The concept of unified masked army armored vehicles

"BLACK BOX"

Including the:

Main Battle Tank concept,

Armored Multi-Purpose Vehicle (AMPV) concept,

etc.

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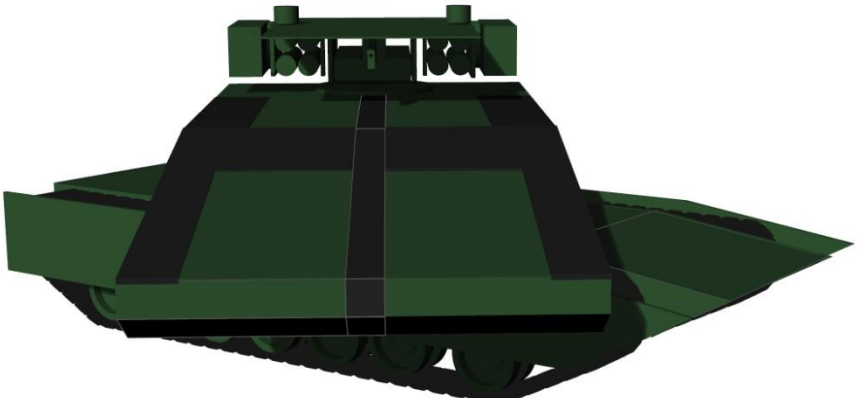
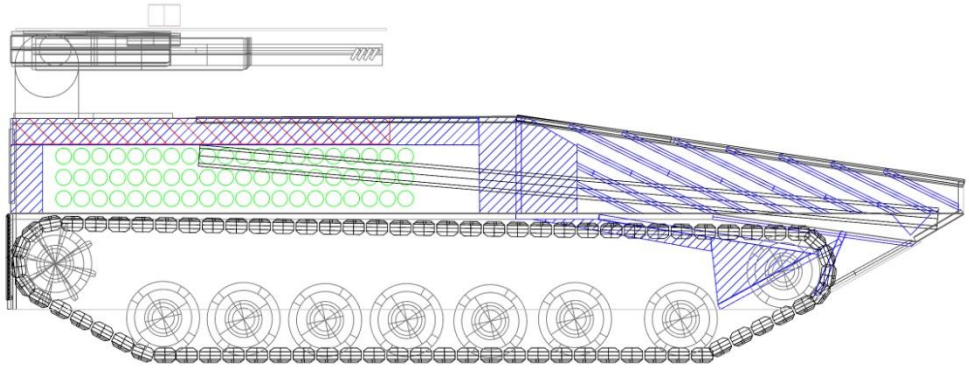
Idea: Summer 2015

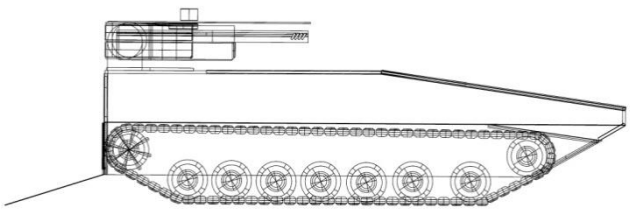
Publication: Aug 10, 2017

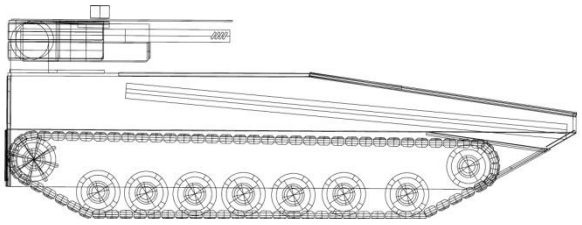
Introduction

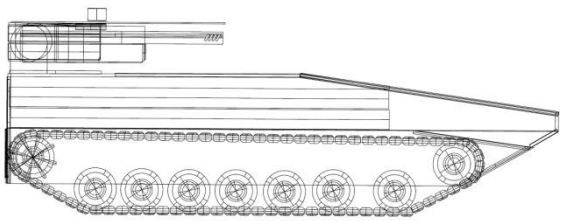
The design of the main battle tank is considered to be exhausted and improvements are impossible. This concept defies this statement and can significantly increase the survivability of tanks and other armored vehicles, and also totally change the tactics of combat operations.

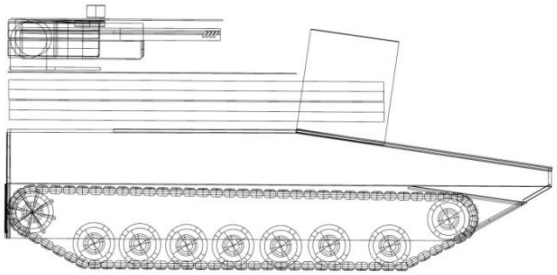












The Concept.

Standardization of the appearance of different types armored vehicles.

The idea is in the development of one or more standard design types of hulls. Hiding from the enemy what kind of vehicle is in front of him.

The technology will make the work of enemy intelligence much more difficult. As his correct response to any tactical moves. Also, the new technology makes it difficult for the enemy to plan the attack and other operations since his determination of defense potential in a specific area becomes significantly more complicated.

The effect is especially powerful if the uniformity of the external appearance of air defense/artillery, mortars, LRMS/tanks/armored personnel carriers (APC) is reached. To attack each of these types of armored vehicles or to defend against them the enemy needs to use completely different, often mutually exclusive tactics. For example, when tanks or artillery are approaching, it is rational to inflict air strikes on them, however, if the air defense group approaches, it is better to inflict the attack by infantry or tank formations. It makes sense to hit the frontal projection of an infantry fighting vehicle from a small-caliber automatic cannon or RPG, but it is not rational to act against the tank in the same way. If it is not clear for the enemy which vehicle is moving, such an attack is unlikely to be attempted due to high risk to the attacker. **The technology is ideal for hybrid wars** when it is necessary to hide the presence of air defense or heavy artillery**. Ground surveillance, satellite reconnaissance or using of drones will not help to get rid of confusion.**

Confusing the enemy soldiers, intelligence, strategic and tactical command, AI

In addition to confusing of the enemy strategists and tactics, represented by personnel, the potential artificial intelligence (AI) which will command the other army shall be confused. AI has a much higher factor of the fighting rationality and logistics management effectiveness. In the case of a battle of two AIs of equal power, a new type of cloaking, that is, the inability to recognize and establish the types of vehicles will give the necessary advantage. The technology can give a chance to a human-operated army against AI. The technology will confuse the enemy human or AI command provoking them to make wrong decisions, prevent effective use of aviation and will overload enemy army by the need of heavy strikes by any target because it can be in the same moment the air defense unit, the tank, or the personnel carrier. It is also difficult for any enemy personnel on all levels to recognize the type of vehicles attacking and choose the right action directly on the battlefield. Even in the case of fire contact and demonstration of the type of specific units, vehicles, it is enough to regroup at a hidden position and, if possible, change the painted designations on the hull, to renew the confusing effect.

Armor improvement.

Since the hull is a little bigger than the present ones for some types of vehicles, for example, tanks, the additional armor layers, including active armor, can be placed there, **improving armor quality twice or more for MBT** without significant mass augmentation. Also, additional space can increase the ammunition load. Niches with additional weapons, equipment can be located in that space. In general, the survivability of vehicle is greatly increased.

At the further images, the medium standard case is shown. In the case of increasing of the hull height, the roof protection and the ammunition load will be significantly increased. But the frontal projection will also increase to the level of some modern armored vehicles, such as Puma. Any additional armor of

different types at more rational angles and/or in several layers can be mounted inside the "outer" hull if necessary.

Parts and modules standardization.

If the army uses the proposed concept, the vehicles and their parts will become more standardized. This will speed up and simplify repairs and reduce the parts costs and production costs. The chassis shall have the standard appearance and better shall be standardized. For example, the standard chassis shall be good for 155mm gun operating.

Implementation example.

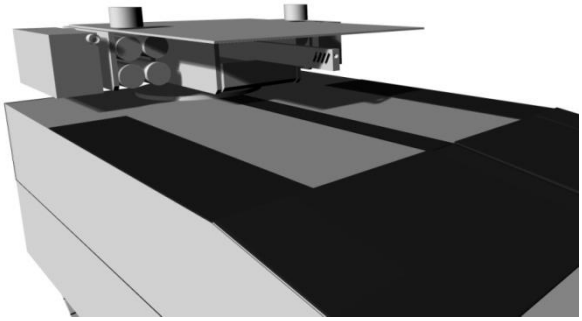
The technology supposes to use of one middle type of a universal vehicle, or two universal types: small and large. Track or wheeled versions of vehicles can be made. Small (8m) is for tanks, infantry fighting vehicles, mortars, small air defense, small-caliber multiple launch rocket systems (MLRS) (220mm). And the large one (10-12m) for artillery, long-range air defense, MLRS of bigger caliber (240-300mm), large-caliber missiles. However, it is problematic to place a gun longer than 6.6 m in a small hull which is necessary for example for tanks with guns caliber greater than 120 mm. It is possible to standardize only BMP, MLRS, air defense, as an optional solution, but for the tank, the effect of the new armor is much bigger.

For example, a medium-sized case is described (9m length, 2.3m height without a machine gun, 500mm clearance), which allows the 140mm or 152mm cal. tank gun to be placed. For comparison, the M1 Abrams tank has a hull length is 7.9 m, and with the gun, the tank is 9.8 m long.

In such hull (9m) it is possible to install main artillery weapon up to 240mm, for example for the mortar "Tulip" and the like. Also, a significant increase in the size of the ammunition compared to modern tanks has been achieved. Up to 60-100 rounds of 120-152mm caliber. It is essential for automatic mortars and artillery. The ammunition is optimally positioned to automate ammo delivery.

Also, there is an additional uninhabited turret on the roof of the vehicle. It can be equipped with 50cal. machine gun or 20-50mm auto cannon. The auto cannon is installed in the standard cannon case which hides it and prevents detection of vehicle type by weapons type. It also protects the auto cannon from negative atmospheric impact improving accuracy. The turret has 4-8 anti-tank and/or anti-air rocket launchers and two automatic mortars. Mortars can attack the enemy behind obstacles using drones information or being guided by other information.

All the BLACK BOX vehicles must be equipped with same looking weapons. Some parts of the turret can be made fake to achieve that. As a variant of the concept realization, all weapons can be made hidden in the upper, front or side parts of the hull with the ability to move out for acting. It can lower the visual and radio visibility of the vehicle but it will lower the internal volume of the vehicle. Or it will require to make the vehicle higher, up to some modern combat vehicles size, for example to 2,7-3m. But it also would significantly improve the roof armor, that can be considered the good option. As the other variant, the top turret can be totally covered by the big standard case which hides all that weapons.



The concept is expected to include all modern systems of active and passive protection, surveillance, guidance, etc. It is recommended to make standardized vehicles modular. All modules, such as engines, power units, ammo packs, etc. better to be exchangeable and fast removable. It is recommended to mainly use the tactics of shooting out of enemy view. Use of automated mortars with guided ammo preferred. Target detection is to be made from drones, special missiles, shells, etc.

Especially new technology is good for the future wars and for the hybrid wars. The design of new vehicles looks common to present ones and is very familiar with GTK Boxer, GD PIRAHNA, PANDUR, Patria AMV that will simplify designing, standardization, and production of the new type of armored vehicles. The new technology can improve even the MBT survivability and firepower, that is considered unreachable today. For example it can utilize 152mm cannon with big ammo quantity. 152 mm shells have 1.5x bigger armor piercing power than 120mm ones, used by Abrams and other tanks. 152mm explosive shells make dramatic damage to enemy tank even if not piercing the armor.

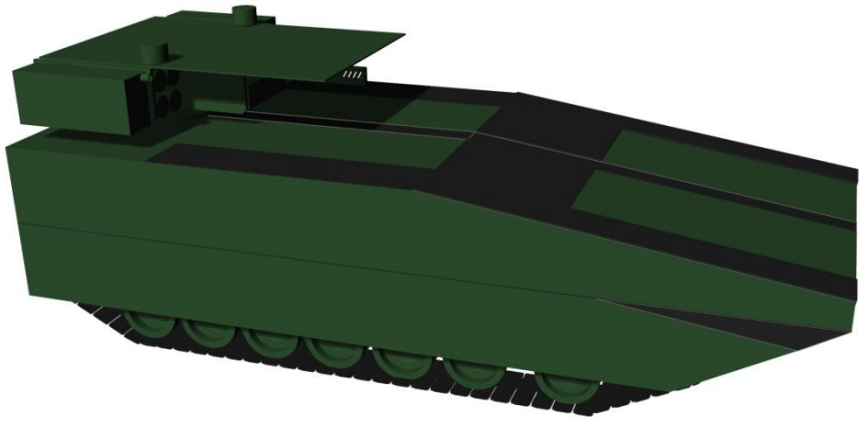
The concept also includes new superior tactics which raise the aggregate squad performance.

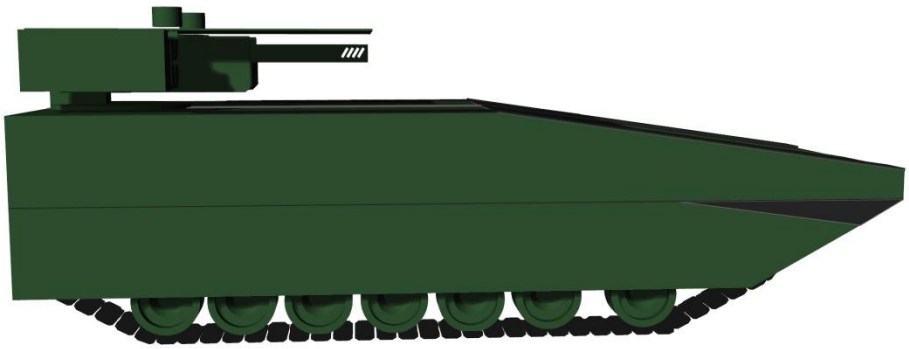
The new technology is achieving:

- **Aggregate squads performance improvement;**
- **Increasing the protection of MBT and other armored vehicles;**
- **Improving surviving kinetic and cyber engagements;**
- **Avoiding human or cyber recognition;**
- **Surprise and advantage in tactical environments including against the AI command.**

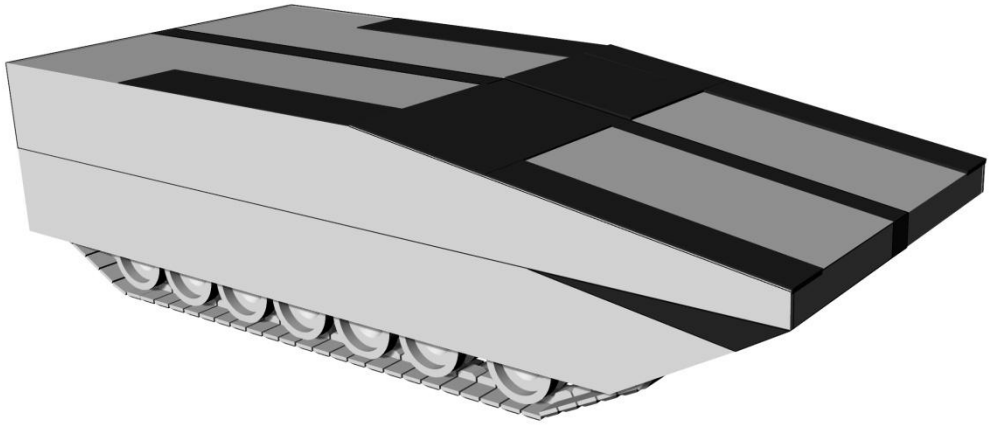
1. BLACK BOX. Standardized Armored Vehicles (SAV) appearance.

It is supposed to use standard masking overlays for all types of SAV in places where some of the types have opening hatches, niches (shown in black). This will prevent recognition.

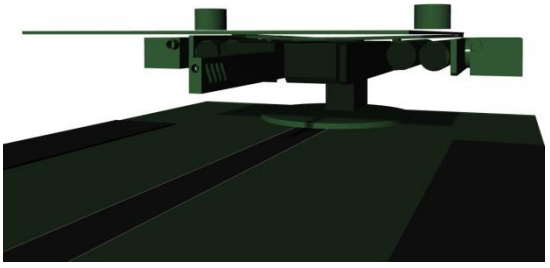


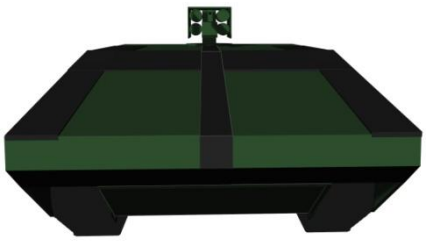


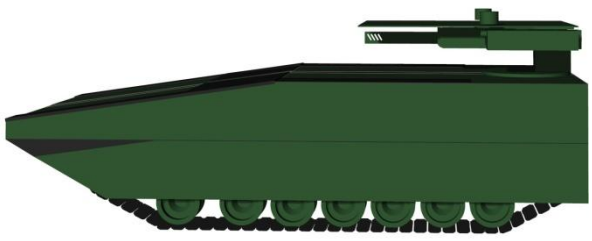
2. BLACK BOX. The variant with weapons completely hidden in the niches in the hull.

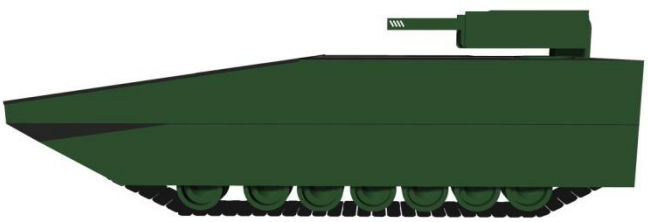


Hideable low profile turret with rocket launchers

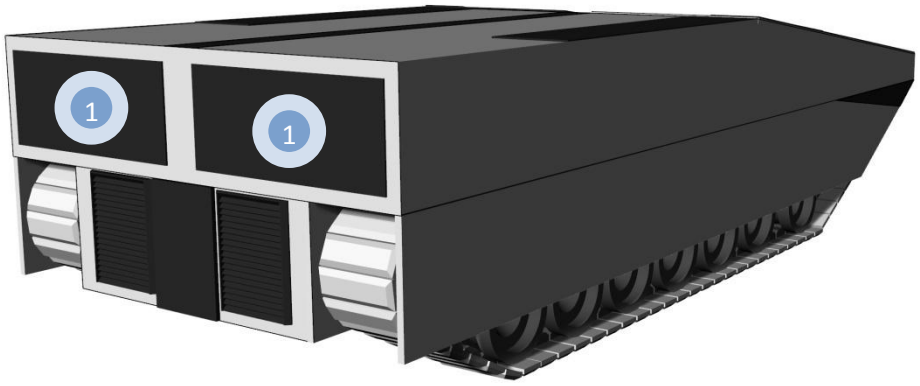






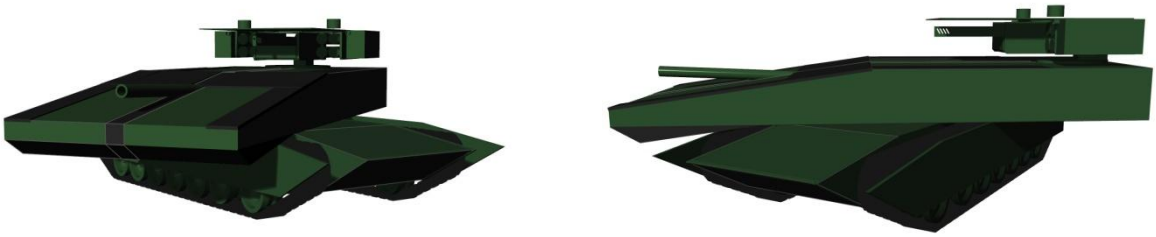


3. In the back side of the hull, as an option, there are hatches (item 1) for ammunition loading in the form of cartridges with all ammunition stock or by flat by one layer cartridges, or one by one ammo unit. It can be made by mobile automatic loaders or by loaders located at the base. This will speed up the reloading and the return of the vehicle to battle**.**

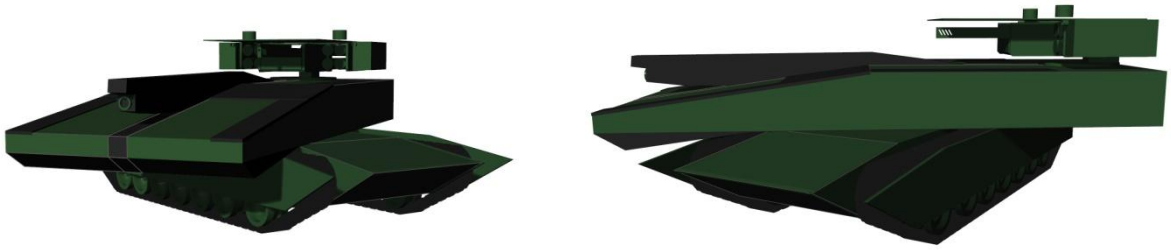


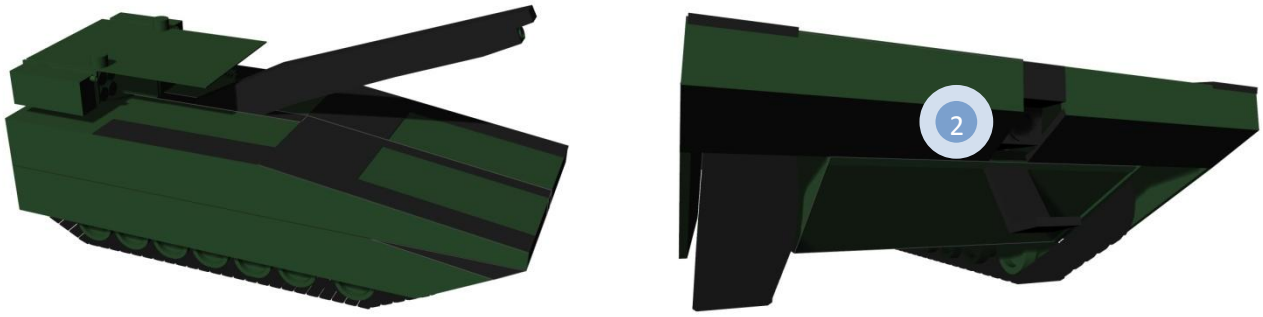
4. BLACK BOX Tank.

4.1 . The appearance of tank based on the BLACK BOX technology



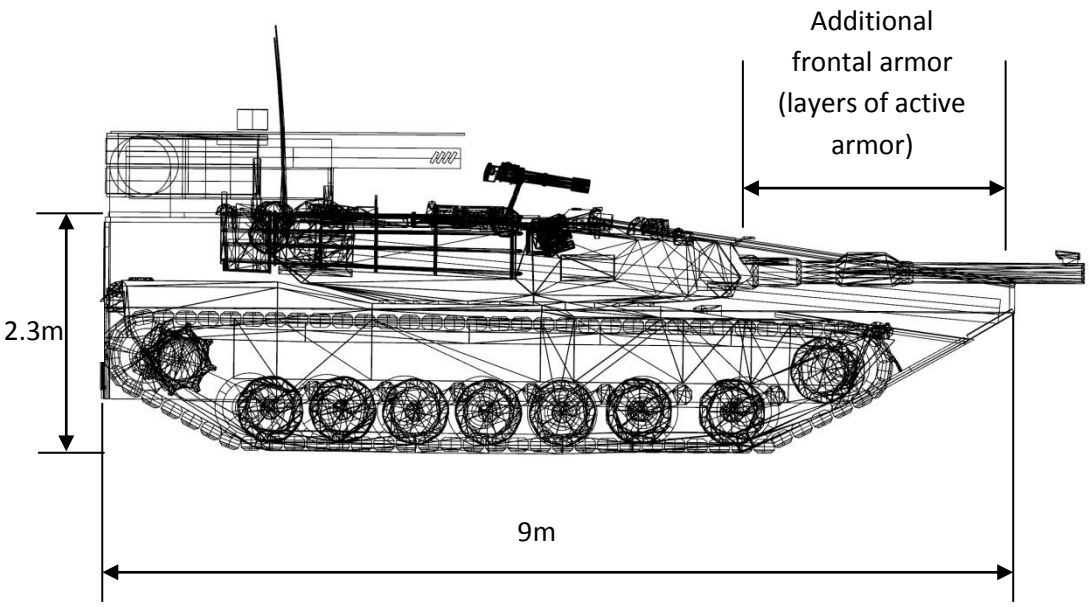
Version with cannon protection cover having elements of armor, protecting from negative weather conditions, that increases accuracy.

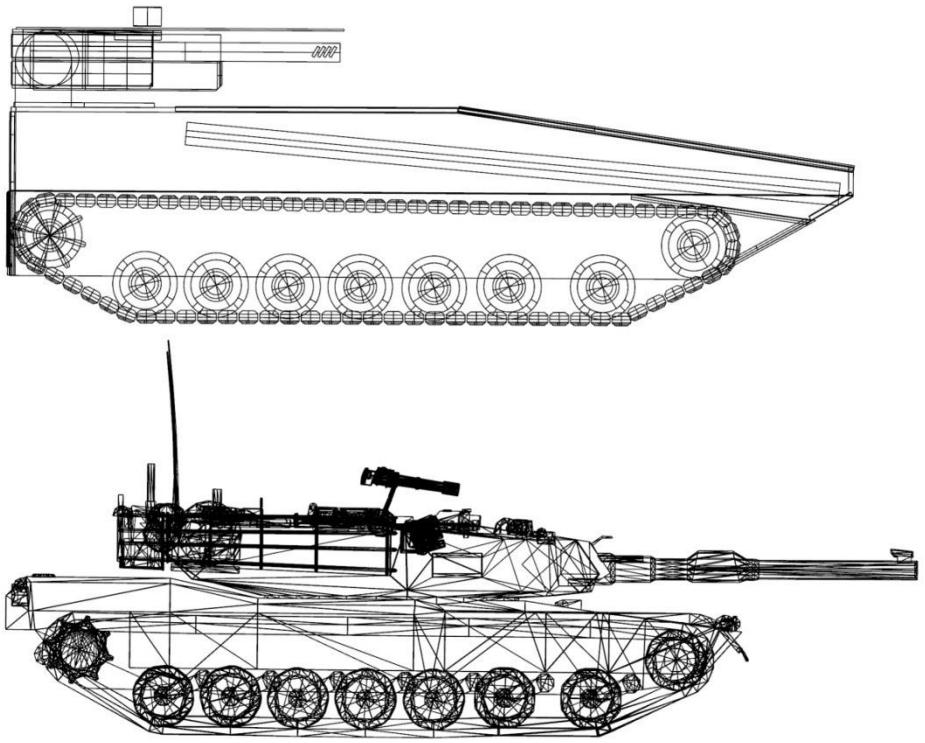




On the front side and optionally on the upper side of the tower there is a camouflage cover (2) for the cannon, which opens to fire.

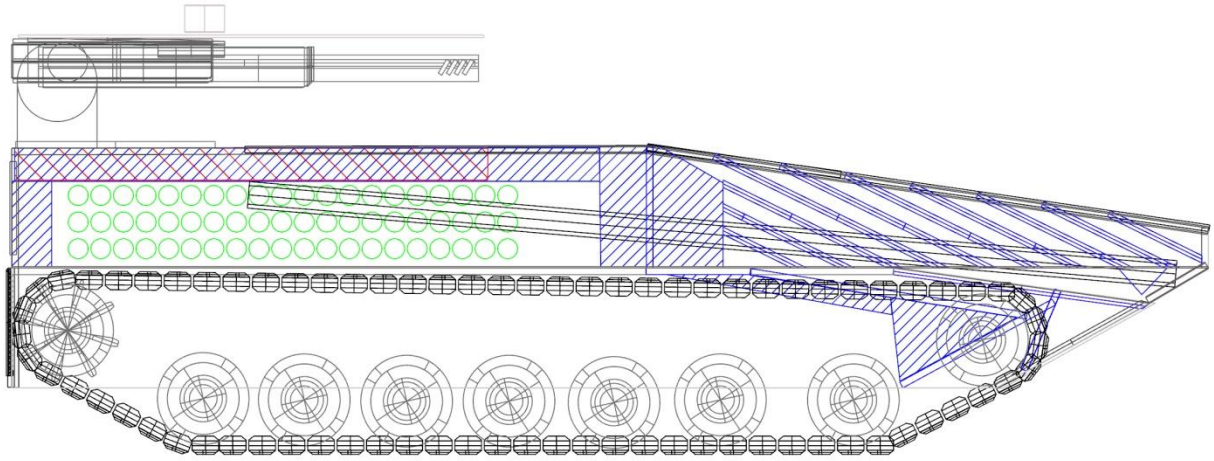
4.2 Size comparison with the M1 Abrams tank.



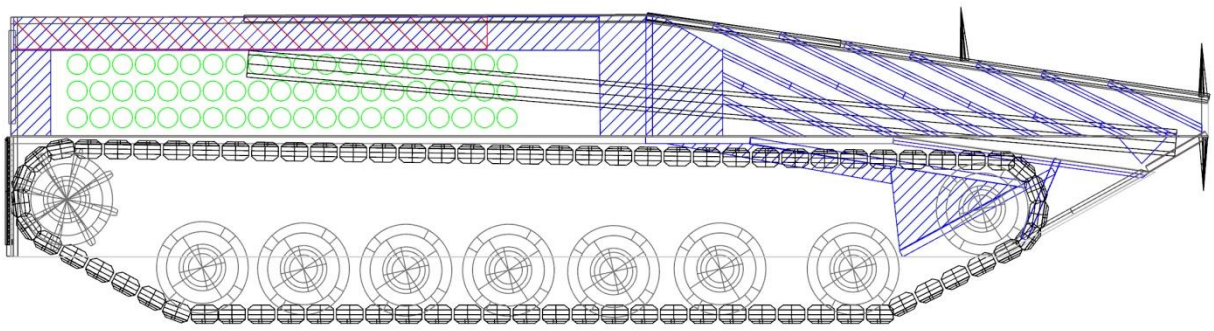


4.3 Multi-layer improved BLACK BOX tank armor.

2.3m high version with one side 60 rounds ammunition of 120mm caliber.
Roof armor: 25cm of composite/multilayer armor.
Back armor: 30cm of composite/multilayer armor.
Turret front armor: 75cm of composite/multilayer armor (or more) + multiple layers of active armor.
Turret side armor: up to 60 cm or composite and/or multilayer armor (for 120 mm ammo (1m len. rounds)).
Front armor: 90cm of composite + several active armor layers.



Additional upper turret can be made low-profile and hideable in the niches in the roof. Anti-missile frontal grids are displayed.

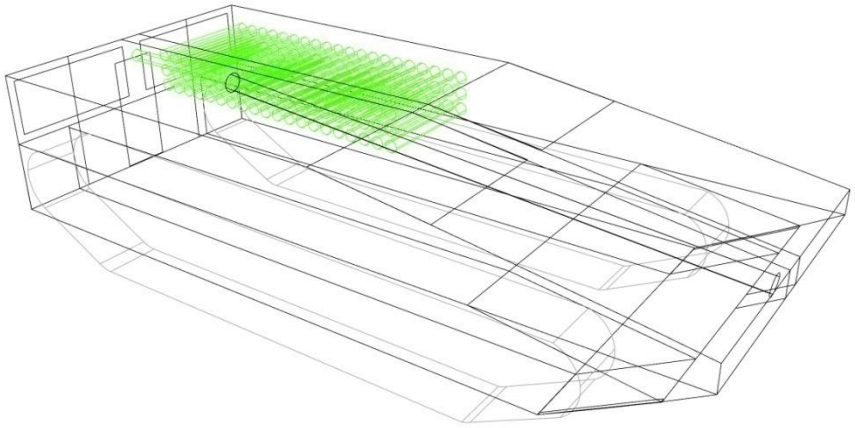


2.4-2.8m height versions can have better roof armor, bigger hideable weapons and more ammo.

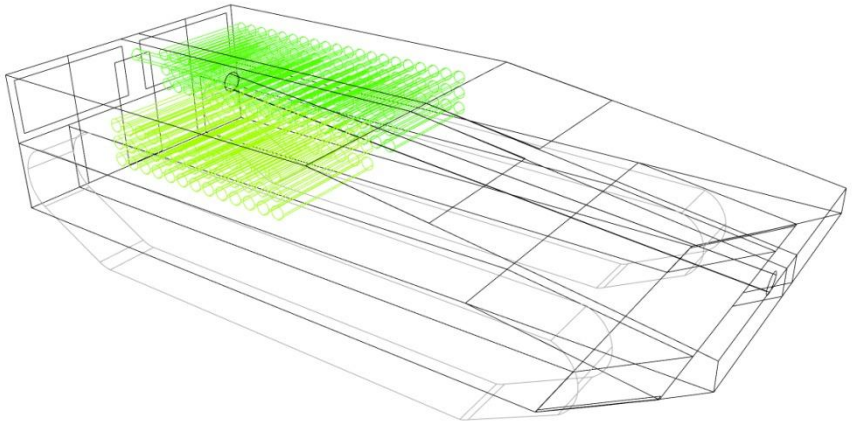
With the 152 mm rounds, the turret side armor shall be less, or ammo shall be rotated to reduce horizontal space it needs.

5. The size of the ammunition for the tank and other BLACK BOX vehicles.

Ammunition is arranged in rows. In this example, there are 60 rounds of 120-152mm caliber. The manual or automatic ammo feed through the hatches in the back of the housing or the roof, in the form of a cartridge or otherwise, is simplified. The roof shall contain blow-off panels for personnel protection against the ammunition detonation.



Additional ammunition for the tank, artillery, automatic mortar. In this example, there are 100 rounds of 120-152mm caliber. However, for the tank, the risk of ammunition hit will increase due to increasing of its volume.

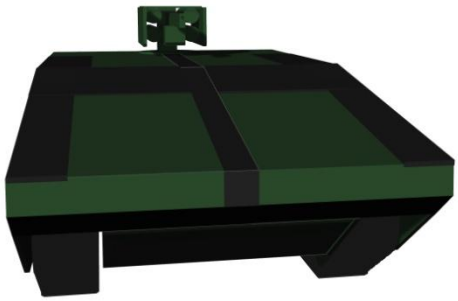


6. BLACK BOX MLRS

Hidden weapons.

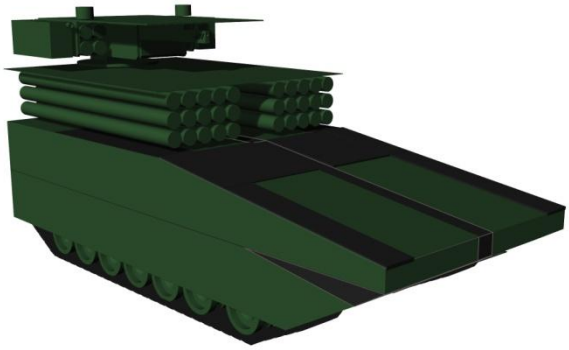
Big turret version

Version with smaller hideable or fixed turret

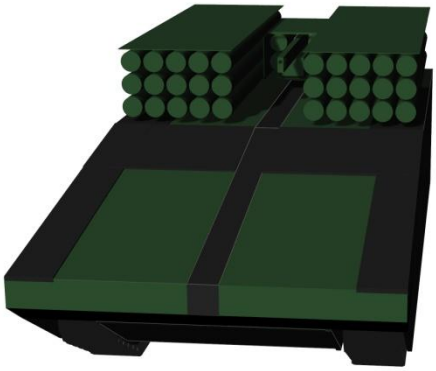


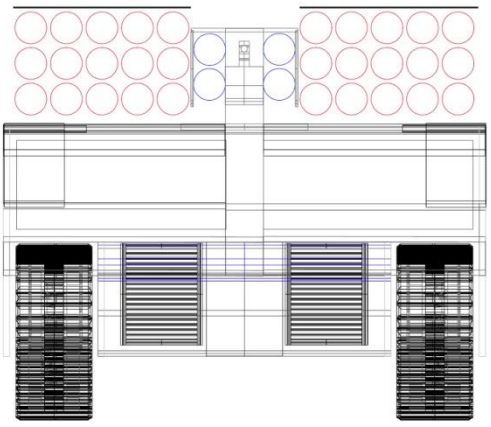
Weapons are ready to fire. 240mm MLRS.

Big turret version



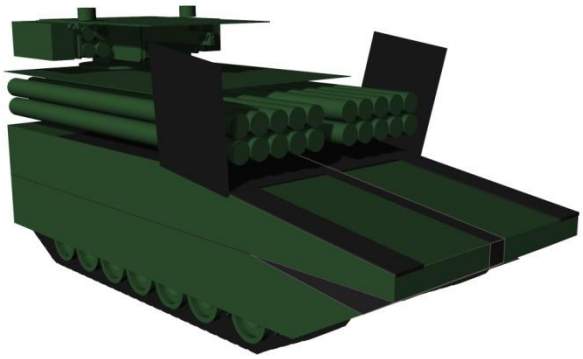
Version with smaller hideable or fixed turret

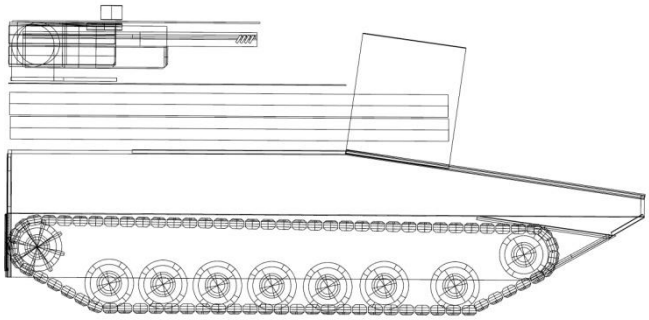




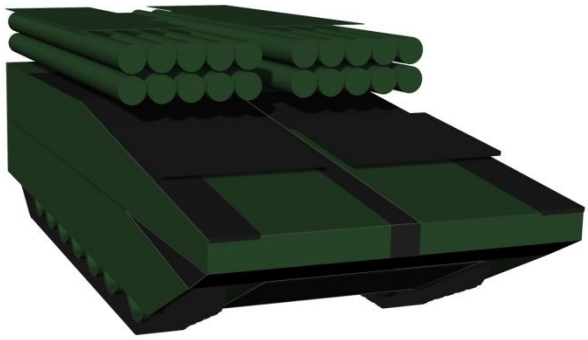
Weapons are ready to fire. 300mm MLRS.

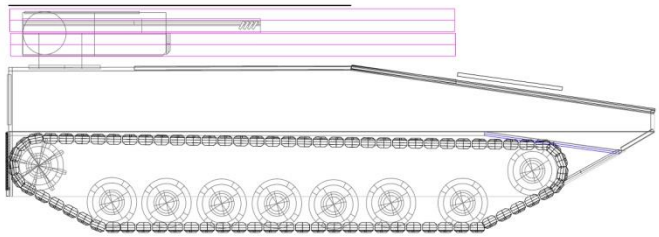
Big turret version



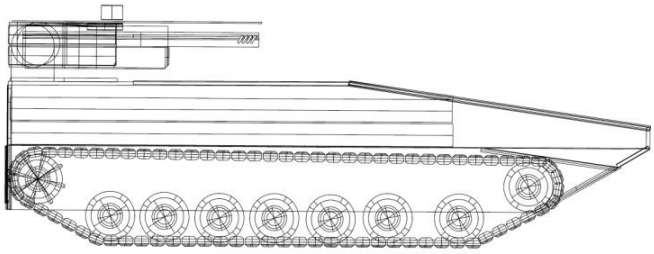


Version with smaller hideable or fixed turret

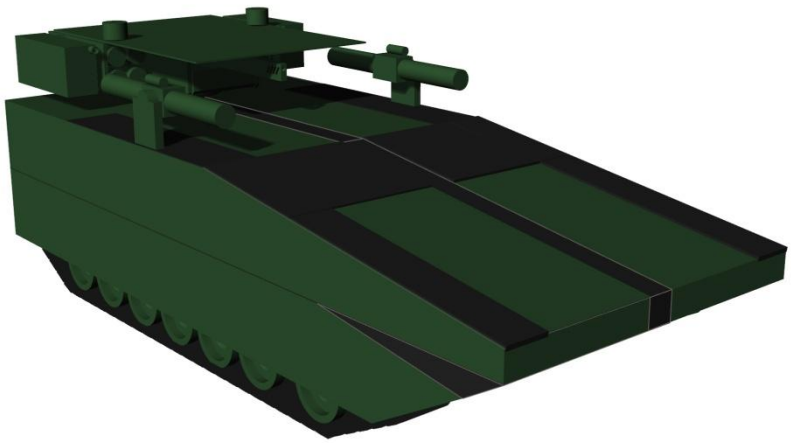


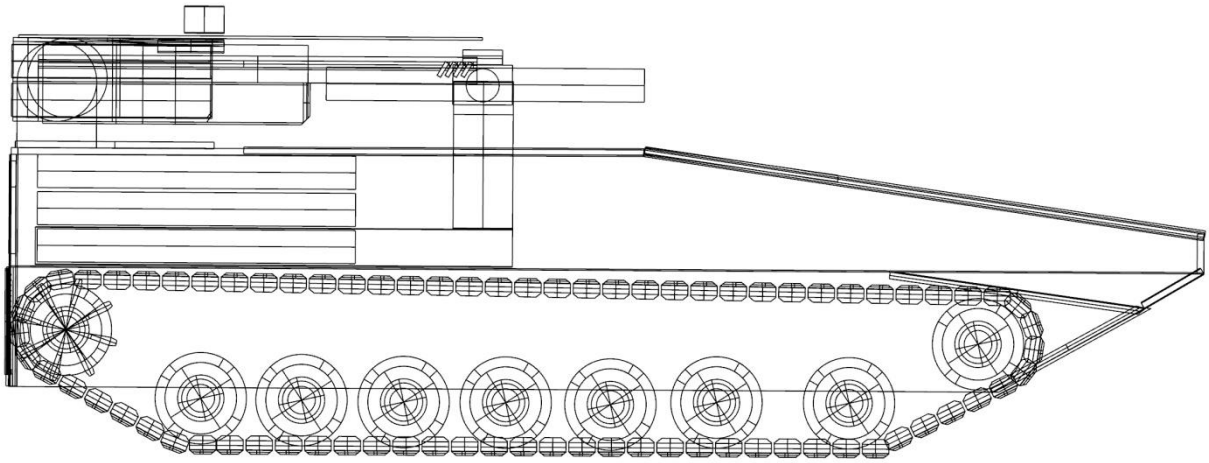


Hidden rocker launchers



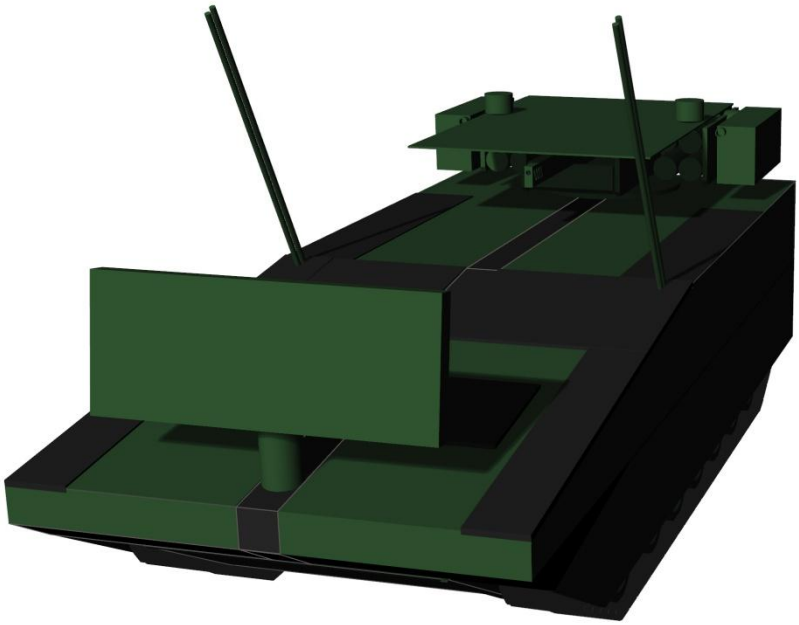
7. BLACK BOX rocket tank





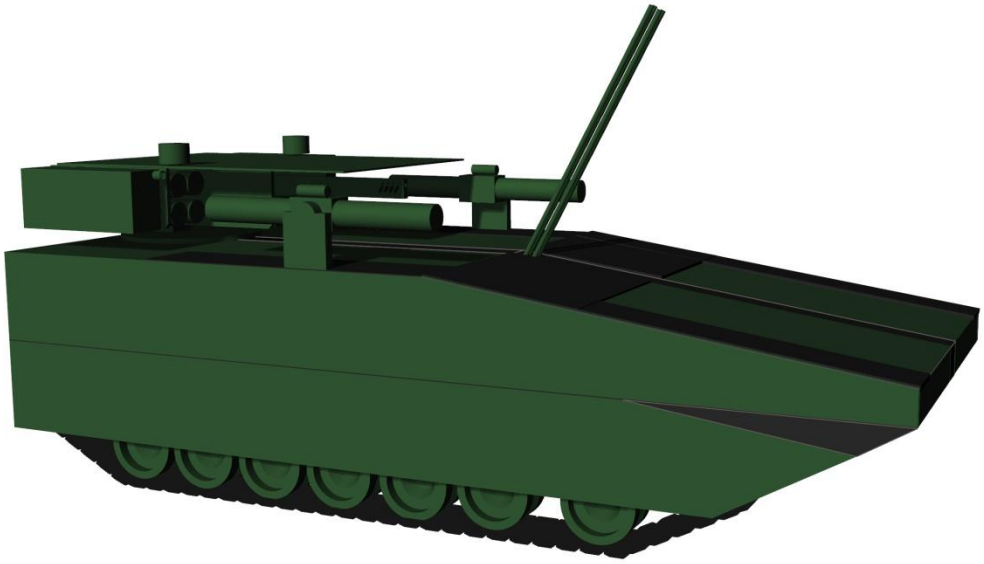
8. Anti-air systems and Medium-range rocket system based on the BLACK BOX technology

Double 2x 23mm AA-guns with radar. All that can be hidden in responsible niches in the hull.

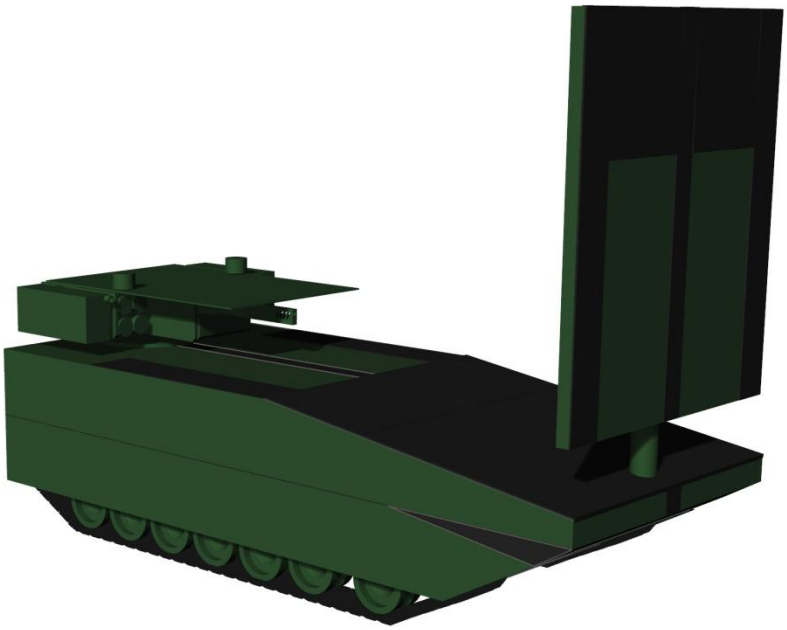


Quad 23mm AA-guns that can be hidden in the responsible niche in the hull.

All those AA-guns can be combined with previously described rocket tank AA rocket systems.

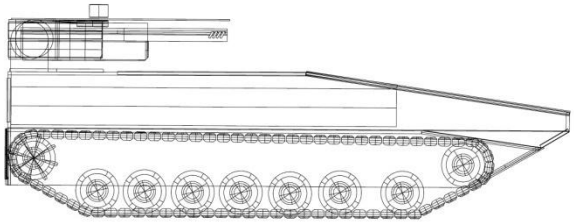


Radar vehicle for AA or artillery squads. Radar is folding with fake hatches drawings.



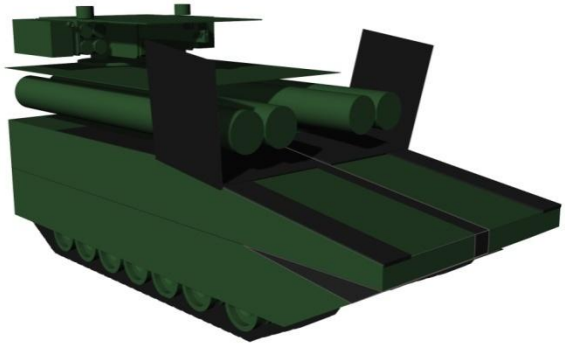
Long range anti-air rocket system. Or medium range ground rocket system. 4 x 600mm diameter rocket case.

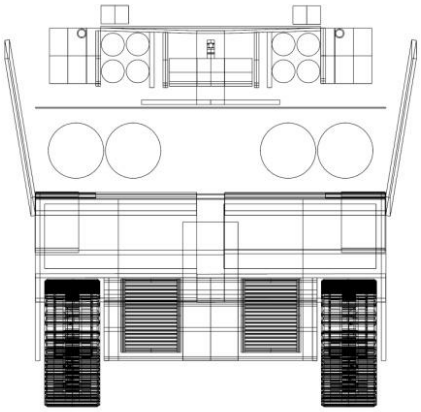
Hidden weapons.



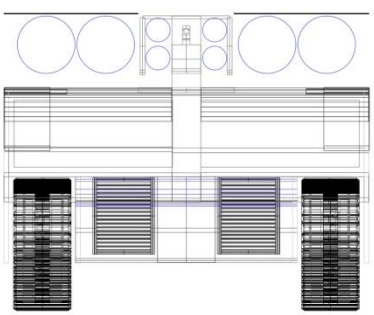
Weapons are ready to fire.

Big turret version



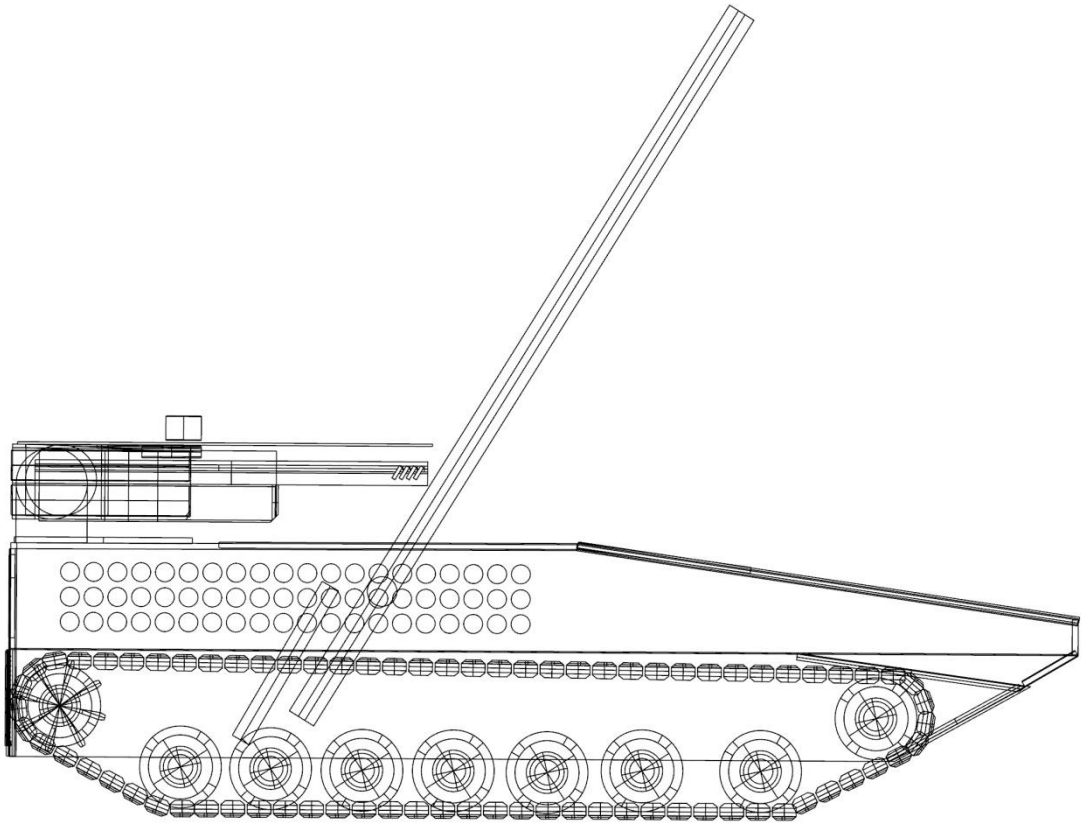


Version with smaller hideable or fixed turret

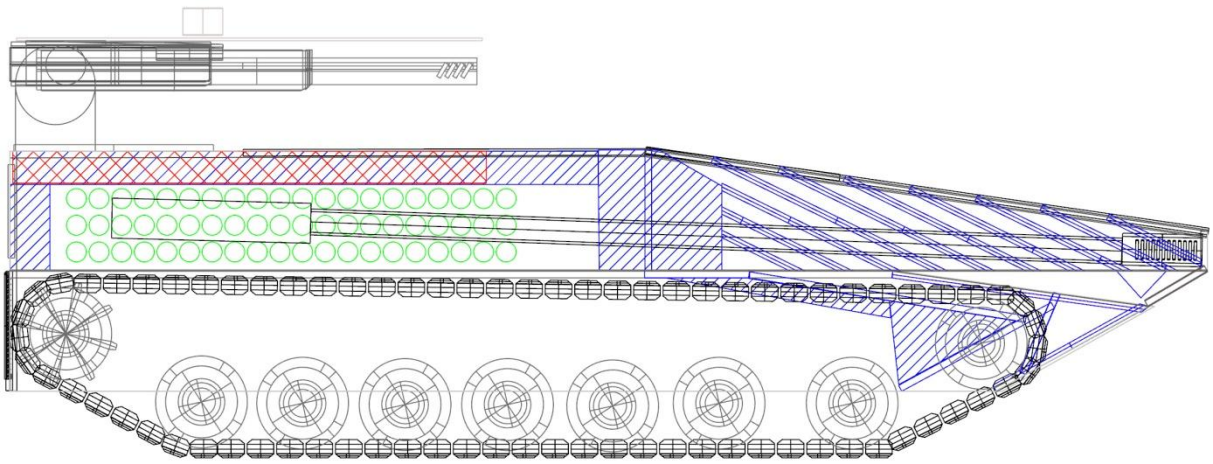


9. BLACK BOX Artillery or Heavy Mortar

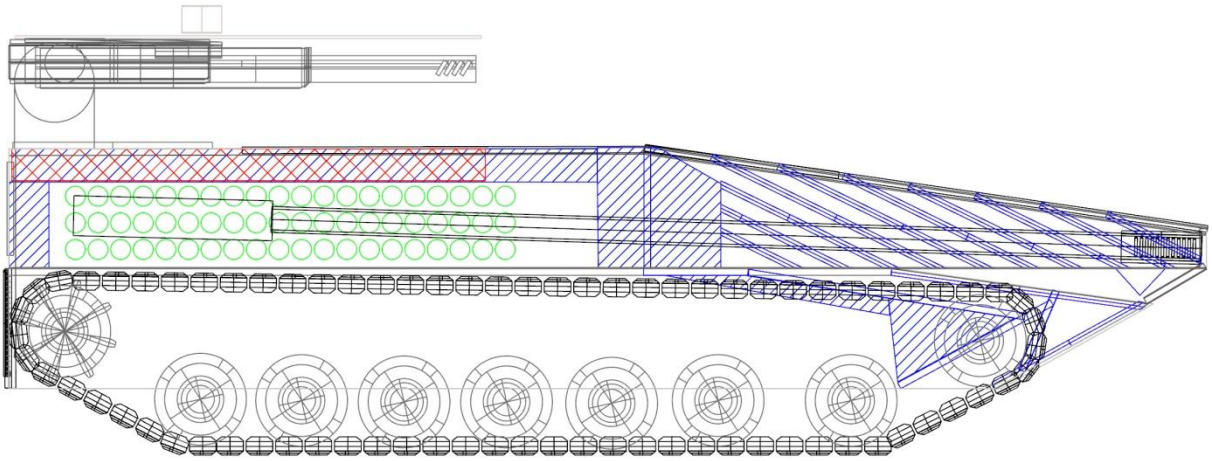
It has bigger ammo load than any modern mortar or artillery.



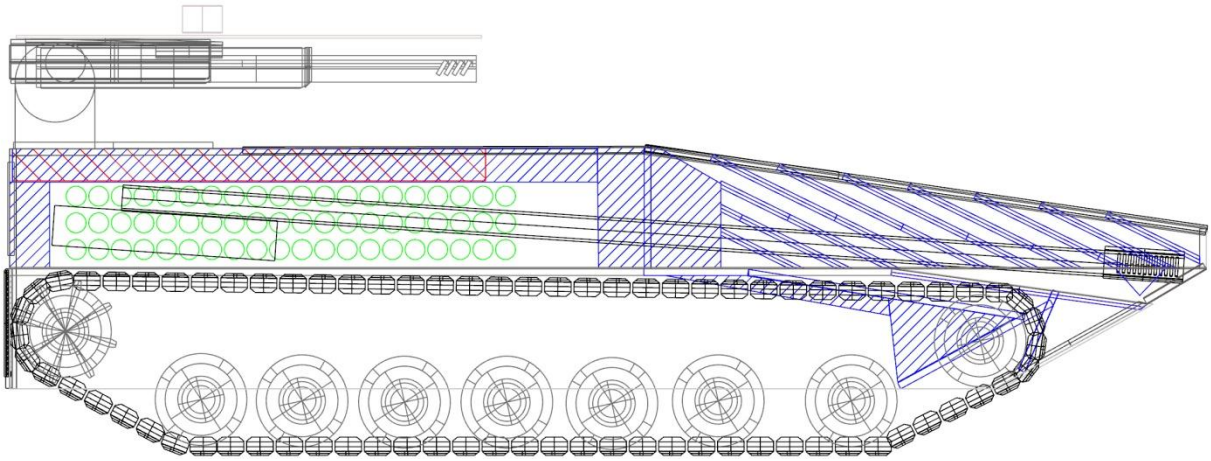
155mm L39 (6,1m barrel) cannon variant.

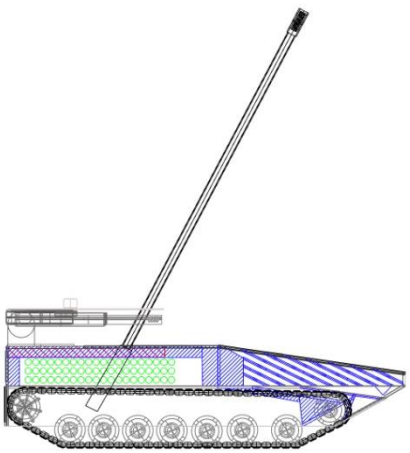


155mm L45 cannon variant (7m barrel). The muzzle brake shall be made folding or shorter.



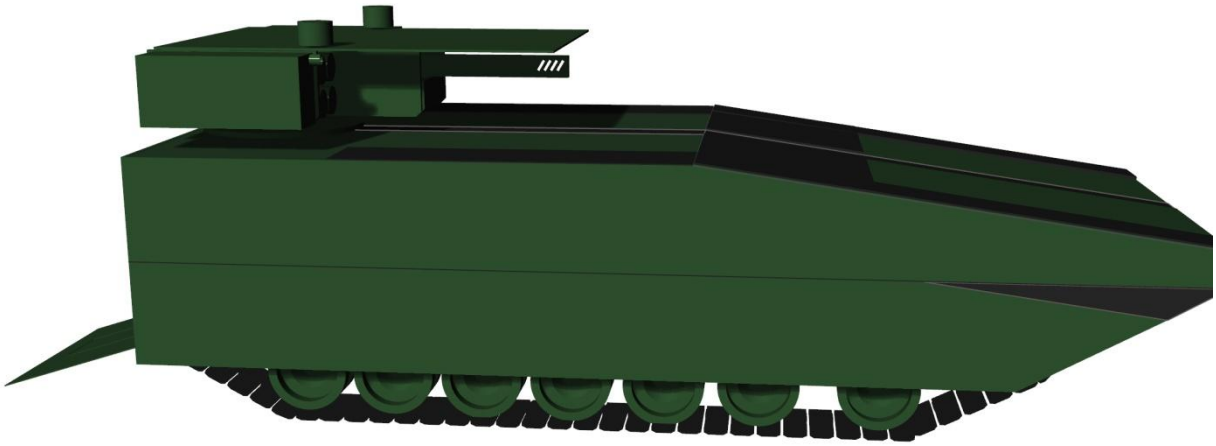
155mm L52 cannon variant (8,1m barrel). The breech and the muzzle brake are folding. For 155mm L52 the breech and the muzzle brake shall be made collapsible or the vehicle size shall be increased. Or barrel will be partially out of the vehicle and masked by anti cumulative grids or by other means.

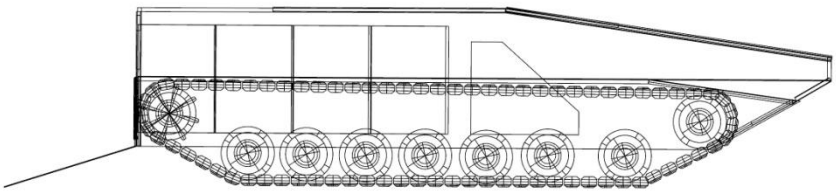


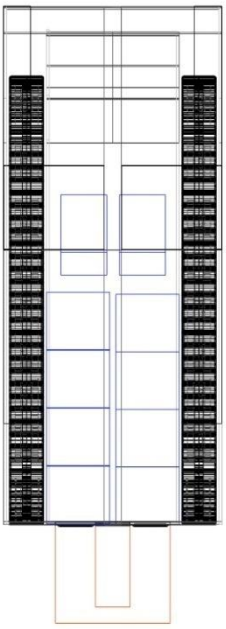


10. BLACK BOX Armored personnel carrier (APC)

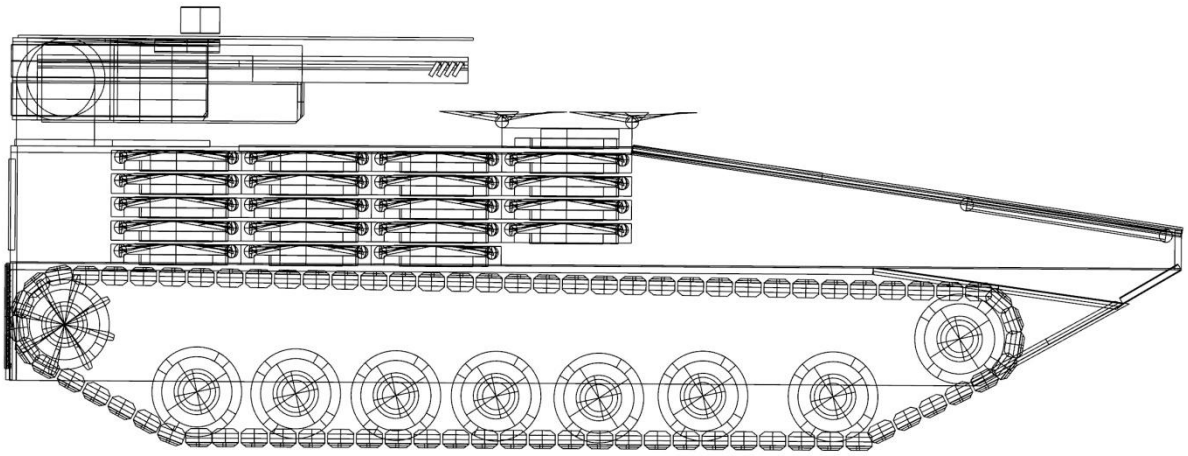
In the middle version (9 m), 8 + 2 people are comfortably accommodated. In the small 6 + 2.



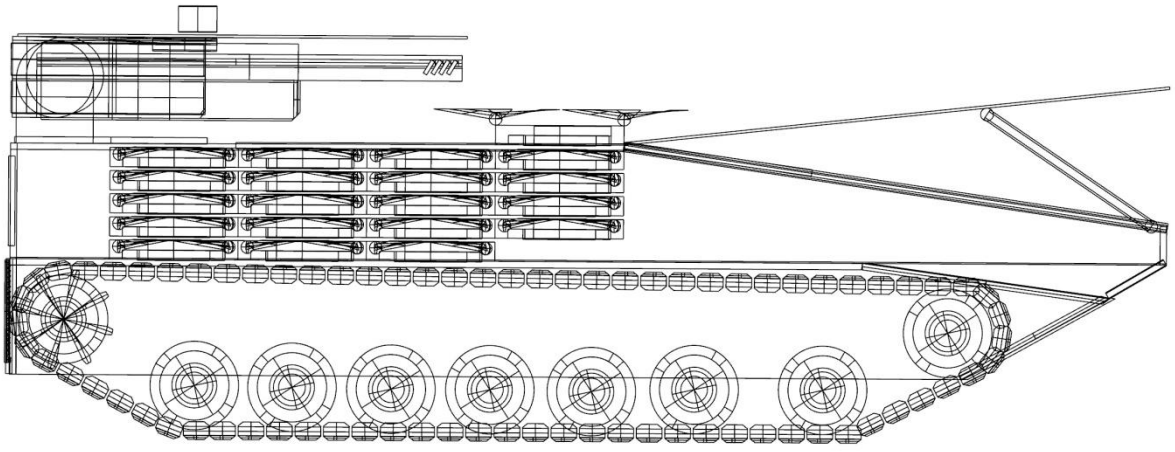




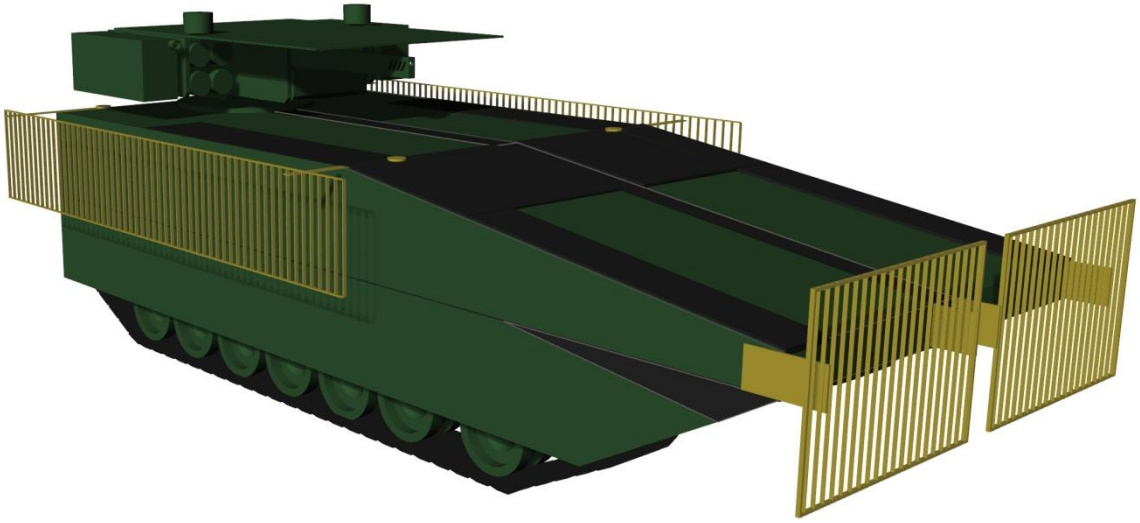
11. BLACK BOX Intelligence/attack drones carrier vehicle.



Take-off platform raised (optional).



12. Additional screens, grids protection



Recommendations for testing the technology:

When testing in a virtual imitation environment, make sure that the AI enemy cannot identify specific types of vehicles directly by its type (id). Perhaps it will be easier by adding one vehicle unit with the ability to select its properties once after entering the battlefield. It is also advisable to avoid standard formations of the vehicle, for example, air defense group in location defense position, to prevent recognition. The expected efficiency increase of the party equipped with new vehicles is about from 20% to 200%, and possibly more.

Summary.

The new technology makes it possible to significantly improve the camouflage, armor, ammo quality, vitality, repair and maintenance speed, general effectiveness and tactics of all new type armored vehicles on the battlefield.

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Aug 10, 2017

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