UKRAINIAN DEFENSE REVIEW

№4 [OCTOBER-DECEMBER 2015]

UDR

Defense express

NEW PROSPECTS FOR UKRAINIAN AVIATION

MADE IN UKRAINE

UKRAINIAN ARMORED LEGION

NOVATOR'S ELECTRONIC WARFARE WARRIOR

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UKRAINE TO GET A NEW MILITARY DOCTRINE

The National Security and Defense Council (NSDC) of Ukraine, at its meeting on 2nd September 2015, approved a draft of the country's new Military Doctrine, and recommended the draft document for approval and signature by the President of Ukraine, NSDC announced in a press statement.

The draft document has undergone public discussion involving both representatives of the state authorities of Ukraine and experts of non-governmental organizations, as well as foreign advisers to NATO Office in Ukraine.

The draft Military Doctrine of Ukraine:

- declares the Russian Federation as the country's military adversary and defines conditions of the liberation of the temporarily occupied territories of Ukraine;
- relies on high probability of a large-scale use of military force against Ukraine as the main threat to Ukraine's national security in the military sphere;
- reaffirms refusal from the non-alignment policy and resuming the strategic course of integration into Euro-Atlantic security system;
- defines signals of armed conflicts emergence in Ukraine, including those inspired by foreign states;
- takes into account the increasing role of information and psychological operations;
- stresses the need to improve mobilization and mobilization preparation system, and increase substantially the number of professionals in the structure of the Ukrainian Armed Forces and other national security sector services;
- defines measures to prepare the State for defense, necessary for the restoration of national sovereignty and territorial integrity, as well as outlines tasks of Ukrainian defense and security potential development as a prerequisite to rebuff military aggression

UKRAINE MAY INCREASE DEFENSE SPENDING TO 5% OF GDP IN 2016

A draft State Budget of Ukraine for FY 2016 envisions military spending at the level of 5 percent of the gross domestic product, Prime Minister Arseniy Yatseniuk has said.

"I will be honest with you. We are going to have a very strained budget in 2016 because of an increase in military spending to 5% of the GDP, which will be an unprecedented level of expenditure," Yatseniuk said.

The Ministry of Defense, for its part, said the country's Armed Forces will require funding worth UAH 67.8B in 2016, which signals an increase of about UAH 20B compared to 2015.

UKROBORONPROM EXPANDING INTERNATIONAL COOPERATION IN DEFENSE INDUSTRIAL PRODUCTION AND TECHNOLOGY DEVELOPMENT

Ukroboronprom has signed cooperation deals with a range of international partners. The deals were signed on the sidelines of the Kiev Arms and Security Expo 2015 in late September.

Particularly with FLIR Systems, Ukroboronprom signed a memorandum of cooperation aimed at providing the Ukrainian Armed Forces with advanced thermal imaging technologies. As well as the direct supply of thermal imaging equipment to the Ukraine Armed Forces, the Memorandum calls for collaboration in the upgrade of legacy types of optical vision systems for integration on Ukrainian aircraft and armored vehicles.
A cooperation agreement signed with the US company Textron Systems deals with the production of hardy combat vehicles SCTV for the benefit of the Ukraine Armed Forces.
The SCTV will be manufactured as an upgraded configuration of the Humvee armored vehicle, according to Textron Systems Director of Business Operations in Europe and Africa, Bear Midkiff.
Aircraft company Antonov, which is incorporated with the Ukroboronprom state defense industries holding group, agreed with Poland's WB Electronics on the use of the latter's know-how designs in the development of a new tactical UAS for the Ukrainian Armed Forces.
Also on the sidelines of the Arms and Security Expo, Ukroboronprom and the Polish company Lubawa presented a business plan on joint production of bullet-proof vests, tactical helmets, shelter tents and armored vehicle camouflage nets designed by Lubawa.
Relevant production facilities will be set up at one of Ukroboronprom's factories based in Ivano-Frankivsk Region by the end of 2016, according to an official at Ukroboronprom. The amount of investment is preliminary estimated at around €1 million.

AVTOKRAZ UPGRADEING ITS VEHICLES TO ADOPT NEW ENGINES

PJSC «AvtoKrAZ» continues vehicle adaptation works to enable the installation of new engines, according to the Company's press office.

Particularly production-standard KrAZ-63221 platforms configured to carry special-purpose equipment are being fitted with 360-horsepower six-cylinder turbocharged Euro-5-compliant engines Ford-Ecotorq.
The Ford-Ecotorq engines are coupled to the MFZ-430 clutch and 9JS150TA transmission, as requested by the Customer.
PJSC «AvtoKrAZ», in 2014, changed the focus of its component procurement activities in favor of EU and CIS markets, and it is also pursuing a strategy of import substitution. The amount of the engines that KrAZ previously bought from Russia's Yaroslavl Motor Works has been fully substituted by suppliers such as Deutz, Cummins, Daimler, Fiat, WEICHAI, Ford and Toyota.

UKRAINIAN MILITARY TO GET SPECIAL-PURPOSE VEHICLES BUILT ON MAN, IVECO PLATFORMS

As part of its international technical assistance program, the US Department of State has provided funding worth a total of USD 2.37M to support the procurement of 10 repair and recovery vehicles Master and 10 telescopic boom excavator vehicles for Ukraine, autoconsulting.com.ua. website reported.

The vehicles will replace the aging ZIL-131-based PARM-1M recovery vehicles currently used in the ATO theater.

The new vehicles provide advantages such as expanded functionality, reliability and ease of use, and they are suitable to be maintained by the global network of IVECO/MAN service centers.

One recovery vehicle came at a price of USD 237,000, and one excavator vehicle based on the MAN TGS 6x6 chassis at USD 241,000.

UKRAINE HAS DEVELOPED A NEW ARMORED CAR NAMED TRITON

Kiev-based Leninska Kuznya will set up a production line for the indigenously designed armored car called Triton; the vehicles will be manufactured to meet the requirement of the Ukraine Armed Forces and National Guard, news.ua website has reported. It is supposed that the Triton vehicle will have a 4x4 wheel configuration. Designed to have a combat weight of 10 tons, the vehicle will be built with a fording capability.

It will feature a remote control turret developed in-house by Leninska Kuznya, integrating a 12.7-mm machine gun and an UAG-40 grenade launcher.

The first prototype of the Triton armored vehicle was revealed at the Arms and Security 2015 exhibition that took place in Kiev in late September.

UKROBORONPROM, AEROS OF THE USA TO CO-MANUFACTURE BORDER SURVEILLANCE AND MONITORING EQUIPMENT

kroboronprom state defense industries holding group and the American company Aeros have agreed on joint manufacture of optronic technologies to be used for surveillance and security monitoring of Ukraine's national border. This news was announced by senior deputy head of Ukraine's State Border Guard Service, Vasyl Servatiuk, at a Sep 7 news briefing in Kiev.

"This equipment can be used effectively both on the border with Russia and for security monitoring of the Sea of Azov", he said.

Commenting on technical specifications of the equipment, Igor Pasternak, CEO of AEROS, said the radar component will have a range of 40 km and will be able to monitor security situation on the ground, in the air and at sea, and it will furthermore provide the capability to record the monitoring data.

KIEV ARMOR FACTORY EXPECTING FOUR-FOLD OUTPUT GROWTH FOR 2015

State Company "Kiev Armor Factory" is expecting a four-fold increase in production of military equipment in 2015 from the previous year, Ukroboronprom has reported quoting CEO of Kiev Armor Factory, Vladyslav Lysytsia as saying.

According to statistics available for 31st August 2015, the Factory put out 78 military vehicles, including 25 MBT vehicles and 53 APC vehicles, and even now, this level of output exceeds the number of vehicles we produced in the whole year of 2014, V. Lysytsia said.

The Factory is now busy carrying out maintenance, repair and overhaul of T-64 MBT vehicles, BTR-70/80 APC vehicles and MBT engines, as well as manufacturing BTR-3 APCs.

In addition to this, Kiev Armor Factory is providing promotion training courses to technician personnel of Ukraine's Armed Forces and other uniformed services.

ANTONOV TO EXPORT ITS AN-178 AIRCRAFT TO IRAQ

State Company Antonov has secured a deal to export new military transport aircraft AN-178 to Iraq, Presa Ukrayiny newspaper reported quoting Interim CEO of Antonov, Mykhailo Gvozdev as saying while visiting an aircraft exhibition at Civil Aircraft Plant # 410 in Kiev.

«Now we have a deal with Iraq, and we have negotiations with China. So we will launch full-rate serial production of [AN-178] aircraft», Mr. Gvozdev said.

In that context, it should be noted that the Ukrainian AN-178 airplane attracted interest from Iranian and Indian officials at Farnborough Air Show. Earlier, the delivery of ten AN-178 airplanes was ordered by Azerbaijan's Silk Way Airlines, and China intends to buy two such aircraft.

ANTONOV EXPANDING COLLABORATION WITH SIEMENS

State Company Antonov, in collaboration with Siemens, have introduced the latest 3D technology into the aircraft construction process.

This innovation will reduce production cost and time budget, and improve the quality of the aircraft production process, Antonov reported in a press statement.

According to Interim CEO of the Company, Mykhailo Gvozdev, this technology was first employed for production of the first prototype AN-178 aircraft, and it is now being implemented for use in new transport aircraft projects AN-178, AN-132, AN-188, as well as unmanned aerial vehicle projects.

As part of its 3D technology implementation program, Antonov has created more than a thousand automated workplaces and provided training to its over 1,500 staff engineers. Staff training is now continuing for employees of Serial Plant Antonov, a company affiliated with the Antonov SC.

UKRAINE'S STATE SPACE AGENCY, BOEING AGREE ON COOPERATION

State Space Agency (SSA) of Ukraine has reached an agreement with Boeing to supply space launch propulsion systems and SLV rockets produced by the Ukrainian companies Pivdenmash and KB Pivdenne. Particularly the KB Pivdenne would provide SLV rockets for use in «Zenit» and «Antares» projects.

The agreement was reached during negotiations in Washington, according to a TV report by Ukraine's TSN.

«Boeing sees us as a partner. The Company is interested in continuing cooperation with Ukraine in the «Sea Launch» project, and they are also interested in a project that we proposed with regard to creating a new telecommunications satellite for Ukraine,» - said Ljubomir Sabodash.

A memorandum of cooperation between Boeing and SSA of Ukraine is scheduled for signature in late October or early November of this year, in time for the start of a visit to Ukraine by a NASA team.

UKRAINE TO DEVELOP A NEW MISSILE DERIVED FROM THE R-27 TECHNOLOGY

In an effort to develop a new product line that would not rely on Russian-supplied components, the Ukrainian companies Artem and Radioniks joined in a collaborative program aimed at the development of a surface-to-air modification of the R-27 «Vympel» missile, Ukrainian defense industry sources told IHS Jane's.

The design of the new missile will include two key upgrades to the baseline R-27 technology. One is the addition of a rocket booster to enable an extended range of 55 kilometers and better performance at higher altitudes. Second, the missiles will be equipped with a choice of three new guidance systems of the IR, SARH and ARM types.

SJSHC «Artem» is a Kiev-based company which is specialist in manufacturing and upgrading R-27 missiles. The Company's current product portfolio includes R-27 missiles in various modifications, including R-27R, R-27ET, R-27UR and R-27UT-RT.

FIRST PROTOTYPE AN-132 AIRCRAFT ALREADY IN PRODUCTION

State Company Antonov has launched production of the first prototype of its newly developed AN-132 aircraft, under a collaborative project with Saudi Arabia, LigaBusinessInform reported on 7th September 2015.

According to Interim CEO of Antonov, Mykhailo Gvozdev, this is the first aircraft in the Antonov family to be manufactured without the use of Russian-supplied components. The first prototype will be built at an Antonov factory in Kiev and delivered to Saudi Arabia in the third quarter of 2016.

Antonov has a memorandum of intent to co-manufacture 80 AN-132s with and for Saudi Arabia. According to Gvozdev, a number of the aircraft will be manufactured at Ukrainian factories, while Saudi Arabia will build factories for in-country production of the aircraft and components.

The AN-132 will be equipped with Pratt & Whitney engines as requested by the Customer.

UKRAINIAN ARMED FORCES TO GET USD 9.05M WORTH OF RQ-11B RAVEN UAVS

AeroVironment announced it has received a contract from the United States Army for small remote-controlled RQ-11B Raven unmanned aircraft systems (UAS) worth USD 9.05M to supply the Ukrainian Ministry of Defense via the Foreign Military Sales (FMS) program, Pentagon reported in a press release.

According to the press release, the contract will be performed at the Company's factory in Monrovia, California. The deliveries under the contract are to be completed by 11 May 2016.

The UAV systems will be supplied fitted with analogous payloads, supposedly from the United States Marine Corps arsenals.

Funding for the contract will be provided by the US DoD non-base budget in FY 2016.

ANTONOV, HAVELSAN OF TURKEY CO-DEVELOPING AN AWACS AIRCRAFT

The Turkish company HAVELSAN and State Company Antonov are jointly working on a R&D project for an AWACS aircraft derived from the AN-24 technology, AzeriDefence website reported.

Sources told AzeriDefence that the two companies have already reached an agreement on the AWACS aircraft development project, which is targeted at export markets as well as Ukraine. The parties are now negotiating cooperation with potential customers of the new aircraft.

In addition to an AWACS modification of the An-24 aircraft, HAVELSAN and Antonov are considering collaborative development of three more airplane designs optimized for coast guard, surveillance and SAR operations.

UKRAINIAN NAVY PLANNING AN UPGRADE TO ITS FLAGSHIP, THE FRIGATE HETMAN SAHAIDACHNY

Ukraine's Ministry of Defense will prepare an upgrade package for the flagship of the country's Navy, the Frigate Hetman Sahaidachny, MoD reported in a press statement.

Full reconstruction of the ship is scheduled for completion in 2018. The upgrade will be funded with Budget expenditure earmarked for the State Defense Procurement and Acquisition Program in FY 2016.

The upgrade package for Hetman Sahaidachny will be developed by MoD's experts in a joint effort with Ukroboronprom and the ship's senior staff.

It is supposed that the package will include the transfer of new and upgraded equipment from the United States Navy.

FRENCH SUPPLIERS HAVE DEMONSTRATED THEIR PRODUCTS TO POTENTIAL NAVAL CUSTOMERS IN UKRAINE

A demonstration of products and capabilities of the French companies THALES Group and ECA Group took place at the Ship R&D Center, Mykolayiv, on 2nd July 2015.

The two companies demonstrated their R&D capabilities, including electronic equipment and sonar systems for surface ships and boats of various classes.

CEO and Designer General at the Ship R&D Center, Oleksandr Zholob said he sees some prospects for the French companies to participate, independently or jointly with Ukrainian counterparts, in the Ukrainian Navy modernization programs.

UKRAINIAN NAVY'S AVIATION BRANCH TO RECEIVE NEW INDIGENOUSLY-BUILT AIRCRAFT

The aviation arm of the Ukrainian Navy is going to get new indigenous airplanes, Navy Commander, Vice-Admiral Serhiy Haiduk told the Fleet of Ukraine newspaper in an interview.

"Old and obsolete ASW/SAR airplanes BE-12 will be de withdrawn from service and replaced with multirole patrol-transport aircraft of the Antonov family, and those Antonov airplanes will be missile armed," S. Haiduk said.

Besides the Antonov transports, the Navy's aviation capabilities will be further reinforced by the addition of gunship helicopters and UAV systems.

DEFENSE INDUSTRY. CHOICE OF TARGETS

PROGRAMS AND RESOURCES WILL DEFINE A NEW LOOK FOR THE ARMED FORCES AND THE NATIONAL DEFENSE INDUSTRY

OLEH GLADKIVSKY
SENIOR DEPUTY SECRETARY
NATIONAL SECURITY AND DEFENSE
COUNCIL OF UKRAINE

«HOMELAND DEFENSE REQUIRES THAT WE RESET NATIONAL DEFENSE INDUSTRY INTO A NEW FORMAT»

Ukrainian defense industry is entering a period a major transformation that pursues a long-term aim of ensuring systemic technical modernization of the Armed Forces and other national security sector services by providing them with most advanced types of arms and military equipment. The overcoming of budget restraints and the start of the long overdue transformation are achievable goals, but only if the strategy of regulation, expansion and funding for the defense industry makes maximum use of proven market mechanisms where the emergence of a new, promising product is a result of a transparent, well-regulated and mutually beneficial cooperation among customers, developers and manufacturers of arms and military equipment, regardless of their form of ownership. This is just one of the key aspects brought up by senior deputy Secretary of the National Security and Defense Council of Ukraine, Oleh Gladkivsky, in an interview with Defense Express. The conversation took place exactly one year after Mr Gladkivsky was appointed chairman of the Interagency Commission on Military-Technical Cooperation and Export Control. In May 2015, Mr. Gladkivsky was appointed to head the Interagency Commission on the Defense Industry Affairs. As chairman of the two interagency commissions, Oleh Gladkivsky can exert a significant, if not key influence on the choice of targets – both internal (with respect to technical modernization of the Armed Forces) and external (with respect to export markets) – to be achieved by the domestic defense industry.

The Interagency Commission on the Defense Industry Affairs took a lead in developing draft national programs on arms modernization and the defense industry modernization, both projected into 2020. What are the role and the status of these documents; what are the approaches underlying them?

There are simple strategic principles underlying the two programs that will shape a new look for arms and military equipment in our Armed Forces and for our defense industry. To be precise, this is a focus on the quality of the products being manufactured and marketed, and, of course, the creation of a competitive market.

In view of the new experiences - the annexation of the Crimea, the difficult initial period of fighting with the enemy, a change in the nature of combat engagements, an urgent need for a sufficient supply of arms and military equipment – all the key government programs related to the defense sector are being drawn up. Our challenge is to ensure effectiveness and efficiency of our Armed Forces and the national security system as a whole, at the level that would allow Ukraine to preserve its self-identity and statehood. This is a key condition on the basis of which various scenarios of action can be explored and, accordingly, the choices of priorities for military-technical and military-industrial policies can be made.

A draft of the State Program on Arms Modernization for the period from 2016 to 2020 has been completed and is now ready for the Cabinet of Ministers' endorsement. I can say that the program is revolutionary in nature. In developing the draft document we did not have regard to budgetary constraints but took as a basis the needs of armed services and branches of the Armed Forces. The essence of the program is to shift emphasis, as soon as possible, from overhauls of technically obsolescent equipment (which we have to do now) to the upgrade and creation of new designs, and, on this basis, to embark on systemic technical modernization of the Armed Forces. The preceding comments apply equally to objectives of the State Program on the Defense Industry Modernization, a draft of which is being developed by the Ministry of Economy. The program regarding the defense industry must take account of the needs and requirements of the State Program on Arms Modernization on the one hand and, on the other hand, ensure modernization and growth of the defense industry as a real economy sector and a source of revenue from high-tech products.

What is the amount of minimum required budget for modernization and production engineering?

Of course, ambitions are associated with traditional restraints. Since the provision of all the requirements of the Armed Forces clearly exceeds the budgetary capabilities of the State, we are operating under the assumption that the minimum level of defense expenditure for Ukraine at this reference point of time should be 5% of the gross domestic product. We understand that forward-looking indicators of budget expenditure for both the arms modernization program and the defense industry modernization program 2016-2020 must be balanced with our ambitions, on the one hand, and on the other – provide for a sufficiently dynamic pace of the Armed Forces growth and modernization effort, with due regard for different situation scenarios. So we are currently compiling a list of priorities, with due regard for the budgets and expenditures available, and for the types of arms, systems and equipment that are of priority importance for us.

Under such circumstances, the essence of the best suitable strategy for the defense industry modernization lies in soliciting non-government resources, private investment, both domestic and foreign; and in stimulating corporatization, equitisation and privatization within the industries – or, to put it figuratively, opening the «black box» of the defense industry in order to provide new opportunities for qualitative improvements to be achieved within a short period of time. Here's the short-term challenge.

There is nobody in Ukraine who needs to be convinced in the importance of modernization of the army and the defense industries, in a situation where foreign forces are present on our soil and a hostile state is supporting the armed insurgents by supplying them with weapons, equipment and ammunition

What are the other points of focus for the commission on the defense industry modernization? Are the Cabinet ministers in charge of finances and economy have to be convinced in the urgency of modernizing the army at the level as provided for by the arms modernization and defense industry modernization programs?

I don't think there is anybody in Ukraine who needs to be convinced in the importance of modernization of the army and the defense industries, in a situation where foreign forces are present on our soil and a hostile state is supporting the armed insurgents by supplying them with weapons, equipment and ammunition. But the problem is that, over the years, there has been a system evolving that was specifically designed so that sensible ideas could not be implemented by virtue of the presence of formalized procedures, regulations, binding decisions, directives, standards and so on. This needs to be changed. For example, there is an urgent need to move to three-year or five-year cycles in planning for arms development and procurement programs, and, as a result, to change the format of the budgeting and reporting system. I would stress that this problem is rooted in the specifics of the global economic model adopted by Ukraine, where there is the dominance of commercial capital rather than industrial capital.

For growth and expansion, industrial capital indeed needs a strategy resting on long-term projects and programs. This is the basic foundation where industrial business is built on, and arms development and procurement programs are no exception but rather an emblematic example. Not only such innovations need to be introduced by Cabinet decisions but, more important, they should be legitimized legislatively so to preclude any possibility of rollback.

Besides this I intend to initiate a decision that would allow all the companies compliant with our national export control regulations to have export authorization for their products and, consequently, for the services related to maintenance, repair, overhaul and upgrade of their own products. This step is directly linked with the increasing popularity of some of Ukraine's high-tech products such as Antonov aircraft or guided missiles by Luch Design Bureau, and with the emergence and further promotion of new brandname products produced under common brand name of «Made in Ukraine. The long-term result will be increasing interest of industries for producing competitive products.

Can it be said that this is part of a plan to set up individual clusters - armored vehicles, precision weapons, radar equipment etc -- within the Ukrainian defense industry, and that each of these clusters, which will be comprised of specialist firms in a certain discipline, will be given significant rights and capabilities to operate independently both on the domestic and export markets?

Yes, such a strategy is under consideration, undergoing analysis and discussion.

Does it mean that at the next stage, which is corporatization and equitization, the Government will retain some stakes in companies, while the remainder of the shares will be offered for sale and subsequently used for soliciting strategic investment in some or other cluster of industries?

It's exactly so! This is what makes me want to employ both the arms modernization and defense industry modernization programs as a unique opportunity to change the overall format of the national defense industry where there will be a higher level of engagement of both domestic actors -- government-owned as well as privately owned – and international partners. I will do what I can to see that the investments that we have mobilized and will continue to mobilize are so structured to suit our priorities on the one hand, and that investors have long-term assurances in the framework of the programs in which they are partners, on the other hand.

What are the time limits set for implementing this approach?

I hope we will be able to do this within a year.

It so happens that, when it comes to imported procurements, our military authorities – the Ministry of Defense and the General Staff – are using approaches that are different from those employed by authorized arms dealers acting under the aegis of Ukroboronprom. Why is it so?

There are two aspects to this issue. The first is war. And we need this discrepancy eliminated as soon as possible. Second is that we're saying to all suppliers of certain types of equipment: yes, at the initial stage we will buy finished products from you, but please check with your governments, your company executives if they are ready to transfer technology and set up production in Ukraine. This is the number-one criterion. My mission as head of the two commissions is to bring new technology into Ukraine. That same vision is shared by Ukroboronprom, which, being a government stakeholder, is keen that foreign companies should enter our market, set up production facilities and manufacture products here in Ukraine. This will be beneficial both in terms of a substantial saving of resources and the joint development and production with our partners of the types of weapons and military equipment required by our Armed Forces.

Can you give examples showing that our appeals for foreign companies to transfer technology to Ukraine fall on fertile ground?

Such examples do exist, and they are demonstrative. But I wouldn't like to talk about them out loud, because, unfortunately, we are at war, and many countries have to take this factor into account as required by their respective licensing systems. For me personally, progress in our defense industry modernization effort is closely linked to joint development of weapons systems with our partners, especially as we are moving towards a European model regarding how the defense industry is structured and operated. But the common European model, so to speak, differs from country to country depending on national traditions, budgets, relations of ownership etc. Some countries carried out a full privatization reform, while others, such as Poland, on the contrary, opted for the consolidation of the defense industries under the umbrellas of state-run holding companies. We are summing up this experience to be better able to deal with the challenges we are facing. And for me it is vital that we must convert the available capabilities and opportunities into new products and new businesses directly related to growth of arms production and modernization of the defense industries. UDR

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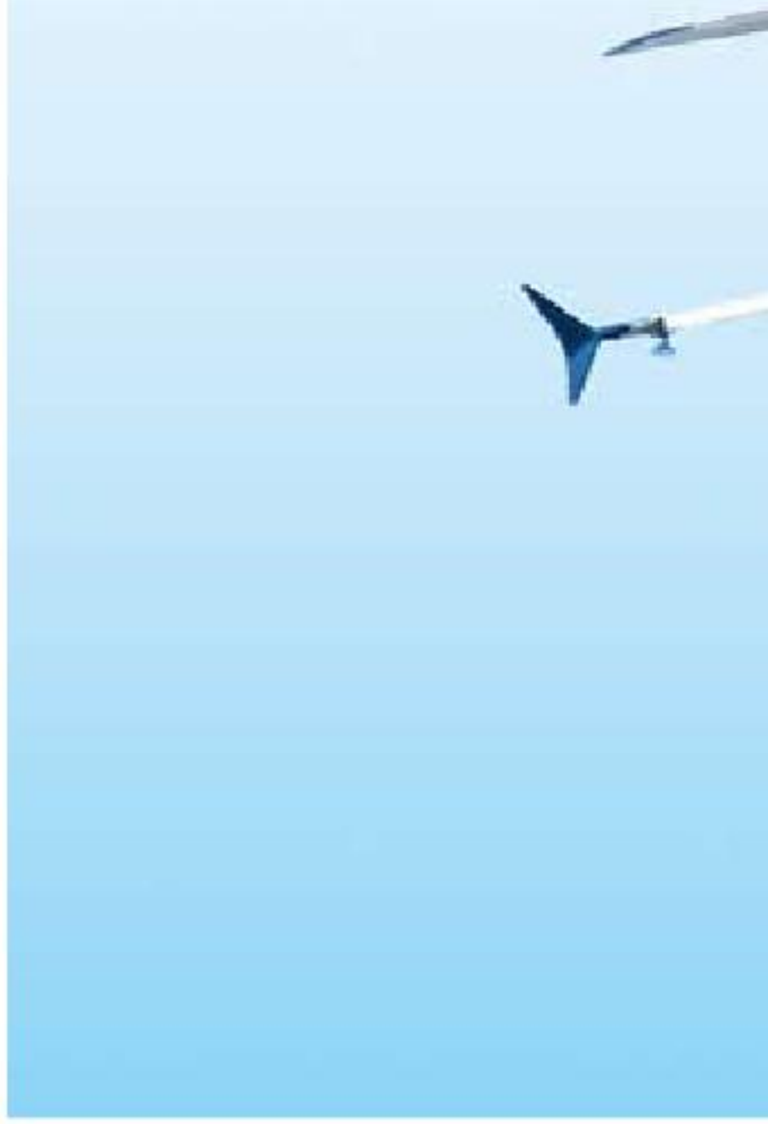


PRODUCE IN UKRAINE TO SECURE WORLD'S PEACE

What is the main goal of Ukroboronprom at the moment?
There has been a clear message from the President that by 2020:
■ Ukraine should be able to protect the sovereignty of its borders
■ Ukraine should become 5th largest exporter of military products.
■ Ukraine is to formally end non-block status, join NATO and switch to NATO military standards.

All the goals mentioned are ambitious targets to reach. As you are well aware of, up to 2014 there has been zero investment in renovation of military-industrial complex of Ukraine. While the whole world has been reshaping the way it looks at defence industry, we were living of our past. Having this incredible engineering heritage from USSR epoch, we managed to remain 8th largest arms exporter for the period from 2009 till 2013, accounting for 3% of world military market. Army Technology, based on such characteristics as protection and mobility, ranks BTR-4 8X8 as one of the TOP 10 world's APCs. This is the birght side. But one can live of the history only for so long and we certainly won't acomlish the goals set up by the President going this way.

So what should we do?
We don't have to reinvent the wheel. As simple as that.

What do you mean by that?
We are not the first to find ourselves in a situation like that. Take a look at Israel in the late 1970s: various suppliers were delivering an increasing share of major weapon systems of the Israel Defense Forces. Reshef missile boat was based on the

plans of the French Mirage III, acquired clandestinely through a Swiss source. Kfir fighter plane was powered with a General Electric J79 United States engine, but embodied with Israel-designed and Israel-produced components for the flight control and weapons delivery systems. Gabriel missile, and the Merkava tank. - the same story. And what about Ukraine? Think about our key planes with avionics, procured from foreign suppliers. Sounds familiar? Don't you see we are Israel of the late 70s, just with a bit more to start with?

By the late 1980s, Israel had become one of the world's leading arms and security services suppliers, with foreign exchange earnings, estimated at US$1.5 billion annually, representing one-third of the country's industrial exports. Initially, most of Israel's arms sales were to Third World countries. Israel succeeded in breaking into the more lucrative American and West European markets due to joint ventures and co-production.

Israel is now one of the world's major military equipment exporters, accounting for 10% of the world total in 2014. Israel's defense industry is represented by 150 firms. The ten largest firms account for 78 percent of the defense industry workers, 82 percent of its total sales, and 87 percent of its total exports. Export makes more than 75 percent of the sales of the defense industry. Defense products and systems account for 32 percent of Israel industrial exports.

Mixture of their own innovations and imported technology allowed Israel to win the world's best markets. Israel firms purchased technology, production rights and entered into joint ventures with foreign companies to manufacture both - end products and components. Nearly every electronics firm has links of some sort with American producers.

That is basically what we need to do: to consolidate the industry and bring in the outside expertise.

Over 70 000 employees:

Armored vehicles
20 subsidiaries

Aviation industry
29 subsidiaries

Radar, Radio Communication and Air Defence Systems
29 subsidiaries

Shipbuilding and marine industry
19 subsidiaries

Rocket artillery weapons and munitions
21 subsidiaries

Design bureaus
11 subsidiaries

Government-authorised arms dealers
6 subsidiaries

What can we offer?

Just think of two simple things – market and work force. Ukraine is a huge market around USD 2 bl in 2014 with estimated USD 5 bln in 2015 and the potential to grow even more than up to USD10+ bl by 2020. We need to protect our borders. And we need the tools to do that. Best of what the world has to offer. On top of that, we have been active and have good ties with quite a few countries: we have been trading with 90+ partners. With relatively cheap but highly qualified personnel and briliant engineering minds that got us so far, we are now uniquely positioned to produce good quality product cheaper, having demand to secure peace knoking into the door.

ALLOY OF POWER

MBT Oplot and new armored repair and recovery vehicle Atlet

Serhiy Zgurets,
Defense Express

In 2015, Ukraine was proceeding with a contract to export Oplot main battle tanks to Thailand. Five Oplot-T MBT vehicles arrived on board a ship at the Thai Navy's Sattahip base on 31st May 2015, while the initial shipment of five vehicles was delivered in February 2014. Thailand became the launch export customer for the new Ukrainian MBT, of which only one vehicle has been procured thus far by the Ukrainian Armed Forces.

Work on the contract was proceeding in a very challenging environment for the Ukrainian economy and defense industry. The ongoing military conflict in eastern Ukraine and the annexation of Crimea, which is home to manufacturers of some of the key components for the Oplot MBT, forced the creation of new cooperative chains for the production of components and subassemblies needed for the Thai Oplot contract. The Oplot stands out among other new Ukrainian-designed military vehicle projects in terms of the integration of both well proven and breakthrough engineering and technological solutions. That is why the Oplot deserves a detailed consideration.

In 2008, General Chief of Staff of the Ukrainian Armed Forces said that the Armed Forces would procure ten Oplot MBT vehicles in 2009, but only one vehicle was actually procured. In 2009, the General Staff requested the Ministry of Defense to procure up to fifty Oplot tanks by 2015. However, the acquisition of Oplot tanks was never included on the State Defense Procurement and Acquisition Plan.

Designed and developed by Kharkiv's Morozov Design Bureau, the Oplot is being manufactured by Malyshev Armor Factory, also in Kharkiv. The Oplot MBT was officially approved for service use in the country's Land Forces in May 2009, with the cost of one vehicle estimated at UAH 65M at year 2009 prices.

Itself an advanced derivative of the T-80UD MBT, the Oplot offers enhancements that improve significantly the vehicle's hitting power, battlefield/strategic mobility performance and the level of protection. The Oplot tank, if compared to the T-80UD tank that Malyshev exported to Pakistan previously, is more complicated to manufacture by a factor of 1.8. Production cycle for the Oplot tank takes 11 months, plus an additional up to 7 months needed for awarding subcontracts and taking the delivery of important components such as armored parts. Ukrainian factories provide all of the vehicle's components and subassemblies excepting the thermal vision camera matrix which is provided by a French supplier.

It was initially announced that the Defense Ministry would procure 50 Oplot MBT vehicles. The size of the Oplot MBT acquisition program was subsequently reduced to 10 vehicles, but, because of budgetary restraints in 2013, this was finally cut to only 6 vehicles to be procured after completion of the Thai contract for 49 Oplot vehicles. It was simultaneously stated that the Bulat, which is an upgraded configuration of the T-64 MBT, is a more cost effective solution for the Ukrainian military given that the Bulat is 3-4 times cheaper to procure than the Oplot. In February 2015, Roman Romanov, CEO of the [defense industries holding company] Ukroboronprom announced that his company would increase annual production of Oplot MBTs to 40 vehicles in 2015 and 100-200 vehicles from 2016 onwards. Oleksandr Turchynov, Secretary of the National Security and Defense Council said in June 2015 that key focus of the State Defense Procurement and Acquisition Program 2016 would be on the quality of military equipment, including the procurement of Oplot MBTs. He furthermore said that the Defense Ministry's acquisition of Oplot MBTs has no relation to completion time of the Thai contract: "We cannot allow ourselves to lose markets that were once dominated by Ukraine. More important, Ukraine must come back to those markets, because this means outside revenue to the National Treasury, and this means the creation of new jobs and resources needed for rebuilding the country's economic potential". Only time will tell if these statements materialize. UDR

> *Forty percent of the domestic defense industrial capacities are involved in the production of the Bulat MBT, while production of the Oplot MBT requires 100% involvement. Production process will be difficult to recover given that a lot of military factories need rehabilitation and modernization for recommencing operations after years of outage, while others have been brought to collapse or reduced to ruins. Still this is possible as key industrial capacities have stayed in place. If there is money available, things will move off the standing block...»*
>
> **Mykhailo Borysiuk,**
> *Ukraine's Designer General for Armored Military Vehicles and Artillery Systems, Narodna Armiya newspaper, 7th April 2009*

Thailand became the launch export customer for the new Ukrainian MBT vehicle. On 1st September 2011, Ukrspecexport signed a contract worth about $240M to supply 49 main battle tanks 'Oplot' and two armored recovery vehicles to the Kingdom of Thailand Armed Forces by the end of 2014.

OPLOT MBT

IN CLOSE-UP

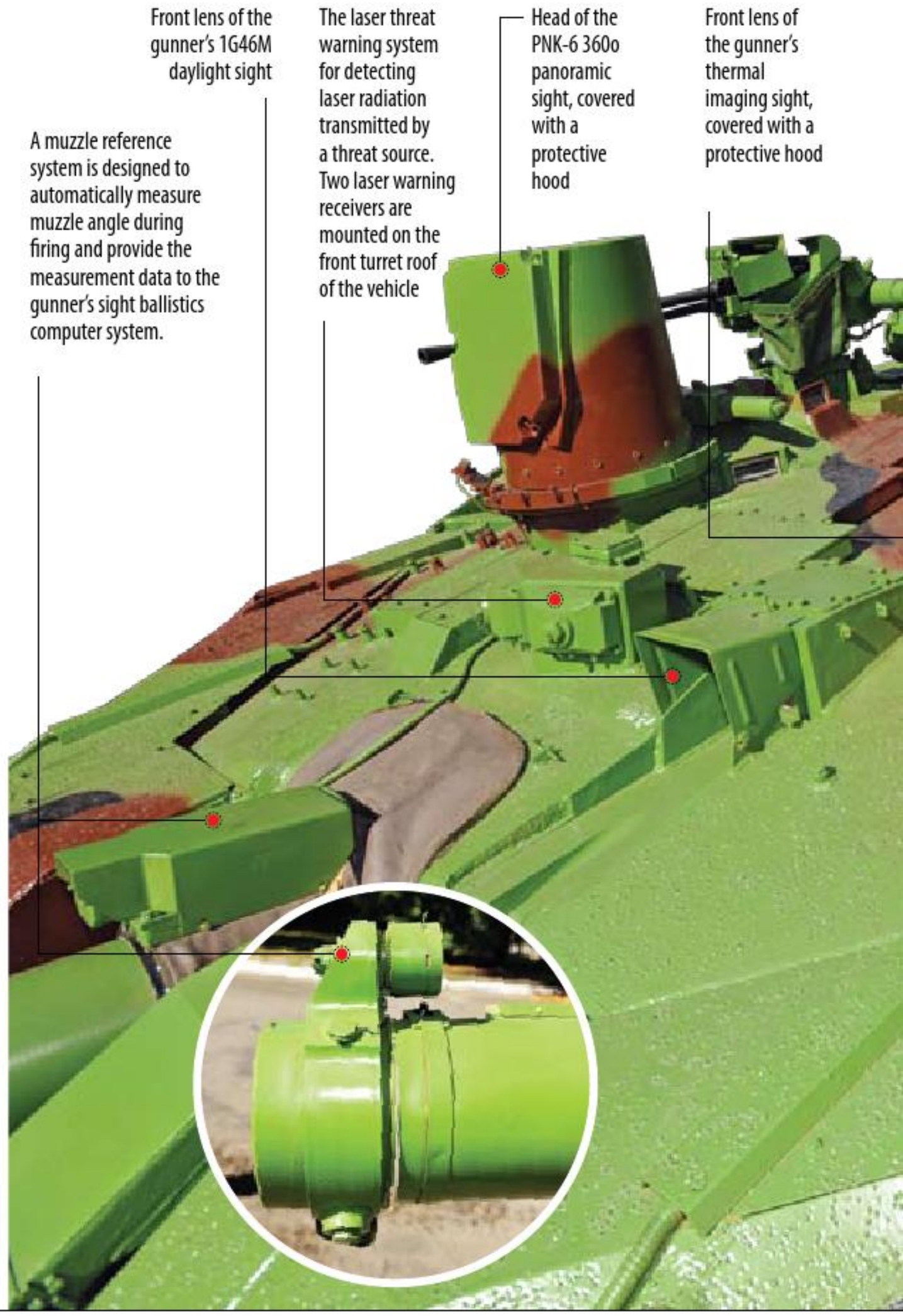
The Oplot main battle tank is a tracked fighting vehicle that provides an impressive amount of firepower, reliable protection and excellent maneuverability performance. It is designed to engage all types of ground, surface and slow low-flying targets, under conditions of hostile fire.

Remotely controlled anti-aircraft machine gun mount accommodating a 12.7-mm antiaircraft machine gun capable of ranges of up to 2,000 meters.

The Oplot is fitted with an under-armor diesel auxiliary power unit (APU) developing 10 kW. This allows the vehicle to run key subsystems without the main engine running (for instance, when the tank is operating from a static fire position or when the vehicle is on silent watch). The APU is mounted at the rear of the hull on the right side.

Optronic Varta countermeasures system provides protection against laser-guided threats.

Modules of the 'Duplet' explosive reactive armor system are mounted on the hull front, turret and hull sides of the Oplot MBT. The Duplet provides robust protection against kinetic-energy (subcaliber armor piercing penetrator projectiles) and explosively formed threats, including tandem-warhead shaped charge threats



Wind sensor provides crosswind speed data for the gunner's sight ballistic computer system

Rear laser threat warners

Track assembly consists of six dual 670-mm rubber-tired road wheels, five 225-mm track support rollers, the idler at the front and drive sprocket at the rear.

A thermal effects protective smoke discharging system is comprised of 12 smoke grenade launchers, arranged in six on either side of the turret.

Steel wire rope for towing and self-recovery

Periscopic vision devices

The vehicle is painted in a camouflage pattern for reduced visual signature.

A rubber mat hangs at the front of the vehicle and this helps to keep down dust.

Anton Mikhnenko, UDR

BTR-3E: A FIERY WHIRLWIND ON THE WHEELS

Ukraine's defense industry is offering potential customers, both on the domestic and export markets, an armored personnel carrier APC designated BTR-3E. Developed by the Morozov Machine Design Bureau in Kharkiv and being produced at Kyiv Armored Plant, BTR-3E has recently passed its baptism of fire in counterterrorist operation in the east of Ukraine. Also next generation of this infantry carrier is being successfully used in Royal Thai Army. UDR decided to describe in details the most successful Ukrainian defense industry product over the last few years. Kozak-2 from the previous-generation design?

Now the procurement programs of the world's biggest military importers suggest that lightweight armored hardware scores a solid third place by the amount total of procurements, behind fighting aircraft and precision-guided weapons. Customers mostly demand wheeled air-deployable vehicles, armed with light turret-mounted weapons complemented by the newest powerful precision weapons suites, and well protected.

The Ukrainian defense industry is offering its potential customers the APC designated BTR-3E. In its maneuverability and combat performance, this new Ukrainian designed armored vehicle far outperforms its rivals originating in the fellow former Soviet states. It has long been assumed that the APC should be as maneuverable as the battle tank, which would not only allow it for motorized infantry troops to march alongside armored units but in some cases even lead the way. In many countries such an approach has led to caterpillar APCs ousting their wheel-typed siblings altogether. But the lessons learned from the Iraq war revealed the advantages of precisely the wheel-typed vehicle which, de-

livering a substantial amount of fire-power, is virtually equivalent to the infantry fighting vehicle (IFV) in its basic performance characteristics.

In that context, the projected APC, developed in 2002 by the Morozov design bureau in Kharkiv in compliance with the Ukrainian Ministry of Defense' (MoD) requirements specification, is deserving of consideration.

BTR-3E wheel-typed armored troop carriers are being assembled by MoD's repair factories, with 90 per cent of all the assembly units coming from domestic companies.

What make the vehicle particularly attractive to prospective buyers, are its price tag; low-cost serviceability and through life support; low weight; a great amount of fire-power as compared to same-class equivalents; the capability to negotiate water obstacles of whatever width or depth; the ability to operate in environments heated up to +55°C, and air conditioning of crew and passenger compartments. The BTR-3E's design has enough room for extra combat modules and also for an automatic transmission (Allison or Ukrainian made). The baseline design is easy to convert into configurations for auxiliary applications such as medical evacuation, policing, command and control or repair and recovery.

The BTR-3E is a highly maneuverable wheel-typed amphibious combat armored vehicle. It can carry a 3-man crew, consisting of the commander (section leader), gunner and driver, plus six troops. Compared to Russia's BTR-80, the Ukrainian APC BTR-3E has a different body that has a greater usable space, hence heavier displacement. The Russian

BTR-80 is claimed to be able to negotiate river obstacles in two point river motions, while for the BTR-3E, as proven by the testing, even three-point river motion is no obstacle.

The BTR-3E is powered by 326hp Deutz engine integrated with Allison MD 3066 automatic transmission. The BTR-3E also features an enhanced clutch; back-up (pneumatic) starting system for cold start; heating system for the coolant and oil, enabling the engine to start in temperatures as low as -55 C; new automatic equipment that discriminates cooler types (water or antifreeze), warning about critical temperatures of the cooler and shutting the engine once the oil pressure falls down to below critical levels.

Also the BTR-3E can be equipped with a computer controlled hydromechanical transmission from Allison, or a manual gearbox. The latter would reduce the overall price of the vehicle. The BTR-3E is two tons heavier than the 14 ton BTR-80. With French tires Michelin, which are ideal for operation in high-temperature environments, the Ukrainian vehicle makes 100 kph, whereas the BTR-80's «rubber legs» only allow for 85 kph during 30 minutes at the longest.

For comfort of the crew and passengers, passenger compartment's ceiling height has been increased by 150 mm, and air conditioning is optional. Air conditioner, as suggested by feedback from the Ukrainian military contingent in Iraq, is a prime necessity in high-temperature environments. The armored vehicle is equipped with protective facilities to shield the crew and passengers from penetrating radiation from nuclear munitions, as well as from toxic agents, germ weapons or radioactive dust.

The vehicle's exclusive forte is combat module Shturm-M, which include a 30-mm automatic gun ZTM-1, a 7.62-mm machine gun, an automatic grenade launcher, an anti tank missile suite and a smoke grenade dispenser. Also it can be protected by screening mesh made by Polish company Lubawa SA.

The vehicle's exclusive forte is a general purpose combat module called Shturm-M. The overall amount of firepower provided by a Shturm-M fitted BTR-3E is on a par with that of an IFV. The combat module include a 30-mm automatic gun ZTM-1, a 7.62-mm machine gun, an automatic grenade launcher, an anti tank missile suite and a smoke grenade dispenser. The turret also accommodates «Panorama-2B» panoramic observation system. Also combat module Shturm-M can be protected by screening mesh made by Polish company Lubawa SA. In particular, with such module's option, the BTR-3E was presented at the international exhibition «Arms and Security 2015», which took place in late September in Kyiv.

The vehicle's weapons, supported by an automatic fire control system and sighting devices, ensure speedy detection, identification and engagement of ground and low-flying targets with high rate and accuracy of fire. The overall price of the armored troop carrier varies with the cost of optional extras.

The price of the Ukrainian APC much depends on the terms and volume of every specific contract, and also on the customer's buying power. The vehicle sells at prices that are on the whole higher than the BTR-80's (due to more powerful, hence more expensive weapons), but far lower than foreign made rivals' such as the AMV XC 360P Rosomak, Pandur II 8x8, Stryker or Piranha IIIC, which are all completed with the expensive IR imaging systems, cameras and surveillance displays nonexistent in the BTR-3E. The hardware may come to buyers with an associated production license.

DEVELOP AND WIN: BTR-3E-1

To develop the APC BTR-3E in Ukraine has been made next generation vehicle, to be known as BTR-3E-1. Ukraine developed combat module Shkval integrated with a 30 mm gun, and anti tank missile suite Baryer with two ready to launch missile containers. State owned design organization Luch and state joint stock holding company Artem will ensure that BTR-3E-1 possess an enhanced amount of firepower by equipping this with new precision guided weapons.

The vehicle's combat module will undergo fundamental modifications as well. In particular, the current fire control system Tandem will be replaced with new indigenously designed TREK system, for which an electronic optical module is currently under development by an instrument making factory in Kharkiv region's Izyum. The

module's designer and integrator is Kyiv's Kvant Radiolokatsiya research and development institute, known for its so far unique naval radar designs.

In the BTR-3E-1, the crew commander will be able to take over gunfire control if need be, unlike in the baseline configuration, where this was solely the gunner's responsibility.

The BTR-3E1 is offered in a number of configurations to meet the varied requirements of armed forces. The major variants are BTR-3E1K command vehicle, BRM-3E1 combat reconnaissance vehicle and repair-and-recovery vehicle. The other variants include the MOP-3E1 fire support vehicle, the BTR-3E1Sh command and staff vehicle, and the BSEM-3E1 armoured ambulance.

The Royal Thai Army acquired more than 230 BTR-3E1 APCs till date, under agreement with Ukrspecexport. The first 2 of 96 BTR-3E1 have been delivered at U Tapao Airport on 17 September 2010. The second batch of 121 BTR-3E1s with a price tag of 5 billion baht have been ordered by Royal Thai Army and 14 BTR-3E1s have been ordered by Royal Thai Navy to be used by Royal Thai Marine Corps in August 2010 with the MTU Engine and Edison Gear.

Thailand placed an order for additional 15 BTR-3E1 and six BTR-3RK vehicles from Ukraine in August 2013.

EXTRA CAPABILITIES AND OPPORTUNITIES

Soldiers in the battlefield can choose variety of APC BTR-3E capabilities because Ukrainian BTR has a several variants of modernization packages, depending on customer's financial capabilities and requirement. Global weapons market players have tended to award contracts to several independent suppliers for one and the same modernization program. Combat modules, for example, can come from one supplier state, and security systems or communications facilities – from another country. Ukrainian suppliers offer an integrated modernization package, each of its components being totally autonomous and easy to integrate into an overall weapons system. The package includes the most advanced armaments and technologies, such as the Stugna laser guided tank gun and armored fighting vehicle gun rounds, explosive reactive armor (ERA) and explosive active armor (EAA) systems Nozh and Zaslon, electronic optical countermeasure system Varta, tank protective system Fantom 3, upgraded communication equipment, camouflage system Kontrast M and even tank simulators mounted on electric motion platforms for driving and firing training. Apart from Stugna, Ukrainian manufacturers offer potential buyers new anti-tank guided projectile Baryer for guns mounted on tanks, IFVs and APCs.

The armored vehicle modernization package offered by Ukraine also includes communications facilities with cryptographic modules to ensure that classified information remain secret. The Ukrainian technology has an advantage of being an average half of the cost of western designed alternatives. Considering that reprogrammable communication devices are on some occurrences easy to counter using modern electronic warfare technologies and radio communication jamming systems, the cost advantage may become a weighty argument in the fight for future customers.

The Royal Thai Army acquired more than 230 BTR-3E1 APCs till date, under agreement with Ukrspecexport.

Ukrainian weapons designers have accumulated considerable expertise in the area of simulating facilities for armored fighting vehicles. In particular, Ukraine supplies to the export market simulators supporting driving and firing training requirements for BMP-1 and BMP-2 IFVs, and also APCs. It is only natural that weapons modernization projects are not the 'thing in itself' but developed to suit specific customer requirements. For example, Kharkiv's Morozov design organization several years ago developed a modified version of the BTR-80 IFV, upgrading this to the BTR-3E capability, which was being supplied to a customer in South-east Asia under a major framework contract. In addition, a new type lightweight armored vehicle BTR-3DA has been developed, marking for Ukraine the initial milestone accomplishment in this area. JDR

[light armor]

THE BREAKTHRO

State Company Lviv Armor Plant, which is incorporated with the Ukroboronprom (Ukrainian Defense Industries) state-owned holding group, has launched production of the Dozor-B light armored 4x4 vehicle developed by the Morozov Machinery Design Bureau. The first two vehicles are already undergoing the State Trials process that is potentially leading to Approval for Service Use.

Igor Fedyk, UDR

UGH OF *DOZOR*

The Dozor-B vehicle is designed to protect the crew, passengers and internal equipment from NRBC attacks, the effects of small arms fire, shell fragments and mine threats, precisely 7.62-mm AP bullets fired from 30 meters, and fragments of 150-mm HE shells detonated 50 meters away. Special operations units of the armed forces and internal security services can use the Dozor-B as a transport vehicle or a mounting platform for different weapons systems and military equipment.

The baseline Dozor-B design can form a basis for a family of specialist vehicles, including command vehicle, scout car and medical evacuation vehicle, as well as a mobile platform for antitank weapons or a fire support squad armed with 120-mm mortar.

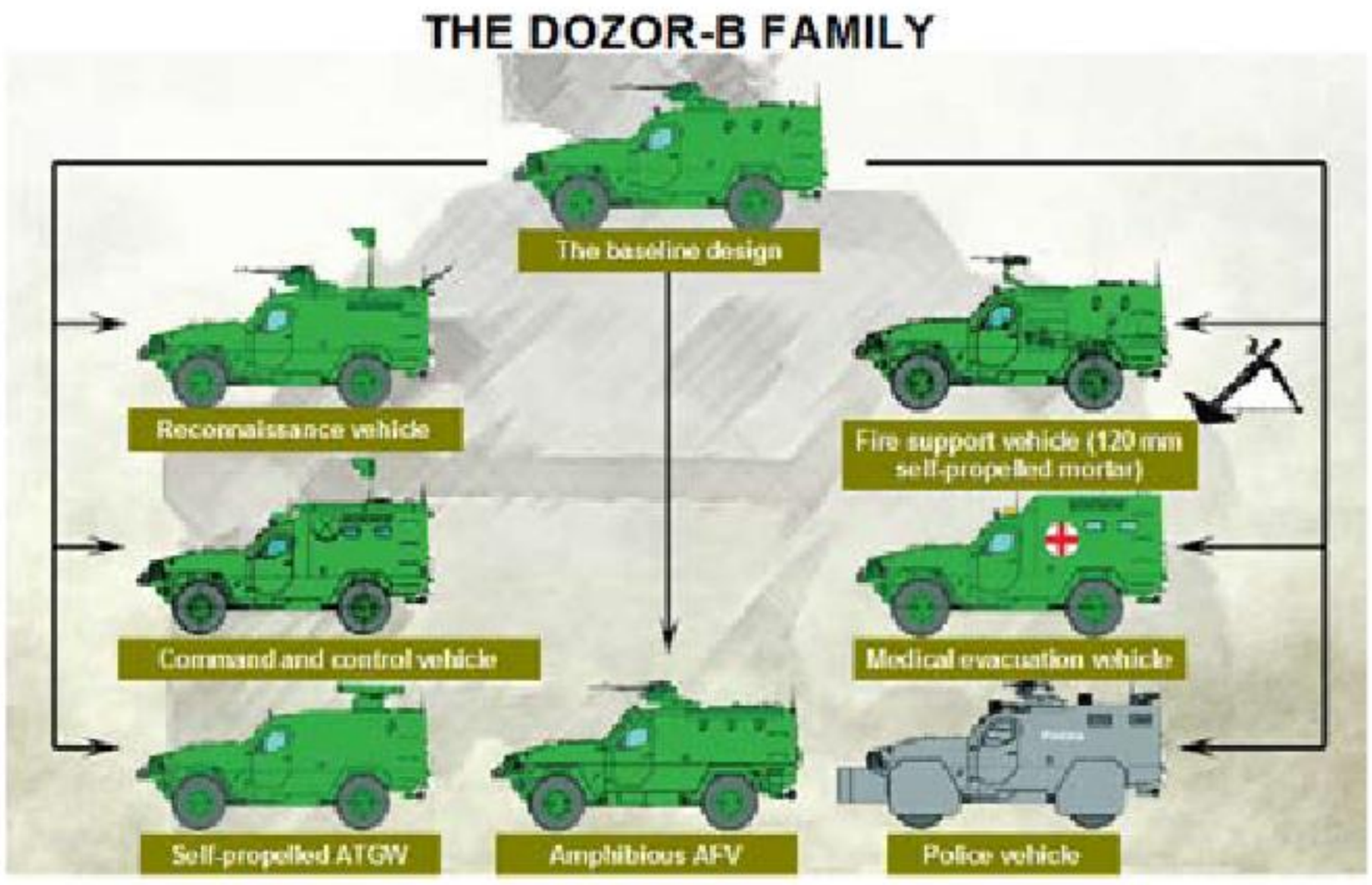
At the Kiev Arms and Security 2015 Expo in September, Lviv Armor Plant showcased the Dozor-B vehicle in two configurations: armored personnel carrier (APC) and light armored personnel carrier (LAPC).

Both of the configurations are powered by DEUTZ BF 4M1013FC four stroke four cylinder turbocharged 190hp diesel engine mated to Allison LCT-1000 automatic transmission. Suspension is of independent type with A-type control arms, with torsion springs integrated with hydraulic buffers on each of the four wheels.

Baseline equipment set on both configurations includes HVAC, communications equipment, a GNSS receiver, a 6.8t self-recovery winch and a smoke grenade dispenser system.

The design of the hull allows the installation of slat armor to protect against larger caliber munitions and heavier mines. The level of additional protection will be defined by specific customer requirements.

The baseline Dozor-B design can form a basis for a family of specialist vehicles.



KEY DOZOR-B APC AND DOZOR-B LAPC SPECIFICATIONS

Specifications	Dozor-B APC	Dozor-B LAPC
Dimensions	5600x2400x2700 mm	5800x2450x2700
Crew	3+6	3+7
Engine	DEUTZ BF 4M1013FC	DEUTZ BF 4M1013FC
Weight	8450±250 kg	8550±3%
Maximum Speed	120 km/h	120 km/h
Capacity of fuel tanks	146 l	180 l

The Dozor-B LAPC vehicle is armed with a turret-mounted 12.7-mm NSVT-12.7 antiaircraft machine gun which is aimed and fired remotely via optical monocular periscope sight with rotating head PZU-7. The Dozor-B APC features the BPU-12.7 machine gun turret. The targets that can be engaged with this machine gun turret are hostile armored vehicles as well as aerial targets (helicopters) at ranges up to 2,000 meters, at day or night. A non-stabilized turret that can run autonomously, the BPU-12.7 is controlled remotely from operator's station. Related fire control system is comprised of a color TV camera, thermal imaging camera and laser rangefinder.

Ukroboronprom announced it would deliver 150 Dozor-B vehicles to the country's Armed Forces during 2015. However, this number was subsequently reduced to 10 vehicles to be procured by year's end.

During a visit to Lviv Armor Plant, Ukrainian Minister of Defense Stepan Poltorak tried out the vehicle and was left satisfied with the results. He praised it for being easily controllable, well riding and highly maneuverable.

The manufacturer did not disclose the estimated price tag for the vehicle, other than to say that the Dozor-B would be four times cheaper as compared to international counterparts.

It has to be mentioned, that Ukraine is not the only manufacturer of the Dozor-B vehicle. Poland is another country that is showing practical interest in the new Ukrainian APC. In 2011, Poland's Mista acquired production license for the DOZOR-B vehicle from the Cyprus-based company Lacenaire Ltd. It took two years for the Polish company to set up production line and obtain the requisite manufacturing facilities. The Polish version of the Dozor-B, named Oncilla, is an upgrade to meet western manufacturing and quality standards

The Polish version of Dozor-B, named Oncilla, is an upgrade to meet western manufacturing and quality standards.

as well as NATO ballistic protection requirements.

Particularly at IDET 2015 arms expo, an improved variant of the Oncilla APC vehicle was showcased for the first time. The original Oncilla APC vehicle has been equipped with a diesel engine DEUTZ BF 4M 1013 FC (190.5 hp), while the upgraded variant features now an IVECO NEF 4 ENTC (209.5 hp), and Allison 1000 automatic 6+1 speeds gearbox, allowing a maximum highway speed of 120 km/h. The fuel range is set at 750 km.

The Oncilla APC is protected by a Level 2 (STANAG 4569) armor protection in standard configuration, and can be upgraded after installation of outboard passive armor up to Level 3 (STANAG 4569).

The Oncilla can be fitted with a remotely controlled turret, as well as an open turret. Each of them is equipped with a NSV 12.7 mm machine-gun, the ammunition load is 450 rounds.

Standard equipment of the Oncilla APC also includes central tire inflation system, hydraulic power steering, heating, ventilation and air-conditioning system (HVAC), automatic fire extinguisher system, filtering and ventilation unit, and 6.8 t self-recovery winch.

A second new variant of the Oncilla APC was unveiled at MSPO exhibition held in Poland in September. This version was displayed equipped with heavier armor protection and a new machinegun mount.

The Oncilla APC vehicle is being promoted by the Polish manufacturer as a multi-purpose armored vehicle aimed to meet the requirement of the Polish Armed Forces. More, the Oncilla vehicle has attracted interest from potential customers in Iraq, Nigeria and some of the North African and Sahel states. UDR

[light armor]

PANTHER JUMP

BOGDAN MOTORS' ARMORED VEHICLES

The Ukrainian Armed Forces and other national security sector services have a critical requirement for armored vehicles of various types. This has set off a great number of R&D programs on new armored vehicles in Ukraine. Bogdan Corporation is keen to win a share of the domestic arms market and, in a longer term, break into the export marketplace for armored military vehicles.

Serhiy Zgurets, Defense Express

Bogdan Motors has placed a special focus on the development of a lineup of multifunctional tactical armored 4x4 vehicles, where the vehicle named Bars-8 (Panther) holds a special place.

Tactical armored vehicle Bars-8 made debut in April 2015, during a demonstration of new indigenous military vehicles to the country's leadership at the National Guard's test and training facility in Novi Petrivtsi outside Kiev, and, in a more mature variant, it was unveiled to experts and visitors at the Kiev Arms and Security 2015 Expo in September.

Available with a 6-speed manual or automatic transmission, the all-wheel drive vehicle features a body-on-frame construction, reinforced suspension and axles, a 6.7 liter Cummins turbocharged diesel engine developing 385hp, and thickened-wall exterior body panels.

The Bars-8, as stated by its developers, is designed to support tactical and special operations of military forces and other national security sector services, by providing transportation of personnel and supplies over rough terrain. Being in the 8t gross vehicle weight (GVW) category, the armored car can carry a full squad of 10 personnel, under the protection of its STANAG 4569 Level 2 compliant armor. The body-on-frame vehicle is built on the chassis of the Dodge Ram truck – a full-size civilian pickup truck that has been produced from 1981 by Chrysler factories in Mexico and the United States.

The vehicle incorporates a conventional layout with engine in the front, driver's station in the middle and troop compartment in the rear. The welded hull is made of steel armor plates inclined at an angle, offering NATO STANAG 4569 Level 2 ballistic protection. The hull has a five door design, with two front side doors for the driver and commander, and one rearward and two middle side doors for troop mount/dismount. The doors have bullet-proof windows in the upper panels. The windshield is of two-part construction consisting of two bullet-proof windows. Over the troop compartment, there is a roof hatch for observation, firing and emergency exit.

The vehicle can be optionally equipped with a winch for self-recovery or assisting other vehicles of the same or lighter mass. Other optional extras include HVAC equipment, a situational awareness system with rear-view and 360-degrees cameras, a GPS navigation device, thermal imaging cameras and night vision devices, NRBC filters and air filtering system. As regards the vehicle armaments, these will be selected based on specific customer requirements and the missions to be dealt with by any individual vehicle. The Bars-8 can accommodate different types of weapons stations and turrets armed with a 7.62 mm/12.7 mm machinegun or an automatic 40 mm grenade launcher, or an indigenous AT-GM launcher system.

The Bars-8 is designed to support tactical and special operations of military forces and other national security sector services, by providing transportation of personnel and supplies over rough terrain

As a matter of fact, the Bars-8 vehicle will compete in its niche market segment with KrAZ Spartan - a Ford F550-based 4x4, 8t GVW armored vehicle co-manufactured by Auto-KrAZ and Streit Group. However, as demonstrated by the experience of using such armored vehicles in the ATO theater, heavy weight of the armored hull built on a civilian production car chassis usually results in excessive load and damage to suspension system that isn't designed for such duties, especially where vehicles are operated on unpaved roads or off-the-road. To eliminate this problem, Bogdan Motors intends to upgrade the vehicle by introducing a significantly stronger suspension and improving strength of all of the other key components of the vehicle.

The Company is keen to supply its Bars-8 vehicles both to the Ukrainian Armed Forces and other security institutions. But before this happens, the vehicle has to undergo the State Trials process that is potentially leading to Approval for Service Use. UDR

BARS-8

TACTICAL ARMORED VEHICLE

Designer and Manufacturer
PJSC «Bogdan Motors Automobile Company», Ukraine

Bars-8 is a multifunctional armored 4x4 vehicle designed to support tactical and special operations of the Armed Forces and other national security services; it can provide the transportation of personnel and supplies over rough terrains, and offers NATO STANAG 4569 Level 2 ballistic protection

9 t Gross Vehicle Weight (GWV)

2 t Payload capacity

Engine
Cummins 6.7l ,V8,
turbocharged 385hp diesel

700 **km –** Mobility Range

110 **km/h –** Max speed

Protected lights

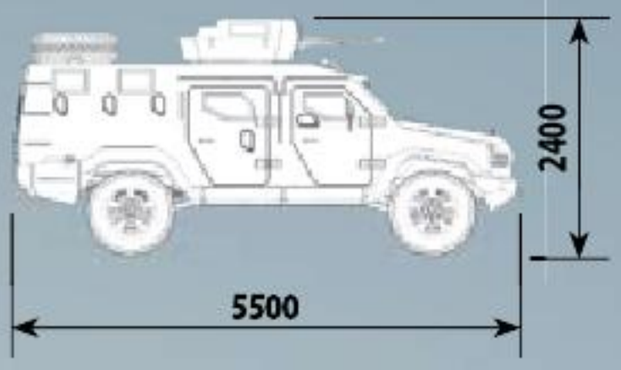
Self-recovery winch

280 MM – Ground clearance height

The vehicle features a body-on-frame construction, strengthened suspension and axles, and chassis adopted from the Dodge Ram pickup truck

$200000

Average price tag of the production vehicle without optional extras

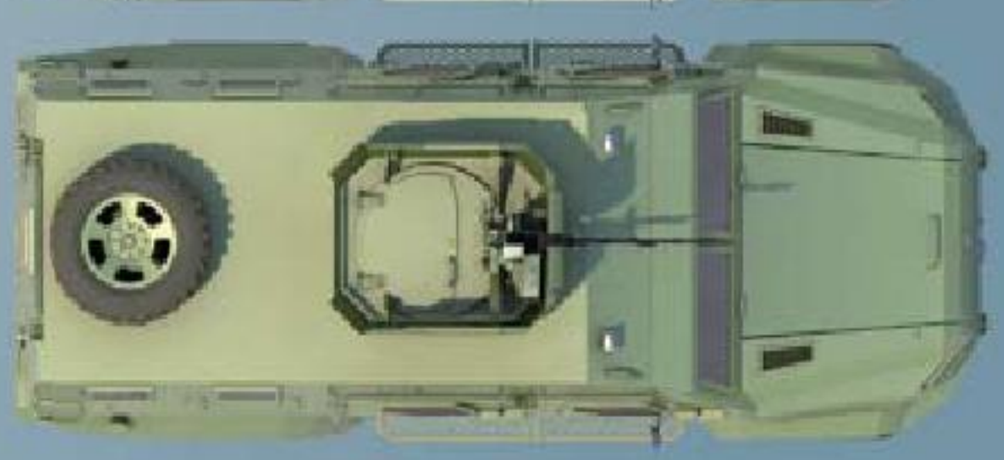


Armaments

The troop compartment roof can accommodate a variety of weapons stations armed with a PKMS 7.62 mm, NSVT 12.7 mm or KT 12.7 mm machinegun, or an AG-17/ AG-40 grenade launchers etc.

Maneuverability

Ascending angle, *m*	Fording depth, *m*	Side slope, %
1,4	0,76	20/40



COMBAT MODULE "VIY"

Remotely controlled Combat Module

Can be mounted onlight armored vehicles (LAV) such as "DOZOR-B" and intended to destroy medium armored targets, firing points, manpower and enemy air targets. LAV with CM "Viy" are designed for patrol, reconnais-sance and combat missions.

CM "Viy" has a simple steel constructions without stabilization, which significantly reduces its cost. The structure of CM "Viy" is based on commander hatch of the tank T-64, which ensures the reliability of the structure of CM "Viy", simplifies the manufacture and therefore reduces its cost

Westan Group Associates LTD
viy.module@gmail.com +971566001573

CM "Viy" SPECIFICATION:

GSh-23L specification:

CALIBER
23 mm

RATE OF FIRE
3..3400 rounds/min

MUZZLE VELOCITY
700 m/s

DESIGNED RESOURCE
4000 shots

FIRE CONTROL
electric, 27 V

WEIGHT	ANGLE OF ROTATION
50 kg	**Y:-5⁰ – 60⁰ X: 360⁰**

OVERALL DIMENSIONS (not more, mm)

Length	width	height
1387 (1537)	**165**	**168**

Tank hatch is equipped with vertical and horizontal targeting drives, bracket for mounting gun carrier and other mechanisms and electric equipment.

For storage and loading of ammunition CM "Viy" is quipped with box-type ammunition mechanism with capacity of 250 pcs of 23mm ammunition. It has a rigid welded construction and is attached to the back wall of the CM "Viy".

For collection of used cartridge belts CM "Viy" is equipped with a box type cartridge belts collector.

23 mm double-barreled aircraft gun "GSh-23L" designed for firing at air and ground targets with fragmentation high-explosive, armor-bursting and armor-piercing incendiary shells.
Automation work is based on usage of energy of powder gases. GSh-23L is equipped with a localizer, which are used for the directed removal of powder gases and reduce recoil force.

[metal heartbeat]

DEUTZ – A RELIABLE HEART FOR UKRAINIAN MACHINES

Today, one of the largest manufacturers of diesel engines for machinery, diesel and gas generators – the DEUTZ company, is being active in the Ukrainian market, by breathing life into the local machines. UDR interviewed representative of DEUTZ in Ukraine – a senior adviser to Automotors Michael von Hayden about latest company's achievements.

What is the DEUTZ experience on the Ukrainian market? When this cooperation started and what are the results up to date (if possible – quantitatively or in percent). Please, give the most successful/interesting examples.

DEUTZ had a breakthrough when KhTZ decided to purchase 3000 motors in the year 1998. Additional highlights were the sale of 200/300 motors to LAZ for the Kiew city buses and the sale of 200 diesel motors (with Allison automatic transmissions) to Malishev Plant in Kharkov, who was exporting BTR3 to UAE. Besides BTR3 DEUTZ motors are also used in BTR4 and Dozor B. The success of the compact motor is due to several unique features proving to be very advantageous, especially for the application in APCs. The main advantages are: high torque, low weight, low fuel consumption, V-type engine (if requested) and highest durability even under extreme stress.

Which products/services of DEUTZ are of the greatest demand in Ukraine? Which sectors of Ukrainian industry – military or civilian – are the largest customers?

Presently, the focus is on the military sector. However, in the future the demand in the civil sector will dominate again. As soon as the economy is reversing its downtrend, more buses, tractors and trucks will be produced.

As to your question about the services big in demand I could name 2 services:

a) Our application engineers are constantly in contact with Morozov Design Bureau and the producers of APCs assisting them especially when prototypes are newly designed and produced.
b) DEUTZ is the market leader with a population of app. 15000 diesel motors in Ukraine. DP Automotors as exclusive distributor of DEUTZ AG for the Ukrainian market has important service obligations. In order to fulfill them Automotors is running a fleet of service cars in order to render a mobile service all over the country.

What caused the situation of not supplying of engines by DEUTZ to Ukraine during 2014 – beginning of 2015?

Before talking about supply problems of the past I would like to make the following statement: DEUTZ AG is ready to supply as many motors as required by the Ukrainian OEMs.

In the second half of the year 2014 indeed export restrictions to Ukraine were in place. All European exporters were facing a jungle of boycott measures hard to overcome. There were general export restrictions, but also those against individuals and institutions in Ukraine. Finally due the active intervention of the president of Ukraine, chancellor of the Federal Republic of Germany, Ukrainian Foreign Ministry, RNBO and a board member of DEUTZ, we received the permission of the German Export Control Institution and, finally, common sense prevailed.

DEUTZ has significant experience of cooperation with the leading armies of the world in creation and maintenance of cars/armored vehicles. What you can or wish to advise Ukrainian military and local producers of armored vehicles, taking into account the best practices and experience of other armies in Europe?

DEUTZ AG is neither creating nor servicing armored vehicles. The task to produce modern and compact motors and fulfill all European environmental requirements remains the main goal and at the same time keeping a competitive advantage over the competitors. Our dealers and distributors worldwide have been instructed to carry out the service on their local markets. By decentralization this task DEUTZ is expecting to obtain in return an optimization of the service in the respective countries. For more than 20 years Automotors Kiew is responsible for marketing of motors, spare parts and rendering technical service to customers by means of the service stations in Bucha and Zaporozhe, running a fleet of service cars and training of technical personnel of our customers. The aim is to enable the customers to do all repairs and maintenance by themselves, only major repairs and overhaul will be carried out by Automotors.

Concerning the advice to manufacturers of APCs:

- try to focus on the creation of new APCs by increasing the quality gradually up to NATO standards
- make use of local parts if and when the local producers are willing and enable to increase the quality demands (western industrial norms). Alternatively import the goods which in general have a superior quality to price ratio than locally manufactured products.

What are the priority directions of cooperation DEUTZ with Ukraine for a short, medium and long perspective?

The priority direction of DEUTZ AG and Automotors is to increase sales to the military and civil sector, to strengthen the service infrastructure and to build or to rent 2 more service stations in the nearest future.

Another aim is to train free of charge the mechanics of the armed forces in the training centers of Automotors in order to enable them to become almost autarkic, except for major repairs and works under the guarantee.

In this connection it is important to know: avoid using too many different brands, introduce standardization as much as possible otherwise you will have tremendous logistical problems in and outside of Ukraine.

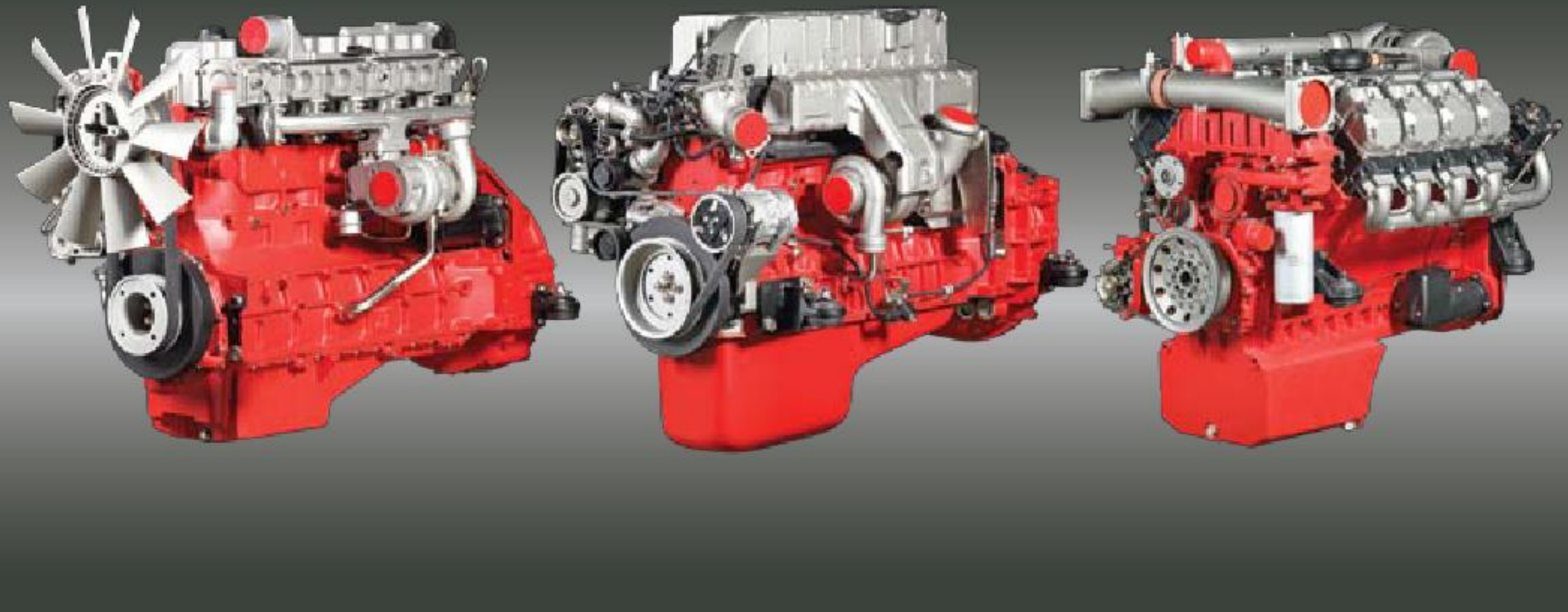
Is the company ready to participate in projects related to the construction in Ukraine of modern service centers or assembly plants for the manufacturing of DEUTZ products in Ukraine? Are there the necessary preconditions for this?

YES, Automotors, as DEUTZ distributor is ready to participate in the construction of new service stations in Ukraine. In fact Automotors is constantly enlarging and improving the existing service infrastructure. Only recently a second service point was opened in Zaporozhe in order to facilitate the service for military vehicles.

Obviously the present economical situation in the country does not warrant an assembly plant. In the future, say in 2 to 3 years, the main OEMs such, such as KRAZ, KhTZ, Bogdan and ZAZ would probably see their sales rise again. Even their increased sales potential would not be sufficient for an assembly plant. They are all private and cannot be forced to unite their purchasing power and buy from one Ukrainian assembly plant. Furthermore the producers need a large variety of motors: different in power output and EU emission norms, since some might export into EU countries, others to countries like Egypt, Iran etc. Due to these circumstances they will be no secure base load for the off-take of motors for any future assembly plant.

Equally important are the following considerations, which are to be taken into account: DEUTZ is an existing, fully automated production, which can produce more than 200 thousand engines annually. While as an assembly plant in Ukraine, which has not even built yet, would produce a small number of engines, and local producers are unlikely to replace imports, because most of Ukrainian companies have not yet reached the European standards.

The only economical reason for erecting an assembly line in Ukraine would be to obtain government subsidies in form of tax's exemption (import duty and/or VAT). This might not be in the very interest of the government since an assembly plant using mainly imported parts represents only a pseudo-industrialization and does not bring any real benefits to the government. Consequently there remain strong doubts as to the economical advantages of such a project. UDR



PRECISION-GUIDED WEAPONS

BARYER V | EXTENDED RANGE ATG MISSILE AND LAUNCHER OPTIMIZED FOR USE FROM AERIAL PLATFORMS

BARYER | VEHICLE-CARRIED LOG-RANGE ATG MISSILE SYSTEM

15,7 kg | 1091 mm | 130 mm ∅

KOMBAT | GUIDED MISSILE ROUND

24,7 kg | 1013 mm | 125 mm ∅

KONUS | GUIDED MISSILE ROUND

22,3 kg | 923 mm | 120 mm ∅

FALARICK 105 | 105 MM GUIDED MISSILE ROUND

25,2 kg | 1015 mm | 105 mm ∅

STUGNA | GUIDED MISSILE ROUND

19,3 kg | 1136 mm | 100 mm ∅

FALARICK 90 | 90 MM GUIDED MISSILE ROUND

20,5 kg | 977 mm | 90 mm ∅

KORSAR | MAN-PORTABLE ATG MISSILE AND LAUNCHER

13,5 kg | 1000 mm | 107 mm ∅

Type of carrier platform
Missile mass
Missile diameter
Missile length

FROM UKRAINE

State Enterprise "State Kyiv Design Bureau "Luch" of Kiev, which is incorporated with the Ukroboronprom state-owned holding company, has developed a family of precision-guided weapons. The missiles are designed for attacks against stationary and armored vehicle targets protected with current-generation hybrid armor or explosive reactive armor systems

25 kg | 1609 mm | 130 mm Ø

7,5 km — 800 mm

5 km — 800 mm

5 km — 750 mm

5 km — 700 mm

5 km — 550 mm

5 km — 550 mm

4 km — 550 mm

2,5 km — 550 mm

Armor penetration capability

Guidance

For target acquisition and aiming, optical and IR sighting devices are used to enable 24-h operation in all weathers. Once the target is designated and locked on, it is tracked automatically without further operator's intervention. Luch missiles carry tandem shaped charge warheads capable of defeating ERA protection of current-generation tanks.

Jet stream

Upon impact, high explosive content of the warhead detonates, producing a molted metal jet stream that travels at speeds up to 15 km/s, burning through the target tank's armor. The jet then pierces inside the vehicle, killing the crew, damaging equipment, and detonating fuel and ordnance payloads.

[air wings]

NEW PROSPECTS FOR

2015 was a landmark year for the Ukrainian aircraft industry leader, Antonov. The Company has unveiled its most recent developments, including the An-178, An-148-300MP and An-132 airplanes, which have already found potential customers.

Igor Fedyk, UDR

The latest development by Antonov Design Bureau – the An-178 military transport aircraft – was unveiled on 16th April 2015, and made its maiden flight on 7th May. Inauguration ceremony for the An-178 took place at Gostomel airfield, near Kiev; after about an hour in the sky, the airplane made a successful landing.

Antonov estimates the current market for An-178-class airplanes at 380 units. By developing the An-178, the Ukrainian firm decided to fill the market niche for transport aircraft with a payload capacity of up to 18 tons, which effectively remains unoccupied today.

The An-178 is designed for transportation of medium to maximum payloads from 15 to 18 tons. This segment of the marketplace is virtually vacant thus far, except for aging or obsolete An-12 and C-160 airlifters which all need a replacement. The new aircraft can find itself in the heavier payload category than the An-74 or Europe's C-27J and C-295. The predecessor of the An-178, the An-12, has been flying for a few decades now, so Antonov will not be

UKRAINIAN AVIATION

a newcomer to the military airlift domain.

The An-178 is propelled by two Ivchenko-Progress turbojet engines instead of four turboprops seen on the An-12. However it will far surpass the latter in terms of fuel burn rate. The An-178 design provides the key advantages as follows:

- capacious cargo bay allowing for accommodation of standard IATA shipping containers;
- digital avionic equipment;
- "glass" cockpit;
- pressurized cargo hold.

The An-178 has a cargo bay cross section that is larger than that of the An-12's, as claimed by the designer. Cargo compartment floor area will amount to 40 m² with loading ramp or 33 m² without it, and inner volume of cargo bay with or without loading ramp will be 125 m² and 112m², respectively. By way of comparison, cargo bay volume makes up 110 m2 in the An-12, 65 m² in the C-27J and only 64 m2 in the C-295. In its cross section, the cargo bay in the An-178 is 2,746mm wide and 2,750mm high, which is clearly optimized for standard 2,440 x 2,440 mm shipping containers. If compared to the An-158 on which basis the An-178 was designed, the latter will have its center wing section enlarged and expanded. This will provide enough space for three Humvee vehicles (13.3 tons), or as many Land Rover jeeps (9.7 tons), or two ZIL-131-class trucks (13.4 tons). The aircraft would allow for autonomous operation during 30 days. Meanwhile, labor intensity of maintenance personnel will be reduced substantially – down to 2.5 personnel per each flying hour – this all against the background of possible dual use as military/commercial airlifter.

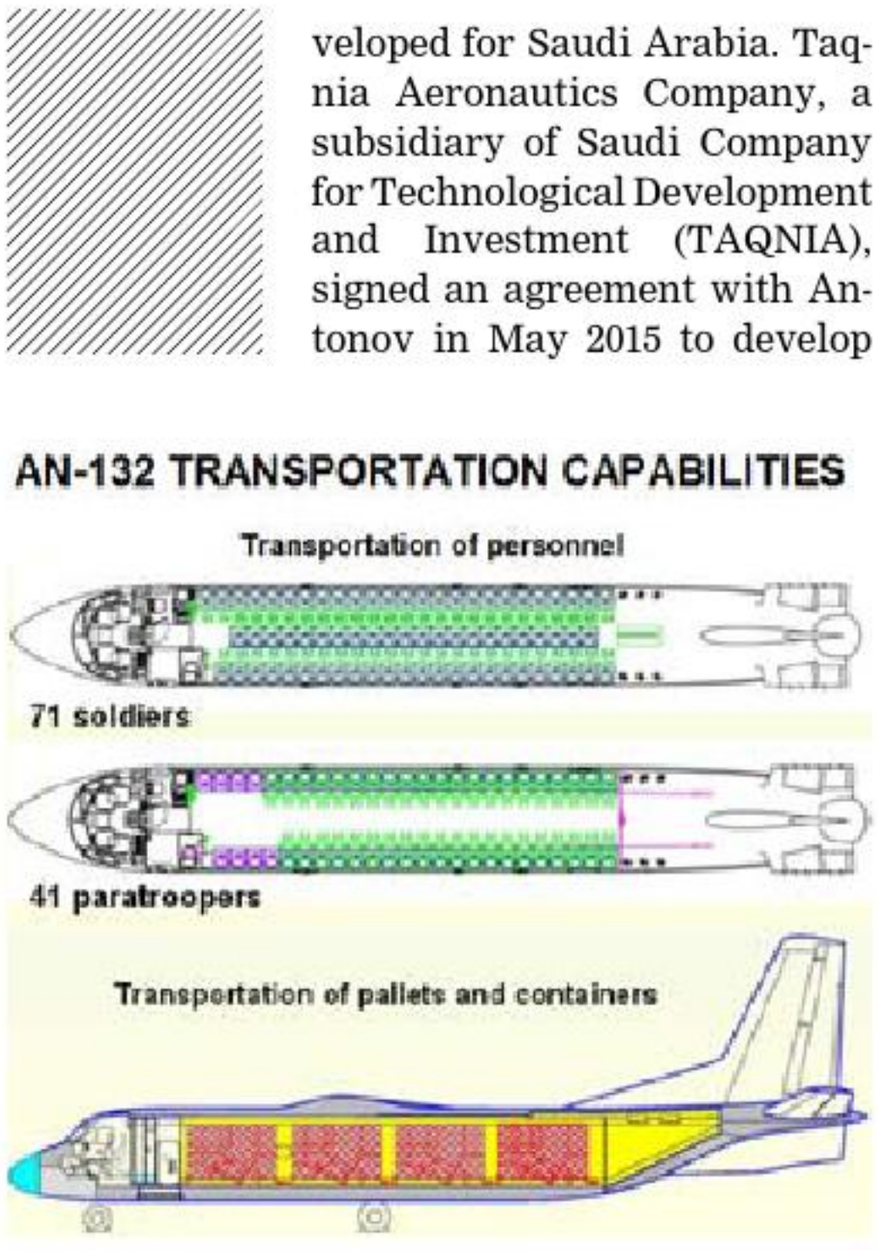
Antonov is working on two versions of the An-178 transport: one with a side door and the other with a loading ramp. Alternative sources of avionic equipment being considered for the An-178 include suppliers such as Honewell and Collins.

The cockpit is designed for a crew of two pilots. The An-178, like each and all of Antonov-series military transport aircraft, can operate both on unpaved and concrete runways no shorter than 915 meters. Cruising speed is set at 825 km/h. The aircraft has a range of 1,000 km with full load and 4,000 km with a 10-ton load. A configuration with additional fuel tanks is being considered, allowing for cargoes up to five tons to be delivered to 6,000 kilometers. By way of comparison, the An-12 can deliver a 10t load to 3,200 kilometers at a cruising speed of 600 km/h.

There are preliminary orders for some 100 An-178s, according to Dmytro Kiva, the chief designer at Antonov. Among the potential customers are Saudi Arabia and some of the Gulf states. Cargo carrier Silk Way Airlines of Azerbaijan ordered ten An-178s just on the day the aircraft made its maiden flight. There is also an agreement concluded with China on the delivery of two An-178 aircraft and the establishment of an industrial partnership for production of the aircraft in China.

Te new Ukrainian military transport aircraft was inaugurated to the public at the 51st International Air Show Le Bourget 2015 in June, and raised a lot of interest among the visitors to the event.

Also at Le Bourget, Antonov unveiled its new light transport aircraft An-132 project developed for Saudi Arabia. Taqnia Aeronautics Company, a subsidiary of Saudi Company for Technological Development and Investment (TAQNIA), signed an agreement with Antonov in May 2015 to develop

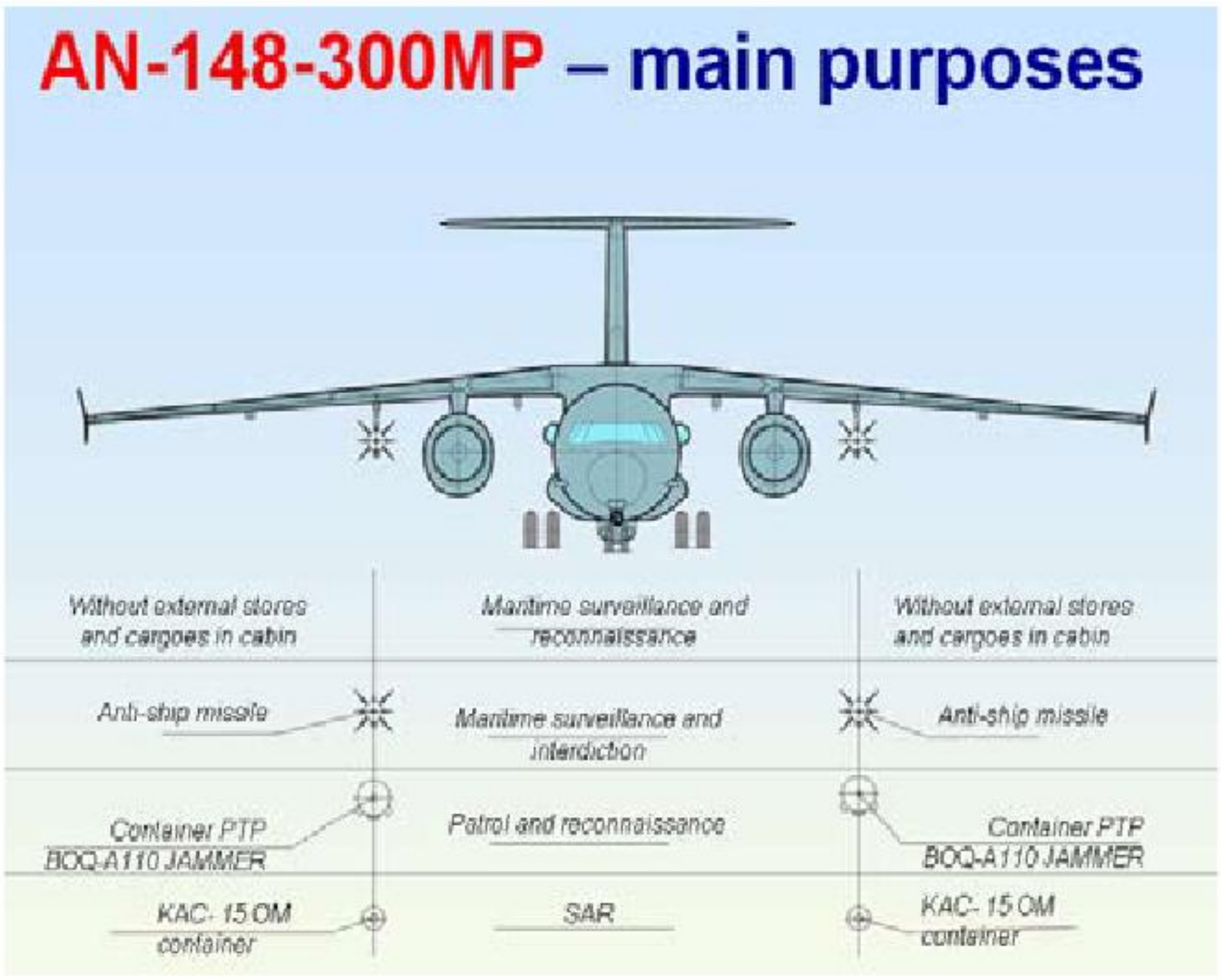


and manufacture the An-132 light cargo planes in Saudi Arabia. Under the agreement, King Abdulaziz City for Science and Technology (KACST), Taqnia Aeronautics Company and Antonov will redevelop the existing An-32 aircraft to produce a new variant with improved payload, range and takeoff characteristics. The program will also encompass the development of a new cockpit with state-of-the-art US-made navigation systems, which will allow the crew to efficiently operate the aircraft in adverse conditions. Additionally, new equipment and systems will be integrated into the aircraft to significantly enhance its capabilities. The new An-132 will be able to deliver payloads of up to 9.2 tons to a range of 3,175 km, at a cruising speed of 550 km/h, and it can be configured for transportation of 71 troops or 41 paratroopers.

Prototype production started in September of this year, and as early as in 2017 the new An-132 is expected on display at Le Bourget.

The An-32 platform was selected after studying the requirements of Saudi Arabia and the global market for light transport aircraft in the military and civil sectors. The light transport aircraft is primarily intended to transport cargoes, while its secondary roles will include aerial delivery of cargoes on parachute platforms, airdropping of paratroopers, medical evacuation, reconnaissance, maritime surveillance, and other military and civilian missions.

For its part, the Ukrainian Navy Command announced it is developing a program to modernize its aviation arm by equipping it with a new maritime patrol aircraft system based on the Antonov aircraft technology. The program particularly includes the replacement of the aging Be-12 ASW/SAR aircraft with multirole patrol airplanes An-148-300MP.



The future maritime patrol aircraft system An-148-300MP will be developed as a derivative of the An-148-300 regional jet technology for use in roles that include maritime patrol, the conduct of surface warfare, electronic reconnaissance, electronic surveillance, electronic warfare, radio intelligence, search and rescue operations.

To perform these roles, the An-148-300MP will be fitted with radar and optronic sensors for surface search, as well as windows on each side of the fuselage for visual search tasks.

The composition of the weapons package will be configured to specific customer requirements. Particularly the modification designed for the Ukrainian Navy will carry anti-ship missiles in underwing pylons.

According to Antonov, the An-148-300MP is designed to have the maximum flight duration of 10 hours, patrolling altitude of 1,525 m and patrolling speed of 370 km/h, and will be able to fly to 2,650 km during a six-hour mission.

The An-148-300MP project -- which was presented by deputy chief designer at Antonov, Oleh Bohdanov at the Ukrainian-Polish forum on "Antonov Aircraft Westernization" in Bydgoszcz, Poland -- will be performed by a consortium consisting of Ukrainian and Polish companies, under the import substitution program.

The above described new Antonov products provide striking evidence that Ukraine's aircraft industry -- despite the break-up of cooperation with Russia and warnings by Russian officials about the potentially disastrous consequences of this decision for the Ukrainian aviation sector – is strong enough not only to operate sustainably, but also to produce modern, high-quality technologies. UDR

ODESSA AIRCRAFT PLANT

THE Y1 *DELFIN*

Light multi-purpose aircraft Y1 *Delfin* is a single-engine classic all-metal cantilever monoplane with low-mounted wing, vertical and horizontal tails located on airframe stern-post and triple retractable landing gear with controllable nose strut.

The Y1 *Delfin* is certified in the State Aviation Service of Ukraine and according to all major requirements of Aviation regulations and is declared fit for service as light class aircraft.

The Y1 *Delfin* is equipped with quick-acting recovery parachute system KC-1500 that ensures safety of the air crew and the aircraft in general.

The Y1 *Delfin* can be produced in different versions:

- Y1.00 - trainer aircraft
- Y1.01 - aerial photography aircraft
- Y1.02 - patrol aircraft
- Y1.03 – modification with amphibious floats
- Y1.04 - transport aircraft
- Y1.05 - aerobatic aircraft

THE Y1 *DELFIN* MAIN SPECIFICATIONS

Aircraft weight, kg	1500
Engine type	SR-305-230-E
Fuel	Jet-A, Jet-A1, TC-1
Maximum takeoff weight, kg	1400
Maximum payload weight, kg	440
Maximum speed, km/h	350
Cruising speed, km/h	280
Maximum flight altitude, m	3000

"Helitraining Ukraine" LLC is present in the market of the aviation personnel training and retraining since 2013. More than 900 aviation specialists from Ukraine, Moldova, Peru, Sudan, Pakistan, Georgia and other countries have already trained in the training center "Helitraining Ukraine" "Helitraining Ukraine" LLC closely cooperates with the Kremenchug Flight College of the National Aviation University in the development and implementation of modern forms and methods of pilots and maintaining personnel training for the helicopters operators.

Our main types of activity:

- **Training, recurrent training, refresher training and simulator training of pilots and engineeringand technical staff of the Mi-17 helicopter in its own Simulator Training Center (Kremenchuk, Ukraine);**
- **development, manufacture, installation, setting to work and commissioning of civil and military flight simulators with qualification levels FNPT-FTD (2-3) and FFS (A,B,C,D), according to EASA (JAR-FSTD H) and ICAO;**
- **development, design and manufacture of electrified stands for aircraft systems and interactive computer classrooms;**
- **development of modern software samples for simulators and Computer-Based Training Systems (CBTS).**

We are open for cooperation and happy to have new partners!

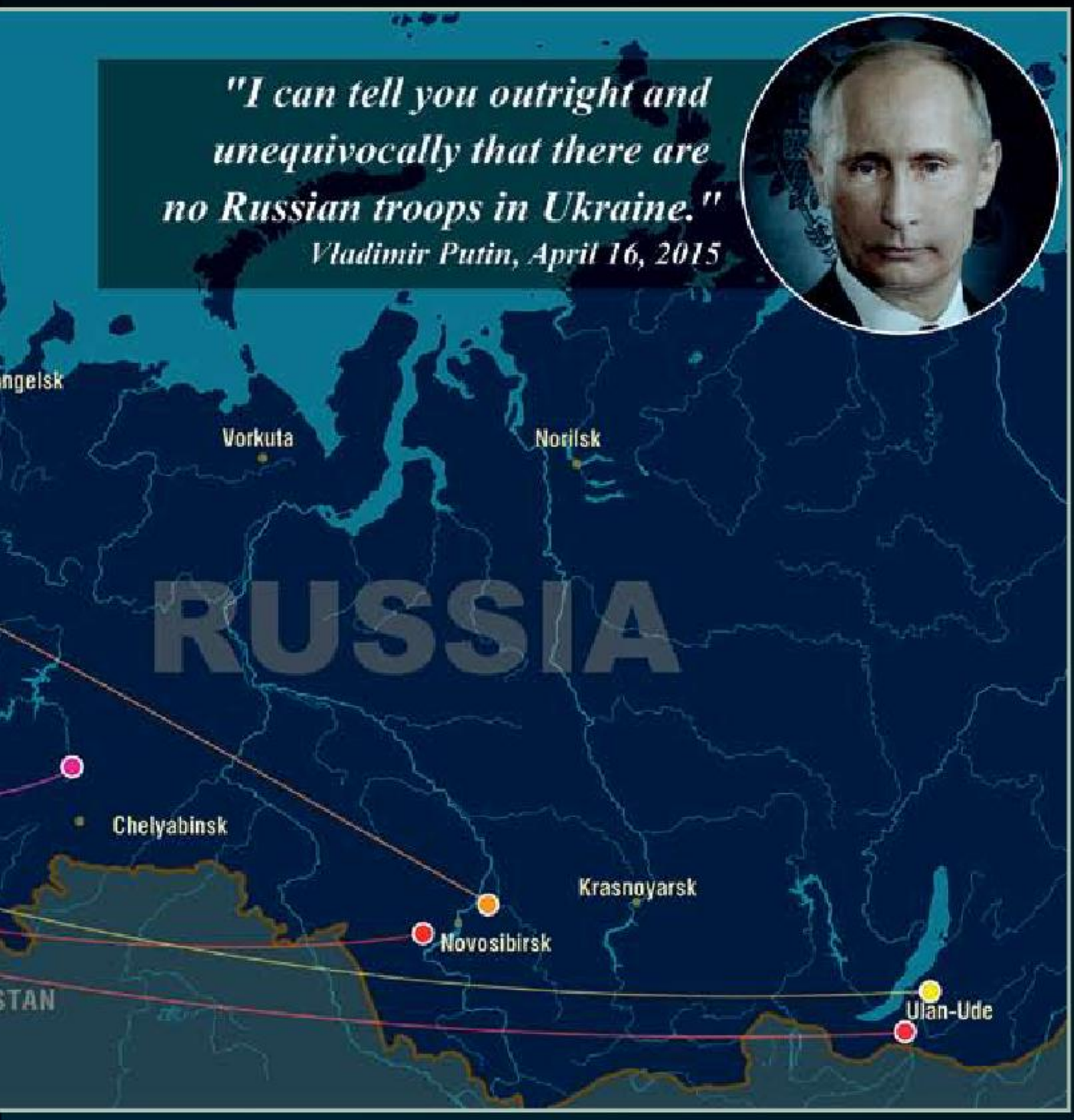
sic ISO 9001 CERTIFIED sic AQAP 2110 CERTIFIED

Russian army in the war in Donbas

[presence]

●	27777	18th separate motorized rifle brigade Kalinovskaya, Republic of Chechnya
●	54046	9th separate motorized rifle brigade Nizhny Novgorod
●	32755	385th artillery brigade Totskoye, Orenburg Oblast
●	65384	17th separate motorized rifle brigade Shali, Republic of Chechnya
●	54096	6th armored brigade Mulino, Nizhny Novgorod Oblast
●	33842	106th division of the 51st airborne regiment Tula
●	71211	98th division, 331st airborne regiment Kostroma
●	73612	31st separate airborne brigade Ulyanovsk
●	32515	76th airborne division, 104th regiment Pskov
●	21208	3rd separate special forces brigade Tolyatti, Samara Oblast
●	30616-8	467th District training center Kovrov, Vladimir Oblast
●	90600	15th separate motorized rifle brigade Roshchinsky, Samara Oblast
●	22316	32nd separate motorized rifle brigade Shilovo, Novosibirsk Oblast
●	21005	74th motorized rifle brigade Yurga, Kemerovo Oblast
●	8275	200th special forces brigade of the North Fleet Pechenga, Murmansk Oblast
●	33027	474th separate automobile battalion Millerovo, Rostov Oblast
●	11384	78th supply brigade Budyonnovsk, Stavropol Krai
●	72153	99th supply brigade Maykop, Republic of Adygea
●	32383	67th air-defense missile brigade Vladikavkaz, North Ossetia
●	63354	136th motorized rifle brigade Botlikh, Buynaksk, Republic of Dagestan

InformNnapalm.org



International volunteer community of InformNapalm organized a set of presentations at the Ukraine Crisis Media Center and on Hromadske TV on August 28, 2015.

The presentations covered OSINT investigations of the Russian military presence in Donbas. The volunteers of InformNapalm demonstrated the database containing the evidence of the Russian aggression against Ukraine.

The database contains information about the incidents involving Russian career servicemen in Ukraine. Each incident indicates date and place of each Russian unit presence in Donbas and includes a list of all the military units involved.

The investigation data uncovers servicemen and equipment from more than 60 Russian military units and armed formations. Part of this data was presented in the form of infographics, which vividly demonstrates the links between the unit bases and the locations in Donbas, where the servicemen and/or equipment of these units were discovered.

The comprehensive information is now available in 12 languages via informnapalm.org

48886	82nd separate special forces electronic brigade Vyazma, SmolenskOblast
65349	23rd motorized rifle brigade Kryazh, Samara Oblast
74814	205th separate motorized rifle brigade Budyonnovsk, Stavropol Krai
30616-6	523rd training motorized rifle regiment Pakino, Vladimir Oblast
69647	37th separate motorized rifle brigade Kyakhta, Republic of Buryatia
41450	106th division, 137th airborne regiment Ryazan
61423	28th motorized rifle brigade Ekaterinburg, Sverdlovsk Oblast
6898	Russian internal troops in Elektrogorsk Elektrogorsk, Moscow Oblast
41600	66th command brigade Stavropol, Stavropol Krai
40491	51st air-defence division, 338th electronic regiment Rostov

54607	16th separate special forces brigade Tambov, Tambov Oblast
11659	22nd special forces brigade Stepnoy, Rostov Oblast
64044	2nd special forces brigade Pskov
20634	19th separate motorized rifle brigade Vladikavkaz, North Ossetia
9332	7th military base Gudauta, Republic of Abkhazia
55433	24th separate special forces brigade Ulan-Ude, Republic of Buryatia
51532	10th separate special forces brigade Goryachy Klyuch, Molkino, Krasnodar Krai

www.facebook.com/informnapalm24
root@informnapalm.org

Infographics by
InformNapalm.org

[navigation]

GLOBAL POSITIONING

State Company Orizon-Navigation, which is incorporated with Ukraine's State Defense Industries Holding Company Ukroboronprom, is the leading supplier of satellite navigation equipment in Ukraine. Navigation equipment developed by Orizon-Navigation is distinguishable by offering Multi System Capability - the ability to support multiple Global Navigation Satellite System (GNSS) signals, thus contributing to enhanced efficiency of both dismounted soldiers and military equipment in the field. The Company unveiled a range of its new products at the Kiev Arms and Security 2015 Expo in early September.

The core element of a GPS navigation device of any kind is GNSS signal receiver (GPS receiver, GLONASS receiver or hybrid GPS/ GLONASS receiver) -a chip set or a circuit board tasked to decode a signal received from a global navigation satellite system and to transform it into the carrier's position location coordinates in a certain user readable format.

GNSS receiver devices developed by Orizon-Navigation are distinguishable by capability to accept GNSS signals from multiple systems – U.S.' GPS, Russia's GLONASS and, eventually, EU's GALLILEO and PRC's COMPASS, as well as their related augmentation systems – the EU's EGNOS, U.S. WAAS and Japan's MSAS. The multi-frequency GPS/GLONASS/GALILEO capability would allow for more sustained and more accurate navigation measurement data to be produced due to a greater number of satellite navigation sources available at a given time. This also improves GNSS signal availability in difficult environments such as urban, mountainous or well wooded terrains. The design offered by Orizon-Navigation provides high resistance to noise and jamming interferences.

Orizon-Navigation is the sole company in Ukraine to design, develop and manufacture GPS/ GLONASS GNSS signal receiver equipment for different applications – aircraft, seaborne and ground-based platforms, purpose-built military equipment and railway vehicles – and severe operational environments. The Company operates a closed-loop production cycle, developing by itself schematic bloc diagrams and layout geometry of chip components. The components are then custom-made by companies in the U.S.A, Germany and the U.K. and integrated by the Company itself at its facilities in Ukraine. Orizon-Navigation has developed and brought into production over five dozen equipment designs for navigation satellite system users.

State Company Orizon-Navigation unveiled its SN-3003MN satellite navigation receiver equipment, which is the Company's follow-on design to the SN-3003M technology, at the Kiev Arms and Security 2015 Expo in September.

Orizon-Navigation has developed the SN-3301 equipment suite which provides integrated capabilities for real-time position location, flight planning and piloting an aircraft in manual/automatic flight control modes. The SN-3301 is used on some of the Antonov-series aircraft such as the An-3, An-38, An-74, An-140, An-124 and An-225. Developed under a contract from State-owned Company MiGRemont of Zaporizhzhia, the SN-3307 equipment suite can be seen installed on Su-25, Su-27 and MiG-25 combat aircraft as well as helicopters. For application on new and upgraded fixed-wing aircraft, Orizon-Navigation developed multifunctional onboard piloting equipment suite – the SN-3311 satellite navigation suite that provides capabilities similar to those of the Flight Management System (FMS).

Another development is the SN-4307 multifunctional display unit that is meant for use during large-scale major retrofit of the Sukhoi and MiG families of aircraft. The SN-4307 provides a number of benefits, the main being that it has the capability to display the whole set of relevant navigation data at once. The pilot has the ability to shift between the pre-installed log books as necessary. The SN-4307 is suitable for use in upgrading the Mi-2 and Mi-8 helicopters.

Company offers a range of products for ground vehicle applications. Particularly the SN-3210 "Bazalt-K" device is intended for use on vehicles and operations control centers. During several recent years, the devices, with minor modifications, have been supplied to Morozov Design Bureau and Malyshev Tank Factory in Kharkiv for installation onto vehicles built under export contracts.

The SN-3101M satellite communication equipment was developed from the operational experience gathered by the Company with its SN-3210 equipment for ground vehicle applications.

State Company "Orizon-Navigation" is constantly evolving and developing new and innovative products. Orizon-Navigation revealed a number of new designs at Kiev Arms and Security 2015 Expo in September. The SN-3003MN satellite navigation receiver equipment,

which was developed as follow-on design to the Company's SN-3003M technology, is intended for portable, personal use. Being twice more compact as compared with the baseline design, the SN-3003MN provides advantages in terms of having a modern GNSS signal receiver and color display unit, longer time of continuous operation, more capacious internal memory etc.

The SN-3003MN will perform coordinates/ground-speed/ time measurements by means of GNSS signals from GLONASS, GPS and SBAS satellites – in any place or time, and in all weather conditions.

The SN-3003MN equipment weighs 0.3 kg. It receives all signals from GLONASS (L1), GPS (L1) and SBAS satellite navigation sources available at a given time and place, measuring coordinates with an accuracy of 10 m at 0.1 m/s.

Also on view at Arms and Security 2015 Expo was the SN-4215 satellite communication equipment, which Orizon-Navigation developed from the operational experience it gathered with its SN-3210 equipment for ground vehicle applications. The SN-4215 will produce real-time navigation data and measure the current coordinates in many coordinate systems. It also will be able to generate and display data on carrier's position and blue-force location. The equipment will provide connectivity to C2IS networks of mobile units.

As a matter of fact, Orizon-Navigation has developed a complete lineup of differently sized products – small and bigger, portable and stationary – for use in different roles and operational environments.

Orizon-Navigation has recently teamed with Izium Instrument Factory to develop an automated reconnaissance equipment (ARE) suite. The ARE suite provides a broad range of capabilities that includes provision of navigational support for ground and special operations forces, intelligence gathering, reference-point/target coordinates measurement and firing data correction.

The ARE equipment suite is a multifunctional command/control/ISR system providing the capabilities for computing position location coordinates of ground targets and large-caliber ammunition impact points; measuring target distances; navigation by cardinal directions; determining target direction; conducting visual reconnaissance; provision of situational awareness and target selection support; vertical and horizontal angle measurements; wireless data feeding to command centers.

The Company has an extensive customer base; aircraft equipment is supplied under a contract for upgrading India's An-32 airplanes; the onboard satellite navigation system SN-3307 is included in Soviet-vintage Su and MiG-series aircraft upgrade packages being implemented by countries of the former Soviet Union as well as countries in Asia and Africa; vehicle-mounted satellite navigation systems are being supplied for equipping the BTR-4E APCs; GLONASS/GPS-aided position location sensors are part of a navigation equipment suite mounted on the Oplot MBTs being built for the export to Thailand.

Orizon-Navigation teamed with Izium Instrument Factory to develop an automated reconnaissance equipment (ARE) suite. The ARE suite provides a broad range of capabilities that includes provision of navigational support for ground and special operations forces, intelligence gathering, reference-point/target coordinates measurement and firing data correction.

The range of equipment types currently being developed by Orizon-Navigation, combined with its existing R&D and production capacity are sufficient to talk about a possibility of developing an integrated wearable equipment kit for "Future Ukrainian Soldier". At least the navigation component of the equipment kit could be fully implemented with products of the domestic design and manufacture.

It matters most that Orizon-Navigation is fundamentally changing its approaches to the development of navigational aids. Now it is not just about production of standalone receivers but about the integration of the entire set of devices into network centric battlespace C4I architecture – a challenge which is handleable even today. Dismounted warriors of all force levels – from regular soldier to commander of a brigade-level unit – could be provided with personal GPS devices with capabilities for obtaining carrier's position location, displaying blue-force and red-force location maps, terrain maps of battlefield areas, minefield maps etc. As a result, enhanced, near-real time situational awareness will be delivered to commanders of all echelons, enabling missions to be accomplished in new, more effective and efficient ways. UDR

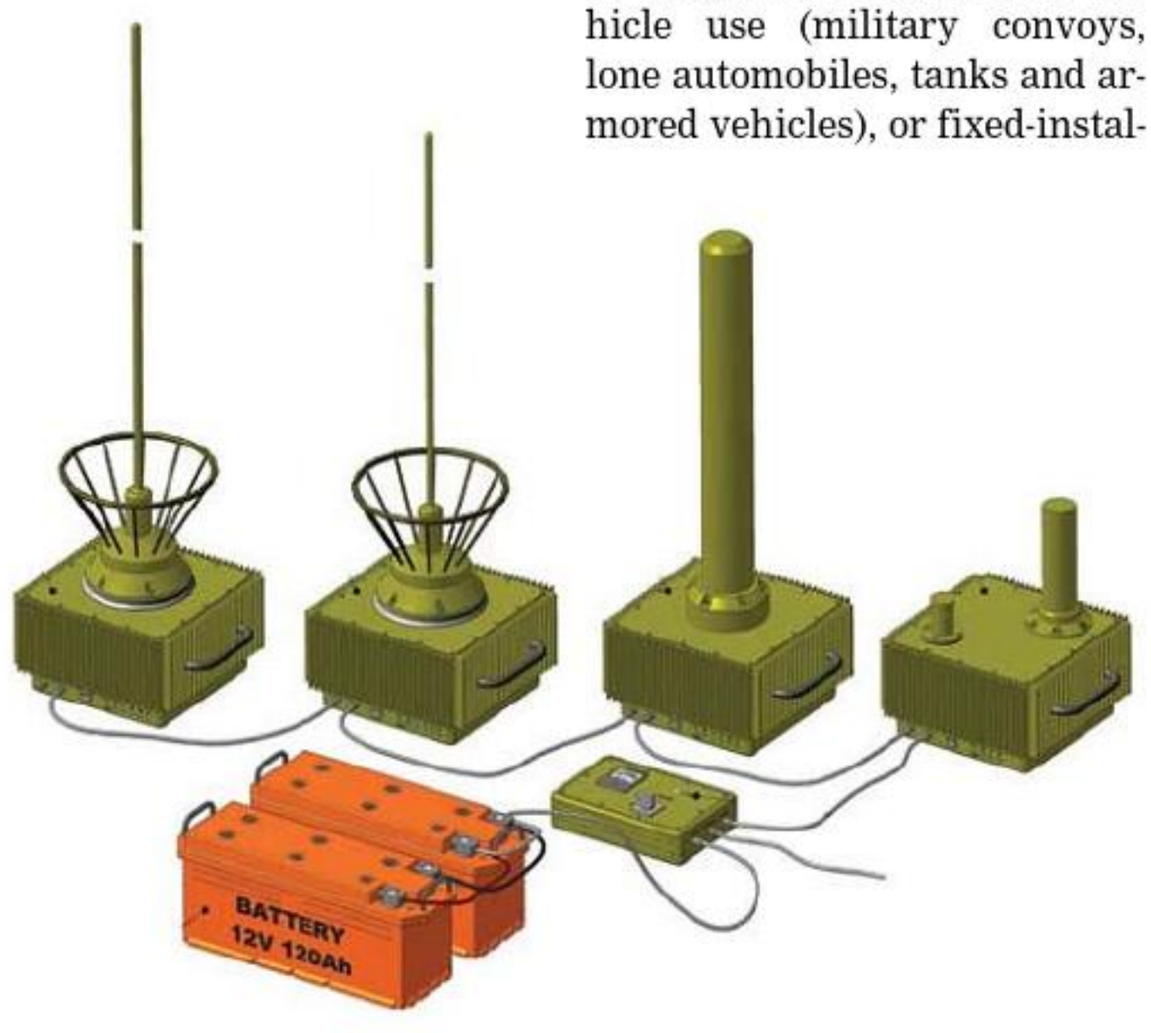
ELECTRONIC WARFARE WARRIOR

Anton Mikhnenko, UDR

The electronic warfare (EW) component is a key factor of success in a modern military operation. Lessons learnt from recent conflicts show the exceptional importance of the EW component, which becomes a true force multiplier allowing battlefield capabilities to be employed with greater effectiveness and efficiency. Ukrainian engineers traditionally have had a broad range of designs to offer in this high-technology area.

In Ukraine, the key player in the area of EW R&D and production of EW equipment is SE Novator of Khmelnitsky, which is part of the State Concern "Ukroboronprom" and is credited for creating EW countermeasure systems for Ukrainian army. Among the last works of the company is the modernized version of RCIED jammer system GARANT, which was presented during international exhibition «Arms and Security 2015», that took place in late September in Kyiv.

GARANT (which means 'guardian') is highly effective EW [electronic warfare] countermeasure system designed to jam the signals of remote control (RC) switches being used to trigger roadside bombs or improvised explosive devices (IED) throughout the frequency range. It is designed for vehicle use (military convoys, lone automobiles, tanks and armored vehicles), or fixed-instal-



lation protection. Adequate protection is provided by jamming the signals of RC initiators and preventing them from functioning at a distance. This is accomplished by setting up high-power broadband barrage jamming creating around the jamming carrier vehicle a 'secure bubble' area impervious to hostile radio transmission from RC triggers, which covers the entire frequency range employed by RC initiators and is powerful enough to protect a vehicle convoy.

The GARANT equipment kit includes three RC link jamming units (designated BPRL-1, BPRL-2 and BPRL-3), each comprising four active jamming dispensers complemented with one highly-productive ultra-broadband omnidirectional-beam flagpole antenna array. In all, the system uses 12 jamming units (each covering its assigned frequency band) and only three antenna arrays. GARANT is kind of a unique design which in its many aspects far surpasses western-designed alternatives. What makes the Ukrainian design truly unique is the broadband flagpole aerials employed in the GARANT RCIED jammer. Western equivalents, for example some of the French make, employ dedicated aerials specific to different parts of the frequency band (each radio transmitter, to be precise) – in all 12-14 antenna arrays as compared to GARANT's three.

GARANT can be mounted on transport vehicles of all kinds (automobiles, armored personnel carriers, tanks and other AFV types), while foreign-designed equivalents (Russian, German or French) require a dedicated platform to be carried, with consequent inconveniences related to the need to assign such a dedicated platform to each vehicle convoy or even a standalone vehicle under protection. The GARANT with a baseline equipment fit includes attachment hardware optimized for the KamAZ-class truck platform. The attachment hardware can be custom-configured for any vehicle type, depending on specific assignments or the scenario's challenges. GARANT equipment kits are mounted on Ukrainian Army tanks used for RCIED countermeasure operator training. The baseline GARANT equipment kit includes one power supply unit for each of the three BPRL jamming units. The power supply unit is built into a standard housing with integral batteries. The BPRL unit can be configured for all types of power supply units from all suppliers. The jammer's output power is optimized in such a way so that to neutralize RC triggers to best effect but to give the operating crew as little as practical exposure to RF radiation.

Each of the BPRL units with an assigned antenna array weighs no more than 16.40 kg. In operating configuration, the antenna arrays for the BPRL-1, BPRL-2 and BPRL-3 units have heights of 2,880 mm, 2,500 mm and 800 mm, respectively. The jamming dispensers can be operating using 12 V power supply units or an external 11.5-14 V supply. Each BPRL unit (with four of its jammers operating all at a time) has an operating time of 60 minutes on two rechargeable batteries.

Also it has to be mentioned, that during the Kiev Arms and Security Expo 2015, the GARANT system was presented with the improved specifications. In particular, a new version of the system has the extended frequency range of noise radiation, which now is 20–2500 MHz, and longer radio suppression distance, which is 75–1000 m (depending on the radio link parameters).

During the Kiev Arms and Security Expo 2015, the GARANT system was presented with improved specifications: extended frequency range of noise radiation, which now is 20–2500 MHz, and longer radio suppression distance, which is 75–1000 m.

In transport configuration, the GARANT equipment kit is transportable by railway, road, sea or air. Equipment options include a wideband directional-beam antenna designed to be mounted on fixed installations for jamming RC signals in a localized area.

The Novator's protection systems, such as GARANT, are understood to be a unique and all-capable means of neutralization and disablement of hostile radio communications, allowing terminal effectiveness of enemy combat devises to be reduced considerably. UDR

WITH THE *JAB* ON THE FRONTLINE

Illustration – Alex Kostur, Digitec Visual Engineering

JSC "HC "Ukrspetstechnika" offers potential customers its new perspective product – the Jab reconnaissance and electronic countermeasure system. It is designed for detection, classification and identification of land mobile and low-flying objectives, conducting radio monitoring, radio interception, radio countermeasures and targeting in order to accomplish tasks of securing the areas and performing the reconnaissance.

Being essentially an integrated reconnaissance and electronic countermeasure system, the Jab system is designed with capabilities for the detection, classification and identification of ground moving targets and slow low flying helicopters, as well as for radio monitoring/interception, jamming warfare and target acquisition roles.

It can automatically detect (using a radar sensor) and provide geographically referenced data and detailed description (using an optical sensor) on ground moving targets of all kinds; and it has the capabilities for the detection and jamming of hostile communication/telecommunication links and radio-radar emplacements.

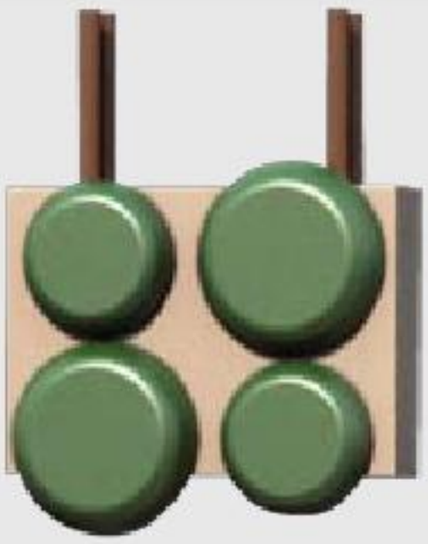
The radar sensor is capable of maximum detection ranges of 3,000 meters for a human being and 6,000 meters for a vehicle; while the thermal imager can detect human beings out to 2,400 meters and vehicles out to 6,600 meters. The jamming capability is provided within a frequency range from 20 to 2,500 MHz. The

STRUCTURAL CONFIGURATION OF SYSTEM ELEMENTS AND OPTIONS FOR THEIR MOUNTING

Radar with rotary support

Rotary support with optical and infrared imaging unit

Portable version



The equipment of Anklav jamming system

Stationary version

Mobile version mounted on the base of:

Dozor-B

HMMWV

Kozak

Triton

full set of the Jab equipment is compact enough to fit on a single light armored car.

The electronic warfare equipment set on the Jab vehicle will include portable GPS/GLONASS satellite navigation jamming system known as Anklav. It operates within two frequency ranges – 11,210…12,600 MHz and 1,550…1,620 MHz.

Transmit power in each of the frequency ranges is higher than 10 Wt, while power input does not exceed 150 Wt. Even without the set of non-directional antennas deployed, the Anklav can effectively jam GPS/GLONASS navigation signals within a 35-km radius, the jamming range extending to 200 km if directional antennas are deployed.

The type of the chassis for mounting the key elements of the equipment can be specified by the military users based on their specific requirements.

In general, the integrated system such as the Jab is useful for a wide variety of missions handled by special operations forces as well as combat elements deployed downrange. UDR

PK LBT – FIELD MAINTENANCE COMPLEX FOR LIGHT ARMORED VEHICLES

SE «KHARKIV PLANT OF THE SPECIAL MACHINES»

Field complex PK-LBT is designed to service armored vehicles (BTR-60, BTR-70, BTR-80, BTR-3, BTR-4) in the field conditions.

PK – LBT includes:

- technical support vehicle with manipulator on the KrAZ-6322 chassis;
- vehicle is designed for installation and dismantling of the complex and providing installation and dismantling procedures at the maintenance facilities;
- six 6058mm x 2438mm x 2591mm modules (approximate weight of each module – 6-7 tons);
- four 6058mm x 2438 mm x 1591mm modules (approximate weight of each module – 5-6 tons);
- covering (awning fabric on a metal frame).

PK LBT complex is divided into 10 blocks:

1. power plant compartment .
2. Welding compartment.
3. Storage compartment.
4. Aggregate compartment.
5. Propulsion compartment.
6. Optical-electronic compartment.
7. Metalwork and mechanical compartment.
8. Washing and painting compartment.
9. Weapon compartment.
10. Engineering compartment.

The blocks of the complex are equipped with air conditioning and heaters. Also the complex is fit out with bathroom and hygiene units.

PK LBT is supplied with set of spare parts, which includes special twists, holders, harnesses, adapters for connection of the modules.

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11–14 OCTOBER 2016 / KYIV, UKRAINE

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- Border security
- Military clothing, shoes, protection means
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