# FM 5-132

DEPARTMENT OF THE ARMY FIELD MANUAL

# INFANTRY DIVISION
# ENGINEER BATTALION

HEADQUARTERS, DEPARTMENT OF THE ARMY
AUGUST 1957

FIELD MANUAL
No. 5–132

HEADQUARTERS,
DEPARTMENT OF THE ARMY
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# INFANTRY DIVISION, ENGINEER BATTALION



*This manual supersedes FM 5–132, 25 January 1952, and TT 5–132–2, February 1957.

# CHAPTER 1

# INTRODUCTION

## Section I. GENERAL

### 1. Purpose

This manual provides information and guidance for individual and unit training and employment in operations of the infantry division, engineer battalion.

### 2. Scope

This manual outlines the organization, employment, missions, equipment, training, operations, and capabilities of the infantry division, engineer battalion. This material is based on TOE 5–15T, 5–16T, and 5–17T, 20 December 1956. The material presented herein is applicable to atomic warfare. Where applicable, appropriate modifying guidance for nonatomic warfare is integrated throughout the manual.

### 3. Mission

To increase the combat effectiveness of the infantry divison by means of general engineer work.

## Section II. ORGANIZATION

### 4. Composition

The infantry division, engineer battalion has a battalion headquarters; a headquarters and head-

quarters company; and five identical combat companies (fig. 1).

### 5. Major Items of Equipment

The major items of equipment of the infantry division, engineer battalion, are listed in the applicable TOE's. The battalion is completely mobile by means of organic transportation.

### 6. Assignment

The infantry division, engineer battalion, is organic to the infantry division, TOE 7T.

### 7. Capabilities and Employment

The infantry division engineer battalion provides the following engineer support to the division:

*a.* Necessary engineer staff planning and supervision for the infantry division, including that required for attached and supporting engineer troops.

*b.* Conducts tactical and technical reconnaissance.

*c.* Constructs, repairs, maintains, and marks roads and trails.

*d.* Constructs, improves, reinforces, and maintains fords, fixed bridges, and culverts.

*e.* Constructs, maintains, and repairs floating bridges and ferries.

*f.* Provides engineer personnel and limited equipment for assault stream crossings.

*g.* Constructs and removes obstacles, including minefields.

*h.* Executes all types of demolitions.

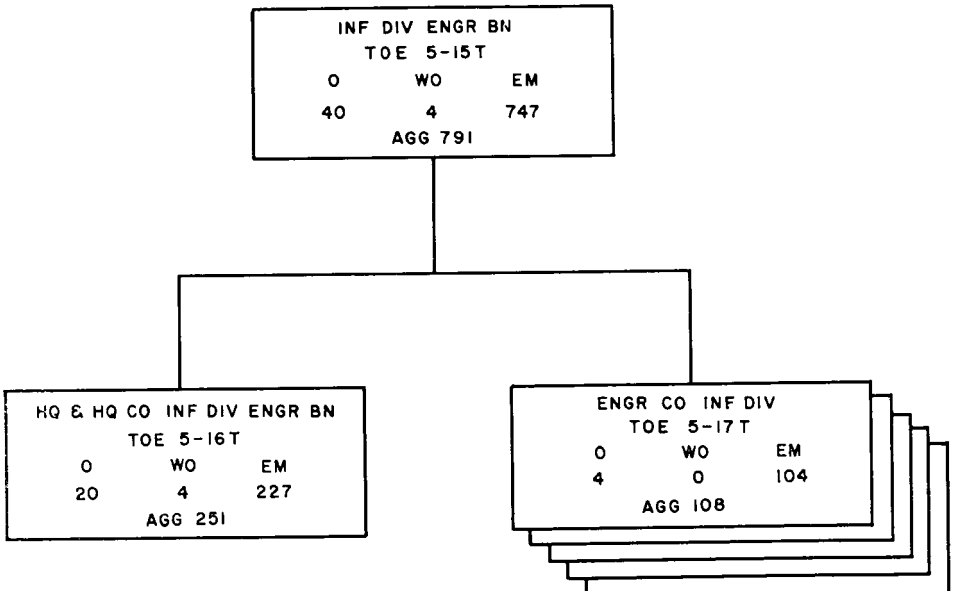



*Figure 1. Organizational chart, infantry division, engineer battalion.*

*i.* Assists in the assault of fortifications.

*j.* Constructs or assists in the improvement of command posts, shelters, and defensive installations.

*k.* Prepares landing facilities for army aircraft.

*l.* Establishes and operates water points.

*m.* Provides engineer supply service for the infantry division.

*n.* Procures and distributes maps.

*o.* Collects, evaluates, and disseminates engineer intelligence.

*p.* Surveys and maps small areas.

*q.* Fights as infantry when required.

*r.* Provides technical advice and assistance, to include assistance in conducting engineering training and in executing combat deception and camouflage.

*s.* Provides field (third echelon) maintenance support for all engineer equipment items organic to the infantry division.

*t.* Employs prepositioned atomic weapons.

# CHAPTER 2

# ENGINEER COMBAT COMPANY

## Section I. GENERAL

### 8. Mission

The engineer combat company is an operating component of the infantry division engineer battalion. It is the basic administrative unit within the battalion. The engineer combat company is equipped to perform combat engineer tasks and, when reinforced with additional heavy equipment, can perform heavy engineer tasks. It fights as infantry when required and provides engineer support for a battle group.

### 9. Organization

The engineer combat company is organized into a company headquarters and two identical platoons (fig. 2).

### 10. Equipment

The company is completely mobile in its organic vehicles. In addition to individual arms, it has machine guns, and grenade and rocket launchers. Radios and other items of signal equipment are provided for communication between squads within each platoon, between platoon and company, and between company and battalion or supported unit. Squad and

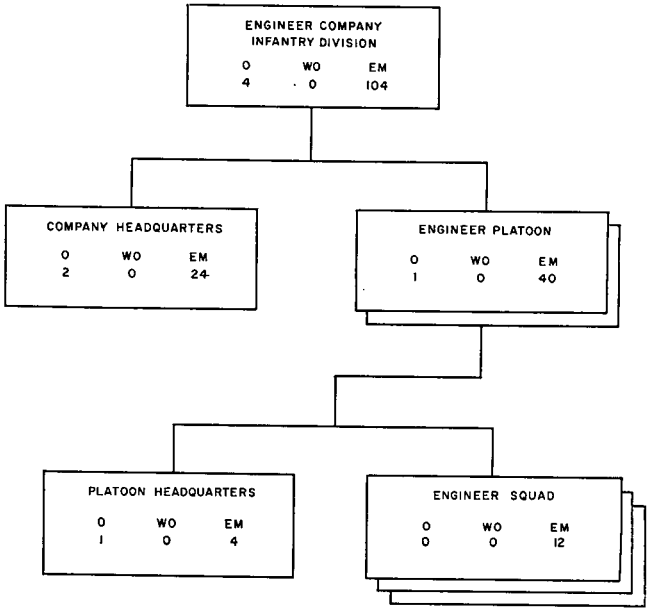



*Figure 2. Organizational chart, engineer company, infantry division, TOE 5–17T.*

platoon carpenter, pioneer, and demolition sets and several pieces of engineer heavy equipment are also organic to the company.

## Section II. COMPANY HEADQUARTERS

### 11. Mission

The mission of the company headquarters is to provide command, administrative, supply, and equipment support for the platoons of the company.

### 12. Organization

Personnel of company headquarters are organized according to the nature of their duties, into the command echelon and the administrative echelons. However, greater flexibility and efficiency can be realized in company operations by permitting the unit commander to decide the exact composition of these echelons for each specific situation. An example of the flexibility desired would be the utilization of the executive officer in the command echelon as a project engineer in one situation and as a unit administrator in the administrative echelon in another situation.

## Section III. COMMAND ECHELON

### 13. Composition

The command echelon is composed of the company commander, executive officer, first sergeant, and communication personnel.

*a. Duties of Command Personnel.*

(1) The company commander is responsible to the battalion commander for the administration, operations, training, discipline, and supply of his company. Among his duties are—

(*a*) Aiding the battalion commander and battalion staff in developing plans for the employment of his company. This includes maintaining contact with the battalion commander and keeping him informed of the company situation and of operational changes that he considers necessary for the efficient employment of his company.

(*b*) Exercising initiative to keep his company constructively employed when no missions are assigned or requested.

(*c*) Analyzing a task and assigning missions to his subordinate leaders.

(*d*) Supervising the execution of work to see that: tasks are carried out properly; correct methods are used; that supply of materials is maintained; difficulties are anticipated and provided for; and the platoon commanders are given all possible facilities, including personnel and equipment from company headquarters or battalion, to help them execute their assigned work.

(*e*) Inspecting tools, equipment, weapons, transportation, and all classes of supply to insure that they are properly maintained, used, or stored. He also makes certain that the mess, supply, communication, administration, and maintenance sections are operating properly.

(*f*) Conducting continuous engineer reconnaissance and reporting appropriate information to battalion headquarters, to the unit which he supports, and to his platoons.

(*g*) Providing liaison with, and engineer staff advice for, the unit he supports.

(2) The executive officer is the senior lieutenant in the company and second in command. He helps the company commander perform his duties, is his chief adviser on company mat-

ters, and assumes command of the company during the commander's absence. He must be familiar with the company commander's policies, keep himself constantly informed of the company situation, and have the authority to make decisions in the name of the company commander. He may be used as the project engineer. He may be designated as company liaison officer and may be used as the assistant unit engineer for a unit supported by the company. He must be prepared to take over command of any of the platoons or the company at any time.

(3) The first sergeant serves as principal enlisted assistant to the company commander. Under the executive officer, he coordinates various activities within the company such as mess, supply, transportation, maintenance, and communications. He helps prepare and maintain records, rosters, correspondence, and reports. In the capacity of a construction foreman he aids the company commander in inspecting and supervising training and operations. He assumes command of the company when all officers are absent.

*b. Employment and Operations.* The command personnel of the company headquarters perform command functions to include: planning, directing, and supervising the operation of the company. The company commander employs his communication means to maintain control over his subordinate units and higher and adjacent headquarters. The executive officer uses

the radio in the ¾-ton truck to contact personnel in the company net when he acts as liaison officer or when he is away from the company command post.

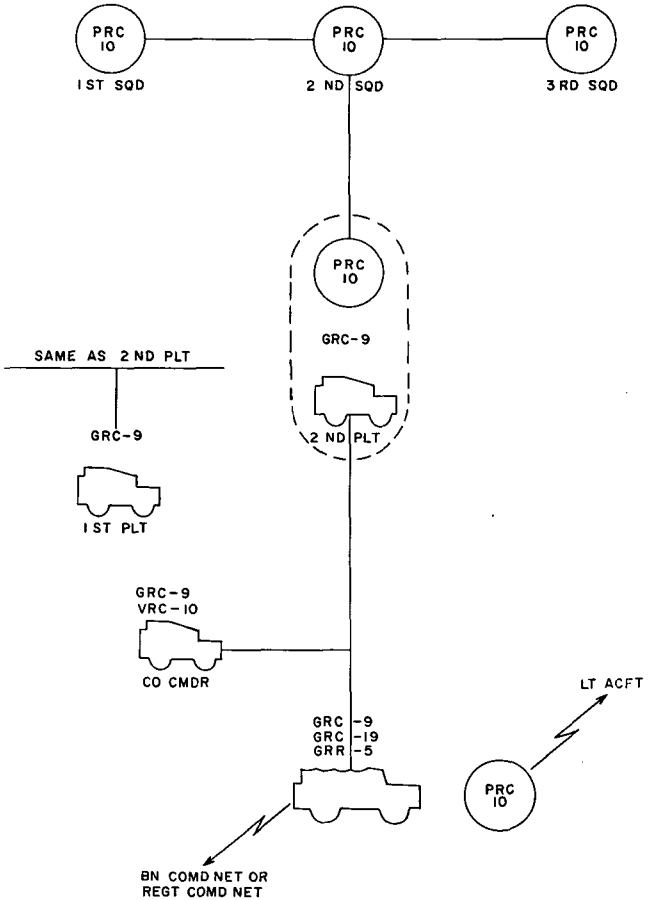



*Figure 3. Typical radio net, infantry division, engineer company.*

### 14. Communication Section

*a. Duties of Communication Section Personnel.*

(1) The radio operators operate the company radios in the battalion and company nets (fig. 3), and perform preventive maintenance on their equipment. They send and receive messages and keep message records. They encipher and decipher messages with the cipher machines, install and operate the emergency switchboard, and use the aircraft panel signaling sets. One of the radio operators drives the section's ¾-ton truck.

(2) The radio mechanic inspects, tests, and performs organizational maintenance on all company communication equipment. He also can operate the company radios.

*b. Employment and Operations.* The communication section provides the company commander with 24-hour radio communication with any of the units in the battalion or company net. The section normally operates at the company command post.

## Section IV. ADMINISTRATIVE ECHELON

### 15. Organization

The administrative echelon normally consists of the company clerk, the mess section, the supply section, and the equipment and maintenance section. It is commanded by the senior officer or NCO present in the echelon.

### 16. Company Clerk

The company clerk is the administrative assistant to the unit commander. He performs various clerical and typing duties at the company level.

### 17. Mess Section

*a. Organization.* The mess section consists of a mess steward and cooks.

*b. Duties of Mess Personnel.* The mess steward supervises and controls the activities of the mess personnel. He prepares menus from the master menu, supervises the preparation and serving of the meals, inspects delivered supplies for condition and quantity, keeps mess records, and sees that proper sanitary and dietetic principles are followed at all times.

*c. Employment and Operations.* The mess section may or may not operate as a unit depending upon whether or not the company is employed as a unit. When elements of the company are operating beyond the supporting distance of the administrative echelon it may be necessary to attach mess personnel to those elements.

### 18. Supply Section

*a. Organization.* The supply section consists of a supply sergeant and an armorer.

*b. Duties of Supply Personnel.*

(1) The supply sergeant supervises the activities of the supply section. Based on the needs of the platoons and sections, he prepares requisitions, survey reports, memorandum receipts, and other forms related to the receipt, storage,

and issue of supplies. He checks supplies received, issued, or shipped and reports discrepancies noticed in quantity, quality, or physical condition. He is responsible for the condition of the company supply room.

(2) The armorer maintains, services, and makes minor repairs on the ordnance weapons of the company.

*c. Employment and Operations.* The supply section handles the procurement of supplies needed by the company. Normally, the company supply section deals directly with the battalion supply section in procuring the supplies and then reissues such supplies directly to the using company unit or individual.

## 19. Equipment and Maintenance Section

*a. Organization.* The equipment and maintenance section consists of a motor sergeant, wheeled-vehicle and engineer-equipment mechanics, wheeled-vehicle mechanic's helper, engineer construction machinery operators and air-compressor operators.

*b. Duties of Equipment and Maintenance Personnel.*

(1) The motor sergeant supervises the work of the equipment and maintenance section. He inspects the performance of preventive and organizational maintenance and helps the mechanics when necessary. He keeps maintenance rosters on all company vehicles and equipment and maintains records on the use and care of supplies in the motor pools. He supervises the dispatch of vehicles.

(2) The mechanics perform organizational inspections, maintenance, and repair on the automotive and construction equipment of the company as directed by the motor sergeant. They also help the motor sergeant during inspections and in organizational preventive maintenance services. The wheeled-vehicle mechanic's helper operates and maintains the section's 2½-ton truck.

(3) The engineer construction machinery operators are provided for double-shift operations. They operate and maintain the company angledozers. These operators also drive the 5-ton truck-tractors.

(4) The air-compressor operators maintain and operate the air compressors and supervise the operation of the accompanying pneumatic equipment. They maintain and may operate the pneumatic equipment. These operators are also truck drivers.

## Section V. COMPANY EMPLOYMENT AND PIONEERING OPERATIONS

### 20. Company Employment

*a.* The engineer combat company may be employed in direct support of a battle group and may remain under control of the division engineer. In this role, maximum flexibility is assured. General support to the division is accomplished by combat companies not otherwise assigned a direct support mission.

*b.* Each company may be given an area assignment or task assignments. Area assignments in turn are normally broken down into platoon tasks.

*c.* The company operates independently of the battalion when attached to another unit. The company may be attached when required by the mission or when centralized control by the battalion is difficult. This condition may often exist when battle groups are motorized or mechanized and when operating under brigade control.

*d.* Many assignments will necessitate staggered work hours, continuous operation in shifts, or even extended periods of operation without relief. The company commander must balance the effects of fatigue on his men and lack of servicing of his equipment against the urgencies of the situation.

## 21. Pioneering

*a. Construction.* The company constructs and repairs bridges, vehicle trails and roads; builds and maintains ferries, fords, and culverts; lays minefields; constructs protective shelters and various types of obstacles. The supervision, coordination, and equipment provided by company headquarters enables the company to accomplish extensive engineer tasks. The company, when reinforced with additional heavy equipment, is able to perform heavy construction missions. Although the company has limited bridging material, it can construct timber, floating, and panel bridges when the necessary materials and equipage are available. It can build and maintain hasty, expedient, and surfaced roads (fig. 4).

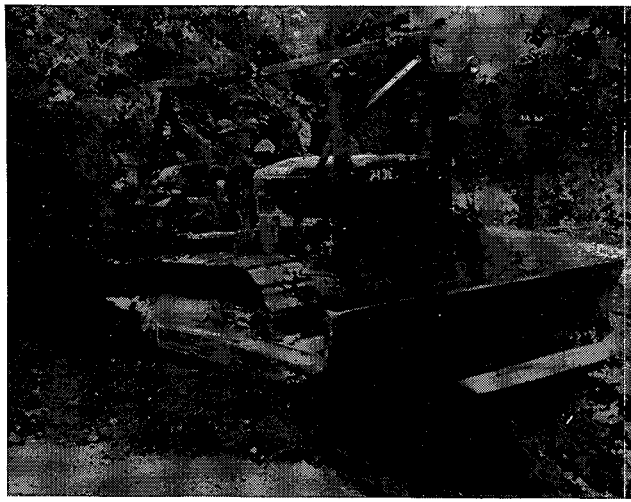


*Figure 4. Engineer dozer repairing a shell-torn road.*

*b. Destruction.* The company commander plans obstacles in accordance with tactical plans prepared by the battle group or division. The platoons then execute the plans under supervision of the company commanders.

*c. Reconnaissance.* The company commander directs general engineer reconnaissance continually and as specified by the battalion commander. Reconnaissance patrols are operated for the battalion or the supported battle group as required. Frequently, special reconnaissance is made to secure detailed information on a specific subject or for a special purpose. Reconnaissance patrols are composed of platoons, squads, or selected groups of men under company officers or NCO's, depending on the mission to be accomplished.

## Section VI. COMPANY COMBAT OPERATIONS

### 22. The Advance to Contact and the Attack

During the advance to contact and the attack, engineer tasks include—

*a.* Performing engineer reconnaissance.

*b.* Repairing and maintaining roads and trails.

*c.* Repairing, strengthening, and maintaining bridges.

*d.* Constructing bridges and bypasses.

*e.* Removing, neutralizing, or destroying all types of manmade and natural obstacles which slow or halt forward movement.

*f.* Assisting the flank security by constructing obstacles in likely avenues of enemy attack.

*g.* Assisting in the organizations of captured ground.

### 23. The Defense

During the defense, the company normally operates in a direct or general support role and is given area or task assignments. Normal engineer tasks include—

*a.* Performing engineer reconnaissance.

*b.* Repairing, maintaining, or constructing roads and trails.

*c.* Constructing shelters, command posts, observation posts, and special field works.

*d.* Providing technical assistance to other troops in preparing defensive positions, including barbed wire and weapons emplacements.

*e.* Providing engineer equipment.

*f.* Laying and recording minefields and constructing other obstacles (fig. 5).

*g.* Aiding in camouflage.

*h.* Preparing alternate positions and erecting barriers in depth.

*i.* Assisting in flank and rear-area security.

### 24. Retrograde Movement

During a retrograde movement, the company commander directs the platoons in providing technical assistance and aid in preparation of successive defensive positions and obstacles to impede the progress of the enemy and to assist in the evacuation of friendly troops. The company is charged with the destruction of specific bridges and with the destruction of supplies and equipment which cannot be evacuated. It may aid in flank and rear-area security.

### 25. River-Crossing Operation

During river-crossing operations the company normally operates as part of the battalion. Among the company's tasks are—

*a.* Operating boats, rafts, or ferries (TM 5–271).

*b.* Removing obstacles, including mines and booby-traps, from near and far shores.

*c.* Constructing or repairing approach roads, abutments, bridges and landing sites.

*d.* Improving assembly areas.

*e.* Providing guides for boat groups.

*f.* Performing engineer reconnaissance.

*Figure 5. Engineers in perimeter defense lay a double-apron fence.*

*g.* Providing engineer support to battle group elements on the far shore.

### 26. Security

*a.* The company commander is responsible for security of the company at all times, unless another unit is specifically assigned the mission. On projects forward of the forward edge of battle area, the supported unit normally furnishes the security for the working party in order to release the engineers for maximum effort on the project.

*b.* If the company is working closely with, and in the immediate vicinity of a battle group, the security may be provided by the group commander. However, when the company is working, moving, or living alone, the security force must come from the company. The size of the security detachment depends on the terrain, and the proximity and strength of the enemy.

### 27. Infantry Combat

When the company is committed as infantry, it reorganizes to improve its fighting potential (app. III).

## Section VII. COMPANY TRAINING

### 28. General

The company commander plans the company training schedule according to the training program and policies provided by the battalion commander. Proficiency in basic engineering subjects on the part of all the men in the company is stressed. Platoon leaders train their own platoons; however, it is often desirable

or necessary to consolidate training in some of the technical subjects at company level. Full advantage should be taken of various school quotas for the training of specialists.

### 29. Training Other Arms and Services

The company may conduct demonstrations of mine laying or clearing, bridge construction, or other engineer functions for the training of nonengineer troops of the division. Most demonstrations, however, are staged by a platoon or squad. The company commander furnishes specialists to instruct other troops. The subjects taught include: mine warfare, use of explosives, camouflage, field fortifications, bridging, roadbuilding expedients, and protective shelters and emplacements to resist effects of conventional and atomic weapons. The instructors are usually the company officers or key noncommissioned officers.

## Section VIII. PLATOON

### 30. Mission

The platoon is the operating component of the engineer combat company. It performs combat engineer missions as assigned by the company commander. With additional equipment attached from the company, the scope of the platoon's operations is greatly increased.

### 31. Organization

The platoon consists of a platoon headquarters and three identical squads (fig. 2).

## Section IX. DUTIES OF PLATOON HEADQUARTERS

### 32. Platoon Leader

The platoon leader is responsible for the discipline, training, performance, supply, and welfare of his platoon. His duties include—

*a.* Analyzing the platoon task and assign missions to his squad leaders.

*b.* Allocating personnel and equipment from platoon headquarters, where necessary.

*c.* Supervising execution of the work and seeing that work parties are efficiently organized, correct methods are used, supply of material is maintained, difficulties are anticipated and provided for, equipment is efficiently used, and proper security measures are taken at all times.

*d.* Obtaining equipment from company headquarters, when necessary to supplement platoon equipment.

*e.* Insuring that tools, equipment, weapons, transportation, and clothing are adequate, serviceable, and properly maintained.

*f.* Making engineer reconnaissance rapidly, accurately, and continuously, and disseminating information properly and promptly.

*g.* Providing liaison with and acting as engineer staff adviser for the unit his platoon supports.

### 33. Platoon Sergeant

The platoon sergeant is second in command of the platoon. He performs duties as required by the platoon

leader. His duties may include but are not limited to the following:

*a.* Assisting the platoon leader to supervise combat construction, repair, and demolition operations.

*b.* Performing engineer reconnaissance.

*c.* Assisting with the organization of work activities and supervising operations.

*d.* Keeping informed on adequacy of equipment and supply of construction material.

*e.* Instructing subordinate personnel in demolition operations, combat construction, and repair activities. This instruction may include placement of explosives to insure effective demolition, design of patterns for hasty and deliberate minefields, placement of culverts, and erection of road blocks.

### 34. Radio Operator

The radio operator maintains and operates the radio and ¼-ton truck.

### 35. Toolroom Keeper

The toolroom keeper maintains tools organic to platoon headquarters. He assists the platoon leader by supervising maintenance on squad tools and makes minor repairs beyond the capability of the squad.

### 36. Truck Drivers

Drivers' duties are outlined in paragraph 51. The radio operator is also qualified as a driver, light truck.

## Section X. PLATOON EMPLOYMENT AND PIONEERING OPERATIONS

### 37. Platoon Employment

*a.* The platoon may be assigned an area in which it is responsible for all engineer work, or it may be given a task assignment. The platoon leader organizes the size of the force to accomplish the task. The platoon may operate beyond the supporting distance of the company for short periods. During this time, the company commander assigns necessary maintenance and administrative personnel to accompany the platoon. For 24 hour operation, relief of the platoon is usually planned and provided by the company commander; however the platoon may operate its own shifts.

*b.* The platoon may be employed in direct support of an infantry unit or in general support of the same unit under company control. However, the platoon is most efficient when employed as a part of the engineer combat company. Under certain tactical situations, when communications and control are difficult, it may be necessary to attach the platoon to another unit.

### 38. Pioneering

*a. Construction.* The platoon constructs and repairs bridges, vehicle trails, roads, and builds and maintains ferries, fords, and culverts (fig. 6). It also lays minefields, constructs protective shelters and various types of obstacles. The speed and efficiency of construction operations are increased by providing addi-

*Figure 6. Engineer platoon constructing a vehicle trail.*

tional engineer equipment to the platoon for specific missions.

*b. Destruction.* The platoon breaches or destroys most types of obstacles through the use of explosives, utilization of heavy engineer equipment, and employment of specially trained personnel.

*c. Reconnaissance.* The platoon may be required to operate engineer reconnaissance patrols. They search in designated areas for specific information and items. It is standing procedure that when no specific reconnaissance missions are assigned, the platoon will maintain continuous engineer reconnaissance in its assigned area of operations.

## Section XI. ENGINEER PLATOON COMBAT OPERATIONS

### 39. The Advance to Contact and the Attack

During the advance to contact and the attack the platoon may operate as part of the company in support of a battle group or, during rapidly moving situations, may independently support advanced or mechanized units. To support the attack, the platoon leader maintains close liaison with the unit commander whom he is supporting. Engineer reconnaissance elements are kept as far forward as possible to discover and immediately report situations requiring engineer work or, when necessary, to allow time for securing reinforcements from the company. Typical platoon tasks during an attack include—

*a.* Conducting engineer reconnaissance.

*b.* Bypassing, removing, or breaching obstacles, including mines (fig. 7), boobytraps, all types of erected obstacles, and debris.

*c.* Clearing and repairing roads and routes.

*d.* Decontaminating chemical and radiological contaminated roads and areas by scraping.

*e.* Constructing, strengthening, and repairing bridges; improving fords; and operating ferries.

*f.* Placing demolitions, laying minefields, and constructing obstacles on the flanks and rear of an advancing unit.

### 40. The Defense

During the defense, the platoon furnishes technical advice and aid to the supported unit in setting up the

*Figure 7. Engineers clearing mines in advance of armor.*

defensive position. The engineer assistance is limited to those tasks requiring special technical skill, or those beyond the capabilities of the supporting units. Such tasks are—

*a.* Furnishing technical advice and/or aid in preparing defensive positions, weapons emplacements, and protective shelters.

*b.* Supervising and assisting in laying and recording minefields.

*c.* Erecting or supervising the erection of wire entanglements, road blocks, and other obstacles.

*d.* Assisting in camouflage.

*e.* Preparing and executing demolitions.

*f.* Construction, repair or maintenance of roads and trails.

*g.* Decontaminate roads and areas by surface scraping.

### 41. Retrograde Movements

During a retrograde movement the platoon assists in preparation of successive defensive positions previously selected and planned by the supported unit; aids the rearward movement of vehicles, artillery, and troops; and evacuates or destroys material. Delaying the enemy is of primary importance. The platoon constructs and sometimes defends road blocks and other obstacles. Bridges, culverts, defiles, and sidehill cuts are prepared for demolition. If they cannot be blown immediately because of the passage of friendly troops, the platoon blows them on order from higher headquarters or when necessary to prevent capture (fig. 8).

All demolition plans are coordinated and integrated with the scheme of maneuver of the withdrawing force.

### 42. River-Crossing Operations

*a.* Division engineer troops support elements of the battle groups that cross the river and operate on the hostile shore. Typical platoon tasks include operating assault boats in the first wave of the crossing, furnishing guides for assault boats in succeeding waves, building access roads to the ferry sites, constructing and operating ferries, and improving assembly areas (fig. 9).

*b.* During a hasty crossing all possible means are employed to cross friendly units to the far shore.

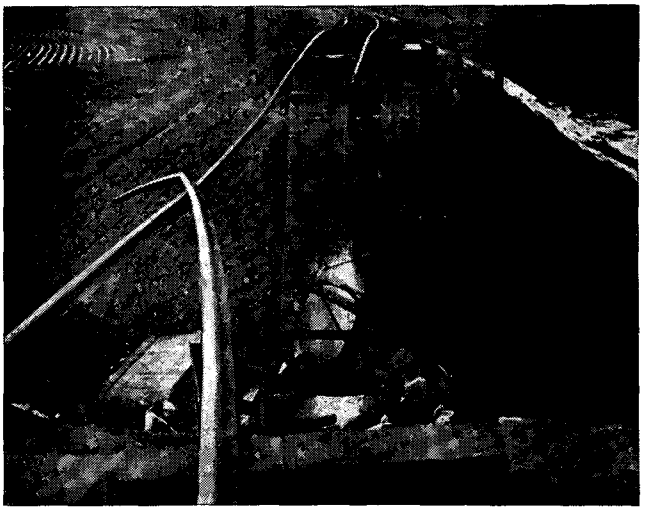


*Figure 8. Bridge destroyed by engineers in a retrograde movement.*

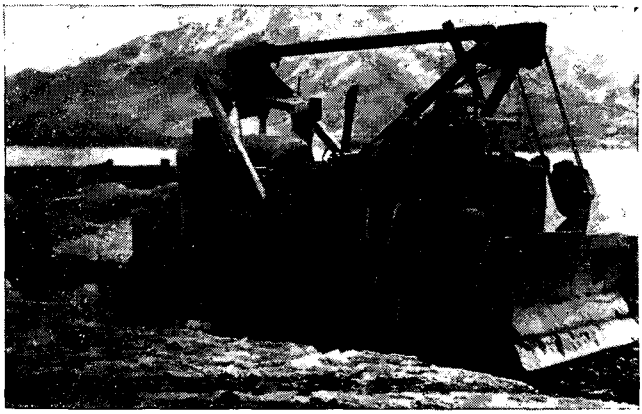


*Figure 9. Engineers in a river-crossing operation return enemy fire.*

Prompt advantage must be taken of the enemy's disorganization or absence. Therefore, whatever means are at hand must be used to get troops across as quickly as possible. The opportunity for a hasty crossing is often presented to a small striking force such as a task force or armored cavalry unit. These forces usually include a company or platoon of the engineer battalion. The work done by the platoon includes such tasks as: construction of a ford, mine clearance on the shores, bridge repair, removal of explosives from a bridge captured intact, or seizure and operation of civilian boats. If standard military bridging or boats are available, the platoon carries troops across in assault boats or infantry support rafts.

## 43. Security

The engineer platoon is used as the security force for an engineer company or for an engineer battalion,

depending on the tactical situation. The security may be furnished for a work party, a bivouac, or a march column. When protecting a column, a platoon may serve as part of an advance guard, rear guard, or flank guard.

### 44. Combat as Infantry

The platoon may be required to fight as infantry. It operates with three rifle squads and one weapons squad. See appendix III for a suggested reorganization.

## Section XII. SQUAD

### 45. Mission

The squad is the basic operating and working unit of the engineer combat platoon. It may work independently of a parent unit for short periods of time. Duties of squad personnel are explained in paragraphs 46 through 51.

### 46. Squad Leader

The squad leader is in the chain of command under the platoon leader. He is responsible to the platoon leader for all that his squad does or fails to do. Under the platoon leader's direction, he cares for the welfare of his men. He instills discipline in his squad by promptly carrying out the orders of his superiors. He insures that all equipment issued to his squad is properly used and maintained. He becomes familiar with infantry squad and platoon tactics in order to lead his squad effectively when it is employed as infantry in combat. He must be fully acquainted with the duties of combat construction specialists and must have the qualifications of a combat construction foreman.

## 47. Assistant Squad Leader

The assistant squad leader performs all duties assigned to him by the squad leader. He may be required to command any part or all of the squad. In the absence of the squad leader, he assumes command of the squad.

## 48. Combat Construction Specialists

*a.* Combat construction specialists assist in the construction and repair of roads and bridges; the removal, demolition, or preparation of obstacles; the laying and clearing of minefields; and the setting and removal of boobytraps. They construct, maintain, and repair temporary structures of various types (fig. 10). They assist in general rigging. They assist in construction, maintenance, and repair of landing facilities for Army

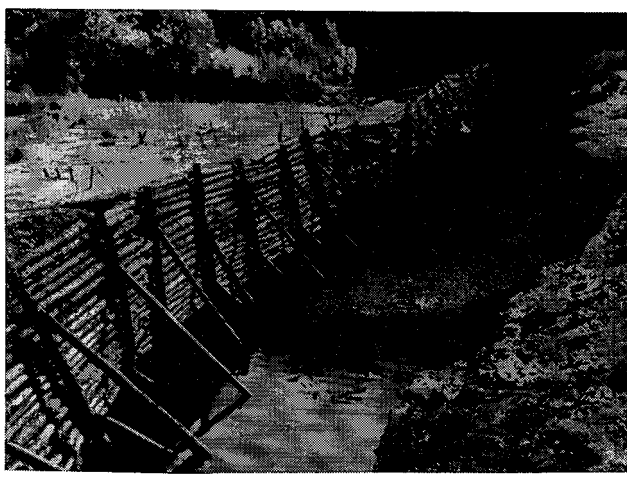


*Figure 10. Log retaining wall constructed by combat engineers.*

type aircraft. They conduct engineer reconnaissance and assemble and operate stream-crossing equipage.

*b.* Combat construction specialists are trained in the duties of pioneers and have a thorough knowledge of the engineering equipment and tools. They are familiar with the characteristics of materials used in demolition operations; how to interpret and prepare reports concerning engineer reconnaissance, obstacles including minefields, demolitions and barriers; the combat principles and techniques of the infantry squad and platoon; and the employment of individual and organizational crew-served weapons. They must be able to read and understand military signs, symbols, and maps and have knowledge of camouflage.

### 49. Demolition Specialists

The demolition specialists compute, prepare, and fire explosive charges (fig. 11). They have a knowledge of military explosives and related devices. In addition to their specialty, the demolition men are trained as combat construction specialists.

### 50. Pioneers

*a.* The pioneers are trained to assist in accomplishing all combat engineering tasks.

*b.* One member of the squad receives additional training in the operation of engineer construction equipment. He may serve as an assistant or second-shift operator for equipment furnished with a regular operator to the squad.

### 51. Truck Drivers

Truck drivers are responsible for the operation, concealment, camouflage, and operator maintenance of

*Figure 11. Engineers prepare a bridge for demolition.*

their vehicles. They assist the mechanics in organizational maintenance on their vehicles. Each driver is responsible for correct loading, driving, servicing, inspecting, cleaning, tightening, and care of the vehicle and its tools and accessories.

## 52. Squad Employment and Pioneering Operations

The squad functions as a part of the platoon. Occasionally, when attached to a small task force, it may be given a separate engineer mission.

# CHAPTER 3

# HEADQUARTERS AND HEADQUARTERS COMPANY

## Section I. GENERAL

### 53. Mission

The mission of the headquarters and headquarters company is threefold. It provides enlisted personnel for battalion staff sections, it provides all company-level administration and administrative support for battalion headquarters, and it provides certain battalion-level service and combat support for the battalion and the division.

### 54. Organization

Headquarters and headquarters company (fig. 12) consists of the company officers and the enlisted personnel who work in battalion headquarters, company headquarters, and in the operating elements; i.e., the bridge section and the equipment platoon. The organization, duties, and training of the men comprising the battalion headquarters sections are detailed in chapter 4, but the company headquarters and operating elements are discussed in paragraphs 57 through 84.

### 55. Headquarters Function

Headquarters and headquarters company provides the enlisted men for battalion headquarters. These

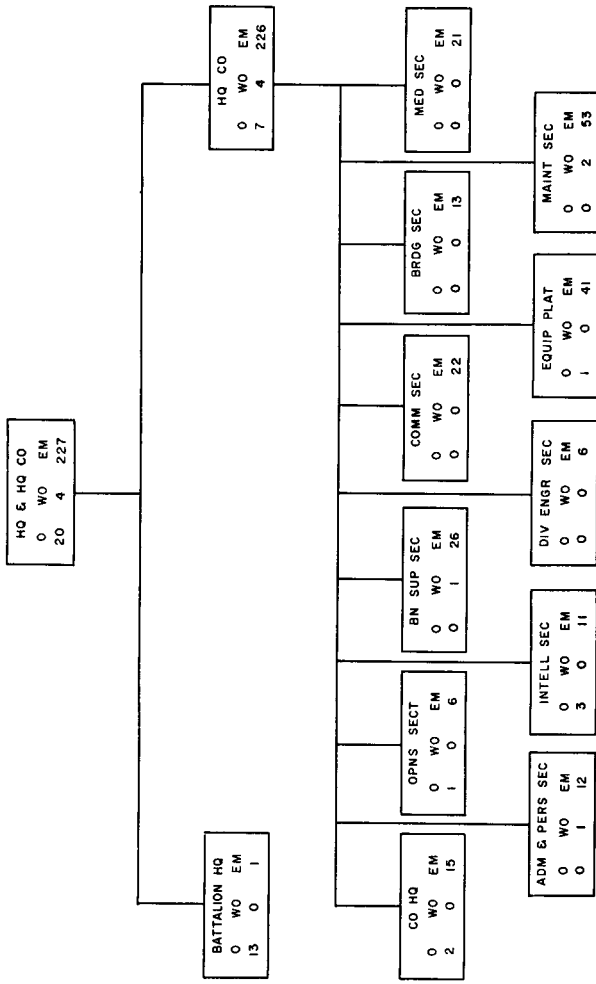



*Figure 12. Organizational chart, Headquarters and Headquarters Company, Infantry Division, Engineer Battalion.*

men are assigned to the various sections of battalion headquarters and are under the operational control of the officer heading the particular section. The company feeds, clothes, houses, and pays these men and is responsible for their conduct when they are not at their duty section. These men are released to the company commander for necessary military training and administrative duties.

### 56. Service Function

The service function of headquarters and headquarters company is explicitly defined. It feeds, clothes, and houses battalion headquarters personnel. It provides an equipment pool for the battalion. Battalion maintenance as well as maintenance for headquarters and headquarters company is provided by the battalion maintenance section. The company has a combat support function which is discharged by the equipment platoon and by the bridge section.

## Section II. BRIDGE SECTION

### 57. Mission

The mission of the bridge section is to provide bridge equipment and technical assistance in construction which will enable the divisional units to cross creeks, narrow rivers, gorges, and ravines with minimum delay. The bridging equipment is suitable for spanning short gaps, light rafting, and assault boat employment. Equipment for deliberate river crossings and for more permanent bridges is supplied by corps and army engineer units, since the division may need the bridge section in its operations on the far side of

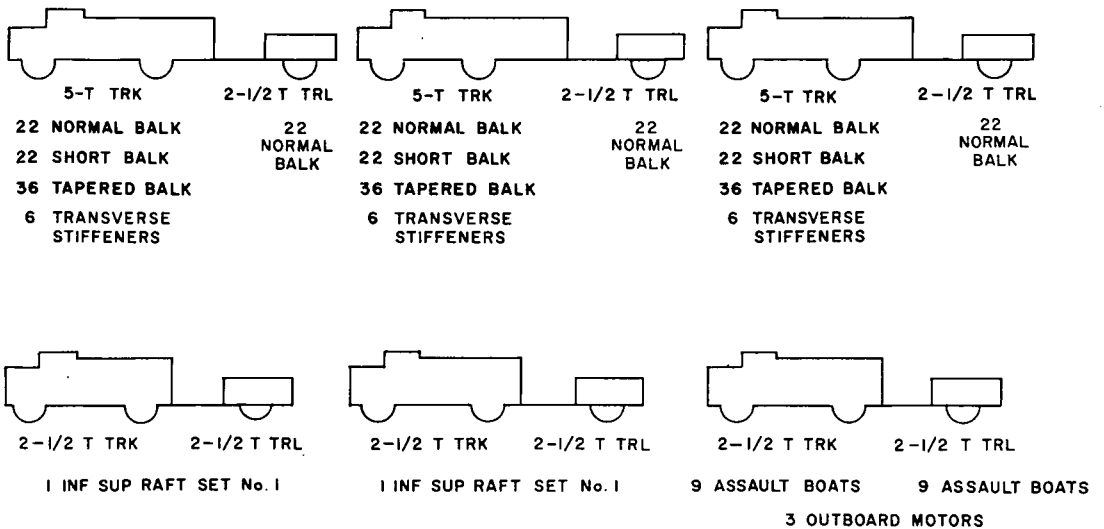



*Figure 13. Loading plan, bridge section.*

the river. The vehicular loading plan (fig. 13) of the bridge section readily permits attachment of appropriate loads of bridge sections to combat companies.

### 58. Organization

The personnel of the section include a bridge section foreman, bridge section sergeants, power boat operators, and bridge helpers. The section provides 38-foot spans (fig. 14) of fixed bridging (see table I for capacities of M4 balk bridge), assault boats and infantry support rafts (fig. 15).

### 59. Duties of Personnel

*a.* The section foreman is responsible for the maintenance and transportation of the equipment. He may provide technical assistance in the construction of the

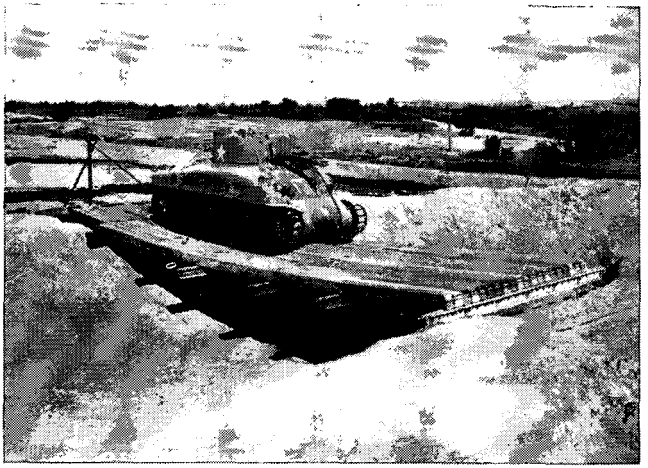


*Figure 14. Short fixed span using M4 decking.*

bridges or he may direct and supervise their construction, operation, and dismantling.

*b.* The assistant foreman directs the operational and maintenance activities of the personnel and equip-

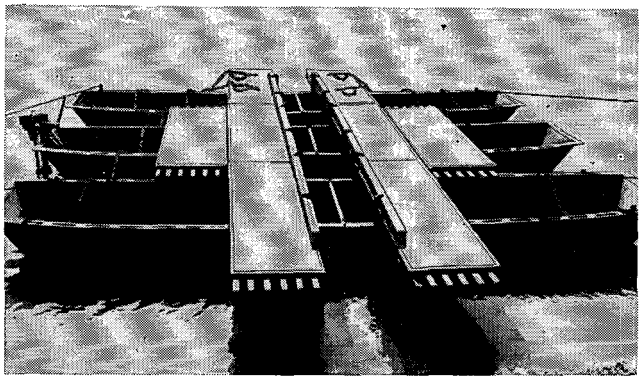


*Figure 15. Three ponton infantry support raft.*

*Table I. Dual Capacities for M4 Balk Treadway and Fully-Decked Unsupported Spans for Short Gaps*

| Span in feet | Balk width per treadway | Type of crossing | | |
|---|---|---|---|---|
| | | Normal | Caution | Risk |
| 30 | 5 | — | — | (45) 65 |
| | 7 | — | — | (60) 85 |
| | 9 | — | — | (75) 105 |
| | Full Deck | (80) 60 | (100) 80 | (100) 90 |

*Table I*—Continued

| Span in feet | Balk width per treadway | Type of crossing | | |
|---|---|---|---|---|
| | | Normal | Caution | Risk |
| 38 | 6 | — | — | (25) 26 |
| | 8 | — | — | (40) 55 |
| | 10 | — | — | (53) 70 |
| | 12 | — | — | (65) 90 |
| | Full Deck | (45) 35 | (70) 55 | (80) 60 |
| 45 | 7 | — | — | (28) 29 |
| | 9 | — | — | (35) 40 |
| | 11 | — | — | (45) 55 |
| | Full Deck | (23) 25 | (45) 40 | (55) 45 |

*Notes.* Upper figures in parentheses represent wheel load class and lower figures represent tracked load class. Example: (45) 65

Full deck ratings are for an 18 balk roadway and a 22 balk deck. All crossings on treadway spans are risk crossings.

ment assigned him. He is responsible for the delivery of the bridge units to the working site and lends technical assistance or supervises the installation, operation, and removal of the bridges.

*c.* The power boat operators, in addition to maintaining and operating the outboard motors, are designated as heavy truck drivers and are responsible for the loading and unloading of their trucks. The bridge helpers are designated as light truck drivers and have the responsibility for the loading and unloading of their trucks.

*d.* The power boat operators and bridge helpers are qualified to supervise and assist in construction or dismantling of the bridge units. They are responsible for the operation and maintenance of their trucks and equipment.

## 60. Operations

Bridging and stream crossing equipment is allocated to companies as required for anticipated missions. Equipment is transported by vehicles from the bridge section and is accompanied by personnel skilled in its use. The supported company commander is responsible for assembly and operation of the equipment. Under exceptional circumstances a member of the bridge section may be made responsible for assembly and operation.

## 61. Training

*a.* The training of the bridge section is coordinated with headquarters and headquarters company commander for general training. Training in the use of section bridge and boat equipment is done on a section

basis. Each bridge specialist and helper is trained to give technical assistance in the portion of bridge carried on his truck. Special training is given the powerboat operators in the operation and handling of the outboard motors and assault boats so they, in turn, can instruct other troops. Emphasis must be placed on having all personnel acquire a thorough knowledge of the care, characteristics, maintenance, employment, loading, unloading, construction, dismantling and transportation of the bridge. In addition, all section personnel should become familiar with the operation and handling of the outboard motors, assault boats, and infantry support rafts. They should also know the characteristics, capabilities, and operational techniques of all section weapons.

*b.* Training with the combat companies must be emphasized since the bridge section normally transports the bridge and boat equipment to the bridge or crossing site. The companies then erect and operate the equipment, with technical assistance from personnel of the bridge section.

## Section III. EQUIPMENT PLATOON

### 62. Mission

The equipment platoon contains engineer construction equipment and operators to supplement the combat companies. It contains three combat engineer vehicles to provide armored engineer construction, demolition, and assault support as required.

### 63. Organization

The platoon is composed of a platoon leader, a construction machinery supervisor, combat engineer

vehicle commanders, crane shovel operators, grader operators, tractor operators, air compressor operator, crewmen and drivers for the combat engineer vehicles, and light truck driver.

### 64. Duties of Equipment Platoon Personnel

*a.* The platoon leader commands the equipment platoon. He is responsible to the headquarters and headquarters company commander. His duties include—

(1) Directing and supervising preventive maintenance, repair, and inspections of the platoon's vehicles and equipment.

(2) Directing and supervising the dispatch and use of platoon transportation and construction equipment.

(3) Assisting the battalion commander and his staff in planning and directing the employment of platoon equipment.

(4) Providing technical assistance to the supported unit in the use and capabilities of the equipment.

(5) Organizing and conducting schools for the training of personnel in operation of equipment, and preventive and organizational maintenance of engineer equipment.

*b.* The construction machinery supervisor is second in command of the platoon. He helps the platoon leader with the control, supervision, training, dispatch, and employment of the construction equipment section.

### 65. Operations

*a.* The construction and assault equipment of the equipment platoon is used by the combat company

commanders to supplement their own construction equipment when necessary. Separate pieces of equipment, with operators, are allotted by the battalion commander for specific purposes on the recommendation of the S3 and upon completion of the project are returned to the equipment platoon for inspection, maintenance, and reassignment. The unit commander using the equipment has operational control over it. Qualified personnel of the equipment platoon give technical assistance to the using company, to prevent abuse of the equipment and to provide information on its use, capability, and operation.

*b.* The equipment is adequate for most heavy engineer construction work encountered in the construction, maintenance, and repair of routes of communications (FM 5–10 and TM 5–252).

### 66. Training

*a.* General training of equipment platoon personnel is coordinated with the headquarters and headquarters company commander.

*b.* Specialist training of equipment operators is given in a platoon school or in a battalion heavy equipment school supervised by the battalion motor officer or the platoon leader of the equipment platoon.

## Section IV. EQUIPMENT PLATOON COMBAT ENGINEER VEHICLES

### 67. Mission

The mission of the combat engineer vehicles (fig. 16) is to provide armored engineer support to engineer combat operations. The 90-mm gun tanks with dozer

blade will be included in TOE's 5–15T and 5–16T as a substitute for the combat engineer vehicle until such time as the latter becomes available for issue. Succeeding paragraphs are generally applicable to the employment of the substitute item.

### 68. Organization and Duties of Personnel

Each of the organic combat engineer vehicles is operated by a 4-man crew consisting of 1 commander, 2 crewmen, and 1 driver.

*a.* The commander is responsible for the control and coordination of the vehicle and assigned crew. He directs the operation of the vehicle to take advantage of cover and maneuver. He supervises the maintenance of the vehicle, vehicular equipment, and all weapons.

*Figure 16. Tank dozer used by engineers to clear debris.*

He directs the fire of the weapons as required. He maintains intervehicular and vehicular-company communications.

*b.* One tank crewman is the gunner who fires the vehicle gun and machine gun to destroy enemy personnel, equipment, vehicles, obstacles, and other targets.

*c.* The other tank crewman is the cannoneer who loads the vehicle gun, assists in operating the tank radio, and performs other duties as directed by the vehicle commander.

*d.* The driver is responsible for the operation of the vehicle and attachments and performs preventive maintenance services. He can fire the weapons as required.

*e.* Each crewman is trained in all the duties of the other crewmen. Each crewman is a demolition specialist.

### 69. Employment

The combat engineer vehicles are employed either singly or as a group in support of the combat companies of the battalion. This support is usually accomplished by attachment.

### 70. Pioneering

The combat engineer vehicles of the equipment platoon clear wrecked vehicles and debris from roads and streets, aid in removal of antitank and other obstacles, decontaminate roads and areas by surface scraping, fill in shell holes and ditches, and do all normal rough dozer operations in connection with roads, fords, and bridges.

### 71. Training

General training of combat engineer vehicle personnel is provided by the company commander of the headquarters and headquarters company. In addition to general training, the members of each engineer armored vehicle crew must be given thorough training in their specialties and alternate assignments. Smooth coordination and functioning by the vehicle crews must be emphasized in combined operations by foot and mechanized units. Primary training emphasis is placed on operation of the vehicle as a valuable item of engineer heavy equipment. Secondary emphasis is given to its use as a tank in combat.

## Section V. COMBAT ENGINEER VEHICLE OPERATIONS

### 72. The Advance to Contact and Attack

During the attack combat engineer vehicles singly or as a group perform such missions as will facilitate the advance of the supported unit. These missions may include:

*a.* Improvement and clearing of fire-swept roads and streets.

*b.* Destruction and removal of defended obstacles other than mines (fig. 17).

*c.* Destruction of pillboxes and other enemy defenses.

*d.* Improvement of fire-swept bridge approaches and fords.

*e.* Delivery of limited support fire in emergencies.

*Figure 17. Engineer tank dozer clearing path through obstacles.*

### 73. The Defense

During the defense, combat engineer vehicles aid in the construction of defense areas and in the active defense of such areas. Tasks may include:

*a.* Dozer work such as clearing fields of fire, filling craters, excavating, and rough grading.

*b.* Defense of obstacles or other antimechanized defense when required.

### 74. Retrograde Movements

During retrograde movements the combat engineer vehicles perform tasks which facilitate the movement of supported troops, hinder the movement of the enemy, and deny the enemy valuable facilities. Such

tasks may be performed by dozer work, destruction by demolitions, or fire in defense of obstacles and barriers.

### 75. River-Crossing Operations

During a river-crossing operation combat engineer vehicles may assist by—

*a.* Clearing debris, wrecked vehicles and other obstacles from near and far banks.

*b.* Constructing or repairing fire-swept approach roads, abutments, and landing sites.

*c.* Improving attack positions and initial assembly areas.

### 76. Assault of Fortified Positions

Combat engineer vehicles can be used to great advantage in an assault of a fortified position because of their armor protection, firepower, mobility under fire, and special accessories. They are particularly useful in the following tasks:

*a.* Destruction and removal of obstacles by—

(1) Direct fire.

(2) Placing of demolitions.

(3) Placement of a demolition snake or similar mine-clearing device.

(4) Mechanical breaching with the dozer blade.

(5) Blinding pillboxes by pushing earth over embrasures.

(6) Providing transportation and protective fire for mine removal teams.

*b.* Surmounting or bridging of obstacles by—

(1) Filling craters and ditches.

(2) Laying mat over heavy wire entanglements or crushing or pulling out light wire entanglements.

*c.* Rapid construction and maintenance of routes into and through the gap in the fortified position.

### 77. Security

When security is not furnished by the supported unit, the combat engineer vehicle commander must set up his own local security. The vehicle commander employs such measures as concealment, defilade, cover, and a system of outposts. If no infantry or engineer foot troops are teamed with the vehicle, at least one crew member dismounts to serve as sentinel.

## Section VI. COMPANY HEADQUARTERS; COMPANY OPERATIONS AND TRAINING

### 78. Mission

The company headquarters provides administrative services for headquarters and headquarters company and battalion headquarters. These services pertain, in a broad sense, to all of the requirements of the personnel including mess, supply, quarters, supervision of non-duty-hour activities, and the maintenance of administrative records. Company headquarters also is responsible for the mess trucks and water trailers for the combat companies. However, these vehicles will habitually be attached to the combat companies.

### 79. Organization

Company headquarters is composed of a company commander, executive officer, first sergeant, mess steward, supply sergeant, company clerk, cooks, and light truck drivers.

### 80. Duties of Personnel

*a.* The company commander has basically the same administrative duties as the combat company commander. However, he loses operational control over the men in battalion headquarters while they are on duty in the staff sections. He maintains close contact with the heads of the various staff sections to discharge properly his administrative responsibilities to the officers and enlisted men of these sections.

*b.* The executive officer has generally the same administrative duties as the executive officer of an engineer combat company.

*c.* The first sergeant has the same duties and qualifications as the first sergeant of a combat company, but he has the additional task of administrative control of the enlisted men of battalion headquarters.

### 81. Company Clerk

The duties, employment, and training of the company clerk are identical with those of a combat company clerk.

### 82. Mess Section

*a. Organization.* The mess section consists of a mess steward and cooks.

*b. Duties of Mess Personnel.* The duties of mess personnel in headquarters and headquarters company

are similar to those in a combat company except that the cook's helper also drives the mess truck.

### 83. Supply Section

*a. Organization.* The supply section consists only of the supply sergeant.

*b. Duties of Supply Personnel.* The duties of the supply sergeant of headquarters and headquarters company are similar to those of the supply sergeant in an engineer combat company.

### 84. Operation

Headquarters and headquarters company does not operate technically or tactically as a unit except, possibly, during extended infantry combat. Administratively, the company feeds, clothes, supplies, quarters, and handles the administration for all the men in the battalion headquarters and headquarters and service company. The section chiefs and the company commander informally arrange their working schedules to permit a portion of the battalion headquarters personnel to participate in military training activities. For infantry reorganization, see appendix III.

# CHAPTER 4

# BATTALION HEADQUARTERS

## Section I. GENERAL

### 85. Mission

The mission of battalion headquarters is to provide planning, direction, supervision, maintenance and supply, communication, medical, and personnel services for the battalion.

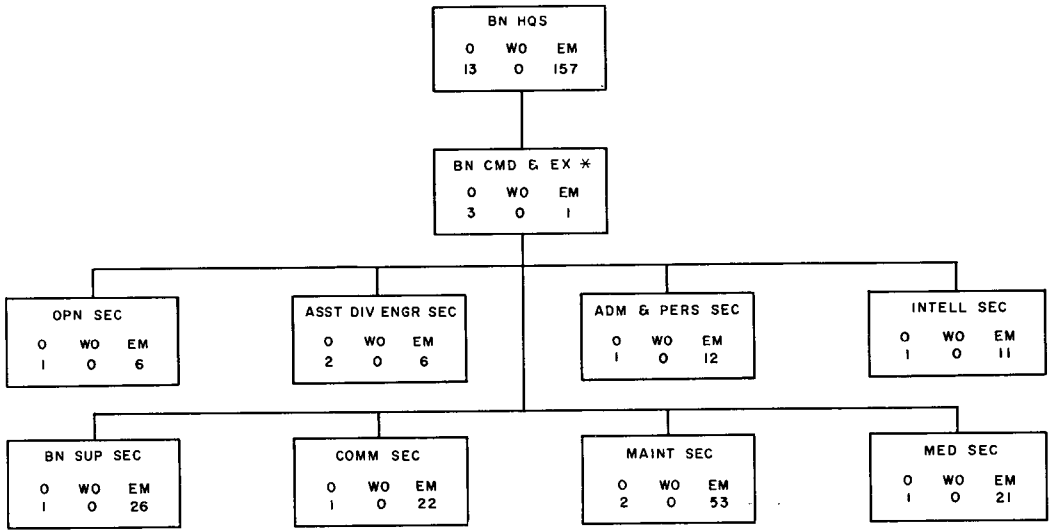
### 86. Organization

Battalion headquarters (fig. 18) is divided into the following elements: command, unit staff, unit special staff, and division special staff.

### 87. Duties of Battalion Commander and Executive Officer

*a.* The engineer battalion commander is also a member of the division commander's staff. His command and staff functions are separate in that each involves different responsibilities and duties. Generally, his duties consist of implementing the engineer battalion capabilities listed in paragraph 7.

(1) The command function requires that the battalion commander direct, supervise, and control the activities of all organic and attached engineer troops and their equipment. He pre-




* NOTE: THE CHAPLAIN IS CARRIED IN THIS SECTION. THE CHAPLAIN'S ASSISTANT IS CARRIED IN THE ADM & PERS SECTION

*Figure 18. Battalion headquarters.*

pares plans, policies, and orders. He visits and inspects his troops and activities and conducts personal reconnaissance.

(2) The staff function requires the battalion commander to serve on the division special staff as division engineer. As such he furnishes engineering advice, information, and assistance to the division commander and staff. He helps prepare division plans, policies, and orders. He determines requirements for engineer supplies for units of the division and maintains close contact with the division general staff sections, particularly G3 and G4. He keeps informed on engineer phases of plans of the other special staff officers and keeps them informed of engineer requirements for their services. He maintains close liaison with the division artillery commander and battle group commanders to anticipate their engineer needs. He makes recommendations for engineer support from corps, when required. He coordinates planning and maintains close liaison with the corps engineer.

(3) If the use of atomic weapons is contemplated, the engineer may be responsible for participation in the preliminary planning conferences in which ways and means are determined to carry out the commanding general's plan. Targets are discussed by all interested members of the staff, and the engineer may be called upon to present reasons for the retention or elimination of specific targets. He may

be detailed to assist in target analyses on proposed targets. Recommendations may include—

(*a*) Quantity, type, and yield of weapons.

(*b*) Height or depth of burst.

(*c*) Desired emplacement site location. .

(*d*) On-call detonation or times of burst.

(*e*) Troop and civilian safety precautions.

(4) The engineer may also be responsible for recommendations concerning troops and special equipment to accomplish the mission. Upon the commander's decision to employ a prepositioned atomic weapon, the engineer may be responsible for designating the emplacing and firing unit. The engineer may also be responsible for the coordination of the supply and movement of equipment, materials, and personnel to support a prepositioned atomic weapon mission.

(5) Since the division engineer is charged with both command and staff responsibilities, either of which might occupy his full time, he must adopt a method of operation that will permit him to perform all of his duties properly. To assist him in his dual role are his executive officer and staff at battalion headquarters and the assistant division engineer (ADE) sections at division and brigade headquarters.

*b.* The executive officer is second in command. He is responsible for supervision of the staff and controls and coordinates all staff activities in accordance with

the orders and policies of the commander. The executive officer remains at the battalion headquarters when the commanding officer is absent. He requires the staff to keep him informed of the battalion and division situation.

## Section II. DIVISION ENGINEER SECTION

### 88. Organization

The division engineer section consists of 2 identical staffs, each composed of 1 assistant division engineer, a combat construction foreman, a construction draftsman, and a radio operator. This duplication provides equal capabilities at both division and brigade headquarters and is necessary because brigade headquarters will not only function as an alternate division headquarters but will frequently command a significant portion of the divisional combat power.

### 89. Duties of Assistant Division Engineer and Section Personnel

The assistant division engineers represent the division engineer at the division staff and brigade headquarters and are empowered to make minor decisions for him in his absence. The assistant division engineers must familiarize themselves with all division and engineer battalion activities. They are responsible for keeping the engineer situation maps at division and brigade headquarters accurate and up-to-date. They keep the engineer battalion informed on the activities and plans of the division and brigade headquarters.

### 90. Operations

The sections are important liaison agencies between division headquarters, brigade headquarters, and the engineer battalion. They normally operate at the division and brigade headquarters where they can readily reach and be reached by the division and brigade commanders, and their staff officers. Through their radios in the battalion net, the ADE's communicate with the battalion commander and members of his staff.

## Section III. ADMINISTRATIVE SECTION

### 91. Organization

The administrative section consists of the adjutant (S1), personnel warrant officer, personnel sergeant, personnel administration clerk, personnel specialists, clerk-typist, mail clerk, chaplain's assistant, and radio operator.

### 92. Duties of Adjutant and Section Personnel

*a. Adjutant.* The adjutant performs in general the functions of the personnel officer of the general staff type organization, the functions of the secretary of the general staff, the functions of the commander's personal staff, and the personnel functions of those special staff officers who are not present in the battalion staff, such as the adjutant general, inspector general, staff judge advocate, provost marshal, public information officer, and special services officer. He is responsible for staff supervision of the following activities:

(1) Personnel management activities pertaining to—

(*a*) Classification to include the awarding and changing of MOS, promotion and demotion.

(*b*) Assignment, to include reassignment, transfer, replacement processing, and reporting and requisitioning of personnel.

(*c*) Reenlistment.

(*d*) Separation, to include discharge, relief from active duty, retirement, and transfer to the Army Reserve.

(*e*) Personnel services to include leaves of absence, awards, and decorations.

(*f*) Records required to perform personnel management functions including all personnel records.

(2) Maintenance of records on military justice procedures and assistance in the review of courts-martial proceedings from an administrative viewpoint.

(3) Military pay matters.

(4) Preparation and processing of reports on casualties and prisoners of war.

(5) Maintenance of strength and other personnel statistics.

(6) Operation of the headquarters communication control, distribution centers, and messenger service.

(7) Operation of the postal service for the battalion.

(8) Distribution, safeguarding, and accounting for classified correspondence.

(9) Publication, authentication, and distribution of all orders and instructions except combat orders.

(10) Maintenance of the office of record for the headquarters and supervision of records administration throughout the battalion.

(11) Reproduction sevice for the headquarters.

(12) Obtaining replacements and arranging for their reception, processing, assignment, and quartering.

(13) Laying out the command post and establishing a standing operating procedure to guide its operation.

(14) Plans for shelter and quartering areas.

(15) Sanitation standards in coordination with the surgeon.

(16) Coordination of recreation for battalion personnel and evaluation of morale. General supervision over the chaplain and maintenance of contact with welfare agencies.

(17) Arrangements for the collection and evacuation of prisoners of war in coordination with the battalion S2 and S4.

(18) Maintenance of the unit journal.

*b. Personnel Warrant Officer.* The personnel warrant officer assists the adjutant in personnel matters. He directs and supervises the activities of the personnel sergeant and the personnel specialists. Specifically he supervises the following personnel functions:

(1) Preparation and maintenance of officer and enlisted qualification records, enlisted service

records, and other documents which are part of the personnel records jacket for officer and enlisted personnel.

(2) Classification, reclassification, assignment, and reassignment of enlisted personnel.

(3) Officer and enlisted separations actions.

(4) Enlistment and reenlistment actions.

(5) Enlisted appointment and reduction actions (to and from pay grade E–5 and above).

(6) Initiation of officer and enlisted military pay orders, allotment applications, and travel vouchers, and enlisted family allowance applications.

(7) Verification of monthly officer and enlisted machine records rosters against qualification records and morning reports.

(8) Administrative actions on officer efficiency reports.

(9) Preparation, maintenance, and use of personnel information rosters and inventory charts.

(10) Requisitioning of officer and enlisted personnel for all elements of the unit (when the formal requisitioning system is specified by the major commander).

(11) Surplus reporting of enlisted personnel.

(12) Audit of company morning reports, extraction of information for records maintenance and for reporting purposes, and coordinating the correction of morning report errors through companies concerned.

(13) Preparation of strength returns and miscellaneous reports and rosters.

(14) Preparation of personnel correspondence.

(15) Publication of special orders and letter orders.

(16) Administrative actions on courts-martial and board reports, reports of investigation and survey, and statements of charges for government property lost, damaged, or destroyed.

(17) Preparation of courts-martial charge sheets.

(18) Filing of correspondence, records, directives, and reports.

### 93. Training

Personnel of the administrative section are given their general training by the headquarters and headquarters company. Administrative training is done on the job or by sending selected personnel to schools conducted by higher headquarters in accordance with quotas made available to the battalion by division headquarters.

## Section IV. INTELLIGENCE SECTION

### 94. Organization

The intelligence section consists of an intelligence officer, reconnaissance officers, intelligence sergeant, engineer reconnaissance sergeants, clerk-typist, draftsman, radio operators, map distributor. and still photographer.

## 95. Duties of Intelligence Officer and Section Personnel

*a. Intelligence Officer.* The intelligence officer is a member on the unit staff and directs the activities of the intelligence section. He is also battalion camouflage officer. The general duties of an intelligence officer are described in FM 101–5. Typical duties include—

(1) *Collection, evaluation, and dissemination of engineer information.* The principal duty of the intelligence officer is to gather and evaluate engineer information and furnish it as needed. He assigns missions to the battalion reconnaissance officers and, in coordination with S3, reconnaissance missions to the combat companies as required. The information collected pertains to radiological fallout; maps; routes of communication; terrain; sources of engineer supplies or usable equipment; engineering structures, both on friendly and hostile territory; all minefields, booby-traps, and obstacles laid by either friendly or enemy troops; and examination of enemy engineer equipment and enemy practices regarding its use. S2 must conserve the effort of reconnaissance agencies by specifying the essential elements of information during a stated period and by issuing definite reconnaissance orders to the gathering agencies.

(2) *Maintaining close contact with G2.* G2 assigns reconnaissance missions to the battalion as an agency in the division collection plan. G2 also furnishes S2 with data, collected by nonengineer agencies, which may be

of value to the engineers. S2 on the other hand may, while seeking technical information, discover valuable tactical information which is promptly given to G2.

(3) *Posting of the engineer intelligence map.* As an aid in collecting and evaluating engineer information and in disseminating the resulting intelligence, S2 keeps an engineer intelligence situation map. This map shows the result of reconnaissance, classification of roads and bridges, potential water supply sites, sources of local materials, minefield information (FM 20–32), results of enemy action, disposition of major units, and other items of engineer intelligence.

(4) *Keeping the S2 journal.* The S2 journal contains summaries of important written and oral messages received and sent. It also contains notes of periodic reports, orders, records of important conferences, and similar matters concerning the section. An S2 worksheet is also maintained to facilitate systematic arrangement of engineer information coming into the intelligence section so that all items on a particular subject will be grouped together for ready reference and comparison.

(5) *Supervision of intelligence training.* S2 assists S3 in supervising training in engineer reconnaissance and combat intelligence. Training must be carefully planned and supervised so engineer troops gain a proper viewpoint on the scope and importance of

engineer reconnaissance and engineer reconnaissance reports.

(6) *Conduct of combat intelligence and counterintelligence activities.* The S2 has staff responsibility for the planning and execution of combat intelligence and counterintelligence activities in the battalion, including security operations. For example, in cooperation with the S1, he is responsible for censorship of postal matter and security requirements for handling messages. He examines enemy personnel, captured documents, civilians, and material of immediate importance to the unit.

(7) *Procurement and distribution of maps.* The intelligence officer procures and distributes maps in accordance with general policies laid down by the G2.

(8) *Furnishing information to battalion commander.* The S2 assists the battalion commander in carrying out his functions as a division special staff officer by furnishing him detailed intelligence on which to base his advice to the division commander.

*b. Reconnaissance Officer.* Each reconnaissance officer supervises a reconnaissance team. He performs such reconnaissance missions as may be assigned him and prepares the necessary reports. He is responsible for the training and performance of the personnel of his reconnaissance team and for the maintenance of the team's equipment. Each reconnaissance officer is assisted by an engineer reconnaissance sergeant and a radio operator. Reconnaissance personnel use light

aircraft for reconnaissance missions when possible. Air reconnaissance is not a substitute for ground reconnaissance. Instead it is best used as a preliminary method to reduce the area assigned for a detailed ground reconnaissance by eliminating areas rated unsuitable from the air view. Light aircraft (fig. 19) within the division are normally made available to the engineers as required. Suggested missions for the use of light aircraft by the reconnaissance teams are—

(1) Locating general sites for water points.
(2) Locating engineer material in specific areas.
(3) Making preliminary reconnaissance of roads, railroads, routes, and bridges.
(4) Locating some enemy obstacles.
(5) Checking camouflage effectiveness.
(6) Locating prospective airfield sites.
(7) Locating prospective river-crossing sites.
(8) Observing roads ahead of a march column.
(9) Verification of terrain maps.
(10) Providing an aerial view for the sketching of local areas.
(11) Performing photographic missions.
(12) Locating prospective bivouac areas.

*c. Combat Engineer Intelligence Sergeant.* The combat engineer intelligence sergeant under the direction of the intelligence officer supervises the activities of the section. He also helps the intelligence officer in his duties by keeping the intelligence situation map up-to-date, preparing reports, instructing patrol and reconnaissance parties, keeping records, preparing correspondence, and performing other intelligence functions.

*Figure 19. Engineers use light aircraft for a reconnaissance mission.*

*d. Map Distributor.* The map distributor receives or picks up maps for division operations from the Corps or Army map depot. Initial issue of maps for division operations is allotted by higher headquarters. The map distributor breaks down the map supply in accordance with the policies established in the division standing operating procedure. The map distributor drives the section's 2½-ton truck.

*e. Draftsman.* The draftsman prepares overlays, sketches, and maps and performs drafting assignments as directed.

*f. Photographer.* The photographer makes, collects, and reproduces photos.

## 96. Training

Intelligence training is acquired on the job and by attendance at special schools conducted by the division G2 or by the corps or army engineer. Personnel of the

intelligence section must be trained to assist the S2 in the processing of incoming information. The large amount of data must be sorted, grouped, and recorded by type, so that related items may be conveniently compared for evaluation and interpretation. In cataloging data use is made of an S2 journal, engineer intelligence maps, S2 worksheets, and files. Information of immediate or potential value to other headquarters must be transmitted promptly to the division G2, to the corps engineer, or to the intelligence section of one of the other services. All intelligence personnel must be taught the principle that intelligence is valueless unless in the hands of those needing it when required.

## Section V. OPERATIONS SECTION

### 97. Organization

The operations section consists of the S3, an assistant, an operations sergeant, a construction surveyor, a clerk-typist, a combat construction specialist, a construction draftsman, and a radio operator.

### 98. Duties of Operations Officer and Section Personnel

*a. Operations Officer.* The operations officer is a member of the unit staff and directs and supervises the operations section. He may be the battalion chemical, biological and radiological (CBR) officer. His general duties as operations and training officer are prescribed in FM 101–5. Typical duties include—

(1) Planning and assisting in supervision of battalion training.

(2) Planning the allocation of engineer troops and construction equipment to various tasks

and preparing battalion operation orders. He coordinates his plans with S4 to be sure the plan of operations is adequately supported by the supply plan.

(3) Arranging details for movement of the battalion under tactical conditions.

(4) Making a continuing estimate of the situation so as to be able to make recommendations at any time on the employment of the battalion.

(5) Utilizing his assistants in the operations section to make technical reconnaissance, designs, and plans for accomplishing engineer tasks.

(6) Conducting training and supervising atomic and CBR activities of the battalion.

(7) Keeping the engineer operations map.

(8) Recommending security measures for battalion headquarters to the battalion commander.

(9) Preparing tactical and technical reports as directed.

(10) Recommending that requests tbe made for additional engineer support.

(11) Planning reconnaissance missions for engineer operational information.

(12) Coordinating with supporting engineer units.

*b. Assistant S3.* In addition to assisting the S3, he coordinates and supervises education and information activities.

*c. Combat Engineer Operations Sergeant.* He helps the operations officer in performing his duties and in supervising the activities of the section.

*d. Combat Construction Specialist.* The combat construction specialist acts as a technical inspector and advisor on all phases of engineer combat construction.

*e. Other Personnel.* The construction surveyor, clerk-typist, draftsman, and radio operator perform duties in accordance with their specialties as directed. In addition the radio operator drives the section's ¼-ton truck.

### 99. Training

The training of the operations section is parallel to that of other headquarters sections. The basic and general training of all enlisted personnel is conducted by the headquarters and service company. Some special training may be required, particularly for the troop information and education specialist.

## Section VI. SUPPLY SECTION

### 100. General

The supply section provides battalion supply, divisional class II and IV engineer supply, and water supply. The section has a limited organic truck assignment and therefore the class IV supply handling must be accomplished by shuttling of trucks from the division transportation battalion. The personnel of the supply section include the supply officer (S4), assistant supply officer, division engineer supply sergeant, battalion supply sergeant, water supply foreman,

engineer supply specialist, water supply specialists, supply clerk, and truck drivers. The supply section is divided into four subsections: administrative, division engineer supply, battalion supply, and water supply.

### 101. Administrative Subsection

*a. Organization.* The administrative subsection consists of the supply officer (S4), a supply warrant officer, a division engineer supply sergeant, a clerk-typist, and light truck drivers.

*b. Duties of Supply Officer and Administrative Subsection Personnel.*

(1) *S4.* The S4 is both a member of the unit staff and the division engineer supply officer. He arranges for the supply, transportation, and issue of engineer supplies to the division. The S4 coordinates and supervises the supply of fortification and construction materials for the division. He supervises the supply section of the battalion and is responsible for its functioning. In general, he must keep himself informed of the tactical situation and must keep in close contact with S2 and S3, with the engineer company commanders, with the division G4, and with all supply installations. The S4—

(*a*) Studies and collects detailed information on the supply situation, in cooperation with S2. This information includes data on local resources, available credits in depots and other stocks under unit control, and captured engineer supplies. Using this infor-

mation, he advises the battalion commander as to availability of equipment and materials.

(*b*) Examines engineer requisitions and makes recommendations for priorities of issue.

(*c*) In coordination with S3, recommends allocation of available engineer supplies, estimates future requirements, and when necessary arranges in advance for using units to draw them.

(*d*) Recommends the number and location of water supply points.

(*e*) Keeps a continuing inventory of stocks of engineer materials available locally and arranges for taking over and distributing them.

(*f*) In coordination with S3, allocates transportation, other than organic, to subordinate units.

(*g*) Supervises the procurement of all classes of supply for the battalion.

(*h*) Supervises the procurement of all engineer supplies for the division.

(*i*) Prepares reports as directed.

(*j*) Coordinates training of supply personnel with the battalion S3.

(2) *Assistant supply officer and division engineer supply sergeant.* The supply warrant officer and division engineer supply sergeant help the supply officer in his duties. They supervise the activities of the subsections to insure the

even flow of supplies and see that all requisitions and supply records are kept correctly and up-to-date. The assistant S4 is also the battalion food supervisor. As such, he is responsible for the procuring and distributing of food for the battalion, keeping battalion level mess records, and inspection of all company mess facilities. Personnel of the battalion supply subsection assist him in these matters.

(3) *Drivers.* All drivers in the supply section help in supply operations as well as drive and maintain their vehicles. They may be required to process requisitions through a depot headquarters, draw supplies, supervise or help in loading and unloading their vehicles, or check issues to other units. The trucks are used for general hauling and are allotted to the subsection as required.

## 102. Division Engineer Supply Subsection

*a. Organization.* The division engineer supply subsection consists of a senior engineer supply sergeant, an engineer supply specialist, and a supply clerk.

*b. Duties of Division Engineer Supply Subsection Personnel.* The senior engineer supply specialist supervises and directs the activities of the subsection. The subsection processes all requisitions and records for engineer supply for all units in or attached to the division. The subsection also supervises the distribution of engineer supplies to all divisional units except the engineer battalion. With the help of the supply specialist and clerk, the sergeant edits and consolidates

engineer requisitions, keeps engineer supply records, and receives, breaks down, stores, and issues engineer supplies.

### 103. Battalion Supply Subsection

*a. Organization.* The battalion supply subsection consists of a battalion supply sergeant, a supply clerk, and an engineer supply specialist.

*b. Duties of Battalion Supply Subsection Personnel.* The battalion supply sergeant directs and supervises the activities of the subsection. With the help of the clerk and the supply specialist, he edits and consolidates requisitions for all classes of supplies, keeps supply records; and receives, breaks down, stores, and issues all classes of supplies to the battalion. These supplies include rations, clothing and equipment, petroleum products, signal equipment, and ammunition. The section personnel also procure, break down, and issue all rations for units within or attached to the battalion. Battalion level mess records are kept and necessary reports are submitted as directed by the supply warrant officer.

### 104. Water Supply Subsection

*a. Organization.* The water supply subsection consists of a water supply foreman and water supply specialists. The specialists are organized into five teams.

*b. Duties of Water Supply Subsection Personnel.* The water supply sergeant (foreman) directs and supervises the activities of the water supply subsection. He is responsible for the maintenance, installation, and operation of water points (fig. 20). He may conduct

reconnaissance for locating water supply points and recommend schedules for drawing water. With the help of the specialists he performs the following duties:

(1) Installs, operates, and demounts water points.
(2) Maintains and performs minor repairs on water purification equipment.
(3) Pumps, stores, and dispenses water.
(4) Performs tests in the field to identify and measure impurities and CBR contamination, to determine the treatment required, to check the effectiveness of treatment, and to insure that the issued water is pure and potable.
(5) Enforces sanitary, traffic, security, and camouflage regulations at the water point.
(6) Keeps water supply records and submits necessary reports.

*c. Operations.*

(1) Under the guidance of the water supply foreman, the subsection operates 5 teams. Normally, 1 team will support each committed battle group. Teams may be attached to the engineer combat companies that support the battle groups. Alternatively, teams may be attached to any unit. If attachment is impractical, teams may operate independently. It is practical to operate 4 points in depth across the divisional front (2 up and 2 back) and displaced in the direction of movement. The fifth point could then be held in reserve or used to support the remainder of the division depending upon depth of area of operations.

*Figure 20. Engineers operating a water supply point.*

(2) 2½-ton cargo trucks and 1½-ton trailers are assigned to the water supply subsection. These are used to transport the water purification sets. One truck and trailer is necessary to transport each team and its equipment to successive sites. Additional mobility and speed in going into and out of operation may be obtained by bolting some components of the purification unit to the floor of each trailer.

(3) The water supply sergeant visits each water point daily to deliver supplies, food, and mail and to help the team at the point with any difficulties that may develop.

*d. Training.* The organization of the water supply subsection lends itself to on-the-job training and to the advancement of inexperienced men assigned to it. The technique can easily be learned on the job if some of the personnel are experienced. The water supply foreman is furnished with the cadre and may be appropriately used to train the entire subsection in a short but intensive school type course. School quotas are utilized when available to train in the more technical jobs. See TM 5–295 and FS 5–108 for additional information.

## Section VII. COMMUNICATION SECTION

### 105. Organization

The communication section consists of the communication officer, a communication chief, radio operators, radio mechanics, switchboard operators, teletypewriter operators, wiremen, and message center clerks.

### 106. Duties of Communication Officer and Section Personnel

*a. Communication Officer.* The communication officer directs the communication section and, as a special staff officer, supervises all communications activities and organizational maintenance on signal equipment in the entire battalion. His duties are to—

(1) Advise the battalion commander and staff on matters of signal communication technique.

(2) Prepare plans and supervise the establishment, operation, and maintenance of the engineer communication system (figs. 21 and 22).

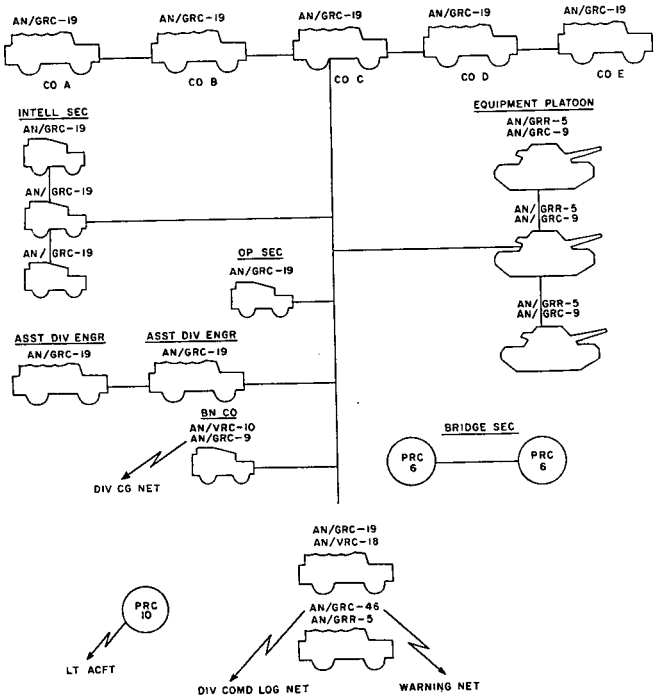
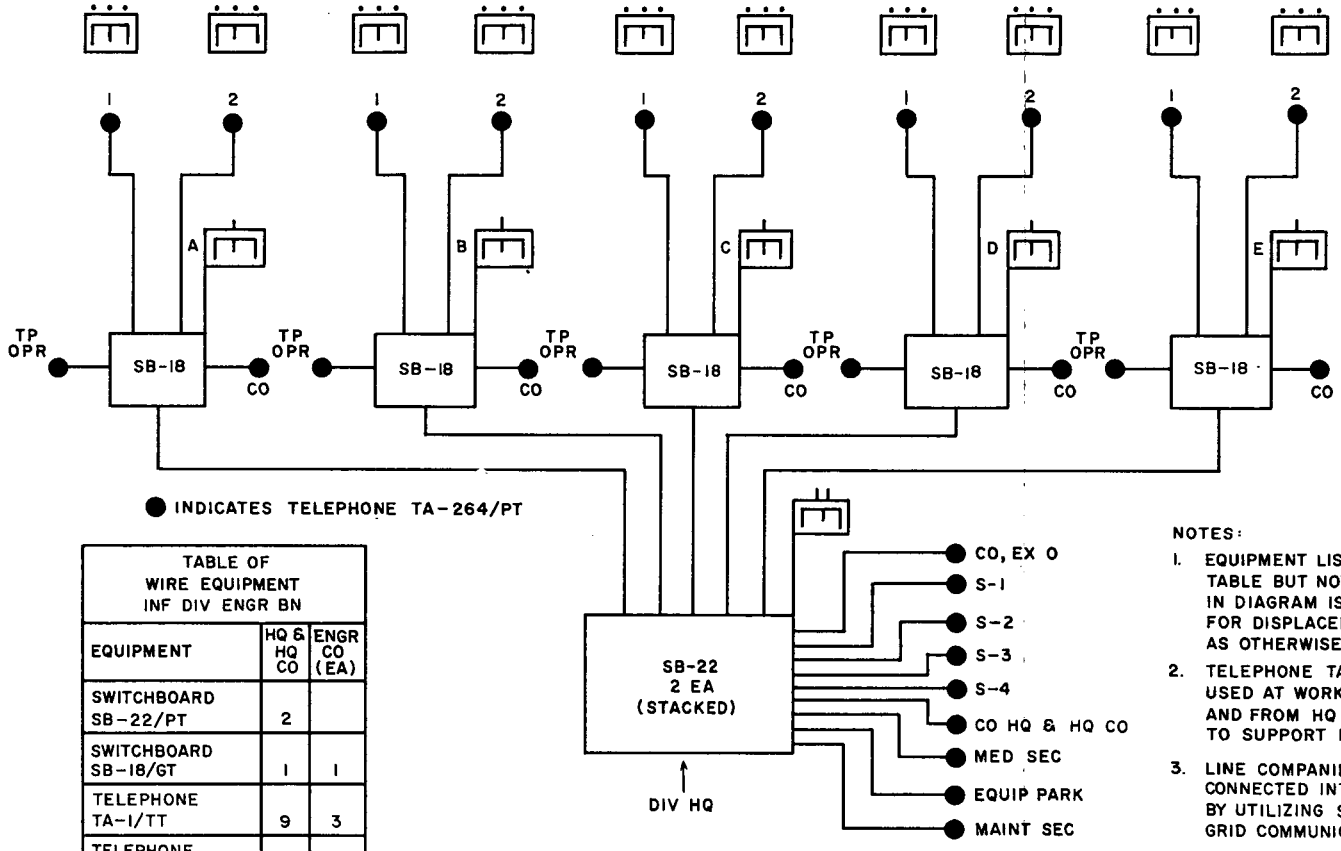



*Figure 21. Typical radio net, infantry division, engineer battalion.*

(3) Supervise technical training of battalion communication personnel.

(4) Advise and assist S4 regarding supply of signal communication materials for the battalion.

(5) Make recommendations, in coordination with S1, for initial and successive locations of the command post of the battalion.




| TABLE OF WIRE EQUIPMENT INF DIV ENGR BN | | |
|---|---|---|
| EQUIPMENT | HQ & HQ CO | ENGR CO (EA) |
| SWITCHBOARD SB-22/PT | 2 | |
| SWITCHBOARD SB-18/GT | 1 | 1 |
| TELEPHONE TA-1/TT | 9 | 3 |
| TELEPHONE TA-264/PT | 10 | |
| TELEPHONE TA-312/PT | | 4 |
| TELETYPEWRITER AN/PGC-1 | 1 | |
| TERMINAL TT AN/TCC-14 | 1 | |

NOTES:

1. EQUIPMENT LISTED IN TABLE BUT NOT SHOWN IN DIAGRAM IS USED FOR DISPLACEMENT AND AS OTHERWISE REQUIRED
2. TELEPHONE TA-1/TT USED AT WORK SITES AND FROM HQ & HQ CO TO SUPPORT PLATOONS
3. LINE COMPANIES ARE CONNECTED INTO BN SWBD BY UTILIZING SIGNAL GRID COMMUNICATION NET

*Figure 22. Typical wire net, infantry division, engineer battalion.*

(6) Make recommendations for procuring and replacing signal communication personnel.

(7) Develop prearranged messages in coordination with S3.

*b. Communication Chief.* The communication chief helps the communication officer in his duties. The communication chief supervises the section in the installation, operation, and maintenance of the wire and radio communication facilities. He may instruct and train communication personnel in the technique of field communications. He supervises the radio operators in operating the battalion net control station.

(1) As communication center chief he directs and coordinates all phases of communication center operations to insure the transmission of all messages with the utmost speed, accuracy, and security. He supervises and instructs communication center personnel in the operation of a message center and in the performance of individual assignments.

(2) He keeps necessary records pertaining to the operation of wire, radio, and message center activities.

*c. Message Center Clerks.* The message center clerks operate the battalion message center under the direct supervision of the communication chief. Their primary functions are to receive, transmit, and distribute messages and to keep the necessary records pertaining thereto.

*d. Switchboard, Radio, and Teletypewriter Operators.* The switchboard, radio, and teletypewriter operators install and operate the wire and radio facili-

ties of the communication section and perform minor maintenance on the equipment.

*e. Wiremen.* The wiremen help install the wire equipment and make minor repairs. They are also trained to be alternate switchboard and radio operators.

*f. Radio Mechanic.* The radio mechanic does organizational maintenance on signal equipment in the communication section and in the headquarters and headquarters company. He assists in the installation of wire and radio equipment.

### 107. Operations

The communication section operates the battalion radio net, as required by the battalion commander, operates the radio for communication with division headquarters, operates the telephone system and message center, and does organizational maintenance on Signal Corps equipment in battalion headquarters and headquarters and service company. Operators are provided for 24-hour communication. See FM's 7–100 and 11–10 for more details on communications in the division.

## Section VIII. MAINTENANCE SECTION

### 108. Mission

The maintenance section performs company maintenance for headquarters and headquarters company, organizational maintenance for all battalion equipment, and third echelon maintenance for all divisional engineer equipment.

### 109. Organization

The section is divided into a battalion maintenance subsection and a field maintenance subsection. The battalion motor officer supervises both subsections.

## Section IX. BATTALION MAINTENANCE SUBSECTION

### 110. Organization

The battalion maintenance subsection is composed of a motor officer, warrant officer (assistant motor officer to the battalion motor officer), motor sergeant, senior engineer equipment mechanics, senior wheeled vehicle mechanics, armorer, engineer equipment mechanics, tracked vehicle mechanic, welder, wheeled vehicle mechanics, engineer equipment mechanic's helpers, sign painter, toolroom keeper and wheeled vehicle mechanic's helpers.

### 111. Duties of Battalion Motor Officer and Section Personnel

*a. Battalion Motor Officer.* The battalion motor officer, a member of the special staff, exercises immediate control over the organizational maintenance section. His duties are to—

(1) Advise the battalion commander, his staff, and subordinate commanders on the technical aspects of automotive operation and maintenance.

(2) Direct the operations of the battalion maintenance section.

(3) In coordination with S3, direct the training of drivers, mechanics, and operators.

(4) Prepare reports and maintain records on equipment and supplies.

*b. Assistant Motor Officer.* The warrant officer under the immediate supervision of the motor officer directs the operation of the battalion shop, giving technical advice and help to all company motor pool personnel. His duties are to—

(1) Check incoming repair work to determine amount and exact nature of repairs.
(2) Set up maintenance schedules on vehicles and equipment in accordance with existing directives.
(3) Assign repair and maintenance work.
(4) Inspect shop operations to insure that repair schedules are maintained and that correct methods are being used.
(5) Check completed work to insure that vehicles and equipment are in proper operating condition before being released from the shop.

## 112. Operations

The battalion maintenance subsection provides organizational maintenance service for headquarters and headquarters company and all battalion vehicles and other equipment. The battalion maintenance section is supervised by the assistant motor officer and is under control of the battalion motor officer. The headquarters and headquarters company shop is supervised by the motor sergeant. The battalion maintenance subsection issues parts and repair supplies to the combat companies.

## Section X. FIELD MAINTENANCE SUBSECTION

### 113. Organization

The field maintenance subsection is composed of the battalion engineer equipment maintenance officer, an engineer equipment maintenance warrant officer, section chief, machinist, diesel repairmen, engineer equipment repairmen, engineer parts specialists, electric generator repairmen (fig. 23), special electric device repairman, and welder.

### 114. Duties of Personnel

*a. Division Engineer Equipment Maintenance Officer.* The division engineer equipment maintenance

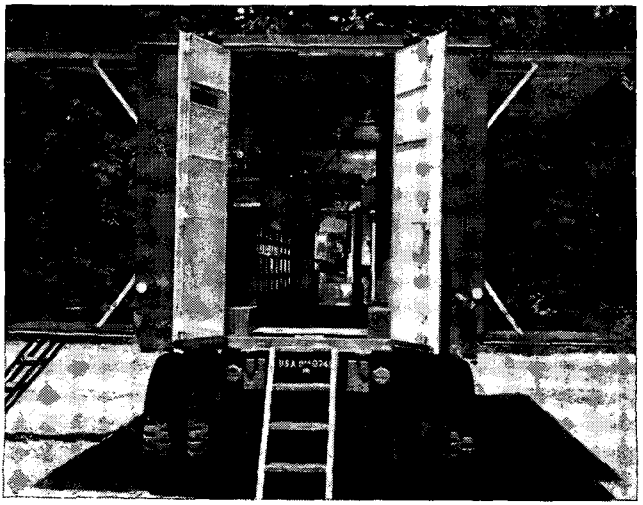


*Figure 23. Electric repair set, field maintenance section.*

officer exercises control of third echelon engineer maintenance activities in the division. His duties are to—

(1) Advise commanders and their staffs on technical aspects of engineer equipment operation and maintenance.

(2) Direct the supply and operations of the engineer field maintenance section.

(3) Advise commanders and staff concerning training of engineer maintenance personnel and equipment operators.

(4) Prepare reports and records of engineer equipment and supplies.

*b. Assistant Division Engineer Equipment Maintenance Officer.* The assistant engineer equipment maintenance officer supervises the engineer field maintenance shop (fig. 24). His duties are to—

(1) Check incoming repair work to determine amount and exact nature of repairs.

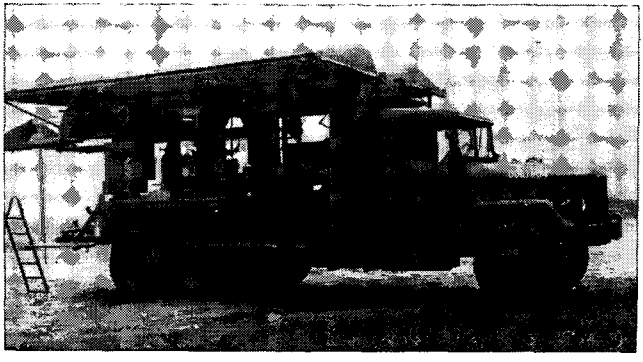


*Figure 24. General purpose repair shop, field maintenance section.*

(2) Assign repair and maintenance work.

(3) Inspect shop operations to insure that repair schedules are maintained and that correct methods are being used.

(4) Check completed work to insure that vehicles and equipment are in proper operating condition before being released from the shop.

### 115. Operations

The field maintenance subsection inspects and effects third echelon repair of engineer equipment in the division at work sites. Major items which are determined to be beyond the capabilities of contact repair (fig. 25) will be evacuated by the using organization to the supporting engineer field maintenance company. Minor items, such as sniperscope, small generators, and compressors, may, at the discretion of the engineer inspector, be evacuated to the field maintenance subsection for repair and return. However, the requirement of maintaining mobility and the lack of evacuation equipment make it mandatory that the field maintenance subsection not build up backlogs of items for repair beyond that which can be moved by means of its organic equipment. The engineer field maintenance subsection is based upon the supporting engineer field maintenance company for repair parts. The engineer field maintenance subsection will maintain continuous liaison with division organizations and the supporting engineer field maintenance company in order to speed up the evacuation, repair, and return of items from the field maintenance company to division organizations.

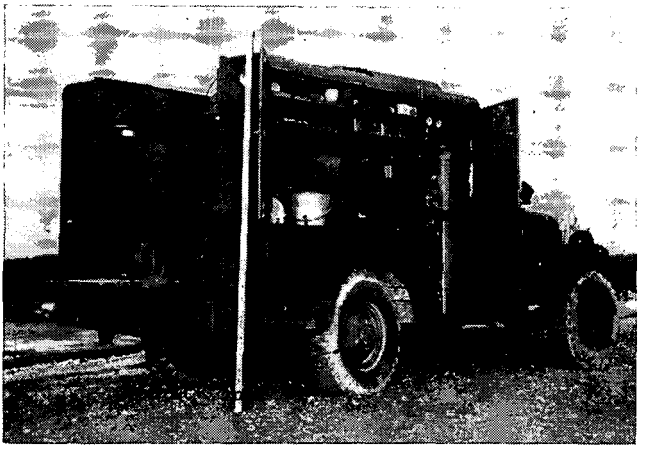


*Figure 25. Field maintenance contact repair vehicle.*

### 116. Training

*a.* General training of field maintenance section personnel is coordinated with the battalion S3.

*b.* Specialist training of mechanics is given by battalion or division schools, service schools, or on-the-job training. When school quotas are not available, it is usually possible to arrange for the on-the-job training of a selected soldier by a qualified technician in a nearby engineer unit. In addition to individual training, the section needs considerable "shakedown" training to enable it to move and work as an efficient team.

## Section XI. CHAPLAIN SECTION

### 117. Organization

The chaplain, a member of the special staff, is assigned to battalion headquarters and his enlisted assistant, to the administrative and personnel section.

### 118. Duties of the Chaplain

The chaplain is advisor to the battalion commander and staff on all matters pertaining to religious welfare. He furnishes spiritual guidance and religious services for all members of the battalion.

## Section XII. MEDICAL SECTION

### 119. Organization

The medical section consists of a medical officer, section sergeant, senior medical aidman, company aid men, aid station attendant, medical aid men, general clerk, and ambulance driver. Aid men are attached to the companies in accordance with the anticipated need for their services.

### 120. Duties of Medical Officer and Section Personnel

*a. Medical Officer.* The medical officer, a member of the special staff, directs the battalion medical section and supervises the medical services of the battalion. He serves as advisor to the battalion commander and staff on matters affecting the health of the command and the sanitation of the battalion area. In general the medical officer—

(1) Supervises training in medical subjects within the battalion.

(2) Makes medical and sanitary inspections and keeps the battalion commander informed on the health of the battalion.

(3) Prepares the medical plan, including recommendations for location of the battalion aid station.

(4) Establishes and operates the battalion aid station.

(5) Supervises the collection, care and treatment, and evacuation of the sick and injured.

(6) Requisitions the medical supplies and equipment required by the medical section.

(7) Verifies the status of medical supplies in all elements of the battalion and recommends steps to insure timely replenishment.

(8) Prepares the monthly sanitary report and other required medical records and reports.

*b. Section Sergeant.* This noncommissioned officer, under the supervision of the medical officer, directs the technical and administrative activities of the section.

*c. Other Section Personnel.* Other section personnel assist in the care of the sick and injured, act as company aid men, drive the ambulance, keep records, and prepare reports and correspondence.

### 121. Operations

The medical officer, in coordination with S3, supervises the medical training in the battalion. The section provides company aid men, operates a battalion aid station, and may evacuate casualties to the division clearing company. Dental care is obtained at the nearest division clearing station.

# CHAPTER 5

# BATTALION OPERATIONS

## Section I. GENERAL

### 122. Employment

*a.* The battalion functions as a unit only during certain phases of training, on large engineering projects, or as infantry in combat. It executes all types of normal engineer combat missions. An engineer combat company may operate in direct support of each committed battle group. The remainder of the battalion performs engineer missions in the division area and is prepared to reinforce the forward engineer companies as required. Engineer troops are attached only when necessary battalion control cannot be effected by direct or general support. Direct or general support roles give the division engineer proper control of his troops, and provide for the maximum flexibility and effectiveness of engineer effort within the infantry division.

*b.* In instances where an engineer unit from the engineer battalion is in support of, or attached to a battle group, the engineer commander of that unit acts as engineer advisor to the battle group commander.

### 123. Standing Operating Procedure

A battalion standing operating procedure (SOP) promotes smooth functioning throughout the bat-

talion and aids in orienting newly assigned personnel. To be effective, an SOP is informative, understandable, and complete, yet concise. Appendix II shows an SOP sample outline.

### 124. Security

Each commander is responsible for the security of his unit. Security includes all measures taken by a commander to protect the unit against enemy interference, surprise, and observation. The measures adopted should be appropriate to the threat; as the danger becomes greater, security measures are increased. For the engineers, security measures are required to protect troops and equipment in bivouac and during movement and to protect work parties. Work parties are sometimes protected by infantry elements so more engineer troops can be released for work on engineer missions. Security is also required at stationary positions such as completed bridges and their approaches and bridges prepared for demolition. Details of composition, organization, operation, and nomenclature of security elements are given in FM's 7–10, 7–40, and 7–100.

## Section II. TRAINING

### 125. General

This section outlines the progressive training, from the basic and advanced individual training through unit, combined, and concurrent training of the infantry division, engineer battalion. It should be kept in mind that training never ceases, before, during, or

after combat, and that the ultimate goal of all training is success in battle.

### 126. Responsibility

*a.* Commanders at each echelon are responsible for training their units. The battalion commander is responsible for the training of his organization. Similarly, the company commanders are responsible for the training of their units. The battalion operations and training officer (S3) prepares a training program and makes recommendations concerning training to the battalion commander. He also establishes battalion-level schools for officers, noncomissioned officers, and specialists.

*b.* Subject to modifications imposed by division training directives, training follows Army Training Programs (ATP's). In accordance with the infantry division training program, ATP's prescribe the training subjects and the minimum time to be spent on each subject during each phase of training. Throughout all training, the application of prior instruction to current training is stressed. Instruction in a subject once completed must not be neglected; it must be applied whenever possible and concurrently with other training.

*c.* In the conduct of the Army Training Program the instructor should keep in mind the importance of the integration of intelligence into the instruction being presented. A substantial number of subjects in the ATP include intelligence phases or factors which can be emphasized during the instruction period. The battalion intelligence officer will assist by furnishing material and guidance for this integration.

## 127. Management

*a. Preparation.* Responsible commanders must insure thorough preparation by the instructor and effective presentation of instruction by coordinated explanation, demonstration, application, and examination. Every effort must be made to insure that instruction, whether classroom, field, or on-the-job training, is carefully prepared and presented in an understandable, interesting, and dynamic way. Fundamental training doctrine and principles of training are outlined in FM 21–5 and FM 100–5. Detailed instructions for engineer training are in FM's, TM's, and ATP's of the 5-series. Special training instructions are published in training circulars and periodic training directives. Department of the Army publications, training films, and film strips, and visual training aids are listed in DA Pams. 108–1 and 310–1 through 310–5. Additional necessary training aids should be prepared to accomplish the training mission effectively. To be of maximum value to the student all instruction and training should follow these recognized steps:

(1) Instructor preparation.
(2) Instructor explanation.
(3) Instructor demonstration.
(4) Student application.
(5) Student examination.
(6) Instructor-controlled discussion.

*b. Equipment.* Newly activated engineer units are normally furnished enough equipment to permit effective training. If the equipment is inadequate, every effort must be made through proper supply channels to obtain what is necessary. If needed equipment is

still not available, expedients must be constructed and used. Proper utilization and economy of equipment requires that the training schedule be arranged so that available equipment can be rotated among using units.

*c. Training Time.* A general breakdown showing total time to be devoted to each subject in a 44- or 48-hour week is given in Army Training Programs. Forty-four hours constitute a minimum training week; night operations, bivouac, field exercises, and maneuvers normally require much additional time. The number of weeks of basic, unit, and combined training periods are published from time to time by the Department of the Army.

*d. Training Areas.* Large training areas are necessary so that training in such subjects as explosives and demolitions can be safely isolated. Training areas should be selected which contain a variety of terrain conditions.

*e. Supervision.* Proper training requires active personnel supervision by higher echelon commanders and their staffs. Each company commander constantly supervises training of his unit. Administrative work is planned in order to have a minimum adverse effect on the training mission.

*f. Inspections.*

(1) Frequent training inspections are made by each command level to evaluate the progress of training and to determine what training must be stressed to reach required standards. Inspections cover all phases of training. Engineer soldiers are first tested in their individual military and technical proficiency and

then on their abilities as members of an engineer unit. Performance in combat is the only true test of training.

(2) Inspecting officers are just, impartial, and constructive in their relations with subordinates. They assist and teach, as well as uncover faults and deficiencies.

### 128. Essential Training Phases

*a. General.* The training program for a newly activated infantry division engineer battalion is outlined in ATP 5-300.

*b. Objective.* The objective is to train the battalion to perform the combat construction and other combat duties that are of critical importance and normal to the unit's performance in the field.

### 129. Cadre Training Phase

*a. General.* A period prior to the start of basic individual training is allotted to cadre testing, training, and organization. Subjects to be covered are listed in ATP 5-300.

*b. Purpose.* The purpose of this training period is to: test the proficiency of the cadre and make necessary corrections; review the employment, duties, and TOE of the infantry division, engineer battalion; establish unit standards; refresh the cadre in basic military and engineering subjects; review training methods and management; ascertain post facilities for training aids and areas; and conduct organization and administrative duties.

### 130. Basic Individual Training (Basic Military)

*a. General.* Filler personnel from reception centers undergo basic military training in accordance with ATP 21–114. The basic engineer subjects introduced during this phase of individual training are common to all privates regardless of arm or service.

*b. Purpose.* Basic military training is designed to orient the individual into the Army way of life. It teaches him to care for himself, his equipment, and his fellow soldier. It prepares him for advanced individual training and to take his place as a member of the military team.

*c. Subjects Covered.* The schedule of subjects to be covered during basic individual training is shown in ATP 21–114.

### 131. Advanced Individual Training (Basic Engineer Training)

*a. General.* The advanced phase of individual training is devoted, principally, to specialist training.

*b. Purpose.* The purpose of this training is to qualify the individual soldier and to enable the unit commander to appraise the qualifications and aptitudes of the individual soldier in filling the specialists' positions of the TOE.

*c. Subjects Covered.* The training during this period is covered in ATP 5–300.

### 132. Unit Training

*a. General.* Unit training of the battalion consists of training in all phases of combat operations. During

this phase, the battalion spends much of the time in the field working under simulated combat conditions. Increased emphasis is placed on leadership, administrative efficiency, unit integrity and teamwork, morale, and supply economy. Competitive exercises between units can be used to advantage during this period to promote excellence in performance of tasks and pride of individuals in their unit.

*b. Purpose.* Unit training is to develop and polish the skills learned in individual training and to teach men to perform as members of a team.

### 133. Phases of Unit Training

*a. Basic.* Basic unit training provides the team training in which individuals are welded into effective squads and platoons. Emphasis is placed on performance of combat and combat construction tasks requiring hand labor, drill type organization, and use of field expedients.

*b. Advanced.* Advanced unit training provides team training in company and battalion tasks with the platoons or squads reinforced with heavy engineer equipment.

*c. Combined.* The engineer battalion now takes its place in the infantry division and functions as the "division engineers." Field exercises and maneuvers are held under simulated combat conditions. Engineer combat companies are associated with the battle groups to promote maximum coordination and understanding between supporting and supported units during combat. Exercises establish an association between a specific engineer company and a specific battle

group because each company will habitually support the same group. The bridge section is employed in conjunction with the engineer combat companies. The assault section is also employed with the engineer combat companies in performing rough "dozer" work under simulated fire and furnishes fire support with the tank armament. The command, staff, and administrative sections throughout the battalion receive practical and intensive training in their respective fields. Approximately one week of the combined training period is devoted to proficiency testing of the battalion by the army commander or other authority responsible for unit training.

### 134. Concurrent Training

*a. General.* To increase the realistic effectiveness of training, arbitrary boundaries between training phases are to be avoided and efforts are made to integrate and relate each subject to another subject and all subjects to the team mission. This will entail to some degree the concurrent conductance of basic, advanced individual, specialist, and unit training. Judicious application of this principle without violating that of logical progression will result in attainment of the maximum teamwork and miltary effectiveness for time expended. Review of basic military and technical subjects must be regularly incorporated into the progressive training phases. Tactical requirements are included in many technical exercises, such as providing security for bridge construction projects and the protection of working parties and obstacles from both ground and air attack. Each commander must integrate leadership exercises throughout all training

phases particularly during periods of tactical and technical training. Command is decentralized and interference with subordinate commanders kept to a minimum consistent with coordinated effort. All personnel must be instilled with the idea that they must decide on and quickly take necessary steps in a situation which requires immediate action and where specific orders are not available.

*b. Supply Economy.* Throughout all training phases, every opportunity must be used to stress supply economy. All engineer personnel must be thoroughly trained to understand that, particularly in theaters of operation, supply is a crucial factor. Training and supervision of all personnel in the conservation, care, and maintenance of individual and organizational supplies and equipment must be continuous. Definite responsibility for each item of equipment and supply, in storage or in use, is placed upon an officer or enlisted man.

*c. Staff Sections and Administrative Personnel.* The engineer battalion must have well-trained and highly coordinated staff and administrative sections. Their training, both individually and by sections, is continuous. Additional individual training may be received in special schools conducted by battalion or higher headquarters. Standing operating procedures for these elements, as well as for the operating echelons, should be established at the command level where they can be coordinated with SOPs of higher echelons.

*d. Tactical Training.* Progressive instruction in combat principles which apply particularly to security on the march, in bivouac, and at work sites is closely tied

in with all engineer training. Infantry methods and formations prescribed in FM's 7–10, 7–40, 7–100, and 21–5 should be used as a guide, but they must be adapted to engineer strength, armament, and organization. A typical reorganization of the infantry division engineer battalion for combat as infantry is shown in appendix III.

## Section III. ADMINISTRATIVE MOVEMENTS

### 135. Engineer Assistance to Other Arms

*a. General.* The division usually needs engineer support when it moves. The engineer work generally consists of the following:

(1) Providing facilities and assistance during loading and unloading at entraining, embarkation, detraining, and debarkation points.
(2) Maintaining roads and bridges.
(3) Preparing the new area to receive the unit. This involves providing or improving facilities.

*b. Employment.* This engineer work normally requires keeping some engineers at the starting point until the bulk of the division has departed, providing an engineer advance party to prepare the new area, and sending some engineers with each major echelon moving independently. All of these engineers normally remain under control of the division engineer. In general, engineer assistance is limited to work of benefit to the division as a whole or to work for which engineers are better trained and equipped than other troops. Other units provide their own facilities and labor as far as practicable.

## 136. Engineer Work at Entraining Points

*a. Type of Work.* Engineers at entraining points may—

(1) Construct or strengthen ramps and loading platforms.
(2) Construct or improve routes of approach.
(3) Construct or improve railway spurs and sidings.
(4) Help troops of other arms to load and lash equipment.
(5) Convert railway cars for special uses, such as modifying flatcars to accommodate equipment.

*b. Loading Facilities.* Every effort is made to choose entraining points that require only a minimum of new construction or improvement. However, loading ramps and platforms often have to be built. Loading facilities are of two general types: side-loading and end-loading (FM 5–10 and TM 5–280).

## 137. Engineer Work on Roads

*a. Engineer Reconnaissance.* Engineers make a detailed route reconnaissance before major motor marches. It is particularly important to determine the load capacities of bridges and roads and to estimate the density and speed of traffic that the roads can carry without undue wear and tear. The division engineer recommends routes to be followed and maximum speeds to which both tracked and wheeled vehicles should be restricted. When applicable, he also estimates the time and work required to put the route in proper condition. During administrative moves, tracked vehicles are usually moved by rail.

*b. Engineer Work.* Engineer work to put roads in condition for a troop movement is completed before the move starts. Such work consists of strengthening bridges and making minor repairs to road surfaces.

*c. Engineers With Advance Elements.* Enough engineer troops accompany advance elements of the force to do whatever work is necessary to meet contingencies while on the march. Engineer troops are also located in the march column or columns to be readily available for work beyond the capacity of the engineers of the advanced elements and to do any maintenance work which becomes necessary as the force advances.

### 138. Engineer Work at Destination

Troops moving on foot, truck, or by track-type vehicles should be able to move their organic and attached transportation off the road and into their bivouac area without halting. To make this possible, engineers may have to construct temporary crossings over roadside ditches and gullies, improve secondary roads and trails, and clear new trails. Engineer work at detraining points is similar to that at entraining points.

### 139. Movement by Task Force

The engineer company comprising the engineer element of a task force (FM 7–100) is normally attached and is adequate to support the movement of the force. Platoons of the engineer company may be further attached to elements of the task force in accordance with the plans of the commander.

## 140. Traffic Circulation

The engineers assist in traffic circulation plans by supplying road and bridge reconnaissance reports, road maps and overlays, and posting signs and markers.

*a. Road and Bridge Reconnaissance.* Time available for reconnaissance may be limited, therefore priority is given to the collection of essential information. This information must be accurate and kept up to date. It includes—

(1) Map or sketch of road net, including detours and alternate routes available.

(2) Physical characteristics of roads, including type of surface, conditions, road width, and number of lanes.

(3) Location, type, and characteristics of limiting roadway surfaces, such as bridges, underpasses, steep grades, and one-way defiles. Information on such features includes load capacity, width, condition of approach, vertical clearance, and limitations on speed and distance between vehicles.

(4) Mileage between important road intersections.

(5) Location and characteristics of facilities for turning, parking, and halting.

(6) Sections of important roads where engineer help is or may be required because of difficult operating conditions.

*b. Engineer Recommendations.* The road and bridge data obtained from the engineer reconnaissance are applied directly, by the use of symbols, to a large-scale

map or overlay of the area concerned and submitted to G4 with the engineer reconnaissance report. Included in the report are recommendations for the protection of the road net from abuses such as excessive speeds, overloadings of roads and bridges, heavy and continuous traffic on roads with poor surface or subgrades and the use of roads in need of repair. The division engineer recommends a traffic circulation plan consistent with the engineer limitations of the road net and the availability of engineer troops.

*c. Supply of Maps and Overlays.* Overlays or maps required for traffic control are prepared by the engineers as requested by G4.

*d. Supply and Posting of Road Signs and Markers.* The supply and posting of road signs in traffic operations is a responsibility of the engineers. The determination of the need for such signs and markers is a responsibility of the G4 who coordinates the plans of the division engineer and the provost marshal. Signs are supplied to identify places, mark routes, state traffic regulations, and warn of special road conditions. See FM 5–10 for proper sizes and locations for traffic signs.

### 141. Battalion Movement

*a. General.* During administrative movements the engineer battalion usually moves as a unit forming an integral part of the division. A move may be by motor, rail, water, or air. For long moves, it packs and stencils its own equipment in accordance with current directives. For motor and rail movement it also loads its own equipment.

*b. Motor March.* The battalion is completely mobile in its organic transportation. Routine motor marches will normally be covered by a battalion SOP, with such items as routes, initial points, order of march, speed, and destination specified separately for each move (FM 25–10).

*c. Rail Movement.* In training and preparation for movement by rail, the engineer battalion should become familiar with packing, boxing, and crating of organic equipment and the loading of equipment and personnel on railway cars. A battalion rail-movement table and rail-movement annex to the SOP should be prepared and kept up to date. Detailed information on rail movements; types, characteristics, and capacities of railway cars; loading plans; and loading scales and tables are found in FM's 5–35, 100–5, 100–10, 101–10 and AR's 55–105, 55–145.

*d. Air Movement.* The prime consideration in loading the engineer battalion for air movement is the anticipated employment in the airhead or at the destination (fig. 26). Troops can best be controlled during the operation and after arrival at the landing area if unit integrity is maintained. Key personnel and equipment should be distributed throughout the airlift to minimize the effect of losses. Equipment too heavy or too bulky to be air-transportable must either be disassembled for movement and then accompany the followup echelon to the destination or be turned in to the appropriate depot. Prior to emplaning, troops are instructed in the loading and lashing of equipment, in safety regulations on airstrips and in flight, and in the plan of assembly after landing. The battalion rail

*Figure 26. Engineers transported to forward area by helicopter.*

movement table, with a few alterations, may be used in compiling an air movement table. For further details of movement by air see FM's 57–30, 100–5, 100–10, 101–10, and TM 57–210.

*e. Water Movement.* Water movement requires special packing, crating, and marking of equipment and additional training of personnel. Destination, mission, type of operation, anticipated employment on disembarking, available shipping space and type of vessel are factors which determine whether the unit will be combat loaded, unit loaded, or convoy loaded. The same data contained in the battalion rail movement table, but in a slightly different form, can be used for the unit personnel and tonnage table in preparation for movement by water. For additional information on water movements see FM's 31–5, 100–5, 100–10, 101–10, and SR 55–720–1.

## Section IV. TACTICAL MOVEMENTS

### 142. General

A march in a combat zone is a tactical march when the column will be employed against the enemy upon making contact or when interference from the enemy is a possibility. The mission of the column, proximity of hostile ground forces, terrain over which the column will travel, types of enemy resistance expected, and activity of hostile air forces are all primary factors that will determine the organization and composition of the column in a tactical march. Divisional movement orders are prepared by G3 in coordination with other staff officers. G3 coordinates particularly with G4 in the selection of routes and in movements requiring transportation in addition to organic transportation. Divisional units, including the engineer battalion, should maintain tables showing road space requirements for their units based on actual strength and material on hand. However, these basic figures may be greatly increased or decreased under extremes of variable factors such as weather, road conditions, and hostile air and mechanized threats. Basic road spaces for both foot troops and motor elements are shown in FM 101–10.

### 143. Division Motor Movement

During a motor march the infantry division may either move in 1 trip by use of attached transportation, or by echelon. If the latter move is made in 2 echelons of 3 or 4 serials each, each serial is usually composed of a battle group with separate serials for division troops and division trains. Necessary trucks

in the first echelon return to assist in moving the second echelon. Security for the move is normally furnished by the infantry division cavalry squadron. See FM 101–10 for road space, time lengths, march graphs, march tables, and divisional motor movement SOP.

### 144. Battalion Participation

The engineer battalion participating in an infantry division tactical march will normally furnish reinforced combat companies to support leading battle groups. The remainder of the battalion normally marches with the division troops serial. The battalion may be required to furnish vehicles to assist in the movement of troops in both echelons. Certain equipment and vehicles from the engineer battalion may be attached to the division trains as desired by the division engineer.

## Section V. THE ADVANCE TO CONTACT AND THE ATTACK

### 145. General

*a.* The division engineer recommends disposition of available engineer troops and equipment for all phases of the advance and attack (fig. 27) based on the scheme of maneuver as announced by the division commander. He recommends appropriate changes in disposition as the situation develops and the need arises. Engineers may be used in the advance guard and in the flank and rear security forces as well as in the main body.

*b.* If the situation is such that the engineer battalion is unable to perform all the engineer tasks required,

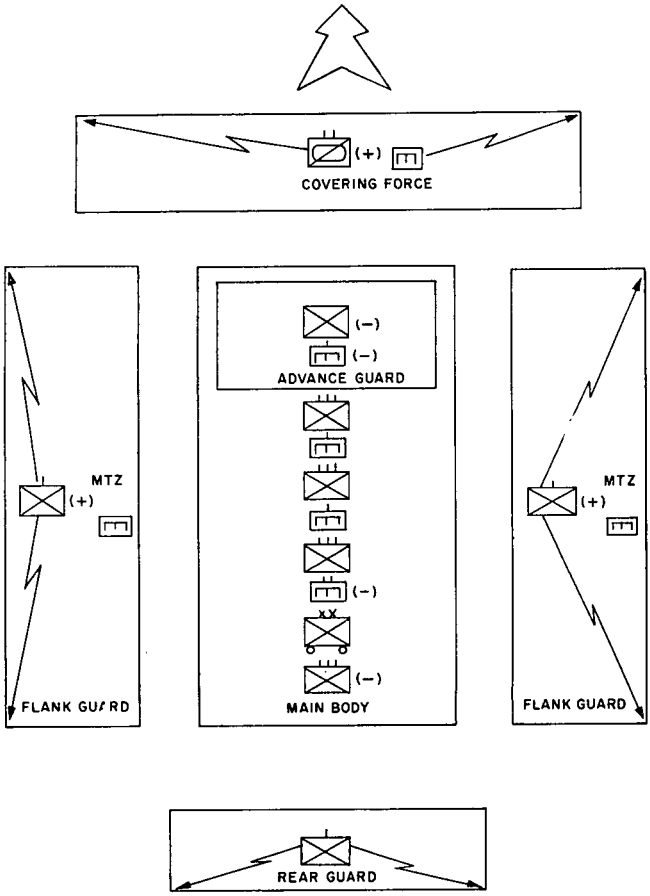



*Figure 27. Typical disposition of the engineer battalion organized for the advance to contact.*

the division commander may request reinforcement. In this case, additional engineer units are placed in support of the division engineer battalion by corps or army.

*c.* At times, nondivisional engineer units may be attached to the division or to the infantry division engineer battalion to accomplish a specific mission or missions. For example, a corps engineer battalion may be attached to the infantry division for a certain river-crossing operation. At the conclusion of the operation, the battalion is relieved from attachment and returned to the control of its parent unit.

*d.* Except for special operations, it is normally desirable for corps engineer units, under parent unit control, to support the division on an area-assigned basis. Boundaries between the divisional and corps engineer units may be established informally to denote the forward working limit of the supporting engineer unit. Such working limits also serve to eliminate unnecessary concentration of nondivisional troops in forward areas. Specific missions, by corps engineer units, such as bridge or road construction or maintenance forward of a work limit are made on a task assignment basis.

*e.* Regardless of the seniority of supporting engineer unit commanders, the commander of the infantry division engineer battalion remains the division engineer and directs the engineer work in the division area through liaison with the supporting units or through recommendations to the division commander.

### 146. Engineer Missions

*a.* During the advance to contact and the attack, emphasis is placed on "off the road" parking facilities,

bivouacs, and camouflage. Reconnaissance is detailed and continuous, and is conducted, in part, by all commanders concerned.

*b.* In general, the mission is to assist the forward movement of attacking echelons. The mission may be considered threefold:

(1) Assisting the movement of infantry and supporting arms (fig. 28).

(2) Assisting the troops protecting the flanks by creating obstacles in roads and other possible avenues of approach to the flanks.

(3) Performing general engineer tasks.

### 147. Control of Engineer Effort

*a. Disposition of Engineer Troops.* The division engineer recommends the disposition of engineer troops for each division operation. Such disposition is nor-

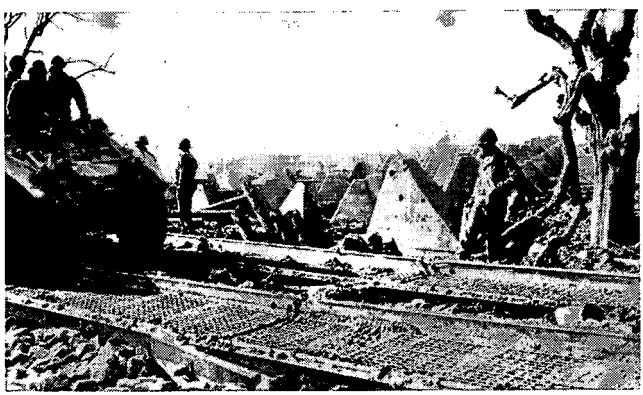


*Figure 28. Combat engineers in the attack breach an obstacle and construct a temporary roadway.*

mally made by assigning engineers specific tasks, placing engineer units in support of other elements or, in some cases, by attachment.

*b. Responsibility for Control.* The division engineer maintains contact with the advanced elements to assure that maximum value is obtained for the engineer effort expended. The engineer unit commander retains control and command of the engineer element but must suit his plans and troop employment to the plans of the supported unit or units.

*c. Liaison.*

(1) Liaison between supporting and supported units and between adjacent units must be maintained during the attack to assure cooperation and coordination between all units participating in the operation. It is the responsibility of the supporting unit to establish and maintain liaison with the supported unit. Liaison between adjacent units is established as directed by the senior commander; usually each unit is charged with maintaining liaison with the unit to the right.

(2) The assistant division engineers are the chief liaison agents among the engineer battalion, division headquarters, and brigade headquarters. Similarly, liaison functions between the supporting engineer company and a battle group are performed by personnel designated by the company commander. The liaison officer is familiar with the capabilities and operations of both units and keeps himself completely informed of all plans and opera-

tions in order to give reliable, up-to-date information and advice to both commanders. If a further breakdown of engineer elements becomes necessary, they establish and maintain liaison with their supported units.

### 148. Typical Engineer Duties

Engineer duties in the attack include—

*a.* Conducting reconnaissance.

*b.* Opening and improving roads, trails, and bridges for troop movement, supply, and evacuation.

*c.* Assisting in preparation of traffic circulation plans.

*d.* Assisting forward movement of infantry and supporting arms by repairing roads, constructing bridges, and removing obstacles.

*e.* Locating, marking, and removing mines.

*f.* Assisting in flank security through the use of demolitions, minefields, and obstacles.

*g.* Constructing advanced landing facilities for divisional planes (fig. 29).

*h.* Such general duties as supply of engineer materials, water, and maps which are continuous and normal duties of headquarters and headquarters company.

### 149. Engineer Reconnaissance

*a.* Engineer reconnaissance during the advance is performed initially by reconnaissance teams from battalion headquarters. These teams provide the division engineer with early, reliable engineer information in

*Figure 29. Advance landing facilities constructed by combat engineers.*

the area over which the division is to advance. Routes of advance are thoroughly examined for serviceability, type, condition, location of critical points, alternate routes, mines, and condition and types of bridges. This reconnaissance will enable the teams to make an estimate of engineer work to be done and of engineer materials available. This on-the-ground reconnaissance must be supplemented by air reconnaissance, map and aerial photograph studies, and study of reconnaissance from other elements of command. It is essential that this reconnaissance be made prior to the movement, since the information gained provides a basis for the estimate of engineer troops, supplies, and equipment necessary to support the operation and for the selection of routes and the formation of traffic circulation plans. Engineer reconnaissance elements from

an engineer company may accompany the advance guard of each leading battle group to provide the unit engineer with timely warning of engineer requirements to the front. Terrain characteristics which appear favorable to the advance are closely examined, especially for possible enemy use of mines, obstacles, and defending weapons.

*b.* Engineer reconnaissance during the attack is thorough and detailed. On the ground, personal reconnaissance is made by commanders and is supplemented by the study of maps, aerial photographs, and air and ground reconnaissance reports. Engineer combat companies supporting the committed battle groups make continuous reconnaissance of the routes of advance, particularly the main supply route (MSR) and the bridges, obstacles, mines, and sources of engineer materials in their assigned areas. Engineer battalion reconnaissance teams continue their general reconnaissance effort, following closely the forward engineer companies and paying careful attention to the routes of advance, the MSR and lateral roads, bridges, obstacles, engineer materials, and sites for new water points. Special reconnaissance missions are assigned by the battalion S2 as required. On the basis of this reconnaissance information, engineer operational plans are made and means are provided to assist in maintaining the momentum of the attack.

### 150. Engineer Work Done by Other Arms

Because there are seldom enough engineer troops available to do all the engineer work necessary to assist the advance of the infantry and supporting arms, the other troops do as much of this work as possible

in order to help themselves. All combat and service troops are trained in the installation and removal of antitank and antipersonnel mines. Infantry troops do much of their own pioneer work, assisted by the engineer platoon organic to each battle group.

### 151. Engineer Platoon, Infantry Battle Group

*a.* The mission of the engineer platoon, infantry battle group is to increase the combat effectiveness of the battle group by means of general engineer work. The engineer platoon is normally employed in general support of the battle group to which it is organic. The platoon contains sufficient wheeled transportation to move the entire unit and its equipment at one time and all equipment is air-transportable.

*b.* The capabilities of the engineer platoon, infantry battle group are as follows. It can—

(1) Repair and improve roads and bridges.
(2) Construct minor field works.
(3) Install minefields, perform minefield reconnaissance, supervise the breaching or removal of enemy minefields, and provide passage through friendly minefields.
(4) Emplace and execute demolitions.
(5) Assist in reduction and destruction of enemy fortifications.
(6) Fight as infantry when required.

*c.* In instances where an engineer unit from the infantry division engineer battalion is in support of, or attached to a battle group, the engineer commander of that unit acts as advisor to the battle group commander on its employment.

## 152. Engineers With the Advance Guard

*a.* Each column commander is supported by engineer troops, some of whom are normally assigned to the advance guard. The commander of the engineer element functions as the unit engineer of the advance guard and maintains liaison with the advance guard commander. During the advance of a battle group, a platoon from the supporting engineer combat company normally forms part of the advance guard.

*b.* A squad of engineers may travel with the point. If on foot, they have supporting troops, tools, and equipment following by bounds on transportation. The engineers on foot normally have mine detectors and probes. They search for and mark or remove mines (fig. 30), and remove all other obstacles within their capabilities. Removal of large obstructions may require additional engineer troops and equipment. Such engineer elements are moved forward from the support or reserve.

*c.* Engineer battalion reconnaissance parties move with the forward elements of the advance guard to give timely warning of required engineer work to the supported and supporting units and the engineer battalion commander.

*d.* The remainder of the engineers in the advance guard move with the support or reserve. They are not separated from their tools, transportation, and equipment. The advance guard engineers leave work parties at vital points where need for engineer assistance exists or can be foreseen. These details rejoin their unit on completing their task. The engineers with the advance guard may thus become depleted and by the end of

*Figure 30. Advance guard engineers search for mines.*

the march may be deployed at a number of points. It may be necessary, therefore, to renew the engineer strength of the advance guard by substituting a new unit for the original one which was depleted during the march.

### 153. Initial Duties

The initial mission of the engineer battalion includes reconnaissance and preparation of the axial routes of advance. The preparation of the axial routes may require the rehabilitation of old or construction of new roads, trails, and bridges, suitable for the wheeled and track-laying vehicles of the division and the 50-ton loads present also in the infantry division. Consequently, the magnitude of the engineer effort may vary considerably. Rapid construction of advanced landing facilities for divisional aircraft may require considerable engineer effort.

### 154. Flank and Rear Security

The division engineers play a vital role in flank and rear security by placing demolitions and mines and constructing obstacles to prevent enemy interference against the division flank and rear. Flank and rear security measures depend on such factors as—

*a.* Extent of flank exposed.

*b.* Proximity of adjacent friendly troops.

*c.* Type of terrain over which the attack is moving.

*d.* Reinforcing or reserve units available.

*e.* Natural obstacles.

*f.* Strength and morale of enemy forces.

*g.* Mobility of friendly and enemy forces.

### 155. Measures to Stop Enemy Advance

Engineers help stop the advance of enemy forces by creating obstacles (fig. 31), and by improving natural barriers. Since troops of all arms can create obstacles, engineers are used to construct the more complicated types. All obstacles are defended if feasible, by weapons of the covering force. Natural and manmade obstacles assist in confusing, delaying, canalizing, or halting enemy movement.

### 156. Use of Smoke

*a. General.* Smoke is sometimes used by engineers to mask operations and reduce casualties when working in view of the enemy or under conditions which prevent surprise. The smoke is used either as a screen between the work site and the enemy, as a blanket on enemy positions and observation posts, or as a haze

*Figure 31. Flank guard engineers laying antipersonnel and antitank minefields.*

over the area of operations itself. Under some conditions of wind and weather it is possible for engineer troops to lay and maintain an effective smoke screen by using smoke pots and grenades. Smoke is normally obtained through the division artillery officer. The use of smoke must be planned carefully to prevent interference with the operations of friendly troops. Close coordination with adjacent units must be maintained when smoke is to be used. Smoke skillfully employed can aid in some engineer operations, but its promiscu-

ous and ill-planned use can be a hindrance. It should be used over large areas, since small concentrations usually draw enemy fire.

*b. Employment.*

(1) Smoke can be used to mask engineer operations such as: bridge building, river crossing, demolitions, and obstacles clearance including breaching of minefields. It can also be used to blanket supporting enemy fortifications or strong points while the supported fortification is being reduced.

(2) When the engineers are employed as infantry, they can use smoke to screen their own movement, blind hostile observation, and disorganize enemy attacks. Colored smoke is used to indicate targets and to mark front lines for supporting artillery or tactical air-force units.

*c. Additional Information.* For additional information on the use and source of smoke see FM's 3–5 and 3–50.

## Section VI. PURSUIT

### 157. General

The pursuit (fig. 32) is launched when the enemy is no longer able to maintain his position and endeavors to escape. The commander of the attacking force utilizes all means to maintain the continuity of the attack and to exert a relentless pressure on the defeated

enemy. The pursuit is conducted on a broad front with continuous direct pressure against the retreating forces, combined with an enveloping or encircling maneuver to place troops across the enemy's line of retreat. The object of the pursuit is the annihilation of the hostile forces.

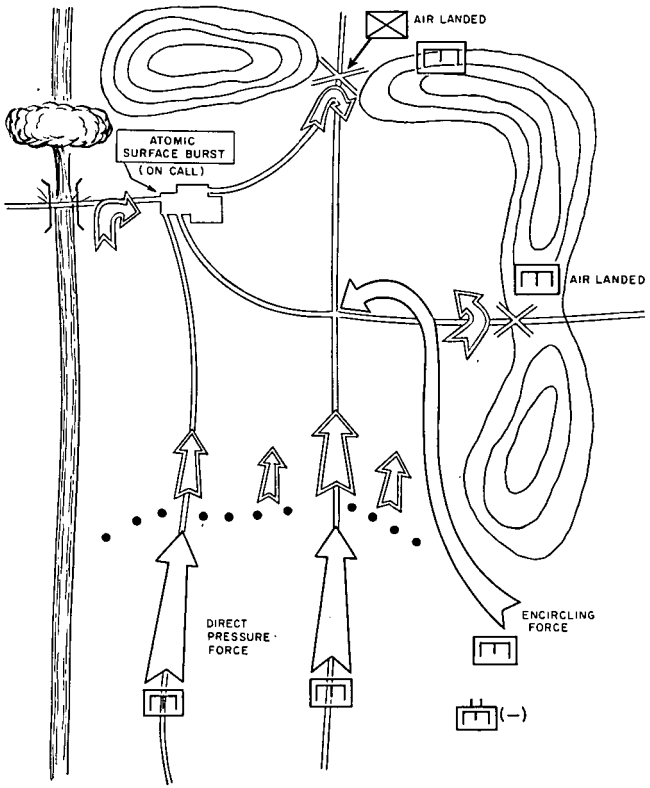



*Figure 32. Typical disposition of the engineer battalion in the pursuit.*

### 158. Composition

The pursuing force is composed mainly of mobile infantry element, reinforced by engineers, artillery, armor, combat aviation, and perhaps airborne troops. It is characterized by boldness, determination, speed, mobility, fire power, and coordination of the combined arms team.

### 159. Employment of Engineers

The size of the supporting engineer unit depends on the size of the pursuing force and the anticipated engineer work during the operation. Normally, engineer units are placed well forward in the columns to facilitate rapid stream crossing and removal of mines and other obstacles. Engineer units are normally attached to, rather than used in support of, the major pursuing force.

### 160. Duties of the Engineers

The pursuit is essentially an attack and therefore the mission, employment, and duties of the engineers are generally the same as in the attack and are discussed in FM's 7–10, 7–40, 7–100, 17–35 and 100–5.

## Section VII. THE DEFENSE

### 161. Engineer Role in the Defense

*a. General.* This section describes the nature and extent of the activities of the infantry division engineer battalion in support of the infantry division in a defensive situation. It includes activities pertaining to the construction of defensive positions and the supply

of engineer materials for fortifications for either the position defense or the mobile defense (figs. 33, 34, 35, and 36).

*b. Engineer Functions.* In general, defensive positions are laid out and constructed by the troops which are to occupy them. However, engineers are used extensively in performing such duties as—

(1) Conducting reconnaissance.

(2) Repairing, maintaining, and improving roads for supply and evacuation, and recommending traffic circulation plans.

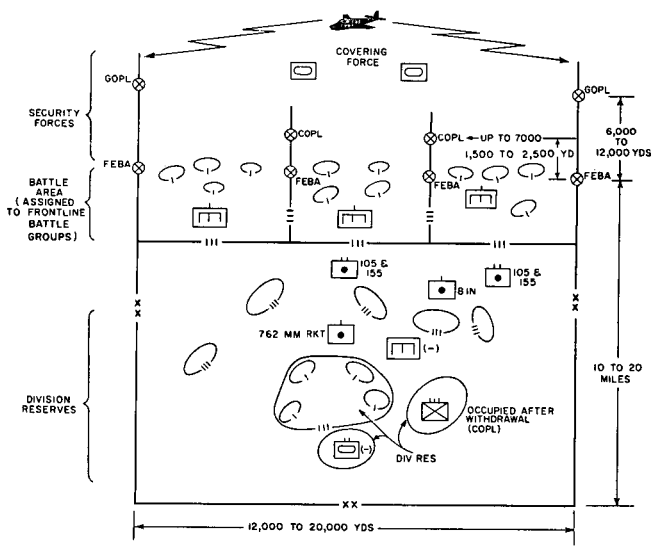



*Figure 33. Typical disposition of the engineer battalion in a position defense.*

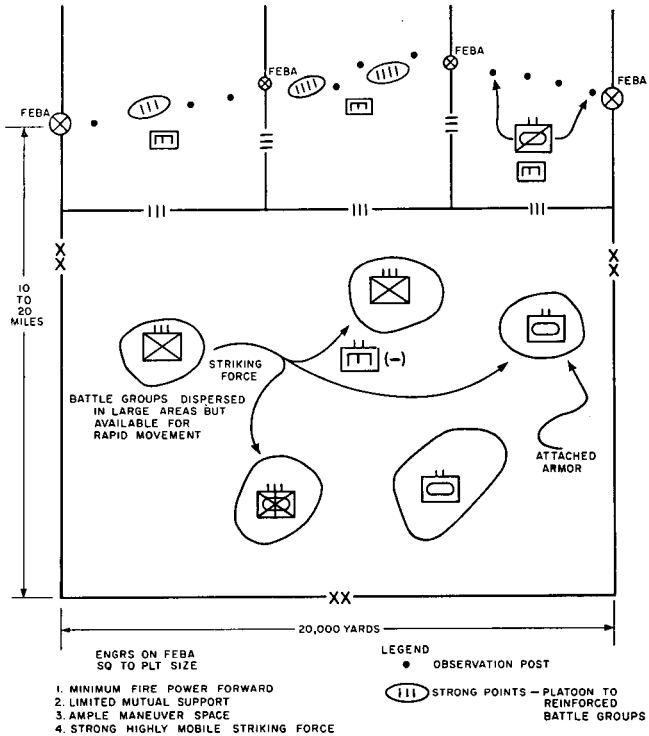



*Figure 34. Typical disposition of the engineer battalion in a mobile defense.*

(3) Assisting in field works by providing engineer technicians, mechanical equipment, power tools, engineer materials, engineer technical advice, and similar help.

(4) Constructing command and observation posts, and obstacles of all types.

(5) Assisting in flank and rear-area security through use of demolitions and obstructions.

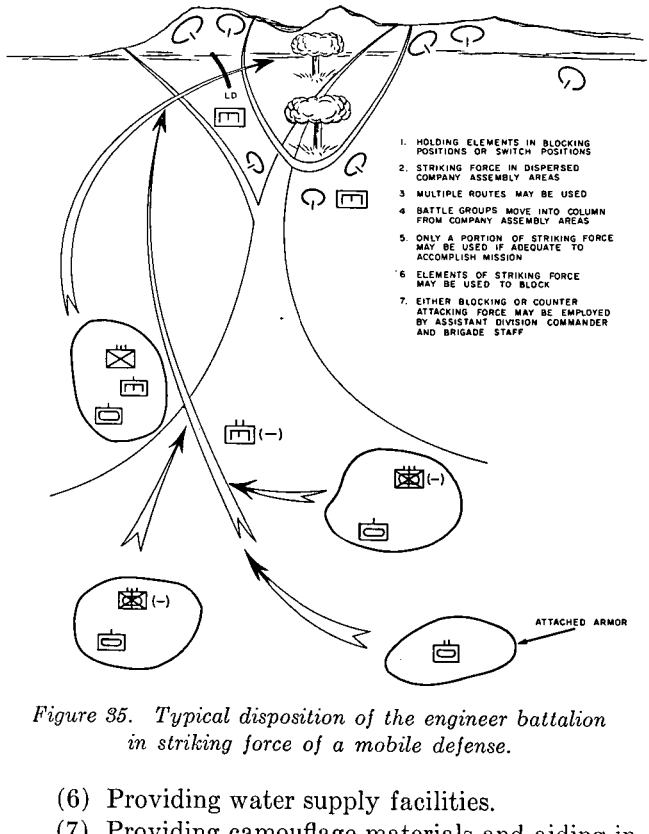



*Figure 35. Typical disposition of the engineer battalion in striking force of a mobile defense.*

(6) Providing water supply facilities.
(7) Providing camouflage materials and aiding in their use.
(8) Obtaining and supplying maps.
(9) Participating in combat as infantry.

## 162. Engineer Supply

*a. General.* The division engineer is responsible for supplying field fortification materials to all divisional

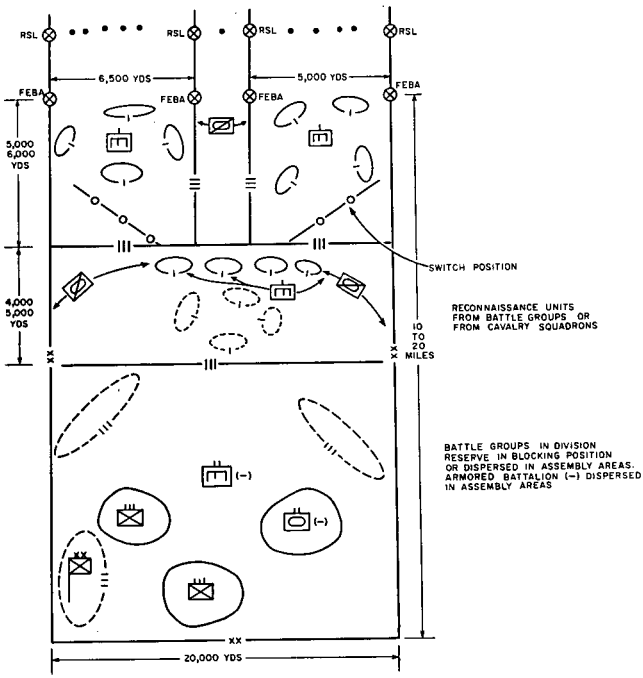



*Figure 36. Typical disposition of the engineer battalion in a mobile defense based on battle group strong points.*

and attached troops. In a defensive operation, the amount of materials required for field fortifications may be so great that transportation is furnished from the division or from supporting transportation units. Principal materials supplied include sandbags, pickets, barbed wire, timber, chicken wire, camouflage nets and garnishing materials, steel bars, cement, and aggregate. Quantities of materials can be estimated by using data given in FM 5–34.

*b. Hasty Defense Positions.* Since hasty defense positions involve a relatively simple system of individual foxholes, gun emplacements, and obstacles constructed under fire or the threat of immediate attack, speed in preparation is essential.

(1) *Tools.* Infantry units carry their own intrenching equipment sets which are used extensively and are supplemented by hand tools carried by the engineers. Heavy engineer equipment is used where practical.

(2) *Materials.* When an attack may be expected before the hasty organization is completed, distributing points or stock piles for fortification materials are located for the infantry units far enough to the rear so that enemy fire in front of the forward edge of the battle area cannot prevent their use. However, they should be close enough to the defense line to reduce transportation problems. It is desirable to have a defiladed and concealed distributing point or stock pile for each front-line battle group. In addition to the stock piles provided for the main battle area, one or more distributing points may be provided for fortification materials to be used on the flanks or in defensive areas behind the battle area. These distributing points should be well to the rear in concealed locations and accessible to trucks at all times.

*c. Deliberate Defense Positions.* In a defense requiring deliberate defensive positions, the supply of fortification materials is planned and regulated by the

division engineer in coordination with G3 and G4. Special tools and heavy equipment, in addition to that in the engineer battalion, may be obtained from corps and army engineer units or from class IV depots. Fortification materials are brought up by the unit which is to use them, or by supporting truck units. To insure economical use and distribution of materials, a simple system of property accounting is advisable. Trucks bringing up materials are routed through a distributing point which acts as a dispatching station.

### 163. Organization of the Battle Area

*a. General.* Each unit commander assigned an area to defend makes plans, with the help of his unit engineer, for the organization of his battle area. His plans are based on the plan of the next higher echelon, on thorough reconnaissance, and on the troops and weapons available. Outposts, strong points, and alternate positions are planned. The troops who are to occupy the positions do most of the work in preparing their defenses, but are aided by the engineers. Special emphasis is placed on the correct use of terrain, natural concealment, obstacles, observation and fields of fire, and avenues of approach.

*b. Battle Area.* The main battle area is a zone of resistance consisting of a number of defense areas disposed irregularly in width and depth. Each is organized for all-around defense with foxholes, obstacles, and weapons emplacements. The following basic points in planning the battle area must be considered by commanders. The availability of atomic weapons necessitates modification and changes in emphasis on these considerations.

(1) *Terrain.* The commander must consider how terrain fits into his scheme and should not be rigidly bound by any set patterns of holding the high ground or always occupying the critical terrain. Repeated occupation of key terrain features could provide the enemy with lucrative atomic targets. The defenders' capability of employing atomic weapons permits the temporary loss of critical terrain without seriously jeopardizing the successful accomplishment of the mission.

(2) *Cover and concealment.* Natural features of terrain, and manmade cover may reduce the effects of atomic weapons. Concealment by artificial and natural means makes target acquisition by the enemy more difficult.

(3) *Obstacles.* Natural and manmade obstacles assist in canalizing enemy troop movements or causing him to mass, thereby presenting an atomic target. Obstacles covered by effective fire will cause the enemy to attempt to bypass or to mass the necessary force to overcome the obstacle. Full advantage should be taken of all natural obstacles in the organization of the defense to enable the defender to remain as dispersed as possible and still adequately defend avenues of approach.

(4) *Observation and fields of fire.* The value of high ground for observation is undiminished. Increased use is made of air observation and helicopters for posting and shifting ground OP's. Atomic weapons and conventional

artillery may be used to protect gaps between positions within the division battle area.

(5) *Avenues of approach.* Atomic weapons facilitate the control of avenues of approach to and into the battle areas. Analysis of the avenues of approach provide a basis for the location of atomic targets. Increased dispersion between units places attention on avenues of approach from all directions.

(6) *Security.* The enemy's atomic capability, which causes us to increase our dispersion, creates a need for additional emphasis on all-around security. Depending on the plan of defense, the security forces may or may not attempt to force the enemy into premature deployment. It may be desirable to allow the enemy to come closer to the defensive area or into areas where defensive atomic fires are more effective. The capability of the defender to employ atomic weapons may make possible the destruction of the attacker by numerically inferior forces.

(7) *Mutual support.* The more extended defense under atomic conditions requires the achievement of mutual support by the positioning or movement of units, by the location of units in relation to each other, by the ability of one unit to reinforce another by fire or movement, and by the mobility of reserves rather than the attainment of mutual support by interlocking bands of fire.

(8) *All-around defense.* Provisions are made to prepare positions for all-around defense.

(9) *Defense in depth.* Maximum depth of defense is a requirement under atomic warfare conditions because the enemy may be expected to rapidly exploit his atomic attacks. Positions are organized in depth to attain dispersion and contain penetrations.

(10) *Barriers.* An effectively coordinated barrier system is of particular importance when defending on the wide frontages which are normal under conditions of atomic warfare. Careful consideration must be given the necessity for freedom of maneuver of the striking force in the mobile defense and the routes to be used by the reserve in counterattacks in the position defense. Use of prepositioned atomic weapons assists in creating additional obstacles.

(11) *Coordinated fire plan.* When used, atomic fires dominate the defensive fire plan. Nonatomic fires are planned to assist in the defense of unit positions, to cause the enemy to mass, and to augment the effects of atomic fire. Troop safety is a major consideration in planning atomic fires. The fire plan under atomic conditions brings the enemy under fire at long ranges, keeps him under increasingly heavy fires as he approaches the battle area, and assists the counterattacking forces.

(12) *Flexibility.* The flexibility afforded the defender by possession of atomic weapons is greater than in a nonatomic situation. Organizational flexibility of the division is retained

by rapid shifting of forces in the defense and by retaining an adequate reserve for commitment at a decisive time.

(13) *Maximum use of offensive action.* In fluid situations with wide frontages and great depths, there will be many opportunities to regain the initiative by offensive action. Destruction of the attacking forces by atomic supported counterattacks will be a frequent occurrence.

(14) *Maximum dispersion.* The degree of dispersion required of units in atomic warfare is of major importance to the defender. Dispersion applies to administrative and tactical units and must not be so great as to jeopardize the accomplishment of the mission. Dispersion of an unrealistic order of magnitude which introduces rigidity in the defense, fragmentation of combat power, and inability to maneuver or to destroy enemy penetration must be avoided.

*c. Fortifications and Obstacles.*

(1) Types of fortifications and priorities of construction are specified by higher headquarters. In constructing deliberate positions, precautions are taken to conceal from the enemy the location of the principal defensive elements. Communication trenches are limited to areas where terrain features conceal them. Dummy and decoy positions may be constructed for deception (fig. 37). Weapons emplacements and troop shelters must fit the

terrain and the means available. They must give as complete protection as the time, troops, and materials available permit. Local materials and expedient construction are used where conditions restrict normal construction and supply procedure. Construction work to strengthen the position is continued during the entire period of occupancy. For prescribed types of fortifications, see FM 5–15 and TB ENG 117.

(2) Construction priority provides for efficient use of available time, personnel, tools, and materials. It insures that maximum value is derived from the time and labor already expended, if the area is attacked before construction is completed. Camouflage and the

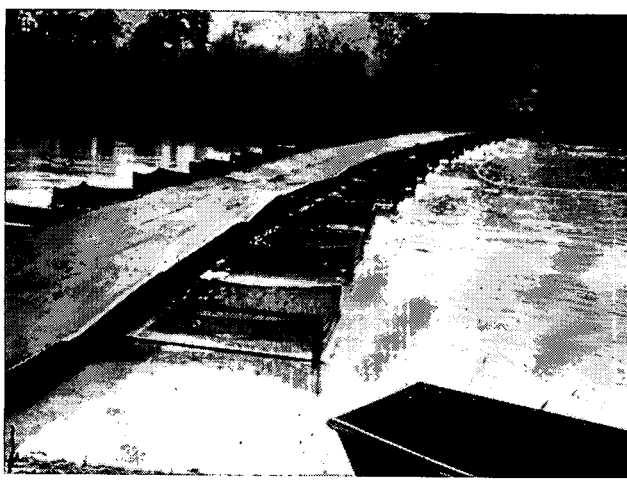


*Figure 37. Decoy bridge constructed by combat engineers.*

preparation of decoys normally proceed concurrently with other work if the tactical situation permits. In organizing deliberate areas, construction features with a low priority within the defense may be carried on after contact is made with the enemy. For suggested priorities of construction work, see FM 101–10.

(3) Normally, the use of artificial obstacles is limited by the time, labor, and materials required for construction. The most satisfactory method of creating an obstacle in ordinary terrain is by demolition of bridges over unfordable streams. Bridges are prepared for demolition and blown on order to prevent them from falling intact into enemy hands. All "prepared" bridges must be adequately guarded to prevent enemy interference with the explosive. Road blocks on main road nets in locations difficult to bypass, such as heavy woods, steep sidehill slopes, or swamps, are also satisfactory. For details of demolitions, field fortifications, and barriers, see FM's 5–15, 5–25, 31–10, and TB ENG 117. In open country, minefields are the most practical obstacles. For a detailed discussion of minefield technique see FM 20–32. Engineer troops are used in preparing the obstacles or may supervise construction if other troops are available for the work. Care must be exercised in planning and siting obstacles, particularly in the rear and flanks of the battle area, not to interfere with the planned

commitment of the reserve elements. Obstacles are normally defended by infantry or armored units. Defended obstacles organized into a coordinated system of successive battle areas form divisional barrier zones in depth.

*d. General Outpost.*

(1) The general outpost is organized forward of the forward edge of the battle area. There is no prescribed organization for a general outpost. It is normally a balanced combined arms force including elements of engineers and necessary logistical and air support. It may be supported by artillery fire including atomic fires. The general outpost is as mobile as conditions permit, using tanks, armored personnel carriers, trucks, and army aviation. It may consist of the entire armored cavalry squadron reinforced by a tank element and artillery or a motorized battle group, with elements of the division tank battalion and engineers. The outpost gives early warning of the enemy's approach, and deceives and forces him to deploy. It also covers the withdrawal of the covering force and can locate atomic targets. It accomplishes its mission by delivery of intense fires, including atomic fires; use of obstacles and demolitions including atomic demolitions when authorized; aggressive patrolling and reconnaissance; delaying action; deception measures; and, when necessary, use of close combat.

(2) An engineer company may be attached to the general outpost. The company commander advises the general outpost commander on engineer work and assigns missions and areas of responsibility to his platoons. Each platoon with an area assignment is responsible for keeping open the main withdrawal route within its area and prepares the obstacles along that route. A small detachment of engineers, normally a noncommissioned officer and a few men, is left at each site. This detachment has specific instructions as to when to effect the obstacle so that it will be accomplished neither too soon nor too late. As additional assurance of proper execution, the engineer platoon leader is responsible for each route, while the time of execution is coordinated by the company commander. The order to execute obstacles on each route is normally given by the senior tactical commander of the general outpost withdrawing over that route. Each platoon leader is also responsible for preparation and execution of obstacles on the lateral roads within his respective area. If two engineer companies should be attached to the general outpost, the battalion executive or other designated officer would be sent forward as the unit engineer to coordinate the engineer effort of the two companies.

### 164. Division Rear Area Defensive Positions

In addition to barriers in depth, from the general outpost through the battle group reserve area, block-

ing positions are prepared in the rear of the battle group reserve area (fig. 38). These blocking positions are planned by the division commander and prepared by the battle groups not on line, assisted by the engineers. Positions are selected and organized to prevent major penetrations from securing lightly held or exposed flanks and are occupied by elements of the division reserve. Full advantage is taken of natural terrain features. Positions are prepared for all-around defense. Emphasis is placed on defense against armored attack and possible atomic strikes.

*Figure 38. Engineers in a defensive position swing road block into place.*

## Section VIII. ATOMIC DEFENSE

### 165. General

*a.* Injuries to personnel from atomic weapons can be divided into four general categories: those caused

by the direct blast; those caused indirectly by blast; those caused by burns, either in the wreckage or from radiant heat; and those caused by nuclear radiation, either directly or through residual contamination.

*b.* Atomic defense, which includes radiological defense, is defined as the protective measures taken to minimize personnel and material damage from atomic blast, thermal, and radiation effects and is interpreted to include measures such as—

(1) Training of organization and distribution of personnel with special reference to radiological specialists.

(2) Preparation and maintenance of fixed and portable structures and equipment.

(3) Teaching of techniques and procedures including use of detecting equipment; protection or removal of exposed personnel; and decontamination of personnel, equipment, structures, or terrain.

### 166. Command Responsibilities

The atomic defense training of the unit and of the individuals in the unit and the protection of the unit against atomic weapons effects are basic responsibilities of command. Some aspects which may be expected to require the consideration by unit commanders are briefly discussed in this section and are more completely covered in FM's 21–40, 21–41, and 21–48.

### 167. Training

*a.* All military personnel receive orientation in atomic defense. This provides minimum essential in-

struction in protective measures against blast and thermal effects and initial and residual radiation. Since the lingering effects of residual radiation represents a primary hazard to post-attack recovery operations, a radiological defense organization with trained unit radiological defense specialists is necessary. Unit radiological defense specialists receive additional indoctrination and training in unit schools or in radiological defense schools conducted at higher levels. Courses of instruction and training phases are described in FM's 21–40, 21–41, and 21–48. In addition to indoctrination courses required, unit commanders include in troop information programs and similar discussions, frank and open presentations of unclassified atomic energy information to instill in the command the proper respect for this weapon and to refute irresponsible and misleading rumors.

*b.* Medical specialists assigned to the unit receive military technical training in the clinical aspects of radiation injuries in Army Medical Service Schools. Their training is continued thereafter through medical channels.

*c.* During unit training particular attention must be directed to developing the unit's capability to—

(1) Continuously make maximum use of protective measures against atomic attack.

(2) Reduce damage and disorganization caused by atomic weapons.

(3) Participate in operations to exploit friendly use of atomic weapons as exhibited by—

(*a*) Procedures for dissemination of warning of friendly employment and compliance with

and adherence to troop safety instructions such as covering of eyes, use of foxholes, armored vehicles, and protective clothing.

(*b*) Procedures for crossing of, or working in, contaminated areas to include preparation of vehicles and equipment for such crossings, determination of safe crossing times, rate of march, safe working periods, etc.; and determination of accumulated dose rates of radiological contamination.

(*c*) Care, maintenance, calibration, and use of radiological detection equipment.

### 168. Before-Burst Operations

The division engineer is responsible for construction of installations required for radiological defense in the division area. He consults the division radiological defense officer concerning optimum protection to be gained through special types of construction, the location of new shelters, and special command posts. Additional before-burst engineer tasks include to—

*a.* Survey area for suitable shelters and sheltered locations.

*b.* Disperse unit personnel, equipment, and supplies consistent with operational practicability.

*c.* Cover essential equipment and supplies with canvas or other material for protection against contamination.

*d.* Select alternate sites for water points to utilize, where possible, underground sources.

*e.* Organize unit medical, rescue, and evacuation teams.

*f.* Select and prepare, in bridging operations, an alternate bridge site for each bridge needed.

*g.* Organize a radiological defense warning system for the battalion.

*h.* Prepare a radiological defense SOP based on that of the next higher headquarters for the battalion.

### 169. After-Burst Operations

The engineer mission in case of an atomic attack is expected to be essentially the same as for other types of attack, but to be complicated in practice by the destructive effects of atomic weapons and the additional hazards of residual radiation. After the burst engineers may be required to—

*a.* Perform first aid, rescue, and evacuation tasks.

*b.* Prepare personnel and equipment decontamination stations.

*c.* Make and post signs for unsafe areas.

*d.* Decontaminate essential areas or evacuate to safe areas.

*e.* Fight fires.

*f.* Clear debris from essential routes to facilitate relief, supply, and evacuation.

*g.* Produce a maximum of potable water.

*h.* Perform other special and general engineer tasks as required.

## Section IX. DEFENSE AGAINST GUERILLA FORCES

### 170. General

An area confronted with a serious guerilla menace is as much a combat area as is the forward area. Com-

manders and troops in such an area must maintain the same alert and aggressive attitude as troops in the forward area. Security measures are taken to safeguard troops, installations, and lines of communication. Vigilant security and sound defensive measures not only minimize our own losses but tend to discourage guerilla operations.

### 171. Troop Security

All echelons are thoroughly briefed on known or suspected hostile guerilla forces. Combat security measures, including extensive patrolling, are employed on the march, during halts, and while in bivouac to minimize losses from guerilla ambushes or attacks. Troops in rear areas may acquire a sense of false security and relax their vigilance even though guerillas threaten them with dangers as great as those in forward areas. Since guerilla operations may be spasmodic, long quiet periods tend to reduce security vigilance. Therefore, commanders exercise methodical supervision to maintain security discipline.

### 172. Supply Economy

Supply economy is enforced. It is emphasized to troops and units that supplies that are lost, traded, or thrown away usually are recovered by guerillas and used against our forces. Arms and equipment are salvaged from battlefields and from civilians who have collected them.

### 173. Unit Security

Unit areas are secured against guerilla attacks and sabotage, with special attention being given to the

security of arms, ammunition, and other equipment of value to the guerillas. Fields of fire are cleared. Hasty field fortifications are constructed and manned by adequate guards who are supplemented by patrols. Precautions are taken to prevent guards being surprised and overpowered before they can give the alarm. All soldiers are trained in antiguerilla tactics and keep their weapons available for instant use. The routine means of securing an area are altered frequently to prevent guerilla forces from obtaining detailed accurate information about the composition and habits of the defense. Natives are not permitted to enter the area and natives residing in the vicinity are carefully screened or evacuated.

### 174. Engineers With Convoy Security Detachments

*a.* Lone vehicles and convoys not capable of providing their own security are grouped and escorted through danger areas by armed security detachments. These detachments are specially organized and trained to protect convoys from hostile guerilla actions and may contain elements of armor, infantry, and engineers. The size and composition of a detachment varies with the topography, the capabilities of hostile guerilla forces, and the size and composition of the convoy. Traffic through known danger areas is normally controlled by traffic control stations.

*b.* The combat engineer element is placed well forward in the column to perform such engineer tasks as minor bridge and road repair, obstacle removal, and detection and removal of mines.

### 175. Unescorted Convoy Operation

When a convoy is not escorted through a danger area by a convoy security detachment, the parent unit organizes its own convoy security. Part of the available troops are placed well forward in the convoy, and a strong detachment is placed in vehicles that follow the main body by about three minutes. Radio contact is established between the two groups if possible. Fairly fast speed is maintained. Defiles are traversed at high speed. Sharp curves, steep grades, or other areas where low speed is necessary are reconnoitered by foot troops. At the first indication of ambush while the convoy is in motion, leading vehicles, if the road appears clear, increase their speed to the maximum consistent with safety in an effort to run through the ambush area. Drivers or assistant drivers of vehicles disabled by enemy fire or mines seek to direct their vehicles to the sides or off the roads so as not to block vehicles in rear. Troops from vehicles stopped in the ambush area dismount and return fire. Machine guns mounted on vehicles are fired. Troops from vehicles breaking through the ambush, dismount and attack back against a flank of the ambush position. The rear guard of the convoy, upon learning that the main body has been ambushed, dismounts and attacks forward against the other flank of the ambush position. Both attacking groups take care not to fire on each other. If the guerillas allow the main convoy to pass through and then ambush the rear guard, troops from the main body return and relieve the rear guard by an attack against the flank of the ambush position.

### 176. Summary

*a.* Hostile guerilla forces are not to be underrated.

*b.* Rear-area, as well as frontline troops must be constantly on the alert for guerilla attack.

*c.* Commanders must emphasize continuous unit security and maintain plans to counter guerilla activity at any and all times (FM's 31–20 and 31–21).

## Section X. RETROGRADE MOVEMENTS

### 177. General

A retrograde movement is a movement to the rear or away from the enemy. It may be forced by the enemy or it may be voluntary. Retrograde movements are covered by mobile forces of combined arms, which delay and deceive the enemy and prevent interference with the execution of the retrograde plan. Contact with the enemy is maintained by these covering forces, who force the enemy to fight or maneuver for the ground that is given up. Retrograde movements are made only by order of, or after approval by, higher headquarters and include withdrawals from action, retirements, and delaying actions.

### 178. Engineer Support of Other Arms

During retrograde movements, engineers play a vital role in delaying the advance of the enemy. Proper coordination and execution of engineer tasks in retrograde movements normally require the attachment of engineer elements to the covering force. The leading elements of the retiring friendly troops must be kept moving to their destination, and the routes must be kept open and clear to allow successive elements to

reach their destinations. Engineers near the tail of the retiring column destroy bridges and culverts, block roads, lay mines, destroy stores, and demolish railways and rolling stock (fig. 39). The time available determines the degree of destruction and the number of obstacles constructed. Major obstacles must receive priority, since their construction leads to the greatest difficulty for the enemy. The engineers work closely with the other elements of the covering force, preparing alternate delaying positions and obstacles for the infantry and antitank units, while moving to the rear in leapfrog fashion.

### 179. Engineer Duties

*a.* The duties of the engineers in a retrograde movement are basically the same as in the defense. Typical duties include—

(1) Performing engineer tasks to aid movement of retiring columns.

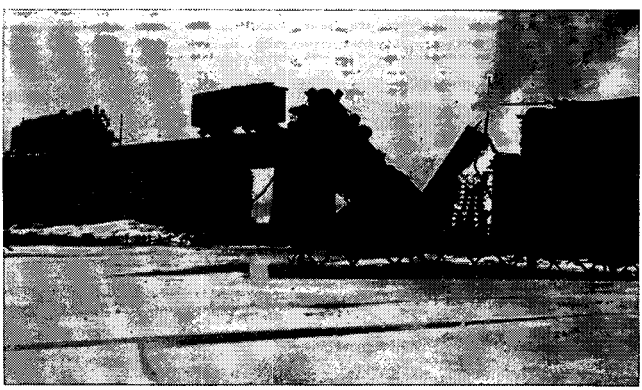


*Figure 39. Engineers in a retrograde movement destroy railway and rolling stock.*

(2) Participating in denial operations as authorized by higher headquarters.
(3) Delaying the enemy by destroying bridges and culverts, blocking roads, demolishing railways, and erecting barriers.
(4) Assisting in flank security by preparing demolitions and creating obstacles.
(5) Engaging in combat as infantry.

*b.* In a retrograde movement, supply trains, including engineer supplies and equipment, may be among the first elements to move to the rear. However, to meet the needs of engineers with security elements, it is frequently necessary to operate engineer supply points near the front until the last elements withdraw. Material that has to be abandoned must be destroyed.

### 180. Delaying Action

*a.* Delaying action is a form of defensive action and is used to retard the enemy's advance and to gain time without becoming decisively engaged.

*b.* Engineer elements are employed in support of the delaying force, or they may be attached to tactical units. They are employed to construct a barrier of obstacles and demolitions in front of the first delaying position and in the area between successive positions. Obstacles are normally defended.

## Section XI. DENIAL OPERATIONS

### 181. General

*a.* A denial measure is action to hinder or deny the enemy use of space, personnel, or facilities.

*b.* The decision as to the extent to which denial operations are to include nonmilitary supplies and facilities is a responsibility of the highest military commander in the theater. When the denial policy is established, the detailed planning and execution involve major problems in engineering and logistics. (For details see FM 31–10.)

*c.* A scorched-earth policy makes an entire area useless to the enemy by the removal or destruction of everything that can in any way aid him. The civilian population of an area in which the scorched-earth policy is to be applied must be evacuated if the area is friendly. A partial-denial operation, less drastic than a scorched-earth policy, is more often employed.

### 182. Battalion Participation

The division commander is responsible for denial operations within his divisional area. His plan for denial of both military and civilian supplies, equipment, and installations is prepared in accordance with denial policy from higher headquarters and is distributed to divisional units for execution. The infantry division engineer battalion is especially suitable for executing denial operations. Extensive use is made of the engineer equipment and demolitions in the removal or destruction of items to be denied to the enemy. Troops of other arms and services are also used extensively in denial operations, usually under engineer supervision. It is a command decision to determine when preliminary work is to be done and when plans are to be executed. A denial operation to be successful must be prosecuted ruthlessly. The engi-

neer battalion, like other units, normally has an SOP for the destruction of its own supplies and equipment.

### 183. Denial by Removal

Evacuation of materiel, if at all possible, should be accomplished in a denial operation. Destruction is to be effected only as a last resort. Evacuation must be started early and conducted in accordance with prepared priority lists. All available means of labor and transportation must be used to capacity in order to save all possible supplies and equipment.

### 184. Denial by Destruction

All possible methods of destruction are used. In order that destruction may be executed at the desired time, the personnel who will destroy each item must be designated in advance; the supplies necessary for the destruction must be estimated and assembled at convenient locations; and the circumstances under which the destruction is to take place must be definitely prescribed. If orders for destruction are to be issued, the means of transmission must be provided.

### 185. Use of Prepositioned Atomic Weapons

*a.* Prepositioned atomic weapons may be used for denial operations. Normally the officer responsible for the execution of a mission requiring a prepositioned atomic weapon will be the commander of the engineer emplacement and firing unit. The designated commander should be highly trained in all aspects of atomic weapons operations which are the responsibility of engineer personnel and should be cognizant of the technical phases actually performed by other person-

nel. He ordinarily directs all operations at the emplacement site, takes emergency action in the event of a change of mission or misfire, and detonates the atomic weapon on order from higher headquarters.

*b.* Engineer personnel prepare the emplacement site under the direction of the engineer emplacement site commander. This may include providing appropriate access roads, installing antitank and antipersonnel minefields or other obstacles when ordered, camouflaging the area to avoid disclosure of the operation, providing local security, and providing communication facilities. Engineer personnel install the atomic weapon in the emplacement and complete all preparation of the site with the assistance of other technicians provided for the mission.

## Section XII. RIVER-CROSSING OPERATIONS

### 186. General

The immediate objective of the attack on a river line is to get across quickly and economically and establish one or more bridgeheads to protect the crossing of the remainder of the command. A division usually crosses as part of a larger force and has one of the following missions: to force the crossing or to make a feint. The actual crossing is a means, not the end sought.

### 187. Types of Crossings

Plans for crossing a stream over which the enemy has destroyed all bridges depend on several factors including the strength with which the enemy holds the

opposite bank and the characteristics of the river. There are two general types of crossings—a hasty river crossing and a deliberate river crossing.

*a. Hasty River Crossing.* A hasty river crossing must be boldly executed to insure surprise, to prevent the organization of strong defenses, and if possible, to seize an existing bridge or ford. Detailed reconnaissance and planning are secondary to speed. Advanced elements are crossed by any means available. Such crossings must be foreseen; all available equipment must be utilized promptly. When the opportunity for such a crossing is presented to an advance force, the supporting engineer troops aid in the immediate crossing and exploitation. Bridges or other crossing means are constructed as soon as possible by the division engineers to enable the crossing of additional divisional troops which are rushed forward to exploit the initial successes.

*b. A Deliberate River Crossing.* A deliberate river crossing is necessary if the opposite bank is strongly held. Detailed planning, extensive logistical preparation, and air and ground superiority are required. Overall planning and coordination are performed by higher commands, corps or higher.

### 188. Equipment and Capabilities

The infantry division, engineer battalion has a limited river crossing capability. The bridge section in headquarters and headquarters company has 38-foot spans of fixed aluminum deck balk bridge, 16-foot plastic assault boats, infantry-support raft sets, outboard motors of 25 and 30 horsepower, and 2-wheel

utility pole type trailers. With this limited amount of bridging equipment, the engineer battalion is restricted to spanning short gaps and aiding the assault effort in offensive operations (fig. 40). Extensive operations require backup support from corps or army in the form of additional fixed, floating, and assault bridging equipment and units. See FM 31–60 for details.

*Figure 40. Combat engineers in a river-crossing operation.*

## Section XIII. INFANTRY COMBAT

### 189. General

*a.* The infantry division engineer battalion or any element thereof engages in combat when necessary for its own protection, when necessary to insure completion of an engineering task, or when assigned an infantry mission. When assigned an infantry role, under nonatomic warfare conditions, the battalion may be committed as a whole. Under atomic warfare conditions,

it is more likely that the combat companies will fight under their supported battle groups. Engineer units maintain their own close-in security while on the march, in bivouac, or at work. Fighting to provide this security often involves small units of squad, platoon, or company size. Ordinarily, very little time is available to plan or reorganize for combat. In certain situations combat engineers are relieved of engineer functions and assigned specific infantry combat missions. This step is taken by a commander only after carefully weighing its value against the effect upon performance of necessary engineer work. The unit engineer must advise his commander of the effect engineer work stoppage will have on accomplishment of the mission of the higher unit.

*b.* The basic tactical training of engineers parallels that of the infantry. However, the engineers receive much less tactical training with a consequent reduction of combat efficiency. The combat efficiency of the infantry division engineer battalion is limited by lack of close support weapons, communications personnel, and medical personnel. For these reasons, engineers committed to combat are normally used as defensive rather than offensive troops. When engineer troops fight as infantry, they are normally attached to infantry units to insure adequate fire support. The infantry command to which the engineer unit is attached must be at an echelon high enough to insure necessary fire support and coordination. To compensate in part for the above disadvantages, engineer units are assigned smaller frontages than infantry units of corresponding size. The employment of the combat companies as infantry depends upon the tactical situa-

tion, the mission, and the frontage responsibilities assigned.

*c.* Training of the infantry division engineer battalion in infantry tactics should be based on the plan or SOP for reorganization for combat. Emphasis must be placed on training company officers in the proper utilization of supporting mortar and artillery fire. See FM's 7–10 and 7–40 for employment of infantry units.

### 190. General Organization for Combat

*a.* When in combat, either in furnishing its own security on engineer missions or in performing missions normally assigned to infantry, the engineer combat company is organized to provide command, rifle, and crew-served-weapon elements. Normal organization is modified to provide for effective use and control of crew-served weapons, for security of equipment not needed for combat, and for the special problems of command, communication, and supply incident to combat. Standing operating procedures for infantry combat are prepared and rehearsed by the battalion, companies, and platoons, to establish definitely the duties of personnel.

*b.* When the engineer battalion or any of its elements enters combat it is divided into forward and rear echelons.

(1) The forward echelon consists of the elements that actually engage in combat and also the command, communication and supply personnel and equipment necessary to control and supply the combat elements. In most situations, the light vehicles are needed in the for-

ward echelon for security, communication, ammunition supply, and the displacement of crew-served weapons.

(2) The rear echelon is commanded by the senior officer or enlisted man included therein and normally attached to division trains. It consists of the personnel and equipment not needed for combat, including kitchen trucks, trucks carrying supplies and equipment, and special vehicles such as air compressors, cranes, tractors, and other heavy equipment. The number of personnel assigned is the minimum necessary to maintain the mobility of the rear echelon, provide for its local security, and perform essential administrative functions. The actual composition and location of the rear echelon varies with the situation.

*c.* The extent of reorganization for combat varies with the size of the unit, the time available, and the mission. The battalion is generally deliberately committed to combat, allowing time for necessary adjustments before meeting the enemy. However, when a platoon operating alone on an engineer mission becomes involved in combat, the change is made as quickly as possible and is based upon fragmentary orders issued after contact. Each rifle company consists of a company headquarters and 2 rifle platoons. The rifle platoons are organized into a platoon headquarters, 3 rifle squads, and a weapons squad.

*d.* Engineer operations are normally suspended when the unit is committed to combat. However, certain types of engineer work, such as water supply, supply

of engineer materials, and engineer reconnaissance, may be continued by personnel of the rear echelon. In certain situations, an engineer company may be held out and assigned engineer missions in support of the division defensive operation.

*e.* Appendix III contains details of a typical reorganization of the infantry division, engineer battalion for combat as infantry. See FM 7–40 for relief of front line units.

### 191. Support, Fire Power, and Communication Facilities

*a.* In order for the engineer battalion to be an effective fighting force as infantry, it must be provided with supporting fire. If the engineer battalion is committed deliberately as an infantry unit, this necessary support may be achieved by attaching the battalion to a battle group or to the brigade. It then becomes the responsibility of the battle group or brigade commander to furnish the necessary supporting fire.

*b.* For antitank protection the engineer battalion has mines, 3.5-inch rocket launchers, and engineer combat vehicles.

*c.* In preparing for combat, the engineer battalion plans for a more flexible signal communication system than is normally necessary. The extent of the communication facilities required varies with the type of situation. In a defensive situation, for instance, it is necessary to establish communication laterally. This can be accomplished by taking two radios from the battalion net and netting them with the units on the left and right. The battalion communication section ties in with the battle group net.

# APPENDIX I

# REFERENCES

## 1. Publication Indexes

The following publications should be consulted frequently for latest changes to, or revisions of publications given in this list of references, and for new publications on the subjects covered in this manual:

DA PAM 108–1 Index of Army Motion Pictures, Filmstrips, Slides, and Phono-Recordings.

DA PAM 310–3 Military Publications: Index of Training Publications.

DA PAM 310–4 Military Publications: Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.

DA PAM 310–5 Military Publications: Index to Graphic Training Aids and Devices.

## 2. Army Regulations and Special Regulations

AR 55–105 Transportation by Commercial Means.

AR 55–145 Transportation of Troops; Entraining, Duties en Route, and Detraining.

| | |
|---|---|
| AR 220–60 | Battalions: General Provisions. |
| AR 220–70 | Companies: General Provisions. |
| AR 700–2300–1 | Motor Vehicles. |
| SR 55–720–1 | Preparation for Oversea Movements of Units. |
| SR 320–5–1 | Dictionary of United States Army Terms. |
| AR 320–50 | Authorized Abbreviations. |

**3. Field Manuals**

| | |
|---|---|
| FM 3–5 | Tactics and Technique of Chemical, Biological, and Radiological Warfare. |
| FM 3–50 | Chemical Smoke Generator Battalion and Chemical Smoke Generator Company. |
| FM 5–10 | Routes of Communications. |
| FM 5–15 | Field Fortifications. |
| FM 5–20 | Camouflage, Basic Principles. |
| FM 5–22 | Camouflage Materials. |
| FM 5–25 | Explosives and Demolitions. |
| FM 5–31 | Use and Installation of Boobytraps. |
| FM 5–34 | Engineer Field Data. |
| FM 5–35 | Engineer's Reference and Logistical Data. |
| FM 7–10 | Rifle Company, Infantry Regiment. |
| FM 7–30 | Service and Medical Companies, Infantry Regiment. |
| FM 7–35 | Tank Company, Infantry Regiment. |
| FM 7–40 | Infantry Regiment. |
| FM 7–100 | The Infantry Division (when published). |

| | |
|---|---|
| FM 8–10 | Medical Service, Theater of Operations. |
| FM 11–10 | Signal Battalion, Infantry Division. |
| FM 11–17 | Tactical Communications Center Operations. |
| FM 17–22 | Reconnaissance Platoon and Reconnaissance Company. |
| FM 17–32 | Tank Platoon and Tank Company. |
| FM 17–33 | Tank Battalion. |
| FM 17–35 | Reconnaissance Battalion, Armored Division. |
| FM 20–32 | Employment of Land Mines. |
| FM 21–5 | Military Training. |
| FM 21–6 | Techniques of Military Instruction. |
| FM 21–10 | Military Sanitation. |
| FM 21–11 | First Aid for Soldiers. |
| FM 21–26 | Map Reading. |
| FM 21–30 | Military Symbols. |
| FM 21–40 | Defense Against CBR Attack. |
| FM 21–41 | Soldier's Manual for Defense Against CBR Attack. |
| FM 21–48 | CBR Training Exercises. |
| FM 22–5 | Drill and Ceremonies. |
| FM 22–10 | Leadership. |
| FM 24–5 | Signal Communications. |
| FM 24–18 | Field Radio Techniques. |
| FM 25–10 | Motor Transportation, Operations. |
| FM 26–5 | Interior Guard. |
| FM 30–5 | Combat Intelligence. |
| FM 30–15 | Examination of Personnel and Documents. |
| (C) FM 31–5 | Landing Operations on Hostile Shores (U). |

| | |
|---|---|
| FM 31–10 | Barriers and Denial Operations. |
| (C)FM 31–20 | U. S. Army Special Forces Group (Airborne) (U). |
| FM 31–21 | Guerilla Warfare. |
| FM 31–50 | Combat in Fortified Areas and Towns. |
| FM 31–60 | River-Crossing Operations. |
| FM 57–30 | Airborne Operations. |
| FM 100–5 | Field Service Regulations; Operations. |
| FM 100–10 | Field Service Regulations; Administration. |
| (C)FM 100–31 | Tactical Use of Atomic Weapons (U). |
| FM 101–5 | Staff Officers' Field Manual; Staff Organization and Procedure. |
| FM 101–10 | Staff Officers' Field Manual; Organization, Technical, and Logistical Data. |

**4. Technical Manuals**

| | |
|---|---|
| TM 5–220 | Passage of Obstacles Other Than Mine Fields. |
| TM 5–223A | Soviet Mine Warfare Equipment. |
| (C)TM 5–223B | Mine Warfare Equipment, Oriental and European (Except British, French, German, Italian, and Soviet) (U). |
| TM 5–252 | Use of Road and Airfield Construction Equipment. |
| TM 5–271 | Light Stream-Crossing Equipment. |
| TM 5–278 | Outboard Motors. |

| | |
|---|---|
| TM 5–280 | Construction in the Theater of Operations. |
| TM 5–295 | Military Water Supply. |
| TM 5–725 | Rigging. |
| TM 5–727 | Engineer Hand Tools. |
| TM 9–2810 | Tactical Motor Vehicle Inspections and Preventive Maintenance Services. |
| TM 21–305 | Manual for the Wheeled Vehicle Driver. |
| (S)TM 23–200 | Capabilities of Atomic Weapons (U). |
| TM 38–660–1 | Operator's Maintenance Instructions and Procedures for Administrative Motor Vehicles. |
| TM 57–210 | Air Movement of Troops and Equipment. |

**5. Technical Bulletins**

| | |
|---|---|
| TB ENG 117 | Field Fortifications. |

# APPENDIX II

# TYPICAL SOP

RECOMMENDED OUTLINE FOR AN SOP
(To be used as a checklist)
HQ
____ ENGR BN (INF DIV)
APO ____ US ARMY

DATE

STANDING OPERATING PROCEDURE
TABLE OF CONTENTS
(List paragraph numbers and titles)

Section I. GENERAL

1. APPLICATION (to operations, relation to prior SOP's, lower units to conform)
2. PURPOSE
3. REFERENCES (AR's, SR's, FM's, TM's)
4. RESPONSIBILITY FOR SOP (preparation, changes, and revisions)
5. EFFECTIVE DATE

Section II. COMMAND, STAFF, AND LIAISON

6. ORGANIZATION
   *a.* Normal.
   *b.* Special internal attachments and organization.
   *c.* Normal and special external attachment and support (Task Forces, etc.).

7. COMMAND POSTS
   a. Normal location (in relation to next higher headquarters).
   b. Reporting change of location (coordinates and time).
   c. Forward CP's.
      (1) When (situation for which required).
      (2) How (organized).
      (3) Personnel and equipment.
8. STAFF DUTIES
   a. Special or additional duties to those in FM's 5–132 and 101–5.
   b. Duties of such other important special staff officers as the commander desires to prescribe (paragraph for each).
9. LIAISON (FM's 5–132 and 101–5)
   a. Duties of liaison officers.
   b. Responsibilities for liasion (with next higher, lower, and adjacent units).

## Section III. ADMINISTRATION

10. GENERAL (Channels) FM 100–10
11. REPORTS
   a. Routine.
   b. Special.
   c. Information concerning submission of reports.
      (1) Title and reports control symbol.
      (2) Form for report.
      (3) Date due.
      (4) Number of copies.
      (5) Negative report required or permissible.

12. PROMOTIONS (policies)
   *a.* Officer (AR's in 140 and 605-series).
   *b.* Enlisted (AR 624–200).
   *c.* Battlefield.

13. COURTS-MARTIAL (MCM, US 1951)
   *a.* Local jurisdiction.
   *b.* Procedure for submitting cases.

14. MAIL (AR's 340–15, 341–10, and 341–50)
   *a.* Handling of official mail.
   *b.* Handling of personal mail.

15. LEAVES AND PASSES (AR's 630–5, 630–10, 630–20)
   *a.* Policy of command (frequency, conduct, VD policies, and so forth).
   *b.* Authority to grant.

16. JOURNALS AND HISTORY (AR's 220–345, 220–346, SR 600–730–5)
   *a.* Responsibility for unit journal and history.
   *b.* Maintenance of staff-section journals.

17. DISTRIBUTION OF MILITARY PUBLICATIONS (AR 310–1)

18. HANDLING OF PRISONERS OF WAR (DA Pam 20–151)
   *a.* Reference to FM 27–10.
   *b.* Special instructions for capturing units.

19. AWARDS AND DECORATONS (AR's 220–315 and 672–5–1)
   *a.* Channels.
   *b.* Forms.
   *c.* Presentation.

20. ORDERS (FM 101–5)
   *a.* Combat orders.
   *b.* Memoranda of combat orders to S3.
21. BILLETS AND BIVOUACS
   *a.* Billeting policies (occupation and vacating).
   *b.* Billeting party (organization and duties).

## Section IV. MOVEMENT

22. GENERAL (Reference Division SOP and march orders)
23. MOTOR MOVEMENT (FM 25–10 and AR 55–8)
   *a.* Preparation of vehicles.
   *b.* Motor marches.
      (1) Strip maps.
      (2) Route reconnaissance.
      (3) Messing and refueling.
      (4) Night marches.
      (5) Make up of march units and serials.
      (6) Distances to be maintained.
      (7) Speeds and rate of march.
      (8) Posting of traffic guards during halts.
   *c.* Conduct of personnel during movement.
   *d.* Maintenance on marches and movements.
24. VEHICLE AND EQUIPMENT REGULATIONS
   *a.* Motor pool (AR's 700–2300–1 and 57–5, and SR 57–5–1).
      (1) Dispatch.
      (2) Service.
      (3) Maintenance.
   *b.* Regulations for administrative vehicles.

25. RAIL MOVEMENTS (AR's 55–130, 55–135, 55–145)

*a.* Action by S1.
(1) Movement policy.
(2) Troop lists.
(3) Designation of movement control personnel.

*b.* Action by S2.
(1) Railroad reconnaissance report.
(2) Security.

*c.* Action by S3.
(1) Determine rolling-stock requirements.
(2) Coordinate loading plans.
(3) Prepare loading schedule and designate areas.

*d.* Action by S4.
(1) Initiate transportation requests.
(2) Troop and guard mess.
(3) Procurement of blocking and dunnage.
(4) Prepare shipping documents.

26. AIR MOVEMENT (AR's 55–8, 55–42)

*a.* Action by S1 (same as par. 25*a*).

*b.* Action by S2.
Security.

*c.* Action by S3.
(1) Determine type of craft required.
(2) Coordinate loading plans.
(3) Prepare loading schedule and designate loading areas.
(4) Instruct all personnel in air transportability technique.

*d.* Action by S4.
(1) Initiate transportation requests.

(2) Assure availability of tie-down devices or material.
(3) Furnish weights of equipment for loading computation.
(4) Arrange for any necessary Air Force supplies.
(5) Prepare shipping documents.

27. WATER MOVEMENT (AR 55-305 and SR 55-720-1)
*a.* Action by S1 (same as par. 25*a*).
*b.* Action by S2 (same as par. 25*b*).
*c.* Action by S3.
(1) Determine shipping required.
(2) Coordinate loading plans.
(3) Prepare loading schedule and designate loading areas.
*d.* Action by S4.
(1) Initiate transportation requests.
(2) Provide for troop mess.
(3) Prepare shipping documents.

28. FOOT MARCHES (FM's 7-10, 7-40, and 7-100)

## Section V. SECURITY

29. GENERAL (policy and responsibilities) (FM 26-5, AR 380-1 and AR 380-5)

30. SECURITY DURING MOVEMENT
*a.* Air guards.
*b.* Manning of vehicular weapons.
*c.* Camouflage during halts.
*d.* Advance, flank, and rear guards.

*e.* Action in case of attack.
  (1) Air.
  (2) Mechanized.
  (3) Atomic, bacteriological, and chemical (see sec. X).

31. SECURITY IN BIVOUAC (FM's 5–20C, 5–31, 7–10, 31–20)
  *a.* Camouflage.
  *b.* Mines and boobytraps.
  *c.* Placement of weapons for:
    (1) Air attack.
    (2) Mechanized attack.
    (3) Troops and guerillas.
  *d.* Joint security.
  *e.* Security plans.
  *f.* Sentry posts and outposts.

32. REAR AREA OBSERVATION (FM's 7–10, 7–40)
  *a.* Formation of rear area observation groups.
  *b.* Selection of rear area observation posts.
  *c.* Twenty-four hour manning of posts.
  *d.* Observation of rear areas, when required.
  *e.* Communications for observation posts.

33. SECURITY OF WORKING PARTIES
  *a.* Responsibility.
  *b.* Camouflage of equipment.
  *c.* Combat readiness.

34. SECURITY WARNING SIGNALS
  *a.* Air attack.
  *b.* Airborne attack.
  *c.* Mechanized attack.

*d.* Gas attack.

*e.* Atomic, bacteriological and chemical attack (see sec. X).

35. FIRE SAFETY AND FIREFIGHTING (SR 420–510–1)

*a.* Plan (general).

*b.* Fire personnel and duties.

*c.* Safety rules (motorpools, kitchens, and so forth).

36. ALERT PLANS

*a.* Unit plans.

*b.* Alert roster.

## Section VI. COMMUNICATION

37. TYPES USED

38. COMMUNICATION BETWEEN UNITS (TM's 11–462, 24–210 and FM's 24–5, 24–20)

*a.* Radio.

*b.* Telephone (TM 24–210).

*c.* Responsibility for installation.

*d.* Visual (FM 21–60).

39. COMMUNICATION PROCEDURES

*a.* Radiotelephone voice procedure (CCBP 3–2).

*b.* Signal security.

*c.* Citation of SOI and SSI of higher headquarters.

40. MAINTENANCE RESPONSIBILITIES OF COMMUNICATION OFFICER (FM's 100–11, 7–25)

## Section VII. RECONNAISSANCE, INTELLIGENCE, AND COUNTERINTELLIGENCE

41. RECONNAISSANCE
   - *a.* Reconnaissance a continuing function.
   - *b.* Essential elements of engineer information.

42. ENGINEER INTELLIGENCE
   - *a.* Evaluation.
   - *b.* Preparation of reports.
   - *c.* Dissemination.

43. COMBAT INTELLIGENCE (FM 30–5)
   - *a.* Definition of "spot report."
   - *b.* "Spot reports" required.
     - (1) Initial contact with enemy.
     - (2) Marked changes in enemy disposition or situation.
     - (3) Attack by armored, aircraft, or airborne forces.
     - (4) New units identified.
     - (5) Enemy strength, composition, and movement.
     - (6) Location of enemy installations.
     - (7) Use of chemicals or new weapons.
     - (8) New enemy materials or equipment.

44. COUNTERINTELLIGENCE.
   - *a.* Mail censorship.
   - *b.* Blackout discipline.
   - *c.* Extent of information given, if captured.
   - *d.* Signs and countersigns.
   - *e.* Destruction of classified material.
   - *f.* Civilian control.
   - *g.* Secrecy discipline.
   - *h.* Information to press representatives.

## Section VIII. SUPPLY

45. CLASS I
   *a.* Ration pickup.
   *b.* Daily ration return and ration cycle.
   *c.* Reserve rations carried.
      (1) By unit.
      (2) By individual.
   *d.* Responsibility for attached units.

46. WATER
   *a.* Authorized sources.
   *b.* Purification by expedient methods.
   *c.* Water economy.

47. CLASS II AND IV
   *a.* Requisition days for various services.
   *b.* Pickup procedure.
   *c.* Salvage turn-in procedure.
   *d.* Droppage by "Battle Loss Certificate."

48. CLASS III
   *a.* Method of supply.
   *b.* Fuel sources.

49. CLASS V
   *a.* Method of requisitioning.
   *b.* Forms used and certificates required.
   *c.* Basic load.
   *d.* Salvage.

50. MAINTENANCE OF VEHICLES AND EQUIPMENT (TM's 5–505, 9–8000, 38–660)
   *a.* Echelons of maintenance.
   *b.* Maintenance officer's responsibilities.
   *c.* Forms used.
   *d.* Priorities.

51. REPAIR PARTS
   *a.* Method of requisitioning; engineer and ordnance.
   *b.* Maintenance of stock levels.
   *c.* Inspections for maintenance and stock levels.
   *d.* Parts and equipment records.

52. EVACUATION OF VEHICLES AND EQUIPMENT
   *a.* Engineer channels.
   *b.* Ordnance channels.

53. PURCHASE AND PROCUREMENT (AR's 700–34, 35–6300)
   *a.* Designation and duties of P&C Officer.
   *b.* Procedures and channels.
   *c.* Items and services (include real estate).

Section IX. REORGANIZATION FOR COMBAT

54. REORGANIZATION (GENERAL)

55. DESIGNATION OF FORWARD ECHELON
   *a.* Personnel.
   *b.* Equipment.

56. DESIGNATION OF REAR ECHELON
   *a.* Personnel.
   *b.* Equipment.

57. SUPPLY (TM 9–1900)
   *a.* Ammunition.
   *b.* Unit trains.

58. COMMUNICATION

59. MEDICAL EVACUATION (FM's 7–30, 8–35)

60. STATEMENT OF EFFECT ON NORMAL MISSION

## Section X. ATOMIC WARFARE
(See DA TC 33,1952; FM 100-31)

61. GENERAL
- *a.* Purpose. Scope and application.
- *b.* Unit procedure.

62. COMMAND
- *a.* Atomic warning system and control net.
- *b.* Coordination with higher, lower, and adjacent units.

63. PERSONNEL
- *a.* Strength, records, and reports.
- *b.* Replacements.
- *c.* Discipline, law and order.
- *d.* Prisoners of war.
- *e.* Burial and graves registration (mass burial).

64. CIVIL AFFAIRS/MILITARY GOVERNMENT
(Reference to next higher headquarter's SOP.)

65. INTELLIGENCE
- *a.* All information to be relayed to higher headquarters promptly.
  - (1) Atomic targets.
  - (2) Enemy countermeasures.
  - (3) Effects of our atomic weapons.
  - (4) Indication of enemy use of atomic weapons.
    - (*a*) Appearance of special type aircraft, weapons, instruments, or equipment.
    - (*b*) Adoption of special precautions and troop restrictions.
    - (*c*) Creation of wide gaps in formations or withdrawal of front-line units.
    - (*d*) Special training instructions.

*b.* Handling of prisoners of war, captured documents, and materiel related to atomic warfare.
(1) Prisoners of war.
(2) Documents.
(3) Materiel.

*c.* Escapees and evaders.

*d.* Clandestine agents, guerillas, partisan forces, and underground organizations.

*e.* Counterintelligence.
(1) Atomic intelligence security.
(2) Capture of enemy specialists.
(3) Civilian evacuation.
(4) Disclosures of enemy attacks.

*f.* Tactical propaganda.

66. OPERATIONS

*a.* Alternate tactical plans.

*b.* Post attack operations.
(1) Tree blow down.
(2) Thermal.
(3) Fallout.
(*a*) Unit protection.
(*b*) Operation in contaminated areas.

*c.* Warning orders to our own troops.

*d.* Communication.

*e.* Security.
(1) Bivouac and assembly areas.
(2) Shelters and fortifications.
(3) Camouflage.
(4) Movement.
(5) Dispersion.

*f.* Training.
(1) Individual.
(2) Unit.
(3) Specialist.

*g.* Psychological warfare.

*h.* Reorganization of units.

67. LOGISTICS

*a.* Supply.
(1) Requisitions for special supplies for defense against atomic attack.
(2) Restocking of supplies and equipment.

*b.* Evacuation and hospitalization.
(1) Maximum permissible radiation exposure.
(2) First aid procedures.
(3) Evacuation of mass casualties.
(4) Provision for requesting mobile medical and surgical augmentations.

*c.* Service.
(1) Evacuation of damaged materiel.
(2) Decontamination of supplies, equipment, and personnel.
(3) Camouflage of dummy installations.
(4) Priorities for repair and construction.

68. REPORTS

*a.* Personnel—casualty estimates.

*b.* Intelligence—materiel, documents, enemy specialists.

*c.* Operations—report of effectiveness of units after atomic attack.

## ANNEX

Section X. CBR DEFENSE SOP
Annex ____ (CBR) to ____ ENGR BN,
INF DIV, SOP

1. GENERAL
   *a.* Purpose.
   *b.* Subordinate units to issue SOP's to conform.
2. REFERENCES
   *a.* FM 21–40 (list other pertinent doctrinal sources).
   *b.* Division Training Directive No. ____.
   *c.* Orders, SOP's, and annexes.
3. ORGANIZATION
   *a.* Command and staff structure.
   *b.* Specialists.
4. RESPONSIBILITIES
   *a.* Individual.
   *b.* Company Commanders.
      (1) Plans.
      (2) Proficiency of unit personnel.
      (3) Safeguarding and processing of captured enemy CBR personnel and equipment.
      (4) Unit CBR equipment.
      (5) First and second echelon decontamination.
   *c.* Large-scale decontamination (see Engineer Annex, Inf Div SOP No. ____).

5. DISPERSION

Guide to minimum yardage maintained between various type sections.

6. CBR ALARMS

*a.* General alarm. Attack considered imminent.

*b.* Actual attack.

7. PROCEDURE IN CASE OF CBR ATTACK

*a.* Action prior to attack.

*b.* Action during attack.

(1) Protective equipment.

(2) Cover and movement.

(3) Unit protective measures.

(4) Coordination between higher, lower, and adjacent units.

*c.* Action after attack.

(1) All-clear signal.

(2) Continuation of mission.

(3) Resupply of protective equipment and material.

(4) Marking and reporting of contaminated areas.

8. PROTECTION

*a.* Individual.

*b.* Unit.

*c.* Tactical.

9. SUPPLY

*a.* Emergency requisitions.

*b.* Authorized levels of CBR equipment.

10. TRAINING

See Division Training Directive No. ——.

BY ORDER OF LT. COLONEL MOYER

/s/ Daniel Dean
/t/ DANIEL DEAN
Capt, CE
Adjutant

OFFICIAL:

/s/ Daniel Dean
/t/ DANIEL DEAN
Capt, CE
Adjutant

DISTRIBUTION:

RECOMMENDED ANNEXES

1. Wearing of the uniform.
2. Signs.
3. Format for "Daily Engineer Situation Report."
4. Billets and bivouacs.
5. Destruction of classified documents.
6. Staff section SOP's.
7. Headquarters and headquarters and service company loading plan.
8. Reorganization for combat.
9. Alert plan.
10. March table.
11. Battalion radio net.

# APPENDIX III

# TYPICAL REORGANIZATION OF INFANTRY DIVISION, ENGINEER BATTALION, FOR COMBAT AS INFANTRY

## Section I. GENERAL

### 1. Purpose

The purpose of this appendix is to establish a guide for the reorganization of the battalion prior to engagement as infantry. The reorganization is designed to better prepare the battalion and its components for a combat role through the most judicious use of personnel, equipment, and organic weapons.

### 2. Alert

All personnel of the battalion are alerted as soon as orders are received from higher headquarters to commit the battalion as infantry. Upon receipt of such an alert the reorganizational plan outlined in each company SOP is placed into operation. All company SOP's will reflect the reorganizations detailed in the battalion SOP.

### 3. Weapons

All individual and crew-served weapons organic to the battalion, to include the assault subsection, are utilized. In such an emergency, it cannot be assumed

that additional weapons will be available for issue to the engineer battalion.

### 4. Engineer Work

When the battalion is committed as infantry, all engineer work except engineer supply and maintenance, map supply, water supply, and limited engineer reconnaissance is discontinued.

### 5. Training

This plan is effective during all combat training exercises.

### 6. Support Fire

See chapter 5.

### 7. Communication

See chapter 5.

### 8. Individual Equipment

Each individual prepares full field equipment for retention. All other individual equipment is stored by the battalion rear echelon until released by the battalion commander.

## Section II. REORGANIZATION OF THE ENGINEER COMBAT SQUAD

### 9. Rear Echelon

The squad driver is assigned to the rear echelon. The squad truck, trailer, tools, and individual equipment are assigned to the rear echelon.

### 10. Forward Echelon

Three men are released to platoon headquarters for the organization of a provisional weapons squad. The remaining eight men are organized into a rifle squad (fig. 41).

## Section III. REORGANIZATION OF ENGINEER COMBAT PLATOONS

### 11. Rear Echelon

*a. Squads.* See section II above.

*b. Platoon Headquarters.* The driver of the platoon truck, the truck, trailer, platoon tools, and .50 cal machine gun are assigned to the rear echelon. The driver of the platoon truck takes charge of the platoon rear echelon and reports to the commander of the company rear echelon. The driver also mans the .50 cal machine gun for AA defense of the vehicles.

| | INFANTRY JOB | WEAPON | ENGINEER JOB |
|---|---|---|---|
| 1. | Squad Ldr | Rifle | Squad Ldr |
| 2. | Rifleman | Rifle & Grenade Lchr | Combat Const. Specl |
| 3. | Rifleman | Rifle | Combat Const. Specl |
| 4. | Rkt Lchr Gunner | Rifle & Rkt Lchr | DML Specl |
| 5. | Rifleman | Rifle | Combat Const. Specl |
| 6. | Asst Rkt Lchr Gunner | Rifle | Pioneer |
| 7. | Rifleman | Rifle | Pioneer |
| 8. | Asst Squad Ldr | Rifle & Grenade Lchr | Asst Squad Ldr |

*Figure 41. Typical reorganization of the engineer squad.*

## 12. Forward Echelon

*a. Squads.* See section II above.

*b. Platoon Headquarters.* Platoon headquarters consists of the platoon leader, platoon sergeant, radio operator (truck driver), and ¼-ton truck (fig. 42). One assistant squad leader becomes squad leader of the weapons squad and in turn the toolroom keeper joins the squad.

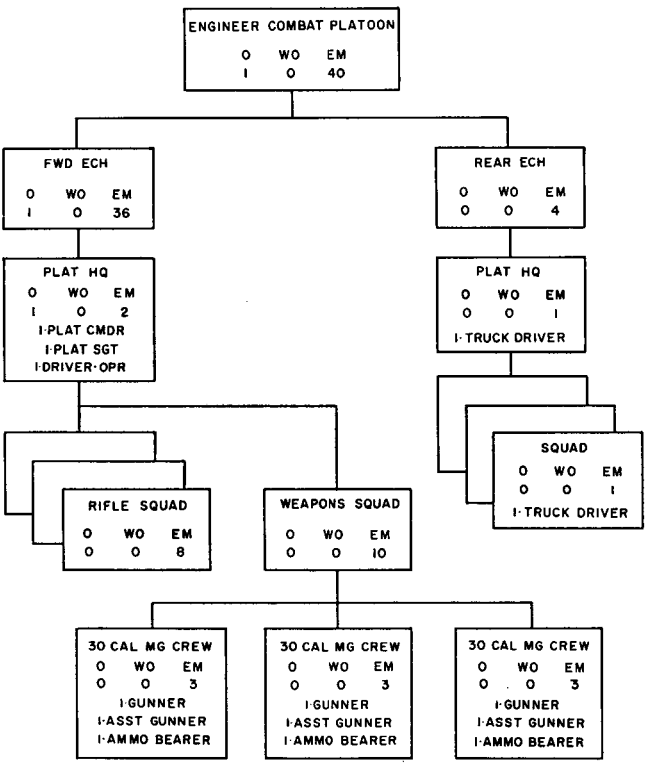



*Figure 42. Typical reorganization of the engineer platoon.*

*c. Weapons Squad.* The provisional weapons squad consists of the squad leader, and three 3-man machine gun crews. The three .30 cal machine guns are organic platoon weapons. The rocket launchers remain in their respective squads.

## Section IV. REORGANIZATION OF THE ENGINEER COMBAT COMPANY

### 13. Rear Echelon

*a. Personnel.* The company rear echelon is under command of the executive officer. It consists of the executive officer and 15 men from company headquarters and 8 men from the combat platoons (fig. 43). The personnel from company headquarters are—

(1) *Administrative section.* (2) Executive officer and company clerk.
(2) *Mess section.* (5) Entire section.
(3) *Equipment and maintenance section.* (9) Entire section, less two drivers.

*b. Equipment.* Major items of company headquarters equipment in the rear echelon are—

1 truck, 2½-ton 6 x 6 (supply and mess from H&S Company).
1 trailer, water (mess from H&S Company).
1 trailer, ¾-ton cargo (supply).
2 truck-tractor 5-ton (equip and maint).
2 trailer, semi, 25-ton (equip and maint).
2 tractor, with angledozer (equip and maint).
2 compressor, air, trk mtd (equip and maint).

*c. Platoons.* The company rear echelon includes 2 platoon dump trucks with cargo trailers, .50 cal.

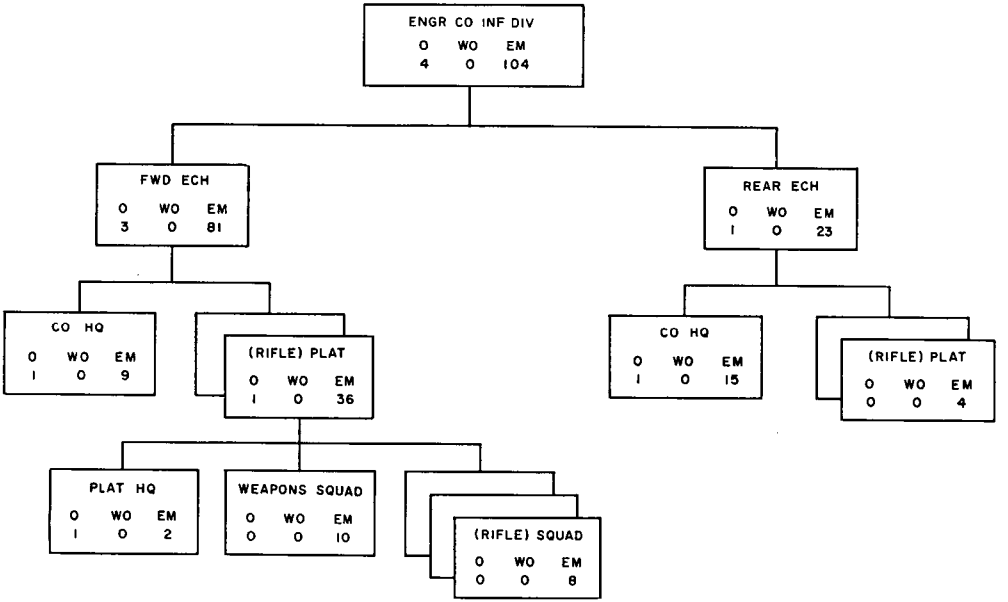



*Figure 43. Typical reorganization of the engineer company, infantry division.*

MG's, drivers, and 6 squad trucks with drivers and pole type trailers.

*d. Operation.* When the entire battalion is reorganized for combat, the company rear echelon becomes part of the battalion rear echelon. On a separate combat mission, the company establishes its own rear echelon. In any event, the mission for the rear echelon is to support the company operations and provide its own security.

### 14. Forward Echelon

*a. General.* The forward echelon of company headquarters consists of 3 officers and 82 enlisted men organized into the command, supply, and communication section and 2 rifle platoons.

*b. Command Section.* (3) The company commander, 1st sergeant, and a light truck driver with a ¼-ton truck.

*c. Supply Section.* (3) The company supply sergeant, armorer, light truck driver, and 2½-ton truck.

*d. Communication Section.* (4) Three radio operators, a radio mechanic, and a ¾-ton truck. One of the radio operators drives the truck.

*e. Medical Attachment.* One aid man from the battalion medical section accompanies each platoon. Litter bearers are drawn from the company fillers or the rear echelon, as required.

*f. Support Fire.* See chapter 5.

*g. Rifle Platoon.* (74) The rifle platoons are composed of a platoon headquarters, a weapons squad, and 3 rifle squads.

## Section V. REORGANIZATION OF HEADQUARTERS AND HEADQUARTERS COMPANY

### 15. Headquarters and Headquarters Company

*a. Rear Echelon.* The rear echelon of the headquarters and headquarters company is located with, and provides the command for, the battalion rear echelon. The company commander is also designated as the battalion rear echelon commander. His mission is to support the battalion forward echelon with men and materials; to provide command, administration, and security; and to coordinate operations of the battalion rear echelon. Company rear echelon consists of 1 officer and 35 enlisted men (fig. 44) to include—

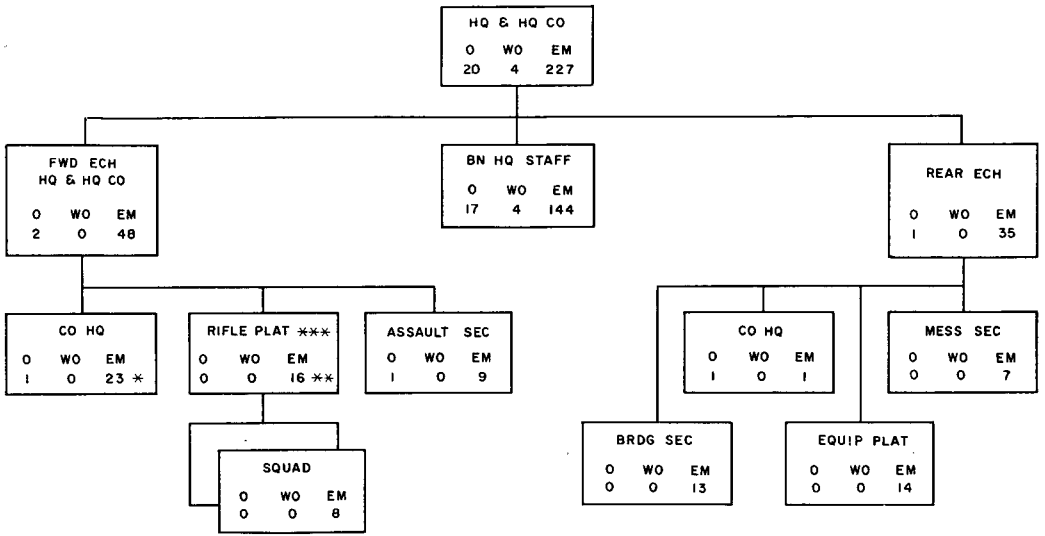
(1) *Administrative section.* (2) The company commander and company clerk who also handles company supply in the rear.

(2) *Mess section.* (7) Entire section with mess truck and water trailer.

(3) *Equipment platoon.* (14) Eight-man rifle squad is sent to forward echelon. Ten men are sent forward with the battalion communication section and 1 officer and 9 men are sent forward in the assault subsection. All equipment except the 3 engineer combat vehicles remain with the rear echelon.

(4) *Bridge section.* (13) Entire section with equipment and vehicles. Trucks and drivers assist S4 in hauling supplies as required.

*b. Forward Echelon.* The forward echelon of headquarters and headquarters company is commanded by the company executive officer. It is located with the




NOTE: * INCLUDES 16 MEN FROM MAINTENANCE SECTION
** INCLUDES 8 MEN EACH EQUIPMENT PLATOON AND MAINTENANCE SECTION
*** ONE OF THE RECONNAISSANCE OFFICERS MAY BE USED AS A LEADER FOR THIS PLATOON

*Figure 44. Typical reorganization of headquarters and headquarters company.*

battalion forward echelon. The company forward echelon consists of 2 officers and 48 enlisted men.

(1) *Company headquarters.* (24) Executive officer, first sergeant, supply sergeant, and 5 truck drivers. The maintenance section furnishes an armorer, 2 messengers, 12 filler personnel, a driver, and a 2½-ton truck.

(2) *Assault section.* (10) Entire section to include the equipment platoon leader and assigned engineer combat vehicles. The section is held as battalion mobile reserve unless employed otherwise by the battalion commander.

(3) *Rifle platoon.* (16) One eight-man rifle squad from the equipment platoon and one from the maintenance section. One of the reconnaissance officers from the intelligence section may be used as the leader of this platoon.

### 16. Battalion Headquarters

*a. Rear Echelon.* Members of the staff sections not required in the forward echelon become part of the rear echelon. These staff sections of 4 warrant officers and 58 enlisted men (fig. 45) include—

(1) *S1 section.* (8) Personnel section of 1 warrant officer and 7 enlisted men. The section furnishes 2 drivers for the command section and the chaplain's assistant.

(2) *S2 section.* (1) One specialist, map distributor.

(3) *S3 section.* (1) One construction draftsman.

(4) *S4 section.* (37) One assistant S4, supply warrant officer, and the battalion, division engi-

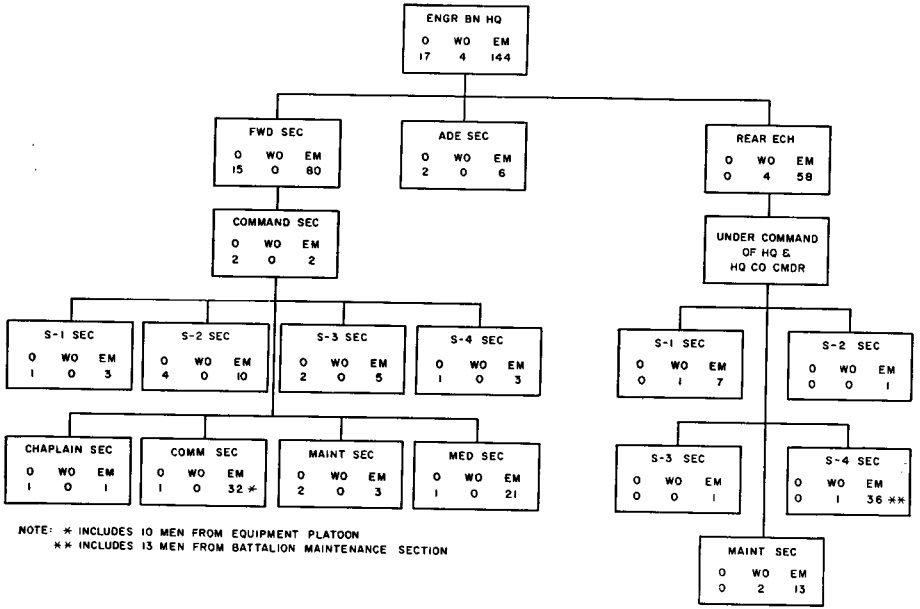



*Figure 45. Typical reorganization of battalion headquarters section.*

neer, and water supply subsections. This section is augmented by 13 men from the battalion maintenance section.

(5) *Battalion maintenance section.* (15) Assistant motor officer, enginer equipment maintenance warrant officer, section chief, machinist, 2 welders, and 9 mechanics.

(6) *Assistant division engineer sections.* (8) Although listed in the TOE as a part of battalion headquarters, these sections continue their normal functions at division and brigade headquarters. These 8 men are not included in figure 59.

*b. Forward Echelon.* The battalion headquarters forward echelon of 15 officers and 80 enlisted men includes—

(1) *Command section.* (4) Battalion commander, executive officer, and 2 light truck drivers with ¼-ton trucks.

(2) *S1 section.* (4) Battalion adjutant, sergeant major, clerk-typist, and radio operator (truck driver) with ¼-ton truck.

(3) *S2 section.* (14) The intelligence officer and entire section to include the 3 reconnaissance teams, less the enlisted map distributor.

(4) *S3 section.* (7) Operations officer and entire section less the construction draftsman.

(5) *S4 section.* (4) Supply officer, supply specialist, and two supply clerks. Additional trucks and personnel for ammunition supply are obtained from the rear echelon as required. The S4 will be assisted by the battalion motor

officer and the engineer equipment maintenance officer.

(6) *Communication section.* (33) The entire section with organic vehicles and augmented by ten men from the equipment platoon for use as linemen and messengers.

(7) *Chaplain section.* (2) Chaplain, assistant, and transportation.

(8) *Medical detachment.* (22) Entire section with organic transportation. Three aid men per rifle company.

(9) *Maintenance section.* (5) Includes battalion motor officer and engineer equipment officer (primary duties to assist the S4) and 3 wheeled vehicle mechanics.

## 17. References

For duties of personnel and employment and tactics of infantry units, see FM's 7–10, 7–40, and 7–100.

# INDEX

[AG 210.01 (19 Jun 57)]

By Order of *Wilber M. Brucker,* Secretary of the Army:

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| | | |
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*NG:* State AG; Div; Engr Brig; Engr Gp; Engr Bn.

*USAR:* Div; Engr Brig; Engr Gp; Engr Bn.

For explanation of abbreviations used, see AR 320–50.

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