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AMG1303
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STUDENT OUTLINE

INTRODUCTION TO ARMOR VEHICLE IDENTIFICATION

1. **TERMINAL LEARNING OBJECTIVE**

a. Given a representation of 40 armored vehicles, identify armored vehicles by determining the identity of 33 of 40 vehicles by NATO designator in accordance with FMFM 2-11. (52TR.01.06)

2. **ENABLING LEARNING OBJECTIVES**

a. Given a representation of an armored vehicle, determine whether a vehicle is a tank or a non-tank in accordance with FMFM 2-11. (52TR.01.06a)

b. Given a representation of an armored vehicle, determine the absence or presence of a cupola in accordance with FMFM 2-11. (52TR.01.06b)

c. Given a representation of an armored vehicle, determine the absence or presence, type, and location of a bore evacuator in accordance with FMFM 2-11. (52TR.01.06c)

d. Given a representation of an armored vehicle, determine the absence or presence, type, and location of turret in accordance with FMFM 2-11. (52TR.01.06d)

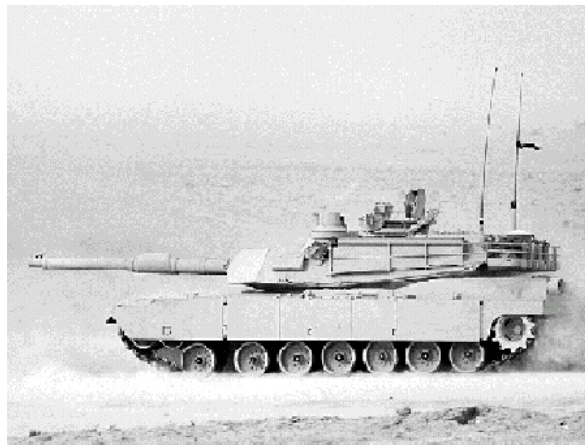
e. Given a representation of an armored vehicle, determine the type of suspension in accordance with FMFM 2-11. (52TR.01.06e)

f. Given a representation of an armored vehicle, identify country of origin indicators in accordance with FMFM 2-11. (52TR.01.06f)

g. Given a representation of an armored vehicle, assess key identifying features in accordance with FMFM 2-11. (52TR.01.06g)

1. **DEFINITION OF ARMORED VEHICLES.** There are many types of armored vehicles, however, we will only discuss the following six types: the Tank, the A.P.C., the I.F.V., the Recon vehicle, the Self-Propelled Gun, and the A.A. Vehicle.

a. Tank: A heavily armored vehicle (up to the equivalent of 1,000 mm of armor), mounting a large caliber cannon (90mm or above) in a large, fully enclosed, heavily armored turret. It must have tracks. It has excellent cross-country mobility, armor protection, firepower, and the capability of producing a shock effect on the enemy. (A tank is an offensive weapon designed to fire and maneuver and assault through an objective. Remember, all tanks are armored vehicles, but not all armored vehicles ARE tanks.)



b. A.P.C. (Armored Personnel Carrier): A thinly armored vehicle, (about 12mm-25mm of armor), that has tracks, wheels, or a combination of both. It mounts a machine gun, medium caliber cannon, an ATGM (Anti-Tank Guided Missile) system, or any combination of the three. It is designed to protect the crew and infantry passengers from small arms fire and ballistic fragments. Its mission is to take the enemy from point A to point B, but it DOES NOT directly support the infantry in the attack, or the assault on the objective (turrets forward).



c. I.F.V. (Infantry Fighting Vehicle): A thinly armored vehicle, (about 25mm-50mm of armor), that has tracks, wheels, or a combination of both. It mounts a machine gun, medium caliber cannon, an ATGM system, or any combination of the three. It is designed to protect the crew and infantry passengers from small arms fire and ballistic fragments. Its mission is to take the enemy from point A to point B, and DOES directly participate in the assault on the objective. It can also keep pace with the assaulting tanks (turrets center).



d. Recon vehicle: A thinly armored vehicle, (about 12mm-25mm of armor), that can have tracks, wheels, or a combination of both. It mounts a machine gun, medium caliber cannon, an ATGM system, or any combination of the three. It is designed to scout well forward of its parent unit and gather information about the enemy and the terrain. Recon vehicles are very fast, and usually use this great speed to avoid direct contact with the enemy (turrets are rear for tracked recon vehicles).



e. Self-Propelled Gun (S.P.G.): A thinly armored vehicle, (about 25mm-50mm of armor), that can have tracks, wheels, or a combination of both, designed to give the forward deployed troops immediate large bore artillery support. Although it has a tank caliber main gun, it does NOT have the large, heavily armored turret, nor does it possess the speed maneuverability and offensive shock effect of a tank. The Self-Propelled Gun is NOT heavily armored (though some are built on existing tank chassis) and NOT designed to engage enemy vehicles.



f. A.A. (Anti-Aircraft) Platform: A multi-gun system that is designed to destroy fixed and rotary wing aircraft (airplanes and helicopters). It usually mounts at least two (but up to six) heavy machine guns, or heavy caliber cannons, and/or small Anti-Aircraft missiles as well. Some self-propelled A.A. platforms are built upon existing tank chassis and thus inherited the tank's heavily armored body. The turrets however, have been redesigned to incorporate the newer main armament, so they are usually much thinner than a tank turret. A.A. guns never assault through an objective. The majority is positioned with the headquarters element of the main body.



2. **BASIC TANK NOMENCLATURE**. There are several parts to a tank that you need to know. These will aid you in proper armored vehicle identification. The various parts are, (but not limited to):

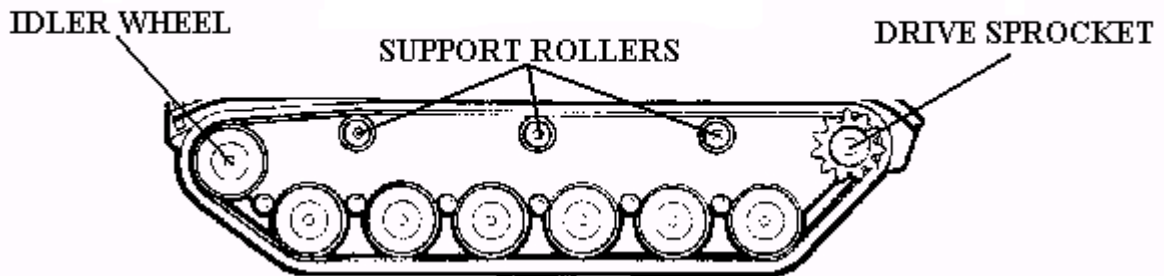
a. Track. A series of heavy metal links, linked together, that wrap around the road wheels, idler wheel and drive sprocket, that allow the tank to move.

b. Road Wheels. The road wheels support the weight of the tank, and allow it to move. They can come in single or double pairs and, there are two types, stamped and milled. Stamped road wheels are cast from a poured mold, are usually hollow, cheaper and lightweight. Milled road wheels are literally carved from a solid piece of steel, are extremely durable, heavy and expensive. Road wheels are usually rimmed with an inch or so of thick rubber coating.

c. Support Rollers. Smaller, free turning wheels used to prevent "track drag" and keep tension on the upper portion of the track. These wheels are usually rimmed with a thin rubber coating. They are not powered. Not found on all tanks.

d. Drive Sprocket. The toothed, powered wheel which transfers the power of the engine, via the transmission, to the tracks. The teeth on the drive sprocket fit into corresponding holes in the track.

e. Idler Wheel. The free turning wheel which helps maintain track tension, but neither drives the track or supports the weight of the tank or the complete weight of the track.



f. Hull. The massive armored body, excluding tracks, engine compartment, turret, and armament of the tank. Sometimes called the chassis.

g. Glacis Plate. The forward, most heavily armored portion of the vehicle. The "nose".

h. Turret. The main fighting compartment, that houses the crew and primary and secondary armament. Most ammunition is usually stored in the turret. Turrets are not found on all non-tanks.

i. Main Gun. The main armament. It is entire reason the vehicle exists.

j. Mantle. The juncture where the main gun joins into the turret.

k. Bore Evacuator. A device located on the main gun that allows the escaping gases to exit from the bore when the main gun is fired. Not found on all tanks.

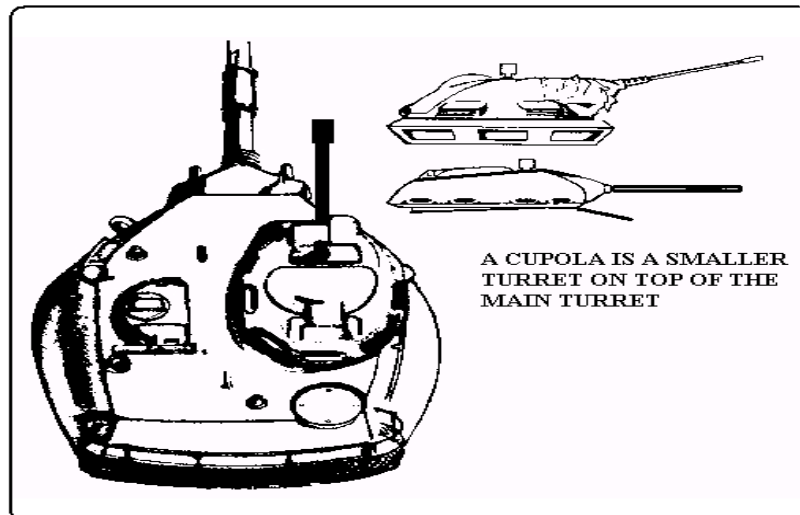
MAIN GUN WITH BORE EVACUATOR



l. Muzzle Brake. A device attached to the muzzle of the main gun, which utilizes escaping gases to reduce recoil. Muzzle brakes can be single, double or multi-baffled. Usually found on older tanks. Not found on all tanks.

m. Blast Deflector. A device attached to the muzzle of the main gun which pushes the escaping gases sideways to help reduce muzzle flash. It's usually found on older tanks, but not found on all tanks.

n. Cupola. A small, dome-shaped, independently revolving, armored turret with an internally mounted automatic weapon, which is found atop the main turret and designed for the tank commander. A small access hatch is usually found on the top rear of the cupola to allow the vehicle commander to enter his tank. Not found on all tanks.



o. Hatch. An oblong or round shaped armored fixture atop the turret that allows access to the tank. It may or may not be raised and it may or may not have an automatic weapon adjacent to it.

3. **MENTAL PROCESS OF ELIMINATION FOR TANKS.** The process of grouping particular features together to isolate the tank so we may identify it is called the mental process of elimination. The first step in this process is to determine if the vehicle we are looking at is indeed a tank, vice a non-tank. Use the definition(s) above to be sure. Once we have determined that the vehicle is a tank, we must now assess the THREAT LEVEL using the four tank indicators. Simply stated, we must first decide if the tank is enemy or friendly. For identification purposes, this will greatly reduce the number of possible choices later on. Remember, in this process we are simply trying to determine whether or not the tank poses a threat, NOT the name of the tank. In an immediate shooting scenario, it is initially enough to know simply whether or not to fire.

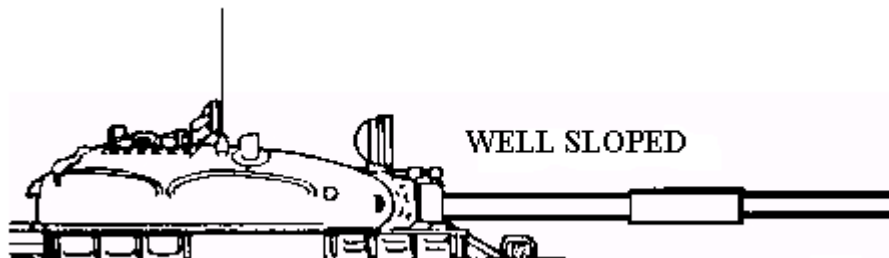
a. Four indicators of a tank: Assessing the threat level of a tank can be accomplished by considering four main areas. To achieve a positive tank threat assessment, you must be able to identify at least three of these four main areas. The four main areas are:

(1) Cupolas: The absence or presence of a cupola is the first step used to assess the tank threat level. Tanks fitted with a cupola usually belong to a friendly or NATO country. Enemy or former Warsaw Pact tanks are not usually fitted with cupolas. Instead, they have a separate hatch for the vehicle commander. If a secondary armament is present, it is mounted to one side of the hatch. Some hatches are raised and capable of independent movement separate from the turret. The absence of a cupola alone, is NOT enough to assess the threat level, although it is considered an enemy trait.

(2) Turret Type: Turrets are either placed in the center, forward of center, or aft of center on the tank. Most modern tanks mount the turret dead center on the vehicle chassis. There are three types of turrets (Note that turret types ARE NOT indicators for non-tanks).

(a) Box Style: Both friendly and threat tanks prior to 1950 had box style turrets. These types are bulky and have nearly vertical front and rear ends. They are somewhat more vulnerable to anti-tank weapons because the projectile has little chance of "glancing" off. This type is especially vulnerable to modern Anti-Tank Guided Missiles. (ATGM's) (Example on top of next page).

(b) Well Sloped: After 1950, threat country tanks went to the well sloped turret style. These are domed (or egg shaped) and present a very low silhouette. The major design draw back to this type of turret is that the main gun cannot depress as much as their NATO counterparts and the tank CANNOT take full advantage of a reverse slope defense.



(c) Streamlined: After 1950, NATO tanks went to the streamlined turret style. This type combines the front portion of a well sloped style and a modified rear portion of a box style. A streamlined style turret will have a feature known as "turret overhang". This is the space between the top of the hull and the bottom of the turret. Given the right circumstances, this area is especially vulnerable to modern ATGM's.



(3) Bore evacuator: Threat tanks equipped with a bore evacuator usually have them located forward of center on the main gun. NATO tanks with a bore evacuator usually have them located center or aft of center on the main gun tube; however, modern British tank bore evacuators are concentric and forward of center, and modern French tanks have no bore evacuator at all.

(a) The non-concentric bore evacuator is not fitted equally around the circumference of the main gun tube. There is much more above the horizontal upper plane of the gun than there is below. This gives it a somewhat lopsided appearance. Non-concentric bore evacuators are usually found center or rear of center on the main gun tube, which is also a friendly tank trait.

(b) The concentric bore evacuator is fitted equally around the circumference of the main gun tube, giving it a much more streamlined appearance. Concentric bore evacuators are usually very long and fitted forward of center or on the very tip of the main gun tube, which is a threat tank trait.

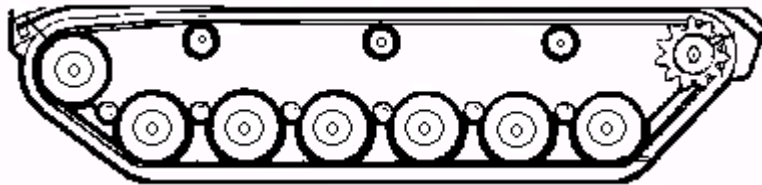
(c) A baffled muzzle brake is sometimes fitted to the end of the main gun for reducing the barrel's muzzle flash. Muzzle brakes can be single, double or multi baffled, and are usually found only on older tanks (both threat and friendly).

(d) A blast deflector may also be fitted to the end of the main gun by itself or in conjunction with a muzzle brake. It reduces the barrel recoil by channeling the escaping gases to the sides of the barrel, and helps deflect the gases away from the gunner's line of sight. They are usually found only on older tanks (both threat and friendly).

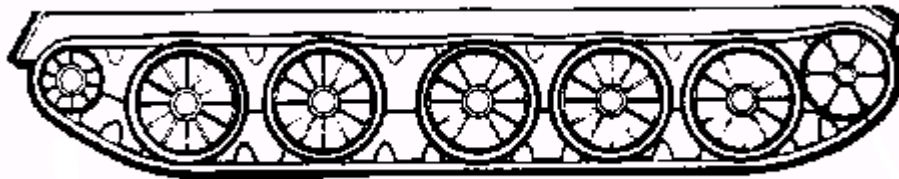
(4) Suspension Type: The suspension system provides the tank with a means of propulsion. There are two types of suspension systems currently used. They are:

(a) Torsion Bar Suspension: This suspension system has additional smaller wheels called support rollers, which apply tension and help alleviate "track drag". This system is generally more durable

than a Christie suspension. Torsion bar suspension equipped tanks are indicative of most NATO and newer threat tanks. This indicator is the least accurate of all of the tank indicators. Most modern tanks, regardless of threat level, have this type of suspension. However, it must be considered a friendly trait.



(b) Christie Suspension: This suspension system has no support rollers, so the tracks rest on top of the road wheels. The tracks do not have as much tension on them as on a torsion bar suspension. This suspension system is usually found on older threat tanks. (i.e. T-54/55 or T-62.). Although a Christie suspension is not as durable as a torsion bar suspension, comparable vehicles equipped with a Christie suspension are usually somewhat faster. Again, this indicator is the least accurate of all of the tank indicators. Many friendly vehicles have this type of suspension, i.e., M-113, LVTP-7 and Scorpion. However, it must be considered an enemy trait.



4. APPLYING THE MENTAL PROCESS OF ELIMINATION. As previously stated, the first step in AFVID is to determine if the vehicle being identified is a tank or a non-tank. (Use the tank definition used earlier in the lesson to decide). The vehicle on the next page is indeed a tank, as it fits the tank definition. Use the example below to apply the four tank indicators:

a. Absence or Presence of a Cupola: The tank on the next page lacks a cupola. This in itself does not necessarily indicate that it is an enemy tank, it merely means that the absence of a cupola is an enemy tank trait. Using the four indicators as a guide, this tank now has one enemy trait.

b. Turret Type: In addition to lacking a cupola, the tank below has a well-sloped turret. This in itself does not necessarily indicate that it is an enemy tank, it merely means that a well-sloped turret is an enemy tank trait. Using the four indicators as a guide, this tank now has two enemy traits.

c. Absence or Presence of a Bore Evacuator, Location and Type: The tank below does have a bore evacuator. The bore evacuator is forward of the barrel centerline, and is concentric. This in itself does not necessarily indicate that it is an enemy tank, it merely means that a concentric bore evacuator is an enemy tank trait. Using the four indicators as a guide, this tank now has three enemy traits.

d. Suspension Type: The tank below has a Christie suspension. (The tracks can just be seen on the tops of the road wheels, beneath the skirting system.) This in itself does not necessarily indicate that it is an enemy tank, it merely means that a Christie suspension system is an enemy tank trait. Using the four indicators as a guide, this tank now has four enemy traits.

5. **COUNTRY OF ORIGIN INDICATORS**. As stated above, certain features are dead giveaways to the tanks threat level. Additionally, certain other features will help you decide a tank's country of origin. These indicators are features that may be seen externally on a tank. These will further help in the mental process of elimination by allowing you to further isolate the tank within the threat assessment. The country indicators may not be visible or readily identifiable due to a number of reasons, (i.e., optional reactive armor add-ons, scheduled maintenance procedures), or simply because they are hidden by the crew, foliage, or SL-3 equipment. This group of indicators will not be utilized until the four main indicators have been applied. Country indicators may change, but the four indicators NEVER will. Below is a general list of country of origin indicators of generic tank features:

a. France

(1) Modern French tanks have no bore evacuators. They use a different system to extract the gasses.

(2) Modern French tanks usually mount their smoke grenade launchers in clusters of two or three on the extreme rear upper portion of the turret.

(3) Some French tanks have a tall "castle" style commander's cupola.

b. Germany

(1) Modern German tanks have large turrets that appear to be boxy, although aren't.

(2) Modern German tanks have square or sharply outward angled gun mantles.

(3) Modern German tanks are sometimes fitted with a unique "Wavy" style armored skirt.

(4) Modern German tanks mount their smoke grenade launchers in vertical rows of one or two on the rear sides of the turret.

(5) German tanks make obvious use of their national insignia, the Cross-Patee'.

c. Great Britain

(1) Modern British tank turrets have long, obvious frontal slopes.

(2) Modern British tanks have forward mounted concentric bore evacuators.

(3) Modern British tanks barrels are fitted with "wrap" around (as opposed to "bolt-on) thermal sleeves (these help reduce barrel warpage and decrease thermal emissions.)

(4) Modern British tanks are sometimes fitted with a unique armored skirt. This skirt has a horizontal bottom and sharply angled sides that leave the majority of the drive sprocket and idler wheel exposed.

(5) Modern British tanks have obvious "driver's" channels" on the upper glacis.

d. Israel. (Until the 1982, with the introduction of the Merkava (Chariot) Mk I, Israel did not possess a locally manufactured tank. They utilized heavily modified French, British, U.S., and captured Soviet tanks to equip their armored forces.

(1) The Merkava tank series have an extremely large, streamlined turret mounted slightly to the rear of the vehicle centerline.

(2) The Merkava tank series turret overhang is almost half the length of the turret. Thick lengths of chain hung from the turret bottom usually protect this area.

(3) The Merkava tank series have a long, pointed gun mantle that overhangs the main gun.

(4) The Merkava tank series have a long, horizontal engine exhaust on the right front side of the hull.

(5) The Merkava tank series has a front mounted drive sprocket. The engine is mounted in the front as well.

e. United States

(1) Early U.S. tanks (Post WWII) have a very tall silhouette.

(2) Early U.S. tanks (Post WWII) are generally fitted with a low silhouette domed cupola.

(3) Early U.S. tanks (Post WWII) have an oversized square/rectangular gun mantel.

(4) Early U.S. tanks (Post WWII) main guns are fitted with a T-shaped blast deflector and a bore evacuator mounted on the end of the cannon, except the M-60.

(5) Modern U.S. tanks have a low, rectangular silhouette.

f. Soviet/CIS/Former Warsaw Pact

(1) Early Soviet tanks (Post WWII) usually have a notched, horizontal mudguard.

(2) Early Soviet tanks (Post WWII) have a tall, well-sloped turret.

(3) Early Soviet tanks (Post WWII) have a Christie suspension and five large stamped road wheels.

(4) Early Soviet tanks (Post WWII) have an engine exhaust on the upper, left rear side of the hull.

(5) Early Soviet tanks (Post WWII) have a pointed glacis plate front.

(6) Early Soviet tanks (Post WWII) have a driver's hatch mounted to the upper, left front of the hull.

(7) Modern Soviet tanks have a very low silhouette.

(8) Modern Soviet tanks have a low, well-sloped turret.

(9) Modern Soviet tanks usually have a "V" shaped mudguard.

(10) Modern Soviet tanks have externally mounted, tube encased snorkeling gear on various positions on the turret.

(11) Soviet tanks have a forward opening tank commander's hatch.

6. **TANK SPECIFIC INDICATORS.** Tank specific indicators are those features or combination of features that ARE UNIQUE TO EACH TANK. These will be emphasized in depth in a later class. It is imperative that once you have decided the tank/non-Tank issues, and assessed the threat level, that you use ALL available indicators to identify the tank. Below you will find the complete tank identification procedures:

a. Decide whether or not the vehicle is a tank or non-tank.

b. Use the four tank indicators to assess the threat level.

c. Use any visible country of origin indicators to further isolate the tank.

d. Use tank specific indicators to identify the tank.

7. **MENTAL PROCESS OF ELIMINATION FOR NON-TANKS.** You have already decided the vehicle you are looking at is a non-tank for any number of reasons. (Use the tank definition above to decide if the vehicle is a non-tank.) Assessing the threat level is a little more difficult for non-tanks. Here you will learn how to use the three indicators of a non-tank. (DO NOT USE THE FOUR INDICATORS OF A TANK FOR A NON-TANK). The three indicators of a non-tank are:

a. Turret Position: The first step in assessing the threat level for non-tanks is to decide the type of vehicle you are looking at. There are only six. If you have identified what type of vehicle it is you have just mentally reduced the number of possible vehicles. Use the position of the turret to isolate the type:

(1) Armored Personnel Carriers (A.P.C.) turrets are usually mounted forward of the vehicle centerline on the hull. This leaves room in the rear for troops and equipment. A.P.C.'s usually have a front mounted engine and corresponding drive sprocket. A.P.C.'s may be fitted with large rubber tires instead of tracks.

(2) Infantry Fighting Vehicles (I.F.V) turrets are usually centered on the hull. This leaves room in the rear for troops and equipment. I.F.V.'s usually have a front mounted engine and corresponding drive sprocket

(3) Recon vehicle turrets are usually mounted to the **rear** of the vehicle centerline on the hull, if the vehicle has tracks. If the Recon vehicle has large rubber wheels, the turret will usually be centered on the hull. (Do not confuse this with an I.F.V.)

(4) Self Propelled Guns (S.P.G.) mimic tanks in that their main armament is usually quite large. However, unlike tanks, their turrets are sometimes half the size of a corresponding tank with the same main gun. A small turret with a large gun is a good indicator of the vehicle type. S.P.G.'s tend to have their turrets slightly rear of center.

(5) Anti-Aircraft vehicles usually mount their turrets centered on the hull. However, the distinguishing feature is not the location of the turret but the confirmation of a **multi-barrel gun system**. The main armament may be fitted center mass in the front of the turret, or on special "Arms" on the turret's sides.

b. Country of Origin Indicators for Non-Tanks: The second step used to assess the threat level of non-tank is the identification of country of origin indicators. These features will quickly help you assess the threat level of non-tanks. The country indicators may not be visible or readily identifiable due to a number of reasons, (i.e., optional reactive armor add-ons, scheduled maintenance procedures), or simply because they are hidden by the crew, foliage, or SL-3 equipment. The more indicators you identify, the easier the process will be. Remember, although country of origin indicators are part of the mental process of elimination for non-tanks, they are NOT part of the process for tanks. Below is a general list of country of origin indicators of generic non-tank features:

(1) Soviet/CIS/Former Warsaw Pact:

(a) Soviet non-tanks have upward opening "eye-lid" style vision hatches.

(b) Soviet non-tanks have forward opening vehicle commander's hatches.

(c) Many Soviet non-tanks have an externally mounted ATGM on the rear portion of the main gun or on the top of the turret. (Very few NATO vehicles are armed like this).

(d) Most early tracked Soviet non-tanks have stamped road wheels.

(e) Soviet non-tank turrets are usually small and flat topped.

(f) Some Soviet non-tanks use a special thin, hinged, grooved armored skirt.

(g) Soviet wheeled non-tanks have a distinctive "boat shaped" front end.

(2) France:

(a) French non-tanks often mount their smoke grenade launchers in clusters of two or three on the extreme rear upper corners of the hull.

(b) French tracked non-tanks (when so equipped) will have a unique, rectangular water intake screen on the lower rear of each side of the hull.

(3) Germany:

(a) German tracked non-tanks are often fitted with the same unique "wavy" style armored skirt found on their MBT's (main battle tanks).

(b) German non-tanks make obvious use of their national insignia, the Cross-Patee'.

(4) Great Britain: British non-tanks are often fitted with a main gun that appears to consist of two pieces. (The lower half of the gun barrel is almost twice as thick as the upper half.) The end of the main gun is fitted with a cone shaped flash suppressor/hider.

(5) Israel: As of this writing, 991215, Israel has very few organically produced non-tanks in production. Israel has always used extensively modified existing French, British, U.S. and captured soviet non-tanks to suit their needs. Their new locally produced APC, the "Azcharit", is based upon the Soviet T-55 tank chassis.

(6) United States: U.S. non-tanks tend to have a high silhouette.

c. Suspension system: The final step for assessing the threat level of non-tanks is the identification of the suspension system. Unlike the procedure for tanks, this only entails confirming whether or not the vehicle has tracks or rubber tires. A.P.C.'s and Recon vehicles can have either wheeled or tracked but most Infantry Fighting vehicles and Anti-Aircraft Platforms have tracked suspension.

8. APPLYING THE MENTAL PROCESS OF ELIMINATION FOR NON-TANKS: As previously stated, the first step in AFVID is to determine if the vehicle being identified is a tank or a non-tank. The vehicle below is indeed a non-tank, as it does not fit the tank definition. Use the example below to see how to apply the three non-tank indicators:

a. Turret Position: The turret on the non-tank above is positioned forward of the vehicle centerline. This tells us that it is an A.P.C. (Knowing this reduces the total number of vehicles for our mental process of elimination.)

b. Country of Origin Indicators: The non-tank above has two readily visible threat country of origin indicators; the upward opening "eyelid" style vision hatches and the "boat shaped" front end. We know that the vehicle above is an enemy A.P.C.

c. Suspension type: The non-tank above is obviously wheeled and not tracked. We now know that the vehicle above is an enemy, wheeled A.P.C. Using the three non-tank indicators we have isolated this vehicle to a such a point that there are only a few vehicles that it could be.

9. NON-TANK SPECIFIC INDICATORS: Non-tank specific indicators are those features or combination of features that are unique to each non-tank. These will be emphasized in depth in a later class. It is imperative that you use all of the indicators to identify the non-tank. Below you will find the complete non-tank identification procedures:

- a. Decide whether or not the vehicle is a tank or non-tank.
- b. Use the three non-tank indicators to assess the threat level.
- c. Use the non-tank specific indicators to identify the vehicle.

10. DECIDING TO SHOOT OR NOT TO SHOOT: Assessing the threat level is only the first step in proper vehicle identification. Once you have mentally grouped the vehicle into one or more categories, the elimination process becomes that much easier. If, from whatever features you identify, you decide it is an enemy vehicle, you don't have to worry about any friendly vehicles you may know. Once you receive the next three classes on each vehicle's unique and common characteristics you will be able to make solid choices in your armor identification endeavors. Once the threat level has been assessed, then, and only then, may the exact name of a vehicle be decided.

a. Proper armor identification is more than seeing a picture of a vehicle and reciting the name. Properly trained Anti-Armor men should be able to spew out five minutes worth of information about any given vehicle. You don't even need to see the picture of the vehicle to identify it. For example, you get an intelligence brief that says your battalion has just destroyed an enemy convoy was carrying 115mm ammunition. This tells you that the convoy was going to supply a mechanized unit that contained T-62 tanks. From that little bit of information, you can then tell your company commander everything he needs to know to properly engage the T-62's. You can tell him that the T-62 has five stamped, double sets of road wheels, a Christie type suspension, a well sloped turret, a crew of four, and that the maximum

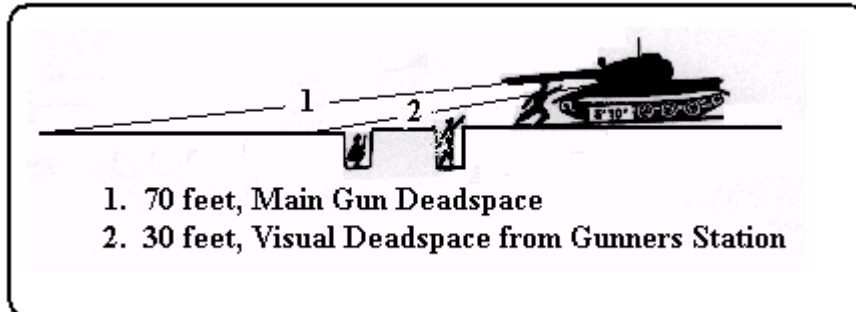
effective range of its main gun is only 1,600 meters. All of this information will effect his overall battle plan to defeat the enemy. Once you become familiar with all the currently available information, you will discover that proper identification is not really all that difficult.

11. **ARMORED VEHICLE VULNERABILITY:** All armored vehicles are vulnerable in some way or another to the SMAW, Javelin, and TOW anti-armor weapons found in the Marine infantry battalion. These five vulnerable areas are:

a. Dead Space: (Visual and weapons)

(1) Visual dead space is the area around the vehicle the crew cannot see when the armored vehicle has all its hatches closed. ("buttoned-up") On the average armored vehicle, this area will extend out about ten meters and is greatest to the sides and rear. This is assuming that the hull, turret and cupola are all facing the same way. Remember, they are all capable of independent movement.

(2) Weapons dead space is the area around the armored vehicle that cannot be covered by the vehicle's weapon systems, because they cannot depress the weapons beyond a certain point. Average weapons dead space is about 20 meters, and again, is the greatest to the sides and rear.



b. Armor Protection: It is impossible to provide armor of sufficient thickness throughout an armored vehicle to protect it completely from armor-defeating ammunition. In order to achieve this, the vehicle would weigh so much that the engine would not be able to move it.

(1) Frontal slope: The thickest armor on an armored vehicle is the glacis plate and the front of the turret. **It is not desirable to engage a tank from the front unless it is a last resort.** If you are forced to engage an armored vehicle from the front, aim dead center on the visible mass. A direct hit here should detonate stored ammunition, resulting in the destruction of the vehicle. If the round impacts on the left or right front of the vehicle, the impact is likely to kill the driver, but it is less likely to destroy the vehicle. This will usually only result in a mobility kill, as the drivers' compartment and steering mechanisms will be destroyed.

(2) Flank: This is the easiest and preferred area to engage, as it provides the largest target area. An impact here should set off stored ammunition, hit a fuel cell, and kill the crew. Armor found here is of **medium** thickness.

(3) Rear: This is the most desired area to engage, as it provides a good sized target and the main gun could be facing away from you. An impact will destroy the vehicle by igniting the fuel and causing a sympathetic detonation. Armor found here is **thin**.

(4) Top: This area is the absolute **thinnest** on any armored vehicle. Once the Javelin /TOW 2B become available in larger numbers, the individual Marine will be able to utilize their "fly over, shoot down" capabilities to destroy enemy armor.

c. Engine Compartment: The **most vulnerable** spot on an armored vehicle is the engine compartment, usually located at the rear of the vehicle. The engine compartment has very little armor protection. A hit here will destroy the vehicle by exploding the engine and setting fire to the fuel system. Sympathetic explosions will then ignite all remaining fuel and ammunition, thus ensuring vehicle and crew destruction.

d. Suspension System: The suspension system (including the tracks) is a highly vulnerable area. It should be pointed out that destruction of road wheels or support rollers may slow down or hinder vehicle movement; however, in most instances, the loss of one or two road wheels or support rollers will not stop the vehicle. Remember, if you merely stop a vehicle and do not destroy him, you will still have to contend with its main gun. (mobility kill)

e. Fuel System and Ammunition: Many vehicles use both internal and external auxiliary fuel tanks, which may be mounted on the side and rear of the vehicle. Though normally jettisoned prior to contact, if caught in an ambush, these fuel tanks make the vehicle considerably more vulnerable. In addition, igniting the onboard ammunition will usually result in a series of quick sympathetic explosions, resulting in the complete destruction of the vehicle. (catastrophic kill)

References. FMFM 2-11 Anti-Armor Operation; Pages 2-6 through 2-19, FM 100-2-3 The Soviet Army; Pages 5-21 through 5-72, and Jane's Armor and Artillery CD-ROM.