**Mikoyan MiG 31**

From Wikipedia, the free encyclopedia

*For the fictional aircraft of the novel and movie* [Firefox](https://en.wikipedia.org/wiki/Firefox_(film))*, see* [*Mikoyan MiG-31 (fictional)*](https://en.wikipedia.org/wiki/Mikoyan_MiG-31_(fictional))*.*

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| --- | --- |
| **MiG-31** | |
|  | |
| Russian Air Force MiG-31B (Ser: RF-92387; Bort: 70 Blue) | |
| **Role** | [Interceptor aircraft](https://en.wikipedia.org/wiki/Interceptor_aircraft) |
| **Manufacturer** | [Mikoyan](https://en.wikipedia.org/wiki/Mikoyan) |
| **First flight** | 16 September 1975 |
| **Introduction** | 6 May 1981 |
| **Status** | In service |
| **Primary users** | [Russian Air Force](https://en.wikipedia.org/wiki/Russian_Air_Force) [Kazakhstan Air Force](https://en.wikipedia.org/wiki/Military_of_Kazakhstan) |
| **Produced** | 1975–1994 |
| **Number built** | 519 |
| **Developed from** | [Mikoyan-Gurevich MiG-25](https://en.wikipedia.org/wiki/Mikoyan-Gurevich_MiG-25) |

The **Mikoyan MiG-31** ([Russian](https://en.wikipedia.org/wiki/Russian_language): Микоян МиГ-31; [NATO reporting name](https://en.wikipedia.org/wiki/NATO_reporting_name): **Foxhound**) is a supersonic [interceptor aircraft](https://en.wikipedia.org/wiki/Interceptor_aircraft) developed for use by the [Soviet Air Forces](https://en.wikipedia.org/wiki/Soviet_Air_Forces). The aircraft was designed by the [Mikoyan](https://en.wikipedia.org/wiki/Mikoyan) design bureau as a replacement for the earlier [MiG-25 "Foxbat"](https://en.wikipedia.org/wiki/Mikoyan-Gurevich_MiG-25); the MiG-31 is based on, and shares design elements with the MiG-25. The MiG-31 has the distinction of being one of the fastest combat jets in the world. It continues to be operated by the [Russian Air Force](https://en.wikipedia.org/wiki/Russian_Air_Force) and the [Kazakhstan Air Force](https://en.wikipedia.org/wiki/Armed_Forces_of_the_Republic_of_Kazakhstan) following the end of the [Cold War](https://en.wikipedia.org/wiki/Cold_War) and the collapse of the [Soviet Union](https://en.wikipedia.org/wiki/Soviet_Union) in late 1991. The Russian Defense Ministry expects the MiG-31 to remain in service until at least 2030.

**Development**

**Origins**

The MiG-25 made substantial design sacrifices in capability in order to achieve high speed, altitude and rate of climb. It lacks maneuverability at interception speeds and is difficult to fly at low altitudes. The MiG-25's speed is limited to [Mach](https://en.wikipedia.org/wiki/Mach_number) 2.83 but could reach a maximum speed of Mach 3.2 or more with the risk of engine damage.



MiG-31BM taking off from [Chelyabinsk Shagol Airport](https://en.wikipedia.org/wiki/Chelyabinsk_Shagol_Airport) in 2012

Development of the MiG-25's replacement began with the Ye-155MP ([Russian](https://en.wikipedia.org/wiki/Russian_language): Е-155МП) [prototype](https://en.wikipedia.org/wiki/Prototype) which first flew on 16 September 1975. Although it bore a superficial resemblance to the MiG-25, it had a longer fuselage to accommodate the radar operator's cockpit and was in many respects a new design. An important development was the advanced radar, capable of both look-up and [look-down/shoot-down](https://en.wikipedia.org/wiki/Look-down/shoot-down) engagement, as well as multiple target tracking. This gave the Soviet Union an interceptor able to engage the most likely Western intruders (low flying cruise missiles and bombers) at long range.

Like its MiG-25 predecessor, the introduction of the MiG-31 was surrounded by early speculation and misinformation concerning its design and abilities. The West learned of the new interceptor from Lieutenant [Viktor Belenko](https://en.wikipedia.org/wiki/Viktor_Belenko), a pilot who defected to [Japan](https://en.wikipedia.org/wiki/Japan) in 1976 with his MiG-25P. Belenko described an upcoming "Super Foxbat" with two seats and an ability to intercept cruise missiles. According to his testimony, the new interceptor was to have air intakes similar to the [Mikoyan-Gurevich MiG-23](https://en.wikipedia.org/wiki/Mikoyan-Gurevich_MiG-23), which the MiG-31 does not have, at least in production variants.

**Into production**

Serial production of the MiG-31 began in 1979. The MiG-31 is able to maintain combat effectiveness despite the potential use of active and passive radar jammers and thermal decoys by adversaries. A group of four MiG-31 interceptors is able to control an area of air space across a total length of 800–900 km; its radar possessing a maximum detection range of 200 km in distance (radius) and the typical width of detection along the front of 225 km.

The MiG-31 was designed to fulfill the following mission objectives:

* Intercept cruise missiles and their launch aircraft by reaching missile launch range in the lowest possible time after departing the loiter area;
* Detect and destroy low flying cruise missiles, UAVs and helicopters;
* Long range escort of strategic bombers;
* Provide strategic air defense in areas not covered by ground based air defense systems.

MiG-31 production ended in 1994. A total of 519 MiG-31s were produced of which 349 "baseline models" were produced at the Sokol plant between 1976 and 1988. The second production batch of 101 Mig-31DZ's were produced between 1989 and 1991. The final batch (Mig-31B) of 69 aircraft were produced between 1990 and 1994. Of this final batch, 50 were retained by the Kazakhstan Air Force after the dissolution of the Soviet Union. Of the "baseline models," 40 airframes were upgraded to Mig-31BS standard.

**Upgrades and replacement**

Some upgrade programs have found their way in the MiG-31 fleet, like the MiG-31BM multirole version with upgraded avionics, new multimode radar, hands-on-throttle-and-stick ([HOTAS](https://en.wikipedia.org/wiki/HOTAS)) controls, [liquid crystal](https://en.wikipedia.org/wiki/Liquid_crystal_display) (LCD) color multi-function displays (MFDs), ability to carry the [R-77](https://en.wikipedia.org/wiki/R-77) missile and various Russian [air-to-ground missiles](https://en.wikipedia.org/wiki/Air-to-surface_missile) (AGMs) such as the [Kh-31](https://en.wikipedia.org/wiki/Kh-31) [anti-radiation missile](https://en.wikipedia.org/wiki/Anti-radiation_missile) (ARM), a new and more powerful computer, and digital [data links](https://en.wikipedia.org/wiki/Data_link). A project to upgrade the Russian MiG-31 fleet to the MiG-31BM standard began in 2010; 100 aircraft are to be upgraded to MiG-31BM standard by 2020. Russian Federation Defense Ministry chief Colonel Yuri Balyko has claimed that the upgrade will increase the combat effectiveness of the aircraft several times over. 18 MIG-31BMs were delivered in 2014. The Russian military will receive more than 130 upgraded MiG-31BMs, and the first 24 aircraft have already been delivered, Russian Deputy Defense Minister Yuri Borisov told reporters on 9 April 2015.

Russia plans to start development for a replacement for the MiG-31 by 2019. The aircraft will be called PAK-DP (ПАК ДП, *Перспективный авиационный комплекс дальнего перехвата* - Prospective Air Complex for Long-Range Interception).

Development of a new aircraft, designated MiG-41, began in April 2013. Development of a new interceptor is favored over restarting MiG-31 production. In March 2014, Russian test pilot [Anatoly Kvochur](https://en.wikipedia.org/wiki/Anatoly_Kvochur) said that work began on a Mach 4MiG-41 based on the MiG-31. Development on the MiG-31 replacement is to begin in 2017, with the first aircraft to be delivered in 2020, and to enter service in 2025.

**Design**

**Overview**



A MiG-31DZ in flight over Russia, 2012

Like the MiG-25, the MiG-31 is a large twin-engine aircraft with side-mounted air [intake ramps](https://en.wikipedia.org/wiki/Intake_ramp), a shoulder-mounted wing with an [aspect ratio](https://en.wikipedia.org/wiki/Aspect_ratio_(wing)) of 2.94, and twin vertical tailfins. Unlike the MiG-25, it has two seats, with the rear occupied by a dedicated [weapon systems officer](https://en.wikipedia.org/wiki/Weapon_systems_officer). The MiG-31 is limited to only 5 [*g*](https://en.wikipedia.org/wiki/G-force) when travelling at supersonic speeds. While flying under combat weight, its [wing loading](https://en.wikipedia.org/wiki/Wing_loading) is marginal and its [thrust-to-weight ratio](https://en.wikipedia.org/wiki/Thrust-to-weight_ratio) is favorable. However, the MiG-31 is not designed for [close combat or rapid turning](https://en.wikipedia.org/wiki/Dogfight).

The wings and airframe of the MiG-31 are stronger than those of the MiG-25, permitting supersonic flight at low altitudes. Its [D30-F6](https://en.wikipedia.org/wiki/Aviadvigatel_D30-F6) jet engines, each rated at 152 kN thrust, allow a maximum speed of [Mach](https://en.wikipedia.org/wiki/Mach_number) 1.23 at low altitude. High-altitude speed is temperature-redlined to Mach 2.83 – the thrust-to-drag ratio is sufficient for speeds in excess of Mach 3, but such speeds pose unacceptable hazards to engine and airframe life in routine use.

**Electronics suite**



MiG-31BM showing its *Zaslon* phased-array radar

The MiG-31 was the world's first operational fighter with a [passive electronically scanned array radar](https://en.wikipedia.org/wiki/Passive_electronically_scanned_array) (PESA), the [*Zaslon S-800*](https://en.wikipedia.org/wiki/Zaslon_radar). Its maximum range against fighter-sized targets is approximately 200 km (125 mi), and it can track up to 10 targets and simultaneously attack four of them with its [Vympel](https://en.wikipedia.org/wiki/Vympel) [R-33](https://en.wikipedia.org/wiki/R-33_(missile)) missiles. The radar is matched with an [infra-red search and track](https://en.wikipedia.org/wiki/Infra-red_search_and_track) (IRST) system in a retractable undernose fairing.

The MiG-31 was equipped with RK-RLDN and APD-518 digital secure datalinks. The RK-RLDN datalink is for communication with ground control centers. The APD-518 datalink enables a flight of four MiG-31 to automatically exchange radar-generated data within 200 km (124 mi) from each other. It also enables other aircraft with less sophisticated avionics, such as MiG-23,25,29/Su-15,27 to be directed to targets spotted by MiG-31 (a maximum of 4 (long-range) for each MiG-31 aircraft). The [A-50](https://en.wikipedia.org/wiki/Beriev_A-50) [AEW](https://en.wikipedia.org/wiki/Airborne_early_warning) aircraft and MiG-31 can automatically exchange aerial and terrestrial radar target designation.

**Radars**

Adopted in 1981 RP-31 N007 *backstop* (Russian -*Zaslon*).

* the range of detection of air targets: 200 km (for the purpose of a [radar cross-section](https://en.wikipedia.org/wiki/Radar_cross-section) of 19 m2 on a collision angle with probability 0.5)
* target detection distance with [radar cross-section](https://en.wikipedia.org/wiki/Radar_cross-section) of 3 m2 in the rear within 35 km with a probability of 0.5
* number of detected targets: 24 (was originally 10)
* number of targets for attack: 6 (was originally 4)
* range of automatic tracking: 120 km
* detection of [infrared signature](https://en.wikipedia.org/wiki/Infrared_signature) targets: 56 km
* Effective in the detection of cruise missiles and other targets against [ground clutter](https://en.wikipedia.org/wiki/Clutter_(radar))
* Until 2000, it was the world's only fighter in service equipped with phased array radar, when the [Mitsubishi F-2](https://en.wikipedia.org/wiki/Mitsubishi_F-2) entered service with state of the art [J/APG-1](https://en.wikipedia.org/wiki/J/APG-1) [active phased array](https://en.wikipedia.org/wiki/Active_phased_array) radar.
* Able to intercept and destroy cruise missiles flying at extremely low altitudes.

**Variant differences**

The basic differences between other versions and the МiG-31BM:

* The onboard radar complex of the MiG-31BM can track 24 airborne targets at one time, 6 of which can be simultaneously attacked by [R-33S](https://en.wikipedia.org/wiki/R-33_(missile)) missiles.
* Modernized variants of the aircraft can be equipped with anti-radiation missiles [Kh-31](https://en.wikipedia.org/wiki/Kh-31), [Kh-25MR](https://en.wikipedia.org/wiki/Kh-25) or MPU (up to six units), anti-ship Kh-31A (up to six), air-to-surface class missiles [Kh-29](https://en.wikipedia.org/wiki/Kh-29) and [Kh-59](https://en.wikipedia.org/wiki/Kh-59) (up to three) or Kh-59M (up to two units), up to six precision bombs [KAB-1500](https://en.wikipedia.org/w/index.php?title=KAB-1500&action=edit&redlink=1) or eight [KAB-500](https://en.wikipedia.org/wiki/KAB-500) with television or laser-guidance. Maximum mass of payload is 9000 kg.
* The MiG-31M, MiG-31D, and MiG-31BM standard aircraft have an upgraded *Zaslon-M* radar, with larger antenna and greater detection range (said to be 400 km (250 mi) against [AWACS](https://en.wikipedia.org/wiki/Airborne_Early_Warning_and_Control)-size targets) and the ability to attack multiple targets — air and ground — simultaneously. The Zaslon-M has a 1.4 m diameter (larger) antenna, with 50% to 100% better performance than Zaslon. In April 1994 it was used with an [R-37](https://en.wikipedia.org/wiki/Vympel_R-37) to hit a target at 300 km distance. It has a search range of 400 km for a 19/20 m2 RCS target and can track 24 targets at once, engaging six (282 km for 5 m2). Target speed increased from 5 Mach to 6 Mach, improving possibility of firing through the land. The MiG-31BM is one of only a few aircraft able to intercept and destroy cruise missiles flying at extremely low heights.

**Cockpit**

The aircraft is a two-seater with the rear seat occupant controlling the radar. Although cockpit controls are duplicated across cockpits, it is normal for the aircraft to be flown only from the front seat. The pilot flies the aircraft by means of a [center stick](https://en.wikipedia.org/wiki/Centre_stick) and left hand [throttles](https://en.wikipedia.org/wiki/Throttle). The rear cockpit has only two small vision ports on the sides of the canopy. The presence of the WSO (Weapon Systems Operator) in the rear cockpit improves aircraft effectiveness since the WSO is entirely dedicated to radar operations and weapons deployment, thus decreasing the workload of the pilot and increasing efficiency. Both cockpits are fitted with zero/zero [ejection seats](https://en.wikipedia.org/wiki/Ejection_seat) which allow the crew to eject at any altitude and airspeed.

**Armament**



MiG-31 armed with [R-33](https://en.wikipedia.org/wiki/R-33_(missile)) missiles

The MiG-31's main armament is four [R-33](https://en.wikipedia.org/wiki/Vympel_R-33) [air-to-air missiles](https://en.wikipedia.org/wiki/Air-to-air_missile) ([NATO](https://en.wikipedia.org/wiki/NATO) codename AA-9 'Amos') carried under the belly. The R-33 is the Russian equivalent of the [U.S. Navy's](https://en.wikipedia.org/wiki/United_States_Navy) [AIM-54 Phoenix](https://en.wikipedia.org/wiki/AIM-54_Phoenix).

* 1× [GSh-6-23](https://en.wikipedia.org/wiki/Gryazev-Shipunov_GSh-6-23) 23 mm cannon with 260 rounds.
* Fuselage recesses for 4× [R-33 (AA-9 'Amos')](https://en.wikipedia.org/wiki/R-33_(missile)) or 6x [R-37 (AA-13 'Arrow')](https://en.wikipedia.org/wiki/R-37_(missile)) (MiG-31M/BM only).
* 4 underwing pylons for a combination of (6 places for charging (+ 2 space to add removable fuel tanks)):
  + 6× [R-37 (missile)](https://en.wikipedia.org/wiki/R-37_(missile)) long-range missiles (280 km).
  + (4)× [R-33 (missile)](https://en.wikipedia.org/wiki/R-33_(missile)) long-range missiles (304 km) 2012.
  + (?)× Kh-31 long-range missiles (200 km) for high-speed target (maneuvering with overload 8G).
  + (?)× Р-33 AA-9 «Amos» (1981) 120 km, Р-33S (1999) 160 km.
  + 2 4 (superior limit) × [R-40TD1 (AA-6 'Acrid')](https://en.wikipedia.org/wiki/R-40_(missile)) medium-range missiles (P-40 (50 km, MiG-25P, 1970) 80 km(PD)(user)), height applications between 0.5 and 30 km (maneuvering with overload 4 g).
  + 4× [R-60 (AA-8 'Aphid')](https://en.wikipedia.org/wiki/R-60_(missile))
    - 4× [R-73 (AA-11 'Archer')](https://en.wikipedia.org/wiki/R-73_(missile)) short-range IR missiles,
    - 4× [R-77 (AA-12 'Adder')](https://en.wikipedia.org/wiki/R-77) medium-range missiles (100км) for high-speed target (maneuvering with overload 12G).
* Some aircraft are equipped to launch the [Kh-31P (AS-17 'Krypton')](https://en.wikipedia.org/wiki/AS-17_Krypton) and [Kh-58 (AS-11 'Kilter')](https://en.wikipedia.org/wiki/AS-11_Kilter) [anti-radiation missiles](https://en.wikipedia.org/wiki/Anti-radiation_missile) in the [Suppression of Enemy Air Defenses](https://en.wikipedia.org/wiki/Suppression_of_Enemy_Air_Defenses) (SEAD) role.

**Operational history**



A side view of a MiG-31 from 790th Fighter Order of Kutuzov Aviation Regiment on the runway of Khotilovo airbase, Tver region.



A MiG-31B on left and MiG-31BM on right flying in formation.

The MiG-31 entered operational service with the [Soviet Air Defense Forces](https://en.wikipedia.org/wiki/Soviet_Air_Defence_Forces) (PVO) in 1981 It was the world's first aircraft with a [phased array radar](https://en.wikipedia.org/wiki/Phased_array_radar), and is one of only two aircraft in the world capable of independently firing long-range [air-to-air missiles](https://en.wikipedia.org/wiki/Air-to-air_missile) as of 2013. (The other is the [Iranian Air Force](https://en.wikipedia.org/wiki/Islamic_Republic_of_Iran_Air_Force) [F-14 Tomcat](https://en.wikipedia.org/wiki/Grumman_F-14_Tomcat#Iran) which uses a domestic version of the long-range [AIM-54 Phoenix](https://en.wikipedia.org/wiki/AIM-54_Phoenix#Variants) called the Fakour-90.) The MiG-31BM has a detection range of 282 km for a target with a [radar cross-section](https://en.wikipedia.org/wiki/Radar_cross-section) of 5 square meters, and 189 km for stealth targets.

With the designation Ye-266, a re-engine Ye-155 set new world records. It reached an [absolute maximum altitude](https://en.wikipedia.org/wiki/Flight_altitude_record#Jet_aircraft) of 37,650 meters (123,520 ft) in 1977, and set a time to height record of 35,000 meters (115,000 ft) in 4 minutes, 11.78 seconds, both of which were set by the famous MiG test pilot Alexander Fedotov. Pyotr Ostapenko, his deputy, set a time to height record to 30,000 m (98,000 ft) in 3 minutes and 9.8 seconds in 1975.

**Export**

[Syria](https://en.wikipedia.org/wiki/Syria) ordered eight MiG-31E aircraft in 2007 for [Syrian Air Force](https://en.wikipedia.org/wiki/Syrian_Air_Force). However, the order was suspended in May 2009 reportedly either due to Israeli pressure or lack of Syrian funds. On 15 August 2015, six MiG-31s were delivered to the Syrian Arab Air Force. However, Russia denied making MiG-31 deliveries to Syria.

**Variants**



A front view of a MiG-31 on the ramp of Khotilovo airbase, Tver region

**MiG-31 / MiG-31 01DZ**

Two-seat all weather, all altitude interceptor. Designated as MiG-31 01DZ when fitted with air-to-air refueling probe.

**MiG-31M**

Development of a more comprehensive advanced version, the MiG-31M, began in 1984 and first flew in 1985, but the [dissolution of the Soviet Union](https://en.wikipedia.org/wiki/Dissolution_of_the_Soviet_Union) prevented it from entering full production. One piece rounded windscreen, small side windows for rear cockpit, wider and deeper dorsal spine. Digital flight controls added, multifunction CRT cockpit displays, multi-mode phased array radar. No gun fitted in this model. Refueling probe moved to starboard side of aircraft. Fuselage weapon stations increased from four to six by adding two center-line stations. Maximum TO weight increased to 52,000 kg using increased thrust D-30F6M engines.

**MiG-31BS**

Designation applied to type 01DZ when converted to MiG-31B standard.

**MiG-31B**

Second production batch with upgraded [avionics](https://en.wikipedia.org/wiki/Avionics) and in-flight refueling probe introduced in 1990. Its development was the result of the Soviet discovery that [Phazotron](https://en.wikipedia.org/wiki/Phazotron) [radar](https://en.wikipedia.org/wiki/Radar) division engineer [Adolf Tolkachev](https://en.wikipedia.org/wiki/Adolf_Tolkachev) had sold information on advanced radars to the West. A new version of the compromised radar was hastily developed. MiG 31B also have the improved ECM and EW equipment with integration of improved R-33S missiles. Long range navigation system compatible with Loran/Omega and Chaka ground stations added. This model replaced the 01DZ models in late 1990.

**MiG-31BM / MiG-31BSM**

The upgraded MiG-31B was designated MiG-31BM and the upgraded MiG-31BS was designated MiG-31BSM. The most visible addition to the BM/BSM variant was the rear-view periscope added above the front cockpit canopy. The MiG-31BМ's maximum detection range for air targets was increased in the upgrade to 320 km. It had the ability to automatically track up to ten targets, and the latest units can track up to 24 targets and simultaneously engage up to 6 targets. The on-board Argon-K computer selects four targets of highest priority, which simultaneously are engaged by long-range [R-33S](https://en.wikipedia.org/wiki/R-33_(missile)) air-to-air missiles. Infrared search is interfaced with radar and is designed for passive search of the airspace, and for the targeting of [R-40](https://en.wikipedia.org/wiki/R-40_(missile))TD and [R-60](https://en.wikipedia.org/wiki/R-60_(missile)) [TGS](https://en.wikipedia.org/wiki/GOS) missiles.

The basic difference between earlier versions and the МiG-31BM is that the МiG-31BM can act as a small [airborne early warning](https://en.wikipedia.org/wiki/Airborne_early_warning) aircraft. Onboard equipment provides interaction with [surface-to-air missile](https://en.wikipedia.org/wiki/Surface-to-air_missile) units and can function as an airborne command post to coordinate the actions of other types of fighters with less powerful radars.

The flight-navigation equipment of the MiG-31 includes a system of automatic control system SAU-155МP and sighting-navigation complex KN-25 with two inertial systems and IP-1-72A with digital computer Maneuver, electronic range navigation system Radical NP (312) or A-331, electronic system of the far - [navigation](https://en.wikipedia.org/wiki/Navigation) A-723. Distant radio navigation is carried out by means of two systems: [CHAYKA](https://en.wikipedia.org/wiki/CHAYKA) (similar to the system of [Laurent](https://en.wikipedia.org/wiki/LORAN)) and «Route» (similar to the system of omega).

The MiG-31 is equipped with sr-you ECM radar and infrared ranges. Interceptor MiG-31 is capable of performing combat tasks.

The MiG-31 was equipped with RK-RLDN and APD-518 digital secure datalinks. The RK-RLDN datalink is for communication with ground control centers. The APD-518 datalink enables a flight of four MiG-31 to automatically exchange radar-generated data within 200 km (124 mi) from each other (a group of four MiG-31 interceptors is able to control an area of air space across a total length of 800 km). It also enables other aircraft with less sophisticated avionics, such as MiG-23,25,29/Su - 15,27 to be directed to targets spotted by MiG-31 (a maximum of 4 (long-range) for each MiG-31 aircraft). Similarly complex S-300 aircraft with a group of APD-518 can: share data obtained by various radars from different directions (active or passive scanning radiation) and summarize the data. That is, the target can be detected by passively (through noise posed to protect themselves / active search radar (target)) and (or) the active simultaneously from many different directions (active search radar MiG-31). And everyone aircraft has APD-518 will have exact data, even if it is not involved in the search.

* arming - 4 long-range missiles + 4 short-range/medium-range missiles (including R-77 medium-range).
* interacting with ground-based automated digital control system (ACS «Rubezh» Operating radius of 2000 km, can control multiple groups of planes), operating modes remote aiming, semi-automated actions (coordinate support), singly, and also: to direct on the target missiles launched from the other aircraft.
* Digital immune system provides the automatic exchange of tactical information in a group of four interceptors, remote one from another at a distance of 200 km and aiming at the target group of fighters with less-powerful avionics (in this case the aircraft performs the role of guidance point or repeater).

**MiG-31D**

Two aircraft were designated as Type 31D and were manufactured as dedicated anti-satellite models with ballast in the nose instead of radars, flat fuselage undersurface (i.e. no recessed weapon system bays) and had large winglets above and below the wing-tips. Equipped with Vympel [ASAT](https://en.wikipedia.org/wiki/Anti-satellite_weapon) missiles.

**MiG-31E**

Export version of the MiG-31B type.

**MiG-31F**

Planned fighter-bomber intended for use with TV, radar and laser-guided ASM weapon systems.

**MiG-31FE**

Planned Export version of the MiG-31F. Was never produced.

**Operators**



MiG-31 operators as of August 2015

[Syria](https://en.wikipedia.org/wiki/Syria)



* [Syrian Arab Air Force](https://en.wikipedia.org/wiki/Syrian_Arab_Air_Force) - 6 delivered

[Kazakhstan](https://en.wikipedia.org/wiki/Kazakhstan)



* [Kazakhstan Air Force](https://en.wikipedia.org/wiki/Armed_Forces_of_the_Republic_of_Kazakhstan) - 29 in service

[Russia](https://en.wikipedia.org/wiki/Russia)



* [Russian Air Force](https://en.wikipedia.org/wiki/Russian_Air_Force) - 252 in inventory. 152-190 (MiG-31/B/BM) active, +18 BMs in 2014, 80 totally (2016), 100 units in mod. BM on 2018
* [Russian Naval Aviation](https://en.wikipedia.org/wiki/Russian_Naval_Aviation) 30+ were in inventory

**Former operators**

[Soviet Union](https://en.wikipedia.org/wiki/Soviet_Union)



* [Soviet Air Defense Forces](https://en.wikipedia.org/wiki/Soviet_Air_Defence_Forces)
* [Soviet Air Forces](https://en.wikipedia.org/wiki/Soviet_Air_Forces) aircraft passed on to Russia and Kazakhstan in 1991.

**Notable accidents**

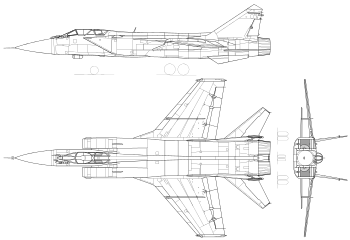
On 6 September 2011, a MiG-31 crashed near Bolgary village, Perm region, Russia. The aircraft crashed shortly after takeoff, killing both pilots. Another, non-fatal crash occurred in 2010. The entire fleet was grounded pending an investigation.

During the night of 23 April 2013, a Kazakhstan Air Force MiG-31 crashed during a training flight near the village of Prostornoye in the Karaganda Region of Kazakhstan, killing the pilot and injuring the navigator. The plane crashed due to technical failure. The same plane underwent a major overhaul at a plant in Rzhev, northwest Russia in December 2012.

On 4 September 2014, a MiG-31 crashed during exercises at a distance of 25 kilometers from the city of [Armavir](https://en.wikipedia.org/wiki/Armavir,_Russia).

On 25 January 2016, a MiG-31 fighter jet crashed in the [Krasnoyarsk region](https://en.wikipedia.org/wiki/Krasnoyarsk_Krai) of Siberia. The pilots were able to eject safely and no casualties have been reported.

**Specifications (MiG-31)**



MiG-31BM on display at [MAKS Airshow](https://en.wikipedia.org/wiki/MAKS_Airshow) on 22 August 2009



MiG-31E at 2005 MAKS Airshow



MiG-31E landing at [Sormovo Airfield](https://en.wikipedia.org/wiki/Sormovo_(airfield)), 2007

*Data from* Great Book of Modern Warplanes, MiG-31E data, *Combat Aircraft since 1945*

**General characteristics**

* Crew: Two (pilot and weapons system officer)
* Length: 22.69 m (74 ft 5 in)
* [Wingspan](https://en.wikipedia.org/wiki/Wingspan): 13.46 m (44 ft 2 in)
* Height: 6.15 m (20 ft 2 in)
* Wing area: 61.6 m2 (663 ft2)
* [Empty weight](https://en.wikipedia.org/wiki/Manufacturer%27s_empty_weight): 21,820 kg (48,100 lb.)
* Loaded weight: 41,000 kg (90,400 lb.)
* [Max. takeoff weight](https://en.wikipedia.org/wiki/Maximum_takeoff_weight): 46,200 kg (101,900 lb.)
* [Powerplant](https://en.wikipedia.org/wiki/Aircraft_engine): 2 × [Soloviev D-30F6](https://en.wikipedia.org/wiki/Soloviev_D-30) afterburning [turbofans](https://en.wikipedia.org/wiki/Turbofan)
  + Dry thrust: 93 kN (20,900 lbf) each
  + Thrust with [afterburner](https://en.wikipedia.org/wiki/Afterburner): 152 kN (34,172 lbf) each

Performance

* [Maximum speed](https://en.wikipedia.org/wiki/V_speeds#Regulatory_V-speeds):
  + High altitude: Mach 2.83 (3,000 km/h, 1,860 mph)
  + Low altitude: Mach 1.2 (1,500 km/h, 930 mph)
* [Cruise speed](https://en.wikipedia.org/wiki/V_speeds#Vc): Mach 2.35 (2,500 km/h; 1,550 mph)
* [Combat radius](https://en.wikipedia.org/wiki/Combat_radius): 1,450 km (900 mi) at Mach 0.8 and at altitude of 10,000 m (33,000 ft); 720 km (450 mi) at Mach 2.35 and altitude of 18,000 m (59,000 ft)
* Combat range: 3,000 km (1,860 mi) with 4xR-33E and 2 drop tanks; 5,400 km (3,360 mi) with 4xR-33E and 2 drop tanks with one in-flight refueling
* [Service ceiling](https://en.wikipedia.org/wiki/Ceiling_(aeronautics)): 20,600 m (67,600 ft)
* [Rate of climb](https://en.wikipedia.org/wiki/Rate_of_climb): 208 m/s (41,000 ft/min)
* [Wing loading](https://en.wikipedia.org/wiki/Wing_loading): 665 kg/m2 (136 lb./ft2)
* [Thrust/weight](https://en.wikipedia.org/wiki/Thrust-to-weight_ratio): 0.85
* Maximum *g*-load: 5 g

**Armament**

MiG-31BM

* 1× [GSh-6-23](https://en.wikipedia.org/wiki/Gryazev-Shipunov_GSh-6-23) 23 mm cannon with 260 rounds.
* Fuselage recesses for either:
  + 4× [R-33 (AA-9 'Amos')](https://en.wikipedia.org/wiki/R-33_(missile))
  + 4x R-33S
  + 4x [R-37M (AA-13 'Arrow')](https://en.wikipedia.org/wiki/R-37_(missile))
* 4 underwing pylons for either:
  + 2 or 4x [R-40 (AA-6 'Acrid')](https://en.wikipedia.org/wiki/R-40_(missile)) MVR AAM
  + 4× [R-73 (AA-11 'Archer')](https://en.wikipedia.org/wiki/R-73_(missile)) WVR AAM
  + 4× [R-77-1 (AA-12 'Adder')](https://en.wikipedia.org/wiki/R-77) BVR AAM

**See also**

|  |  |
| --- | --- |
|  | [***Aviation portal***](https://en.wikipedia.org/wiki/Portal:Aviation) |

* [*Firefox (novel)*](https://en.wikipedia.org/wiki/Firefox_(novel)) and [*Firefox (film)*](https://en.wikipedia.org/wiki/Firefox_(film)), the premise of which is the theft of a speculated/fictional version of the MiG-31

Related development

* [Mikoyan-Gurevich MiG-25](https://en.wikipedia.org/wiki/Mikoyan-Gurevich_MiG-25)

Aircraft of comparable role, configuration and era

* [Sukhoi Su-27](https://en.wikipedia.org/wiki/Sukhoi_Su-27)
* [McDonnell Douglas F-15 Eagle](https://en.wikipedia.org/wiki/McDonnell_Douglas_F-15_Eagle)
* [Panavia Tornado ADV](https://en.wikipedia.org/wiki/Panavia_Tornado_ADV)
* [Grumman F-14 Tomcat](https://en.wikipedia.org/wiki/Grumman_F-14_Tomcat)

Related lists

* [List of military aircraft of the Soviet Union and the CIS](https://en.wikipedia.org/wiki/List_of_military_aircraft_of_the_Soviet_Union_and_the_CIS)
* This page was last modified on 13 March 2016, at 17:25.