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[Air University Review](#) 1986-09

Barbarossa Christer Bergstrom 2007 Although Operation Barbarossa, the German invasion of Russia in June 1941, is widely perceived seen as a great land offensive, equally important was the aerial supremacy that the Luftwaffe achieved over the front during its early phases. Without the elimination of the threat posed by the Soviet air force, it would have been impossible for the army to have made the rapid advances of the summer and autumn of 1941. This book provides a detailed account of the massive aerial campaign fought in the skies over the Soviet Union following the launch of Operation Barbarossa. Drawing on both Russian and German sources, the strength of Christer Bergström's writing lies in its detail, his ability to tell the story from the viewpoints of both sides and to put events in both their strategic and tactical contexts. A large number of rare and previously unpublished photographs, biographical studies of major players, data tables, technical assessments and appendices accompany the text. Compiled by one of the world's leading experts on the air war over the Eastern Front, this is the first in a series of books to cover the major phases of World War Two in this theatre of operations.

[Soviet Fighters of the Second World War](#) Jason Nicholas Moore 2021-07-30 The Red Air Force had just started to re-equip with modern monoplane fighters when the Germans opened Operation Barbarossa, the invasion of the Soviet Union. Hundreds of fighters were destroyed in the first few days, but many of these were obsolete biplanes. **Soviet Fighters of the Second World War** details fighter development from the dark days of Barbarossa to eventual triumph over Berlin. Starting with outdated aircraft such as the Polikarpov Po-2 biplane and monoplane fighters, the Soviets then settled on two main lines of development: the inline-engine LaGG-3 and its radial-engine derivatives, the La-5 and La-7, and the inline-engine Yakovlev fighters, which were produced in greater numbers than any other series of fighters. Not only are these aircraft

accurately described, but experimental fighters are also dealt with. In addition, colour profiles illustrate these aircraft in terms of design, camouflage and markings. From the I-15bis biplane of the late 1930s to the superb La-7 and Yak-3 fighters of the last year of the war, all Red Air Force fighters are covered in this comprehensive volume.

Soviet Combat Aircraft of the Second World War E. Gordon 1998 Soviet Combat Aircraft of the Second World War, Volume One Gordon and Khazanov Subtitled: Single-Engined Fighters. Arranged by manufacturer, this authoritative study contains the products of Soviet designers Lavochkin, Mikoyan and Yakovlev, as well as several lesser known names. Fact-filled with design and development histories, political backgrounds, production numbers, flight test results, operational accounts, and details of units and campaigns. Technical descriptions are backed up by comprehensive spec tables. Exceptional archive photography. Introduction by Bill Gunston. Hdbd., 9 1/2"x 12", 184 pgs., 358 bandw ill., 17 color.

American Aviation Historical Society Journal American Aviation Historical Society 1987

[Air Force Magazine](#) 1988

Hwelte Clinton R. Petrie 2002-03-01 THE BEST KEPT RUSSIAN SECRET OF WORLD WAR II. By the close of World War II almost 1,000 Russian women had flown combat missions in every type of Soviet warplane. This was kept secret, not by the Soviets but by the Allies, from the general public in the West. Using historical fiction based on fact Roy McShane's exciting novel, HWELTE, reveals for the first time what truly deadly hunters these women fighter pilots proved to be. It also chronicles the adventures of a young American pilot, who stumbles across this secret, at the Battle of Stalingrad in 1942. Author's Websites:

www.thaiwave.com/hwelte www.phuketdir.com/hwelte

Messerschmitt Bf 109 Jan Forsgren 2017-06-29

[Design of Aircraft Landing Gear](#) Robert Kyle Schmidt 2021-02-28 The aircraft landing gear and its associated

systems represent a compelling design challenge: simultaneously a system, a structure, and a machine, it supports the aircraft on the ground, absorbs landing and braking energy, permits maneuvering, and retracts to minimize aircraft drag. Yet, as it is not required during flight, it also represents dead weight and significant effort must be made to minimize its total mass. The Design of Aircraft Landing Gear, written by R. Kyle Schmidt, PE (B.A.Sc. - Mechanical Engineering, M.Sc. - Safety and Aircraft Accident Investigation, Chairman of the SAE A-5 Committee on Aircraft Landing Gear), is designed to guide the reader through the key principles of landing system design and to provide additional references when available. Many problems which must be confronted have already been addressed by others in the past, but the information is not known or shared, leading to the observation that there are few new problems, but many new people. The Design of Aircraft Landing Gear is intended to share much of the existing information and provide avenues for further exploration. The design of an aircraft and its associated systems, including the landing system, involves iterative loops as the impact of each modification to a system or component is evaluated against the whole. It is rare to find that the lightest possible landing gear represents the best solution for the aircraft: the lightest landing gear may require attachment structures which don't exist and which would require significant weight and compromise on the part of the airframe structure design. With those requirements and compromises in mind, The Design of Aircraft Landing Gear starts with the study of airfield compatibility, aircraft stability on the ground, the correct choice of tires, followed by discussion of brakes, wheels, and brake control systems. Various landing gear architectures are investigated together with the details of shock absorber designs. Retraction, kinematics, and mechanisms are studied as well as possible actuation approaches. Detailed information on the various hydraulic and electric services commonly found on aircraft, and system elements such as dressings, lighting, and steering are also reviewed. Detail design points, the process of analysis, and a review of the relevant requirements and regulations round out the book content. The Design of Aircraft Landing Gear is a landmark work in the industry, and a must-read for any engineer interested in updating specific skills and students preparing for an exciting career.

Aircraft of World War II Stewart Wilson 1998 A comprehensive directory of the aircraft that saw service during WWII, with over 300 entries covering the fighters, bombers, reconnaissance and strike aircraft, trainers and transports built in some 15 nations around the world. Entries list: country of origin; aircraft type; powerplants; dimensions; weights; armament; performance; operators; production; and history of each featured aircraft. Sftbd., 8 1/2"x 11", 176 pgs., 322 bandw ill.

The Air Forces Ashley Brown 1990-02

Flying Warbirds Cory Graff 2014-11-03 Get a comprehensive look at how World War II was fought from the

air. Do you want to get an up-close look at some of the rarest airplanes in the world? Are you curious about combat aircraft from World War II? In deluxe hard-back volumes, *Flying Warbirds* brings U.S., British, German, Russian and Japanese fighting planes from the 1930s and 1940s together, complete with detailed photographs to delight every aeronautics connoisseur. The airplanes at the Flying Heritage Collection were created at a time when aeronautical discovery had evolved to aviation mastery. Finely crafted by distinguished design bureaus with the leading technologies of the 1930s and 1940s, the main emphasis of the collection includes combat aircraft from World War II. In 1998, Paul G. Allen began acquiring and preserving these iconic warriors and workhorses, many of which are the last of their kind. Allen's passion for aviation and history, and his awareness of the increasing rarity of original WWII aircraft, motivated him to restore these artifacts to the highest standard of authenticity. Periodically, one or more of the exhibits are temporarily absent to participate in an event, for maintenance, or for continuing restoration. Experience one of the world's top airplane collections any time you like through *Flying Warbirds*. Photographs include cockpit shots, exterior museum shots, historic photographs, and breathtaking contemporary flying shots from photographers like award-winning John Dibbs. *Flying Warbirds* is the definitive guide to everything you want to know about this fascinating period in aeronautics and military history.

Condor Patrick Laureau 2010 Originally published as: *Legion Condor*. Ottringham: Hikoki, 2000.

A Century of Triumph Christopher Chant 2002 An illustrated history of aviation retraces humankind's fascination with flight, from the Wright Brother's famous 1903 flight through the triumphs of technology manifest in the Stealth Bomber and beyond.

Air War Over Spain Rafael A. Permuy López 2010-02 The air campaigns fought during the Spanish Civil War prompted important technical and tactical developments for all parties - from the actual deployment of air power through to communications. The small and largely obsolescent Spanish Air Force of 1936 grew into an effective fighting arm, which, by 1937 had become a significant force thanks, in part, to German and Italian support. The Nationalists fielded Heinkel, Fiat, and Messerschmitt fighters and Heinkel, Caproni, Savoia-Marchetti, Junkers, and Dornier bombers. These forces entered into a grinding battle of attrition over the less-organized but fiercely motivated Republican air arm over Aragon, the Jarama, and Madrid Fronts and later over Brunete, Belchite and the final campaign over the Ebro in mid to late 1938. The Republicans were equipped with Soviet-built Polikarpov, Nieuport, Hawker, and Dewoitine fighters and Potez and Tupolev bombers. The aircraft were often colorful and adorned with vivid markings, illustrated in this book with color artwork as well as contemporary photographs. Twenty Nationalist pilots gained five or more victories, with the German and Italian contingents also scoring high kill numbers.

LaGG & Lavochkin Aces of World War 2 George Mellinger 2012-10-20 This book examines the LaGG family of fighters, that were amongst the first modern piston-engined interceptors made available to the Red Air Forces in early 1941 and proved far better fighters than their radial-engined predecessors. Despite technical maladies and political interference from Moscow, the LaGG-3 matured into an effective fighter when flown to its strengths at low level. Many early Soviet aces were weaned on the LaGG-3, and if they survived the early massacres of 1941-42, they went on to fly the Lavochkin family of fighters. Indeed, the Lavochkin La-3, -5 and -7 were the fighters of choice for Heroes of the Soviet Union such as Ivan Kozhedub, who claimed 62 kills.

Soviet Hurricane Aces of World War 2 Yuriy Rybin 2012-08-20 Following the destruction wrought on the Red Army Air Forces during the first days of Operation Barbarossa in June 1941, the Soviet Union found itself desperately short of fighter aircraft. Premier Josef Stalin duly appealed directly to Prime Minister Winston Churchill for replacement aircraft, and in late 1941 the British delivered the first of 3360 Hurricanes that would be supplied to the Soviet Union under the Lend-Lease agreement. Specifically requested by the USSR, the Hurricanes were quickly thrown into action in early 1942 – the Soviet Air Forces' most difficult year in their opposition to the Luftwaffe. Virtually all the Hurricanes were issued to Soviet fighter regiments in the northern sector of the front, where pilots were initially trained to fly the aircraft by RAF personnel that had accompanied the early Hawker fighters to the USSR. The Hurricane proved to be an easy aircraft to master, even for the poorly trained young Soviet pilots, allowing the Red Army to form a large number of new fighter regiments quickly in the polar area. In spite of a relatively poor top speed, and only a modest rate-of-climb, the Hurricane was the mount of at least 17 Soviet aces.

Soviet Heavy Fighters 1926-1949 Dariusz Paduch 2021-12-31 The history of Dornier aircraft in the Kingdom of Serbs, Croats, and Slovenes.

Chronicle of Aviation M. J. Armitage 1992 Uses contemporary accounts to trace the history of aviation and describe records, events, and technical developments

The Illustrated Directory of Fighting Aircraft of World War II Bill Gunston 1999-01 Specs for more than 160 aircraft, with illustrations and period photos to detail paint schemes. Ideal for scale and R/C modelers.

Junkers Ju 88 Kampfgeschwader on the Russian Front John Weal 2012-10-20 The Ju 88, "Wunderbomber" was the main punch of the Luftwaffe's bomber arm during the initial invasion of the Soviet Union and went on to provide critical ground support to the advancing Wehrmacht. This book tells the complete story of the Ju 88's activities on the Eastern Front including their participation in the campaign against the arctic convoys and the several variants employed. Written and illustrated by renowned Luftwaffe expert John Weal, this book completes Osprey's trilogy on one of the most important German aircraft of World War II.

Soviet Bombers of the Second World War Jason Nicholas Moore 2019-09-08 Soviet bombers were a varied lot during the Second World War, ranging from single-engined biplanes such as the 1920's era Polikarpov U-2 to the excellent and modern twin-engined Tu-2 medium bomber. Although the use of four-engined strategic bombers was mostly limited to use of the huge Pe-8 bomber, the Soviets used many other aircraft for both strategic and tactical bombing. As the bombers of the Red Air Force were mainly tasked with supporting the Red Army, most of the bombers were used for tactical bombing, attacking tanks, troop convoys, trains, and airfields. This book will deal with both strategic bombers and tactical bombers, but will concentrate on the smaller tactical bombers, as this is where the Red Air Force's emphasis lay. Such types as the Il-4, the Su-2, the aforementioned Tu-2, and the most important bomber of all, the Il-2 Shturmovik attack bomber, will be described in great detail, including not only details on the aircraft themselves, but how they were deployed in combat. The one truly strategic bomber, the Pe-8, will not be forgotten, and neither will the comparatively tiny U-2 biplane, which was so effective in its use as a night-time "nuisance" raider that the Germans copied the tactic wholesale. Accurate colour profiles in some number will accompany the text in this comprehensive work on Soviet bombers.

Dogfight Dr Alfred Price 2016-09-14 This book not only uncovers how the tactics of aerial warfare have changed through each major conflict of modern times, but also the dramatic narrative allows the reader to feel like they were there in the skies, flying alongside these incredible pilots.

The Red Army and the Second World War Alexander Hill 2016-12-24 A major new account of the Soviet Union at war which charts the development, successes and failures of the Red Army.

Polikarpov's Biplane Fighters Yefim Gordon 2002 The Soviet Polikarpov design bureau is perhaps best known for the I-16 fighter, the world's first monoplane fighter to have a retractable undercarriage. This aircraft is covered in Volume 3 of the Red Star series. This book explores the development of Polikarpov's fighting biplanes from the 2I-N1 to his first aircraft to see production; to the I-3 and the I-5 created while the designer was in prison. This design paved the way for the I-15 which earned fame as the Chato during the Spanish Civil War and also saw action against the Japanese, and the I-15bis which owed its existence mainly to Soviet Air Force's prejudice against gull wings; and the famous I-153 Chaika, a gull-wing biplane with retractable-landing gear. Experimental versions of this aircraft are also included in the book. A detailed account of the combat role of these aircraft is given as are structural descriptions. The book also includes details of the ill-starred I-190 which was to have superseded the Chaika and of privately owned I-15bis and I-153s which have been restored to airworthy condition.

MiG-3 Aces of World War 2 Dmitriy Khazanov 2013-05-20 The MiG-1/3 family of fighters was built to satisfy a

Soviet Air Force requirement for an advanced, fast, high-altitude fighter. Entering service in the spring of 1941, the problematic MiG-1 had its handling issues rectified with the hasty production of the MiG-3. Many of these were destroyed on the ground when the Germans launched Operation Barbarossa. Nevertheless, enough examples survived to allow pilots such as Stepan Suprun and Aleksandr Pokryshkin to claim a number of victories in the type. This book tells the complete story of the men who made ace in the first examples of the famous MiG fighter.

Russian Civil and Military Aircraft, 1884-1969 1971

Great Fighting Planes Alan Austin 1986-09-22 Describes the history of fifty top fighter planes from the Sopwith Camel to the Spitfire to the F-16 and MiG-27, and describes the specifications of each aircraft

Yakovlev Aces of World War 2 George Mellinger 2012-10-20 The Yak-1 entered Soviet service in 1941, one of three modern types of aircraft accepted for production just prior to the German invasion of the USSR. Despite initial shortcomings, it soon proved to be the thoroughbred of the Soviet Airforce. Indeed, it remained in production until the end of the war, modernized but fundamentally recognizable. By VE-day about 33,100 Yakovlev fighters had been built. Virtually all Soviet fighter regiments flew at least one variety of Yak for a time, including those which gained their fame identified with other aircraft, and consequently many pilots known as Airacobra or Lavochkin aces also scored victories with the Yak. Many other famous aces were exclusively 'Yak patriots', including the French Normandie pilots. This book focuses on the Soviet aces who scored all, or most of their victories in the Yak, drawing information from official unit histories and memoirs of the Soviet pilots themselves.

Black Cross/red Star: Resurgence, January - June 1942 Christer Bergström 2000

The Chief Culprit Viktor Suvorov 2013-02-18 "A remarkable book. A delayed bombshell that includes very pertinent new research and discoveries Suvorov has made since 1990. He makes savvy readers of contemporary and World War II history, of a mind to reexamine the Soviet past in terms of what historians call 'present interest.' None of the 'new Russian' historians can match his masterful sweep of research and analysis." —ALBERT WEEKS, Professor Emeritus of International Relations, New York University, author of *Stalin's Other War: Soviet Grand Strategy, 1939-1941* In *The Chief Culprit*, bestselling author Victor Suvorov probes newly released Soviet documents and reevaluates existing historical material to analyze Stalin's strategic design to conquer Europe and the reasons behind his controversial support for Nazi Germany. A former Soviet army intelligence officer, the author explains that Stalin's strategy leading up to World War II grew from Lenin's belief that if World War I did not ignite the worldwide Communist revolution, then a second world war would be necessary. Suvorov debunks the theory that Stalin was duped by Hitler and that the

Soviet Union was a victim of Nazi aggression. Instead, he makes the case that Stalin neither feared Hitler nor mistakenly trusted him. He maintains that after Germany occupied Poland, defeated France, and started to prepare for an invasion of Great Britain, Hitler's intelligence services detected the Soviet Union's preparations for a major war against Germany. This detection, Suvorov argues, led to Germany's preemptive war plan and the launch of an invasion of the USSR. Stalin emerges from the pages of this book as a diabolical genius consumed by visions of a worldwide Communist revolution at any cost—a leader who wooed Hitler and Germany in his own effort to conquer the world. In contradicting traditional theories about Soviet planning before the German invasion and in arguing for revised view of Stalin's real intentions, *The Chief Culprit* has provoked debate among historians throughout the world.

Spanish Republican Aces Rafael A López Permy 2013-03-20 At the start of the Spanish Civil War, most young fighter pilot officers joined the rebels, while the high ranking officers, grupo or escuadrilla commanders, and the NCOs, sergeants and corporals remained loyal to the government. Mostly flying the obsolete Nieuport Ni.52s these loyalists were soon outpaced by the more modern Fiat CR.32s and Heinkel He 51s. However, at this early stage of the war, there were several Republican airmen who became aces and famous in the process, despite the small numbers of enemy aircraft shot down. Widely speaking, the Republican military aviation did not keep an exhaustive record of individual shooting claims. However, sufficient documentation exists to make a reasonable assumption as to which pilots fall into the ace category. This volume details the exploits of those pilots, complementing previous works in the Osprey Aircraft of the Aces series on Nationalist CR.32 Aces and Polikarpov I-15, I-16 and I-152 Aces.

Strike From the Sky Richard P. Hallion 2010-03-14 Chronicles the history of battlefield air attack from 1911, when the airplane was first used in war, to the end of World War II.

Russian Aircraft of World War II Edward Ward 2021-06 Organized chronologically by type, *Russian Aircraft of World War II* offers a highly illustrated guide to the main types of aircraft used by the Soviet Air Force during World War II. The book provides a comprehensive survey of combat aircraft, from the compact, revolutionary Polikarpov I-16 fighter of the Winter War in Finland, to the Ilyushin Il-2 Shturmovik and Petlyakov Pe-2, two of the outstanding ground-attack aircraft of the Eastern Front campaign. All the major and many minor types are featured, including fighters, dive bombers, ground-attack aircraft, night bombers, strategic bombers, and reconnaissance and transport aircraft. This includes both well-known models, such as the classic MiG-1 fighter and Tupolev SB fast bomber, through lend-lease aircraft like the A-20 Havoc and B-24 Liberator, to lesser-known models, including the Yermolayev Yer-2 medium bomber and Kharkiv KhAI-5 light bomber. Each featured profile includes authentic markings and color schemes, while every separate model is

accompanied by exhaustive specifications. Packed with 110 full-color artworks with detailed specifications, *Russian Aircraft of World War II* is a key reference guide for military modelers and World War II enthusiasts.

Vakhmistrov's Circus Mikhail Maslov 2017-01-02 The purpose of this publication is to provide readers with most complete history of combined aircraft designs created by Vladimir Vakhmistrov. The designer himself referred to his projects as 'Zveno Aircraft' (where the Russian word 'Zveno' stands for 'Chain link' or 'Flight' combat unit), adding the names of aircraft which were included in each configuration. Vakhmistrov was among the world's pioneers in devising and implementing the attachment of small fighters under heavy bombers. The larger aircraft were thus able to carry the smaller ones to the target area, whereas the fighters, in their turn, after the separation from their 'motherships', acted as guards for the slow-speed giants. During the period from 1931 thru 1941, several configurations of this concept were created involving mass-produced TB-1 and TB-3 bombers, and I-4, I-5, I-Zet, and I-16 fighters, which were modified correspondingly in order to fit the task. Basing on Vakhmistrov's projects there were carried out the first in the world air connections of fighters under their bomber carriers. The most successful variant among all the created Zveno aircraft consisted of a four-engined Tupolev TB-3 bomber and two Polikarpov I-16 fighters attached under the bomber's wing. The fighters carried two 250-kg bombs each and acted as a high-speed dive bombers after disconnection from the carrier plane. Several such aircraft, referred to as Zveno-SPB, were used operationally during the war by the Black Sea Fleet Air Force. Initially, three TB-3s with AM-34RN engines were allocated for re-equipment into Zveno-SPB which were taken into service by the 2nd Special Squadron of the 32nd Fighter Regiment, 62nd Aviation Brigade of the Black Sea Fleet Air Force stationed in Eupatoria. The order to begin combat application of the 32nd Regiment's combined aircraft was given on 22 July 1941, while the first air raid on port structures in Romania, the German ally, was made on 26 July. More than thirty combat missions were carried out till October 1941, and became one of the most successful operations of the Soviet aviation during the Great Patriotic War. Meanwhile, Vakhmistrov had a large number of other interesting projects and many of them remained on the designer's drawing board. More than 20 years were spent by the author on the historical research of the subject in the Russian archives. The book is extensively illustrated by the pictures from the author's archive, aircraft test reports, as well as specially prepared scale drawings and color side views.

Soviet Lend-Lease Fighter Aces of World War 2 George Mellinger 2012-10-20 By the end of 1941 the Soviet Union was near collapse and its air force almost annihilated, leaving large numbers of surviving pilots with no aircraft to fly. To help prevent this collapse the UK eventually supplied a total of 4300 Hurricanes and Spitfires to the USSR. After the United States entered the war, the Americans extended Lend-lease to include direct

supply to the Soviets as well as the British, and among the aircraft sent were almost 10,000 fighters. Although the aircraft were outdated and often unsuitable to Russian conditions, they served when they were needed, and a number of Russian pilots became Heroes of the Soviet Union flying Lend-lease aircraft. The Soviet government tried to conceal or minimize the importance of Lend-lease fighters well into the 1980s, and the pilots who flew them were discriminated against as 'foreigners'. Only in recent years have these pilots felt free to admit what they flew, and now the fascinating story of these men can emerge.

Hispano Suiza in Aeronautics Manuel Lage Marco 2003-11-30 This book examines Hispano Suizas evolution and the technological advances of its engines. Starting with circumstances that favored the creation of an indigenous aviation engine, the story follows engine development for a breadth of applications, particularly aviation engines, and describes, in parallel, the birth and development of aircraft in Spain by Campaa Espaola de Construcciones Aeronuticas (CECA), La Hispano, La Hispano Aircraft, La Hispano Suiza, SAF-5, SAF-15, and La Hispano Aviacin. *Hispano Suiza in Aeronautics: Men, Companies, Engines and Aircraft* is an in-depth study covering a vast period in the history of the Spanish and French aircraft industry (1913-1967) and offers insight into Hispano Suizas significant developments.

World War II Soviet Fighter Aircraft Source Wikipedia 2013-09 Please note that the content of this book primarily consists of articles available from Wikipedia or other free sources online. Pages: 33. Chapters: Polikarpov I-16, Mikoyan-Gurevich MiG-3, Yakovlev Yak-9, Yakovlev Yak-1, Petlyakov Pe-3, Lavochkin La-7, Yakovlev Yak-3, Mikoyan-Gurevich MiG-1, Polikarpov I-15, Lavochkin La-5, Lavochkin-Gorbunov-Gudkov LaGG-3, Polikarpov I-185, Lavochkin-Gorbunov-Gudkov LaGG-1. Excerpt: The Polikarpov I-16 was a Soviet fighter aircraft of revolutionary design; it was the world's first cantilever-winged monoplane fighter with retractable landing gear. The I-16 was introduced in the mid-1930s and formed the backbone of the Soviet Air Force at the beginning of World War II. The diminutive fighter, nicknamed "Ishak" ("donkey") by Soviet pilots, prominently featured in the Second Sino-Japanese War, the Battle of Khalkhin Gol and the Spanish Civil War where it was called the Rata ("rat") by the Nationalists or Mosca ("fly") by the Republicans. The Finnish nickname for I-16 was Siipiorava ("Flying Squirrel"). While working on the Polikarpov I-15 biplane, Nikolai Nikolaevich Polikarpov began designing an advanced monoplane fighter. It featured cutting-edge innovations such as retractable landing gear and a fully enclosed cockpit, and was optimized for speed with a short stubby fuselage (similar to Gee Bee R-1) and a Wright Cyclone radial engine in a NACA cowling. The aircraft was small, light and simple to build. Full scale work on the TsKB-12 prototype began in June 1933 and the aircraft was accepted into production on 22 November 1933, a month before it took to the air. The TsKB-12 was of mixed construction using a wooden monocoque fuselage and wings based around a KhMA chrome-

molybdenum steel alloy wing spar, dural ribs and D1 aluminum alloy skinning on the center and leading edges, with the remaining portions of the wings fabric covered. Another modern feature were the ailerons which ran almost the entire trailing edge of the wing...

[Polikarpov I-15, I-16 and I-153 Aces](#) Mikhail Maslov 2013-02-20 The I-15, I-16 and I-153 fighters were the world's first mass-produced fighters. Some 17,000 Polikarpovs had been manufactured by the time production ceased in 1941. They served with the Republicans in the Spain, the Chinese against Japan in 1937–38, and

the Soviets against both Japan in the Nomonhan Incident and Finland during the Winter War. By 1941, more than 20 Soviet pilots had made ace in Polikarpovs, and many more attained that status during the first months of the German invasion. Though thoroughly outclassed, the Polikarpov was the backbone of the Soviet air force during the early months of the war in the east, and continued to serve, as training aircraft and as frontline fighters, some right through to 1945.

[The Illustrated Encyclopedia of Aviation](#) 1979