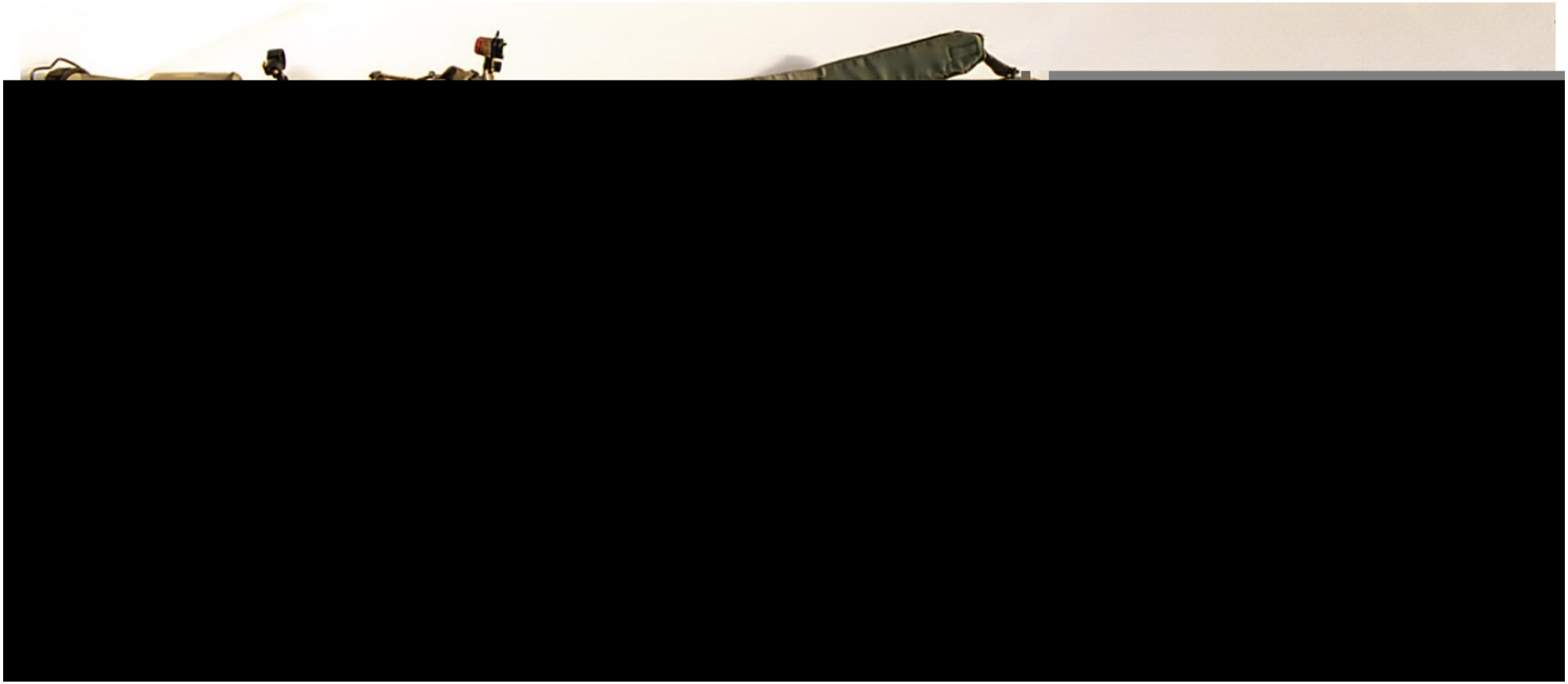
IGLA 9K38 / SA-18 / GROUSE
SURFACE-TO-AIR MISSILE



What is it

It is a anti-aircraft missile, from the surface-to-air missile family known as the SAM’S

It has an infra-red seeker and guidance system, which gives it the capability to lock onto the infra-red light waves given off by the engines on air craft.

Specifications

Also referred to as MANPADS (man portable air defense systems)

Place of origin	Soviet Union
Service history	1983 – present
Unit cost	$60,000 to $80,000 from original supplier (KBM), much cheaper on black market
Weight	10.8kg
Length	1.574m
Diameter	72mm
Warhead	1.17 kg (2.6 lb) with 390 g (14 oz) explosive
Engine	solid fuel rocket motor
Operational range	5.2 km (3.2 mi)
Flight ceiling	3.5 km (11,000 ft)
Speed	800 m/s (peak), about Mach 2.3
Guidance system	two color infrared

Why is it different from the previous designs

The development of the Igla short-range man-portable air defense system (MANPADS) began in the Kolomna OKB in 1972. Contrary to what is commonly reported, the Igla is not an improved version of the earlier Strela family (Strela-2/SA-7 and Strela-3/SA-14), but an all new project. The main goals were to create a missile with better resistance to countermeasures and wider engagement envelope than the earlier Strela series MANPADS systems.

Igla-1

The 9K310 Igla-1 system and its 9M313 missile were accepted into service in the Soviet army on 11 March 1981. The main differences from the Strela-3 included an optional Identification Friend or Foe system to prevent firing on friendly aircraft, an automatic lead and super elevation to simplify shooting and reduce minimum firing range, a slightly larger rocket, reduced drag and better guidance system extend maximum range and improve performance against fast and maneuverable targets, an improved lethality on target achieved by a combination of delayed impact fuzing, terminal maneuver to hit the fuselage rather than jet nozzle, an additional charge to set off the remaining rocket fuel (if any) on impact, an improved resistance to infrared countermeasures (both decoy flares and ALQ-144 series jamming emitters), and slightly improved seeker sensitivity.

On the top a SA-18 (Igla) missile, launch tube and grip stick. Below is a SA-16 (Igla-1) missile and launch tube.

According to the manufacturer, South African tests have shown the Igla's superiority over the contemporary (1982 service entry) but smaller and lighter American FIM-92A Stinger missile. However, other tests in Croatia did not support[1] any clear superiority, but effectively equal seeker performance and only marginally shorter time of flight and longer range for the Igla.

According to Kolomna OKB, the Igla-1 has a P_k (probability of kill) of 0.30 to 0.48 against unprotected targets which is reduced to 0.24 in the presence of decoy flares and jamming. In another report the manufacturer claimed a P_k of 0.59 against an approaching and 0.44 against receding F-4 Phantom II fighter not employing infrared countermeasures or evasive maneuvers.

Igla

A soldier with an Igla-1 launcher

The full-capability 9K38 Igla with its 9M39 missile was finally accepted into service in the Soviet Army in 1983. The main improvements over the Igla-1 included much improved resistance against flares and jamming, a more sensitive seeker, expanding forward-hemisphere engagement capability to include straight-approaching fighters (all-aspect capability) under favorable circumstances, a slightly longer range, a higher-impulse, shorter-burning rocket with higher peak velocity (but approximately same time of flight to maximum range), and a propellant that performs as high explosive when detonated by the warhead's secondary charge on impact.

Tests in Finland have shown that in comparison with the French Mistral, the 9K38 Igla has inferior range and seeker sensitivity and smaller warhead, but it has a superior resistance to countermeasures.

The naval variant of 9K38 Igla has the NATO reporting name SA-N-10 Grouse.

Advantages summarized

- More improved resistance to flares and jamming
- More sensitive seeker
- Ability to engage target head on under favorable conditions
- Longer range
- Higher speed

- Exploding propellant on impact

History on the battlefield

Iraq

The most notable combat use of the SA-16 was during the Gulf War. On January 17, 1991, a Panavia Tornado bomber of the Royal Air Force was shot down by an Iraqi SA-16 MANPADS after an unsuccessful bombing mission

Bosnia

During Operation Deliberate Force in 1995, one French Mirage 2000 was lost over Bosnia to a 9K38 Igla fired by air defense units of the Army of Republika Srpska.

Chechnya

As was seen in the khattab video, where emir khattab shot down a Russian helicopter, the model used was the SA-16 IGLA-1.

Other variants of the IGLA type SAM'S

al variants of the Igla were developed for specific applications:

Igla-1E	-Export version.
Igla-1M	-Improved version of 9K38 Igla. Entered service in Soviet Military during late 1980s.
Igla-1D	-A version for paratroopers and special forces with separate launch tube and missile.
Igla-1V	-Air-launched version, mainly for combat helicopters.
Igla-1N	-A version with heavier warhead at the cost of a slight reduction in range and speed.
Igla-1A	-Export version?
Igla-S	-The newest variant, which is a substantially improved variant with longer range, more sensitive seeker, improved resistance to latest countermeasures, and a heavier warhead.

Comparison chart to other MANPADS

	9K34 Strela-3	9K38 Igla	9K310 Igla-1	FIM-92A Stinger
Service entry	1974	1983	1981	1982
Weight, full system, ready to shoot	16.0 kg (35 lb)	17.9 kg (39 lb)	17.9 kg (39 lb)	14.3 kg (32 lb)
Weight, missile	10.3 kg (23 lb)	10.8 kg (24 lb)	10.8 kg (24 lb)	10.1 kg (22 lb)
Weight, warhead	1.17 kg (2.6 lb), 390 g (14 oz) HMX	1.17 kg (2.6 lb), 390 g (14 oz) HMX	1.17 kg (2.6 lb), 390 g (14 oz) HMX	2–3 kg (4.4–6.6 lb), 450 grams (16 oz) HE
Warhead type	Directed-energy blast fragmentation	Directed-energy blast fragmentation	Directed-energy blast fragmentation	Annular blast fragmentation
Fuze type	Impact and grazing fuze.	Delayed impact, magnetic and grazing.	Delayed impact, magnetic and grazing.	Delayed impact.
Flight speed, average / peak	470 m/s (1,100 mph) sustained	600 m/s (1,300 mph) / 800 m/s (1,800 mph)	570 m/s (1,300 mph) sustained (in +15°C temperature)	700 m/s (1,600 mph) / 750 m/s (1,700 mph)
Maximum range	4,100 m (13,500 ft)	5,200 m (17,100 ft)	5,000 m (16,000 ft)	4,500–4,800 m (14,800–15,700 ft)
Maximum target speed, receding	260 m/s (580 mph)	360 m/s (810 mph)	360 m/s (810 mph)	?
Maximum target speed, approaching	310 m/s (690 mph)	320 m/s (720 mph)	320 m/s (720 mph)	?
Seeker head type	Nitrogen-cooled, lead sulfide (PbS)	Nitrogen-cooled, Indium antimonide (InSb) and un-cooled lead sulfide (PbS)	Nitrogen-cooled, Indium antimonide (InSb)	Argon-cooled, Indium antimonide (InSb)
Seeker scanning	FM-modulated	FM-modulated	FM-modulated	FM-modulated
Seeker notes		Aerospike to reduce supersonic wave drag	Tripod-mounted nosecone to reduce supersonic wave drag	