

# Tank-Infantry Smartpack

## *The Urban Fight: Tools for the Tank-Infantry Team*

### **M1A1 Tank Characteristics:**

- Engine = 1500 hp Turbine
- Speed = 41.5 mph forward / 25 mph backwards
- Range at 25 mph = 273-298 miles
- Fuel Types=JP8, DF-2, Mogas
- Weight w/combat load = 68 tons
- 360 degree turret traverse in 8 seconds

**M1A1 Tank Advantages:** The M1 Abrams series tanks possess lethal firepower. A platoon of these tanks has more firepower than an infantry company. The M1 has four killing systems:

- 120-mm main gun
- 7.62-mm COAX machine gun
- 7.62-mm loader's gun
- .50-caliber machine gun

Because of its size and weight, the M1 tank can breach buildings and walls.

Tanks can move rapidly over a variety of terrain conditions. They have enhanced target acquisition systems, organic air defense, can provide two types of smoke for point obscuration, and, when equipped with the mine plow or mine roller, enhance mobility. Tanks can transport infantry and critical supplies. Tanks can provide mobile cover from small arms for infantry. Because of its height, the M1 tank provides an excellent observation platform. They can breach obstacles, kill quicker and mass combat power much faster than an infantry company.

### **M1A1 Tank Capabilities:**

#### **Obstacles:**

- Climb 3-foot high rubble, concertina, or log barricades
- Cross <9-foot tank ditches
- Climb 60% incline, 40% side slope

#### **Weapons:**

1. Commander's M48 .50 cal HBMG, 1000 rounds combat load:
  - Highly accurate, 3x Magnified sight with stadia lines to 1800m
  - Un-stabilized, not designed for shooting on the move
  - No night sight

2. COAX M240 7.62mm MG, 11,500 rounds combat load:
  - Fully integrated with GPS and ballistic solution, most accurate M240 on the battlefield
  - Full night capability via thermal sights
  - Stabilized
  - Truly effective to 900+ meters
3. Loader's M240:
  - Free-gun primarily for defensive suppressive purposes
  - For shooting bad guys off of the turret and back deck
4. 120 mm Main Gun, 40 rounds combat load:
  - Laser Range Finder
  - Thermal Imaging Night Sight
  - Hydraulically stabilized turret/gun system

### **Ammunition:**

The current selection of main gun ammo consists of 120mm HEAT, MPAT (ground mode), HE-OR-T (XM908 Obstacle Reducing Round), and SABOT. SABOT is an armor-defeating round and less useful in the MOUT environment. HEAT ammunition will open a large hole in reinforced concrete or masonry structures, far larger than MPAT or MPAT-OR (XM908). Both MPAT and MPAT-OR offer great penetration. HEAT ammunition arms at approximately 60 feet from the gun muzzle. It loses most of its effectiveness against urban targets at ranges of less than 60 feet. MPAT and MPAT-OR rounds arm approximately 100 feet from the muzzle end of the gun. Because of the shape and metal components of the projectiles, however, this ammunition remains effective at ranges of less than 100 feet. Sabot petals, including those on MPAT and MPAT-OR, endanger accompanying dismounted infantry. They create a hazard area extending 70 meters on either side of the gun-target line out to a range of 1 kilometer.

### **Communications:**

Tanks are equipped with two single channel ground/airborne radio systems (SINCGARS). Tank-Infantry phones are attached to the right rear of the tank. They provide instant communication between the infantryman on the ground and the tank commander. FAC/FO modifications on the HQs tanks provides additional communication assets in order to reach artillery and air support. Each tank is equipped with a GPS with an external antenna modification in order to provide quick and accurate position reports while closed hatched.

### **M1A1 Tank-Infantry Modifications:**

Heat Deflectors: The tank's 900-degree exhaust will burn the skin if the exhaust grate or deflector shield is touched. Heat shields may be constructed from sheet metal and bolted to the exhaust grates to deflect the tank's heat and exhaust downward, enabling infantry to walk behind the tank. The shield may be mounted to deflect the exhaust upward. However, the exhaust will then interfere with the thermal sight when engaging to the rear. Tankers must warn infantry of

the extreme exhaust temperature. Infantry must keep in constant communications with the tank crew in case the tank needs to move.

### Other Assets:

M88A2 Recovery Vehicle is an armored platform to conduct quick retrieval of any immobile tank. In addition, the recovery vehicle can act as an improvised ambulance in order to remove battlefield casualties to a more secure location for medevac.

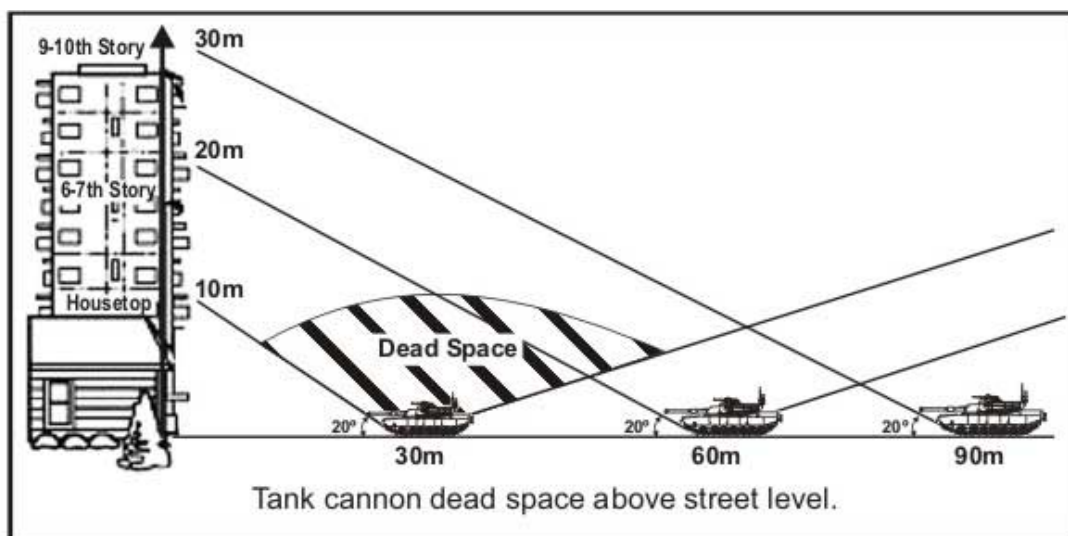
### M1A1 Tank Disadvantages:

- Vulnerable to attack in restrictive terrain.
- Cannot traverse certain types of terrain.
- Emit a significant audio and visual signature on the battlefield.
- Require a greater amount of logistical and maintenance support.
- Have limited air defense capability.

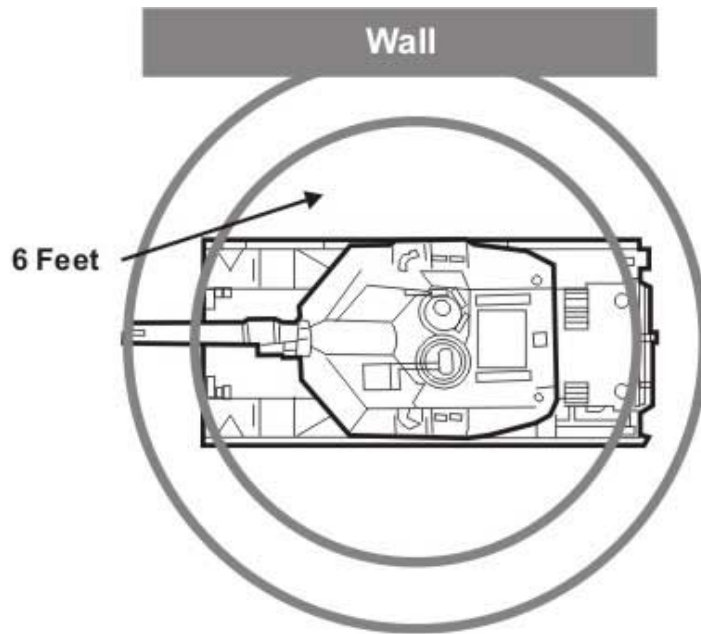
### M1A1 Tank Limitations:

#### Dead Space:

The tank's main gun and coax machine gun can depress to -10 degrees and elevate to +20 degrees. This creates considerable dead space for tank crews at close ranges, which are typical during urban operations. Engaging targets at rooftop level requires the crew to be at least 30 meters away to be able to elevate to rooftop level. For a target located on the 6th or 7th floor, crews must be a minimum of 60 meters away from the target. Crews may back up or use rubble, vehicles, or higher elevation to allow them to elevate and engage targets. When supporting infantry, TCs should seek these positions to support with fire.

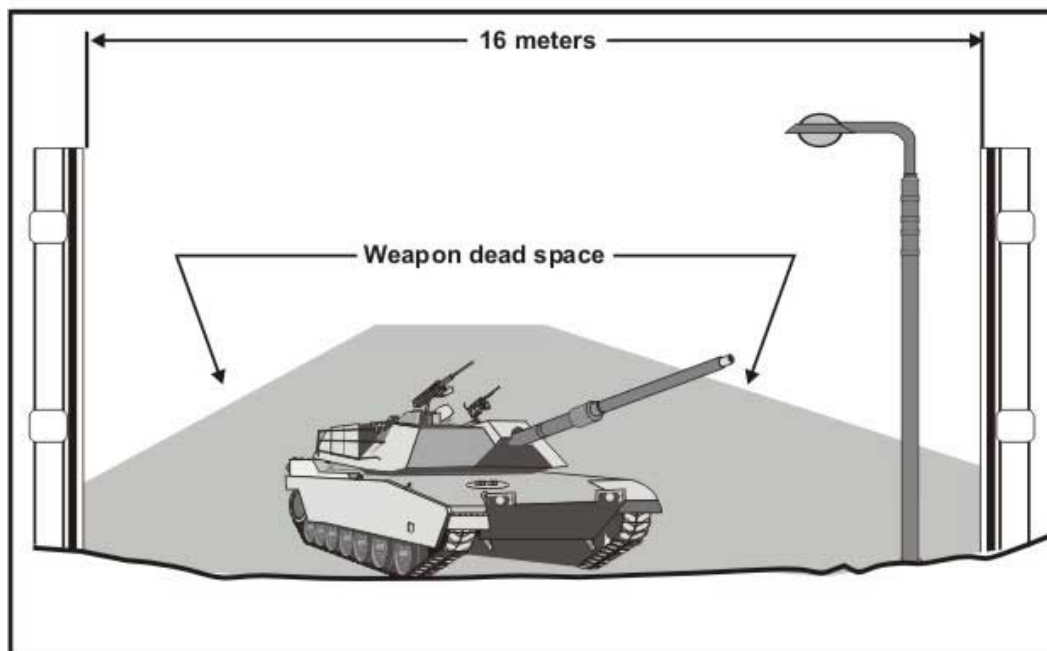


With an average street width of 16 meters in urban areas, traversing the main gun may be difficult. Crews must consider the rear of the turret as well as the muzzle end of the gun. Crews should allow 6 feet of clearance for the back of the turret. They must account for additional length if additional gear or equipment has been stowed on the stowage racks.



### Closed Hatches:

Conducting operations with closed hatches creates considerable dead space where the enemy may approach and emplace explosives. Most streets are less than 16 meters wide in urban areas. This short width creates dead space where the crew cannot observe through their vision blocks or engage with crew-served weapons. Using tank sections and infantry support can greatly mitigate this risk by maintaining constant observation of these areas. Tank crews must not become overdependent on infantry support to cover this dead space. Brief infantrymen that if they take cover in this area, they may be killed when the tank turns, pivots, or backs up.



### **Main Gun Overpressure:**

Dismounted Marines may be injured or killed from the overpressure and discarding sabot pedals from the 120mm cannon, falling glass, and debris created by the overpressure and rounds impacting on buildings.

### **Fire Control Limitations in Urban Environment:**

The fire control system cannot provide a ballistic solution for less than 200 meters for the main gun. A battle sight range of 300 meters for the main gun will enable crews to engage targets at 0 to 600 meters and provide faster engagement times.

### **Fratricide Avoidance:**

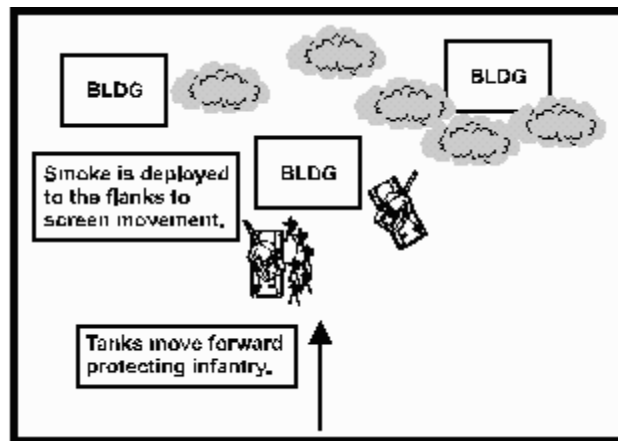
Due to the rapid movement of friendly infantry seeking covered and concealed positions, the chance of fratricide greatly increases. Communications between tank crews and infantry is critical to prevent fratricide. Man-portable radio systems must be used to keep constant contact between the tank and infantry. Recognition markings must be established. Tank crews should use the GPS in both daylight and TIS channel to observe infantry in all their gear prior to operations. TCs, loaders, and drivers should use passive systems to observe infantry.

### **Logistics Burden:**

To keep attached tanks mission-capable requires planning for refueling and rearming. Additionally, there may be a requirement for recovery of one or more tanks because of maintenance problems or the tank being disabled during contact. Infantry logisticians need to ensure they understand the planning factors for fuel and ammunition consumption, and then make the necessary arrangements for adequate resupply, maintenance support, and recovery capability. Failure to do so can result in unnecessary loss of attached tanks. Push the necessary support packages well forward on the battlefield. Put them under the control of the company tank leader to provide the most immediate support reaction. This will shorten the recovery period.

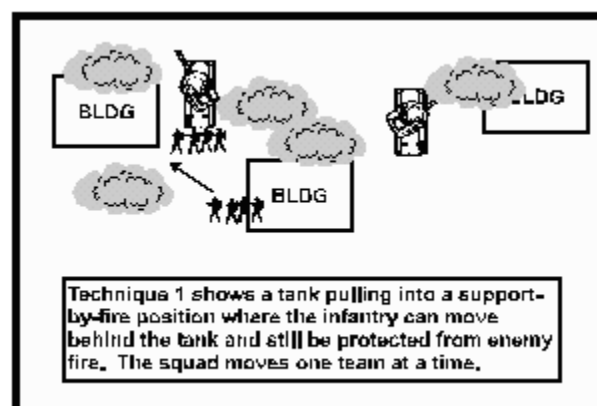
### **Techniques for Employment:**

1. Use of tanks in a support by fire for the infantry.
  - Employ tanks as a support-by-fire element.
  - Employ stand-off to maximize the effectiveness of the tank's weapon systems. Stand-off allows for greater coverage of the objective.
  - Use clearly understood control measures – graphic, visual and direct and indirect fire – to mark the progress of the infantry.
  - Maintain enough maneuver flexibility that tanks can reposition their support-by-fire positions based on, and relative to, the infantry advance.
  - All the tanks in the combined arms force should not be dedicated to support by fire.

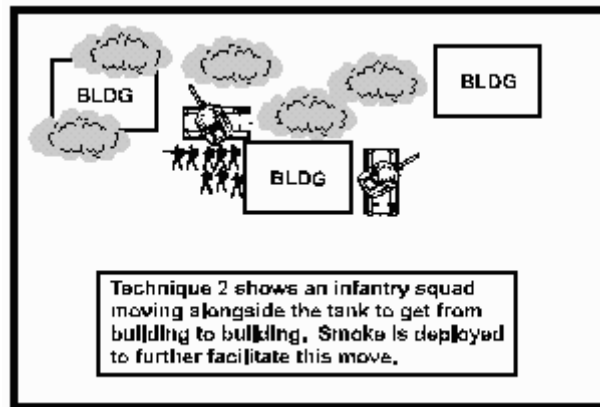


2. Use tanks to maneuver infantry squads into the village.

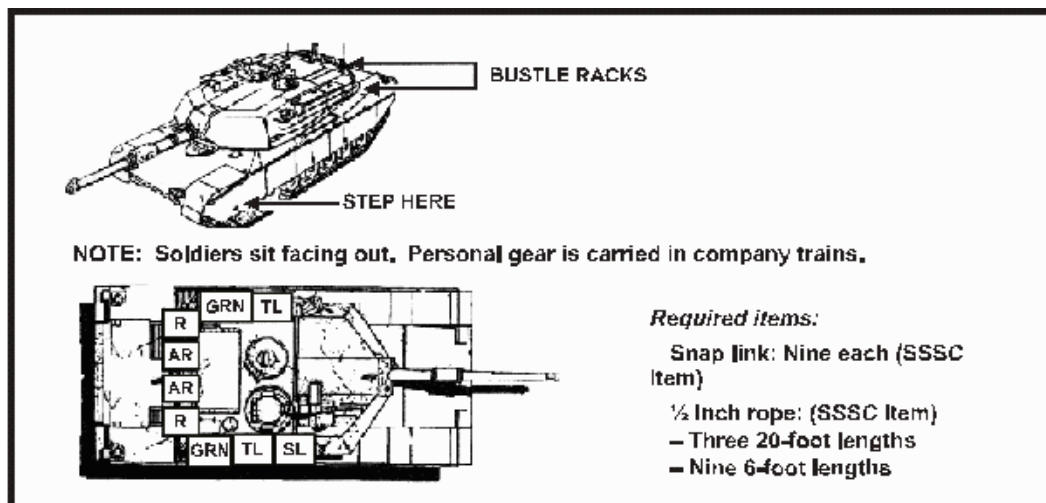
- With some tanks in the support-by-fire role, the remaining tanks can move infantry into a position to gain the foothold.
- Tanks typically train, operate, and fight as platoons. In the urban fight, the Marine Corps comfortably operates down to the section level. Never separate a tank section. Crews train as sections. This facilitates target acquisition, hasty recovery (without an M88, only a tank can recover a tank), and allows for ammunition transfers internally (between ready and semi-ready ammo racks) and externally (cross-decking). Like an infantry fireteam, the section is the lowest operating echelon for tanks.
- Tanks can provide a mobile shield for dismounted infantry, protecting them from small-arms fire and shell fragments. This allows an infantry squad to move behind a tank forward to the targeted building. The tank also provides immediate direct fire support for any threat to the infantry squad. Tanks can move a maximum of nine personnel.
- After gaining the foothold, continue to use tanks to move infantry.
- Maintain communication between tanks and infantry throughout mission execution.
- Establish identification, friend or foe (IFF) to prevent fratricide.



3. Use smoke to screen movement from those areas that tanks cannot block. Use smoke to obscure the vision from other buildings, not between the infantry and the building they wish to enter.



4. Infantry elements can use tanks to carry water and ammunition as well as other supplies. This obvious benefit to the dismounted infantryman is too often overlooked, especially when operations are extended or require the expenditure of large amounts of ammunition.
5. Use tanks to support the infantry's movement from building to building in order to minimize casualties when moving outside or between buildings.
  - Cover all possible threat locations with either observation or fire.
  - For those areas where it is not possible to cover with observation or fire, use smoke to set a screen to block enemy observation of friendly movement.
  - Use tanks to support infantry moves. Properly position the tanks before the infantry begins moving, whether the tanks are supporting by fire or being used as shields, or both.
  - Pre-plan positions if possible, but devise a marking system and communication signals to designate situationally-dependent positions to help maintain momentum.
  - When using tanks as a shield for the infantry, move the tanks as close as possible to the start point to allow the infantry the freedom of movement when exiting the building.
  - Tanks need to move at the infantry's rate of movement.
  - When the distance between buildings is short, tanks can just position themselves to block the open area from enemy fire.
6. Use tanks for *limited* transportation of infantrymen.



- One infantry squad can ride on the turret. They must mount in such a way that their legs cannot become entangled between the turret and the hull by an unexpected turret movement. Rope may be used to provide secure handholds.
- Everyone must be to the rear of the smoke grenade launchers. This automatically keeps everyone clear of the coaxial machine gun and laser range finder.
- The infantry must always be prepared for sudden turret movement.
- Leaders should caution soldiers about sitting on the turret blowout panels. 250 pounds of pressure will prevent the panels from working properly. If there is an explosion in the ammunition rack, these panels blow outward to lessen the blast effect in the crew compartment.
- If enemy contact is made, the tank should stop in a covered and concealed position, and allow the infantry time to dismount and move away from the tank. This action needs to be practiced before movement.
- The infantry should not ride with anything more than their battle gear. Personal gear should be transported elsewhere.

### **TANK-INFANTRY COORDINATION:**

In order for tanks to safely and effectively support the infantryman, a level of coordination between the tank and the infantry must be achieved. As the tank can protect the infantry by destroying obstacles, fortified machine gun positions, troop concentrations, and other targets, the individual tank requires the mutual protection provided by the infantry. It is the responsibility of the infantryman to protect the tank from dismounted enemy infantry and anti-tank teams. It is also their job to communicate desired fire support or position the tank to best support movement.

#### **1. Infantry Protection of Tanks**

- **Close-In Protection.** When movement is restricted and observation is poor, the squad must provide close-in protection to the tank. At least one fire team should cover the rear and the flanks of the tank. The remaining fire teams follow behind.
- **Short Range Fire Support.** In open terrain or in an area that offers good observation, the tank is well protected against small arms fire. The squad protecting the tank can maneuver in trace of the tank up to 300 meters but must have at least one fire team covering the tanks flanks and rear at all times.
- **Responsibility for Type of Support Used.** As the attack advances the squad leader may have to change the method of protection. This change should be communicated to the tank commander in order for him to be aware of the positions of the infantry. In addition, the squad leader should communicate to the tank commander of any specific targets that need to be engaged that has not been identified by the tanks.

#### **2. Tank-Infantry Communication**

- **Radio.** Infantry units can communicate with tanks by using the PRC119 normally carried on the platoon and company level.
- **Tank-Infantry Phones.** The T-I phones are located in the box on the right rear of the tank. Announce "Name, On Intercom" to alert the tank commander that the T-I phone is being



used. Then speak in clear language your intent or concerns. When finished with the T-I phone put it and the cord back in the box and secure it.

- Target Designation. The simplest form of target designation is the clock method. Using the front slope of the tank as 12 o'clock, announce to the tank commander a description of the target, direction, and an estimated distance.

#### COMPANY COMMANDER'S REMARKS:

- **Absolute situational awareness must exist between the tanker and the infantry on the ground.** The tanker must be aware of the location of the infantry around him. The infantry must be on constant guard against potential dangers associated with working closely with tanks.
- **Cross-talk between the tankers and the infantry is essential to foster a good working team.** We offer various techniques to accomplish this, to include field expedient installation of field phones on the right rear fender of the tank.
- **Both the infantry and the tankers must exercise tactical patience.** The tanks, indoctrinated in moving quickly from one position to another, must remember they are in a support role to the infantry. Their mission is to protect the infantrymen on the ground. They also depend on infantrymen for support and protection against close ambush. Separating themselves from the infantry will not only result in needless loss of life and equipment destruction but also mission failure. Also, terrain easily trafficable to an infantryman may be impassable to a tank. Be aware that mobility consideration for tanks and infantry is different when planning your moves.
- **Use of tanks does not negate the need to use smoke, obscurants, and indirect fire when moving up to obstacles and support-by fire-positions.**
- **It is essential that tankers attached to the infantry unit be involved in every step of the troop-leading procedures – especially rehearsals.**
- **To be effective, organize the unit as a combined arms team.**