UKROBORONPROM

Ukrainian Defence Industry

LUCH

STATE KYIV DESIGN BUREAU

I am happy to welcome you on the pages of this brochure which is prepared especially for wide range of specialists to introduce the information with potentialities of STATE ENTERPRISE "STATE KYIV DESIGN BUREAU "LUCH".

For years of its existing, the Enterprise has worked its way up from development of the first USSR automatic test systems for air armaments to modern air and antitank defense technologies.

I hope that the brochure information would promote the establishment and development of mutually beneficial cooperation with our Enterprise.

Yours sincerely,

General Designer -
Director General
SE "SKDB "LUCH"

OLEG KOROSTELOV

ABOUT ENTERPRISE

STATE ENTERPRISE "STATE KYIV DESIGN BUREAU "LUCH" is a Principal Enterprise in Ukraine in the field of development, upgrading, repair and overhaul-period renewal of weapon and military equipment.

The Enterprise was found in **1965** as the main developer of control and fault diagnostic automated system for special-purpose aircraft equipment.

Talented scientists, qualified engineers, highly skilled workers and technicians work at SE "SKDB "LUCH".

The Enterprise is certificated in accordance to **ISO 9001** standard requirements to quality management system certification. It has modern scientific laboratories and own production base.




MAIN ACTIVITIES

It performs scientific research and engineering works for development, repair, upgrading and overhaul-period renewal of:

- ground and air based antitank missile systems;
- air-launched guided missiles, antiaircraft guided missiles and antiaircraft guided missile systems;
- multiple launch rocket systems;
- aerodynamic missiles and ground, sea and air based missile systems;
- simulators of antitank missile system;
- telemetric on-board and ground based equipment for missile system control;
- automated control and diagnostic systems of guided weapon.

In cooperation with Ukrainian enterprises it carries out captive manufacture of:

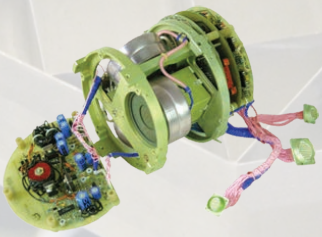
- antitank guided missiles and missile systems;
- ground, air and naval based antitank missile systems;
- automated control and diagnostic systems of guided weapon;
- units of electric control actuators for air-launched, antiaircraft and antitank missiles and naval torpedoes;
- simulators and telemetric systems of missile systems.

CONTROL SYSTEMS AND SERVO ELECTRIC CONTROL SURFACE ACTUATORS

SE "SKDB "LUCH" develops and manufactures control systems and servo electric control surface actuators of high-precision weapon for:

- antitank guided missiles;
- air-launched guided missiles;
- corrected air bombs;
- short-range and medium-range antiaircraft guided missiles;
- naval torpedoes.

CONTROL SYSTEM



Control systems can be single-channel, dual-channel and three-channel. They have changeable adaptive structure and ensure high guidance accuracy. Executive control elements: aerodynamic control surfaces, gas-dynamic control surfaces and combined control elements as well.

MAIN SPECIFICATIONS OF ELECTRIC CONTROL SURFACE ACTUATORS	
Maximum torque on control surfaces, N•m	from 1,2 to 150,0
Range of reproduced frequencies of control surfaces oscillations, Hz	up to 35
Angular rate of turn of control surfaces, ...°/s	up to 2000
Weight of electric control surface actuators units, kg	from 1 to 25
Outer diameter (caliber), mm	from 100 to 400

The Enterprise produces and delivers control systems and control surfaces sections of electric actuators with the following specifications:

No. of control surface actuator	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Maximum torque on control surfaces, N•m	50	150	30	30	30	2	1,5	1,5	1,2
Range of reproduced frequencies of control surface oscillations, Hz	10	20	20	25	35	25	25	25	25
Range of operating angles, ...°	±22	±30	±20	±36	±30	±20	±20	±20	±18
Angular rate of turn of control surfaces, ...°/s	250	360	150	350	450	2000	2000	2000	2000
Outer diameter (caliber), mm	400	360	277_{max}	200	170	125	120	108	100
Length, mm	244	400	297	180	300	110	75	70	121
Weight, kg	25*	26**	21*	7,6*	10*	1*	1,1*	1,05*	1,2**
Type of executive element (control surface)	***	***	***	****	*****	***	***	***	***

* Including weight of control surfaces. ** Without weight of control surfaces. *** Plane. **** Lattice. ***** Plane and gas-dynamic.

GURT-M

general-purpose system of missile preparation for application

SE "SKDB "LUCH" supplies "**GURT-M**" system instead of "**GURT**" system which has been manufactured **since 1984** and delivered to more than 40 countries all over the world.

Upgraded "GURT-M" system ensures:

- control and preparation for application of more than 50 various modifications of air-launched missiles and corrected air-launched bombs;
- missile outgoing inspection at manufacturing plants;
- failure diagnosis while missiles repairing;
- forecast of missiles technical state while prolonging their service life.

"GURT-M" system advantages:

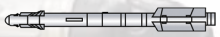
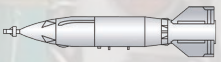
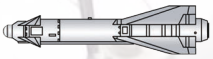
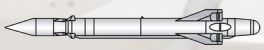
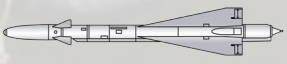
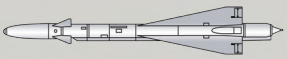
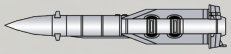
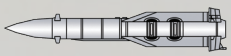
- dimensions and weight of AKPA are reduced;
- characteristics of operational reliability are improved;
- modern methods of visualization and documenting of the test results are introduced. The usage of the modern industrial computer allows to document the results in various languages and also to correct the check routines while in operation;
- long-term storage of results of missiles testing for the whole operation period is provided that allows to forecast their technical state while prolonging their service life;
- power supply systems, created on the basis of static transducers of improved comfort (low-energy, noiseless in operation, convenient in maintenance), are applied in AKPA6.2M;
- the specialized equipment kit could be delivered with diagnostic equipment kits (KDO) besides AKPA. *They help to localize failures in missiles for their repairing. The missiles for which KDO are designed are marked with red.*

***SE "SKDB "LUCH"* carries out following list of services for the system:**

- delivery of "**GURT-M**" system in any kitting-up;
- upgrading of "**GURT**" system that is in operation into "**GURT-M**" system. Upgrading is carried out by additional equipment kit delivery;
- prolongation of the assigned service life;
- delivery and repair of the spare parts.

MEANS OF AUTOMATIC CONTROL

SPECIAL-PURPOSE EQUIPMENT

 Kh-59, Kh-59M, Kh-59ME	 AKPA2.9M
 R-73K, R-73L, R-73E, U-73	 AKPA2.13M (KDO)
 KAB-500L, KAB-500L-K, KAB-500OD, KAB-500Kr, KAB-500Kr-U, KAB-1500L-F, KAB-1500L-Pr, KAB-1500Kr	 AKPA2.20M (KDO)
 R-27R1, R-27ER1, R-27T1, R-27ET1, R-27P, R-27EP, 470UT-RT, 470UT-ERT	 AKPA2.21M (KDO)
 Kh-29T, IKh-29T, Kh-29TD, IKh-29TD, Kh-29L, IKh-29L, S-25L, S-25LD	 AKPA6.4M (KDO)
 Kh-31A, Kh-31A-UD	 AKPA6.7 (KDO)
 R-60M, R-60MK	 AKPA6.11M (KDO)
 Kh-31P (with L-111), Kh-31P (with L-112), Kh-31P (with L-113), Kh-31P-UL (with L-111), Kh-31P-UL (with L-112), Kh-31P-UL (with L-113)	 AKPA6.17
 Kh-25MP (with LO77M), Kh-25MP (with LO15M1), Kh-25ML (with 24N1), Kh-25MR (with B500), Kh-25MU (with LO77M), Kh-25MU (with LO15M1), Kh-25MU (with 24N1)	 AKPA6.18 (KDO)
 R-40T, UR-40T	 AKPA6.30
 R-40TD, R-40RD, R-40TD1, R-40RD1, UR-40TD, UR-40RD	 AKPA6.31
 R-33	 AKPA6.32
 R-33S	 AKPA6.33

MULTY-PURPOSE CONTROL MEANS

AKPA6.1M-05

AKPA6.2M (AKPA6.2)

MAINTENANCE FACILITIES

MANUFACTURING EQUIPMENT

Manufacturing equipment kit No.1 MS-14610G 

Multi-purpose kit MS-14603G 

Special kits for specific type of AKPA 

AGGREGATES OF COMMON APPLICATION

TRUCK TRACTOR

CARGO-PASSENGER VEHICLE

TRUCK CRANE

GAS-DISCHARGE STATION

AIR COMPRESSOR STATION

ELECTRIC POWER STATION

SKIF

man portable antitank missile system

"SKIF" man portable antitank missile system is designed to destroy manpower and stationary and mobile modern armored targets with combined, carried or monolithic armor including ERA (explosive reactive armor) and also pinpoint targets like weapon emplacements, lightly armored objects and hovered helicopters at any time of day or night.

The system's feature lies in its possibility to aim the missiles at a target from closed emplacements and shelters that reduces the risk of the gunner destruction by reply fire attack of the enemy as well as target tracking in automatic mode, which provides automatic control of the missile flight in the laser beam without participation of the gunner.

The system is completed with **130 mm** and **152 mm** caliber missiles in Transport and Launching Containers with tandem hollow-charge (RK-2S, RK-2M-K) and high-explosive fragmentation (RK-2OF, RK-2M-OF) warheads.

"**SKIF**" man portable antitank missile system with **RK-2M** missile

152	1000	104	5100
missile caliber, mm	armor penetration, mm	system weight, kg	range of fire, m

"**SKIF**" man portable antitank missile system with **RK-2S** missile

130	800	97	5000
missile caliber, mm	armor penetration, mm	system weight, kg	range of fire, m

	RK-2S, RK-2OF MISSILES	RK-2M-K, RK-2M-OF MISSILES
Firing range, m:		
- at daytime	100-5000	100-5100
- at night time	100-3000	100-3000
Missile guidance system	by laser beam with target tracking in TV or thermal imaging channels in manual or auto mode	
Warhead:		
- tandem hollow-charge, armor penetration behind ERA, mm	not less than 800	not less than 1000
- high-explosive fragmentation with EFP:		
- armor penetration, mm	not less than 60	not less than 120
- number of fragment, pcs.	not less than 600	not less than 1000
Weight, kg		
- Missile in container	30	37
- Launcher	38,2	38,2
- Remote-Control Panel	14	14
- Guidance Device	15	15
- Thermal Imager	4,1	4,1
Overall dimensions, mm:		
- missile caliber	130	152
- container length	1360	1435
- container outer diameter	140	162
Operating temperature range, °C	from minus 40 to +60	

* - Explosively Formed Penetrator,

BAR'ER

vehicle-carried antitank missile system

130
missile caliber, mm

800
armor penetration, mm

5000
range of fire, m

"**BAR'ER**" **vehicle-carried antitank missile system** is mounted on a turret of a combat vehicle like ***ICV*** or ***APC*** and is designed to destroy stationary and moving armored targets with combined, carried or monolithic armor, including explosive reactive armor (ERA), as well as pinpoint targets such as permanent fire positions, light-armored objects and helicopters.

Range of fire, m	100-5000
Guidance system	semi-automatic by laser beam
Warhead of missile:	
- tandem hollow-charge, armor penetration behind ERA, mm	not less than 800
- high-explosive fragmentation with explosively formed penetrator, armor penetration, mm	not less than 60
Weight, kg:	
- missile in container	29,5
- guidance device	14,6
Overall dimensions, mm:	
- missile caliber	130
- container length	1360
- container outer diameter	140
Operating temperature range, °C	from minus 40 to +60

BAR'ER-V

helicopter antitank missile system

130	800	7500
missile caliber, mm	armor penetration, mm	range of fire, m

"BAR'ER-V" helicopter antitank missile system is intended for modernization of ***Mi-8, Mi-17, Mi-35 and Mi-24*** helicopters.

The system is designed to destroy stationary and moving modern armored targets with combined, carried or monolithic armor, including ERA (explosive reactive armor) as well as pinpoint targets such as weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum firing range, m	7500
Guidance system	by laser beam with target tracking in manual and automatic mode
Stabilization system of optical and aiming station	two-planed gyro-stabilized platform
Warhead:	
- tandem hollow charge with armor penetration behind explosive reactive armor, mm	not less than 800
- high-explosive fragmentation with number of fragments of 2-3g weight, pcs	up to 900
Weight of missile in container, kg	47
Overall dimensions, mm:	
- missile calibre	130
- container length	1917
- container outer diameter	140
Operating temperature range, °C	from minus 40 to +60

CORSAR

light portable missile system

"**CORSAR**" **light portable missile system** is intended to destroy stationary and moving armored targets and other objects with combined, carried or monolithic armor, including explosive reactive armor (ERA), as well as pinpoint targets such as weapon emplacements, light-armored objects and helicopters.
Firing can be carried out from the mount as well as from a trench parapet.
System is completed with missiles in transport and launching containers with tandem hollow-charge (RK-3K) and high-explosive fragmentation (RK-3OF) warheads.
The system provides carrying out of firing from prepared and unprepared positions, using the Mount and without it as in day and night time with the use thermal Imager.

Maximum range of fire, m	2500
Guidance system - semi-automatic by laser beam	
Warhead of missile:	
- tandem hollow-charge, armor penetration behind ERA, mm	not less than 550
- high-explosive fragmentation with explosively formed penetrator, armor penetration, mm	not less than 50
Weight, kg:	
- launcher with thermal imager	12
- mount	8,3
- missile in container	15,5
Overall dimensions, mm:	
- missile caliber	107
- container length	1180
- container outer diameter	113
Operating temperature range, °C	from minus 40 to +60

PORTABLE ROCKET GRENADE LAUNCHER

107	50	20	800
grenade caliber, mm	armor penetration, mm	system weight, kg	range of fire, m

Portable rocket grenade launcher is designed to destroy lightly-armored and unarmored equipment (launchers, radars, parked aircrafts, cars and etc.), field-type constructions (permanent fire positions, earth-and-timber emplacements), as well as personnel located outdoor, in shelters, in stone, brick or concrete buildings and constructions.

Electro optical sight mounted on the launcher contains a kit of detectors that ensure consideration of factors, significantly influencing accuracy of fire such as wind velocity, environmental temperature, range and velocity of a target.

The grenade launcher processor unit automatically inputs ballistic corrections and adjusts the aiming mark positioning that ensures accuracy at maximum range of fire.

Maximum range of fire, m	800
Minimum range of fire, m	70
Direct fire range, m	up to 500
Warhead of grenade	thermobaric, HE fragmentation
Grenade in container weight, kg	11,4
Overall dimensions, mm:	
- grenade caliber	107
- container length	1678
- container outer diameter	115
Operating temperature range, °C	from minus 40 to +60

SARMAT

system

107	550	2500
missile caliber, mm	armor penetration, mm	range of fire, m

SARMAT system is designed to equip a wide range of combat vehicles, light ships and coast guard motorboats.

It is used to hit stationary and moving armored targets that have combined, carried or monolithic armor, including explosive reactive armor, as well as pinpoint targets like permanent fire positions, tank in a trench, lightly armored objects, hovered helicopters, waterborne targets and manpower of enemy at any time of day or night.

SARMAT system comprises:

- combat module consisting of:
  - rotating platform with launching rails for missiles,
  - power unit,
  - guidance device,
  - thermal imager.
- two guided missiles RK-3 in transport and launching containers;
- machine gun;
- remote control panel.

COMBAT MODULE	
Weight of combat module with armament, kg	not more than 420
Overall dimensions with armaments, mm	2120x1300x610
Maximum azimuth slew rate, °/c	5
Maximum elevation slew rate, °/c	5
Guidance angles, …°: - horizontally - vertically	 ± 360 from minus 8 to +40
Readiness time, min	3
Operating temperature range, °C	from minus 40 to +50
GUIDED MISSILE RK-3	
Range of fire, m	2500
Guidance system - by laser beam with target tracking in automatic mode	
Warhead type	- tandem hollow-charge, - HE fragmentation - thermobaric
Weight of missile in container, kg	15,4
Overall dimensions, mm: - missile caliber - container length - container outer diameter	 107 1180 113
MACHINE GUN KT-12,7	
Sighting range of fire, m	2000
Caliber, mm	12,7
Weight, kg	25

AMULET

missile system

130/152	800/900	2500
missile caliber, mm	armor penetration, mm	range of fire, m

AMULET universal missile system is designed to equip a wide range of combat vehicles.

System is equipped with the Thermal imager in order to be effectively used in night time under difficult metrological conditions.

It is used to hit static and moving modern armored targets that have combined, spaced or monolithic armor, including explosive reactive armor (ERA), as well as pinpoint targets like permanent fire positions, tank in a trench, lightly armored objects, hovered helicopters, waterborne targets and manpower of enemy at any time of day or night.

AMULET system comprises:

- Combat module consisting of:
  - Rotating platform with launching rails for missiles,
  - Guidance device,
  - Thermal imager;
- Power control box;
- Power module;
- Two guided RK-2S or RK-2M missiles in transport and launching containers;
- Remote control panel.

COMBAT MODULE		
Weight of combat module with armament, kg	385	
Overall dimensions with armament, mm	1440x755x790	
Maximum azimuth steering rate, °/s	5	
Maximum elevation steering rate, °/s	5	
Guidance angles, …°: - horizontally - vertically	 ± 360 from minus 9 to +25	
Readiness time, min	3	
Operating temperature range, °C	from minus 32 to +50	
GUIDED MISSILES	**RK-2S**	**RK-2M**
Range of fire, m	5000	
Guidance system	semi-automatic by laser beam	
Warhead: - tandem hollow-charge, armor penetration behind ERA, mm - high-explosive fragmentation with EFP, armor penetration, mm	 not less than 800 not less than 50	 not less than 900 not less than 150
Weight, kg: - Missile in transport and launching container - Warhead	 30 6,7	 37 9,2
Overall dimensions, mm: - missile caliber - container length - container outer diameter	 130 1360 140	 152 1435 162

BAR'ER-S

543 ANTITANK MISSILE SYSTEM

"Bar'er-S" 543 antitank missile system is designed to modernize the 9P149 combat vehicle ("Shturm-S").
"Bar'er-S" 543 antitank missile system as a part of the modernized 9P149 combat vehicle, is intended to destroy modern armored targets with combined, carried or monolithic armor especially with explosive reactive armor (ERA), as well as small targets such as permanent fire positions, light-armored objects and hovering helicopters at any time of day or night.

Maximum firing range, m	6000
Guidance system	by laser beam with target tracking in manual and automatic modes
Stabilization system of optical aiming guidance station	two-planed gyro-stabilized platform
Television channel:	
- narrow field of view	1,75° x 1°
- medium field of view	6° x 3,33°
- wide field of view	23° x 13,5°
Thermal imaging channel:	
- narrow field of view	1,8° x 1,44°
- medium field of view	6° x 4,8°
- wide field of view	12,5° x 10°
Guided missiles	RK-2P, RK-2POF
Warhead:	
- tandem hollow-charge with armor penetration behind ERA, mm	not less than 800
- high-explosive fragmentation with number of fragments of 2-3 g weight, pcs.	up to 900
Operating temperature range, °C	from minus 40 to +60

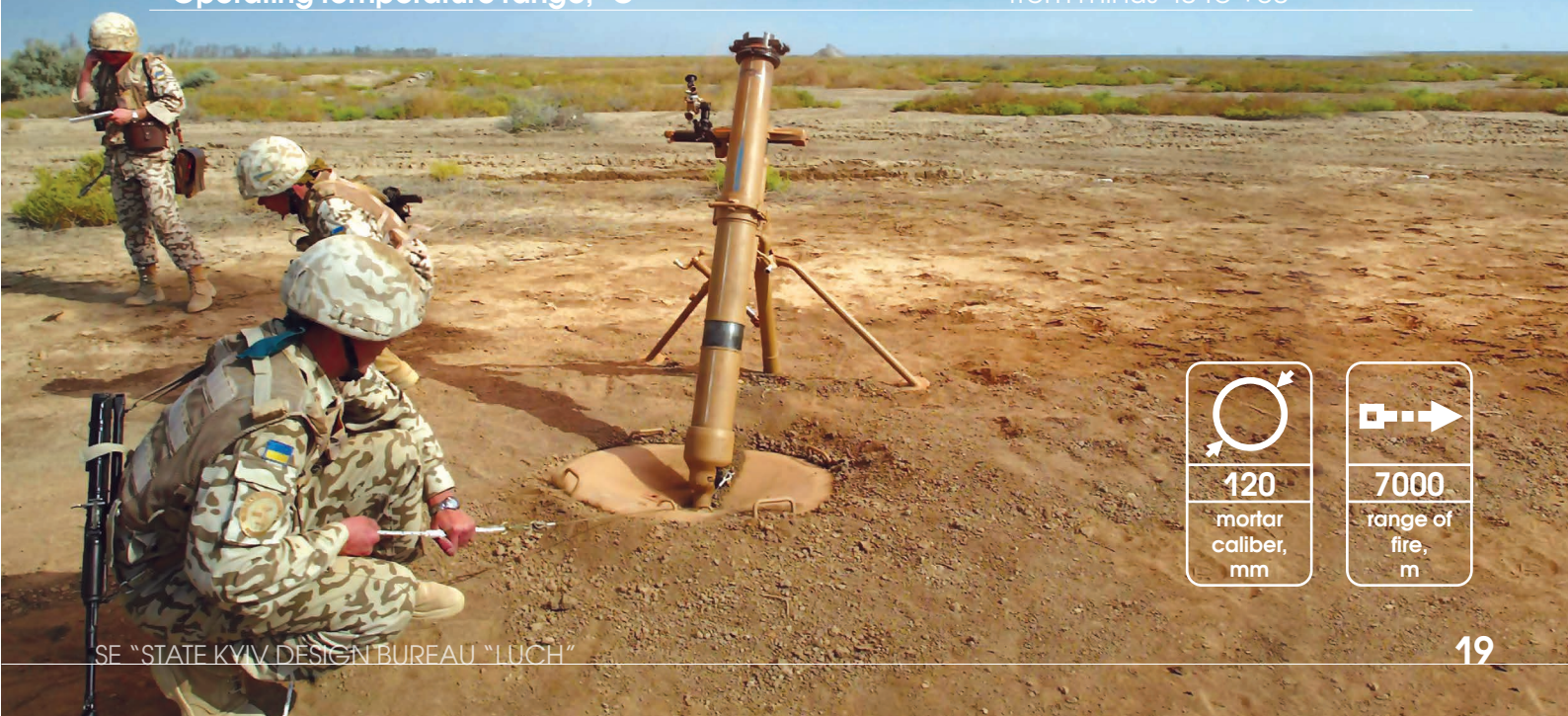
GUIDED MORTAR ARMAMENT SYSTEM

Guided mortar armament system comprising 120 mm high-precision guided mine designed for combat use from ***2B11 mortar*** is designed to destroy armored and unarmored, moving and stationary equipment as well as pinpoint engineering constructions.

The system includes:

- 120 mm high-precision guided mine;
- laser target designator and ranger that ensures targets detection, observation and identification on location, their spherical coordinates measurement (range, position and elevation angles) and designation by method of laser illumination of the target;
- fire synchronization system that provides "fire" command transmission for automatic powering-on of the laser target designator and ranger illumination mode with a specified delay;
- installable device that provides flight task input into the guided mine control system;
- radio stations that ensure digital and vocal connection between the observation station and the firing post.

Range of fire, m	from 1200 up to 7000
Mine control system (on the terminal part of the trajectory)	laser semi-automatic homing
Target hit probability	0,75 - 0,80
Guided mine caliber, mm	120
Guided mine weight, kg	15
Guided mine length, mm	804
Warhead type of mine	high-explosive fragmentation
Operating temperature range, °C	from minus 40 to +60



STUGNA

round comprising antitank guided missile

100	550	5000
missile caliber, mm	armor penetration, mm	range of fire, m

"STUGNA" round comprising antitank guided missile is intended to destroy, while firing from ***tank T-55*** or ***artillery gun MT-12***, stationary and moving armored targets with combined, carried or monolithic armor, including explosive reactive armor (ERA), as well as pinpoint targets like weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum range of fire, m	5000
Guidance system	semi-automatic by laser beam
Warhead of round:	
- type	tandem hollow-charge
- armor penetration behind ERA, mm	not less than 550
Weight of round, kg	not more than 24,5
Overall dimensions, mm:	
- missile caliber	100
- round length	1196
Operating temperature range, °C	from minus 40 to +60

ROUND COMPRISING ANTITANK GUIDED MISSILE of 90 mm caliber

90	550	4000
missile caliber, mm	armor penetration, mm	range of fire, m

Round comprising antitank guided missile of 90 mm caliber is intended for firing from ***LCTS90 weapon system gun*** against stationary and moving armored targets with combined, carried or monolithic armor, including explosive reactive armor (ERA), and also against pinpoint targets like weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum range of fire, m	4000
Guidance system	semi-automatic by laser beam
Warhead of round:	
- type	tandem hollow-charge
- armor penetration behind ERA, mm	not less than 550
Weight of round, kg	20
Overall dimensions, mm:	
- missile caliber	90
- round length	977
Operating temperature range, °C	from minus 40 to +60

ROUND COMPRISING ANTITANK GUIDED MISSILE of 105 mm caliber

105 missile caliber, mm

550 armor penetration, mm

5000 range of fire, m

Round comprising antitank guided missile of 105 mm caliber is intended for firing from ***CT-CV™ weapon system gun*** against stationary and moving armored targets with combined, carried or monolithic armor, including explosive reactive armor (ERA), and also against pinpoint targets like weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum range of fire, m	5000
Guidance system	semi-automatic by laser beam
Warhead of round:	
- type	tandem hollow-charge
- armor penetration behind ERA, mm	not less than 550
Weight of round, kg	24
Overall dimensions, mm:	
- missile caliber	105
- round length	1015
Operating temperature range, °C	from minus 40 to +60

ROUND COMPRISING ANTITANK GUIDED MISSILE FOR BMP-3 (IFV-3)

100	550	5500
missile caliber, mm	armor penetration, mm	range of fire, m

Round comprising antitank guided missile is intended for firing from the **armored vehicle BMP-3 (IFV-3)** against stationary and moving armored targets with combined, carried or monolithic armor, including explosive reactive armor (ERA), and also against pinpoint targets like weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum range of fire, m	5500
Guidance system	semi-automatic by laser beam
Warhead of round:	
- type	tandem hollow-charge
- armor penetration behind ERA, mm	not less than 550
Weight of round, kg	21,6
Overall dimensions, mm:	
- missile caliber	100
- round length	1180
Operating temperature range, °C	from minus 40 to +60

ROUND COMPRISING ANTITANK GUIDED MISSILE of 115 mm caliber

120 missile caliber, mm

550 armor penetration, mm

5000 range of fire, m

Round comprising antitank guided missile is intended for firing from ***T-62 tank*** against stationary and moving armored targets with combined, carried or monolithic armor including explosive reactive armor (ERA), and also against pinpoint targets like weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum range of fire, m	5000
Guidance system	semi-automatic by laser beam
Warhead of round:	
- type	tandem hollow-charge
- armor penetration behind ERA, mm	not less than 550
Weight of round, kg	not more than 25,2
Overall dimensions, mm:	
- missile caliber	115
- round length	1196
Operating temperature range, °C	from minus 40 to +60

KONUS

round comprising antitank guided missile

"**KONUS**" **round comprising antitank guided missile** is intended to destroy, when firing from ***T-84-120, T-72-120 tanks***, stationary and moving armored targets with combined, carried or monolithic armor, including explosive reactive armor (ERA), and also pinpoint targets like weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum range of fire, m	5000
Guidance system	semi-automatic by laser beam
Warhead of round:	
- type	tandem hollow-charge
- armor penetration behind ERA, mm	not less than 800
Weight of round, kg	28
Overall dimensions, mm:	
- missile caliber	120
- round length	1074
Operating temperature range, °C	from minus 40 to +60

KOMBAT

round comprising antitank guided missile

125	750	5000
missile caliber, mm	armor penetration, mm	range of fire, m

"KOMBAT" round comprising antitank guided missile is intended for firing from ***OPLOT combat vehicle, T-80UD, T-84, T-72, upgraded T-64 tanks*** against stationary and moving armored targets with combined, carried or monolithic armor, including explosive reactive armor (ERA), and also against pinpoint targets like weapon emplacements, a tank in a trench, light-armored objects and helicopters.

Maximum range of fire, m	5000
Guidance system	semi-automatic by laser beam
Warhead of round:	
- type	tandem hollow-charge
- armor penetration behind ERA, mm	not less than 800
Weight of round, kg	not less than 30,5
Overall dimensions, mm:	
- missile caliber	125
- main part length	675
- tail part length	408
Operating temperature range, °C	from minus 40 to +60

AK-1

ground control equipment

AK-1 ground control equipment is designed for target observation, selection and tracking, as well as for aiming of ***"STUGNA"*** antitank guided missile at a target while firing from the ***MT-12 gun*** by method of teleorientation in the laser beam.

AK-1 ground control equipment consists of:

- guidance device PN-K;
- traverse platform;
- power supply;
- kit of cables.

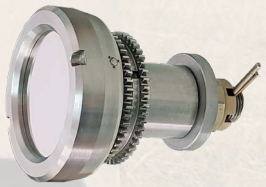
Range of fire, m	from 50 to 5000
AK-1 equipment angles of turn, ...°:	
- horizontally	from minus 45 to +45
- vertically	from minus 10 to +30
AK-1 equipment readiness time to fire once the power is supplied, minutes	not more than 1
AK-1 equipment transition time from stowed to combat position, minutes	not more than 2
Weight of AK-1 equipment, kg	not more than 50
Operating temperature range, °C	from minus 40 to +60

SUIT-1

system set for the barrel bending measurement

BUIT-1 BARREL BENDING MEASUREMENT UNIT

REFLECTOR



The system measures the actual value of the barrel bending of combat vehicle and artillery armaments, which appears as a result of the barrel heating during firing and under the solar radiation effect, and also under mechanical impacts on the barrel. An electric signal, proportional to the measured bend value, is transmitted to the fire control system for the firing error compensation by correcting the aiming angles. The system can be adapted to the different artillery armament systems. Thus the firing accuracy is several times increased.

Angle measurement range, mrad	from minus 5 to +5
Measurement error, mrad	±0,1
Supply voltage, V	24 ±3
Consumption current, A	0,8 ±0,1
Weight, kg	12,5
Overall dimensions, mm	502x256x178

KTK1

training and checking kit

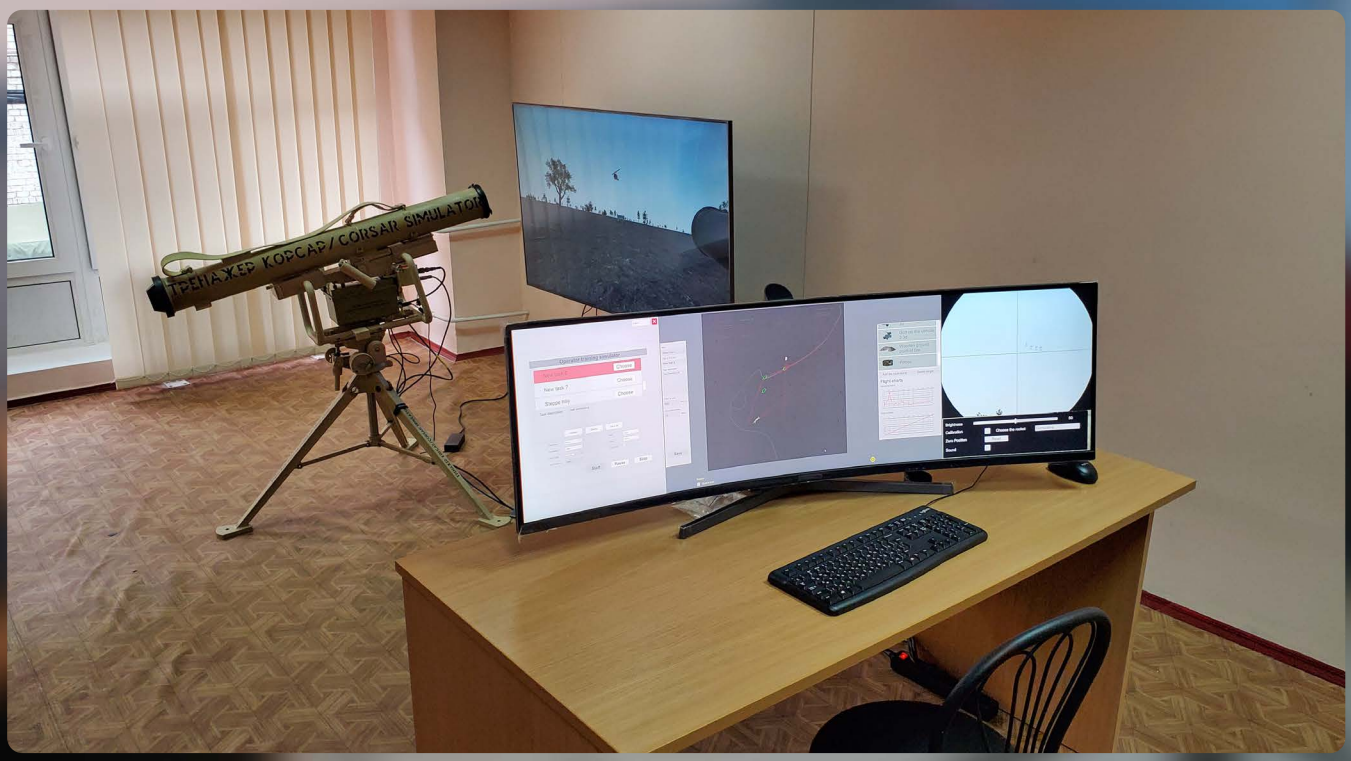
KTK1 training and checking kit is intended for acquisition of professional skills by a gunner to aim guided missiles without ammunition use.

Range of action, m	not less than 6000
Time of continuous work, h	not less than 6
Operating temperature range, °C	from minus 40 to +60

SIMULATOR CORSAR

Simulator CORSAR is intended for theoretical training, shaping and improvement of practical skills for working with "CORSAR" Light Portable Missile System in the classroom and it allows to:

- study the parameters, characteristics, structure, rules and techniques of combat use of "CORSAR";
- form and improve the skills of search, detection, recognition, tracking and defeating of simulated targets under various conditions;
- perform simulated launch without consuming ammunition and resource of "CORSAR";
- control and evaluate quality of theoretical knowledge and gunner's acquired practical skills;
- save in computer database information about the results of training with the displaying on monitor screen of the computer;
- evaluate the level of training according to results of testing.



Computing device type	Personal Computer (PC)
Operating system	Windows 10 or new versions
Language of training	Ukrainian, English
Time of readiness for operation, min	not more than 5
Supply voltage, V	~ 220 ± 20
Designated service life, years	10
Operating temperature range, °C	from +15 up +30

SKIF-UTS

training simulator

SKIF-UTS1.10 training simulator is intended for training, formation and improvement of practical skills for work with ***"SKIF"*** man portable antitank missile system in classroom conditions.

Type of computing device	IBM compatible personal computer
Operational system	WINDOWS
Language of training	Ukrainian, Russian, English, Arabian
Readiness time for operation, minutes	not more than 5
Power source voltage, V	220 ±20
Weight, kg:	
- remote control panel	14,0
- personal computer (laptop)	not more than 3,9
Operating temperature range, °C	from +5 to +40

CORRECTED AIR BOMB

400	850	650	20
bomb caliber, mm	bomb weight, kg	warhead weight, kg	range of fire, km

The bomb is intended for destruction of the ground-based targets like railway bridges, concrete constructions, runways, radar stations, positions of operative and tactical missiles, antiaircraft missile systems as well as waterborne targets during level flight, diving and pulling-up of the carrier with the "drop-and-forget" principle realization.

It is equipped with a television seeker which ensures the target locking-on under the aircraft and automatic guidance in autonomous flight.

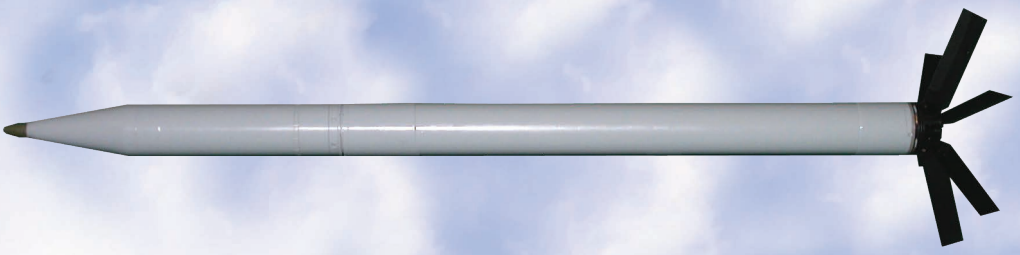
Operational range, km:	
- from the altitude of 0,5	up to 8
- from the altitude of 5	up to 20
Target aiming accuracy (CEP), m	3 – 5
Aircraft velocity while dropping, m/s	200 – 300
Diameter, mm	400
Weight, kg	850
Warhead weight, kg	650
Warhead type	high-explosive
Type of suspension	AKU-58

AR-8

unguided aircraft rocket

80	4,3	4000
missile diameter, mm	warhead weight, kg	range of fire, m

AR-8 unguided aircraft rocket is intended for destruction of different kinds of ground targets (tanks, APC, self-propelled artillery launchers, missile launchers, radar stations, parked aircrafts, ammunition depots, special trains, manpower). The rocket is launched from ***B8M*** and ***B8V20 launching units*** that form a part of unguided rocket armament of combat aircrafts and helicopters.



Range of fire, m	1200–4000
Caliber, mm	80
Missile length, mm	1590
Missile weight, kg	12,9
Warhead weight, kg	4,3
Warhead type	HEAT-fragmentation
Damage effect:	
- armor penetration, mm	not less than 400
- amount of fragments, pcs	not less than 500

GUIDED AIR-TO-AIR MISSILE

High maneuverable guided air-to-air missile of close air combat with infrared homing head, noncontact radar target sensor in millimetric range and thrust-vectoring engine is intended for interception and destruction of high maneuverable means of air attack and reconnaissance during attack:

- at any time of day or night;
- at the target front and aft hemisphere;
- against ground, sky and water surface backgrounds;
- under ordinary and adverse weather conditions;
- with active informational and maneuverable counteraction of the enemy.

The missile is intended for use in armament systems of fighters, front bombers and low-flying attack aircrafts.

Flight altitude of carrier, m	20 – 20 000
Hit altitude of target, m	20 – 20 000
Carrier speed, km/h	650 – 2 500
Target speed, km/h	not more than 2 700
Correlation of carrier and target speeds	0,8 - 3,0
Target overload, g	0 – 12
Angles of target designation, …°	± 60
Maximum launch range under conditions of attack, km:	
- at aft hemisphere	up to 20,0
- at front hemisphere	up to 40,0
- at side aspect angles	up to 15,0
Minimum launch range under conditions of attack, km:	
- at aft hemisphere	0,3
- at front hemisphere	0,65
- at side aspect angles	0,6
Time of guided flight, s	up to 25

ALTA

helicopter antitank missile system

170	1200	55	12
missile diameter, mm	armor penetration, mm	missile weight, kg	range of fire, km

Missile system is designed to destroy stationary and moving armored targets, boats, small ships and low maneuverable air targets.

Target types (moving, stationary)	tank, APC, helicopter, motor boat, missile systems, radar station etc.
Guidance system	combined: at the initial stage – guidance by the laser beam; at the final stage – homing by a seeker of the following types: active radar, thermal imager, TV.
Maximum range of fire, km	12
Weight, kg - missile in container - missile	 70 55
Container length, mm	2000
Warhead type	tandem hollow-charge and fragmentation
Armor penetration, behind ERA, mm	no less than 1200
Single missile hit probability	0,9

BAR'ER-VK

naval missile guided weapon system

"**BAR'ER-VK" naval missile guided weapon system** is designed to destroy ships as well as coastal moving and stationary armored targets and light-armored objects, coastal fortified firing positions and helicopters with RK-2V missiles.

Maximum range of fire, m	7000
Missile control system - by laser beam with target tracking in automatic mode	
Warhead of missile:	
- tandem hollow-charge with armor penetration behind explosive reactive armor, mm	not less than 800
- high-explosive fragmentation with number of fragments of 2-3 g weight, pcs	up to 900
Weight, kg:	
- system	1168
- missile in container	47,2
Overall dimensions, mm:	
- launching unit with RK-2V missiles	1955x1375x1675
- missile caliber	130
- container diameter	140
- container length	1917
Traverse platform angles of rotation, ...°:	
- at heading angle	from minus 150 to +150
- at elevation angle	from minus 25 to +60
- at roll angle	±25
Targets detection range, km	12
Operating temperature range, °C	from minus 40 to +60

"BAR'ER-VK" system includes:

- base with actuators;
- remote control panel;
- guidance device with thermal imager;
- traverse platform;
- control unit;
- launching rail;
- RK-2V guided missile in transport and launching container;
- cables kit ;
- kit of checking equipment.

ARBALET-K

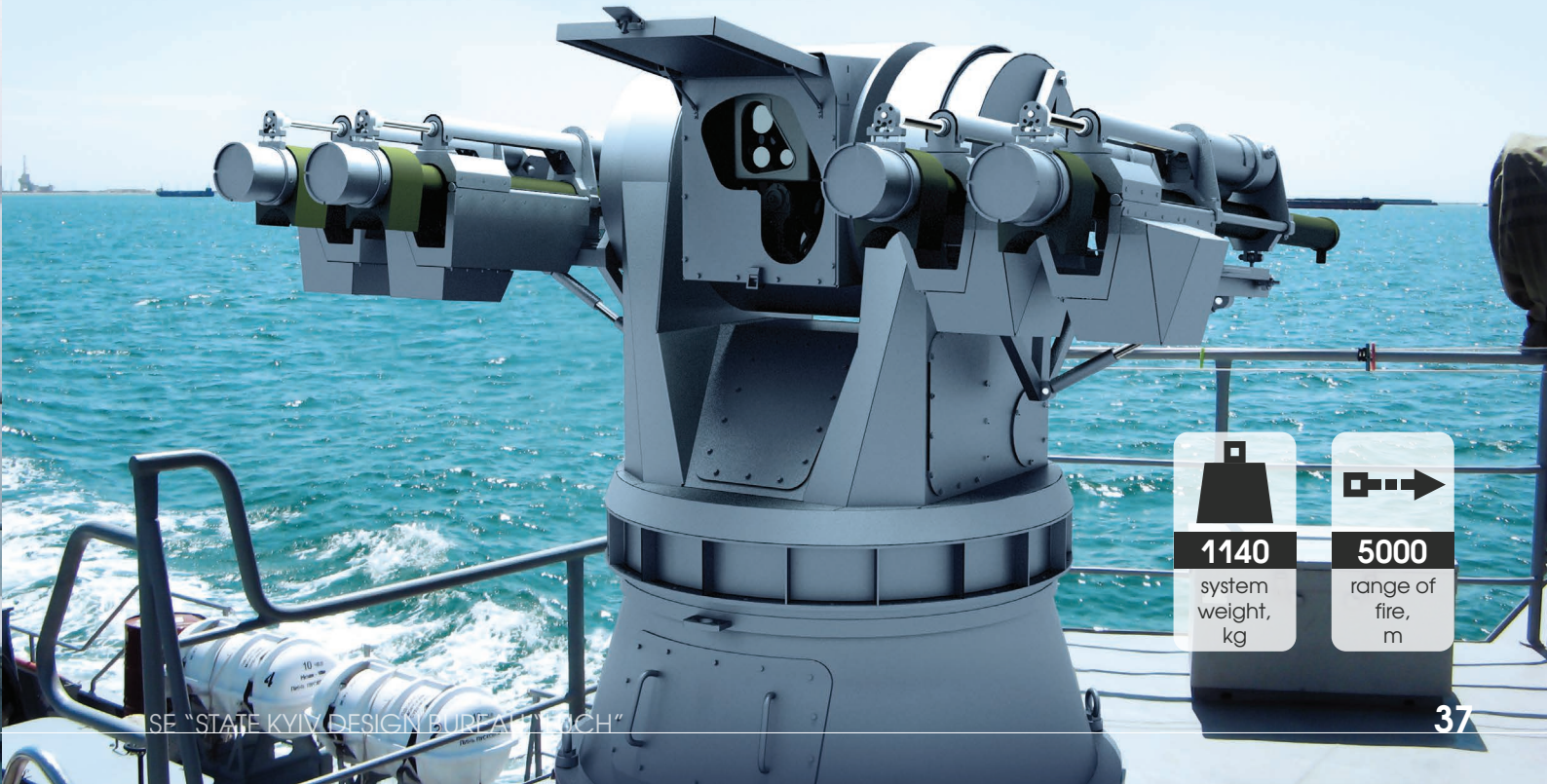
short range shipborne air defense system

"ARBALET-K" short range shipborne air defense missile system is intended to destroy jet, propjet and propeller-driven aircrafts and helicopters at head-on and pursuit courses under conditions of a target direct visibility with the use of antiaircraft guided missiles of *"Igla"* type.

"Arbalet-K" system consists of:

- base with actuators;
- control panel;
- guidance device and thermal imager;
- traverse platform;
- two launching units with two antiaircraft missiles of *"Igla"* type, mounted on each unit.

Range of target destruction, m	500-5000
Maximum altitude for targets destruction, m:	
- jet aircrafts:	
- at head-on courses	2000
- at pursuit courses	2500
- helicopters and propjet aircrafts:	
- at head-on courses	3000
- at pursuit courses	3500
Minimum altitude for targets destruction, m	10
Targets speed, m/s:	
- at head-on courses	360
- at pursuit courses	320
Range of targets detection, km	12
Traverse platform angles of rotation, ...°:	
- at heading angle	from minus 150 to +150
- at elevation angle	from minus 25 to +60
- at roll angle	±25
Weight of system, kg	1140
Overall dimensions, mm	1730x2245x1590
Operating temperature range, °C	from minus 40 to +60



UPGRADING OF S-125 ANTIAIRCRAFT MISSILE SYSTEM

Upgrading of S-125 antiaircraft missile system is changing of radio command guidance into combined guidance system with semi-active or active radar seeker. S-125 system is intended to defeat manned and unmanned air combat vehicles, flying both with subsonic and supersonic speeds at head-on and pursuit courses. Antiaircraft missile (AAM) defeats targets by day and by night, under any aspect angle at front and aft hemisphere of a target, under ordinary and adverse weather conditions, under active informational and maneuverable counteraction of the enemy.

Destruction area	
- range	3,5 – 50,0
- altitude	0,02 – 20,0
Guidance system - combined INS with radio-correction and semi-active or active radar seeker	
AAM maximum velocity, m/s	900
AAM launching weight, kg	955
Warhead weight, kg	70
AAM caliber, mm	390/552
Length, mm	6226

STRILA-10 LUCH

modernized short-range anti-aircraft missile system

Anti-aircraft missile system "STRILA-10 LUCH" is designed to destroy modern aircrafts, helicopters, aerodynamic missiles, unmanned aerial vehicles and other air targets. In some cases, it can be used to destroy ground (above-water) radar-contrast moving targets.

Target type	airplanes, helicopters, UAVs
Guidance system	by laser beam with target tracking in automatic mode
Missile weight, kg	45
Weight of missile in container, kg	57
Warhead type:	
- type	high-explosive fragmentation with non-contact target sensor
- weight	6,2
Length of container with missile, mm	1850
Operating temperature range, °C	from minus 40 to +60

VILKHA

multiple launch rocket system

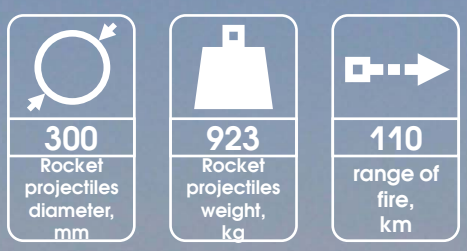
"VILKHA" multiple launch rocket system (MLRS) is designed to destroy armored, lightly armored and unarmored vehicles, enemy manpower, command posts, communication centers, military-industrial facilities, aboveground facilities for store and other purposes at long distances.

The peculiarity is that at the initial part of the trajectory a rocket projectile flight correction is provided with the help of pulse engines that reduce to minimum rocket projectile fly deviation from the preset trajectory. At the final part the rocket projectile is aimed at the target by an inertial and satellite navigation system using aerodynamic control surfaces. "VILKHA" MLRS ensures forming of individual flight task for each rocket projectile that makes possible to defeat several targets by one salvo.

Quantity of rocket projectiles in multiple launching pod, pcs.	8-12
Maximum firing range, km	up to 110
Rocket projectiles length, mm	7600
Rocket projectiles caliber, mm	300
Rocket projectiles weight, kg	923
Guidance system	INS+GPS
Quantity of control channels	12
Duration of full salvo, s	not more than 40
Time of rocket projectile control, min	not more than 3
Ambient temperature, °C	from minus 40 to +50

The MLRS consists of:

- Guided rocket projectile R624M;
- Combat vehicle;
- Transport-loading vehicle;
- Mobile command post;
- Test and control equipment.



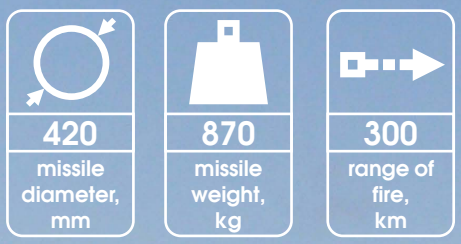
SE "STATE KYIV DESIGN BUREAU "LUCH"

NEPTUNE

360ST rocket system

"NEPTUNE" 360ST rocket system is a land-based cruise rocket system with anti-ship rockets. It is intended to defeat warships such as cruiser, destroyer frigate, corvette, airborne, tank landing ships and vehicles, which operate both independently and as part of the ship groups and amphibious groups, and coastal radiocontrast targets in visual and adverse meteorological conditions, at any time of the day and year, at active fire and electronic countermeasures of the enemy.

Firing range, km	up to 300
Remoteness of the firing position from the coastal strip, km	not more than 25
Maximum ammunition reserve, pcs.	72
Maximum quantity of rockets in salvo from 4 launchers, pcs.	16
Firing interval in salvo, s	from 3 to 5
Maximum speed, km/h:	
- on highway	70
- on dirt road	20
Time of deployment of a system in the new position, min	up to 15
Rockets flight altitude range above the wave crest on the final part of trajectory, m	from 3 to 10

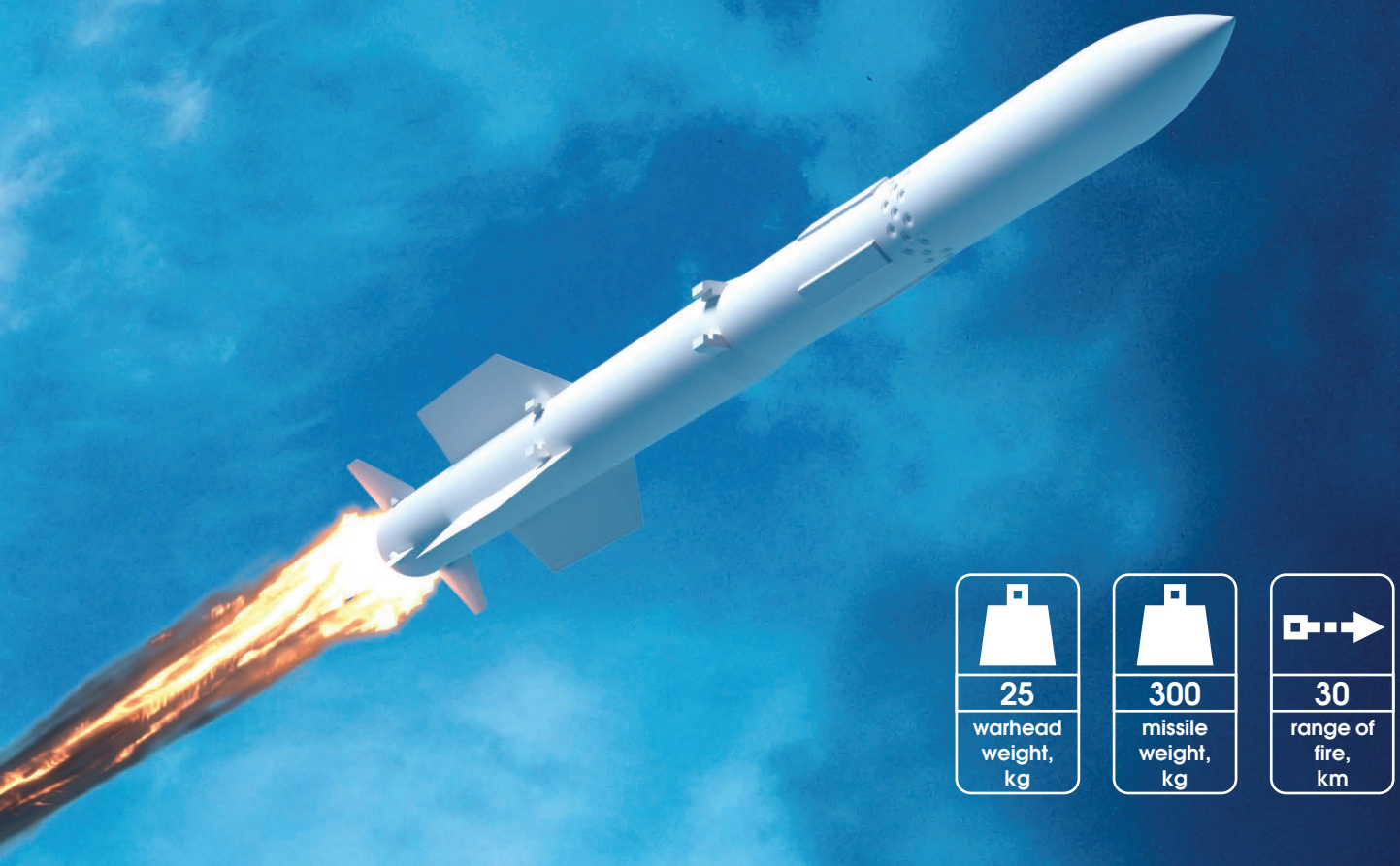


The system consists of:

- Mobile command post;
- Unified self-propelled launcher;
- Rocket in the transport and launch container;
- Transport-loading vehicle;
- Transport vehicle;
- Set of ground equipment.

CORAL

unified rocket



"CORAL" basic unified rocket of modular design for ship-based and land air defense systems and air forces is intended to use as a part of air defense system to destroy modern aircraft, helicopters, cruise missiles, tactical ballistic missiles, unmanned aerial vehicles and other air targets. In exceptional cases, it can be used to destroy ground (above-water) radar-contrast moving targets.

Maximum firing range, km	30
Maximum altitude of target destruction, km	10
Maximum flight speed, m/s	1100
Guidance system	INS + active radar seeker
Rocket weight, kg	300
Warhead weight, kg	25
Overall dimensions, mm:	
- diameter	230/260
- length	4330
- wing span	674
- container	490x490x4870

SOKIL–300

reconnaissance and combat UAV system

"SOKIL–300" reconnaissance and combat UAV system is designed for reconnaissance and strike at the operational and tactical depth of the enemy.

Engine	**AI–450T2**	**Rotax 914**
Maximum takeoff UAV weight, kg	1220	1130
Payload, kg	300	
Maximum speed, km/h	450	230
Cruising speed, km/h	270	150
Flight duration, h	5	26
Maximum range / with retransmitter, km	150 / 300	
Max flight range, km	1300	3300
Navigation system	INS + GPS	
Length of the UAV, m	8,6	
UAV wing span, m	14	
Ammunition	Guided missiles for 10 km	
Landing system	automatic by laser	
Takeoff system	automatic	

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