

COMBAT MISSION

BLACK SEA



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■ INTRODUCTION

■ Foreword

Sometime in 2009, we determined the setting for Combat Mission: Black Sea: a fictional future conflict between NATO, Ukraine, and Russia in the year 2017. A few years later, the details of this conflict were fleshed out and work began on creating the unique military formations and equipment that would participate in such a conflict. In the midst of development, the unthinkable happened, and conflict actually came to Ukraine during the spring of 2014.

After much internal discussion we decided to move forward with the development of Combat Mission: Black Sea. We prefer that our Combat Mission releases cover historical or fictional modern topics, and in that regard Black Sea is still a fictional story. However, the previously written back story for the game was slightly altered to take into account 2014's real life events. To be clear: Combat Mission: Black Sea is a hypothetical conflict between NATO and Russia set in 2017, not a depiction of present day events such as the Crimean Crisis or the War in Donbass.

War in real life is a terrible, horrible thing that should only be embarked upon as an absolute last resort. Combat Mission: Black Sea is thankfully still a fictional story, and likely to remain so unless our global leaders and populace collectively lose their minds. The stories that will be created within this game can serve as a grim reminder of the human cost incurred when diplomacy and decency fail.

■ Important

This supplemental manual for Combat Mission: Black Sea contains reference information specific to the Black Sea setting. A tutorial is also included. For more general information on the Combat Mission engine, such as specific information on game features, please refer to the Game Engine Manual.

■ Back Story

Russian and Ukrainian relations chill considerably beginning in 2014 as a result of the Crimean Crisis and the separatist rebellion in Donbass. After a tense period, the situation stabilizes somewhat as the separatists in eastern Ukraine are checked. Russia and Ukraine partially draw down their mobilizations. Moving forward, however, relations between Ukraine, the North Atlantic Treaty Organization (NATO), and Russia remain very strained over the recent events.

Tensions soon flare up again after the new pro-western Kiev government makes a dramatic announcement: Ukraine intends to join NATO and the European Union (EU) by 2018. In response to the Crimean Crisis of 2014, Ukraine also continues to deny Russia the use of land connections to move goods into Crimea. The loss of this route combined with the inefficiency of moving goods across the Black Sea soon puts Crimea into an economic crisis.

Russia strongly denounces these developments as acts of aggression, and declares that a NATO member on Russia's border would be a direct threat to Russian national security. Russia also points to Crimea's economic problems as a Kiev-manufactured crisis, one which will be worsened by the spread of the EU. The Russian government states that they will take any steps necessary to protect their national security, the well-being of Crimea, and any Russian-speaking people living in Ukraine.

The United States and NATO see Ukraine as an opportunity to expand their influence eastward and further weaken Russian influence on Eastern Europe. With the help of NATO advisors, the

Ukrainian military begins reforms in order to qualify for NATO membership. This process includes joint training exercises between Ukrainian and NATO forces, some of which take place on Ukrainian soil. NATO also backs Ukraine in their isolation of Crimea from land connections to Russian territory, with the justification that the referendum joining Crimea to Russia was illegal, and that Crimea is an occupied territory. As a result of the strained tensions, the United States Armed Forces increases the amount of troops and equipment sent to Europe for rotational training; a thin pretense for having more troops and logistical stockpiles near Ukraine.

In late 2016, the situation explodes when the Ukrainian government drops a bombshell: Ukraine will join NATO by the end of 2017. The separatist sentiments that have been simmering for years in eastern Ukraine erupt and soon armed revolt returns to the Donbass region. A local referendum is hastily conducted that splits the region into an autonomous state. The new separatist leadership formally asks Russia to provide security troops during the transition. Before Ukraine can move more forces to the region, Russian troops are quickly moved across the border into the Donbass region with the stated mission of a peacekeeping operation to restore order.

The Kiev government refuses to recognize the referendum and begins the process of deploying more troops to the Donbass region. A tense standoff results as the Ukrainian and Russian militaries stare each other down on the border of the new state. As in Crimea, local Ukrainian military bases and outposts are surrounded and isolated by Russian troops, while roads leading in and out of the region are closed. Ukraine accuses Russia of performing another de-facto invasion, and Russia responds that their peacekeepers are there by invitation, that the people of eastern Ukraine have a right to self-determination which must be respected by the Kiev government and the West.

During early 2017, the gears of war begin to turn. Russian units in Joint Strategic Command South and West begin mobilizations. Russian combat units fill their manpower shortages and deploy along Russia's shared borders with Ukraine. Although officially labeled training exercises by the Russian government, Western observers note that important logistical and Air Force elements usually not used for training have also mobilized or heightened readiness. Additional Russian troops are moved to Crimea.

In response to the observed Russian mobilizations, Ukraine begins to mobilize low-readiness units and call up reservists. An expeditionary NATO force comprised of American and European military units is moved to eastern Poland, adjacent to the Ukrainian border. An American mechanized unit on rotational training in Germany joins them. The United States begins to prepare logistically by moving more prepositioned supplies and equipment to Germany, while transportation plans for stateside units to be moved overseas are put in motion.

On a morning in early June 2017, the situation comes to a head when a firefight erupts between Russian and Ukrainian forces at one of the isolated garrisons. The violence claims the lives of multiple soldiers on both sides. The next morning, fighting breaks out on the border, and the conflict begins.

■ The Black Sea Conflict

The Black Sea conflict extends from June to August 2017. Black Sea's base game release concentrates on the fighting in Central Ukraine around the Dnieper River, as Russia advances on the Ukrainian capital of Kiev in a bid to force the Kiev government to come to the negotiating table.

■ June

Fighting breaks out between Russian and Ukrainian forces in eastern Ukraine. Russian forces move quickly from the Luhansk and Donetsk areas into Ukraine. Ukraine scrambles to react, moving forces to block the Russian advance. The NATO expeditionary force moves into Ukraine, intending to establish a "line in the sand" in central Ukraine along the Dnieper River. Some of the NATO expeditionary force moves to reinforce the Kiev defenses.

In a matter of days, Russian forces smash through Ukrainian defenses in eastern Ukraine and reach the Dnieper River. The NATO expeditionary force, combined with Ukrainian units, meets the Russians in battle along the river. The Russian advance is temporarily halted where the NATO units have stiffened the defenses around Kremenchuk and Dniproderzhynsk, but the NATO expeditionary force is not large enough to guard the entire river. The Russians simply bypass their defenses by crossing the Dnieper River to the south between Dnipropetrovsk and Zaporizhia, then roll up along the west side of the river.

Fearing that any delays in ending Ukrainian resistance will allow NATO to deploy more troops, Russia enacts Plan B: strike hard against major Ukrainian cities in an attempt to bring Ukraine to the negotiating table. A two-part offensive is launched against Odessa and Kiev, as Russian forces poised along the northeastern border and in Crimea roll forward. Ukraine is forced to keep their best units in the north to protect Kiev, while the NATO fleet in the Black Sea lands Marines at Odessa to protect the city from capture as Russian forces move out of Crimea.



■ July

Ukraine, emboldened by NATO military aid, continues to resist despite the threat to Kiev and Odessa. Russia, desiring a conclusion to the fighting before even more NATO troops arrive, continues its advance. The deterrent effect that NATO had hoped the presence of their expeditionary force would have on the Russian advance does not materialize.

NATO expeditionary forces defending the Dnieper River in central Ukraine are outnumbered and outflanked by the Russian crossings to the south. Eventually they are forced to fall back to the more defensible region between Kirovohrad-Cherkasy-Kremenchuk to protect Kiev and buy more time until reinforcements can arrive.

The Russians achieve a breakthrough in the Kirovohrad-Cherkasy-Kremenchuk area as the Ukrainian and NATO defenses are bypassed or brushed aside, and there is little standing between them and Kiev to the north. Kiev is now threatened by a two-prong offensive from both the east and the south.

NATO reinforcements arrive through Poland and western Ukraine just in time to address the Russian pressure on Kiev. NATO launches a counter-offensive from western Ukraine into central Ukraine, while reinforcements are sent to bolster the Kiev defenses.



■ NATO Win Branch

In a swirling battle, the Russians are caught off-balance and sent reeling back towards the Dnieper River. At Kiev, the NATO reinforcements arrive just in time to save the city, and the Russian advance is halted outside the city. By the end of the month, NATO has the initiative in central Ukraine while the Russian advance on Kiev has been halted.

■ Russia Win Branch

The Russian advance north deflects the NATO counterattack and continues the drive north on Kiev. NATO reinforcements to the Kiev defenses slow the Russian advance down, but it continues nevertheless. By the end of the month, Russia has continued their breakthrough and their grasp on Kiev tightens.

■ August, NATO Win Branch

After the successes of July and reinforced with freshly arrived brigades, NATO launches offensives on all fronts. To the north, NATO seeks to push the Russians away from Kiev and relieve the pressure on the beleaguered city. In the center, NATO aims to push the Russians back across the Dnieper and breach the river defenses. In the coastal south, NATO prepares to invade Crimea.

The conflict has proven to be deeply unpopular in both Western and Russian populations, who are shocked at the high cost following months of reckless escalation. Both the Russians and the West could commit further units and equipment to stay in the fight, but at this point both have become war-weary and seek an end to the fighting. Furthermore, the Russians have the additional problem of trouble flaring up on their other borders, where groups and nations with a grudge are taking advantage of the distraction.

After the August offensives are successful, NATO takes advantage of the chance to offer a cease fire in order to avoid escalating the conflict outside of Ukraine's borders. The Russians withdraw from Ukraine and return to their original borders.



■ August, Russia Win Branch

The NATO counterattack proves to be a disappointment, as it proves to be "too little, too late". The Russian advance continues on Kiev from the south, as Russian forces grind their way into the city from the east. Ukraine's military defenses are spent, and Western will to continue defending them is evaporating in the face of attrition. With Kiev in the process of being lost to the Russians, the Ukrainian government is ready to come to the negotiating table in order to end the destruction as soon as possible.

Modern Western populations are unused to the idea of such extreme losses, especially for a country so close to Russia's sphere of influence. Politicians for the respective governments quickly begin looking for a way out of the conflict. When Russia offers an out via a cease fire in exchange for the continued existence of the separatist state and other concessions, NATO and the Ukrainian government quickly accept the offer.



■ Story Notes for Campaign and Scenario Designers

We have purposely avoided including any details of this conflict to give campaign and scenario designers the freedom to create their own stories and campaigns within the framework presented here. A more detailed document will be made available in the future for scenario designers to use as inspiration for their own content.

The storyline's purpose is first and foremost designed to meet the needs of Combat Mission's tactical battlefields: a wide variety of terrains and forces, plus enough time and space for modders to create their own unique stories within the context of the campaign. A more realistic one-week skirmish between a few battalions before saner heads prevail would not make for a very interesting Combat Mission setting!

■ What's New

■ Since Red Thunder

Combat Mission: Black Sea includes the following new or enhanced features. The following list only contains major new features. The list of tweaks and smaller changes to the simulation of modern equipment are too numerous to list here.

Note: Black Sea uses Version 3 of the Combat Mission game engine. Consequently, new features are focused on bringing our modern equipment up to date as opposed to general engine changes.

■ Amphibious Vehicles

Water is no longer an obstacle! Most Russian and Ukrainian vehicles are now capable of swimming across the surface of water obstacles, giving them enhanced tactical utility. The following vehicle families, along with all of their variants, are capable of amphibious movement: BMP, BTR, BRDM, MT-LB.

Amphibious vehicles are capable of moving through Water, Ford Deep, and Reeds terrain. Marsh and Deep Marsh ground types remain impassable to amphibious vehicles. Ordering a vehicle to move through water is as simple as issuing any normal movement command onto or across water. When it reaches the water, the vehicle will automatically begin swimming.

Some notes on amphibious movement:

- Amphibious movement speed is capped at a relatively slow maximum swimming speed, regardless of the movement command given.
- Passengers and crew cannot dismount or bail out if the vehicle is in deep water (not a Ford), and if the vehicle is destroyed while in deep water, all passengers and crew are instantly lost.

■ Unmanned Aerial Vehicles (UAVs)

Unmanned Aerial Vehicles (UAVs) are a new type of support asset for the Combat Mission battlefield. UAVs are controlled very similarly to air support assets, but have some major differences, chief among them being the ability to perform an Observe mission.

Observe missions are ordered just like a normal support mission, but instead of attacking targets, the UAV performs surveillance of the ordered area. UAVs performing an Observe mission will spot enemy units and contacts just like a ground unit would, and will transmit that information through the communications network, giving friendly units with a C3 link enhanced spotting abilities on the target area. UAVs are equipped with high resolution cameras and thermal imagers, allowing them to be used night or day.

In addition, artillery and air support strikes can be ordered on an area that a UAV is Observing, even if the spotter ordering the mission does not have LOS to the area. In this case, the UAV essentially acts as the spotter's eyes.

Other special features of UAVs include:

- UAV Observe missions can break the rule of only one support mission per spotter; spotters directing a UAV Observe mission can direct one extra support mission in addition to the UAV, allowing a single team to call in a UAV and direct a fire support mission at the same time.
- Spotters for UAV missions do not require LOS to the target.

- Tactical and MALE UAVs carry laser designators for precision artillery missions. Smaller hand-launched micro UAVs, such as the RQ-11B Raven and ZALA 421-08, are too small to carry laser designators.
- Observe missions last indefinitely. The UAV will not depart until shot down or ordered.
- UAVs are much better at spotting and IDing vehicle targets than infantry targets. Units in motion are also much easier to spot. Enemy infantry inside a building are essentially invisible.
- Observe missions have a much higher chance of detecting enemy targets if set to a Point target, which will encompass a 50m diameter circle. Area targets cover much more ground but have a lower resolution. Linear missions function like area missions.
- Unlike air support assets, most UAVs are not armed. Currently the only armed UAV in Black Sea is the MQ-1C Gray Eagle. This UAV can perform Observe missions or attack targets like an air support asset.
- UAVs are highly vulnerable to AA fire. Although difficult to detect due to their small size, UAVs fly slowly and have no defensive countermeasures. Once detected, a UAV will be shot down fairly quickly if the enemy possesses AA weapons that are capable of attacking it (each UAV entry in the Equipment Encyclopedia lists what can fire upon it).
- If the controller for a micro UAV (such as a Raven or ZALA) is killed or incapacitated while the UAV is in the air, the UAV will crash and be destroyed. Larger UAVs will automatically cancel the Observe mission.

■ Electronic Warfare

Don't want modern radio and satellite communications nets for your scenario? Shut them down! A new scenario environmental setting that can be independently set for either side simulates electronic warfare attacks allows you to degrade or completely disable electronic communications, forcing even Information Age forces to communicate without the benefit of modern technology.

Electronic warfare is represented in the game through a Data editor setting. (it is also available in the QB setup window). There are two settings: Blue Electronic Warfare Strength, and Red. The setting for one side will negatively affect the enemy systems. So for example, if Blue EW strength is set to Strong, then the Red player will feel the effects of Strong EW. These settings do NOT cancel each other out! So you could theoretically set both to Medium and both sides would have seriously degraded comms. Once in battle, you can see what the EW strength is for both sides by checking the Conditions panel.

The available EW strengths are None, Light, Medium, and Strong.

NONE:

No EW assets are deployed against the enemy. Systems are unaffected.

LIGHT:

- Hand-held "walkie-talkie" radio communications are degraded. Manpack radios (as carried by "radio operator" soldiers), and vehicle-mounted radios are unaffected.
- Hand-held satellite communications links via PDA devices are degraded. Vehicle-mounted satellite stations such as FBCB2 and Constellation are unaffected.
- UAV Support Mission delivery times are lengthened and UAV spotting ability is degraded due to electronic interference.

MEDIUM:

- Hand-held radio equipment no longer functions.

- Manpack radio and vehicle-mounted radios still function but are degraded.
- Hand-held satellite communications links via PDA devices no longer functions.
- Vehicle-mounted satellite stations such as FBCB2 and Constellation are degraded.
- Delivery times for Artillery, UAV, and Air Support Missions are much longer due to comms interference.
- UAV spotting ability is further degraded.
- Precision artillery missions of all types are not available.
- The ability of on-map Surface to Air Missiles (SAMs) to detect and engage aircraft is degraded.

STRONG:

- All radio and satellite communications links are disabled. Units must maintain C3 links via verbal face-to-face communications or visual hand signals.
- Artillery, Air Support, and UAV Support Missions now have an extreme delay, often over 20 minutes. UAV spotting ability is extremely degraded.
- On-map SAM ability to detect and engage aircraft/UAVs is highly degraded.

■ Precision Artillery

Many fire support assets in Black Sea have access to precision artillery shells. These special support missions fire only one artillery shell per gun, but they are guided shells with much higher accuracy and precision. Precision missions do not have a spotting phase; the shells arrive (hopefully) on target with no warning. Precision missions are very useful for attacking enemy armored vehicles that typically need a direct or near-direct hit to knock them out of the fight, or for targeting a specific building or location while trying to avoid collateral damage.

American 155 mm artillery, Russian 122 mm and 152 mm, and Ukrainian 152 mm artillery have precision ammunition. American and Russian 120 mm mortars have "near-precision" rounds that while still very accurate, are not quite as accurate artillery precision ammunition.

Other important notes for precision artillery missions:

- Precision missions must use a Point target.
- Russian and Ukrainian precision missions are laser-guided, which requires that the spotter team possess a laser designator. American precision missions are GPS-guided, which do not require a laser designator.
- Precision missions do not have a duration. The maximum number of shells that can be dropped during a mission is one per gun.

■ Active Protection Systems

As weapon systems have become more sophisticated in order to destroy combat vehicles, so too have the defensive systems designed to defeat them. Combat Mission: Black Sea features a variety of Active Protection Systems (APS) that detect and defeat incoming projectiles before they even have a chance to strike their target.

APS systems currently modeled include Trophy, Zaslon, and Arena. APS detect incoming missiles or rockets, calculate an intercept vector, and then shoot projectiles to destroy or deflect the warhead before it can strike the vehicle. A fire control radar covers a specific arc around the vehicle, and is set to detect only projectiles moving at a certain speed such as missiles or rockets. In this way, faster and harmless projectiles such as bullets are ignored by the system.

Once a valid projectile is detected, an on-board computer almost instantly identifies the weapon along with its vector. Just as quickly an intercept path is calculated, and a launcher shoots projectiles to destroy or damage the incoming threat. Even if the incoming projectile is not destroyed, its penetrating capability is usually heavily degraded by damage from the projectiles.

Some notes on the use of APS:

- Only specific vehicles have APS available as an option: M1A2 SEPv2 Abrams, M2A3 Bradley, M3A3 Bradley, M7A3 Bradley, T-72B3, T-90AM, Oplot-M, and BMP-3M.
- Most APS only protects against rockets, missiles, and large HEAT warheads. Other threats, such as tank sabot or autocannon rounds, artillery shells, small arms, or grenades, are not intercepted. The Javelin missile is also immune to Arena, as the diving profile is too steep for it to intercept.
- Incoming rockets or missiles that have been intercepted are still an explosive threat to nearby infantry and unbuttoned crew.
- APS have a limited number of shots before they are expended and will no longer function during the scenario. This number will vary depending on the system.
- Attacking simultaneously with two or more attacks makes it more likely that the APS will not be able to reset in time to intercept all of the attacks.
- There is a small chance that APS may simply fail to intercept a threat.
- Coverage around the vehicle depends on the specific APS system. Some systems such as Trophy and Arena on Russian tanks have 360 degree coverage, while others such as Zaslon and Arena on BMPs do not protect the rear of the vehicle.

■ Airburst Munitions

High explosive shells fired from many ground weapons are now even deadlier thanks to their ability to airburst directly above the target, or even just behind cover such as a wall or building window! This capability is possible due to the proliferation of integrated laser rangefinders, targeting computers, and programmable munitions. Airburst capability is available at the squad level to United States rifle squads in the form of the M25 CDTE as well as to vehicles such as Abrams tanks, Oplot-M tanks, BMP-3s, BTR-82As, and T-90AMs.

■ Surface-to-Air Missiles (SAMs)

Combat Mission: Red Thunder introduced anti-air capability to the game. This feature continues in Combat Mission: Black Sea with the addition of Anti-Aircraft (AA) assets that will attack air support or UAV units that are currently performing Strike or Observe missions on the battlefield. Systems included in the initial release are the Stinger, Igla, Igla-S, 9K35 Strela-10M3, and 2K22 Tunguska.

Currently, AA units fall into two general categories: Surface to Air Missiles (SAMs) and Anti-Aircraft Artillery (AAA). Tunguskas are special in that they have both missiles and cannons for attacking aircraft. SAMs can attack any air asset other than micro UAVs such as the RQ-11B Raven and ZALA 421-08. AAA can attack all assets. The degree to which the AA fire is effective will depend on the AA platform and the air asset involved. AA fire can miss the aircraft, drive it away and force it to abort the attack, or hit and damage or destroy the aircraft.

If you expect to encounter enemy aircraft, you should carefully position any AA assets you might have so that they do not get attacked by ground forces. If you are facing an enemy with AA,

you should prioritize finding and attacking their AA assets. If you can destroy them, your aircraft will be unimpeded in carrying out their missions.

Note: Cursory research will show that many of the fixed wing aircraft and UAVs present in Black Sea are easily capable of exceeding the maximum engagement altitude for the AA platforms currently present in the game, being able to essentially fly above their maximum range. For our simulation purposes we have assumed that the airspace is hotly contested on the frontlines, with the constant threat of fighter aircraft combat patrols and long range / high altitude SAM systems making high altitude attacks on ground targets an untenable proposition. Aircraft in Black Sea are assumed to be operating at lower altitudes in order to avoid the above mentioned threats, thus bringing them within range of the AA systems in the game. However, aircraft are only vulnerable to AA fire at certain moments in their mission when they are closest to the battlefield, typically just before and after attacking a target.

■ Expanded Soldier Night Vision Systems

Darkness is not the impediment to combat that it once was. Individual night vision gear for soldiers has proliferated rapidly in recent years. American soldiers are equipped with the state-of-the-art AN/PSQ-20 Enhanced Night Vision Goggle (ENVG), a device that fuses night vision and thermal imaging systems, while more of their weapons are equipped with lightweight thermal imagers. Russian and Ukrainian troops can be equipped with both monocular night vision goggles and weapon-mounted night vision sights. What's more, these night vision systems are now automatically equipped in low light conditions!

■ Since Shock Force

The above were just features added since Red Thunder. If you are a strictly Modern Warfare setting player and have not played any Combat Mission titles since Shock Force, the list is far, far more extensive! The below list is just a highlight of what has changed since Combat Mission: Shock Force:

MULTIPLAYER

- * WeGo TCP/IP with the ability to save but not the ability to replay combat action.
- * Pausable RealTime TCP/IP option. A player can request a Pause and, if the other player agrees, the game is Paused until both players are ready to continue play.

QUICK BATTLES

- * Redesigned Quick Battle Generator that includes the ability for players to purchase formations, units and support, for their own force and for the computer AI. By deleting subformations/units, setting experience, motivation, fitness, and leadership levels, and attaching Specialist Teams and individual vehicles, the player can custom-tailor their force for the mission.
- * Automatically purchased force options are still available for the player and opponent, as well as a "Suggestion" button in the unit purchase screen that will quickly buy a force that the player can then modify.
- * Players can now choose their own maps, and preview maps before playing.

USER INTERFACE

- * Two new camera control modes have been introduced in addition to the traditional Combat Mission controls: First Person Shooter (FPS), and Real Time Strategy (RTS). These new camera controls allow a player the choice to control the in-game camera in a way that is more familiar to other game genres.
- * Hotkey Unit Groups. Select units and assign them to number keys for quick navigation during gameplay.
- * New Load New Game dialog screen. The list of scenarios can now be sorted by size, length, or alphabetically.
- * Improved Saved Game dialog screen. The list of scenarios can now be sorted by newest file, oldest file, or alphabetically, or filter between single player and PBEM saves. Save games can be deleted in the game.
- * Visual Hotkey binding. A new dialog in the Options menu allows you to specify and view key assignments.
- * KIAs are shown in the Soldier/Crew Panels to track soldiers lost during the game.
- * The Ammo Panel has been redesigned: Ammunition is now listed by name and in discrete quantities instead of with icons and depleting bars.
- * Option to disable music separate from other game sounds.

UNITS

- * FoW floating icons. FoW floating icons. Instead of getting a general area "?" icon and then immediately progressing to an accurate 3D representation, now there is an inbetween stage where you get a icon that represents the general category of enemy unit and no 3D representation. This tells the player "you know roughly what the unit is, but nothing more specific than that."
- * Command lines are back! Command and Control (C3) links can now be shown on the battlefield, allowing you to quickly determine whether subordinate units are in contact with their headquarters. Use Alt-Z.
- * Expanded floating icon categories. New unique floating icons have been added for Ammo Bearer, Recon, Engineer, MANPADS, LMG, Light Truck (Antitank), SPAAs.
- * Dismounted vehicles function as Ammo Dumps, allowing formations to have reserve ammo stored separately on map (automatically distributed for certain Skill Levels).
- * Player-placeable static defenses and fortifications such as trenches, barbed wire, and mines.
- * Active Protection Systems (APS) are now available for some vehicles.
- * Some vehicles can salvo fire two ATGMs simultaneously at the same target.
- * Vehicles with laser warning receivers will display hit text warning the player that they have been lased. The vehicle will then rotate towards the threat, deploy smoke launchers and back up to cover, unless it is immediately preoccupied with another task such as engaging an enemy vehicle or moving.

COMBAT AND SIMULATION

- * Ground units are now able to fire at attacking aircraft using self-propelled anti-aircraft vehicles, emplaced anti-aircraft guns, or shoulder-launched MANPADS units. Aircraft that are fired upon may have their combat effectiveness diminished, be forced to abort the mission, or even be shot down.
- * Soldiers with assault rifles are more likely to use aimed semi-automatic fire at distant targets instead of burst fire. Soldiers fire weapons faster at short ranges. MGs fire longer, more accurate bursts. More realistic and varied RoF of automatic weapons. Ammo bearers and heavy weapon assistant soldiers generally use their weapons only at shorter ranges.
- * Soldiers can surrender to nearby enemy units and possibly be "rescued" by nearby friendly units. This replaces the "routing" behavior from CMSF.
- * Wide range of weather types and environmental effects, including rain, fog, heavy winds (with ballistic effects), different types of ground conditions, animated water effects, and more...
- * Vehicles and soldiers equipped with night vision and thermal vision have a significantly improved boost to spotting abilities in low visibility conditions such as night.
- * Buttoned-up armored vehicles spot enemies to their flanks less effectively.
- * Improved UI display for timing of preplanned artillery missions also indicates what delay would be after the battle begins.
- * Small arms fire causes more suppression than before.

MAPS AND ENVIRONMENT

- * Game performance for large maps has been increased while load times for large maps have been improved.
- * Maps can now be up to 8 kilometers long or wide (up from 4 kilometers). However, total map size is still restricted to 16 square kilometers. This means that you can make a 2 kilometer wide map that is 8 kilometers long!
- * Conduct combat operations in lush rural landscapes, dense urban settings, or anywhere in between.

- * Heavy Rocks, Heavy Forest, Marsh, and Deep Marsh block all vehicle movement, while Deep Marsh additionally blocks infantry movement.
- * Water terrain types added: Water, Reeds, Deep Ford, and Shallow Ford. Infantry can cross Deep Ford and Shallow Ford, while non-amphibious vehicles can only cross Shallow Ford.
- * Bridges are now available as a terrain type. Bridges come in multiple varieties, including wooden foot bridges, small rural stone bridges, large concrete traffic bridges, and even railroad bridges. Bridge lengths vary from 16 meters to 600 meters long.
- * New and improved tree and bush models added, representing a variety of European species ranging in size from small shrubs to towering evergreens. Forest ground tiles can accompany them for proper forest terrain.
- * Generic buildings can now be up to 14 stories high, and have sloped roofs available in addition to flat roofs.

SOLDIERS

- * Dynamic, context sensitive equipment loadouts for individual soldiers depending on what weapon and equipment are carried.
- * Expanded Soldier details. A completely new way of assigning models and textures allows greater flexibility and variety of how Soldiers look in the game. It also allows for more flexible Modding possibilities.
- * When available, pre-made soldier appearance options can be toggled in the editor or QB Purchase screen by using the Appearance button. For example, this allows the player to choose between Ukrainian troops equipped with either new digital camouflage uniforms or older TTSKO uniforms.
- * Night vision equipment, such as goggles and weapon sights, will be automatically and visually equipped in scenarios with low-light conditions.
- * Many new soldier animations, stances and positions, including kneeling and sitting positions for crew served weapons, pistol firing animations, hand grenade throwing, crew functions, first aid, and much more...
- * Automatic ammo sharing between nearby soldier Units.

FIRE SUPPORT

- * On-map mortars, both dismounted and vehicle-mounted, are now available. On-map assets such as mortars are able to fire in both direct and indirect modes, using their own spotters or separate forward observers.
- * Spotters are now restricted to directing only one Artillery or Air Support Mission at a time. Assets can now be group fired by shift-left-clicking them, allowing more than one Asset to be assigned to the same Mission. EXCEPTION: Spotters directing one UAV Observation Mission can also simultaneously direct one Artillery or Air Support Mission.
- * Player-placeable Target Reference Points (TRPs) allow simulating prepared support strikes and ambushes. Support missions aimed at TRPs do not require LOS from the spotter, or any spotting phase.
- * Precision artillery missions are available for Point targets. These missions are only available for certain artillery assets and 120mm mortars.
- * UAV Support Missions are now available. These missions use UAV support assets which can share spotting information with the player and ground units.
- * Helicopter and UAV Support Assets no longer require Line of Sight (LOS) for the spotter to call in a mission. In other words, the mission can be called anywhere on the map.

COMMANDS

- * Scout Team Command splits off 2 men to act as scouts.
- * Target Armor Arc Command. Instructs units to engage only armored units within the specified arc. As with nearly every Command, outcome varies greatly depending on unit quality and battlefield conditions.
- * Target Briefly Command. Tells a unit to fire all its guns on a designated spot for 15 seconds, then cease fire. Issuing the command repeatedly increases the duration in increments of 15 seconds.
- * Mark Mines Command for Engineer teams and squads.
- * Waypoint dragging. A waypoint can be clicked on and moved by dragging it to a new location.
- * Grouped Spacebar Command system. Instead of getting all of the commands in a big list when the Spacebar is used, instead you get four groups of commands: Movement, Combat, Special, and Administrative. Selecting one of these presents the Commands specific to that Commands Group.
- * For vehicles with more than two weapons systems, such as an IFV armed with ATGMs, cannon, and MGs, the Target Light Command will fire only MGs on the target, while the Target Command will allow all weapon systems to be fired.

GRAPHICS AND PERFORMANCE

- * Shaders.
- * Faster graphics, including FPS improvements, especially for infantry-heavy maps and faster video cards.
- * Possible speed improvements depending on video card hardware and drivers.
- * Movie Mode.

- * Bright Night Mode.
- * Hit impacts to vehicles and bunkers now shown graphically ("hit decals").
- * Improved rendering. Normal and Bump mapping allows for more texture detail while using less system resources and improving the pressure on framerates.

EDITOR

- * Independent Vehicles and Specialist Teams can be purchased and attached to any formation, allowing players to tailor their formations.
- * Exit objectives.
- * Improved Scenario briefing format, including a new Designer Notes subsection.
- * "Reduced headcount" option to simulate previously depleted formations.
- * "Ditch Contours" feature. Map editor elevation changes can be "sharp" by holding the control key when clicking tile elevations. This allows the creation of realistic ditch contours.
- * Ability to create AI Triggers that execute actions based on other units or interaction with Objectives.
- * Improved responsiveness of 2D editing, especially for large maps.
- * Improved load time for 3D Preview, especially large maps.
- * Customized "Mod Tags" for most graphics. This allows for multiple mods for the same item without the need to move items in/out of Data folder.
- * Ability to specify specific mods be used for a specific Scenario. If CM fails to find the specified mod it will use the default graphics.
- * Auto-Assemble linear terrain tool. Roads, walls, fences, and hedges can now be automatically drawn across the map instead of placing them one tile at a time. The old manual selection interface still exists to allow tweaking specific Action Spots.
- * BMP map overlay. Instead of having to create game maps by freehand you can now trace over a real world map within the Editor. Four different levels of transparency make the process easier by adjusting for different needs as work progresses.
- * More AI Groups. The number of AI Groups available has been increased from 8 to 16. This allows for greater fidelity of AI Plans and their assigned units.
- * Copy and paste AI Plans. Create a solid AI Plan, copy it, and paste it into an unused AI Plan slot. Once done the copied Plan can be modified to make a unique variant without having to build the Plan up from scratch.

BONUS

- * Combat Victories (Kill Stats) for individual units showing how many and what types of units the soldier or vehicle has eliminated in the mission (totals tracked for campaigns).

■ INSTALLATION & LICENSING

■ Installation from Disk

In order to install the game, insert the game disc into the DVD drive.

(PC) The Installation Menu should appear if you have CD Autostart enabled on your computer.

Click on the "Install Game" option to begin the installation process. If you have CD Autostart disabled, or if the Installation Menu does not appear, please browse the contents of the disc and simply double-click on the file called "Setup.exe". This will manually launch the game installer.

(Mac) For the Mac version, simply open the disc icon and copy the game application into a place on your hard drive (for example, the Applications folder).

■ Installation for Download Version

After you have successfully downloaded the Combat Mission: Black Sea setup file, double-click on it to launch the installer.

Note: **Battlefront.com now offers unlimited re-downloads, should you need them. But nothing is forever, so it is a good idea to keep a copy of the installer file you downloaded somewhere safe (e.g. burn to disc, USB stick or external hard drive) so you can reinstall the game later if needed.**

■ License Overview

Combat Mission: Black Sea is protected by an online activation system that helps us restrict the illegal distribution of the software with minimal annoyance and intrusion for the legitimate customer.

■ How to Find Your License Key

For download versions, your license key is the same code that you used to download your game.

You will find your license key saved in your online account at www.battlefront.com/store. After logging in, click on the "My Account" link in the top menu. If you forgot your login, go to www.battlefront.com/lostpw to retrieve a new random password as well as your username, both of which will be sent to you in the same email. The username is called "user account" in the email.

For mail delivery only versions, the license key is printed on the product itself, usually on the back of the case or the game manual, sometimes inside the case or manual cover, depending on the product. Do not lose this label because we may not be able to retrieve your license key for you if you do!

■ Activation / Licensing

When you first run Combat Mission: Black Sea, you will be prompted to activate your copy after the initial install. In most cases all you need to do is:

- a) *Make sure the computer on which you have installed the game has an active connection to the internet*
- b) *Choose "Online Activation" from the dialog window*

- c) Enter your license key into the correct field.
- d) Hit the "Activate" button and wait a few seconds while your license authorizes.

If you wish to install the game on a computer which has no internet connection, you must perform what is called a "Manual License Request".

(PC/Mac) After launching the game:

- a) Click on the "Manual Activation" button
- b) Write down or memorize the Authorization Request Code presented to you
- c) On a computer that is connected to the internet, go to
<http://www.battlefront.com/activate>
- d) Enter your License Key and the Authorization Request Code in the appropriate place
- e) Write down or memorize the Authorization Code
- f) Go back to the computer where the game is installed. Launch the game again and click on "Manual Activation". Ignore the Request code and click on the Next button. Enter the Authorization Code from step (e) above

Off-line licensing is also a good workaround for online computers which experience problems with firewall, router or proxy settings which interfere with establishing an internet connection to the activation servers.

■ Additional Activations

Our End User License Agreement allows you to have the game activated on one PC and one backup PC. Our online activation system enforces this limit, but will allow you two additional activations without asking questions (so called "Overflow Activations"). These Overflow Activations are meant to be used when you switch to a new PC and would like to continue playing the game on the new PC.

Note: there is no way to "unlicense" a previously activated copy on a computer, which has the advantage that you can't ever forget to do so :^)

In addition to the previously described four activations, you can add one additional activation to your key every 365 days. In order to do this, please point your browser to <http://www.battlefront.com/activate>. You will be asked to login and enter your license key.

Note: If you forgot your login, go to "www.battlefront.com/lostpw" to retrieve a new random password as well as your username, both of which will be sent to you in the same email. The username is called "user account" in the email.

If your key is eligible for an additional activation (i.e. if you have not previously requested an additional activation within the past 365 days), then you'll be notified of your new activation and it will be automatically added to your key, so you can use it immediately.

Should you ever need an additional activation more than once during a 365 day period, you can always contact our License Activation Support staff for help (see below).

■ License Activation Support

Battlefront.com prides itself on customer service, and the implementation of our online licensing system is a part of this. Please check out our Knowledgebase section for more detailed information on how our online activation system works:

<http://www.battlefront.com/helpdesk>

If you ever need specific assistance, do not hesitate to email us with a description of your problem. We usually respond within 1 working day.

Please note: only the original Battlefront.com version of the game uses our online activation system. If you have purchased your game elsewhere (e.g. in a store), then you probably have a retail version of the game, which does NOT use our online activation system.

■ USEFUL SHORTCUT LINKS

The Installation program adds a number of useful links into your (PC) Windows Start>Programs group / (Mac) game installation folder by default, such as:

■ Direct Link to the PDF Manual

The game documentation is included as an Adobe PDF (Adobe Reader required from www.adobe.com) file, and it can be accessed quickly from here.

■ Activation Link

This is the shortcut link to activate your Module. You MUST run this for the first time after installation, and any time you need or wish to re-activate your module. This link is only used for activation, and once activated, you do not need to use it to launch the game.

■ Version Check Link

This is a quick way to check for updates online. The link is pre-coded to know which version of the game you have installed, and will automatically inform you if any patches or updates for your specific game combination are available.

■ TUTORIAL

This tutorial and the accompanying training campaign will teach you the basics of tactical warfare in the Combat Mission environment. If you are new to Combat Mission, we highly recommend that you follow this tutorial. If you are a Combat Mission veteran, you can safely skip the tutorial, although you may wish to play the campaign to familiarize yourself with modern weaponry and vehicles, especially if you have never played Combat Mission: Shock Force.

During this tutorial, your controls will never be restricted and you are allowed to command your troops as you see fit. With the exception of a few step-by-step instructions for tricky procedures, you should view this text as more of a guide, instead of a rote series of steps to follow. There is a saying that "no plan survives first contact with the enemy", and that saying applies to Combat Mission as well! Because Combat Mission strives to simulate the chaos and unpredictability of real battlefields, it is possible that through good or bad luck, events will deviate from the outcomes described in this text. In these cases, you should do what every good battlefield commander would do: adapt to the situation and follow the spirit of the tutorial instructions.

■ Training Campaign Overview

In Combat Mission, a Campaign is a series of missions that are linked together, usually with an accompanying story arc. Missions are single battles, and winning or losing them may change the course of the Campaign. At the end of the Campaign, all mission results are tallied up and the Campaign results are determined. You can typically lose some missions and still win a Campaign, or vice versa.

The Training Campaign is designed to let you practice with a variety of units and equipment while teaching you some basic tactics for success in Combat Mission. The campaign is four missions long. Here's a peek at what the missions offer:

Mission 1: "*Basic Gunnery Range*". Learn basic movement and combat commands on a practice patrol and firing range.

Mission 2: "*Advanced Gunnery Range*". Learn more advanced infantry and vehicle topics.

Mission 3: "*Fire Support Training*". Learn the ins and outs of directing fire support missions from mortars, artillery, aircraft, and UAVs. The basics of night vision, spotting, and information sharing are also covered.

Mission 4: "*Practical Exercise*". Use basic tactical skills to defeat an opponent who shoots back.

When you are ready to begin this tutorial, select "Campaign" from the main menu and then select "Training Campaign". Select "Fight!" to start the campaign.

You will be asked to select a play mode and skill level. Combat Mission: Black Sea has two different play modes available for campaigns: turn-based and real time.

Turn-based play (also known as WEGO) in Combat Mission allows the player to order commands and examine the battlefield at his leisure while the action is paused. Once the player begins the turn however, the action will continue for 60 seconds without interruption. The player can replay the turn as often as they like, and, once satisfied, a phase of giving orders begins, and so on.

In Real Time, the action will be continuous and you can issue orders at any time; you can also pause the game by pressing the ESC key and continue to issue orders. Replay is not available in Real Time mode.

For this campaign you may select either play mode, but WEGO is recommended since the rest of this text will assume that you are playing in WEGO mode. You will be prompted at the start of every mission in the campaign to choose a play mode.

Select Veteran skill level. Skill level primarily affects Fog Of War (FOW) and fire support. The higher the skill level, the less you will know about enemy units and the longer it takes for fire support, such as artillery, to arrive.



After you have selected your play mode and skill mode (**WEGO and Veteran recommended for the tutorial**), hit "OK".

You will now be given the campaign briefing. This briefing will inform you of the entire campaign's scope and details, accompanied by an assortment of maps. Left-click "OK" to move to the first scenario of the campaign. After the loading screen, you will again find yourself at a briefing screen, this time for the first mission. You should read all briefings carefully for information that may be vital to your mission, but with a glance at your maps you can glean the basic facts.



■ Mission 1: Basic Gunnery Range

When you are done reading the briefing, press "OK" to enter the mission. If you wish to revisit the briefing, you can always find it by left-clicking on "Menus" in the lower right-hand corner and then "Briefing".



■ The User Interface

Upon entering the mission you will be greeted with a view of your troops on a road. Before you begin to give them commands, take a moment to become accustomed to the interface. Most of the screen is occupied by the view of the battlefield, with the user interface located along the bottom of the screen. Select one of your squads by left-clicking on the round blue icon that floats above them. The squad icon will look like a soldier. The interface below will then be populated with information on that unit.



On the left is the Unit Info Panel(1), where you will find basic information about the selected unit, including what type of unit it is, its name, experience, ammunition levels, and so on. The next box to the right (2) shows what special equipment the unit is carrying, such as binoculars, night vision equipment, and rocket launchers.

The center panel, called the Team Info Panel (3), gives detailed information about each soldier in the squad, such as what weapon they are carrying, whether they possess a specialty skill, and whether they are wounded. Each column represents a different team within the squad.

The panel furthest to the right (4) is the Command Panel. Here you can select Commands to give to the selected unit. The Commands are separated into four tabs by function: Movement, Combat, Special, and Admin. Move between tabs by either using the hotkeys F5-F8 or by pressing the buttons above the panel: M for Movement, C for Combat, S for Special, and A for Admin. You can also bring up a pop-up list of Commands by pressing the Spacebar. In this mission we will only be concerned with the Movement and Combat tabs. Don't worry about what all the Commands mean just yet; we will get to them later.

At the bottom-right of the interface (5), you will find the Menus button. Left-clicking this button will bring up various game menus, such as the mission briefing, a list of hotkeys, a save game function, or an option to exit the mission. The big red button will start the turn (6), while the buttons above that will advance the turn, pause the game, and control the replay feature in WEGO play mode. The white numbers tell you how much time remains before the mission ends.

Take some time to explore the interface. You should also take a look at the Hotkeys window within the menu options (5), where you can find some commonly used keyboard shortcuts. If you ever want to know more about the equipment displayed in the User Interface, such as rifles and tank models, you can consult the Encyclopedia chapter of this manual.

Your troops are almost ready to begin their training, but first you must learn how to use the camera.

■ Using the Camera

Combat Mission features a precision camera for viewing the detailed 3-D battlefield from any angle or position. Because this camera is much more flexible than those found in most games, it is controlled differently, so it may take some practice for you to smoothly move around.

The Standard camera controls can use either the mouse or keyboard (or both) to control the camera.

To pan the camera (i.e. move it forward, backward, left, or right across the battlefield):

- Mouse: Press and hold the left mouse button and drag the mouse. The camera will pan and follow your motion. The further you drag the mouse, the faster the camera will move.
- Keyboard: Use the W, A, S, and D keys to pan the camera. Press and release to make small incremental adjustments, and hold the keys down to pan the camera quickly.

To swivel the camera (i.e. change which direction it is facing: left, right, up, or down)

- Mouse: Press and hold the right mouse button and drag the mouse in any direction. The camera facing will follow the motion of the mouse. Once again, the further you drag the mouse, the faster the camera will turn.
- Keyboard: Use keys Q and E to rotate the camera to the left and right.

To change the altitude of the camera (i.e. how close it is to the ground):

- Mouse: Scroll up or down with the mouse wheel to raise and lower the camera.
- Keyboard: Use key R to raise the camera and key F to lower the camera.

Other useful controls:

- You can jump to preset altitudes by pressing keys 1-9. Keys 2, 3, and 4 are often the most useful
- CTRL-left clicking on the ground will instantly jump the camera to that point. This is useful on large maps where you can avoid panning for long distances.
- Pressing V will flip the camera view around 180 degrees.
- The camera can be zoomed up to 20.0x. Press X to zoom in, and Z to zoom out.

Some useful tips for controlling the camera:

- It is important to know where your cursor is on the screen, because the sensitivity of these changes decreases as the cursor approaches the edge of the screen. To move quickly, click your cursor in the center of the screen; to make small adjustments to the camera, click your cursor when it is nearer to the edge of the screen.
- You can also move the camera by touching the edge of the screen with the cursor. The camera will quickly pan in that direction.
- It is best to make slow dragging motions with your mouse when moving the camera.

Being able to move the camera around the battlefield quickly and precisely will be important to your battlefield success. Be sure to practice the controls described above throughout the mission.

■ Selecting Units

A unit in Combat Mission is a vehicle or a group of soldiers that receives commands and act together as a group. Soldier units are typically either teams of 2-7 men or squads of 2-3 teams. When you give a command to a squad unit or team unit, all of the soldiers in that unit will carry out the command. Each vehicle is always a single unit. Each unit is marked with a floating icon that floats above it on the battlefield.

To select a unit, left-click on the floating icon or on any of the soldiers in the unit. The floating icon will blink and pulsing green circles will appear underneath the soldiers. To select a group of units, press and hold the Shift key, then, while holding down the left mouse button, drag a box around the units you wish to select. In this manner, you can give multiple units the same movement or targeting command. You can also select all of the units within a small formation, such as a platoon, by double-clicking on the floating icon of any of the units in the platoon. This will automatically select all of the units belonging to the platoon. You can also select multiple units by holding the Shift key while you left-click on units.

■ Move Out!

Your first objective is to move your platoon to the objective labeled "(1) Range Control". The objective is signified by white text floating above tinted ground. To fulfill this objective you must move a unit onto this zone. You can toggle the display of objects by pressing ALT-J.

1. Select your platoon headquarters (HQ) by left-clicking on the floating icon that resembles a flag.

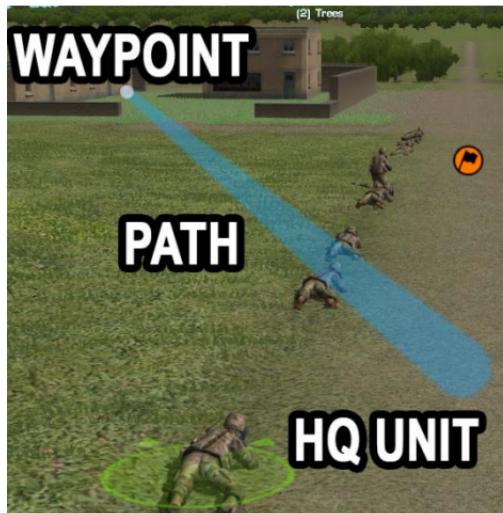


2. Ensure that the Movement panel is open by pressing the F5 key.
3. Left-click on the Move command button and then left-click on the tinted ground inside the objective.

A white ball will appear at this point with a colored line connecting the HQ unit to the point. This white ball at the destination is known as a Waypoint, and when the action starts the soldiers will move themselves to this point.

4. Right-click anywhere on the screen to end the order.

IMPORTANT: If you mess up an order and want to re-do it, press the Backspace key to delete the last waypoint.



Repeat this process for your three rifle squads following the HQ. Assign them Move commands to anywhere in the objective area. You can move troops into buildings by simply left-clicking on the building. If the building is more than one floor tall, a prompt will pop up asking you to choose which floor you want to move the unit to. Try moving one of your rifle squads into a building; you will know that you have successfully set a waypoint in the building if a waypoint appears inside the building, and the building turns translucent while the rifle squad is selected.

Note: Use the hotkey Alt-P to activate Show All Move Paths: this will allow you to see other units' movement orders when you have a unit selected.

Your orders for this turn are complete! When you are ready to watch the action, left-click the red button in the lower right-hand corner of the screen.

You will now watch for sixty seconds as the game plays. Remember, you will not be able to modify or give any new orders until sixty seconds have elapsed. The Move command orders soldiers to walk at a relaxed pace, without undue regard for potential enemy activity. This command is useful for moving units long distances without tiring them out. Some units are that tired, burdened with an excessive load or carrying very heavy equipment may also be restricted to Move and will not be able to move any faster.

You will notice that, as the first soldiers move over the objective space, the tinted coloration disappears and a message informs you that your unit has reached the objective. This is a "Touch" objective, and entering it once will award you victory points; you will not have to occupy it for the entire battle. All of the objectives in this mission are Touch objectives. In contrast, "Occupy" objectives require you to keep troops inside the objective zone to earn victory points. If enemy troops are also in an "Occupy" objective, then the objective is contested and neither side will be awarded points.

You can either watch your troops move for the full sixty seconds, or you can left-click the red button to end the replay phase immediately and skip to the next turn. If you watch the full sixty seconds, you will see a "DONE" text pop up, at which point you should left-click the red button to enter the next turn. You will then be back in Command Phase and can give your units fresh commands, or modify pre-existing ones that have not been completed yet.



■ Quick Move Command

Your training is behind schedule! Issue your platoon a Quick movement command to the objective "(2) Trees". Remember to right-click to end the order after you've set down the Quick command. Your men will now run at a slow jog, much faster than the previous Move command. The extra speed will come at a cost, however. The faster your men move, the less aware they are of their surroundings, and the more likely the enemy is to spot them. Quick tends to be the most commonly used movement speed for troops in combat, since it offers a balance of speed and physical exertion.

Reminder: If you mess up an order and want to re-do it, press the Backspace key to delete the last waypoint.

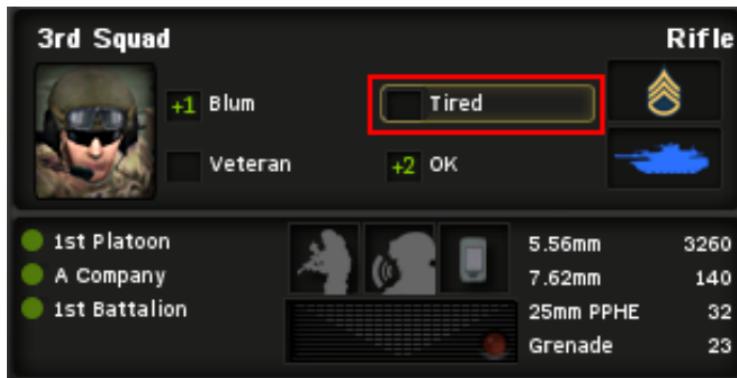
After issuing your orders and beginning the action, you will notice that your troops automatically move around obstacles in their path, such as the tall walls around the compound. Units usually do not follow your commands precisely, and will alter their path as needed to avoid obstacles and take advantage of terrain. Depending on where you place the Quick commands, it may take one or two turns for your troops to reach the objective.

■ Fast Move Command and Fatigue

It's time to sprint! Issue the platoon a Fast movement command to the "(3) Field" objective and start the action. The soldiers will now move in a fast run, covering a lot more ground in one turn. Fast is useful if you need to get somewhere very quickly without stopping for any reason. Running across streets that may be covered by enemy fire is a good situation to use a Fast Command. However, this speed comes at a cost: fatigue.

After the turn has ended and you have entered the next Command Phase, you will notice that your squads display "Tiring" or "Tired" in the left-hand Unit Info panel of the interface. They have become fatigued from running and may have to rest before they can use the Fast command again. As long as they do not move too quickly, the unit fatigue level will improve over a number of turns as the soldiers catch their breath. Be careful to not run your troops too hard before they enter into combat with the enemy, or they may wind up being too tired to fight or move effectively!

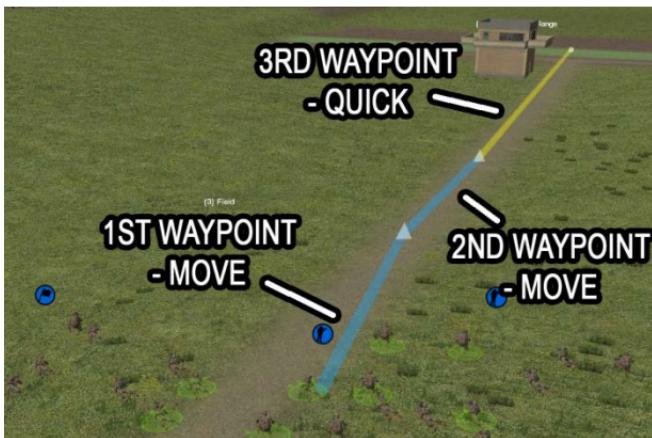
Fatigue is affected by numerous factors, including soldier fitness, ambient temperature, and how much weight the soldier is carrying. Soldiers carrying heavy loads and/or in hot temperatures will tire more quickly. If burdened enough, soldiers may not even have the Fast or Quick commands available to them.



■ Multiple Waypoint Commands

To conclude the patrol, you will move your platoon to the objective "(4) Small Arms Range" for some target practice. However, this time we will give them multi-waypoint orders. Select one of your units and give it a Move command somewhere halfway between the unit and the objective. However, instead of right-clicking to end the order, left-click a bit further ahead, onto the road. A second line and waypoint will appear. Right-click to stop giving Move commands. Now select the Quick command, and left-click on the "(4) Small Arms Range" objective, just next to the short wall running along the objective. Right-click again to stop giving commands.

Reminder: If you mess up an order and want to re-do it, press the Backspace key to delete the last waypoint.



Advance the turn. Your units will move to each of the waypoints in the order they were laid down.

At each waypoint (the white pyramid-shaped joints connecting the colored lines), they will change movement speeds as commanded, so you will see your troops change from a walk to a jog as they arrive at the waypoint that separates the Move and Quick commands. You'll also notice that waypoints are color-coded to the type of command they use: blue for Move, yellow for Quick, orange for Fast, and so on. During the command phase, you can edit the movement command used by an already existing waypoint by left-clicking on the colored line and selecting a new movement command. The color of the line will change to match the new command. Left-click anywhere on the map to stop editing the waypoint.

You can combine multiple waypoints and movement commands in as many combinations as you want. Multiple waypoints are especially useful when following terrain features such as curved roads. You can adjust the location of waypoints after you place them by left-clicking the waypoint and then dragging it across the map.

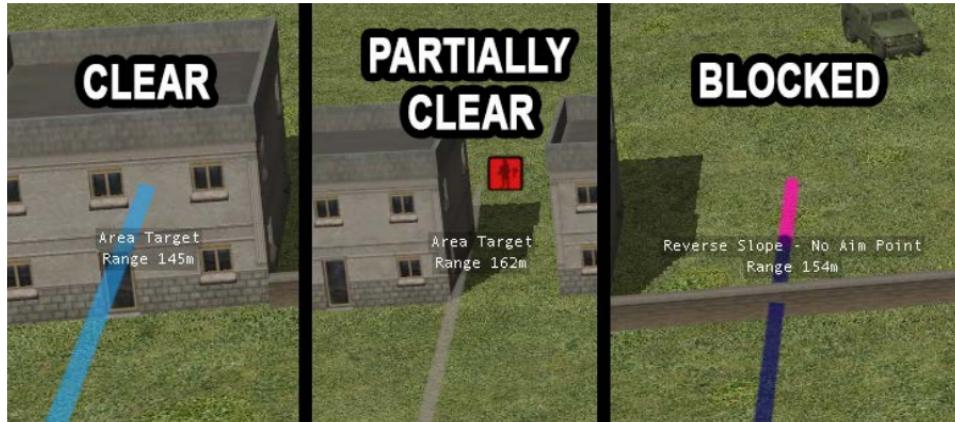
■ Target Practice

It will probably take a couple of turns for your troops to reach the smalls arms range, depending on how fast you move them. When they reach it, they will automatically align themselves along the wall, spot targets, and begin shooting.

■ Combat Commands

For the most part, your troops will intelligently select their own targets without any need for commands from you. However, sometimes you will want to specify a target for your units. Select one of your units and open the Combat command panel (hotkey F6). Left-click on Target, then move the cursor onto the map. A line will be drawn between your unit and the cursor's location. This line indicates your line of fire (LOF) and the distance to the target in meters. If the line is light blue, you have a clear LOF and can fire at the target. If the line is dark blue and pink, then the line of fire is blocked somewhere along the way and you cannot

fire at the target. A grey line means that you can issue a fire order, but not all of the soldiers in the unit can see the target and fire at it.



Select the Target command and left-click on one of the walls, or buildings to designate it as a target, then advance the turn. Your unit will shoot at it until you order it to stop by using the Clear Target order in the Combat command panel.

You can also order a unit to fire at a specific enemy unit by left-clicking the Target command and then left clicking on either the enemy unit itself or the floating icon above it. Your unit will then attack it until it is destroyed, out of sight or range, or your unit is no longer capable of firing.

Issuing a Target order against the ground or a building will order the unit to perform what is known as Area Fire. The unit will fire at the terrain without knowing whether it is hitting any enemy units or not. Area Firing units will spread their shots around to cover the nearby terrain, and will automatically switch to target enemy units if they appear in the nearby area.

Note: The Clear Target command does not tell a unit to stop firing altogether, it just tells the unit that they are no longer required to fire at the target previously specified. If Clear Target is used, the unit will return to firing at will on its own targets.

■ More Toys!

After five minutes have elapsed (this should happen while your men are using the small arms range), reinforcements will arrive on the east end of the map. Two M1A2 Abrams main battle tanks and two M2A3 Bradley infantry fighting vehicles have arrived on the road. With these beasts, you have some real firepower! Move the tanks up to the objective "(5) Gunnery Range". They will automatically spot and begin firing at enemy target tanks, changing targets as each is destroyed. Don't worry, these enemy tanks are just targets, and will not shoot back.

■ Target Light

Tanks and other armored fighting vehicles are usually equipped with not only a main gun, but also secondary machineguns. Although vehicle units will usually choose the most appropriate weapon to engage a target with, you may want to save main gun ammunition by not wasting it

on low-threat infantry targets. Giving vehicle units a Target Light command from the Combat command panel tells them to engage a target with secondary weapons only, such as machineguns. Try giving one of your Abrams a Target Light command aimed at a building on the gunnery range.

■ Target Arc Command

Sometimes you will want your units to focus their fire in a specific area. The Target Arc command was made for this purpose. A unit with a Target Arc command will usually attack only enemy units that are located in the designated area, unless it feels immediately threatened by an enemy outside its arc.

Select an Abrams, then open the Combat command panel, and then left-click the Target Arc command. By left-clicking on the map twice, make a small highlighted arc in front of the tank.



You can use the Clear Target command to erase the Target Arc command. The tank will then continue to fire at targets, but it will no longer be constrained by the Target Arc command.

An alternative to Target Arc is Target Armor Arc. It functions the same as Target Arc, except that a unit with this command will only engage enemy armored vehicles within its arc, and will leave soft targets like infantry alone. This is useful if you do not want your anti-tank weapons to reveal themselves too soon against enemy scouts.

■ Anti-Tank Guided Missiles

Like many infantry fighting vehicles, your Bradleys are equipped with Anti-Tank Guided Missiles, or ATGMs for short. ATGMs are powerful weapons that can destroy main battle tanks (and any other target) at very long distances, often far exceeding that of tank cannons. ATGMs have enabled even light vehicles and dismounted infantry to be a severe threat to heavy vehicles such as tanks.

However, ATGMs have a number of drawbacks:

- ATGMs move much slower than cannon shells or bullets. A target in the crosshairs can dodge the missile by moving behind cover or deploying a smoke screen before it arrives.
- Most ATGMs must be actively guided by the operator all the way to the target in order to achieve a hit. This means that if the operator is spotted and killed or forced to take cover before the missile arrives, it will most likely veer off and miss.

- ATGMs cannot be used at extremely close ranges, because they require a certain amount of distance in order to stabilize in flight and acquire the target. The minimum required range will differ depending on the exact model of ATGM.
- ATGMs can be intercepted and destroyed by passive and active protection systems, which are discussed later in this text.

■ Airburst Munitions

Your Abrams are equipped with shells capable of airbursting above soft targets such as infantry. Many top line vehicles in Black Sea, such as most main battle tanks, BMP-3Ms and BTR-82As, have this capability. The handheld M-25 CDTE "Punisher" used by US rifle squads has an airburst fuse setting as well. Airburst weapons are advantageous because they can explode above obstacles such as walls, negating much of the protection that enemy infantry gain from them. To see this in action, order your Abrams to fire at the top of the building downrange labeled "Airburst Target".

■ End

You have now completed all objectives for the mission. When you are ready to move on to the next battle, select "Cease Fire" from the Menus panel. This will end the scenario. Press "OK" to move past the After Action Report (AAR) screen to the next scenario (we will address the AAR screen in Mission 3).

At this point, you will be prompted to save your campaign progress. You should always make a unique save file at the beginning of every mission in a campaign; you might want to backtrack or replay a mission.

Note: Combat Mission DOES NOT MAKE AUTOSAVES. Always save between missions or before exiting a mission in progress!

■ Mission 2: Advanced Gunnery Range

During your second day at the gunnery range you will learn more advanced commands with some new forces. Upon entering the mission, you'll be greeted with a view of some of your new forces. Today is a joint training exercise. You have some American infantry mounted in Strykers and a platoon of Ukrainian mech infantry mounted in BTR-4Es. We will use these troops to demonstrate a number of special commands and pieces of equipment. Notice that this time your troops begin the mission sitting on blue-tinged ground.

■ Setup Phase

Setup Phase is a special phase that occurs at the beginning of every scenario. During this time the battle is paused and you may arrange your forces around the setup zone instantly by using movement commands. The blue-tinged ground underneath your soldiers is called a Setup Zone, and is a special zone that exists only during the Setup Phase. There can be up to three different Setup Zones present per side.

A unit placed within a Setup Zone must start the battle somewhere within that same setup zone. A unit that is not in any setup zone is locked in place until the battle begins. During Setup Phase, you can give all units starting orders for the first turn, which they will immediately begin to execute when the battle begins. For this mission you don't need to move your units in the Setup Zone, but you can rearrange them if you wish. In future missions, how you arrange your forces within the Setup Zone can be vitally important, especially if you are defending.

■ Transporting Troops in Vehicles

Currently almost all of your infantry are riding in vehicles, which are a very common way to move your troops in Black Sea. Any vehicle that can carry passengers will have grey dots in its info panel. Each grey dot represents an empty passenger seat, while a green dot is a seat occupied by a passenger. You can order troops into a vehicle by simply selecting any movement command and clicking on either the vehicle or its floating icon as the movement destination. The troops will then move to the vehicle and mount it.

Dismounting is just as easy: select the passenger unit and give it a movement order anywhere.

Once the vehicle has finished its own movement commands, if any, the passengers will dismount. You can also use the Dismount command in the Special command panel (F7). If the passenger unit is also the driver of the vehicle, as sometimes happens with light trucks such as Tigrs and Humvees, you'll have to use the Dismount command, found in the Special command panel (hotkey F7).



Spend the first couple turns of the mission driving the Ukrainian BTR-4Es to the "Dismount" objective, and then have their passengers dismount there. Remember, you can either use the Dismount command, or simply give the passengers any movement command and they will automatically dismount while they carry out their orders.

You should be careful about driving a vehicle laden with passengers in view of the enemy: one lucky shot from an ATGM or tank could destroy a whole rifle squad along with the vehicle! While armored personnel carriers and infantry fighting vehicles provide some degree of protection from small arms and shell splinters, any hits from bigger guns are likely to cause major damage to the passengers.

■ Stacking Commands

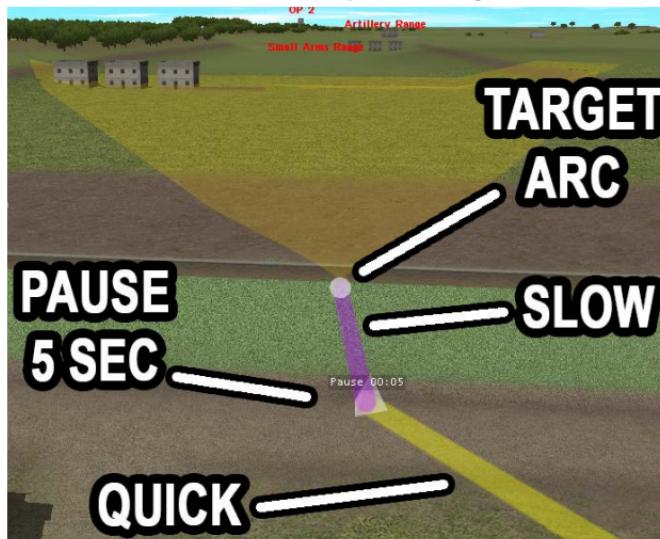
Let's get your Ukrainian infantry to the small arms firing range. We'll use this movement as a chance to show how stack multiple commands on a single waypoint.

Select one of the Ukrainian rifle squads that have just dismounted from their BTR. Open the Movement command panel (hotkey F5), select Quick, and place a waypoint just shy of the Small Arms Range, on the dirt road that runs adjacent to it. Use the picture on the next page as a guide.

Select the Quick movement waypoint by left-clicking on the colored line. The line will highlight, indicating that any orders you give will edit the waypoint. Open the Special commands panel (hotkey F7), and select Pause. A five second counter will appear above the waypoint. Once the unit reaches the waypoint, it will wait five seconds before moving on to the next waypoint.

Left-clicking the Pause order repeatedly will increase the length of the pause and eventually remove it. Set Pause to 5 seconds (00:05) and left click anywhere on the screen to deselect the waypoint.

What you have just done is stack commands. A waypoint can contain one command each from the Movement, Combat, and Special command tabs. Stacking commands allows you to dictate very sophisticated orders to your units. The next waypoint you plot will contain a Movement and Combat order stacked on it. Refer to the picture as a guide.



Ensure that your infantry squad is still selected and that the first waypoint is not highlighted. Open the Movement command panel and select Slow. Slow orders your units to crawl on the ground. This movement command is very slow and tiring, but allows for maximum protection and concealment. Left-click inside the "Small Arms Range" objective to order them to crawl to it. Next, select the Slow waypoint by left-clicking on its line, open the Combat command panel (F6), and give the unit a Target Arc that covers a portion of the firing range. Notice that the orange arc comes out of the waypoint, and not the current position of the unit. The unit will adopt this covered arc as soon as it reaches the waypoint.

To summarize your units orders, they will Quick move up to the range, pause for five seconds, Slow move (crawl) to the "Small Arms Range" objective, then adopt a Covered Arc covering the range.

Repeat these instructions or mix it up with your own commands for the rest of the Ukrainian rifle platoon.

■ Infantry Anti-Tank Weapons

It will take a couple minutes for your soldiers to reach the firing range. When they do, they'll begin attacking enemy targets with the usual small arms. In addition, your Ukrainian troops will attack the enemy vehicles with their RPG-7s. Almost all rifle squads in Black Sea possess some sort of light anti-tank weapon. For Russia and Ukraine, the RPG-7 and RPG-22/26 launchers are standard, while American fire teams carry an AT-4. These launchers are

primarily designed to be portable so that their operators can keep up with the squad. These weapons are a dangerous threat to most armored vehicles within about 150 meters, although the frontal armor of main battle tanks is enough to defeat these light anti-tank weapons. However, American rifle squads typically have another fun toy for fighting tanks...

■ Acquiring the Javelin

The Javelin is a powerful ATGM that can kill any vehicle on the battlefield. Most American rifle squads have a Javelin stowed in their transport vehicle. Select one of the American rifle squads near the objective "OP 1". The squad should still be mounted in the Stryker. If it is not, order it back into the Stryker with any movement command. Open the Special commands panel (F7), and left-click on the Acquire command. A list of ammunition will pop up. This is ammunition carried in the vehicle that passengers can grab and carry with them. As such, vehicle ammo stocks are an excellent way for your infantry to restock when their ammunition runs low during a battle. Most heavy weapons will also tend to have extra ammo for their weapon stocked in the transport vehicle.

Acquire the Javelin ATGM Launcher (which comes pre-equipped with a missile) and two extra missiles for it. Next, order the Javelin-equipped squad to climb to the roof of the "OP 1" tower. Once there, they will automatically spot and attack enemy vehicles with the Javelin. The Javelin has a special plunging attack profile that allows it to attack vehicles where they are weakest at the top armor. The descent is also steep enough that active protection systems cannot stop the Javelin missile. Javelins are a vital battlefield asset: if you are the American player, you should guard them carefully while making full use of them, and if you are the Russian player you need to eliminate Javelin teams as fast as you can find them.

■ Active Protection Systems

Move the BTR-4Es up to the "Gunnery Range" objective. They will begin spotting enemy vehicles and engaging them with autocannon and ATGMs. When the ATGMs reach their targets, you may be in for a rude surprise: these targets are protected by Active Protection Systems (APS), and the missiles get destroyed before they can hit.

Some tanks and infantry fighting vehicles can be equipped with APS as an option. APS works by using radar to detect incoming threats such as ATGMs, RPGs, or some HEAT shells and fire an explosive charge that destroys the projectile before it can reach its target. APS does not work against tank sabot or autocannon shells, nor is it triggered by small arms fire.

Although APS is a formidable defensive tool, it is not infallible. APS have a limited number of shots before they are expended, and then no longer function for the duration of the mission. Attacking an APS simultaneously with two or more attacks also makes it more likely that the APS will not be able to reset in time to intercept all of the attacks. Precision artillery and Javelin attacks are also handy ways to bypass APS. There is also a small chance that APS will simply miss. Finally, there is the good old-fashioned method of attacking the vehicle with a tank cannon, whose shells are not stopped by APS.

■ Explosive Reactive Armor

To counter the threat of ATGMs and weapons such as the RPG that use HEAT warheads, many modern armored vehicles are equipped with Explosive Reactive Armor (ERA). ERA consists of a high explosive material sandwiched between two metal plates, placed on top of the vehicles normal armor. When penetrated by a weapon, the explosive detonates, blowing the metal plates away. Against the jet penetrator formed by a shaped charge High Explosive Anti-Tank (HEAT) warhead, these moving plates impede their function by effectively lengthening the

length of material that the jet must penetrate, as well as breaking up the jet before it can enter the interior of the vehicle. Against a long rod penetrator such as from a tank's SABOT round, some advanced ERA can deflect or damage the rod.

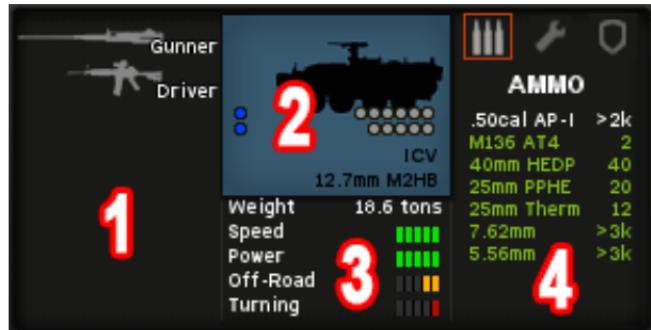
The mechanism of most ERA can be defeated by a tandem-charge HEAT warhead. The warhead uses two shaped charges, with the first being a precursor warhead that punches a channel through the ERA or detonates it prematurely, before the larger primary warhead strikes the regular armor underneath.

■ Remote Weapon Stations

Some vehicles, such as your Strykers and BTR-4Es, are equipped with Remote Weapons Stations (RWS). RWS allow the vehicle gunner or commander to observe through, aim, and fire the weapon from the interior of the vehicle. This is a major advantage if the vehicle finds itself engaging enemy infantry within small arms range, since the operator will not have to expose themselves to use the weapon. However, with many RWS the operator must unbutton to reload the weapon. RWS typically also feature powerful optics for observation. Vehicles in Black Sea that are equipped with RWS include the M1A2 SEPv2 Abrams, BTR-4E, T-90AM, and some Stryker vehicles.

■ Vehicle Interface

Select one of the Stryker or BTR vehicle units. Make sure you select the vehicle itself, and not one of the passenger units. You will notice that the Team Info Panel in the center of the UI strip has been replaced with a new panel that provides detailed information on the selected vehicle.



From left to right:

- Shows the status of the vehicle crew.
- Describes the vehicle type and main weapon, as well as passenger capacity. Blue dots are crew members, and grey dots are open passenger "seats". Green dots are passengers.
- Provides some basic comparisons on vehicle mobility
- This section has three sub-tabs. The first sub-tab with the bullets icon shows how much ammunition the vehicle carries, and what type. White text is ammunition carried for the vehicle's own weapon systems, such as tank shells or bullets for the coaxial machine gun. Green-colored ammo can be Acquired by infantry and passengers. More on Acquiring that soon.

The middle sub-tab with the wrench icons shows the status of vehicle subsystems. Individual vehicle subsystems, such as the gun, tracks, engine, radio, etc can be damaged or destroyed individually. A green square means that the subsystem is in optimal condition, a yellow or orange circle means that the subsystem is damaged, and a red "X" means that the subsystem has been destroyed. Destroyed or damaged subsystems will be at the top of the list.

The last sub-tab with the shield icon lists general protection levels against various projectiles. From top to bottom the threats are: HEAT projectiles (ATGMs, rockets), large shells (tank gun), medium shells (30mm autocannon), and small arms (machine gun or rifle). From left to right the icons represent protection against those threats from the front, left and right sides, and rear. The white-blue icons below list which types of special protective systems the vehicle is equipped with. You can also look up their meaning in the Icons and Reference chapter.

■ Squad Splitting Commands

Squads can be split into their component teams using the Split commands in the Admin commands panel (F8). Select a squad, go to the Admin orders panel, and select the Split Teams command. Your squad will split into distinct team units, each with their own floating icon and ability to be given commands separately. There are a variety of other Split Team commands which can be very useful in the right situations. The Antitank Team option, for example, will split off one soldier carrying the squad's antitank weapon, such as a Javelin or RPG-7, and an assistant to help him. To merge a squad that has been split, move the teams to the same spot and let them stay there for a moment. They will automatically merge into a whole squad. Only teams originally from the same squad can merge.

■ Engineers and Blasting

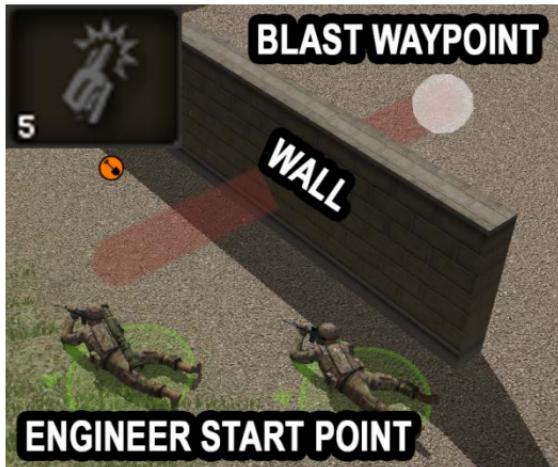
Next to the "MOUT Range" objective you have a Breach team (their floating icon looks like a shovel). This unit is an example of an Engineer unit, also called Sappers or Pioneers. Engineers are specialized combat units that are equipped with demo charges. Demo charges and breach kits can be used to open holes in walls and buildings, allowing you to make new and unexpected entry points. This is an extremely useful tool in urban combat, where the enemy is usually covering the streets with fields of fire. Demo charges are only carried by engineers, while breach kits can be carried by some rifle or recon units. The difference between them is that demo charges can also be used in combat against enemy vehicles and infantry at close range, while breach kits only function against walls and building sides.



■ Blast

Units possessing demo charges or breach kits have access to a special movement command called Blast. Blast allows a unit to expend a demo charge or breach kit to blow through a tall wall or the side of a building. Additionally, enemy units on the other side will be heavily suppressed.

To give a Blast command, position a unit carrying demo charges or breach kits next to a wall or building. Open the Movement command panel (F6) and select the Blast command. Place the destination on the other side of the wall, or inside the building. The unit will go prone for a period of time (up to 10-30 seconds) before blasting its way through the wall. Use your breach team to practice the Blast command throughout the MOUT training complex.



■ BM Oplot Tanks

At some point during your field exercises, you will receive reinforcements. A platoon of three BM Oplot main battle tanks have arrived on the east edge of the map. These advanced Ukrainian tanks are available for you clean up any enemy units left on the map. If you do not want to mop up, you can simply move on by using the Cease Fire function.

Reminder: Save your campaign progress!

■ Mission 3: Fire Support Training

This mission will teach you the basics of a vital part of Black Sea: fire support. Fire support comes in three forms: artillery, air support, and UAVs. Before we can get started however, we need to cover two inter-related game mechanics that are at the heart of Combat Mission: Spotting, and the Command, Control, and Communications (C3) information sharing system.

■ Spotting and Contacts

You should have noticed that right at the start of the scenario some enemy icons are visible: this is known as pre-battle intelligence and tells you the location of some enemy units at the beginning of the scenario. You or your opponent may receive this bonus. Whether a side receives pre-battle intelligence and how much will vary based on the scenario.

Let one turn pass without giving any orders. Some red icons will pop up out on the firing range as your headquarters unit stationed in OP 1 begins to see them. The act of your units seeing enemy units is known as spotting.

Spotting is a rather complicated affair in Combat Mission, but basically consists of your units detecting confirmed enemy units, which are signified by a floating icon that can be selected by left-clicking on it, and contacts, which appear as floating icons with question marks. A confirmed enemy unit is straightforward: at least one of your units can see it, and confirm its basic type, such as a soldier, an anti-tank gun, or a vehicle. Your units will automatically fire upon these units as they see fit.

Contacts, on the other hand, are merely possible enemy units: your units think there might be something there, or know that something is there but cannot identify the type or exact position. Your units will not automatically fire at contacts. The opacity of a contact will tell you how confident your troops are that something is there: a very translucent contact is less certain than one that is fully opaque. Contacts can be upgraded to confirmed units over time, by moving closer to the contact, if the enemy units moves or shoots, or through C3 information sharing (more on this soon). Units that move or fire are much easier to spot. Contacts can also be the last known location of confirmed units.



Unlike the "Borg" spotting seen in most games, where once spotted a unit is automatically seen by every enemy, units do not automatically share their spotting with all friendly units. This system is known as Relative Spotting. For example, under the Relative Spotting system, if one of your units spots an enemy tank, a nearby unit might not see the same tank at all! The unit will have to spot the tank on its own, or have the information passed to it through the C3 network.

You can tell which of your units can spot an enemy unit by clicking on the enemy unit icon. All of your units that have currently spotted and confirmed it will have highlighted icons. If you select a friendly unit under your control, the display of enemy units on the map will change to show only what units and contacts that particular unit can see. If you do not have any friendly units selected, then you see the totality of what your entire force sees.

As you will soon see, the subject of spotting is a complex one whose mechanics are purposely somewhat mysterious to the player. The best way to take advantage of the spotting system is to act like you would in real life, by occupying excellent observation points, being careful in dense areas like woods, and keeping all of your units in contact with their headquarters so that they can share information.

■ Night Vision Systems

You have probably figured out by now that this scenario takes place at night, and that just as in real life, darkness impedes your ability to see things. Modern militaries seek to negate this limitation by equipping their troops and vehicles with night vision technology, typically through image intensification, active illumination, and thermal vision. Troops can be equipped with night vision or thermal vision goggles and weapon sights.

In Black Sea, American troops are equipped with the AN/PSQ-20, a night vision goggle that fuses light amplification and thermal systems. When the light conditions are dark, they will automatically equip the goggles. Zoom in on some of your troops to see for yourself. American infantry belonging to sniper, recon, or rifle squads also often carry thermal sights for night combat. Russian infantry are typically equipped with night vision rifle sights, although recon troops are also equipped with goggles. The Ukrainian infantry typically have no night vision at all, except for some recon troops that possess old night vision rifle sights. You can tell whether your troops are equipped with night vision by checking the special equipment panel and looking for the night vision icon.

Almost all armored combat vehicles such as APCs, IFVs, and tanks are equipped with either night vision or thermal vision. Because the imaging units on these vehicles are much larger, they have a higher resolution and zoom, and thus can typically spot better and further than man-portable systems. You can tell whether a vehicle has night vision systems by opening the

subsystem tab in the vehicle info panel (it is the middle tab). "IR Optics" will be listed here if the vehicle possesses such technology.

Now we will do some practical exercises to demonstrate the spotting system and the advantages of night vision.

■ Spotting and Information Sharing

Let's start by going back to the small arms range. You have some Ukrainian soldiers already present at the range. If you haven't already let the first turn pass, go ahead and do it now. If you are playing in WEGO mode as recommended, you can fast forward through the turn. During the turn it is very unlikely that your troops will spot any enemy units on the small arms range, although there might be a contact or two from the pre-battle intel. These Ukrainian troops are not equipped with any night vision systems, so the darkness has severely impacted their spotting.

After the turn is over, find the US scout teams located just behind the small arms range. Their silhouette resembles a man looking through binoculars. These scouts are equipped with night vision goggles and some thermal weapon sights. Move the scouts up to the small arms range, to the same spot that the Ukrainian troops are occupying. Once the US troops have arrived, they will immediately begin to spot enemy units and contacts on the small arms range. Night vision makes a big difference!



Now comes the fun part. During the next turn, select the Ukrainian units on the range again. You will see that they now have spotted some contacts! The US troops have verbally shared their spotting information with the nearby Ukrainian troops, consequently boosting their ability to see the enemy units.

Let's try another example. Go to OP 1, and select the sniper team by the tower. The floating icon looks like a crosshair. Move the sniper team up to the roof of OP 1 to join the HQ unit. Let one turn pass. This sniper team is equipped with the M107A1 .50 caliber sniper rifle, which during night operations is fitted with a powerful thermal scope. When the sniper team arrives, they will begin spotting Russian tanks at a great distance. Now click on one of the US scout teams at the small arms range. Notice that they too have contact icons for the Russian tanks! The sniper team shared information on what it had spotted through the C3 network, through both radios and satellite-linked PDAs. Every unit connected to the sniper team through some form of communication, whether verbal, hand signals, radio, or satellite, will get information on the battlefield passed to it. Ultimately this makes it easier for other units to spot and attack enemy units that have already been spotted by another friendly unit with a C3 link.



As a last example of the C3 information sharing system in action, select one of the Ukrainian units on the small arms range. You should see that they have some contact icons for Russian tanks on the range, but that they are not as strong or as numerous as the contacts for the scouts next to them. That is because the Ukrainians are receiving the information second-hand from the scout team next to them. Eventually as information passes through the connections, their contacts will grow stronger as well.

Remember that in order to share information between each other, two units must have some sort of communications link. In Black Sea this is most commonly via radio, but other types include visual (close distance), visual (long distance),

	AUDIO LINK (VOICE)
	VISUAL LINK (DISTANT)
	VISUAL LINK (CLOSE)
	AUDIO LINK (RADIO)
	SAT DATA LINK (PDA)
	SAT DATA LINK (VEHICLE)

verbal, satellite (vehicle station), and satellite (PDA). The more ways in which two units are linked, the stronger the connection. The unit info panel displays connections to its higher HQ.

Note: You can toggle the display of "command lines" to show whether your HQs and their subordinates have a C₃ connection by pressing Alt-Z. The brighter the line, the stronger the link. A black line means that there is no C₃ link, and thus no data will be shared.

With the lessons on C₃ links out of the way, it's time to start using some big guns!

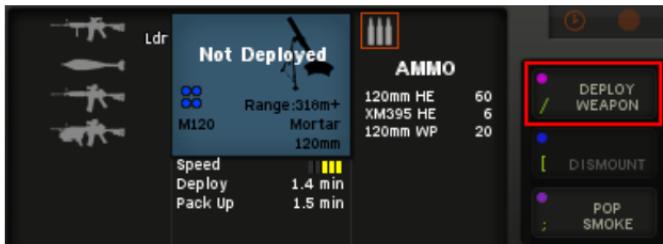
■ Support Missions

As mentioned before, fire support comes in three forms: artillery, air support, and UAVs. Artillery support can be either off-map, or be on-map mortars. Air support and UAVs are always considered off-map. This means that they are not a visible unit that you can control and move around, but are instead interacted with through the support panel.

To start, we are going to use some on-map mortars.

■ Deploy Weapon

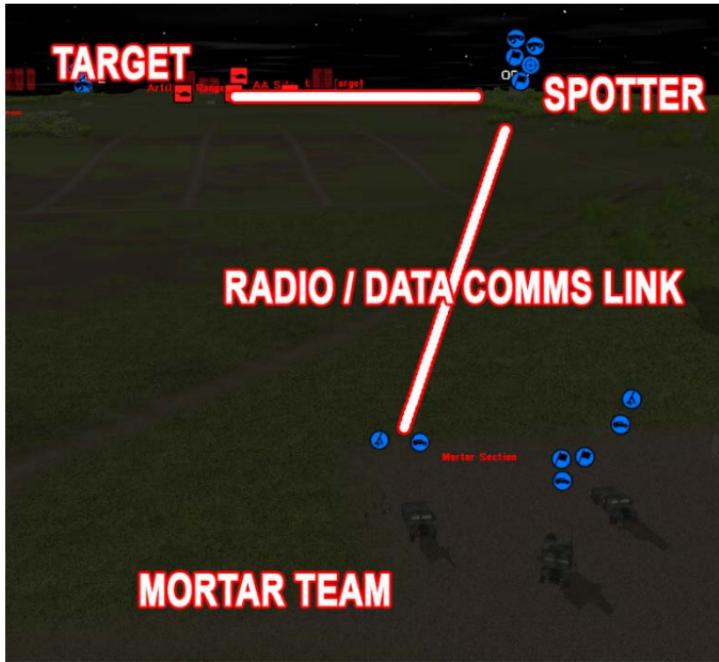
Before your mortars can be fired, they must be set up. Many crew-served weapons such as mortars, some tripod-mounted ATGMs, and heavy machine guns must be Deployed before they can be fired. Find and select one of your mortar teams by the Range Control buildings (their floating icons looks like a mortar). Open the Special commands panel (hotkey F7). Click Deploy Weapon to order them to deploy their mortar. Repeat this for the other mortar team.



Advance the turn. The mortar teams will be busy deploying the weapon for a period of time, in this case about a minute and a half. The duration varies depending on the specific weapon. While the mortars are setting up, select all of the JTAC and forward observer teams (their floating icons resemble binoculars) and move them to the roofs of the OP towers they are next to. The two towers are OP 1 and OP 2. When the mortar teams have finished setting up, the white "Not Deployed" text will disappear from the weapon info panel.

■ Call for Fire

Now that your mortars are deployed, it's time to blow things up! To fire indirectly onto a target, your mortars will need a spotter. HQ teams and Forward Observers (FOs) make the best spotters, although other units can usually serve in a pinch. The mortar team must also be able to communicate with the spotter. Communication occurs in one of two ways; either the mortar team is close enough to be within visual or shouting distance of the spotter (about 50 meters), or the mortar team has radio or satellite data contact with the spotter.



In this case the mortars are already in contact with the fire support teams on OP 1 and OP 2: the FO is linked to the mortars by the communications equipment that the fire support and mortar HQ possess, allowing the HQ to pass on the fire support teams commands to the mortars.

Select the fire support team. Their icon looks like a pair of binoculars. These teams are extremely valuable assets that are specialized at calling in support missions more quickly than HQ teams. Depending on their nationality, they may also have access to more powerful artillery that HQ teams cannot contact. Guard them carefully! It is usually prudent to give them a short Target Arc Command, so that they will not fire at enemy soldiers and attract attention to themselves.



Follow these steps to call the support mission:

1. Click on the artillery icon (located just above the special equipment panel). The support mission interface will now appear. Select one of the M120 120mm mortar boxes from the panel that pops up. If you failed to correctly Deploy the mortars, their boxes will be unselectable and they will display "Not Positioned". Deploy them and this will go away. The support mission has parameters to define that will determine the characteristics of the support mission.



2. For Target Type, select Point Target. The cursor will turn orange and you will now pick the target. Left-click on one of the buildings within the "Artillery Range" area. You will also notice that a glowing green line connects both the spotter and the mortar team to the target.
3. For Mission, select Medium. This defines how intensively the mortar will fire. A Heavy mission will cause the mortar to fire as fast as possible, while a Harass mission will order it to fire rounds only occasionally, conserving ammunition. Emergency missions shorten the length of the call for fire at the risk of greater inaccuracy; only use these missions in true emergencies!
4. For Duration, select Medium. This tells the mortar how long to fire. Quick fire missions last a very short time, while Maximum fire missions last until all ammunition has been expended.
5. For Effect, choose General. General missions will cause the shell to explode upon contacting an obstacle. These missions are best when you are attacking a building, fortification, or vehicle. The Personnel setting causes the shells to airburst above the target, which is most effective against enemy infantry in the open or in woods.
6. Confirm the fire mission. If you mess anything up or change your mind, you can cancel here and restart the call for fire without penalty.



If you open the Support panel again with the FO selected, you'll notice that the other assets have a "Spotter Busy" text over them. A spotter team can only direct one support mission at a time. Once the current mission has been cancelled or entered "fire for effect", they can create a new support mission.

You can assign multiple support assets to a single support mission by shift-left-clicking on multiple assets.

With the other mortar, you can attack another target of your choosing. Choose the Personnel effect to see airburst rounds in action. Remember that you will need to select another team to act as the spotter, since a team can only spot for one mission at a time.

Within a turn or two, the support mission should begin. After receiving the fire mission and preparing, the spotter and support asset will enter "spotting" phase. During this time, a single round will be shot every now and then. It may be very inaccurate, but the spotter will adjust the shots until the target area is hit. Once the spotting rounds hit the target area, the asset will "fire for effect" and begin firing full-speed on the target.

Note: On-map mortars can also fire directly on battlefield targets without using a spotter if they can see the target from their position. Although this means that they can bring rounds on target much faster, it also makes them vulnerable to enemy counterfire. The enemy will usually make spotted mortar teams a priority target!

■ Target Reference Points

Along with your mortars, you also have three platoons of M109A7 Paladins for artillery support. These are more powerful support assets than your mortars. Artillery is a higher-level asset than mortars, which means that it takes longer for the fire-for-effect to arrive.

Fortunately, you have a special fortification "unit" called a Target Reference Point (TRP). You can find it by looking for an orange symbol on the ground in the vicinity of the "TRP" landmark.



TRPs are sites where your artillery has "dialed in" and crunched the math necessary to fire on the site quickly and accurately, without the need for spotting adjustments. Ordering a mission near these points results in a shorter delay until delivery, greater accuracy, and zero warning to your opponent that a barrage is incoming. Furthermore, your spotter does not need to have a visual LOS on the TRP to order the fire mission. Needless to say, this is a huge advantage, especially if you possess heavy artillery.

Unlike all other units, TRPs are not restricted to set up zones and may be placed anywhere on the map during the Setup Phase. However, once the game has begun, TRPs can never be moved. TRPs are also secret: your opponent will not know where they are, although he will probably find out the hard way!

This time, the TRP has already been placed for you. In future scenarios, you should place TRPs on objectives that are likely to be heavily defended, obvious enemy routes of advance, and in "dead space" that your units cannot see but you suspect that the enemy will try to move through.

■ Pre-Planned Bombardments

Support missions made during Setup Phase arrive instantly beginning with the first turn, without the need for preparation or spotting. You can even set a delay so that the mission arrives 5, 10, or 15 minutes after the mission has begun. Also, each spotter team can manage an unlimited number of Support Requests as long as they are made during Setup Phase. This represents pre-planned support strikes that do not need active involvement from the spotter team.

■ Smoke Support Missions

Support assets that have smoke ammunition can perform Smoke missions instead of firing high explosive rounds. When making a Support Request, specify Smoke in the Mission parameter.

With Smoke missions, you can lay down smoke screens that will conceal your troops moving across open ground. Troublesome enemy positions can also have smoke put in front of them to blind them. When laying down smoke, always check what direction the wind is blowing! How far the smoke spreads, and long how long it lasts, is influenced by the direction and strength of the wind. You can check the wind by going into the menu and selecting "Conditions".



Note: Thick smoke from artillery missions will not block spotting with thermal sights. Smoke from many vehicle-deployed smoke grenades, however, will block thermal sights.

■ Precision Support Missions

Many fire support assets in Black Sea have access to precision artillery shells. These special support missions fire only one artillery shell per gun, but they are guided shells with much higher accuracy and precision. Select either of your fire support teams and choose an enemy tank as a Point target. Under Mission, select Precision. Precision missions do not have a spotting phase; the shells arrive (hopefully) on target with no warning. Precision missions are very useful for attacking enemy armored vehicles that typically need a direct or near-direct hit to knock them out of the fight, or for targeting a specific building or location while trying to avoid collateral damage.



Note: Russian and Ukrainian precision missions require that the spotter team possess a laser designator.

Note: Precision missions must use a Point target.

■ Air Support Missions

Select the JTAC team in OP 1. Their floating icon, like the fire support team, looks like a pair of binoculars. JTAC teams are an example of a special unit called Air Controllers. Air controllers are personnel specially trained for directing air strikes. Air controller units (typically referred to as JTAC or TACP teams in US service) get a significant bonus to delivery time and accuracy when ordering an air strike.



Note: Russian and Ukrainian air support MUST be ordered by an air controller team; ordinary units do not have access to their air support.

With the JTAC team selected, open up the Air Support Panel by clicking on the middle button of the support panel. The procedure and rules for ordering air support missions are almost identical to ordering artillery support missions, with some exceptions:

- If given a Point target, the aircraft will attempt to destroy that specific target. Once destroyed, the air asset will end the mission.
- If given an Area target, the aircraft will hunt the specified area for targets to attack.
- Aircraft carry a variety of loadouts, ranging from cannons to bombs to guided missiles. Heavy missions will instruct the aircraft to prioritize the use of its most powerful weaponry such as large bombs and Hellfire missiles. Light missions will prioritize cannons (if available). However, the aircraft will ultimately decide what weapons to use
- Spotters for Helicopter strike missions do not require LOS to the target. Any point on the map can be targeted by a helicopter support mission.
- Aircraft can engage in "friendly fire" if friendly units are too close to the target. Be careful!

Go ahead and order some strike missions around the map with your helicopters and airplanes.

The procedure for ordering air support is the same as for ordering artillery support.

■ Anti-Aircraft Fire

Once the aircraft arrive and begin attacking targets, they may be attacked by special vehicles on the map, near the "AA Site" landmark. These vehicles are Tunguskas, a self-propelled anti-aircraft (SPAA) vehicle. Anti-Aircraft (AA) assets will attack any air support or UAV units that are currently performing Strike or Observe missions on the battlefield.

Currently, AA units fall into two general categories: Surface to Air Missiles (SAMs) and Anti-Aircraft Artillery (AAA). Tunguskas are special in that they have both missiles and cannons for attacking aircraft. SAMs can attack any air asset other than micro UAVs. AAA can attack all assets. The degree to which the AA fire is effective will depend on the AA platform and the air asset involved. AA fire can miss the aircraft, drive it away and force it to abort the attack, or hit and damage or destroy the aircraft.

If you expect to encounter enemy aircraft, you should carefully position any AA assets you might have so that they do not get attacked by ground forces. If you are facing an enemy with AA, you should prioritize finding and attacking their AA assets. If you can destroy them, your aircraft will be unimpeded in carrying out their missions.

Now that you know of the importance of these Tunguskas, you should order some artillery strikes to destroy them. A couple of Precision strikes should do the trick! Once you destroy the Tunguskas, feel free to order some more airstrike missions to experiment.

■ Unmanned Aerial Vehicles

Unmanned Aerial Vehicles (UAVs) are a new type of support asset for the Combat Mission battlefield. UAVs are controlled very similarly to air support assets, but have some major differences, chief among them being the ability to perform an Observe mission.

Unlike air support assets, most UAVs are not armed. Instead, UAVs perform Observe missions. These special missions are ordered just like a normal support mission, but instead of attacking targets, the UAV performs surveillance of the ordered area. UAVs performing an Observe mission will spot enemy units and contacts just like a ground unit would, and will transmit that information through the communications network, giving friendly units with a C3 link enhanced spotting abilities on the target area. UAVs are equipped with high resolution cameras and thermal imagers, allowing them to be used night or day.

In addition, artillery and air support strikes can be ordered on an area that a UAV is Observing, even if the spotter ordering the mission does not have LOS to the area. In this case, the UAV essentially acts as the spotter's eyes.

Let's give this special feature a try. Select one of your fire support teams and open the UAV Support Panel (the button on the right). Select the RQ-7B Shadow asset and then select an Area target. Place the circle around the "UAV Target" landmark located on the map. Select Observe mission, Immediate, and Confirm. After some length of time (it is variable, so it may take a few minutes), the UAV will begin to spot some vehicles in the area.

Once some vehicles have been spotted, you can call in artillery strikes on them. Select the same fire support team and order artillery strikes on the spotted vehicles. Without the UAV Observing the area, it would have been impossible for your fire support team to call in an artillery barrage here. Another special feature of UAVs is that a spotter directing a UAV Observer mission can break the rule of only one support mission per spotter; spotters directing a UAV Observe mission can direct one extra support mission in addition to the UAV, allowing a single team to call in a UAV and direct a fire support mission at the same time.

■ End

This concludes the tutorial for this mission. You can continue to use fire support against the remaining targets on the battlefield, or you can move on by using the Cease Fire function.

Reminder: Save your campaign progress!

■ Mission 4: Practical Exercise

This is the final mission of the training campaign. In this mission you will conduct an attack on an enemy that shoots back, and in the process learn some basic tactics. You can think of this mission as a graduation exercise.

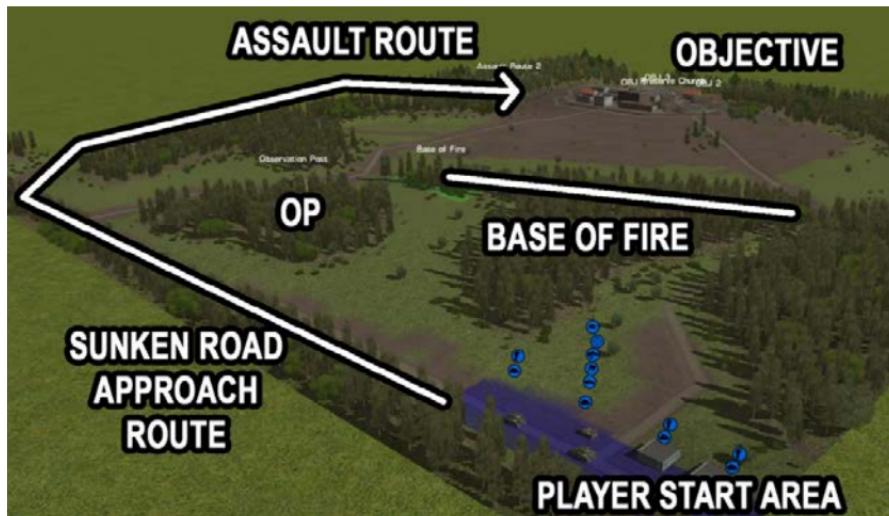
■ Assess the Situation

Before moving your troops, be sure to thoroughly read the briefing. Briefings will give you valuable information that will help you complete your mission, such as information on what reinforcements may be arriving, disposition of enemy forces, and what your objectives are.

During the Setup Phase of each mission you should thoroughly take stock of the forces you have available, as well as check the briefing for whether reinforcements will arrive. What tactical options you have available will depend in part on the forces available to you. In this case, your force is comprised of a mechanized infantry platoon, with the addition of a Humvee, automatic grenade launcher team, and a sniper team. For support you have a RQ-11B Raven UAV and a section of off-map 120mm mortars.

After determining what forces you have, the next task is to take a close look at the terrain. The terrain that you must move and fight over will determine your tactics as much as the composition of your force. This map consists of patches of woods separated by open ground, with the exception of the objective area which is an urban combat training course. This means that most of the combat in this mission will likely take place from the edge of the forests and the urban area, while the open ground should be avoided when possible by infantry units.

Your setup zone is connected to a sunken road that runs along the north edge of the map, and curves around the northeast corner to lead south, fairly close to the objective area. The low elevation of this road will mask the movement of units travelling along to get as close to the objective as possible. It is recommended that when evaluating the terrain, you bring the camera close to the ground so that you can more easily see the contours of the terrain. Even a couple of meters in elevation difference can make a major difference in your maneuvers.



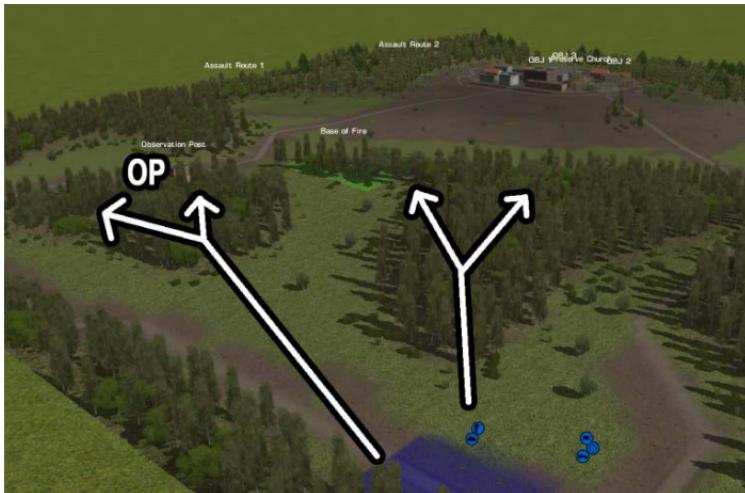
The objective area is composed of densely packed buildings. This indicates that the final assault is going to be urban combat, and that typically indicates close range combat against enemy infantry. The large patch of woods between your setup zone and the objective area has decent cover and a clear line of sight over open ground. This makes it an ideal location for some of your units (such as the Bradleys) to set up a base of fire to attack the objective area from afar.

■ Reconnaissance

Although it is certain that the primary enemy defenses are around the objectives, it is likely that some defenses or outposts are established elsewhere on the map. You will have to find out where the enemy is, or you may get ambushed! Even if there are not any enemy ambushes waiting for you, moving carefully and making maximum use of cover and concealment may allow you to see them before they see you. The first foe to see the other often wins the day.

The first step is to send some rifle teams forward to conduct reconnaissance and get an idea of where the enemy is. The ideal observation post contains concealment, such as foliage or buildings, to hide you from enemy eyes and is higher in elevation so that as much of the map can be observed as possible. In case your rifle teams stumble upon the enemy and get in trouble, having their Bradleys overlooking their advance from a distance can be helpful.

Take a rifle squad and split it using the Split Teams command in the Admin command panel (F8). Split into two, your rifle team will be able to cover more ground and if an enemy vehicle spots them, they won't take as many casualties. Send the rifle team forward through the areas that your attack will advance through soon, while their Bradley looks over them from a distance. The Hunt movement Command will tell them to advance at a cautious pace, with weapons at the ready. If any enemy is spotted or they are fired upon, the units will stop moving immediately and await further orders. Hunt also maximizes spotting at a cost to speed and fatigue. Hunt is a useful command when you want a unit to probe for enemy units, without risking overextending itself and running into trouble.



Note: the woods here can be dense, making it hard to see the ground. You can temporarily toggle off the appearance of foliage by pressing Alt-T.

By cycling through Alt-T you can either make foliage completely invisible to you or make only foliage near your camera invisible.

As part of your reconnaissance, you also need to occupy observation points that your HQs and fire support teams can use to survey the battlefield for potential fire support targets. Send your fire support team to the "Observation Post" (OP) objective. However, make sure that they trail behind the scouting rifle teams; you really don't want these valuable units to get ambushed!

Be sure to give the teams occupying the OP a Target Arc command so that they do not fire on distant enemy troops and give their positions away. Holding the Shift key while placing the arc will allow you to place a full circle Target Arc. Set the circle at about 50 meters or so, so that your men will defend themselves against nearby enemies that would have spotted them anyways, but won't start shooting at distant targets.

Whenever possible, you should strive to never give away the position of your spotter teams such as high level HQs, fire support teams, or air controllers, because they are extremely valuable.

You should also not co-locate any unit that will be shooting at the enemy with the spotter team.

Once your scout teams arrive at their objective, leave them in place for at least a couple of turns to let them take a look around. the longer they stay in place, the better their spotting will be.

Depending on where exactly you send them, they may get shot at. If this happens, they will stop moving and go to ground if they are using the Hunt command. Leave the rest of your units in place for now; the job of your scouts is find out where the enemy is (or isn't!) so that you will have a better idea of where to send the rest of your forces.

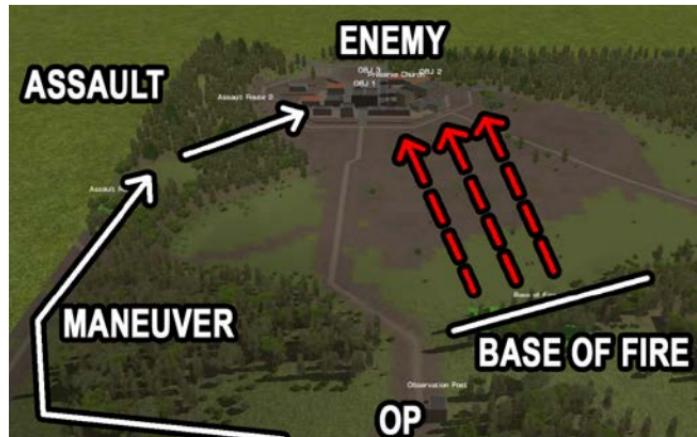
Once your HQ and fire support team have occupied the Observation Point, it is time to conduct some aerial reconnaissance. Select the fire support team and open the UAV support panel. Select the RQ-11B Raven and have it conduct an Observe mission over the objectives OBJ 1, OBJ 2, and/or OBJ 3 and the surrounding area. With any luck, the UAV will over the course of the battle gather intel for your forces. If any enemy vehicles or infantry are spotted by the UAV, remember that your fire support team can order some fire missions on them with the 120mm mortar section. This is an ideal way to destroy enemy units, since they can be destroyed before they have a chance to deal any damage.

■ Fire and Maneuver - Base of Fire

The opposing force occupies a dominating position within the group of buildings, protected by excellent cover and with clear ground all around them. In order for your rifle platoon to most effectively assault their objectives, you will need to suppress and destroy the defenders as much as possible before your infantry try to attack the position. To do this you will split your forces into two groups: a base of fire group and an assault group.

The base of fire group usually consists of high firepower units such as infantry fighting vehicles (your Bradleys), machine guns, and automatic grenade launchers. Forward observers and snipers are also well suited to the role. The base of fire's job is to fire constantly on the enemy positions and keep them ducking. Once the enemy is suppressed by your base of fire, the assault group, which typically consists of the rifle squads, headquarters units, and perhaps some of the vehicles, moves in and attacks at close range. You will use this basic tactic or some variation of it in almost every Combat Mission battle.

Get the base of fire in position by moving the Mk.19 grenade launcher team and sniper team, along with a Bradley or two, to the "Base of Fire" objective. You can also send the rifle squad that you had used for scouting, and their Bradley. Although it means a stronger base of fire, you'll also have less infantry for your assault force. Your choice! Remember that the Mk. 19 grenade launcher team will need to Deploy before it can fire.



■ Fire and Maneuver - Assault

While your base of fire is setting up, start moving your assault force into position. They will have the unenviable task of assaulting the objectives. The wooded area around "Assault Route 1-2" should give your soldiers the cover and concealment they need to get as close as possible to the objectives without incurring devastating enemy fire.

Move your rifle squads and their Bradleys to the "Assault Route 1" objective by following the sunken road running along the northeast corner of the map. Avoid exposing them to observation/attack from the objective area. Once you reach the wood line and dismount your rifle squads, give them Assault movement commands to travel to the "Assault Route" objectives. When using the Assault command, squads will move alternately in small groups of men and engage the enemy on the move, making this order time consuming but very useful when closing with the enemy to destroy them. Remember, if you have trouble seeing around the trees in this area, you can temporarily toggle them off visually by pressing Alt-T.

Continue to send your dismounted infantry assault towards the "Assault Route 2" objective. You can either send their Bradleys along with them in the woods, or have the Bradleys move alongside the woods in the open ground. Sending vehicles directly into wooded terrain is a risky proposition for several reasons. First, enemy infantry will have a better chance of attacking the vehicle at close range with anti-tank weapons before the vehicle can spot them. Second, the chance of vehicles temporarily bogging or becoming completely immobilized is much higher in wooded terrain.

Note: The Assault movement command is only available to squads which have multiple teams.

■ Suppression and Morale

As your troops exchange fire with the enemy, you will notice that some of them will curl into a fetal position and not do much of anything that is useful other than trying to survive. You are witnessing the effects of suppression. People quite reasonably do not like being shot at or blown up and, if pushed hard



enough, will begin to value conserving their lives over following your orders.

Each unit's morale status can be seen in the Unit Info Panel. A colored indicator (the colored fan) tells you how suppressed the unit is. The more intense or accurate the enemy fire, the higher the level of suppression will be, and the more likely the unit will sustain unfavorable penalties. Taking casualties will cause even higher amounts of suppression. Moving a unit away from enemy fire (or stopping the enemy from shooting at it) will allow the suppression to wear off and the morale state to eventually improve.

Always monitor your troops' suppression levels throughout the battle and try not to push them too hard. If a unit receives a large amount of accurate enemy fire, it may become "Pinned", where it is still in relatively good order but will ignore your movement commands. You can lose control of your units even further if their morale continues to drop. If the unit's morale state is enclosed by a red box then the unit is so demoralized that it will not respond to your commands at all. The unit may even run away or surrender to the enemy! If a unit's morale becomes seriously degraded, it becomes "brittle", incurring a significant morale penalty for the rest of the battle. If a unit becomes brittle, the light next to the suppression meter will light up.

How much suppression a soldier or vehicle can take depends on its Motivation. A unit with high Motivation will be able to receive more enemy fire before becoming suppressed than a unit with poor Motivation. A unit with high Motivation will also rally faster after being suppressed.

■ Headquarters and Leadership

By now you have probably begun to wonder just what the HQ units with flag icons are good for. These units contain your leaders. Every section, platoon, company, and battalion possesses an HQ unit. The leaders in HQs fulfill two very important functions: they exert a leadership modifier on their subordinate units, and link units to the Command and Control (C3) network.



If you select your platoon leader, you will notice a "+1" next to their name in the unit information panel (1). This means that they exert a positive leadership bonus on all units under his command. The details of what this bonus entails are intentionally murky, but the gist is that units under their command will perform their jobs better than units under the command of a leader without a bonus. Leaders may have a -2, -1, 0, +1, or +2 leadership bonus; yes, that means that you can even get bad leaders! But that doesn't mean you should hide your less than stellar leaders in a corner somewhere, because HQs are always vital in C3 links.

In the lower left corner (2) of the Unit Info Panel you will see what organizational C3 levels the unit is linked to, and whether they are currently connected to them. A green dot means that they are connected, and a red X means that they are not. If they are connected, then information and leadership bonuses can be shared. How efficiently this sharing happens depends on the

type of C3 established (3), as discussed previously in the last mission. The most effective leadership is always through the close verbal C3 link.

What does this mean for you in the current scenario? Keep your HQ unit near your assault force. The leader will confer his leadership bonus to them, and they will most likely need it.

■ Close With and Destroy

Before your assault forces leaves the "Assault Route" objectives and begin their final attack, you should make sure that your Bradleys are in a position where they can provide fire support, but don't let them get too close (within about 250 meters) or Russian RPG-7s may score a hit. Even if enemy units are not currently spotted, you can keep the suppressing fire up from the Base of Fire by using generous amounts of Area Target commands on the buildings around the objective areas.

To maximize the suppression from their weapons as your rifle squads assaults, try waiting until the last moment before lifting their fire as the rifle squads approach. To do so, select a Bradley, open the Combat command panel (F6), and then give them a Target Briefly command. Set any of the buildings as a target. A "00:15" text will pop up. Target Briefly tells the unit to stop firing after the indicated time has elapsed. You can add extra 15-second increments to the order by giving the Target Briefly command repeatedly. However, for this situation, keep this command at 30 seconds: we don't want to blow up our own troops!

When you are ready and the enemy is no longer shooting back, order your rifle squads at the "Assault Route 2" objective to enter the town. Use Assault commands so that the squad members can cover their teammates as they move. Move to secure all three OBJ objectives. If you encounter a particularly troublesome patch of enemy resistance, don't solve it by throwing more soldiers at the meat grinder. Instead, back off and call for fire support to destroy the position, or carefully move a Bradley up to attack the position directly. You will take casualties, because urban combat is messy, but you should press on.

■ Victory and After Action Report Screen

At some time during the final fight, the Russians will surrender, and you will be shown the results of the battle. Once the enemy has surrendered, the After Action Report (AAR) screen will appear. This screen lists a summary of the scenario results and outcomes. Most importantly it will tell you who won the battle! The AAR screen shows the Victory Points (VP) breakdown in detail, organized by objective types.

There are three objective types in Black Sea: Ground, Targets and Parameters. Ground objectives are the Touch objectives you have seen before and the OBJ 1, OBJ 2, and OBJ 3 Occupy objectives. The church is a Preserve objective, which awards you points for not causing structural damage to the building within the objective. Target objectives are units themselves. Depending on the scenario, a side can get points for destroying enemy units or even just spotting them. Parameter objectives deal with simple percentage-based statistics, such as being awarded 200 points for sustaining less than 25 percent casualties.

■ Campaign End

Although the tutorial is over, the learning will never end, as there are a near-endless number of tactical situations to experience. With a game as richly detailed and complex as Combat Mission, you will never stop learning and becoming a better tactical commander. With three more campaigns, dozens of scenarios, an endless Quick Battle system, online opponents, and a thriving internet community creating new campaigns and scenarios, you have years of combat ahead of you.

■ FORMATION ENCYCLOPEDIA

The following section is a quick reference for the formations and units available in Combat Mission: Black Sea. Entries for formations give a brief description, notes on any special features of the formation, and a list of special vehicles and equipment used by the formation. To investigate the formation in detail, it is recommended that you purchase the formation in the game editor. From there you can examine its structure down to the team and squad level, and you can load the formation in 3D View to examine individual soldiers and vehicles within the formation.

■ United States Army

■ Infantry Brigade Combat Team

■ Infantry Battalion

The infantry battalion is the standard line formation of the IBCT. Most of the battalion is dismounted light infantry, but the weapons company consists of Humvee gun trucks and TOW ATGM Humvees.

Structure:

Headquarters and Headquarters Company

x3 Rifle Company

Weapons Company

Special Notes:

1. Rifle squads have two equipment choices: the designated marksman can be equipped with an M4A1 with ACOG sight or an M110 CSASS marksman rifle, and the B Team grenadier can be equipped with an M320A1 grenade launcher or an M-25 CDTE.
2. The M1152 Humvees assigned to rifle company HQs are stocked with additional small arms ammunition and 60 mm mortar rounds for the company mortars.
3. Assault Platoons within the Weapons Company have the option to be a mixed configuration of Humvees equipped with .50 cal machine guns, Mk.19s, and TOWs, or an anti-tank configuration with more M1167 TOW Humvees.
4. Humvees armed with the Mk.19 or M2A1 .50 cal machine gun can have their crew dismount and take the weapon with them, allowing the crew to take the heavy weapon somewhere inaccessible to a vehicle, such as a wooded hilltop or a building.

Associated Special Equipment: M1167 TOW Humvee, LMTV truck, M224A1 mortar, M252A1 mortar, M120 mortar, RQ-11B Raven UAV

■ Infantry Battalion (Task Force)

This is an infantry battalion with a standard task force configuration. A combat engineer platoon, MANPADS platoon, and artillery battery have been attached at the battalion level.

Associated Special Equipment: Same as infantry battalion plus: Stinger SAM, demo charges, artillery battery

■ Cavalry Squadron

The cavalry squadron functions as the reconnaissance unit for the IBCT. The cavalry squadron consists of a mix of motorized and dismounted reconnaissance units.

Structure:

x2 Cavalry Troop [motorized]

Cavalry Troop [dismounted]

Special Notes:

1. Cavalry organization terms: squadron = battalion, troop = company.
2. Line soldiers in recon platoons have higher amounts of thermal weapon sights and communications gear such as PDAs and manpack radios.

Associated Special Equipment: M1200 Armored Knight, M1167 TOW Humvee, M120 mortar, RQ-11B Raven UAV

■ Brigade Engineer Battalion

Recently US brigade engineer companies have been expanded into a new formation, the brigade engineer battalion. This unit consists of combat engineers mounted in Humvees.

Structure:

x2 Combat Engineer Company (A Company has x2 Engineer Platoons, B Company has x1 Platoon)

Special Notes:

1. Combat engineer squads are the only unit that possesses demo charges, other than breach teams.
2. Most combat engineer squads have a choice to be equipped with Javelins or bipod-mounted M240L medium machine guns.
3. Brigade engineer battalions in-game may appear unusually small for a battalion-sized unit; this is because many of the brigade engineer battalion's assets are non-combat entities such as bulldozers and other construction equipment.

Associated Special Equipment: RQ-11B Raven UAV, demo charges. We hope to expand on engineer equipment in a future release!

■ LRS Platoon

Long Range Surveillance (LRS) units are specially trained units used for intelligence gathering, operating deep behind enemy lines for long periods. A LRS unit that has done its job will not get involved in a firefight unless absolutely necessary, so things have gone terribly wrong if an LRS platoon appears in a Combat Mission scenario!

■ LNO Advisor Section

This is a generic advisor team that would operate within Ukrainian units, most likely at the brigade level and sometimes among Ukrainian battalions in important sectors.

Special Notes:

1. Within Combat Mission's scope, the chief utility of advisor teams is that they provide a strong link to US artillery and air support. The section contains forward observers, air controllers, and laser designators.

■ Armored Brigade Combat Team

■ Combined Arms Battalion

The combined arms battalion is the frontline combat formation of the Armored Brigade Combat Team. This battalion mixes together Abrams tanks and Bradley-mounted mechanized infantry within a single tactical command. In recent years the engineer company was removed to allow for the growth of the brigade engineer battalion.

Structure:

Headquarters and Headquarters Company

x2 Rifle Company

x2 Armor Company

Special Notes:

1. Rifle squads have two equipment choices: the designated marksman can be equipped with an M4A1 with ACOG sight or an M110 CSASS marksman rifle, and the B Team grenadier can be equipped with an M320A1 grenade launcher or an M-25 CDTE.
2. Bradley IFVs that carry rifle squads have an acquirable Javelin launcher and extra missiles. Be sure to have the squad grab this launcher before exiting the Bradley if you expect to encounter enemy armor.

Associated Special Equipment: M1A2 Abrams, M2A3 Bradley, M3A3 Bradley, M7A3 Bradley, Recon Humvee, M106A3 mortar carrier, RQ-11B Raven UAV

■ Combined Arms Battalion (Task Force)

This is a typical task force built upon a combined arms battalion. A combat engineer platoon, MANPADS platoon, and artillery battery have been attached at the battalion level. In addition, the rifle and armor companies have been mixed together to provide balanced company teams.

Special Notes:

Same as combined arms battalion except:

1. The rifle and armor companies have been mixed together, resulting in four company teams. Two company teams are rifle-heavy, with two rifle platoons and one Abrams platoon. The other two company teams are armor-heavy, with two armor platoons and one rifle platoon.

Associated Special Equipment: Same as combined arms battalion plus: Stinger SAM, demo charges, artillery battery

■ Cavalry Squadron (Armored)

The cavalry squadron is the reconnaissance arm of the Armored Brigade Combat Team. All of the reconnaissance units are mounted in M3A3 Bradleys, operating in small sections that are capable of independent operation.

Structure:

x3 Cavalry Troop

Special Notes:

1. Cavalry organization terms: squadron = battalion, troop = company.
2. Line soldiers in recon platoons have higher amounts of thermal weapon sights and communications gear such as PDAs and manpack radios.

4. Bradley CFVs that carry recon teams have an acquirable Javelin launcher and extra missiles. Be sure to have the squad grab this launcher before exiting the Bradley if you expect to encounter enemy armor.

Associated Special Equipment: M3A3 Bradley, M7A3 Bradley, M106A3 mortar carrier, RQ-11B Raven UAV

■ Brigade Engineer Battalion (Armored)

Brigade engineer battalions have a similar structure and purpose as the ones found in infantry brigades, but have their engineers mounted in M2A3 Bradleys.

Structure:

- x2 Combat Engineer Company (A Company has x2 Engineer Platoons, B Company has x1 Platoon)

Special Notes:

1. Combat engineer squads are the only unit that possesses demo charges, other than breach teams.
2. Brigade engineer battalions in-game may appear unusually small for a battalion-sized unit; this is because many of the brigade engineer battalion's assets are non-combat entities such as bulldozers and other construction equipment.

Associated Special Equipment: M2A3 Bradley, RQ-11B Raven UAV, demo charges

■ Stryker Brigade Combat Team

■ Stryker Infantry Battalion

These are the main battle formations of the Stryker brigade. The Stryker infantry battalion is basically a light infantry unit with the advantage of a fast ride to the battlefield. Although the Stryker can engage enemy infantry effectively, Russian BMPs and tanks will make short work of it.

Structure:

Headquarters and Headquarters Company

x3 Rifle Company

Special Notes:

1. Rifle squads have two equipment choices: the designated marksman can be equipped with an M4A1 with ACOG sight or an M110 CSASS marksman rifle, and the B Team grenadier can be equipped with an M320A1 grenade launcher or an M-25 CDTE.
2. Strykers that carry rifle squads have an acquirable Javelin launcher and extra missiles. Be sure to have the squad grab this launcher before exiting the Stryker if you expect to encounter enemy armor.
3. The MGS Stryker platoon was originally a company-level organization, with nine MGS Strykers per battalion. Recently the MGS platoon has been moved to the HHC company, resulting in only three MGS Strykers per battalion.

Associated Special Equipment: M1126 Stryker, M1127 Recon Stryker, M1128 Mobile Gun System (MGS) Stryker, M1129 Mortar Carrier Stryker, M1130 Command Stryker, M1131 Fire Support Stryker, RQ-11B Raven UAV

■ Stryker Infantry Battalion (Task Force)

This is a typical task force with a combat engineer platoon, MANPADS platoon, and artillery battery attached at the battalion level.

Associated Special Equipment: Same as Stryker infantry battalion plus: M1132 Stryker, Stinger SAM, demo charges, artillery battery

■ Cavalry Squadron (Stryker)

Like the other cavalry squadrons, the Stryker variant is a reconnaissance unit, lightly equipped compared to line infantry battalions.

Structure:

x3 Cavalry Troop

Special Notes:

1. Cavalry organization terms: squadron = battalion, troop = company.
2. Line soldiers in recon platoons have higher amounts of thermal weapon sights and communications gear such as PDAs and manpack radios.
3. Stryker APCs that carry recon teams have an acquirable Javelin launcher and extra missiles. Be sure to have the squad grab this launcher before exiting the Stryker if you expect to encounter enemy armor.

Associated Special Equipment: M1127 Recon Stryker, M1129 Mortar Carrier Stryker, M1130 Command Stryker, M1131 Fire Support Stryker, RQ-11B Raven UAV

■ Brigade Engineer Battalion (Stryker)

Brigade engineer battalions have a similar structure and purpose as the ones found in infantry brigades, but have their engineers mounted in M1132 Strykers.

Structure:

x2 Combat Engineer Company (A Company has x2 Engineer Platoons, B Company has x1 Platoon)

Special Notes:

1. Combat engineer squads are the only unit that possesses demo charges, other than breach teams.
2. Brigade engineer battalions in-game may appear unusually small for a battalion-sized unit; this is because many of the brigade engineer battalion's assets are non-combat entities such as bulldozers and other construction equipment.

Associated Special Equipment: M1126 Stryker, M1130 Stryker, M1132 Stryker, RQ-11B Raven UAV, demo charges

■ Antiarmor Company

The antiarmor company is composed of specialized tank destroyer Stryker variants that can be allocated within the brigade to counter enemy tank threats. This is the only formation that possesses the M1134 ATGM Stryker.

Structure:

x3 Antiarmor platoons

Associated Special Equipment: M1131 Fire Support Stryker, M1134 ATGM Stryker

■ Shared Formations

The following formations are identical across all US Branches.

■ MANPADS Platoon

A MANPADS platoon is the US Army's air defense unit in Combat Mission: Black Sea. The platoon contains eight Stinger Surface-to-Air Missile (SAM) teams, which are divided into two sections. Bring MANPADS along with you if you expect to be attacked by Russian air support.

Special Notes:

1. Each two-man Stinger team drives a Humvee. These Humvees are stocked with extra Stinger missiles for reloads.
2. The Stinger MANPADS can attack any Russian air support with the exception of micro UAVs such as the ZALA 41-08.

Associated Special Equipment: Stinger SAM

■ Supply Section

This is a generic truck unit that can represent any number of convoys put together by supply units. LMTVs within the supply section are stocked with generous amounts of ammunition for various small arms and anti-tank weapon systems.

Special Notes:

1. With LMTVs selected, the supply section is an excellent way to stockpile extra ammunition for resupplying combat units, especially Infantry branch units which lack other means of transport or replenishment.
2. Don't forget that you can turn the entire supply section into a large ammo dump by selecting the Dismounted option under Vehicle Status in the editor!

Associated Special Equipment: LMTV, M1151 Humvee, M1152 Humvee

■ COLT Section

COLT stands for Combat Observation Lasing Team. COLT units are typically brigade-level forward observer teams that specialize in precision targeting for fire support.

Associated Special Equipment: M1200 Armored Knight

■ Air Controller Section

An Air Force JTAC (Joint Terminal Attack Controller) team that specializes in directing fire supports from air support. JTAC and other air controller teams get significant bonuses to delivery time and strike effectiveness when ordering support missions from helicopters, airplanes, and UAVs.

■ Ground Forces of the Russian Federation

■ Motor Rifle Brigade

■ Tank Battalion 41

Motor rifle brigades typically have a single tank battalion assigned to them. This tank battalion has 41 tanks, instead of the usual 31 contained in battalions that belong to tank brigades.

Structure:

x4 Tank Company (x10 tanks in each)

Special Notes:

1. The T-72B3 and T-90AM have Active Protection System (APS) variants available. APS and non-APS variants can be mixed together, but the tank battalion must be equipped with the same base tank model (T-72B3, T-90A, or T-90AM).

Associated Special Equipment: T-72B3, T-90A, T-90AM

■ Motor Rifle Battalion (BMP)

The backbone of the motor rifle brigade, motor rifle BMP battalions consist of mechanized infantry mounted in either the BMP-2 or BMP-3. This is the most commonly encountered Russian combat formation.

Structure:

- Grenade Launcher Platoon
- x3 Motor Rifle Company
- Mortar Battery

Special Notes:

1. The entire battalion (except for battalion HQ vehicles) must be mounted in one of the following BMP variants: BMP-2, BMP-2M, BMP-3, or BMP-3M.
2. The BMP-3M has a variety of special equipment available: explosive reactive armor (ERA), Arena APS, or Shtora. These variants can mix freely among each other in the battalion.
3. Vehicles transporting automatic grenade launchers and mortars carry additional ammo for these weapon systems.

Associated Special Equipment: BMP-2, BMP-2M, BMP-2K, BMP-3, BMP-3K, BMP-3M, BMP-3M (ERA), BMP-3M (Shtora), BMP-3M (Arena), AGS-17, AGS-30, 2B11, 2B14

■ Motor Rifle Battalion (BTR)

Some motor rifle battalions are mounted in BTRs instead of BMPs. Since the wheeled BTR is not as heavily armed or armored as the BMP, BTR-equipped motor rifle battalions have a different structure, with more weapons units such as ATGM platoons to boost their firepower.

Structure:

- Recon Platoon
- Engineer Platoon
- ATGM Platoon
- Grenade Launcher Platoon
- x3 Motor Rifle Company
- Mortar Battery

Special Notes:

1. The entire battalion (except for battalion HQ vehicles) must be mounted in one of the following BTR variants: BTR-80A, BTR-82, or BTR-82A.
2. The BTR-82A is the most capable BTR choice available. The BTR-82 is the least effective because it lacks a 30 mm cannon.
3. The BTR lacks an ATGM, severely limiting its firepower against armored vehicles. To make up for this, portable ATGMs are assigned to the battalion and company levels.

4. The battalion-level ATGM platoon contains larger ATGM systems that have better tank-killing power and longer range. For this platoon the AT-4C and AT-14 Kornet are available.
5. The company-level ATGM squad emphasizes short range defense and portability. The AT-7 and AT-13 are available for this squad.
6. Vehicles transporting ATGMs, automatic grenade launchers, and mortars carry additional ammo for these weapon systems.

Associated Special Equipment: BTR-80A, BTR-80AK, BTR-82, BTR-82K, BTR-82A, AT-4C, AT-7, AT-13, AT-14, AGS-17, AGS-30, 2B11, 2B14 demo charges

■ Motor Rifle Battalion (MTLB)

A few motor rifle battalions in mountain and arctic climates use the MT-LB as an armored personnel carrier due to its high off-road mobility. Other than MT-LBs instead of BTRs, the battalion structure is identical to the BTR motor rifle battalion described above.

Special Notes:

1. The MT-LBM-6MA and -6MB are up-gunned variants of the MT-LB with BTR turrets and weaponry. You will find these to be much more capable APCs than the base MT-LBM.

Associated Special Equipment: MT-LBM, MT-LBM-6MA, MT-LBM-6MB

■ Battalion Tactical Group (BMP)

Russian motor rifle brigades typically operate as battalion tactical groups, the Russian equivalent of US task forces. The single tank battalion has been divided up amongst the motor rifle battalions to provide them with organic tank support. Forward observers, air controllers, an engineer/sapper platoon, a MANPADS air defense platoon, and an artillery battery have also been attached at the battalion level.

Structure:

- Grenade Launcher Platoon
- x3 Company Tactical Group
- Mortar Battery
- Engineer Platoon
- Air Defense Platoon
- Artillery Battery

Special Notes:

Same as BMP motor rifle battalion, plus:

1. One tank company has been divided up amongst the rifle companies, resulting in one tank platoon per rifle company. The company HQ tank is attached to the battalion HQ.

Associated Special Equipment: Same as BMP motor rifle battalion, plus: T-72B3, T-90A, T-90AM, Igla, Igla-S, 2B11, 2B14, demo charges, artillery battery

■ Battalion Tactical Group (BTR)

A BTR motor rifle battalion with the same attachments made as described above for the BMP battalion tactical group.

■ Battalion Tactical Group (MTLB)

The same as the BTR battalion tactical group above, but BTRs are replaced with MT-LBMs.

■ Reconnaissance Battalion (New)

Motor rifle brigades have a single reconnaissance battalion. Some of these battalions are equipped with the new GAZ-2975 Tigr and follow a new light infantry structure.

Structure:

Recon Company

Technical Recon Company

Special Notes:

1. Russian soldiers belonging to reconnaissance units have digital PDAs, more radios, night vision goggles, breach kits, and laser designators.
2. ZALA 421-08 UAVs are assigned to every recon company.

Associated Special Equipment: GAZ-2975 Tigr, ZALA 421-08 UAV, breach kits

■ Reconnaissance Battalion (Old)

This reconnaissance battalion differs greatly from the battalion above, using an older mechanized structure with recon unit mounted in BRMs, BMPs, and BRDMs

Structure:

x2 Recon Company

Recon Assault Company

Special Notes:

1. The two recon companies are equipped with two BMP infantry platoons and one tank platoon. The recon assault company has two platoons riding in BRDM-2s.
2. Battalion and company HQ vehicles are BRMs, a highly modified and specialized reconnaissance vehicle based on the BMP.

Associated Special Equipment: BRDM-2, BRDM-2M, BRM-1K, BRM-3K, T-72B3, T-90A, T-90AM, BMP-2, BMP-2M, BMP-3, BMP-3M, BMP-3M (ERA), BMP-3M (Shtora), BMP-3M (Arena)

■ Antitank Battalion

Motor rifle brigades have a single antitank battalion. This battalion consists solely of tank destroyers; vehicles specialized in destroying enemy main battle tanks.

Structure:

x2 Antitank Battery

Special Notes:

1. Available tank destroyers are the 9P157-2 Khrizantema, 9P149 Shturm-S, and the BRDM-2 (AT-5). Out of these, the 9P157-2 Khrizantema is by far the most effective tank destroyer, while the BRDM-2 (AT-5) is the least.
2. Two platoons of MT-12 Rapiras are available as off-map fire support.

Associated Special Equipment: BRDM-2 (AT-5), BRDM-2M (AT-5), 9P157-2 Khrizantema, 9P149 Shturm-S, MT-12 artillery battery

■ Sniper Platoon

Sniper platoons provide the motor rifle brigade with marksman teams that can be parceled out to rifle units as needed for missions. Although these teams would usually be separately assigned to motor rifle units in the form of attached Specialist Teams, the sniper platoon in its whole form is included for you to use as you see fit for custom scenarios.

■ RPO Platoon

Platoons of specially trained soldiers equipped with the RPO-M "Shmel" can be attached to units expected to attack fortified defenses or engage in urban combat. RPO teams would usually be separately assigned to motor rifle units in the form of attached Specialist Teams, the RPO platoon in its whole form is included for you to use as you see fit for custom scenarios.

Special Notes:

1. Transport vehicles carry additional rockets for the RPO teams to acquire.

Associate Special Equipment: RPO-M "Shmel", MT-LBM, MT-LBM-6MA, MT-LBM-6MB

■ Tank Brigade

■ Tank Battalion 31

Tank battalions assigned to tank brigades have the same basic structure and equipments as the motor rifle brigade tank battalions described above, with one difference: they have three tank companies instead of four, for a total of 31 tanks in the battalion.

■ Motor Rifle Battalion (BMP)

Tank brigades typically have a single motor rifle battalion assigned to them, usually a BMP-equipped battalion. This battalion is identical to the one described for motor rifle brigades.

■ Motor Rifle Battalion (BTR)

This is the same formation as the BTR battalion described for the motor rifle brigade.

■ Motor Rifle Battalion (MTLB)

This is the same formation as the MTLB battalion described for the motor rifle brigade.

■ Tank Battalion Tactical Group (BMP)

This formation is similar to the battalion tactical group described above, but the ratios have been flipped: the tank brigade's single motor rifle battalion has been divided up and spread out among the tank battalions. Forward observers, air controllers, an engineer/sapper platoon, a MANPADS air defense platoon, and an artillery battery have also been attached at the battalion level.

Structure:

- x3 Tank Company Tactical Group
- Engineer/Sapper Platoon
- Air Defense Platoon
- Artillery Battery

Special Notes:

1. One motor rifle company has been divided up amongst the tank companies, resulting in one rifle platoon per tank company. The company HQ and sniper section are attached to the battalion HQ.

Associated Special Equipment: T-72B3, T-90A, T-90AM, BMP-2, BMP-2M, BMP-3, BMP-3M, BMP-3M (ERA), BMP-3M (Shtora), BMP-3M (Arena), Igla, demo charges

■ Tank Battalion Tactical Group (BTR)

This formation follows the same principles as the formation described above, but a BTR motor rifle company has been used instead of a BMP-equipped company. The weapons platoon for the BTR company has been attached to the battalion HQ.

Associated Special Equipment: T-72B3, T-90A, T-90AM, BTR-80A, BTR-82, BTR-82A, AT-7, AT-13, Igla, demo charges, artillery battery

■ Tank Battalion Tactical Group (MTLB)

Same as Tank Battalion Tactical Group (BTR), but with MTLB-mounted infantry.

■ Reconnaissance Company (New)

Tank brigades typically have a reconnaissance company assigned to them. The (New) reconnaissance company has the same structure and equipment as the company found in the Tigr-equipped reconnaissance battalion described above in the motor rifle brigade section.

Associated Special Equipment: GAZ-2975 Tigr, ZALA 421-08, breach kits

■ Reconnaissance Company (Old)

A small reconnaissance company for tank brigades, with one recon platoon riding BMPs and the other riding BRDMs.

Special Notes:

1. The company HQ vehicle is a BRM, a highly modified and specialized reconnaissance vehicle based on the BMP.

Associated Special Equipment: BRDM-2, BRDM-2M, BRM-1K, BRM-3K, BMP-2, BMP-2M, BMP-3, BMP-3M, BMP-3M (ERA), BMP-3M (Shtora), BMP-3M (Arena)

■ Shared Formations

The following formations are identical across all Russian Branches.

■ Sapper Company

An engineer company with roughly one platoon of engineers riding in trucks.

Special Notes:

1. Engineer squads are the only unit that possesses demo charges, other than breach teams.

Associated Special Equipment: Demo charges

■ Air Defense Artillery Battery

The air defense artillery battery comprises three platoons of the 2K22 Tunguska, six SPAAs vehicles in total. The Tunguska is an armored self-propelled AA vehicle that is designed to provide front line units with short range protection against enemy aircraft and UAVs.

Special Notes:

1. The Tunguska can attack all air and ground units with autocannons, with the exception of MQ-1C Gray Eagles while observing.
2. SAMs from the Tunguska can engage all aircraft and UAVs with the exception of micro UAVs such as the ZALA 421-08 and RQ-11B Raven, and MQ-1C Gray Eagles while observing.

Associated Special Equipment: 2K22 Tunguska

■ Air Defense Missile Battery

This formation consists of Surface to Air Missile (SAM) platforms, divided into two platoons.

Special Notes:

1. Two SAM options are available: 9K35 Strela-10M3 mobile AA launchers, or the Igla MANPADS.
2. The Strela SAM vehicle carries a large number of missiles for air protection, but does not have any weapons for engaging ground targets. Protect it carefully.
3. The Igla is a man portable shoulder-fired SAM. It is available as the Igla or the upgraded and more capable Igla-S.
4. Igla operators carry only one missile with them, but acquirable reloads are available in their transport vehicles.
5. SAMs can engage all aircraft and UAVs with the exception of micro UAVs such as the ZALA 421-08 and RQ-11B Raven, and MQ-1C Gray Eagles while observing.

Associated Special Equipment: 9K35 Strela-10M3, Igla, Igla-S

■ Supply Section

This is a generic truck unit that can represent any number of convoys from supply units.

Special Notes:

1. Don't Forget that you can turn the entire supply section into a large ammo dump by selecting the Dismounted option under Vehicle Status in the editor!

Associated Special Equipment: GAZ-2975 Tigr, Ural-4320, UAZ-469

■ Forward Observer Section

A small observer section with radios, laser designators, and a special forward observer vehicle.

This unit (and the vehicle crew) excel at directing artillery and precision fire support missions.

Associated Special Equipment: PRP-4M, MT-LBu 1V14, BTR-80 1V152

■ Air Controller Section

A team that specializes in directing fire supports from air support. Air controller teams get significant bonuses to delivery time and strike effectiveness when ordering support missions from helicopters, airplanes, and UAVs.

■ Ukrainian Ground Forces

■ Mechanized Brigade

■ Tank Battalion 40

Mechanized brigades typically have a single tank battalion. The tank battalions of mechanized brigades have a special structure, with three tank companies possessing thirteen tanks each in platoons of four.

Structure:

x3 Tank Company

Special Notes:

1. The Oplot-M has an APS variant available. APS and non-APS Oplot-M variants can be mixed together, but otherwise the entire battalion must use the same tank model.

Associated Special Equipment: T-64BV, BM Bulat, Oplot-M

■ Mech Infantry Battalion (BMP)

The most commonly encountered combat formation for Ukraine, the mech infantry battalion forms the backbone of the ground force's combat power. The Ukrainian mech infantry battalion shares many similarities with its Russian counterpart. The standard vehicle of this battalion is the BMP-2. Recently the PKM machinegun squads were removed from the battalion in order to distribute the PKM as a bipod-mounted light machine gun among rifle squads, partially replacing the RPK-74.

Structure:

Recon Platoon

Antitank Platoon

Grenade Launcher Platoon

x3 Rifle Company

Mortar Battery

Special Notes:

1. Although very similar to Russian BMP motor rifle battalions on a large scale, the Ukrainian mech infantry battalion has many small differences such as rifle platoon composition and the presence of an antitank platoon.
2. The battalion antitank platoon has both man portable ATGMs and the SPG-9 recoilless gun. ATGMs are a choice of either the AT-4C or the new Skif.
3. Vehicles transporting ATGMs, SPG-9s, automatic grenade launchers, and mortars carry additional ammo for these weapon systems.
4. Some soldiers in the recon platoon have night vision sights for their rifles.

Special Associated Equipment: BMP-2, BMP-2K, BRM-1K, AT-4C, Skif, SPG-9, AGS-17, 2B11

■ Mech Infantry Battalion (BTR)

Entire BTR-equipped mech infantry battalions are something of a rarity in the Ukrainian Ground Forces. The overall structure of the battalion is very similar to the BMP battalion, except for the BTRs and a weapons platoon with ATGMs is attached to each rifle company.

Structure:

Recon Platoon

Antitank Platoon

Grenade Launcher Platoon

x3 Rifle Company

Mortar Battery

Special Notes:

1. The entire battalion (except for battalion HQ vehicles) must be mounted in either the BTR-70 or BTR-4E. Of these, the BTR-4E is the superior choice due its 30 mm autocannon and mounted ATGMs.
2. The battalion-level antitank platoon contains larger ATGM systems that have better tank-killing power and longer range. For this platoon the AT-4C and Skif are available.
3. Company-level ATGM emphasize short range defense and portability. The AT-7 and Corsar are available.
4. Vehicles transporting ATGMs, SPG-9s, automatic grenade launchers, and mortars carry additional ammo for these weapon systems.
5. Some soldiers in the recon platoon have night vision sights for their rifles.

Special Associated Equipment: BTR-70, BTR-70K, BTR-4E, AT-4C, Skif, AT-7, Corsar, SPG-9, AGS-17, 2B11

■ Battalion Tactical Group (BMP)

Ukrainian mechanized brigades typically operate as battalion tactical groups, the equivalent of a US task force. The single tank battalion has been divided up amongst the mech infantry battalions to provide them with organic tank support. Forward observers, air controllers, an engineer/sapper platoon, a MANPADS air defense platoon, and an artillery battery have also been attached at the battalion level.

Structure:

- Recon Platoon
- Antitank Platoon
- Grenade Launcher Platoon
- x3 Rifle Company
- Mortar Battery
- Engineer Platoon
- Air Defense Platoon
- Artillery Battery

Special Notes:

Same as BMP mech infantry battalion, plus:

1. One tank company has been divided up amongst the mech rifle companies, resulting in one tank platoon per mech rifle company. The company HQ tank is attached to the battalion HQ.

Special Associated Equipment: T-64BV, BM Bulat, Oplot-M, BMP-2, BMP-2K, BRM-1K, AT-4C, Skif, SPG-9, AGS-17, Igla, 2B11, demo charges

■ Battalion Tactical Group (BTR)

A BTR mech rifle battalion with the same attachments made as described above for the BMP battalion tactical group.

■ Mountain Infantry Battalion

Mountain infantry battalions are special units that belong to mountain infantry brigades. For Combat Mission purposes the mountain battalion is a modified mech rifle battalion, with larger rifle squads and more attached support unit grouped together into a fire support company. The standard vehicle for this battalion is the BMP-2.

Structure:

- Recon Platoon
- Sapper Platoon
- x3 Mountain Rifle Company
- Fire Support Company
- Mortar Battery

Special Notes:

1. Mountain infantry rifle squads are larger than their mech rifle counterparts.
2. The fire support company is a unique formation, containing grenade launcher, antitank, air defense, and RPO platoons.
3. Vehicles transporting ATGMs, SPG-9s, automatic grenade launchers, MANPADS, RPOs, and mortars carry additional ammo for these weapon systems.
4. The Sapper platoon possesses demo charges, useful for blasting new entry points in urban environment.
5. Some soldiers in the recon platoon have night vision sights for their rifles.

Special Associated Equipment: BMP-2, BMP-2K, BRM-1K, AT-4C, SPG-9, AGS-17, Igla, 2B11, demo charges

■ Corps Reconnaissance Battalion

This is a high-level reconnaissance unit assigned at the corps level. A combination of BRMs, BMPs, and BTRs are used. This unit is lightly equipped with no organic fire support or heavy weapons.

Structure:

- Observation Platoon
- x2 Recon Company
- Recon Assault Company

Special Notes:

1. Some soldiers in recon squads have night vision sights for their rifles.

Special Associated Equipment: BMP-2, BRM-1K, BTR-70, BTR-4E

■ Artillery Brigade Antitank Battalion

Ukrainian artillery brigades incorporate an antitank battalion that can be deployed to bolster the defenses of Ukrainian mech infantry units. The antitank battalion is equipped with Shturm-S ATGM tank destroyers as well as MT-12 antitank guns. The MT-12 is an aging weapon but can still be effective against vehicles lighter than main battle tanks.

Structure:

- ATGM Battery
- x2 Antitank Gun Battery

Special Notes:

1. The MT-12 and MT-12K Rapira can be used as an on-map antitank gun or as off-map artillery
2. MT-LBs towing the antitank guns carry additional ammo for the gun.

Special Associated Equipment: MT-12, MT-12K, 9P149 Shturm-S, MT-LB

■ ATGM Battery

A simple formation containing nine Shturm-S tank destroyers divided into three platoons.

Special Associated Equipment: BRDM-2, 9P149 Shturm-S

■ Antitank Gun Battery

The antitank gun counterpart to the ATGM battery above, this battery consists of six MT-12 antitank guns divided into two platoons. MT-LBs provide transport.

Special Notes:

1. The MT-12 and MT-12K Rapira can be an on-map antitank gun or as off-map artillery
2. MT-LBs towing the antitank guns carry additional ammo for the gun.

Special Associated Equipment: MT-12, MT-12K, MT-LB

■ Sniper Company

Sniper companies provide the mechanized brigade with marksman teams that can be parceled out to units as needed for missions. Although sniper teams would usually be separately assigned to units in the form of attached Specialist Teams, the sniper platoon in its whole form is included for you to use as you see fit for custom scenarios.

■ RPO Platoon

Platoons of specially trained soldiers equipped with the RPO-A "Shmel" can be attached to units expected to attack fortified defenses or engage in urban combat. Although RPO teams would usually be separately assigned to motor rifle units in the form of attached Specialist Teams, the RPO platoon in its whole form is included for you to use as you see fit for custom scenarios.

Associate Special Equipment: RPO-A "Shmel"

■ Tank Brigade

■ Tank Battalion 31

Three tank battalions are assigned to Ukrainian tank brigades. These battalions mirror the Russian structure, with platoons of three tanks adding up to ten tanks per company, and thirty one tanks total.

Structure:

x3 Tank Company

Special Notes:

1. The Oplot-M has APS variants available. APS and non-APS Oplot-M variants can be mixed together, but otherwise the entire battalion must use the same tank model.

Associated Special Equipment: T-64BV, BM Bulat, Oplot-M

■ Mech Infantry Battalion (BMP)

Tank brigades typically have a single motor rifle battalion assigned to them, usually a BMP-equipped battalion. This battalion is identical to the one described above for mechanized brigades.

■ Mech Infantry Battalion (BTR)

This is the same formation as the BTR battalion described for the mechanized brigade.

■ Tank Battalion Tactical Group (BMP)

This formation is similar to the battalion tactical group described above, but the ratios have been flipped: the tank brigade's single mech infantry battalion has been divided up and spread out among the tank battalions. Forward observers, air controllers, an engineer/sapper platoon, a MANPADS air defense platoon, and an artillery battery have also been attached at the battalion level.

Structure:

Antitank Platoon

x3 Tank Company Tactical Group

Engineer/Sapper Platoon

Air Defense Platoon

Artillery Battery

Special Notes:

1. One mech infantry company has been divided up amongst the tank companies, resulting in one rifle platoon per tank company. The company HQ is attached to the battalion HQ.

Special Associated Equipment: T-64BV, BM Bulat, Oplot-M, BMP-2, BMP-2K, AT-4C, Skif, SPG-9, Igla, demo charges, artillery battery

■ Tank Battalion Tactical Group (BTR)

This formation follows the same principles as the formation described above, but a BTR mech infantry company has been used instead of a BMP-equipped company. The weapons platoon for the BTR company has been attached to the battalion HQ.

Special Associated Equipment: T-64BV, BM Bulat, Oplot-M, BTR-70, BTR-4E, AT-7, Corsar, Igla, demo charges, artillery battery

■ Shared Formations

The following formations are identical across all Ukrainian Branches.

■ Brigade Reconnaissance Company

Both mechanized and tank brigades may have a brigade reconnaissance company assigned to them. This lightly armed unit uses three platoons of BRMs, BMPs, and BTRs to seek out the enemy.

Special Notes:

1. Some soldiers in recon squads have night vision sights for their rifles.

Special Associated Equipment: BRM-1K, BMP-2, BTR-70, BTR-4E

■ Sapper Company

An engineer company with two platoons of engineers riding in trucks.

Special Notes:

1. Engineer squads are the only unit that possesses demo charges, other than breach teams.

Associated Special Equipment: Demo charges

■ **Air Defense Battery**

The air defense battery consists of two platoons of three AA vehicles, six AA systems in total. The battery can be equipped with either the 2K22 Tunguska armored SPAA, or the 9K35 Strela-10M3 mobile SAM platform.

Special Notes:

1. The Tunguska can attack all air and ground units with autocannons, except for MQ-1C Gray Eagles while observing.
2. SAMs from the Tunguska and Strela can engage all aircraft and UAVs with the exception of micro UAVs such as the ZALA 421-08 and RQ-11B Raven, and MQ-1C Gray Eagles while observing.
3. The Strela SAM vehicle carries a large number of missiles for air protection, but does not have any weapons for engaging ground targets. Protect it carefully.

Associated Special Equipment: 2K22 Tunguska, 9K35 Strela-10M3

■ **MANPADS Company**

MANPADS batteries consist of soldier armed with the shoulder-launched Igla SAM. The battery has three platoons, each with nine Igla teams riding in BTR or MT-LB transport.

Special Notes:

1. Igla operators carry only one missile with them, but acquirable reloads are available in their transport vehicles.
2. SAMs can engage all aircraft and UAVs with the exception of micro UAVs such as the ZALA 421-08 and RQ-11B Raven.

■ **Supply Section**

This is a generic truck unit that can represent any number of convoys from supply units.

Special Notes:

1. Don't forget that you can turn the entire supply section into a large ammo dump by selecting the Dismounted option under Vehicle Status in the editor!

Associated Special Equipment: Ural-4320, UAZ-469

■ **Forward Observer Section**

A small observer section with radios, laser designators, and a special forward observer vehicle. This unit (and the vehicle crew) excel at directing artillery and precision fire support missions.

Associated Special Equipment: PRP-4M, MT-LBu 1V14

■ **Air Controller Section**

A team that specializes in directing fire supports from air support. Air controller teams get significant bonuses to delivery time and strike effectiveness when ordering support missions from helicopters, airplanes, and UAVs.

EQUIPMENT ENCYCLOPEDIA

The following section is a quick reference for the vehicles and weapon systems available in Combat Mission: Black Sea. It is by no means exhaustive and should be seen as a starting point for research; interested players will find countless and more detailed materials available in printed and online media.

■ United States Army

■ United States Army Vehicles

■ Abrams Main Battle Tank

The M1 Abrams is the main battle tank of the United States Army and Marine Corps. Designed during the 70s to replace the aging M60 tank, the M1 Abrams entered service in the United States Army in 1980, and first saw combat during the Persian Gulf War in 1991. Over 9,000 tanks have been produced in total, in three major variants: the M1, M1A1, and M1A2.

Initially, the Abrams was armed with an M68A1 105 mm rifled gun, a version of the British Royal Ordnance L7 gun. Beginning with the M1A1, the Abrams tank was upgraded to an M256A1 120 mm smoothbore gun, a Rheinmetall manufactured weapon used on German Leopard 2 tanks. The cannon can fire a variety of ammunition, including the M829 Armor-Piercing, Fin-Stabilized, Discarding Sabot (APFSDS). The M829 is a depleted uranium dart encased by a sabot which discards after exiting the barrel. This dart uses kinetic energy to force its way through a narrow channel in the armor, spraying super-heated material and deadly pressure waves into the interior of the target after penetrating the armor.

To guide its weaponry, the M1 Abrams is equipped with a fire-control computer that combines various data from sensors and a laser rangefinder to calculate a firing solution. Both the tank commander and gunner can aim and fire the cannon. Combined with an advanced fire control system, the Abrams can detect and engage two targets in short succession with a very high hit probability on first shot at ranges beyond 3,000 m.

The M1 Abrams is equipped with protection that is matched by few other tanks. The armor is comprised of a British-designed composite armor also used on Challenger tanks. This armor is composed of layers of ceramic tiles, composites, steel, and Kevlar within a metal matrix. An interior Kevlar liner helps protect against spalling. Beginning with the M1A1 variant, the armor of Abrams tanks was enhanced with the addition of Depleted Uranium (DU) armor in the front turret and hull. Although DU armors add significantly to the weight of the vehicle, the protection they offer is undeniable, as seen during Operation Desert Storm when even the 120 mm APFSDS rounds of other Abrams had difficulty penetrating the armor of an abandoned Abrams tank.

In the event that the armor is penetrated, an automatic halon firefighting system can control fires within the crew space. The engine compartment has a firefighting system as well. Ammunition is stored in an armored compartment with blast doors that is designed to direct explosions away from the crew compartment.

For mobility, the M1 Abrams is equipped with a 1,100 kW Honeywell AGT 1500 gas turbine engine. The Abrams has a top governed speed of 72 km/h on roads and 48 km/h cross-country.

■ M1A2 SEPv2 Abrams

A System Enhancement Program (SEP) set of upgrades to the M1A2 has further extended the capabilities of the M1A2 Abrams. Survivability is increased with the addition of 3rd generation DU armor. The SEP has also added new electronics and computer systems, including digital maps and FBCB2 (Force XXI Battlefield Command Brigade and Below). The tank's observation capabilities are enhanced with a new second-generation Forward-Looking InfraRed (FLIR) sight for both the gunner's sight and commander's sight. The program also included support for the Common Remotely Operated Weapon Station (CROWS), a remote weapon station that allows the tank commander to operate the .50 caliber machine gun from the safe interior of the tank. These subsystem upgrades enhance survivability and allow the tank crew to acquire targets faster while having greater situational awareness.

New ammunition for the SEP program also increases the lethality of the M1 Abrams. The M829A4 APFSDS (currently E4) will soon be fielded operationally. This latest variant of the M829 has been designed to penetrate the latest Russian "Relikt" armor, found on modernized T-90 tanks. The Advanced Multi-Purpose (AMP) round will replace most other Abrams rounds, including HEAT and canister rounds, allowing for simpler logistics and more effective battle loads. The AMP round uses an ammunition data link and a programmable fuse to act in a variety of roles on the fly, allowing a single round to effectively engage a wide variety of targets. For example, after lasing the distance to a target, the AMP round can be programmed to airburst over an infantry target, negating the protection gained from walls, ditches, or earthen slopes. With a delay fuse setting the AMP round can also be used to engage bunkers and fortifications, buildings or to breach walls.

ERA Variant: The M1 Abrams can be equipped with Explosive Reactive Armor (ERA) over the turret sides and skirts to further enhance protection against penetrating weapons. The ERA kit used for M1 Abrams is the Abrams Reactive Armor Tiles, or ARAT-II. This set consists of M19 ERA blocks placed on the side skirts (as used in the TUSK upgrade), with convex M32 ERA tiles placed on top of the M19 blocks and on the turret sides.

Commander				
Gunner				
Loader				
Driver				
Main Battle Tank				
AMMO				DEFENSES
120mm APFSDS 18				
120mm Multi 18				
.50cal AP-I >1k				
7.62mm >11k				
Weight 65.0 tons				
Speed				
Power				
Off-Road				
Turning				

APS Variant: The M1 Abrams can be equipped with an Active Protection System (APS) such as the Trophy system that can defeat incoming projectiles. Although there are United States Army APS programs in development, within the timeframe of this game and facing the prospect of a well-equipped enemy military, it is likely that commercial off-the-shelf APS such as Trophy would be procured for tanks and AFVs.

■ Bradley Infantry Fighting Vehicle

The M2 Bradley is the United States Army's standard Infantry Fighting Vehicle (IFV). The Bradley is designed to move infantry under armor protection and pack enough firepower to engage infantry and armored targets, while being fast enough to keep up with the M1 Abrams tank.

The Bradley was developed in response to the Russian BMP line of IFVs.

Bradleys are fitted with aluminum armor, along with spaced laminate armor and steel skirts. Two sets of four-barreled smoke grenade launchers allow the Bradley to deploy smoke screens for concealment. The Bradley is equipped with an M242 25 mm chain gun dual-fed with APFSDS-T and HEI-T rounds, and an M240C coaxial machine gun.

For vehicles and fortified targets, a twin BGM-71 TOW Anti-Tank Guided Missile (ATGM) launcher is attached to the turret side, allowing the Bradley to fire TOW II missiles. By 2017 we project that US expeditionary force vehicles such as the Bradley would be equipped with the new TOW-2B missile. The TOW-2B has a new top attack capability: the missile still flies straight towards the target (instead of a plunging top attack like the Javelin), but instead of hitting the closest surface the missile flies above the target and shoots tandem explosively-formed penetrators (EFP) vertically down towards the target. This method allows the TOW missile to attack the vulnerable top armor of tanks instead of the stronger frontal armor, resulting in better chance of a kill. The TOW-2B missile is also radio guided instead of wire guided.

TOW missiles, like many ATGMs, are guided via Semi-Automatic Command to Line Of Sight (SACLOS), which means that an operator points a sighting device at the target while the missile is in flight, allowing the fire control system to guide the missile to the target. SACLOS guidance systems can be wire, radio, or beam-guided; the TOW can be wire guided or radio guided, depending on the missile used. Wire guidance systems deliver course corrections to the missile through a thin wire connecting the in-flight missile and launcher. Radio guidance systems track the course of the missile through an IR strobe in the rear of the missile, and send flight path corrections to the missile via a radio signal. Both methods require that the operator keep the target in the weapon sights until the missile hits the target, making the launcher vulnerable to counter-fire until then. If the shooter can be incapacitated or the line of sight blocked before the missile hits the target, the missile will most likely miss.

Note: We have artificially increased the passenger capacity of the M2 Bradley to accommodate a full rifle squad. In reality, a full rifle squad cannot fit in a Bradley, so there is a complicated cross-loading routine.

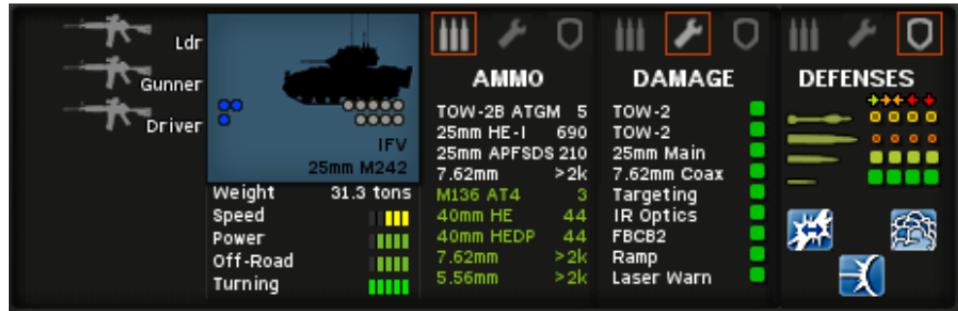
that results in members of multiple squads mixed together in the platoon HQ Bradley. Needless to say, simulating this is more trouble than it is worth!

■ M2A3 Bradley

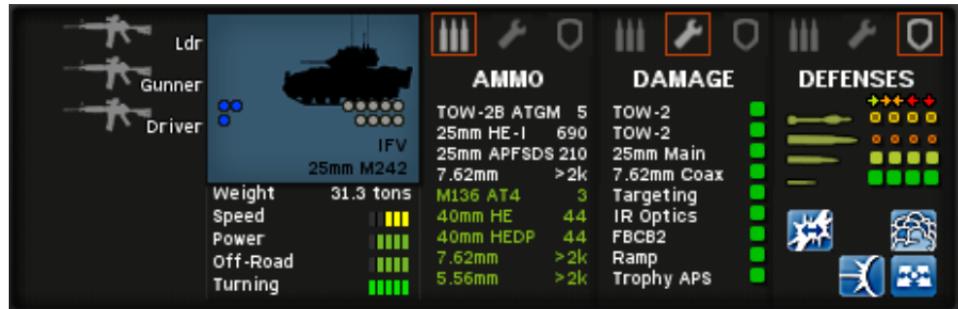
The Bradley has undergone a number of variant upgrades since it began service in 1981.

Beginning in 2000 the M2A3 Bradley was introduced. The M2A3 upgraded various electronics systems, improving communications and sensors. A GPS and inertial navigation system was added in addition to an FBCB2 installation. Improved sensors included second-generation FLIR and TV imaging system, and Commander's Independent Viewer (CIV), which allows the vehicle commander to scan with thermal imaging independently from the gunner. A new fire control software similar to the M1 Abrams setup was also installed, allowing the Bradley to generate a firing solution with high first-round-hit probability.

ERA Variant: Bradleys can be equipped with the Bradley Reactive Armor Tile (BRAT) kit to increase protection against shaped charge HEAT weapons. This upgrade adds reactive armor blocks to the sides and front of the vehicle, much like the BUSK upgrade.



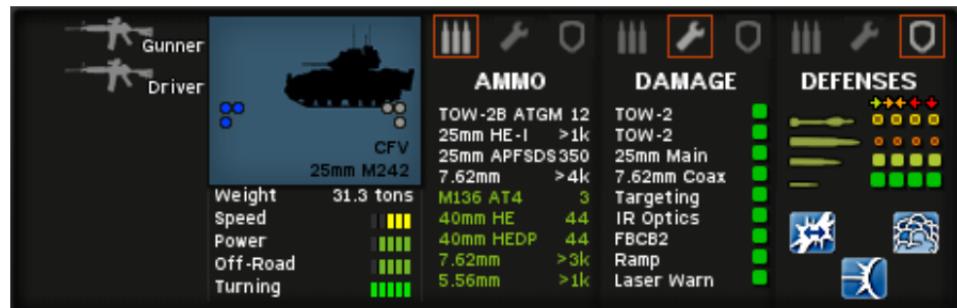
APS Variant: Like the M1 Abrams, Bradleys can be equipped with an active protection system like the Trophy.



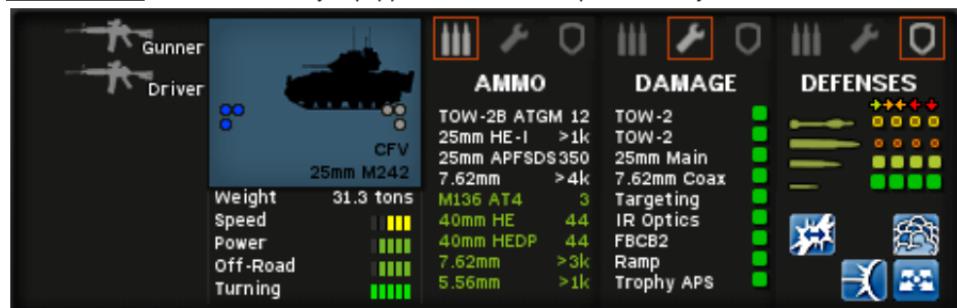
■ M3A3 Bradley

The M3A3 Bradley Cavalry Fighting Vehicle (CFV) is a reconnaissance variant of the M2 Bradley. Used by cavalry and reconnaissance formations, the M3 CFV is only slightly different from the standard Bradley, the chief differences being more radios, TOW missiles, and ammunition for the 25 mm and 7.62 mm guns, and lower passenger capacity than the M2 IFV. The firing ports for passengers have been covered.

ERA Variant: An M3A3 Bradley equipped with BRAT explosive reactive armor.



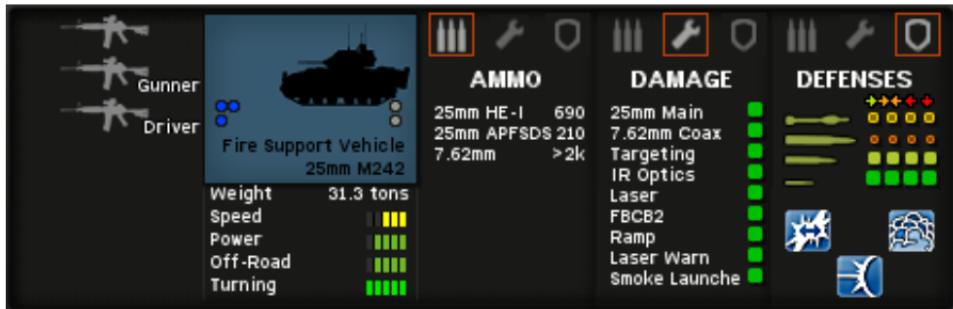
APS Variant: An M3A3 Bradley equipped with an active protection system.



■ M7A3 Bradley

The M7A3 Bradley Fire Support Vehicle, also known as the B-FiST, is a variant of the Bradley specialized for coordinating artillery fire support. The Bradley's TOW missiles have been swapped for fire support and observation equipment, including target designation equipment for laser-guided munitions and more communications gear.

ERA Variant: An M7A3 Bradley equipped with BRAT explosive reactive armor.



APS Variant: An M7A3 Bradley equipped with an active protection system.



■ Stryker Armored Fighting Vehicle

The Stryker is a family of eight-wheeled armored fighting vehicles designed by General Dynamics Land Systems and fielded by the United States Army beginning in 2002. With its roots in the Canadian LAV III and the Swiss Piranha III, the Stryker line of vehicles was developed as an answer to post-Cold War combat scenarios which often necessitated fast deployment across the world. The Stryker provides infantry with high strategic mobility while having a smaller logistical footprint than heavy mechanized units. There are almost a dozen specialized Stryker variants, all providing high speed, mobility, and advanced electronics for their intended roles.

Most Strykers are equipped with the Protector M151 Remote Weapon Station (RWS). This RWS can be fitted with the M2 .50 caliber heavy machine gun or a Mk.19 automatic grenade launcher. Weapon stabilization, thermal cameras, and a fire control system are included. With an RWS the vehicle can maintain a lower profile since the weapon system does not need to house the operator, who can safely operate the system from within the interior of the vehicle hull. However, an autoloader is not included in the system so a crewmember must open a hatch and expose themselves to reload the weapon. The M151 RWS also mounts four smoke grenade dischargers for deployable concealment.

The Stryker's armor is high-hardness steel, protecting against 14.5 mm rounds from the frontal arc. On top of this steel armor, ceramic armor is bolted on which also protects against 14.5 mm rounds from all directions as well as artillery fragments. If the worst happens and the armor is breached, the Stryker is equipped with a halon automatic fire-extinguishing system.

Externally mounted fuel tanks and a sealed CBRN system also help improve crew survivability. Additional protection can be added in the form of slat armor, explosive reactive armor, or active protection systems.

The Stryker is an 8x8 vehicle, able to drive in 4-wheel drive or 8-wheel drive. The powerpack is a Caterpillar C7 260 kW diesel engine shared by many medium trucks, with an Allison 3200SP transmission. The Stryker can reach speeds up to 100 km/h on roads. The vehicle can also change the air pressure in all tires to adapt to different terrain or speeds, and has a run-flat capability.

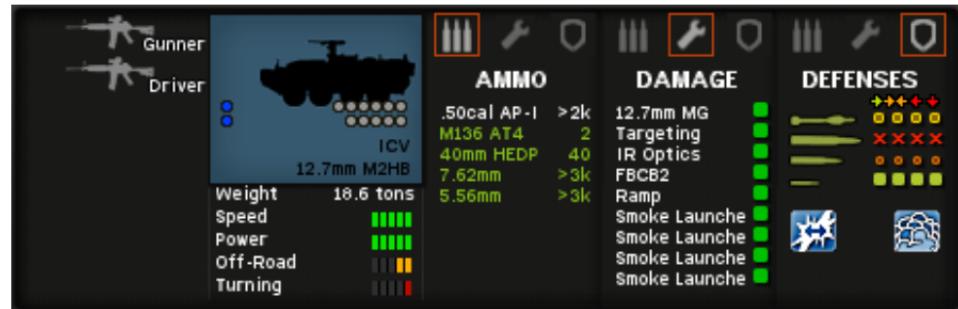
■ M1126 Stryker

The M1126 Infantry Carrier Vehicle (ICV) is the standard Armored Personnel Carrier (APC) variant of the Stryker vehicle family, and the most common variant. The M1126 ICV carries the rifle squads of Stryker units, providing them with armored protection and organic direct fire support with a heavy machine gun or automatic grenade launcher.

ERA Variant: Strykers can be equipped with the Stryker Reactive Armor Tile (SRAT) kit to increase protection against shaped charge HEAT weapons. This upgrade adds reactive armor blocks to the sides and front of the vehicle, in place of slat armor. This setup reduces the width and length of the vehicle, allowing it to maneuver in tighter spaces.

.50 cal Variant: An M1126 Stryker equipped with an M2 .50 caliber heavy machine gun.

Mk. 19 Variant: An M1126 Stryker equipped with a Mk. 19 40 mm automatic grenade launcher in its RWS. The vehicle is otherwise identical to the .50 cal variant.



■ M1127 Stryker

The M1127 Reconnaissance Vehicle (RV) is a recon variant of the Stryker equipped by Stryker rifle battalion scout platoons and Stryker cavalry squadrons. For observation and enemy identification, the M1127 RV is equipped with a Long-Range Advanced Scout Surveillance System (LRAS3). This multi-sensor system gives the crew advanced observation and surveillance capabilities. The LRAS3 has second-generation FLIR, GPS, laser rangefinder and an electro-optical day camera. All of this information is fed directly into the onboard FBCB2 system. The M1127 RV is equipped with either a .50 cal HMG or a Mk. 19 grenade launcher; however unlike the M1126 ICV it does not have a RWS.

ERA Variant: An M1127 Stryker equipped with SRAT explosive reactive armor.

.50 cal Variant: An M1127 Stryker equipped with an M2 .50 caliber heavy machine gun.

Mk. 19 Variant: An M1127 Stryker equipped with a Mk. 19 40 mm automatic grenade launcher.

The vehicle is otherwise identical to the variant armed with the .50 cal HMG.

Gunner								
Driver								
Recon								
12.7mm M2HB								
Weight	18.6 tons							
Speed								
Power								
Off-Road								
Turning								

■ M1128 Stryker

The M1128 Mobile Gun System (MGS) is an armored fighting vehicle variant of the Stryker armed with a 105 mm cannon. The MGS provides Stryker units with mobile direct fire support against fortified infantry positions. Although it can be used as an anti-armor asset in an emergency, it has thin armor and a very limited supply of APFSDS rounds.

The 105 mm cannon is a Royal Ordnance L7 rifled cannon, the same used on the initial 80s variants of the M1 Abrams. The cannon is mounted in a special RWS with stabilization, an autoloader (rare for US combat vehicles), a fire control system, and a coaxial M240C machinegun. A pintle-mounted M2 .50 cal HMG is also accessible from the commander's hatch. A big drawback is its limited storage space for 105 mm rounds.

Originally assigned to Stryker rifle companies, MGS platoons have been moved to the battalion level, with one MGS platoon of three vehicles per rifle battalion.

ERA Variant: An M1128 Stryker equipped with SRAT explosive reactive armor.

Commander								
Gunner								
Driver								
Mobile Gun System								
105mm L/52 M68A1								
Weight	20.9 tons							
Speed								
Power								
Off-Road								
Turning								

■ M1129 Stryker

The M1129 Mortar Carrier (MC) provides Stryker rifle and cavalry formations with self-propelled mortar fire support. The M1129 MC is armed with a rear-facing 120 mm mortar that fires through an opening in the top of the vehicle. In addition to the standard load of high explosive and white phosphorus shells, the vehicle also carries precision guided mortar munitions, able

to strike pinpoint targets with GPS guidance. A pintle-mounted M240 is also provided for self-defense against enemy infantry.

ERA Variant: An M1129 Stryker equipped with SRAT explosive reactive armor.

 Commander	 Gunner	 Loader	 Driver		 AMMO	 DAMAGE	 DEFENSES
				Mortar Carrier 7.62mm M240B	120mm HE XM395 HE 120mm WP 7.62mm	50 4 6 >2k	M120 7.62mm MG IR Optics FBCB2 Radio Engine Wheels
Weight	18.6 tons						
Speed	  						
Power	  						
Off-Road	 						
Turning	 						

■ M1130 Stryker

The M1130 Commander Vehicle (CV) is the command vehicle variant of the Stryker. Assigned primarily to battalion and some company headquarters units, the M1130 CV acts as a communication and information hub for Stryker formations. The CV is equipped with additional communications equipment and a .50 cal HMG mounted on the standard RWS.

ERA Variant: An M1130 Stryker equipped with SRAT explosive reactive armor.

 Gunner	 Driver		 AMMO	 DAMAGE	 DEFENSES
		Command Vehicle 12.7mm M2HB	.50cal AP-I M136 AT4 5.56mm	>2k 1 >1k	12.7mm MG Targeting IR Optics FBCB2 Ramp Smoke Launche Smoke Launche Smoke Launche Smoke Launche
Weight	18.6 tons				
Speed	  				
Power	  				
Off-Road	 				
Turning	 				

■ M1131 Stryker

The M1131 Fire Support Vehicle (FSV) is the standard fire support variant of the Stryker. The FSV has additional communications equipment and the FS3 system, similar to the LRAS3 found on the M1127 RV Stryker. For self-defense the FSV has a .50 cal HMG.

ERA Variant: An M1131 Stryker equipped with SRAT explosive reactive armor.

Driver	Fire Support Vehicle 12.7mm M2HB	 .50cal AP-I >2k	 12.7mm MG	
	M136 AT4	 M136 AT4 1	 Targeting	
	5.56mm	 5.56mm >1k	 Laser	
Weight	18.6 tons	 Speed	 Ramp	 Smoke Launcher
Speed		 Power	 Smoke Launcher	 Radio
Power		 Off-Road		
Off-Road		 Turning		
Turning				

■ M1132 Stryker

The M1132 Engineer Squad Vehicle (ECV) is used by combat engineers within the brigade engineer battalion. The ECV is equipped with mine detectors and obstacle clearing systems, including a plow mounted on the front for clearing mines on paved surfaces and small amounts of debris. For self-defense the ECV has a .50 cal HMG mounted on the standard RWS.

ERA Variant: An M1132 Stryker equipped with SRAT explosive reactive armor.

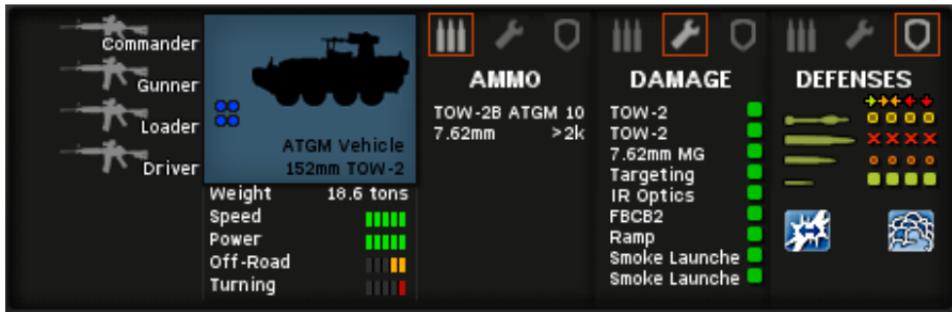
Note: The specialized engineering capabilities of this vehicle are not currently simulated.

Gunner		 .50cal AP-I >2k	 12.7mm MG	
Driver	ESV 12.7mm M2HB	 M136 AT4 2	 Targeting	
		 40mm HEDP 40	 Laser	
		 7.62mm >3k	 Ramp	 Smoke Launcher
Weight	18.6 tons	 5.56mm >3k		 Radio
Speed				
Power				
Off-Road				
Turning				

■ M1134 Stryker

The M1134 Anti-Tank Guided Missile (ATGM) Vehicle is the brigade-level anti-tank vehicle for Stryker brigade combat teams. The M1134 Stryker is equipped with a dual TOW launcher, allowing it to destroy armored and fortified targets up to 4,500 m away. A pintle-mounted M240 is also provided for self-defense against enemy infantry.

ERA Variant: An M1134 Stryker equipped with SRAT explosive reactive armor.



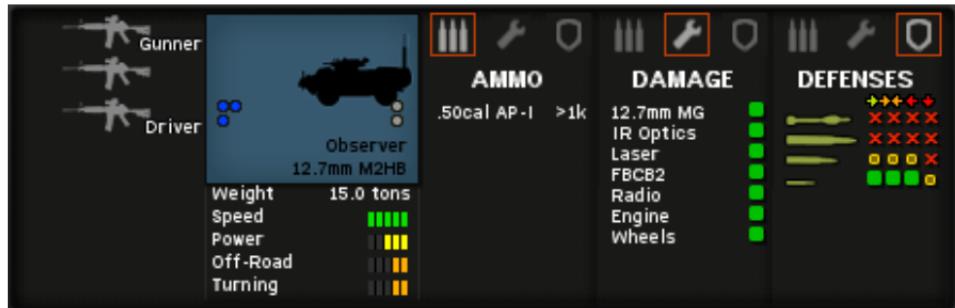
■ M1064A3

The M1064A3 is a self-propelled mortar carrier variant of the M113, a 60s-era APC that although obsolete in its original role has continued service in many specialized support roles. The M1064A3 is the standard mortar carrier for armored brigade combat teams. The primary weapon is an M121 120 mm mortar that fires to the rear of the vehicle, and for self-defense a .50 cal HMG is equipped.



■ M1200 Armored Knight

The M1200 Armored Knight is a wheeled fire support vehicle that began service in 2008, replacing the M707 Knight. The M1200 is derived from the M1117 Guardian Armored Security Vehicle, an APC typically used by military police. The M1200 is used by Combat Observation Lasing Teams (COLTs) and some fire support teams to provide precision targeting for artillery and air support. The vehicle is equipped with a Fire Support Sensor System (FS3), which includes a second-generation FLIR imager, electro-optical day TV, laser designator, laser rangefinder, and special software for target identification. Combined with GPS and an inertial navigation system, the M1200 can designate targets for guided munitions with precise accuracy. For self-defense a .50 cal HMG is equipped.



■ Humvee

The High Mobility Multipurpose Wheeled Vehicle (HMMWV), most commonly known as the "Humvee", is the United States Army's standard light utility vehicle. The Humvee began service in 1984 as a universal platform to replace all 1/4-1 1/4-ton utility vehicles; over 280,000 Humvees have been built since then. Dozens of variants of the Humvee exist, fulfilling various utility and combat roles in every military formation.

Humvees have four-wheel drive with independent suspensions and run-flat tires. The Humvee can ford up to 0.76 m without fording kits equipped, and can climb a 60% incline. The V8 engine can reach speeds up to 89 km/h at maximum weight.

The original unarmored Humvee model was the M998. After combat experience in Somalia where the Humvee's vulnerability in urban combat was exposed, the M1114 armored Humvee was put into production. The M1114 introduced armor that could resist small arms fire, air conditioning, and a turbocharged engine. With the advent of the Global War on Terror, the emphasis on improved armor became front and center. Beginning in 2008 the M1151 Humvee was fielded, featuring engine and chassis improvements to better carry armor kits.

The Humvee was originally designed to operate behind the front lines, where light armor and high mobility were more desirable than high survivability. However, the Humvee found itself thrust into front line combat with operations in Somalia and the Global War on Terror. As a result, numerous armor packages have been developed to increase the vehicle's survivability, at the cost of much heavier weight, reduced mobility, and mechanical stress on the vehicle chassis. Humvees equipped with these armor kits are called "up-armored" Humvees. Humvees in this game are equipped with the FRAG 5 armor kit, which features more heavily armored doors and side armor, providing protection against 7.62 mm bullets and shell fragments.

■ M1151 Humvee

The M1151 Enhanced Armament Carrier is a new version of the Humvee, designed to bear the heavy weight of add-on armor. The M1151 has a heavier chassis and a more powerful engine, allowing it to carry more weight than previous versions. The M1151 is the standard four-seat version, with a fifth space for a gunner in the center. In Humvees equipped with mounted weapons, the gunner's station is surrounded with a simple turret and gunshield.

.50 cal Variant: Equipped with a turret-mounted M2 .50 caliber heavy machine gun.

Mk. 19 Variant: Equipped with a turret-mounted Mk.19 grenade launcher.

M240 Variant: Equipped with an M240 medium machine gun.

■ M1151 Reconnaissance Humvee

Certain Humvees in reconnaissance and cavalry units are equipped with a Long-Range Advanced Scout Surveillance System (LRAS3). This multi-sensor system gives the crew advanced observation and surveillance capabilities. The LRAS3 has second-generation FLIR, GPS, laser rangefinder and an electro-optical day camera.

.50 cal Variant: Equipped with an M2 .50 caliber heavy machine gun.

Mk19 Variant: Equipped with a Mk.19 automatic grenade launcher.

	Gunner		Driver
	Recon		AMMO
	12.7mm M2HB		DAMAGE
Weight	5.8 tons		DEFENSES
Speed			
Power		IR Optics	
Off-Road		Laser	
Turning		FBCB2	
		Radio	
		Engine	
		Wheels	

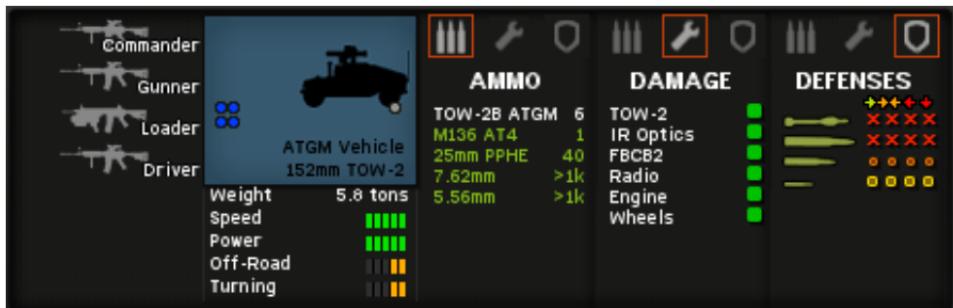
■ M1152 Humvee

The M1152 is a flatbed variant of the M1151 Humvee, with a larger cargo and passenger capacity. It is generally used as a troop or cargo carrier.

 Driver  Multipurpose Vehicle	 AMMO M136 AT4 1 25mm PPHE 40 7.62mm >1k 5.56mm 500	 DAMAGE FBCB2 Radio Engine Wheels	 DEFENSES 
Weight 5.8 tons Speed  Power  Off-Road  Turning 			

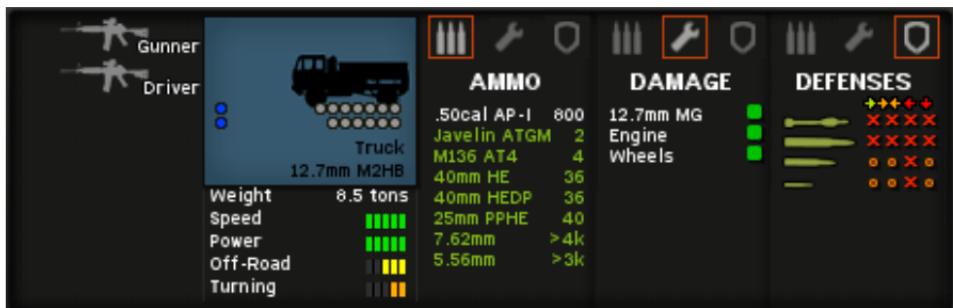
■ M1167 Humvee

The M1167 TOW Carrier is an anti-tank variant of the M1151 Humvee, replacing the M1046 TOW Carrier in service. The M1167 is armed with a TOW anti-tank guided missile system, giving infantry formations a mobile anti-tank weapon.



■ Light Medium Tactical Vehicle (LMTV)

The LMTV is part of the FMTV Family of Medium Tactical Vehicle) series of vehicles. The LMTV is the light version of the FMTV and is the standard 2.5 ton 4x4 cargo truck. In this game the vehicle is fitted with a LSAC (Low Signature Armored Cab) package, which includes an armored cab, an M2 .50 caliber heavy machine gun, and a ballistic glass turret.



■ United States Army Small Arms

■ M4A1

The standard issue firearm of the United States Army, the M4 is a carbine version of the M16 series of assault rifles, being lighter and shorter while firing the same 5.56 mm NATO round. Initially the M4 was destined to be replaced by the winner of the Individual Carbine competition, but instead the M4A1 carbine was selected to replace the M4 and the M16 in service across the Army. All existing M4s will be converted to M4A1s, which is expected to be complete by 2017.



Originally used by special operations forces, the M4A1 is an improved version of the M4, replacing the burst fire mode with a fully automatic mode. The fully automatic trigger group has the benefit of a more consistent trigger pull. The M4A1 also features a heavier barrel and ambidextrous fire controls.

In Army service the M4A1 comes by default with the Aimpoint M68 Close Combat Optic (CCO).

The M68 CCO is a red dot reflex sight used in lieu of iron sights. Additionally all M4A1s in combat service are equipped with the AN/PEQ-16, a multifunction laser sight that emits visible and infrared (IR) aiming lasers as well as visible and IR flashlights.

ACOG Attachment: In place of the M68 CCO, many M4A1s are equipped with the Advanced Combat Optical Gunsight (ACOG) manufactured by Trijicon. Unlike the M68's 1x magnification and battery powered red dot, the ACOG has 4x magnification and reticles that are fiber optic and tritium illuminated.

LWTS Attachment: Some M4A1s are equipped with the AN/PAS-13(V1) Light Weapon Thermal Sight (LWTS) to enhance their effectiveness in low visibility situations. The LWTS can clip onto the top Picatinny rail. The LWTS has a magnification of 1.55x with a maximum target recognition range of 550 m.

Cartridge.....	5.56x45 mm NATO
Action.....	Gas-operated, rotating bolt
Feed system.....	30 round box magazine
Rate of fire.....	Semi-automatic, automatic (700-950 rds/min)
Muzzle velocity.....	880 m/s
Effective range.....	Point target: 300 m, area target: 500 m

■ M4A1 w/ M320 Grenade Launcher

The M320 Grenade Launcher Module was fielded by the United States Army to replace the M203 grenade launcher. The M320 can be used as a standalone grenade launcher or underslung on an assault rifle. Unlike the M203, the M320 barrel turns to the side for breech loading. The sights for the grenade launcher are located on the side to prevent interference with rifle sights.



The M320 fires the same 40 mm NATO grenades as the M203, including High Explosive (HE) and High Explosive Dual Purpose (HEDP) grenades. HE rounds are suited to infantry targets while HEDP rounds have a shaped charge and can also be used effectively against lightly armored targets.

Cartridge.....	40x46 mm
Action.....	Single shot, double action
Feed system.....	Single shot
Muzzle velocity.....	76 m/s
Rate of fire.....	5-7 rds/min
Effective range.....	Point target: 150 m, area target: 350 m

■ M110 SASS

The M110 Semi-Automatic Sniper System (SASS) is supplied by Knight's Armament Company to the United States Army to replace the bolt-action M24 Sniper Weapon System. The M110 SASS was first fielded in combat in 2008 by the 10th Mountain Division. Similar in design to the Mk 11 Mod 0 (SR-25), the M110 SASS has a new buttstock, modular rail system, and suppressor. The M110 uses a Leupold 3.5-10x variable power daytime optic, which can be supplemented by an AN/PVS-30 night vision sight that clips onto the rifle in front of the scope.



CSASS variant: In 2012, the United States Army made requests to manufacturers to modify the M110 into a Compact Semi-Automatic Sniper System (CSASS). Firing the same ammunition as the M110 SASS but shorter and lighter, the M110 CSASS is suited as a squad or platoon Designated Marksman Rifle (DMR).

<i>Cartridge</i>	7.62x51 mm NATO
<i>Action</i>	<i>Gas-operated, rotating bolt</i>
<i>Feed system</i>	20 round box magazine
<i>Rate of fire</i>	Semi-automatic
<i>Muzzle velocity</i>	783 m/s
<i>Effective range</i>	800 m

■ Mk. 21 Precision Sniper Rifle

Also known as the Modular Sniper Rifle (MSR), the Precision Sniper Rifle (PSR) is a bolt-action action sniper rifle produced by Remington Arms.



The MSR won the Precision Sniper Rifle competition in 2013, which required a rifle with 1 Minute of Angle (MOA) accuracy out to 1,500 meters, be less than 18 pounds loaded, have Picatinny rails, and have a quick-change barrel. The PSR is slated to replace all United States Army bolt-action sniper rifles. The PSR uses a Schmidt & Bender 5-25x variable power daytime optic, which can be supplemented by an AN/PVS-30 night vision sight. Other features include an aluminum alloy body, a Titan QD suppressor, adjustable trigger, and a lightweight, adjustable buttstock.

The PSR is a modular sniper rifle, allowing it to be chambered in 7.62 mm NATO, .300 Winchester Magnum, or .338 Lapua Magnum. The caliber can be quickly changed simply by swapping the bolt face, barrel, and magazine.

<i>Cartridge</i>	7.62x51 mm NATO, .300 Winchester Magnum, or .338 Lapua Magnum
<i>Action</i>	Bolt-action
<i>Feed system</i>	10, 7, or 5 round box magazine
<i>Muzzle velocity</i>	841 m/s, 938 m/s, or 1,002 m/s
<i>Effective range</i>	1,500 m

■ M107A1

Also known as the M82, Barrett, or Light Fifty, the M107 is an anti-material sniper rifle produced by Barrett Firearms Manufacturing. Long and unwieldy, with a large round and a long effective range, the M107A1 is best used against enemy vehicles and as an explosive ordnance disposal (EOD) weapon. Contrary to popular belief, it is legal to use .50 caliber sniper rifles against enemy personnel. The M107 uses a Leupold 4.5-14x Mark 4 daylight scope, with an AN/PVS-13(V)3 Heavy Weapon Thermal Sight (HWTS) for night operation. The HWTS has a magnification of 3.3x/10x and a maximum target recognition range of 2,200 m.



The M107A1 replaced the M107 in production in 2011. The M107A1 features multiple improvements over its predecessor, including a cylindrical muzzle brake and a weight reduction of five pounds.

<i>Cartridge</i>	50 BMG
<i>Action</i>	<i>Recoil-operated, rotating bolt</i>
<i>Feed system</i>	10 round box magazine
<i>Rate of fire</i>	Semi-automatic
<i>Muzzle velocity</i>	853 m/s

Effective range.....1,800 m

■ M249 SAW PIP

Correctly designated as a light machine gun instead of squad automatic weapon, the M249 is an American version of the Belgian Minimi manufactured by Fabrique Nationale. The M249 fires assault rifle 5.56 mm NATO ammunition supplied by a 100 or 200 round belt contained in a soft bag. The M249 provides rifle squads with organic automatic weapons firepower from a linked ammunition belt while staying portable enough to keep up with carbine-wielding soldiers.



A Product Improvement Program (PIP) replaced and upgraded many aging parts on the M249, including a new stock with hydraulic buffer system, a new handguard, bipod, pistol grip, sights, flash suppressor, and Picatinny rails.

M249s are typically equipped with an ACOG or M145 Machine Gun Optic for daylight sights. For night operations, an AN/PEQ-16 multifunctional laser sight is attached and an AN/PVS-13(V)2 Medium Weapon Thermal Sight (MWTS) is issued. The MWTS has a magnification of 1.66x/5x and a maximum target recognition range of 1,100 m.

<i>Cartridge.....</i>	<i>5.56x45 mm NATO</i>
<i>Action.....</i>	<i>Gas-operated, open bolt</i>
<i>Feed system.....</i>	<i>Linked 100 or 200 round belt</i>
<i>Rate of fire.....</i>	<i>850 rds/m</i>
<i>Muzzle velocity.....</i>	<i>915 m/s</i>
<i>Effective range.....</i>	<i>700 m</i>

■ M240L

The M240 is a general-purpose machine gun used extensively by the members of NATO. Originally designed by the Belgian manufacturer Fabrique Nationale, the M240 has been in use by the United States Armed Forces since 1977. The M240 can be fired from a bipod or tripod by dismounted infantry, and is commonly mounted on light vehicles or used as a coaxial machine gun.



The M240 is typically equipped with the M145 Machine Gun Optic. This American variant of the Canadian C79 optical sight has 3.4x magnification, an illuminated reticle and is optimized for use on machineguns. For low-visibility operations, the M240 can also be equipped with a Medium Weapon Thermal Sight (MWTS) and AN/PEQ-16.

Although relatively heavy for a medium machine gun, the M240 is regarded for high reliability. The M240B was the standard infantry variant in United States Army service, but beginning in 2010 the improved M240L began replacing the M240B in combat units. The M240L brings a host of improvements, the foremost being a significant 2.5 kg weight reduction by using titanium components. The M240C remains as the standard coaxial variant for many combat vehicles such as the Abrams and Bradley.

<i>Cartridge.....</i>	<i>7.62x51 mm NATO</i>
<i>Action.....</i>	<i>Gas-operated, open bolt</i>
<i>Feed system.....</i>	<i>Linked 100 or 200 round belt</i>
<i>Rate of fire.....</i>	<i>750-950 rds/min</i>
<i>Muzzle velocity.....</i>	<i>853 m/s</i>
<i>Effective range.....</i>	<i>Bipod: 800 m, tripod: 1,800 m</i>

■ M9A1

The Beretta M9 is a pistol of Italian design adopted as the standard service pistol of the United States Armed Forces since 1985, replacing the venerable M1911A1. The M9 is a military version of the Beretta 92F, with modifications to improve durability and ergonomics. The M9A1 update added a Picatinny rail to the underside of the barrel and a beveled magazine well.



<i>Cartridge</i>	<i>9x19 mm Parabellum</i>
<i>Action</i>	<i>Short recoil</i>
<i>Feed system</i>	<i>15 round box magazine</i>
<i>Rate of fire</i>	<i>Semi-automatic</i>
<i>Muzzle velocity</i>	<i>381 m/s</i>
<i>Effective range</i>	<i>50 m</i>

■ United States Army Special Weapons

■ M25 CDTE

The M25 Counter Defilade Target Engagement (CDTE) is an airburst grenade launcher in service with the United States Army. The M25 is a descendant of the XM29 OICW program and began service in Afghanistan in 2010. The M25 fires grenades that explode in mid-air on top of and just behind a target. A built-in laser rangefinder determines the distance to the target, and then a computer transmits the data to the grenade. When fired, the grenade determines the distance at which to explode by counting its spiral rotations while in flight. Although its lethality against targets behind walls has garnered praise from troops and the nickname of "Punisher", it has also been criticized for heavy weight and low magazine capacity.



With airburst capability, the M25 is much more effective than traditional grenade launchers at engaging infantry targets dug in or behind cover such as buildings or walls, since the grenade can be exploded above the target's cover. The High-Explosive Airbusting Round (HEAB) can be fired in four modes: airburst, point detonation, point detonation delay, and window. The M25 can also fire thermobaric and armor piercing grenades.

<i>Cartridge</i>	<i>25x40 mm</i>
<i>Action</i>	<i>Gas-operated</i>
<i>Feed system</i>	<i>4 round box magazine</i>
<i>Rate of fire</i>	<i>Semi-automatic</i>
<i>Muzzle velocity</i>	<i>210 m/s</i>
<i>Effective range</i>	<i>Point target: 500 m, area target: 700 m</i>

■ M2A1 Heavy Machinegun

The M2 heavy machine gun has a long and storied history, being in production since 1933, longer than any other machine gun. The M2, or "Ma Deuce", is primarily used on vehicles as a primary weapon or for self-defense. The large .50 BMG round is highly versatile and is effective against infantry, structures, light armored vehicles, and helicopters. While normally mounted on vehicles, the M2 can be mounted on a tripod and fired from ground positions. The M2 is usually aimed using iron sights, or in the case of Abrams with CROWS and some Stryker family of vehicles, a Remote Weapon Station (RWS). However, for low-visibility operations a Heavy Weapon Thermal Sight (HWTS) can be attached.

Beginning in 2011, the United States Army began converting its venerable M2HBs into improved M2A1s. This new variant introduces a variety of improvements, including a much more

effective flash suppressor, a quick change barrel, and the elimination of the need to set or maintain headspace and timing. A lighter tripod for ground mounting is included.

*Cartridge.....50 BMG
Action.....Short recoil-operated
Feed system.....Linked belt
Rate of fire.....485-635 rds/min
Muzzle velocity.....890 m/s
Effective range.....1,800 m*



■ Mk. 19 Automatic Grenade Launcher

The Mk. 19 is an automatic grenade launcher widely used by the United States Armed Forces. It uses a 40 mm HEDP (High Explosive Dual Purpose) grenade which is much more powerful than the HEDP rounds used by rifle grenade launchers. The extra power gives the Mk. 19 a fairly long range and excellent lethality. It is also capable of destroying light armored vehicles, while having a decent chance of damaging heavier armor's more vulnerable components. Although generally mounted on vehicles as an infantry defense weapon due to its high weight, the Mk. 19 can be dismounted and used on a tripod.

The Mk. 19 is usually aimed using iron sights, or in the case of some vehicles, a Remote Weapon Station (RWS). For night operations a Heavy Weapon Thermal Sight (HWTS) can be attached.

*Cartridge.....40x53 mm
Action.....Blowback
Feed system.....32 or 48 grenade linked belt
Rate of fire.....325-375 rds/min
Muzzle velocity.....240 m/s
Effective range.....1,400 m*



■ M136 CS AT4

The AT4 is a single-shot disposable recoilless rocket launcher designed in Sweden by Saab Bofors Dynamics. Designated the M136 AT4 by the United States Armed Forces, the AT4 is used as a squad-level disposable light anti-tank defense weapon. The AT4's 84 mm HEAT warhead is most effective against light and medium armored vehicles, although it can be effective against main battle tanks if fired at the side or rear of the tank. The explosive effect of the warhead is also useful against enemy infantry, especially those in bunkers or buildings.

The Confined Space (CS) variant of the AT4 is specially designed for urban warfare. The CS has a saltwater countermass in the rear of the launcher to absorb the dangerous backblast. This allows the weapon to be fired from confined spaces such as buildings without risk of injury.

*Effective range.....Point target: 300 m, area target: 500 m
Muzzle velocity.....290 m/s
Armor Penetration.....420 mm RHAe*

■ FGM-148 Javelin

The FGM-148 Javelin is a man-portable, fire-and-forget, anti-tank missile employed by dismounted infantry to defeat enemy armored combat vehicles up to and including Main Battle Tanks. The Javelin has a range of approximately 2,500 m. It is equipped with an infrared imaging (I2R) system and a fire-and-forget guided missile.

The Javelin's normal engagement mode is a top-attack, diving flight profile to penetrate a tank's most vulnerable armor, though it can also fire in direct-attack mode to engage targets with overhead cover or with greater horizontal vulnerability. A "soft launch" capability allows employment from within buildings and enclosed fighting positions. The Javelin accomplishes this by ejecting the missile a short distance from the launcher before the main rocket motor ignites.

The Javelin consists of a missile in a disposable launch tube and a reusable Command Launch Unit (CLU). The CLU houses the trigger mechanism, an integrated day/night sighting device for surveillance and target acquisition, built-in test capabilities, and associated electronics. The CLU provides the capability for battlefield surveillance, target acquisition, missile launch, and damage assessment.

The round consists of a disposable launch tube assembly, battery coolant unit (BCU), and the missile. The missile locks on to the target before launch using an infrared focal plane array and on-board processing, which also maintains target track and guides the missile to the target after launch. Because the missile is guided by infrared imaging and not SACLOS, targets with laser warning receivers will not detect a Javelin that has locked onto them. The tandem warhead uses two shaped charges, with the first being a precursor warhead that punches a channel through any Explosive Reactive Armor (ERA) before the larger primary warhead strikes the base armor underneath.

*Effective range.....75-2,500 m
Guidance system.....Imaging Infrared,
.....radio-guided
Armor Penetration.....600+ mm RHAe*



■ BGM-71 TOW

The BGM-71 Tube-launched, Optically-tracked, Wire-guided (TOW) is an ATGM designed by Hughes Aircraft Company and began service in 1970. Now produced by Raytheon, the TOW is widely used across the world. United States Army vehicles armed with the TOW include The M1134 Stryker, M2, and M3 Bradleys.

Light infantry also use the TOW for self-defense against enemy vehicles, with the TOW mounted on M1167 Humvees or ground-mounted on a tripod as the M220 launcher. The M220 has recently been upgraded with the M41 TOW Improved Target Acquisition System (ITAS). The ITAS includes a new target acquisition system, fire control system, and lithium battery attached to the launch tube. The TOW includes a second-generation FLIR and laser rangefinder. The weapon is equipped with new TOW-2B missiles, which feature a top-attack

penetrator that shoots down at the target to attack thin top armor, and a switch to radio missile guidance instead of wires.

*Effective range.....200-5,200 m
Guidance system.....SACLOS, radio-guided
Armor Penetration.....800-900 mm
.....RHAe*



■ FIM-92 Stinger

The FIM-92 Stinger is a man-portable Surface-to-Air Missile (SAM) widely used across the world as a light air defense system. The Stinger is a passive SAM that is shoulder-launched by a single operator. The Stinger has also been adapted for service on various vehicles and slow-flying aircraft such as UAVs and helicopters. The Stinger launches a 10 kg, 1.52 m long missile with a small ejection motor to push the missile a safe distance before the solid rocket motor engages and carries the missile to its target. Once in the air, the missile accelerates to 750 m/s, or Mach 2.2. The missile is guided by an infrared homing guidance system to detect IR signatures emitting from the target. The target is attacked with a 3 kg warhead with an impact or proximity fuse.

*Effective range.....4,800 m
Guidance system.....Infrared homing*



■ M224A1 60 mm Mortar

The M224 is the standard United States Army light mortar, providing light infantry rifle companies with organic fire support. The M224 replaced the WW2-era M2 60 mm mortar in 1978. Like all United States mortars currently in service, the M224 is smooth bore and muzzle loading. The M224 mortar system consists of four pieces: a cannon, bipod, baseplate, and sight unit. The mortar is typically crewed by three soldiers. The M224 can fire High Explosive (HE) or White Phosphorus (WP) rounds. HE rounds use a multi-option Fuse that, with a simple hand twist before firing, can be selected to proximity burst, near-surface burst, impact burst, or delay burst. In 2011 the M224A1 began service. This new variant uses lighter and simpler components to reduce the weight of the overall system by 4 kg.

*Effective range.....70-3,490 m (HE)
Rate of fire.....30 rds/min maximum,
.....20 rds/min sustained*



■ M252A1 81 mm Mortar

The M252 is the standard United States Army medium mortar, providing light infantry rifle battalions with organic fire support. The M252 is an American version of the British L16A2 mortar and replaced the M29 mortar in service in 1987. The mortar is typically crewed by four soldiers. The M252 can fire High Explosive (HE) or White Phosphorus (WP) rounds, with the same fuse options as the 60 mm M224A1 mortar. In 2011 the M252A1 began service. This new variant uses lighter and simpler components to reduce weight of the system by 9.4 kg.

*Effective range.....91-5,935 m (HE)
Rate of fire.....20-30 rds/min maximum,
.....8-16 rds/min sustained*

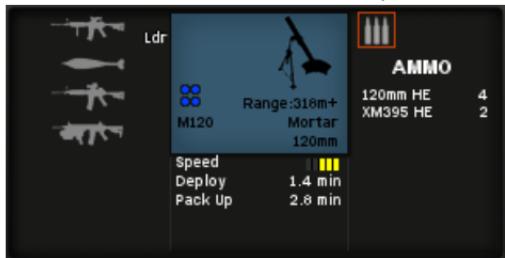


■ M120 120 mm Mortar

The M120 is the standard United States Army heavy mortar, providing rifle and cavalry units with organic fire support. The mortar began service in 1991 as an American version of the Israeli Soltam K6. The M120 is usually self-propelled on either the M106A3 or M1129 Stryker mortar carriers, although it is also towed by Humvees and mounted on a baseplate in light infantry units. When mounted on vehicles, it is labeled the M121.

In Combat Mission the M120/M121 can fire High Explosive (HE) or White Phosphorus (WP) rounds, with the same fuse options as the 60 mm M224A1 mortar. In addition, the XM395 Precision Guided Mortar Munition (PGMM) is stocked in small numbers. This near-precision round's flight path is adjusted with thruster motors and is GPS-guided to strike point targets with high accuracy and no need for spotting rounds or adjustment.

*Effective range.....200-7,240 m (HE)
Rate of fire.....16 rds/min maximum,
.....4 rds/min sustained*



■ United States Army Artillery Support

■ M109A7 Paladin 155 mm Self-Propelled Howitzer

The M109A7 Paladin is the standard howitzer used by Army armored brigade combat teams. The Paladin provides indirect fire support from a highly mobile and armored platform to limit vulnerability to counter battery fire. The Paladin can hit targets up to 18 km away conventionally, or 30 km with rocket assistance. The Paladin has a turret with 360 degree traverse and can travel at up to 56 km/h. The newest variant has been upgraded with inertial navigation, digital communications, and automated systems, allowing it to halt and fire in less than 30 seconds after receiving a fire mission.

In addition to the usual HE and WP ammunition, Paladins and other American 155 mm howitzers are also equipped with M982 Excalibur guided artillery shells. Jointly developed by Raytheon and Bofors, the Excalibur is a GPS-guided munition with a Circular Error Probably (CEP) of <5 m, at ranges up to 57 km. The pinpoint accuracy of precision rounds grants multiple advantages. Because there is no need to fire spotting rounds and adjust them onto the target before calling a Fire For Effect (FFE), the target typically has no warning before the shell strikes. In addition, the small CEP allows for missions to be called closer to friendly or civilian presence without fear of collateral damage.

Rate of fire.....6 rds/min maximum, 3 rds/min sustained

■ M119A3 105 mm Howitzer

The M119A3 is a lightweight howitzer used by infantry brigade combat teams. Light enough to be easily towed, airlifted, or airdropped, the M119A3 is also known as the L119 Light Gun in British Army service. After beginning service in 1989, the M119 has undergone several digital upgrades to give it a modernized fire control system, inertial navigation system, and digital communications.

Rate of fire.....8 rds/min maximum, 3 rds/min sustained

	3	M109A7 Paladin	155mm Howitzer
155mm HE	117		
Excalibur HE	12		
155mm WP	12		

	3	M119A3	105mm Howitzer
105mm HE	105		
105mm WP	30		

■ M777A2 155 mm Howitzer

The M777A2 is a towed howitzer used by infantry and Stryker brigade combat teams. The M777 was designed to replace the M198 Howitzer, being far faster to emplace and pack up at 42% of the weight due to titanium construction. Recent modernizations of the M777, the A1 and A2 variants, gave the artillery piece inertial navigation, GPS, and a digital fire control system. Like the M109A6 Paladin, the M777A2 can fire M982 Excalibur guided artillery shells.

Rate of fire.....5 rds/min maximum, 2 rds/min sustained

	3	M777A2	155mm Howitzer
155mm HE	180		
Excalibur HE	12		
155mm WP	18		

■ United States Army Air Support

■ AH-64D Apache Longbow

The AH-64 Apache is the standard attack helicopter of the United States Army, and has been in active service since 1986. The Apache is designed to operate on the front lines, with armor sufficient to withstand 23 mm hits around the crew compartment and redundant flight systems. Sensor and avionics suites allow the Apache to operate during day or night, and in bad weather.

The AH-64D variant, also known as the Apache Longbow, is equipped with a glass cockpit, new sensors, the Longbow millimeter-wave fire-control radar, and a radar frequency interferometer, located in the distinctive dome above the rotor. Upgraded communications and data sharing systems allow multiple Apache Longbows to share targeting data with each other.

The Apache has four hardpoints on stub-wing pylons, which usually carry AGM-114 Hellfire missiles and Hydra 70 rocket pods. The combinations of these weapons is highly flexible and can be adjusted for different missions. The AGM-114 is a precision air-to-surface missile (ASM) that can easily destroy any armored vehicle. The Hellfire has a maximum range of 8,000 m and can be used as a fire-and-forget radar-guided weapon or be guided by a reflected laser beam. The Hydra 70 is an unguided rocket mounted in a 19-tube launcher pod. Fired in rapid succession, these rockets can saturate an area with 70 mm HE warheads, making them effective against light vehicles and infantry.

In addition to the pylon weaponry, a 30 mm M230 chain gun is attached under the forward fuselage. The M230 carries 1,200 HEDP rounds, which can penetrate over 50 mm of armor and fragments on impact with a lethal radius of 3 m against enemy personnel, out to an effective firing range of about 1,500 m. Using a helmet mounted display, the crew can slave the chain gun to their helmet, allowing the crew member to aim the gun at a target simply by looking at it.

Note: Like many air support assets in Black Sea, the Apache Longbow support asset can be purchased with two different loadouts: "Normal" and "Antitank". Antitank loadouts emphasize ATGMs and air to surface missiles, while normal loadouts have more bombs and rockets.

■ AH-64E Apache Guardian

Also previously known as the Block III Upgrade, the AH-64E Guardian features numerous high-tech upgrades. New composite rotor blades and more powerful engines give the Guardian better flight characteristics, including speed, climb, and max payload. The Guardian is also equipped with new digital data communications, the joint tactical radio system, and improved radar.

Most interestingly, the Guardian flight crew has the

	AH-64D Apache	Attack Helicopter		AH-64D Apache	Attack Helicopter
30mm HEDP	800	30mm HEDP	600		
70mm HE	38	30mm APDU	400		
Hellfire ATGM	4	70mm HE	38		
		Hellfire ATGM	8		

	AH-64E Apache	Attack Helicopter		AH-64E Apache	Attack Helicopter
30mm HEDP	1200	30mm HEDP	700		
70mm HE	38	30mm APDU	500		
Hellfire ATGM	8	Hellfire ATGM	16		

capability to interface with and control UAVs such as RQ-7B Shadow or MQ-1C Gray Eagles that operate alongside Apaches in aviation regiments. This capability allows the Apache-UAV pair to replace Kiowa scout helicopters, removing the need for human pilots to risk themselves in scouting missions. With this system the UAV and attack helicopter can act as a pair, with the UAV searching for targets for the Apache to attack. Even if the flight crew does not directly control the UAV, they can receive imagery from its camera payload and use its laser designator to mark targets for the Apache's weaponry.

■ F-15E Strike Eagle

The F-15E Strike Eagle is a multirole fighter used by the United States Air Force since 1988. Equipped with the low-altitude navigation and targeting infrared for night (LANTIRN) system, the two seat F-15E Strike Eagle is a potent dual role fighter/fighter-bomber. The F-15E can carry a weapons payload up to 7,300 kg.



■ F-16CJ Fighting Falcon

The F-16CJ is the current production version of the F-16 Fighting Falcon and first began to appear in the late 1990's. Able to be armed with a staggering combination of air-to-air weapons and air-to-ground precision-guided and unguided munitions, the F-16CJ has repeatedly proven itself to be an extremely capable and adaptable weapons platform.



■ United States Army UAV Support

■ RQ-11B Raven

The Raven is a small hand-launched recon UAV designed and manufactured by AeroVironment for the United States Army. The Raven is becoming standard-issue for US Army line companies as organic UAV support, although it is widely used by militaries across the world.

The Raven weighs 1.9 kg and has a wingspan of 1.3 m. The electric motor operates very quietly, allowing the Raven to often travel with no noticeable sound from the ground. The Raven's payload can include color video, infrared night vision, or laser illuminator.

The Raven and its ground control unit break down and assemble quickly and fit into a rucksack-sized carry device. The Raven can be launched and operational in two minutes from an unprepared state. The Raven uses a rechargeable battery as a fuel source, which can be quickly changed.



RQ-11B Ravens are vulnerable to AAA fire while performing Observe missions, but cannot be attacked by SAMs. If the controller for the UAV is killed or incapacitated while the Raven is in the air, the Raven will be destroyed.

■ RQ-7B Shadow

The RQ-7B Shadow is a tactical reconnaissance UAV issued to Brigade Combat Teams, with one platoon of four UAV per brigade. The Shadow is used to provide organic real time tactical intelligence, target acquisition, surveillance, and battle damage assessment to the brigade combat team.



Takeoff is assisted by a pneumatic launcher, similar to how aircraft are launched from carriers. While in flight, the Shadow is controlled by an operator in a Humvee-mounted Ground Control Station (GCS). The Shadow has an operating range of 125 km, a cruising speed of 130 km/h, and weighs 170 kg.

A fleet upgrade program began in 2010 that added the POP300 payload system, and increased the wingspan to 6.1 m in order to increase mission endurance time to 9 hours. The POP300 payload system includes a gimbal-mounted EO/IR (Electro-Optical/InfraRed) high resolution camera and a laser designator. The EO/IR payload sensors have sufficient resolution to detect and ID an armored personnel carrier from 2,100 m AGL at a standoff distance of 3-5 km.

RQ-7B Shadows are vulnerable to AAA and SAM fire while performing Observe missions.

■ MQ-1C Gray Eagle

The General Atomics MQ-1C Gray Eagle, previously known as the Sky Warrior, is a Medium-Altitude Long Endurance (MALE) unmanned combat air vehicle. The Gray Eagle is a successor to the MQ-1 Predator, and entered operational status in 2009. The US Army plans to equip all combat aviation brigades with a company of 12 Gray Eagles, which will operate alongside AH-64 Apache attack helicopters while providing reconnaissance and strike capability.



The MQ-1C is armed with AGM-114 Hellfire missiles in Combat Mission, allowing it to conduct surveillance or strike missions. Other systems include avionics, targeting system, a gyro-stabilized EO/IR payload, and laser designator. The MQ-1C has a maximum speed of 280 km/h, an operating range of 400 km, and a mission endurance time of 30 hours.

MQ-1C Gray Eagles are invulnerable to AA fire while performing Observe missions, but can be attacked by AAA and SAMs during certain portions of Strike missions.

■ Russian and Ukrainian Ground Forces

■ Russian and Ukrainian Ground Forces Vehicles

■ T-64 Main Battle Tank



The T-64 is a Soviet main battle tank that began service in 1964. The T-64 was originally designed and manufactured in Ukraine, and the basic design features would form the basis of future modern Soviet tank design. The T-64 was known for introducing revolutionary advances in Soviet tank design: variants of the T-64 introduced the autoloader, the 125 mm gun, and the ability to fire ATGMs through the gun barrel. After the break-up of the Soviet Union, Ukraine continued to develop the T-64 as its primary main battle tank due to the biggest T-64 manufacturing plant being located in Ukraine. Almost 13,000 T-64s have been built since their introduction.

■ T-64BV



The T-64BV is currently the most numerous main battle tank in Ukraine's inventory. Introduced in the late 1970s, the T-64B is an upgrade from the older T-64A. The T-64B has improved armor protection, including a stronger glacis. T-64BVs are a variant that further improves protection against HEAT ammunition by attaching Kontakt-1 ERA blocks to the outer surface of the tank. In addition, Tucha smoke grenade launchers are installed. The armament is upgraded with the 2A46 125 mm smoothbore cannon. Other new systems included a new stabilizer, autoloader, and fire control. Although an aging vehicle and outclassed by other tanks in Black Sea, the T-64BV can still be a threat if handled properly.

Due to the degradation of Cold War stocks, T-64BVs in Ukrainian service are no longer equipped with ATGM ammunition.

	Commander		Gunner		Driver
Main Battle Tank					
125mm D-81					
Weight	40.3 tons		AMMO		DAMAGE
Speed		125mm HE	14	125mm Main	
Power		125mm T-HEAT	4	12.7mm MG	
Off-Road		125mm APFSDS	10	7.62mm Coax	
Turning		12.7mm AP	300	Targeting	
		7.62x54R	>1k	IR Optics	
				Autoloader	
				Smoke Launche	
				Smoke Launche	
				Radio	

■ BM Bulat



Sometimes known as the T-64BM Bulat, this is an extensive upgrade package to prepare the T-64 for the modern battlefield. Protection is greatly upgraded with the installation of modern Nozh ERA, which has been designed to minimize damage to adjacent ERA blocks. In addition, composite armor has been added to the front of the hull and turret, and an automatic fire extinguishing system has been installed.

The cannon has been replaced with a KBA-3 125 mm smoothbore cannon that fires APFSDS, HE, and T-HEAT rounds. The Bulat can also fire Kombat Anti-Tank Guided Missiles (ATGMs)

through the cannon, extending the range at which it can engage enemy targets. Kombat is a laser-beam riding missile with a maximum range of 5,000 m, and has a tandem HEAT warhead capable of penetrating up to 750 mm of armor.

Other new systems include the same fire control system as the T-84, the TKN-4S commander's sight, and the TPN-4E Buran-E night vision system. Propulsion is provided by an 850 hp 5TDFM diesel engine.

	Commander		Gunner		Driver		Main Battle Tank		AMMO		DAMAGE		DEFENSES
							125mm HE 125mm T-HEAT Kombat ATGM 125mm APFSDS	14 4 8 10	125mm Main 12.7mm MG 7.62mm Coax Targeting IR Optics Autoloader Smoke Launcher Smoke Launcher Radio				
	Weight Speed Power Off-Road Turning	45.0 tons 											

■ T-72 Main Battle Tank

The T-72 is a main battle tank of Soviet design. A second-generation main battle tank, the T-72 was designed in the late 60s and early 70s and entered service in 1973. Over its long lifetime, more than 25,000 T-72s have been built and the tank has seen combat in dozens of conflicts across the world. The T-72 has existed in myriad specialized variants, but in domestic Russian service has been made in three major variants: the T-72, T-72A, and T-72B.

For main armament, the T-72 is equipped with the 125 mm 2A46 series of smoothbore guns. In addition to the usual APFSDS and HEAT shells, the tank can also fire the 9M119 Svir (NATO reporting name "AT-11 Sniper") anti-tank guided missile through the cannon. The beam-riding, tandem hollow-charge ATGM has a maximum range of 5,000 m, giving the tank the ability to reach out and touch enemy targets well outside of tank shell range. The T-72 uses an autoloader to eliminate the need for an extra crewmember, which has the added benefit of reducing the size of the tank. The autoloader is capable of a rate of fire of 6-8 rounds per minute.

The armor of the T-72 has been successively upgraded over its service life in a continual arms race with Western APFSDS rounds. The cast armor turret was first thickened, then replaced with a laminate of steel and rubber layers to deflect incoming rounds. Later models of the T-72 added composite and applique armor. In Russian service, T-72s are also usually fitted with Explosive Reactive Armor (ERA), in the form of Kontakt-1 or the advanced Kontakt-5. Fitting ERA to the tank greatly increases its survivability, especially against HEAT projectiles.

■ T-72B3

The T-72B3 is a Russian refurbishment and modernization program for the T-72 tank with the intent of extending its service life alongside the T-90 series of main battle tanks until the new generation of tanks is fielded. The T-72B3 is equipped with a new fire control system and ballistic computer to increase its ability to rapidly and accurately engage targets. A new Sosna-U gunner sight with thermal imager gives the tank increased ability to spot targets in night and poor weather conditions. Digital communications are also included.

BLACK SEA

For defense, Kontakt-5 third-generation ERA is fitted to the vehicle front, top, and sides. A modernized version of the Tucha smoke grenade launcher is equipped, replacing the older black smoke that required extra time to form a screen with new bursting IR-blocking white smoke that forms a concealment screen almost immediately.



APS Variant: A T-72B3 outfitted with the Arena active protection system. Arena is the successor to the Drozd system, which was developed in the 1970s in response to the RPG threat in Afghanistan. Experiences against RPGs in Chechnya prompted Russia to develop the Arena system, which can be mounted on tanks and the BMP-3M.



■ T-84 Main Battle Tank

The T-84 is a Ukrainian-designed main battle tank that entered service in the Ukrainian Ground Forces in 1999. The T-84 is based on the T-80UD, a Ukrainian-produced T-80 variant with a diesel engine. The T-80's cast turret has been replaced with a new welded turret, and the tank's composite armor lacks the Russian ceramic plate, replacing it with rubber between the steel and alloy layers. The T-84 is a fast tank, with a top governed speed of 70 km/h on roads and 45 km/h off-road thanks to a very high power-to-weight ratio provided by a 6TD-2 1,200 hp diesel engine. The main gun has been replaced with a 125 mm KBA-3 smoothbore cannon, a Ukrainian variant of the Russian 2A46 cannon found on Russian T-64, T-72, and T-80 tanks.

■ BM Oplot

Sometimes known as the T-84 Oplot-M, the BM Oplot is a major modernization of the T-84. The tank's protection has received major upgrades, including new multilayer armor and Duplet

ERA, which has been designed to better defend against tandem HEAT warheads and minimize damage to adjacent ERA blocks. A new welded turret features a separate ammunition compartment with blowout panels, as seen on the Abrams tank. This compartment is designed to direct explosions away from the crew compartment, which can potentially save crew lives even after catastrophic damage. Hull sides have rubber skirts hanging over the wheels for additional protection against light weapons. The Oplot-M also has the Varta optronic countermeasure system.

The BM Oplot's KBA-3 125 mm smoothbore cannon fires APFSDS, PPHE, and T-HEAT rounds.

A new autoloader has been designed to work with the ammunition compartment. Air burst munitions allow the tank to fire air bursts at infantry targets. In addition to normal shells, the BM Oplot can also fire Kombat ATGMs through the cannon, extending the range at which it can engage enemy targets. Kombat is a laser-beam riding missile with a maximum range of 5,000 m, and has a tandem HEAT warhead capable of penetrating up to 750 mm of armor. A PKT 7.62 mm machine gun is mounted coaxially, and a 12.7 mm machine gun is mounted on the roof.

The BM Oplot has a suite of modern digital systems, including a GPS navigation system, and a digital communication system. Other electronic systems include a PTT-2 thermal imager, and a PNK-6 commander's panoramic sighting system. Accuracy is maintained with stabilizers and a TIUS-VM ballistic computer. Like the Abrams, both the gunner and the tank commander can aim and fire the main gun.

	Commander		Gunner		Driver
Main Battle Tank 125mm D-81					
Weight	46.0 tons	AMMO	DAMAGE	DEFENSES	
Speed		125mm PPHE 14	125mm Main		
Power		125mm T-HEAT 4	12.7mm MG		
Off-Road		Kombat ATGM 8	7.62mm Coax		
Turning		125mm APFSDS 10	Targeting		
		12.7mm AP 450	CITV		
		7.62x54R >1k	IR Optics		
			Autoloader		
			EO Jammer		
			Laser Warn		

APS Variant: A variant of the BM Oplot equipped with the Zaslon Active Protection System (APS).

	Commander		Gunner		Driver
Main Battle Tank 125mm D-81					
Weight	46.0 tons	AMMO	DAMAGE	DEFENSES	
Speed		125mm PPHE 14	125mm Main		
Power		125mm T-HEAT 4	12.7mm MG		
Off-Road		Kombat ATGM 8	7.62mm Coax		
Turning		125mm APFSDS 10	Targeting		
		12.7mm AP 450	CITV		
		7.62x54R >1k	IR Optics		
			Zaslon APS		
			EO Jammer		

■ T-90 Main Battle Tank

The T-90 is a Russian-designed 3rd-generation main battle tank. The T-90 is a modernization of the T-72 series and is the most advanced Russian tank currently in service. While the T-80 is being withdrawn from frontline service, the T-90 and modernized T-72Bs have remained in service together due to their high parts commonality. The T-90 began service in 1991 and over 2,000 examples have been built, of which about 900 are in Russian service. The most common major variants of the T-90 are the T-90A, which is the domestic Russian version, and the T-90S, an export version used by Algeria, Azerbaijan, India, and Turkmenistan.

The T-90 uses the 125 mm 2A46M smoothbore cannon for main armament. Like the T-72, the cannon can also fire the 9M119M Refleks (AT-11 Sniper) ATGM with tandem hollow-charge HEAT warhead. Like other Russian tanks, the cannon is fed with an autoloader which holds 22 ready rounds and can reload in 5-8 seconds. The Ainet system allows the T-90 to engage enemy infantry with airburst rounds for increased effectiveness against infantry targets. A remotely controlled Kord 12.7 mm anti-aircraft machine gun can be operated by the tank commander from within the vehicle. For target acquisition, the gunner was initially equipped with a TO1-KO1 BURAN night sight and 1G46 day sighting system, while the commander was equipped with PNK-4S/SR AGAT day/night system.

The T-90 uses multiple defensive systems to enhance survivability. The tank's base armor is a composite, consisting of alternating layers of aluminum and plastics within a steel casing. On top of the composite armor, Kontakt-5 explosive reactive armor (ERA) is fitted over the turret, hull front, and forward hull sides. The T-90 is also equipped with the Shtora-1 protection system.

■ T-90A

The T-90A quickly replaced the T-90 in production. The T-90A features a fully welded turret, a new V-92S2 1,000 hp turbine engine, and most importantly a new ESSA thermal imaging sight. The export version of the T-90A is the T-90S.

 Commander	 Gunner	 Driver	 Main Battle Tank 125mm D-81	 AMMO	 DAMAGE	 DEFENSES
Weight	46.5 tons		125mm HE 21	125mm Main	 	
Speed	 		125mm T-HEAT 8	12.7mm MG	 	
Power	 		AT-11 ATGM 4	7.62mm Coax	 	
Off-Road	 		125mm APFSDS 14	Targeting	 	
Turning	 		12.7mm AP 300	Cmdr video	 	
			7.62x54R >2k	IR Optics	 	
				Autoloader	 	
				Constellation2	 	
				EO Jammer	 	

■ T-90AM



A modernized version of the T-90A, the T-90AM could potentially be the most advanced tank in Russian service. Numerous subsystems have been upgraded in the tank. The new "Kalina" fire control system has automated tracking for moving targets, and stabilized integrated daylight/thermal optics. The T-90AM includes information system upgrades in the form of inertial navigation systems, GLONASS satellite navigation system, and the Constellation-2M satellite communications system, an analogue to the United States FBCB2 program. These battle management upgrades greatly increase the situational awareness of the tank crew.

The T-90AM is equipped with advanced "Relikt" ERA, the successor to Kontakt-5. Relikt was developed in response to new US kinetic energy penetrators such as the M829A2 which were designed to penetrate Kontakt-5. Relikt is claimed to be twice as effective as Kontakt-5, and effective against tandem warheads and APFSDS rounds.

The commander is equipped with a panoramic sight and remote controlled UDP T05BV-1 weapon station with a 7.62 mm machine gun. A new ammunition stowage arrangement places many of the tank shells in a blast compartment, increasing crew survivability by directing the blast of exploding shells away from the crew compartment. Other subsystem upgrades include slat armor protecting the rear of the tank, a new autoloader, a 1130 hp diesel engine, automatic transmission, and a new 2A46M-5 cannon.

The export equivalent of the T-90AM is the T-90SM.

	Commander		Gunner		Driver		Main Battle Tank 125mm D-81		AMMO		DAMAGE		DEFENSES
								125mm PPHE	21	125mm Main			
								125mm T-HEAT	8	7.62mm MG			
								AT-11 ATGM	4	7.62mm Coax			
								125mm APFSDS	14	Targeting			
								7.62x54R	>2k	CITV			
										Cmdr video			
										IR Optics			
										Autoloader			
										Constellation2			

APS Variant: A T-90AM outfitted with the Arena active protection system.

	Commander		Gunner		Driver		Main Battle Tank 125mm D-81		AMMO		DAMAGE		DEFENSES
								125mm PPHE	21	125mm Main			
								125mm T-HEAT	8	7.62mm MG			
								AT-11 ATGM	4	7.62mm Coax			
								125mm APFSDS	14	Targeting			
								7.62x54R	>2k	CITV			
										Cmdr video			
										IR Optics			
										Autoloader			
										Constellation2			

■ BMP Infantry Fighting Vehicle



The BMP (Boevaya Mashina Pekhoty, or "fighting vehicle of infantry") is a Soviet-designed amphibious Infantry Fighting Vehicle (IFV) family. Revolutionary at the time of their introduction in the late 1960s, BMPs were among the first IFVs to see widespread service. Unlike the armored personnel carriers that preceded them, such as the BTR and M113, IFVs were designed to fight alongside their infantry dismounts instead of merely provide them with an armored ride to the battlefield.

As an IFV, the BMP's design requires speed, firepower, and armor protection. Armor protects the vehicle from light cannon fire and machine gun fire to the front, and light machinegun fire to the sides and rear. Passengers are completely protected from shell splinters. A cannon, coaxial machinegun, and a mounted ATGM provide the BMP with the ability to destroy almost any threat. Firing ports for small arms on the sides and rear of the passenger compartment allow squad members to help defend the vehicle. The BMP is also amphibious, able to float and swim through water with very little preparation. This ability greatly enhances operational mobility of units equipped with the BMP, since it does not depend on specialized bridging equipment to cross water obstacles.

■ BMP-2



The BMP-2 is the second generation vehicle of the BMP family of infantry fighting vehicles, and the standard IFV of the Ukrainian ground forces. Soon after the BMP-1 entered service it was discovered that, among other problems, the main armament (in the form of a 73 mm cannon and a 9M14 Malyutka (AT-3 Sagger) ATGM) was not sufficiently accurate and that the armor could not sufficiently protect the vehicle from .50 caliber machine guns. Design on the BMP-2 began in 1972 to address these shortcomings, and the new model entered service in 1980.

The BMP-2 uses a chassis that is mostly similar to the BMP-1. The armament has been significantly upgraded, however, with a 2A42 30 mm autocannon and roof-mounted 9P135M ATGM launcher equipped with 9M113 Konkurs (AT-5 Spandrel) missiles. These weapons are part of a new and larger two-man turret

	Gunner		Driver		IFV		AMMO		DAMAGE		DEFENSES
					30mm 2A42	AT-5A ATGM	4	AT-5			
						30mm HE -I	340	30mm Main			
						30mm APDS	160	7.62mm Coax			
						7.62x54R	500	Gyrostab.			
						PG-7VL HEAT	5	IR Optics			
						RPG-26 HEAT	1	Smoke Launche			
						7.62x54R	>1k	Smoke Launche			
						5.45mm	>2k	Radio			
								Engine			

■ BMP-2K



The BMP-2K (K = "Komandirskaya", or "Command") is a command variant of the BMP-2. Extra communications gear has been installed in the form of more radios and, more recently in Russian service, a Constellation-2M satellite communications system. Externally the vehicle can be quickly recognized by the presence of an additional antenna.

Gunner	
Driver	
Command Vehicle	
30mm 2A42	
Weight 14.3 tons	
Speed	
Power	
Off-Road	
Turning	
AMMO	
AT-5A ATGM	4
30mm HE-I	340
30mm APDS	160
7.62x54R	500
PG-7VL HEAT	5
RPG-26 HEAT	1
7.62x54R	>1k
5.45mm	>2k
DAMAGE	
AT-5	
30mm Main	
7.62mm Coax	
Gyrostab.	
IR Optics	
Constellation2	
Smoke Launche	
Smoke Launche	
Radio	
DEFENSES	
AT-14 ATGM	
30mm HE	250
30mm HE-I	340
30mm APDS	160
7.62x54R	500
PG-7VL HEAT	5
RPG-26 HEAT	1
7.62x54R	>1k
5.45mm	>2k
AT-14	
AT-14	
AT-14	
AT-14	
30mm Main	
AGS-17	
7.62mm Coax	
Targeting	
Gyrostab.	

■ BMP-2M

The BMP-2M is a modernized variant of the BMP-2 usually sold as an export vehicle. The BMP-2M replaces the Konkurs ATGM with two 9M133 Kornet (AT-14) launchers mounted on either side of the turret. In addition, the BMP-2M is capable of salvo firing two missiles almost simultaneously at the target to increase the chances of a kill. An automatic grenade launcher is also fitted. The BMP-2M is equipped with modernized sights and fire control system. A modernized version of the Tucha smoke grenade is equipped, replacing the older black smoke that required extra time to form a screen with new bursting IR-blocking white smoke that forms a concealment screen almost immediately. Although still lightly armored, the presence of four AT-14 launchers makes this vehicle a lethal adversary to any battlefield opponent.

Two different versions of the BMP-2M are being produced by different factories. The version currently in Combat Mission is the "Berezok" version, while the other version is the "Kurganmashzavod", named after the factory that is producing it.

Gunner	
Driver	
Command Vehicle	
30mm 2A42	
Weight 14.3 tons	
Speed	
Power	
Off-Road	
Turning	
AMMO	
AT-14 ATGM	4
30mm HE	250
30mm HE-I	340
30mm APDS	160
7.62x54R	500
PG-7VL HEAT	5
RPG-26 HEAT	1
7.62x54R	>1k
5.45mm	>2k
DAMAGE	
AT-14	
AT-14	
AT-14	
AT-14	
30mm Main	
AGS-17	
7.62mm Coax	
Targeting	
Gyrostab.	
DEFENSES	
AT-14 ATGM	
30mm HE	
30mm HE-I	
30mm APDS	
7.62x54R	
PG-7VL HEAT	
RPG-26 HEAT	
7.62x54R	
5.45mm	

■ BMP-3

The BMP-3 is one of the newest additions to the BMP family of vehicles, and represents a significant upgrade from the BMP-1 and BMP-2 with an entirely new chassis. The BMP-3 began life as the chassis for a light tank prototype called the Obyekt 685. Although this tank did not enter service, the chassis was modified to become an infantry fighting vehicle, and the resulting BMP-3 entered service in 1987.

The BMP-3 is extremely heavily armed for an infantry fighting vehicle. The 2A70 100 mm rifled gun can fire low-velocity high explosive shells with devastating effect against soft targets and is fed by an autoloader. The 100 mm gun can also engage vehicles with the 9M117 (AT-10 Stabber) missile and "Basnya" ATGM system. To complement this gun the BMP-3 also sports a 2A72 30 mm autocannon fed with high explosive and armor piercing rounds for engaging lighter targets. Both are aimed using the SOZH gunner sight. Additionally, the Ainet fuse system allows the vehicle to airburst 100 mm HE-FRAG shells just above targets. Finally, the vehicle has three PKT medium machine guns, one mounted coaxially and two located in the bow which can be operated by the passengers.

For observation the BMP-3 is equipped with a TKN-3MB day/night sight, SOZH gunner's sight, and an IR searchlight. For protection the BMP-3 uses aluminum armor, with additional spaced armor on the front. Six modernized IR-blocking smoke grenade launchers and an automatic fire extinguisher are also equipped. Unlike most IFVs which have the engine in the front, the BMP-3's 500 hp UTD-29M engine is located in the right rear of the hull, underneath the troop compartment. This arrangement also provides a smoother ride for the passengers compared to the BMP-2. Like other Russian IFVs, the BMP-3 is amphibious with very little preparation, using a water jet for propulsion.

Gunner		AMMO	DAMAGE	DEFENSES
Driver				
	IFV			
	100mm 2A70			
Weight	19.0 tons	100mm PPHE 40	100mm Main	
Speed		AT-10 ATGM 8	30mm Main	
Power		30mm HE-I 305	7.62mm MG	
Off-Road		30mm APDS 195	7.62mm MG	
Turning		7.62x54R >1k	7.62mm Coax	
		PG-7VL HEAT 5	Targeting	
		RPG-26 HEAT 1	IR Optics	
		7.62x54R >5k	Autoloader	
		5.45mm >2k	Smoke Launcher	

■ BMP-3K

The BMP-3K is a command variant of the BMP-3. Extra communications gear has been installed in the form of more radios and, more recently, a Constellation-2M satellite communications system. Externally the vehicle can be quickly recognized by the presence of an additional antenna and the lack of the bow machine guns.

Gunner		AMMO	DAMAGE	DEFENSES
Driver				
	Command Vehicle			
	100mm 2A70			
Weight	19.0 tons	100mm PPHE 40	100mm Main	
Speed		AT-10 ATGM 8	30mm Main	
Power		30mm HE-I 305	7.62mm Coax	
Off-Road		30mm APDS 195	Targeting	
Turning		7.62x54R >1k	IR Optics	
		PG-7VL HEAT 5	Autoloader	
		RPG-26 HEAT 1	Constellation2	
		7.62x54R >5k	Smoke Launcher	
		5.45mm >2k	Smoke Launcher	

■ BMP-3M



The BMP-3M is a modernized variant of the BMP-3 and the most advanced Russian IFV currently in service. Numerous electronic and observation systems have been upgraded, including a SOZH-M gunner's sight, Vesna-K thermal imager, TKN-AI commander's vision device, and Constellation-2M satellite communications system. Extra armor has been added to the vehicle sides for protection against .50 caliber armor-piercing rounds. Mobility has been improved with a 660 hp UTD-32 engine.

ERA Variant: The BMP-3M can be equipped with Explosive Reactive Armor (ERA) blocks over the sides and front. The vehicle retains its amphibious capability.

	Gunner		Driver
	IFV		AMMO
100mm 2A70	100mm PPHE AT-10 ATGM 30mm HE-1 30mm APDS 7.62x54R	40 8 305 195 >1k	100mm Main 30mm Main 7.62mm MG 7.62mm MG 7.62mm Coax
Weight Speed Power Off-Road Turning	19.0 tons PG-7VL HEAT RPG-26 HEAT 7.62x54R 5.45mm	5 1 >5k >2k	Targeting IR Optics Autoloader Constellation2

Shtora Variant: The BMP-3M can be equipped with the Shtora electro-optical jammer system.

Arena Variant: BMP-3Ms can be equipped with the Arena active protection system. Arena is the successor to the Drozd system, which was developed in the 1970s in response to the RPG threat in Afghanistan. Experiences against RPGs in Chechnya prompted Russia to develop the Arena system, which can be mounted on tanks and the BMP-3M.

Gunner		AMMO	DAMAGE	DEFENSES
Driver		100mm PPHE 40 AT-10 ATGM 8 30mm HE-I 305 30mm APDS 195	100mm Main 30mm Main 7.62mm MG 7.62mm MG	
	IFV	Weight 19.0 tons Speed 7.62x54R Power PG-7VL HEAT 5 Off-Road RPG-26 HEAT 1	7.62mm Coax Targeting IR Optics Autoloader	
	100mm 2A70	Turning 7.62x54R >1k 5.45mm >5k >2k	Constellation2	

■ 9P157-2 Khrizantema-S

The 9P157 is an advanced Russian tank destroyer based on the BMP-3 hull and has been in service since 2005. The vehicle 9P157 fires the 9M123 "Khrizantema" (AT-15 Springer) supersonic anti-tank guided missile. The Khrizantema was designed to destroy modern main battle tanks such as the Abrams, and has a tandem HEAT warhead with a penetration value of about 1,200 mm RHAe.

The 9P157 carries its missiles in pairs on launch rails that extend above the turretlss hull. After firing, the missiles are automatically reloaded from an internal magazine. Missiles can be guided by SACLOS and radar systems, and both missiles can be fired almost simultaneously in a dual salvo, giving the Khrizantema a better chance to punch through APS. The 9P157 is equipped with thermals, advanced optics, and a millimeter wave band radar system that allows it to detect and track targets through any weather and obscurants such as smoke.

Gunner		AMMO	DAMAGE	DEFENSES
Driver		9M123 ATGM 15	9M123 9M123 Targeting Radar	
	Tank Destroyer	Weight 19.0 tons Speed 7.62x54R Power 150mm 9M123 Off-Road Turning	Autoloader Constellation2 Radio Engine Wpn Controls	
	150mm 9M123			

■ BRM-1K



BRMs (Boevaya Razvedyvatelnaya Mashina, or "Combat Recon Vehicle") are highly modified combat reconnaissance variants of BMPs. The BRM-1K is based on the BMP-1 chassis. The BRM-1K is equipped with a variety of surveillance equipment, including laser rangefinders, radio direction finders, ground surveillance radar, WMD detection devices, night vision devices, and extra communications equipment including a mast antenna. Vehicle firepower is slightly downgraded with the deletion of the ATGM and most firing ports.

Gunner		Driver	Recon	AMMO	DAMAGE	DEFENSES
			73mm 2A28	73mm HE	10	73mm Main
				73mm HEAT	10	7.62mm Coax
Weight	13.2 tons			7.62x54R	500	Targeting
Speed				TBG-7V Therm	1	Radar
Power				PG-7VR	1	Constellation2
Off-Road				PG-7VL HEAT	5	Smoke Launche
Turning				7.62x54R	>1k	Smoke Launche
				5.45mm	>2k	Radio
						Engine

■ BRM-3K



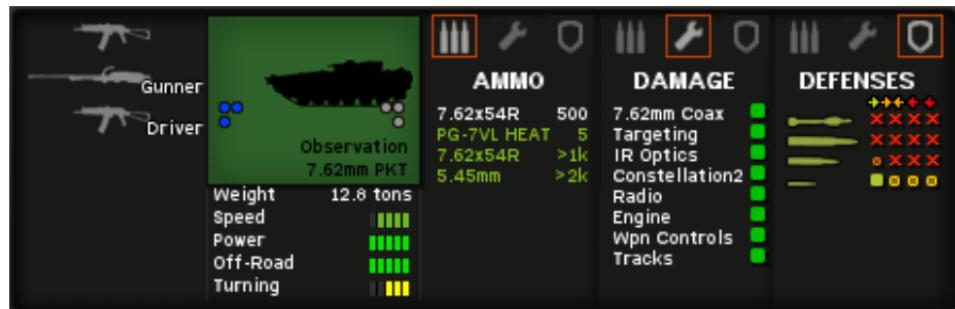
The BRM-3K is a combat reconnaissance version of the BMP-3 designed in the 1990s and intended to replace the BRM-1K. Like the BRM-1K, the BRM-3K sheds some weaponry and infantry carrying capacity in exchange for a suite of sophisticated sensors and communications equipment. Surveillance equipment includes the 1PN71 thermal sight, 1PN61 night vision sight, and a mast-mounted 1RL-33-1 ground surveillance radar. The vehicle is also fitted with navigation systems and communications systems for radio and data links. A modernized version of the Tucha smoke grenade is equipped, replacing the older black smoke that required extra time to form a screen with new bursting IR-blocking white smoke that forms a concealment screen almost immediately.

Gunner		Driver	Recon	AMMO	DAMAGE	DEFENSES
			30mm 2A72	30mm HE-I	400	30mm Main
				30mm APDS	200	7.62mm Coax
Weight	19.0 tons			7.62x54R	>2k	Targeting
Speed				TBG-7V Therm	1	Radar
Power				PG-7VR	1	Constellation2
Off-Road						Smoke Launche
Turning						Smoke Launche
						Radio
						Engine

■ PRP-4M



The PRP-4M is an artillery reconnaissance vehicle based on the BMP-1 chassis. The PRP-4 replaced the PRP-3 in the 1980s, and the PRP-4M is a further modernized variant developed in the late 1980s. PRPs are regularly assigned to anti-tank battalions and artillery regiments for target acquisition. The PRP-4M is equipped with extra communications and navigation equipment, including a 1PN71 thermal sight, laser rangefinders, ground surveillance radar. The PRP-4M is lightly armed, with only a PKT medium machinegun mounted in the turret.



■ Tunguska



The 9K22 Tunguska, known to NATO as the SA-19 Grison, is a Self-Propelled Anti-Aircraft (SPAA) system first fielded by the Soviet Union in 1982. The Tunguska is designed to protect motor rifle and tank brigades from low-flying enemy air assets such as aircraft, helicopters, and UAVs. The Tunguska began life in the 1970s as a replacement for the ZSU-23-4, after it was determined that 30 mm cannons (such as those found on the Tunguska) were much more effective at engaging enemy close attack aircraft than the 23 mm cannons on the ZSU. The Tunguska is equipped with dual 2A38 30 mm autocannons and eight ready-to-launch 9M311 Surface-to-Air Missiles (SAMs). The presence of two weapon systems gives the Tunguska more flexibility in engaging aerial targets, allowing it to engage short range targets with the faster guns (which also have the benefit of not being fooled by deployed countermeasures), and long range targets with missiles.

The Tunguska is a tracked armored vehicle, allowing it to keep pace with the frontline combat units that it is usually tasked to protect. The armor protection is light, but enough to protect the crew from small arms fire and shell splinters. Unlike most vehicles or Soviet design the vehicle is not amphibious, with a max fording depth of 1 m. The Tunguska is propelled by a V-46 turbocharged multi-fuel diesel engine and can reach speeds of 65 km/h on roads.

The 2A38 cannons fire alternately with a combined rate of fire at up to 5,000 rounds per minute, and are able to engage targets at ranges up to 4,000 m away and up to 3,000 m in altitude. Because the guns can depress to -10 degrees, they can also be used to attack ground targets, and can be used with devastating effect against lightly armored and infantry targets. Even tanks should respect the Tunguska's cannons, since their high rate of fire will quickly scour exposed subsystems such as optics from the tank's surface and quickly reduce the tank's combat effectiveness. The guns can be used in radar or optical guidance modes, allowing the gunner to either allow the radar system to automatically aim the guns or aim them himself with

a stabilized 1A29 optical sight. The optical sight is most useful for targets that the radar cannot easily acquire, such as ground targets and UAVs with minimal radar cross-sections.

The 9M311 missiles that complement the Tunguska's guns can be used to engage low flying aircraft and larger UAVs. The first 9M311 missiles had an effective range of about 8,000 m and altitude of 3,500 m. Newer versions of the Tunguska have thermal sights and upgraded missiles such as the 9M311-M1 which have increased that maximum range to 10,000 m, although the effective altitude remains the same.

■ BTR Armored Personnel Carrier



The BTR (Bronetransportyor, or "armored transporter") is an Armored Personnel Carrier (APC) that originated in the Soviet Union. BTRs were designed as a cheaper alternative to the BMP infantry fighting vehicle. The first mass-produced variants, the BTR-40 and BTR-152, proved to be inadequate during the Suez Crisis in the hands of the Egyptian Army. In response, the BTR-60 was developed. This design turned out to be highly successful and a major influence on APC design for years to come. Future iterations of the BTR, such as the BTR-70 and BTR-80 series, are essentially modified BTR-60 designs. The BTR has spawned dozens of specialized variants and modernized upgrades over its long service life.

Being an APC, the BTR is designed as more of a "battle taxi" that gives infantry a protected ride to the battlefield than as a fighting vehicle such as the BMP. Light armor provides protection against light small arms and shell splinters, while a turret mounted heavy machine gun or autocannon allows the BTR to defend itself against enemy light armored vehicles and infantry if necessary. The wheeled design gives the BTR excellent on-road mobility and a lighter logistical footprint than tracked vehicles. All variants of the BTR are amphibious.

■ BTR-70

The successor to the venerable BTR-60, the BTR-70 is a modernization of the BTR series that began service in 1972. Differences between the BTR-60PB and BTR-70 include heavier armor, puncture resistant tires, and redesigned side doors that allow passengers to exit the vehicle faster while providing them some protection as they exit. The turret sports a 14.5 mm KPVT heavy machine gun as the primary weapon and a coaxial PKT. Armor protection is light, but enough to protect crew and passengers from light small arms and shell splinters. The BTR-70 remains the primary BTR of the Ukrainian Ground Forces.

Gunner			AMMO	DAMAGE	DEFENSES
Driver					
		APC 14.5mm KPV			
Weight	11.5 tons		14.5mm AP-I 500	14.5mm MG	
Speed			7.62x54R 500	7.62mm Coax	
Power			PG-7VL HEAT 5	IR Optics	
Off-Road			RPG-22 HEAT 1	Radio	
Turning			7.62x54R >1k	Engine	
			5.45mm >2k	Wpn Controls	
				Wheels	

■ BTR-70K

A command vehicle variant of the BTR-70, with additional radios and antennas.

Gunner			AMMO	DAMAGE	DEFENSES
Driver					
		APC 14.5mm KPV			
Weight	11.5 tons		14.5mm AP-I 500	14.5mm MG	
Speed			7.62x54R 500	7.62mm Coax	
Power			PG-7VL HEAT 5	IR Optics	
Off-Road			RPG-26 HEAT 1	Radio	
Turning			7.62x54R >1k	Engine	
			5.45mm >2k	Wpn Controls	
				Wheels	

■ BTR-4E

The BTR-4E is Ukraine's modern take on the BTR platform, designed by the Kharkiv Morosov Machine Building Design Bureau. The BTR-4 represents a major departure from the previous BTR conventions. The turret has been replaced with a space for a Remote Weapon Station (RWS), allowing the BTR gunner and commander to observe and fire the weapons from a higher elevation while remaining safely within the hull. A variety of RWS modules can be fitted, in this case the BM-7 Parus. The module is heavily armed for a BTR, with a 30 mm autocannon, coaxial PKT, AGS-17 automatic grenade launcher, and two Barrier ATGM launchers. The Parus is also equipped with a commander's independent day/night video camera, gunner's day/night sight, laser rangefinder, and fire control system.

The hull of the vehicle has also undergone major changes, with the unconventional Soviet hull layout being replaced with a western design. The engine and transmission have been moved to the middle, with the troop compartment at the rear. Unlike a normal turret, the RWS does not extend into the vehicle, allowing for a larger passenger compartment. Passengers exit the vehicle through rear doors and roof hatches. The 3TD diesel engine can reach top speeds of 110 km/h on roads, and the vehicle is amphibious.

Gunner					
Driver					
		APC 30mm 2A72			
Weight	17.5 tons	Barrier ATGM	2	Barrier	
Speed		30mm HE	149	Barrier	
Power		30mm HE-I	180	30mm Main	
Off-Road		30mm APDS	180	AGS-17	
Turning		7.62x54R	>1k	7.62mm Coax	
		PG-7VL HEAT	5	Targeting	
		RPG-22 HEAT	1	Gyrostab.	
		7.62x54R	>1k	Cmdr video	
		5.45mm	>2k	IR Optics	

■ BTR-80 Armored Personnel Carrier

The BTR-80 Armored Personnel Carrier (APC) is the newest mass-produced member of the BTR family that replaced the BTR-60 and BTR-70 in Russian service beginning in 1986. The BTR-80's design is based on the BTR-70 hull. The turret has been modified to allow weapons to reach a higher maximum elevation of 60 degrees, giving the vehicle more flexibility in engaging targets in urban and mountainous terrain. This turret houses a 14.5 mm KPVT heavy machine gun and a coaxial 7.62 mm PKT machine gun, which the gunner can aim with a daytime optical sight or a night sight with infra red search light.

The twin gasoline engines have been replaced with a more powerful single turbocharged V-8 diesel 260 hp engine, and the engine compartment has been reconfigured to allow this. This new engine allows the BTR-80 to reach speeds up to 90 km/h on roads. The passenger compartment has also received some modifications, with redesigned side doors that provide some protection from the front for dismounting soldiers as well as reconfigured internal firing ports for easier use.

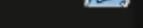
■ BTR-80A

The BTR-80A is a BTR-80 fitted with the upgraded BPPU turret. This turret features a 30 mm 2A72 gun that replaces the 14.5 mm KPVT, as well as new optics in the form of the 1PZ-9 day sight and the TPN-3 night sight.

	Gunner		Driver
	APC		AMMO
	30mm 2A72		30mm HE-I 150
			30mm APDS 150
			7.62x54R 500
			PG-7VLM HEAT 5
			PG-26 HEAT 1
			5.45mm >1k
			5.45mm >2k
	Weight 13.6 tons		Speed
			Power
			Off-Road
			Turning
	DAMAGE		DEFENSES
	30mm Main		30mm Main
	7.62mm Coax		7.62mm Coax
	IR Optics		IR Optics
	Smoke Launcher		Smoke Launcher
	Radio		Radio
	Engine		Engine
	Wpn Controls		Wpn Controls
	Wheels		Wheels

■ BTR-80AK

A command variant of the BTR-80A, fitted with extra communications equipment.

 Gunner	 Driver	 Command Vehicle	 AMMO	 DAMAGE	 DEFENSES
		30mm 2A72	30mm HE-I 150 30mm APDS 150 7.62x54R 500 PG-7VL HEAT 5 RPG-26 HEAT 1 7.62x54R >1k 5.45mm >2k	30mm Main 7.62mm Coax IR Optics Smoke Launche Smoke Launche Radio Engine Wpn Controls Wheels	    
Weight	13.6 tons				
Speed					
Power					
Off-Road					
Turning					

■ BTR-82

The BTR-82 is the latest production version of the BTR-80 in frontline Russian service. The BTR-82 boasts a variety of improvements and modernizations over the BTR-80. The vehicle was first publicly revealed in 2009, and officially began service in 2010.

The BTR-82 has slightly enhanced protection against heavy machine gun rounds, as well as a spall liner to further protect crew and passengers. A double hull has been added for additional protection against mines, and an automatic fire extinguisher system has been installed. A modernized version of the Tucha smoke grenade is equipped, replacing the older black smoke that required extra time to form a screen with new bursting IR-blocking white smoke that forms a concealment screen almost immediately.

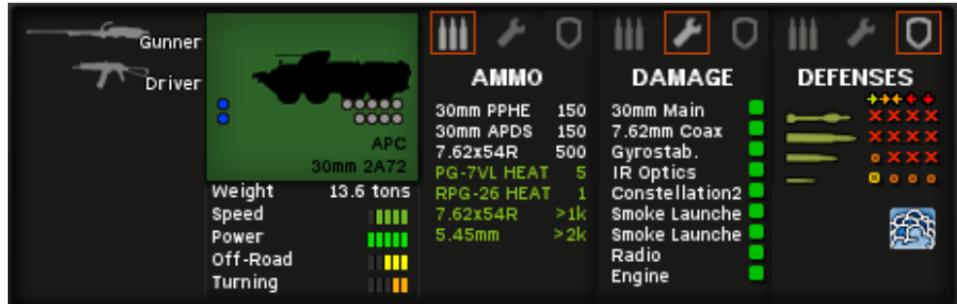
The BTR-82 is equipped with the new BPPU turret, although it retains its original armament unlike the BTR-82A (see below). The night vision device has been replaced with a modern TKN-4GA sight and a GLONASS navigation system has been installed. Mobility has been improved with a new transmission, suspension, and a 300 hp engine, giving the BTR-82 a maximum road speed of 100 km/h.

 Gunner	 Driver	 APC	 AMMO	 DAMAGE	 DEFENSES
		14.5mm KPVT	14.5mm AP-I 500 7.62x54R 500 PG-7VL HEAT 5 RPG-26 HEAT 1 7.62x54R >1k 5.45mm >2k	14.5mm MG 7.62mm Coax Gyrostab. IR Optics Constellation2 Smoke Launche Smoke Launche Radio Engine	    
Weight	13.6 tons				
Speed					
Power					
Off-Road					
Turning					

■ BTR-82A

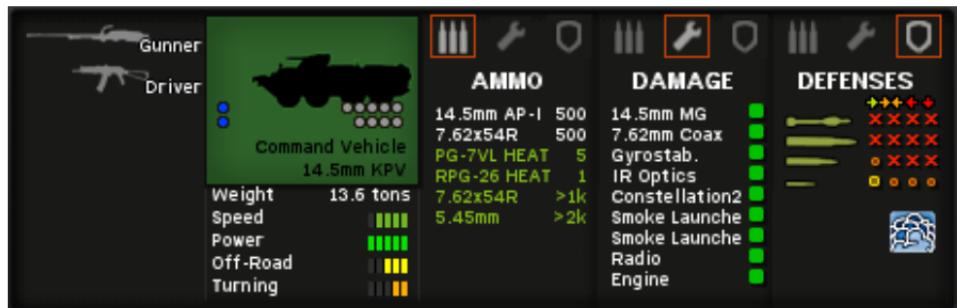
This is the same vehicle as the BTR-82, but with the much more capable 2A72 30 mm gun replacing the 14.5 mm KPVT heavy machine gun. The gun is dual-fed with HE-FRAG and

APDS-T rounds, with a maximum range of 2,000 m during the day. Additionally, a programmable fuse system allows the vehicle to airburst the 30 mm HE-FRAG shells just above targets, diminishing the value of cover such as walls.



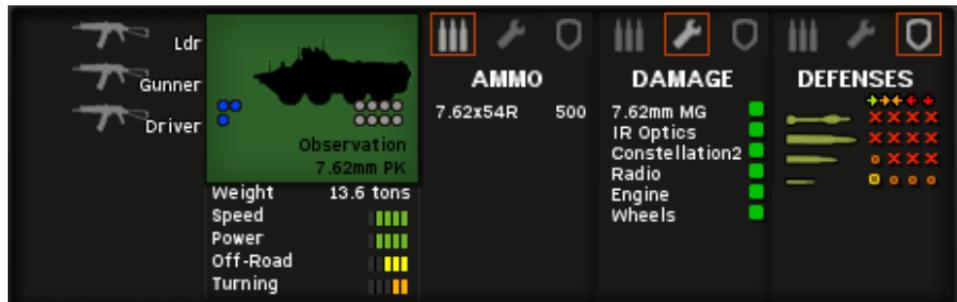
■ BTR-82K

A command variant of the BTR-82, fitted with extra communications equipment.



■ BTR-80 1V152

The 1V152 is a command and forward observer variant for Russian field artillery formations. This variant is equipped with additional equipment such as range finders, observation devices, GLONASS, and additional communications equipment for radio and data links. To make room for this additional equipment, turret weaponry is removed, the forward hull houses only a PKT 7.62 mm machine gun, and the vehicle has reduced passenger capacity.



■ MT-LB Armored Personnel Carrier



The MT-LB (Mnogotselevoi Tyagach - Legko Bronirovanny, or "multipurpose tower - light armored") is a versatile tracked light armored vehicle developed in the 1960s that has been in service around the world for almost five decades. The MT-LB is widely used as an armored auxiliary and towing vehicle in a wide variety of specialized roles, although it can also serve as an armored personnel carrier.

The vehicle typically has a crew of two, a driver and commander/gunner who sit in a separate compartment at the front of the vehicle. Behind them is the engine compartment, and behind that is the passenger compartment which can hold up to ten soldiers. The vehicle has a lightly armored welded steel hull, enough to protect the occupants from small arms and shell splinters. A small one-man turret at the front of the vehicle houses a 7.62 mm PKT machine gun for self defense.

The MT-LB is amphibious with little preparation, using the motion of its tracks to propel it in the water at up to 6 km/h. A 240 hp diesel engine gives the MT-LB a top speed of 61 km/h on roads. The MT-LB's low weight and tracks give it excellent off-road mobility due to low ground pressure, making it a useful APC for mountain infantry brigades and arctic units.

The MT-LB is used for a wide variety of utility roles, resulting in large amounts of specialized variants, many of which use a larger chassis known as the MT-LBu. It is also widely used as a tow vehicle for anti-tank guns and artillery. When needed, the MT-LB can also serve as an APC, fulfilling the same role as the BTR but with the off-road mobility of a fully tracked vehicle.

Gunner							
Driver							
APC							
7.62mm PKT							
Weight	11.9 tons						
Speed							
Power							
Off-Road							
Turning							
AMMO		DAMAGE		DEFENSES			
7.62x54R	>2k	7.62mm MG		PG-7VL HEAT	5	IR Optics	
PG-7VL HEAT	5	IR Optics		RPG-26 HEAT	1	Radio	
RPG-26 HEAT	1	Radio		7.62x54R	>1k	Engine	
7.62x54R	>1k	Engine		5.45mm	>2k	Tracks	
5.45mm	>2k	Tracks					

■ MT-LBM-6MA



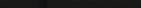
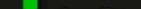
A modernized APC variant of the MT-LB, this vehicle has been fitted with a BTR-80 turret to replace the old MT-LB turret. This upgrades the weaponry to include a 14.5 mm KPVT heavy machine gun and a coaxial PKT 7.62 mm machine gun.

 Gunner	 Driver		 AMMO	 DAMAGE	 DEFENSES
			14.5mm AP-1 7.62x54R PG-7VL HEAT RPG-26 HEAT	500 >2k 5 1	14.5mm MG 7.62mm Coax IR Optics Smoke Launche Smoke Launche Radio Engine Wpn Controls Tracks
Weight	11.9 tons		7.62x54R 5.45mm	>1k >2k	
Speed					
Power					
Off-Road					
Turning					
					

■ MT-LBM-6MB



Another modernized APC variant, this time a BTR-80A BPPU turret has been fitted. The 2A72 30 mm cannon allows the MT-LB to defend itself against light armored vehicles.

 Gunner	 Driver	 APC 30mm 2A72	 AMMO	 DAMAGE	 DEFENSES
Weight	11.9 tons	30mm HE-1	150	30mm Main	
Speed		30mm APDS	150	7.62mm Coax	
Power		7.62x54R	>2k	IR Optics	
Off-Road		PG-7VL HEAT	5	Smoke Launche	
Turning		RPG-26 HEAT	>1k	Smoke Launche	
		5.45mm	>2k	Radio	
				Engine	
				Wpn Controls	
				Tracks	

■ 9P149 Shturm-S



The 9P149, or "Shturm-S", is a tank destroyer variant of the MT-LB assigned to anti-tank battalions and batteries. The vehicle is equipped with a 9K114 Shturm (known to NATO as the AT-6 Spiral) ATGM launcher. The Shturm is armed with 9M114 or 9M114M Kokon missiles and uses SACLOS VHF radio guidance instead of wire guidance to allow for faster and further travel. The missile has a maximum range of approximately 7,000 m and the HEAT warhead can penetrate up to 560-720 mm of armor (RHAe). This missile system is also commonly used by attack helicopters.

Gunner	
Driver	
Tank Destroyer	
130mm AT-6	
Weight	11.9 tons
Speed	
Power	
Off-Road	
Turning	
AMMO	
DAMAGE	
DEFENSES	
AT-6 ATGM	
12	
AT-6	
IR Optics	
Radio	
Engine	
Tracks	

■ 9K35 Strela-10M3



The 9K35 Strela-10 (SA-13 Gopher) is a Surface-to-Air Missile (SAM) variant of the MT-LB. The Strela is armed with 9M37M or 9M333 SAMs, which have a maximum engagement range of 5,000 m and a maximum engagement altitude of 3,500 m. The missiles use a optical/infra-red homing system with a triple channel guidance system to resist countermeasures. Laser proximity and contact fuses instruct the missile to detonate upon reaching the target, which can be enemy aircraft, helicopters, or UAVs.

The Strela is defenseless against ground vehicles and infantry, so be sure to protect it well!



■ 2S24



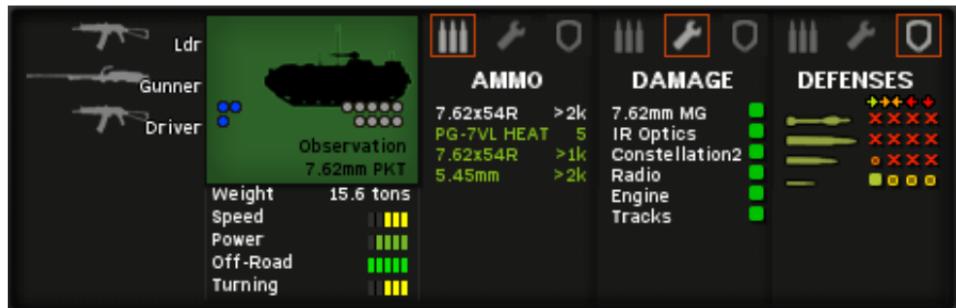
The 2S24 is a self-propelled mortar carrier variant of the MT-LB, with a heavily modified passenger compartment that carries the Podnos 82mm mortar, 83 mortar rounds, and mortar crew.



■ MT-LBu 1V14



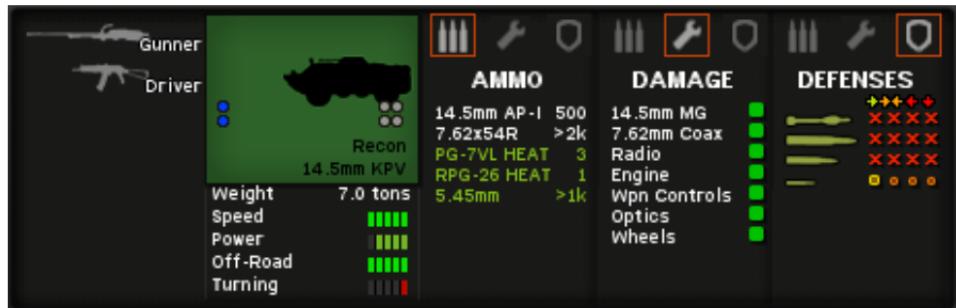
Using the larger chassis of the MT-LBu, the 1V14 is a battery command and forward observer variant. This variant is equipped with extra communication and observation equipment



■ BRDM-2 Armored Scout Car



The BRDM-2 (Boevaya Razvedyvatelnaya Dozornaya Mashina, or "Combat Reconnaissance Patrol Vehicle") is an armored scout car developed by the Soviet Union in the 1960s and used by Russia and other ex-Soviet Union states. Due to its simplicity, low cost, and ruggedness, the BRDM-2 is widely used across the world in a variety of roles, including utility, police, reconnaissance, antitank, and more. The BRDM-2 replaced the earlier BRDM-1, with the addition of a turret, better armament, day/night optics, and NBC protection. The armament is a 14.5 mm KPVT heavy machine gun with a 7.62 mm coaxial machine gun. Welded steel armor protects against small arms fire and artillery shell fragments. The BRDM-2 is amphibious, swimming at speeds up to 10 km/h.



■ BRDM-2M



A modernized version of the BRDM-2, this vehicle has had the GAZ-41 gasoline engine replaced with a diesel engine and six smoke grenade launchers fitted to the rear of the turret.

Gunner						
Driver						
			Recon			
			14.5mm KPV			
Weight	7.0 tons			14.5mm AP-I 500	14.5mm MG	
Speed				7.62x54R >2k	7.62mm Coax	
Power				PG-7VL HEAT 3	Smoke Launcher	
Off-Road				RPG-26 HEAT 1	Smoke Launcher	
Turning				5.45mm >1k	Radio	
					Engine	
					Wpn Controls	
					Optics	
					Wheels	

■ BRDM-2 (AT-5B)

Known to the Russian military as the 9P148, this variant of the BRDM-2 is armed with the 9M113 Konkurs (known to NATO as the AT-5 Spandrel) ATGM. The turret has been removed and a rack of five ATGMs is mounted above the hull. The rack is reloaded via a small hatch to the rear.

Gunner						
Driver						
			ATGM Vehicle			
			135mm AT-5			
Weight	7.0 tons			AT-5B ATGM 15	AT-5	
Speed					AT-5	
Power					AT-5	
Off-Road					AT-5	
Turning					AT-5	
					Radio	
					Engine	
					Wpn Controls	
					Optics	

■ BRDM-2M (AT-5B)

Like the BRDM-2M, this variant has a new diesel engine. However, without a turret there are no smoke grenade launchers.

Gunner						
Driver						
			ATGM Vehicle			
			135mm AT-5			
Weight	7.0 tons			AT-5B ATGM 15	AT-5	
Speed					AT-5	
Power					AT-5	
Off-Road					AT-5	
Turning					AT-5	
					Radio	
					Engine	
					Wpn Controls	
					Optics	

■ UAZ-469



The UAZ-469 is an all-terrain vehicle manufactured by UAZ starting in 1971. Widely used by the Soviet Union and Warsaw Pact since it began service, the UAZ continues to be manufactured and used today as a sturdy light truck that is able to drive in virtually any terrain. Technically UAZs in use today are most likely UAZ-3151s and -31512s, modernized versions developed in the 1980s. The vehicle is also used in the civilian and civil service sectors.



■ GAZ-2975 Tigr

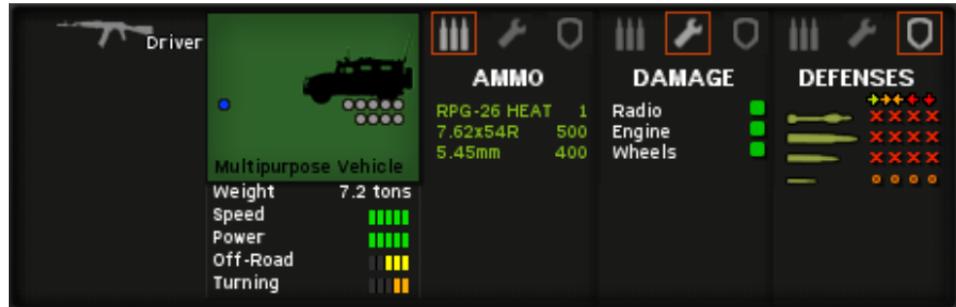


The GAZ-2975, commonly known as the "Tigr", is a modern 4x4 multipurpose infantry mobility vehicle adopted into service by the Russian Army beginning in 2006. Analogous in function and role to the American Humvee, the Tigr is designed to transport troops and equipment both on and off road in a variety of terrain and climates. The Tigr has a modular design that allows it to be adapted for a number of roles. The Tigr is currently used in Russia mostly by Special Forces, reconnaissance, and Ministry of the Interior forces.

Light armor provides moderate protection against small arms fire and a variety of available engines allow for top speeds of 140 km/h on roads and 80 km/h off-road. Automatic tire inflation allows the driver to adjust tire air pressure for different terrain types. Other features include power steering, independent all-wheel torsion suspension, hydraulic shock adapters, and an automatic fire suppression system in the engine compartment. The Tiger has a generous cargo capacity, carrying up to half a ton of cargo or up to ten passengers. One passenger can stand in a roof hatch with a mounted weapon or their personal firearm.

MG Variant: A Tigr equipped with a PKP 7.62 mm machinegun.

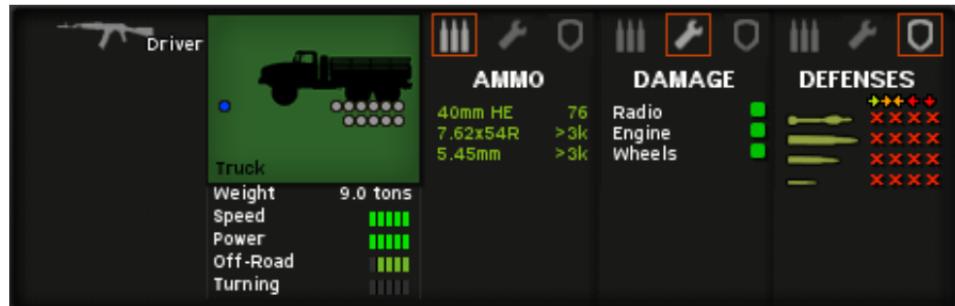
AGL Variant: A Tigr equipped with an AGS-17 automatic grenade launcher.



■ Ural-4320



The Ural-4320 is a 6x6 general purpose truck that has been in production since 1977. The Ural-4320 is designed to transport personnel and cargo both on-road and off-road. Reliable and easy to maintain, the Ural-4320 has a V-8 diesel engine, a 5-speed manual transmission, and 6x6 all wheel drive. The Ural can reach speeds of 82 km/h and carry up to 6,000 kg of cargo.



■ Russian and Ukrainian Ground Forces Small Arms

■ AK-74



The AK-74 is the service assault rifle used by the Russian and Ukrainian militaries. Designed by Mikhail Kalashnikov in the 1970s to replace the ground-breaking AK-47, the AK-74 first saw combat in Afghanistan in 1979. Since then the AK-74 has become a ubiquitous firearm across the world, and heavily fielded by former members of the Soviet Union.



The AK-74 is a development of the AKM, replacing the 7.62x39 mm round with a smaller 5.45x39 mm cartridge. Smaller rounds have allowed for better accuracy and automatic fire handling, and more ammunition can be carried. The AK-74 shares about half of its parts with the AKM, but has a new buttstock, handguard, and gas cylinder. In early versions of the AK-74, the furniture of the weapon is made from laminated wood, while later versions use dark fiberglass.

Some Ukrainian reconnaissance troops can be equipped with a special variant of the AK-74 for night-fighting. The AK-74N mounts the NSPU-3, a GEN II night vision rifle sight.

AK-74M variant: Beginning in the 1990s a modernization program for AK-74s in Russian service began. The result was the AK-74M, which features a number of upgrades over the older base model. The old fixed stock has been replaced with a new polyamide black side-folding stock. The versatility of the weapon has been increased with the addition of a side-rail bracket for mounting optics. Other improvements include a new muzzle device and dust cover. The AK-74M remains the standard service rifle of the Russian military, despite a number of successors that have not yet seen widespread service.

The AK-74M can be fitted with the 1PN93-1 night vision weapon sight. Night vision sights for weapons are much more commonly issued to Russian infantry than night vision goggles, so in Black Sea most Russian soldiers have night vision sights like the 1PN93 in lieu of night vision goggles.

Nations.....Ukraine (AK-74), Russia (AK-74M)
Cartridge.....5.45x39 mm

Action.....*Gas-operated, rotating bolt*
 Feed system.....*30 round box magazine*
 Rate of fire.....*Semi-automatic, automatic (650 rds/min)*
 Muzzle velocity.....*900 m/s*
 Effective range.....*500 m*

■ AK-74 w/ Grenade Launcher



AK-74s can be equipped with the GP-25, one of a series of underslung grenade launchers for AK assault rifles. The standard HE grenade for the GP-25 is the VOG-25, a 40 mm caseless grenade. Grenades are muzzle loaded into the weapon and held in place by a spring catch before firing. Russian AK-74Ms use the updated GP-30, which has similar characteristics compared to the GP-25 but uses lighter materials to reduce weight.

Nations.....Ukraine (GP-25), Russia (GP-30)
 Cartridge.....40 mm caseless grenade
 Action.....Single-shot
 Feed system.....Muzzle loaded
 Rate of fire.....5-6 rds/min
 Muzzle velocity.....76.5 m/s
 Effective range.....200 m

■ AKS-74



The AKS-74 is a lightweight version of the AK-74 that replaces the fixed stock with a skeletal side-folding metal stock. The AKS-74 is commonly used by soldiers that need a lighter rifle that can fold up to be more compact, such as armored vehicle crewmen, mountain infantry, air assault infantry, and airborne infantry.

■ AKS-74U



The AKS-74U is a carbine variant of the AK-74, used by soldiers who need to maneuver their weapon in tight spaces or carry a heavy load. As a compact version of an assault rifle, the weapon has had its fixed stock replaced with a skeletal folding stock and has a shorter barrel. Although much more maneuverable, the lower muzzle velocity of the AKS-74U makes it more of a personal defense weapon or submachine gun than an assault rifle. AKS-74Us are commonly carried by armored vehicle crewmembers and RPG-7 gunners. Like the AK-74M, the AKS-74U in Russian service can be equipped with the 1PN93-1 night vision sight for combat in low visibility conditions.

Cartridge.....5.45x39 mm
 Action.....Gas-operated, rotating bolt
 Feed system.....30 round box magazine
 Rate of fire.....Semi-automatic, automatic (700 rds/min)
 Muzzle velocity.....735 m/s
 Effective range.....400 m

■ SVD



Also known as the Dragunov, the SVD is a semi-automatic sniper and designated marksman rifle first produced in 1963. The Dragunov is

widely used among former Soviet Union and Warsaw Pact forces as a sniper rifle and a designated marksman rifle at the squad and platoon level. The SVD was designed as a long range squad support weapon to complement shorter ranged assault rifles in the rifle platoon.

Because of its primary role as a designated marksman rifle, the SVD has been designed to be well balanced and lightweight for maneuverability in battle, and semi-automatic instead of bolt action to allow for faster rate of fire. The SVD is also durable, cheap to produce, and accurate out to ranges of 800 m, longer if special ammunition is used. Most SVDs were manufactured with a wooden stock, but newer models have a synthetic polymer black stock. A PSO-1 telescopic sight with 4x magnification is fitted in such a way that iron sights can still be used. In Russian service a 1PN93-4 GEN III night vision weapon sight can be fitted for night operations.

<i>Cartridge</i>	7.62x54 mm R
<i>Action</i>	Gas-operated, rotating bolt
<i>Feed system</i>	10 round box magazine
<i>Rate of fire</i>	Semi-automatic
<i>Muzzle velocity</i>	830 m/s
<i>Effective range</i>	800 m

■ RPK-74

The RPK-74 is a 5.45x39 mm light machine gun based on the AK-74 designed to complement the assault rifle variant at the squad level.



Modifications to the weapon focus on delivering sustained and accurate automatic fire, including a longer and heavier barrel that can better withstand sustained automatic fire and a folding bipod for better stability. Other modifications include a modified gas system and return mechanism, as well as structural reinforcements to key points on the weapon.

The RPK-74 serves alongside the bipod-mounted PKM as the standard squad automatic weapon for Ukrainian rifle squads. An upgraded version of the RPK-74, the RPK-74M, is being replaced in frontline Russian units by the PKP Pecheneg. A night fighting version, labeled the RPK-74N and equipped with a NSPU-3 sight, is used by some Ukrainian recon troops.

<i>Cartridge</i>	5.45x39 mm
<i>Action</i>	Gas-operated, rotating bolt, closed bolt
<i>Feed system</i>	45 round box magazine
<i>Rate of fire</i>	Automatic (650 rds/min)
<i>Muzzle velocity</i>	960 m/s
<i>Effective range</i>	800 m

■ PKM

The PK is a 7.62 mm general-purpose machine gun widely used by Russia and Ukraine in a variety of roles. Most PKs in service today are PKMs, a lighter modernized version introduced in the late 1960s. The PKM has an integrated bipod and is fed with a non-disintegrating ammunition belt held within a metal box. When used with the bipod the PKM can be used as a squad automatic weapon. When equipped with a tripod for a more stable firing platform, the PKM is a medium machine gun that provides rifle platoons and companies with support fire (in this role, it is also known as the



PKMS). In Russian service, a 1PN93-3 GEN II+ night vision sight can be attached for night combat.

The PKT is a vehicle weapon variant, often found as a coaxial machine gun on armored vehicles. For this role the stock has been removed, the barrel has been substituted with a heavier version for better sustained fire, and an electric solenoid trigger is fitted for remote firing.

<i>Cartridge</i>	7.62x54 mm R
<i>Action</i>	Gas-operated, open bolt
<i>Feed system</i>	Linked 100, 200, or 250 round belt
<i>Rate of fire</i>	650-750 rds/min
<i>Muzzle velocity</i>	825 m/s
<i>Effective range</i>	800 m (bipod) 1,500 m (tripod)

■ PKP Pecheneg

The PKP "Pecheneg" is a modern squad automatic weapon modification of the PKM machine gun used by the Russian military. The PKP has recently replaced the RPK-74M as the standard squad automatic weapon in Russian front line units. The PKM barrel has been replaced with a heavier version that is non-detachable and is fitted with air cooling ribs. A new flash suppressor addresses the significant muzzle blast from the PKM. The bipod has been moved closer to the muzzle, granting better stability and accuracy for aimed fire. For night combat a 1PN93-3 GEN II+ night vision sight can be attached.



<i>Cartridge</i>	7.62x54 mm R
<i>Action</i>	Gas-operated
<i>Feed system</i>	Linked 100, 200, or 250 round belt
<i>Rate of fire</i>	600-800 rds/min
<i>Muzzle velocity</i>	825 m/s
<i>Effective range</i>	800 m (bipod) 1,500 m (tripod)

■ Makarov PM

The PM (Pistolet Makarova, meaning "Makarov's Pistol") Makarov is a semi-automatic pistol that has been in service since the 1950s. The Soviet firearms designer Nikolai Makarov adapted the German Walther Ultra to produce a pistol that would replace the WW2-era Tokarev TT-33 and Nagant M1895. The Makarov has had a long service life due to its balance of simplicity, reliability, and stopping power. In the Russian military the Makarov PM has been officially replaced by the MP-443 Grach (or Yarygin PYa) as the standard service pistol, but in practice the PM is still the primary service pistol for most Russian military units due its abundance compared to the MP-443.



<i>Cartridge</i>	9x18 mm Makarov
<i>Action</i>	Blowback
<i>Feed system</i>	8 round box magazine
<i>Rate of fire</i>	Semi-automatic
<i>Muzzle velocity</i>	315 m/s
<i>Effective range</i>	50 m

■ Russian and Ukrainian Ground Forces Special Weapons

■ RPG-7V1 and RPG-7V2



Easily the most widely used and influential shoulder-launched anti-armor weapon in the world, the RPG-7 is a portable anti-tank rocket propelled grenade launcher. The RPG-7 began service in 1961 in the Soviet Army, and replaced the RPG-2. The RPG-7 is famous for being simple to operate, cheap to produce, and reliable, while its effectiveness against armored vehicles has managed to keep pace with armor advancements through a series of upgraded warheads.

The design of the RPG-7 is simple and effective. An open-ended steel tube with wood wrappings for heat protection accepts a rocket-propelled grenade from the front end. Only part of the grenade inserts into the tube, with the warhead itself protruding from the tube front. The weapon is aimed with a PGO-7 2.7x optical sight or with backup iron sights. For night operations a 1PN93-2 GEN II+ night vision sight can be attached. A booster charge ejects the grenade from the tube, and after 10 meters a rocket motor ignites, carrying the grenade to its target aided by stabilizing fins. The RPG-7 is a recoilless weapon, resulting in no recoil for the shooter due to the open back end of the tube.

Warheads for the RPG-7s grenade have been upgraded throughout its service life as armored vehicles have become better protected. The most common warhead currently used by the Ukrainian Ground Forces is the PG-7VL, introduced in 1977. This 93 mm HEAT warhead is effective against most armored vehicles, and is a potentially lethal threat to any vehicle (even the Abrams) if it can hit the sides or rear. The HEAT warhead is also effective against enemy infantry.

The latest grenade used by Russian forces (and in small numbers by Ukrainian forces) is the PG-7VR, introduced in 1988. This grenade uses tandem HEAT warheads to defeat Explosive Reactive Armor (ERA). A 64 mm secondary warhead strikes first, prematurely detonating any ERA blocks. Shortly afterwards the 105 mm primary warhead hits the base armor underneath. Several specialized grenades are also often carried in smaller quantities by Russian infantry. The TBG-7V grenade uses a thermobaric warhead especially suited for attacking infantry in buildings or other structures. The OG-7V is a fragmentation warhead that is also specialized for attacking infantry targets.

The RPG-7 can be fired indoors in large rooms due to its two-stage propulsion system. However, the backblast can still be dangerous so care must be taken; your soldiers will suffer a small amount of suppression from firing RPG-7s indoors in Combat Mission.

Nations.....Ukraine (RPG-7V1),

.....Russia (RPG-7V2)

Effective range.....200 m (point target)

.....1,000 m (area target)

Muzzle velocity.....115 m/s

Armor Penetration....PG-7VL: 500 mm,

.....PG-7VR: 600-750 mm



■ RPO-A Shmel



The RPO-A "Shmel" is a man-portable rocket launcher. The disposable tube contains a 93 mm thermobaric rocket that is optimized for use



against infantry targets in hard cover such as buildings or bunkers. The RPO-A is not very effective against armored vehicle targets and should be reserved whenever possible for infantry targets in urban terrain.

Effective range.....250 m (point target), 1,000 m (area target)

■ RPO-M Shmel



A modernization of the RPO-A, the RPO-M has been upgraded with a reusable launch tube, improved handling, and a new rocket that increases range and accuracy.

*Effective range.....300 m (point target),
.....1,700 m (area target)*



■ AGS-17



The AGS-17 is an automatic grenade launcher of Soviet origin. Originally designed to counter hypothetical Chinese human wave attacks, the AGS-17 first saw combat in Afghanistan where it became a popular ground support weapon for infantry. When used as an infantry support weapon, the AGS-17 is fired from a tripod. It is also commonly mounted on vehicles as a defensive or secondary weapon. Like other automatic grenade launchers, the AGS-17 is brutally effective against infantry or unarmored vehicles, and moderately effective against lightly armored vehicles.

*Cartridge.....30x19 mm
Action.....Blowback
Feed system.....30 grenade
.....linked belt
Rate of fire.....400 rds/min
Effective range.....1,700 m*



■ AGS-30



The AGS-30 is a Russian modernization of the AGS-17 automatic grenade launcher. The AGS-30 is significantly lighter than its predecessor, weighing 15 kg less than the AGS-17. New GDD-30 grenades give the AGS-30 an increased maximum range over the AGS-17.

*Cartridge.....30x19 mm
Action.....Blowback
Feed system.....30 grenade
.....linked belt
Rate of fire.....400 rds/min
Effective range.....2,100 m*



■ RPG-22



The RPG-22 is a disposable anti-tank rocket launcher based on the design of the RPG-18. The RPG-22 uses a single-stage rocket with a 72.5 mm HEAT warhead. The RPG-22 is commonly carried as a lighter anti-tank alternative to the RPG-7 by Ukrainian soldiers who cannot afford to lug around a RPG-7 along with its multiple grenades. The RPG-22 has a dangerous backblast and may suppress or injure troops who use it indoors.

*Effective range.....200 m
Armor Penetration.....400 mm RHAe*



■ RPG-26



The RPG-26 is a disposable anti-tank rocket launcher. The RPG-26 uses a single-stage rocket with a 72.5 mm HEAT warhead. The RPG-26 is commonly carried as a lighter anti-tank alternative to the RPG-7 by Russian soldiers who cannot afford to lug around a RPG-7 along with its multiple grenades. The RPG-26 has a dangerous backblast and may suppress or injure troops who use it indoors.

*Effective range.....250 m
Armor Penetration.....440 mm RHAe*



■ SPG-9



The SPG-9 is a 73 mm recoilless, smooth-bore, breach loaded man portable antitank weapon that fires a variety of anti-armor and anti-personnel ammunition. The SPG-9 can be carried fully assembled over short distances, however usually it is broken down and carried in its component pieces due to weight.

The SPG-9 has a rate of fire of 6 rounds per minute and can fire either HE against soft targets or HEAT against hard/armored targets. The HE round has an effective range of about 2,500 m, though it can theoretically be used at much greater distances. The HEAT round can achieve 400 mm armor penetration at any range up to 800 m.



Armor Penetration.....PG-9N HEAVT: 400 mm, PG-9VNT Tandem HEAT: 550 mm

■ AT-4C / 9K111



The 9K111 Fagot (NATO reporting name AT-4 Spigot) is an Anti-Tank Guided Missile (ATGM) launcher developed in the 1960s to boost the anti-tank capability of Soviet BTR battalions. The missile system consists of a launch tube, missile, guidance box, sight, and tripod, which when complete weigh 22.5 kg. The latest missile developed is the 9M111M Faktoriya (AT-4C Spigot C) with an increased maximum range, and an improved HEAT warhead.

AT-4 missiles, like many ATGMs, are guided via Semi-Automatic Command to Line Of Sight (SACLOS), which means that an operator points a sighting device at the target while the missile is in flight, allowing the fire control system to guide the missile to the target. SACLOS guidance systems can be wire, radio, or beam-guided. Wire guidance systems deliver course corrections to the missile through a thin wire connecting the in-flight missile and launcher.

Radio guidance systems track the course of the missile through an IR strobe in the rear of the missile, and send flight path corrections to the missile via a radio signal. Both methods require that the operator keep the target in the weapon sights until the missile hits the target, making the launcher vulnerable to counter-fire until then. If the shooter can be incapacitated or the line of sight blocked before the missile hits the target, the missile will most likely miss.

Effective range.....75-2,500 m

Guidance system.....SACLOS,

.....wire-guided

Armor Penetration.....600 mm RHAe



■ AT-7 / 9K115



The 9K115 Metis (NATO reporting name AT-7 Saxhorn) is a man-portable ATGM launcher that is designed to be a lighter and more mobile version of the AT-4. The AT-7 is designed to support company-level operations, providing short range ATGM capability to infantry on the move. The AT-7 primarily differs from the AT-4 in having a lighter firing post and a missile with a smaller fuel load. The lighter fuel load results in a shorter maximum range. The entire system weighs 10.2 kg. The AT-7 uses a booster to eject the missile from the launcher, allowing it to be used in enclosed spaces with some careful positioning on the part of the operators. However, the backblast can still be dangerous so your soldiers will suffer a small amount of suppression from firing AT-7s indoors in Combat Mission.

Effective range.....40-1,000 m

Guidance system.....SACLOS,

.....wire-guided

Armor Penetration.....460 mm RHAe



■ AT-13 / 9K115-2



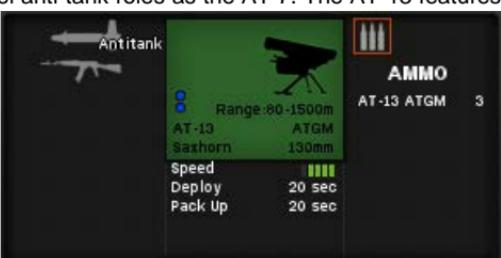
A modern replacement for the aging AT-7, the 9K115-2 Metis-M (NATO reporting name AT-13 Saxhorn-2) fulfills the same company-level anti-tank roles as the AT-7. The AT-13 features increased maximum range, better accuracy, and a significantly more lethal tandem HEAT warhead, while retaining light weight and mobility.

Effective range.....80-1,500 m

Guidance system.....SACLOS,

.....wire-guided

Armor Penetration.....950 mm RHAe



■ AT-14 / 9K135 Kornet



The stuff of nightmares for any tanker, the Kornet (NATO reporting name AT-14 Sprigyan) is an advanced ATGM designed by Russia in the late 1990s. The Kornet can be found in battalion-level ATGM platoons and is also equipped on the BMP-2M. The Kornet was specifically designed as a heavy ATGM for destroying main battle tanks. As with other Russian ATGM systems, the Kornet consists of an optical sight, launcher, and tripod. In addition the Kornet is equipped with a 1PN80 thermal sight. A powerful tandem HEAT warhead allows the Kornet to defeat ERA systems and can penetrate almost any armor. The newest missile variants feature a fire-and-forget capability that allows them to be salvo fired from vehicles such as the BMP-2M, providing the system with a better chance of defeating active protection systems.

Unlike most Russian ATGMs, the Kornet uses a laser beam riding SACLOS system instead of wire guidance. Flight adjustments for the missile are transmitted from the sighting device via a focused laser signal, which is then received by a special detector in the tail of the missile. Laser beams present advantages over older SACLOS methods because there is no wire to become fouled up in vegetation or structures, and the tightly focused signal is much harder to detect or disrupt by enemy systems. Additionally the length of the wire is no longer a factor, allowing for increased maximum range.

*Effective range.....100-8,000 m
 Guidance system.....SACLOS,
laser beam riding
 Armor Penetration.....1,000-1,200
mm RHAe*



■ Corsar



The Corsar is a Ukrainian light ATGM designed to replace the AT-7. The Corsar is a modern ATGM with excellent performance characteristics. The weight of the entire system including missile is 18 kg, allowing the operator to easily keep up with their fellow infantry. Unlike many other ATGMs, the Corsar is shoulder-fired, instead of being mounted on a tripod. The Corsar launches a 105 mm missile tipped with a tandem HEAT warhead.

*Effective range.....80-2,500 m
 Guidance system.....SACLOS,
laser beam riding
 Armor Penetration.....550 mm RHAe*



■ Skif



The Skif (export name, known as Stugna-P in Ukrainian service) is a man-portable ATGM system designed by Ukraine as a replacement for the aging 91K111 AT-4. Like many other ATGMs, the Skif is mounted on a tripod and acquires targets with a x16 optical sight or a thermal sight. The Skif fires the R-2 tandem HEAT missile, which is also used by the BTR-4.

Effective range.....100-5,000 m

Guidance system.....SACLOS,

.....laser beam riding

Armor Penetration.....800 mm RHA



■ Igla SA-18

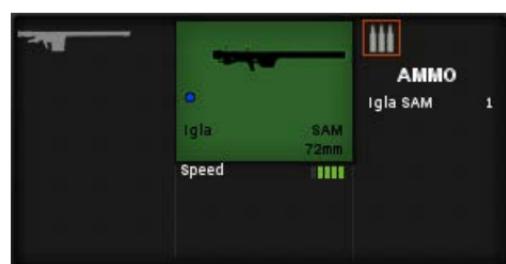


The 9K38 Igla (known as the SA-18 Grouse to NATO) is a Soviet-designed Man-Portable Air-Defense System (MANPADS). The Igla is shoulder-launched by a single operator, and fires a missile with a 1.17 kg HE warhead. The missile can reach speeds of 800 m/s (Mach 2.3) while a dual waveband infra-red guidance system guides it to the target. Maximum flight ceiling is 3,500 m.

Effective range.....5,200 m

Guidance system.....Infrared,

.....dual waveband



■ Igla-S SA-24



The Igla-S is an improved variant of the Igla, beginning service in 2004 in the Russian military. Known to NATO as the SA-24 Grinch, the Igla-S has a heavier 2.5 kg warhead, increased range, a better seeker, and improved resistance to countermeasures.

Effective range.....6,000 m

Guidance system.....Infrared,

.....dual waveband



■ MT-12 100 mm Anti-Tank Gun



The MT-12 is a 100 mm anti-tank gun developed by the Soviet Union in the 1950s. The MT-12 uses a setup reminiscent of World War 2 guns, with a gun shield and a split trail carriage. The gun is smoothbore instead of rifled, so the MT-12's ammunition is finned for accuracy. Although the MT-12 remains in Russian and Ukrainian service, it is outdated and is usually used now as an artillery piece. However, Ukrainian tank destroyer units continue to use the MT-12 in its original anti-tank role due to a shortage of more modern equipment.

MT-12K Variant: The MT-12K is an upgraded variant of the MT-12 that can fire ATGMs in addition to its 100 mm shells.



■ 2B14 82 mm Podnos



The 2B14 Podnos is a medium mortar used primarily by Russian and Ukrainian light infantry and airborne forces, although it can also be occasionally seen in service with mountain and motor rifle infantry battalions.

Effective range.....95-4,270 m (HE)

Rate of fire.....24-30 rds/min maximum



■ 2B11 120 mm Sani



The 2B11 Sani is the standard battalion-level mortar for Russian and Ukrainian motor rifle units. 2B11 mortars in Russian service can fire the Gran laser guided mortar round, allowing these mortars to fire precision fire missions.

Note: Russian and Ukrainian precision fire missions require a spotter that is equipped with a laser designator.

Effective range.....460-7,180 m (HE)

Rate of fire.....15 rds/min maximum



■ Russian and Ukrainian Ground Forces Artillery Support

■ MT-12 100 mm Gun



The MT-12 is an anti-tank gun. Although outdated as a direct-fire anti-tank weapon, the MT-12 still exists in large numbers and is sometimes used as an artillery piece.

Rate of fire.....4-6 rds/min



■ 2S34 Chosta 120 mm Self-Propelled Gun



The Chosta is a modernization of the 2S1 Gvozdika. Based on the MT-LB chassis, the Chosta features a new 120 mm 2A80-1 mortar gun and new fire control systems. Kitolov-2 laser guided high explosive ammunition is available for Russian 120 mm artillery, allowing this asset to fire precision fire missions.

Note: Russian and Ukrainian precision fire missions require a spotter that is equipped with a laser designator.

Rate of fire.....5 rds/min maximum, 1-2 rds/min sustained



■ 2S1 122 mm Self-Propelled Howitzer



The 2S1 Gvozdika ("Carnation" in Russian) is a self-propelled howitzer armed with a 122 mm 2A18 gun. Using a modified MT-LB chassis, the 2S1 has a 360 degree traverse turret added which houses a gun modified from the towed D-30 howitzer. Kitolov-2M laser guided high explosive ammunition is available for Russian 122 mm artillery, allowing this asset to fire precision fire missions.

Rate of fire.....5 rds/min maximum, 1-2 rds/min sustained



■ 2A65 152 mm Howitzer



The 2A65 Msta-B is a towed 152 mm howitzer that has been in service since the late 1980s. The howitzer weighs 6,800 kg and uses a crew of up to eleven soldiers. The 2A65 uses a conventional split trail carriage and has an armored shield. Russian 152 mm artillery have the Krasnopol laser guided HE shell available, allowing these assets to perform precision fire missions.

Note: Russian and Ukrainian precision fire missions require a spotter that is equipped with a laser designator.

Rate of fire.....8 rds/min maximum, 1 rds/min sustained

■ 2S19 152 mm Howitzer



The 2S19 Msta-S is the self-propelled counterpart to the 2A65 howitzer.

The 2S19 uses a modified T-80 tank hull with a new turret added. This turret houses the same gun as the 2A65 howitzer. Other equipment included is a semi-automatic laying system, an automatic loader, and smoke grenades.

Rate of fire.....6-8 rds/min maximum, 1 rds/min sustained

■ 2S19M1 152 mm Howitzer



A modernized version of the 2S19 with an automatic laying system and GLONASS satellite navigation system.

Rate of fire.....6-8 rds/min maximum, 1 rds/min sustained

■ 2S19M2 152 mm Howitzer



A further modernized version with a new automatic fire control system and digital maps.

3	2A65	152mm Howitzer
152mm HE	90	
Krasnopol-M HE	6	
152mm WP	30	

3	2S19	152mm Howitzer
152mm HE	90	
Krasnopol-M HE	6	
152mm WP	30	

3	2S19M1	152mm Howitzer
152mm HE	90	
Krasnopol-M HE	9	
152mm WP	30	

3	2S19M2	152mm Howitzer
152mm HE	90	
Krasnopol-M HE	9	
152mm WP	30	

■ 2S3M1 152 mm Howitzer



The 2S3 Akatsiya is a 152 mm self-propelled howitzer. The 2S3 uses a modified Object 123 chassis. The same gun as the D-20 howitzer is used. Like other Russian self-propelled artillery, the 2S3 is fully enclosed in armor and has a 360 traverse turret. The M1 is a modernized variant with new fire control equipment and sights.

Rate of fire.....4 rds/min maximum, 1 rds/min sustained

2S3M1	152mm Howitzer
152mm HE	138
Krasnopol-M HE	6
152mm WP	30

■ 2S3M2 152 mm Howitzer



A further modernized variant of the 2S3 with an automatic fire control system, smoke grenade launchers, and GLONASS satellite navigation system.

Rate of fire.....4 rds/min maximum, 1 rds/min sustained

2S3M2	152mm Howitzer
152mm HE	138
Krasnopol-M HE	9
152mm WP	30

■ 2S7M Mialka 203 mm Howitzer



The 2S7M is a 203 mm self-propelled heavy howitzer, the largest conventional artillery piece currently in Russian or Ukrainian service. The blast from firing the 203 mm gun is so powerful that the crewmen must shield themselves from the concussive wave or risk injury. The Mialka is a modernized variant, with a new fire control system and increased ammunition load.

Rate of fire.....2.5 rds/min

2S7M Mialka	203mm Gun
203mm HE	60

■ Russian and Ukrainian Ground Forces Air Support

■ Mi-24P Hind F

The Mi-24, known by the NATO reporting name of "Hind", was the first helicopter to enter service with the Soviet Air Force as a combination of assault transport helicopter and gunship; the Mi-24 can carry troops to the battlefield and act as an armored gunship during the same mission. The Hind can also be used in close air support, anti-tank, armed escort, and air-to-air combat.

The Hind developed on the basis of the Mi-8 propulsion system: two top-mounted turboshaft engines, a five-blade main rotor, and a three-blade tail rotor. Hind D and later variants have a tandem "double bubble" cockpit for the pilots. Behind the cockpit is a troop compartment with seating for eight troops or space for cargo. Two stub wings with weapon hardpoints are mounted on the middle of the helicopter, which can be loaded with a variety of weapon loadouts based on the mission, most commonly 80 mm rocket pods and 9K114 Shturm (AT-6 Spiral) ATGMs. A twin-barrel GSh-30-2 30 mm cannon is located on the chin. The Hind fuselage is heavily armored, with all-around protection from up to .50 caliber heavy machine gun bullets. The pilots sit in a titanium-armored tub topped with ballistic glass.

The Hind exists in dozens of variants due its versatility and worldwide use. The Mi-24P is the earliest variant of the Hind F model. The Hind F replaced the 12.7 mm machine gun with the 30 mm twin-barrel cannon.

■ Mi-24PM Hind F

An upgraded Mi-24P, with improved avionics, communications gear, and new wings.

	Mi-24P Hind F	Attack Helicopter		Mi-24P Hind F	Attack Helicopter
30mm HE	250	30mm HE	250	AT-6 ATGM	2
AT-6 ATGM	2	AT-6 ATGM	8	80mm HEAT	40
80mm HEAT	40				

■ Mi-24PN Hind F

The Mi-24PN is the Russian military's newest standard attack helicopter variant. A night flying version, the Mi-24PN features TV and FLIR cameras, rotor blade and wing modifications borrowed from the Mi-28 Havoc, and fixed landing gear.

	Mi-24PM Hind F	Attack Helicopter		Mi-24PM Hind F	Attack Helicopter
30mm HE	250	30mm HE	250	AT-6 ATGM	4
AT-6 ATGM	4	AT-6 ATGM	8	80mm HEAT	40
80mm HEAT	40				

	Mi-24PN Hind F	Attack Helicopter		Mi-24PN Hind F	Attack Helicopter
30mm HE	250	30mm HE	250	AT-6 ATGM	4
AT-6 ATGM	4	AT-6 ATGM	8	80mm HEAT	40
80mm HEAT	40				

■ Mi-28N Havoc



The Mi-28 (NATO reporting name "Havoc") is a Russian dedicated attack helicopter. Development of the Mi-28 began in the 1970s, but the program was beset with cancellations and delays due to changing priorities and competition with the Kamov Ka-50 helicopter. The Havoc finally entered service in 2006 as the Mi-28N, an anti-tank attack helicopter. The "N" variant is a night flying version equipped with FLIR thermal systems and mast radar.

The Havoc uses a conventional modern attack helicopter setup. The Havoc has a slender fuselage and tandem cockpits. The pilot has a helmet mounted display that follows their gaze and allows them to designate targets for the weapons officer. A nose-mounted integrated surveillance and fire control system contains optics, television, and laser rangefinder. Composite plastic rotors resist direct hits from up to 30 mm cannon, and the armored cockpit can withstand hits from .50 caliber bullets. Two mid-mounted stub wings mount weapon hardpoints for 9M120 Ataka (AT-9 Spiral-2) ATGMs and S-13 122 mm unguided rockets, the Havoc's chin mounts a 30 mm 2A42 autocannon.

	Mi-28N Havoc	Attack Helicopter
30mm APDS	250	
AT-9 ATGM	16	
122mm HE	10	

■ Ka-52 Alligator



The Ka-52 Alligator (NATO reporting name "Hokum B") is a two-seat variant of the Ka-50 attack helicopter. As a modern attack helicopter, the Ka-52 is to be fast, agile, and armed with weaponry capable of destroying enemy tanks and infantry. To aid its mission the helicopter is equipped with FLIR, radar, a two seat side-by-side cockpit, and digital communication systems for relaying target data.

	KA-52 Alligator	Attack Helicopter
30mm APDS	460	
80mm HEAT	40	
Vikhr 130mm ATGM	12	

Protective measures include a warning receiver and countermeasures for SAMs, while the cockpit and vital systems are protected by armor plating. The Ka-52 lacks tail rotor blades, and instead uses an unusual coaxial rotor configuration where two large rotors are located one atop the other on top of the helicopter, rotating in opposite directions. Armament includes 9K121 Vikhr ATGMs, 80 mm S-8 rockets, and a 2A42 30 mm autocannon with 460 rounds. The Ka-52 also holds the distinction of being the first operational helicopter to include a pilot ejection system.

■ Su-24M Fencer D



The Sukhoi Su-24 (known to NATO as the Fencer) is an all-weather attack aircraft developed in the 1970s by the Soviet Union. The Fencer was designed to attack ground and naval targets with precision air strikes. The design includes variable-sweep wings and a two seat side-by-side cockpit. Hardpoints underneath the aircraft can be equipped with up to 8,000 kg of ordnance, including bombs or Kh-25ML air-to-ground missiles.

	Su-24M Fencer D	Ground Attack		Su-24M Fencer D	Ground Attack
30mm HE	500	30mm HE	500	30mm HE	500
500kg bomb	2	500kg bomb	2	500kg bomb	2
1525kg bomb	2	Kh-25ML ATGM	2	Kh-25ML ATGM	2

The SU-24M, also called the "Fencer-D", was an upgrade program that began service in 1983. The aircraft has a longer fuselage to accommodate a new refueling probe and attack radar.

setup. Other additions include a TV system, laser designator, inertial navigation, and digital computer systems.

■ Su-24M2 Fencer D

A further modernization of the Su-24M, the M2 variant features new navigation and weapons control systems along with a new HUD.

Su-24M2 Fencer D	Ground Attack	Su-24M2 Fencer D	Ground Attack
30mm HE	500	30mm HE	500
500kg bomb	2	500kg bomb	2
1525kg bomb	2	Kh-25ML ATGM	2

■ Su-25 Frogfoot

The Sukhoi Su-25 is a single-seat, twin-engine jet aircraft developed in the Soviet Union. It was designed to provide close air support for the Soviet Ground Forces. It is heavily armored and easy to service.

The Su-25 is armed with one twin barrel 30 mm gun in the bottom of the fuselage with 250 rounds. There are eight pylons under the wings which can carry up to 4,000 kg of air-to-ground weapons, including 122 mm rockets, 515 kg bombs, and Kh-25ML ATGMs. The Su-25 has an integrated GSh-30-2 30 mm cannon with 250 rounds.

Su-25 Frogfoot	Ground Attack	Su-25 Frogfoot	Ground Attack
30mm HE	250	30mm HE	250
266kg bomb	4	515kg bomb	2
122mm HE	10	122mm HE	10

■ Su-25SM Frogfoot

The three SM versions of the Su-25 are a modernization upgrade that began around the turn of the century. The SM program features both system upgrades and refurbishments to increase the service life of the Su-25 frame. A new digital computer system with navigation and attack systems is part of the upgrade, along with a new Head-Up Display (HUD), warning receivers, GLONASS, comms, and various other electronic systems.

Su-25SM Frogfoot	Ground Attack	Su-25SM Frogfoot	Ground Attack
30mm HE	250	30mm HE	250
515kg bomb	2	Kh-25ML ATGM	4
122mm HE	10		

■ Su-34 Fullback



The Su-34 is a Russian twin-seat fighter-bomber developed starting in the 1980s and began service in 2014. The Su-34 is able to fulfill a multitude of air, ground, or naval missions in all weather and environments.

The Su-34 shares much of its frame with the Su-27 Flanker, but has a new nose, forward fuselage, and cockpit. Twelve hardpoints allow for up to 12,000 kg of ordnance, and the GSh-30-1 autocannon Su-27 is retained.

Su-34 Fullback	Ground Attack	Su-34 Fullback	Ground Attack
30mm HE	180	30mm HE	180
500kg bomb	2	500kg bomb	2
1525kg bomb	2	Kh-25ML ATGM	4
Kh-25ML ATGM	2		

■ Russian and Ukrainian Ground Forces UAV Support

■ ZALA 421-08



The ZALA 421-08 is a micro UAV used by some Russian military and interior units. The ZALA weighs only 1.7 kg with a 0.8 m wingspan, and can be prepared for flight in three minutes. The ZALA can be used by Russian reconnaissance units to provide real time tactical intelligence, target acquisition, surveillance, and battle damage assessment. Propulsion is provided by a battery-powered electric motor, making the UAV very quiet even as it flies only 300-500 feet above the ground. Although the ZALA can fly higher, like other micro UAVs it must stay relatively close to the ground in order to provide usable imagery. The ZALA is also capable of automated flight while using GLONASS satellite navigation.



ZALA 421-08s are vulnerable to AAA fire while performing Observe missions, but cannot be attacked by SAMs. If the controller for the UAV is killed or incapacitated while the ZALA is in the air, the ZALA will be destroyed.

■ Pchela-1T



Also known as the Yakolev Pchela-1T, this is a UAV used by Interior and military forces for surveillance and by artillery brigades for observation and target acquisition. The Pchela can carry a variety of TV and infrared imaging payloads.



Pchelas are vulnerable to AAA and SAM fire while performing Observe missions.

■ Orlan-10



The Orlan-10 is a tactical UAV used by the Russian military. The Orlan-10 is catapult launched and can reach a cruising speed of 150 km/h to a flight ceiling of 5,000 m. The payload includes a photo camera, TV camera, and infrared imager.



The Orlan-10 is vulnerable to AAA and SAM fire while performing Observe missions.

■ ICONS AND REFERENCE

Combat Mission: Black Sea makes extensive use of various icons to allow the player to spot vital information in the game user interface at a glance. Below is a list of the most important icons used in the game and their description.

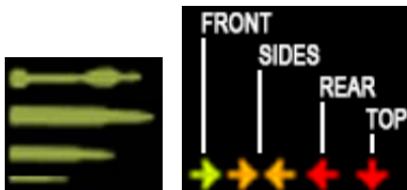
■ Vehicle Defenses Icons

HEAT warhead (e.g. ATGM, HEAT shell)

Large caliber (e.g. 120 / 125 mm tank shells)

Medium caliber (e.g. 25 / 30 mm auto cannon shells)

Small caliber (e.g. rifle, machinegun bullets)



- █ Excellent Defense
- █ Good Defense
- █ Average Defense
- █ Bad Defense
- █ Poor Defense



■ Defensive Equipment Icons

■ Active Protection System (APS)



APS systems currently modeled include Trophy, Zaslon, and Arena. Active Protection Systems detect incoming missiles or rockets, calculate an intercept vector, and then shoot projectiles to destroy or deflect the warhead before it can strike the vehicle. A fire control radar covers a specific arc around the vehicle, and is set to detect only projectiles moving at a certain speed such as missiles or rockets. In this way, faster and harmless projectiles such as bullets are ignored by the system. Once a valid projectile is detected, an on-board computer almost instantly identifies the weapon along with its vector. Just as quickly an intercept path is calculated, and a launcher shoots projectiles to destroy or damage the incoming threat. Even if the incoming projectile is not destroyed, its penetrating capability is usually heavily degraded by damage from the projectiles.

The Trophy system uses two launchers on either side of the vehicle, with 210 degrees of coverage each (the coverage overlaps), resulting in 360 degree coverage. Each of the launchers has two shots loaded, with a nearly instant reload time between shots.

Arena uses a Doppler radar to detect incoming threats. A computer uses the radar data to determine the direction and speed of the incoming threat, then selects one of multiple silos to engage it. An explosive charge is launched upwards and detonates above the vehicle, spraying a stream of projectiles downwards into the path of the incoming projectile. When mounted on BMP-3Ms, Arena covers threats within a 220 degree arc to the front, with the back left unprotected. This setup allows infantry to follow behind the vehicle more safely. When mounted on tanks, Arena has 360 degree coverage.

Zaslon provides protection over 360 degrees, and works by launching two explosive charges outwards, which explode and deploy a fragmentation ring that destroys the incoming projectile.

■ Electro-Optical Jammer

Shtora-1 is an electro-optical jammer currently modeled the T-90A, T-90AM, and BMP-3M. Most Shtora-1 installations use two electro-optical/IR dazzlers mounted on either side of the turret, laser warning receivers, twelve aerosol smoke grenade dischargers, and a control system to operate it. The T-90AM uses Shtora-1 but without the dazzlers.

When the electro-optical/IR dazzlers are activated (they can operate continuously), they interfere with or jam SACLOS guidance systems used by many ATGM systems. When the laser warning receivers detect that the vehicle has been "painted" by an enemy weapon laser range finder, the Shtora-1 system detects the direction of the threat with an accuracy of about 4 degrees, warns the crew, and prompts them to automatically slew the turret towards the threat. Next, the system launches the smoke grenades towards the threat to interfere with ATGM guidance, giving the vehicle cover for retreat.

The Oplot-M has the Varta optronic countermeasure system. Like the Shtora-1 system, Varta detects laser illumination from incoming ATGMs and dazzle them with active jamming while automatically deploying aerosol smoke screens to hinder visibility.

■ Laser Warning Receiver

Vehicles equipped with laser warning receivers can detect when an enemy laser rangefinder has marked the vehicle, a reliable indication that an enemy weapon is about fire to upon the vehicle. When the laser is detected, the marked vehicle will display "LASER WARNING" hit text. The vehicle will turn towards the threat, activate smoke launchers if available, and then back up towards cover. Vehicles will delay this defensive behavior if they are currently occupied with an important task, such as engaging an enemy target or moving.

■ Explosive Reactive Armor (ERA)

Many modern vehicles are equipped with Explosive Reactive Armor (ERA). ERA consists of a high explosive material sandwiched between two metal plates, placed on top of the vehicles normal armor. When penetrated by a weapon, the explosive detonates, blowing the metal plates away. Against the jet penetrator formed by a shaped charge High Explosive Anti-Tank (HEAT) warhead, these moving plates impede their function by effectively lengthening the distance that the jet must penetrate before entering the interior of the vehicle.

The mechanism of most ERA can be defeated by a tandem-charge HEAT warhead. The warhead uses two shaped charges, with the first being a precursor warhead that punches a channel through the ERA or detonates it prematurely, before the larger primary warhead strikes the regular armor underneath.

■ Slat Armor



Also known as cage armor, slat armor uses a grid of metal bars attached on top of a vehicle's armor to protect against attacks from anti-tank weapons such as the RPG-7.

■ Smoke Launcher



Many armored vehicles are fitted with smoke launchers. When deployed, these launches eject multiple smoke grenades to the front of the vehicle and form a defensive smoke screen so that the vehicle can retreat or reposition safely. Many smoke launchers use IR-blocking smoke to prevent vehicles with thermal imagers from peering through the screen.

■ Instant Command Buttons



Pause: Selected unit temporarily halts all activities until the Pause button is pressed again.

Cancel: All commands for the selected unit are instantly deleted.

Evade: All active commands for selected unit are deleted, and it takes immediate evasive action.

■ Communication Links

Voice



Unit has verbal contact with its HQ, either face-to-face or shouting distance

Visual (Distant)



Unit can see its HQ at long distance. Can use visual signals to communicate.

Satellite (PDA)



Unit has satellite data link with HQ through hand held PDA or tablet.

Visual (Close)



Unit can see its HQ at close range. Can use hand signals to communicate.

Radio



Unit has radio contact with HQ, either hand held "walkie talkie", manpack radio, or vehicle-mounted radio station.

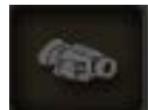
Satellite (Vehicle-mounted station)



Unit had satellite data link with HQ through vehicle-mounted digital communications system such as FBCB2 or Constellation.

■ Special Equipment

Night Vision Equipment



Numbers on this icon denote how many soldiers in the team or squad are equipped with any type of night vision equipment. However, each soldier may have multiple pieces of night vision equipment, such as night vision goggles plus a night vision sight on their weapon.

Binoculars



Binoculars increase unit spotting ability at long range. Commonly carried by small unit leaders, weapon crew members, scouts, observers, and officers.

Laser Designator



Laser designators are used by forward observers and air controllers to mark targets for attack. Laser designators aid in fire mission speed and accuracy. Russian and Ukrainian precision fire support missions require that the spotting team be equipped with a laser designator.

Demolition charge



Demo charges are carried by engineer specialists (also called pioneers or sappers), as well as Breach teams. Demo charges can be used to attack vehicles at close range, or can open entry points into buildings, walls, and fortifications with the Black Command.

Breaching Kit



Breach kits function like demolition charges, except that they can only be used against building sides and walls, not against fortifications or vehicles. Some Russian recon and American rifle squads carry breach kits.

M136 AT-4



RPG-22



RPG-26



RPO-M



Javelin Launcher



Anti-Tank Guided Missile



Stinger Launcher



Igla Launcher



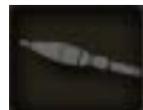
Surface-to-Air Missile



RPG-7



RPG-7 HEAT Rocket



RPG-7 Thermobaric Rocket



RPG-7 HE-FRAG Rocket



■ Floating Icons

	HEADQUARTERS		LIGHT TRUCK
	INFANTRY		TRUCK
	COMBAT ENGINEER		ARMORED PERSONNEL CARRIER (APC)
	RECONNAISSANCE		INFANTRY FIGHTING VEHICLE (IFV)
	SNIPER		MAIN BATTLE TANK
	FORWARD OBSERVER / AIR CONTROLLER		TANK DESTROYER
	LIGHT MACHINE GUN		SELF-PROPELLED ANTI-AIRCRAFT (SPAAG)
	MACHINE GUN		
	GRENADE LAUNCHER		FORTIFICATIONS
	ANTITANK WEAPON		AMMO DUMP
	MORTAR		MINEFIELD
	ANTI-TANK GUN		
	MANPADS		

■ Stock Mod Tags

[lawn] - Turns Ground Dirt Red into a mowed lawn.

[trash] - Turns Ground Hard into a pile of trash.

[softtrash] - Turns Ground Sand into a pile of trash.

[rubble] - Turns Ground Heavy Rocks into urban rubble.

[night] - Adds camouflage face paint to soldier faces.

[brown] - Used for US soldiers. Replaces camo pattern on gear with solid coyote brown.

[digital] - Used for Ukrainian soldiers. Replaces older uniform with new digital uniform.

[ukraine] - Used for Ukrainian vehicles. Vehicle models in both Russian and Ukrainian service use this mod tag to differentiate between Ukrainian and Russian vehicle textures.

■ United States Army Branches

Infantry Brigade



Stryker Brigade



Armored Brigade



■ Russian Ground Forces Branches

Motor Rifle Brigade



Tank Brigade



■ Ukrainian Ground Forces Branches

Mech Infantry Brigade



Tank Brigade



■ United States Army Ranks

Private



Private First Class



Specialist



Sergeant



Staff Sergeant



Sergeant First Class



Master Sergeant



First Sergeant



Command Sergeant Major



Second Lieutenant



First Lieutenant



Captain



Major



Lieutenant Colonel



■ Russian Ground Forces Ranks

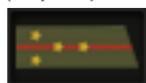
Ryadový
(Private)



Stárshiy Serzhánt
(Senior Sergeant)



Kapitán
(Captain)



Yefréytor
(Senior Private)

Yefréytor
(Senior Private)



Starshiná
(Master Sergeant)



Mayór
(Major)



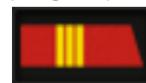
Mládshiy Serzhánt
(Junior Sergeant)



Leytenánt
(Lieutenant)



Serzhánt
(Sergeant)



Stárshiy Leytenánt
(Senior Lieutenant)



■ Ukrainian Ground Forces Ranks

Soldat
(Soldier)



Stárshiy Soldat
(Senior Soldier)

Stárshiy Soldat
(Senior Soldier)



Molodshiy Serzhánt
(Junior Sergeant)



Serzhánt
(Sergeant)



Stárshiy Serzhánt
(Senior Sergeant)

Starshyna
(First Sergeant)



Praporshchyk
(Master Sergeant)

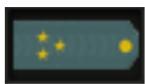


Stárshiy Praporshchyk
(Sergeant Major)



Leytenánt
(Lieutenant)

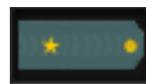
Stárshiy Leytenánt
(Senior Lieutenant)



Kapitán
(Captain)



Mayór
(Major)



Podpolkóvník
(Lieutenant Colonel)



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