

History of Soviet Union Aviation

Synopsis

From the beginning of age, humankind wanted to fly. In Greek mythology, Icarus flew to the sun with his wax wings. Unfortunately, his wings melted. The Chinese did kite flying hundreds of years ago. During the Renaissance period, Leonardo da Vinci had more concrete ideas on how to remain a man in the air. Humans tried flying by developing wings and jumping from cliffs. They failed. The chest muscles of the human body are undeveloped to handle the load.

In the 18th century, the Montgolfier brothers created the hot air balloon. At almost the same time, hydrogen gas was discovered. Hydrogen is lighter than air and thus offers the opportunity to fly. Experiments with gliders offered valuable insights into heavier-than-air dynamics. Cayley, Otto Lilienthal and Octave Chanute were front runners. This followed the groundbreaking work of the Wright brothers in 1903.

Similar efforts existed in Imperial Russia. The origins of Imperial Russian aviation can be traced back to the work of Nikolai Kibalchich and Alexandrer Mozheysky. Their work was further enhanced by Konstantin Tshoilskovsky. It is worth to mention Mozheysky assembled an aircraft. His aircraft could not fly due to poor engine power. Many years later, it proved the plane could fly with increased engine power. Igor Sikorsky toured Europe and came in contact with the Wright brothers concepts.

The development of airships, gliders, fixed wing and rotorcraft almost happened simultaneously. Achievements led to improvements in existing aircraft at the time.

Purpose

The purpose of the exhibition is to demonstrate the development of the aircraft in each category. The stamps were orders in the series they were released and not necessary in chronological order.

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Two seat biplane. First flight 12 May 1972. Successor of the Y-1

Yakovlev AIR-1



Airliner aircraft. First flight 1953.

Ilyuyshin IL-81

Main Sources

- Aviation, the early Years, Almond, P, 1997
- Russian Aircraft Encyclopedia, van Pletzen, M, 2013
- Various sources Wikipedia and internet sources

Imperial Russian and Soviet Airships

The Imperial Russian Union built several airships before establishing the official air force. The Imperial Russian Air Force was established in 1912. Development of the airships relied heavily on foreign technology. The airships were of the semi-rigid types.

The **Albatross** was a non-rigid airship of the Russian Empire. The airship was designed in 1911 and had the Albatros designation. It was constructed in 1913 and participated in several combat missions during World War I. Professors K.P. Boklevsky, A.P. Van-der-Flit, and engineer V.F. Naidenov and with the participation of Captain B.V. Golubov the ship was built. After the start of World War I, the airship was sent to the front; B.V. Golubov was appointed commander, and the crew was recruited from volunteers. On 15 August at 18:00, the airship flew to Lida. On 13 October, during another combat sortie, the airship was damaged by fog and strong winds, striking trees, and made a forced landing, which led to its destruction.



The **Norge** airship was a semi-rigid and built by the Italian aeronautical engineer Umberto Nobile and its construction began in 1923. It flew over the North Pole. It was the first confirmed flight over the North Pole.



The **Victory** airship used hydrogen gas in the balloons. Its transport cargo and used for parachute jump training. It crashed on 29 January 1947. After the war the airships were used for various purposes. This includes connecting airfields, research and observation. The last airship entered service was the Patriot in 1946. its regular inland services ended in 1950.

GA-42

In 1983, shortly after the death of Dick Wirth, partner in the UK firm Thunder Balloons, Thunder merged with Colt to become Thunder & Colt, where Per Lindstrand held the Managing Director position for the next decade. In addition to their well-known hot air balloons, T&C also produced thermal airships and the two-seat GA-42 non-rigid helium airship. When it was first introduced in the 1980s, the GA-42 broke new ground by making helium airships affordable to a wider customer base. With two seats for the pilot and one passenger, it was suitable for pilot training. The airship was equipped with an electrical fly-by-wire flight control system. It had a seat for the pilot and a passenger seat.



There was a **Graf Zeppelin** stamp issued. The stamp depicting the airship over Moscow. Unfortunately, I could not get hold of it. Please see the picture.



History of Soviet Aircraft between 1876 and 1914

Mozhaysky was an admiral in the Imperial Russian Navy. He was of Polish descent, an aviator pioneer, and researched and designed a heavier-than-air aircraft. In 1841, Mozhaysky graduated from the Sea Cadet Corps. In 1853, he demonstrated a model of a working steam engine. Mozhaysky assisted in the design of the schooner Heda in 1855. In 1876, Mozhaysky began to develop heavier-than-air aircraft. He re-enlisted in the navy and received the rank of Captain. In 1882 he was promoted to rear admiral but shortly resigned after the appointment. Mozhaysky's heavier-than-air monoplane failed to fly. His design relied on a launching ramp rather than air power to generate sufficient speed for lift. The aircraft lacked curvature to generate lift. Mozhaysky experimented with various angles of attack. Mozhaysky died on 1 April 1890 in Saint Petersburg. After his death, it proved the aircraft could fly, provided it had sufficient engine power. Mozhaysky's aviation achievements like flight controls and propulsion received serious attention.



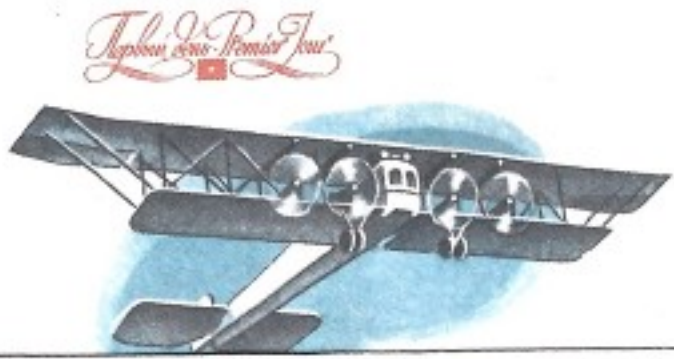
Stepan Vasilyevich Grizodubov was a pioneer Russian constructor and pilot. He built a series of biplanes based on the Wright brothers design. His first aircraft was a copy of the Wright brothers. His second aircraft was a modification on the first aircraft.

No information is available on the **Rossiya-A** aircraft. Indications are that Igor Sikorsky designed the aircraft. This could not be confirmed. Sikorsky toured Europe and came in contact with the Wright brothers' design. He implemented the principles successfully. Later in his life, Sikorsky emigrated to America where he developed helicopters.

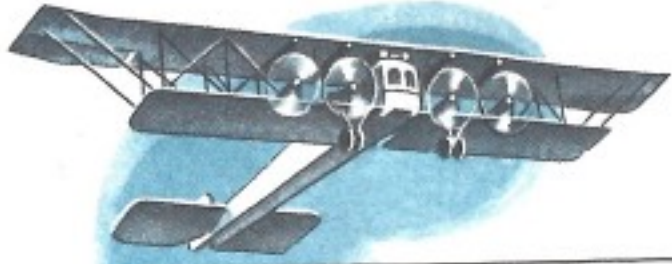


The Sikorsky **Russky Vityaz** or Russian Knight was the first four-engine aircraft in the world. In 1911 Sikorsky started to design the S-21. His objective was to lift more than six hundred kilograms. This was a record set by Ducis, a French pilot. The media speculated that Russky Vityaz would be a failure. On 10 May 1913, the aircraft completed its maiden flight successfully. It was a biplane with unequal span lengths. The fuselage was covered with plywood sheets. The cockpit was equipped with dual controls. Also in the cockpit was a searchlight and a machine gun. There were two passenger sections and a spare parts hold.

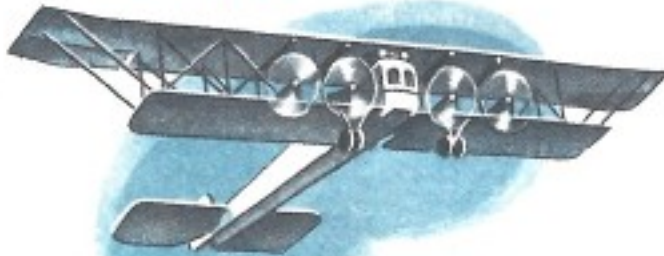
The M-5 aircraft was designed by Dmitry Pavlovich **Grigorovich**. It was the first flying boat that entered serial production. Approximately 100 units were produced. The first prototype, the M-1 was completed in 1913. The M-5 was completed in 1914. The aircraft was of a wood construction. The hull was covered with plywood while the rest of the aircraft was covered with fabric. The fin and rudder were braced with struts and wires. The plane had a pusher engine. The pilot and observer were sitting side-by-side in front of the lower wing. The observer had a machine gun.



Premier Jour



Premier Jour



Development of Soviet Aircraft between 1911 and 1914



Yakov Modetovich Gakkel was a Russian and Soviet Union scientist and engineer. He made significant contributions towards developing aircraft, electrical systems and locomotives. He was born on 30 April 1874 and died on 12 December 1945. Gakkel attended the Saint Petersburg Electrotechnical Institute. In 1903, Gakkel became a teacher at the institute. Six years later Gakkel received an award from Westing-house Electric Company. This award allowed him to begin developing his first aircraft. Gakkel became co-founder of Russia's first aircraft construction company S.S. Shchetinin Russian Association of Aeronautics. On 24 May 1910, Gakkel's third aircraft, the Gakkel-III made a 656 feet long flight. In 1911, he flew with his **Gakkel VII** aircraft to and from Saint Petersburg to Tsarskoye Selo. The average speed was 57 mph at a record height of 4 101 feet above ground level. The **Gakkel IX** was a monoplane. This aircraft was developed in 1912. No reliable information could be found about the performance of the aircraft.



Ivan Ivanovich Steglau was a Latvian businessman and an aviation pioneer. He built his wealth in Saint Petersburg in the metal industry. In 1911, Steglau astonished the aviation world. He denounced the use of fabric for the wings of the plane. According to him, it was too flimsy. He further argued that three-layer plywood would be sufficient. In spring 1912, Steglau appeared at the Imperial All Russia Aero Club aerodrome with his **Steglau-2** biplane. It was made entirely made of wood. Steglau built another two aircraft.



The Dolphin was a monoplane designed by **Dybovski** in 1913. Viktor Vladimirovich Dybovsky was a military pilot and lieutenant. Together with his brother Vyacheslav and a sponsor of a motor plant in Riga, Dybovski built his plane. The name Dolphin originated from the unique shape of the aircraft. The aircraft was well streamlined. The fuselage had no straight lines. The outer of the fuselage was made of veneer and glued to the frame. The axle chassis was taken from a Nieuport IV aircraft. The wheels were smaller and the spokes were covered by plywood. The wing was swept back and covered with plywood.

This World War One bomber was named after a hero from Russian mythology. Sikorsky based the design on the S-21 Russky Vityaz. During the World War One, the aircraft was used for strategic bombing. This **Ilya Muromets** was constructed in 1913. On 10 December 1913, it made its maiden flight. Between 30 June 1914 and 12 July 1914, the aircraft set a record flight between Saint Petersburg and Kiev. It is a distance of 1 200 km. For this achievement, Sikorsky received the Order of Saint Vladimir from Tsar Nicholas II. The bomber versions had bomb sights. There were positions for nine machine guns. The aircraft was removed from service on 10 October 1922.



Development of Soviet Aircraft between 1914 and 1930

The creator of the **P-IV-BIS** was Alexander Alexandrovich Porokhovschikov. He offered a training aircraft based on a Farman aircraft design. In February 1917, he produced one aircraft. The aircraft had the P-IV designation. It was straightforward to assemble and manage. The instructor and pupil sat next to each other. Flight tests were completed in May 1917. Production ended in 1923. In 1920, Porokhovschikov produced a prototype with the P-IV-BIS designation. The aircraft was constructed of wood. The engine cover of the was made of aluminium. The wings were covered with fabric.





The **AK-1** was a prototype airline aircraft built to investigate low-cost construction techniques and verify calculation models for aerofoils. Alexandrov Kalinin was the designer. The aircraft had a strut supported high wing. The cockpit and passenger cabin were enclosed. It was equipped with a single engine. The aircraft's construction was from wood. The aircraft was assembled in 1923 and flight test started in February 1924. The project was funded by The Latvian Riflemen. After test flights, the aircraft was utilized on a route between Moscow and Kazan. In 1925, the aircraft was used in propaganda flights in China. The route was 7000 km long and endured 38 days to complete.

The design work by Tupolev of the **R-3 (ANT-3)** started on 1 August 1924. The prototype was completed in July 1924. The aircraft made its maiden flight on 6 August 1925. It was an all-metal biplane. The shortage of raw materials hampered the production. These models had the R-3 designation. Production of the aircraft was between 1926 and 1928. Approximately 102 units were built. The production models received the R-3 designation.

Aeroflot bought one aircraft with the PS-3 designation. It was used for mail. The aircraft was used for reconnaissance and propaganda flights. During the summer of 1926, the aircraft toured Europa landing at Königsberg, Berlin, Rome, Prague and Warsaw. The radiator had some problems. The distance flown was 7 150 km with 34 flying hours. The second production unit flew between Moscow and Tokyo and a return flight, a distance of 22 000 km in 153 flying hours.



The **TB-1 (ANT-4)** was the development designation for the Tupolev TB-1 bomber aircraft. It was the first large all-metal aircraft built in the Soviet Union. In 1924, the Air Force instructed TsAGI to design a heavy bomber. Designer Tupolev led the design team. He developed a monoplane with a corrugated skin. The TB-1 (ANT-4) was equipped with two Lion engines. The first prototype was constructed in 1925. On 26 November 1925, the aircraft performed its maiden flight. Testing was successful. The shortage of aluminium hampered production. The first completed production aircraft was unarmed. It flew from Moscow to New York in an eastward course via Siberia. It reached its destination on 3 November 1929. This propaganda flight was 21 242 km 137 flying hours. A TB-1 (ANT-4) flown by Anatoly Liapidevski fulfilled a key role in the rescue of the crew of the steamship Chelyuskin. The ship sank on 12 February 1934 near the Bering Strait. The ship was trapped on the ice.

The **R-5** was a reconnaissance bomber aircraft but it was also used for civilian transport. The aeroplane was developed by Nikolai Polikarpov. The aircraft's maiden flight was in 1929. The construction was of wood. The aircraft commenced production in 1930. The landing gear could be placed with floats. More than 6 000 units were produced. The civilian models were operated by Aeroflot and received the P-5 designation. The aircraft was extensively used by the Soviet Air Force against Japan. During the Soviet invasion of Poland the aeroplanes were used actively. The aircraft was used in battles against Finland, in the Spanish war and against Germany. The Chinese government used a number of these aircraft to suppress a rebellion that threatened to overthrow the pro-Moscow administration.



The Shavrov **Amphibious Sh-2** aircraft was a further development on the Sh-1. It was equipped with a more powerful engine. The Sh-1 had its first flight on 21 June 1929. The hull was constructed of pine wood. The aircraft was covered with plywood. The pilot and one passenger was sitting next to each other in the front while the second passenger seated behind them. Cargo and fuel were carried in the nose and under the seats of the aircraft. It was a biplane with the lower wing significantly shorter than the upper wing. The fuselage used an aluminium alloy. The undercarriage was retractable and could be fitted with skis in the winter. The prototypes of the Sh-2 flew on 11 November 1930. Serial production started on 9 May 1933. The first production batch consisted of 270 aircraft. The total units produced exceeded 700 aircraft in 1952.



Development of Soviet Aircraft between 1928 and 1934



The Polikarpov **U-2 (Po-2)** was developed as a training and flight instruction aircraft. It was an all-weather multi-role biplane. The plane was in addition operated as a bomber, for reconnaissance, psychological warfare and for liaison services. Production ended in 1952. It had an extensive list of modifications and variants. The aircraft was designed by Nikolai Polikarpov and was named the U-2. After his death the aircraft was renamed the Po-2. Test on the aircraft began on 24 June 1927. The engine overheated. The engine type was replaced and the aerodynamics of the aeroplane were improved. Test on the improved aircraft showed excellent flight qualities. On 29 March 1929, the first order for six aircraft was placed. During World War Two the well-known all-woman regiment of the 588th Night Bomber Regiment (Night Witches) used Po-2 in their night raids.

The role of the **K-5** was an airline transport aircraft. It had an enclosed cockpit and cabin. In 1926, Kalinin a designer considered developing a 10 to 12-seat passenger aircraft. But never designed such a plane until an airline operator, Ukrvozdukhput expressed their interest. The prototype was completed in the autumn of 1929. The first flight was on 18 October 1929. Safety testing started on 30 May 1930. Ongoing problems with the engine resulted in several alternative engines being fitted. The alternative engines sacrificed load capacity and performance. Eventually, the aircraft was fitted with a powerful Mikulin engine. Aeroflot widely used the K-5. The first scheduled flight was between Moscow and Kharkov. The services were extended to Sverdlovsk, Tashkent and Arkhangelsk. The Soviet Air Force operated the aircraft as a personnel transporter. The aircraft was retired in 1943.



The Ant-6 was the development designation for the **TB-3** heavy bomber. The aircraft flew for the first time on 22 December 1930. Production of the aircraft started at the end of 1931. A total of 818 units were built. Some of the units retained the Ant-6 designation. These units were used for arctic transport. During the period 1938 to 1939 the bomber was used against Japan. When Germany invaded the Soviet Union most of the units were converted to paratroop or freight carriers. These aircraft received the G-2 designation.





The **Stal-2** was a passenger aircraft. It was developed by an experimental aircraft construction section of the Civil Air Fleet Research Institute. The chief designer was Putilov. The aircraft was built at the Tushino State Aviation Factory. The high wing had an enclosed cockpit and a passenger cabin. The aircraft was built with stainless steel. The Stal-2 made its first flight in 1931 and production of the aircraft started in 1934. A total of 111 units were produced. The prototype was equipped with a Wright J-6 engine. The production units had Bessonov M-26 engines.

The Beriev **MBR-2** was a multi-purpose seaplane was also called a flying boat. Georgy Beriev designed the aircraft. It flew for the first time in 1931. The prototype had a BMW-VI engine. The aircraft commenced production in 1934 with a Mikulin M-17 engine. The aircraft's undercarriage could be fitted with fixed wheels or skis. The Beriev MP-1 was the designation for a commercial aeroplane while the MBR-2BIS utilized a more powerful engine. This aircraft was fitted with an enclosed cockpit and gun turrets.



The **I-16** was a fighter aircraft with single engine. The aircraft had a low-wing design. While Nikolai Nikolaevich Polikarpov was working in the I-15 biplane, he started designing the I-16 monoplane. Full scale design work on the prototype began in June 1933. On 22 November 1933 the aircraft was approved for production. The I-16 design featured retractable landing gear and a closed cockpit. The aircraft was optimized for speed. The first prototype first flight was on 30 December 1933. The test pilot was Valery Chkalov. The second prototype equipped with the Wright Cyclone engine flew in January 1934. A third prototype with a Cyclone engine and aerodynamic improvements was delivered to the government on 7 September 1934. The maximum speed of 270 miles per hour no longer satisfied the requirements. The Air Force required a top speed of 290 miles per hour. The aircraft did not go into production.



Soviet Union Transport Aircraft

Development of the aircraft started in 1966 and the first prototype was built in 1968. The **TU-154** replaced the Tu-104 and was displayed on 4 October 1968. It went into service on 9 February 1972. This was also the day of the aircraft's first flight. Approximately 1 000 units were produced and production ended in 1996. Some of these aircraft were converted to freight transport aircraft under the designation of Tu-154S. One of the first production units was converted to a test-bed for liquid hydrogen fuel and bore the designation of Tu-155. One of the popular versions is the Tu-154M that has more efficient engines and improved aerodynamics.



The Antonov Design Bureau developed the **An-28** for multiple roles. The first flight was on 4 October 1968. It had good take-off and landing characteristics with reversible-pitch propellers. The non-retractable landing gear allowed the aircraft to operate from any type of landing strips. A cargo hoist made the aircraft independent from ground services. The aircraft could operate in all weather conditions day and night. To convert the aircraft to a cargo plane, the passenger seats were simply folded away. Passengers embark and the loading of the cargo were done via the large hatch in the tail of the plane.



The first **Il-76** was revealed by the Ilyushin Design Bureau in 1967. On 18 May 1971 it made its public appearance at Sheremetyevo Airport. The first flight was on 25 March 1971. It entered service in 1974. The aircraft is fitted with cargo airdrop equipment. A defensive armament suite comprises of a radar warning system, communications jammer and infrared cartridges.



Design work for short- to medium-range **Yak-42** aircraft started in 1972, by the Yakovlev Design Bureau. The plane was capable of carrying 100 to 120 passengers. The aircraft could operating from relatively small airfields. Authorities rejected the initial design. The new design from Yakovlev included three-shaft high-bypass turbo-fan engines. The first of three prototypes made its maiden flight on 25 March 1975. This prototype had an 11-degree wing. The second aircraft wing was at an angle of 23 degrees. The third aircraft was fitted with improved de-icing gear and the third design had a clean leading edge with no controls surface and plane trailing edge surfaces. The main operator of the aircraft was Aeroflot.



Ilyushin Design Bureau announced the development of the **IL-86** was in 1971 at the Paris Air Show. The first prototype was unveiled in 1976. It entered service in December 1980. Approximately 120 units had been built when production ended in 1994. The aircraft has built-in air-stairs and is used at airports that do not have boarding equipment. Passengers board the aircraft via the air-stairs leading to the lower deck baggage storage area and then climb a fixed internal staircase to the passenger cabin.



Soviet Union Glider Aircraft

Viktor Nikolayevich Belyaev designed the **TsAGI-2**. He was born on 28 March 1896. Belyaev studied mathematics at the Moscow State University. After the revolution, he studied for brief periods of time at the Moscow Polytechnic Institute and again at the State University. In 1925, he joined Dmitry Grigorovich's design bureau as engineer. Viktor focused on strengthening airframes. In 1926, he joined Tupolev's design office. He used strength calculations to improve the ANT series of aircraft. Victor worked under the supervision of Vladimir Petlyakov. In 1930, Petlyakov's team formed a new design bureau. After World War Two, Belyaev returned to working at TsAGI. He died on 25 July 1953. Belyaev performed strength calculations for the TsAGI department. In August 1934, at a glider rally in Koktebel, the TsAGI-2 showed good flight characteristics. Based on the success of the TsAGI-2, Belyaev designed the BP-3. The glider made its first flight on 18 June 1935. Like the TsAGI-2, the glider was tailless and had a backward swept wing.



The **Stakanovetz** was a glider named after Alexy Stahanovets, a Soviet miner. It was a tandem two seat aircraft made of wood. The fuselage and wings were covered with fabric. The wings was forward swept. The rear seat was at the centre of gravity of the glider. The glider landed on a skid. The Stakanovetz first flight was in 1936. In 1938 Kartachey and Savtov flew a record distance of 615 km.



On 30 December 1906, Sergei Pavlovich Korolev was born. In 1924, Korolev graduated from the Odessa Construction Vocational School. He sought admission to the Air Force Academy. Due to the delay in the answer, he entered the Kyiv Polytechnic Institute in the aviation department. Korolev was transferred to the Bauman Higher Technical School in Moscow. At this stage, Sergei was designing and constructing the **Red Star** glider. The glider received the SK-4 designation. With this aircraft, he set a distance record and demonstrated that Korolev displays the talent to design aircraft. In 1933, he joined the newly established Rocket Research Institute. Korolev's main activity was to work on cruise missiles. These missiles used gyroscopic autopilots and guidance systems equipped with liquid-propelled engines. Sergei also worked on a project to propel gliders with rockets. A rocket glider designated RP-318-1 was based on Korolev's airframe and made its first flight on 28 February 1940. On 12 April 1961, Korolev's team successfully launched the Vostok-1 with Yuri Gagarin on board.



The **G-11** was a lightweight military glider used during World War II. It was capable of carrying troops or cargo. The predecessor of the G-11, the G-63 was built in 1932. Vladimir Gribovsky designed the glider. Three hundred and eight units were initially serially produced. Prototype tests started on 1 September 1941. The glider went into production under the G-11 designation. The glider could carry ten troops and the pilot. Serial production began in late 1941 and continued until 1942 at two factories. In 1944 production restarted and ran until 1948. Variants of the glider G-11U training glider with dual controls and a power version designated G-11M. The G-11 was mainly towed by the Tupolev DB-3. In November 1942, an airbridge between Moscow and Stalingrad was established. The purpose was to rapidly deliver anti-freeze coolant for tanks during the battle of Stalingrad. During the period March to November 1943, G-11 gliders were used in Belarus. The purpose of these flights was to send supplies to the Kalinin front line.



Oleg Antonov designed the glider since the early 1930. The most successful plane was the so-called Red Front-7. The glider set a distance record of 149 km. The glider was flown by Olga Klepikova. The record stood from 1939 to 1951. The **A-9** was a development from that aircraft. Comparing the Red Front-7 and the A-9, the fuselage and tail units were the same. The A-9's was a cantilever shoulder wing monoplane. The complete wing was covered with plywood. The spar and aft of the aircraft was covered with fabric. The aircraft was not equipped with wheeled landing gear. The belly of the glider was flat. The Glider is launched from a wheeled dolly.





The **A-15** comprises of a single-seat glider. It had a V-tale. Oleg Antonov designed the glider. It was manufactured by the his production facility. The A-15 was designed based on the experience gained from the A-9, A-11 and A-13 gliders.

The aircraft construction comprise of aluminium. The aircraft used the American-designed air foil at the root of the wings. The landing gear is a retractable nose wheel. A total of 350 units were produced. The aircraft was towed by an Antonov An-22 aircraft. The glider was displayed at the Paris Air Show.

The **Lak-12** was a single-seat mid-wing glider developed in Latvia. The initial models were produced by Lietuviškos Aviacinēs Konstrucijos. Later models were produced by Sportine Aviacija en Sport USSR. The glider was designed for open-class racing. The aircraft was made of fibreglass and carbon fibre. It had air spoilers and flaps. It carried 90 litres of water in the leading edge of the wings. The water served as ballast. It was equipped with one landing wheel and a sky at the tail. In order to improve the aerodynamic properties of the glider, the main landing wheel was pulled into the fuselage. More than 50 units were produced. There was a two-seat variant with the Lak-12E designation.



The **Mastyazhart** glider was developed by Ilyushin. It flew for the first time in 1923.



Mikhail Petrovich Simonov was born on 19 October 1929 in Rostov-on-Don in south-western Russia. He was the creator of the **KAI-12** glider. During the Second World War, Simonov became fascinated with aircraft. As a teenager, he got involved in aircraft manufacturing. In 1947, he entered the Novocherkassk Polytechnic Institute and specialised in design and engineering. In 1951, Mikhail won the prestigious Stalin scholarship. Later, he set up his flying club and showcased his all-metal glider with the designated KAI-12. Mikhail worked for several other design bureaus. The list of all the design bureaus he worked for is long. He significantly contributed to several aircraft like the Mig-29, Su-30, etc. Simonov died in Moscow on 4 March 2011 at the age of 82.



The **SA-7** was developed by the Bureau for Sports Aviation.

Soviet Union Civil Aviation Aircraft

Tupolev envisaged the practical use of metal in aircraft. Lightweight metal is more durable in the severe Russian Winters. At the Kolchuginsk factory, the high-grade Kolchug aluminium alloy was made. The design bureau lacked skills in developing the aircraft and producing the material. Tupolev produced aero sleighs, boats and gliders, to test the alloy. The **Ant-2** was a monoplane with a triangular cross section to increase strength. The design also decreased the drag factor. The corrugated Kolchug aluminium alloy was used to cover the fuselage. The first aircraft was completed in May 1924. The Ant-2 took off for its maiden flight on 26 May 1924. The test pilot was Nikolai Petrov. The aircraft was difficult to handle and unstable during the flight. These problems were eliminated after the tail section was enlarged.



The Polikarpov **Po-2 (U-2)** was developed as a training and flight instruction aircraft. It was an all-weather multi-role biplane. The plane was in addition operated as a bomber, for reconnaissance, psychological warfare and for liaison services. Production ended in 1952. It had an extensive list of modifications and variants. The aircraft was designed by Nikolai Polikarpov and was named the U-2. After his death the aircraft was renamed the Po-2. Test on the aircraft began on 24 June 1927. The engine overheated. The engine type was replaced and the aerodynamics of the aeroplane were improved. Test on the improved aircraft showed excellent flight qualities. On 29 March 1929, the first order for six aircraft was placed. During World War Two the well-known all-woman regiment of the 588th Night Bomber Regiment (Night Witches) used Po-2 in their night raids.



A rise in the demand for a domestic airliner resulted in the development of the **Ant-9**. The airliner Deruluft operated with exclusive foreign-manufactured models. Design work on the modern aircraft started in December 1927. On 1 May 1929, the Ant 9 aircraft was displayed at the Red Square. The aircraft completed the national flight tests in June 1929. Full production started on 1933. Up to the German Invasion of the Soviet Union, the aircraft was used for passengers and staff services. After the war, the aircraft was utilized for transportation and medical services.

The Tupolev **Ant-20** was an eight-engine aircraft. The designer Andrei Tupolev used the German engineer Hugo Junkers all-metal aircraft design techniques. Junkers used corrugated sheet metal design for the fuselage. The propaganda squadron utilized the aircraft. The squadron flew around the Soviet Union promoting the aims and achievements of communism. The aeroplane was equipped with powerful radio broadcasting equipment, a printer, a photographic laboratory and a film projector. The aeroplane was the first to use both direct and alternating current systems. On 18 May 1935, the Ant-20 and three other aircraft flew a demonstration flight over Moscow. The three other aircraft flew a close configuration to demonstrate the size of the Ant-20. One of the aircraft broke the formation and performed loop manoeuvres around the Maxim Gorky. After completing two loops it crashed with the Ant-20. Forty-five people died. A replacement aircraft designated Ant-20bis was built using the same design, except six of the engines were replaced with more powerful units. This aircraft flew for the first time in 1938. On 14 December 1942, it crashed.



The **TsAGI-1** was an experimental helicopter. It made its first flight on 26 June 1936. The fuselage consisted of steel tubes. The M-2 engines did not require cooling during hovering. On 14 August 1932, the helicopter reached a height of 605 meters. One was built.

The **Tu-104** was the Soviet Union's first jet engine civilian passenger aircraft. The Tu-104 was a modified Tu-16 bomber with a pressurised cabin. The aircraft was first seen at Heathrow Airport on 22 March 1955 when Soviet officials flew to London. The aircraft flew passengers for the first time on 15 September 1956. Between 1956 and 1958, the Soviet Union was the only country that flew passengers in a jet airliner. These aircraft were in service until 1981. The Tu-104A was equipped with more powerful engines and could carry up to seventy passengers and the Tu-104B could carry hundred passengers. When production of the units ended in 1960, about two hundred units had been built. After the aircraft was removed from civilian transport service, several units were transferred to the military authorities to be used for transport and as Zero-G cosmonaut trainers.





The **Mi-10** was displayed for the first time at Tushino in July 1961. It was a flying crane development of the Mi-6. The fuselage was redesigned, the cabin was shallower and the tail boom deeper. This allowed the surface under the fuselage to be flat. The undercarriage consisted of four tall legs, each resting on twin wheels. Special wheeled platforms were used to manoeuvre the load underneath the helicopter. The load remained on these platforms for the journey. A typical load could be a large passenger coach or a prefabricated building. In March 1966, a modified version the Mi-10K with a shorter undercarriage was demonstrated. A rear-facing gondola was also fitted underneath the nose. From there an observer could supervise the loading of cargo and monitor it during flight. The Soloviev engines could deliver 3 500 horse power, and enabled the Mi-10K to lift loads of up to 14 000 kg in an external sling. In 1970 the Mi-10P with electronic countermeasure capabilities was displayed. About 55 Mi-10 helicopters were built between 1960 and 1977.



Note - Mi10 is on the right and Tu-134 on the left



This aircraft was a modification of the Tu-124 with newly arranged engines. The **Tu-134** was the first Russian aircraft certified to English standards of airworthiness. A total of 852 units were produced. In different aircraft versions, the crew was reduced to increase the passenger carrying capacity. The aircraft underwent upgrading to extend the service life. This included advanced airborne equipment and avionics upgrades. The Tu-134 could carry 72 passengers, while the Tu-134A could carry 76. The engines of these versions were fitted with thrust reversal and an auxiliary power unit. Trainer versions are the Tu-134A and Tu-134B-L. A specialized version, the Tu-134Skh is equipped for agriculture monitoring. These aircraft are still in service.

The **IL-62** was developed to replace the Tu-114. The prototype was unveiled in September 1962. The first prototype had Lyulka AL7 turbojet engines. Only the outer two engines were fitted with thrust-reverse mechanisms. The aircraft entered service in March 1967 and the first intercontinental flight was in September 1967 between Moscow and Montreal. In 1971, an improved version of the IL-62M was introduced at the Paris Air Show. It had Soloviev D30KU engines that were more economical. The fuel capacity was increased and the cargo hold was modified to house containers. It entered service in 1974. In 1978 the IL-62MK was announced. This version's maximum take-off weight was increased to transport 195 passengers. Production of the IL-62 ended in 1994. About 300 units were produced.



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Russian Sport and Training Aircraft

The **Yak-54** is a two-seat sport and training aircraft. It replaced the Yak-52. The aircraft was a further development of the single-seat Yak-55M. Production started in 1994. The Saratov Aviation Facility, in cooperation with Joint Stock Venture Gorky U-2, produced the aircraft. In 2005 production moved to the Arsenyev Aviation Company "Progress" facility in Arsenyev. The main landing gear is retractable. The tail wheel is not retractable.



Design work for short- to medium-range **Yak-42** aircraft started in 1972, by the Yakovlev Design Bureau. The plane was capable of carrying 100 to 120 passengers. The aircraft could operate from relatively small airfields. Authorities rejected the initial design. The new design from Yakovlev included three-shaft high-bypass turbo-fan engines. The first of three prototypes made its maiden flight on 25 March 1975. This prototype had an 11-degree wing. The second aircraft wing was at an angle of 23 degrees. The third aircraft was fitted with improved de-icing gear and the third design had a clean leading edge with no control surface and plane trailing edge surfaces. The main operator of the aircraft was Aeroflot.



Soviet Union Attack Aircraft – Mig

Designed by Mikoyan and Gurevich, the **Mig-3** was reinforced and more aerodynamic. It was equipped with a rearward sliding canopy. The dihedral of the outer wing panels was increased. The fuel capacity was increased and armour protection was improved. The aircraft could also carry heavier bombs. The 3 322 aircraft built had one main disadvantage, it could not engage in air combat below 5 000 m. The Mig-3 performance was good at altitudes above 5 000 m. Most of the combats against German fighters were below this altitude.



The **Mig-15** was the Soviet Union's answer to the North American Sabre. It was first seen in the Korean War. It was the production version of the I-310 prototype. This aircraft was the first Soviet aircraft with a swept wing. The aircraft tended to snap-roll into an uncontrollable spin during a high-speed turn. This problem was solved with the introduction of the I-330 prototype. The Klimov RD-45 engine was a copy of the British Rolls Royce Nene engine. On 21 September 1953,



The designers of the **Mig-21** were again Mikoyan and Gurovich. The first prototype was used to develop an Elevon control system for tailless aircraft. All four Elevon units were spread over the wingspan. The aircraft had a 78 degree sweptback wing leading edge. It went through severe testing till the end of 1969. During this period, 140 flights were performed. The speeds varied from 212 km/h to Mach 2.06. This delta wing aircraft was produced for more than twenty years. The final production version was quite different than the initial versions. Upgraded avionics and a new engine were introduced in the Mig-21BIS. The Mig-21U is the training version. More recently the Mig-21s were built with western electronics.



During the 1950's the United States of America developed supersonic strategic bomber. This was followed by SR-71 Blackbird reconnaissance aircraft. The Soviet Union needed to develop an aircraft that could counter these USA aircraft. The E-150 and E-152 prototypes were able to fly at 3 000 km/h at a service ceiling of 23 km. In 1961, the Mig design bureau developed the E-155 later called the **Mig-25**. This aircraft had a engine that could withstand the high temperatures of the supersonic speeds A reconnaissance version was also built. On 5 February 1962 the design was approved and the high altitude reconnaissance aircraft was built. In 1962, Mikoyan's experimental production facilities started to assemble prototypes. On 9 September 1964 the aircraft was flown for the first time. Series production started in 1968.



The **Mig-29** was developed as a successor to the Mig-25, with an increased payload capacity. The pilot was less dependent on ground control and guidance. The air intakes could be closed when the aircraft is on the ground to prevent damage to the compressor due to foreign objects entering it. The coherent radar could track up to 10 targets simultaneously. The Mig-29UB was a two-seat combat conversion and training aircraft. The Mig-29 entered operational service in 1985. This aircraft has good manoeuvrability. The coherent radar, laser range finder and infrared search and track system linked to the helmet-mounted sight made it an excellent fighter.



МиГ-29



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Soviet Union Ground Attack Aircraft

The **Pe-2** was an outstanding attack aircraft and heavy fighter. Petlyalov designed the aircraft to operate at high altitudes. The prototype was completed in 1939. The aircraft included a pressurized cabin, had an all-metal construction with superchargers and electrical actuated systems. The prototype flew on 22 December 1939. The aircraft was armed. During WW2 the Soviet Union realized it required a heavy bomber. Due to the outstanding flying characteristics of the Pe-2, the aircraft was converted to a bomber. The aircraft could not be tested in combat conditions.



In 1938, the Soviet Central Design Bureau was requested to design a two-seat antitank aircraft. The long engine partially obstructed the pilot's view. For this reason, the cockpit was raised. A 55 to 65-millimetre armoured glass canopy protected the pilot. There were two bomb bays and external racks under each wing. Preparations for serial production of the **IL-2** started in 1941. IL-2 pilots used to fly at an altitude of 5 to 10 meters to strike soft targets. When striking targets like buildings and bunkers they did a near-vertical bomb dive. The pilots flew in s-shape curves at an altitude of 100 to 150 meters to release antitank bombs. Pilots rescued their colleagues by fastening them to the landing gear and flying them home with the gear down. Some other variants were the IL-2KR used for reconnaissance. The IL-2U was a dual-control training aircraft. Women pilots flew some IL-2s in combat. By November 1944, an astonishing number of 36 163 units were built.



The Lavochkin **La-5** was based on the LaGG-3 aircraft. The LaGG-3's engine was insufficient. Lavochkin developed the La-5 in a small hanger next to an airstrip. The nose of the aircraft was redesigned to accommodate a larger engine. In March 1942 the first prototype performed its maiden flight. The test pilot indicated the aircraft had good flight characteristics. He suggests that the aircraft handled better than the Yak-7. Intensive flight tests started in April 1942. In July 1942 production of the La-5 started. When comparing the La-5 with the German aircraft it was easily outperformed at heights above 5 000 meters.



Due to the fact that the Yak-1's performance was low and better engines and materials were not available, Yakovlev decided to redesign the airframe. This resulted in the Yak-1M. This aircraft was serial produced as the **Yak-3**. It was a lightweight aircraft and had good manoeuvrability. The wooden wing was replaced with a metal wing. In July 1943 some of the pre-production planes were used in the battle of Kursk. Delivery of the production units started in 1944. Also, in 1944, the Luftwaffe issued an order to their pilots to refuse to fight against the Yak-3 fighter. At the end of the war, the Yak-3 was fitted with an upgraded VK-107 engine. The aircraft could not carry large amounts of armament. Serial production ended in 1946, and 4 848 units were built. In 1991, the Museum of flying in California requested Yakovlev to reproduce a Yak-3 aircraft. This unit was built exactly to the plans, tools and fixtures of the originals. The new aircraft with the Yak-3UA designation was powered with Allison engines from the United States of America. These aircraft were made available for civilian service.



Soviet Union Sport Aircraft

The **Y-1** was a Soviet aircraft that first flew on May 12, 1927. The same pilot later flew the aircraft for 15.5 hours. He covered a distance of 733 miles.



The **UT-2** was a single engine two-seat low-wing monoplane designed by Yakovlev. The crew sat in tandem. During the Patriotic War, the aircraft was operated as a trainer. The aircraft had open cockpits. It had no slats and flaps. Serial production of the aircraft started in September 1937. The Soviet Air Force assigned the UT-2 designation to the training aircraft. The UT-2 was prone to enter into a spin hence making it difficult to fly. The 1940, model's front fuselage was lengthened and the engine changed in an attempt to rectify the spinning problem.



Designing of the **Yak-18** started in May 1945. The Yak-18 flew for the first time in 1946. The first aircraft manufactured had a tandem two-seat cockpit and retractable landing gear. Later versions had only semi-retractable tricycle landing gear. This aircraft had the designation Yak-18U. The Yak-18P had a single seat and was equipped for aerobatics. Production of the aircraft started in 1947. Approximately 11 000 units were produced. Production was suspended in 1967 and resumed in 1993.



The Yakovlev **Yak-50** is a single-seat, all-metal, low-wing monoplane with a retractable main landing gear. Fabrics covered the control surfaces. The aircraft's handling characteristics are a relatively high power-to-weight ratio and an agile airframe. The airframe won twice the World Aerobatics championship. Several countries operated the aircraft for training. Aircraft operated by the Soviet National Aerobatics team scrapped a plane after 50 flights. There were numerous cases where the main spar failed. Two modifications carried out to the spar strengthened it.

The Soviet Union Aerobatics Team dominated the world championships. The Yakovlev Design Bureau designed the **Yak-55** for the Aerobatics team. The Yak-55 utilized a single engine. The fuselage had an all-metal design with a monoplane wing mounted on the middle line of the fuselage. The engine drives a two-bladed propeller. The fixed undercarriage comprises a titanium spring-loaded main gear and a tailwheel. The aircraft was unveiled at the Moscow Tushino air show in August 1982. The Design Bureau displayed the plane at the 1982 World Aerobatic Championship. The Bureau redesigned the wings. The span was shorter, thinner and still symmetrical. This led to an increased rate of roll and speed. Serial production started in 1985 at the Arsenyev plant. The plant delivered 108 aircraft by 1991. During the late 1980s, work began increasing the rate of roll. The Yak-55M consist of stubbier wings. Production of the Yak-55M started in 1990. By the end of 1993, only 106 aircraft were produced.



History and Development of Kamov Helicopters

The chief designer of the **Kamov** helicopters studied the works and requirements of Juan de la Cierva and Lomonosov. They built several autogyros. Kamov aimed to counter the rotating effect of the main rotor. Kamov added a second rotor to the main rotor shaft. The second rotor would rotate in the opposite direction than the first. This arrangement brought numerous problems when the rotors were pitched for helicopter movement in any direction.

The **Ka-10** was a ship-borne helicopter used for communications and monitoring in the Navy. The design, configuration and layout were similar to the Ka-8 helicopter. The Ka-10 was designed by the Experimental Design Bureau and manufactured by Sokolniki in Moscow. To check the proper functioning and reliability of sub-assemblies, units and systems, several laboratory and bench trials were conducted in parallel with the construction of the prototypes. One of the helicopters underwent 100-hour fatigue testing. Production started in 1951, and 15 helicopters were produced. One crew member was needed to fly the helicopter. Due to the rolling and pitching ships in the sea, taking off from and landing on boats was very complicated.

The **Ka-22** was produced at the Ukhtomsky helicopter and Tashkentsky Aviation plants. Four helicopters were produced. The design had two main rotors on the tips of the outer wings and two tractor-propeller engines. The maximum transported cargo weight was 1 645 kg. The helicopter had a crew of 4. In 1961, eight records were set for cargo lifting of various weights up to 16 485 kg) to an altitude of up to 2 528 m and flight speeds on a 100 km flight route (336.76 km/h).



The fuselage of the **Ka-26** has a removable purpose-built container that could be used for medical evacuation or passengers transport or crop spraying. The main weakness of the Ka-26 is its two 325 horse power. Vedeneyev M-14V-26 radial engines. These outboard engines were under powered and the helicopter was frequently overloaded. Due to overloading, the interconnect shaft that joins the two engines was prone to break. The aircraft was replaced with the Ka-126. Other versions were Ka-26SS. This was the test platform for the Ka-118. Jet beams were fitted in the tail. The Ka-26 entered production in 1966. Approximately 850 units were built.

The **Ka-27** helicopter was equipped with better capabilities in the compact space of the Ka-25. With the improved engines, heavier weights could be lifted. The fuselage was enlarged. This ship-borne helicopter had a large combat capability. The helicopter could take off from and land on a confined ship-borne platform rolling at up to +10 degrees. It could carry out prolonged flights and could hover over water surfaces for surveillance. The rotor mast was equipped with a blade folding system. Flotation gear was installed on the helicopter to provide take-off and landing on water surfaces. The cockpit was equipped with two sliding doors and was manned by a crew of three. The design team was awarded the prestigious Lenin Prize in 1982. In 1986, Kamov's test pilot N. A. Melnik performed a unique operation. He lowered a sensor pack from an altitude of 250 m (820 ft) into the ventilation shaft of the devastated Unit 4 of the Chernobyl nuclear power station. This sensor pack was used to measure radiation levels.

In 1975 the Ministry of Defence ordered Kamov and Mil Design Bureau to develop a competitive prototype combat helicopter. The aim was to replace the Mi-34 helicopter. Kamov entered the V-80 co-axial helicopter. It is better known by the service designation of Ka-50. A unique feature of the helicopter was that it was equipped with a pilot ejection seat. The first prototype took to the air on 17 June 1982. The **Ka-50** was a single-seat attack helicopter and the role was to destroy armoured vehicles, slow-speed air targets and manpower on the battlefield. Since 1991, it has been in production. The Ka-50SH, equipped with night search capabilities, was unveiled in 1997. The equipment installed included a nose-mounted gyro-stabiliser ball turret housing combined with optical, infrared and laser systems. Production of the Ka-50 started in 1991.

History of Soviet Helicopters

The Yakovlev Design Bureau design the **Yak-24** helicopter that can transport twenty-four passengers. The support for the helicopter should have been unlimited. Yakovlev designed the twin main-rotor helicopter. The first prototype made its maiden flight on 3 July 1952. Ground static tests were performed on the second prototype. The Yak-24 helicopter had synchronised engines. Production of the helicopter started in 1955. It was displayed at the Tushino air show later that year.



The designer of the **Mi-6** helicopter was Mikhail Leontyevich Mil. Design work on the Mi-6 started in 1954. The main requirement was it must be able to lift 11 tons over a distance of 240 kilometres. Another requirement was the helicopter must be able to operate in forest areas and Siberia. Production started in 1960. Bulged windows on the pilot's and co-pilot's doors enabled them to see below and to the back.



Development of the **Mi-8** started in May 1960. The engine permits the helicopter to fly on both liquefied petroleum gas (LPG) and kerosene. The military versions had smaller round cabin windows. The Mi-8SMV had electronic countermeasure equipment. The Mi-8PPA had active communication jammers and intelligence equipment. All versions could be converted to an air ambulance. The rear of the cabin opened with two clamshell freight loading doors. The combat version had guided missiles, rockets and guns.



All Kamov helicopters have two main rotors. The **Ka-26** prototype made its maiden flight on 18 August 1965. Production of the helicopter started in 1970. The design made it possible to operate different equipment containers with it. The equipment container fitted in the section behind the cockpit, under the rotor and the main landing wheels.



On 1 October 1934, the TsKB for sea aircraft construction was launched with Beriev as the chief designer. The whole construction of the **Be-10** was metal and was powered by jet engines. Spray fences protected the engines against water. It was displayed for the first time at the Tushino Air Show in 1961. A few Be-10 aircraft were manufactured but the propeller version, the Be-12 was preferred.



Soviet Aircraft Used in Other Countries - Uzbekistan

Boris Pavlovich Lisunov was born in Saratov Province, Russia. Since 1926 he served as mechanical engineer in an aviation squadron in the Soviet Army. In 1936, Lisunov was temporarily transferred to the Douglas Aircraft Company to obtain experience and training in producing the DC-3 under license. Due to the deteriorating relationship between the East and West, the Soviet Union started producing the **Li-2** under the leadership of Lisunov. On 27 January 1938, Lisunov was appointed as technical director of Plant 84. He was arrested as part of the Great Purge, Stalin's effort to suppress any party or person he believed would be the foe. Before Lisunov's death in 1946, he was awarded the Order of Lenin and the Order of the Red Star.



After the Soviet area, it was believed that the **An-8** was not in use any more. A few of these aircraft are still being used by a mining company in Siberia and some smaller Russian, African and United Arab Emirates operators. The An-8 has a rear loading ramp.



The **An-12** was a versatile transport aircraft. It was a development of the civilian An-10. The aircraft was capable of operating from bad and remote airfields. With its rear loading ramp and cargo capabilities, the aircraft was very popular in the former Soviet countries. Several specialized versions were developed for electronic sensing, counter measures and weather tracking units. Approximately 1 200 units were produced between 1957 and 1972. China is still building the aircraft under license with the designation Y8.



The **Ka-22** was produced at the Ukhtomsky helicopter and Tashkent's Aviation plants. Four helicopters were produced. The design had two main rotors on the tips of the outer wings and two tractor-propeller engines. The maximum transported cargo weight was 1 645 kg. The helicopter had a crew of four. In 1961, eight records were set for cargo lifting of various weights up to 16 485 kg to an altitude of up to 2 528 m and flight speeds on a 100 km flight route of 336.76 km/h.



The **An-22** was developed to carry fighting vehicles including battle tanks and missile launchers. After 66 units had been constructed, production ended in 1975. Although the aircraft had been built primarily for the Soviet Air Force, the aircraft were painted in Aeroflot colours. This allowed the Air Force wider access to flying over areas and to obtain more landing rights. The first six aircraft built had a glass nose and did not host a radar unit. The main cargo bay was not pressurized. Up to 29 passengers could be carried in the forward cabin. The multi-strut and multi-wheel landing gear allows the crew to land the aircraft with defective land gear. This landing gear allows the aircraft to operate from all airfields, including snow-covered airfields.



The wide-body **IL-96** replaces the IL-86. Design of the aircraft started in the mid-1980s. The wings are newly designed and the fuselage was shortened by four meters and includes fly-by-wire controls. The aircraft went into service in 1993. Since the political transformation, the Ilyushin Design Bureau equipped the aircraft with Pratt and Whitney PW2237 engines. The passenger version had the designation IL-96M, while the IL-96T was the freighter version.



Soviet Aircraft Used in Other Countries - Cambodia

Development of the aircraft started in 1966 and the first prototype was built in 1968. The Tu-154 replaced the Tu-104 and was displayed on 4 October 1968. It went into service on 9 February 1972. This was also the day of the aircraft's first flight. Approximately 1 000 units were produced and production ended in 1996. Hundreds of Tu-154s are still in service worldwide. Some of these aircraft were converted to freight transport aircraft under the designation of Tu-154S. One of the first production units was converted to a test-bed for liquid hydrogen fuel and bore the designation of Tu-155. One of the popular versions is the Tu-154M which has more efficient engines and improved aerodynamics.



Design work for short- to medium-range aircraft started in 1972. The plane should have been capable of carrying 100 to 120 passengers. The aircraft should have been capable of operating from relatively small airfields. Authorities rejected the initial design. The new design from Yakovlev included three-shaft high-bypass turbo-fan engines. The first of three prototypes made its maiden flight in 1975. This prototype had an 11-degree wing. The second aircraft wing was at an angle of 23 degrees. The third aircraft was fitted with improved de-icing gear and the third design had a clean leading edge with no control surfaces and plane trailing edge surfaces. The two engines were mounted on either side of the fuselage. The **Yak-42** was a low-wing monoplane of all metal construction. It had a pressurised fuselage. Access was via two air stairs one at the underside of the fuselage and one at the forward cabin at the port side. Two cargo bays are located at the underside of the aircraft. The main landing gear had two wheels. The third engine and auxiliary power unit with mounted in the rear fuselage. Later versions had four-wheel landing gear.



The **IL-114** was designed to replace to the turboprop engine aircraft of the Soviet Union. Although the design and configuration finished in 1986, the first prototype only flew in 1990. One of the prototypes crashed when taking off for a test flight in 1993. This caused a delay in the test program. Russian certification was awarded on 26 April 1997. Ten per cent of the aircraft structure is made of composite and alloy metals. The six-blade composite propellers made it possible to operate from unpaved airfields and the blades reduce noise. The IL-114T had a freight configuration and the IL-114M equipped with a more powerful engine capable of carrying a payload of up to 7 000 kg. A maritime patrol version is the IL-114P, while the IL-144FK is equipped for electronic intelligence, reconnaissance and cartographic equipment. It has a glazed cockpit and a raised nose. The IL-114-100 fitted with a Pratt and Whitney Canada PW127 engine. This 64-seat aircraft received Russian certification on 27 December 1999.

