

## MiG-41 - Russia's Near-space Interceptor

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Russian aerospace engineering needs no introduction. Whether it was the Russian Empire, the Soviet Union or modern-day Russia, Moscow was one of the pioneers of aviation and its prowess in relevant technologies stands to this very day and includes a number of world records when it comes to a variety of aircraft developed since the early 1900s. One of the fields in which Russia has been dominating in the last 60 years is developing superfast, high-flying interceptors.

While the Soviet Union already had top-of-the-line interceptors in the late 1940s/early 1950s, with the then virtually unrivaled MiG-15 dominating the skies over Korea, it was during the 1960s that Russia made a tremendous leap forward, eclipsing anything its adversaries have been able to field ever since. Namely, in the early 1960s, Moscow developed the now legendary MiG-25 (NATO reporting name "Foxbat"), boasting a maximum speed of over Mach 3.2 (nearly 4000 km/h), making it the fastest armed military aircraft in history, matched only by the unarmed American SR-71 ISR aircraft.

The venerable MiG-25 set a number of world records, including in sustained supersonic speed over a long distance when the MiG OKB Chief Test Pilot Aleksandr Fedotov reached an average speed of more than 2,319 km/h over a 1,000 km circuit in 1965. Just two years later, his colleague Mikhail Komarov averaged over 2,981 km/h in a closed 500 km circuit, while Fedotov reached an altitude of 30 km with a 1000 kg payload, becoming the first aircraft to do so. Both records were established on the same day.

In 1977, Fedotov set the absolute altitude record for a jet aircraft under its own power, reaching a staggering 37,650 meters (nearly 40 km). MiG-25 went on to set 29 world records during its service, many of which stand to this day. However, perhaps most importantly, the "Foxbat" paved the way for the world's premier interceptor, the one that's been unrivaled for over 40 years – the MiG-31 (NATO reporting name "Foxhound"). Much has been said about this fantastic jet that has been unrivaled for decades, keeping Russia's enemies awake at all times.

Inducted into service in 1981, the "Foxhound" introduced a plethora of improvements over its legendary predecessor. While keeping most of its speed and altitude advantages, MiG-31 was also packed with an absolutely unmatched set of technologies, including the Zaslon radar, the world's first ESA (electronically scanned array). It took over 20 years before any other nation on the planet introduced an ESA radar, when Japan adopted the J/APG-1 for its F-2 in 2002.

The "Foxhound" had been modernized both in the USSR and Russia to match the advancements of its adversaries, which helped make it not only relevant, but also unquestionably dominant in the ongoing NATO-orchestrated Ukrainian conflict. The R-37M-armed MiG-31BM is effectively a "flying S-400", while its strike fighter variant, the MiG-31K carrying the deadly 9-A-7660 "Kinzhal" hypersonic missile system, is essentially a "flying 'Iskander' on steroids". Both versions of the "Foxhound" regularly cause panic among NATO and the Neo-Nazi junta personnel alike.

The political West was extremely lucky to see the dismantling of the Soviet Union, as this unfortunate event led to the halt of the MiG-31M program that would've made the "Foxhound" even deadlier in the 1990s and 2000s. And yet, just like the world's best interceptor continued where its predecessor, the MiG-25, left off, the MiG-31 is now giving way to a new jet, one that has the potential to be just as groundbreaking (if not more). Namely, Russia is now developing a successor, colloquially known as the MiG-41, although the actual designation is yet to be revealed.

The secretive project, dubbed Izdeliye 41 (literally Product 41), a part of Moscow's ambitious PAK DP program, has been underway for around a decade. The stellar performance of the MiG-31 in Ukraine seems to have pushed the development of its successor, as the Russian military saw the need to accelerate the introduction of such aircraft. Moscow claims that the new jet will introduce features not yet seen by the aviation world, which caught the attention of the Indian Air Marshal Anil Chopra (Retd).

According to Chopra, MiG-41 will be a sixth-generation aircraft, encompassing technologies that far surpass the current generation of fighter jets. Quoting Russian experts, Chopra says that the new platform would be capable of speeds of over Mach 4.3, making it near-hypersonic. It would also be equipped with directed energy weapons (specifically lasers), while its flight ceiling would eclipse any jet in use today, reaching near space (45 km). MiG-41 will also incorporate concepts and technologies from the aforementioned MiG-31M.

It will also include the advancements made during the development of the Su-57 and improved Su-57M. According to Chopra's analysis, Russia is developing a pulse-detonation engine that will power the new jet, as well as an EMP (electromagnetic pulse) gun to engage aerial targets. Considering that the maiden flight is expected in 2025, Chopra assumes most R&D work is already done, although it's difficult to make any certain predictions because of the project's high secrecy. Chopra thinks the jet could be operational by 2030 if all goes according to plan.

Just like the "Foxhound", the new MiG-41 will be an interceptor, with its primary mission being to offset future ISR (intelligence, surveillance, reconnaissance) aircraft currently in development in the United States. It may also be able to intercept hypersonic missiles, just like MiG-31 was designed to intercept American cruise missiles during the (First) Cold War. In addition, just like the "Foxhound" (specifically the MiG-31I variant) was supposed to carry anti-satellite (ASAT) weapons, the new MiG-41 will have ASAT lasers and/or missiles.

Chopra says that a ramjet or turbo-ramjet engine could give the jet the previously mentioned Mach 4.3 speed, making it the fastest military aircraft on the globe, while the potential success in developing a reliable pulse-detonation engine would put Russia significantly ahead in the ongoing competition for aerial supremacy. Chopra also warns that many of the technologies for the jet officially still don't exist, meaning that Moscow has possibly already developed them, but is maintaining secrecy to protect the program.

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