UKRINMASH

SIMULATORS

UkrOboronProm
Ukrainian Defence Industry

For the last few years Ukrainian Defence Industry has been in the stage of transformation into a highly effective structure. This process is taking place due to new technologies, products, innovations, efficient management and top-professionals who have come into this field. Today we are offering the new armament business culture, customer oriented, flexibility and personal approach.

We represent Ukrainian Enterprises of the State Concern «Ukroboronprom» which employ more than 80 thousand people, and the products of other Ukrainian enterprises. Ukraine is a reliable partner who exports the defence products to many countries of the world. The potential for development of the Ukrainian Military Industrial Sector is a tremendous one who is only at the beginning of its realization and prospects.

We suggest the widest product range in the field of aviation, armour, radio, artillery, as well as ship building and rocket industry, etc.

Ukraine makes part of prestigious club of the countries which has mastered the closed cycle in aircraft building, radio intelligence and radio-electronic warfare, whereas the Ukrainian export potential is among the best 10 in the world.

SE “Ukrinmash” is a unique special exporter and integrator which makes an important part of the Ukrainian Military Industrial Sector honored to be your reliable partner. We are proud that SE “Ukrinmash” is one of the most experienced and one of the biggest export-import companies of Ukraine which has been working in the armament and military hardware market for more than 25 years.

We present you our products range as well as services in repairing, upgrading, joint promotion of the products and cooperation in the military markets. SE “Ukrinmash” is not only reacting to the state of the market but initiates trends in the world market. For nowadays, SE “Ukrinmash” is making a new history of the military industry of Ukraine.

Sergii Sliusarenko
Chief Executive Officer

SE SSFTIF «Ukrinmash»

UKRINMASH - 25 YEARS AT THE INTERNATIONAL MARKET

The State Self-Supporting Foreign Trade and Investment Firm «Ukrinmash» which is the participant of the State Concern “UkrOboronProm”, operates at the international market since 1991.
The aim of the Firm is to implement the interests of Ukraine in the field of military-technical cooperation with foreign partners. «Ukrinmash» has built reliable business connections with countries from every part of the world. The key mission is service excellence, reliability and customer satisfaction.

«UKRINMASH» OFFERS:

- Export of weapons and military products in the field of armoured military vehicles, aircraft engineering, shipbuilding industry, radar, ammunition and air defence, as well as rocket and artillery weapons.
- Transfer of technologies and know-how, including the development of military factories and MRO centers.
- Maintenance, repair / overhaul and upgrade of military equipment.
- Training of foreign military personnel.
- Import of weapons and military products to Ukrainian Army and all other military and defence structures.
- R&D, investment and other partnership opportunities.
- Disposal, demilitarization of the old military equipment and territory demining.
- Marketing, advertising and intermediary services.

CONTENT

MAIN PERFORMANCE DATA

Minimum size of the premises for installation of the simulator	Min. (m^2)	102
Minimum height of the premises for installation of the simulator	Min. (m)	6
Readiness time after switching on	Max. (Minutes)	30
Time of continuous work (with consecutive one hour break before resuming work)	(hours)	8
Nominal voltage, AC	(V)	380/220
Frequency	(Hz)	50± 0.4
Power, Three phase AC 380/220 V	Max.(kW)	45
Operating temperature range	(°C)	+15 ... +25
relative humidity at temperature of +25°C	Max. (%)	80
Type of diagnoses system		Embedded
Record of the simulator service life		Available
Weight: net / gross	(kg)	6660 / 8760

BASIC CONFIGURATION OF A SIMULATOR

Cockpit simulator
Computation system
Instructor and second pilot stations
Visualization system
Six-coordinate dynamic platform

INTEGRATED DYNAMIC SIMULATOR FOR PILOTS OF MIG-29 AIRCRAFT

SOKOL-KTS

The simulator is intended to conduct effective training and skill maintaining of pilots and combat use of the aircraft.

The simulator enables to fulfill the following missions:

- Preparation and control of on board equipment for the flight,
- Preparation of engines to start, starting engines on the ground and in the air,
- Taxiing, take-off in day and night time in normal and adverse weather conditions,
- Take-off, climbing with visibility visualization of the airstrip, take-off in night conditions,
- Instrument and visual flying in full operating range of altitudes, pitch and roll angles in manual and automatic modes,
- Independent and automatic solution of the pilot missions with programming the route and with use of all options of coordinate correction,
- Low altitude flights with flying around obstacles,
- Search, detection and identification of ground, naval and air targets,
- Sighting and using aircraft destruction means in all modes,
- Drilling pilot to use al electronic countermeasure systems of the aircraft,
- Formation flight, aerobatics,
- Radio communication,
- Final maneuvering and landing approach,
- Landing by radio technical means and visual landing in night and day time,
- Drilling pilots in emergencies during refusal of different instruments and systems, during fire.

INTEGRATED FIXED SIMULATOR FOR PILOTS OF MIG-29 AIRCRAFT

KTS-21M

The simulator is intended for air-borne tactical training of combat pilots, as well as for training of military school trainees.

The simulator enables to fulfill the following missions:

- Preparation for flight, starting the engines, taxiing, take-off in day and night time in normal and adverse weather conditions, circular flight, routing;
- Maneuvering and aerobatics at low, medium and high altitudes , formation flight in pair,
- Flight in the battlefield area, search, detection and identification of the ground, naval and air targets, sighting and hitting the targets
- Assessment of radio electronic situation by means of EW equipment
- Radio communication with the ground (instructor)
- Landing approach on programmed and non-programmed airfield.

MAIN PERFORMANCE DATA

Minimum size of the premises for installation of the simulator	Min. (m^2)	65
Minimum height of the premises for installation of the simulator	Min. (m)	4
Readiness time after switching on	Max. (minutes)	30
Time of continuous work (with consecutive one hour break before resuming work)	(hours)	10
Nominal voltage, AC	(V)	380/220
Frequency	(Hz)	50± 0.4
Power, Three phase AC 380/220 V	Max.(kW)	10
Operating temperature range	(°C)	+15 ... +25
relative humidity at temperature of +25°C	Max. (%)	80
Type of diagnoses system		Embedded
Record of the simulator service life		Available
Weight: net / gross	(kg)	3096±30 / 4128±40

BASIC CONFIGURATION OF A SIMULATOR

- Cockpit simulator with imitators of the instruments and systems of the aircraft
- Periphery controllers with interface units
- Three-channel visualization system with 180° horizontal and 45° vertical observation angles
- Modeling computation system and special software
- Instructor work station
- Second pilot work station
- Service documentation set
- SPTA Set
- Mount parts, set

FLIGHT SIMULATOR (L39)

TPL-L39

Skill maintenance of the pilots and trainees in piloting, navigating and combat use of the L-39 aircraft against aerial and ground targets.

The simulator enables to fulfill the following missions:

- Checking the on-board equipment before the flight,
- Preparation for start, starting and running the engine,
- Preparation for taxiing and taxiing in day and night time,
- Take-off and climbing in night and day time, circular flight,
- Normal and advance maneuvering, aerobatics,
- Visual piloting, flying by instruments in all ranges of altitudes, speeds pitch and roll angles, including critical flight modes (stalling, upright and inverted spin, spinning out),
- Piloting by duplicate instrument,
- En-route flight, including use of the «Iskra-K» equipment for missions of navigation,
- Formation flight in pairs,
- Combat use flying (flights for launching guided missiles against aerial targets, unguided rockets against ground targets, bombing, photo-shooting aerial targets),
- Final maneuvering and landing approach, including ADF with RDF switched off, landing in night and day time, adverse weather conditions, straight line, with two turns.

MAIN PERFORMANCE DATA

Minimum size of the premises for installation of the simulator	Min. (m^2)	8x6
Minimum height of the premises for installation of the simulator	Min. (m)	3
Readiness time after switching on	Max. (Minutes)	15
Time of continuous work (with consecutive one hour break before resuming work)	(hours)	10
Nominal voltage, AC	(V)	380/220
Frequency	(Hz)	50± 0.4
Power, Three phase AC 380/220 V	Max.(kW)	7,5
Operating temperature range	(°C)	+15 ... +25
relative humidity at temperature of +25°C	Max. (%)	80
Type of diagnoses system		Embedded
Record of the simulator service life		Available
Weight: net / gross	(kg)	3734 / 4834

BASIC CONFIGURATION OF A SIMULATOR

- Flight cockpit simulator (pilot) with imitators of maintenance instruments and systems
- Display
- Information-computation system
- Instructor work station
- Power cabinet
- Voltage stabilizer
- Service documentation, set
- SPTA single set

INTEGRATED FIXED SIMULATOR FOR PILOTS OF L-39 AIRCRAFT

TKS-L39

Skill maintenance of the pilots and trainees in piloting, navigating and combat use of the L- 39 aircraft against aerial and ground targets.

The simulator enables to fulfill the following missions:

- Checking the on-board equipment before the flight,
- Preparation for start, starting and running the engine,
- Preparation for taxiing and taxiing in day and night time,
- Take-off and climbing in night and day time, circular flight,
- Normal and advance maneuvering, aerobatics,
- Visual piloting, flying by instruments in all ranges of altitudes, speeds pitch and roll angles, including critical flight modes (stalling, upright and inverted spin, spinning out),
- Piloting by duplicate instrument,
- En-route flight, including use of the «Iskra-K» equipment for missions of navigation,
- Formation flight in pairs,
- Combat use flying (flights for launching guided missiles against aerial targets, unguided rockets against ground targets, bombing, photo-shooting aerial targets),
- Final maneuvering and landing approach, including ADF with RDF switched off, landing in night and day time, adverse weather conditions, straight line, with two turns,
- Drilling in particular conditions of flight (different refusal of systems and equipment of the aircraft).

MAIN PERFORMANCE DATA

Minimum size of the premises for installation of the simulator	Min. (m^2)	10,0 x 6,5
Minimum height of the premises for installation of the simulator	Min. (m)	4
Readiness time after switching on	Max. (minutes)	30
Time of continuous work (with consecutive one hour break before resuming work)	(hours)	10
Nominal voltage, AC	(V)	380/220
Frequency	(Hz)	50± 0.4
Power, Three phase AC 380/220 V	Max.(kW)	10
Operating temperature range	(°C)	+15 ... +25
relative humidity at temperature of +25°C	Max. (%)	80
Type of diagnoses system		Embedded
Record of the simulator service life		Available
Weight: net / gross	(kg)	4000 / 5000

BASIC CONFIGURATION OF A SIMULATOR

- Frontal cockpit simulator (pilot) with imitators of the instruments and systems of the aircraft
- Four periphery controllers with interface units
- Visualization overhead system with spherical screen
- Information – computation system
- Work stations of the instructor and second pilot

MAIN PERFORMANCE DATA

Voltage	V	220
Power (Max.)	kW	4
Maintenance personnel (instructor, engineer)		2
Preventive maintenance works		1 time per 6 months
Assigned service life	hours	60 000
VISUALIZATION SYSTEM CHARACTERISTICS:		
horizontal observation angle	deg.	170
vertical observation angle	deg.	80
number of channels (overheads)		6
CHARACTERISTICS OF IMITATORS OF INSTRUMENTS AND CONTROLLERS:		
data exchange delay (Max.)	ms	30
type		LCD and electro-mechanic
CCS connection	(kg)	Ethernet

BASIC CONFIGURATION OF A SIMULATOR

- pilot cockpit Mi-8
- visualization system
- central computation system (CCS)
- vibration and noise system
- air conditioning system
- instructor panel

SIMULATOR FOR HELICOPTER

MI-8MTV

Purpose:

- training for preparation and carrying out the flight,
- drilling the crew in emergency,
- Instrument flight,
- interaction of the crew and the ATC.

The simulator enables to conduct the following missions:

- take-off, training circular flight in the airfield area, landing (by the visual flight and instrument rules),
- en route flight with aero navigation means (NDB VOR beacons),
- en route flight with GPS navigation,
- all stages of flight in different weather conditions and time of a day,
- failure insertion of equipment and system of the Helicopter,
- emergency drill of the crew.

FIXED SIMULATOR OF HELICOPTER

MI-24P

The simulator enables to conduct training of a pilot or a trainee with drilling exercises in piloting, navigation, and combat use as well as training of specific cases in flight in conditions close to real ones.

The simulator enables pilots to conduct the following missions:

- Checking the Helicopter systems before starting the engines,
- Preparing (TV3-117VMA) engines for starting, start and testing the power unit,
- Checking the on-board equipment of the helicopter and the systems,
- Preparation for taxiing, taxiway and take-off strip movement at night and day time,
- No-run take off and running take-off, climbing with visual orientation and by instruments, in normal and adverse weather conditions, circular flight,
- Flying in the training zone, maneuvering (banks, turns, eights, S-turns, spirals, hook turn, nose down, zoom, zoom turns), navigation at all altitude and speed ranges,
- Visual en-route flight and flight with radio electronic navigation means as well as on-time target approach systems,
- Combat maneuvering flights to overcome enemy aerial en-route and in the target area with drilling the attacks against ground and submerged targets,
- Flying for using destruction means against ground (submerged) and aerial targets,
- Landing approach and no-run and running landing .

MAIN PERFORMANCE DATA

Minimum size of the premises for installation of the simulator	Min. (m^2)	8x6
Minimum height of the premises for installation of the simulator	Min. (m)	3
Readiness time after switching on	Max. (minutes)	15
Time of continuous work (with consecutive one hour break before resuming work)	(hours)	10
Nominal voltage, AC	(V)	380/220
Frequency	(Hz)	50± 0.4
Power	Max.(kW)	10
Operating temperature range	(°C)	+15 ... +25
relative humidity at temperature of +25°C	Max. (%)	80
Type of diagnoses system		Embedded
Record of the simulator service life		Available
Weight: net / gross	(kg)	4000 / 5000

BASIC CONFIGURATION OF A SIMULATOR

Work station simulator of Mi-24P Helicopter
Computation system
Visualization system
Instructor work station
Power cabinet
The delivery set includes: simulator, SPTA single set, Service documentation set, packing set

AIRCRAFT-SIMULATOR

KHA-32 "BEKAS"

MAIN PERFORMANCE DATA

Circuit voltage	V	220
Power consumption (max.)	kW	2
Number of staff (instructor)		1
Assigned service life of the simulator	hours	40 000
The frequency of scheduled maintenance work		once per 6 months

BASIC CONFIGURATION OF A SIMULATOR

Cockpit
Visualization system
Central computer system
Vibration and acoustic noise system
Instructor's console

Purpose:

- practicing of procedures for flight preparing and performing ,
- working out the actions of the crew of the Kha-32 «Bekas» aircraft in the event of an emergency,
- flight training in the instrument conditions,
- working out the pilot's interaction and air traffic control.

The simulator enables to fulfill the following missions:

- take-off, training circuit around the aerodrome, landing (according to Visual Flight Rules and IFR),
- en-route flight using the means of radio navigation (beacons NDB and VOR),
- route flight using the GPS navigator,
- all stages of flight under different weather conditions and time of day,
- failure insertions of equipment and aircraft system,
- working out of the crew's actions in abnormal, accident and emergency situations.

TRAINING SIMULATORS FOR HELICOPTERS

MI-8MTV, MI-171, MI-172, MI-24

Purpose:

- To carry out theoretical training of the flight and engineering staff for the study of the design of the helicopter, flight and technical operation manuals;
- To conduct education and training of crew members in the scope of their functional duties for flight preparation.

The simulator enables to fulfill the following missions:

- Preparation for launching, launching, testing of engines, checking the performance of helicopter systems and on-board equipment in accordance with checklists,
- Input and verification of aeronautical information, control, turns and U-turns, run-out and braking
- Climbing, cruise flight, descend and landing,
- Piloting day and night in any meteorological conditions,
- Flight on the route with the use of radio navigation equipment and visual orientation,
- Working out of the crew operations and piloting techniques in visual and adverse meteorological conditions, throughout the operating range of heights and flight speeds,
- Simulation of the operation of all the helicopter's instruments and onboard systems,
- Working out of the crew's operations in abnormal and emergency situations of flight, when errors occur in the technique of piloting, as well as in case of failures of aeronautical equipment in accordance with the RLE,
- Working out of the crew's actions during combat use of air weapons.

BASIC CONFIGURATION OF A SIMULATOR

Integrated flight simulator helicopter (according to classification EASA CS-FSTD(H) FFS of «D» level)
Post-flight analysis system
Procedural simulator of the helicopter
Specialized simulators of helicopter functional systems
Training stands for the construction of a helicopter
Automated learning system
Photo tablet
Mockups of real helicopter units and aggregates.

FIXED SIMULATOR OF HELICOPTER

MI-17

Purpose of the simulator:
To conduct practical training with the ability to simulate flight training in any situation, as close to real as possible and to work out such situations in flight.

BASIC CONFIGURATION OF A SIMULATOR

The staff cabin of a helicopter with real controls
Complex of simulators of instruments and cabin equipment
8-channel visualization system on LCD displays
Simulator of sound environment
Digital computational-modeling complex
Instructor working station with integrated post-flight analysis system
Ventilation and air conditioning systems

SIMULATOR FOR THE DRIVER OF THE DROP-SIDE TRUCK

URAL

Purpose:
Education and training of drivers of the drop-side trucks in the conditions of the classroom in order to form and maintain stable driving skills of the truck in various conditions.

The simulator enables to fulfill the following missions:

- individual training of drivers:
  - driving in column,
  - driving in difficult road conditions,
- Workout of driving exercises in various conditions (moderately rugged terrain, mountainous and desert terrain, day and night, summer and winter, in various weather conditions),
- Provision of training principle “form simple to complex”, implementation of individual approach for training, provision of continuous instruction and training of drivers,
- Organizational and methodological interconnection of exercises and trainings on simulators with practical driving exercises on the motor-racing track and in the city,
- Fairness of assessment of training ability level of every driver of the unit, defining the dynamics of the level of driving skills in different conditions,
- Manageability of the instruction and training process, high intensity of training,
- Decrease of training formalities, approximation of training conditions to the real ones.

BASIC CONFIGURATION OF A SIMULATOR

Cabin simulators on dynamic platform

Working station of the instructor

MAIN PERFORMANCE DATA

Minimum area of premises	m²	20
Type of premises	-	Classroom
Readiness to work once the device is turned on	min	Max. 5
Continuous operation period	hrs.	Min. 12
Power supply: Voltage	V	220±10%
Frequency	Hz	50±1
Maximum power consumption	kW	8
Average power consumption	kW	4
Increased operating and limiting temperature	°C	Up to +35
Reduced operating temperature	°C	Up to +5
Relative humidity at T = + 25 °C	%	Up to 80
Diagnoses system	-	Built-in semi-automatic
Mean time between failures	hrs.	Min. 300
Switching on and off control	-	From the instructor’s working station
Spare parts kit	-	Individual and group (for 10 simulators)
Maintenance	-	Control check, daily maintenance, first maintenance (once per 6 months), second maintenance (once per year)
Operational fluids		Synthetic oil in the dynamic platform motor reducer
Electrical safety of trainees and staff	-	Elimination of unsafe voltage on the operator's working station (+24V DC is applied). Short circuit protection
Account of an operating time of a training simulator		Software hour-meter
Weight of the simulator in assembly, max.	kg	1400
Operating documentation	-	Log book, operating manual, instructions for installation and setup on site for the use of the simulator for the intended purpose, a list of spare parts kit

INTEGRATED SIMULATOR FOR ARMORED PERSONNEL CARRIER CREW

BTR-80

Purpose of the simulator:
It is designed for solving tasks of the combat training program of units armed with BTR-80.

The simulator enables to fulfill the following missions:

- individual training of crew members: studying of BTR-80 arrangement and operations procedure at preparation of weapons and equipment for intended use, formation of target reconnaissance skills, firing from BTR-80 armament day and night, in various weather conditions and on different terrains,
- training of driver mechanics of APC driving in full of Combat vehicle driving course,
- crew weapons training in full of Firing course, APC crew coordination,
- tactical training and crew combat coordination in conditions close to the combat ones including conditions of two-sided battle,
- preparation of mechanized units to tactical training and field exercises with use of 3D digital models of terrain areas where exercise conducting is planned.

Basic configuration of the simulator consists of the following:

- Simulator of the combat compartment (simulator of control compartment of the armored personnel carrier and BPU-1 turret machine gun-mount simulator,
- Dynamic 3-stage platform,
- Working station of the instructor.

INTEGRATED SIMULATORS FOR CREW

BMP-2

Purpose of the simulator:
Education and training of driver-mechanics how to drive and overcome obstacles in different conditions on various terrains.

Basic configuration of the simulator consists of the following:

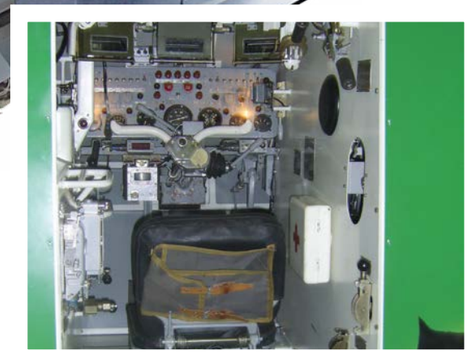
- Simulator of the BMP-2 control compartment on 6-stage dynamic platform
- Simulator of the BMP-2combat compartment

MAIN TECHNICAL CHARACTERISTICS OF THE SIMULATOR

Parameter name	Unit of measure	Value
Number of simultaneous trainees	-	3 (driver-mechanics, gunner, commander)
Minimum area of premises	m^2	30
Readiness to work once the device is turned on	min	Max. 5
Transmitter pulse power	4 kW	1 kW
Continuous operation period	Hrs.	Min. 12
Power supply: Voltage	V	220±10%
Frequency	Hz	50±1
Maximum power consumption	kW	30
Operating temperatures	degrees C	from +5 to +40
Diagnoses system	-	Built-in semi-automatic
Size of the three-dimensional model of tank-training ground	km	2x4
Size of the three-dimensional model of the directrix	km	4x4
Size of the tactical field	km	4x4
Number of terrain types		3 (lowland, desert, mountainous)
Evaluation of the actions of trainees		Automated, in accordance with the indicators and criteria of the Driving Course
Conditions of exercise		Day, night, winter, summer, dust storm, fog, various ranges of optical visibility, temperature range from -20 deg. to +50 deg.
Ability to enter faults and failures of BMP-2		Faults and failures regime was introduced from the working station of the instructor
Mean time between failures	Hrs.	Min. 500
Assigned service life	years	Min. 8
Warranty period	years	1

MAIN CHARACTERISTICS OF DYNAMIC PLATFORM

Parameter	Value
Type of electric drive motors	Asynchronous with short-circuited rotor
Type of reduction gear	worm
Drive motor control	Frequency as per the velocity and as per the position of reducer output shaft
Pitch angle	+/- 20 degrees
Pitch angle	+/- 20 degrees
Vertical movement	+/- 100 mm from intermediate position
Angular movement around the vertical axis	+/- 30 deg. from “zero” position
Axial displacement value	+/- 300 mm from intermediate position
Transverse displacement value	+/- 300 mm from intermediate position
Angular velocity of axis motion	0-20 degrees /s
Accuracy of control signals drill	<0,2 degrees as per the angles
Consumed power (average)	4,5 kW



CREW TRAINING INTEGRATED SIMULATOR

BMP-2

The BMP-2 infantry fighting vehicle crew training integrated simulator (hereinafter referred to as the simulator) is intended for efficient training and for practising the interaction of the BMP-2 infantry fighting vehicle crew (commander, gunner, and driver) in the process of combat training in mechanised infantry units.

SIMULATORS

The composition of the equipment and its location in the simulators of the combat compartment and driving compartment correspond to the stations of the vehicle commander, gunner and the driver.

The BMP-2 infantry fighting vehicle crew training integrated simulator provides for training of the following types of missions:

a) at individual training of the driver:
- study of general equipment, location of the driving compartment instruments and control units;
- training in the use of the controls;
- drilling for start-up preparation and start-up of the engine, in summer and winter;
- drilling for methods of standing start, gear shifting, turns, all kinds of braking;
- drilling for techniques to overcome natural and artificial obstacles;
- execution of preparatory exercises and training exercises on three-dimensional models of training areas;
- driving in any area of the three-dimensional model of the training area with the choice of appropriate engine modes operation.

b) at individual training of the gunner:
- preparation of the firing unit for firing;
- preparation of the firing control system for operation;
- reconnaissance, detection and recognition of targets during the day and night under all climatic conditions;
- firing at day and night.

c) at individual training of the commander:
- preparation of the firing control system for operation;
- reconnaissance, detection and recognition of targets during the day and night under all climatic conditions;
- target designation and preparation of data for firing and receipt of the firing results during the day and night.

d) at complex training of the infantry fighting vehicle crew:
- drilling for joint combat operation of the crew during the organization of defense, offensive, performance exercises for reconnaissance of targets by observation, definition of range and target designation.

TECHNICAL CHARACTERISTICS

Name of the parameter	Units	Value
Ambient operating temperature range	^{0}C	+5…+35
Boundary ambient temperature during storage and transportation	^{0}C	-25... + 40
Average (peak) consumed power, from AC mains 380V/50Hz and 220V/50Hz	kW	12
Relative humidity at temperature of +25°C without condensate formation	%	80
Maximum continuous operation time	h.	4
Duration of the required break in operation	h.	1
Weight	kg.	4000
Under-warranty operation time	year	1

DESIGN OF THE SIMULATOR

Name of the component	Number, pieces
Driving compartment simulator installed on the motion system (dynamic platform)	1
Fighting compartment simulator installed on the motion system (dynamic platform)	1
Instructor's workstation (RMI)	1
Stabilised power supply device	1
SPTA kit	1
Set of service documentation (user's guide, SPTA guide, passport)	1

SIMULATOR OF THE DRIVER-MECHANICS

T-72

Purpose of the simulator:
Education and training of driver-mechanics how to drive and overcome obstacles in different conditions on various terrains.

The simulator enables to fulfill the following missions:

- To work out training tasks for fire training in various conditions (moderately rugged terrain, mountainous, marshy and desert terrain, in day and night conditions, winter and summer, in various weather conditions),
- To ensure the main stages of combat training: individual training and training as part of crew
- Joint fire and tactical training of tank crews (also in conditions of fire counteraction of the enemy),
- Education and training of driver-mechanics: implementation of the full list of exercises for the driving combat vehicles course (KVBM) with automatic assessment of the actions of trainees.

Basic configuration of the simulator consists of the following:

- Simulator of the tank control compartment on dynamic platform,
- Simulator of the tank combat compartment on dynamic platform,
- Working station of the instructor.

MAIN PERFORMANCE DATA

Number of simultaneous trainees	-	3 (driver-mechanics, gunner, commander)
Minimum area of premises	m^2	30
Type of premises	-	Classroom
Readiness to work once the device is turned on	min	Max. 5
Continuous operation period	hrs.	Min. 12
Power supply: Voltage	V	220±10%
Frequency	Hz	50±1
Maximum power consumption	kW	30
Average power consumption	kW	14
Operating temperatures	degrees C	from +5 to +4
Diagnoses system	-	Built-in semi-automatic
Size of the three-dimensional model of tank-training ground	km	2x4
Size of the three-dimensional model of the directrix	km	2x4
Size of the tactical field	km	4x4
Number of terrain types	-	3 (lowland, desert, mountainous)
Evaluation of the actions of trainees		Automated, in accordance with the indicators and criteria of the Driving Course
Conditions of exercise		Day, night, winter, summer, dust storm, fog, various ranges of optical visibility, temperature range from -20 deg. to +50 deg.
Ability to enter faults and failures of tank equipment		Faults and failures regime was introduced from the working station of the instructor
Mean time between failures	hrs.	Min. 500
Assigned service life	years	8
Warranty period	years	1

OPERATOR TRAINING SIMULATOR FOR ANTITANK WEAPONS SYSTEM

FAGOT

Purpose of the Simulator:
The simulator is designed for education and training of operators of antitank guided missile “Konkurs” in conditions similar to the modern combat conditions with the purpose to form and maintain their stable skills of detection and tracking ground targets, choosing right time for guided missile launch, ATGM launch and targeting and firing effect evaluation.

The simulator enables to fulfill the following missions:

- Education and training of ATGM operators: single operator training,
- Conducting battlefield reconnaissance in the normal sector, detection and identification of targets, determination of trajectory parameters and current range, prioritization of targets according to the degree of danger, choice of target for firing,
- Tracking the target on its move, determination the launching time of the missile; tracking the target during the flight of the missile; monitoring the results of the firing,
- Joint training of operators with unit commanders (who monitor the battlefield and set the task for the operator to fire on a specific target) in order to work out the interaction during the combat.

Basic configuration of the simulator consists of the following:

- Hardware Simulator Complex,
- Operator’s Working Station,
- Instructor’s Working Station.

MAIN PERFORMANCE DATA

Minimum area of premises	m^2	15
Type of premises	-	Classroom
Readiness to work once the device is turned on	min	Max. 5
Continuous operation period	hour	Min. 12
Power supply: Voltage	V	220±10%
Frequency	Hz	50±1
Maximum power consumption	kW	1,5
Increased operating and limiting temperature	°C	Up to +35
Reduced operating temperature	°C	Up to +5
Relative humidity at T = + 25 ° C	%	Up to 80
Diagnoses system	-	Built-in semi-automatic
Mean time between failures	hrs.	Min. 500
Switching on and off control	—	From the instructor’s working station
Maintenance	—	Control check, daily maintenance, first maintenance (once per 6 months), second maintenance (once per year)
Electrical safety of trainees and staff	—	Elimination of unsafe voltage on the operator’s working station (+24V DC is applied). Short circuit protection
Account of an operating time of a training simulator		Software hour-meter
Weight of the simulator in assembly	kg	170
Operating documentation	—	Log book, operating manual, instructions for installation and setup on site for the use of the simulator for the intended purpose, a list of spare parts kit
Warranty period	years	1

SIMULATOR FOR THE GUNNER OF PORTABLE ANTI-AIRCRAFT DEFENSE MISSILE SYSTEM

IGLA

Purpose of the simulator:
The simulator provides visual intelligence taking into account optical visibility, range and type of targets, weather conditions, time of day, carrying out min. 90% of the anti-aircraft gunner's actions.

The simulator enables to fulfill the following missions:

- carrying out visual reconnaissance in various visibility conditions,
- performing firing exercises in various conditions (moderately rugged terrain, mountain and desert terrain, day and night conditions, winter and summer, various weather conditions),
- performing firing exercises using various modes of operation of the system, at the head-on and pursuit courses, on maneuvering and non-maneuvering targets,
- training of combat skills in the whole range of conditions of the air and noise situation.

Basic configuration of the simulator consists of the following:

- Working station of anti-aircraft gunner,
- Working station of the instructor,
- Spare parts kit,
- Operating documents,
- Transportation packing.

MAIN PERFORMANCE DATA

Minimum area of premises	m^2	15
Type of premises	-	Classroom
Readiness to work once the device is turned on	min	Max. 5
Continuous operation period	hrs.	Min. 12
Power supply: Voltage	V	220±10%
Frequency	Hz	50±1
Maximum power consumption	kW	1,5
Increased operating and limiting temperature	°C	Up to +50
Reduced operating temperature	°C	Up to +5
Relative humidity at T = + 25 ° C	%	Up to 80
Diagnoses system	-	Built-in semi-automatic
Mean time between failures	hrs.	Min. 300
Switching on and off control	-	From the instructor's working station
Spare parts kit	-	Individual and group (for 4 simulators)
Maintenance	-	Control check, daily maintenance, first maintenance (once per 6 months), second maintenance (once per year)
Electrical safety of trainees and staff	--	Elimination of unsafe voltage on the operator's working station (+24V DC is applied). Short circuit protection
Account of an operating time of a training simulator		Software hour-meter
Weight of the simulator in assembly, max.	kg	130
Operating documentation	-	Log book, operating manual, instructions for installation and setup on site for the use of the simulator for the intended purpose, a list of spare parts kit

OPERATOR TRAINING SIMULATOR FOR ATGM

STRILA-10

Purpose of the simulator:
Education and training of combat vehicles operators, the formation and consolidation of sustainable skills in visual intelligence and identification of air targets, determination of distance to targets, preparation for firing, selection of the firing mode, determination of the moment of launch, observation of the results of firing under various conditions of the background target situation, day and night, from rest, on the move and afloat in the conditions of the classroom.

Basic configuration of the simulator consists of the following:

- Turret simulator,
- One-stage platform,
- Instructor's working station.

MAIN PERFORMANCE DATA

Minimum area of premises	m^2	15
Type of premises	-	Classroom
Readiness to work once the device is turned on	Min	Max. 5
Continuous operation period	hrs.	Min. 12
Power supply: Voltage	V	220±10%
Frequency	Hz	50±1
Maximum power consumption	kW	3,5
Increased operating and limiting temperature	oC	Up to +35
Reduced operating temperature	oC	Up to +5
Relative humidity at T = + 25 ° C	%	Up to 80
Diagnoses system	-	Built-in semi-automatic
Mean time between failures	hrs.	Min. 500
Switching on and off control	-	From the instructor's working station
Spare parts kit	-	Individual and group (for 4 simulators)
Maintenance	-	Control check, daily maintenance, first maintenance (once per 6 months), second maintenance (once per year)
Operational fluids		Synthetic oil in the dynamic platform motor reducer
Electrical safety of trainees and staff	--	Elimination of unsafe voltage on the operator's working station (+24V DC is applied). Short circuit protection
Account of an operating time of a training simulator		Software hour-meter
Weight of the simulator in assembly, max.	kg	130
Operating documentation	-	Log book, operating manual, instructions for installation and setup on site for the use of the simulator for the intended purpose, a list of spare parts kit

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