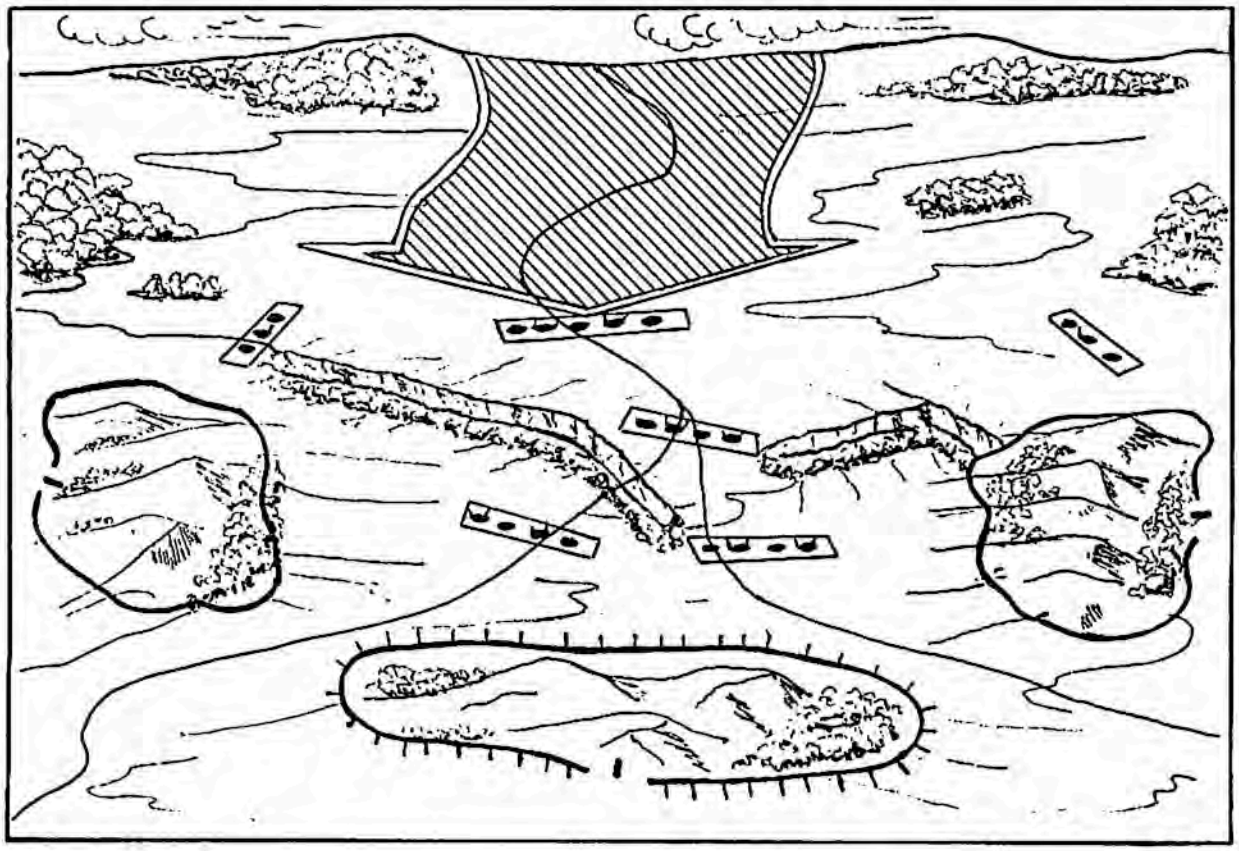
Terrain Reinforcement



This pamphlet reflects lessons learned during Cardinal Point II in the summer of 1978, and reflects the guidance of Major General Gorman, then in command of the 8th Infantry Division.

THE COMMANDING GENERAL

8TH INFANTRY DIVISION

APO NEW YORK 09111

Terrain reinforcement is the improvement of terrain to increase the military advantage of the defender. It ranges in scale from extensively engineered barriers to the infantryman's fighting position. Current doctrine creates awareness of terrain reinforcement as a concept, but fails to describe how to implement the integration of this combat multiplier. To implement terrain reinforcement, with all its advantages, requires emphasis in conceptualization, training, and planning for combat in Europe. The result of such emphasis can provide much-needed new combat capability as we move into an era of vast increases in the accuracy and lethality of weapons systems.

This pamphlet summarizes recent experience with terrain reinforcement so that Pathfinder leaders can build defenses sufficiently resilient and flexible to assure concentration of the Division's armor for counterattack - - the essence of active defense .

Unsigned;CG left while the document was being assembled.

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Effective 31 March 1979, the policies specified in Terrain Reinforcement are directive within the 8th Infantry Division. Overall proponent is the Chief of Staff. Comments or recommendations may be submitted directly to the Office of the Chief of Staff.

The words "he", "his" and "himself" are intended to include both the masculine and feminine genders and any exceptions to this are so noted.

CHAPTER 1

WHY TERRAIN REINFORCEMENT (TR):

TERRAIN REINFORCEMENT is the sum of measures undertaken by a commander to improve terrain (ground and the works of man thereon) through obstacles and field fortification.

TR...	
(1) ...structures the battlefield prior to hostilities	TR is not a belligerent action; it is a self-protective activity of the defending force. It is the best utilization of available time when conflict appears imminent. It thus enhances the forward defense concept in NATO.
(2) ...buys time/space	By protecting and sustaining the friendly force while creating obstacles in depth, and by causing the enemy to deploy, commit engineer assets, and reorganize his attack, TR adds hours and days to the defensive battle. Supplementing natural obstacles gives artificial depth to the battlefield, forcing a heavy commitment early, and striping mobility from the attacker.
(3) ...is a combat multiplier	Covered weapons and crews avoid attrition and continue to engage the enemy throughout his attack. Strongpoints baffle and canalize the enemy, causing attrition while preserving the friendly fighting force.
(4) ...enhances defender mobility/ flexibility	Protection afforded by TR allows the defender to move units laterally to meet threats or to mass for counterattacks. Strongpoints economize defending forces and provide "interior lines."
(5) ...makes CIMIC a combat advantage	TR is an organizer and principal customer for German Territorial Command CIMIC activities which can be planned and rehearsed in advance, better utilizing available host nation assets.

6	...concentrates and exploits engineer capabilities	Extensive barriers composed of minefields, tank ditches, and other obstacles are preplanned in the GDP. Issue of the UNIMOG to infantry units will permit even more efficient massing of engineer assets.
7	...impacts on high-dollar readiness decisions	TR readiness improvements bear on the efficiency of funding for master restationing initiatives and prepositioning of all classes of supply and equipment.
8	...is all possible now	Initiatives in TR are already a significant part of the Division and Corps GDP.

(1) TR...

...structures the battlefield prior to hostilities

Terrain reinforcement is not a belligerent action; it is a self-protective activity of the defending force. It is the best utilization of time when conflict appears imminent. It thus enhances the forward defense concept in NATO. Terrain reinforcement cannot be construed as an overt offensive action during periods of heightening tension. Minefields and ditches simply cannot jump up and attack someone. They are purely defensive in nature and in fact may be one of the best positive actions that field commanders can take prior to hostilities that will protect his forces and subsequently kill tanks if needed.

When properly visualized, planned and executed, terrain reinforcement may cause an enemy to attack along an avenue of approach which is advantageous to the defender.

For example, minefields and anti-tank ditches, carefully placed, may not only halt an enemy, and thereby subject him to greater losses, but may cause him to move in directions which expose him to flanking anti-tank fires or place him at a similar disadvantage.

Conversely, terrain reinforcement increases friendly survivability through increased cover, concealment and preplanned fires.

In short, well-planned and prepared terrain reinforcement permits the defender to fight the battle on his ground, on his terms, from thoroughly concealed and covered positions. Acknowledging this, FM 71-2 charges infantry and armor commanders as follows:

Commanders must use every advantage offered by the terrain. Natural obstacles must be reinforced, extended, and covered by fire. Approaches must be examined to find areas where enemy formations can be subjected to a high volume of lethal fires. Development of obstacles which tend to force an attacking enemy away from cover and concealment and into open ground must be a high priority. Battle positions must be selected which provide long-range unobstructed fields of fire into places where the enemy will be. If necessary, fields of fire must be created. At the same time, battle positions must provide cover and concealment, or nearby concealment from the fires of following enemy echelons. They must have adequate routes in and out so that units can occupy them quickly without unnecessary exposure, and can vacate them in the same way when they have completed an engagement.

(2)

TR...

...buys time/space

By protecting and sustaining the friendly force while creating obstacles in depth, and by causing the enemy to deploy, commit engineer assets, and reorganize his attack, terrain reinforcement adds hours and space to the defensive battle. As an enemy attacker encounters reinforced terrain, he may choose to bypass it. In so doing, he is forced to change his original direction and drive additional distance to the right or left flank. This action must be coordinated with his flank unit and following echelons, resulting in delays, confusion and possible exposure to flanking fires as they proceed to either flank.

The enemy attacker may choose to stop and breach the reinforced terrain. This massing of forces creates lucrative targets for direct and indirect fire systems as well as tactical air.

If an attacker chooses to follow the path of least resistance around obstacles, he may be canalized into killing zones and lose his combat effectiveness. By reinforcing terrain, to include strongpoints, the defender can avoid high attrition while inflicting heavy losses on the enemy.

The reinforced nature of the strongpoint provides the defender a key, stable, fixed point on the battlefield. It may be his only eyes and ears concerning follow on echelons.

It may serve as the pivotal point around which he laterally shifts his reserve to reinforce or counter attack. Terrain reinforcement in depth including successive strongpoints occupied with minimum forces provides the defender time to concentrate his mobile forces and space in which to operate.

(3)

TR...

...is a combat multiplier

Barriers and strongpoints baffle and canalize enemy mobility and cause attrition while preserving the friendly fighting force. Terrain reinforcement enables infantry without tanks to stop or turn enemy armor attacks while defending armor assets remain mobile and flexible to reinforce or conduct counter attacks. Through digging-in and extensive overhead cover the defender's weapons service life is increased. They cannot be easily knocked out and continue to bring effective fire on the enemy.

By creating strongpoints and similar well prepared positions the entire defending force increases its survivability.

TR...

(4)

...enhances defender mobility/flexibility

Recent battle simulations have given some indication that a barrier system proves of great value not only from the obvious viewpoint of canalizing the enemy and destroying his momentum, but more importantly, in providing for friendly lateral reinforcement or repositioning behind the barrier. This is a significant consideration in light of the following guidance in FM 100-5.

> "Thus, for example, division commanders in Europe must be willing to concentrate firepower and up to six to eight of their maneuver battalions on one-fifth of their front to meet breakthrough forces of 20-25 battalions. They must cover the remaining ground with air and ground cavalry, remaining battalions, and attack helicopter units. If the forces and firepower are inadequate to achieve these combat power ratios, then an effective defense is not possible, and division commanders must trade space for time by going to the delay. Corps commanders can assist division commanders who face a main thrust by reducing the division's area of operation or providing more fire support and air support."

One must add that the massing of forces to meet a breakthrough is more feasible along interior lines created behind the screen of a well conceived and prepared barrier system. In fact the sentence which reads "They must cover the remaining ground with air and ground cavalry, remaining battalions, and attack helicopter units," might well better read "They must cover the remaining ground with barrier systems, strongpoints and similar forms of terrain reinforcement overwatched by remaining air and ground cavalry, maneuver battalions, and attack helicopter units."

As discussed earlier, extensive barrier systems buy space and time, multiply combat power and create interior lines for lateral movement of friendly forces. All of these insure flexibility of the defender.

(5) TR...

...makes CIMIC a combat advantage

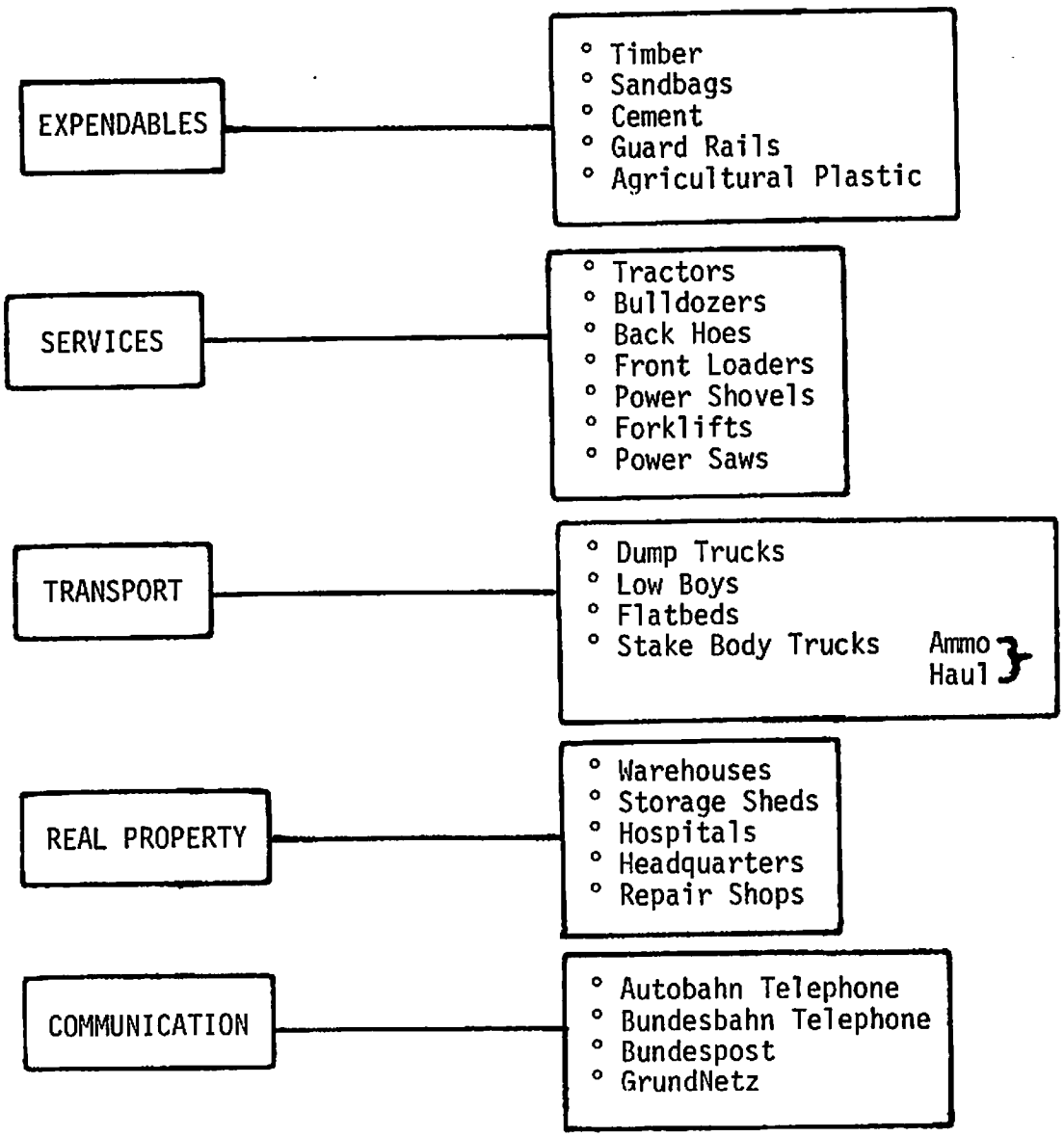
Given the current high level of preparedness of USAREUR forces, there still exist some avenues for quantum jumps in improved combat readiness. One of these avenues is the Master Restationing Plan, and any portion of that plan which can be put into execution will provide a piece of a better readiness picture. Another quantum improvement will be the incoming weapons upgrade. A third, equally as significant in its powerful potential, is CIMIC. The civil-military cooperation which can be coordinated by existing elements of the German Territorial Army can provide the vital link in support of rapid creation of terrain reinforcement in the "up front" areas of USAREUR general defense planning.

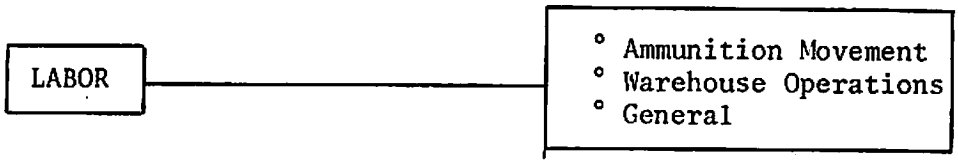
While Host Nation Support agreements are complex and difficult to plan in advance, CIMIC is predicated on wartime liaison as requirements occur for assistance from the German host. Prior planning and coordination serve to point out and predict when and where these CIMIC requirements will occur, and good peacetime working relationships between US and German Territorial counterparts (for example, US Brigade HQ and Verteidigungskreiskommandos or VKK's) can insure that the necessary support is preplanned and ready, and that the channels of communication are adequate.

Both sides have recognized that there is a need to practice CIMIC in peacetime in order to be prepared for operations in wartime, and in actual large-scale (brigade level) terrain reinforcement plans within

8th Infantry Division, a series of agreements between Division and Brigade level US and German counterparts have resulted in much progress toward the rapid and productive coordination of support for a variety of terrain reinforcement requirements.

Areas in which CIMIC support is planned, with specific relation to terrain reinforcement:





The emerging results of current ongoing coordination in the above CIMIC areas do not constitute agreements concerning specific prestocked timber or specific bulldozers, but rather they are plans which recognize the general levels of availability of such items in GDP areas and provide for liaison and coordination to procure these items as requirements arise and as circumstances permit under German law during wartime.

Peacetime coordination for CIMIC support in wartime = greatly enhanced terrain reinforcement = quantum jump in defense capability.

(6)

TR...

...concentrates and exploits engineer capability

Barriers structure the battlefield to the commander's concept, but before they can be completed it is necessary to...

...release and deploy barrier stocks early
...focus on unique logistical requirements
...maximize use of mechanical mine layers
...employ one of a kind equipment in each company in teams
...minimize distances because of slow engineer equipment mobility
...integrate non-divisional engineer support on the MBA

All engineer excavation equipment cannot be committed to obstacle construction without sacrifice of support for digging-in maneuver forces. The German Army has recognized this point and placed 4 highly mobile UNIMOGS in each infantry battalion.

The US Army Armor and Engineer Board in evaluating strongpoint excavators concluded the UNIMOG was the best overall excavator available.

The acquisition of this versatile vehicle would address the infantry digging-in requirement while permitting the full concentration of engineer equipment on terrain reinforcement.

TR...

...impacts on high dollar readiness decisions

TR is an action that lends itself to positive initiatives and improvements for forward defense today. It can bear heavily on high dollar decisions in peacetime in terms of unit stationing and the prepositioning of classes of supply which impact on readiness at the critical moment prior to hostilities. The extensive tonnages involved in supply of TR initiatives require logistical planners to rethink the transportation requirements for Class IV and V. This re-examination has, in turn, led to a new concept in forward positioning of supplies which have long life in storage. Under consideration are pre-stocking barrier munitions very near the intended minefields; storage of Class IV in US Kasernes, or even in rented German facilities; storage of Class VIII medical items under the CIMIC program; use of existing TISAS in GDP areas for prepositioning of Class I wartime stocks; Class VII and IX major assemblies (high tonnage/cube). These concepts have caused the division planners to focus on forward stationing of 8th Infantry Division units in the GDP area, so that forward supply bases may be controlled by our troops.

(8) TR...

...is all possible now

Initiatives in terrain reinforcement are already a significant part of the Division and Corps general defense plans. Additionally, terrain reinforcement training, as typified by the ARTEP supplements at Appendix 1, is a formal part of the Division's training program. In short, it is possible now to plan and train for structuring of the battlefield prior to hostilities, to study the advantages of force multiplication, mobility and flexibility in all exercises. It is possible now to arrange and utilize CIMIC as a combat advantage, to restation units and preposition all classes of supply enabling us to concentrate and exploit our engineer capabilities in time of war.

CHAPTER 2

TERRAIN REINFORCEMENT: THE STRONGPOINT

DOCTRINE

Advantages to the defender are enumerated in FM 71-2:

> They are numerous and permit a numerically inferior force to defeat a much larger attacker. The defender can become intimately familiar with the actual terrain prior to battle; the attacker cannot. The defender can prepare the ground in advance, building obstacles, firing positions, and routes between battle positions. The attacker can only guess at these. The defender can fight from cover while the attacker is in the open. The defender can shoot first from stationary platforms or positions, thus forcing the attacker to react and fire while moving. The defender can shift forces from prepared position to prepared position swiftly to concentrate for successive engagements. The attacker must feel his way over the terrain, seeing each new compartment for the first time. The defender can plan communications, control measures, fires, and logistical support in advance to fit any predictable situation. The attacker must adhere to a predetermined course of action and risk being outmaneuvered, or he must alter his plans as the battle develops and risk an uncoordinated effort.

Our experience in field exercises and gaming simulating confirm these advantages and lead us to believe several hold good prospect for exploitation. Current German defense doctrine, expounded in Army Service Regulation 100/100, recounts similar advantages. It most likely reflects German experience in World War II, which abounds with examples of field commanders practicing advantages of the Defense. General Von Leeb...

> "The purpose is to break the attacker, to parry his blows, to weaken him and to bleed him white. The reversal of strength resulting from this will enable the defender himself to acquire the strength to attack."[1]

General Holder...

> "Since there was not sufficient manpower to construct continuous lines in the rear, it was necessary to establish fortified areas that could be held for prolonged periods by weak forces against superior enemy pressure."[2]

1. Defense, Field Marshall Ritter Von Leeb, pg VIII.
2. DA Historical Study 20-261a, March 1955, pg 129.

General on the eastern front throughout the Russian campaign...

> "A method frequently applied by the Germans as another form of evasion can best be compared with saber-fencing tactics. A cut is warded off by sudden retirement with appropriate guard, followed by an immediate counterthrust which will permit the fencer to regain his former position. Like the fencer, the forces holding the threatened sector of the front executed a surprise withdrawal at the last moment. They moved far enough to the rear so that the blow would miss them, the pursuing enemy could be repelled, and the initial position could be regained by a counterthrust." [3]

But the primary mission of the defense is not merely to protect terrain or stop the enemy. The goal of a strongpoint for example should not be merely to have an enemy impale himself upon it.

> "If you can pursuade you adversary to blunt his sword against your shield, indirectly so much the sharper becomes your own sword."[4]

Instead, the enemy should be jabbed with the sharp sword as well. A tactically astute defender can utilize terrain reinforcement to canalize and trap enemy forces in a barrier system and then attack this enemy by surprise, catching him in a situation of disorganization and inflicting heavy casualties on him. Occasionally to maintain local initiative, the defender must economize in some areas to gain the mobile forces necessary to mount decisive counterattacks in others. To minimize the risks associated with economizing, the defender creates barriers using natural and man-made obstacles to slow the enemy and make him vulnerable to fire and maneuver.

> In short, we must not merely be aware of the advantages of the defender; we must exploit them.

Current US doctrine only briefly treats these matters. Advice on the counterattack is particularly vague. FM 71-100...

> "When the time is right for the defender to attack, strong short counterstrokes against exposed enemy elements are executed."

This rather brief advice was apprently not shared by an earlier practitioner of defensive warfare, Major General J.F.C. Fuller:

3. DA Historical Pam 20-201, Aug 51, pg 29.
4. Armored Warfare, MG J.F.C. Fuller, pg 134.

"As a mechanized army will consist of two forces - tank and anti-tank, whenever it is possible for the latter to take up a position which the enemy will have to attack in order to carry out his plan, then it will generally be to the advantage of his opponent to let him attack, and directly his attack begins to succeed or fail, to launch a counteroffensivein full force against him."[5]

In contrast with current US doctrine concerning defensive counterattacks, the German doctrine in FM 100/100 apparently reflects their extensive experience in World War II. Compare the following with our earlier quote from FM 71-100:

Counterattacks are practical if a favorable opportunity presents itself for eliminating enemy elements in the course of combat. All commanders must resolutely exploit and bring about such possibilities. That applies especially if there is a prospect:

That enemy units, which have been pinned down by defensive fire, can be smashed through a counterattack even before they can be reinforced and before their supporting fire can once again be brought fully to bear, or

That enemy elements, which have advanced across a terrain obstacle, can be fought to a standstill before the bulk of the enemy forces has overcome the obstacle, or

That advanced elements can be attacked along their flanks or in the rear and that they can thus be cut off from their own rear communications.

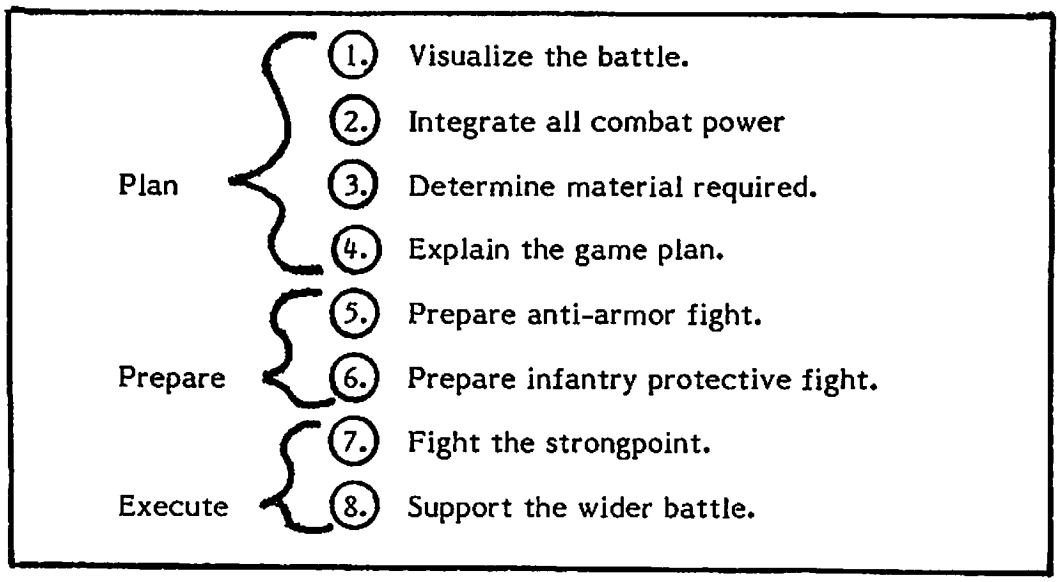
Counterattacks are always necessary when -- in case of deep enemy penetration -- a coherent defense cannot be maintained or restored in any other way or when lost terrain must be recaptured.

With the foregoing as background, let us examine the particulars of one form of terrain reinforcement -- The Strongpoint -- and the possibilities of exploiting advantages from it.

5. Ibid, pg 142.

HOW TO BUILD AND USE IT

FM 71-2 defines a strongpoint as "the cork in a bottleneck formed by terrain, obstacles, and units." The manual continues, "The strongpoint is distinguished from other defensive positions by the importance of the terrain on which it is located and the resulting time, effort, and resources dedicated to its development. It is an immovable object around which the battle will swirl." This happens when the strongpoint not only stops the enemy's advance through a critical area but also provides a friendly island or security zone that allows the mobile force to accept greater risks in the kind of movement it chooses to make.

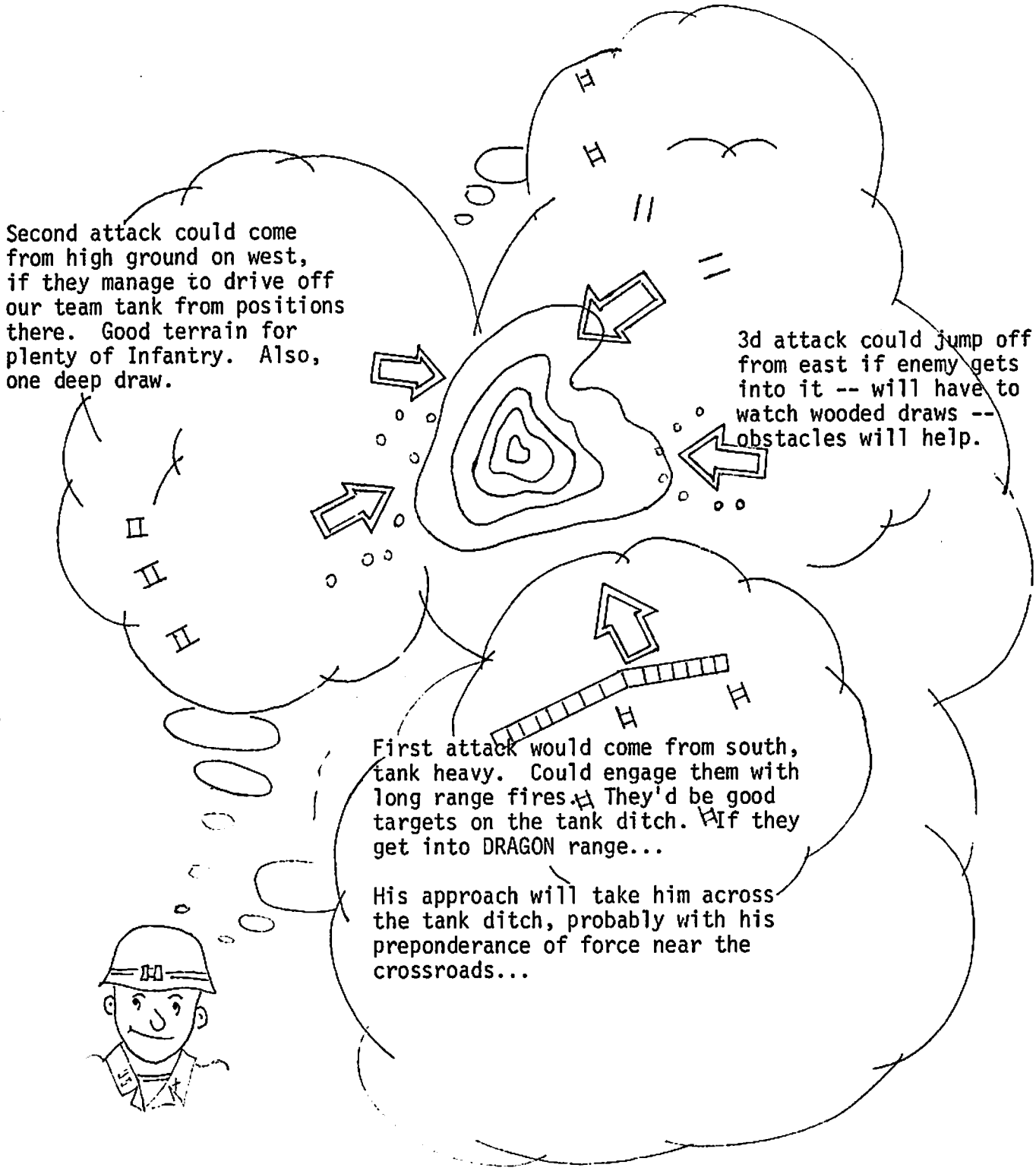


① VISUALIZE THE BATTLE

It is impossible for the team commander to establish a strongpoint -- or indeed any position -- without a clear concept of the defense. A team commander, for example, must know precise mission and also know the task force commander's detailed view (or "visualization") of how the battle is likely to develop in his sector, phase by phase. Obviously, this is not something the task force commander can predict with 100 percent accuracy, but it is a framework of mutual understanding that forms a battle plan. The team commander can then develop a game plan that lays out the probable course of action in each sector. He can paint the picture of the battle so that his subordinates will understand their interacting roles.

> Knowing the ground and well aware of the obstacles and the fire power which he can bring to bear, the commander forms in his own mind a picture of the most likely way in which an enemy force will attack him.

He sees this in a series of phases from his initial acquisition of enemy forces at some distance from his position all the way through a close-in assault against him. He estimates what his longrange fires including Air Force, Army Aviation and Artillery will do to the opposing force and what his opponent's reaction will be. He anticipates and plans for the application of closer in fires (tank main gun, TOW, DRAGON) and decides the timing and fire techniques to be used. He makes assumptions about the routes that enemy forces will use to gain his position and the formations and weapons that the enemy might bring to bear. He then visualizes and plans a close-in battle using mortars, automatic weapons and additional obstacles.


Second attack could come from high ground on west, if they manage to drive off our team tank from positions there. Good terrain for plenty of Infantry. Also, one deep draw.
3d attack could jump off from east if enemy gets into it -- will have to watch wooded draws -- obstacles will help.
First attack would come from south, tank heavy. Could engage them with long range fires. They'd be good targets on the tank ditch. If they get into DRAGON range...
His approach will take him across the tank ditch, probably with his preponderance of force near the crossroads...

② INTEGRATE ALL COMBAT POWER

A defender never has enough time to prepare to his own satisfaction for an attack. He must therefore have a clear sense of the priorities of work to be done. Those will vary with the circumstances, but obviously the siting of weapons is a very early task. Commanders also plan for actions that will insure proper command and control of key weapons, construction of barriers, camouflage, security, and other factors. The main purpose of the strongpoint -- stopping the enemy force -- means that the teams directing artillery and Air Force support (FIST and ALO) must get early attention and be provided with locations (probably several) from which they can bring fire power to bear. Since the position must be capable of sustained defense, its fighting positions must be able to absorb punishment. Well constructed fighting positions take time and engineer knowhow.

The commander must make use of all the defensive power available to him:

Tactical air

Long range artillery

Attack helicopters

TOW

Tank main gun

DRAGON

MORTARS

LAW

Automatic weapons

MINES

OBSTACLES

New weapons using guidance provided by observers will increase the defensive potential of strongpoints and make them even more viable. The same is true of vision and sighting devices that can penetrate darkness, and smoke, or pick up heat differential. These weapons, used correctly, tend to aid the defender more than the attacker.

NEW WEAPONRY

TOW NIGHT & THERMAL SIGHTS

DRAGON NIGHT SIGHT (TRACER)

FAMILY OF SCATTERABLE MINES (FASCAM)

-- AIRCRAFT (M-56)

-- GROUND (GEMISS)

ARTILLERY DELIVERED MINES

-- 155 mm AT

-- 155 mm AP

LASER DESIGNATOR

UNIVERSAL ENGINEER TRACTOR M9

NIGHT VISION GOGGLES

THERMAL VIEWERS & SURVEILLANCE RADARS

VIPER

STINGER

③ DETERMINE MATERIAL REQUIRED

If your mission is to defend, the preservation of your force bears heavily on the degree you succeed in protecting your weapons and men from artillery fires.

Provisioning requirements to construct a strongpoint for a company team often exceed our imagination and experience. How can the Co TM leader determine his requirements?

BREAK IT DOWN BY CATEGORY:

FORTIFICATIONS

- Overhead cover for CP's
- Protection for weapon systems
- Overhead cover for fighting positions
- Needs of mortar section, tows . . .
- Where and how much revetment material is needed

OBSTACLES

- Mines
- Wire and pickets

No shopping list will be all inclusive. Consider what natural material is available such as logs and stone or guard rails. Coordinate with supporting engineer for ideas. Consider the amount of time you will have available to build your defense and what manpower is available. How much transportation is required? Available?

This is one area it pays to think big. How thick must parabets be? Are you protecting your position from mortars or 120 mm rocket fire? Air burst or direct hit? Remember the greater the thickness of the shelter, the greater the strength of supporting members.

Key Types of Material	Purpose
Hvy Timbers/Logs	Sills for roof members Vertical supports for roof Roof Members
Planking, Guard Rail	Roofing
Plastic Membrane	Water proofing of protective fill
Small Timber/logs, Picket	Shoring for Revetments
Pickets	Bracing Material Short width roofing member Wire obstacles
Ammo Boxes	Revetment material Flooring when wet Protective walls when fill w/earth
Sand Bags	Reveting, Parapets
Wire (Barbed & Concertina)	Obstacles

PROVISIONING

Provisioning for survivability is a major task requiring careful planning and coordination.

Digging-in + over head cover = aurvivability

Think big - Be imaginative

MATERIAL - Obstacles: CL V, 600 mines

- Protection: CL IV, wire - 100 rolls concertina
- Fortification: C-IV, timber/log, plaking guard rail, sandbags, revetment

TONS & TONS

TRANSPORTATION - Typical Company TM can consume 19 cargo truck loads of material in 48 hours.

1 Carge trk w/trir CL V barrier

3 Carge trks - wire & pickets

15 Carge trks - CL IV fortification material

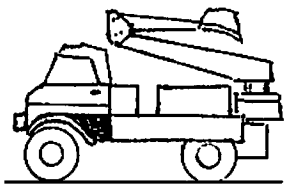
19 Truck loads

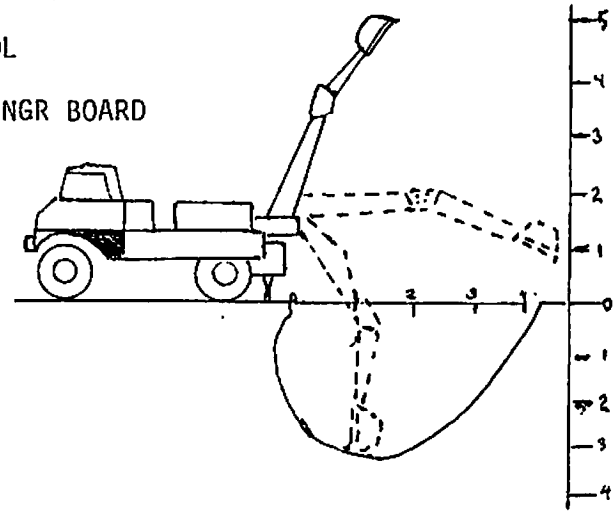
EQUIPMENT - UNIMOG for fighting positions & trenches

Dozer for CPs, tank ramps, hull down positions

BEST by TEST: GERMAN INF SCHOOL

USARMY ARMOR & ENGR BOARD





DIGGING IN-EQUIPMENT PRIORITIES

Key to Survival - Our ability to dig in is directly related to the preservation of the force and is the key to survivability. Important and crucial as this task is, our understanding and capability is often greatly underdeveloped. Recent experience illustrates that actual practice is essential to realize the magnitude of this task and recognize the limited equipment assets available.

> We have 30 years of advances in weapon systems, yet rely heavily on the same hand tools available in WW II. Division wide only 4 backhoes are available. With decision to "Fight Forward" the German army bought commercial UNIMOG w/backhoes to dig in and assigned 4 per INFANTRY BATTALION.

Best by Test - A rescent evaluation by the US Army Armor and Engineer Board on the strong point excavation equipment concluded that the UNIMOG was the over all best excavator with the mobility.

Present equipment available in DS of a Brigade includes 1 bull-dozer, 1 tractor w/backhoe and 2 bucket loaders. Defining work requirements and setting priorities for this equipment is key to timely completion and utilization of maneuver force manpower. As a guide, the following priorities match the size of job to the equipment and subsequent personnel tasks and priorities.

Bulldozer Priorities	
1st 24 hours	1. CMD & Control Bunkers 2. Tank Ramps/Positions 3. Hull sown positions for Tow, Mortar, and APC
2nd 24 hours	4. ANTI TANK ditches 5. Improve Concealed Routes 6. Alternate and Supplement Positions

UNIMOG Priorities	
1st 24 hours	1. Primary Fighting Position w/Over head cover 2. Primary Fighting Positions w/o Over head cover
2nd 24 hours	3. Alternate Positions 4. Connecting Trenches

Bucket Loader Priorities

1. Assist Bulldozer as a team
2. Assist with material handling
3. Assist in digging where soil permits

Building Priorities

1. Begin with obstacles supporting longest range fires and work toward your position considering ranges of each weapon system.
2. Orient obstacle to create flank shots.
3. Use to deny defiles.

QUICK PLANNING GUIDANCE

ANTI-TANK DITCH 1.5 m deep x Dozer Blade wide - 100 m/hour

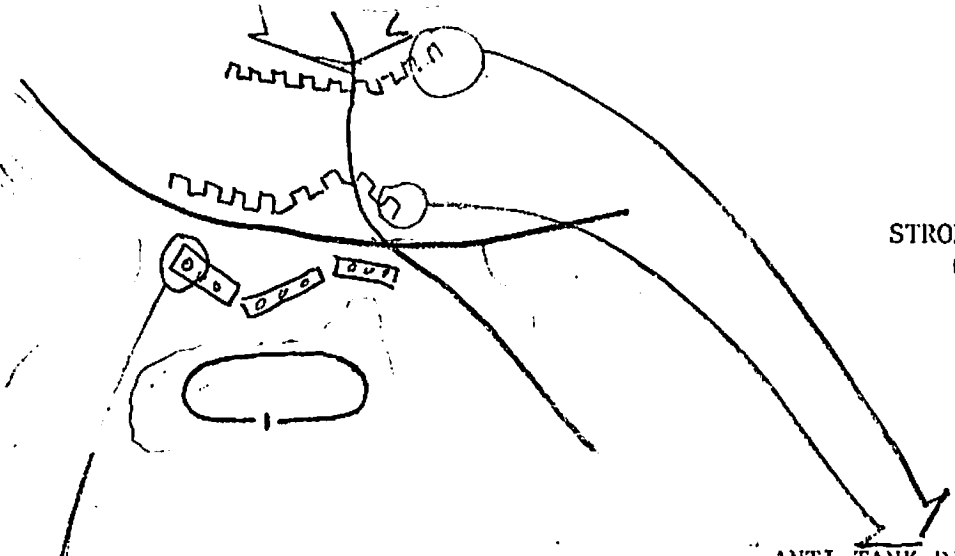
MINEFIELDS M-15 at mine by hand (PLT) 200/hr Pk 75%

(1 MINE/m of front) by mine layer 300/hr Pk 75%

M-21 at MINE by hand (PLT) 100/hr Pk 97%

MINE HAULING CAPACITY	1 ½ T Trir	2 ½ T or ST CARGO TRK
M-15 at	200	200
M-21	264	444

Vehicles lanes are 16m wide - a GAP is 100m or greater width.

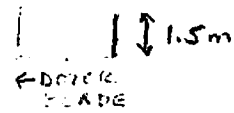


STRONG POINT
OBSTACLE PLAN

ANTI TANK DITCHES

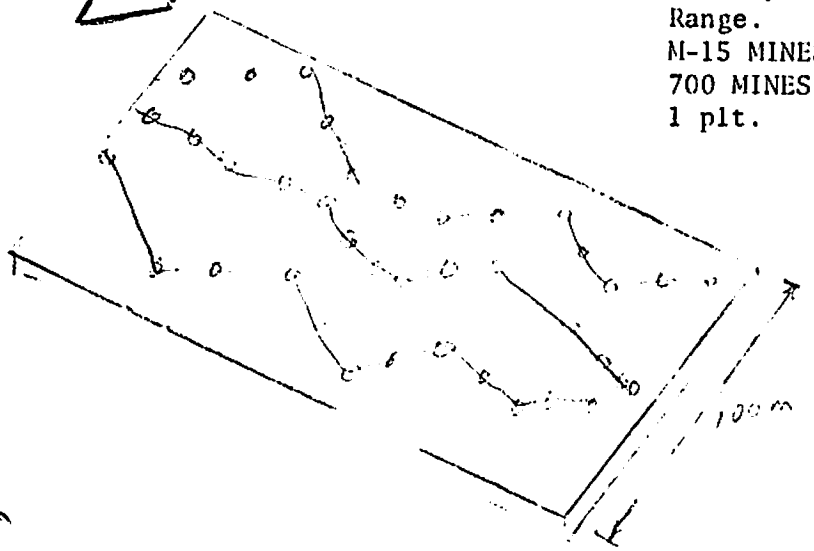
PRIORITY 1. (EQUIP) 1400m ditch at 2500m range for TOW FIRES (14 hours)

PRIORITY 2. (EQUIP) 1100m ditch at 1500m range for TANK FIRES (11 hours)



PRIORITY 3. (PERS) 700m MINEFIELD.

1-0-0 Density Anti Tank minefield at Dragon Range.
M-15 MINES - Pk 75%
700 MINES hand placed (4 hour) with 1 plt.



④ EXPLAIN THE GAME PLAN

COMMANDER'S BATTLE PLAN

When the commander has this complete idea in his mind, he calls his immediate subordinates to a location where the potential battlefield can be seen and explains the game plan to his key defensive players. It is vital that this gaming of the battle takes places as a conversation between the commmander and his subordinates prior to any physical organization of the defensive position. If, for example, the commander merely points out the areas of responsibility or defensive sectors to his subordinate, they may tend to distribute evenly the defensive capability -- soldiers and fire power -- from one flank of their sector to the other without much regard for the dynamics of the defense. The fire of a platoon in defense is a coordinated effort that other elements of the company depend on, and the team commander should know exactly what he wants from each element under his control.

> It is up to the commander to make his unit leaders see and understand in advance how he thinks the battle will go in order that they can properly plan the best use of all the resources available to them.

Whether the battle will follow predicted lines depends on the tactical skill of the defending commander and his ability to sense what his opponent will do. Chances are that there will be many modifications made as the battle progresses; nevertheless, the most important assist that the commander can give to his subordinates is a well thought out and detailed game plan of the defense.

⑤ PREPARE THE ANTI ARMOR FIGHT

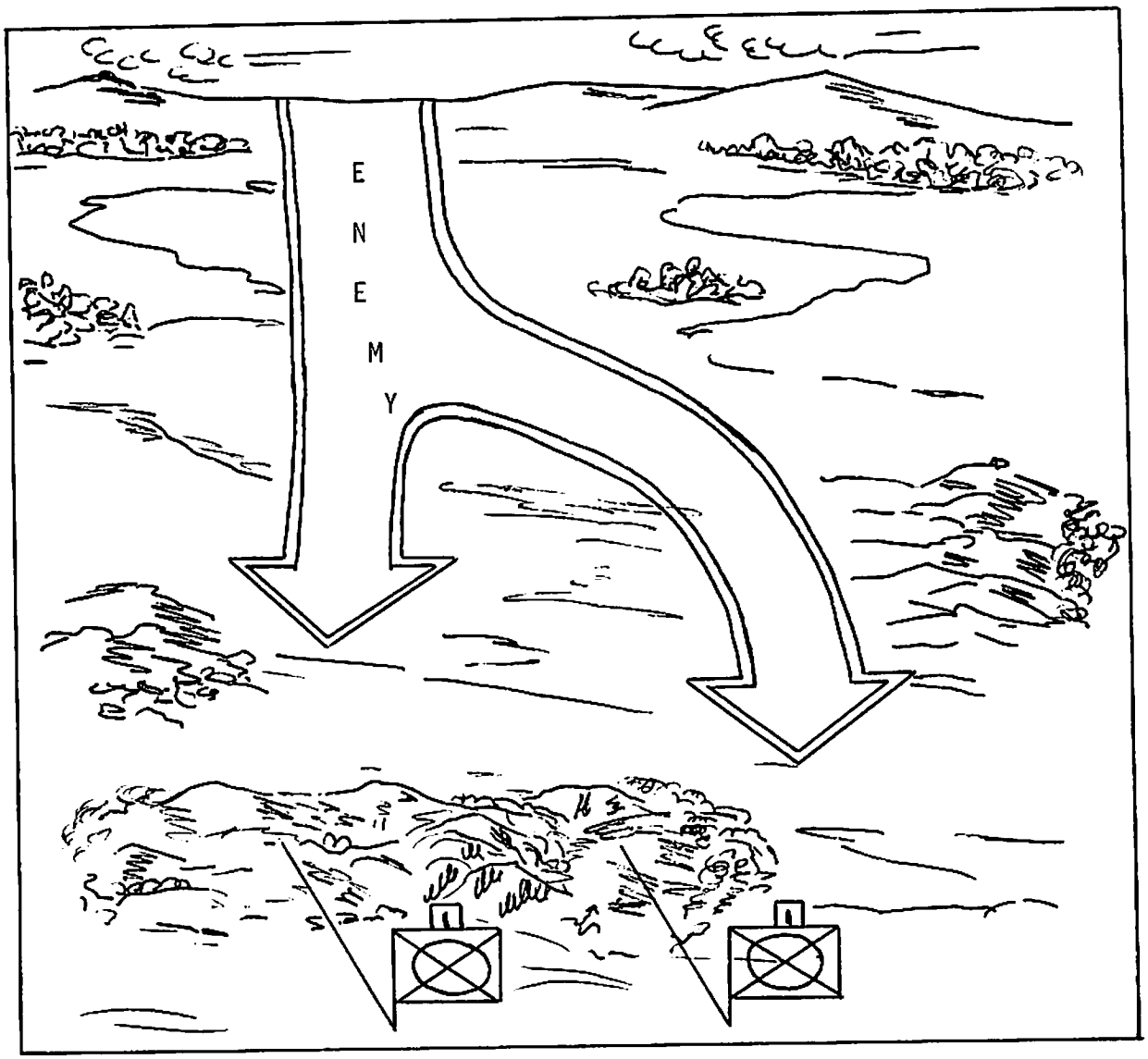
The strongpoint is designed so that it "...physically cannot be overrun or bypassed by tanks.." (FM 71-2). To meet this objective, the strongpoint must be optimally located, integrated with other units and given sufficient assets to accomplish its mission. Internally, the strongpoint commander must carefully integrate all combat systems in order to make his position impassable to enemy armor. This section examines the internal combat systems which contribute both directly and indirectly to the anti-armor fight.

COMMAND AND CONTROL

The strongpoint defense cannot be coherent without proper command and control. To insure the survivability of command and control, CP's must be well dug in with overhead cover. An alternate CP containing the executive officer with a FIST representative and duplicate communications system should also be constructed. The main CP should be located so the commander can optimally observe the area in which the main battle is expected to be fought. In this regard, communication on the strongpoint is essential for success. Messenger, the most secure communications system, becomes impractical when the strongpoint begins to take fire, especially indirect fire. The enemy's EW capability forces the team commander to deemphasize radio communications. Thus wire, properly employed, becomes the most secure means of communication and has the highest probability of survival of the communications systems available today. Line of sight and laser assisted radios are

being developed and will offer tomorrow's commander a highly survivable, mobile, secure communications system.

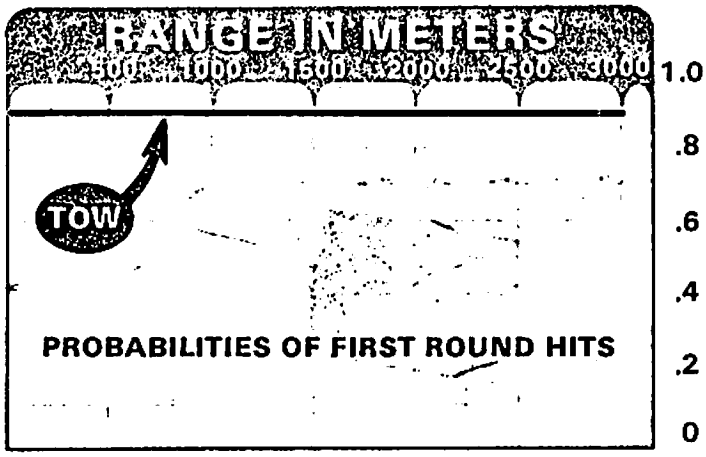
Wire should be laid underground to tie in all command and control elements on the strongpoint.



MAIN CP	SECOND CP
- Company Team Commander	- Company Team XO
- FIST Chief	- FIST NCO
- Support Personnel	- Support Personnel

TOW

The TOW's high hit probability, lethality and long range makes it vital to stronpoint defense. If a large number of TOW's are employed, the TOW platoon leader should function as does the FIST Chief; planning, coordinating and directing the TOW fire.



DISMOUNTED TOW

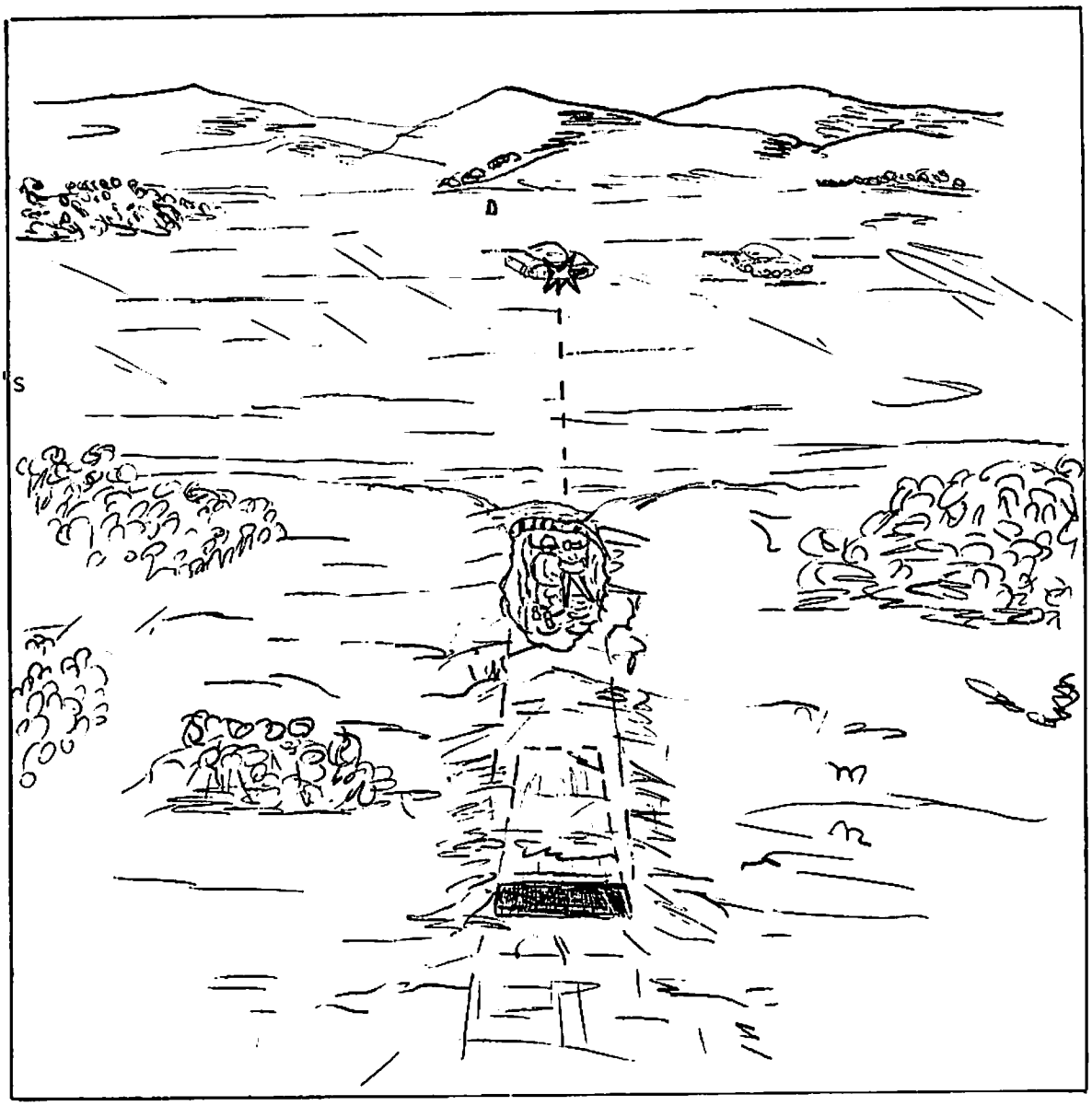
A TOW will survive longer on a strongpoint when dismounted and employed from well concealed, dug-in fighting positions where back-blast can be controlled and hidden.

A TOW is provided greater protection in low-silhouette, covered fighting positions that are built to carry the telltale backblast some distance away from the weapon. These positions need a backblast tunnel with a cross section about the dimensions of an average door in order to stay within the tolerance level for overpressure. Such positions are much harder to knock out than the track mounted TOW,

even when the mounted system is in defilade. The disadvantage of the dismounted TOW is its lack of mobility.

DISMOUNTED TOW
FIGHTING POSITION

Ammo box marks range at 3,000m from gunner's position



Long ramp channels backblast signature away from position

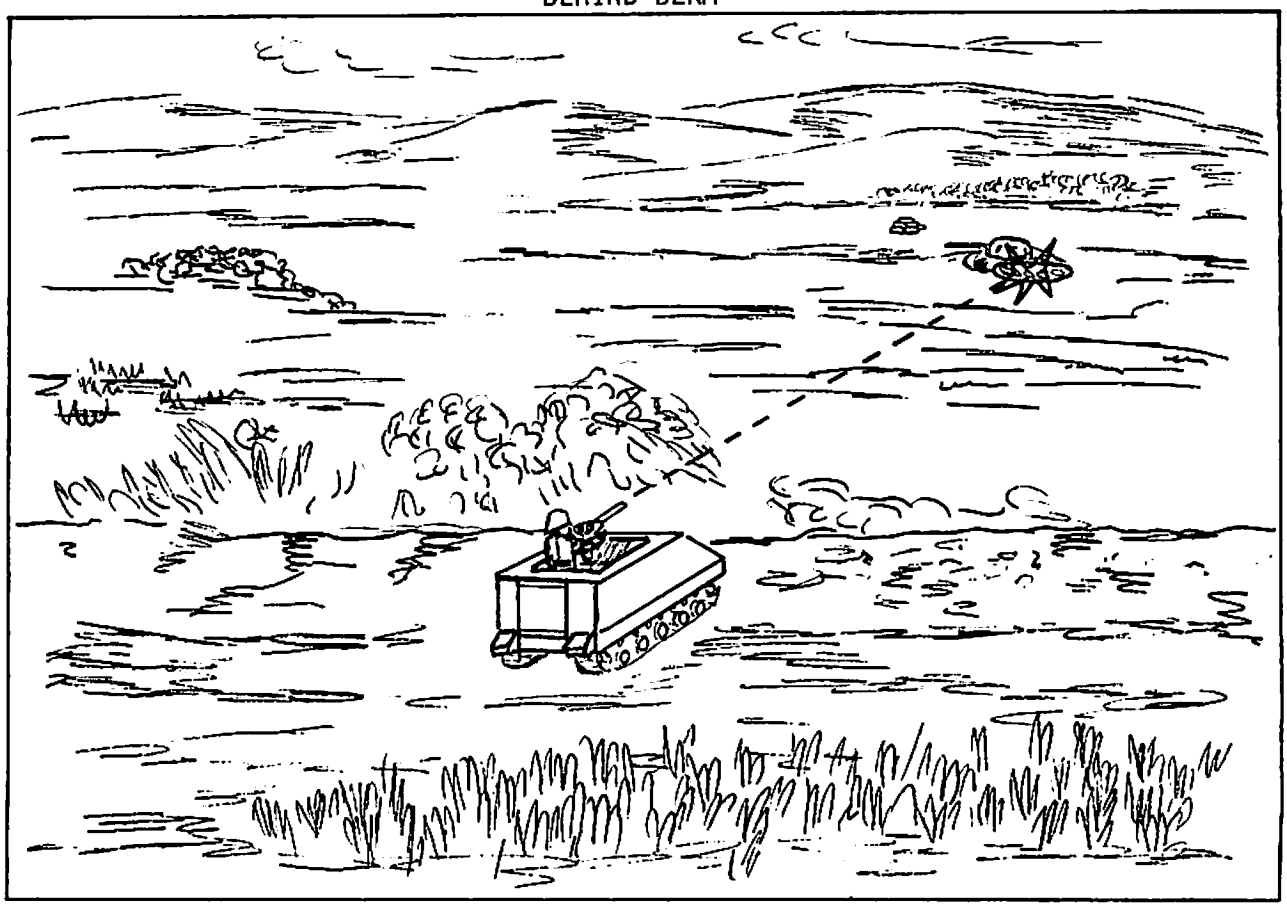
Opening for backblast

MOUNTED TOW

The advantage of the mounted TOW is its mobility, given a variety of covered and concealed positions from which it can fire. The disadvantage is its greater vulnerability to artillery and direct fire. Mounted TOW's are provided with berms or are dug-in to decrease their vulnerabilities. Covered and concealed routes must be sought out and improved by engineers in order to allow movement to alternate positions. The improved TOW vehicle will greatly increase the mounted TOW's survivability and rate of fire.

Sandbag 3,000m range marker from gunner's position

MOUNTED TOW
BEHIND BERM



HASTY BERM

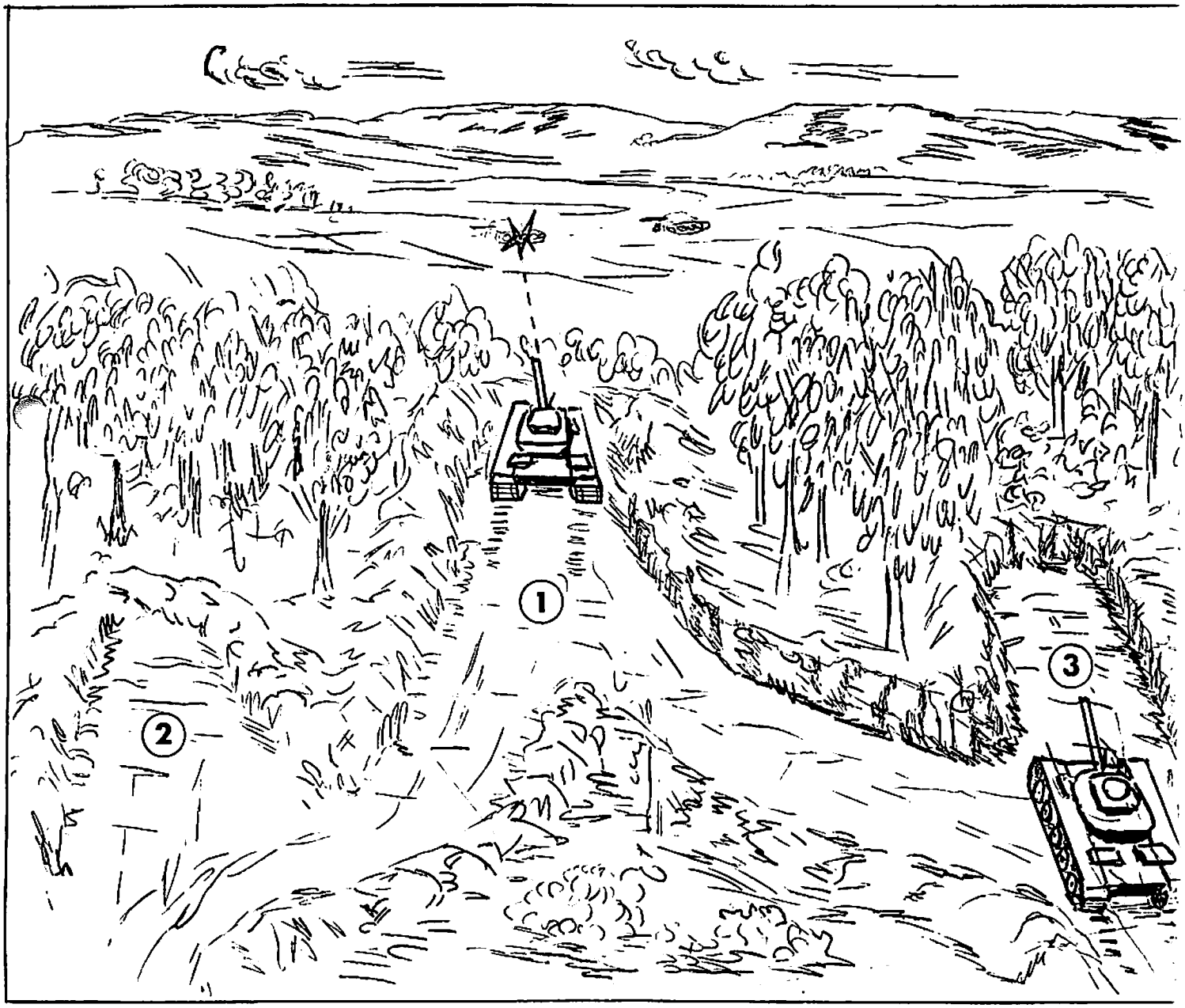
TANKS

Tank positions should be located in areas which provide for a covered and concealed withdrawal to other firing positions. Where necessary, bulldozers can cut or deepen defiles in order to insure tanks can use internal routes within the position without being exposed to direct fire. The location of berms near the inner edges of wood lines is highly effective, as are tank fighting positions near the crest of high ground. It is not tactically sound to place tanks on the forward slopes of strongpoints unless their movement can be concealed by smoke or other means. Excavations for tanks should be wide enough to eliminate tight turns which may result in thrown tracks. The depth of excavations must be carefully planned to insure that the tank's main gun is able to place effective fire in the anticipated direction of enemy attack.

Tanks provide the team commander with the most survivable, powerful weapons system capable of movement to alternate and supplementary positions.

ONE TANK FIRES

WHILE ANOTHER REPOSITIONS



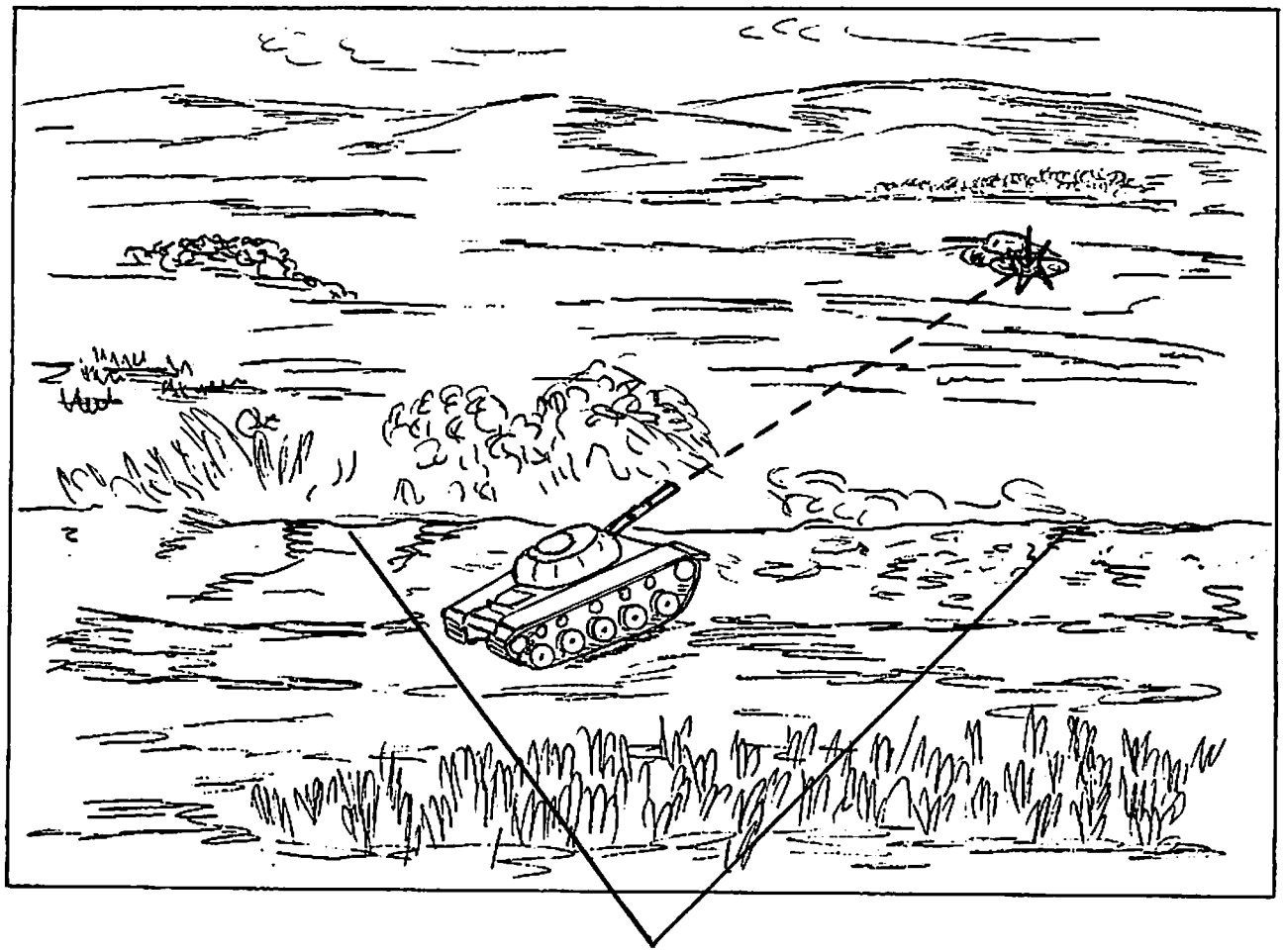
Trenches enable tanks
to move from ramp to ramp
concealed from enemy

Individual positions for tanks may be constructed, however it is more effective to create berms 100 or more meters in length perpendicular to the enemy advance in order to provide flexibility for the tanker in selecting his precise firing position.

Bulldozers and front loaders can provide defilade for tanks on short order, throwing up berms of earth behind which a tank can move and fire. When a front loader builds a berm, it carries earth into position and leaves less ground scar than a bulldozer. It may be better to throw up simple berm over an extended length rather than to dig individual tank positions. The berm method saves time, is easy to construct, does not have to be precise, and gives the tanker more flexibility.

A typical berm can be constructed quickly along a woodline (or preferably just inside the woodline). The berm thus provides some protection while the woods conceal the movement of the tank.

TANK BEHIND BERM



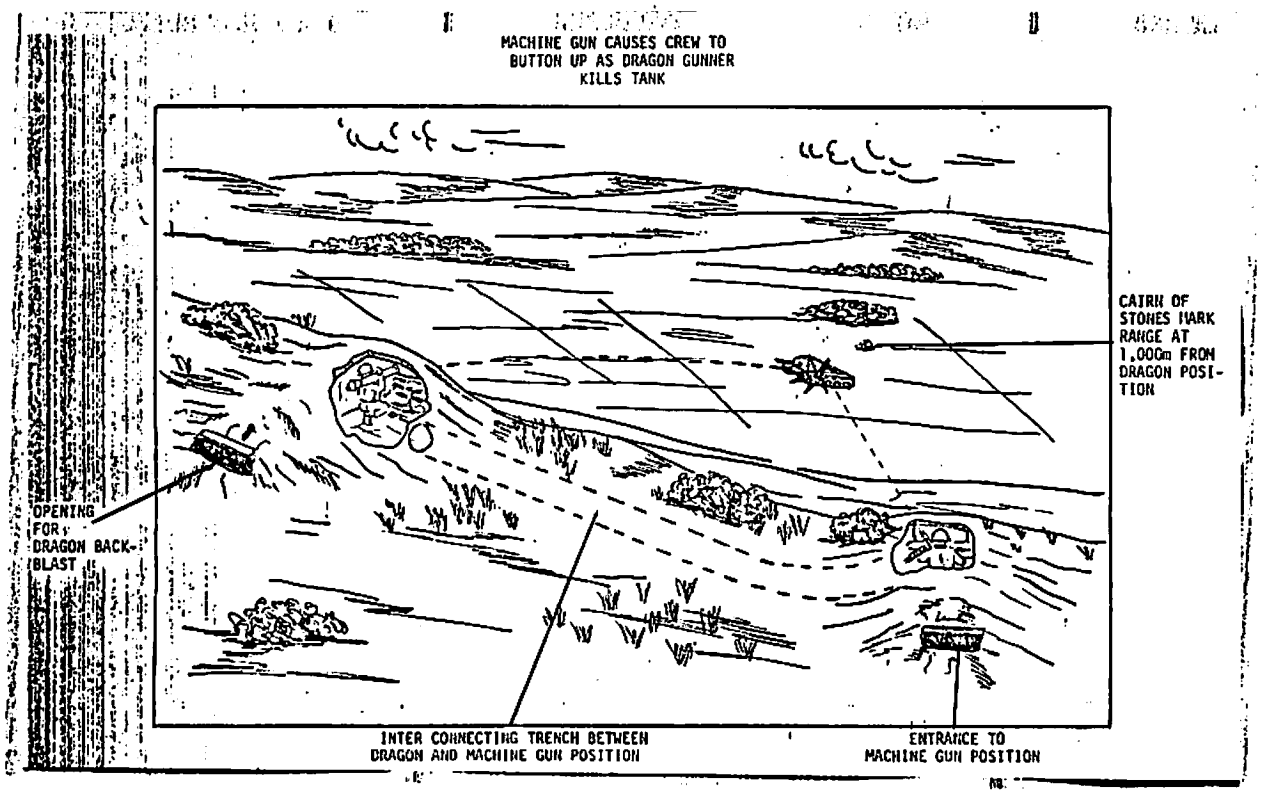
HASTY BERM

DRAGON

As a medium range AT weapon, DRAGON's can be considered as part of either the primary AT defense with tanks or TOW's, or as a part of the close-in dismounted Infantry defenses. In either case, DRAGON's are positioned to supplement tanks and TOW's and are employed in pairs, as are the other armored killing systems.

> In visualizing the battle, the strongpoint Commander must prepare his defense to engage the enemy at decreasing ranges with maximum firepower.

DRAGON's, like TOW's, can be positioned mounted or dismounted on the strongpoint; but, as with the TOW, the dismounted, dug in DRAGON stands a much greater chance of survival than does a mounted DRAGON with little or no overhead cover. In positioning his DRAGON's, the team Commander should insure the firing point permits the firer to engage enemy armor with an oblique or flank shot and is protected by dug in Infantry positions.

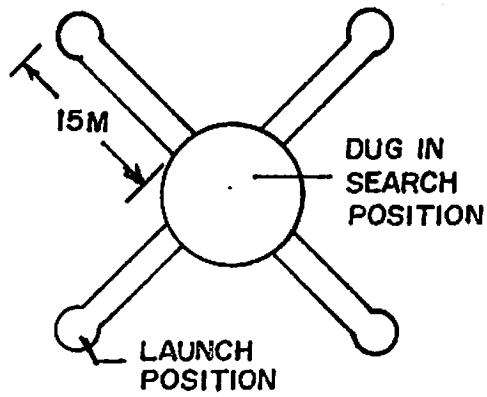


AIR DEFENSE ARTILLERY

The strongpoint will likely be attached by enemy tacair or helicopters. The commander must, therefore, insure that both active and passive air defense weapons are normally the protection of the main anti-armor systems. Air defense assets are positioned based on the known or suspected air threat and the established priorities. The exact location of air defense positions within the strongpoint should be picked by the team commander with advice from the air defense representative. Air defense elements located with units flanking the strongpoint may provide the most effective air defense fires. The task force commander may place supporting air defense systems with units adjacent to the strongpoint or on overwatching terrain.

REDEYES

Redeye firing positions should include a dug-in search position that allows gunners to move to launch positions, fire, and return to the protected search position. Launch positions must be at least 12 meters from the search positions. Ideally, the team should have several firing positions, each with several launch positions.



ONCE FIRED, THE REDEYE MISSILE HAS A HIGHLY VISIBLE SIGNATURE. TO SURVIVE, GUNNERS SHOULD MOVE IMMEDIATELY AFTER FIRING.

CHAPARRAL/VULCAN

Use of Chaparral and Vulcan systems on a strongpoint are dependent upon the terrain and the task force commander's priority for air defense. These systems are extremely vulnerable to enemy artillery fires. Positions which provide cover/defilade from suppression yet still permit immediate movement into firing posture are essential.

ORGANIC WEAPONS

The firepower of the company team's machine guns and rifles -- directed at enemy aircraft in a voluminous manner can be formidable if intergrated properly into the overall strongpoint plan. TOWS can be employed against enemy helicopters if the enemy is flying either towards or away from the firing position.

ENGINEERS

Engineer assets will normally be allocated to the strongpoint commander to assist in enhancing the survivability of the position.

ENGINEERS CAN:

- Provide expert advice and supervision
- Assist in construction, especially with heavy earth moving equipment.
- Help provide and haul reinforcing material.

ENGINEERS CANNOT:

- Do all the work for you!

Heavy engineer equipment is an important and limited resource on the strongpoint. It is vital to insure that the use of engineer equipment is well-planned. Much time can be lost in moving equipment from one side of the position to the other or in confusing the crews on what positions are to be dug and in what order. The integrated use of all engineer equipment will provide the most effective utilization of time. Failure to plan directly will result in idle time created by lack of instructions to engineer crews or cueing of equipment waiting to do successive tasks. Engineer officers and NCO work much better with their equipment if they are given a good idea of the overall plan of the defense. They must know exactly what they are expected to accomplish. Time can be gained by explaining to engineer work crews and equipment operators the purpose of a given fighting position and what the final

result is supposed to look like. This is far better than attempting to provide detailed instructions as to the specifications of a hole to be dug. Strongpoint leaders must take advantage of the potential of the engineer equipment by digging the rough position bigger than the final product and then backfilling against the interior revetments in order to create the position. Leaders at all levels should look for advice from the engineer on every position -- he will have time-saving ideas and suggestions for making the plan a little better. In constructing positions, leaders must remember that in addition to the individual occupants, there must be room for weapons, ammunition, food, supplies, and in general, existence over a period of hours or days. This dictates that positions have to be larger than one might assume at first glance if the defense of the strongpoint is going to be prolonged.

The company team must insure that its own "engineer" related equipment is available and in good working order. This can include a variety of items, from chain saws to entrenching tools.

To optimize the Engineer's capability, the company leadership should:

- Include engineers in overall planning and continually keep them informed.
- Establish work priorities.
- Insure the engineer advisors and equipment operators understand both the company team's mission as well as the mission of the element they're supporting.

ARMORED PERSONNEL CARRIERS

APC will serve in a number of different roles on a strongpoint. It need not be used solely as a weapons carrier and storage facility. The role of the vehicle can be adapted to the strongpoint during construction and during the battle.

PHASE I

CONSTRUCTION

TRANSPORT

- Barrier material
- Mines
- Ammunition
- Concertina

PHASE II

THE BATTLE

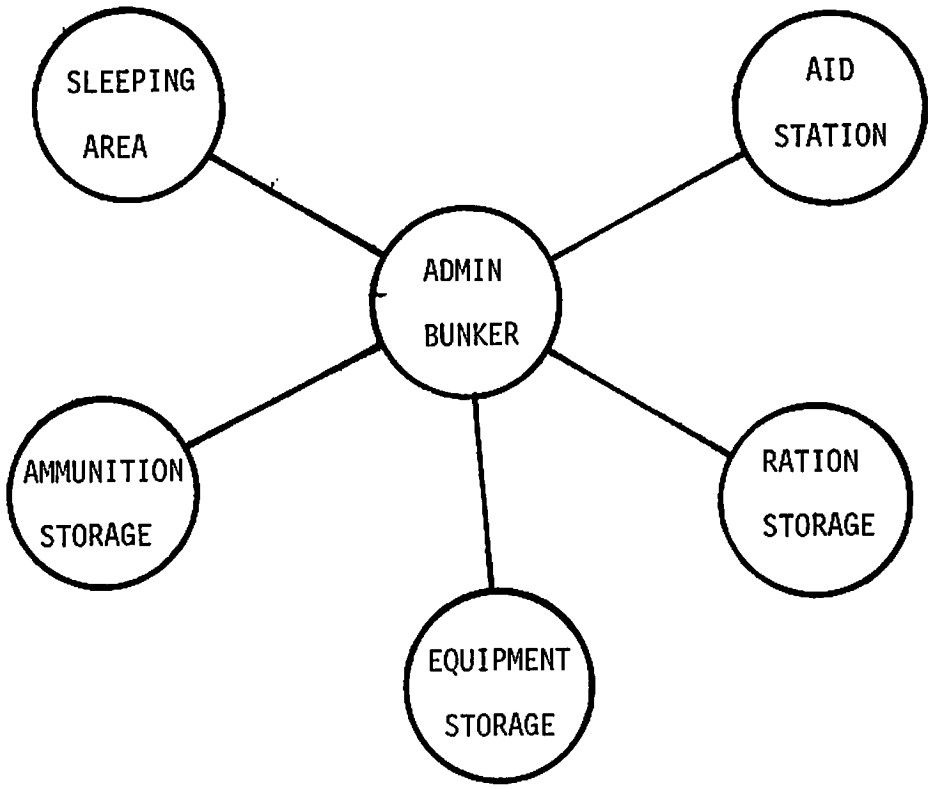
TRANSPORT

- Ammunition
- Wounded
- Personnel and weapons to supplementary positions
- Mounted patrols

If APC cannot be employed effectively on the strongpoint or effectively covered and concealed, they should be held in the rear to reposition forces, augment the strongpoint, or provide vehicles for resupply.

PROTECTED LOGISTIC COMPLEX

A bunker complex must be constructed centrally in the strongpoint to store additional ammunition and other supplies. Part of this complex should contain a bunker that would be a collection point for wounded. Personnel such as the first sergeant, supply sergeant, supply clerk, and senior medic would occupy this position.



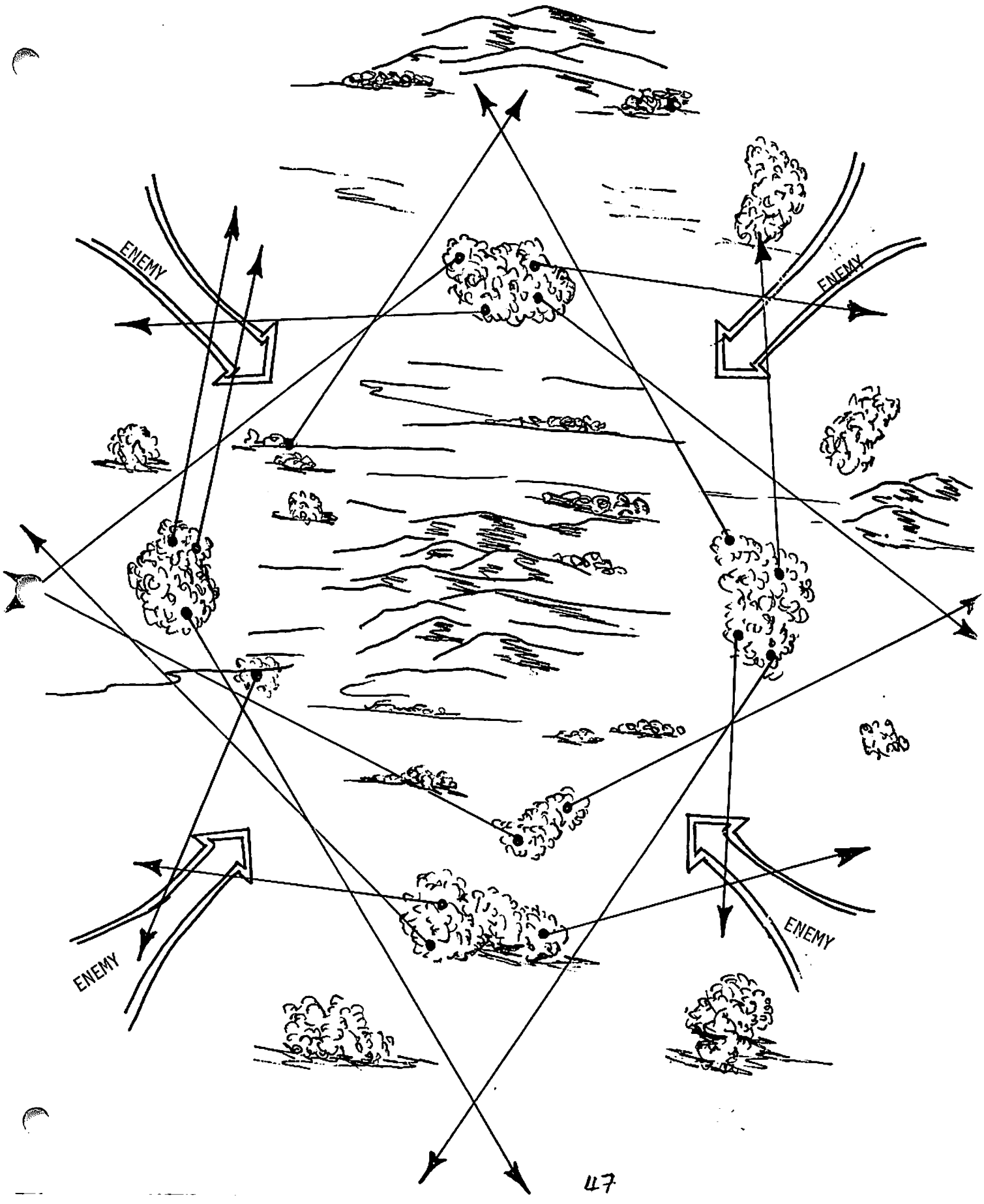
(6) PREPARE THE INFANTRY PROTECTIVE FIGHT

Once the main armor-killing elements have been located to maximize their efficiency, the chain of command directs the remainder of the company into fighting positions that will protect these long range tank killers against close-in assault. The basic teamwork of the strongpoint defense is the interaction in which the TOW, tanks, and FIST challenge the enemy weapons systems that can outgun infantry small arms, while well-positioned small arms fire secures the anti-tank systems.

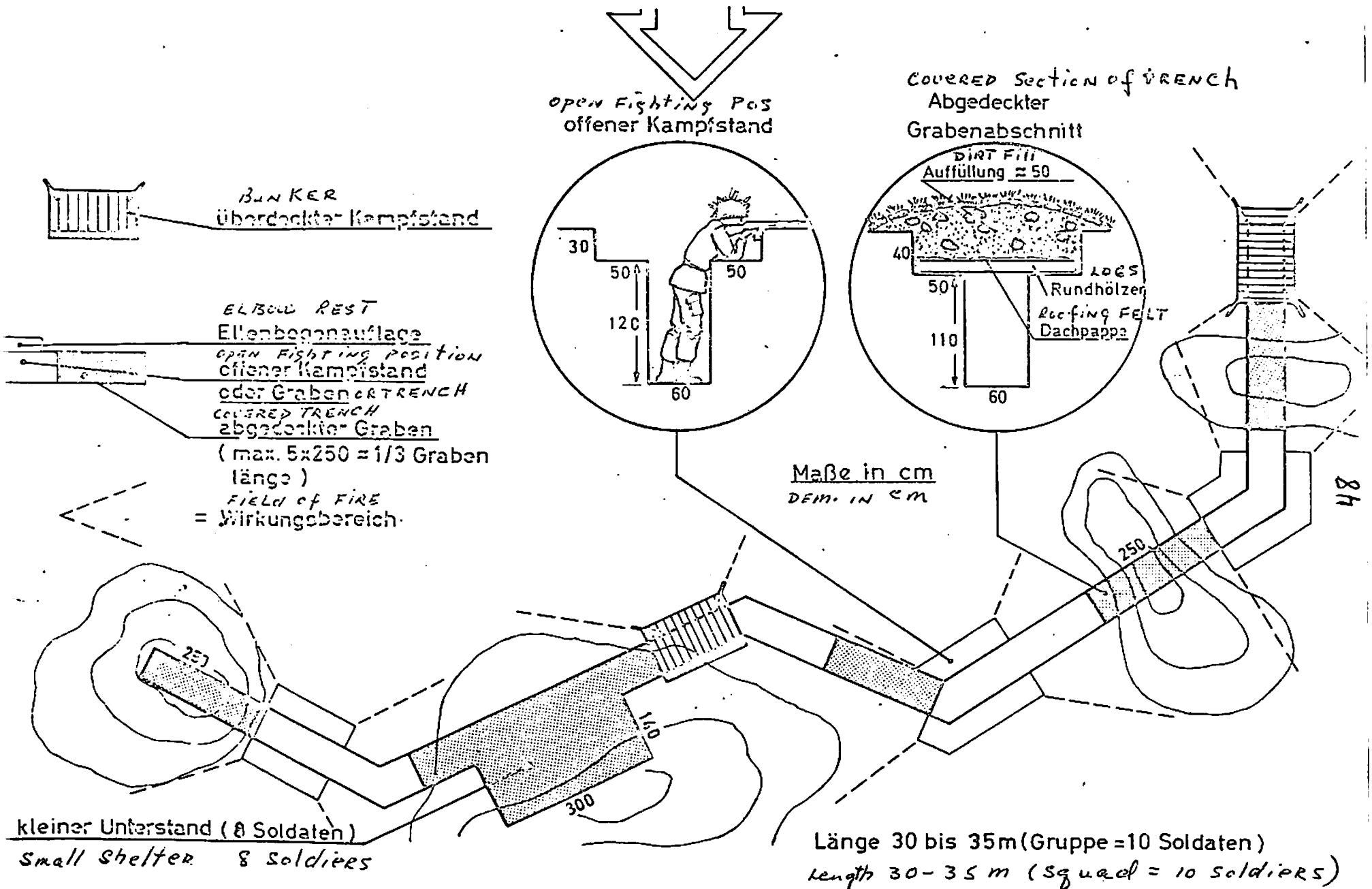
NESTING POSITIONS

The strongpoint must be interwoven with connecting trenches within each fighting position as well as from fighting position to fighting position. The goal in constructing individual fighting positions is to create "nests" of automatic weapons positions that are mutually supporting while attacking the FLANKS of enemy infantry as they assault.

AUTOMATIC WEAPONS "NESTS" PROTECT THE TANK KILLING SYSTEMS FROM ENEMY INFANTRY



(An example of a Bundeswehr interlocking system is shown on the next page)



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16.b

WEAPONS SYSTEMS

.50 Caliber Machine Gun

The Caliber .50 machine gun can be positioned to "suppress" enemy armored vehicles or employed dismounted, in dug-in fighting positions to kill enemy infantry as they assault the strongpoint.

While the Caliber .50 will force enemy armored vehicles to "button up" if employed only with that mission, the weapon is "wasted" after the battle begins. If used in a mounted suppression role, the gunner and assistant gunner must be provided with some overhead cover or their survival rate diminishes markedly as enemy artillery begins. Additionally, it takes far less time to construct a fighting position for a Caliber .50 than to dig in an APC.

The Caliber .50 machine gun is best employed dismounted as a powerful assist for the automatic weapons in keeping enemy infantry from assaulting the larger weapons of the strongpoint. Firing from the nests of small arms weapons, it adds authority to the fire of riflemen, M60 machine gunners, and mortars. It is positioned among these other weapons, where its grazing fire can do most damage to the enemy. The dismounted Caliber .50 also frees the APC for other critical missions.

M60 Machine Gun/M203

The M60 machine gun is used primarily to kill enemy infantry as they assault the strongpoint. While it can be used to suppress and force the enemy to button up, that should not be the primary mission. M60 must be intergrated with other automatic weapons to create a series interlocking "bands of steel" delivering grazing fire into the flanks of assaulting enemy soldiers. The M203 should be located with the M60 and used to assist in denying enemy infantry the protection of all the space.

Although the LAW is not a long range armor killing weapon, it is effective at short ranges.

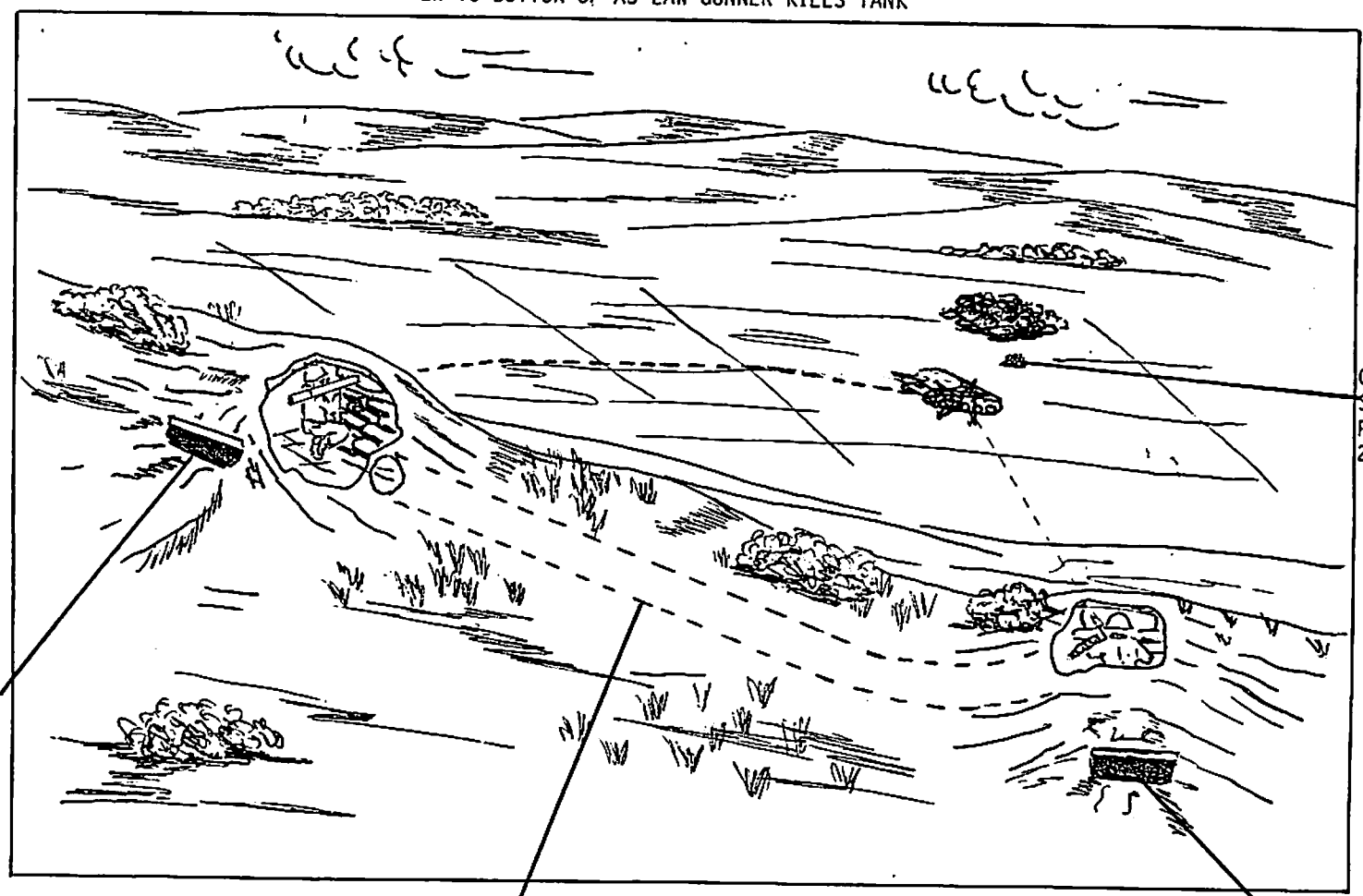
The employment tenchiques for the LAW differ considerably from those for ATGM because of the difference in capabilities.

The warhead of the LAW is less lethal than that of the ATGM. Thus, the team commander must position this weapon to allow the firer the best FLANKING SHOT. These flank shots allow the firer to take maximum advantage of the tank's thinner armor on its sides and rear. Likewise, MULTIPLE HITS that are not needed from TOW and DRAGON are essential if LAW are to destroy enemy armor.

Fire the LAW in VOLLEYS
Fire the LAW in PAIRS
Fire the LAW in Sequences

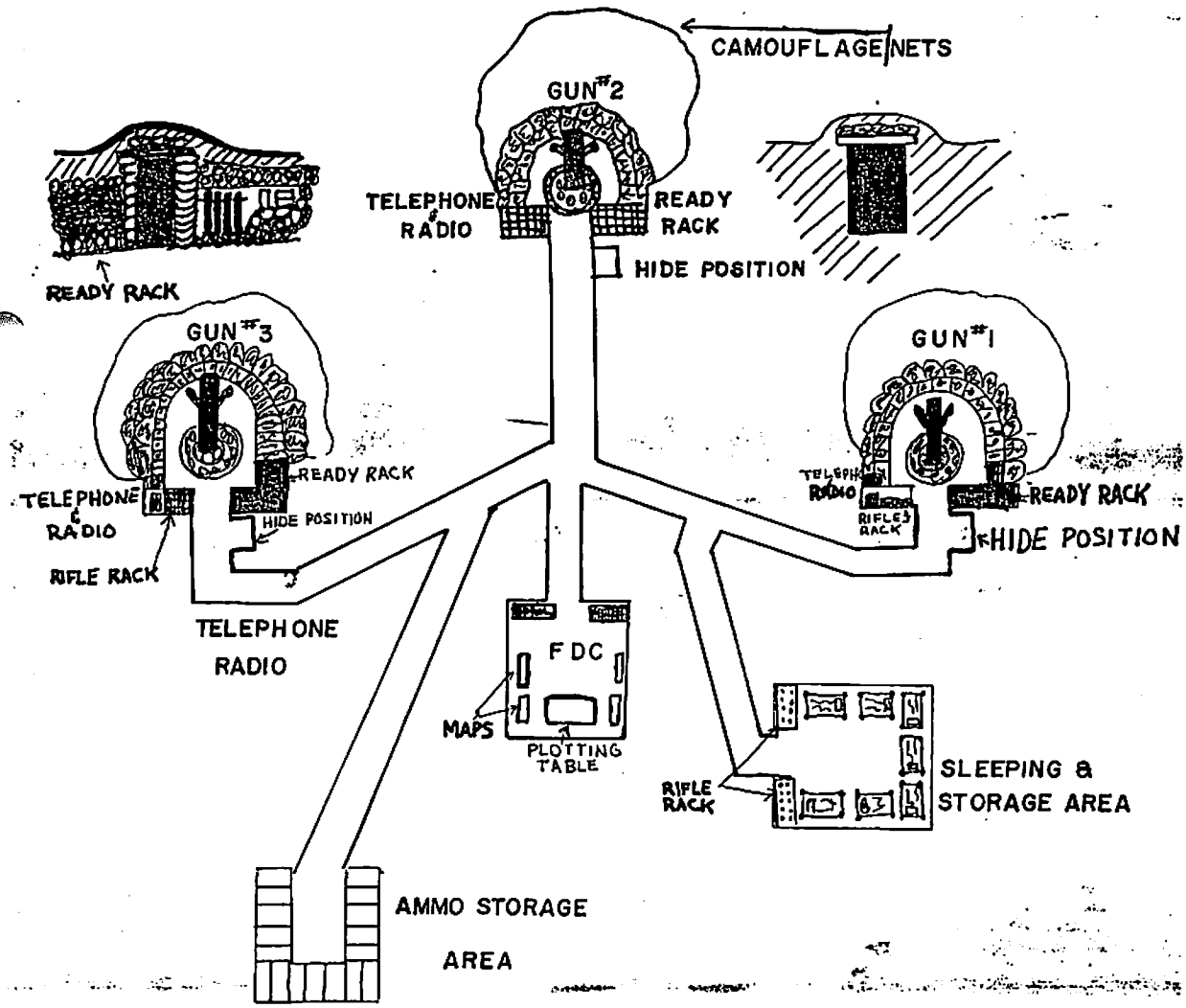
Since the LAW is a short range tank killer, it must be fired from a dug-in fighting position to insure its survivability. LAW firing positions should be included in the planning of automatic weapons and other infantry positions.

MACHINE GUN CAUSES CREW TO BUTTON UP AS LAW GUNNER KILLS TANK



The mortars can be positioned mounted or dismounted. As with the TOW and DRAGON, the mortar will survive longer if dismounted and dug-in. The dismounted mortar pit may be positioned to provide a 360 degree firing capability because a company team strongpoint may be bypassed and surrounded. The strongpoint must be able to stand alone and survive.

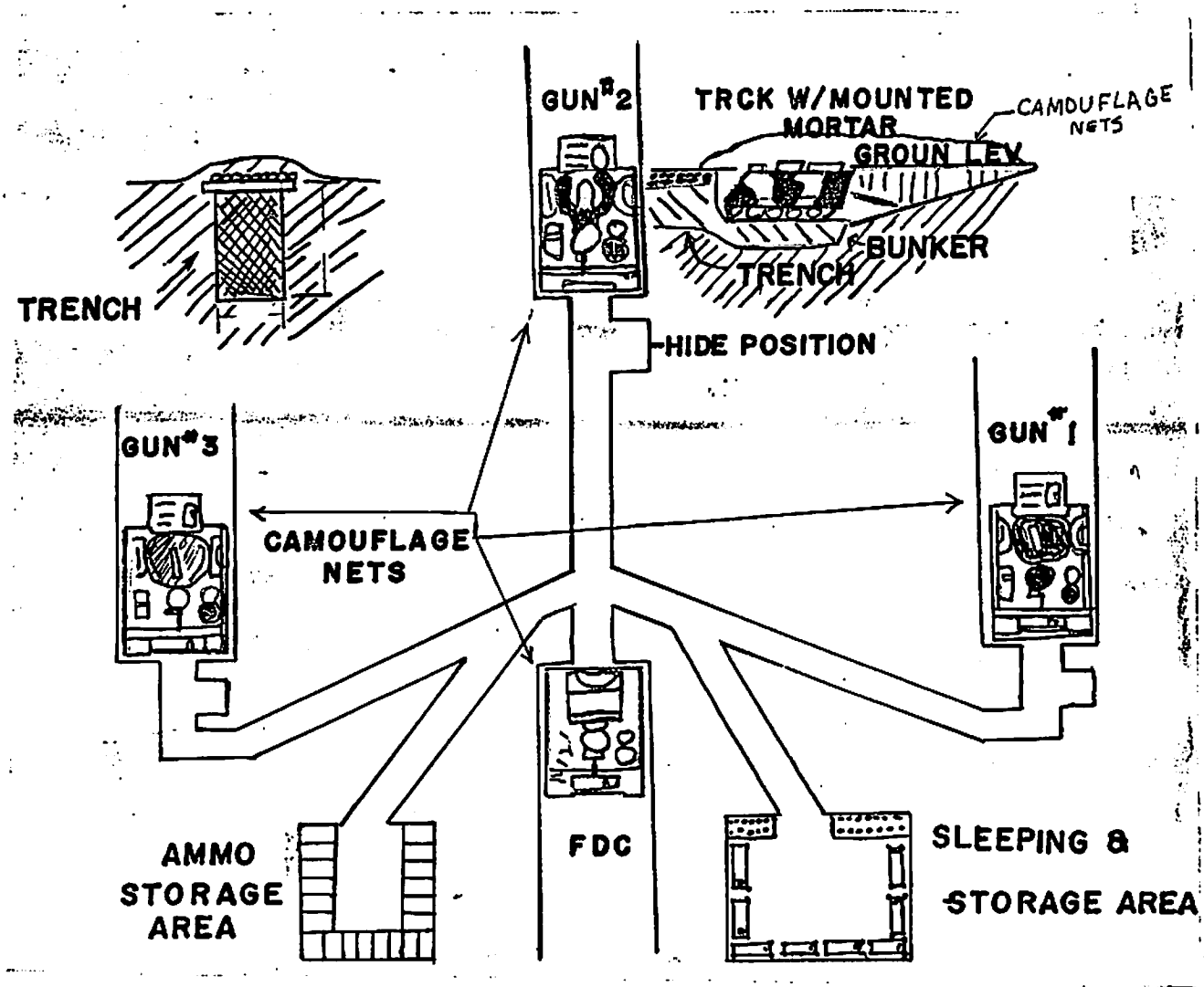
GROUND MOUNTED MORTAR POSITION (STRONGPOINT)



* ALL TRENCHES HAVE OVER HEAD COVER

Mounted mortars offer the commander a quick reaction, mobile, indirect fire capability. The carriers must be dug-in, to provide the maximum protection. An interconnecting trench network that provides covered and concealed routes to supply bunker ammunition storage points, the FDC, and sleeping positions, is essential whether mortars are mounted or dismounted. The soldiers on a strongpoint must prepare their positions to withstand large volumes of indirect fire over a prolonged period of time.

TRACK MOUNTED MORTAR POSITION (STRONG POINT)



* ALL TRENCHES HAVE OVER HEAD COVER

MARKING KNOWN RANGES

The Company team Commander on the strongpoint must insure the ranges of all his armor killing weapons are clearly marked on the terrain. This makes use of the defender's advantage of known distances along the avenues which the attacker must use. The firer must walk his fields of fire measuring exact distance to the range marker. The firer can thus be sure within a few meters of the range to attacking armor. Markers can be natural (trees, fences, houses, etc.) or fabricated and emplaced (cairns of stones, sandbags painted white on the firer's side, ammunition boxes, etc.). During the hours of limited visibility, night observation devices hould be employed to determine range in addition to seeing the enemy.

Range can be measured by walking the terrain, using the tanks range finder or from precise map reconnaissance. Ranges must be determined as precisely as possible and can't be just "estimated".

DEAD SPACE

The strongpoint must be prepared to survive a much greater amount of direct and indirect fire than a battle position in the active defense. Therefore, dead space in which enemy Infantry can use that can't be covered by a direct fire weapon (perferably an automatic weapon) is unacceptable.

While deadspace must be covered by anti-personnel mines, concertina wire, tangle foot, and various early warning devices, enemy Infantry along with both friendly and enemy indirect fire will destroy all these devices eventually and permit the enemy to utilize the dead space in subsequent attacks unless the dead space is covered by direct fire.

STRONGPOINT SECURITY

Local Security on a strongpoint differs little from security requirements in any other defensive position. Agressive patrolling, OP/LP's and maximum

utilization of night vision devices, etc., must all be employed. Because the strongpoint is designed to remain for a prolonged period oftime, all early warning systems must be intergrated carefully into the overall defense of the position, especially those systems which would detect movement during limited visibility.

SINGLE FIGHTING POSITIONS

Detailed information on constructing fighting positions is contained in FM 5-15, 7-7, 71-1 and other documents. These manuals should be used as a guide. The well constructed Infantry strongpoint position discussed here must go far beyond many of the hasty position discussed in the manuals. While there is no single solution to a good fighting position, several principles are fundamental.

PRINCIPLES OF FIGHTING POSITIONS

- The position must be planned to support the overall defense plan and must be mutually supporting with other positions.

- Forward parapets must be thick enough to withstand continued direct fire.

- Overhead cover must be sturdy enough and thick enough to withstand continous heavy enemy indirect fire.

- Overhead cover must rest on sturdy material, not earth or sandbags.

- The position must be constructed to blend in with the terrain.

- There is no "I" way to construct a fighting position. Each must be tailored to the terrain and mission of the weapon.

SELECTED BUNDESWEHR PRINCIPLES FOR THE CONSTRUCTION OF FIELD FORTIFICATIONS

- Standing task to all troops; to build them as strong and as durable as permitted by the given conditions.

- Always post security while working.

- Plan and organize efficiently; use and coordinate all the time, personnel and material available.

- Place priorities on the construction of fighting positions.

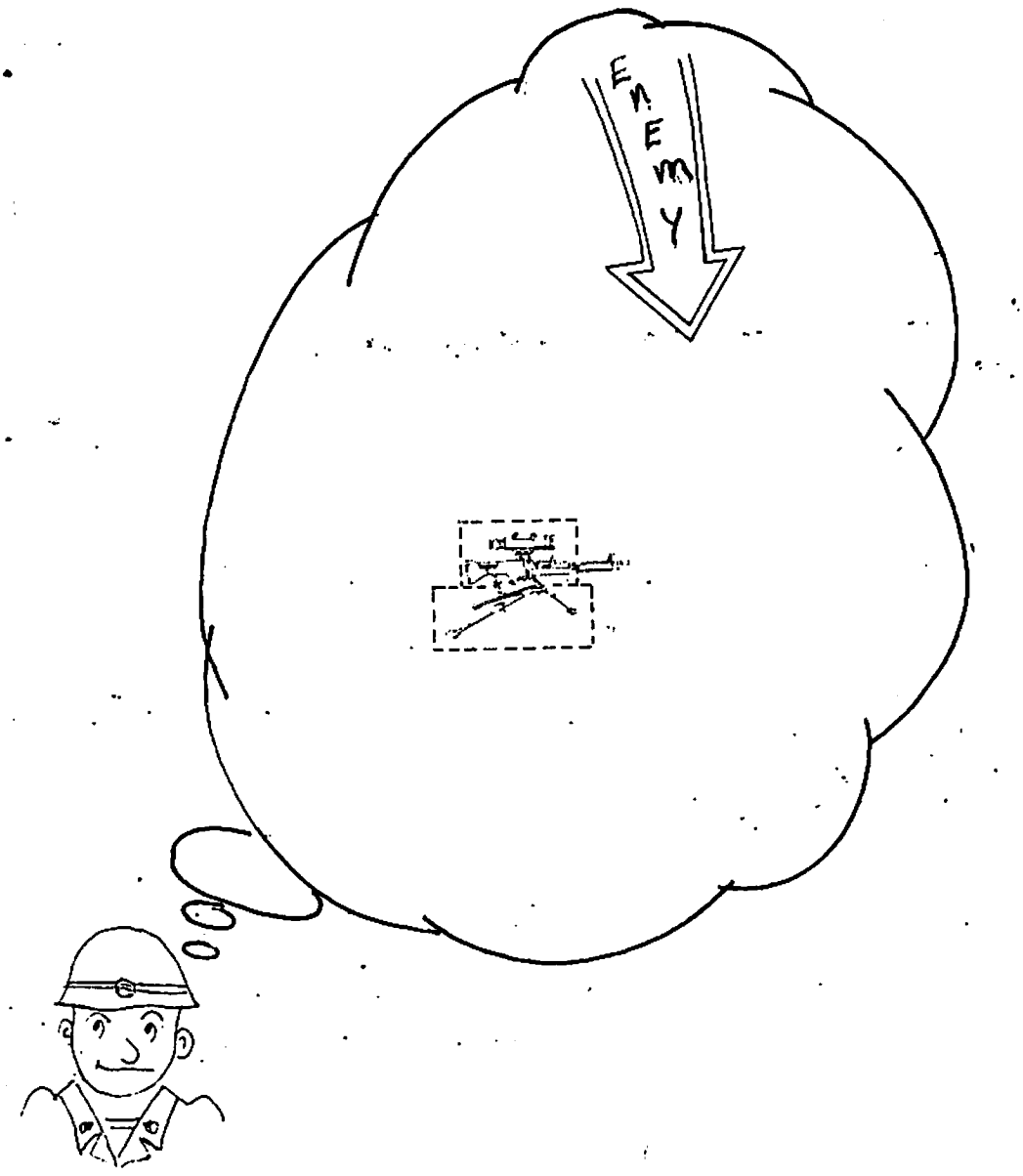
- Camouflage continuously.
- Build positions during darkness if possible.

Direction of Fire

An attacking force will normally direct the preponderance of its fire power directly forward of his direction of attack. The most effective defensive fires are into the flank of the advancing enemy. In order to provide maximum protection and to place the most lethal fire on the enemy, defending Infantrymen must construct positions that will protect them from the front while firing into the flank of the attacking enemy Infantry. This requires careful planning for mutually supporting positions.

STEPS IN BUILDING A FIGHTING POSITION

STEP 1 - Position Weapon Terrain and mission are studied. Weapon is positioned on the ground. Flank coordination is made to insure fires are intergrated. Range card is made.



Once the weapon is implaced and the range card is prepared, the weapon should never move. The position is constructed around the weapon.

STEP II - Plan Position:

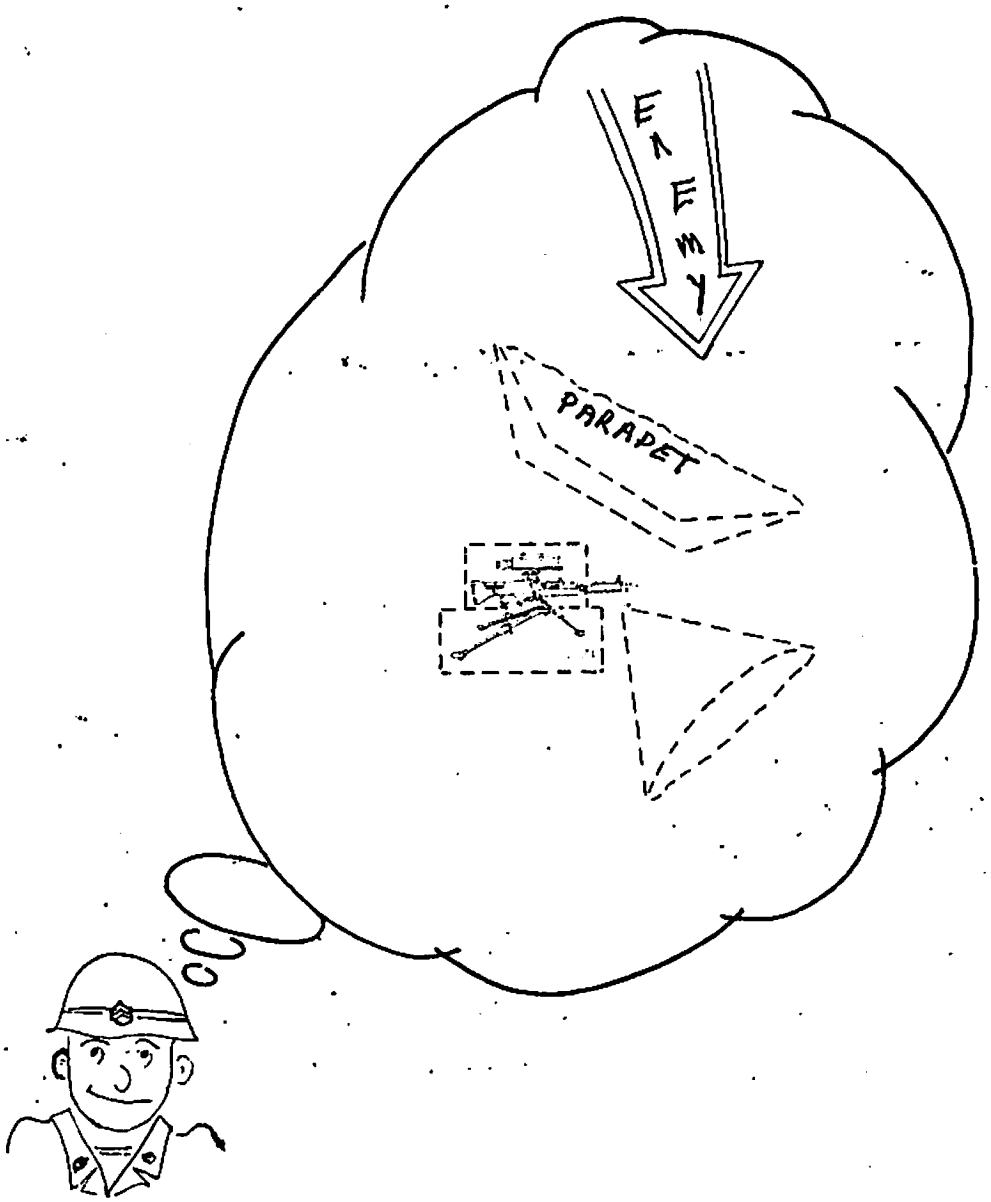
A. Firing platform is planned:

Big enough,

Stable (e.g., capable of absorbing shock of caliber-50 machinegun tripod legs over an extended period of time.),

Provides for assitant gunner and ammunition.

B. Parapet is planned facing enemy avenue of approach (Parapet must be graded to conform to the terrain and avoid a sharp silhouette).



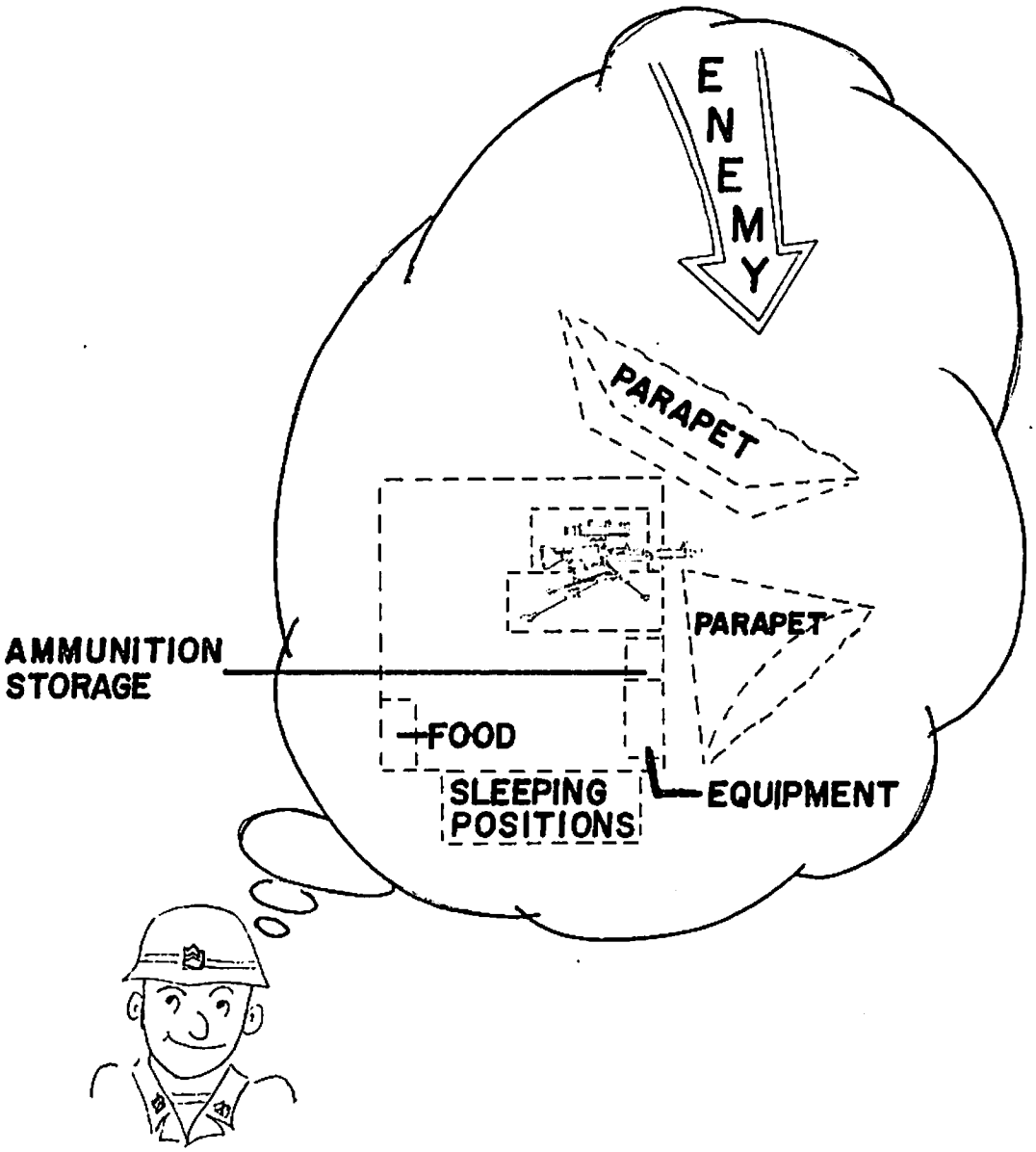
C. Remainder of position is planned to include:

Room for occupants,

Ammunition storage,

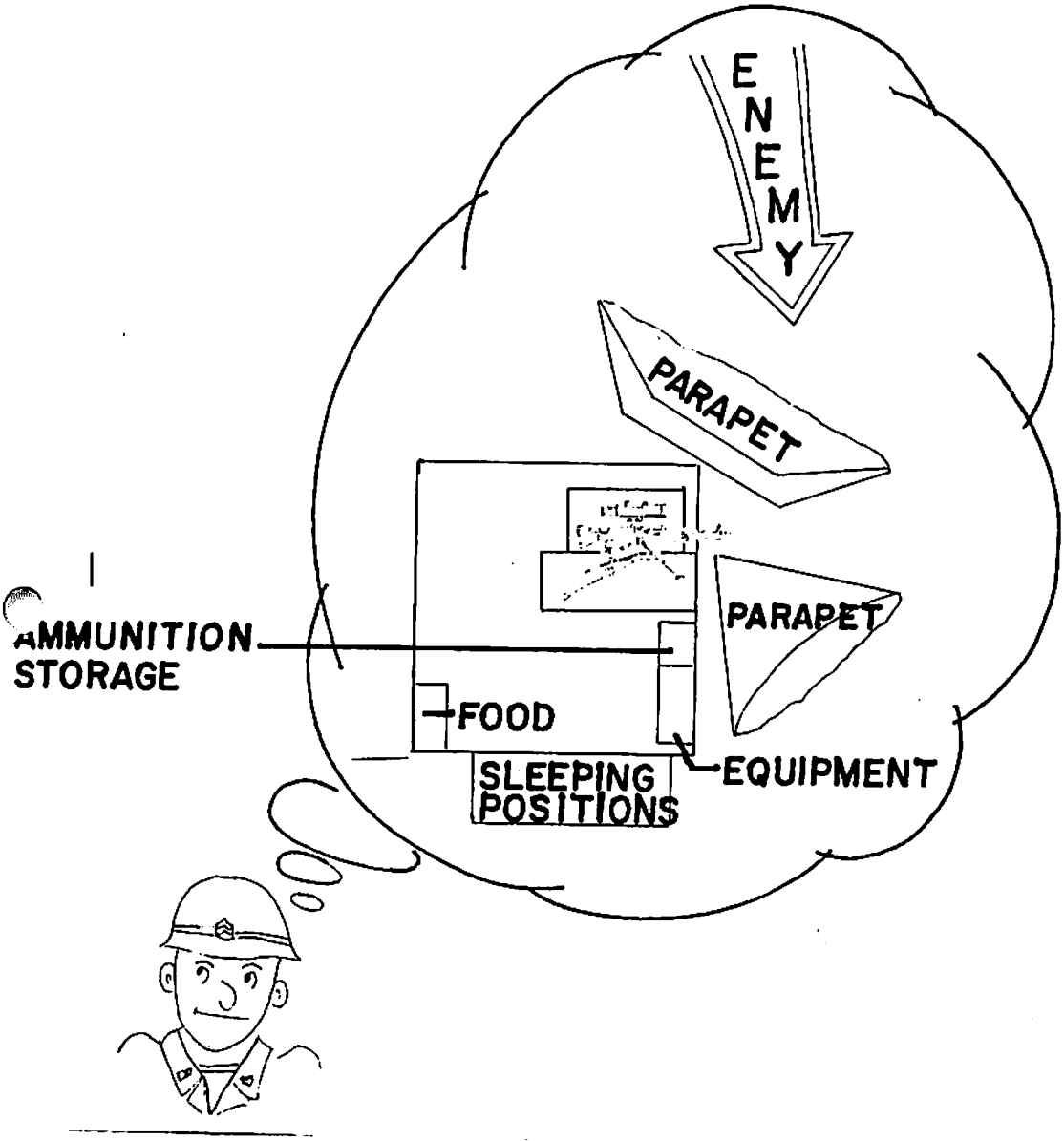
Food storage,

Equipment storage,



Plan firing positions so that the tallest soldier may fire the primary weapon. Difference in height can be overcome by using ammo boxes, sandbags, or other material for shorter gunners.

STEP III - Mark Position: Position is marked for digging to allow for space required for revetting; the position is dug wider than required and filled-back in.



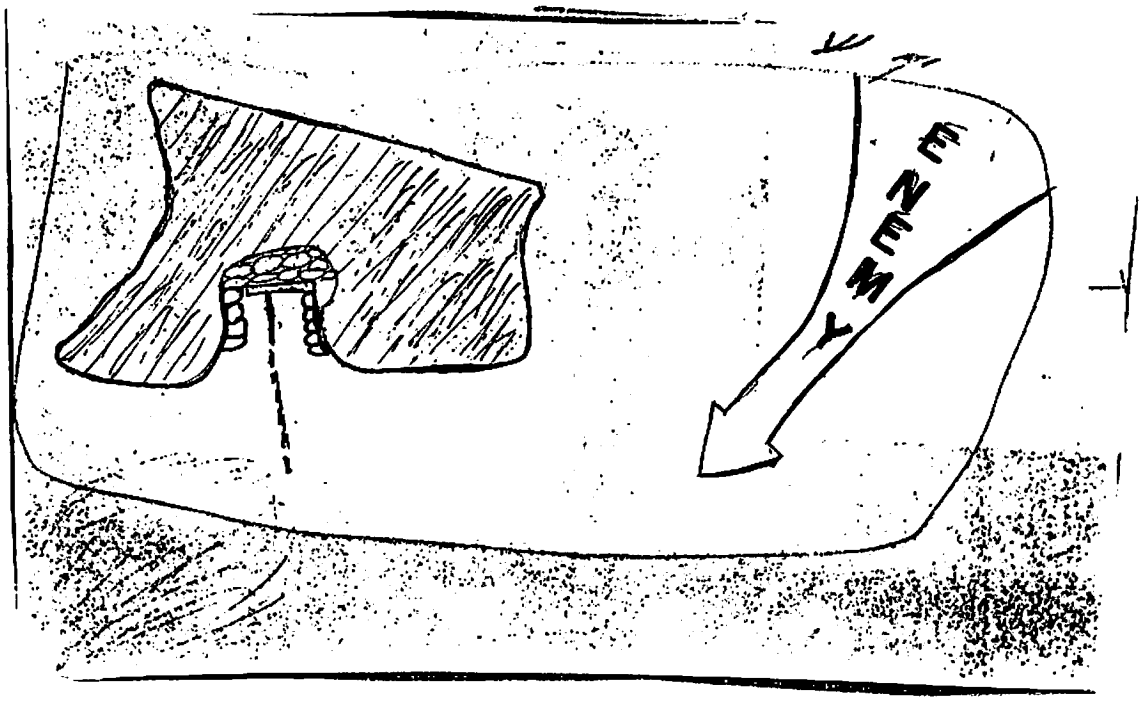
STEP IV - Construct Position:

A. Position is dug.

B. Sides are revetted.

C. Overhead cover is installed.

D. Sod is implaced and camouflage is completed.



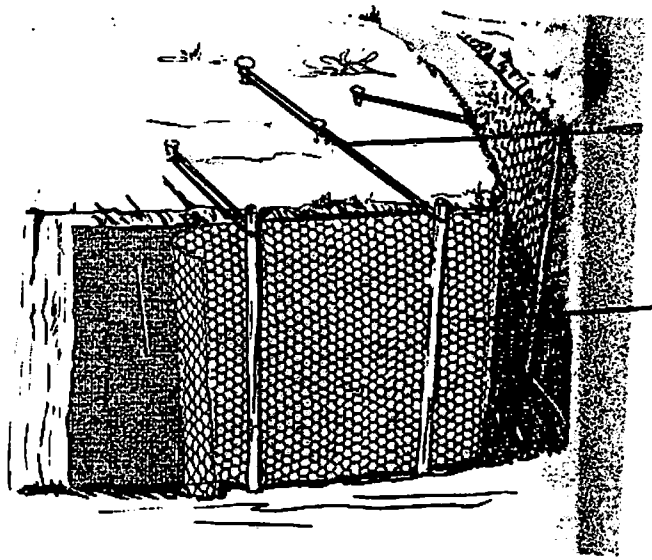
A fighting position is never complete! Work must continue to positions' survivability, camouflage, and functions.

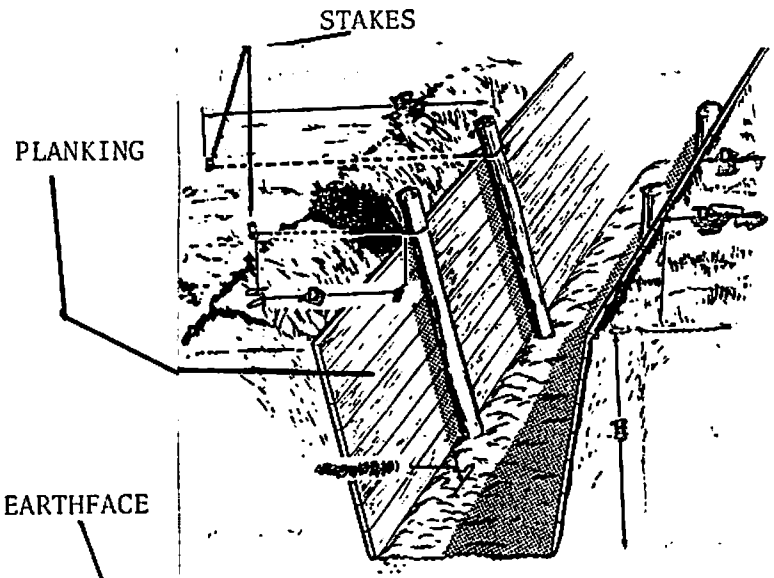
Redundant shortcomings in the construction of sound fighting positions consistantly involve three areas:

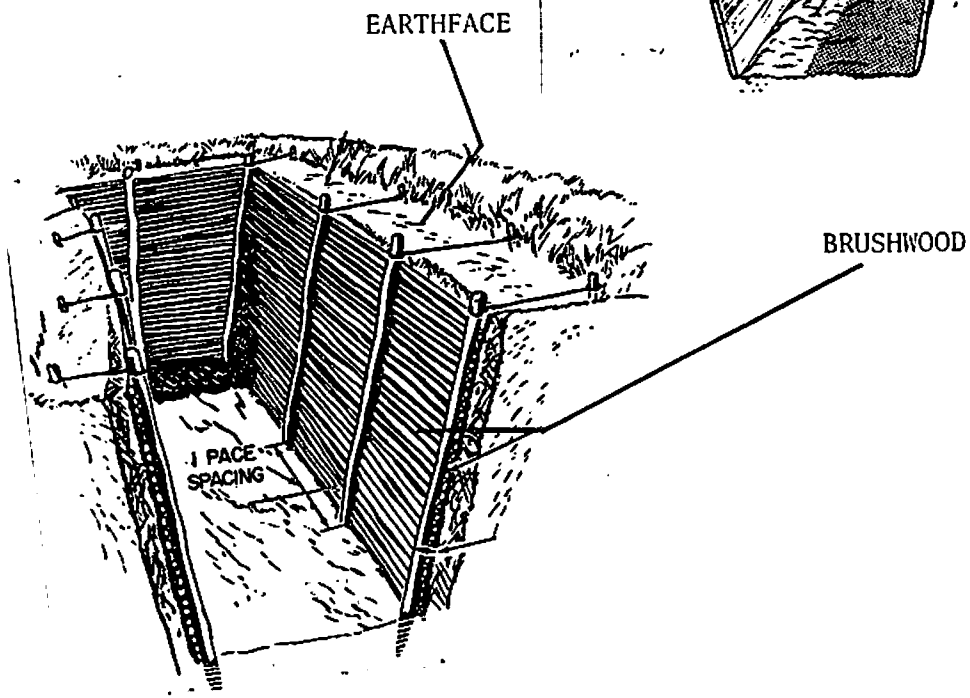
- Revetting,
- Overhead cover,
- Terracing,
- Drainage.

REVETTING

Walls and interconnecting trenches must be revetted to insure they don't collapse during rainy weather.





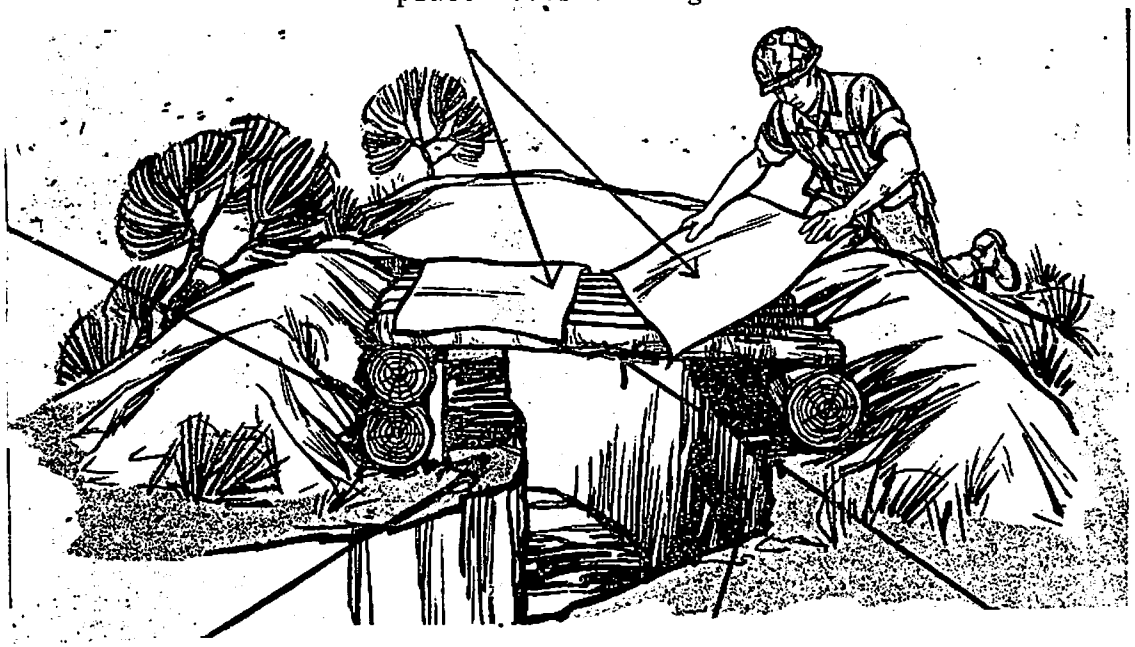


OVERHEAD COVER

Overhead cover must be constructed to provide the best possible protection; especially from airburst. A good position will have overhead cover that allows the soldier to fight from beneath it.

A waterproof or water repellent layer such as waterproof packing material from DRAGONS, C-Rations, or a poncho is placed over the logs.

Structural supports for overhead cover must be correctly place and supported.



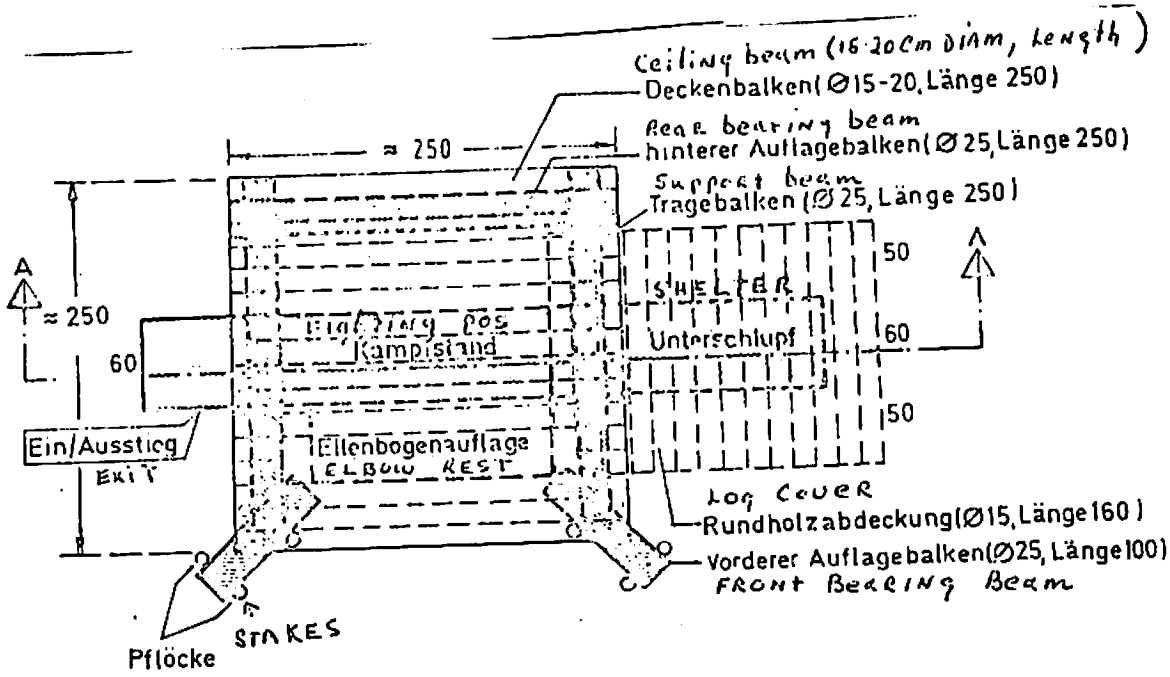
Sills must be level so as to distribute weight evenly on the supporting ground.

Space should be left between sill and the hole itself. (At least 12")

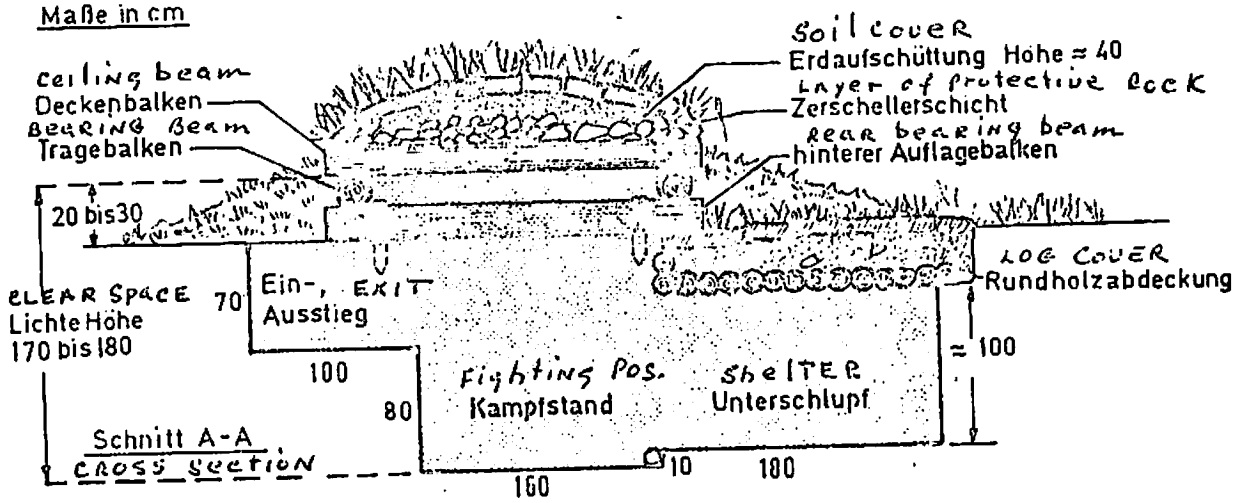
Timbers, logs, highway guardrails are positioned to support sandbags.

(An example of a similar German position is on the fqllowing page)

BUNKER FOR SMALL ARMS WITH OVERHEAD COVER, OPEN ON THREE SIDES

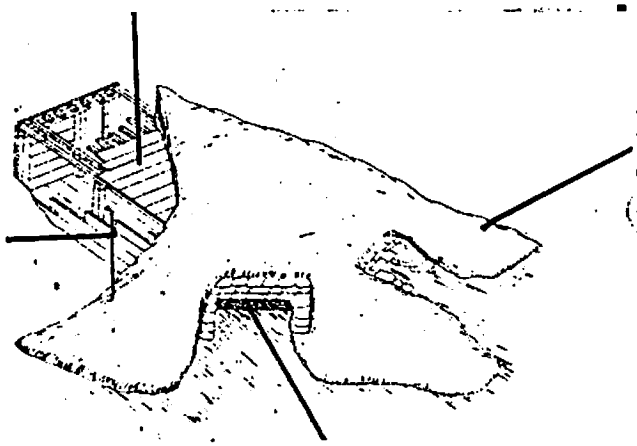


Maße in cm



TERRACING

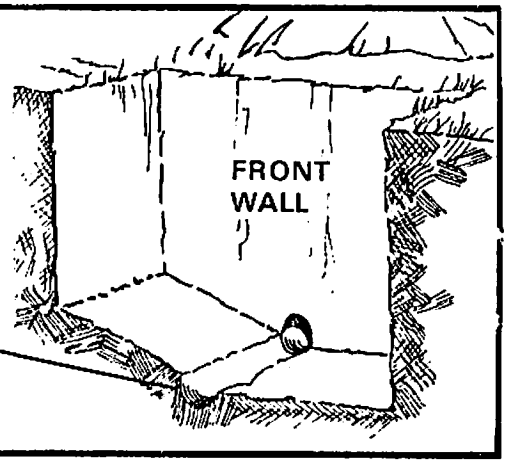
Fighting positions must be terraced and configured so they blend and slope with the surrounding terrain.



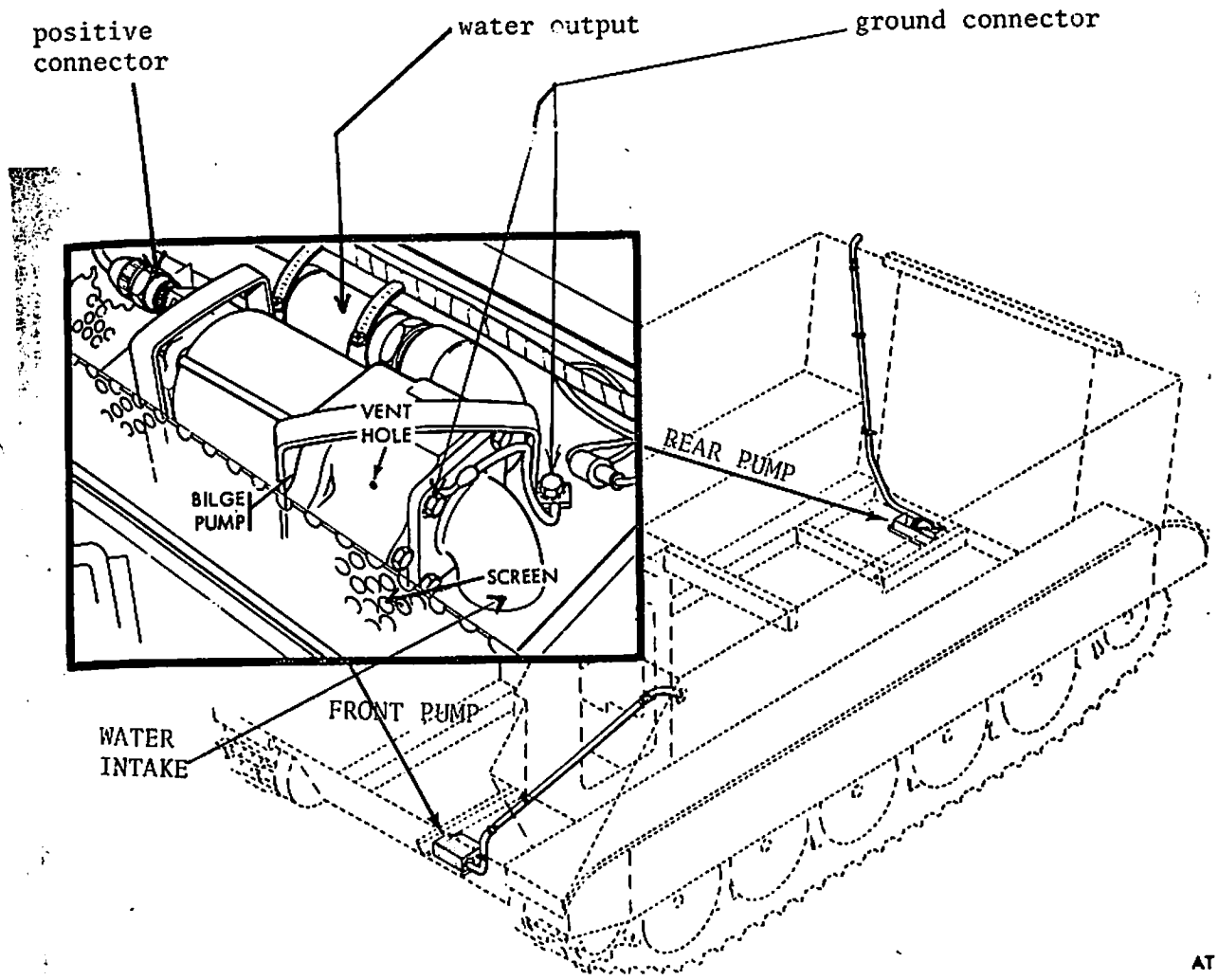
DRAINAGE

Draining fighting positions during rainy weather has traditionally been a problem for the Infantryman. The problem has not only resulted in discomfort but created casualities as well (emersion foot, trench foot, etc.,).

WATER DRAINAGE is provided by sloping the floor of you hole toward the center. A shallow trench scooped out of the floor will further direct water toward the front wall.

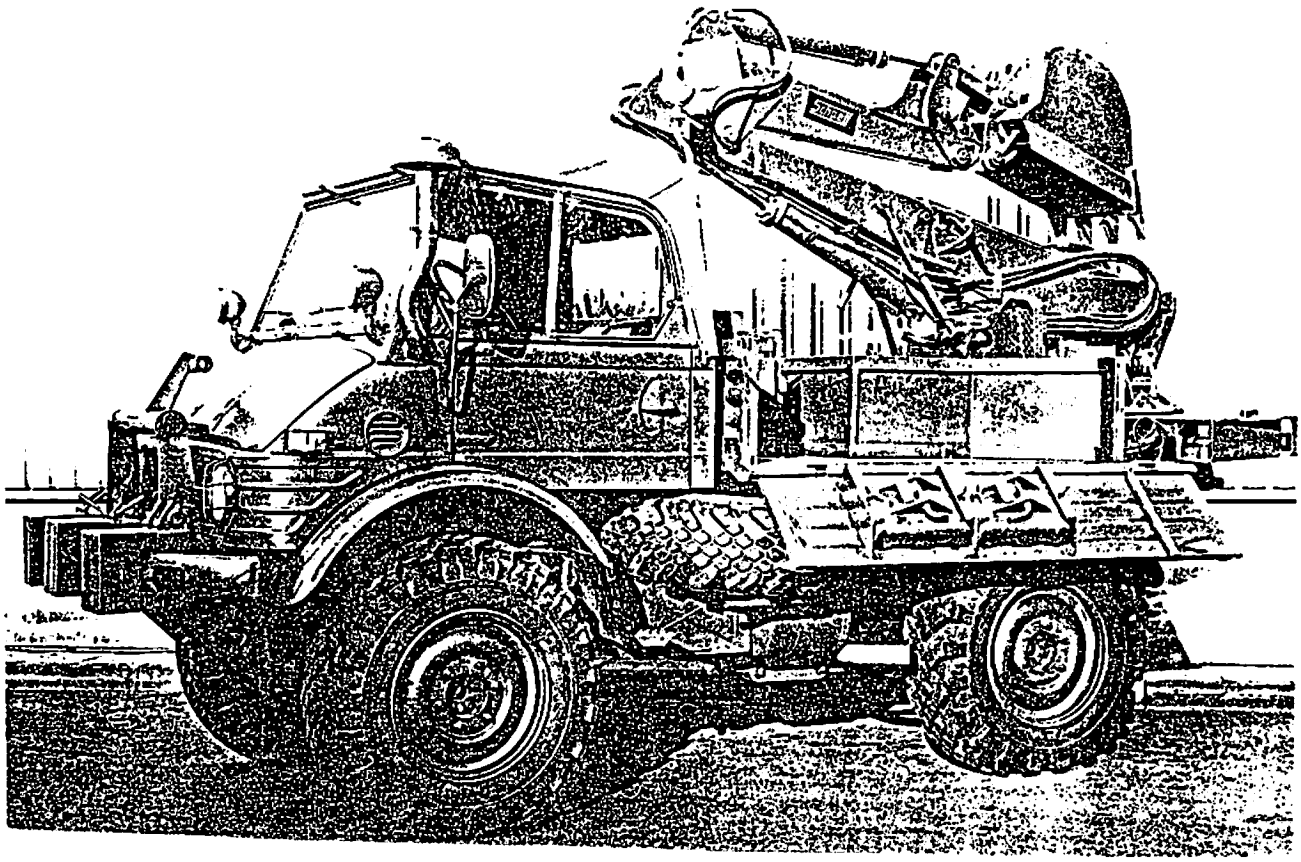


The bildge pump from an armored personnel carrier may also be used to remove water from positions.



Procedures for removing a bilge pump from an M113 and utilizing it for draining flooded positions:

-- Remove the rear floor plate from the M113
-- Disconnect the rear bilge pump electrical and hose connections
-- Remove the pump
-- Install a 1 1/2 inch hose to the wate output pipe using a hose clamp to prevent leakage
-- Install screen over the water intake pipe using a clamp to prevent leakage
-- Install straps around the end of the pumps (positive connector end)
-- Using one strand of WD - 1 wire attach the positive connector on the pump to the positive connector on the vehicle
-- Lower pumps HALFWAY into the water by the attached strap, insuring that the water intake and the positive electrical connector is above the surface
-- Turn the pump switch on in the M113 vehicle and pump as much water from the position without clogging the pump with mud or debris.



The UNIMOG is currently being brought into the Bundeswehr Panzer-Grenadier Battalion inventory and is under consideration for the U.S. Army. It is highly mobile and can rapidly dig positions in all types of soil. For example:

POSITION	TIME
2 man fighting psn	10 min
trench (1m long, 1m deep)	6 min
Other excavations 1 cu m	7.5 min

Times for loose, sandy soil. For cohesive soil or gravel add 25%
tough stiff soil with rocks add 100%
work on sloping ground add 15%
work in old forest stand add 10%
work in tall forest stand add 20%
work in night or rain add 10%
work in NBC environment add 25%

Having organized the weapons systems into the most advantageous covered and concealed positions on the strongpoint, let us now turn our attention to fighting the strongpoint and supporting the wider battle.

7. FIGHTING THE STRONGPOINT

The team commander has to be able to see the battlefield in order to conduct the defense. He adjusts between his various surveillance assets depending on weather and visibility. His radars and thermal imagery, for example, may provide key advantages under limited visibility conditions. His own CP location with the strongpoint is chosen to provide the best possible overview of the likeliest enemy approaches. He may require several well dug-in OP's for occupation under varying conditions.

> Although the strongpoint is a fixed location, the conduct of its defense is dynamic.

The team commander responds to the changing enemy situation by capitalizing one every possible aspect of flexibility. If enemy indirect fire is heavy on one partof the position he may move men to less intensely targeted areas of the strongpoint. If weapons systems go out of action he adjusts to optimize the defensive power of those that remain. If one side of his position comes under mounted or dismounted attack he moves forces to meet it.

The team commander places his weapons in accordance with their missions and capabilities. Locations of his TOW's and tanks must enhance coordination of fire, including intergration of COBRA TOW's when appropriate.

> Normally the long range tank killing weapons occupy the higher killing weapons occupy the higher ground while Infantry close-in protective weapons are positioned in the lower areas where interlocking grazing fire is required in order to keep enemy RPG and rifle fire off the "main mission" larger weapons.

As enemy forces draw closer to the strongpoint, the team commander constantly adjusts his work priorities in order to provide for the most effective preparation and full use of available time. He has to judge when it is time to stop digging and to take the final steps in siting of weapons and adjusting

camouflage.

The Commander does not merely attempt to ascertian which way the enemy will attack his position; he seeks to lead, or force the enemy into taking options that will favor the defense and put the enemy at a disadvantage. Working with the relatively restricted area encompassed by a strongpoint, the team commander nevertheless achieves surprise by such means as withholding fire, moving tanks via covered routes to new firing locations, making use of surprise obstacles, and adjusting the composition of his combined arms firepower. The lethality of modern weapons dictates that the commander must be prepared to make changes based on the developing enemy situation or his own attrition or reinforcement.

The need for flexibility drives the number of fighting positions to be created: every new position provides yet another possibility for a more versatile combined arms defense.

The FIST Chief is the most important man on the strongpoint in terms of providing firepower for the mission of stopping and destroying a mounted armor-protected attacking force.

With the advent of FASCAM and other munitions improvements, the importance of the FIST as an anti-armor team continues to increase. The FIST coordinates the massed firepower of artillery, air and cobra TOW's. Artillery should be registered on main probable enemy avenues if conditions permit. The team commander selects a well dug-in fighting position for himself and his FIST Chief and an alternate position which is to occupied by his XO and the FIST NCO. In order to deceive the enemy as to the location and strength of the strongpoint, the team commander may wish to delay the employment of direct fire weapons, using his FIST Chief to direct tactical air and artillery against the enemy at long range. If friendly forces are already engaged with the enemy, such fires (including attack helicopters) may be in progress -- with the strongpoint FIST monitoring and prepared to take over fire direction at a later phase of the battle.

With the use of laser guided munitions (Copperhead), the FIST Chief will be able to bring new dimensions to the tank killing capability of the artillery. Copperhead will enable the team commander to engage the enemy with effective long range armor-killing indirect fires.

COBRA TOW

The strongpoint supported by teams of Cobra TOW helicopeters is a formidable defense. Ground and helicopter capabilities are mutually supporting. The attack helicopter teams can observe enemy avenues and engage armor targets up to 3,750 meters. The ground forces direct and indirect fires provide the suppression of attacking anti-aircraft systems necessary to permit maximum effective and sustained use of the Cobra.

Cobra TOW teams also enhance the task force and company team commander's capability to force the attacker into hitting the strongpoint at the desired point, and from the desired direction.

> Intergrating the firing positions and kill zones of all the anti-tank systems is the key.

The attack helicopter teams, with their Battle Captain leader, provide a flexible ingredient for extending the teeth of the strongpoint.

The TOW's of the company team are the strongpoint commander's longest-range direct fire weapon, and he sites these on high ground where visibility is best. The protection of dug-in TOW's will allow successive firings from the same position without the need for immediate relocation; since the weapon and crew are protected and backblast is attenuated and partially concealed. Resupply of TOW and other weapons positions utilizes APC's moving by defiladed routes.

Tanks can play a vitally important role on the strongpoint once it is recognized that there is a requirement for their mobility and rapidfire anti-tank capability. By planning firing positions and routes that allow him to take advantage of the tanks armor-protected mobility.

> The team commander insures that the tank does not become a static "pillbox".

It should be arranged that tanks move along defiladed and condealed routes to firing positions, occupying them only when enemy armor is closing within killing ranges. Prior to this, tanks should be located in areas which afford protection from air strikes and artillery fire. A tank cannot remain long in a fighting position after it has begun to fire on enemy targets. It must have alternate position to which it can move by defilated routes. Tanks located immediately below the crest of steep hills, if properly concealed (as, for example, in woods) are partially protected from artillery fire. In many cases the team commander, because of his mission, will be reinforced with additional infantrymen, more TOW's, tanks, radars, air defense weapons, and other fighting capabilities. Much depends on his ability to command and control these resources and to coordinate their employment.

The defenders have an increased advantage if the area surrounding the strongpoint, out to range of direct fire weapons, has been marked to show known distances. As the enemy "buttons up" while under srtillery and air attack and closes to TOW range (unless the team commander decides to hold fire and increase the surprise effect) he is engaged by the strongpoint's TOW's. This is followed by tank fire engagement as the range decreases. Friendly fire is timed and directed to take advantage of the tank ditches and minefields as the attacking armored force is slowed and disorganized. If the mounted

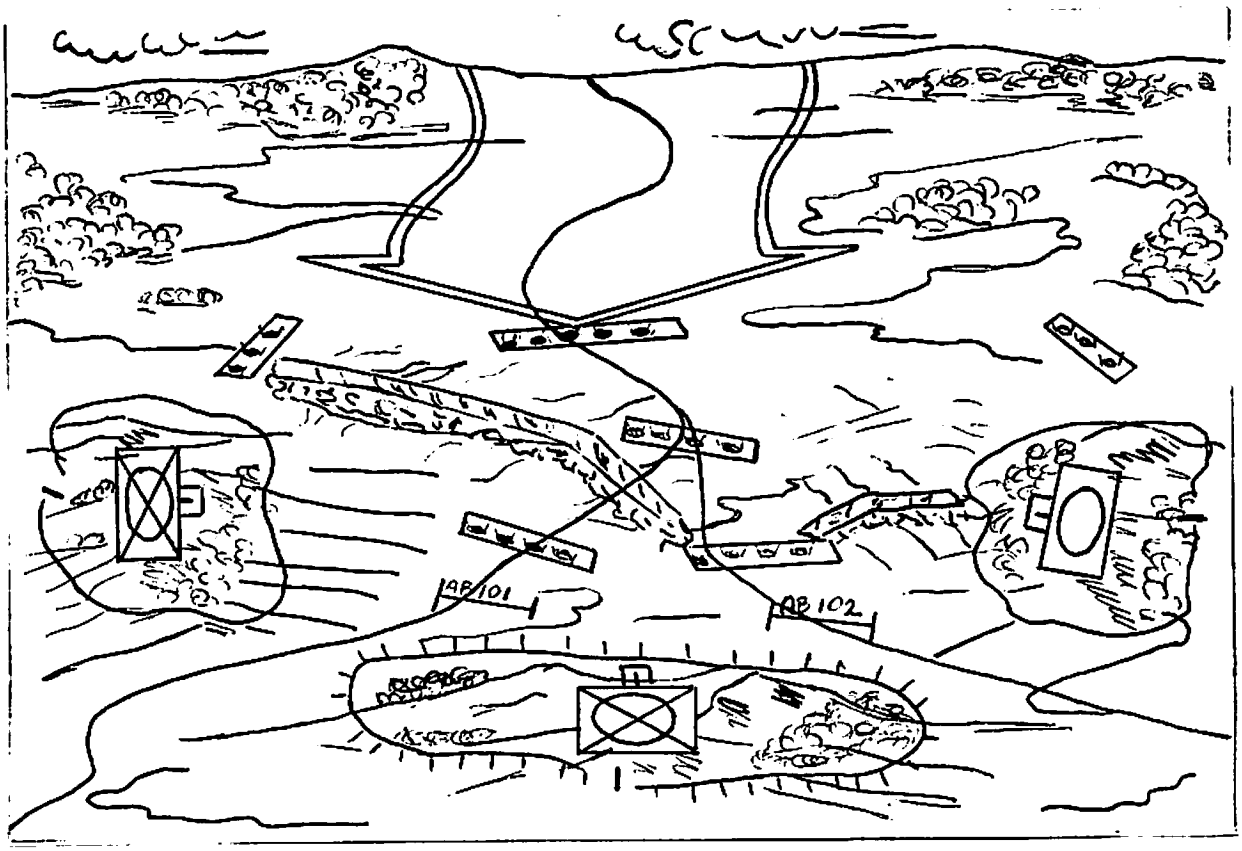
attack continues, DRAGON's and LAW's come into play against enemy armor. With accompanying infantry now separated from armor by artillery and defending infantry fire, the enemy force is attrited to a level that stalls the attack.

The strongpoint commander reorganizes and prepares for a repetition of the previous armored attack, or a more deliberate attack of dismounted infantry. If this attack materializes and is able to assualt the infantry positions, the "nesting" effect operates to surprise the enemy with flushing fire and cuts into ground assausting echelons. The grouping of infantry automatic weapons into nests allows friendly infantry to move further out from the center of the strongpoint without weakening the ability of the perimeter to provide effective grazing fire. Any enemy attempt to reduce individual nests is met with fire from other nests on each flank.

8. SUPPORT THE WIDER BATTLE

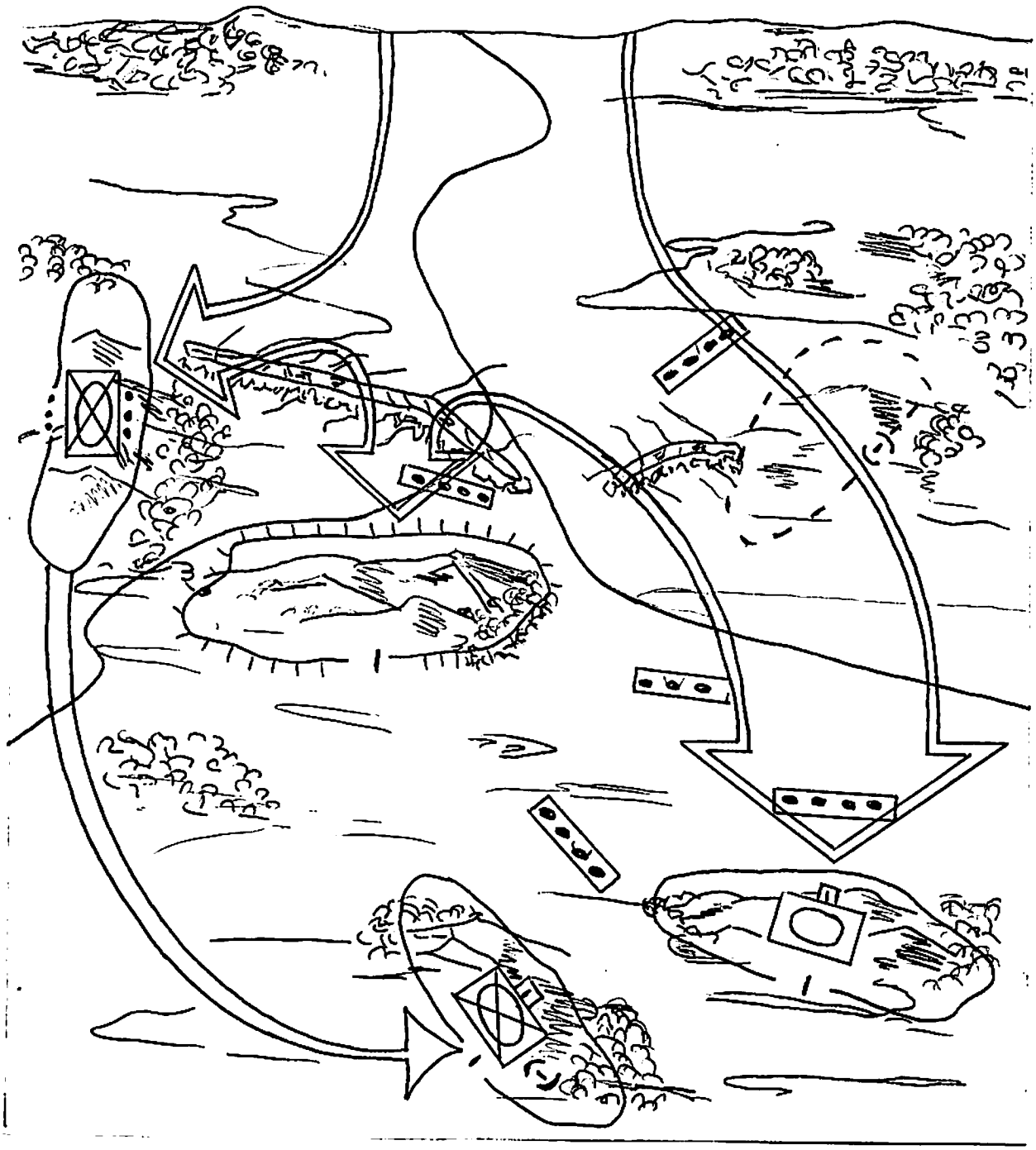
The defense of the strongpoint normally is part of a larger plan serves as a keystone in the progress of the battle. The team commander supports the wider battle in two ways: (1) his defense of the strongpoint provides a solid rock around which his higher commanders can plan execute a more mobile defense with other forces; (2) his ability to maintain surveilance on enemy units, serve as a communication relay, lay down supporting fires, and provide other assistance to friendly forces helps to foil the enemy and to carry out the overall defense.

An example of the role of the strongpoint in the wider battle is illustrated in the following graphic sketches, beginning with a sketch from FM 71-100, page 5-20:



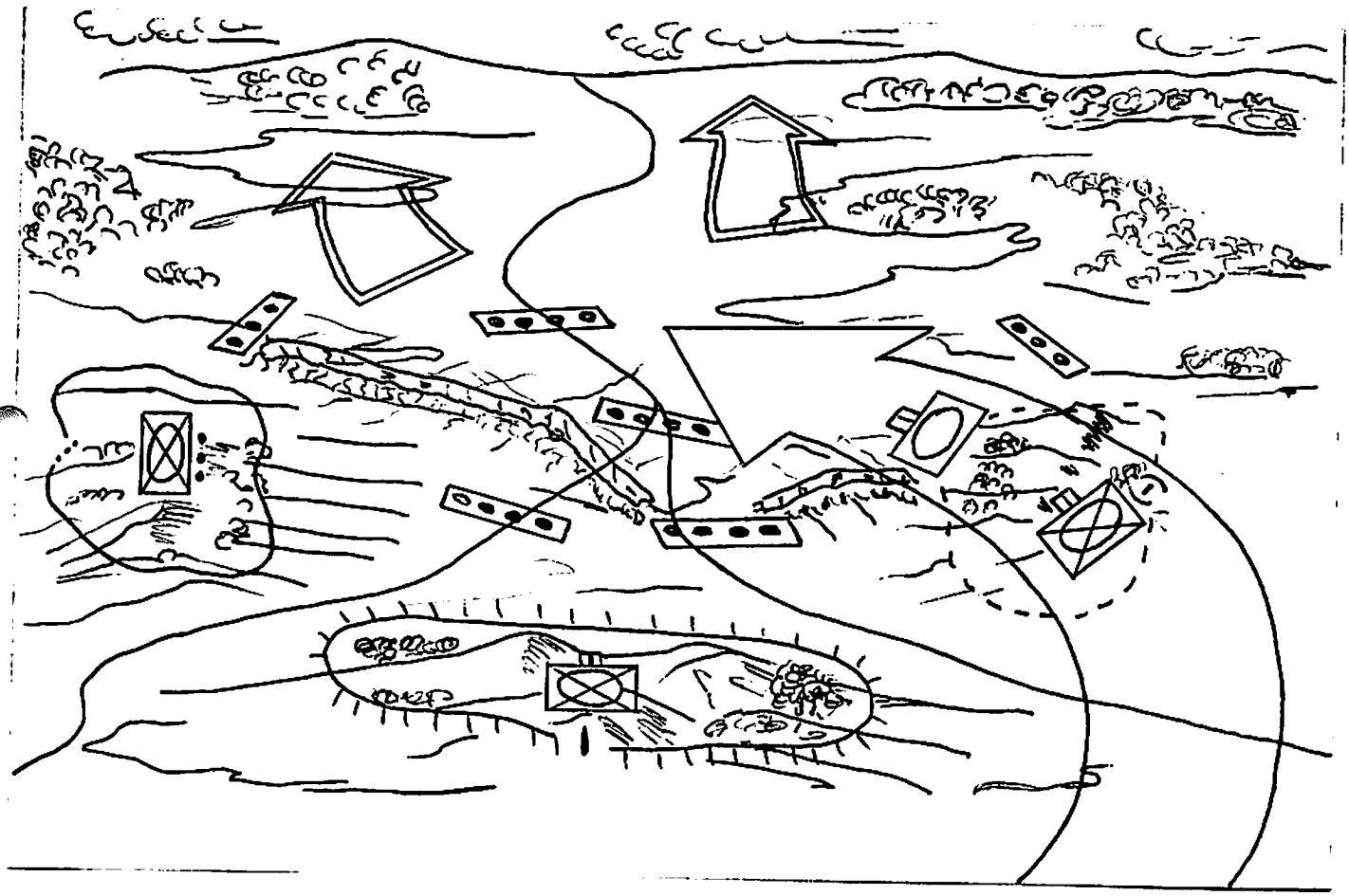
The enemy attacks to bypass the strongpoint and continue on to deeper objectives. Friendly forces on the right flank are driven back, while on the left the weaker enemy attack allows friendly forces to be repositioned by the task force commander in preparation for a counterattack. Local defense of the strongpoint and firesdirected by the strongpoing commander in support of other friendly units have attrited the enemy force and slowed it.

The strongpoint becomes the pivot around which the battle moves, allowing other friendly forces to conduct a more flexible, active defense, attriting the enemy while the Task Force continues to control terrain which is key to counterattack. As the enemy drives his attack into the friendly sector, he strikes the minefields, anti-tank ditches, and other obstacles that form part of the strongpoint's defensive system. He suffers additional attrition because of the overwatching presence of the strongpoint, even though he may have bypassed and surrounded it. Friendly tactical air strikes and artillery, directed from tbypassed and surrounded it. Friendly tactical air strikes and artillery, directed from the strongpoint, take a toll of enemy forces. He then must direct his efforts to an assault on the strongpoint, which causes him further attrition and "sets him up" for the friendly forces' counterattack. The strongpoint also provides key assistance to the counterattack by continuing to direct fires against the enemy and report his movement.



The enemy is disrupted by the terrain, the minefields, the tank ditch, and the fire placed upon him. He moves his attritted force toward Task Force Tank, since this is the fastest route toward his main objectives farther north.

The battalion task force commander executes a counterattack which catches the enemy force by surprise at a moment in which enemy attrition is heavy and control has weakened. Flanking fires from the strongpoint continue to disrupt enemy movement. The coordinated combined arms counterattack breaks up enemy formations and drives them back. In withdrawing, the enemy force is even more vulnerable to fires from the strongpoint.



CHAPTER 3

TERRAIN REINFORCEMENT IN BRIGADE BATTLE AREAS

WHY TR?

- Structures the battlefield prior to hostilities
- Buys time
- Buys space
- Is a combat multiplier
- Enhances friendly mobility
- Adds flexibility
- Makes CIMIC a Combat advantage
- Concentrates Engineer capacity
- Impacts on high -$ readiness decisions
- Is all possible now

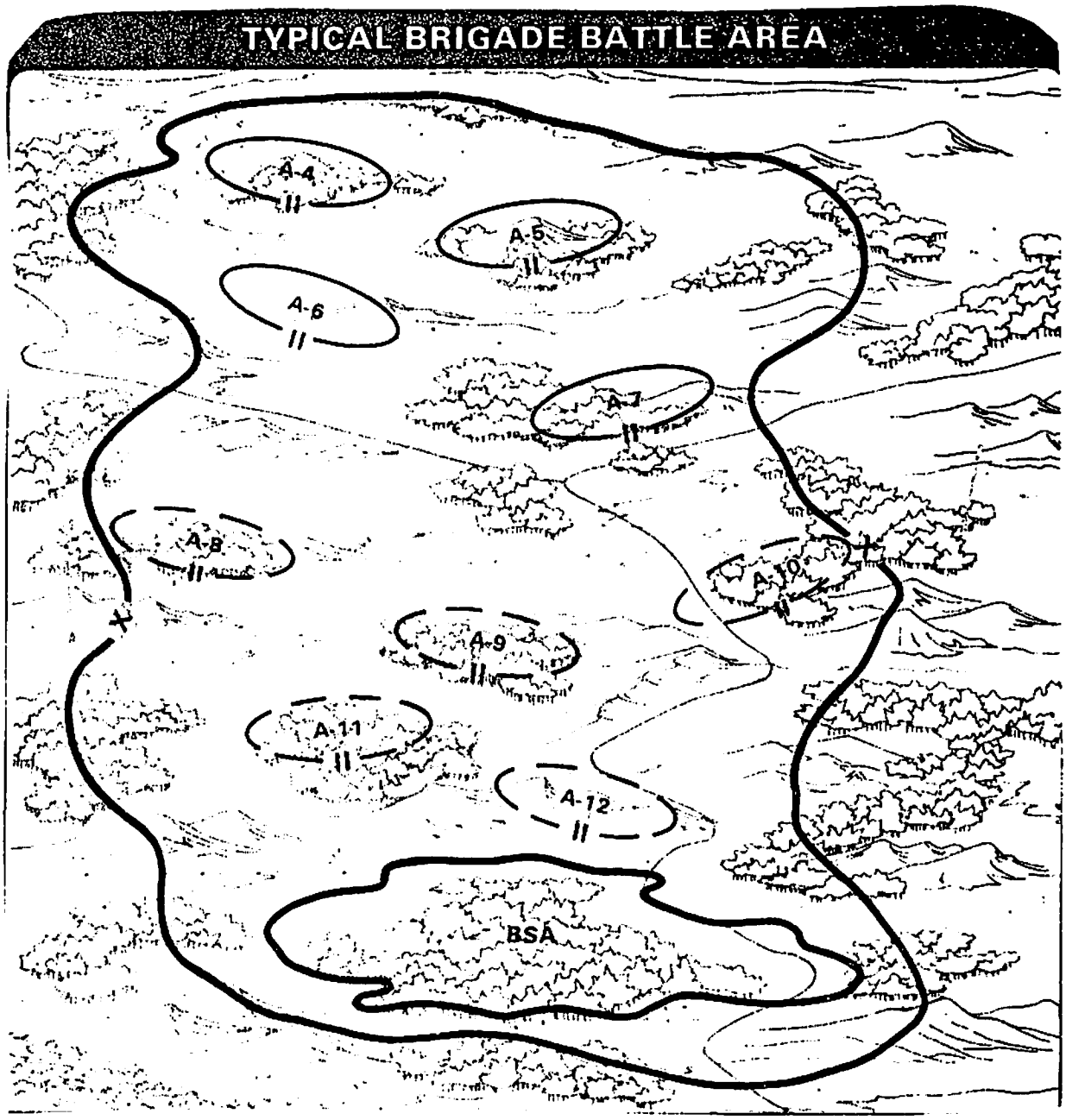
At the Division level, the commander can maximize his defensive advantages by emphasizing terrain reinforcement in selected battle areas. The barriers, obstacles, and field fortifications provide him with all the advantages associated in general with terrain reinforcement (noted in Chapter 1 and restated in the left margin) and in addition, some specific by-products -- indicated below -- that enhance the defense at Brigade and Division level.

1. Enhances mobility and credibility of the forward Defense. Gains Flexibility by allowing movement behind barriers.
2. Improves use of radio silence and other deceptive measures and recognizes increased lethality of modern weapons by protecting troops and equipment.
3. Uses Corps logistical assistance early.
4. Provides for drastic improvement through use of prestocked supplies and magnifies the effect of forward restationing.
5. Takes best advantage of natural terrain and can be planned in advance.
6. Makes extensive use of CIMIC and German Territorial Army support.
7. Maximizes utilization of local infrastructure and built-up areas.
8. Focuses training on practical application of barriers and field fortification.

1. TR....

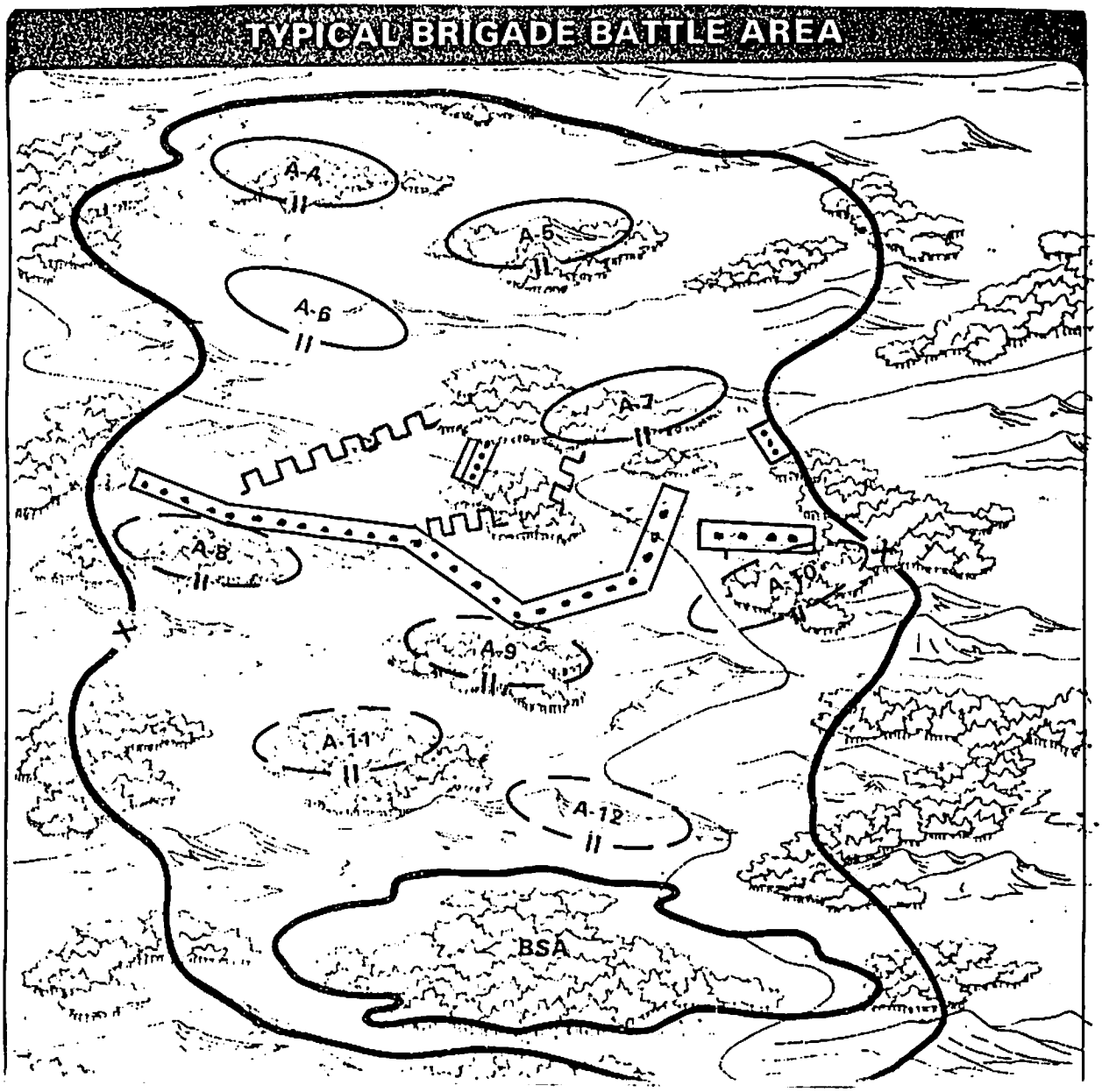
.... Enhances viability and credibility of the forward defense and gains flexibility by allowing lateral movement behind barriers.

An analysis of the threat and the possibilities of defense in the Infantry sector will provide the likely areas for employment of effort in terrain reinforcement. If the probable enemy avenues of approach can be wholly or partially blocked by a barrier system, terrain reinforcement will have a significant contribution to the conduct of the Division defense.

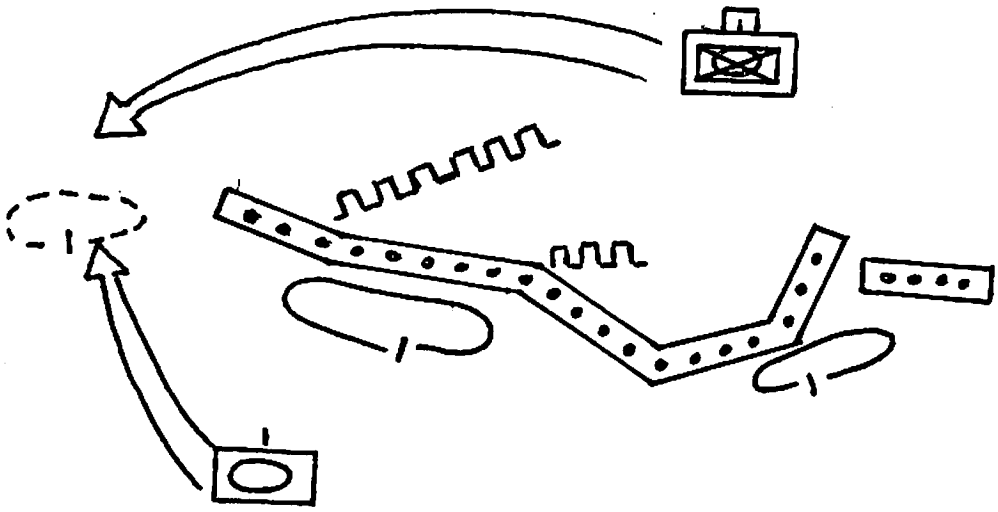


In the illustration below, a barrier system has been superimposed on the sketch of a typical brigade battle area, showing the way in which terrain reinforcement can change the nature of defense. As the enemy moves down from the top of the sketch, the barrier stops him and sets him up for a counterattack by defenders on either side of the system.

The combination of minefields and antitank ditches, carefully integrated into the natural terrain obstacles, allows infantry units to defend relatively wide areas without support from tanks. The armor thus released is available for strong local counterattacks.



Movement of other elements of this Division during the defensive fight is facilitated by the protection and security offered by the barrier, which creates the effect of "interior lines" for the friendly forces; i.e., the enemy has to move farther and with more difficulty than the defenders to get to the same point on the battlefield, while friendly forces can reorganize and make lateral movements behind the protection of the barrier to meet any new contingency with a greater element of security. The attacking force must risk greater exposure to flanking fires in order to make lateral moves in front of the barrier, in a zone where fires have been pre-registered.



(2) TR...

.... improves use of radio silence and other deceptive measures and recognizes increased lethality of modern weapons by protecting troops and equipment.

The presence of a barrier and associated obstacle, plus the combat multiplier afforded the friendly force by the advantages of terrain reinforcement, will slow enemy movement and allow friendly units to remain longer in position, thus increasing the potential for utilizing wire communication and radio silence. Simplified requirements for mobility of this element of the defending force also simplifies command and control.

The friendly field fortifications provide protection that will allow the defending Division commander to accept strong attacks in that brigade sector, including those supported by extensive artillery preparation. By executing a resolute defense he gains the key advantages that accrue to the defender -- an ability to cause heavy attrition of an enemy force, in this case without being forced to accept proportional attrition himself. His employment of FASCAM, thermal sights, and other improved weapons, munitions, and equipment is also enhanced.

(3) TR...

.... uses Corps logistical assistance early.

The amount of logistical support for a barrier system seems extraordinary to those who are not accustomed to the use of terrain reinforcement. In fact, many WWII barriers, even those which were hastily constructed, involved a significant effort in supply, transport, and emplacement.

Any barrier system that is intended to delay or stop a major force must be sophisticated and complex; however, the Engineer capability to construct such barriers exists in the current Corps and Division structure and should be massed and used for this mission when the requirement exists, as it often does in the defensive situation of NATO forces.

In a brigade barrier system, it would not be unusual to implace 75,000 mines or to construct 25 kilometers of antitank ditches. This kind of barrier could be constructed by the Division's normal combat Engineer direct support in 48 hours or less. The material support for such a barrier must be planned in detail, including the following areas of essential activity:

... Prestocking of barrier materials forward

... Transport of supplies to the barrier site

... Organization of forward stockage points

... Emplacement of barrier sections in priority

... Other Engineer preparation

This effort is assisted by Corps, employing transportation and other assets which are temporarily diverted from other efforts. Corps priorities are based on the timing of various phases of the defense; i.e., early in the preparations, prior to hostilities, is more appropriate to move forward mines, class IV barrier supplies, and other items which are entirely defensive and non-hostile in nature -- but which provide a high kill capability against armor. This frees transportation elements later for haul of tank ammunition and other items that come into action at a later phase.

4. TR....

.... provides for drastic improvements through use of prestocked supplies and magnifies the effect of forward restationing.

The "provisioning" of barriers and other terrain reinforcement is a large and complex activity, but the mines and other required supplies lend themselves to storage in forward areas. This is especially true to barbed wire, stakes, pickets, minefield warning signs, Engineer tape, and other items which are of little intrinsic value, not subject to pilferage, not difficult to store, and relatively impervious to weathering. The simplified storage problems for such supplies makes the advantage of forward prestocking extremely desirable.

When units can be moved close to their defensive sectors, the arrangements for storage of class IV and V for barriers is facilitated by their presence.

5. TR....

.... takes best advantage of natural terrain.

The threat force will move rapidly along major avenues of approach in its natural terrain. If obstacles can be supplemented by terrain reinforcement, the enemy can be met on ground that is predictable as a battlefield.

6. TR....

.... can be planned in advance.

Preplanned extensive barriers and coordinated friendly defensive maneuvers associated with the terrain reinforcement can pay big dividends in attrition of the enemy. Advance planning includes arrangements for rapid emplacement of obstacles -- by locating necessary material and munitions close at hand, and by training and rehearsing the engineer units along with the forces which will utilize the barrier.

7. TR....

.... maximizes utilization of local infrastructure and built up areas.

Over the past three decades, the countryside of West Germany has changed -- in some regions drastically -- with the rapid and widespread increase in built-up areas. Cities and even small towns have overgrown their old historical boundaries, and urban sprawl continues apace. Defense plans incorporating terrain reinforcement must take this growth of architectural infrastructure into account.

Fighting <u>from</u> towns

"Combat in Cities" or "Combat in Built-up Areas" is a concept envisioning house-to-house fighting. In many 8th Infantry Division defensive situations there is little advantage to be gained in fighting under circumstances where the enemy has the same protection as the defender (i.e., architectural structures), and where exchange ratios are predictably equal. Units that defend the outer edges of built-up areas, on the other hand, are well protected while the enemy must move through open areas. Buildings are not the only local infrastructure that can be used to advantage. The destruction of bridges, the blocking of underpasses, the use of raised railroad beds, the improvements of artificial defiles, and the creation of rubble across roads are other examples of terrain reinforcement where the infrastructure can be used to support the defense plan.

8. TR....

.... focuses training on practical application of barriers and field fortifications.

The extensive employment of terrain reinforcement as a key factor in the Division's general defense plan has provided a target for training in battalions, where obstacle-building, minelaying, and field fortification have become bywords for increased combat capability. Engineer coordination of training efforts with Armor and Mechanized Infantry has been productive in local and major training areas. Planners have developed greater skill in using barriers in simulation exercises. Training tasks and evaluations have been altered to take advantage of terrain reinforcement capabilities.

CHAPTER 4

TERRAIN REINFORCEMENT TRAINING

This chapter reviews lessons learned and significant aspects of previous chapters and introduces the training and evaluation outlines at appendix one. As we have revised our general defense plans and conducted field training exercises, we have developed supplemental tasks to ARTEP 71-2 which are relevant to the Division and its unique wartime mission.

TR... Training is poorly understood	Few fully acknowledge that terrain reinforcement structures the battlefield prior to hostilities, buys time and space, is a combat multiplier, enhances friendly mobility, gives more flexibility to the defender, makes CIMIC a combat advantage, concentrates and exploits engineer capabilities, impacts on high dollar readiness decisions, and is possible now.
TR... Training is inexpensive	Gaming simulation from company (DUNN-KEMPF) to corps (FIRST BATTLE) provides a flexible, inexpensive means of training leaders and staffs on the benefits of terrain reinforcement.
TR... Training is possible now even in local training areas	Many of the enabling tasks required for large scale terrain enforcement can be accomplished in local training areas.
TR... Training is practical application, not theory	There is an evident gap between terrain reinforcement theory and practical application. Since not much digging is actually done, the gap is not evident to many.
TR... Training is rich in lessons learned for war.	Both gaming simulation and actual digging reveal strengths and weaknesses in general defense planning. Recent maneuver battalion external evaluations, which included extensive digging, provided abundant lessons learned which were then war gamed using FIRST BATTLE during REFORGER '79.

① TR... ... TRAINING IS POORLY UNDERSTOOD

The art of terrain reinforcement which includes tasks as apparently simple as building two man fighting positions and as complex as constructing a barrier system of minefields and tank ditches is something that is not easily visualized, learned, applied or taught to others. It is almost impossible to achieve an effective defensive position in all its complexity without the experience of executing it on the ground -- with all the attendant trial and error that is part of such an endeavor. Armored and Mechanized units will certainly be expected to accomplish such tasks.

How does a unit train for such a mission? What are the lessons to be learned at all echelons? What advantages accrue to a defender who occupies stronpoints in conjunction with a barrier system?

Our experience indicates answers to the foregoing are not readily available unless units train for the mission. To the question, "Is it important to dig in?", our experience, seven times repeated during maneuver battalion evaluations indicates the answer is yes. How does

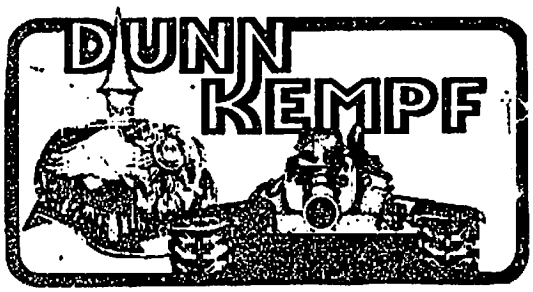
a unit train? Several examples are provided in appendix one. They can certainly be improved upon, but they are a start. What are the lessons learned and the advantages? Some, discussed more fully in chapter one are: terrain reinforcement structures the battlefield prior to hostilities, buys time and space, is a combat multiplier, enhances friendly mobility, gives more flexibility to the defender, makes CIMIC a combat advantage, concentrates and exploits engineer capabilities, impacts on high dollar readiness decisions and is all possible now.

A frequent detractor to initiatives in such training is expense. However, for commanders and staff there are a series of excellent battle simulations available which can be adapted to local situations and provide flexible, inexpensive training. Several, when coupled with a terrain board or sand table, are able to provide as complex and rewarding an experience as could ever be expected by operations on the actual terrain. These battle simulations are training devices that portray battlefield actions which place requirements on commander and staff. The simulations are prepackaged as either manually operated, computer assisted or computer driven devices. They require a minimum effort on the part of the commander and his staff to set up and operate. Selected examples follow:

FIREFIGHT

Firefight is a platoon level simulation designed to illustrate several factors which will affect the outcome of the first battles fought in a European environment. These factors include range and lethality of modern weapons; use of terrain, smoke, and suppresive fire to neutralize enemy weapons, and emphasize the combined arms

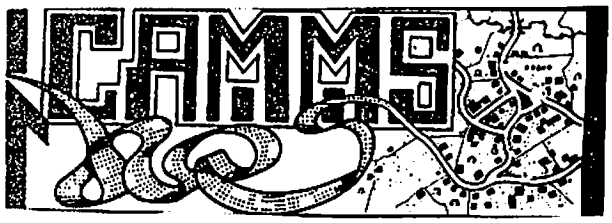
efforts at the lowest levels. Firefight is played by two players. These players conduct operations on a map using cardboard counters. Consequently, it is not capable of fully simulating the complex combat environment. It does, however, demonstrate the effects of some of the more dynamic factors of combat.



DUNN-KEMPF

The Dunn-Kempf Battle Simulation consists of a scaled terrain board with miniature models of US and OPFOR equipment. The combination of the scaled terrain and miniature weapon systems allows for play of the game and simulation of battle at company, company team, and platoon level to a high degree of resolution. The Dunn-Kempf scenario is currently designed around European terrain. However, the simulation can be adapted to any terrain simply by constructing an appropriate terrain board. By varying the mix of miniatures, different types of units can be simulated. During the play of Dunn-Kempf, the miniature weapons systems are physically moved and fought by opposing force players in accordance with the prescribed rules monitored by the controller. The rules are designed to allow the maximum amount of flexibility. In this sense, it is a relatively free-play battle simulation restricted only by the terrain.

COMPUTER ASSISTED MAP MANEUVER SYSTEM (CAMMS)



CAMMS is a battlefield simulation designed to exercise command and staff procedures at brigade and battalion level. CAMMS is capable of accommodating an exercise consisting of armor, infantry, mechanized infantry, and cavalry battalions with normal combat support (CS) and combat service support (CSS) elements in a nonnuclear environment. The computer program greatly reduces maneuver preparation time, provides faster and more accurate results, insures objectivity, and provides historical data for analysis and critique. Player units may participate from remote field locations or a centalized administrative location. The system may be used as a vehicle for training brigade and battalion personnel in proper command and staff procedures or as a framework within which proficiency of procedures may be evaluated. As a training vehicle, CAMMS will:

a. Simulate realistic battlefield conditions.

b. Provide realtime situational requirements which force command and staff actions at brigade and battalion level.

c. Allow free play of tactical operations based upon current doctrine against an appropriate OPFOR.

d. Allow the application of new ideas and concepts.

e. Reduct costly troop and equipment usage.

As a framework for evaluation, CAMMS provides:

a. A simulated battlefield situation which will force action and orders by brigade and battalion commanders and staff.

b. A means for evaluators to trace the flow of reports and directives.

c. An analysis of SOP's.

d. Free play of any portion of the tactical operation for analysis and critique.

e. A means of introducing specific situations for evaluation.

CAMMS is a free-play exercise. Commanders and staff are constrained only by the assets given them and the actions of the opposing forces.

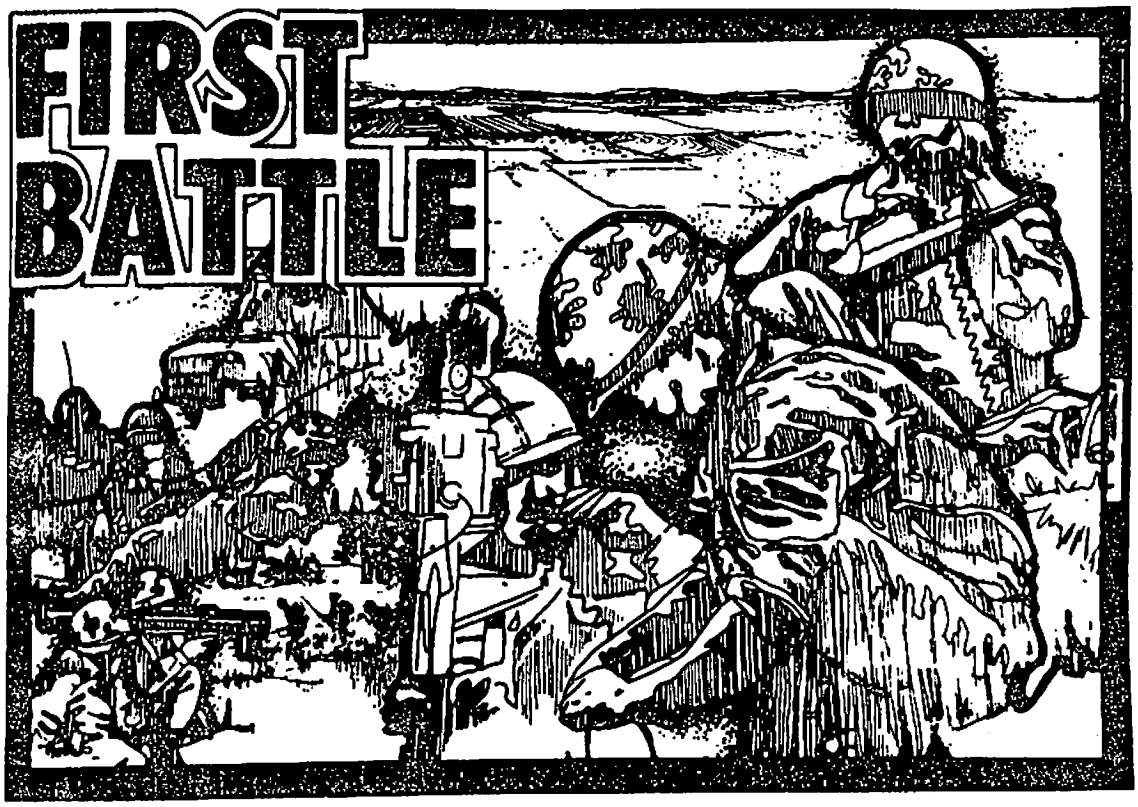
PEGASUS

Pegasus is a realtime, manual battle simulation designed to support CPX's for up to three battalions in support of brigade exercises. While a scenario is provided, the rule books and controller instructions for Pegasus are scenario independent and can be written locally and gamed for specific unit needs.

The simulation exercises a brigade command group or a single battalion command group and enables the commander to train his subordinate commanders and staff. The exercise requires the proper reporting procedures from player/controllers to the command group. Orders are passed from the command group to the controllers who

execute instructions in accordance with game rules. The controller personnel execute operations plans/orders on an enlarged map sheet superimposed with a hexagonal grid to control movement rates. The controllers move subordinate units of the command elements for the primary purpose of providing message play. Unit CP and communications equipment is used in either field or garrison.

Pegasus requires 28-34 player-controllers, depending on the number of maneuver units trained. It can exercise an OPFOR regimental staff, one to three battalions TOC's, and a brigade TOC at the same time. The training time for controllers is approximately 6 hours and the optimum playing time is 6 hours.



FIRST BATTLE

First Battle is a manual simulation designed to provide division command groups with the opportunity to control and coordinate combined arms operations in a simulated tactical environment. The scenario for First Battle is that of a US armored division defending along the FRG border in the Fulda area against an OPFOR tank army consisting of four tank divisions and one motorized rifle division.

The US division is defending with three brigades abreast and a covering force under the control of either the brigades or the division. This battle simulation uses units rather than weapons systems. OPFOR units are played at battalion level and the friendly units are played at company level. Each unit has a relative combat power value. When engagements between opposing units occur, either or both sides are attrited by using simplified probability tables which reduce the combat power value in each succeeding engagement. In addition to direct fire engagements, air strikes, attack helicopter engagements, and indirect fire are employed in this battle simulation. First Battle is designed to allow participants to prepare their plans and develop the enemy and friendly situations. This creates unlimited game possibilities. It is a free-play (unstructured) open or closed wargame. It uses standard 1:50,000 tactical maps and requires only one 1:25,000 scale map for control purposes. While more complicated and more difficult to learn than some other simulations, First Battle is currently the only manual simulation which plays at US division level.

WAR EAGLE

WAR EAGLE is a Corps-level adaptation of the FIRST BATTLE division manual simulation system. Its primary objective is to exercise division and corps commanders and staffs in a multi-echelon training environment. The FIRST BATTLE systems are used simultaneously to provide battle information to the corps TOC. WAR EAGLE consists of instruction pamphlets, a TV tape and a sample scenario for familiarization. A mimimum of 10 days are needed to prepare and play WAR EAGLE.

③

TR...
TRAINING IS POSSIBLE, EVEN IN LOCAL TRAINING AREAS

Many of the enabling tasks required for large scale terrain reinforcement can be accomplished in local training areas not requiring substantial real estate or facilities. A sample battalion has arranged its training as follows:

Position Selection

° Leaders

- Quarterly terrain walks are conducted by the battalion commander, some on the actual General Defense Plan terrain, and others in the local area.

- Quarterly jeeptrains in a larger area on terrain selected to accomplish the purpose of the jeeptrain.

- Semi-annual company dig-in exercises in the local training area involving soldiers as well as leaders.

° Soldiers

- Quarterly Dragon requalification in the local area.
- Scopes exercises in the local area.
- TOW defense training in the local area.
- Quarterly FTX in a larger area.

Fighting Position Construction

° Each company participates in a 48 hour dig-in exercise in the local training area semi-annually.

° Dragon gunners from each company construct a Dragon fighting position in the local area as part of their quarterly requalification.

° TOW squads occupy a hull down mounted position constructed with engineer assistance in the local area.

° Dismounted TOW squads in the local area semi-annually as part of an airmobile task from a TOW training and evaluation outline.

° Fighting from a built-up area is accomplished in an adjacent unit's local area.

Mines and Obstacles

° Squads lay an M-21 strip as part of the company dig-in exercise. The engineer M-57 mine dispenser also participates.

° The SQT task on the M-21 mines is practiced frequently.

° Demolitions exercises are conducted with squad leaders and platoon sergeants quarterly.

° Chain saws are frequently taught and one man per platoon is licensed.

° Positioning of tank ditches is integrated into all leader classes/exercises.

Certainly some of the larger aspects of terrain reinforcement are more time consuming and resource intensive. They require extensive engineer support, materials, and detailed planning. The training and evaluation outlines at appendix one include tasks for squads, platoons, and company teams. Each training and evaluation outline is followed by a tab which indicates tasks that can be accomplished in garrison, a maneuver rights area, or a major training area. In the final section of this chapter, lessons learned from actually digging a company team strongpoint provide food for thought for everyone involved in terrain reinforcement.

④ TR...
...TRAINING IS PRACTICAL APPLICATION, NOT THEORY

There is an evident gap between terrain reinforcement theory and practical application. Since not much actual digging is done, the gap is not evident to many. The fact is, this kind of knowledge does not come naturally; it must be gained first hand. There is a great deal that can be learned only by constructing infantry and armor fighting positions. When the small unit is faced with the actual requirement to dig in, all the multifaceted theory of terrain reinforcement in defense comes into play. Commanders see the results of their troop leading steps, adjust through trial and error, and realize the full extent on small unit defensive operations. Plans are executed 100 percent and the resulting lessons are deeply engraved. Digging in is essential to realistic training, and, indeed, to our GDP. It can and should be done without any diminution of the concept of mobility and the offensive spirit. The strongpoint exercise is a good vehicle for much-needed experience in planning for defense using terrain reinforcement, establishing priorities of construction effort, coordinating an interlocked defense, making proper use of weapons systems, and building good fighting positions. NCO expertise and leadership in the proper construction and integration of fighting positions should be developed and improved so that team commanders and platoon leaders can concentrate on detailed planning for the contingencies involved in the execution of the defense. Our recent experience during maneuver battalion external evaluations revealed that units and soldiers do not

practice theory. They do not routinely insure that individual positions are constructed with berms which face toward the enemy and protect the weapons crewmen from the direct fire of assaulting enemy soldiers while the defenders lay down fire at an angle to the attack, interconnecting with the fire from other defensive nests. They overlook the fact that it is critically important for the soldier to visualize and understand that his opponent in attacking him will tend to fire directly forward as he approaches the position. Therefore, any defender will receive practically all incoming fire from locations directly to the front. This, therefore, is where the defender needs his most protection. As long as he can take advantage of this forward protection, he is free to place flank fire -- surprise fire -- on enemy soldiers assaulting the positions of his neighbors. He will thus give the enemy, who is placing intense concentration directly forward, with devastating and demoralizing fire from the side -- from an unknown and unanticipated location. Experience shows that soldiers tend to concentrate on activities to their front when in the attack, even though they are receiving destructive fire from flanks. Positions must be constructed to take advantage of this. Connecting trenches should allow for resupply and for flexibility in changing weapon locations in order to better fight the battle. It is always difficult to explain initially to soldiers that they do not need to physically spread out over a large area in order to control that area by fire. It is better to have fewer positions with good fields of fire and good local security interlocked with other positions separated by the kind of distance that will allow for the best use of automatic weapons and grazing fire. These

and other lessons learned are usually discovered by actually digging in on an actual position. Only then do the details of building fighting positions strike home. Only then do the immense support requirements for mines, ditches, detailed plans, and constant supervision become apparent. As mentioned in foregoing portions of this chapter, it is possible for leaders to learn some lessons from gaming simulation. Theory and practice can certainly be matched with each other therein. Gaming when coupled with practical training evaluations as outlined at appendix one provide an excellent mix whereby commanders can put theory to practice.

⑤ TR...
...TRAINING IS RICH IN LESSONS LEARNED FOR WAR

Both gaming simulation and actual digging reveal strengths and weaknesses in terrain reinforcement and general defense planning. Recent maneuver battalion external evaluations, which included extensive digging, provided abundant lessons learned which were subsequently war gamed using FIRST BATTLE during REFORGER 79.

The maneuver battalion external evaluations included digging a company team strongpoint to specific ARTEP tasks conditions and standards. The training and evaluation outline at appendix one is an improved version of the document used during the maneuver battalion evaluation. In that evaluation during which all infantry and armor battalions of the Division were rotated in pairs through a major training area on a two week cycle, each infantry battalion detached one rifle company, reinforced with a rifle platoon, to the strongpoint. The company was provided a DS engineer platoon and was promised a tank platoon, to be OPCON prior to initiation of defensive combat, estimated to be 48 hours away. The situation indicated the company was part of a battalion task force of 3 teams.

The company mission: Prepare a strongpoint to operate in a coordinated defense with the other two teams of the battalion as they fight back from positions 15 KM ahead, defending against two enemy tank regiments. The commander was to be prepared to fight a 360° defense of the strongpoint if the teams on either side were driven back beyond his position. The battle plan envisaged an attrition of the attacking enemy force to a point where a successful counterattack (in which the

strongpoint had a key role) would defeat the enemy force and restore a line forward of the strongpoint. The team commander (in every case after the first iteration) "inherited" the position from an earlier unit and to a significant degree was restricted in his flexibility by what he found. He had to adjust his priorities to the circumstances he found on the hill -- the level of completion of various aspects of the work.

Officers of the armored and infantry battalions walked the strongpoint at the end of each cycle and observed first-hand the cumulative results of the effort. Thus at least one infantry company of the three in each cycle had a trial-and-error opportunity to build a strongpoint, and -- with a lesser degree of involvement -- the battalion officers saw first-hand what can be accomplished when a rifle company digs in. Some of the lessons they learned follow:

- Time-worn factors for terrain reinforcement indicate strongly the importance of practical, workable, and realistic arrangements between the Division and VBK elements. Successful efforts here could give us quantum jumps in capability (staying power).

- We need to prestock far more construction material.

- Engineers need more action roles in small units GDP planning and practical work with small combat units.

° GDP troop leading steps definitely should get all the way down to give-and-take discussions on actual individual fighting positions and the integration of all weapons and systems -- to include a solid concept of priorities of effort.

° We must provide more opportunities for practical application of troop leading steps, to include visualization (conceptualization) of the battle.

° Armor-Infantry-Artillery-Aviation-Engineer integration of effort needs plenty of practice.

° Officers and NCO's should acquire more first-hand knowledge of details of terrain reinforcement, to include the time-work factors involved, a sensing of priorities, and better knowledge of the engineering aspects.

° Tactical advantages of the strongpoint should be incorporated in planning to a greater degree.

° There should be a running discussion in small units on integrated defensive fighting positions.

° Even on a basically static strongpoint, the functioning of the dynamics of defense show we need to rehearse small unit game plans often.

° Leaders need work in ranging.

- More knowledge should be acquired in the construction and exploitation of barriers of all kinds.

- Interlocking grazing fire may sound pretty fundamental, but skill in establishing such fire is a bit thin.

During REFORGER 79, the division participated in WAR EAGLE, a FIRST BATTLE gaming simulation. From the exercise, it was concluded that game rules must be improved to better accommodate terrain reinforcement. Nevertheless, the following key lessons were learned:

- Lateral shifting of battalions behind a barrier system is the key to concentrating forces at the critical time and place.

- Terrain reinforcement buys time/space.

- Terrain reinforcement provides interior lines behind the FEBA which allows flexible employment of forces.

- The M56 mine system is responsive and viable.

- Terrain reinforcement is a real capability now.

- The UNIMOG with backhoe/backfill capability would greatly enhance engineer efforts.

- Forward stockage of barrier materiel is essential.

- The UNIMOG with forklift/crane capability would significantly enhance material/ammunition handling at ASPs and FASTs.

TAB A TO APPENDIX 1 TO TERRAIN REINFORCEMENT
APPENDIX 17 TO CHAPTER 8
TRAINING AND EVALUATION OUTLINE
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

1. GENERAL CONDITIONS

The task force has the mission of defending against a large opposing force supplemented by large quantities of artillery and air. The task force commander organizes his sector with two company teams occupying battle positions and one company team preparing a strongpoint position at a critical "choke point" astride the main avenue of approach which the opposing force cannot bypass and must be held. Attack is imminent and timely preparation of fighting positions is critical. The company team will actually prepare all positions fortified with wire, mines, and other obstacles.

2. PRIMARY TRAINING/EVALUATION STANDARDS

To receive a satisfactory rating, the company team must prepare a strongpoint position within the time specified by the task force commander.

3. TRAINING/EVALUATION RESULTS

Check SAT or UNSAT on the following pages of this T&EO to indicate the unit's proficiency on each task for this mission. Trainers/evaluators will record, on an attached sheet of paper, or in the space provided, detailed observations of training deficiencies which need training emphasis. This T&EO and attached sheets should be provided to the unit as a basis for future training. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and the evaluator/trainer's subjective judgment as to whether the unit would have been successful on the modern battlefield had it performed as it did in this exercise. Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

Overall Proficiency: SAT UNSAT

TRAINING AND EVALUATION OUTLINE

UNIT: Company Team MISSION: Prepare Strongpoint

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-17-A Plan and Occupy the Strongpoint Position	The company team has received the task force order which includes the information in the general conditions. Unimog has been attached with operator and assistant. Attack helicopters and M56 mine laying helicopters are available to reinforce the strongpoint.	The company team commander organizes the position in depth for all-round defense based on a ground reconnaissance and terrain evaluation, and occupies the sector using covered and concealed routes. A detailed plan explaining priority of work for available equipment is developed and disseminated. The plan must include a visualization of the battle from friendly and enemy perspectives as well as a clear understanding of the strongpoint role in the overall task force mission. All combat systems available must be integrated into the plan, and an accurate determination of the assets available/required must be clear, complete and understood by all. Verbal feedback and frequent inspection of strongpoint preparations is required to insure the plan is complete, understood, and progressing according to schedule. The team commander and his attached engineer identify lucrative sites for aerial M56 support from battalion and integrate as a tentative addition to the terrain reinforcement plan. If M56 emplacement is approved, request coordination with aviation representative. Exchange radio call signs and frequencies. Place appropriate radios in OLD SQUELCH ON position. For daytime emplacement, mark the desired minefield location using engineer tape or other agreed upon substitute. For night emplacement, mark the location using lights. Plan for observation/fires to protect M56 minefield. Record and report the location(s) through command channels to the Division Engineer. The team commander coordinates with aviation LNO and/or the Battle Captain. He provides known enemy positions, likely directions of movement, suspected size/composition of force as well as friendly dispositions (graphic preferred). Exchange frequencies and call signs. Adjacent and supporting indirect fire units are identified.		

TRAINING AND EVALUATION OUTLINE

UNIT: Company Team MISSION: Prepare Strongpoint

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
		Appropriate radios are placed in OLD SQUELCH ON. The team commander receives from LNO or Battle Captain details of attack helicopter support. This will include on station time, weather/visibility limitations, battle positions of the attack helicopters, kill zones to be covered by the attack helicopters, and downed aviator pickup points. (If face to face coordination is not possible, accomplish via secure FM.)		
8-17-B Prepare Strongpoin	General and preceding conditions apply. Non persistent chemical vapor hazards are present in the area of operation.	Individuals mask within nine seconds, 17 seconds with hoods. NBC alarms are sounded and survey monitor teams begin work. An NBC 1 report is submitted to task force headquarters. The mission is continued in full MOPP. Dismounted infantry positions are carefully prepared using natural cover and concealment, providing good observation and fields of fire for all weapons including LAW and DRAGON. Tank, TOW and APC positions are prepared using natural cover and concealment and hide positions providing good observation and long range fields of fire. The UNIMOG is utilized according to the commander's plan to dig fighting positions, bunkers, and trench work, and IAW FM 5-15. When the survey monitor teams indicate "all clear" proper unmasking procedures are followed. The FIST team chief and ALO coordinate TAC Air, indirect fires on avenues of approach, forward of and in the position, and final protective fires (direct and indirect) are planned and coordinated. Protective minefields, obstacles, and protective wire are positioned to tie in with the fire plan and impede opposing force movement. Redeye and DS air defense are integrated into the plan when available. Primary and alternate command posts are constructed, and FM/underground telephone communications are established. Trains and logistical		

TRAINING AND EVALUATION OUTLINE

UNIT: Company Team MISSION: Prepare Strongpoint

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	L
		support are finalized.		
8-17-C Provide Security	General and preceding conditions apply.	The strongpoint position is coordinated with adjacent units for mutual support. Supplementary positions for LAW, tanks, and APC's are prepared to concentrate direct fires. Supplementary positions for dismounted infantry are planned to reposition forces. Concealed routes of movement within the sector are reconnoitered. OP's are established on terrain overlooking avenues of approach and likely engagement area. Indirect fire observation (Smoke) is planned to supplement natural concealment. Surveillance devices are placed on likely avenues of approach. Patrols are planned to detect opposing force movement and provide early warning. Company team is prepared to defend by the time specified in the task force order.		
8-17-D Fight the Strongpoint	General and preceding conditions apply. Strongpoint preparations have been underway for a minimum of 48 hours.	The strongpoint is attacked by OPFOR. The team commander should be forewarned of their arrival by means of radar and other surveillance devices available. Patrols and OP's may also detect OPFOR and provide early warning. Although the strongpoint is a fixed location, the conduct of its defense is dynamic. The team commander should respond to the changing situation by capitalizing on every possible aspect of flexibility. If enemy indirect fire is heavy on one part of the position, he may move men to less intensely targeted areas. If weapons systems go out of action, he adjusts to optimize the defensive power of those that remain. If only one side of his position comes under attack, he moves meet it.		

TRAINING AND EVALUATION OUTLINE

UNIT: Company Team MISSION: Prepare Strongpoint

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
		The long range tank killing direct fire weapons engage enemy forces supplemented by indirect fire, TAC air and attack helicopters, forcing him to button up and thus encounter obstacles. As enemy forces draw closer to the strongpoint, close in protective weapons of the infantry, including LAW and DRAGON engage the enemy.		
8-17-E Fight the Wider Battle	General and preceding conditions apply. The strongpoint is part of a larger plan and serves as a keystone in the progress of that plan. The strongpoint serves as a solid pivot around which the task force or brigade commander executes a counterattack.	The strongpoint becomes a pivot around which the battle moves. The team commander continues to control strongpoint terrain which is key to the counterattack. The strongpoint provides assistance to the counterattack but continues to direct fires against the enemy flank and to report his movement. The strongpoint serves as a communications relay, lays down supporting fires, provides intelligence and seeks to engage the enemy as he withdraws and is even more vulnerable to fires from the strongpoint.		

TAB A TO APPENDIX 17 TO CHAPTER 8
SUGGESTED SUPPORT REQUIREMENTS
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

1. Administration:

a. Task force orders must be prepared in advance by the evaluator for issue to the company team commander when the company team is evaluated without the task force.

b. FO parties, unimog, and other attachments join the company team before the evaluation starts.

c. An engineer platoon should be provided.

2. Minimum Evaluators: 1 MAJ/CPT, 1 LT/NCO for ground evaluations
1 CPT/CWO aviator for attack helicopter and M56 mine evaluations

3. Opposing Force: 2 tank companies and 2 motorized rifle platoons

4. Support Troops: 2 drivers

5. Vehicles/Communications: 2 vehicles with radios

6. Maneuver Area: A defense sector at least 3 to 5 kilometers wide by 3 to 5 kilometers deep.

7. Firing Area: None

8. Training Aids, Devices, and Special Equipment: Tank main gun fire simulations; M181A1 Claymore mines (INERT), 20 ea per platoon; 600 meters of tactical wire; sufficient mines for hasty protective minefield; material to construct overhead cover on bunkers and fighting positions; 10,000 sandbags. One helicopter, equipped with M56 mine dispensers. One platoon of attack helicopters.

9. Ammunition: See chapter 12.

TAB B TO APPENDIX 17 TO CHAPTER 8
UNIMOG TRAINING TIPS
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

TASK: 8-17-B

1. PURPOSE: To explain how to properly train/evaluate the excavation operations of the unimog in preparing strongpoint positions.

2. CONCEPT:

a. The unimog is to be utilized with the backhoe and front shovel attached.

b. Finishing touches are made by hand on fighting positions while the unimog is worked continuously from position to position.

c. Soil removed from the excavations is used as needed for filling sandbags, making berms and parapets, and overhead cover. Additional spoil should be distributed to the rear of the positions and well camouflaged so as not detectable from aerial observation.

d. Great care must be exercised in moving the unimog around the battle position. If at all possible, the unimog should never move in front of or disturb the soil forward of the battle position.

e. Continual use of the unimog is necessary to insure maximum effort during the allotted time. A work/rest schedule for the operator and assistant allowing them to alternate is necessary.

f. Soil type, NBC environment, and other limiting factors will affect the time needed to complete positions. The following information is a planning guide for loose sandy soil:

POSITION	TIME
2 man fighting position	10 minutes
Trench (1 m long, 1 m deep)	6 minutes
Other excavations 1 cu m	7.5 minutes
For cohesive wet soil or gravel, add 25%	
For tough stiff soil with rocks, add 100%	
For work on sloping ground, add 15%	
For work in old forest stand, add 10%	

For work in tall forest stand, add 20%

For night or limited visibility, add 10%

For work in rain, add 10%

For work in NBC environment, add 25%

g. Trenches should be dug wider than needed in order to allow room for revetments and movement.

h. Individual fighting position bunkers, and field fortifications should be prepared in accordance with FM 5-15 and TC 7-50.

i. Evaluate company team cover and concealment from opposing force positions.

j. Overhead cover and concealment should be evaluated from the air if aircraft are available.

k. Positions can be planned and orders can be issued in a garrison situation from a map reconnaissance.

l. Insufficient maneuver space and terrain is available in garrison to adequately train the movement along concealed and covered routes for Task 8-17-A.

m. Insufficient space is available in garrison to organize all positions for a company strongpoint. Several individual fighting positions could be simultaneously prepared along with protective barriers while in a garrison situation.

3. Sequence of Events

4. Administration

5. Minimum Evaluators

6. Support Troops

7. Vehicle/Communications

8. Maneuver Area

9. Firing Area

10. Training Aids Devices and Equipment

11. Ammunition

12. Key References: FM 5-15, TC 7-50, E AnwAusb Inf Nr 2/76 "Das Erdarbeitsgerat"

TAB C TO APPENDIX 17 TO CHAPTER 8
M56 TRAINING TIPS
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

TASK: 8-17-C

1. PURPOSE: To explain how to properly train/evaluate the use of M56 mine dispensing aircraft in strongpoint positions.

2. CONCEPT:

a. Philosophy of M56 mines:

(1) Temporary area denial.

(2) Not an offensive weapon.

(3) No physical damage to terrain.

(4) Allows re-use of area after delay.

b. M56 authority is held by Corps, requiring thorough preplanning and timely requests from subordinate units.

c. M56 mine employment:

(1) The M56 Mine Dispensing subsystem is mounted on specially equipped UH-1 helicopters.

(2) The UH-1 normally carries 160 M56 mines, 80 in each of two refillable pods.

(3) One UH-1 pass results in a minefield with approximate dimensions of 20 meters by 150 meters. Airspeed and altitude determine the actual dimensions.

(4) Aircraft are normally employed in pairs, allowing for a minefield of 40 meters by 300 meters with two passes. This provides a mine density of .02 (mines/sq meter), adequate for a delaying minefield.

(5) The M56 minefield, because of delivery limitations and self destruct feature, is best planned for and used as a supplemental barrier.

(6) The M56 minefield, as with other barriers, is most effective when covered by observation and fires. The M56 is readily seen - and avoided - if attacking forces are not buttoned up.

(7) An anti-tamper feature is built into a percentage of the mines to discourage disarming.

(8) Two types of fuzes are used, pressure, and pressure delay.

(9) Because of the dispensing altitude requirement, the M56 minefield is normally emplaced a minimum of 3000 meters forward of the attacking force.

d. M56 minefield coordination:

(1) Authority to install a temporary minefield rests with the Division Commander.

(2) Preplanned M56 minefields are developed by the Division Engineer.

(3) The strongpoint commander, in coordination with his engineer representative, plans for M56 mine emplacement to augment other defensive measures.

(4) The engineer representative requests an M56 mine allocation through brigade to division.

(5) The aviation unit providing the M56 mine dispensing aircraft will normally coordinate directly with the ground commander. This coordination will specify, as a minimum, the minefield marking procedure, to enable the aircraft to correctly place the mines, and the air/ground communications means to be used prior to and during the mine dispensing. Engineer tape or prominent ground reference points may be used for daylight drops, lights are required for night emplacements. If air/ground radio communications are required, ground radios must be in the OLD SQUELCH ON position.

(6) The ground commander is responsible for recording and reporting the M56 minefield up through command channels.

Key References:
TC 20-32-2 Employment of the M56 Helicopter Delivered Mine System
FM 20-32 Landmine Warfare

TAB D TO APPENDIX 17 TO CHAPTER 8
ATTACK HELICOPTER TRAINING TIPS
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

TASK: 8-17-D

1. PURPOSE: To explain how to properly train/evaluate the use of attack helicopters in strongpoint positions.

2. CONCEPT:

a. Attack helicopter units are maneuver elements.

b. Attack helicopters provide high probability tank kills out to 3750 meters.

c. Attack helicopters are least vulnerable when engaging targets at or beyond 3000 meters.

d. Attack helicopter organization:

(1) The Division Aviation Battalion (Combat) has 42 AH-1S Cobra TOW helicopters organized into two attack helicopter companies.

(2) Each attack helicopter company has three attack platoons. Each attack platoon is task organized for combat with 3 OH-58 observation/scout helicopters, and 5 AH-1S Cobra TOW helicopters.

(3) The attack platoon is led by the Battle Captain, who is responsible for directing the attack helicopter battle, artillery fire, TACAIR and communicating with the supported ground commander.

e. Attack helicopter employment:

(1) Attack helicopter companies are normally OPCON to brigade.

(2) Brigades normally use the attack helicopter company as a unit. While platoons can be used separately, optimum advantage is gained by keeping the company intact.

(3) The attack helicopter company is used under the "rule of three", with one platoon attacking, one platoon rearming/refueling, and one platoon enroute. This provides continuous contact with the enemy and no disruption of Cobra TOW support of the ground commander.

(4) Prior planning of all available anti-tank assets ensures interlocking kill zones and effective fire control which incorporates the strengths of airborne and ground anti-tank systems.

f. Attack helicopter coordination is best accomplished by a face to face meeting between the ground commander and the aviation LNO and/or the Battle Captain.

(1) Information needed by the aviation LNO/Battle Captain:

(a) Enemy - positions, directions of movement, suspected size/composition of the force.

(b) Friendly - positions, defensive fire plans.

(c) Communications - frequencies and call signs of subordinate, adjacent, and supporting indirect fire units, future coordination points and reporting procedures.

(2) Information provided by the LNO/Battle Captain:

(a) On station time and estimated duration.

(b) Weather and visibility limitations.

(c) An overlay depicting:

(1) Holding areas.

(2) Battle positions.

(3) Kill zones.

(4) Arrival and departure routes.

(5) Downed aviator pickup points.

(3) Ground radios must be in OLD SQUELCH ON position.

g. Secure FM will be used to coordinate attack helicopter operations only if time or circumstances do not permit direct coordination.

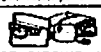
h. Attack helicopters have significant strengths and weaknesses. While capable of defeating tanks at extended ranges, the attack helicopter is extremely limited during periods of night and reduced visibility. In addition, the helicopter is easily defeated by small arms and other AA systems if it is employed improperly.

Key References:
FM 17-50
FM 17-50-1
FM 90-1

TAB E TO APPENDIX 17 TO CHAPTER 8
STANDARD US ANTI-TANK MINES
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

M18A1 FRAGMENTATION ANTIPERSONNEL MINE

Wt ..... 3.5 lbs.
Explosive ..... 1.5 lb. C4
Projectiles ..... 700 (steel balls)
Equipment: One electric cap 30m firing wire per mine. One electric firing device per mine. One Tester per 6 mines.

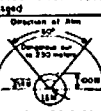


TEST CIRCUIT: Male firing device, circuit tester and blasting cap. Depress handle. Light should show in window. Separate test components.

ARMING: IN ARMING THE M18A1 MINES USING THE SALT TYPE STEP EIGHT ARE THE SAME AT AN INDIVIDUAL'S HEAD WHEN STANDING 40M FROM THE MINE AND IN USING THE KNIFE EDGE SIGHT, ARE THE SAME AT AN INDIVIDUAL'S FEET WHEN STANDING 30M FROM THE MINE

Remove shipping plug-priming adapter, insert blasting cap and screw into either cap well.

Unroll firing wire and connect directly to firing device with safety engaged

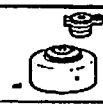


FIRING POSITION: A minimum of 15 meters from rear of mine to fox hole. Friendly troop. at side and rear should be under cover at a minimum of 190 meters.

TO FIRE: Disengage safety bail and depress handle

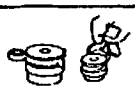
TO DISARM: Reverse arming procedure.

M15 HEAVY ANTITANK MINES



Wt ..... 39 lbs.
Explosive ..... 22 lbs.
Fuze M603
Secondary fuze wells ... 2
Functioning 300 to 400 lbs.

Remove plug and inspect fuze well.



Inspect fuze and remove safety.

Insert fuze

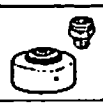
Replace plug with dial in safe position.

Turn dial to ARMED

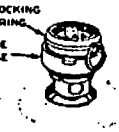
TO BURY: Put mine in hole with pressure plate at or slightly above ground level.

TO DISARM: Reverse arming procedure.

M15 ANTITANK MINE USED WITH M608 FUZE

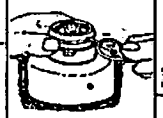


Functioning ... 200-350 lbs for 250-450 milliseconds.
Resistant to blast type countermeasures



Remove plug and inspect fuze well. Insure fuze is in SAFE position. Thread fuze into mine.....HAND TIGHT

Hold fuze to prevent rotating, turn locking ring down until it locks against pressure plate.



Place mine in hole and remove pull pin from fuze

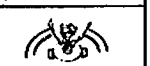
Turn dial from SAFE to ARMED.

TO DISARM: Reverse procedure except DO NOT replace pull pin

M19 PLASTIC HEAVY ANTITANK MINE

Wt ..... 28 lbs
Explosive ..... 21 lbs
Fuze ..... M606 integral (with pressure plate)
Secondary fuze wells ... 2
Functioning 350 to 500 lbs

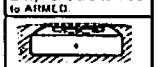
Remove pressure plate-fuze



Remove shipping plug, check position of striker (offset). Remove safety fork, then turn dial to ARMED position. Check position of striker (center). Turn to SAFE and replace safety fork.

Screw threaded detonator into detonator well

Place mine in hole, remove safety fork, and turn dial to ARMED.

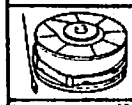


Complete camouflage

TO BURY: Put mine in hole with pressure plate at or slightly above ground level.

TO DISARM: Reverse arming procedure

M21 METALLIC (KILLER) ANTITANK MINE

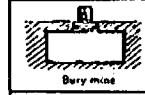


Wt ..... 18 lbs
Explosive ..... 10.5 lbs
Fuze M607
Functioning ..... 290 lbs. (Pressure or. pressure ring or 20° deflection of tilt rod)

Remove closing plug, insert M120 booster in bottom, and replace closing plug.

Remove closure assembly from fuze.

Remove shipping plug from mine and screw in fuze, then screw in tilt rod extension



Bury mine

Remove safety (pull ring assembly) and complete camouflage.

For pressure type mine bury with fuze cap flush with ground surface.
Tilt Rod mines should be seated firmly in snug-fitting hole. Most effective in tall brush or grass

TO DISARM: Reverse arming procedure.

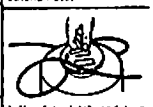
M21 ANTITANK MINE USED WITH M612 FUZE

Has two 2.7m pneumatic leads, safety latch and arming lever.

Remove closing plug, insert M120 booster.

Remove shipping plug from mine. Screw in fuze

Bury mine. Cross and extend hoses



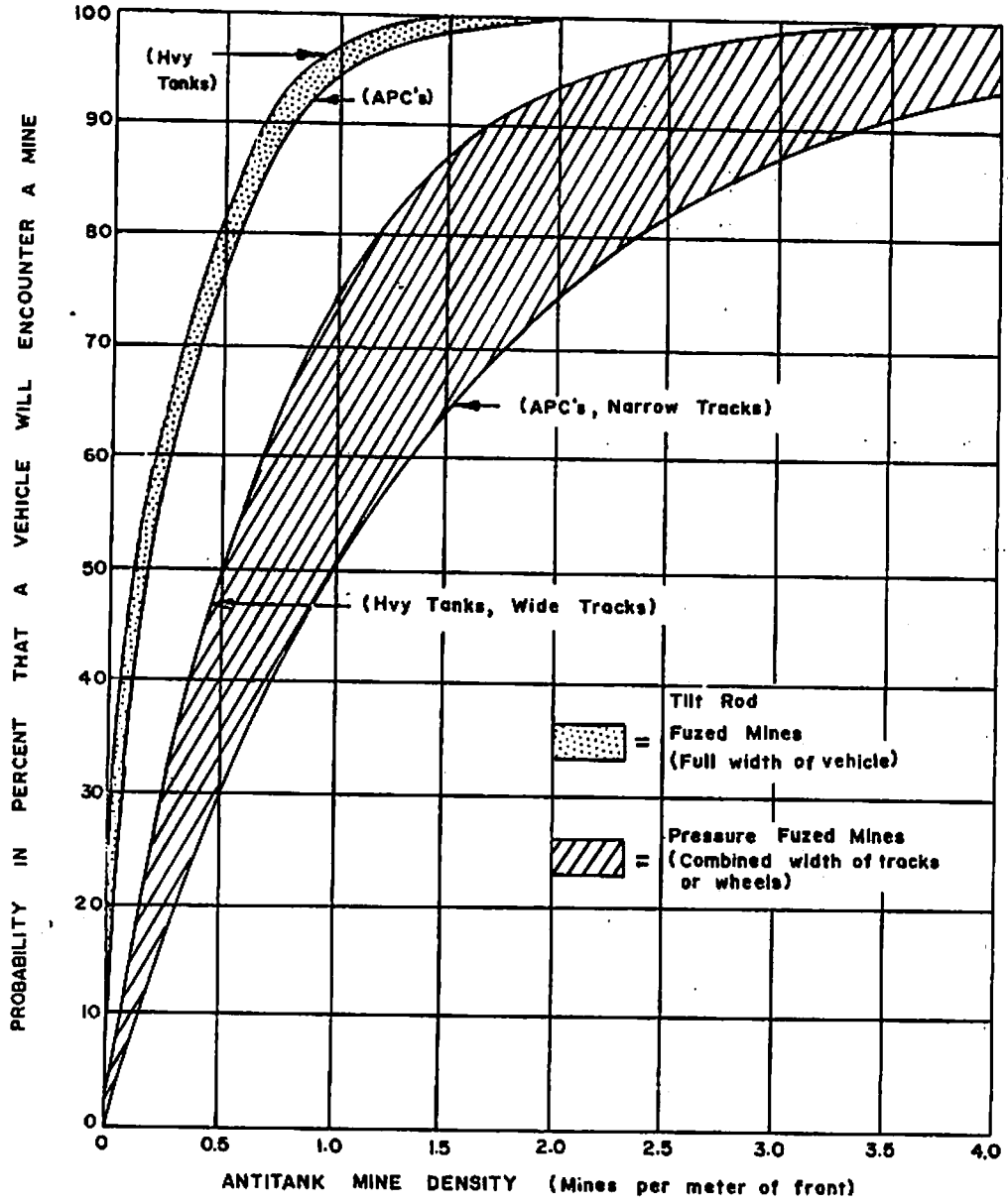
Lift safety latch and turn arming lever to ARMED. Recross hoses

Complete camouflage

Timer provides a 30 ± 5 minute safe separation period. Both leads must be depressed for initiation

TO DISARM: Reverse arming procedure

TAB F TO APPENDIX 17 TO CHAPTER 8
ANTI-TANK MINE DENSITY
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT



Density is defined as the average number of mines of a specific type per meter of minefield front. (The density may also be expressed as the number of mines per square meter of minefield when mines have been scattered). Density is expressed as a three part number, i.e., 2-0-4.

2 = no. of antitank mines per meter front.

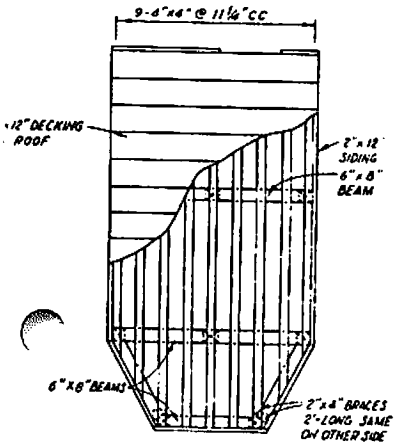
TAB G TO APPENDIX 17 TO CHAPTER 8
MANPOWER, MATERIALS, AND TRANSPORTATION
REQUIREMENTS FOR MINEFIELD OPERATIONS
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

Per 100 Meters of Minefield Front												Meters Minefield per Company Day	
Density			Mines Required			Crated Mines		5 T Trks Rqd		Manpower Required			
(1) AT	(2) APF	(3) APB	(4) AT	(5) APF	(6) APB	(7) Wt Tons	(8) Vol Cu Ft	(9) Cargo	(10) Dump	(11) Man Hrs	(12) Co Days	(13) Buried	(14) Surface*
1	0	0	164			4.02	205.5	0.81	1.48	41	0.05	2190	10,975
0	1	0		164		0.92	31.91	0.18	0.24	20.5	0.02	4390	
0	0	1			164	0.04	3.14	0.01	0.02	10.25	0.01	8780	10,975
1	1	1	164	164	164	4.98	228.5	1.00	1.68	87	0.10	1034	3200
1	2	2	164	312	312	5.85	260.1	1.17	1.91	120	0.13	750	1800
1	4	8	164	623	1213	7.82	337.8	1.57	2.47	234	0.26	385	800
2	0	4	312		623	7.80	280.3	1.56	2.80	144	0.16	640	3100
2	2	2	312	312	312	9.48	435.9	1.90	3.21	164	0.18	550	1500
2	4	4	312	623	623	11.29	502.0	2.52	3.69	233	0.26	385	900
2	4	8	312	623	1213	11.44	512.7	2.29	3.76	279	0.31	325	790
3	4	8	459	623	1213	15.05	686.7	3.01	5.03	323	0.36	280	780

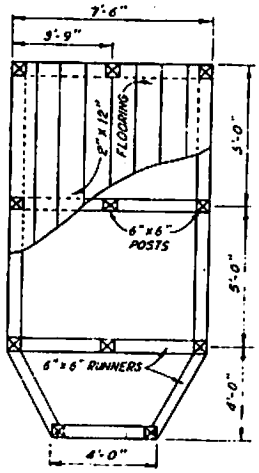
* Antitank mines laid on surface of the ground from the back of a vehicle. Estimate includes personnel from the company uncrating mines at the prestock point.

TAB H TO APPENDIX 17 TO CHAPTER 8
CONSTRUCTION PLANS
UNIT: COMPANY TEAM
MISSION: PREPARE STRONGPOINT

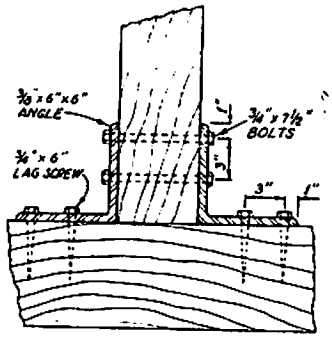
CONSTRUCTION PLANS
POSITIONS WITH OFFSET FIRING



ROOF PLAN

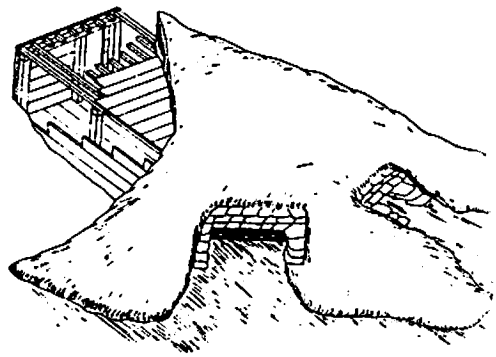


FLOOR PLAN

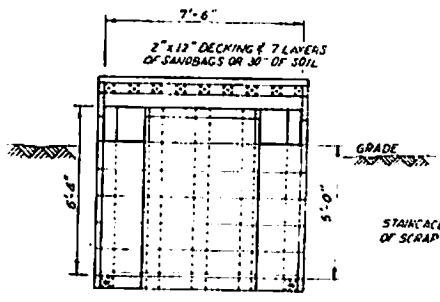


TYPICAL POST CONNECTING DETAIL

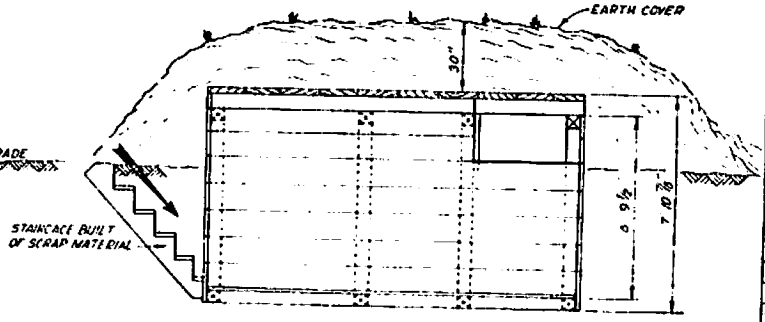
USE ANGLES AT TOP AND BOTTOM AS SHOWN FOR CORNER POSTS REPLACE ONE ANGLE WITH ONE PLATE.



PICTORIAL VIEW



FRONT ELEVATION



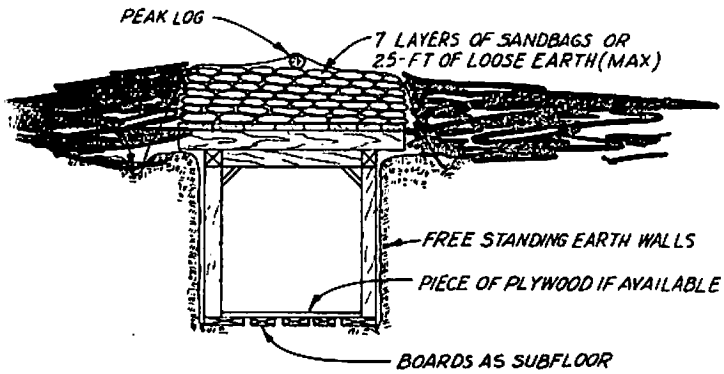
RIGHT SIDE ELEVATION

BILL OF MATERIALS

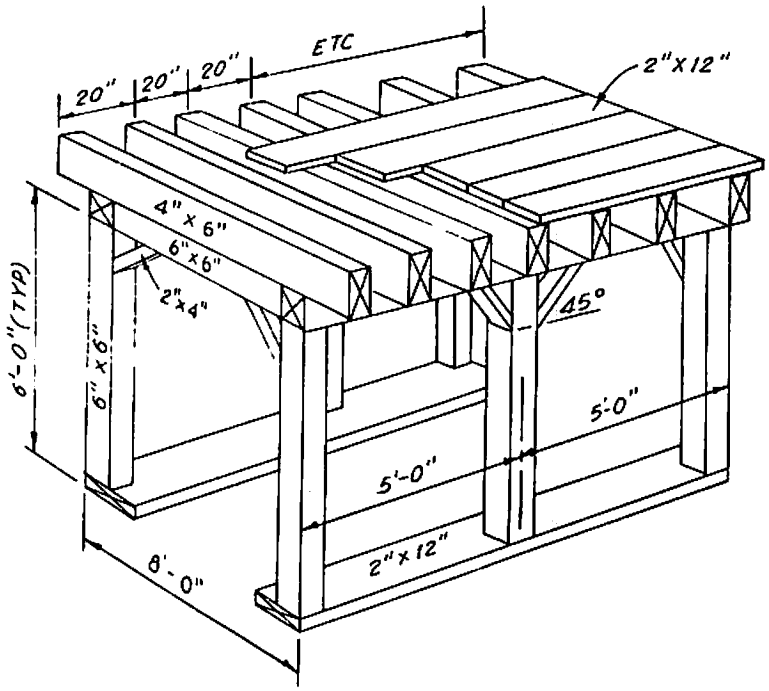
ITEM	UNIT	QUANTITY	REMA
1. 2"x4"x10'	EA	2	
2. 2"x12"x14'	EA	8	FLO
3. 2"x12"x16'	EA	26	SIDES &
4. 4"x4"x16'	EA	9	
5. 6"x6"x8'	EA	21	
6. 6"x8"x8'	EA	6	
7. 8'-LONG STEEL PICKETS	EA	12	
8. NAILS	LB	10	60d
9. NAILS	LB	10	20d
10. NAILS	LB	20	8d
11. NAILS	LB	10	16d
12. ROOF PAPER	SQ FT	225	
13. SANDBAGS	EA	150	
14. 6"x6"x⅜ ∠ 5½" LG	EA	32	
15. 6"x6"x⅜" PLATE	EA	12	
16. ¾" ϕ BOLTS 7½" LG	EA	44	
17. ¾" ϕ LAG SCREWS 6" LG	EA	44	

CONSTRUCTION PLANS

UNDERGROUND TROOP BILLET.

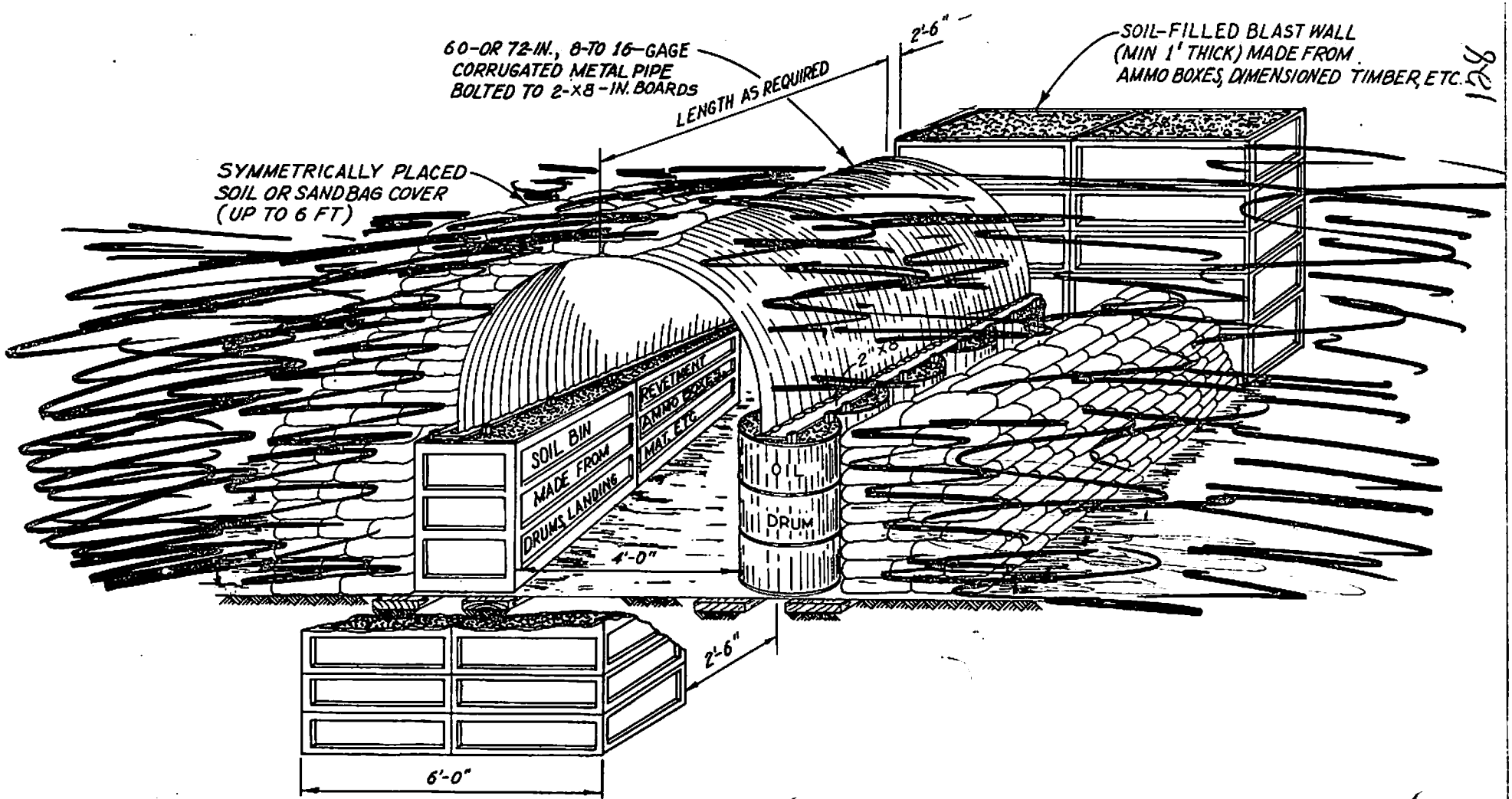


BILL OF MATERIALS				
NO.	ITEM	UNIT	QUANTITY	REMARKS
1	2"x4"x4'	EA	10	
2	4"x6"x10'	EA	7	
3	6"x6"x6'	EA	6	
4	6"x6"x10'	EA	2	
5	6"x6"x7'	EA	2	
6	40d NAILS	LB	25	
7	16d NAILS	LB	25	



CONSTRUCTION PLANS

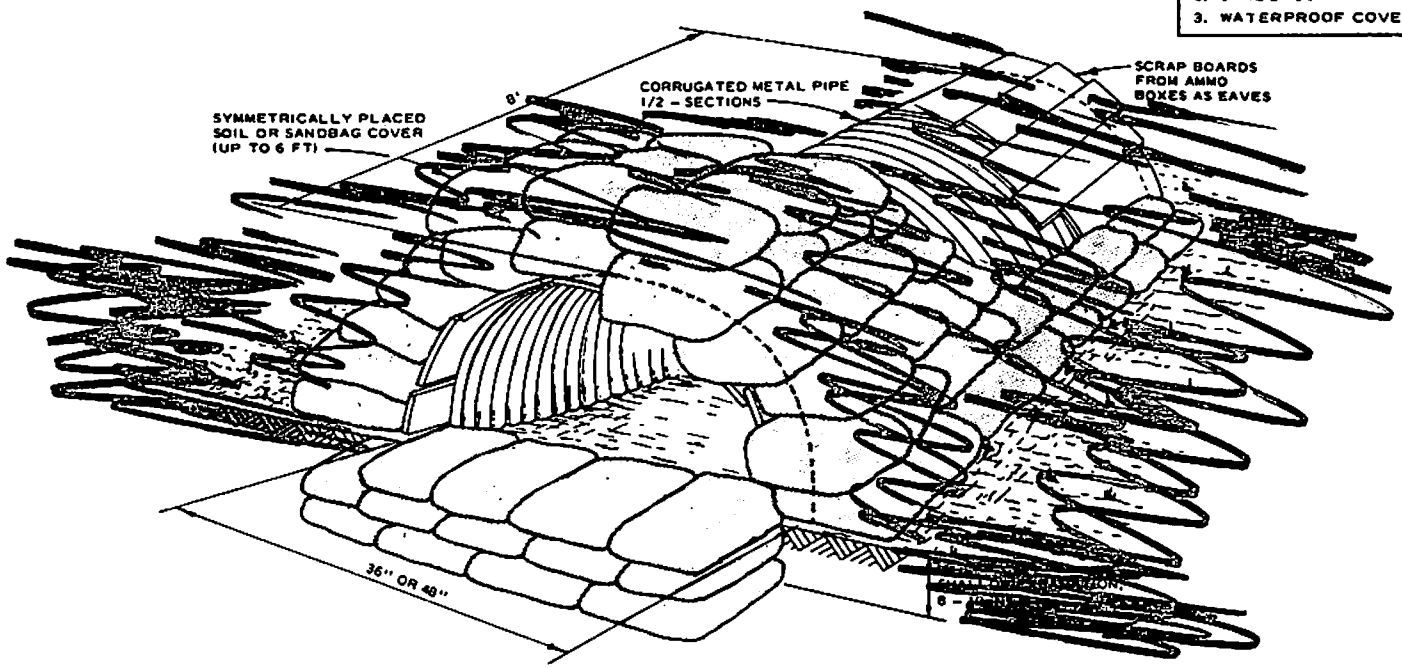
UNDERGROUND PERSONNEL SHELTER



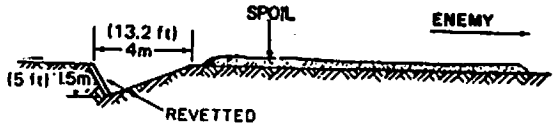
CONSTRUCTION PLANS

UNDERGROUND TWO-MAN SLEEPING HOOTCH

BILL OF MATERIALS			
ITEM	UNIT	QUANTITY	REMARKS
1. 48" ϕ NESTABLE CMP	LF	8	10-16 GA
2. SANDBAGS	EA	200	
3. WATERPROOF COVER		1	(10' × 10')



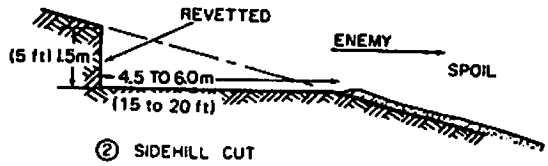
1 TRIANGULAR DITCH



① TRIANGULAR DITCH

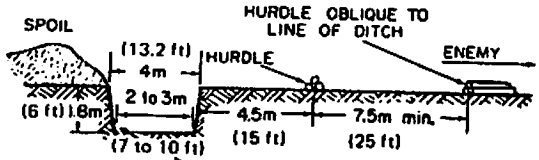
PLATOON USING HANDTOOLS: 4 METERS/HOUR
13 FEET/HOUR

2 SIDEHILL CUT



② SIDEHILL CUT

3 TRAPEZOIDAL DITCH



③ TRAPEZOIDAL DITCH

PLATOON USING HANDTOOLS: 2 METERS/HOUR
6.5 FEET/HOUR

TAB B TO APPENDIX 1 TO TERRAIN REINFORCEMENT
APPENDIX 26 TO CHAPTER 8
TRAINING AND EVALUATION OUTLINE
UNIT: MECH INF PLATOON
MISSION: PREPARE STRONGPOINT

1. GENERAL CONDITIONS:

The task force, of which the company team is a part, is fighting a defense in depth, preparing strongpoints on ground to be retrained and is prepared to counterattack on order. The platoon, as part of the company team, must accomplish the following:

a. Occupy a partially completed strongpoint position, ascertain the state of construction and complete construction within 24-48 hours.

b. Reconnoiter an alternate strongpoint position and prepare detailed plans and orders within 4 hours, and

c. Occupy and defend (live fire) an already constructed strongpoint position forward on order, to gain time for the preparation of the strongpoints under construction.

To accomplish these missions, one platoon of the company team will be forward defending from the prepared strongpoint (both day and night), while the two remaining platoons construct and reconnoiter strongpoints to the rear. Intelligence estimates that the opposing force can attack within 24 hours with a reinforced motorized rifle regiment, in sector.

2. PRIMARY TRAINING/EVALUATION STANDARDS:

a. To receive a satisfactory rating, the platoon must:

(1) Prepare an order for movement to and occupation of the partially completed strongpoint position within the specified time.

(2) Ascertain the state of construction of the position, inventory construction material, prioritize work and prepare a platoon-size strongpoint position, to be completed within 24-48 hours.

(3) Reconnoiter an alternate strongpoint position.

(4) Stake platoon fighting positions, prepare a platoon overlay and prepare range cards for an alternate strongpoint position.

(5) Prepare an order for movement to and occupation of a prepared strongpoint position within the specified time.

(6) Conduct both day and night defensive operations from the prepared position, controlling direct and indirect fires using appropriate command and control techniques.

3. TRAINING/EVALUATION RESULTS:

Check SAT or UNSAT on the following pages of this T&EO to indicate the unit's proficiency on each task for this mission. Trainer/Evaluators will record, on an attached sheet of paper or in space provided, detailed observations of training deficiencies which need training emphasis. This T&EO and attached sheets should be provided to the unit as a basis for future training. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and the evaluators'/trainers' subjective judgment as to whether the unit would have been successful on the modern battlefield had it performed as it did in this exercise. Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

OVERALL PROFICIENCY: SAT UNSAT

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: PREPARE STRONGPOINT

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-26-A-1 Prepare, plan and conduct reconnaissance	In daylight, from an OP affording good view of terrain to be occupied, team commander briefs oral order to platoon leader, including map with overlay; order also includes: (1) Opposing force and friendly situation and mission described in the general conditions. (2) Other necessary information (e.g., route of advance, command and signal). (3) Artillery/mortar fire is available upon request. (4) Light resistance may be encountered during movement.	Platoon leader issues warning order, stating the mission and critical times as a minimum, and performs other troop-leading procedures. Tentative plan is based on order from team commander and a map reconnaissance. A ground reconnaissance is conducted to ensure assigned strongpoint position is suitable. If suitable, a new strongpoint position is selected and is coordinated with the team commander.		
8-26-A-2 Conduct movement to assigned strongpoint position	In daylight, the platoon moves along its assigned route.	Platoon uses appropriate movement techniques for the terrain and expected degree of opposing force contact. Maximum use is made of cover and concealed routes. Overwatch movement by platoon elements is supported by indirect fires. Platoon coordinates direct/indirect fires to support movement reports.		
8-26-A-3 Occupy strongpoint and provide security	Given a location capable of holding a company-sized unit, prepared holes capable of holding a platoon, prepared range cards, barrier plan and sufficient engineer and construction materials for the platoon position.	Platoon moves into position quickly and without confusion. Platoon leader establishes priority of work. OP's are planned and placed and surveillance devices are placed covering likely avenues of approach, according to team plan. Within 24 hours: a. Complete each position based on evaluation of cover and concealment, observation, fields of fire and material on hand. b. Complete obstacles in conjunction with company fire plan to impede enemy forces.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: PREPARE STRONGPOINT

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-26-B-1 Plan alternate platoon strongpoint position	Given a location capable of holding a company-sized unit and a sector designated the platoon's position.	Within 4 hours: a. Stake all platoon fighting positions. b. Prepare a platoon overlay showing all organic weapons positions, squad and platoon leader positions. c. Prepare range cards on each fighting position which includes weapons symbol plotted from a known location, sector of fire, representative sketch of terrain, TRP's deadspace, FPL's, "N" arrow, time and date. d. Prepare paragraph 3 of the alternate defense position OPORD. e. Establish priority of work.		
8-26-B-2 Use CEOI to decode message.	Given a coded message over an FM secure radio and a CEOI.	Decode the message correctly.		
8-26-B-3 Conduct movement to forward area strongpoint	In daylight, the platoon moves along its assigned route.	Platoon uses appropriate movement techniques for the terrain and expected degree of opposing force contact. Maximum use is made of cover and concealed routes. Overwatch movement by platoon elements is supported by indirect fires. Platoon coordinates direct/indirect fires to support movement reports.		
8-26-C-1 Occupy defensive position	Given an overlay showing the overall company team position, platoon prepared positions with guides, range cards, tripods for MG's, ammunition, wire communication, claymores and chemical alarms.	Within 30 minutes: Platoon moves quickly, quietly into positions using relief in-place techniques.		
8-26-C-2 Detect approach of enemy unit, make required reports.	Given a battle area, two BRDM silhouettes at 1,000 m and a TA 312 with land line to company CP.	Platoon detects and correctly reports enemy situation using SALUTE.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: PREPARE STRONGPOINT

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-26-C-3 Call for indirect fire support	Given multiple targets representing BMP's at 1000 m and a TA 312 and an FO (zone III targets, see table in 8-16-C-5).	Platoon leader/FO calls for indirect fire to suppress enemy targets; calls for FPF when enemy appears 400 m or less.		
8-26-C-4 Call for direct fire support	General and preceding conditions apply.	Platoon leader directs, adjacent direct fire Tk and TOW elements to engage BMP targets at 1000 m to 600 m using TPR's or any other practical (pointing) method.		
8-26-C-5 Engage enemy infantry targets	Given targets in 3 zones each consisting of a group of silhouettes at ranges from 1000 m to 100 m, sequenced to represent an attacking reinforced motorized rifle company (see diagram and table, right.) Each silhouette exposed only once. Targets in any zone exposed only after more distant zone exposed.	Zone / Range / Tgt Array / Exp (Sec) / Must Hit III / 1000-600M / 4 BMP 2 BROM / 120 / 3 2 II / 600-200M / 4 BMP 15E / 120 / 3 10 I / 200-100M / 2 BMP 30E / 120 / 2 20 If targets are not engaged successfully, the use of mortar and volume of fire will be subjectively included in the overall evaluation of fire control and distribution.		
8-26-C-6 Consolidated	Attacking force has been eliminated.	Platoon reports situation according to FSOP to include losses, ammunition expenditures, fuel status and condition of vehicles/ equipment.		
8-26-C-7 Treat and evacuate casualties	Platoon has suffered casualties. (Evaluators insert 2 simulated casualties.)	Platoon treats casualties with emphasis on life-saving steps. Unit submits casualty reports. Unit evacuates casualties as specified in FSOP.		
8-26-C-8 Detect mask against chemical agent	Given an artillery attack and an M8 chemical detector.	Within 15 seconds after M8 given alarm: a. Don protective masks. b. Give alarm via voice on land line to platoon and higher.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: PREPARE STRONGPOINT

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-26-C-9 Detect approach of enemy	In darkness, given 2 BMF reconnaissance protraying elements of a reinforced motorized rifle company advancing on strongpoint position using active IR driving devices/blackout drive, in the range of 1000 m to 800 m, to be exposed 2 minutes.	Using all night fighting and sensor equipment available, platoon detects and reports enemy targets using SALUTE.		
8-26-C-10 Call for indirect fire support.	Previous conditions apply.	Indirect fire is called on opposing force. Mortar illum is called for to light targets for direct fire weapons. Platoon shifts fires as enemy approaches.		
8-26-C-11 Call for direct fire support	Given multiple targets representing BMP's at 1000 m to 600 m, one TA 312 and an FO (zone III targets, see table in 8-26-C-12).	Platoon leader directs adjacent fire tank and TOW elements to engage BMP targets at 1000 m to 600 m, using TRP or any other practical (pointing) method.		
8-26-C-12 Engage enemy infantry and armor targets	Given targets in 3 zones, each consisting of a group of silhouettes, at ranges from 1000 m to 100 m, sequenced to represent an attacking reinforced motorized rifle company. (See diagram and table at right.) Each silhouette exposed only once. Targets in any zone exposed only after more distant zone exposed.	Zone / Range / Tgt Array / Exp (Sec) / Must Hit III / 1000-600M / 4 BMP, 2 BRDM / 120 / 3, 3 II / 600-200M / 4 BMP, 15E / 120 / 3, 10 I / 200-100M / 2 BMP, 30E / 120 / 2, 20 If targets are not engaged successfully, the use of mortar and volume of fire will be subjectively included in the overall evaluation of fire control and distribution.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: PREPARE STRONGPOINT

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-26-C-13 Consolidate	Attacking force has been eliminated.	Platoon reports situation according to FSOP to include losses, ammunition expenditures, and condition of equipment/vehicles.		
8-26-C-14 Displace to subsequent position	Company team commander orders platoon to conduct relief-in-place operation and move to rearward assembly area.	Platoon leader readies and organizes platoon for movement and coordinates with relief unit. Platoon displaces to subsequent positions over previously reconnoitered routes. Platoon calls for indirect fires to suppress opposing force during displacement. Movement is rapid and subsequent position is occupied with no confusion or hesitation while maintaining light and noise discipline.		

TAB C TO APPENDIX 1 TO TERRAIN REINFORCEMENT
APPENDIX 23 TO CHAPTER 8
TRAINING AND EVALUATION OUTLINE
UNIT: TANK/MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE

1. GENERAL CONDITIONS

The task force has been ordered to defend. The company team has been assigned a battle position to occupy. Task force and company team orders have been issued. The platoon has been assigned its primary and subsequent positions. The platoon moves to the defensive sector and prepares to occupy the battle position. This mission may be conducted during day or night.

2. PRIMARY TRAINING/EVALUATION STANDARDS

To receive a satisfactory rating, the platoon must occupy the battle position within the time specified by the company team commander, prepare and continually improve positions, plan and coordinate fire support, and defend from battle positions to wear down the attacker by continually fighting throughout the MBA.

3. TRAINING/EVALUATION RESULTS

Check SAT or UNSAT on the following pages of this T&EO to indicate the t's proficiency on each task for this mission. Trainers/evaluators will record on an attached sheet of paper, or in the space provided, detailed observations of training deficiencies which need training emphasis. This T&EO and attached sheets should be provided to the unit as a basis for future training. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and the evaluator/trainer's subjective judgment as to whether the unit would have been successful on the modern battlefield had it performed as it did in this exercise. Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

OVERALL PROFICIENCY: SAT UNSAT

UNIT: TANK/MECHANIZED INFANTRY PLATOON MISSION: DEFENSE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-23-A Move to position.	Platoon has received order from company team commander.	Platoon leader gives platoon order and performs other troop-leading procedures. Platoon uses proper movement techniques and available cover and concealment. Platoon observes assigned sectors for ground and air security. Platoon uses visual signals for control.		
8-23-B Occupy fighting positions or platoon battle position.	Platoon arrives at position assigned by company team commander.	Platoon selects specific positions based on evaluation of cover, concealment, observation and fields of fire. Platoon coordinates selection of specific positions with unit commander.		
8-23-C Establish security.	General and preceding conditions apply.	Platoon establishes OPs on terrain that overlooks opposing force avenues of approach. Platoon posts observers to warn of opposing force ground or air activity. Mounted observers monitor radios. Elements enforce noise and light discipline. Elements minimize movement in and around positions. Elements maintain and lift listening silence according to unit SOP. Platoon emplaces trip flares to warn of infiltrators.		
8-23-D Prepare fighting positions.	General and preceding conditions apply.	Platoon leader assigns primary fighting positions and overlapping sectors of fire to each tank/APC crew.		

UNIT: TANK/MECHANIZED INFANTRY PLATOON MISSION: DEFENSE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
		Tank commanders/squad leaders select hide and alternate fighting positions. HAWs are positioned to provide long-range fires on dangerous armor avenues of approach. Tanks cover the most dangerous armor approaches with long- and mid-range fires. Infantry provide local security for HAWs and tanks when required and block dismounted approaches or hold key positions. MAWs are employed from or near APCs and are positioned to gain flanking, terrain masked fires on the opposing force. Hull down positions are prepared and vehicles are camouflaged, covered, and concealed. Unit plans and integrates direct and indirect fires to cover opposing force avenues of approach into the position, obstacles, and likely engagement areas; to force opposing force armor to button up; to deny the opposing force covered and concealed approaches into the position; and to suppress or obscure opposing force overwatch positions. Platoon plans indirect fires in front of, on and behind the position. Platoon selects target reference points (TRPs), checks TRPs assigned by company, and makes changes if necessary. Final protective fires are planned and fired in if the situation permits. Platoon plans indirect fires to cover movement to subsequent battle positions.		

TRAINING AND EVALUATION OUTLINE

UNIT: TANK/MECHANIZED INFANTRY PLATOON MISSION: DEFENSE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
		Unit plans for illumination Range cards are prepared for each position. Platoon prepares a fire plan that covers the area of platoon responsibility. Movement is limited into and around positions. Subsequent positions are planned and reconnoitered and are prepared, as time permits. Routes between the positions are reconnoitered and clearly marked. Unit uses the same criteria to select subsequent positions as for selection of primary positions. Unit improves venicle positions and other improvements are made as time allows.		
8-23-E Construct and improve obstacles	Platoon is in position.	Platoon emplaces obstacles, including hasty protective minefields, to improve or extend natural obstacles. Emplaced obstacles support the tactical plan and enhance friendly weapons effectiveness. If minefields are not disturbed and the tactical situation permits, mines are disarmed and recovered.		
8-23-F Defend.	Opposing force approaches platoon position.	Indirect fire is called on opposing forces that are beyond direct fire range. Elements engage opposing force at effective range of direct fire weapons. Suppressive fires isolate the opposing force and suppress its overwatch elements. Elements engage opposing force with direct fire simultaneously from as many fighting positions as possible.		

UNIT: TANK/MECHANIZED INFANTRY PLATOON MISSION: DEFENSE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
		Platoon leader controls distribution of fires.		
		Platoon leader sends spot reports of activity to company team commander.		
	When defense is conducted at night.	Elements reposition as necessary and use night vision sights, flares, searchlights, and/or indirect fire illumination to acquire and engage targets.		
8-23-G Displace to subsequent positions.	Company team commander orders platoon to move to subsequent positions.	Platoon displaces to subsequent positions over previously reconnoitered routes before effective opposing force direct fires are delivered against it. Contact with opposing force is maintained during Movement.		
		Platoon calls for indirect fires to suppress opposing force while friendly elements reposition.		
		Elements usedirect fire to destroy opposing forces.		
		Where possible, movement is lateral or forward rather than rearward. Movement is rapid and not observed by the opposing force.		
		Platoon occupies subsequent battle positions with no confusion or hesitation while maintaining light and noise discipline.		
	Platoon may be given the additional mission to retain specified terrain.	Specified terrain is held until time specified by commander or until permission is given to move.		
	Opposing force attacks the new platoon position.	Platoon engages the opposing force again. (Process outlined above is repeated as necessary).		

UNIT: TANK/MECHANIZED INFANTRY PLATOON MISSION: DEFENSE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-23-H Conduct counter-attack.	Opposing force is in the open and unprepared to defend. The platoon is ordered to mount a counterattack as a part of the company team or alone under company team control, to gain the initiative.	Platoon rapidly conducts a counter-attack by concentrating combat power to overwhelm and destroy the opposing force. Platoon maneuvers only to place effective fire on the opposing force. Fire support assets are used to stop attack and destroy opposing forces in the penetrated area.		
	AND/OR			
	The platoon is ordered to mount a hasty attack as a part of the company team or alone under company team control, to regain critical terrain.	Platoon conducts a hasty counterattack by concentrating combat power to overwhelm and destroy the opposing force. Platoon maneuvers to place effective fire on the opposing force and to to regain terrain critical to the defensive system. Fire support assets are used to stop opposing force attack, destroy his forces in the penetrated area, and restore the defensive position.		
8-23-I Consolidate.	Counterattack gains the initiative.	Counterattacking force prepares for another opposing force attack by positioning forces in the next positions, establishing security elements and physically improving the position.		
	AND/OR			
	Terrain critical to the defensive system has been regained.	Platoon reports situation according to SOP to include losses, ammunition expenditures, fuel status, and condition of vehicles. NOTE: TAB A, next page, contains suggested support requirements.		

TAB A TO APPENDIX 23 TO CHAPTER 8
SUGGESTED SUPPORT REQUIREMENTS
UNIT: TANK/MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE

1. Administration:

a. Company team orders should be prepared in advance by the evaluators for issue to the platoon leader when the platoon is evaluated without the company team.

b. FO parties should be attached to the platoon prior to the exercise.

2. Minimum Evaluators: 1 CPT, 1LT/NCO. When REALTRAIN equipment is used, the requirement will increase.

3. Opposing Force: 1 motorized rifle company reinforced with tanks.

4. Support Troops: None

5. Vehicles/Communications: 1 venicle with radios

6. Maneuver Area: A sector 1.5 to 3 kilometers wide, 1 to 5 kilometers deep, with 1 to 1.5 kilometer observation to front, and suitable primary and subsequent battle positions.

7. Firing Area: None

8. Training Aids, Devices, and Special Equipment: Tank main gun fire simulators; REALTRAIN equipment; tactical wire; demolition, and mines.

9. Ammunition: See Chapter 12.

10. Key References: TC 17-12-1, TC 17-12-3, FM 7-7, TC 7-3, TC 7-3-1, FM 71-1 and TC 71-5.

11. Tips for Evaluators/Trainers:

a. Observe and evaluate platoon movement techniques and cover and concealment in the battle position from opposing force positions.

b. Monitor platoon radio and wire nets to evaluate adequacy of OPSEC, orders, reports, and requests.

4.

TAB B TO APPENDIX 23 TO CHAPTER 8
TRAINING TIPS
UNIT: TANK/MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE

GARRISON	MANEUVER RIGHTS AREA	MAJOR TRAINING AREA
°8-23-A Move to Position a. Sand Table/Terrain Board Drills b. Wheel Vehicle Exercises °8-23-B Occupy Fighting Positions or Platoon Battle Position a. Sand Table/Terrain Board Drills b. Wheel Vehicle Exercises 8-23-C Establish Security a. Wheel Vehicle Runs b. Platoon Security Drills °8-23-D Prepare Fighting Positions a. Sand Table/Terrain Board Drills °8-23-E Construct and Improve Obstacles a. Construction of Hasty Mine Fields b. Engineer Tape Obstacle Plans °8-23-F Defend a. Calls for Fire 1. 1/10 Scale 2. BT 33 Trainer b. Exact Gunnery Skills 1. 1/60 Scale Range 2. 1/20 Scale Laser Range	°All tasks conducted in Garrison could be conducted in a Maneuver Rights Area with organic vehicles. °Laser Trans/Receiver Realtrain devices mounted on vehicles	°All tasks conducted in garrison and a Maneuver Rights Area can be conducted in a Major Training Area. °Main Gun Live Fire Exercises °Nacca/Telfare Subcaliber Device exercises.

TAB B TO APPENDIX 23 TO CHAPTER 8
TRAINING OPTIONS
UNIT: TANK/MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE

GARRISON	MANEUVER RIGHTS AREA	MAJOR TRAINING AREA
3. Laser Stout Device 4. CTT Indoor Range 5. Tank Fire Simulators c. Crew/Platoon Skills 1. Section Drills-1/60 Scale Range 2. Section Drills-Laser Stout Device °8-23-G Displace to Subsequent Positions a. Calls for Fire 1. 1/10 Scale 2. BT 33 Trainer b. Maneuver Training 1. Sand Table/Terrain Board Drills 2. Wheel Vehicle Exercises c. Exact Gunnery Skills 1. Same as 8-23-F d. Crew/Platoon Skills 1. Same AS 8-23-F °8-23-H Conduct Counterattack a. Calls for Fire 1. 1/10 Scale 2. BT33 Trainer b. Maneuver Training 1. Sand Table/Terrain Board Drills 2. Wheel Vehicle Exercises		

TRAINING OPTIONS
UNIT: TANK/MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE

GARRISON	MANEUVER RIGHTS AREA	MAJOR TRAINING AREA
c. Exact Gunnery Skills 1. Same as 8-23-F d. Crew/Platoon Skills 1. Same as 8-23-F		

TAB C TO APPENDIX 23 TO CHAPTER 8
TRAINING TIPS
UNIT: TANK/MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE

1. Tasks: 8-23-F, 8-23-G, 8-23-H

a. Purpose: To train an armor platoon in a garrison training area. The platoon will fire a stationary tank, multiple engagement course using laser transmitting/receiving devices and multiple pop-up targets.

b. Concept:

(1) The platoon will establish a firing line 200-250 meters wide.

(2) Firing will be done by platoon and section fire commands.

(3) Targets will be designated by signature devices with a 30 second time limit per engagement sequence.

(4) A defensive scenario will be built into the target sequence to include simulating occupation of subsequent positions and conducting a counterattack operation.

c. Schedule of Units and Sequence of Events:

(1) Each platoon will be allocated two hours to complete the exercise.

(2) Upon arrival in the training area, each platoon will be given a safety briefing and instruction on the mounting of equipment.

(3) Laser transmitting/receiving equipment will be mounted on the tanks (including zeroing lasers).

(4) The platoon will occupy defensive firing positions along the firing line.

(5) Targets will be controlled by a target designator transmitting device.

(6) Tanks will engage under the control of the platoon leader as targets appear.

(7) Tanks will submit reports to the platoon leader who will pass necessary information on to the company commander.

(8) Company commander will tell the platoon leader to simulate displacement by section to subsequent positions.

(9) The platoon will continue to engage targets and prepare for counterattack.

(10) Company commander will tell the platoon leader to simulate conducting a counterattack using good overwatch techniques.

(11) Platoon destroys enemy force.

(12) At the completion of the exercise, the platoon will be ciritqued by both the platoon leader and company commander.

d. Administration:

(1) All targets will be remote controlled pop-up targets with target designating devices. Each target will have a laser reciever device attached that will generate a "kill" indicator when hit by a laser impulse.

(2) Target control will be accomplished by an operator working with the company commander.

(3) One platoon per day will conduct the course in order to allow additional training if necessary.

e. Minimum Evaluators: The company commander and platoon leader will act as evaluators for the exercise.

f. Support Troops and Equipment: Two men with a 1/4 ton vehicle and trailer to service targets are required. The company commander will have a radio and target control operator with him. Organic platoon vehicles will be used.

g. Training Area: The training area will be at least a 250m by 1500m area.

h. Training Aids, Devices and Special Equipment:

12 - Pop-up targets w/signature device
12 - Laser impulse receivers/hit indicators
5 - Laser transmitting/receiving devices (one per tank)
1 - Target control transmitter

i. Ammunition: 84 target signature charges

j. Tips for Evaluators/Trainers:

(1) Pop-up targets are operated by rechargeable batteries. Battery life will have to be monitored and managed accordingly.

(2) Ammo conservation should be closely monitored in order to maximize training value.

TAB C TO APPENDIX 23 TO CHAPTER 8
TRAINING TIPS
UNIT: TANK/MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE

2. Tasks: Appendix 23 to Chapter 8, Defense

a. Purpose: To train a platoon in a maneuver rights area or major training area. The platoon will conduct maneuver exercises with an opposing force using REALTRAIN concepts. The exercise will be a combined arms, defensive operation with a counterattack.

b. Concept:

(1) The platoon will be issued a Frag Order to conduct a defensive operation. One infantry squad will be attached to the platoon.

(2) Each tank will be equipped with a laser/trans/receiver device. Infantry personnel will also be equipped with such devices for individual and crew served weapons. The opposing force will be similarly equipped.

(3) The platoon will occupy primary battle positions, prepare subsequent battle positions, be attacked, occupy subsequent positions, repell the attack and conduct a counterattack to regain key terrain.

c. Schedule of Units and Sequence of Events:

(1) One day will be allocated to the platoon.

(2) Upon arrival in the training area, the platoon leader will be issued a Frag Order from the company commander.

(3) The platoon (+) will be issued the laser trans/receiver equipment for each vehicle and personnel/crew served weapons. Instruction will be given on how to mount the devices. Equipment will be installed at this time.

(4) The platoon leader will issue a Frag Order to his platoon and prepare for movement.

(5) The platoon (+) will commence the operation with the platoon leader rendering necessary reports, per unit SOP to company commander.

(6) The platoon occupies the defensive positions and prepares subsequent positions.

(7) An opposing force attacks the platoon and platoon engages at maximum range to include the use of indirect fire.

(8) Company commander orders platoon leader to occupy subsequent positions.

(9) Platoon successfully repells enemy attack and conducts a counter-attack to regain key terrain.

(10) When key terrain has been reoccupied and consolidation has taken place, the company commander ends the exercise and critiques the whole platoon.

d. Administration: One platoon will conduct the mission per day. Night operations may be included if desired.

e. Minimum Support Evaluators:

1 - Chief Evaluator (Company commander)
1 - Opposing force chief controller
2 - Assistant controllers (one for evaluated platoon , one for opposing force)

f. Support Troops: One opposing force motorized rifle company with tanks attached.

g. Vehicles/Communications:

2 - 1/4 ton vehicles with 2 net radio capability (1 for Chief Evaluator, 1 for opposing force chief controller)

h. Maneuver Area: A sector 1.5 to 3 kilometers wide, 1-5 kilometers deep, with 1 to 1.5 kilometer observation to front, and suitable primary and subsequent battle positions.

i. Firing Area: N/A.

j. Training Aids, Devices and Special Equipment:

8 - Laser transmitting/receiving devices with hit indicators (one per tank)
40 - personnel laser receiver devices with hit indicators (for opposing and attached infantry)
10 - Anti-tank laser transmitting/receiving devices with hit indicators (1 per anti-tank missile)
10 - Laser receiving/hit indicator devices for personnel carriers.

k. Ammunition:

128 - Tank fire simulators
400 - 5.56 blank rounds
800 - 7.62mm blank rounds
10 - Smoke Pots
40 - Artillery Simulators

1. Tips for Evaluators/Trainers:

(1) Target hit devices will reduce the number of controllers needed to conduct the exercise.

(2) Time should be allowed for the platoon leader to make an initial recon is desired. Upon occupation of initial battle positions, sufficient time should be allowed for preparation of initial battle positions and subsequent positions.

(3) Calls for fire can be assessed by the assistant controllers including smoke pot detonation.

TAB D TO APPENDIX 1 TO TERRAIN REINFORCEMENT
APPENDIX 24 TO CHAPTER 8
TRAINING AND EVALUATION OUTLINE
UNIT: MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

1. GENERAL CONDITIONS:

The task force is defending terrain which includes small villages and farms. The company team is in a battle position extending through the edge of a village, and orders the platoon to defend from buildings dominating a road which is a primary avenue of approach. As the platoon arrives, departing engineers turn over a target folder to the platoon leader containing data for an obstacle based on a crater in the road. The platoon occupies its position during daylight, prepares for both day and night defense, and engages probing OPFOR.

2. PRIMARY TRAINING/EVALUATION STANDARDS:

To receive a SATISFACTORY rating the platoon must:

a. Prepare an order for movement to and occupation of its defensive position.
b. Properly assume responsibility for the engineer obstacle, and emplace a hasty minefield to augment the crater.
c. Select, organize and prepare positions within village making maximum use of available structures/rubble to obtain concealment, cover, grazing or plunging fire as appropriate, observation, and shelter.
d. Plan and coordinate direct and indirect fires.
e. Be ready to fight at specified time.
f. Direct effective fire against attacking OPFOR, hitting 70% of targets within 40 seconds by day, within 60 seconds by night.
g. Treat and evacuate casualties, handle POW's, maintain and resupply as required.
h. Plan and conduct a move to a subsequent position.
i. Communicate, as required, to 8th Division CEOI standards.

3. TRAINING/EVALUATION RESULTS:

Check SAT or UNSAT on the following pages of this T&EO to indicate the unit's proficiency on each task for this mission. Trainers/Evaluators will record, on an attached sheet of paper or in space provided, detailed observations of training deficiencies which need training emphasis. This T&EO and attached sheets should be provided to the unit as a basis for future training. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and the evaluators'/trainers' subjective judgement as to whether the unit would have been successful on the modern battlefield had it performed as it did in the exercise. Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

OVERALL PROFICIENCY: SAT UNSAT

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-24-A Troop leading procedures	Platoon in Assy Area. Oral company team order, which includes: (1) Opposing force and friendly situation and mission, including positions of adjacent units. (2) Route of advance. (3) Artillery/mortar fire available upon request. (4) Information that village to be occupied is rubbled/ deserted, except for engineer element. (5) Instructions to relieve engineers and to complete obstacle per engineer plan. (6) Requirement to plan positions for two TOW's and two tanks within the platoon sector. (7) Priority of work. (8) Subsequent position for platoon. (9) Operations overlay. (10) Command and signal instructions, and latest time for readiness to fight.	Platoon Leader: (1) Issues warning order, stating the mission and critical times as a minimum and instructions readying the platoon for mission. (2) Makes tentative plan based on team order and a map reconnaissance. Conducts reconnaissance on ground. (3) Coordinates any changes with the Company Team Commander. (4) Issues defense order to key subordinates.		
8-24-B Move to position.	In daylight, the platoon moves along assigned route to defensive position.	Platoon uses movement techniques appropriate for the terrain and OPFOR situation.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-24-C Execute engineer obstacle plan.	An engineer element in village on arrival of platoon; crater in road to front of platoon's sector; target folder requiring hasty protective minefield to extend crater.	Platoon: a. Properly accepts responsibility for target folder. b. Executes target (emplaces mines, marks, and records properly). c. Submits appropriate reports concerning obstacles.		
8-24-D Establish security.	Warning to platoon leader to expect OPFOR ground, helicopter, or attack air activity.	Platoon: a. Establishes continuous observation over avenues of approach. b. Monitors radios and observes communications discipline. c. Prepares security for night and reduced visibility.		
8-24-E Prepare position.	Several buildings, rubble, and other materials likely to be found in and around a small rural village; sketch of village in engineer target folder.	Platoon: a. Designates primary fighting positions with overlapping sectors of fire covering obstacle and avenues of approach. b. Provides fighting positions covered from direct and indirect fire. c. Selects covered or concealed routes among fighting positions. d. Conceals vehicles, fighting positions and OP's. e. Uses upper stories of buildings for observation and plunging fire, base of buildings for grazing fire. f. Positions TOW to provide long range anti-armor fire, tanks to cover most dangerous mid- and short-range approaches. g. Secures TOW and tank positions with infantry. h. Employs DRAGON from or near APC's, seeking flanking, terrain-masked shots. i. Designates alternate positions as appropriate.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

)#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
		j. Integrates direct and indirect fires to force attacker to button up, to suppress or obscure his overwatch, and to deny him covered or concealed approaches. k. Plans indirect fires in front of, on, and behind position, including fires to cover movement within or from positions. l. Selects target reference points, coordinating same with company team. m. Prepares range cards for each fighting position, and an overall platoon plan. n. Reconnoiters subsequent position and plans move thereto. o. Completes preparation by specified time.		
8-24-F-1 Defend (Day)	Array of targets representing an OPFOR probe of the platoon position exposed as follows: RANGE (M) TARGETS PORTRAY			
1A	3000 to 1000 OPFOR recon element: moving BRDM(s) or cycle(s); stationary BMP(s) or tank(s); minimum three direct fire targets, and one indirect fire target.	Platoon: (1) Acquires, identifies, and reports targets. (2) On order, designates targets for tanks and/or TOW. (3) On order, calls for and adjusts indirect fire.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
3-24-F (cont) 1B	1000 to 500 OPFOR movement to assault position: moving and stationary BMP(s); ATGM (dismounted) firing(s); minimum four AFV, exposed for 40 seconds, plus two ATGM (flashes) to flank or rear AFV: 2 suppression targets (24m X .3m).	(4) Hits three out of four AFV with DRAGON. (5) Suppresses ATGM by engaging within 20 seconds of firing; calls for indirect fire for suppression/obscuration.		
1C	500 to 300 OPFOR dismounted assault: minimum two groups of 6E each, line and deep, each group exposed for 40 seconds.	(6) Hits 1/2.		
1D	300 to 175 Assault closing: mimimum 4 groups of 4E each, line and deep, each exposed for 40 seconds.	(7) Hits 3/4.		
1E	175 to 50 Final rush: minimum 6 groups of 4E each line, each group exposed for 40 seconds.	(8) Hits 3/4: M-18 AP mines fired as appropriate.		
1F	100 to 50 Rifle/grenade (mortar) fire from defilade.	(9) M203 respond with steady fire, hits within 25 meters.		

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-24-F-1 (Cont) 1G	150 to 50 Single OPFOR tank (stray from another platoon sector) attempting to exfiltrate: manned target tank with protected engine, and sponson boxes, or hulk with screen.	(10) Four LAW subcaliber hits.		
8-24-F-2 Defend (Night)	Array of targets representing an OPFOR probe of the platoon position, sequentially exposed as follows: RANGE (M) / TARGETS PORTRAY 2A 3000 to 1000 OPFOR recon element: moving BRDM(s) or cycle(s); stationary BMP(s) or tank(s); minimum three direct fire targets and one indirect fire target. All vehicles with IR driving light and station-keeping markers active.	Platoon: (1) Acquires, identifies, and reports targets. (2) On order, designates targets for tanks and/or TOW. (3) On order, calls for and adjusts fire.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-24-F-2 (cont) 2B	1000 to 500 OPFOR movement to assault position: moving and/or stationary BMP(s); ATGM (dismounted) firing(s). Minimum two ATGM, range 700-500m, both with IR driving light active, and both backlighted by burning vehicle, exposed for 60 seconds.	(4) Hits one out of two BMP with DRAGON. (5) Suppresses ATGM by engaging area (within 50 meters) within 20 seconds of firing.		
2C	500 to 300 OPFOR dismounted assault: minimum one group of 6E, line and deep, exposed for 60 seconds, group backlighted with burning vehicle, or lighted by tank searchlight from adjacent platoon.	(6) Hits 2/3.		
2D	300 to 175 Assault closing: minimum two groups of 6E each, line and deep, each group either backlighted by burning vehicle, or trip flare, or equipped with blinkers simulating assault fire; each group up for 60 seconds, sequentially.	(7) Hits 2/3.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-24-F-2 (cont) 2E	175 to 50 Attempt to breach obstacle: minimum six groups of 4E each, line, each group exposed sequentially for 60 seconds, each group either backlighted by burning vehicle or trip flare, or equipped with blinkers simulating assault fire.	(8) Hits 3/4.		
2F	100 to 50 Rifle/grenade (mortar) fire from defilade.	(9) M203 respond with steady fire, hits within 25 meters.		
8-24-G Treat and evacuate casualties	Members of TOW (tank) crew WIA.	Platoon: a. Reports casualties. b. Administers first aid (4 lifesaving steps). c. Evacuates WIA promptly.		
8-24-H Handle prisoners.	Group of one officer, one NCO, two soldier POW.	Platoon silences, searches, segregates and speedily evacuates POW.		
8-24-I Communicate.	Telephone wire from company team CP, and orders to emplace a directional antenna and maintain listening silence.	Platoon communicates: -- By wire when possible; all vehicles, platoon and squad leaders, and OP's interconnected. -- By visual signals as necessary. -- By radio, using a properly oriented and mounted directional antenna, as required; using a whip antenna in emergency only.		
8-24-J Reorganize and replenish.	Given casualties, vehicular damage, and ammunition expended within the platoon.	Platoon reorganizes, maintains, resupplies and evacuates as required.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIR

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-24-K Move to subsequent position.	Given company team order to occupy subsequent position.	Platoon: a. Moves quickly over planned route, providing for overwatch, and for obscuration or suppression of OPFOR elements. b. Occupies subsequent position without hesitation, and continues engagement, or commences improvement of the new position.		

TAB A TO APPENDIX 24 TO CHAPTER 8
SUGGESTED SUPPORT REQUIREMENTS
UNIT: MECHANIZED RIFLE PLATOON
MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

1. ADMINISTRATION:

a. This evaluation can be connected by scenario that of Appendices 10 & 11, 16, 21, or 32, and can be combined with that of Appendix 25 (Defense Against Aircraft).

b. Chief evaluator functions as Company Team commander. Supporting elements (e.g. tanks or TOW) can be attached to the platoon, or remain under "Team" control. A FIST element will be provided, or represented by an evaluator.

c. Buildings used can be knock-down facades only, provided they furnish height for observation and plunging fire, concealment (cover) for weapons emplaced for grazing fire and vehicles, and otherwise facilitate application of sound principles for selecting positions and siting weapons.

2. MINIMUM EVALUATORS: One Chief Evaluator (officer with platoon leader experience); one senior NCO (platoon sergeant experience), one NCO per squad.

3. OPPOSING FORCE: Four POW's with appropriate uniforms, weapons, and documents.

4. SUPPORT TROOPS:

a. FIST element (minimum one FO).

b. One Company Team RTO.

c. Four casualty players, preferably medics with moulage wound kits.

d. Medic(s) for range; may participate in evacuation of "casualties".

e. Range operations personnel and ammunition detail, as necessary.

5. VEHICLES/COMMUNICATIONS:

a. Jeep for Chief Evaluator, with radio.

b. Range radio and telephones.

c. Telephones and wire to establish wire link from Company Team to platoon.

d. Ammunition truck.

6. MANEUVER AREA: Route from Assembly Area to defensive position preferably 3-5 km, but as little as 1 km will suffice, if a subsequent position can be designated in that space.

7. FIRING AREA: Should provide 3 km observation and fields of fire. Preferably should accommodate firing tank cannon and indirect fire, plus DRAGON, .50 caliber machine gun, M60 and M16's in event tanks and/or indirect fire not feasible, .50 caliber fan governs.

8. TRAINING AIDS, DEVICES, AND SPECIAL EQUIPMENT:

a. Radio-controlled pop-up or cable pull-up targets.

b. In event DRAGON missiles not used, substitute REALTRAIN techniques, tracker trainer, or TVT; four sets simulation devices required.

c. Training mines (number function of length minefield) and other obstacle materials.

d. Modular buildings or scaffold facades.

9. AMMUNITION: See Chapter 12.

10. KEY REFERENCES: FM 7-7, FM 71-1, FM 71-2, FM 90-10, TC 7-3-1, TC 7-1, FM 17-12, TC 71-5.

11. TIPS FOR TRAINERS/EVALUATORS:

a. If necessary, all adjacent and supporting units/elements can be represented by evaluators.

b. Hand or radio-controlled pull-down screens placed in front of hulks may provide for selected presentation of LAW or DRAGON targets (e.g., LAW target, Task 8-24-F-1G).

c. For Tasks 8-24-F-1F and 8-24-F-2F, use of TP grenades will be safer and more convenient. An evaluator should be stationed to observe strike of rounds. In event natural defilade is not available, a simulated draw or wash will be staked or outlined with brush.

d. These tasks may be trained in garrison, LTA, and MRA as well as MTA via use of sandtable, TEWT, subcaliber and plastic munitions, and REALTRAIN techniques.

UNIT: MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE OF A BUILT-UP AREA

GARRISON/LTA	MRA	MTA
8-24-A Troop Leading Procedures 8-24-C Execute Engineer Obstacle Plan 8-24-D Establish Security 8-24-E Prepare Platoon Positions 8-24-F-1 Defend (Day)* 8-24-F-2 Defend (Night) * 8-24-G Treat and Evacuate Casualties 8-24-H Handle Prisoners 8-24-I Communicate 8-24-J Reorganize and Replenish 8-24-K Move to Alternate Position	All Tasks listed in Garrison, plus: 8-24-B Move to Position	All Tasks listed for Garrison and MRA.

* FOR M203 PRACTICE AND LAW SUB-CAL NOTE SAFETY REQUIREMENTS FOR DRDS.

TAB C TO APPENDIX 24 TO CHAPTER 8
TRAINING TIPS
UNIT: MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE OF A BUILT-UP AREA

TASK: 8-24-F Defend (Day and Night)

1. PURPOSE: To train a Mechanized Infantry Platoon in an Garrison environment through the use of scalar range, plastic and training ammunition, laser weapons simulators and adapted targets.

2. CONCEPT:

a. Plastic ammunition enables the unit to train this task in conjunction with other individual and collective tasks in a restrictive training location. The firing proficiency of the platoon using plastic/training ammunition on a 1:10 ratio scalar range can be evaluated and ARTEP standards applied.

b. Laser weapon simulators provide the option of firing on 1:10 scalar ranges or having full scale engagements with laser adapted plastic targets or laser equipped OPFOR units.

3. SCHEDULE OF UNITS AND SEQUENCE OF EVENTS:

a. Each unit will be allocated 8 hrs (4 day and 4 night) to complete this task.

b. Laser system impose no safety restrictions and allow more flexibility in any scenario which incorporates this task.

c. The appearance of targets (OPFOR Probes) will be controlled by the evaluator.

4. ADMINISTRATION: N/C

5. MINIMUM EVALUATORS: N/C

6. SUPPORT TROOPS: If used, OPFOR must have a superior combat power ratio. Exact manning levels as desired by the unit.

7. VEHICLE/COMMUNICATIONS: N/C

8. MANEUVER AREA: Within limitations of garrison

9. FIRING AREA: (Plastic/Training Ammunition) 300 by 700m area which can be temporially restricted as an impact area (Incl 1)

10. AMMUNITION: All service ammunition deleted.

a. Plastic ammunition for M16, M60 and M2

b. 81mm Mortar SABO

c. 35mm M72A2 LAW Sub-cal

d. M203 Practice

e. Pyrotechniques as permitted by local regulations.

11. TRAINING DEVICES AND EQUIPMENT:

a. Laser adaptors for M16, M60, M2 LAW, DRAGON, TOW and Tank

b. Targets: 45 of one type of the following:

1) Full scale (mechanical w/E & F silhouettes)

2) 1:10 scalar (manual) (Incl 2)

3) 1:10 scalar (laser)

c. Plastic ammunition adaptor as required for:

1) Special bolts for M16 and M60

2) Special barrels for M2

12. KEY REFERENCES: N/C

13. TIPS FOR TRAINERS:

a. Bolt Adaptors and Barrels for firing plastic ammunition should be installed and tested prior to training.

b. Standards E and F type silhouettes do not react properly to the impact of plastic projectiles and could produce inaccurate firing results. Special aluminum silhouettes can be obtained from the target device manufacturer which will provide exact firing data when hit.

c. Goggles should be worn when firing plastic ammunition at ranges of 10 meters or less.

d. 1:10 scale manually operated targets can be locally fabricated using materials commonly found in the unit (Incl 2).

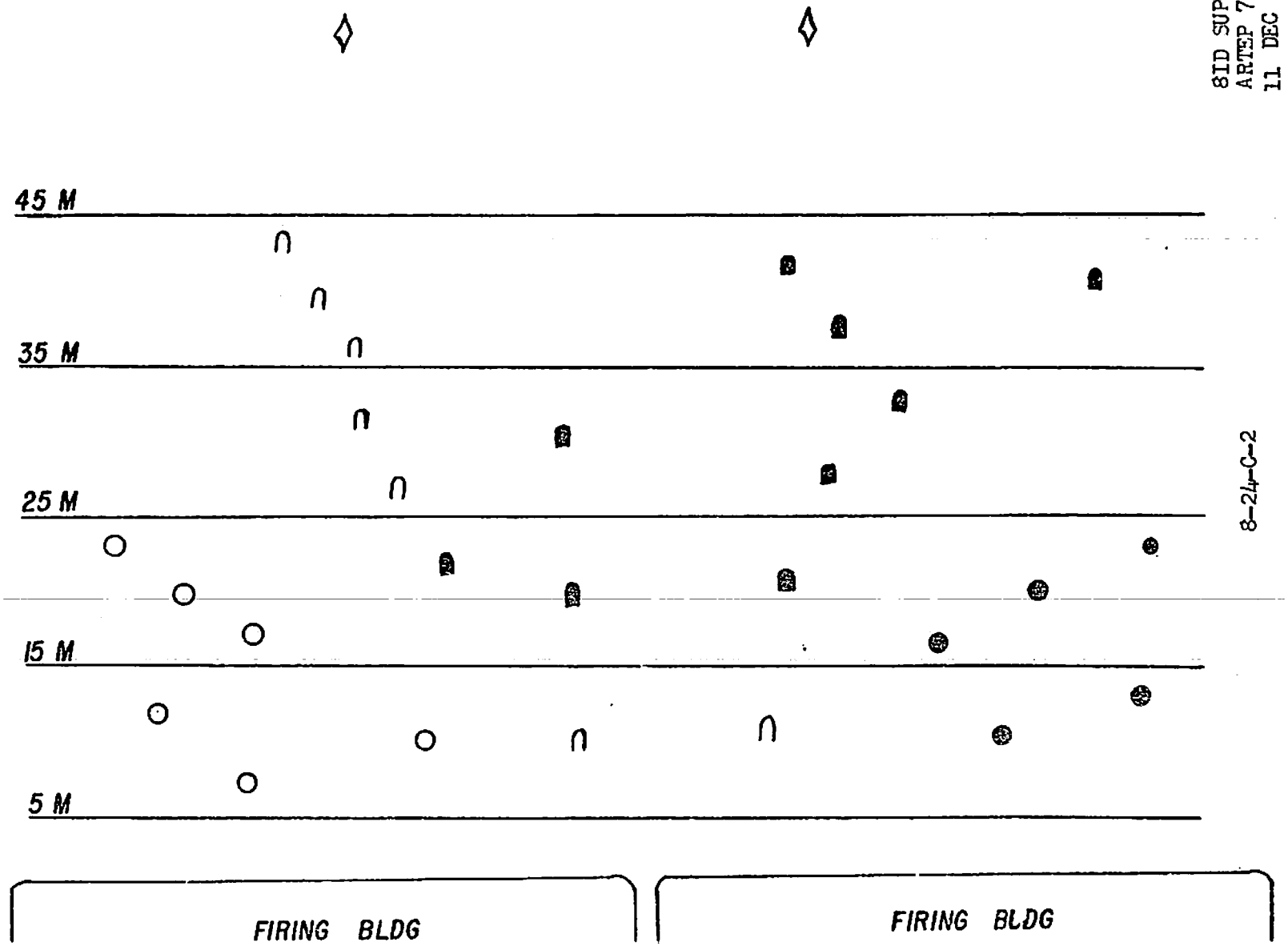
e. Upper story firing positions are not used for scalar range firing because of range/slant problems.

f. Training buildings (Incl 3) can be arranged in any configuration (i.e., GDP analog) and can be combined with existing buildings/facilities to expand training potential.

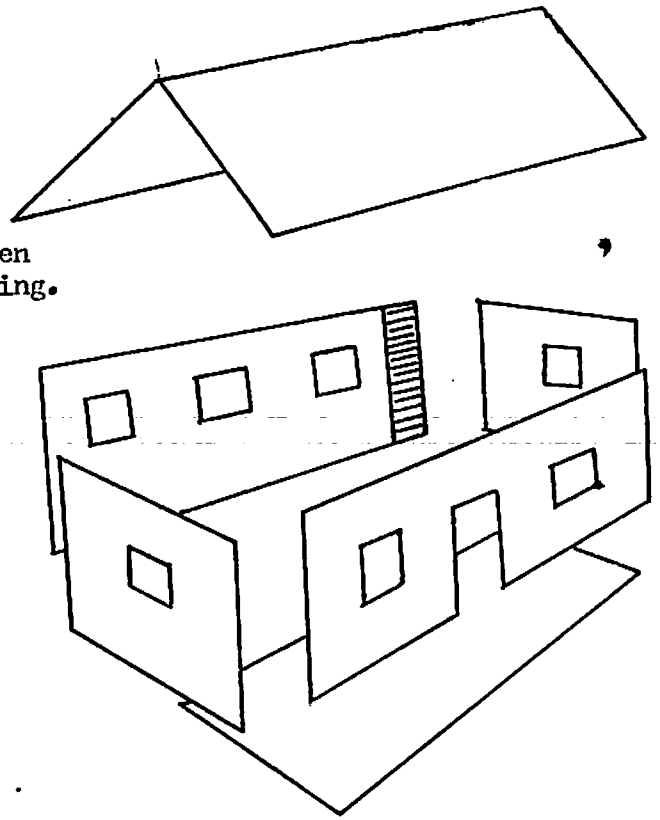
g. Laser equipment must be fully charged, during cold weather, and a re-charge capability on hand to ensure continuous operability of the equipment.

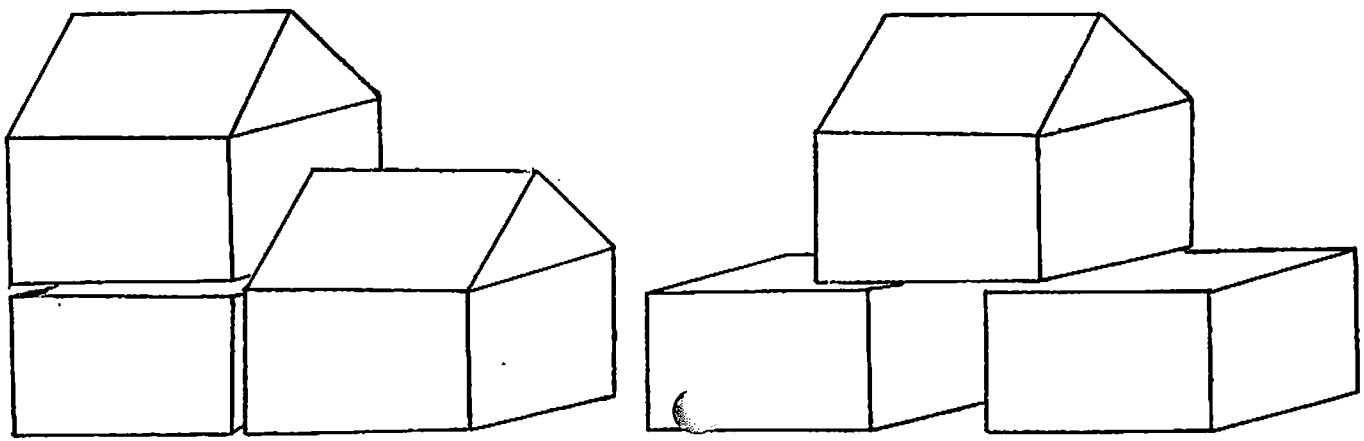
h. POC for additional information: S-3, 3d Bn 28th Inf, WAB MIL (2355) 5941.

SUGGESTED RANGE LAYOUT (1:10 SCALE)



The training buildings are totally collapsable and transportable. Additional floor and wall sections can be added to create virtually any type of building desired. Additional floors can be used between the walls and roof to create a ceiling. Each floor section has a trap door (not shown) which corresponds with ladders attached to the side wall sections. Each building rests on a 8' by 8' beam foundation which is also portable. All components can be locally fabricated.





TAB E TO APPENDIX 1 TO TERRAIN REINFORCEMENT
APPENDIX 28 TO CHAPTER 8
TRAINING AND EVALUATION OUTLINE
UNIT: MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE OF A BATTLE POSITION (LIVE FIRE)

1. GENERAL CONDITIONS:

OPFOR attack is imminent. The platoon is attached to a tank company occupying a prepared Battle Position. Company Team orders platoon to defend from fighting positions already constructed, and provides fire plan, position sketch, and rangecards. Platoon completes obstacle(s), prepares defense, and engages OPFOR probes, day and night.

2. PRIMARY TRAINING/EVALUATION STANDARDS:

To receive a SATISFACTORY rating the platoon must:

a. Prepare an order for movement to and occupation of its fighting position.
b. Properly assume responsibility for sector, including engineer obstacle(s).
c. Plan and coordinate direct and indirect fires.
d. Be ready to fight at specified time.
e. Direct effective fire against attacking OPFOR, hitting 70% of target within 40 seconds by day, within 60 seconds by night.
f. Treat and evacuate casualties, handle POW, maintain and resupply as required.
g. Plan and conduct a move to a subsequent position.
h. Communicate as required to 8th Division CEOI standards.

3. TRAINING/EVALUATION RESULTS:

Check SAT or UNSAT on the following pages of this T&EO to indicate the unit's proficiency on each task for this mission. Trainers/evaluators will record detailed observations of training deficiencies which need training emphasis. This T&EO should be provided the unit as a basis for future training. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards and the evaluators'/trainers' subjective judgement as to whether the unit would have been successful on the modern battlefield had it performed as it did on this mission. Circle one of the following to indicate the overall combat proficiency of the unit on this mission.

OVERALL PROFICIENCY: SAT UNSAT

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE OF A BATTLE POSITION (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-28-A Troop leading procedures.	Platoon in assembly area. Oral company team order, which includes: (1) Opposing force and friendly situation and mission, including positions of adjacent units. (2) Route of advance. (3) Artillery/mortar fire available upon request. (4) Fire plan, position sketch and range-cards. (5) Instructions to relieve engineer element working forward of position to complete obstacle per engineer plan. (6) Requirement to plan positions for two TOW's and two tanks within the platoon sector. (7) Priority of work. (8) Subsequent position for platoon. (9) Operations overlay. (10) Command and signal instructions, and latest time for readiness to fight.	Platoon Leader: (1) Issues warning order, stating the mission and critical times as a minimum, and instructions readying the platoon for mission. (2) Makes tentative plan based on team order and a map reconnaissance. (3) Coordinates any changes with the Company Team Commander. (4) Issues defense order to key subordinates.		
8-28-B Move to position.	In daylight, the platoon moves along assigned route to defensive position.	Platoon uses movement techniques appropriate for the terrain and OPFOR situation.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE OF A BATTLE POSITION (LIVE FIRE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-28-C Execute engineer obstacle plan.	An engineer element forward of position on arrival of platoon, working on obstacle; target folder requiring hasty protective minefield to extend obstacle.	Platoon: a. Properly accepts responsibility for target folder. b. Executes target (emplaces mines, marks, and records properly). c. Submits appropriate reports concerning obstacles.		
2-28-D Establish security.	Warning to platoon leader to expect OPFOR ground, helicopter, or attack air activity.	Platoon: a. Establishes continuous observation over avenues of approach. b. Monitors radios and observes communications discipline. c. Prepares security for night and reduced visibility.		
8-28-E Prepare position.	Constructed infantry fighting positions and defilade for APC's, sketch of positions, and range-cards. Construction materials (sand bags, trip flares and mines.	Platoon: a. Designates primary fighting positions with overlapping sectors of fire covering obstacle and avenues of approach. b. Provides fighting positions covered from direct and indirect fire. among fighting positions. d. Conceals vehicles, fighting positions and OP's. e. Positions TOW to provide long-range anti-armor fire, tanks to cover most dangerous mid- and short-range approaches. f. Secures TOW and tank positions with infantry. g. Employs DRAGON from or near APC's, seeking flanking, terrain-masked shots. h. Designates alternate positions as appropriate. i. Integrates direct and indirect fires to force attacker to button up, to suppress or obscure his overwatch, and to deny him covered or concealed approaches.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE IN A BUILT-UP AREA (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
		j. Plans indirect fires in front of, on, and behind position, including fires to cover movement within or from positions. k. Selects target reference points, coordinating same with company team. l. Reconnoiters subsequent position and plans move thereto. m. Completes preparation by specified time. n. Confirms rangecards for each fighting position, and the overall platoon plan; revises as required for completeness and accuracy.		
8-28-F-1 Defend (Day)	Array of targets representing an OPFOR probe of the platoon position exposed as follows: RANGE (M) / TARGETS PORTRAY			
1A	3000 to 1000 OPFOR recon element: moving BRDM(s) or cycle(s); stationary BMP(s) or tank(s); minimum three direct fire targets, and one indirect fire target.	Platoon: (1) Acquires, identifies, and reports targets. (2) On order, designates targets for tanks and/or TOW. (3) On order, calls for and adjusts indirect fire.		
1B	1000 to 500 OPFOR movement to assault position: moving and stationary BMP (s); ATGM (dismounted) firing (s); minimum four AFV exposed for 40 seconds, plus 2 ATGM (Flashes) to flank or rear AFV; 2 suppression targets (24m.X.3m).	(4) Hits three out of four AFV with DRAGON. (5) Suppresses ATGM by engaging within 20 seconds of firing; calls for indirect fire for suppression/obscuration.		

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UNIT: MECH INF PLATOON MISSION: DEFENSE OF A BATTLE POSITION (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-28-F-1 (cont) 1C	500 to 300 OPFOR dismounted assault: minimum two groups of 6E each, line and deep, each group exposed for 40 seconds.	(6) Hits 1/2.		
1D	300 to 175 Assault closing: minimum four groups of 4E each, line and deep, each group exposed for 40 seconds.	(7) Hits 3/4.		
1E	175 to 50 Final rush: minimum six groups of 4E each, line, each group exposed for 40 seconds.	(8) Hits 3/4, plus steady M203 fire into defilade areas, and M-18 AP mines fired as appropriate.		
1F	100 to 50 Rifle/grenade (mortar) fire from defilade.	(9) M203 respond with steady fire, hits within 25 meters.		
1G	150 to 50 Single OPFOR tank (stray from another platoon sector) attempting to exfiltrate: manned target tank with protected engine, and sponson boxes, or hulk with screen.	(10) Four LAW subcaliber hits.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE OF A BATTLE POSITION (LIVE FIRE

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-28-F-2 Defend (Night)	Array of targets representing an OPFOR probe of the platoon position, sequentially exposed as follows RANGE (M) — TARGETS PORTRAY	Platoon: (1) Acquires, identifies, and reports targets. (2) On order, designates targets for tanks and/or TOW. (3) On order, calls for and adjusts fire.		
2A	3000 to 1000 — OPFOR recon element: moving BRDM(s) or cycle(s); stationary BMP(s) or tank(s); minimum three direct fire targets and one indirect fire target. All vehicles with IR driving light and station-keeping markers active.			
2B	1000 to 500 — OPFOR movement to assault position: moving and/or stationary BMP(s); ATGM (dismounted) firing (s). Minimum two BMP, range 700-500m, both with IR driving light active, and both backlighted by burning vehicle, exposed for 60 seconds. Supported by minimum two ATGM (flashes) range 800-600m. Two suppression targets (24m X .3m).	(4) Hits one out of two BMP with DRAGON. (5) Suppresses ATGM within 20 seconds of firing; calls for indirect fire for suppression/obscuration.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE OF A BATTLE POSITION (LIVE FIRE)

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-28-F-2 (cont) 2C	500 to 300 OPFOR dismounted assault: minimum one group of 6E, line and deep, exposed for 60 seconds, group backlighted with burning vehicle, or lighted by tank searchlight from adjacent platoon.	(6) Hits 2/3.		
2D	300 to 175 Assault closing: minimum two groups of 6E each, line and deep, each group exposed for 60 seconds, sequentually, each group either backlighted by burning vehicle, equipped with blinkers simulating assault fire.	(7) Hits 2/3.		
2E	175 to 50 Attempt to breach obstacle: minimum six groups of 4E each, line, each group exposed sequentially for 60 seconds, each group either backlighted by burning vehicle or trip flare, or equipped with blinkers simulating assault fire.	(8) Hits 3/4.		
2F	100 to 50 Rifle/grenade (mortar) fire from defilade.	M203 respond with steady fire, hits within 25 meters.		

TRAINING AND EVALUATION OUTLINE

UNIT: MECH INF PLATOON MISSION: DEFENSE OF A BATTLE POSITION (LIVE FI

ID#/TASK	CONDITIONS	TRAINING/EVALUATION STANDARDS	S	U
8-28-G Treat and evacuate casualties	Members of TOW (tank) crew WIA.	Platoon: a. Reports casualties. b. Administers first aid (4 lifesaving steps). c. Evacuates WIA promptly.		
8-28-H Handle prisoners	Group of one officer, one NCO, two soldier POW.	Platoon silences, searches, segregates and speedily evacuates POW.		
8-28-I Communicate.	Telephone wire from company team CP, and orders to emplace a directional antenna and maintain listening silence.	Platoon communicates: -- By wire when possible; all vehicles, platoon and squad leaders and OP's interconnected. -- By visual signals as necessary. -- By radio, using a properly oriented and mounted directional antenna, as required; using a whip antenna in emergency only.		
8-28-J Reorganize and replenish.	Given casualties, vehicular damage, and ammunition expended within the platoon.	Platoon reorganizes, maintains, resupplies and evacuates as required.		
8-28-K Move to subsequent position.	Given company team order to occupy subsequent position.	Platoon: a. Moves quickly over planned route, providing for overwatch, and for obscuration or suppression of OPFOR elements. b. Occupies subsequent position without hesitation, and continues engagement, or commences improvement of the new position.		

TAB A TO APPENDIX 28 TO CHAPTER 8
SUGGESTED SUPPORT REQUIREMENTS
UNIT: MECHANIZED RIFLE PLATOON
MISSION: DEFENSE IN A BATTALE POSITION (LIVE FIRE)

1. ADMINISTRATION:

a. This evaluation can be connected by scenario that of Appendices 10 and 11, 16, 21, or 32, and can be combined with that of Appendix 25 (Defense Against Aircraft).

b. Chief Evaluator functions as Company Team Commander. Supporting elements (e.g., tanks or TOW) can be attached to the platoon, or remain under "Team" control. A FIST element will be provided, or represented by an evaluator.

c. Positions should be prepared, except for fresh camouflage, baling, and similar minor upgrading.

2. MINIMUM EVALUATORS: One Chief Evaluator (officer with platoon leader experience); one senior NCO (platoon sergeant experience), one NCO per squad.

3. OPPOSING FORCE: Four POW's with appropriate uniforms, weapons, and documents.

4. SUPPORT TROOPS:

a. FIST element (minimum one FO).

b. One Company Team RTO.

c. Four casualty players, preferably medics with moulage wound kits.

d. Medic(s) for range; may participate in evacuation of "casualties".

e. Range operations personnel and ammunition detail, as necessary.

5. VEHICLES/COMMUNICATIONS:

a. Jeep for Chief Evaluator, with radio.

b. Range radio and telephones.

c. Telephones and wire to establish wire link from Company Team to platoon.

d. Ammunition truck.

6. MANEUVER AREA: Route from Assembly Area to defensive position preferably 3-5 km, but as little as 1 km will suffice, if a subsequent position can be designated in that space.

7. FIRING AREA: Should provide 3 km observation and fields of fire. Preferably should accommodate firing tank cannon and indirect fire, plus DRAGON, .50 caliber machine gun, M60 and M16's in event tanks and/or indirect fire not feasible, .50 caliber fan governs.

8. TRAINING AIDS, DEVICES, AND SPECIAL EQUIPMENT:

a. Radio-controlled pop-up or cable pull-up targets.

b. In event DRAGON missiles not used, substitute REALTRAIN techniques, tracker trainer, or TVT; four sets simulation devices required.

c. Training mines (number function of length minefield) and other obstacle materials.

9. AMMUNITION: See Chapter 12.

10. KEY REFERENCES: FM 7-7, FM 71-1, FM 71-2, FM 90-10, TC 7-3-1, TC 7-1, FM 17-12, TC 71-5.

11. TIPS FOR TRAINERS/EVALUATORS:

a. If necessary, all adjacent and supporting units/elements can be represented by evaluators.

b. Hand or radio-controlled pull-down screens placed in front of hulks may provide for selected presentation of LAW or DRAGON targets (e.g., LAW target, Task 8-24-F-1G).

c. For Tasks 8-24-F-1F and 8-24-F-2F, use of TP grenades will be safer and more convenient. An evaluator should be stationed to observe strike of rounds. In event natural defilade is not available, a simulated draw or wash will be staked or outlined with brush.

d. These tasks may be trained in garrison, LTA, and MRA as well as MTA via use of sandtable, TEWT, subcaliber and plastic munitions, and REALTRAIN techniques.

TAB B TO APPENDIX 25 TO CHAPTER 8
TRAINING OPTIONS
UNIT: MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE OF A BATTLE POSITION

GARRISON/LTA	MRA	MTA
8-28-A Troop Leading Procedures 8-28-C Execute Engineer Obstacle Plan 8-28-D Establish Security 8-28-E Prepare Platoon Positions 8-28-F-1 Defend Day 8-28-F-2 Defend Night 8-28-G Treat and Evacuate Casualties 8-28-H Handle Prisoners 8-28-I Communicate 8-28-J Reorganize and Replenish	All Tasks listed for Garrison, plus: 8-28-B Move to Position 8-28-E-d and e Conceals Vehicles and Positions Tanks. 8-28-K Move to Alternate Position	All Tasks listed for Garrison and MRA.

TAB C TO APPENDIX 28 TO CHAPTER 8
TRAINING TIPS
UNIT: MECHANIZED INFANTRY PLATOON
MISSION: DEFENSE OF A BATTLE POSITION

TASK: 8-28-F (Defend; Day/Night)

1. PURPOSE: To train a Mechanized Platoon in Garrison enviornment through the use of scalar range/plastic ammunition and/or laser weapons simulators and laser adapted targets.

2. CONCEPT:

a. Plastic ammunition enables the unit to train this task in conjunction with other individual and collective tasks in a restricted training enviornment. The firing proficiency of the platoon using plastic ammunition on a 1:10 scalar range can be evaluated and compared to ARTEP standards.

b. Laser weapon simulators provide flexibility by providing the option of firing on 1:10 scalar ranges with scalar laser targets or full scale engagements with laser adapted pop up targets or laser equipped OPFOR units. Firing proficiency can be evaluated and related to ARTEP standards.

3. SCHEDULE OF UNITS AND SEQUENCE OF EVENTS:

a. Each platoon will be allocated two hours to complete this task (1 hr day, 1 hr night).

b. Firing will be initiated by squad as targets appear. Cease fire command will be controlled by platoon leader.

c. Upon arrival at the training site each platoon will be given a safety briefing and instructions on use or mounting of training devices or equipment.

d. The appearance of targets (OPFOR Probes) will be controlled by the evaluator.

4. ADMINISTRATION: N/C

5. MINIMUM EVALUATORS: N/C

6. SUPPORT TROOPS:

a. Laser equipped OPFOR unit must have a 1:2 superior combat power ratio. Exact manning level as desired.

7. VEHICLE/COMMUNICATIONS: 2-¼ ton vehicles with trailers for transporting targets/ammunition.

8. MANEUVER AREA: Within limitations or garrison.

9. FIRING AREA (Plastic/Training Ammunition Only): 300 by 700m area which can be temporarily restricted as an impact area.

10. AMMUNITION: All service ammunition deleated.

a. Plastic ammunition for M16, M60 and M2

b. 81mm Mortar SABO

c. 35mm M72A2 LAW Sub-Cal

d. M203 Practice

e. Pyrotechniques as permitted by local regulations

11. TRAINING DEVICES AND EQUIPMENT:

a. Laser weapon simulators for M16, M60, M2, LAW, DRAGON, TOW and Tank

b. Targets: 48 pop-up of one of the following types:

1) Full scale (mechanical with E and F silhouettes)

2) 1:10 scale (manual) (Incl 1)

3) 1:10 scale (laser)

c. Plastic ammunition adaptors as required:

1) M16 and M60 bolts

2) M2 Barrel

12. KEY REFERENCES: N/C

13. TIPS FOR TRAINERS:

a. Bolt adaptors and special barrels are required to fire plastic ammunition. These should be installed and tested prior to training.

b. Standards E and F silhouettes do not react properly to the impact of plastic projectiles and could produce inaccurate firing data. Allumimum silhouettes can be obtained from the target manufacturer and will provide precise results.

c. Goggles should be worn when firing at targets within ranges of ten meters.

d. 1:10 scale manually operated targets can be locally fabricated using materials commonly found in the unit (Incl 1).

e. Laser equipment must be fully charged and a recharging capibility on hand during cold weather to insure continuous training.

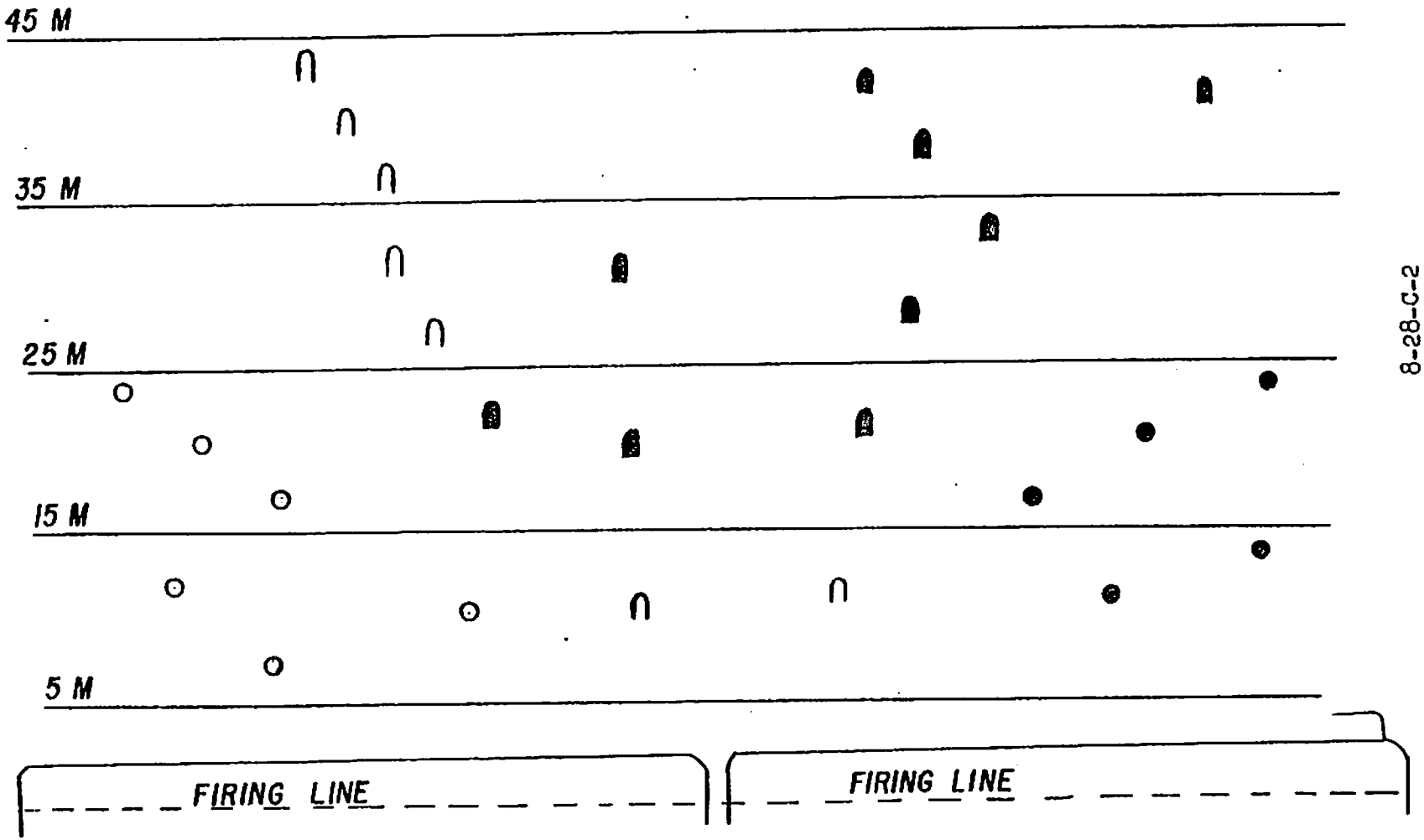
f. POC for additional information: S-3, 3d Bn 28th Inf, WAB MIL (2355) 5941.

Inclosure 1 to TAB C to Appendix 28 to Chapter 8

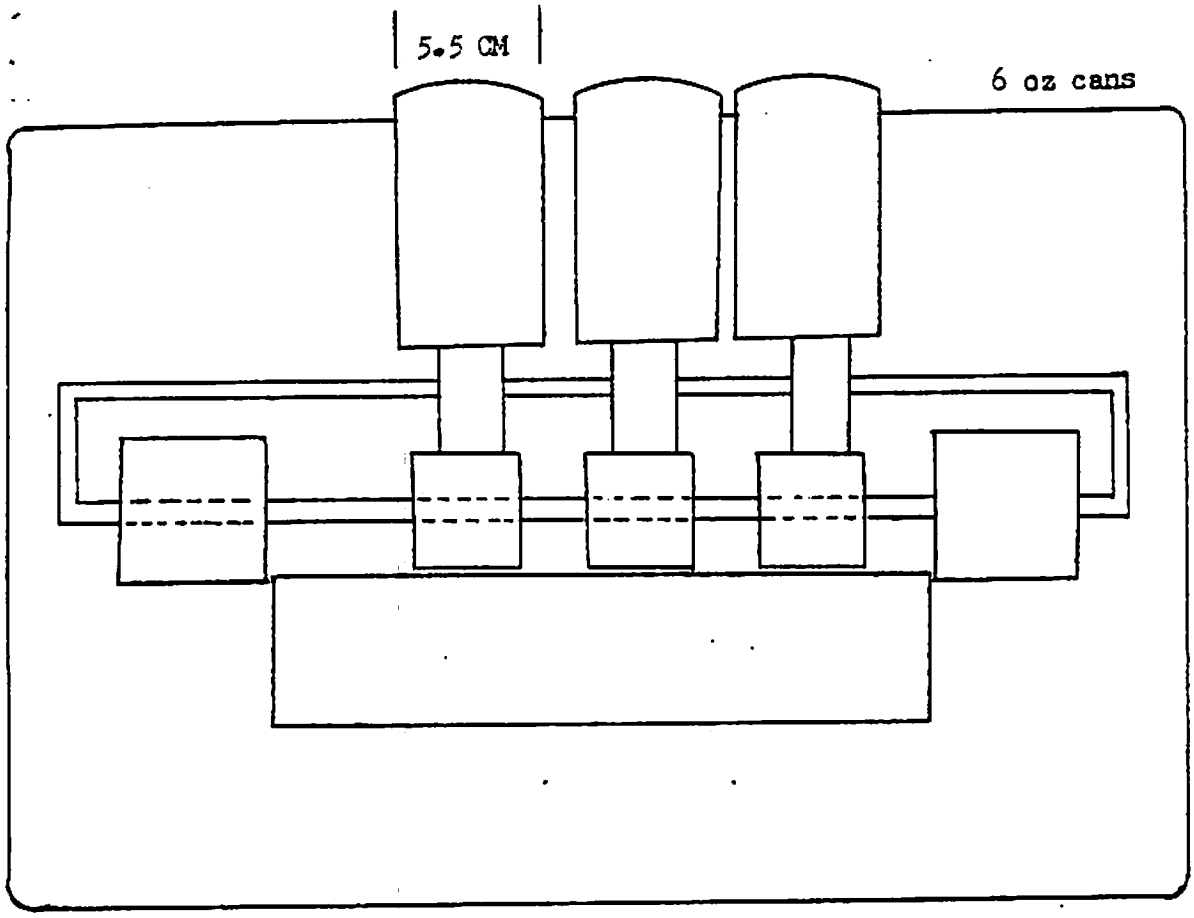
8ID SUPPL
ARTEP 71-2
11 Dec 78

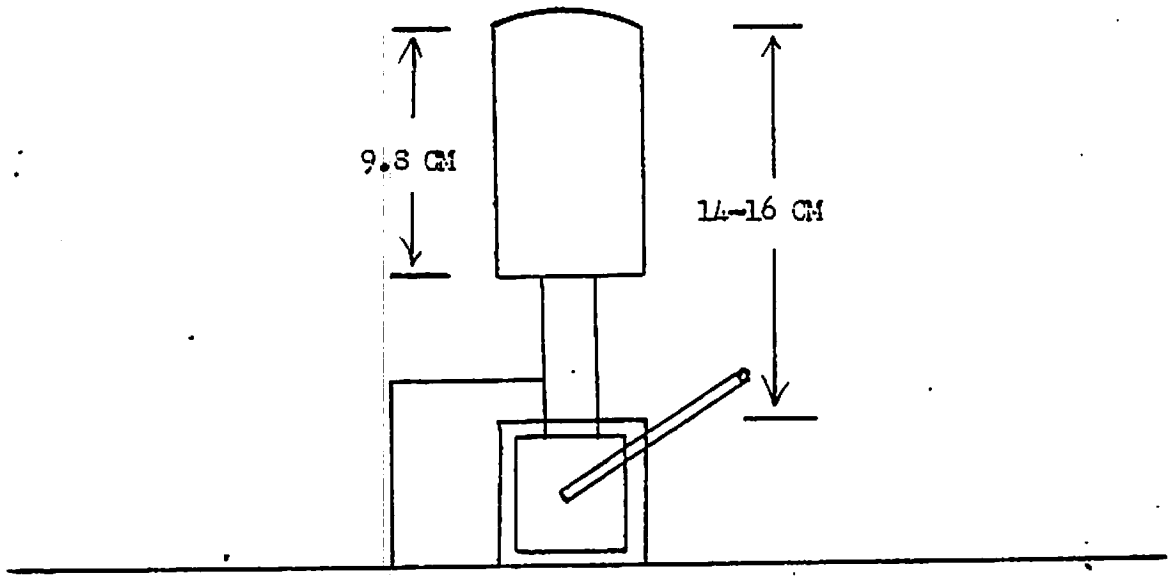
8-28-C-2

SUGGESTED RANGE LAYOUT (1:10 SCALE)



△ AV Target ∩ Group Target (5 ea) ○ Single Target





Incl 2 to TAB C to Appx 28 to Chapter 8

APPENDIX 2
Pocket Card Terrain Reinforcement

Unofficial Translation

Pocket Card

Construction of Field Fortifications

January 1978

Drafted in accordance with ZDv 3/11 "Gefechtsdienst aller Truppen"
"Combat Duty of All Troops"
ZDv 3/760 "Feldbefestigungen"
"Field Fortification"
EAnwAusb Inf Nr 2/76 "Das Erdarbeitsgerät"
"The Excavator"

This pocket card will be issued to subunit leaders and company commanders of the infantry and to subunit leaders (platoon leaders or leaders in a corresponding position) of all the branches of the Army.

1. Types and Designs of Field Fortifications

- Fighting positions, firing trenches
  + Fighting position for small arms
  + Fighting position for recoilless AT rifles (rocket Launchers)
  + Fighting position for ATGM MILAN
  + Fighting position for a machine gun on an anti aircraft tripod
  + Fighting positions for fighting vehicles
  + Fighting positions for artillery pieces,
  + Firing trench;

- Shelters
  + Small dugout
  + Medium dugout
  + Large dugout
  + Connecting trench
  + Hull defilade-positions for wheeled vehicles and supplies;

- Additional Facilities
  + for obtaining, purifying, storing and distributing water,
  + for drainage (ditches, shafts, sumps),
  + for maintaining the soldier's health (washing facilities, latrines).

2. Principles for the Construction of Field Fortifications

- Standing task of all troops
- to build them as strong and as durable as permitted by the given conditions

- Points to be considered while reconnoitering:
  + mission of the company/platoon/squad (Can you do your job in the location ordered?)
  + approach routes of the enemy and the effects of his weapons,
  + your own fields of fire and observation (flanking fire); protection against enemy heavy flat trajectory weapons is more important than a clear field of fire to your maximum combat range.
  + fire coordination from individual firing positions or from the positions of individual squads/platoons,
  + repositioning of forces at night and during periods of reduced visibility
  + camouflage and deception (e.g. Choose a dark background for fighting positions with overhead cover!),

+ the location of the field fortification should blend with the surrounding terrain; make use of natural cover (e.g. holes in the ground, ditches, road cuttings, dips), avoid open terrain and conspicuous terrain features,
+ clear backblast zone for recoilless rifles,
+ stake out the dimensions of the field fortification and point out the field of fire and/or the place to dump the excavated soil (especially when employing excavators),
+ the available time,
+ construction materials and equipment,
+ personnel
+ type of soil,

- Before you start building determine if you can accomplish your mission at the designated site; if not report a more favourable position to your company commander/platoon/squad leader; he will decide about the final location of the position,
- plan and organize efficiently; use and coordinate all the time, personnel and materials available (time tables, records on available materials, breakdown timetable for the various stages of construction)
- Place the priority on the construction of fighting positions (recoilless rifle, machinegun, snipers); the construction of the communications firing trench is dictated by the location of the fighting positions
- when building your position keep in mind that you must be able to cover your designated field of fire - especially the part close in front of your position - with fire,
- if possible, build the actual positions during darkness
- camouflage continously; camouflage exavated soil immediately and camouflage the tracks of equipment as soon as possible,
- always post security forces while working
- the BnCdr (or Cdrs in an equivalent position) decide on
  + the type and the design of the field fortifications (with regard to time, construction equipment and materials and the consistency of the soil),
  + the priorities,
  + if applicable, the employment of excavators (decide on point of main effort!)

- CoCdr (or a leader in an equivalent position) considers the time, location and forces available and decides on
  + the priorities of construction) Breakdown timetable
  + the employment of machinery and equipment) for all stages of
  + the assignment of materials) construction
  + mutual support
  + security forces
- The PltLdr (or Ldrs of equivalent position) coordinates all the work (e.g. controlling the work, working in shifts) and organizes the conduct, and controls the employment of the excavator if applicable,
- The squad leader (or any leaders in an equivalent position)
  + supervises all the work done by his squad
  + checks the fields of fire and observation and camouflage
  + gives instructions to his soldiers concerning the construction
  + assists in digging only if required by the situation.

3. Types of Soil, Equipment and Materials Required, Performance Data

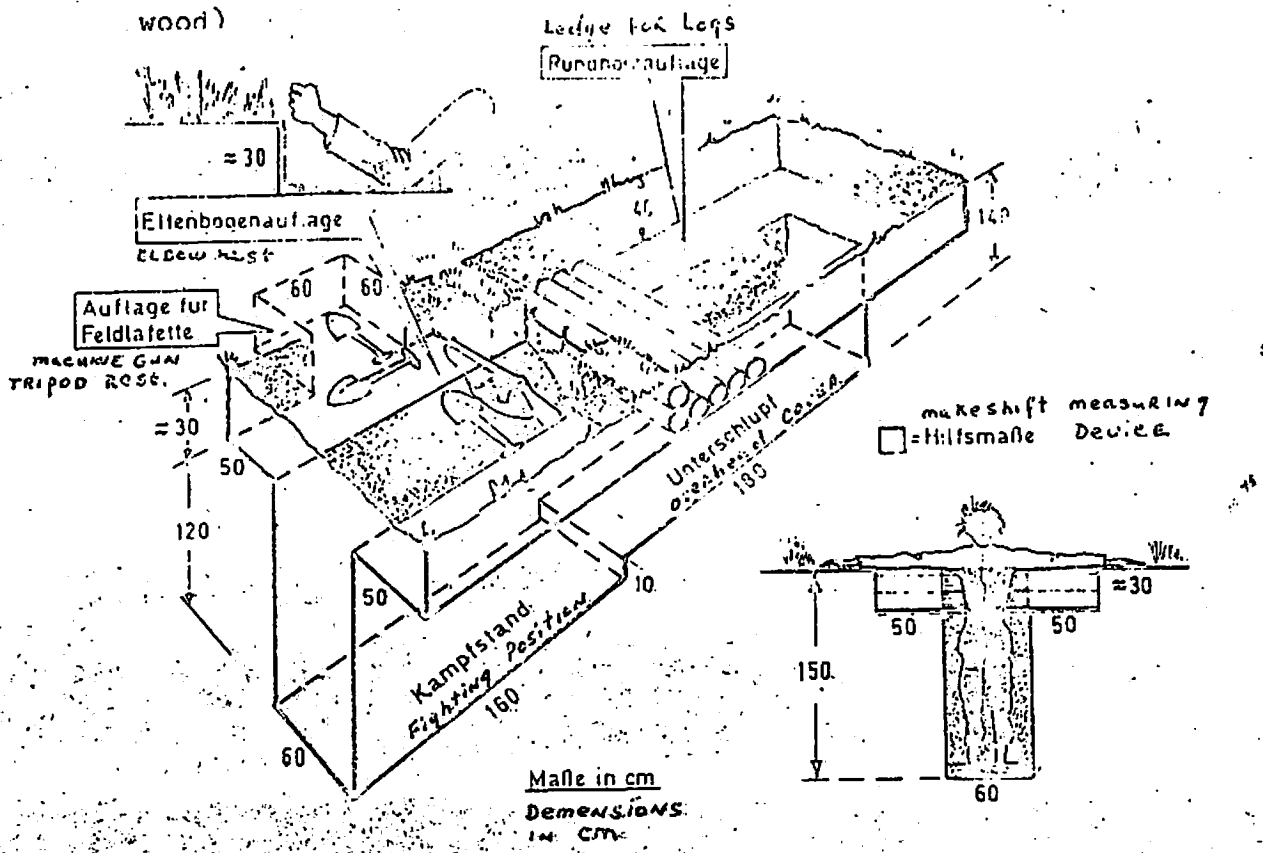
Types of Soil

Soil Classification 1)	Description	Equipment/Materials	Performance[2]
I Soils workable with shovels	Topsoil; soil containing water e.g. swamp, peat, loose or slightly loamy sand and gravel	entrenching tool, shovel, spade, excavator	cubic meters per hour per soldier: 0.6
II Soft soil	Cohesive soil such as strongly loamy sand, loam, marl, loess; very cohesive when wet.	entrenching tool, spade, mattock excavator	0.4
III Hard soil	Tough soils such as fat, stiff clay, or parched, heavily cohesive soils and soils of class II intermingled with rocks,	mattock, drills excavators	0.3
IV Rock workable with mattocks	loosely layered types of rock, strongly jointable, friable, brittle, consolidated sand and gravel layers; rocks larger than head-size,	mattock, drills excavators[3]	0.2
V Rock workable with demolitions	Rocks and stones over 0.1 cubic meters [3]	drills demolitions	hot predictable

1) Frozen soil is to be classified in classes II to V depending on its composition and its moisture.
2) Only applicable for excavations not exceeding 1.80 meters (6 feet) deep.
3) Only with restrictions and a great time requirement.

4. Construction of Fighting Positions (Examples)

4.1. Fighting position for small arms with overhead cover (made of wood)



Materials: 18 logs, 15 cm in diameter, 160 cm long,
2 clamps
1 ground sheet (a sheet 1.70 m x 2.60 m issued with five nylon strings and ten anchors)/3 sq. meters of roofing felt/ similar material.

Equipment: 1 spade, 1 mattock, 1 shovel, 1 bowsaw.

Construction cycle:

1. Stake out the dimensions (340 cm x 60 cm),
2. remove sod from the marked area and, if necessary, also from the place where excess dirt is to be dumped.
3. Excavate the rough form with an excavator or do it manually.
4. Dig the elbow rest and the log ledge (dig out the log ledge beyond the covered space so that two logs can be placed there) and a machine gun tripod rest is necessary.

5. Put the logs in. Two should be put on top of one another in front to prevent dirt sliding into the position; clamp these logs together or tie them together with wire.
6. Cover the logs with a ground sheet, roofing felt or similar material.
7. Put dirt back on, shape it up, make it look natural and camouflage it.

4.2. Fighting position for small arms with overhead cover (made from guide rails)

Materials: 3 guide rails (430 cm long, 31 cm wide).
Equipment: 1 spade, 1 mattock, 1 shovel, 1 acetylene torch (maintenance platoon) for cutting the guide rails.
Construction cycle: See fighting position with wooden overhead cover, in addition:

- Cut the guide rails into sections of 143 cm,
- Put the sections on the ledge (place them alternately so that the rails hook into each other).

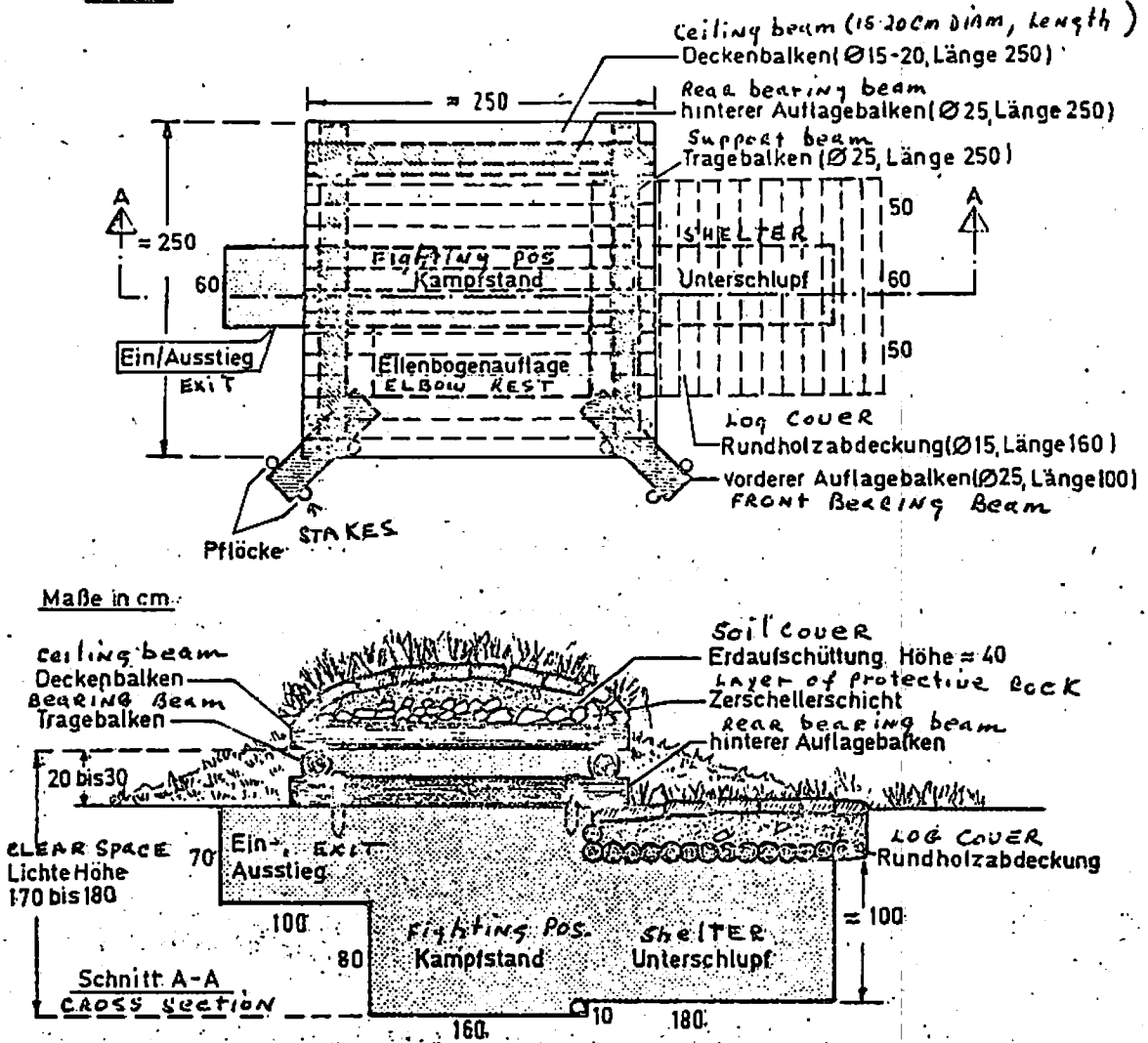
4.3. Fighting position for small arms with overhead cover (made of sandbags)

Material: 7 long sandbags.
Equipment: 1 spade, 1 mattock, 1 shovel.
Construction cycle: See fighting position with wooden overhead cover, and in addition:

- Excavate covered space as depicted in the drawing.
- Fill the sandbags (but not completely!)
- Curve the sandbags starting from the rear of the covered area; put in the sandbags with a slight tilt to the rear wall and bend them so far that the ends conform to the ledge; improve the round form.

Note:
Guide rails are found on all autobahns and along roads at clangerons curves in the Bundesrepublik. They are easely removed with a wrench and are ideal material for building.

4.4. Bunker for small arms with overhead cover, open on three sides (covers of the fighting position and the shelter are made from logs)



Material: 3 logs 25 cm in diameter and 250 cm long; 2 logs, 25 cm in diameter, 100 cm long; 17 logs 15 cm diameter, 250 cm long; 18 logs, 15 cm diameter, 160 cm long; 16 stakes, 60 cm long; 12 clamps, 3 kilograms of nails, 210 mm long; 1 roll of plain wire; 2 ground sheets/ 9 sq.meters roofing felt/similar material.

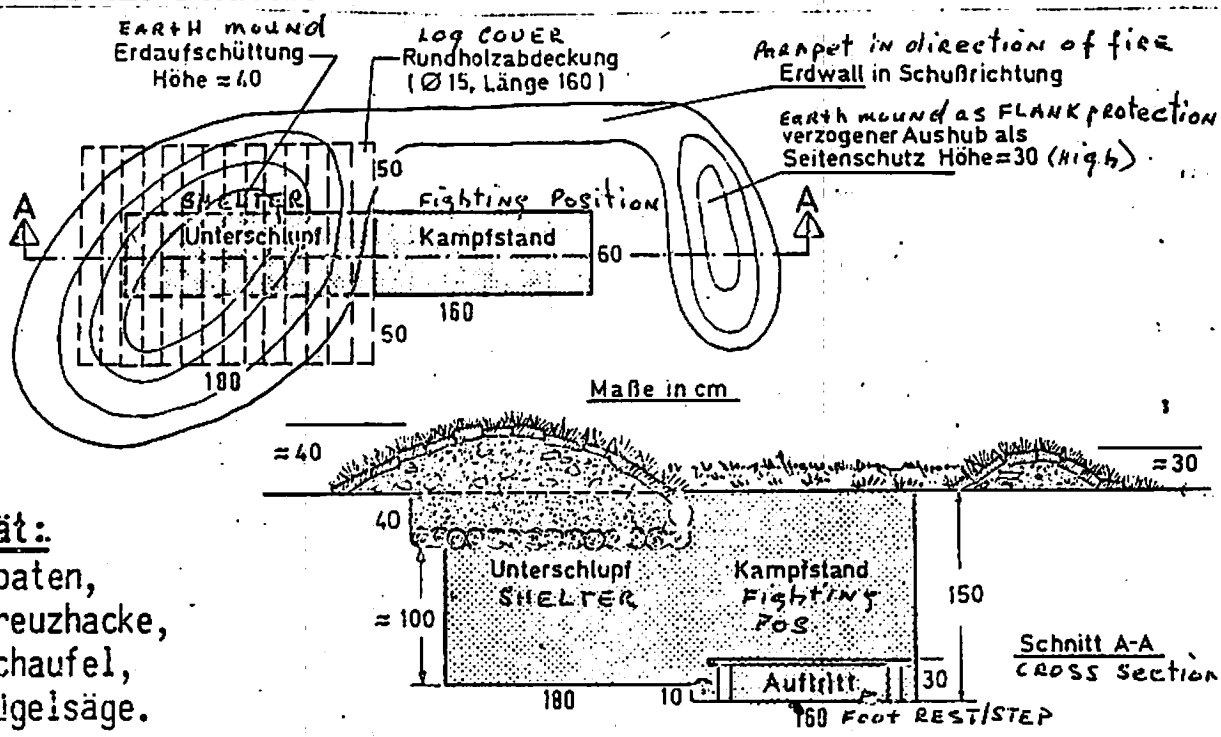
Equipment: 1 spade, 1 mattock, 1 shovel, 1 bow saw, 1 axe.

Construction cycle: See fighting position with wooden overhead cover, in addition:

- Excavate the entrance/exit.
- Put in the rear bearing beam and fix it with stakes. Put down the front bearing beams so that their ends do not project into the fighting position and so that the supporting beams rest in their center if possible, secure them with stakes.
- Clamp the bearing and the supporting beams together.
- put on the ceiling beams and nail them tightly. Clamp some of them together.
- Cover it with the ground sheet, the roofing felt or similar materials.
- Set up sods or sandbags as a protection against falling dirt.
- Cover the roof with soil (abput 40 cm high) and camouflage it.
- Camouflage the shadow created by the hole.

4.5. Fighting position for recoilless rifles

- defilade position (without elbow rest) for recoilless riflemen and riflemen,
- build a foot rest according to your size (clear backblast zone)
- Pile up the excavated dirt on both sides, most of it on top of the shelter.



Gerät:
1 Spaten,
1 Kreuzhacke,
1 Schaufel,
1 Bügelsäge.

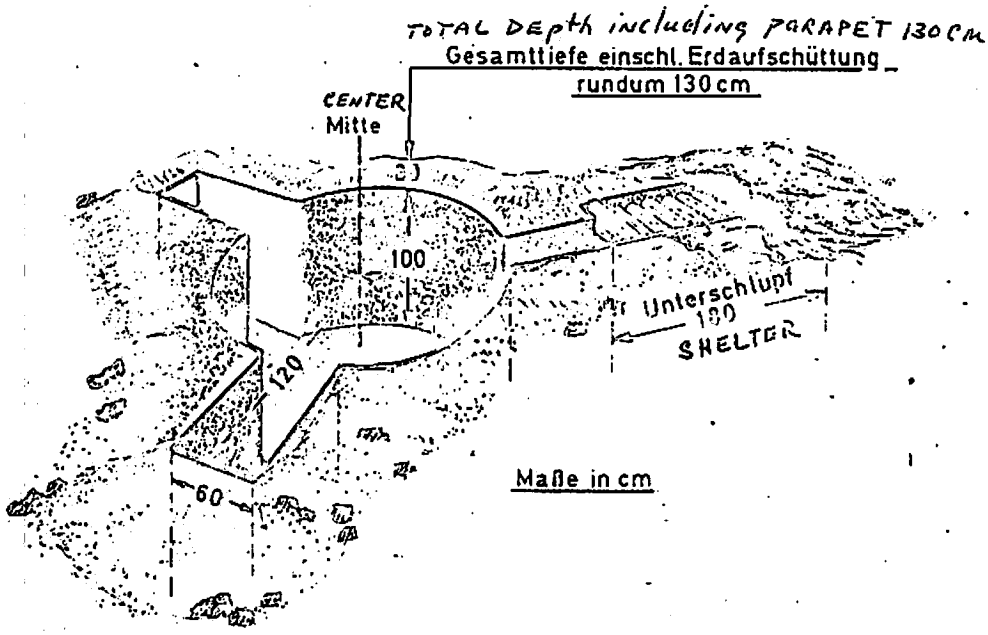
Baustoffe: 18 Rundhölzer, Ø 15 cm, Länge 160 cm; 2 Bauklammern; 1 Deckungsplane/3 m² Dachpappe/ähnliches Material.

Equipment: 1 spade, 1 mattock, 1 shovel, 1 bowsaw.

Materials: 18 logs, 15 cm diameter, 160 cm long; 2 clamps; 1 ground sheet/3 sq. mtrs roofing felt/similar material.

4.6. Fighting position for a machinegun on an anti-aircraft tripod with shelter

Gerät:
1 Spaten,
1 Kreuzhacke,
1 Schaufel,
1 Bügelsäge.

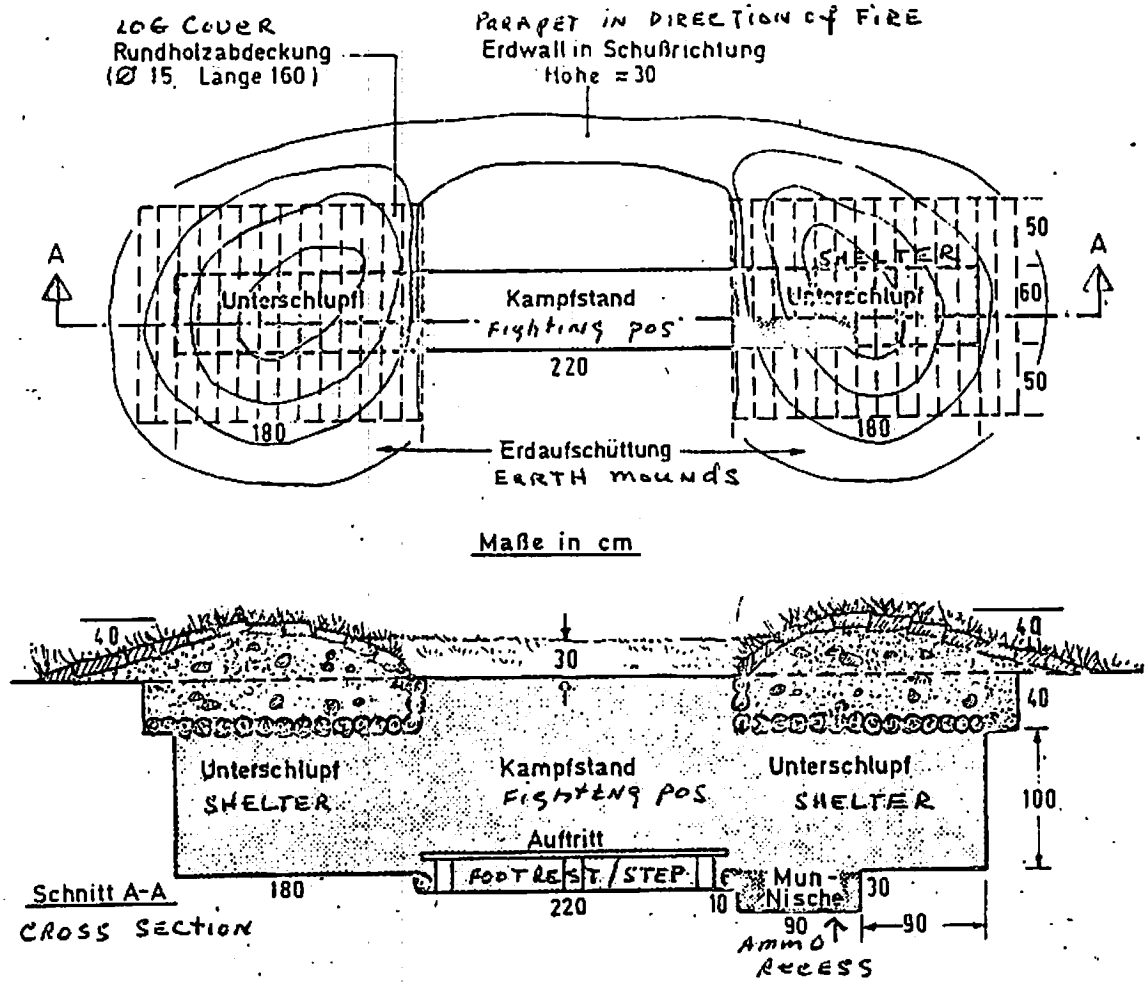


Baustoffe: 18 Rundhölzer, Ø 15 cm, Länge 160 cm; 2 Bauklammern; 1 Deckungsplane/3 m² Dachpappe/ähnliches Material.

Equipment: 1 spade, 1 mattock, 1 shovel, 1 bowsaw.

Materials: 18 logs, 15 cm diameter, 160 cm long; 2 clamps; 1 ground sheet 3 sq mtrs roofing felt/similar material.

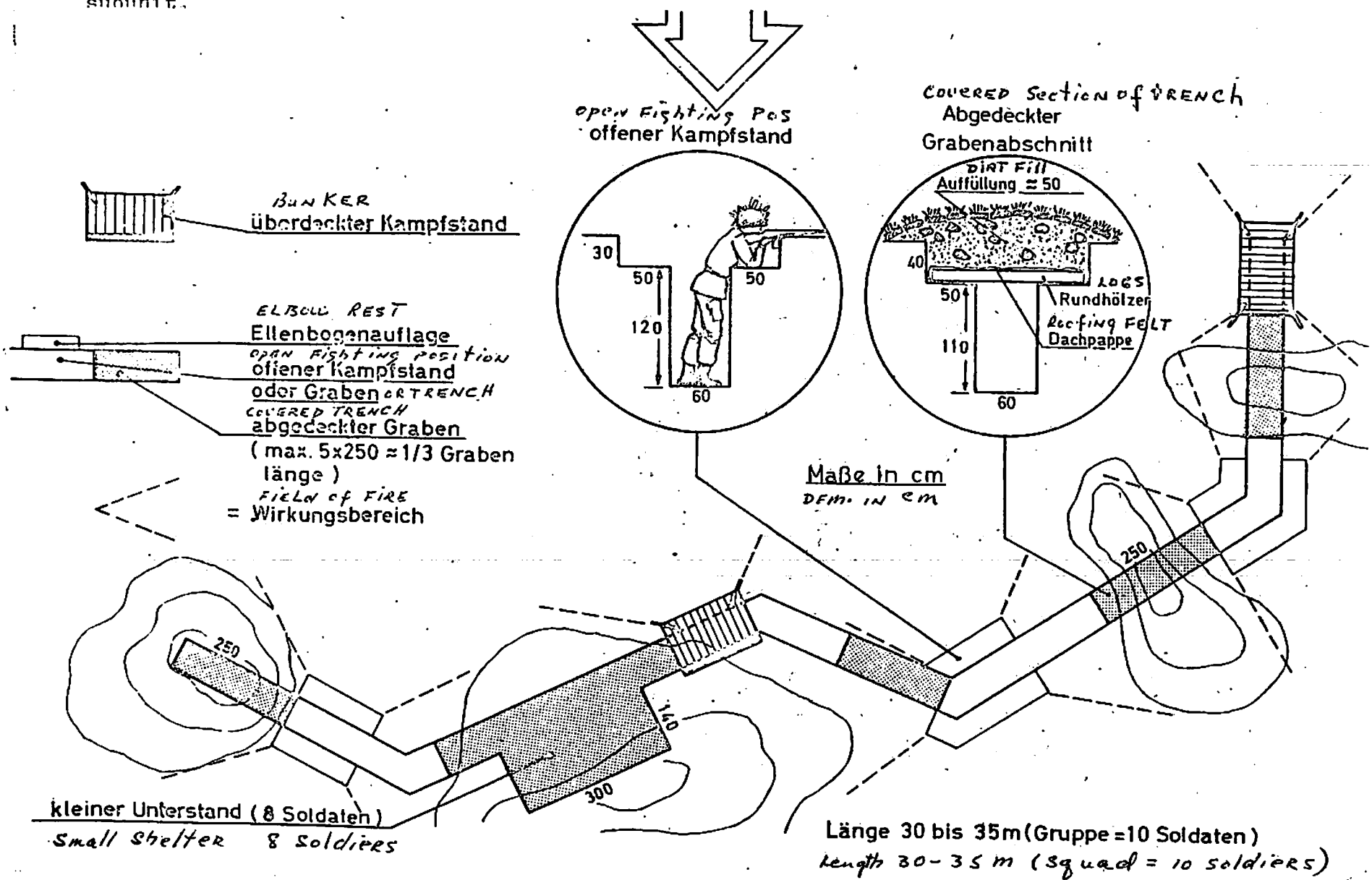
4.7. Fighting position for ATGM MILAN (open, with logs)



- Keep the line of fire or your backblast zone free of excavated soil.
- Excavate an ammunition recess 90 x 25 x 30 centimeters.
- Set up a parapet in your line of fire (30 cm high) <u>which slopes to the front</u> as a protection against observation and flat trajectory fire. Assume your firing position with your weapon to make sure that the parapet is not too high.
- Build a foot rest.

4.8. Firing trench with a small shelter

Fighting positions (at least one of them with overhead cover) and shelter for one squad/similar subunit.



Materials:

- Log construction

  14 logs, 25 cm diameter, 300 cm long; 4 logs, 25 cm diam., 250 cm long; 17 logs 15 cm diam., 250 cm long; 85 logs, 15 cm diam., 160 cm long (for approx. 12 m overhead trench cover); 30 Stakes, 60 cm long; 22 clamps; 4.20 sq.mtrs boards, 1 inch thick, 140 cm long; 1 roll of plain wire; 8 ground sheets/ 30 sq.mtrs roofing felt/similar material; 1 kilogram nails, 80 mm; 3 kilogram nails 210 mm.

- Guide rail construction

  14 guide rails for 12 mtrs overhead cover (42 sections of 1/3 of the original length) 13 guide rails for the small shelter.

Equipment: 3 spades, 3 mattocks, 3 shovels, 1 chain saw, 1 bow saw, 3 claw hatchets, 1 acetylene torch (only for guide rail construction).

Construction cycles:

1. Reconnoiter the fighting positions, decide on the course of the trench (including the shelter) and the location for the excavated dirt.
2. Stake out the trench.
3. Brief the excavator driver.
4. Remove the grass sods (for fighting positions, trench, excavated dirt).
5. Excavator digs out a constant depth of 1.5 meters
   - first for the entire trench (if applicable also the ledge for the overhead cover),
   - and then the small shelter.

Notice: Consider your field of fire when you dump excavated dirt!

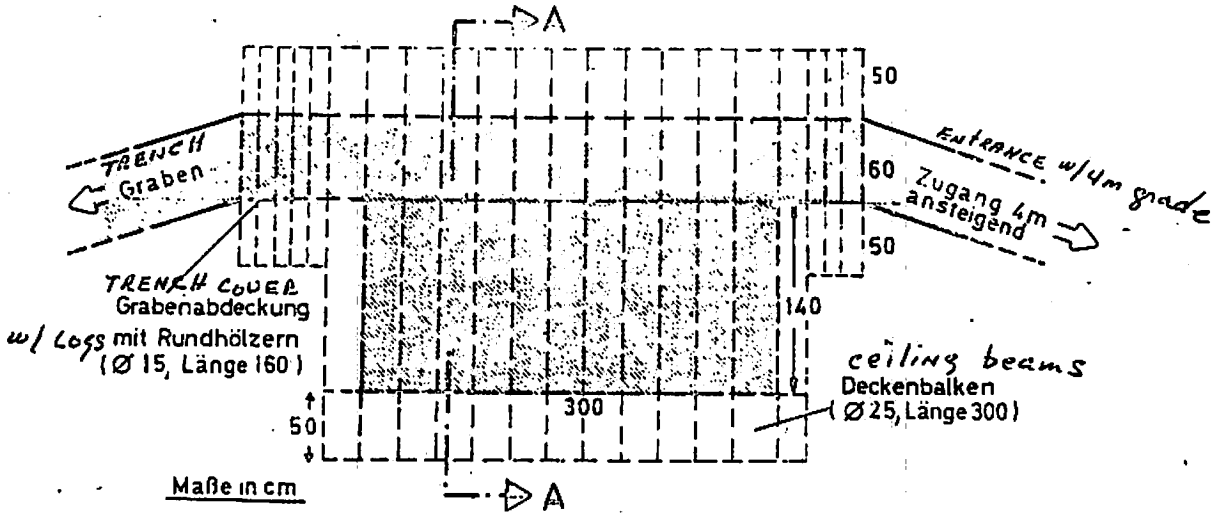
6. Straighten corners and edges, excavate elbow rests and overhead cover rests (if you haven't done it already), raise the foot rests in the open fighting positions for recoilless-rifles to 1.20 meters' depth.
7. Build in the logs or guide rails as trench overhead cover. Covered sections of trenches (at least 2.5 meters long) should be built close to a fighting position.

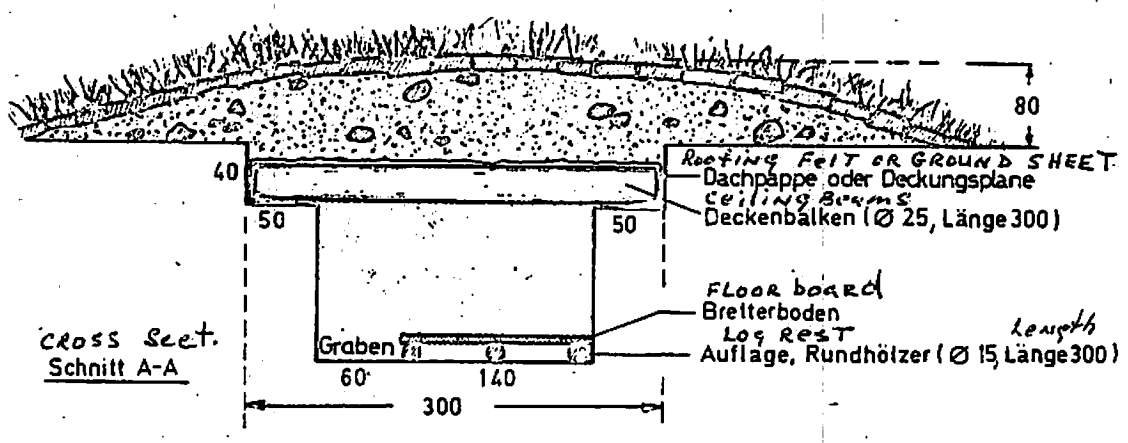
8. Fill up the covered sections with at least 40 centimeters of rocks and dirt.
9. Build floor boards (e.g. an old door) on a coarse grid of logs (15 cm diameter) and dress up the walls with gound sheets or shelter halves in the shelter.
10. Cover with logs or guide rails as overhead protection for the shelter.
11. Fill up the roof of the shelter with at least 100 cm of dirt and rocks.
12. Build an overhead cover for at least one fighting position.
13. Use the excavator or shovels to form mounds with the excavated dirt which blend with the terrain.
14. Camouflage the whole position including the excavated soil.
15. Build in additional facilities (e.g. recesses for ammo, drainage sumps etc.).

5. Construction of shelters

5.1. Small shelter

- accommodates 8 soldiers (e.g. 6 lying, 2 sitting),
- can be used for resting, first aid and storekeeping,
- its walls usually remain unreveted; however, if it is intended for use over a longer period of time they should be reveted.





- Log construction

14 Logs, 25 cm diam., 300 cm long; 24 logs, 15 cm diam., 160 cm long; (for 1.5 meters of trench cover on both sides), 3 logs, 15 cm diam., 300 cm long or 6 logs, 15 cm diam., 160 cm long (as a rest for the floor boards), 4.20 sq.mtrs boards, 1 inch thick, 140 cm long, 2 ground sheets/9 sq.mtrs roofing felt/similar materials, 12 clamps, 0.5 kilogram nails, 80 mm long.

- Guide rail construction

15 guide rails, 3 logs, 15 cm diam., 300 cm long, or 6 logs, 15 cm diam, 160 cm long (as rest for the floor boards), 4.20 sq.mtrs boards, 1 inch thick, 140 cm long, 0.5 kilograms of nails, 80 mm long.

Equipment: 2 spades, 2 mattocks, 2 shovels, 1 bowsaw, 1 claw ratchet, 1 acetylene torch (only for guide rail construction).

Construction cycle:

Construction of a single shelter (shelter and entrance trench):

1. Stake out the dimensions.
2. Remove the sod from the marked area and the place for dumping dirt.
3. Excavate the shelter with an excavator or do it manually.
4. Excavate the entrance at a slight slant with an excavator or do it manually; every trench form an entrance should be about 4 meters long and rising to wards its end.
5. Excavate the ledge for the cover of the shelter and the entrance.
6. Build in the floor boards which rest on log supports (3 logs, 15 cm in diam, 300 cm long or 6 logs, 15 cm diam, 160 cm long).
7. Cover the walls of the shelter with ground sheets or shelter halves.
8. Cover the shelter with logs or guide rails (31 cm wide, 300 cm long) as an overhead protection for the shelter, and connect the logs with clamps.
9. Emplace the logs or guide rails as a trench cover (31 cm wide, 143 cm long)
10. Put ground sheets, roofing felt or similar materials on the logs
11. Put 100 cm of dirt on the shelter and at least 40 cm on the trench cover.
12. Remove and blend the rest of the dirt with the terrain using an excavator and or manual tools.
13. Camouflage the whole shelter.
14. Build in recesses, benches, blackout curtains etc.

6. Average Time Required for Excavating Field Fortifications (in minutes, without breaks)

Type of field fortification	With excavator				Without excavator		
	soil classification[2]	I	II	III	I	II	III
Fighting position (smallarms) w/o shelter 2 soldiers	excavator	6	8	12			
	Finishing touches by Hand	+15	+15	+20	95	125	165
Fighting position(small arms) w/ shelter 2 soldiers	excavator	10	12	18			
	finish by hand	+40	+40	+50	190	270	360
Firing trench w/ small shelter 6 soldiers	excavator	100	120	260			
	finish by hand[3]	130	130	180	680	980	1290

1) Basic work time at optimum conditions. Additional time add: sloping ground 10 - 15%; old forest stand: 10%; dense, tall forest stand: 20%; Night: 10%; Rain: 10%

2) Additional time for varied types of soil: Soil class II: appr. 25%; - " - III: appr. 100%; - " - IV: appr. 200%

3) The finishing touches are already being made while the excavator is still working. Therefore the employment of the excavator and the finishing touches done by hand are made simultaneously.

7. Average times required [1] for the construction of field fortifications, disposing of the excavated dirt and camouflaging the position (w/o excavated dirt; in hours, w/o breaks)

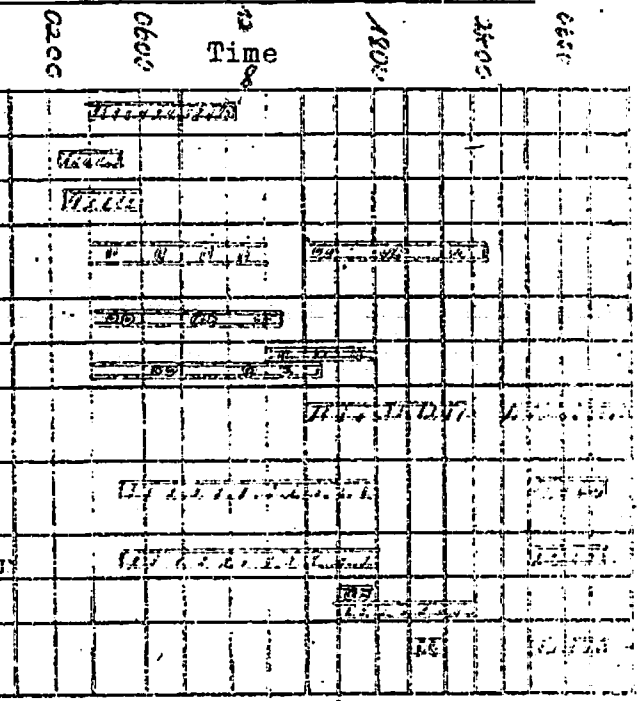
Field fortifications/personnel	construction and disposing of exc. dirt logs	guide rails	sandbags	camouflage foliage
Fighting position(small arms) w/shelter/2 soldiers	2 hrs	2 hrs	4 hrs	0.5 hrs
overhead cover for fighting position (small arms)/2 soldiers	3 hrs	2 hrs	-	0.5 hrs
F i r i n g trench[2] w/shelter, 1 covered f.pos./6 soldiers	6 hrs	5.5 hrs	10[3] hrs	2.5 hrs

1) Materials are already available 2) Dirt is disposed of with excavator 3) w/o shelter

Time Table for the Constuction of Field Fortifications (Example)

Breakdown timetable for the constuction done by B Company (excerpt) on 05/06 January 1978

Cons.No	Personnel	Task
1	1st Plt	Set up obstacles IAW barrier plan
2	1st Plt	Distribute the materials within the Co
3	1st-3rd Plt	Pick up and distributing mat within Plts
4	1st Plt	Excavate firing trenches and platoon shelter disp. exc.dirt
5	2nd Plt	Excavate firing trenches
6	3rd Plt	Excavate firing trench and Plt shelter
7	1st Plt	Finish firing trenches and Plt shelter, camouflage
8	2nd Plt	Finish fighting positions and firing trenches, camouflage
9	3rd Plt	Finish fighting pos + firing trench, Plt shelter
10	2nd Plt	Excavate Plt shelter; finish firing trenches
11	CoHQ, elm 3rd Plt	Excavate CoHQ shelter, finish and camouflage 4 fighting positions



Material and Equipment for the consecutive numbers of the construction time table

Con.No	Materials + Equipment
2	chain saw
3	3 trucks
4, 6	drill rig
4,5,6, 10 11	2excavators assigned from 050400 to 060200 = 22 hours

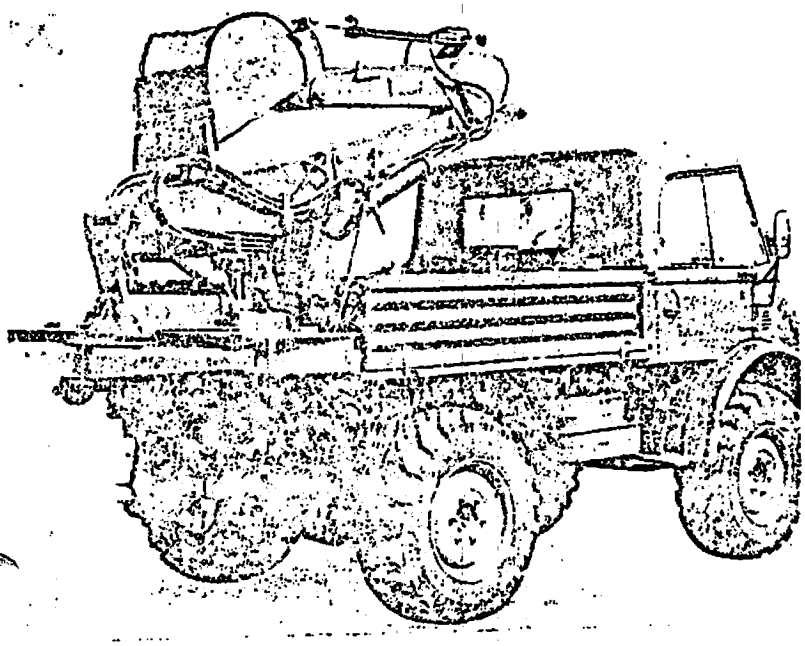
Legend

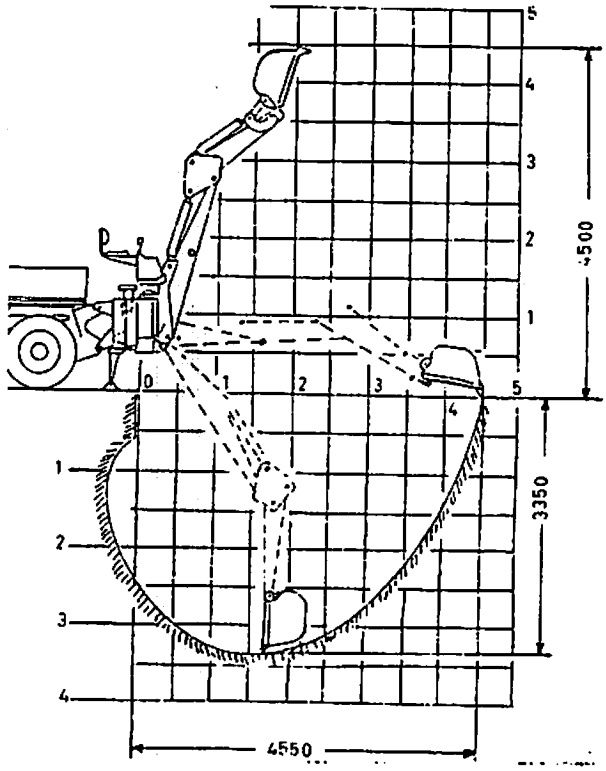
excavator 1:

excavator 2:

Description of Erdarbeitsgerät (Unimog)

Purpose:
The Erdarbeitsgerät is a hydraulic excavation machine mounted on an Unimog vehicle. It is assigned to infantry battalions in the Bundeswehr as organic equipment for construction of field fortifications.
(All infantry Bn - M 113; Marder; airmobile - 4 ea.)





Length:	5,30 m
Width:	2,21 m
Height:	3,25 m (for air or rail transport 2,90 m)
Weight:	4,5 t
Horse power (Diesel)	82 HP (62 Kw)
Speed:	75 km/h (on roads)
Turning radius (scoop)	180 °
Entrenching capability:	34 m^3/h
for example:	1 Fighting position for 2 soldiers: 11 min (3,40 m x 0,60 m. 1,80 m deep
	1 Squad Strong point: 1 hr (31 m x 0,60 m x 1,80 m)
Training time for operator:	3 weeks (ca. 140 hr)

APPENDIX 3

Weather Reference Data

Tab A Humidity Data For Forward Area

Sample Charts from Climatology Handbook for V Corps Forward Areas

Tab B Visibility Chart for Any January

Tab C Gale Winds for Any Year

Tab D Ground Conditions for Any January

Tab E Snow Depth for Any Year

Tab F Mean Monthly Temperatures

HUMIDITY DATA - 8TH ID FORWARD AREA

GROUND ELEVATION	AVERAGE PERCENT RELATIVE HUMIDITY												
	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
ALL ELEVATIONS	88	86	79	75	75	76	76	77	82	85	88	89	81
UP TO 349 METERS	85	82	77	73	73	74	74	77	79	83	35	86	79
350-699 METERS	90	87	81	76	75	76	75	78	82	85	90	90	82
ABOVE 700 METERS	91	90	81	77	77	80	79	77	86	87	92	92	84

Provided by Det 12, 7th Wea Sq
26 October 1978

AF FORM SEP 77 3134 GENERAL PURPOSE (10½" X 8") © U.S. G.P.O. 1977-701/175

VISIBILITY CHART FOR V CORPS FORWARD AREAS DURING JANUARY

HOURS OF THE DAY (LOCAL TIMES)	IF YOUR ELEVATION ABOVE SEA LEVEL IS IN ONE OF THE FOLLOWING THREE CATEGORIES YOU CAN EXPECT GROUND VISIBILITIES IN YOUR AREA TO BE AS SHOWN AT LEAST 90% (80%) OF THE TIME *		
	UP TO 349 METERS	BETWEEN 350-699 METERS	ABOVE 700 METERS
2300 - 0159	2200 (4700)	1100 (1800)	** (**)
0200 - 0459	1800 (2200)	** (1100)	** (**)
0500 - 0759	1100 (1800)	** (600)	** (**)
0800 - 1059	1100 (1800)	600 (1100)	** (**)
1100 - 1359	1300 (2200)	1100 (2200)	** (**)
1400 - 1659	1800 (2200)	1100 (3700)	** (**)
1700 - 1959	2200 (2200)	1100 (1800)	** (**)
2000 - 2259 -	3700 (4700)	1100 (2200)	** (**)

EXAMPLE: YOUR GROUND ELEVATION IS 600 METERS; LOCAL TIME IS BETWEEN 1000 AND 1359; YOUR GROUND VISIBILITY SHOULD BE 1100 METERS OR MORE AT LEAST 90% OF THE TIME, OR 2000 METERS OR MORE AT LEAST 80% OF THE TIME.

* WEATHER FACTORS SUCH AS FOG AND HAZE DETERMINE GROUND VISIBILITIES. DURING THE DAY YOU CAN EXPECT TO SEE OUT TO THE DISTANCES INDICATED. AT NIGHT YOU MUST USE NIGHT VISION DEVICES TO SEE THAT FAR.

** DATA TO OBTAIN EXACT DISTANCES IS NOT AVAILABLE. HOWEVER, THE DISTANCE TO WHICH YOU CAN EXPECT TO SEE EITHER 90% OR 80% OF THE TIME WILL BE LESS THAN 600 METERS.

TAB B

GALE WINDS IN V CORPS FORWARD AREAS DURING THE YEAR

Month	Determine you elevation. The figures under that column show the number of days that you can expect gale winds during the months in the left column.		
	Up to 349 meters	Between 350-699 meters	Above 700 meters
January	1	4	7
February	1	4	6
March	0	4	6
April	0	3	4
May	0	2	2
June	0	1	3
July	0	2	4
August	0	2	2
September	0	4	4
October	1	4	8
November	0	3	5
December	0	3	5

EXAMPLE: Your elevation is 710 meters, and the month is October. You can expect gale winds to occur 8 times during the month.

Gale winds are generally destructive in nature and can sometimes blow trees over. They can be expected also to blow tents, antennas, and other light contstruction facilities down unless these things are exceptionally well secured. In addition, it normally is not possible to fly helicopters/light airplanes during gale winds.

TAB C

GROUND CONDITIONS FOR V CORPS FORWARD AREAS DURING THE MONTH OF JANUARY

	Determine your elevation above sea level. Figures under that column show the number of days the conditions in the left column are expected to exist during the month. The first figure is the number of days the condition exists at 0600Z and the figure in parenthesis is the number of days the condition exists at 1800Z.					
	Up to 349 meters		Between 350-699 meters		Above 700 meters	
Dry	1	(2)	0	(1)	1	(0)
Moist or Wet	14	(17)	9	(11)	2	(3)
Bare and Frozen	7	(4)	4	(2)	1	(1)
Ice, Slush, Snow or Glaze	9	(8)	18	(17)	27	(27)

EXAMPLE: Your ground elevation is 400 meters. You can expect dry conditions 0 days of the month at 0600Z, and 1 days of the month at 1800Z. (Continue down the column for the rest of the conditions).

As a rule, Dry conditions normally indicate favorable conditions for both track and wheel vehicles. Moist or Wet ground usually indicates unfavorable conditions, especially during fall, winter, and spring.

Ground that is frozen several inches, and ground that is covered with at least several inches of snow are usual indicators of favorable conditions for track vehicles and wheel vehicles with chains.

TAB D

MEAN NUMBER OF DAYS WITH SPECIFIED SNOW DEPTHS ON THE GROUND IN V CORPS FORWARD AREAS

Month	Snow Depths		
	1.0 in or more	5.0 in or more	10.0 in or more
Jan	23	7	2
Feb	19	9	5
Mar	9	2	1
Apr	1	0	0
May	0	0	0
Jun	0	0	0
Jul	0	0	0
Aug	0	0	0
Sep	0	0	0
Oct	0	0	0
Nov	4	0	0
Dec	11	1	0

NOTE: SNOW DEPTHS INDICATED ABOVE ARE MOST RELIABLE FOR INTERMEDIATE ELEVATIONS (350-699 METERS). FOR LOCATIONS WHERE THE ELEVATION IS LESS THAN 350 METERS AND TEMPERATURES ARE GENERALLY WARMER, ONE CAN EXPECT LESS SNOWFALL AND CONSEQUENTLY FEWER DAYS WITH SNOW ON THE GROUND, FOR LOCATIONS WERE THE ELEVATION IS GREATER THAN 699 METERS AND TEMPERATURES ARE GENERALLY COOLER, ONE CAN EXPECT MORE SNOWFALL AND CONSEQUENTLY MORE DAYS WITH SNOW ON THE GROUND.

TAB E

MEAN MONTHLY TEMPERATURES FOR V CORPS FORWARD AREAS

Month	Temperatures (°F)	
	Mean Daily Maximum	Mean Daily Minimum
Jan	32	26
Feb	34	25
Mar	42	31
Apr	50	36
May	59	43
Jun	65	49
Jul	68	51
Aug	67	51
Sep	60	46
Oct	53	40
Nov	39	31
Dec	34	28

NOTE: TEMPERATURES INDICATED ABOVE ARE MOST REPRESENTATIVE OF INTERMEDIATE ELEVATIONS (350 - 699 METERS). FOR LOCATIONS WHERE THE ELEVATION IS LESS THAT 350 METERS TEMPERATURES 3 - 5 DEGREES WARMER CAN BE EXPECTED. FOR LOCATIONS WHERE THE ELEVATION IS GREATER THAN 699 METERS TEMPERATURES 3 - 5 DEGREES COOLER CAN BE EXPECTED.

TAB F

APPENDIX 4

FOOTNOTES

1. The Trail of the Fox, David Irving, 1977.
2. Defense, Field Marshal Ritter von Leeb, pg viii.
3. Armored Warfare, MG J.F. Fuller, pg 134.

APPENDIX 5

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2. DA PAM 20-261a, The German Capaign in Russia, Planning Operation 1940 - 1942, Match 1955, pg 129

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4. FM 5-34, Engineer Field Data.

5. FM 7-7, The Mechanized Infantry Platoon & Squad.

6. FM 71-1, The Tank and Mechanized Infantry Company Team.

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9. FM 100-5, Operations.

10. FM 105-5 (Draft) Exercise Control and Battle Simulation, April 1978.

11. Engineer Handbook ST 7-155 USAIS, 1977.

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