

# Sukhoi Flanker

**Definition:** The Sukhoi Su-27, Su-30, Su-33, Su-34 and Su-35 are variants of a fourth-generation, Russian twin-engine fighter bearing the NATO codename "Flanker." They are built by the Sukhoi Design Bureau.

**Select Variants and Features:** The original Su-27S, aka "Flanker-B" ("Flanker-A" refers to the pre-production test version), was designed as an air-superiority fighter to counter the U.S. F-15. The aircraft achieved IOC in 1985 and stands apart from other fourth-generation fighters for its power, maneuverability and range. Its two AL-41F turbofans generate a high thrust-to-weight ratio, allowing the aircraft to set multiple climbing records previously held by the F-15.

A two-seat, combat-capable trainer was developed under the designation Su-27UB ("Flanker-C"). Both the single-seat and two-seat versions have been exported, as the Su-27SK and Su-27UBK, respectively.

In 2004, the Russian air force introduced the Su-27SM, the result of a mid-life update program that was intended to bring

for two 528-gal. drop tanks, an inflight-refueling probe and buddy-refueling capability. New NPO Saturn 117S engines provide 16% greater thrust, which permit supersonic flight without afterburners, in addition to 3-D vectoring nozzles for increased agility and longer times between repairs and overhauls. The radar is a Tikhomirov NIIP Irbis-E with a passive-phased array and a claimed detection range of 3m2 RCS targets at 400 km (240 mi.).

**Production and Delivery:** It is estimated that that the Soviet Union produced 600 Su-27S and 140 Su-27UB aircraft for its air force, some of which transferred to the newly independent republics after the dissolution of the USSR in 1991. In 1993, Sukhoi began deliveries of 24 Su-33Ks to the Russian navy, completing the production run in August 1994. In 2002, Russia began upgrading at least 48 of its Su-27S aircraft to Su-27SMs in two batches: Sukhoi delivered 24 between 2004 and 2006, and another 24 between 2007 and 2009.

At the Moscow airshow on August 18, 2009, Russia signed contracts for 12 Su-27SM3, four Su-30M2 and 48 Su-35S aircraft. The 12 Su-27SM3s were delivered in 2011, and the four Su-30M2s delivered in 2010. The first batch of six Su-35S aircraft were delivered in December 2012; 34 have been delivered since then, with the remaining 14 due in 2015.

A total of 72 Su-30SM aircraft also are under contract. Thirty were ordered for the air force on March 23, 2012, with deliveries beginning in November 2012 and due to conclude in 2015. Another 30 of the type were ordered on Dec. 19, 2012, with deliveries scheduled to be completed in 2016. In addition, at the end of 2013, the Russian defense ministry ordered five Su-30SMs for the country's navy, three of which were delivered in July 2014. In October 2014, the ministry ordered another seven aircraft for the Russian navy.

At least four former Soviet Republics inherited Su-27s from the Soviet Union: Kazakhstan (~32), Belarus (~22), Ukraine (~66) and Uzbekistan (~30). Two Flankers inherited by Belarus were transferred to the U.S. in 1995, presumably to support adversary training; the rest were retired from service in 2012.

Ten other countries have imported versions of the Flanker: China, Vietnam, India, Angola, Ethiopia, Eritrea, Indonesia, Algeria, Venezuela and Uganda.

—Dan Katz



Su-35 Photo: Sukhoi

existing aircraft to a "generation 4+" standard. At the end of 2014, the air force introduced another variant in the Su-27 series, known as the Su-27SM3.

The Su-30 is a series of two-seat multi-role fighters adapted from the Su-27UBK. It was designed for the export market and evolved into two branches. The first branch began with the export variant for China, the SU-30MKK ("Flanker-G"), which is manufactured in Russia by the Komsomolsk-on-Amur Aircraft Production Association (KnaAPO) and first flew in 1999. The other branch of the Su-30 family stems from the export version for India, the Su-30MKI ("Flanker-H"), which is manufactured in Russia by the Irkut Corp. It was first delivered in 2002 and has been exported to the country in at least five configurations.

The Su-35S—previously referred to as the Su-27M, Su-27SM2 and Su-35BM—is the newest and most-advanced variant of the Flanker family. Sukhoi refers to this mid-life upgrade of the Su-27 as a "generation 4++" aircraft, a half-step between the Su-30 and fifth-generation T-50 PAK FA. Range is increased with 20% more internal-fuel capacity, provision

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## Specifications: Sukhoi Flanker

Designation:	Su-27S/SK, Su-27UB/UBK, Su-27SM/SMK/SM3	Su-30MKI/MKK/MKM/M2/MK2/SM	Su-34 (aka Su-27IB, Su-32)	Su-35S (aka Su-27M, Su-27SM2, Su-35BM)
Name:	Flanker-B/C	Flanker-F (MK), Flanker-G (MKM), Flanker-H (MKK)	Fullback	Flanker-E
Manufacturer:	Sukhoi	Sukhoi	Sukhoi	Sukhoi
Category/Type:	S/SK: Air Superiority Fighter SM/SMK/SM3: Multirole fighter	Multirole Fighter	Strike Fighter	Multirole Fighter
Crew:	S/SK/SM/SMK/SM3: 1 UB/UBK: 2	2	2	1
IOC:	1985 (S), 2004 (SM), SM3 (2011)	1997 (MK), 2004 (MKI), 2011 (M2), 2013 (SM)	2014	2014
<b>Dimensions and Weights</b>				
Length:	71 ft. 10 in. (21.9 m)	71 ft. 10 in. (21.9 m)	76 ft. 7 in. (23.3 m)	71 ft. 10 in. (21.9 m)
Wingspan:	48 ft. 3 in. (14.7 m)	48 ft. 3 in. (14.7 m)	48 ft. 3 in. (14.7 m)	50 ft. 2 in. (15.3 m) including wingtip ECM pods
Height:	S/SK/SMK: 19 ft. 4 in. (5.9 m) UB: 20 ft. 10 in. (6.4 m)	20 ft. 10 in. (6.4 m)	21 ft. 4 in. (6.5 m)	19 ft. 4 in. (5.9 m)
Wing Area:	667.4 ft <sup>2</sup> (62 m <sup>2</sup> )	MKK/MKM/M2: 667.4 ft <sup>2</sup> (62 m <sup>2</sup> ) MKI/SM: ~ 699.7 ft. <sup>2</sup> (65 m <sup>2</sup> ) <sup>2</sup>	667.4 ft <sup>2</sup> (62 m <sup>2</sup> )	667.4 ft <sup>2</sup> (62 m <sup>2</sup> )
Aspect Ratio:	3.5	MKK/MKM/M2: 3.5	3.5	3.5
Weight (empty)	S/SK: 36,100 lb. (16,380 kg) UB/UBK: 38,600 lb. (17,500 kg)	39,000 lb. (17,700 kg)	49,600 lb. (22,500 kg)	37,500 lb. (17,000 kg)
Weight (max take-off)	S/SK: 67,000 lb. (30,450 kg) later SK/UB/UBK: 72,700 (33,000 kg)	75,900 lb. (34,500 kg)	97,800 lb. (44,350 kg)	76,100 lb. (34,500 kg)
Fuel Capacity (Internal):	S/SK: 3,110 ga. - 20,700 lb. (9,400 kg)	21,200 lb. (9,640 kg)	26,700 lb. (12,100 kg.)	3,790 ga. - 25,400 lb. (11,500 kg)
Fuel Capacity (External)	S/SK: None SM/SMK: 2 x PTB-2000 (528-gal) drop tanks - 7,080 lb. (3,200 kg)		3 x PTB-3000 (806-gal) drop tanks - 15,900 lb. (7,200 kg) total	2 x PTB-2000 (528-gal) external drop tanks - 7,060 lb. (3,200 kg)
Fuel Capacity (Max Total)	S/SK: 3,110 ga. - 20,700 lb. (9,400 kg)	21,200 lb. (9,640 kg)	42,550 lb. (19,340 kg.)	4,850 ga. - 32,400 lb. (14,700kg.)
<b>Performance</b>				
Engine(s):	2 x A.M Lyulka AL-31Fs SM3: 2 x A.M Lyulka AL-31F-M1s	2 x A.M Lyulka AL-31Fs or FPs (later indicated thrust-vectoring) 2 x Saturn/Lyulka AL-35Fs	2 x Salyut AL-31F-M1s	2 x NPO Saturn 117S
Thrust:	55,000 lb. (25,000 kg) combined 33,950 lb. (15,340 kg) without afterburner SM(3): 59,400 lb. (27,000 kg) combined	55,000 lb. (25,000 kg) combined 33,750 lb. (15,340 kg) without afterburner	59,760 lb. (27,055 kg) combined	63,800 lb. (29,000 kg) combined 38,700 lb. (17,600 kg) without afterburner
Max Speed:	S/SK/UB/UBK: Mach 2.35 (1,550mph / 2,500 km/h) SM/SMK: Mach 2.17 (1,429 mph / 2,300 km/h)	Mach 2; Mach 1.9 with canards	Mach 1.8 (1,180 mph / 1,900 km/h)	Mach 2.25 (1,485 mph / 2,390 km/h)
Service Ceiling:	60,700 ft. (18.5 km) SM/SMK: 4,170 ga. - 28,000 lbs. (12,600 kg)	56,800 ft. (17,300 m)	49,200 ft. (15 km)	56,400 ft. (18,000 m)
Range:	S/SK: 2,285 mi. (3,680 km) UB: 1,865 mi. (3,000 km) SMK: 2,355 mi. (3,790 km)	1,865 mi. (3,000 km)	2,500 mi. (4,000 km)	2,200 mi. (3,600 km)
Ferry Range:	SMK only: 2,730 mi. (4,390 km)		2,800 mi. (4,480 km)	2,800 mi. (4,500 km) with two drop tanks
Combat Radius:	S/SK/UB/UBK: 930 mi. (1,500 km) SMK: 970 mi. (1,560 km)		600 mi.+ (1,000 km+) with 24,000 lb. payload	

Source: Aviation Week Intelligence Network

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prepared by Dan Katz

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G-limit	9	9	9	9
<b>Weapons</b>				
Cannon:	Gryazev/Shipunov 9A-4071K GSh-301 30mm cannon in starboard wingroot with 150 rounds	Gryazev/Shipunov 9A-4071K GSh-301 30mm cannon in starboard wingroot with 150 rounds	Gryazev/Shipunov 9A-4071K GSh-301 30mm cannon in starboard wingroot with 150 rounds	Gryazev/Shipunov 9A-4071K GSh-301 30mm cannon in starboard wingroot with 150 rounds
Hardpoints:	10 (2 in tandem at centerline, 1 under each engine, 1 under each wing for heavy stores and 1 under each wing and one at each wingtip for SRAAMs)	12 (2 in tandem at centerline, 1 under each engine, 2 under each wing for heavy stores and 1 under each wing and one at each wingtip for SRAAMs)	12 (2 in tandem at centerline, 1 under each engine, 2 under each wing for heavy stores and 1 under each wing and one at each wingtip for SRAAMs)	12 (2 in tandem at centerline, 1 under each engine, 2 under each wing for heavy stores and 1 under each wing and one at each wingtip for SRAAMs)
	SM/SMK: 12 (2 in tandem at centerline, 1 under each engine, 2 under each wing for heavy stores and 1 under each wing and one at each wingtip for SRAAMs)			
Max Stores:	S: 9,770 lb. (4,430 kg)	17,600 lb. (8,000 kg)	26,456 lb. (12,000 kg)	17,600 lb. (8,000 kg)
	SK: 13,700 lb., (6,200 kg)			
	SMK: 17,600 lb. (8,000 kg)			
Weapons Compatibility:	R-60 (AA-8 "Aphid"), R-27R1/ER1 (AA-10A/C "Alamo"), R-73E (AA-11 "Archer") IR-guided SRAAMs	R-27ER1 (AA-10C), R-73E (AA-11) IR-guided SRAAMs	R-27R1/ER1 (AA-10A/C "Alamo" - IR homing), R-73E (AA-11 "Archer")	R-27R1/ER1 (AA-10A/C), R-73E (AA-11)
				LGB-250 laser-guided bomb
	RBK-500 cluster bombs	RBK-500 SPBE-D (sensor-fuzed anti-armor cluster bomb)	RBK-500 SPBE-D (sensor-fuzed anti-armor cluster bomb)	RBK-500 SPBE-D (sensor-fuzed anti-armor cluster bomb)
				S-25LD 340mm laser-guided rocket
	SMK: KH-29L/T (AS-14 "Kedge") laser/TV-guided missiles	Kh-29TE (L/T) [AS-14 "Kedge"] laser/TV-guided missiles	Kh-29TE (L/T) (AS-14 "Kedge"); laser/TV-guided missiles	Kh-29TE (L/T) (AS-14 "Kedge"); laser/TV-guided missiles
		Kh-59ME (AS-18 "Kazoo") stand-off land attack missiles	Kh-59ME (AS-18 "Kazoo") stand-off land attack missiles	Kh-59ME (AS-18 "Kazoo") stand-off land attack missiles
	SMK: Kh-31P (AS-17 "Krypton") anti-radiation	Kh-31P (AS-17 "Krypton") anti-radiation missile	Kh-31P (AS-17 "Krypton") anti-radiation missile	KH-58UShe (AS-11), Kh-31P (AS-17), R-27EP (AA-10F) anti-radiation missiles
	SMK: KH-31A anti-ship missiles	Kh-31A anti-ship missiles	Kh-31A anti-ship missiles	KH-31A, Kh-35U anti-ship missiles and Kh-59MK (AS-18 "Kazoo") anti-ship cruise missiles
		SM, MKI "Super-30": Brahmos/Onyx		
Typical Armament:	2xAA-10A, 2xAA-10B, 2xAA-10C/D, 4xAA-11			6 x BVRAAM, 4 x SRAAM
<b>Avionics</b>				
Radar:	Phazotron N001 Myech ('Slot Back')	MKI: Phazotron Zhuk-27, later NIIP N011M Mk. 3	Leninets B004	Tikhomirov NIIP Irbis-E
	SK: later upgraded to N1001VE	MKK: Phazotron N001VE		
	SM: NIIP RLPK-27V (N001V)	M2: N001V		
		SM: N011M Bars-R		
Radar Warning Receiver:	SPO-15LM Beryoza	Pastel RWR with APK-9 datalink		
	SM: L-150	MKM:L-150-30 pastel		
Electronic Countermeasures	Gardeniya	MKI: Israeli System	TsNIRTI electronic warfare system	
	SM: L175 Khibiny-M	MKM: SAP518M		
	Sorbtsya-S ECM pod			
Chafe/Flare Dispensers:	Three banks of APP-50 chaff/flare dispensers in tailcone			
Other Avionics:	OLS-27 Infrared Search and Track System	MKI: Rear-facing Radar, UOMZ OLS-30I Infrared Search and Track System (IRST), Sura-M Helmet Sight, Rafael Litening Pod	Rear-facing Radar	Wide angle HUD
	SM: OLS-27M IRST	Anti-Radar Missile Guidance pods	Urals Optical and Mechanical Plant (UOMZ) EO targeting system	OLS-35 IRST
		MKM: UOMZ OLS-30I Infrared Search and Track System (IRST), Sura-M Helmet Mounted Site	Geofizika FLIR	Sapsan laser designator pod

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		MKK: ILS-31 HUD, A737 GPS		
		MKK2: M400 reconnaissance pod, UOMZ Sapsan-E EO/laser targeting pod		
		MKM: MAW-300 missile approach warners, LWS-310 laser warners, Thales wide-angle HUD, LDP Damocles Thermal imaging pod, Sagem sigma 95 nav system.		
Cost				
Unit cost:		MKI: \$28M flyaway in 1998 based on \$20M flyaway plus \$8M each for indigenous electronics integration for Indian Aircraft purchased in 1998	\$36M in 2008	~\$65M
		MKK: \$37.5M gross in 2000 based on Chinese deal for 40 aircraft at \$1.5B		
		MKA: \$42.9M gross in 2006 (based on 28 aircraft for \$1.2B)		
		MK2: \$35-37M in 2013		

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