

= Sukhoi Su @-@ 35 =

The Sukhoi Su @-@ 35 (Russian : ????? ?? @-@ 35 ; NATO reporting name : Flanker @-@ E) is a designation for two separate , heavily upgraded derivatives of the Su @-@ 27 ' Flanker ' jet plane . They are single @-@ seat , twin @-@ engine , supermaneuverable multirole fighters , designed by Sukhoi and built by Komsomolsk @-@ on @-@ Amur Aircraft Production Association (KnAAPO) .

The first variant was designed during the 1980s , when Sukhoi sought to upgrade its high @-@ performance Su @-@ 27 , and was initially known as the Su @-@ 27M . Later re @-@ designated Su @-@ 35 , this derivative incorporated aerodynamic refinements with increased manoeuvrability , enhanced avionics , longer range , and more powerful engines . The first Su @-@ 35 prototype , converted from a Su @-@ 27 , made its maiden flight in June 1988 . More than a dozen of these were built , some of which were used by the Russian Knights aerobatic demonstration team . The first Su @-@ 35 design was later modified into the Su @-@ 37 , which possessed thrust vectoring engines and was used as a technology demonstrator . A sole Su @-@ 35UB two @-@ seat trainer was built in the late 1990s that strongly resembled the Su @-@ 30MK family .

In 2003 , Sukhoi embarked on a second modernization of the Su @-@ 27 to produce what the company calls a 4 + + generation fighter that would bridge the gap between legacy fighters and the upcoming fifth @-@ generation Sukhoi PAK FA . This derivative , while omitting the canards and air brake , incorporates a reinforced airframe , improved avionics and radar , thrust @-@ vectoring engines , and a reduced frontal radar signature . In 2008 the revamped variant , erroneously named the Su @-@ 35BM in the media , began its flight test programme that would involve four prototypes , one of which was lost in 2009 .

The Russian Air Force has ordered 98 production units , designated Su @-@ 35S , of the newly revamped Su @-@ 35 . Both Su @-@ 35 models are marketed to many countries , including Brazil , China , India , Indonesia , and South Korea ; China ordered the Su @-@ 35 in late 2015 . Sukhoi originally projected that it would export more than 160 units of the second modernized Su @-@ 35 worldwide .

= = Design and development = =

= = = Upgraded Su @-@ 27 = = =

In the early 1980s , while the Su @-@ 27 was entering service with the Soviet Air Forces , Sukhoi looked to develop a follow @-@ on variant . Originally designated " Su @-@ 27M " and known internally as the " T10 @-@ M " , it would be much more agile and feature greatly improved avionics compared to the aircraft considered to be the best contemporary fighter . It was also to carry more armament to improve its Air @-@ to @-@ ground weaponry capabilities .

The improved variant , the development of which began in the early 1980s , featured a host of changes in aerodynamics , avionics , powerplants , and construction methods , as well as increasing payload capacity . High @-@ strength composites and Aluminium @-@ lithium alloys were used to reduce weight and boost internal fuel volume . One of the distinguishing features of this early design were the canards , which improved airflow over the wings , eliminating buffeting and allowing the aircraft to fly at an angle of attack of 120 ° . These canards were governed by a new digital fly @-@ by @-@ wire flight @-@ control system . The aircraft was fitted with the Luyka AL @-@ 31FM (AL @-@ 35F) turbofan engine which is larger , more reliable and , with a thrust of 125 kN (28 @ , @ 200 lbf) , more powerful than those found on the Su @-@ 27 .

Also new was the fire @-@ control system , at the heart of which is the N011 pulse @-@ Doppler radar , which could track up to 15 aerial targets simultaneously and guide up to six missiles simultaneously . The tail " stinger " houses the Phazotron N @-@ 012 rear @-@ facing radar . The aircraft could carry various bombs (including napalm , dumb and Cluster munitions) and both air @-@ to @-@ air and air @-@ to @-@ surface missiles ; and had two additional underwing pylons . The cockpit was modernized , equipped with multi @-@ function colour LCD screens , and fitted

with a K @-@ 36DM ejection seat inclined at 30 ° to improve pilot g @-@ force tolerance . Range was increased to 4 @,@ 000 km (2 @,@ 222 nmi) , the adoption of an aerial refuelling probe enables further range extension . The aircraft was characterized by its twin nose wheel ? as a result of higher payload ? and larger tail fins with Carbon @-@ fiber @-@ reinforced polymer square @-@ topped tips .

= = = Testing and demonstration = = =

The Su @-@ 27M (T @-@ 10S @-@ 70) prototype first flew on 28 June 1988 piloted by Sukhoi chief test pilot Oleg Tsoi . The first prototype differed slightly from later examples in : retaining standard Su @-@ 27 vertical stabilizers without the cropped top ; lacking a fire @-@ control system ; having a three @-@ tone grey / blue camouflage scheme , along with minor differences . Designated T10M @-@ 1 to T10M @-@ 10 , the first ten prototypes were built by Komsomolsk @-@ on @-@ Amur Aircraft Production Association (KnAAPO) in conjunction with Sukhoi (as the Soviet military @-@ industrial structure separated the aircraft designer and manufacturer) . They differed slightly , as four were converted from Su @-@ 27s , and the others were new @-@ builds . The second prototype started flying in January 1989 , while the third followed in mid @-@ 1992 . The prototypes were used to validate the canards and new flight @-@ control system .

In 1990 , the first prototype was displayed to Ministry of Defence officials at Kubinka Air Base . The aircraft first aerial demonstration occurred on 13 February 1992 , in front of CIS leaders in Machulishi , Minsk , before making its public debut at that year 's Farnborough Airshow . The third prototype , T10M @-@ 3 , appeared at the Dubai Airshow in 1993 , by which time Sukhoi had re @-@ designated its fighter the " Su @-@ 35 " . T10M @-@ 3 demonstrated its dogfight manoeuvres , including the Pugachev 's Cobra , to potential export customers . Viktor Pugachyov subsequently piloted the prototype in a mock fight with an Su @-@ 30MK . The Su @-@ 35 performed at numerous air shows during the following years , including at the 1993 and 1995 MAKS Airshows and the 1994 ILA Berlin Air Show . In addition to Su @-@ 27 conversions , three production Su @-@ 35s were completed in 1996 and delivered to Russian Air Force (VVS) for testing .

Throughout the Su @-@ 35 's flight test programme , active controls during manoeuvres such as the Pugachev 's Cobra and tailslide could not be maintained . The eleventh Su @-@ 27M (T10M @-@ 11) was built by KnAAPO and delivered in 1995 for the installation of exclusive systems to give it thrust @-@ vectoring capabilities . The resultant Su @-@ 37 technology demonstrator made its first flight in April 1996 . A second Su @-@ 35 was modified into an Su @-@ 37 in the late 1990s . In 2001 , AL @-@ 31F engines with fixed nozzles , an upgraded fly @-@ by @-@ wire controls , and improved cockpit systems were fitted to a Su @-@ 37 for testing .

In total , 15 airworthy Su @-@ 35s (Su @-@ 27M) were produced , including an Su @-@ 35UB two @-@ seat prototype , along with two static test prototypes . The Su @-@ 35UB , powered by two modified AL @-@ 31FPs with thrust @-@ vectoring nozzles , made its first flight on 7 August 2000 . It was demonstrated to South Korea during that country 's F @-@ X replacement fighter tender , before becoming an avionics testbed . The original Su @-@ 35 never entered serial production due to a lack of funding , and the VVS continued to use its Su @-@ 27 fleet . The Su @-@ 35 's automatic control of canards and the Su @-@ 37 's thrust @-@ vectoring technology were applied to the Sukhoi Su @-@ 30MKI . One of the Su @-@ 35s , T10M @-@ 10 , served as a testbed for the Saturn 117 (AL @-@ 41F1) engine intended for Russia 's upcoming PAK FA fifth @-@ generation jet fighter .

= = = Modernization = = =

In 2003 , even as Russia aimed to export the Su @-@ 27M , Sukhoi launched a project to produce a fighter to bridge the gap between upgraded variants of the Su @-@ 27 and Su @-@ 30MK , and Russia 's fifth @-@ generation Sukhoi PAK FA . The project 's aim was a second modernization of the Su @-@ 27 airframe (hence its classification as a " 4 + + generation fighter ") by incorporating

several characteristics that would be implemented on the PAK FA . Additionally , the aircraft was to be an alternative to the Su @-@ 30 family on the export market . The design phase was to take place until 2007 , when it would be available for sale . It was later reported that the programme was launched due to concerns that the PAK FA project would encounter funding shortages . The project 's in @-@ house designation is T @-@ 10BM (Bolshaya Modernizatsiya , " Big Modernization ") while the aircraft is marketed as the Su @-@ 35 .

While the aircraft maintains a strong superficial resemblance to the Su @-@ 27 , the airframe , avionics , propulsion and weapons systems of the Su @-@ 35 have been thoroughly overhauled . Technological advancements have produced more compact and lighter hardware , such as the radar , shifting the centre of gravity to the aircraft 's rear . These improvements removed the need for canards and saw the abandonment of the " tandem triplane " featured on several Su @-@ 27 derivatives . Also omitted was the Su @-@ 27 's dorsal airbrake , which was replaced by differential deflection of the vertical stabilizers . Other aerodynamic refinements include a height reduction of the vertical stabilizers , a smaller aft @-@ cockpit hump , and shorter rearward @-@ projecting " sting " .

The reinforced airframe sees extensive use of titanium alloys , increasing its durability to some 30 years or 6 @, @ 000 service hours , and raising the maximum takeoff weight to 34 @. @ 5 tonnes . Internal fuel capacity was increased by more than 20 % to 11 @. @ 5 tonnes , and could be raised to 14 @. @ 5 tonnes with the addition of drop tanks ; in @-@ flight refueling can also be used to extend missions .

Sukhoi has overhauled the avionics suite , at the heart of which is the information management system that enhances man @-@ machine interaction . The system , which has two digital computers , collects and processes data from various tactical and flight @-@ control systems and presents the relevant information to the pilot through the two main multi @-@ function displays , which , together with three secondary MFDs , form the glass cockpit . The aircraft features many other upgrades to its avionics and electronic systems , including digital fly @-@ by @-@ wire flight @-@ control system , and the pilot is equipped with a head @-@ up display and night @-@ vision goggles .

The Su @-@ 35 employs an Irbis @-@ E passive electronically scanned array radar that constitutes an essential component of the aircraft 's fire @-@ control system . The radar is capable of detecting a 3 @-@ square @-@ metre (32 sq ft) aerial target at a distance of 400 km (250 mi) , and can track 30 airborne targets and engage eight of them at the same time . Su @-@ 35S uses the N135 Irbis passive antenna array with electronic scanning radar for improved locating . The radar can also map the ground using a variety of modes , including the synthetic aperture mode . The Irbis @-@ E is complemented by an OLS @-@ 35 optoelectronic targeting system that provides laser ranging , TV , Infra @-@ red search and track (IRST) functionality . The Su @-@ 35 is compatible with a multitude of long- and short @-@ range air @-@ to @-@ air missiles , precision and unguided air @-@ to @-@ ground weaponry that include missiles , fuel @-@ air bombs and rockets . A maximum weapon payload of 8 tonnes can be carried on the fourteen hardpoints . The fighter may use missiles with a range of up to 300 km

The Su @-@ 35 is powered by a pair of izdeliye (Product) 117S (AL @-@ 41F1S) turbofan engines . Developed jointly by Sukhoi , NPO Saturn and UMPO , the engine is a heavily upgraded AL @-@ 31F variant , and draws on the design of the fifth @-@ generation PAK FA 's Saturn 117 (AL @-@ 41F1) engines . Its thrust output is estimated at 142 kN (31 @, @ 900 lbf) , 20 kN (4 @, @ 500 lbf) more than the Su @-@ 27M 's AL @-@ 31F . It has a service life of 4 @, @ 000 hours , compared to the AL @-@ 31F 's 1 @, @ 500 ; the two engines feature thrust @-@ vectoring capability . Each thrust vectoring (TVC) nozzle has its rotational axis canted at an angle , similar to the configuration on the Su @-@ 30MKI . The thrust vectoring nozzles operate in one plane for pitch , but the canting allows the aircraft to produce both roll and yaw by vectoring each engine nozzle differently . A similar thrust vectoring system is also implemented on the PAK FA .

The engine may give the Su @-@ 35 limited supercruise capability , or sustained supersonic speed without the use of afterburners . Radar @-@ absorbent material is applied to the engine inlets and the front stages of the engine compressor to halve the Su @-@ 35 's frontal radar cross @-@

section (RCS) ; the canopy was also modified to deflect radar waves .

= = = Production and flight testing = = =

Design work on the Su @-@ 35 had been completed by 2007 , paving the way for KnAAPO to construct the first prototype in the summer of 2007 . Upon completion , Su @-@ 35 @-@ 1 was ferried to the Gromov Flight Research Institute in Zhukovsky Airfield before being placed on static display at that year 's MAKS air show . At the time , Sukhoi General Designer Mikhail Pogosyan commented that the aircraft was in great demand abroad , saying Russia was negotiating with several prospective customers and that there were plans to export the aircraft starting in 2010 .

Preparations began for the aircraft 's maiden flight immediately following the air show . Particular efforts were made to debug the flight @-@ control system and test the engine . By mid @-@ February 2008 , Su @-@ 35 @-@ 1 had been rolled out to conduct taxiing tests . On 19 February , Sukhoi test pilot Sergey Bogdan took the aircraft aloft for its first flight from Zhukovsky , accompanied by an Su @-@ 30MK2 acting as a chase plane . During the 55 @-@ minute flight , the Su @-@ 35 reached a height of 5 @,@ 000 metres (16 @,@ 000 ft) , and tests were carried out on its stability , controllability and engines . The prototype was put on static display for President Vladimir Putin and Prime Minister Dmitry Medvedev the following day .

Approximately 40 flights were conducted before the second prototype took to the air on 2 October from KnAAPO 's Dzemgi Airport , again piloted by Sergey Bogdan . The Su @-@ 35 had earlier in July made its first demonstration flight in front of Defence Ministry and foreign officials . At the time , Sukhoi estimated that a total of 160 Su @-@ 35s would be supplied to customers worldwide , in particular those in Latin America , Southeast Asia and the Middle East . Domestically , the VVS Commander @-@ in @-@ Chief Colonel General Alexander Zelin stated that the service was seeking enough aircraft , estimated to be 24 ? 36 units , to equip " at least two to three regiments " .

On 26 April 2009 , the fourth Su @-@ 35 prototype was destroyed at Dzemgi Airport during a taxi run . The aircraft crashed into a barrier at the end of the runway , burned , and was written off . The pilot , Yevgeny Frolov , ejected and was taken to hospital with burns and other injuries . The aircraft was expected to be the third flying prototype , with its first flight scheduled on 24 April , which was rescheduled for 27 April . A commission was opened to investigate the crash , but several sources initially speculated that the incident had been the result of a brake failure or a faulty fuel pump .

During the 2009 MAKS air show , the Russian Defence Ministry signed a US \$ 2 @.@ 5 billion contract for 64 fighters , which consisted of a 48 @-@ aircraft launch order for the Su @-@ 35S (" Serial ") . The Russian government promised to provide Sukhoi an additional US \$ 100 million in capital , with additional financial assistance from Sberbank and Vnesheconombank , the latter of which was contracted to provide US \$ 109 million to start the production programme . The Su @-@ 35S 's estimated price was \$ 40 million each , and the 64 @-@ aircraft contract was the largest aircraft order after the collapse of the Soviet Union . All are expected to be delivered by 2015 .

In November 2009 , KnAAPO started manufacturing the first serial aircraft ; Sukhoi estimated that 24 to 30 aircraft would be produced each year from 2010 to 2020 . On 11 October 2010 , the first production Su @-@ 35S had completed general assembly ; at this point the preliminary flight test programme had logged 350 flight hours across 270 flights using the two remaining flying prototypes . Sukhoi confirmed that the aircraft had fully met all specifications and parameters , including maximum speed , height , radar detection range and manoeuvrability . The first Su @-@ 35S took its maiden flight in May 2011 .

Following preliminary tests , the Defence Ministry was expected to initiate state joint tests involving six Su @-@ 35s to further scrutinize systems such as weapons . In early 2012 , two aircraft were reportedly planned for delivery in 2011 , eight in 2012 , twelve in 2013 and 2014 , and fourteen in 2015 . In February 2014 , the Russian Air Force received 12 Su @-@ 35S aircraft . By 2014 , 34 of the 48 aircraft originally ordered had been delivered with the remaining 14 due in 2015 .

In March 2015 , it was reported that Russia and India signed an agreement to jointly develop a fifth @-@ generation upgrade to the Su @-@ 35 . A Russian industry source stated that the upgraded Su @-@ 35S will cost about US \$ 85 million each .

A contract for another 50 Su @-@ 35s was signed in August 2015 , but parent company United Aircraft Corporation (UAC) stated in January 2016 that delays in finalizing the order was due to a lack of clarity in Russia ? s 2016 federal budget , which was only signed by Russian President Vladimir Putin in mid @-@ December 2015 . The fighters will be delivered at a rate of 10 aircraft per year starting in 2016 .

= = Operational history = =

= = = Russia = = =

Three production Su @-@ 27Ms were completed and delivered to VVS in 1996 for testing . They were operated by 929th State Flight Test Center (abbreviated as GLITS in Russian) at Vladimirovka Air Base , Akhtubinsk , performing weapons trials . During one such flights , a weapon pylon , to which a bomb and rocket were attached , fell into a village in Ryazan ; nobody was hurt . In 2001 , the Air Force decided that the aerobatics team Russian Knights would receive several Su @-@ 27Ms , presumably from GLITS and Sukhoi . After pilots from the team undertook conversion course at Vladimirovka AB , the first of five aircraft was delivered to the team in July 2003 . It was expected that the Su @-@ 27Ms would enhance the flying repertoire of their new owners , but due to various reasons , they were used as a source of spare parts for other aircraft in the demonstration fleet .

In late May 2011 , Sukhoi flew the first Su @-@ 35S to the Defence Ministry 's 929th State Flight Test Centre at Akhtubinsk prior to states joint tests conducted to prepare the aircraft for operational service with the VVS . Official trials commenced in mid @-@ August with the two Su @-@ 35 prototypes , before being joined by production aircraft . As of March 2012 , four Su @-@ 35S units were involved in such tests , operating alongside the two flying prototypes . These Su @-@ 35s had by April and August 2012 , completed 500 and 650 test flights , respectively .

On 28 December 2012 , Sukhoi delivered a batch of six serial production Su @-@ 35S fighters to the VVS . Defence Ministry officials accepted the aircraft at KnAAPO 's manufacturing plant in Komsomolsk @-@ on @-@ Amur , Russia . Five of the six Su @-@ 35S delivered in December went to the Gromov Flight Research Institute , where in February 2013 an eighteen @-@ month programme began to test the Su @-@ 35 's ability to conduct highly maneuverable short @-@ range combat . The programme consists of three components , which are dogfights ; the use of weapons and the ability to evade enemy fire ; and the ability to destroy helicopters and unmanned aerial vehicles . State @-@ acceptance trials would conclude in 2015 , by which time a second 48 @-@ aircraft order is expected to have been signed with the VVS . Another 12 Su @-@ 35S fighters were delivered in 2013 .

In December 2012 , Russian officials commented that the Swifts and Russian Knights aerobatics teams would receive new aircraft to replace the Mikoyan MiG @-@ 29 and Su @-@ 27 , respectively . The Swifts was expected to receive the Su @-@ 30SM and the Russian Knights receive the Su @-@ 35 . Deputy Prime Minister Dmitry Rogozin commented the upgrade was to " show to the world not only the inimitable skill of our pilots , but also the talent of our aircraft designers ... " Russian Air Force received another 12 Su @-@ 35S fighters on 12 February 2014 to be deployed with an air regiment based in Russia ? s Far East .

In January 2016 , Russia , for the first time in combat conditions , deployed four Su @-@ 35S planes to its Khmeimim base ; on 1 February the Russian defence ministry said the aircraft had begun to participate in the Russian air operations in Syria .

= = = China = = =

Since the early 1990s , an extensive sales arrangement of the Su @-@ 35 to China has been discussed . Sukhoi officials , in 1995 , announced their proposal to co @-@ produce the Su @-@ 35 with China , contingent on Beijing 's agreement to purchase 120 aircraft . However , it was alleged

that the Russian Foreign Ministry blocked the sale of the Su @-@ 35 and Tupolev Tu @-@ 22M bombers over concerns about the arrangements for Chinese production of the Su @-@ 27 .

In 2006 , China was showing interest in the modernized Su @-@ 35 , and was negotiating with Moscow for a purchase of the fighter . At the 2007 MAKS air show , a number of Chinese delegates were seen taking photos and videos of the Su @-@ 35 prototypes . In November 2010 , Russia , through Rosoboronexport , was ready to resume talks with China on the sale of the Su @-@ 35 . China reciprocated in 2011 by presenting a proposal on the purchase of the fighter .

In March 2012 , the Russian media reported that the two countries were in final contract negotiations for 48 Su @-@ 35s ; the remaining obstacle is reportedly Moscow 's demand that Beijing guarantee proper licensing for its Su @-@ 35 production . China denied this deal because it did not want the Su @-@ 35 , but only shown slight interest in its 117S engine ; at the 2012 Zhuhai Air Show Russia approached China with its 117S engine in a failed attempt to sell Su @-@ 35 .

In late 2012 , it was reported that China wanted to purchase only 24 units , which was less than what Russia deemed to be worthwhile , thus stalling negotiations . By late 2012 , the negotiations resumed , this time involving 24 aircraft . During the next three years , negotiations would prove to be protracted , with several false reports claiming that a deal had been reached between the two countries ; for example , in March 2013 , it was reported that both sides had signed an initial agreement for 24 Su @-@ 35s and four submarines prior to Chinese President Xi Jinping 's visit to Russia . Negotiations concluded in November 2015 , when a contract for 24 fighters worth \$ 2 billion , was signed . The first aircraft will be delivered to China in 2016 . One motive for China 's purchase of the Su @-@ 35 is its thrust @-@ vectoring 117S engine ; while China has recently developed modern fighters , its engines still lag behind Russia and the West despite heavy investments by China in domestic engine programs during recent years to catch up . According to Russian National Defense magazine , China will not order additional Su @-@ 35s but will instead focus on its domestic fighter programs especially its fifth generation fighters .

= = = Potential operators = = =

In May 2006 , it was reported that Venezuela planned to purchase dozens of Su @-@ 30 and Su @-@ 35 fighters , and as many as 100 T @-@ 90 tanks . There were unconfirmed reports in October 2008 that the Venezuela government had ordered 24 Su @-@ 35s for the Venezuelan Air Force . In July 2012 , Venezuelan President Hugo Chávez repeated his interest in acquiring the Su @-@ 35 fighters .

In January 2015 , North Korea has expressed interest in the fighter . But due to the international sanctions imposed on North Korea the delivery of fighters is unlikely in the near future .

Also in September 2015 , Indonesia 's Ministry of Defence selected the Su @-@ 35 to replace the Indonesian Air Force 's aging F @-@ 5E Tiger II fleet . Indonesian Air Force intends to initially buy 8 Su @-@ 35S fighters from Russia .

Vietnam and Algeria are also interested in this aircraft . In February 2015 , one of the Su @-@ 35 was tested at Tamanrasset Airport in Algeria . According to " Kommersant " , the Algerian military were satisfied with the fighter 's flight characteristics and now Moscow is waiting for a formal application . It is expected that the first phase will focus on the acquisition of at least 12 aircraft .

Negotiations have begun with Egypt on the sale of Su @-@ 35 fighters , according to leaked information from Russia 's military @-@ industrial complex .

= = = Failed bids = = =

= = = = Brazil = = = =

In 2001 , Brazil under President Fernando Henrique Cardoso announced the F @-@ X tender to procure a replacement for its aging aircraft including the Dassault Mirage IIID / E and Northrop F @-@ 5 . Sukhoi partnered with Avibras to submit the Su @-@ 27M for the US \$ 700 million tender

that would see at least twelve aircraft delivered to the Brazilian Air Force . Other contenders were the Mirage 2000 , F @-@ 16 , MiG @-@ 29 , and JAS Gripen . Any contract would have been accompanied by an offset agreement that would see the winning bidder provide input to Brazil 's aviation industry . Had the Su @-@ 35 won , Russia would have purchased 50 Embraer airliners for use by Aeroflot . The Su @-@ 35 and Mirage 2000 were the front @-@ runners to the program , but the former was favoured for its superior flight characteristics . According to the Centre for Analysis of Strategies and Technologies , the Su @-@ 35 would have been the first heavy supersonic fighter to be delivered to Latin America . The tender was suspended for much of 2003 as the newly elected President Luiz Inácio Lula da Silva focused more on social welfare . The tender was again suspended in 2005 , pending the availability of new fighters .

In 2007 , Russia submitted the modernized Su @-@ 35 for Brazil 's relaunched F @-@ X2 competition . The tender this time attracted the participation of the Boeing F / A @-@ 18E / F Super Hornet , Lockheed Martin F @-@ 16BR , Saab JAS Gripen NG , Dassault Rafale , and Eurofighter Typhoon . Brazil was looking to purchase at least 36 , and up to 120 , aircraft to replace Northrop F @-@ 5BRs , Alenia / Embraer A @-@ 1Ms , and Dassault Mirage IIIs . In October 2008 , the Brazilian Air Force selected the Boeing F / A @-@ 18E / F Super Hornet , Dassault Rafale , and Saab Gripen NG as the three finalists . In October 2009 , Rosoboronexport declared that Russia would provide 120 Su @-@ 35s and full technology transfer to Brazil . The Su @-@ 35 was expected re @-@ enter the tender after Brazilian President Dilma Rousseff postponed the programme in January 2011 due to fiscal concerns . In December 2013 , the Brazilian government selected the Gripen NG for procurement .

= = = = Others = = = =

At the 1996 Seoul Air Show , Russia submitted the Su @-@ 35 (Su @-@ 27M) and Su @-@ 37 for South Korea 's F @-@ X procurement programme , a 40 @-@ aircraft requirement to replace the Republic of Korea Air Force 's F @-@ 4D / Es , RF @-@ 4Cs , and F @-@ 5E / Fs . The Su @-@ 35 competed against the Dassault Rafale , Eurofighter Typhoon , and F @-@ 15K Slam Eagle . The proposed Su @-@ 35 featured a phased grid radar and AL @-@ 31FP vectoring @-@ thrust engines ; final assembly would have taken place in South Korea , the offer included a full technology transfer . The US \$ 5 billion contract may have been partially financed through a debt @-@ reduction deal on money Russia owed to South Korea . The Su @-@ 35 was reportedly the cheapest aircraft to purchase and maintain , however it was eliminated early in the bidding process , along with the Typhoon . The F @-@ 15K , viewed as the competition 's front @-@ runner due to South Korea 's ties with the United States , was chosen in 2002 . Reports have claimed that , had South Korea not chosen the F @-@ 15K , the United States would have refused to integrate American weapons on the selected aircraft .

In 2002 , Sukhoi offered Su @-@ 30 family aircraft to Australia , including the Su @-@ 35 . However Australia opted for the F @-@ 35 to replace the F @-@ 111 and F / A @-@ 18 . Russia has offered the Su @-@ 35 to India , Malaysia , Algeria and Greece ; no firm contracts have materialised , with the first three countries having been occupied with other fighter projects and unlikely to procure the modernized Su @-@ 35 . In 2010 , Libya was expected to sign a contract for twelve Su @-@ 35s as part of a bigger military transaction that would have included S @-@ 300PMU @-@ 2 surface @-@ to @-@ air missiles , Kilo @-@ class submarines , and T @-@ 90 tanks . The civil war in Libya and the resulting military intervention caused Rosoboronexport to miss out on US \$ 4 billion in arranged contracts as they were never signed .

= = Variants = =

Su @-@ 27M / Su @-@ 35

Single @-@ seat fighter .

Su @-@ 35UB

Two @-@ seat trainer . Features taller vertical stabilizers and a forward fuselage similar to the Su

@-@ 30 .

Su @-@ 35BM

Single @-@ seat fighter with upgraded avionics and various modifications to the airframe . Su @-@ 35BM is informal name .

Su @-@ 37

Thrust @-@ vectoring demonstrator .

Su @-@ 35S

Designation of production Su @-@ 35BM version for the Russian Air Force .

= = Operators = =

Russia

Russian Air Force ? 48 Su @-@ 35S fighters in inventory as of March 2016 plus another 50 ordered in January 2016.Dzemgi Airport - 24

Centralnaya Uglovaya - 11

Lipetsk Air Base - 6

Akhtubinsk - 6

KnAAPO - 1 on hold

China

People 's Liberation Army Air Force ? 24 Su @-@ 35S fighters ordered in 2015 .

= = Specifications (Su @-@ 35S) = =

Data from KnAAPO , Su @-@ 27 books , Jane 's AWA

General characteristics

Crew : 1

Length : 21 @. @ 9 m (72 @. @ 9 ft)

Wingspan : 15 @. @ 3 m (50 @. @ 2 ft , with wingtip pods)

Height : 5 @. @ 90 m (19 @. @ 4 ft)

Wing area : 62 @. @ 0 m ² (667 ft ²)

Empty weight : 18 @, @ 400 kg (40 @, @ 570 lb)

Loaded weight : 25 @, @ 300 kg (56 @, @ 660 lb) at 50 % internal fuel

Max. takeoff weight : 34 @, @ 500 kg (76 @, @ 060 lb)

Powerplant : 2 × Saturn 117S (AL @-@ 41F1S) afterburning turbofan with 3D thrust vectoring nozzle

Dry thrust : 8 @, @ 800 kgf (86 @. @ 3 kN , 19 @, @ 400 lbf) each

Thrust with afterburner : 14 @, @ 500 kgf (142 kN , 31 @, @ 900 lbf) each

Fuel capacity : 11 @, @ 500 kg (25 @, @ 400 lb) internally

Performance

Maximum speed : At altitude : Mach 2 @. @ 25 (2 @, @ 390 km / h , 1 @, @ 490 mph)

At sea level : Mach 1 @. @ 15 (1 @, @ 400 km / h , 870 mph)

Range : At altitude : 3 @, @ 600 km (1 @, @ 940 nmi)

At sea level : 1 @, @ 580 km (850 nmi)

Ferry range : 4 @, @ 500 km (2 @, @ 430 nmi) with 2 external fuel tanks

Service ceiling : 18 @, @ 000 m (59 @, @ 100 ft)

Rate of climb : > 280 m / s (> 55 @, @ 000 ft / min)

Wing loading : 408 kg / m ² (500 @. @ 8 kg / m ² with full internal fuel) (84 @. @ 9 lb / ft ² 50 % fuel)

Thrust / weight : 1 @. @ 13 at 50 % fuel (0 @. @ 92 with full internal fuel)

Maximum g @-@ load : + 9 g

Armament

Guns : 1 × 30 mm GSh @-@ 301 internal cannon with 150 rounds

Hardpoints : 12 hardpoints , consisting of 2 wingtip rails , and 10 wing and fuselage stations with a

capacity of 8 @, @ 000 kg (17 @, @ 630 lb) of ordnance and provisions to carry combinations of :

Rockets : S @-@ 25L laser @-@ guided rocket

S @-@ 25 unguided rocket

B @-@ 8 unguided S @-@ 8 rocket pods

B @-@ 13 unguided S @-@ 13 rocket pods

Missiles : Vypel R @-@ 73E / M , and R @-@ 74M

Vypel R @-@ 27R / ER / T / ET

Vypel R @-@ 77 ? the proposed R @-@ 77M , R @-@ 77T , K @-@ 77M

Vypel R @-@ 37M

Kh @-@ 29T / L

Kh @-@ 31P / A

Kh @-@ 59ME

Bombs : KAB @-@ 500L laser @-@ guided bomb

KAB @-@ 1500L laser @-@ guided bomb

FAB @-@ 250 250 @-@ kilogram (550 lb) unguided bombs

FAB @-@ 500 500 @-@ kilogram (1 @, @ 100 lb) unguided bombs

Other : buddy refueling pod

Avionics

Irbis @-@ E passive phased array radar

OLS @-@ 35 infra @-@ red search and track system

L265 Khibiny @-@ M electronic warfare pod