

# Mikoyan-Gurevich MiG-15 UTI



Single-seat MiG-15 of the Polish Air Force in Museum Uzbrojenia in Poznań

Role	Fighter
Manufacturer	Mikoyan-Gurevich
First flight	30 December 1947
Introduction	1949
Status	Trainers in service
Primary users	Soviet Air Force PLA Air Force Korean People's Air Force 41 others
Number built	~12,000 + ~6,000 under license
Developed into	Mikoyan-Gurevich MiG-17

The Mikoyan-Gurevich MiG-15 (Russian: Микоян и Гуревич МиГ-15; NATO reporting name: "Fagot") is a jet fighter developed for the Soviet Union by Mikoyan-Gurevich ОКБ. The MiG-15 was one of the first successful swept-wing jet fighters, and it achieved fame in the skies over Korea, where early in the war, it outclassed all straight-winged enemy fighters in most applications. The MiG-15 also served as the starting point for development of the more advanced MiG-17. The MiG-15 is believed to have been one of the most widely produced jet aircraft ever made, with over 12,000 built. Licensed foreign production perhaps raised the total to over 18,000. The MiG-15

is often mentioned along with the North American F-86 Sabre as among the best fighter aircraft of the Korean War and in comparisons with fighters of other eras.

NATO reporting names

MiG-15

NATO reporting name "Fagot",

MiG-15UTI

NATO reporting name "Midget".

USAF/DoD reporting names

MiG-15

USAF/DoD reporting name "Type 14".

MiG-15P

USAF/DoD reporting name "Type 19".

MiG-15UTI

USAF/DoD reporting name "Type 29".

## **Design and development**

The first turbojet fighter developed by Mikoyan-Gurevich was the Mikoyan-Gurevich MiG-9 (NATO reporting name: Fargo) which appeared in the years immediately after World War II. It used a pair of reverse-engineered German BMW 003 engines. The MiG-9 was a troublesome design which suffered from weak, unreliable engines and control problems. Categorized as a first generation jet fighter, it was designed with the straight-style wings common to piston-engine fighters.

The Germans failed to develop reliable turbojets with thrust over 2,500 lb which limited the performance of Soviet jet designs. By 1946, Soviet designers were impressed by the Rolls-Royce Nene engine. Soviet aviation minister Mikhail Khrunichev and aircraft designer A. S. Yakovlev suggested to Premier Joseph Stalin the USSR buy advanced jet engines from the British. Stalin is said to have replied, "What fool will sell us his secrets?"

However, he gave his consent to the proposal and Mikoyan, engine designer Vladimir Klimov, and others traveled to the United Kingdom to request the engines. To Stalin's amazement, the British Labour government and its Minister of Trade, Sir Stafford Cripps, were perfectly willing to provide technical information and a license to manufacture the Rolls-Royce Nene. The engine was reverse-engineered, produced as the Klimov RD-45, and subsequently incorporated into the MiG-15. Rolls-Royce later attempted to claim £207 million in license fees.



MiG-15 UTI Trainer version, Chino Planes of Fame Air Museum

To take advantage of the new engine, the Council of Ministers ordered the Mikoyan OKB to build two prototypes for an advanced high-altitude daytime interceptor to defend against bombers. It was to have a top speed of 621 miles per hour and a range of 745 miles.

Designers at MiG's OKB-155 started with the earlier MiG-9 jet fighter. The new fighter used Klimov's British-derived engines, swept wings, and a tailpipe going all the way back to a swept tail. The German Me 262 was the first fighter fitted with an 18.5° wing sweep, but it was introduced merely to adjust the center of gravity of its heavy engines. Further experience and research during World War II later established that swept wings would give better performance at transonic speeds. At the end of World War II, the Soviets seized most of the assets of Germany's aircraft industry.

The MiG team studied many of these plans, prototypes and documents, particularly swept-wing research and designs. The swept wing later proved to have a decisive performance

advantage over straight-winged jet fighters when it was introduced into combat over Korea.

The design that emerged had a mid-mounted 35-degree swept wing with a slight downward anhedral and a tailplane mounted up on the swept tail. Western analysts noted that it strongly resembled Kurt Tank's Focke-Wulf Ta-183, which was a follow-on to the Me-262 that never progressed beyond the design stage. While the majority of Focke-Wulf engineers (in particular, Hans Multhopp, who led the Ta-183 development team) were captured by Western armies, the Soviets did capture plans and prototypes for the Ta-183. The MiG-15 bore a much stronger likeness than the American F-86 Sabre which also incorporated German research. The new MiG retained the previous straight-winged MiG-9's wing and tailplane placement, and the F-86 inherited its low-wing from the Fury (which in turn had wings similar to the P-51). The two aircraft were otherwise similar enough in appearance to prompt US forces to paint their planes with bright stripes to distinguish them. It has been argued that the MiG-15 design team drew some limited inspiration from the Ta-183, but it is disputed that it was heavily influenced. One view is that the MiG-15 is an original design benefiting from German research, but conceived, designed, engineered, and produced by the Soviets. The MiG-8 Utka experimental canard aircraft, built right at the conclusion of World War II by the MiG design bureau also lent experience in the use of swept wings on later Mikoyan designs.

The resulting prototypes were designated as I-310. The I-310 was a swept-wing fighter with 35-degree sweep in wings and tail, with two wing fences fitted to each wing to improve airflow over the wing. The design used a single Rolls-Royce Nene fed by a split-forward air intake. A duct carried intake air around the cockpit area and back together ahead of the engine. Its first flight was 30 December 1947; some two months after the American F-86 Sabre had first flown. It demonstrated exceptional performance, reaching 1,042 km/h (647 mph) at 3,000 m (9,800 ft).

The Soviet Union's first swept-wing jet fighter was actually the underpowered Lavochkin La-160 which was otherwise more similar to the MiG-9. The Lavochkin La-168, which reached production as the Lavochkin La-15, used the same engine as the MiG but used a shoulder mounted wing and t-tail; it was the main competitive design. Eventually, the MiG design was favored for mass production. Designated MiG-15, the first production example flew on 31 December 1948. It entered Soviet Air Force service in 1949, and subsequently received the NATO reporting name "Fagot." Early production examples had a tendency to roll to the left or to the right due to manufacturing variances, so aerodynamic trimmers called "nozhi" (knives) were fitted to correct the problem, the knives being adjusted by ground crews until the aircraft flew correctly.



Polish Air Force MiG-15UTI

An improved variant, the MiG-15bis ("second"), entered service in early 1950 with a Klimov VK-1 engine, an improved version of the RD-45/Nene, plus minor improvements and upgrades. Visible differences were a headlight in the air intake separator and horizontal upper edge airbrakes. The 23 mm cannons were placed more closely together in their undercarriage. Some "bis" aircraft also adopted under-wing hardpoints for unguided rocket launchers or 50–250 kg (110–551 lb) bombs. Fighter-bomber modifications were dubbed "IB", "SD-21", and "SD-5". About 150 aircraft were upgraded to SD-21 specification during 1953–

1954. An unknown number of aircraft were modified to "IB" specification in the late 1950s.

The MiG-15 arguably had sufficient power to dive at supersonic speeds, but the lack of an "all-flying" tail greatly diminished the pilot's ability to control the aircraft as it approached Mach 1. Later MiGs incorporated all-flying tails.

The MiG-15 was originally intended to intercept American bombers like the B-29. It was even evaluated in mock air-to-air combat trials with a captured U.S. B-29, as well as the later Soviet B-29 copy, the Tu-4 "Bull". To ensure the destruction of such large bombers, the MiG-15 carried cannons: two 23 mm with 80 rounds per gun and a single 37 mm with 40 rounds. These weapons provided tremendous punch in the interceptor role, but their limited rate of fire and relatively low velocity made it more difficult to score hits against small and maneuverable enemy jet fighters in air-to-air combat. The 23 mm and 37 mm also had radically different ballistics, and some United Nations pilots in Korea had the unnerving experience of 23 mm shells passing over them while the 37 mm shells flew under. The cannons were fitted into a simple pack that could be winched out of the bottom of the nose for servicing and reloading, allowing pre-prepared packs to be rapidly swapped out. (Some sources mistakenly claim the pack was added in later models.)

Many MiG-15 variants were built, but the most common was the MiG-15UTI (NATO reporting name "Midget") two-seat trainer. Because Mikoyan-Gurevich never mass-produced the transition training versions of the later MiG-17 or MiG-19, the MiG-15UTI remained the sole Warsaw Pact advanced jet trainer well into the 1970s, the primary training role being fulfilled exclusively by Czechoslovak Aero L-29 Delfin and the L-39 Albatros jet trainers (save for Poland, which used their indigenous TS-11 Iskra jets). While China produced two-seat trainer versions of the later MiG-17 and MiG-19, the Soviets felt that the MiG-15UTI

was sufficient for their needs and did not produce their own trainer versions of those aircraft.



SB Lim-2 of the Polish Air Force

## Production

The USSR built around 12,000 MiG-15s in all variants. It was also built under license in Czechoslovakia (as the S-102 and S-103) and Poland (as the Lim-1 and Lim-2, and two-seat SB Lim-1 and SB Lim-2).

In the early 1950s, the Soviet Union delivered hundreds of MiG-15s to China, where they received the designation J-2. The Soviets also sent almost a thousand MiG-15 engineers and specialists to China, where they assisted China's Shenyang Aircraft Factory in building the MiG-15UTI trainer (designated JJ-2). China never produced a single-seat fighter version, only the two-seat JJ-2.

The designation "J-4" is unclear; some sources claim Western observers mistakenly labelled China's MiG-15bis a "J-4", while the PLAAF never used the "J-4" designation. Others claim "J-4" is used for MiG-17F, while "J-5" is used for MiG-17PF. Another source claims the PLAAF used "J-4" for Soviet-built MiG-17A, which were quickly replaced by license-built MiG-17Fs (J-5s). What is certain is that the service lives of the J-2 and J-4 in the PLAAF were short, as they were quickly replaced by the more capable J-5 and J-6.



Egyptian Air Force MiG-15UTI at Muzeyon Heyl ha-Avir,  
Hatzerim airbase, Israel



## MAPS MiG-15 UTI, Serial Number 526-116

The MiG-15 UTI two-seat dual control trainer aircraft arrived at MAPS on 7 October 2013. The history of this aircraft is being researched.

### Variants

I-310

Prototype.

MiG-15

First production version.

MiG-15P

Single-seat all-weather interceptor version of the MiG-15bis.

MiG-15SB

Single-seat fighter bomber version.

MiG-15SP-5

Two-seat all-weather interceptor version of the MiG-15UTI.

MiG-15T

Target-towing version.

MiG-15bis

Improved single-seat fighter version.

MiG-15bisR

Single-seat reconnaissance version.



- MiG-15bisS  
Single-seat escort fighter version.
- MiG-15bisT  
Single-seat target-towing version.
- MiG-15UTI  
Two-seat dual-control jet trainer.
- J-2  
(Jianjiji – fighter) Chinese designation of USSR production MiG-15bis single-seat fighter.
- JJ-2  
(Jianjiji Jiaolianji – fighter trainer) Chinese production of MiG-15UTI two-seat jet trainers. Exported as Shenyang FT-2.
- BA-5  
Un-manned target drone conversions of J-2 fighters.
- Lim-1  
MiG-15 jet fighters built under license in Poland.
- Lim-1A  
Polish-built reconnaissance version of the MiG-15 with AFA-21 camera.
- Lim-2  
MiG-15bis built under license in Poland, with Lis-2 (licensed VK-1) engines.
- Lim-2R  
Polish-built reconnaissance version of MiG-15bis with a place for a camera in the front part of the canopy.
- SB Lim-1  
Polish Lim-1 converted to equivalent of MiG-15UTI jet trainers, with RD-45 jet engines.
- SB Lim-2  
Polish Lim-2 or SBLim-1 converted to jet trainers with Lis-1 (VK-1) jet engines.
- SBLim-2A  
Polish-built two-seat reconnaissance version, for correcting artillery.
- S-102

MiG-15 jet fighters built under license in Czechoslovakia, with M05 (licensed RD-45) Motorlet/Walter engines.

S-103

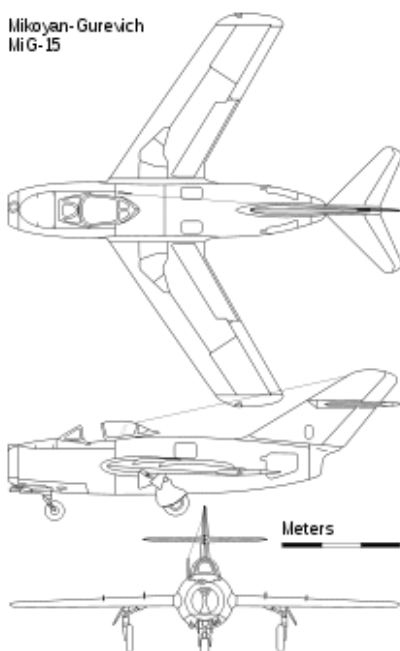
MiG-15bis jet fighters built under license in Czechoslovakia with M06 (licensed VK-1) Motorlet/Walter engines.

CS-102

MiG-15UTI jet trainers built under license in Czechoslovakia.

Raduga KS-1 Komet

### Specifications (MiG-15bis)



## MiG-15 drawing

### General characteristics

- Crew: 1 or 2
- Length: 10.08 m (33 ft 1 in)
- Wingspan: 10.08 m (33 ft 1 in)
- Height: 3.7 m (12 ft 2 in)
- Wing area: 20.6 m<sup>2</sup> (222 sq ft)
- Airfoil: TsAGI S-10 / TsAGI SR-3
- Empty weight: 3,630 kg (8,003 lb)
- Gross weight: 5,000 kg (11,023 lb)
- Max takeoff weight: 6,105 kg (13,459 lb)
- Fuel capacity: 1,420 l (312.4 imp gal; 375.1 US gal)
- Powerplant: 1 × Klimov VK-1 centrifugal flow turbojet, 26.5 kN (6,000 lbf) thrust

### Performance

- Maximum speed: 1,059 km/h (658 mph; 572 kn) at sea level  
1,033 km/h (558 kn; 642 mph) at 5,000 m (16,000 ft)  
992 km/h (536 kn; 616 mph) at 10,000 m (33,000 ft)
- Cruising speed: 850 km/h (528 mph; 459 kn)
- Range: 1,240 km (771 mi; 670 nmi)
- Service ceiling: 15,500 m (50,853 ft)
- Rate of climb: 51.2 m/s (10,080 ft/min) at sea level  
36.2 m/s (7,130 ft/min) at 5,000 m (16,000 ft)  
21 m/s (4,100 ft/min) at 10,000 m (33,000 ft)
- Time to altitude: 5,000 m (16,000 ft) in 2 minutes  
10,000 m (33,000 ft) in 5.2 minutes
- Wing loading: 240.8 kg/m<sup>2</sup> (49.3 lb/sq ft)
- Thrust/weight: 0.00534 kN/kg (0.544 lbf/lb)

### Armament

- 2x NR-23 23 mm (0.906 in) cannon in the lower left fuselage (80 rounds per gun, 160 rounds total)
- 1x Nudelman N-37 37 mm (1.457 in) cannon in the lower right fuselage (40 rounds total)
- 2x 100 kg (220 lb) bombs, drop tanks, or unguided rockets on 2 underwing hardpoints.