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Combat, combat-trainer and trainer aircraft

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ROSOBORONEXPORT
Russian Defence Export

Contents

Combat, combat-trainer and trainer aircraft

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

THE MOST POWERFUL 4TH++ GENERATION AIRCRAFT SYSTEM WITH THE ELEMENTS OF THE 5TH GENERATION

Su-35 Multirole supermaneuverable one-seat fighter is designed to engage air, ground threats and to counteract naval surface forces of an enemy as well as to destruct ground infrastructure objects that are covered by ADMS means and located far from the aircraft's home airfield.

Su-35 is intended for fulfilling of the following tasks:

- Gaining air superiority.
- Covering friendly forces and installations from hostile air reconnaissance and air attacks.
- Escorting of strike aircraft all the way behind the enemy lines.
- Disruption of air traffic.
- Air support of land forces.
- Air interdiction.
- Destruction of enemy command and control system elements.
- Patrolling in the threat corridors.
- Control of aviation forces and target designation for ground and air command and control posts.

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

ADVANTAGES

- High combat power and mission flexibility with a capability of air support of combat units on the ground and on the sea, in defense and in attack.
- Long-term control of prolonged air, ground and surface areas, located far from base airfields, timely detection and engagement of enemy objects under the conditions of counter fire and electronic countermeasures.
- The latest complex of airborne electronic equipment, including an airborne radar control system with an airborne radar, which has unique characteristics in terms of the detection range of air, ground (surface) targets, the number of simultaneously tracked and fired on air and ground (surface) targets.
- Modern information and control field with colored multifunctional indicators and push-button frames (“glass cockpit”).
- Modern navigation and radio communication equipment providing group actions of fighters.
- A wide range of aviation weapons, including new types of short, medium, long-range air-to-air guided missiles and air-to-surface guided missiles, including long-range missiles.
- New highly effective electronic countermeasures system to ensure high survivability in the face of enemy fire resistance.

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

FLIGHT SPECIFICATIONS

SU-35 CHARACTERISTICS	
Normal takeoff weight, kg	25,300
Max. takeoff weight (MTOW), kg	34,500
Max. speed (H=11,000 m), Mach number	2.25
Service ceiling, m	18,000
Fuel load in internal fuel tanks, kg	11,200
Engine thrust (special mode), kg	14,500
Max. flight range with main fuel tanks at altitude, km	3,600
Maximum climb rate, m/s	280
Max. weight of combat payload, kg	8,000
Number of hardpoints	12
Maximum g limit	9.0

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

ARMAMENT COMPLEX

The Su-35 has a powerful striking and defensive armament for engaging air, ground and surface targets due to high engagement range, high accuracy of en-route flight and target approach.

It can apply guided and unguided weapons including unique long-range RVV-BD missiles as well as RVV-SD, RVV-AE medium range and RVV-MD short range air-to-air missiles, that use fire-and-forget principle, antiship and antiradar missiles, high-precision 500 and 1500 kg caliber guided bombs that can be mounted on 12 hardpoints.

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

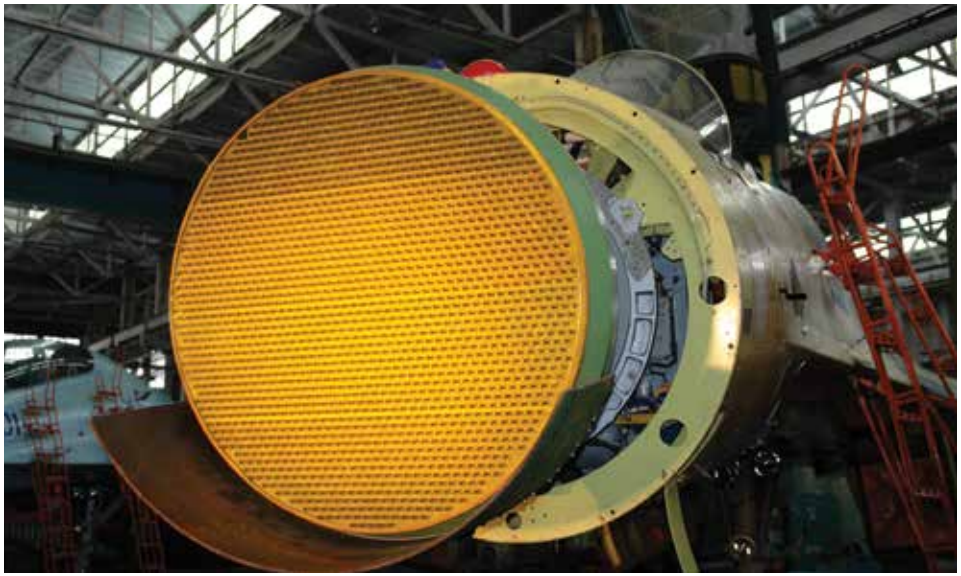
MODERN INFORMATION AND CONTROL FIELD

Su-35 aircraft is equipped with the intellectual support of the pilot along with the new cabin's large 15" high-resolution (1400 x 1050) displays which provide full information about tactical environment, flight modes, air and ground threats.

Information from the aircraft systems can be shown on any of the MFDs. Large size of the MFD can facilitate detection and acquisition of the targets through the optical channel, it can ensure comfortable operation of the ground map.

What is more, the HUD provides pilot with targeting data for air weapons application. HOTAS controls concept when you can operate the aircraft without taking hands off the aircraft and engine controls is applied here.

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

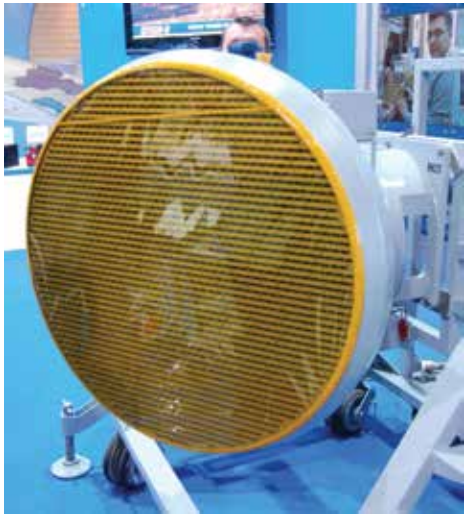


MODERN AIRBORNE RADIO ELECTRONIC EQUIPMENT

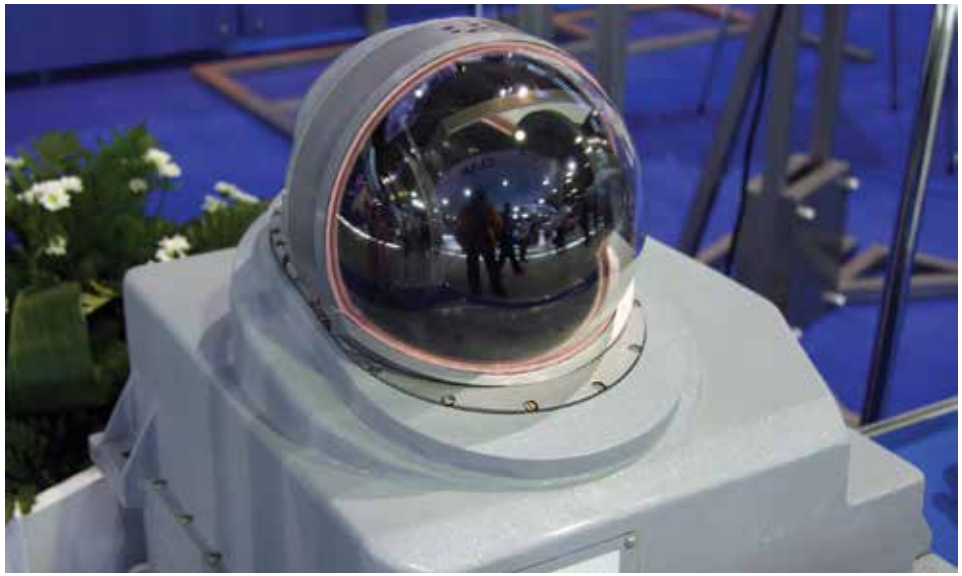
Su-35 phased-array radar ensures unique capabilities in detection range – up to 350 km, electronic beam scanning in azimuth and in elevation – up to 120 deg. To increase angle of sight in horizontal plane up to 240 deg hydraulic actuator is implemented.

- Simultaneous tracking of 30 air targets and attack of 8 air targets in long-range air combat or attack of one air target in a dogfight.
- Simultaneous tracking of up to 4 ground (sea surface) targets and attack of 2 sea surface targets.

Air-to-surface mode of the radar control system ensures mapping, ground (sea surface) target detection and engagement with simultaneous detection and tracking of air targets and attack of one air target in long range combat.



SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER



OPTIC ELECTRONIC STATION

Su-35 sighting system comprises optic electronic station that can be operated autonomously or jointly with a radar control system and a helmet-mounted targeting system. Apart from thermal direction finder, TV and laser channels there is an image IR channel in an optic electronic station that shows a thermal target image, facilitate its identification and increases aircraft's abilities in detection of air and surface targets.

New channel and impressive ranges of target detection and range measuring increase aircraft's capabilities of covert conducting combat without radar's switching on that provide tracking of 4 air targets in an IR band.

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

ONBOARD SELF-DEFENSE MEANS

When creating Su-35 to ensure survivability in the air integrated approach is realized:

- application of radar and laser warning systems as well as attacking missiles receiver;
- active jamming of enemy's onboard radars, missile homing heads and radar stations;
- application of antiradar guided missiles to engage emitting means and AD systems;
- application of internal heat flares and chaffs.

SU-35 MULTIROLE SUPERMANEUVERABLE FIGHTER

BASING CONDITIONS

Su-35 can be employed autonomously from operational airfields as it is outfitted with the integrated control system, auxiliary power unit and an onboard oxygen generating system. This allows to reduce fuel consumption during ground run and economy of engines service life, creating comfortable environment for a pilot that is ready for the takeoff.

Combat, combat-trainer and trainer aircraft

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

MULTIFUNCTIONAL 5TH GENERATION AIRCRAFT SYSTEM FOR EXECUTION OF A WIDE RANGE OF COMBAT TASKS

Su-57E Perspective multifunctional fighter is designed for execution of a wide range of combat tasks while operating against aerial, ground and surface targets day-and-night with the use of the up-to-date progressive guided and unguided weaponry.

Unique features of the 5th generation fighter provide covertness of combat operation due to low radar signature level, ensure continued supersonic cruise flight, solve the whole range of fighter and strike tasks that are assigned on tactical aviation.

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

ADVANTAGES

- Stealth actions due to the low visibility level in the radar range, including during the avionics suite operation and application of weapons;
- Developed intellectual support for the pilot and a high level of automation make it possible to effectively operate the aircraft and solve the whole range of combat missions by one crew member.
- High noise immunity of the on-board avionics suite and the aviation armament complex;
- Long-term super-maneuverable flight mode with a wide range of weaponry onboard;
- Solving long-range interception tasks.

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

FIFTH GENERATION CRITERIA

- Automation and high intellectualization, network-centric operations.
- Low profile quality.
- Spherical data and protection field.
- Supermaneuverability, supersonic maneuverability.
- Versatility of the aircraft system.
- Large variety of aerial weapons. Reconfiguring payload bays.
- Low-observable employment of long-range weapons, multichannel weapon employment.
- Solving long-range interception missions.
- Supersonic unboosted cruise flight.

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

ARMAMENT COMPLEX

The Su-57E has a powerful armament complex for solving striking and defensive tasks while engaging air, ground and surface targets.

The aircraft has unique long-range air-to-air, air-to-surface class missiles, which have no analogues in the world. The cutting-edge aerial weapons can be stored on the external hardpoints or in the internal payload bay, depending on the assigned tasks.

The Su-57E is the single 5th generation fighter which can carry big-sized long-range air weapons in a low-signature configuration.

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

MODERN ONBOARD EQUIPMENT

The Su-57E has the latest on-board equipment, which is integrated into a single open architecture complex, built on the basis of an information control system and multiplex communication channels. It has a spherical data and defense field due to modern ECM suite and an active electronically scanned array (AESA) radar.

The open architecture and modularity of the on-board equipment construction ensure the high modernization potential of the aircraft. The implementation of self-control, reconfiguration and self-protection mechanisms in the data control system substantially increases mission execution reliability and failure resistance.

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

VERSATILITY

- Long-term monitoring of airspace at large distances from the base.
- Interference-proof, open and secured radiotelephone and telecode communication in the networks of air force and navy.
- Destruction of the aviation operations control system by destroying AWACS aircraft.
- Overcoming of local and object air defense systems.
- The application of single and coordinated attacks of a group of aircraft against single and group surface targets from different directions.
- Aircraft group striking against single and group ground targets from long range without entering the air defense zone.

SU-57E PERSPECTIVE MULTIFUNCTIONAL FIGHTER

BASING CONDITIONS

To provide autonomous operation the Su-57E is fitted out with integrated control system, onboard oxygen generating system and auxiliary power unit.

The application of an onboard oxygen generating system ensures the operation of the aircraft without the need for ground-based oxygen filling of all systems.

The auxiliary power unit ensures the launch of main engines, ground launch up to a 3500 m altitude of the aerodrome, as well as the generation of electric power in flight in case of main generators failure, which guarantees a reduction of fuel consumption during ground preparations and saves the resource of main engines.

Combat, combat-trainer and trainer aircraft

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

COMBAT AND TRAINING EFFICIENT

The Su-30SME multirole fighter is designed to engage air targets as well as ground (surface) targets using precision weapons in all weather conditions, day-and-night, acting independently or as part of a group, in the conditions of fire and information countereffortts.

Su-30SME is intended for fulfillment of the following tasks:

- Destruction of enemy's fighters in air fight and winning air supremacy.
- Engagement of enemy's tactical, cargo and strategic aircraft, as well as helicopters and cruise missiles.
- Coverage of troops and ground facilities against enemy's air strikes and reconnaissance.
- Destruction of armor and other vehicles in concentration areas and on the move.
- Destruction of runways on landing sites.
- Engagement (penetration) of enemy's ground AD means.
- Destruction of surface targets in maritime areas.

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

ADVANTAGES

- Two cockpits with equal piloting capabilities for better application of weapons and optimal distribution of piloting functions between crew members.
- High flight performance and supermaneuverability due to AL-31FP two turbojet bypass aircraft engines with TVC.
- Modern complex of on-board radio-electronic equipment includes a radar control system, an integrated optical-electronic sighting and navigation system, and EW.
- A powerful complex of aerial weapons includes modern aerial guided and unguided weapons with a total weight of up to 8000 kg, which can be placed on 12 external suspension points, as well as a built-in aviation cannon installation of 30 mm caliber.
- Inflight refueling to increase range and flight endurance.
- Suspended container with IR and laser sighting equipment.

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

FLIGHT SPECIFICATIONS

SU-30SME CHARACTERISTICS	
Normal takeoff weight, kg	26,090
Maximum takeoff weight (MTOW), kg	34,000
Maximum speed (H=12000 m), Mach number	1.75
Service ceiling, m	16,100
Maximum fuel load in internal fuel tanks, kg	9,300
Engine thrust (full afterburner mode), kgf	12,500
Maximum flight range with main fuel tanks at cruising altitude, km	3,000
Maximum weight of combat payload, kg	8,000
Number of hardpoints	12
Maximum g limit	9.0

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

ARMAMENT COMPLEX

The armament complex of the Su-30SME includes guided and unguided weapons, such as RVV-AE, RVV-SD air-to-air medium range guided missiles and R-73E, RVV-MD short range missiles applied according to the “fire-and-forget” principle, general purpose Kh-29TE missile, supersonic Kh-31A anti-ship and Kh-31P(PK) antiradar missiles, KAB-500Kr and KAB-1500Kr high-precision guided aerial bombs of 500 and 1500 kg caliber.

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

MODERN INFORMATION AND CONTROL FIELD

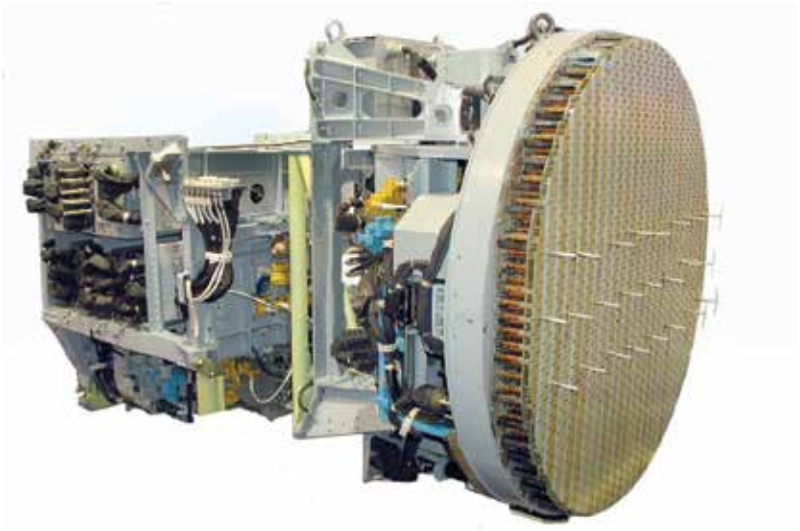
The information and control field of the cabin is built in accordance with the “glass cockpit” concept with the use of color multifunction indicators.

Su-30SME aircraft is equipped with modern information-control field of cabins with color multifunctional indicators that display aerobatic, navigation and tactical information. Thanks to the two-seat cockpit, the assignment of piloting and weapons application tasks is provided between crew members when solving combat missions.

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

MODERN AIRBORNE RADIO ELECTRONIC EQUIPMENT

A radar station with a phased array antenna of the Su-30SME fighter provides capability to track up to 20 and simultaneously engage up to 8 targets, as well as simultaneous operation against ground and air targets, stable operation in the conditions of heavy electronic countermeasures.



SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

OPTICAL LOCATING STATION

Su-30SME is a fighter, which avionics include high-efficient optical locating station for detection of air targets, allowing to perform concealed attacks of air target using missiles with passive self-homer.

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

ONBOARD SELF-DEFENSE MEANS

The Su-30SME aircraft has implemented an integrated approach to ensure its survivability in the air, which includes:

- active electronic suppression of airborne radars, self-homing heads of missiles, enemy's ADMS radars;
- application of air-to-radar guided missiles to destroy radio-emitting means and air defense systems;
- application of built-in EW systems which include automatic dispensers of chaffs and flares.

SU-30SME MULTIROLE SUPERMANEUVERABLE FIGHTER

BASING CONDITIONS

High self-sufficiency of the Su-30SME fighter is ensured due to the use of an auxiliary power unit and an on-board automated equipment control system, which reduces the fighter's dependence from airfield infrastructure.

Combat, combat-trainer and trainer aircraft

SU-34E FIGHTER-BOMBER

SU-34E FIGHTER-BOMBER

FIRE POWER AND HIGH SURVIVABILITY – GUARANTEED SOLUTION OF STRIKE TASKS

The Su-34E fighter-bomber is a two-seat multifunctional aircraft designed for all-weather and round-the-clock engagement of ground and surface targets, including strongly fortified targets at considerable distances from home airfields using precision-guided weapons as well as air targets in an intense enemy counter-fire and ECM environment.

Su-34E is intended for fulfillment of the following tasks:

- Engagement of covered air defense objects of enemy air, land and naval units.
- Engagement of the elements of troop command and control system.
- Air support of land forces.
- Air interdiction.
- Patrolling in the threat corridors.
- Aerial reconnaissance.
- Data exchange with ground, air and ship-born command posts.
- Electronic Counter-Measures and group ECM.

SU-34E FIGHTER-BOMBER

ADVANTAGES

- Application of a wide nomenclature of high-precision guided aerial weapons against ground, surface and aerial targets with simultaneous firing of several targets.
- Joint group operations (group flight navigation and target distribution by aerial and ground targets).
- Impressing combat radius when engaging ground and surface targets.
- Highly efficient electronic countermeasures (ECM) suite.
- Armored cockpit with crew members sitting side-by-side and relaxation area.
- Significant modernization potential thanks to the avionics open-end architecture.
- High survival capability on the ground and in the air.
- Provision of aerial reconnaissance due to fitting out with standardized reconnaissance pod (radar or radio intelligence or optical-electronic).
- Increased level of autonomous basing.

SU-34E FIGHTER-BOMBER

FLIGHT SPECIFICATIONS

SU-34E CHARACTERISTICS	
Normal takeoff weight, kg	39,500
Maximum takeoff weight (MTOW), kg	45,100
Maximum speed at altitude, Mach number	1.5
Service ceiling, m	15,350
Fuel load in internal fuel tanks, kg	11,250
Engine thrust (full afterburner mode), kgf	12,500
Practical flight range (with maximum fuel at cruising altitude), km	2,230
Maximum endurance of combat mission with air refueling, h	10
Max. weight of combat payload, kg	8,500

SU-34E FIGHTER-BOMBER

UNIFIED COMBAT PLATFORM

Apart from Bomber tasks the Su-34E can be operated as a unified platform for Reconnaissance aircraft and an Active jammer.

Successful execution of reconnaissance tasks is ensured due to the application of detachable pods: removable UKR-RL radar, UKR-OE optical reconnaissance and UKR-RT-E electronic intelligence.

Electronic countermeasures suite provides both individual and group protection thanks to detachable jamming pods with various band frequencies.

SU-34E FIGHTER-BOMBER

ARMAMENT COMPLEX

The fighter-bomber has a powerful strike and defensive armament complex. Guided and unguided weaponry can be suspended on 12 hardpoints, including the RVV-MD short-range air-to-air missiles, supersonic anti-ship missiles and anti-radar missiles, high-precision guided aerial bombs of 500 and 1,500 kg caliber, and aerial bombs of 100, 250 and 500 kg caliber.

Heavy payload and variety of employed aerial weapons make the combat potential greater. Thus aerial group is capable to execute combat tasks more flexible.

SU-34E FIGHTER-BOMBER

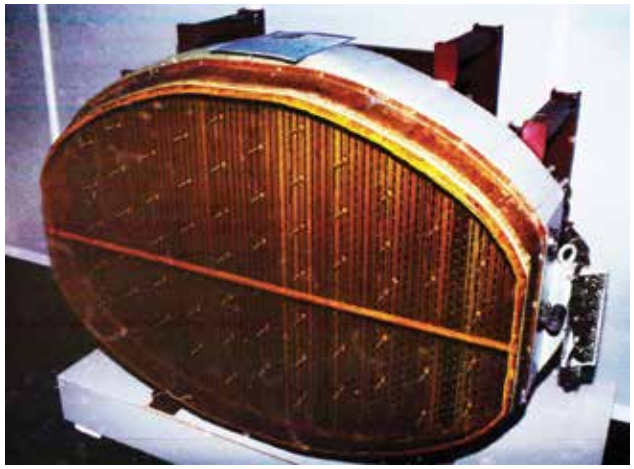
CREW COCKPIT

The Su-34E cockpit has a “side by side” arrangement, where crew members are located close to each other, that reduces the degree of duplication of equipment and provides direct communication of the crew.

Modern instrumentation, an air conditioning system and a “relaxation area” located in front of the rear wall of the cockpit create comfortable conditions and facilitate work of the crew during long-duration flights (crew members can stand upright, take food, etc.).

Built-in ladder in the nose landing gear provides pilots with the entrance to the cockpit.

SU-34E FIGHTER-BOMBER



MODERN AIRBORNE RADIO ELECTRONIC EQUIPMENT

The Su-34E aircraft is equipped with a modern avionics suite of open architecture, which makes it possible to integrate new units into the avionics complex, update and increase software, and it provides execution of the tasks assigned on the aircraft. The main components of the avionics suite of the aircraft are:

- information and control field of the cockpit;
- avionics complex, that include a radar with a phased array for detection, tracking of air, ground and surface targets as well as application of weapons and an electronic countermeasures suite;communication complex (KSS);
- weapon control system.

SU-34E FIGHTER-BOMBER

ONBOARD SELF-DEFENSE MEANS

Su-34E ensures great survivability in the air, including:

- armored cockpit, protected fuel tanks (filling with polyurethane foam), armored protection of engine compartment, electronic engine control units and engine fire extinguishing system;
- design and layout measures - twin-engine aircraft layout, increased wall thickness of fuel tanks, duplication, redundancy, shielding of the main systems;
- application of a highly-intelligent ECM suite, that include an electronic intelligence container, a jamming container, a chaff/flare dispenser.

SU-34E FIGHTER-BOMBER

MAINTAINABILITY

- The on-board system of Ekran built-in control and crew warning system significantly reduces time and labor required to maintain the technical serviceability of the aircraft.
- Possibility to test the serviceability of systems and equipment, to set the inertial system and fill it with fuel and oil simultaneously.
- Easy access to all maintenance points.
- Automated input of initial data during preflight procedures.
- Weapons control system provides execution of all scheduled maintenance work in parallel sequences during flight preparation.

Combat, combat-trainer and trainer aircraft

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

THE BEST IN ITS CLASS

The MiG-35/35D multifunctional frontline fighter / two-seat multifunctional frontline fighter is designed to engage various air targets, moving and fixed ground (surface) targets with the use of guided and unguided aerial weapons in favorable and adverse weather conditions, day and night.

In a two-seat configuration it can be applied both in combat and training modes.

MiG-35/35D is intended for fulfilling the following tasks:

- Destruction of various air targets, including high-value targets: reconnaissance aircraft, airborne command posts, ECM aircraft and helicopters, etc.
- Air cover of territory, troops and logistics facilities from aerial reconnaissance and air strikes.
- Air support of land forces.
- Escort of attack aircraft delivering strikes on ground (surface) targets in an operational depth.
- Air interdiction.
- Destruction of ground targets, infrastructure and communications facilities, troops and weapons command and control systems.
- Aerial reconnaissance.

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

ADVANTAGES

- Combat employment day and night, in simple and adverse weather conditions, under any climatic conditions, as well as under heavy radio-electronic and fire countermeasures of the enemy.
- Prolonged aerial patrolling of combat areas (with air refueling).
- Significant combat power when against air, sea and ground targets, high accuracy of flight on the route and access to the target, a large mass of external load (up to 6.5 tons)
- Capability to effectively overcome air defense zone with the use of electronic warfare and engagement of ADMS with anti-radar missiles, that ensure their destruction without entering into the fire damage zone.
- Enhanced capabilities to detect and track air and ground (surface) targets using new airborne radar with slot array, optical electronic system (OLS) and a down-looking optronic system (in a container).
- Ability to control tactical fighter groups in the air outside the radar field.
- High flight safety, including flights at low altitudes and above sea.
- Capability of out-of-hangar storage due to employment of cutting-edge materials and anticorrosion protection.

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

FLIGHT SPECIFICATIONS

MIG-35/35D CHARACTERISTICS	
Normal takeoff weight, kg	19200/19000
Maximum takeoff weight (MTOW), kg	24,500
Maximum speed (H=12,500 m), km/h	2,100
Service ceiling, m	16,000
Fuel load in internal fuel tanks, kg	4,600/4,130
Maximum engine thrust, kgf	9,000
Maximum flight range with 3 AFT at altitude, km	3,000/2,700
Maximum climb rate, m/s	240
Max. weight of external payload, kg	6,500
Number of hardpoints	9
Maximum g limit	9.0

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

ARMAMENT COMPLEX

MiG-35/35D fighters have significant combat power when applied against air, surface and ground targets due to the great engagement range to the targets, high accuracy of flight on the route and target approach, great external payload (up to 6.5 tons), that can be suspended on 9 hardpoints.

MiG-35/35D multifunctional fighters are able to carry medium- and short- air-to-air guided missiles, air-to-surface guided missiles, including supersonic air-to-radar or air-to-ship missiles.

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

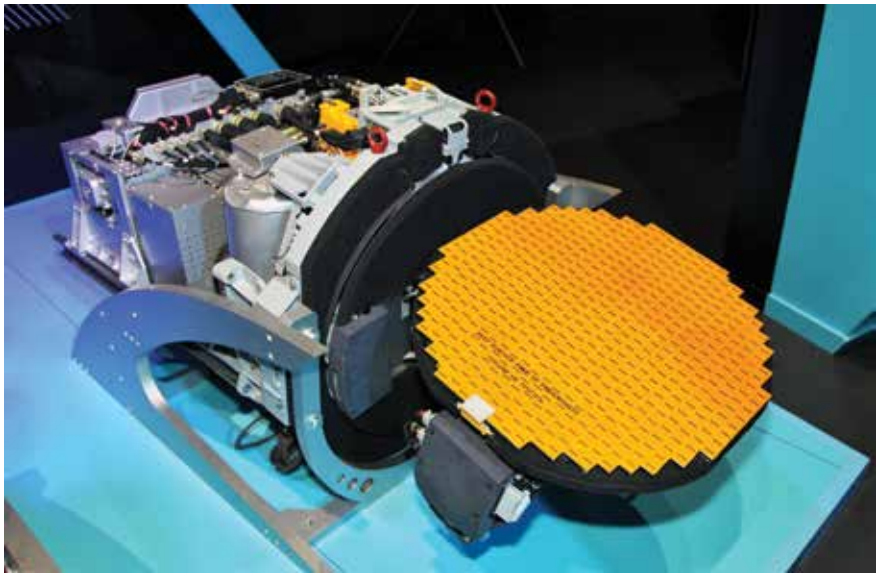
MODERN INFORMATION AND CONTROL FIELD

MiG-35/35D aircraft are equipped with the new displays which provide full information about tactical environment, flight modes, potential threats in the air or on the ground as well as high degree of automation which allows the pilot to focus on the combat mission performance.

New multifunctional displays provides:

- Glass cockpit principle.
- Innovative tactical environment indication.
- High resolution image quality.
- Intuitive ergonomic interface.
- Implementation of the HOTAS concept.

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER



MODERN AIRBORNE RADIO ELECTRONIC EQUIPMENT

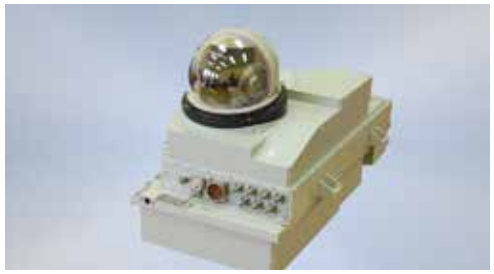
New radar with slot array provides all-weather and round-the-clock application of weapons, selection of moving targets and a mapping mode.

The radar is capable to track simultaneously up to 10 aerial targets and engagement of up to 4 aerial targets in long-range air combat or firing of one air target in close air combat.

Radar can implement the following:

- Simultaneous functioning in “air-to-air” and “air-to-surface” modes;
- Efficient operation in active jamming conditions;
- Aircraft-to-aircraft navigation and data exchange in a group combat mode.

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER



OPTICAL LOCATING STATION

Thanks to the integrated optical-electronic front-view system OLS-UEM, detection and stable tracking of aerial and ground targets, covert attacks of aerial targets (without switching on the radar) are provided. Detection range of an air target (front hemisphere / rear hemisphere) is up to 15 / 45 km.

Detection and tracking of ground targets is carried out by the down-looking optical-location station (in the container). The detection range for a tank-type ground target is 15 km.

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

ONBOARD SELF-DEFENSE MEANS

The airborne defense complex increases the survivability of MiG-35/35D fighters under conditions of active radar and fire countermeasures and ensures decrease in losses during air battles and while firing against ground (surface) targets.

The complex consists of:

- Radar warning station.
- Active jamming station (in container).
- Control and target designation equipment for Kh-31P(PK) missiles' passive self-homing heads.
- Laser warning station.
- Attacking missiles warning system.
- Chaff / flare dispensers.

MIG-35/35D MULTIFUNCTIONAL FRONTLINE FIGHTER

BASING CONDITIONS

The MiG-35/35D fighters demonstrate capability of autonomous basing and operation at alternative airfields far from the main airfield due to the onboard automated control system and equipment of turbine-starters operating in the electric generation system mode. Supply of oxygen is provided by the onboard oxygen generating station.

Combat, combat-trainer and trainer aircraft

MIG-29K/KUB SHIPBORNE AIRCRAFT

MIG-29K/KUB SHIPBORNE AIRCRAFT

INDISPENSABLE FOR COVERING SHIP FORMATIONS AND DESTRUCTION OF MARITIME OBJECTS TASKS

The MiG-29K/KUB shipborne aircraft/shipborne combat-training multirole aircraft is designed to conduct fleet air defense missions, engage aerial targets in any weather, day or night, as well as to destroy surface (ground) targets.

Aside from accomplishing combat missions, the MiG-29KUB facilitates instruction and training of flying crews to fly and use the MiG-29K.

MiG-29K/KUB is intended for fulfilling the following tasks:

- Combat air patrol.
- Air target interception and destruction.
- Striking against surface (ground) targets.
- Air support of troops and landing forces.
- Battlefield air interdiction.
- Aerial reconnaissance.

MIG-29K/KUB SHIPBORNE AIRCRAFT

ADVANTAGES

- Round-the-clock and all-weather capability.
- An improved airframe with a share of composite materials of about 15% and anticorrosion protection.
- Folding wing with improved mechanization, providing improved take-off, landing and basing on ship characteristics. reinforced landing gears, arrestor hook and a catapult for carrier operations.
- Digital integrated fly-by-wire aircraft control system with quadruple redundancy.
- Increased combat payload of modern air-to-air and air-to-surface missiles, mounted on eight hardpoints.
- Increased capacity of fuel and in-flight refueling system.
- Capability to provide refueling of other aircraft when equipped with a PAZ-MK refueling pod.

MIG-29K/KUB SHIPBORNE AIRCRAFT

FLIGHT SPECIFICATIONS

MIG-29K/KUB CHARACTERISTICS	
Maximum takeoff weight (MTOW), kg	24,500
Maximum speed at altitude, km/h	2,200/2,100
Service ceiling, m	17,500
Fuel load in internal fuel tanks, kg	5,200/4,700
Maximum engine thrust, kgf	9,000
Maximum flight range with main fuel tanks at altitude, km	1,850/1,600
Maximum weight of combat payload, kg	4,500
Maximum g limit	8.0
Crew	1/2

MIG-29K/KUB SHIPBORNE AIRCRAFT

ARMAMENT COMPLEX

The MiG-29K/KUB is equipped with short- and medium-range air-to-air missiles, air-to-surface missiles, including Kh-31A/P high-speed missiles, guided aerial bombs, unguided rockets and bombs, and an internal gun.

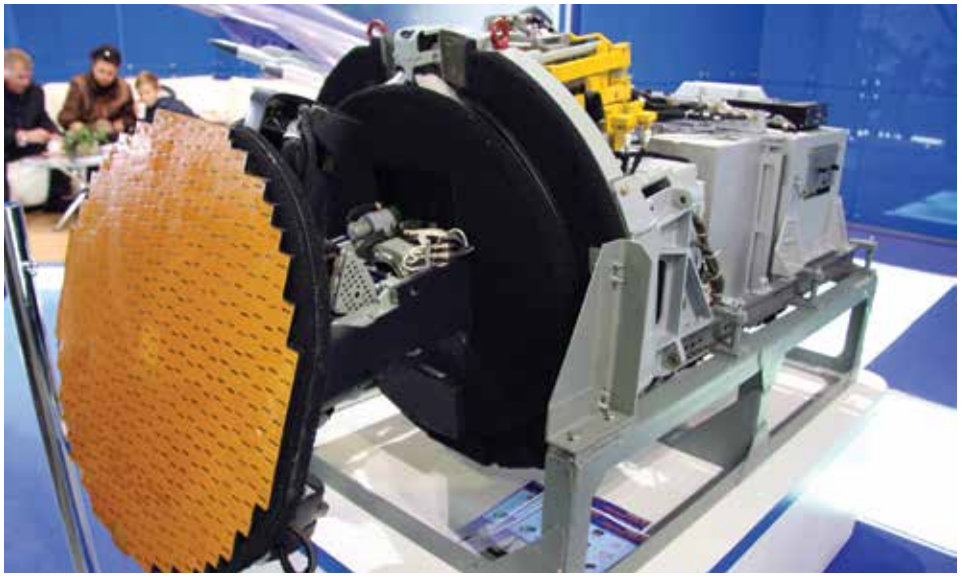
Owing to a wide range of weapons coupled with its excellent flight performance, the MiG-29K/KUB offers high combat effectiveness.

MIG-29K/KUB SHIPBORNE AIRCRAFT

INFORMATION AND CONTROL FIELD

Cockpit information and control field with multifunctional color indicators and their push-button framing was implemented in MiG-29K and MiG-29KUB fighters. Control of on-board equipment and weapons without removing hands from aircraft controls (HOTAS concept) is provided while solving combat tasks.

MIG-29K/KUB SHIPBORNE AIRCRAFT



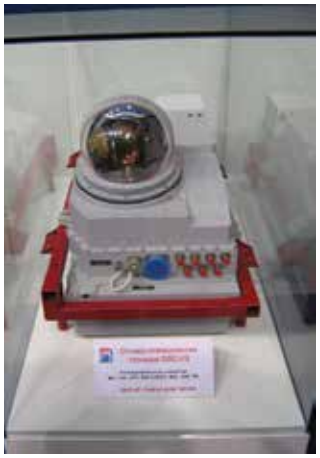
MODERN AIRBORNE RADIO ELECTRONIC EQUIPMENT

The MiG-29K/KUB carries modern targeting and navigation system, quad-redundant fly-by-wire flight control system, radar and optical locating stations, helmet-mounted targeting/display system, communications and self-defense equipment, cockpit instrumentation and other aids that working together provide high flight safety, effective use of weapons, as well as handling of navigation and training tasks.

The MiG-29K/KUB is equipped with the multifunctional Zhuk-ME radar, which provides detection of aerial targets at distances of up to 120 km, destroyer-type sea targets up to 200 km and bridge-based ground targets up to 120 km.

Air-to-surface radar systems provide terrain mapping, low-level flight information support, detection and tracking of moving ground and surface targets, sea surface observation, target designation to the Kh-31P/31A, Kh-35 missiles.

MIG-29K/KUB SHIPBORNE AIRCRAFT



OPTICAL-LOCATION STATION

The MiG-29K/KUB is equipped with a modern multi-channel optical-location station and a target designation system for passive homing heads of anti-radar missiles.

Fighter can be also fitted out with infrared and laser sighting containers for illumination of ground targets.

Combat, combat-trainer and trainer aircraft

YAK-130 COMBAT TRAINER AIRCRAFT

YAK-130 COMBAT TRAINER JET

AVIATION COMPLEX THAT IS DESIGNED TO TRAIN AND FIGHT

The Yak-130 trainer (combat-trainer) aircraft is intended for flight and combat training of flight personnel on the 4th and 5th generation fighters as well as for performing combat missions against ground and aerial targets in favorable and adverse weather conditions. Thus Yak-130 Combat trainer jet is capable to perform both training and real combat tasks as a light combat aircraft.

Yak-130 is intended for fulfilling the following tasks:

- Piloting training at take-off and landing, low-altitude flights.
- Initial and advanced flying, aerobatics.
- Navigation training (visual flight, instrument flight).
- Striking tasks, engagement of ground (surface) objects.
- Fighter tasks against low-speed targets.
- Close air combat.
- Air patrolling.

YAK-130 COMBAT TRAINER JET

ADVANTAGES

- Versatility (ability to perform training and combat missions).
- Capability to train piloting on various types of combat aircraft.
- Maximum training adaptation to modern combat aircraft in terms of characteristics and information-control field of the cockpit.
- High power-to-weight ratio and high maneuverability in a wide range of flight modes.
- Possibility of autonomous basing and operation, including from unpaved airfields
- High flight safety.
- Capability of operation as a light combat aircraft (LCA) to destroy low-speed air and ground (surface) objects.

YAK-130 COMBAT TRAINER JET

FLIGHT SPECIFICATIONS

YAK-130 CHARACTERISTICS	
Maximum takeoff weight (MTOW), kg	10,290
Maximum speed, km/h	1,060
Service ceiling, m	12,500
Fuel load in internal fuel tanks, kg	1,700
Maximum engine thrust, kgf	2,500
Flight radius with AFT (strike mission), km	800
Maximum climb rate, m/s	65
Maximum weight of combat payload, kg	3,000
Number of hardpoints	9
Maximum angle of attack, deg	35
Maximum operational overload, g	+8,0

YAK-130 COMBAT TRAINER JET

ARMAMENT COMPLEX

Yak-130 has a powerful armament complex. It can carry up to 3 000 kg of aerial guided and unguided weapons on 9 hardpoints. When operating Yak-130 as a light combat aircraft it can engage military transport aircraft, helicopters, light strike-fighters, UAVs and other low-speed aerial targets.

Yak-130 can be equipped with R-73E short-range air-to-air missiles with IR self-guiding head, aerial and guided bombs, such as KAB-500Kr TV-guided bombs and S-8 and S-13 unguided rockets.

YAK-130 COMBAT TRAINER JET

MODERN INFORMATION AND CONTROL FIELD

The information-control field comprise three multifunctional 6”x 8” LCDs in each cabin and HUD in the front cockpit ensures representation of all required information to the pilots.

Maximum compliance of the information and control field of the cabin to the modern combat aircraft ensures decrease of combat aircraft time mastering.

YAK-130 COMBAT TRAINER JET

POWER PLANT

Yak-130 is equipped with two AI-222-25 engines with Full Authority Digital Engine Control (FADEC) system.

Fitting out of Yak-130 with two engines (whereas western trainer aircraft have only one) ensures high flight safety that is very important when training young pilots to form assurance in ability of successful landing in emergency situations.

YAK-130 COMBAT TRAINER JET

DISTINCTIVE FEATURES

- Protective air intakes with shields that avert getting of the foreign matters into the engines at take-off and landing.
- Fire protection system of engines and auxiliary power unit's sections.
- On-board automated test-and-control system for equipment and systems.
- Integrated digital re-programmable fly-by-wire control system.
- Digital flight / navigation /sighting avionics suite.
- "0-0" ejection seats with through-canopy ejection capability.

YAK-130 COMBAT TRAINER JET

BASING CONDITIONS

Yak-130 combat trainer jet demonstrates autonomous deployment capability due to aircraft fitting out with the auxiliary power unit (APU), onboard oxygen generating system and an integrated control system.

YAK-130 COMBAT TRAINER JET

SPECIALIZED SIMULATOR

Training of the flying personnel conception on the Yak-130 simulator assumes staged (gradual) training: from studying of piloting and navigation theories, primary and basic trainings up to flight-tactical programs and perfecting of piloting technique for further Yak-130 assimilation. Experience shows that up to 80% of flight tasks can be mastered on simulators.

Specialized simulator of combat application is intended for studying and training of flight personnel when executing piloting-navigational tasks and application of aerial weapons.

Combat, combat-trainer and trainer aircraft

YAK-152 PRIMARY TRAINER AIRCRAFT

YAK-152 PRIMARY TRAINER AIRCRAFT

THE BEST CHOICE FOR INITIAL TRAINER

The Yak-152 Primary training aircraft provides professional selection among aviation cadets, primary flight training and professional guidance of future military aviation pilots. The Yak-152 is capable to perform training flights in normal and harsh weather conditions, day-and-night, moreover it has a deployment on the unpaved airfields capability. The information and control field of the Yak-152 is fully unified with cockpit of the Yak-130 combat trainer jet.

Yak-152 is intended for fulfilling of the following tasks:

- Aircraft operation training (round flight, basic, advanced and high-class aerobatics).
- Basic navigation training.
- Aircraft operation training during instrumented flight (under the curtain) and landing using the airfield Instrument Landing System (ILS).
- Group flight training at daytime according to Visual Flight Rules and over clouds.
- Emergency situations training.

YAK-152 PRIMARY TRAINER AIRCRAFT

ADVANTAGES

- Aerodynamic configuration ensuring high level of flight safety.
- 24/7 flight operation capability according to VFR and IFR.
- Deployment on the unpaved airfields with soil density not lower than 5 kg/cm^2.
- Thread lead and power plant are operated with single control lever.
- Yak-152 cockpit layout is fully unified with Yak-130.
- Airframe construction is made of aluminum alloy.
- Open-air storage capability.
- Modernization capability within the aircraft family.
- Advanced kerosene-operated piston diesel engine.
- Operation of aircraft aggregates, clusters, systems and equipment in terms of “on-condition” basis.

YAK-152 PRIMARY TRAINER AIRCRAFT

FLIGHT SPECIFICATIONS

YAK-152 CHARACTERISTICS	
Maximum takeoff weight (MTOW), kg	1,490
Maximum flight speed, km/h	500
Service ceiling, m	4,000
Fuel load in internal fuel tanks, kg	175
Maximum flight range, km	1,500
Maximum endurance of flight, h	5
Climb rate, m/s	10
Maximum operational overload one pilot / two pilots, g	9,0 / 8,0

YAK-152 PRIMARY TRAINER AIRCRAFT

DISTINCTIVE FEATURES

- Tandem arrangement with trainee in the front cockpit.
- Safe emergency ejection system.
- Optimal aerodynamic configuration provides flight safety in case of crew errors.
- Retractable tricycle landing gear with nose wheel.
- Multifunctional avionics indicators and triple reserving of flight and navigation parameters.
- Air-conditioning system (optional).
- One pilot operating capability from front or rear cockpit during aerobatic flight with no additional balance weight.

YAK-152 PRIMARY TRAINER AIRCRAFT

ONBOARD EQUIPMENT

Avionics suite ensures effective tasks accomplishment, including:

- Flight and navigation data display, as well as aircraft systems and power plant information.
- Standard and emergency operation modes.
- Landing performance with the radio landing aids employment.
- Flight information, onboard equipment, aircraft systems, power plant performance data registration and flight crew voice conversation recording.

YAK-152 PRIMARY TRAINER AIRCRAFT

AIRCRAFT SYSTEMS

Yak-152 Primary trainer aircraft comprises the following aircraft systems:

- Flight control system.
- Fuel system.
- Hydraulic system.
- Electric supply system.
- Ventilation and cockpit heating system.
- Emergency ejection system.
- Conditioning system (optional).

Systems of Yak-152 trainer provide fulfillment of piloting and navigation tasks at professional selection and initial training of pilots, as well as assure high level of flight safety and reliable employment of the aircraft.

YAK-152 PRIMARY TRAINER AIRCRAFT

SIMULATOR

The procedure simulator of the Yak-152 is used to get familiar with the interior of the pilot's workplace, develop skills in working with control and display bodies, and become familiar with various flight modes, including the emergency mode as well as to form skills of recognition of situations, to develop the initial skills of piloting an aircraft.

FOR NOTES

ROSOBORONEXPORT

Russian Defence Export

ISBN 978-5-6045198-6-8

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