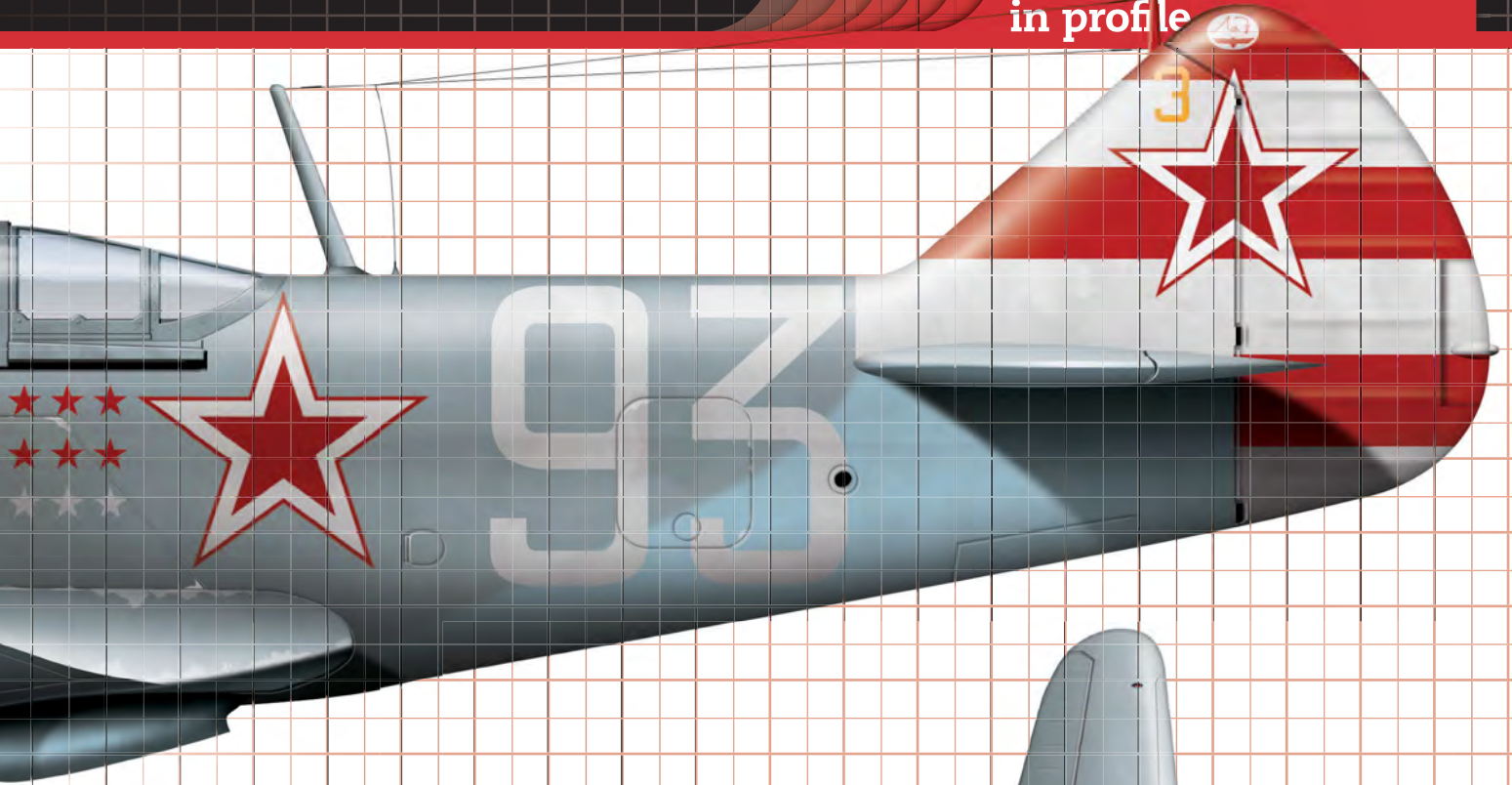
AMT-11 grey

AMT-7 light blue

Red

White

La-7
in profile



Savage

Vladimir Kotelnikov details how the La-7 was blooded in combat

Right
Pilots of the 32nd GIAP pose with an unidentified La-7 while serving on the first Baltic Front with Gen Lt N F Papivin's 3rd Air Army, circa 1944. ALL VLADIMIR KOTELNIKOV COLLECTION

Far right
Twice Hero of the Soviet Union Maj Aleksey Alelyukhin in the cockpit of his personal La-7 'White 14' while serving with the 9th GIAP. The fuselage inscription reads: "To Aleksey Alelyukhin from collective of Trust No 41 of the People's Commissariat of Aviation Industry".

The La-7's baptism of fire came on June 24, 1944 while the 19th Fighter Air Regiment (IAP) of the Red Air Force (VVS) operated over the Belorussian Front in support of Operation Bagration – the Red Army's attempted push west. Having already flown the La-5FN, the unit received its initial batch of Moscow-built La-7s earlier that month; the conversion to the new fighter was easy given the similarity to its predecessor.

First blood

However, despite several skirmishes with Luftwaffe fighters, the first confirmed 'kills' weren't recorded until July 7, when S Lt Petrov and Capt A Baklan each shot down a Messerschmitt Bf 109. The enemy had no idea the VVS had a new fighter on the front line and took them initially for La-5FNs. For its courage and heroism during the breakthrough of German defences, the 19th IAP was renamed the 176th Guards Fighter Air Regiment (GIAP) in August 1944 and placed under the command structure of the 3rd Guards Fighter Aviation Division (GvIAD).

Usually, 176th GIAP pilots, commanded by Col Pavel Chupikov, were deployed to the most important sectors of the front and entrusted with 'purging' the airspace. Aircraft belonging to this regiment wore distinctive markings – red noses and white tails. Any time the unit relocated, the pilots took along their mascot, a lively and mischievous bear cub named 'Zorka', with them in a Lisunov Li-2 transport aircraft 'for good luck'.

Shortly after, two more regiments within the 3rd GvIAD – the 63rd and 32nd GIAPs – started receiving the La-7, known as the Semyorka (seven). Commanded by

'Semy



Soviet Premier Joseph Stalin's son Col Vasily Stalin, the 32nd took delivery of 30 examples in July 1944 while based just outside the city of Tula, 100 miles (161km) south of Moscow. With the addition of the 63rd's aircraft, the GvIAD comprised some 70 La-7s. In August that year, the 3rd was sent to the 1st Baltic Front to join Gen Lt N F Papivin's 3rd Air Army.

From September 15, the 63rd GIAP was ordered to undertake four weeks of official combat evaluation with the new fighter. Operating from several airfields, pilots flew more than 460 sorties covering frontline troops and escorting both bombers and ground-attack aircraft. Given the proximity of the enemy, most sorties took less than an hour, meaning the La-7s could launch six times daily. With fighter opposition coming principally in the form of Fw 190s, Soviet records indicate 55 German aircraft were shot down during these trials; 52 were noted as Focke-Wulfs, but it is likely this figure has been exaggerated. Eight Russian losses were also reported – four of which were shot down, while the rest were destroyed in forced landings linked to engine failures. Three Russian aviators were killed.

Soviet pilots were not afraid of fighting in the new aircraft, even

when drastically outnumbered. On August 25, seven La-7s, led by Maj A G Voronko, came across a dozen Fw 190s and two Bf 109s. Despite the enemy's numerical advantage, the Soviet fliers attacked, resulting in seven German machines being downed for one Russian; the pilot abandoned his aircraft by parachute.

Highs and lows

The La-7 was designed to counter fighters, ground-attack aircraft and light/medium bombers at both low and medium altitudes. When it came to air combat, the La-7 demonstrated a superior rate of climb at these altitudes over both the Fw 190 and Bf 109 and could catch them in ascending and tight radius turns. It was arguably unrivalled in terms of manoeuvrability. The Russian pilots would evade German fighters by flying steep, climbing spirals. However, there were noted instances of '190s breaking away in abrupt dives, cutting the engine and deploying the flaps to slow down. Trying to chase after them, the La-7s would be forced to break off, so as not to overtake the German machine and end up in its line of fire.

Overall, the La-7's flight performance suited Soviet aviators – as did its firepower. The Focke-Wulfs would rarely employ

La-7
in combat

orka'

Алексею Амельяшину
ОТ КОЛЛЕКТИВА
ТРЕСТА

Clockwise from right

Commander of the 1st Ukrainian Front, Col Gen Ivan Konev (second from left) inspects new La-7s and crews of the 2nd Air Army. Col Gen Stepan Akimovich Krasovskiy, Commander of the 2nd, is on the far right.

Twice Hero of the Soviet Union Maj Vladimir Lavrinenkov in his La-7, 'White 17', around March 1945. During this time, his unit - the 9th GIAP - was engaged on operations in East Prussia.

An armourer prepares to reload a La-7 with belts of 20mm ammunition between missions.

During the La-7's early combat career, problems with the Shvetsov ASh-82FN powerplant led to several forced landings, as demonstrated by 'White 32' while operating with the 12th Air Army in 1944.



a head-on attack, while the Messerschmitts would avoid them completely. Pilots remarked on the spaciousness of the cockpit and the excellent visibility. But they did complain that the heat generated in the 'office' was unbearable at times, along with the sheer effort required to control the rudder and unsynchronised deployment of the flaps. Engine reliability was often noted as low, too. Normally the ASH-82FN would work well for the first ten or so hours, before the oil consumption increased dramatically, which was almost inevitably followed by failure.

The 32nd GIAP underwent conversion on the front line and by September 14, was considered combat ready as the advance towards Riga commenced. During the battle, La-7s were tasked primarily with disrupting Luftwaffe Fw 190F fighter-bombers attempting to stop the Soviet push – either by shooting them down, forcing them to jettison their bombs or simply driving them away. Other tasks included attacking convoys, depots and troop concentrations. By December 1944, the 32nd had shot down 61 German aircraft.

The 9th GIAP at Chkalovskaya airfield, near Moscow, began receiving the La-7 in June 1944. Among its pilots were famous aces such as Hero of the Soviet Union Amet-khan Sultan, and Vladimir Lavrinenkov and Aleksey Alelyukhin, who received this accolade twice. Compared with the 63rd and 32nd GIAPs, conversion took longer as it had previously operated the Bell P-39 Airacobra – a very different aircraft. After four months' training, the 9th moved to Rutkishki airfield, near the city of Kaunas, and was tasked with clearing the skies of enemy aircraft. Closer to the front line, the unit utilised a 'free hunting' method with the need to destroy German recce aircraft given particular emphasis – the orders were that they had to be downed at any cost.

At the end of December 1944, Hero of the Soviet Union Capt Pavel Golovachev's guns jammed while engaging a reconnoitring Luftwaffe Junkers Ju 88 at high altitude. So as not to give it the opportunity to escape, the pilot deliberately rammed the enemy machine – cutting off its tail with his propeller. While the Ju 88 crashed into the ground near the city of Freiburg, East Prussia,

Golovachev managed to land his damaged 'seven' back at Rutkishki.

Under the command of Lavrinenkov, the 9th continued to fight throughout Courland and East Prussia. On February 19, 1945 eight La-7s attacked the Luftwaffe airfield at Heiligenbeil. With three La-7s providing top cover against a flight of four Bf 109s, the others strafed the aircraft hardstandings and hangars. Two '109s were shot down during the ensuing dogfight.

Already an exponent of air combat, Amet-khan Sultan (who became a noted test pilot at the Zhukovsky Flight Research Institute after the war) received his second Gold Star while flying the type. La-7 pilots S Lts Mikhail Tvelenev and Ivan Timofeenko became first-time Heroes of the Soviet Union – both also became noted test pilots.



Numbers increase

Further units took delivery as more La-7s arrived on the front line. The 179th IAP, 3rd GvIAD, received its first examples in mid-1944. Following suit, the 164th IAP's initial



airframes were flown in by December that year and, by the following March, were combat ready. At the end of 1944, Lavochkin's new fighters reached the 111th GIAP – the unit with whom Hero of the Soviet Union Maj Pyotr Gnido served. This was followed by the 171st IAP in February 1945 and the 40th GIAP soon after. On April 2, 1945 Gnido shot down three Focke-Wulfs in the area around Kranowitz on the Polish-Czech border.

In November, the intention was to convert the 9th GvIAD to 1944-stock La-7s. However, the divisional commander Col Aleksandr Pokryshkin (who went on to become the Soviet Union's second highest-scoring ace with 65 'kills') personally asked Lavochkin for a batch of aircraft fitted with ASh-83 engines and armed with three cannon. This special order was rescinded following the death of Hero of the Soviet Union Capt Aleksandr Klubov during the unit's conversion.

On February 10, 1945 some 433 La-7s were attached to units on the front line, with a further 458 at second-line bases. It is easy to say the new aircraft already occupied a significant position in Soviet fighter aviation. However, almost a third of the fleet was unserviceable at the time.

In 1945, Lavochkin's fighter was being used in support of nearly every Soviet Army operation. In Hungary two units, including the 523rd IAP under the 295th Fighter Air Division (IAD), flew the type in combat across East Prussia. Many were active in the final operations against Berlin and, from April 16, ➔



La-7 and Fw 190 head to head

Lavochkin's fighter is known for being one of the best of World War Two, with reports from frontline pilots stating advantages over the Bf 109 and Fw 190. Usually, the La-7 was compared with the Fw 190A-8 which, while heavier, was fitted with a powerful MW 801 D-2 radial engine.

But even with the German machine using this lead and boost, the Soviet machine still had a speed advantage of around 27kts (50km/h) at low level. Conversely, the La-7's instrumentation, navigation equipment and radio were all incredibly basic, while the armament was restricted. One of the advantages the German machine carried was its firepower and far greater rate of fire.

The difference in rate of climb at low level was enormous, but the La-7's advantage fell away sharply as altitude increased, and from 14,000ft upwards the German aircraft started to gain the upper hand. Above 14,500ft, the Lavochkin's advantages had tailed off to very little, if not zero.

In May 1945, Soviet forces captured several serviceable Fw 190D-9s fitted with liquid-cooled inline engines.

After one of the airframes was dismantled, it was transported to Russia, rebuilt and underwent assessment at the Air Force Scientific Testing Institute, where it demonstrated better flight and performance characteristics over the A-8. However, it still lost out to the 'seven' in terms of speed below 14,500ft; just 200ft higher, that advantage had been slashed to 8kts (15km/h). Even so, the Soviet machine's rate of climb was noted as better than the German aircraft.

While evaluating the D-9, test pilots pitted it against the La-7 in a series of mock dogfights for training purposes. It was found that when manoeuvring in the vertical, the Soviet aircraft was able to get onto the enemy aircraft's tail in just two or three turns. Likewise, when using a combat turn, the La-7 would gain considerable altitude and a significant advantage for a favourable firing position, or to fire a deflection shot.

Comparison statistics (compiled by Malcolm V Lowe)

Lavochkin La-7

Powerplant	1 x Shvetsov ASh-82FN (M-82FN) 14-cylinder, air-cooled radial, 1,851hp (1,380kW)
Crew	1
Length	28ft 2 ³ / ₄ in (8.6m)
Wingspan	32ft 1 ³ / ₄ in (9.8m)
Height	8ft 6 ¹ / ₄ in (2.6m)
Gross wing area	189.34sq ft (17.59m ²)
Empty weight	5,776lb (2,620kg)
Max take-off weight	7,496lb (3,400kg)
Maximum speed	413mph (665km/h) at 19,685ft (6,000m)
Range	615 miles (990km)
Service ceiling	38,714ft (11,800m)
Armament	2 x 20mm ShVAK cannon in upper forward fuselage with 200rpg

Fw 190A-8

Powerplant	1 x BMW 801D-2 air-cooled radial, 1,700hp (1,268kW)
Crew	1
Length	29ft 4 ¹ / ₄ in (8.95m)
Wingspan	34ft 5 ¹ / ₂ in (10.50m)
Height	12ft 11 ¹ / ₂ in (3.95m)
Gross wing area	196.98sq ft (18.30m ²)
Empty weight	7,694lb (3,490kg)
Max take-off weight	9,789lb (4,440kg)
Maximum speed	402mph (647km/h) at 18,045ft (5,500m)
Range	513 miles (825km) without auxiliary fuel tank
Service ceiling	35,761ft (10,900m)
Armament	2 x 13mm Rheinmetall-Borsig MG131 machine guns in upper forward fuselage with up to 475rpg; 2 x 20mm Mauser MG151 cannon in wing-roots with 250rpg; 2 x 20mm Mauser MG151 cannon in outer wings with 140rpg



Above
Leading La-7 ace
Ivan Kozhedub
(centre, left) and
aircraft designer
Semyon Lavochkin
(centre, right)
share a joke during
an official visit in
August 1945.

aircraft from the 32nd GIAP were tasked with escorting Tupolev Tu-2 bombers hitting the city's remaining defences; La-7s first appeared over the Reich capital on April 21. Four days later, aircraft from the 9th GIAP blockaded Tempelhof Airport in the south of the city to prevent any possible escape of the German leaders. It was there that a large, four-engined aircraft was attacked and destroyed on the ground.

Later, an attempt was made to obliterate the temporary runway at Tiergarten, north of Tempelhof. With fierce aerial skirmishes raging over the city, Soviet pilots shot down seven enemy fighters and damaged a further two. On several occasions, La-7 pilots encountered their first jet aircraft, but were unable to shoot down any. By May 1, 1945 there were 967 La-7s on the front line, along with 676 La-5FNs. The final combat sorties came shortly after this, with the 207th IAD attacking several Waffen-SS units, which had managed to break through near Dresden to the west.

Combat exponent

The vast majority of La-7 'kills' were credited to Capt Ivan Kozhedub – the Soviet Union's highest-scoring ace. Serving with the 176th GIAP from August 1944, his logbook records 14 aircraft shot down while flying La-7 'White 27' – including two Fw 190s near Berlin on April 17. It was believed the Soviet ace had in fact claimed a Messerschmitt Me 262 in February 1945, but gun camera photographs later found by historians showed a type similar to a Bf 109 carrying some form of stores under the wings instead.

However, Kozhedub is said to have shot down 16 aircraft, with two being omitted from his official 'score' due to the fact they were USAAF North American P-51D Mustangs. Encountering a group of Boeing B-17 Flying Fortresses under attack, he was apparently mistaken by the bombers' escort as an enemy type and engaged. With no other option, Kozhedub supposedly shot down two '51s in self-defence.

Kozhedub finished the war as a regimental commander with the rank of major. Shortly after the cessation of hostilities, he became a Hero of the Soviet Union for a third time – one of just three people to do so. As well as this, he was awarded the Order of the Red Banner seven times, again one of only three people to achieve this. The La-7 'White 27' survives to this day and is displayed in the Great Patriotic War Hall of the Russian Air Force Museum at Monino, 14 miles (23km) east of Moscow. After the war, Kozhedub studied at the Air Force Academy, commanded the 324th IAD during the Korean War and finally became Marshal of Aviation in 1985. He died in Moscow in August 1991.

During the Soviet Union's build-up for combat operations against Japan, 313 La-7s were spread across the 9th, 10th and 12th Air Army units, some of which redeployed with their pilots and groundcrews from the west immediately following Germany's surrender. Almost all fighter units in the Soviet Far East, such as the 14th IAP based on the Kamchatka Peninsula, also received the La-7, while the Pacific Fleet Air Forces took delivery of 79 examples.

The type proved useful during operations over northern China and Korea, with tasks including bomber and transport escort, and providing top cover for airfields and advancing troops. Air combat in this area was sparse at best though, with Japanese fighters not showing any significant signs of activity.

Peace beckons

By mid-1945, the La-7 had started to enter service with numerous home-based fighter units, such as the 159th IAP, which, by May 1, 1945 boasted 96 of the type. However, given the dire straits the Luftwaffe was facing, the unit very rarely flew against them as raids into Soviet territory were now consigned to history. As World War Two ended, the Soviet Naval Aviation (AV-MF) received its first La-7s and, by the end of the year, several units, including the Baltic Fleet Air Force's 10th GIAP, were partially equipped.

Directly following World War Two, La-7 units were based across the Soviet Union, Germany, Austria, Poland and Czechoslovakia. Despite the war being over, factories continued to roll out the type at the same rate. Towards the end of 1945, Commander of the Red Army Air Force Alexander Novikov, in a letter to Premier Stalin, proposed that all the IAPs then flying foreign aircraft should be equipped with indigenously designed and built machines – specifically, the La-7. A decree written by the Council of Ministers dated March 22, 1946 envisaged all fighter units to operate three types – the Yakovlev Yak-3 and -9U, alongside Lavochkin's machine. However, the document also stated that 748 early series La-7s were to be written off due to wear, tear and damage.

In 1947, the 790th IAP, based at Shchuchin airfield near Grodno, Belarus converted from the La-5FN to the La-7. But it was not to remain in service much longer.

The 'Semyorka' had a number of shortcomings, caused partly by its rushed entry into production. This wasn't helped by shortages of a proper workforce, equipment and materials – problems that were never solved. Throughout the world at that time, fighters built from wood did not have a great service life expectancy, normally no more than two years. When losses

were very high and expected this was considered acceptable, but in peacetime it was not.

From 1948, the La-7 was gradually replaced by new types such as the La-9 and Mikoyan-Gurevich MiG-9 Fargo jet. The 790th IAP took delivery of its first La-9s in March 1948, having flown La-7s for less than a year. Soon after, the 32nd GIAP at Oryol, 205 miles (330km) southwest of Moscow, also began converting to the MiG-9. While most IAPs changed to the new types rapidly, the 401st IAP only started replacing its airframes in December 1950. Examples considered properly serviceable were spread around the La-9 and La-11 equipped IAPs for



Above
Heroes of the Soviet Union Capt Ilya Borisov (left) and Maj Amet-khan Sultan of the 9th GIAP stand with the latter's personal La-7, 'White 24'. Just visible is Sultan's eagle motif on the engine cowl.

were transferred to China in 1950 for use in flying schools. Numerous US pilots reported encounters with La-7s at the beginning of the Korean War in June 1950 – but this is clearly an error as no examples were sent to the North Korean Air Force.

Overall, the La-7 could be assessed as an aircraft created for the specific conditions of the Soviet-German conflict, while considering the capabilities of the indigenous aviation industry at the time. Despite being at war, the Soviets did not have a large fleet of heavy bombers that needed escorting. This meant La-7s operated over the front line or just beyond it, meaning their long range wasn't needed and the interception of high-altitude targets was not foreseen either. In the Air Defence System IAPs, Supermarine Spitfire Mk.IXs supplied by Britain demonstrated much better performance and reliability – a key indication of the state of Soviet aircraft production at the time. ●

Left
Pilots of the 32nd GIAP rest between missions under La-7 'White 46' at an airfield in Germany, sometime in mid-1945. The unit was one of the first to take delivery of the type in July 1944.



Below
Three times Hero of the Soviet Union and then Marshal of Aviation Ivan Kozhedub acquaints himself with 'White 27' at the Russian Air Force Museum, Monino, post-1985.

use as trainers and 'hacks'. Thus, the 899th IAP, which had been deployed to Germany, still operated a handful of La-7s and UTILa-7s well into the very late 1940s.

At several aviation colleges, the now antiquated fighters survived for longer still – again in the instructional role. As late as 1951, the AV-MF pilot training facility at Yeysk, on the shores of the Taganrog Gulf of the Sea of Azov, still utilised both single-seat and two-seat La-7s. Evidently, it would seem the final La-7s in the Soviet Union had been written off a year later.

Deliveries abroad

Between March and April 1945, La-7s began to enter service with the 1st Czechoslovak Mixed Air Division, which had been active along the Soviet-German Front. However, they did not take part in any combat missions. Following

the German surrender, large swathes of German hardware were awarded to Czechoslovakia free of charge. In June 1945, more than 50 examples had arrived, the type being designated S-97 in Czechoslovak Air Force service. In autumn that year, the 1st and 2nd Regiments operating the type were subsumed into the 4th Air Division and deployed to Slovakia. It was there in 1947 the S-97 was used in combat for the first time, with strikes against detachments of Ukrainian nationalists hidden in mountainous areas during Operation Vistula. The aircraft served with the country until the early 1950s.

In many foreign publications, mentions are made of the Soviet Union supplying 40 La-7s to Romania, but no confirmation has been found in official records. On the other hand, what is known for sure is that a dozen 'taxiable' aircraft

