GLOSSARY FOR GROUND VEHICLES

General Terms

Price: This is the price *in game terms* for a vehicle with a wear value of 1 or less. It indicated the relative worth of the vehicle *in game terms.* In general, the price of the vehicle listed will bear no resemblance whatsoever to the real-world price, except possibly by accident.

Fuel Type: This lists the types of fuels the vehicle may use to power its engine. The abbreviations here are D=Diesel, G=Gasoline, AvG=Aviation Gasoline, and A=Alcohol (methyl or ethyl).

Load: This is the amount of cargo the vehicle may carry internally. Up to 10% more may be hung on the outside of the vehicle without penalty; if more is hung outside of the vehicle, it goes against the internal cargo capacity. (This does not include the ERA which may be mounted upon some armored vehicles, if the armored vehicle is listed as being able to mount lugs for ERA or already has lugs for ERA.) This capacity may be exceeded even further, with a maximum overload of 25% being able to be carried for tracked vehicles, or 15% for wheeled vehicles. Of course, this may be mitigated by carrying less fuel, ammunition, or crew/passengers. The additional 10% which may be hung outside of the vehicle is not considered over load for this purpose.

Of course, carrying cargo will slow a vehicle down as well as increase the fuel consumption. For every 100 kg of listed Load capacity the vehicle carries, the vehicle speed is reduced by 0.5%, and fuel consumption is increased by 0.5%. If the vehicle is carrying an overload (as listed in the previous paragraph), the vehicle's speed and fuel consumption is affected in the same way (to a greater degree). The additional 10% which may be hung outside of the vehicle does count against this vehicle movement and fuel consumption penalty. The listed Crew capacity does not count against the cargo capacity for these purposes.

For reducing the amount of passengers to increase cargo/equipment carrying capacity, consider a person to weigh 80 kg.

Veh Wt: This is the vehicle weight in metric tons (or tonnes). This weight includes a full load of ammunition and fuel, and, if the vehicle is listed as coming with it, the weight of a full set of ERA blocks.

Crew: This is the amount of crew the vehicle requires for optimum performance, along with the amount of passengers the vehicle may carry (if any). If one number is listed, they are all crewmembers; if the number is listed as "n+x", this is the number of crewmembers required for optimum performance plus the maximum number of passengers the vehicle may carry.

Night Vision: This indicates what, if any, night vision devices are carried as standard integrated equipment by the vehicle. The most basic are simple headlights, others may include Passive IR (Infrared), Active IR, Image Intensification, Thermal Imaging, 2nd Generation Thermal Imaging, FLIR, WL (White Light) or IR searchlights, and Radar. Most of these are covered by the *Twilight 2000* rules, but a few extra notes are in order:

Active IR: Active IR generally has more range than Passive IR (+10-25%, depending upon the generation of the device), but has largely been abandoned in favor of Passive IR due to one glaring defect – Active IR emits an infrared beam which lights up the area in which it is searching. This beam stands out like a brilliant light on other IR viewers (whether Passive or Active), Image Intensifiers, and Thermal Imagers, generally revealing the position of the vehicle using the Active IR immediately.

Image Intensification: While Image Intensification (also known as Light Intensification) may be used as a night vision device, they do have some defects and problems. Depending upon the generation of the device, the user of Image Intensification as a night observation device (i.e., using the night channel of the device as opposed to the day channel) can be temporarily blinded by bright flashes, including flares, searchlights, the main gun firing, and suchlike. This can also blind the device itself, causing anything from permanent damage to a reset requiring up to 2 minutes (again, depending upon the generation of the device). The newest Image Intensifiers have night channels that cut off the device for a fraction of a second when a bright light flashes, preventing damage to the Image Intensifier.

In addition to the above, (and again with severity depending upon the generation of the device), the shapes seen in an Image Intensifier can be a bit indistinct and fuzzy, making identification of friendlies and enemies difficult. The newer the generation of the device, the better the image will be. They will also be in shades of green or shades of gray; colors cannot be seen.

Thermal Imaging/FLIR: As with Image Intensification, the vision through a Thermal Imager will not be in color; they are generally in shades of white, gray, and black. It's also sort of like looking at a photographic negative; the hotter the item, the darker it will be (though this can be reversed in many Thermal Imagers). Though 1st generation Thermal Imagers generally have a range of 3000 meters, and 2nd Generation devices 5000 meters, identification of targets becomes more and more uncertain at ranges over 1000

meters for vehicles, 500 meters for personnel, and a variable distance for buildings depending upon their size. GMs should require an Intelligence roll for identification starting at these ranges, starting at an Average level of difficulty and increasing in difficulty for every additional doubling of range beyond that. For this reason, Thermal Imagers are generally coupled with some sort of telescopic sights.

True FLIR is rare in ground vehicles, but it generally has the same difficulties as Thermal Imaging, but at double the range.

Radiological: This is a general measurement of the amount of protection the vehicle has against chemical, biological, and radiological agents. The levels are None, Open, Enclosed, and Shielded; these are amply explained in the basic *Twilight 2000* rules.

Tr Mov: This is Travel Movement, the amount of ground in kilometers the vehicle may cover in a four hour period when cruising at an average speed. This may be increased (see basic *Twilight 2000* rules), but at the cost of increased fuel consumption and an increased chance of breakdowns or mishaps.

Com Mov: This is Combat Movement, the amount of ground the vehicle may cover in a 5-second combat phase in meters when traveling at safe speed. Again, this may be increased, but at a cost of increased fuel consumption and chance of breakdowns or mishaps.

Fuel Cap: This is the Fuel Capacity, the amount of fuel the vehicle carries in its internal tanks. If this figure is given as “n+x”, the vehicle is capable of carrying external fuel tanks to increase the range of the vehicle, and the number after the plus sign is the capacity of those external tanks. Note that external fuel tanks are *very* vulnerable to any kind of weapon fire or shrapnel, since they are almost never armored. External fuel tanks, regardless of where they are carried, are not protected by the armor face upon which they are carried (if the vehicle has armor). However, most external fuel tanks have mechanisms, triggered from inside the vehicle, which will drop them off the vehicle.

Fuel Cons: This is Fuel Consumption, the amount of fuel the vehicle burns in a four-hour period if traveling the entire time at cruising speed. (If the vehicle is just sitting still or crawling along, it’s still going to burn fuel, just at a lesser rate.) This figure is based on the burning of gasoline, diesel, of aviation gasoline as fuel; if the vehicle is burning ethanol or methanol, the vehicle will consume fuel much more rapidly (see the *Twilight 2000* basic rules for more on this).

Config: This is the Configuration of the vehicle. The types of configuration are Cycle, such as a motorcycle or bicycle; Stnd (Standard), which is simply a basic body, chassis, and suspension, with no sort of turret; CiH (Crew-in-Hull), also known as Small Turret, in which the vehicle has a small turret that is either unmanned or has one crewmember who is only partially inside the turret (usually from the chest up or less); and Trtd (Turreted), in which the vehicle has a large turret on top of the hull (like a tank), which is almost always manned.

Susp: This is the Suspension rating. A wheeled vehicle has a W followed by a number in parentheses, which relates to the number of hits the suspension may take; tracked vehicles have a T followed by a number, which is an actual armor value for the suspension. Consult the basic rules for more information on suspension damage.

Armor: This gives the Armor Value for each face of armor on the vehicle. The faces are HF (Hull Front), HS (Hull Side), HR (Hull Rear), TF (Turret Front), TS (Turret Side) and TR (Turret Rear). The roof armor for the hull is one-half the lowest armor rating of the hull faces, rounded down; the turret roof’s armor is one-half the lowest face of turret armor, rounded down. Belly armor for a vehicle is one-half the lowest armor value of the hull, rounded down. However, the minimum AV for the hull roof and floor of an armored vehicle is 2, unless otherwise listed. Certain vehicles have extra-heavy roof or belly armor, or designs which increase the effective armor value of the roof or belly; this will be noted in the vehicle description. Some vehicles are equipped with Remote Weapons Stations (RWS); these will not have increased turret roof armor, even if the vehicle description calls for increased roof armor protection.

Mine-Resistant Ambush-Protected (MRAP) vehicles are specially designed to resist mine blasts, IEDs, and other explosions which take place below the vehicle. These vehicles have bellies that are shaped like a wide V, shunting blast forces out and away from the vehicle. Vehicles which are MRAPs take only one-half damage from blasts below them, and only after that is the remaining blast damage subject to any belly armor the vehicle has. Damage to the suspension is likewise reduced by 50%. MRAPs can be thrown over on their side by mine explosions, but often all that is required to make the vehicle operational again is to right it.

Bar/Slat armor for armored vehicles (or much less commonly, unarmored vehicles) consists of a cage of flattened barstock assembled into sections which can be attached to the exterior of a vehicle. This generally extends about 15-30 centimeters out from the body of the vehicle (and can vary depending upon its position on the vehicle), and extends to just below the wheel wells/tracks of the vehicle, and upwards to about 30 centimeters above the top of the vehicle. It is designed to not obstruct any turrets or pivoting weapons, and therefore is not normally applied to turrets. Bar/Slat armor works by not letting HE-type rounds reach the skin of the vehicle before detonating, acting as spaced armor (-2D6 penetration) 75% of the time and substandard spaced armor (-1D6 damage) 25% of the time. It is a cheap way of applying extra protection to vehicles, adding $167 per meter of protection (obviously, the GM/players will

have to do their homework on what size their vehicles are. Weight will again depend on the size of the vehicle, but is given in the stats. Bar/Slat armor has no effect on kinetic energy penetrators or AP rounds; indeed, AP rounds can damage Bar/Slat armor enough to provide an opening for HE-type rounds – 25% for an AP-type hit that covers 10% of the Bar/Slat armor face, and 25% for a KEP hit or Sabot hit which covers 10% of the armor face. Enough hits will break Bar/Slat armor to the point that it is falling off the vehicle – Bar/Slat armor can absorb 20 hits per meter it covers before opening a 10%-wide hole; 50% damage and the Bar/Slat armor face has a 25% chance of falling off, cumulative. Bar/Slat armor can be added to doors, but this severely limits the opening of the door unless special precautions are taken when installing the Bar/Slat armor, and is not normally done. Ramps can likewise be fitted with Bar/Slat armor, but such can be easily damage by normal operations of the ramp, and it is likewise not normally done. The rear of vehicles are therefore protected by Bar/Slat only as much as opening and closing or doors and ramps allows, and leaves significant open areas – only 25% of a rear area is generally protected by Bar/Slat armor. Bar/Slat armor does not obstruct firing ports.

Appliqué armor can take many forms, from simple metal plates bolted on to the vehicle's faces to spaced armor modules to composite armor modules. The can also be incorporated into the base design of vehicles. The effects of appliqué armor is accounted for in the stats for vehicles. Appliqué armor typically seals off firing ports, unless specially provided for, and reduced visibility from windows.

COMBAT EQUIPMENT TERMS

GENERAL VEHICLE TERMS

Blast/Crash-Resistant Seats: Often found in MRAPs (but other vehicles as well), these are crew and passenger seats which are designed to protect the occupants from getting hurt in rollover accidents and when blasts come from below. They have an armored seat and are designed to cradle the occupant. They are equipped with special seat belts to keep the occupant in place during a rollover and when blasts would tend to force his head into the ceiling. Occupants of Blast/Crash resistant seats take half damage during a rollover (assuming they are wearing their seatbelts – if not, they are thrown about the interior and take normal damage). Occupants of these special seats have the protection of AV 2Sp against mine and IED blasts which penetrate the interior of the vehicle. The downside of these seats is that they are heavy and take up more room then a standard bench seat.

Breech-Loading Mortar: With a breech-loading mortar, you essentially have a small, lightweight, short-barreled artillery piece that fires at a very high angle, higher than a conventional artillery gun. These have lesser recoil forces and much shorter barrels than standard artillery pieces and are more flexible in their deployment and mounting options, but they are much different from standard mortars. One does not drop rounds down the end of a breech-loaded mortar's; instead, they are loaded and fired from a standard breech-block arrangement like that of a conventional heavy gun, though the breech blocks are generally much lighter. Some require purpose-designed shells, though most fire conventional mortar ammunition, and use the same charge system as standard mortar shells. An advantage of breech-loaded mortars is that in emergency situations, they can be fired using direct fire instead of indirect fire.

Casemate Turret: Normally, a vehicle turret is manned by the gunner and commander. A casemate turret is unmanned, similar to an OHWS, but much larger. The casemate turret carries the sensors for the armament, such as a laser rangefinder, barrel droop sensor, or weather sensor, and if such a vehicle has devices such as laser or IR detectors or APS systems, they are normally mounted on the casemate as well. The day and night vision devices as well as aiming devices are also in the casemate. The gunner and commander control the turret, its armament, and its sensors and vision devices using downlinked monitors. A *very few* casemates have small stations to allow the commander or gunner to actually exit, enter, or look out through a hatch in the top; such hatchways are always a rather tight squeeze, and almost never have weapons mounts by them. The armament, particularly in the case of large caliber guns, is fed by automatic loading systems with magazines containing all or almost all of the vehicles ammunition. Likewise, belt-fed weapons feed via long, continuous belts that contain all or almost all of the weapons' ammunition.

Counterbattery Radar: Counterbattery radar is a variant of ground-surveillance radar, and its specific purpose is to detect the flight of artillery, artillery rocket, and mortar projectiles right after they have been fired. Counterbattery radar systems then use a simple computer (usually not having much more power than a scientific calculator – that's all that's necessary) to calculate the position of the enemy battery that fired those rounds – and they are connected by radio to friendly artillery batteries. Those friendly batteries can then open up on the enemy artillery unit. Counterbattery radar systems can be quite accurate – standard US Army doctrine is to fire no more than three rounds (or salvos), then get the hell out of Dodge fast. (When I was in a mortar platoon in the mid-1980s, our three-round mortar barrages were usually followed quickly by an emergency move.) Once a counterbattery radar system has figured

out where an enemy artillery unit is, response time is, of course, dependent upon the artillery unit used for counterbattery fire. (Finding an enemy artillery battery will depend upon the size and speed of the projectile fired, the local conditions, and the equipment used, but the base task level is Easy: Electronics or INT – and it usually takes no more than 30 seconds or so.)

Counterbattery radar can give friendly troops a slight chance of taking cover from an incoming barrage, but all that counterbattery radar is designed to do is detect projectiles in flight for a short distance after they have risen above the enemy unit that fired them. They do a poor job of figuring out where the projectiles are actually heading. (This would be an Impossible: Electronics or INT task.) Counterbattery radars are not suitable for use as tracking radars or ground-surveillance radars.

Downlinked Monitor/Controls: This sort of system is used with overhead weapons stations and remote turrets, and consists of a CRT or LCD monitor that is electronically or fiberoptically linked to the vision devices of the OHWS or turret. The gunner is actually inside the hull of the vehicle instead of being in the turret or OHWS. Such systems, like standard gunner stations that are inside turrets, normally have day and night observations channels with variable magnification capabilities, and the controls for these vision devices are also at the gunner's station inside the hull.

FIST or FISTV: A FIST (Fire Support Team) is a special unit (in the US Army, a part of the 13 series, or Artillery, MOS) whose job is to control various types of mortar and artillery supporting fire. FISTs normally work with units ranging from battalion mortar teams to Corps-level assets like ATACMS missiles, but are also trained to work with naval units capable of supporting gunfire, and to a lesser extent, supporting helicopters and aircraft. FIST teams are almost always attached to other combat arms units, particularly infantry, armor, and combat engineer units, and they end up going wherever the units they are supporting go – their job usually puts them in just as much danger as the units they are supporting. A FIST team will, at a minimum, be equipped with as many radios as they can lug along with them, and these radios are usually of several types, allowing them to communicate with several units of different types at once. FISTs sometimes have standard vehicles modified for their purposes…

…but in most First- and Second-World armies, they will use special vehicles either designed or heavily modified for their mission. These are called FISTVs (Fire Support Team Vehicle, also abbreviated FIST-V). Sometimes they will have a distinctive appearance, but they are most often based on standard vehicles already in use by a country's military forces, and can only be told apart from the vehicles they are based on with close inspection. FISTVs are designed this way deliberately – a FIST or FISTV is a **very** high-priority target to enemy forces due to the death and damage they can cause to rain down upon the enemy. FISTVs are generally equipped with as many as a dozen radios of various types, several imaging devices, telescopes, and computers to compute fire solutions. They are, unfortunately, poorly-armed at best in most cases, as their equipment takes the room that would normally be used for heavier armament.

FDC: An FDC (Fire Direction Center) is a vehicle set up specifically to compute and control supporting artillery, artillery rocket, and mortar fire. Like a FISTV, they are equipped with several radios of different types to allow them to communicate with FISTs and FALOs (Forward Air Liaison Officer team – a pilot also rated as a forward observer, whose job is to communicate and direct air support), higher command, and the various units that the fire support elements are assigned to support. (In many modern armies, a FISTV can do the same job, and if supporting elements are so equipped, fire coordinates can be transmitted directly to the supporting elements – often making an FDC unnecessary or redundant.) As with a FISTV, they are often equipped with one or more small computers to compute fire solutions – though in armies using older equipment, that computing job is probably done with fire plotting boards and maps, and the artillery or mortarmen are generally chosen for their quick minds, memory, and ability to do math in their heads.

As a side note, FDC's don't *have* to be vehicles – in fact, in light infantry, airborne, and air assault/airmobile units, they usually are not.

Fire Solution: When an FDC, FIST, or sometimes even the artillery, mortar, or artillery rocket unit themselves (if properly equipped) figure out what kind of target is to be hit, the map coordinates of the target, range to the target, and which way the guns, rockets, or mortars need to be pointing, as well as how many guns, rockets, or mortars they need to provide the necessary fire support and how many times each piece needs to fire, they are computing a fire solution. (As an aside, most units prefer to fire no more than three salvos [3 rounds per individual gun or mortar] or one rocket pack salvo before moving – that's generally all it takes for enemy counterbattery radar to pinpoint the firing unit's position – and in about two minutes or so, they'll be on the receiving end of an enemy barrage. Heavy *towed* artillery or artillery rocket units tend to be more likely to stay put (due to the sheer size of the pieces) – but they WON'T like it!)

If the group is lucky, they may have a fire solution computer (and an accurate map); if they know their guns' locations and the targets' locations, the user of a fire solution computer (usually about the size of a large PDA) can punch in their guns' locations and the targets' locations (or estimates of range and direction) and in seconds know what elevation and traverse settings to apply to their guns. MRLs, or mortars. Proper use of a fire solution computer is an Average: Heavy Artillery, Difficult: Electronics, or Difficult: Intelligence task, modified by the accuracy of the PC's map and available information.

Firing Port: A its simplest, a firing port is a simple hole cut in the side of a vehicle to allow the occupants to stick the barrels of their weapons out and fire upon surrounding enemy personnel and vehicles. The fire is not expected to be accurate and meant primarily to provide suppressive fire, something that is still true today with vehicles equipped with more modern firing port arrangements. Later, a knock-aside sliding cover (usually a round cover affixed at the top of the firing port) was added. Modern firing ports, however, as present on most modern vehicles equipped with firing ports, consist of a ball-and-socket mount that the weapon is inserted into, and with the shooter being provided with a vision block that sometimes looks directly ahead of the shooter, but is more commonly a periscope-type vision block that can present the shooter with some problems in aiming.

While typical firing through a vision port is not meant to be really aimed, the position of the vision block (normally providing showing the outside world through a vision block head 1-4 inches above the weapon) gives the shooter a parallax error that gives him an automatic -2 penalty to his fire. This is not generally important in suppressive fires. Most firing ports are designed for the submachineguns, assault rifles, automatic rifles, and light machineguns of the country using the vehicle, and cannot accept weapons that differ much in design from those weapons. (Universal mounts are **very** rare, though most companies will tailor the firing ports they install in their vehicles to the needs of the customer.) The firing ports of some vehicles, like the US M-2 Bradley are designed only to accept a single purpose-built weapon, and cannot accept any others, but the sights of such vehicles allow the purpose-designed weapons to fire at much greater effective ranges; these weapons are also typically loaded with only tracer ammunition, allowing easy adjustment of aim points. Typical modern firing ports have about a 30-degree arc of fire, with straight-out being the base direction of fire. Not that these days, firing ports are being deleted and plated over more often, as the appliqué armor being added is deemed to have more survival value than the firing ports; the firing ports themselves also cause a weak point in the armor face.

Firing Spade: In the case of many self-propelled artillery guns and some heavy mortar vehicles, the weight of the vehicle and the gun's recoil dampeners are not enough to allow the vehicle to fire and stay in place enough to allow quick follow-up shots, or even to fire the weapons without damaging internal equipment or injure the crew. These vehicles usually lower a pair of spades and dig them into the ground – some have as much as four, and a few have only one – and these stabilize the vehicle to keep it still enough to avoid these ill effects. Lowering and emplacing these spaces are usually by power mechanisms actuated by internal controls, and take 15-30 seconds.

Firing spades are also common on antiaircraft artillery vehicles. Though many operate in the same manner as artillery and mortar vehicle spades, some used with light antiaircraft autocannons actually raise the entire vehicle completely clear of the ground, to provide a more stable firing platform.

Hammerhead Mount: Used with certain ATGM launchers mounted on vehicles, a hammerhead mound is retracted so that it lays down on top of the hull of the vehicle until the ATGMs are to be launched. Before launching, the launchers are raised so that the carrier for the launchers is straight up or almost straight up, so that the exhaust from the ATGM does not damage the vehicle and also to give the aiming devices for the ATGMs (usually located integral with the launcher) a better field of view. The gunner for a vehicle with a hammerhead mount normally uses a downlinked monitor, but some older designs use periscopes.

Inertial Land Navigation System: A vehicle equipped with an inertial land navigation system can use a computerized map to plot a course from one point to another, then allow the commander to direct the driver which direction to drive (on some vehicles, the driver himself has access to the equipment), as the inertial system is linked to a magnetic compass or gyrocompass. Many inertial navigation systems also have the ability to save up to 20 previous routes in memory, or have routes preprogrammed into the computer. The sticking point here is that to use an inertial land navigation system, you have to know where you are starting out from – usually within no more than 10 meters. The bigger the error in locating yourself at the start point, the bigger the error will be in the navigation system. If you accurately determine your position within 10 meters, you will pretty much end up where you need to be, but for every meter you mis-locate yourself past that 10 meters, there is a 1% chance that you will get lost – and that error will be 2 degrees per meter you mis-locate yourself at the start. (Obviously, a long drive will get you very lost if you plot your position inaccurately!) Plotting your initial position is an Average: Navigation or Difficult: Intelligence task, modified by the accuracy and detail of the PC's map, weather conditions, and whether it is night or day. As many PCs may try to determine the vehicles location as the group wants, and they will just have to agree on a start point if they have different opinions.

Any group may make an Average: Navigation or Difficult: Intelligence roll once per hour of travel to "just happen" to realize they are going in the wrong direction (using the highest Navigation or Intelligence roll in the group, assuming they have a map and can see outside of the vehicle) – but the GM gets to make those rolls, and he makes them secretly. A PC may also deliberately check the map against the terrain features and around him to see if they are going astray, with the same probability of success – but rolls made within 10 minutes of each other only count once, with only the first roll's score counting as success or failure. Again, this is modified by the accuracy of the map, the weather conditions, and whether it is night or day. And again, the vehicle using the inertial system may get panicked calls from the rest of the group's vehicles that they are off course, and the players will have to figure out who is right and wrong.

IR Jamming System: Designed to decoy and confuse IR-guided missiles (including many of the modern fire-and-forget ATGMs,

which are often guided by IR or Thermal homers), an IR jamming system projects several lasers or infrared beams, usually on differing wavelengths, with light that is in the infrared part of the spectrum. Since the infrared part of the spectrum is largely heat energy, this can be quite effective at decoying IR-guided ATGMs (which are essentially heat-seeking missiles of a sort). More modern IR jamming systems can also have the projected laser beams rapidly change frequency, further confusing incoming weapons and helping to defeat any countermeasures the homing devices in the missile may have. IR jamming systems are sometimes also linked to special grenade launchers that fire smoke grenades designed to produce smoke that not only provides general concealment, but obscures the IR spectrum. IR jamming systems reduce the accuracy of IR-guided munitions against the target vehicle by one difficulty level, and if the munition misses, scatter distance is doubled. IR jamming systems sometimes include devices to help hide the vehicle from observation by IR night vision devices or thermal imagers.

Laser Designator: A laser designator is used to guide laser-guided munitions to a target; the munition has a sensor (almost always in the nose) that senses a laser in a specific wavelength, and a small onboard computer (generally little more than what you might find in a scientific calculator, though MUCH tougher and generally EMP-hardened) adjusts the fins or thrusters of the munition to allow it to hit on target. The laser of a laser designator is almost always able to generate pulses in several different wavelengths. Different wavelengths are required because different types of munitions (or sometimes, even different rounds of the same models of munitions) would be easily confused by what could thousands of laser beams being used in a single large battle; you also want your laser wavelengths to be different than your enemy's, since you don't want your own rounds hitting your own troops. The designators also have the ability to change wavelengths for security purposes; if the enemy finds your wavelength and duplicates it, they can possibly re-target your own munitions onto your own people. Modern-day laser designators are also capable of using sets of rapidly-changing wavelengths and lengths of pulses (with the munitions being programmed to recognize the correct wavelengths and pulse duration) to further increase security and flexibility. I could go further into this, but I won't; it should be obvious why I won't.

Laser Jamming System: Laser jamming systems are simply smoke grenade launchers that are linked to a vehicle's laser warning detector and launches obscurant smoke in the direction of the targeting beam. The downside of this is that the smoke also blocks friendly targeting beams. The smoke merely degrades the effectiveness of the enemy weapon from riding their laser beam to the target (usually degrading the chance to hit from 1-3 difficulty levels – use one level of degradation if not otherwise listed). If the jamming system does properly work, the amount of scatter is increased by a factor of ten.

Laser Warning Detector: This is a device that detects when a targeting, rangefinding, or guidance laser beam is shining on the vehicle. When such a beam is detected, an alarm in the vehicle sounds (usually in the crew's headsets, and/or blinking indicators or lights). Laser warning detectors are sometimes linked to vehicle countermeasures (if so equipped), usually triggering smoke grenades or other devices.

Launching Box: Some ATGM-firing vehicles have launchers that are little more than boxes in which the ATGMs fit. (Sometimes, these boxes are lightly armored.) These boxes are set at a slight upward angle to the vehicle to allow the ATGMs to clear the vehicle when they launch.

Turntable: Most mortar-carrying vehicles have their mortars mounted on an internal turntable that makes large deflection adjustments (adjustments to either side) easier. This turntable takes the place of the baseplate and any turntable mechanism it may have, and allows the assistant gunner or gunner himself to make the required turn. The turntable can normally be turned freely, with the turntable having a lock once the desired deflection is achieved. With a few exceptions, vehicle-mounted mortars fire over the rear of the vehicle, and the turntable normally is limited to a 30-degree turn to either side of the centerline at the most; some vehicles are designed to fire primarily over the front of the vehicle, and some turntables allow for wider turns (some up to 360 degrees of movement).

"Shoot-and-Scoot:" The typical counterbattery radar operator can pinpoint an artillery or mortar position after they have fired only three rounds – and a counterbattery salvo by his own artillery units will quickly follow. In most countries using self-propelled artillery or mortars, therefore, the crews are trained to fire a salvo of no more than three moves, then Unass (quickly leave) the area from which they fired. If a vehicle does not require much in the way securing the vehicles and supporting units to allow this quick move (no more than a couple of minutes), this is "Shoot and Scoot" capability.

Vehicle Smoke Grenade Launcher: Virtually all armored vehicles in the world mount clusters or rows of smoke grenade launchers. These launchers use large smoke grenades of 50-80mm in caliber, creating a larger and longer-lasting smoke cloud than hand-thrown smoke grenades or those fired by personnel grenade launchers. Vehicles with turret almost always mount them on the turret, while other vehicles normally mount them on the front or glacis of the hull. They almost always fire forwards and upwards, at a 30-45-degree angle. The idea is to hide the getaway of the vehicle by firing one or more smoke grenades, then driving into and beyond the cloud of smoke. Such smoke can also be used to obscure the vehicle if it is a target of laser or IR-guided weapons, or obscure it from observation by IR devices (if the proper types of smoke grenades are loaded). These launchers are normally electrically linked to controls at the commander's station, though on some vehicles, the gunner and loader or even the driver can trigger them. Most vehicles with laser warning systems or soft-kill APSs can also be set to automatically trigger one or more smoke grenade launches when a targeting laser is detected. Note that this type of system is not the same as a grenade launcher mounted as armament on a

vehicle, such as the Mk 19 AGL on an AAPV-7A1.