Battery Defense in OOTW: How to Harden a Static Position

by Captains Julio L. Alvarez, Jr., and William N. Vockery

With the emphasis on operations other than war (OOTW) in the new *FM 100-5 Operations*, it's beneficial to revisit the unconventional threats we've already faced. In Vietnam, the enemy looked, spoke and acted like members of the indigenous population, and the threats were mortars and attacks by dismounted infantry who struck quickly at the time and place of their choosing. The Field Artillery countered the enemy by building hardened firebases. In Somalia, the same threat model applied, although an occasional mounted terrorist attack also occurred.

Except for the sheer numbers of enemy soldiers and civilians on the battlefield, Joint Readiness Training Center (JRTC) training scenarios at Fort Polk, Louisiana, are remarkably similar to those faced in Vietnam and Somalia. This article discusses when and how to harden a static position—battery defense tactics that worked in Vietnam, work at the JRTC and will work in future OOTW.

When to Harden a Static Position

When maneuver elements conduct search and destroy operations, protect convoys or conduct local air assaults on the nonlinear battlefield, the artillery may not always follow to provide support. Firing batteries may remain in dispersed, hardened positions for long periods of time—perhaps days—to provide fires over a large area.

The defense of this static battery is quite different than a move-and-shoot battery. Because it's stationary, it's most likely going to be detected—the fundamental difference between the two survivability techniques. The threat on the nonlinear battlefield is not one of armor or aircraft attacks or even heavy artillery fire; rather, the threat is dismounted soldiers and mortars. (See Figure 1 for a comparison of OOTW and conventional battlefield factors for the Field Artillery.)

This threat is not necessarily less than that in a conventional conflict; it's simply different. In a world so dominated by technology, it's easy to forget that our enemy may be a few thousand soldiers armed only with rifles, machineguns, rocket-propelled grenades (RPGs) and mortars. An enemy of this kind will attack when and where he feels confident of victory at minimum cost, and a poorly defended firing battery provides a lucrative target.

There are many reasons to occupy a static position. Field Artillery units could occupy a static position when maneuver units conduct operations to secure a limited terrain objective. For example, when a brigade secures an airfield, its soldiers probably won't walk beyond the range of artillery deployed on the same airfield. In less inhabited areas, an airfield may be the only terrain suitable for artillery to occupy.

The rules of engagement (ROE) may limit the areas that can be used to support an operation. Ammunition resupply may be tied to an airstrip or helicopter landing zone (LZ). When the threat is not from just one direction, the battery will have to position itself to fire in all directions.

Commanders and planners must first analyze the factors of mission, enemy, terrain, troops and time available (METT-T) to help them decide if the Field Artillery position should be static and whether or not the firebase should be hardened.

Mission. Does leaving a firing battery in a static position support the maneuver commander's intent? Is there a requirement for 6400-mil coverage of the battlefield? Are there tasks implied that require a hardened position—for example, protecting the Q-36 Firefinder radar or task force tactical operations center (TOC) or projecting US artillery deep into en-

Factors	Conventional	OOTW
Enemy Threat (In order)	Artillery, Armor, Air, Dismounted	Dismounted, Indirect Fire, Terrorist Attacks
Enemy Missions	Defend, Attack, Maneuver	Cause US Casualties, Involve Media, Involve Civilians
Friendly Missions	Defend, Attack, Maneuver	Search and Attack, Protect Convoys, Defend
Terrain Considerations	Linear, Multiple Positions	Restrictive, Limited Positions, 6400-Mil Firing
Field Artillery Survival Techniques	Movement, Dispersion, Avoid Detection	Hardening, Defense

Figure 1: Comparison of Conventional and OOTW Battlefields Factors for the Field Artillery

emy territory? The latter example is particularly important in the context of clear-in-zone missions. The force can use the firebase as a protected, centrally located headquarters to control its operations and, perhaps, lure the enemy into a decisive engagement.

Enemy. Is the enemy capable of air or armor attacks, counterbattery fire—how will he attack? In what numbers? How sophisticated is the enemy—what weapon systems will he use?

Dispersion of friendly equipment within a position is determined by the threat. Tight positions work better against a ground threat. The opposite is true against more conventional threats.

Terrain. Are positions with open, clear fields of fire (300+ meters) available or engineers available to create these positions? Are there any restrictions as to where the position can be situated, such as ROE or terrain too rocky to allow hardening? Will the soil support the type of weapon being emplaced? Will resupply occur by air or ground? Will the position support other assets, such as a radar? Are there sufficient positions to provide mutually supporting fires? What is the climate (particularly rainfall)?

Troops. Are engineer assets available? Have we factored in the additional demands on the troops when they have to harden a position? Firing units need to be at full strength to occupy and operate from a hardened position effectively. This is due to the demands of perimeter security and position improvement, which exceed the abilities of a depleted battery.

How many missions are going to be fired and what will the operations tempo (OPTEMPO) be? A standard modification table of organization and equipment (MTOE) battery can support 24-hour operations, if firing is sporadic and limited in number of rounds per mission. However, the daily controlled supply rate (CSR) for one battery on a firebase late in the Vietnam War was *2,000* rounds.[1]

Are additional troops available to support the defense of the position? Generally, Field Artillery units must not count on infantry support for survivability as infantrymen will be involved in other manpower-intensive operations.

Time. Are the priorities of work defined for each situation and the support available to make hardening feasible in the given time? Hardened positions are not occupied in 10 minutes or even one hour.

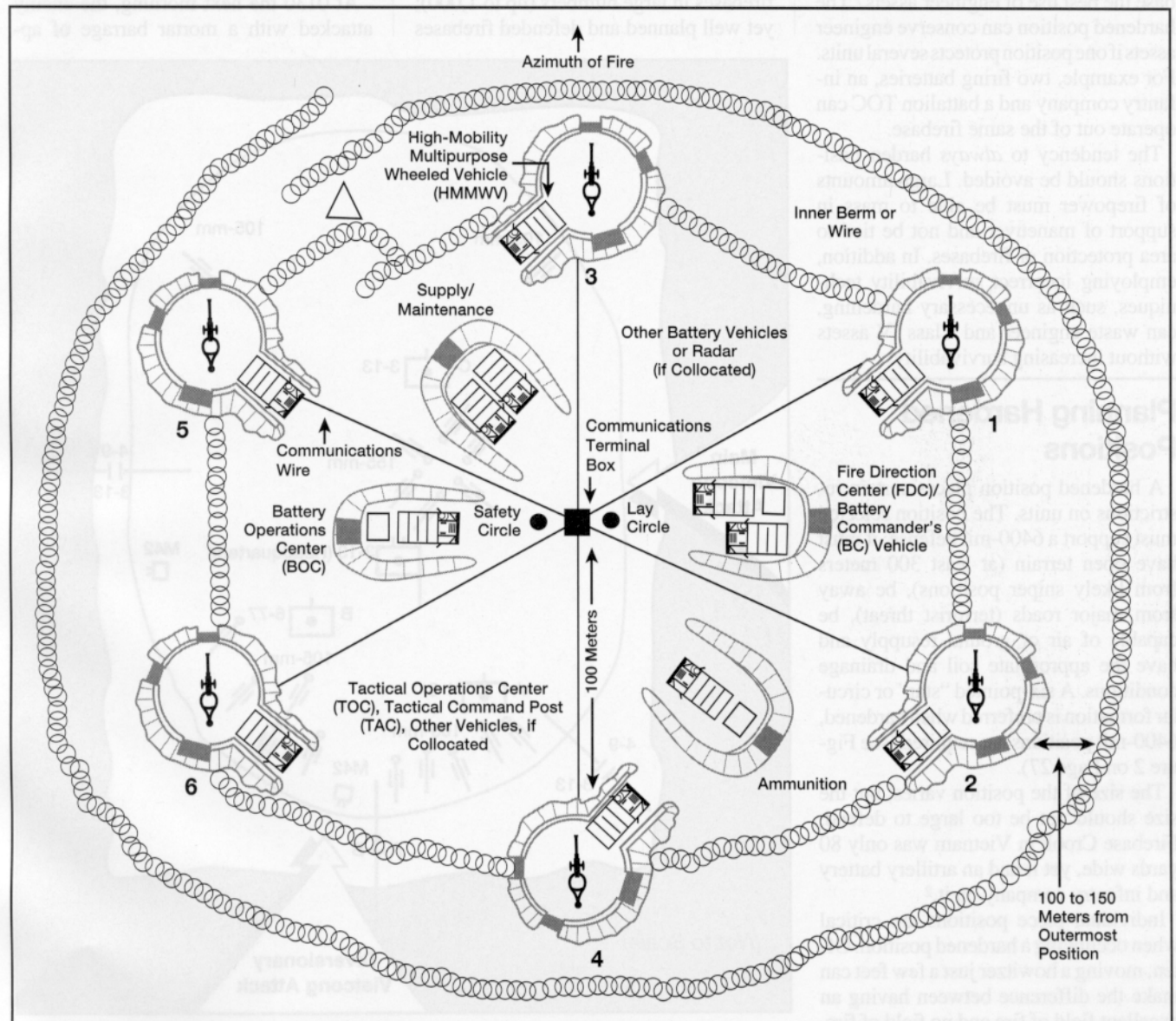

Figure 2: Hardened Battery Position in the Star Formation

Each takes a different amount of time to construct, depending on the quality of the position and the amount of hardening necessary. The length of time it takes to occupy and harden a position is directly proportional to the number of soldiers occupying the position and the availability of engineers and Class IV (building materials).

As you analyze METT-T, you must be sure the decision to harden a static position *best* supports the maneuver commander and consider several critical factors. Will maneuver forces move out of artillery range if the position is static? Will the hardened site facilitate the defense of maneuver forces when they aren't conducting operations? Is hardening the firebase the best use of engineer assets? The hardened position can conserve engineer assets if one position protects several units. For example, two firing batteries, an infantry company and a battalion TOC can operate out of the same firebase.

The tendency to *always* harden positions should be avoided. Large amounts of firepower must be able to mass in support of maneuver and not be tied to area protection or firebases. In addition, employing incorrect survivability techniques, such as unnecessary hardening, can waste engineer and Class IV assets without increasing survivability.

Planning Hardened Positions

A hardened position places certain restrictions on units. The position selected must support a 6400-mil defense; it must have open terrain (at least 300 meters from likely sniper positions), be away from major roads (terrorist threat), be capable of air or ground resupply and have the appropriate soil and drainage conditions. A six-pointed "star" or circular formation is preferred when hardened, 6400-mil positions are required (see Figure 2 on Page 27).

The size of the position varies, but the size should not be too large to defend. Firebase Crook in Vietnam was only 80 yards wide, yet it had an artillery battery and infantry company on it.[2]

Individual piece positions are critical when occupying a hardened position. Often, moving a howitzer just a few feet can make the difference between having an excellent field of fire and no field of fire. The locations of the section crew-served weapons are crucial. In terms of survivability, a machinegun position is more important than a howitzer position when a battery isn't augmented by infantry. This is because the crew-served weapon can be manned even during heavy shelling while the howitzer cannot. The howitzer and other crew-served weapons *must* be well-positioned—and if that takes an hour to accomplish, it's time well spent.

The availability of engineer equipment and Class IV is also extremely important. A position that will be occupied for an extended time requires a large amount of Class IV for success.

If properly planned, a hardened artillery position can survive against overwhelming odds. The enemy in Vietnam attacked firebases in large numbers (up to 1,000); yet well planned and defended firebases survived with minimum losses. Firebase Pike VI in Vietnam is an excellent example of a firebase occupation and defense against an enemy attacking in human waves and with mortars (see Figure 3).

Three batteries (one 155-mm and two 105-mm) entered the Pike VI fire support base early in the afternoon, and a bulldozer began constructing berms for the six 155-mm howitzers. By nightfall, only the turrets of the howitzers were exposed. The 105-mm batteries were carefully positioned to allow maximum use of Beehive rounds. Two 105-mm howitzers (one from each of the 105-mm batteries) were placed at strategic points along the perimeter some distance from the rest of the battery positions.

At 0130 the next morning, the enemy attacked with a mortar barrage of ap-

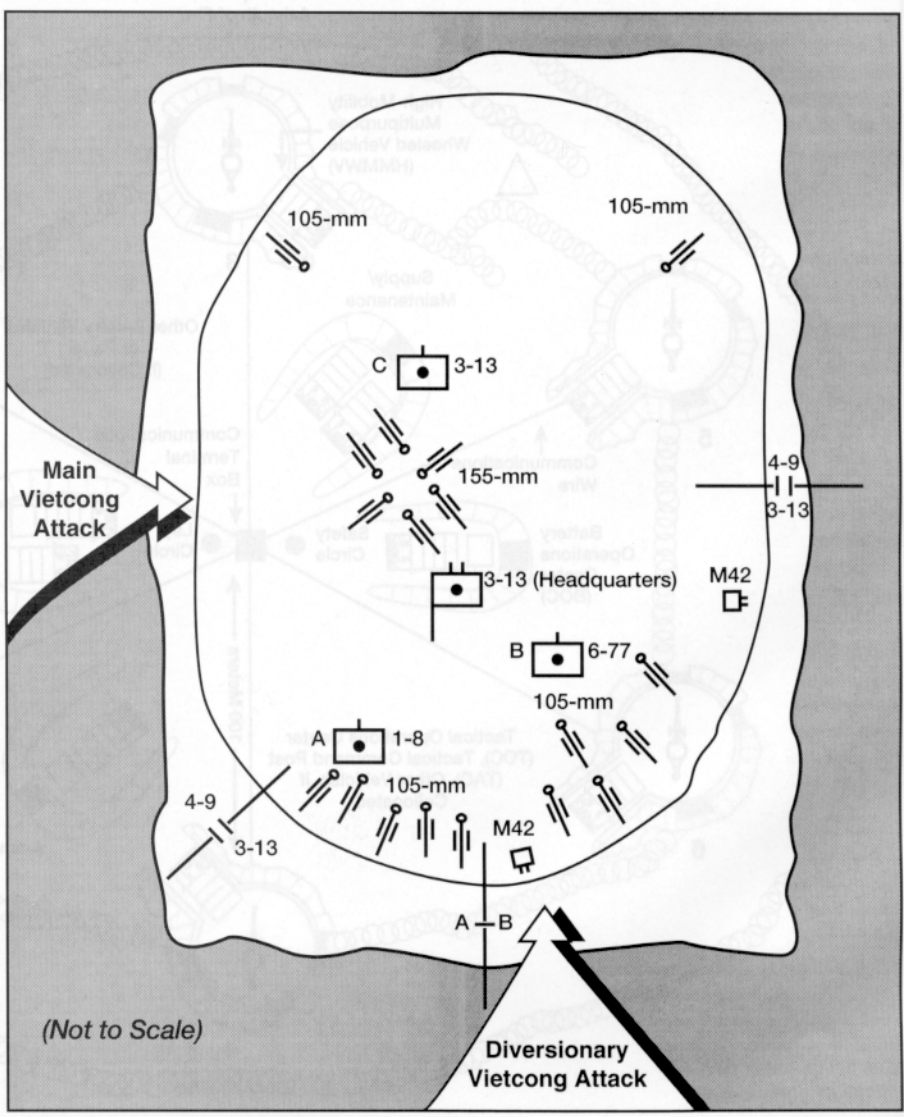

Figure 3: Firebase Pike VI in Vietnam. This is an excellent example of a firebase occupation and defense against an enemy attacking in human waves and with mortars.

proximately 400 rounds, all falling within 60 minutes. The enemy was repelled by small arms and the devastating use of multiple 105-mm Beehive rounds. Friendly force losses amounted to five killed and 30 wounded, of which one killed and five wounded were artillerymen. No equipment was lost.[3]

Advance Party

1. Select a defensible site that will support maneuver forces yet does not require massive engineer effort (300+ meters fields of fire).
2. Scratch out positions for howitzer and equipment berms, bunkers, vehicle positions, critical equipment positions, machinegun sectors of fire, howitzer direct fire sectors, etc.
3. Construct individual hasty fighting positions.
4. Lay out the defensive perimeter (interlocking fields of fire).

Occupation

5. Site/emplace the crew-served weapons.
6. All personnel dig individual hasty fighting positions.
7. Determine the final locations for defensive fighting positions and howitzer sectors of fire.
8. Finalize the perimeter.

After Occupation

9. Emplace wire obstacles, mines and early warning devices.
10. Improve individual positions from hasty to two-man foxholes.
11. Harden/dig-in critical materiel and equipment (in priority): overhead cover for all personnel, radar, TOC or other critical nodes, fire direction center/battery operations center (FDC/BOC), howitzers, ammunition and the remaining support vehicles and equipment.
12. Identify and plan defensive targets (verify with the global positioning system, or GPS).
13. Improve the perimeter wire (triple-strand concertina, tanglefoot).
14. Assign direct fire sectors.
15. Verify the siting of defensive weapons and the preparation of range cards.
16. Coordinate with adjacent units for areas of responsibility, mutual support, communications, etc.
17. Rehearse defenses (including test fires and ranging rounds).

Figure 4: Priority of Work for Hardening a Firebase (*FM 5-15 Field Fortifications*, 1972, Pages 2-15 to 2-19)

How to Establish a Hardened Position

After a decision to occupy a hardened position is made, the success or failure of the position (like every other position) is a direct result of the preparation and training the unit conducted at its home station. Keys to successful preparation are having a detailed but flexible battery defense standing operating procedure (SOP), the right tools and materials, experience working with engineers, knowledge of the capabilities and limitations of unit defense weapons and basic combat skills honed to standard.

Battery Defense SOP. A good SOP on battery/unit defense entails much more than rewriting Chapter 3 of *FM 6-50 Tactics, Technique and Procedures for the Field Artillery Cannon Battery*. The SOP must delineate standards for constructing equipment and personnel positions within the battery perimeter. It should address priorities of work, time standards and use of materials.

When establishing construction standards in a battery defense SOP, the writers should provide pictures, diagrams and measurements to explain the positions. Soldiers can get step-by-step instructions on how to build their positions from the SOP, and leaders can use it as a guide for checking and enforcing standards.

The SOP should outline exactly what soldiers and leaders do and when they do it. Figure 4 shows the priority of work to improve battery survivability.

The SOP also should establish time standards. The hardening process calls for soldiers to begin by constructing hasty positions and then improving them to hardened fighting positions to the standard of a minimum of 18 inches of overhead cover. With the right materials, it's realistic to expect all soldiers to build standard positions within one to four hours of occupation. Time estimates for constructing various positions are available in FM 5-15 and *FM 5-34 Combat Engineer*.

Equipment positions are constructed next and usually start as berms. Care should be taken to ensure each berm is as high as the people working inside. If possible, command and control centers should be remoted inside a bunker with overhead cover.

Ammunition then receives attention, depending on the quantities on hand and likelihood of enemy mortar attacks. When berms are constructed around the equipment, the berms also should protect the ammunition. An additional ammunition storage point may be constructed to store bulk ammunition temporarily. In the unlikely event an enemy round strikes ammunition, the explosive effects of burning powder will be contained within the berm.

A priority for establishing the perimeter should be to extend concertina wire around the firebase. The first belt should be at least 50 to 75 meters from the outermost equipment. FM 5-34 provides guidance for emplacing triple-strand concertina. Wire obstacles, mines, booby traps and early warning devices should be emplaced within the first six hours of occupation. Even a single-strand layer of concertina

Section/Vehicle	Plywood Sheet 3/4-Inch	Long Steel Pickets	Sandbags	Concertina Wire (Rolls)
Battery Commander/M998	2	6	500	3
BOC/M1038	4	12	500	3
FDC/M1038	4	12	500	3
Supply/M998	4	18	2,000	8
Ammunition/M925 (x 2)	20	60	8,000	20
Howitzer Section/M1038 (x 6)	24	72	3,000	18
Chief of Firing Battery/M1038	6	12	500	3
Advance Party/M998	6	12	500	3
Totals:	70	204	15,500	61

Figure 5: Class IV Basic Load for a Light Artillery Battery

wire can establish a perimeter and provide a basis for adding subsequent layers.

The priorities established for position defense must be as deliberate and methodical as those used to emplace a howitzer. The "Unit Defense Checklist" in Appendix H of FM 6-50 provides an outline for establishing a unit SOP. The SOP must be specific and detailed yet allow the flexibility to account for changing threats. A copy must be available for every soldier—they can't meet the standards if they don't know what they are.

Tools and Materials. To harden a position, soldiers must have adequate tools and materials. Many units assume that Class IV will be available automatically soon after arrival in theater—which is not the case. To facilitate both training and deployment, units should maintain a unit basic load (UBL) of Class IV at their home stations for use in the early stages of operations. (See Figure 5 on Page 29 for the Class IV UBL for a light artillery battery.)

Commanders can make the unit accountable for its Class IV UBL by placing it on section hand receipts as additional authorization list (AAL) items. Leaders should inspect the materials during layouts, thus preventing their use for other projects in garrison. These materials are easily replaced when damaged, and having them on hand will save soldiers' lives.

Besides materials, soldiers must have the appropriate tools to construct their positions to standard. Vehicle and howitzer basic issue items (BII) simply aren't adequate for sections to maximize their hardening efforts. Units should buy and maintain section construction kits, consisting of the hardware and tools necessary to expedite constructing positions. The following should be considered for each section's kit: two long-handled shovels, one additional mattock, one claw hammer, nails, one cross-cut saw, one roll of binding wire, one spool of rope (1/2 to 3/4 inch), 550 cord, two pair of wire handling gloves, one sledge hammer (a 10-pounder), two machetes and one swing blade. Commanders also can add the construction kits to section hand receipts as AAL items. The supply section can maintain materials that are bulky or shared throughout the battery, such as four locally fabricated picket drivers and a chain saw.

Training with Engineers. This training is extremely important as constructing a hardened position requires extensive engineer support. Although engineers can construct a multitude of positions (as outlined in *FM 5-103 Survivability*) there's no standard established for constructing a hardened position for a light towed artillery piece or firebase. Units must design their own positions for the various contingencies they could face (see Figure 6). Then they must validate the construction plan with the brigade's engineers.

The Field Artillery battalion must plan and coordinate early to ensure the brigade gives priority to fire support assets in its engineer support matrix. The firing batteries and radar should receive engineer support as early as four to six hours after occupation. The Field Artillery support plan must list in detail the times and places for linking up with engineer equipment, security responsibilities, fuel requirements and the number of engineer equipment "blade hours" allocated.

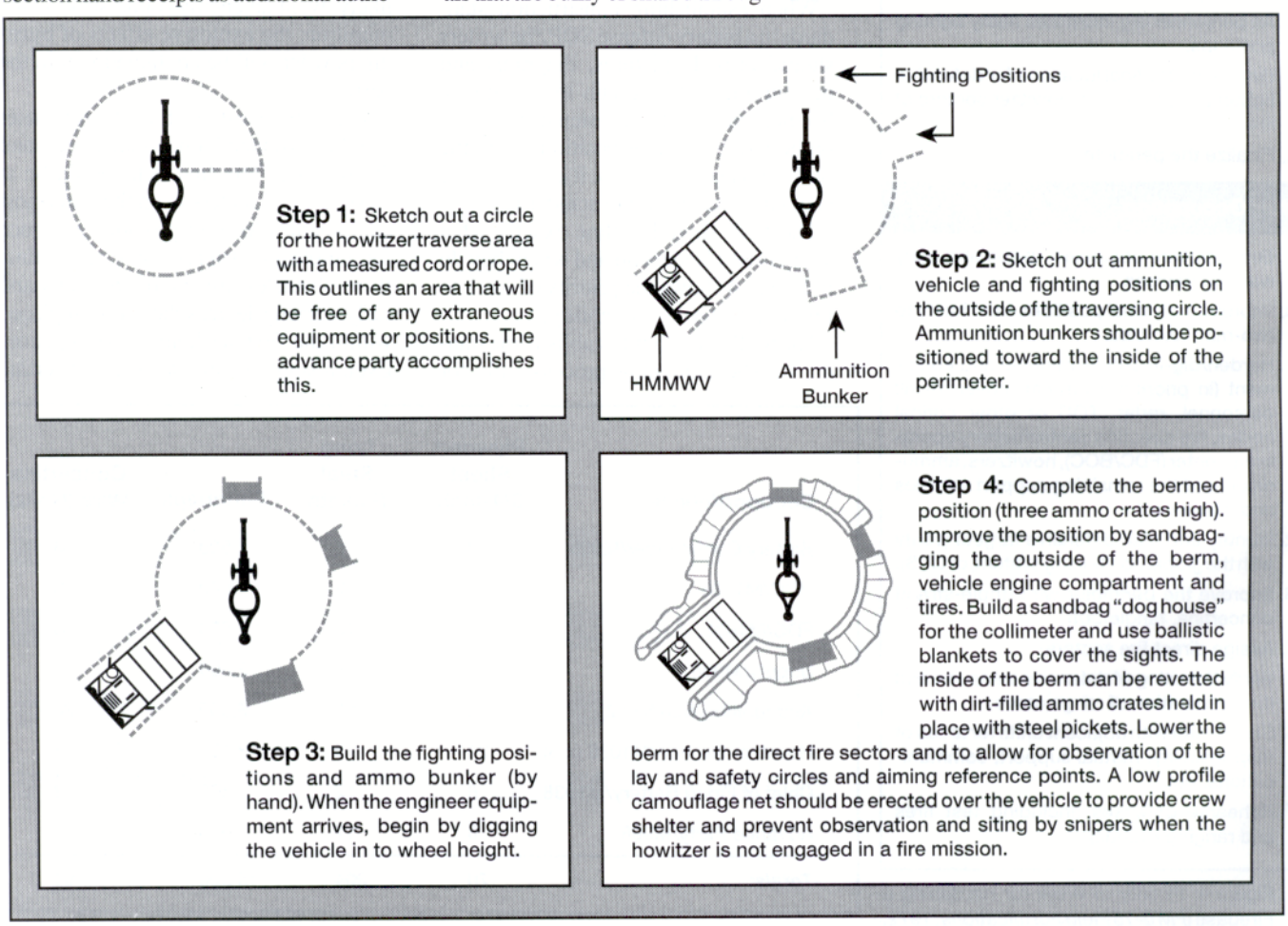

Figure 6: How to Build a Hardened Howitzer Position

Howitzer and equipment berms are constructed by either pushing dirt from the inside out, by pushing dirt up from the outside in or a combination of the two. Berming from the inside out allows for a lower equipment profile and creates a less spoiled outside appearance. This is best for critical nodes, such as ammunition, a fire direction center (FDC)/battery operations center (BOC), any tenant TOCs or the radar shelter. However, this method creates an uneven firing platform for howitzers, which requires time and effort to level. It also negates the howitzer's direct-fire capability because the firing platform is lowered. Berming up from the outside creates a "messier" position, but it's quicker and provides a thicker layer of earth for protection and a better firing platform.

Prime movers can be dug-in to wheel height and bermed up from the outside to cargo canvas level. In this way a vehicle presents a low profile, allowing the howitzer to provide 6400-mil fires over its top.

Some engineer units provide squad-sized elements to not only operate small emplacement excavators (SEEs) and dozers, but also to augment the battery's defensive position preparation. With assistance from battery personnel, these engineers can quickly erect triple-strand concertina wire, tanglefoot and other wire obstacles, mines and early warning devices. Their expertise is invaluable to the battery's survivability.

Knowledge of Weapons Systems. An important aspect of a successful perimeter defense is a thorough knowledge of the battery's weapons and their capabilities. The reality is that most soldiers (and sadly their leaders) do not know how to employ their own crew-served weapons. Training on all these systems—rifles, machineguns, grenade launchers, light antitank weapons (LAWs), mines and early warning devices—is often nonexistent because Redlegs tend to think of the howitzer as the only weapon required for battery defense. Assuming that no enemy will attack the firepower of several well-positioned howitzers leads to complacency about employing an integrated battery defense. The battery defense plan should be based on small arms, crew-served weapons and planned direct fire.

To devise an integrated battery defense plan, leaders must know the capabilities and limitations of their weapons, which is not always the case. For example as seen at the JRTC, a supervisor often stands over soldiers building a crew-served weapon's position and gives the sector of fire for the weapon. If the leader would sight the weapon at the ground level, he often would see the weapon has an obstructed view in its designated firing sector. Another example: too often a supervisor displays misguided compassion and won't tell a soldier to build a new hardened position when the one he built is incorrect or does not meet the standard. Taking care of soldiers means having them rebuild positions to ensure they can survive.

The following is a checklist for positioning and employing a machinegun: emplace the weapon first, then build the position; ensure you're able to open the feed-tray cover, change barrels and sight on targets all under protective cover; ensure the traverse and elevating (T&E) mechanism can operate; use limit stakes; and ensure the weapon has a field of fire for the entire sector.

Range cards must be accurate and usable. Soldiers need to know that range cards aren't just for the preparer but for follow-on users as well. To integrate the battery defense, the first sergeant uses data from the range cards to identify and account for gaps in the perimeter.

Howitzer range cards *must* include accurate firing data for the munitions to fire at defensive targets. This includes the planned use of Killer Junior, improved conventional munitions (ICM) in the wire, Beehive, and direct fire high-explosive (HE) rounds. It's too late to compute the data while under attack. Units can use the global positioning system (GPS), aiming circles or survey to provide distances, ranges, grids, etc. for direct and indirect fire targets.

Conclusion

Every soldier must know every aspect of his unit's defensive plan because any soldier could have to defend any part of the perimeter. Leaders should rehearse every aspect of the defense plan, from actions on the howitzer to a complete walk of the perimeter. They need to identify key areas such as observation posts, entrance and exit points, key mines and obstacles, defensive targets, mutual supporting units, casualty collection points, etc.

The old "whistle, assemble on me" reaction force is not sufficient. Too much confusion exists to assemble individuals from each section and beat back an enemy who is already inside the perimeter. Additionally, friendly soldiers moving about are often mistaken for enemy soldiers during an attack. A reaction force to augment a weakened portion of the perimeter is valid; however, by design, a mutually supporting and well-rehearsed defense plan often eliminates the requirement for its use.

The concept of fighting from hardened positions is not a new one. It is, however, an undertaking that significantly changes our training methods. History has shown we fight like we train. As artillerymen, we have trained our units to move, shoot and communicate—to be mobile. Under many conditions, this is appropriate. But during operations other than war, the conditions, the threat and the mission are different than those calling for mobile artillery.

The Army faced such circumstances in Panama and Vietnam and, more recently, in Somalia. We'll see more of the same in the future—we must be prepared.

Notes:

1. David Ewing Ott, *Field Artillery, 1954-1973* (Washington, DC: Department of the Army, 1975), 186.
2. Robert H. Scales, *Firepower in Limited War* (Washington, DC: National Defense University Press, 1990), 139.
3. Ott, 163

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