



# T-50

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## KICKS OFF ITS OFFICIAL TESTS

Sukhoi T-50 also known as PAK FA (Future Tactical Aircraft) – the Russian fifth-generation fighter being developed by the Sukhoi company, United Aircraft Corp. subsidiary, – started its official trials this year. For this purpose, one of the five T-50 flying prototypes was ferried from Zhukovsky, Moscow Region, to the Defence Ministry State Flight Test Centre's base in Akhtubinsk. The rest of the PAK FA prototypes are to follow it soon. Two T-50 prototypes have been unveiled with weapons on their underwing stations at the flight demonstration within the framework of a Aviadarts 2014 Russian Air Force combat skills competition held in the Voronezh Region recently, in late May.

Russia is to become the second country operating a fifth-generation fighter, the United States being the first one. United Aircraft Corporation President Mikhail Pogosyan has said recently that the delivery of production-standard T-50s to the Russian Air Force for operational evaluation is poised to begin as soon as 2016.

The PAK FA has all basic characteristics inherent in fifth-generation fighters, namely, low observability in the radio-frequency band and other wavebands of the electromagnetic spectrum in the first place; secondly, supersonic cruising capability; thirdly, supermanoeuvrability; and, fourthly, a cutting-edge highly automated avionics suite comprising innovative active and passive radar and electro-optical systems designed to spot aerial and surface targets, cue a wide range of air-launched weap-

ons, ensure flight, navigation, radio communications, and protect from incoming enemy weapons.

The PAK FA's stealth is owing to a special shape of its airframe, the extensive use of composite materials and radar-absorbent coatings, and internal weapon bays. The aircraft owes its supersonic cruising capability to its engines capable of high thrust in non-afterburning mode. The fighter's supermanoeuvrability is owing to a combination of special algorithms of its integrated flight control system, on the one hand, and its thrust vector control engines.

The PAK FA's avionics suite is based on a cutting-edge information management system with multiple-redundant computers and data buses monitoring and controlling the onboard systems and weapons. Sukhoi has implemented this information management system philoso-



being developed by Tikhomirov-NIIP and the integrated electro-optical system being developed by UOMZ (a subsidiary of the Schwabe corporation that itself is a subsidiary of Rostec corp.) are the PAK FA's basic target designation, weapon employment, navigation and self-defence assets. The fighter's weapons suite will comprise both upgraded production-standard weapons and a considerable number of advanced types of air-to-air and air-to-surface missiles and smart bombs being developed by the Tactical Missiles corporation, including those developed for internal carriage.

As many as five PAK FA prototypes have been undergoing the flight tests by this summer. The first of them took to the air in Komsomolsk-on-Amur on 29 January 2010 and has been tested in Zhukovsky, Moscow Region, since April of the same year. In addition, two more examples are being used in ground experiments – one for integrated full-scale bench tests and the other for static tests.

The second T-50 flying prototype has been in trials since 2011. It has been ferried to the Defence Ministry State Flight Test Centre's airfield in Akhtubinsk for the official tests on 21 February this year. Its first flight in Akhtubinsk took place late in February with Sukhoi's chief test pilot Hero of Russia Sergei Bogdan, PAK FA programme lead pilot. Military test pilots will soon join their Sukhoi design bureau colleagues flying PAK FA test missions. The first military pilot flew the T-50 in Zhukovsky more than a year ago, on 25 April 2013. He was Col. Rafael Suleimanov, a test pilot with the State Flight Test Centre.

The third and fourth flying prototypes are designed for testing the avionics and weapons suites in the first place. It is the third T-50 that was used for starting the flight trials of the fighter's AESA radar. Last October saw the maiden flight of the fifth PAK FA flying prototype in Komsomolsk-on-Amur, which departed for Zhukovsky in November.

According to UAC President Mikhail Pogosyan, the PAK FA passed the factory test phase in 2013. This year, the aircraft is to begin its official tests, which first phase is slated for completion by December 2015. The delivery of opeval-intended production-standard planes to RusAF is supposed to commence in 2016. According to Mikhail Pogosyan, the PAK FA prototypes have displayed "a good dovetailing of the development and bench tests, including the tests of the AESA radar". According to Mr. Pogosyan, this applies to the engine, "which thrust is 15% higher than that of the AL-31FP and is considerably higher in non-afterburning modes, which allows supercruise". The tests of mid-air refuelling techniques, supermanoeuvrability, etc., began as part of the development trials too.

Late in May 2014, the third and fourth T-50 flying prototypes were demonstrated in flight as part of the nationwide final stage of the Aviadarts 2014 combat skills competition staged by the Russian Air Force. Sukhoi test pilots Sergei Bogdan and Roman Kondratyev performed a breathtaking terrain-hugging aerobatics set with attached underwing weapons at the Pogonovo testing ground in the Voronezh Region. Their aerobatics included simulated ground target attacks. One of the fighters carried a couple of medium-range and dogfight missiles under wing, and the other packed two high-speed precision-guided air-to-surface missiles in addition to two air-to-air ones.

Equally important is that a decision has been taken to use the PAK FA as the mainstay of a promising Russian-Indian joint aircraft development programme on development and production of the fifth-generation Future Multirole Fighter (Russian acronym PMI) earlier known in India under the abbreviated designation FGFA (Fifth Generation Fighter Aircraft). Russian and Indian engineers are deriving the aircraft on a parity basis from the Russian-built PAK FA with due account of additional Indian requirements.

*Aviadarts 2014 Russian Air Force combat skills competition held in late May 2014 became the occasion for public debut of two Sukhoi T-50 prototypes in configuration with external weapon stores. The photo shows T-50-4 aircraft carrying a pair of air-to-air medium range missiles and two high-speed ASMs*

phy in the Gen. 4++ Su-35S fighter, which delivery to the Russian Air Force has been under way since earlier this year.

The multifunction integrated active electronically scanned array (AESA) radar system



*T-50-2 became the first PAK FA prototype to be ferried for official tests to Akhtubinsk earlier this year*

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