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FM 10-35

WAR DEPARTMENT FIELD MANUAL



QUARTERMASTER TRUCK COMPANIES

WAR DEPARTMENT • JULY 1945

FIELD MANUAL

TRANSPORTATION CORPS TRUCK
COMPANIESCHANGES }
No. 1 }WAR DEPARTMENT
WASHINGTON 25, D. C., 12 May 1947

FM 10-35, 13 July 1945, is changed as follows:

The title is changed to read "TRANSPORTATION CORPS TRUCK COMPANIES."

All reference to Quartermaster truck companies, battalions, or groups will be changed to read Transportation Corps truck companies, battalions, or groups wherever they occur in the manual.

4. ASSIGNMENT.

* * * * *

d. ASSIGNMENT BY TABLES OF ORGANIZATION.

Rescinded.

13. CONVOY.

* * * * *

g. *Proper convoy control* is essential to * * *
from enemy action.(1) *Traffic systems.* Rescinded.(a) *Area control.* Rescinded.(b) *Unit or organizational control.* Rescinded.(2) *Briefing.* Prior to starting * * * from
the column.

* * * * *

[AG 300.5 (2 Apr 47)]

BY ORDER OF THE SECRETARY OF WAR:

DWIGHT D. EISENHOWER
Chief of Staff

OFFICIAL:

EDWARD F. WITSELL
Major General
The Adjutant General

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For explanation of distribution formula, see
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WAR DEPARTMENT FIELD MANUAL

FM 10-35

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QUARTERMASTER
TRUCK COMPANIES



WAR DEPARTMENT · JULY 1945

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FM 10-35, Quartermaster Truck Companies, is published for the information and guidance of all concerned.

[AG 300.7 (11 Sep 44)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

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Refer to FM 21-6 for explanation of distribution formula.

CONTENTS

| | <i>Paragraph</i> | <i>Page</i> |
|--|------------------|-------------|
| CHAPTER 1. GENERAL. | | |
| <i>Section I.</i> Introduction. | | |
| Purpose and scope of the manual | 1 | 1 |
| II. Quartermaster Truck Company (Troop) or Quartermaster Troop Transport Company T/O & E 10-57. | | |
| Mission of company | 2 | 2 |
| Functions | 3 | 2 |
| Assignment | 4 | 4 |
| Organization and equipment | 5 | 6 |
| III. Quartermaster Truck Company, Heavy, T/O & E 10-37. | | |
| Mission of company | 6 | 7 |
| Functions | 7 | 8 |
| Assignment | 8 | 8 |
| Organization and equipment | 9 | 8 |
| CHAPTER 2. PERSONNEL. | | |
| Commissioned officers | 10 | 10 |
| Enlisted personnel | 11 | 12 |
| Training | 12 | 18 |
| CHAPTER 3. OPERATIONS. | | |
| Convoy | 13 | 23 |
| Loads and loading | 14 | 39 |
| Shipment of vehicles | 15 | 43 |
| Dispatching | 16 | 44 |
| Refueling | 17 | 46 |
| Special operations | 18 | 49 |
| Tractor-trailer operation | 19 | 51 |
| Selection of bivouac area | 20 | 53 |
| Security of bivouac area | 21 | 54 |

| | <i>Paragraph</i> | <i>Page</i> |
|----------------------------|------------------|-------------|
| Mines and booby traps..... | 22 | 58 |
| Weapons | 23 | 59 |
| Demolition | 24 | 59 |

CHAPTER 4. MAINTENANCE.

| | | |
|-------------------------------------|----|----|
| Importance of maintenance | 25 | 60 |
| First echelon maintenance | 26 | 60 |
| Second echelon maintenance | 27 | 63 |
| Third echelon | 28 | 69 |
| Maintenance forms and records | 29 | 70 |

CHAPTER 1

GENERAL

Section I. INTRODUCTION

1. PURPOSE AND SCOPE OF THE MANUAL. a.

The purpose of this manual is to provide basic information necessary for the efficient functioning of the quartermaster truck company. The mission, organization, duties of personnel, and the operation of the company are carefully described. The manual does not include operator's instructions or technical data covered in Technical Manuals and other War Department publications. Throughout the manual references are made to technical publications which provide the detailed information necessary for the specialists to perform their functions in the company operation. This manual gives general directions for the functioning of the company and serves as a guide to the publications which give the personnel of the company specific information on how to carry out these directions.

b. The manual is applicable to both the Quartermaster Truck Company (Troop) or Quartermaster Troop Transport Company, T/O & E 10-57, and the Quartermaster Truck Company, Heavy, T/O & E 10-37. Section II of this chapter outlines the mission, functions, assignment, organization, and equipment of the Quartermaster Truck Company (Troop)

or Quartermaster Troop Transport Company, T/O & E 10-57; section III similarly treats the Quartermaster Truck Company, Heavy, T/O & E 10-37. Other chapters of the manual are applicable to both companies.

Section II. QUARTERMASTER TRUCK COMPANY (TROOP) OR QUARTERMASTER TROOP TRANSPORT COMPANY, T/O & E 10-57

2. MISSION OF COMPANY. The Quartermaster Truck Company (Troop) or Quartermaster Troop Transport Company, T/O & E 10-57, provides motor vehicle transportation for cargo or for personnel. Its personnel and equipment must be ready to haul any kind of cargo, any time of day or night, to and from any place that higher authority may direct.

3. FUNCTIONS. **a. Functional organization.** (1) To carry out its mission, the company is divided into a company headquarters and three operating platoons. (See fig. 1.)

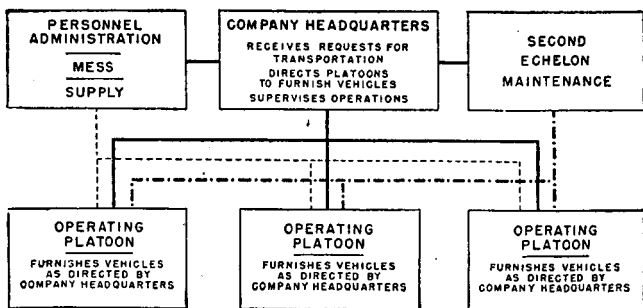


Figure 1. The functions of a quartermaster truck company are carried out by a company headquarters and three operating platoons.

Platoon operations depend upon the requests for transportation received by company headquarters. The trucks of the platoons may operate either in convoy or as individual vehicles depending upon the nature of the assignment.

(2) When 24-hour operations are required regularly, driver augmentation to permit two drivers per vehicle may be authorized. T/O & E 10-500 furnishes a guide for ratings of the additional drivers in the same proportion as for those assigned by T/O & E 10-57, as well as for the additional organizational and individual equipment which may be required.

(3) A platoon may be detached and operate independently. When smaller units of motor transport are required, they may be organized according to T/O & E 10-500.

b. Employment. The function of transporting men or supplies is performed in as many different ways as there are active tactical areas. Because of the widely varying demands for motor transportation, truck companies may be employed as separate companies or may be formed into battalions for more efficient utilization. (See par. 4.) Normally the company operates as a motor pool (or part of it) for the headquarters to which it is assigned or attached according to the standing operating procedure of the headquarters. When operating as a motor pool, the company dispatches its vehicles to perform various types of hauling jobs according to the requisitions received. (See par. 16.) The vehicles may be employed in any type of hauling that higher authority may direct. Supplies may be hauled from shore to dump, from dump or depot to truckhead, from railhead to supply points, within a storage area, over established motor transport routes, or between any two points directed. In transporting troops, quartermaster truck companies may be employed to motorize a division, haul labor details, evacuate prisoners of war, carry up replacements, or to expedite troop movements whenever the situation demands.

4. ASSIGNMENT. a. General. Quartermaster truck companies are assigned to headquarters of:

- (1) theaters of operations
- (2) communications zones
- (3) armies
- (4) separate corps
- (5) task forces

on the basis of motor transport required. Headquarters to which companies are assigned may attach them to any of their lower headquarters as the situation may require. The policy of assigning companies to higher headquarters and attaching them as needed to lower echelons has the effect of forming a massive motor pool in each theater which is broken into smaller operating units. This results in a flexible organization that can readily be adjusted to changes in the tactical situation.

b. Assignment as a separate company. The company may be attached to an installation or organization such as a port, division, or task force as motor transport to supplement the organic transport of the installation or organization. When the company is so attached, the company commander normally receives his instructions and operates according to standing operating procedure set up by the installation or organization.

c. Assignment as part of a motor transport organization. Truck companies may be organized into larger groups for more efficient utilization of vehicles. The following organizations are the more common:

(1) *The quartermaster battalion, mobile (troop transport)*, is formed by attaching from two to six truck companies to a headquarters detachment (T/O & E 10-56) for administration and control. A battalion consisting of six companies may be attached to an infantry division; its vehicles, together

with the organic transport of the division, will completely motorize the division.

(2) *The quartermaster battalion, mobile (truck)*, is composed of a headquarters detachment (T/O & E 10-56) and from two to six attached truck companies. This designation is used when the battalion is used for general transportation and supply movement. The company is the basic unit and the battalion headquarters is formed for purposes of administration and control. The number of truck companies varies with the requirements of the local situation.

(3) *The quartermaster battalion* is composed of a headquarters and headquarters detachment (T/O & E 10-536) and from three to six quartermaster companies. The companies may be all of one type or a combination of different types, such as salvage repair, bakery, laundry, truck, etc. A quartermaster battalion is organized to supervise and coordinate administration, training, operation and supply of a number of quartermaster companies or remount troops.

(4) *The quartermaster group* is composed of a headquarters and headquarters detachment (T/O & E 10-22) and two or more battalions. The group is formed to provide a command agency for planning, supervising and coordinating the operation, training, administration and supply of quartermaster units attached or assigned to the group.

d. Assignment by Tables of Organization. Several tables of organization call for quartermaster truck companies to be assigned or attached as part of larger organizations. The more common of these are:

(1) Headquarters and Headquarters Company, Quartermaster Base Depot, T/O & E 10-520-1.

(2) Quartermaster Depot Company, Supply, T/O & E 10-227.

(3) Quartermaster Squadron, T/O & E 10-115.

(4) Quartermaster Headquarters and Headquarters Company, Engineer Special Brigade, T/O & E 10-276S.

5. ORGANIZATION AND EQUIPMENT. a. Organization. The quartermaster truck company (troop), T/O & E 10-57, consists of a company headquarters and three platoons of two sections each. (See fig. 2.) Each of these components is organized as follows:

(1) *Company headquarters* performs the following functions:

(a) *Command.* The function of command is embodied in the company commander.

(b) *Administration.* The first sergeant and the company clerk perform the administrative details concerning the company personnel.

(c) *Mess.* The mess sergeant and the cooks under him operate the company mess.

(d) *Supply.* The supply sergeant is responsible for supply of individual and organizational equipment.

(e) *Maintenance.* The motor officer, motor sergeant, and the company mechanics perform second echelon maintenance,

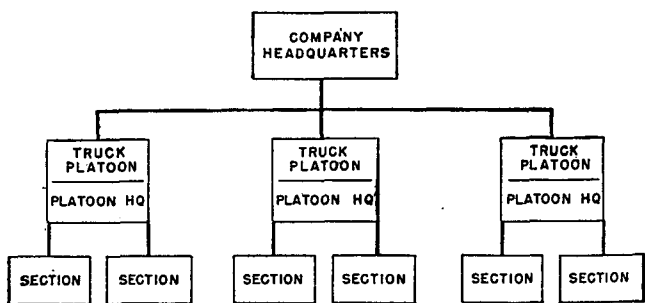


Figure 2. The quartermaster truck company is composed of a company headquarters and three truck platoons of two sections each.

supervise first echelon maintenance, and supply spare parts and motor supplies.

(2) *Platoons.* Each of the operating platoons is composed of a platoon headquarters and two sections. In the platoon headquarters the platoon leader and platoon sergeant direct and supervise the operation of the platoon. Each section is headed by a section leader who directs and supervises the operations of the section. The section operates as two squads, each headed by a squad leader.

b. Equipment. The individual and organizational equipment of the quartermaster truck company (troop) is prescribed by section II, T/O & E 10-57.

Section III. QUARTERMASTER TRUCK COMPANY, HEAVY, T/O & E 10-37

6. MISSION OF COMPANY. a. The quartermaster truck company, heavy, T/O & E 10-37, when equipped with 10-ton semitrailers, provides transportation for general cargo under conditions which would render the use of lighter equipment uneconomical.

b. When equipped with gasoline semitrailers, the company is designated as quartermaster truck company (petroleum), T/O & E 10-37. When so equipped, the company provides bulk transportation for petroleum products.

c. The quartermaster truck company, heavy, T/O & E 10-37, provides motor vehicle transportation according to its equipment under the same and similar conditions as stated in paragraph 2 above (except so far as it applies to personnel) for the quartermaster truck company (troop), T/O & E 10-57.

7. FUNCTIONS. a. The quartermaster truck company, heavy, is divided into a company headquarters and three operating platoons. (See fig. 1.) Its functions are essentially the same as those of the quartermaster truck company (troop), T/O & E 10-57. (See par. 3.) However, the heavy truck company is employed when road conditions, distances involved, absence from threat of immediate enemy attack, and unavailability of rail or water transport make its use more economical.

b. When vehicles are used continuously in convoy or under other maximum operating conditions, driver augmentation to permit two drivers per vehicle may be authorized. T/O & E 10-500 furnishes a guide for ratings of the additional drivers in the same proportion as for those assigned by T/O & E 10-37, as well as for the additional individual and organizational equipment which may be required.

8. ASSIGNMENT. Quartermaster truck companies, heavy, are assigned to headquarters of:

- a. Theaters of operations
- b. Communications zones
- c. Armies
- d. Separate corps
- e. Task forces

in the same manner as quartermaster truck companies (troop). The headquarters then attach the companies to lower headquarters as the situation requires. Each company may operate separately, or several companies may be attached to a headquarters detachment (T/O & E 10-56) to form a quartermaster battalion, mobile (truck), as described in paragraph 4c(2).

9. ORGANIZATION AND EQUIPMENT. a. **Personnel.** The quartermaster truck company, heavy, consists

of a company headquarters and three platoons of two sections each. The company headquarters functions as described in paragraph 5a(1). The platoon organization is described in paragraph 5a(2).

b. Equipment. (1) The individual and organizational equipment of the company is prescribed in section II, T/O & E 10-37.

(2) The quartermaster truck company, heavy, is furnished either stake and platform tractor-trailer units for transporting general cargo, or gasoline tractor-trailer units for transporting bulk petroleum products. When conditions permit, dollies and additional stake and platform semitrailers may be provided to permit dual trailer operations. This heavy equipment gives the company a capacity about three times that of the quartermaster truck company (troop) while requiring only a few more men.

CHAPTER 2

PERSONNEL

10. COMMISSIONED OFFICERS. a. **General.** All officers of the company must be thoroughly familiar with the operation, maintenance, and employment of vehicles, as well as with convoy operations, accident investigation procedure, security measures, field sanitation, and truck company operation.

b. *The company commander* is both the administrator of the company and the director of its operation. He is responsible for the training of the company, for its efficient administration, and for maintaining discipline. The administrative duties of the company commander are given in AR 245-5 and TM 12-250. As director of the motor transport operations of the company, his duties include:

(1) Instructing and supervising company personnel in truck and convoy operation, maintenance of vehicles, and methods of loading.

(2) Preparing schedules for operation.

(3) Supervising and assigning driving and maintenance duties.

(4) Supervising the dispatching of vehicles.

(5) Coordinating operational and maintenance phases of company activities.

c. *The motor officer* is responsible to the company commander for the efficient operation of the automotive equip-

ment of the company. He assists and advises the company commander in the assignment of proper personnel to the various operating units and in the conduct of the various phases of technical training. The duties of the motor officer may be summarized as follows:

(1) Supervising the second echelon maintenance and repair.

(2) Supervising the basic and advanced instruction of vehicle drivers and the basic, technical, and tactical training of motor maintenance personnel.

(3) Assigning repair tasks and supervising the performance of the company mechanics through the motor sergeant.

(4) Making inspections to determine repair or replacement requirements and the adequacy of repairs accomplished.

(5) Keeping informed about the location and availability of third echelon shops and motor parts supply operated by higher echelons.

(6) Maintaining stock records of motor supplies and spare parts and requisitioning these items as required.

(7) Recommending to the company commander the location of the maintenance point in the field.

(8) Making recommendations for improvements of motor maintenance and transport operations.

d. Platoon leaders. (1) The three platoon leaders of a quartermaster truck company have the responsibilities for the training and discipline that devolve upon platoon leaders in any military organization. In addition, the platoon leader is a truck officer who commands a truck unit and is responsible for hauling cargo and personnel by motor transport. Thus he is responsible for the proper training and operation of his platoon, including both the technical and the tactical phases. Following the general instructions and training schedules of the company commander, he instructs and supervises the platoon personnel in truck and convoy operations,

in first echelon maintenance, in methods of loading, and in cargo distribution. He is responsible for making certain that the instructions of the company commander are carried out by the members of his platoon.

(2) Platoon leaders should train their platoons with a dual purpose in mind. First, they are responsible to the company commander for the development and training of the platoon personnel as part of the company team. Secondly, they must make the unit self-reliant since the platoon may be detached from the company and operate as a separate unit. In such a situation the platoon leader would function as commander of an independent detachment and might be responsible for the administration, transportation, supply, and security of the unit. Platoon leaders should be encouraged to act on their own initiative in order to be prepared to operate either as a separate detachment or as part of the company.

(3) When the company operates as a unit, platoon leaders are available for additional duties which may be assigned by the company commander. Such duties include assignments as mess officer, supply officer, gas officer, security officer, company censor, and such others as the situation demands. In delegating this authority, the company commander retains responsibility for the proper performance of these duties. However, he must free himself of some of these duties in order to have adequate time to supervise and direct the company's operations. Truck company officers are often called upon to perform such duties as convoy officers, motor pool supervisors, and accident investigation officers.

11. ENLISTED PERSONNEL. a. *The first sergeant* is the senior noncommissioned officer of the company. He is the noncommissioned administrative assistant to the company commander. His duties are explained fully in TM 12-250 and TM 12-255. In the quartermaster truck company

(troop), T/O & E 10-57, he is the truckmaster in addition to his duties as first sergeant.

b. *The truckmaster* is the noncommissioned operations assistant of the company commander. He acts as the direct supervisor of motor transport operations, assisting the company commander in their coordination and control. He should be an experienced truckman capable of instructing drivers in operating, lubricating, and cleaning vehicles and in map reading, first echelon maintenance, and other essential details incident to proper operation of Army motor vehicles. He must be thoroughly familiar with civil laws and military regulations pertaining to the operation of motor vehicles and motor convoys. When the company operates as a unit, his duties are:

- (1) Supervising the motor vehicle park.
- (2) Assisting, when required, in making inspections.
- (3) Supervising and checking vehicle operation.
- (4) Reporting evidence of neglect, abuse, or carelessness to his superior officers.
- (5) Keeping, or supervising the keeping of, records concerning motor vehicle operation, fuel and oil used, and supplies (in coordination with the motor sergeant).
- (6) Supervising the proper dispatching and routing of company vehicles.
- (7) Supervising the organization of the company vehicles in convoy operation. (See par. 13c.)

c. *The motor sergeant* is the chief mechanic of the company and the noncommissioned assistant to the motor officer. He is responsible for control and coordination of the maintenance crew. He is responsible to the motor officer for the proper operating condition of motor vehicles. He must be familiar with TM 37-2810, TM 31-200, appropriate vehicle Technical Manuals, applicable Technical Bulletins, Modification Work Orders, and Lubrication Orders. He must know

Army vehicle operation, maintenance, inspection, and repair. He must organize the second echelon shop and operate it in accordance with good shop procedure. In general, his duties are:

(1) Organizing, assigning, and supervising the work of the mechanics.

(2) Determining the priority of work.

(3) Diagnosing mechanical failure, and, when necessary, giving mechanics instruction as to proper corrective action.

(4) Checking mechanics' adjustments and repairs.

(5) Enforcing scheduled maintenance.

(6) Supervising the ordering and issuing of motor supplies and coordinating the technical phases of motor supply with motor maintenance activities.

(7) Supervising the lubrication of motor vehicles.

(8) Supervising the starting of vehicle engines (particularly at motor call) to insure prompt starting and proper warming up.

(9) Supervising the recovery and evacuation of stalled or disabled vehicles.

(10) Establishing the company maintenance point in the field, and notifying all concerned of its location.

(11) Making prescribed records and reports on scheduled preventive maintenance, and on servicing and repair work satisfactorily completed.

(12) Riding in convoy operations, usually at the tail of the column as part of the maintenance group, and observing vehicle operation on the march, making corrections when necessary and checking, or requiring mechanics to check, all vehicles during any march halt and upon completion of the day's run.

d. Mess sergeant. (1) The mess sergeant is in immediate charge of the company mess, functioning as the non-commissioned assistant to the mess officer. He is charged

with the supervision and control of the activities of mess personnel. He must have sufficient knowledge of dietetics to maintain a balanced menu, and must be able to direct the preparation of palatable meals under unfavorable field conditions. His duties are discussed in detail in TM 12-250 and TM 10-205.

(2) The mess sergeant must coordinate the mess with the company operations. In addition to the regular meals, food must be provided for drivers who are on duty at mealtime. When vehicles are operating at night, box lunches or special type rations must be issued. If vehicles are operating over an established route, the mess may be divided into two sections with one serving meals at the bivouac and the other serving at the loading point or a servicing point along the route. Under these conditions, additional mess equipment, such as pumps and tools for the fire unit, may be necessary. The mess sergeant must work in close cooperation with the first sergeant so that he will know how many meals to prepare and when and where to serve them.

e. *The supply sergeant* is the noncommissioned assistant to the company commander or the company supply officer. He is in direct charge of the supply of organizational and individual equipment and expendable supplies for the company. He performs the normal duties of a supply sergeant as outlined in TM 12-250, and according to procedures prescribed by TM 38-403 and related War Department publications. In the field, he must plan his work so as to be able to contact personnel when they are in the bivouac area. The collection of salvage and the issue of clothing and equipment must be coordinated with the company operations.

f. **Platoon sergeant.** (1) The platoon sergeant is the noncommissioned assistant to the platoon leader. He helps in training the platoon and supervises both its tactical and

technical operations. Through the section leaders and squad leaders under him he directs the drivers of the platoon in truck and convoy operations, first echelon maintenance, loading of vehicles, and security measures.

(2) To perform his duties and to supervise the jobs of the men under him, the platoon sergeant must know the following publications:

(a) FM 25-10, Motor Transport.

(b) TM 21-300, Driver Selection, Training, and Supervision, Wheeled Vehicles.

(c) TM 21-305, Driver's Manual.

(d) TM 31-200, Maintenance and Care of Pneumatic Tires and Rubber Treads.

(e) TM 37-2810, Motor Vehicle Inspections and Preventive Maintenance Services.

(f) Vehicle Technical Manuals.

(3) When the platoon is operating independently, the platoon sergeant assumes the duties of truckmaster and, usually, those of motor sergeant. During the training period he should learn these jobs in order to be able to operate a separate platoon efficiently. He should also be familiar with dispatching and with administrative procedure.

g. Section leaders and squad leaders. Under the direction of the platoon leader and platoon sergeant, each section leader and squad leader is directly responsible for the discipline, training, and operation of the drivers assigned to his section and squad. The duties of section and squad leaders in convoy operations are discussed in paragraph 13. Each one should be familiar with the publications listed in *f* above and should be ready to assume the duties of the platoon sergeant at any time. Section and squad leaders are charged with continuous supervision of their drivers to insure efficiency of operation under all circumstances.

h. *The company clerk* performs his duties as prescribed in TM 12-250.

i. *The dispatcher* schedules trips for all motor vehicles available for duty. His duties are as follows:

(1) Receiving and filling requests from authorized persons for use of motor vehicles.

(2) Checking the time of departure and return of each vehicle.

(3) Issuing trip tickets and collecting them on completion of each trip, checking to see that they are properly signed by the person for whom the transportation was authorized.

(4) Maintaining records of speedometer readings, gasoline and oil consumption, and such other records as may be required.

j. Mechanics. (1) Under the supervision of the motor sergeant, the company mechanics perform organizational maintenance and repairs on the vehicles of the company. They perform the monthly and semiannual services of the company vehicles in accordance with TM 37-2810 and the vehicle Technical Manuals. They also make repairs and replace parts and unit assemblies within their capabilities.

(2) Mechanics should become familiar with the duties of the motor sergeant so that one of them could take over his duties should the motor sergeant become a casualty.

k. *The cooks*, under the mess sergeant, prepare the food for the company. Their duties are discussed in detail in TM 10-205. Information in TM 10-400, TM 10-701, TM 10-405, TM 10-406, TM 10-407, TM 10-408, TM 10-411, and TM 10-412 is essential in the performance of their duties. When the truck company is operating 24 hours a day, cooks must provide meals for both shifts of drivers as well as box lunches or meals to be delivered to the loading area. They must be capable of cooking palatable food, under unfavorable field conditions, using the field range.

1. Drivers. (1) Well-trained and responsible drivers are the backbone of an efficient truck company. They must know their vehicles, first echelon maintenance, convoy operation, and loading. The driver is responsible for the operation of his vehicle and for the safe and prompt delivery of his loads. He must *know* TM 21-305 and the Technical Manual pertaining to his vehicle. The duties of the drivers in convoy operations are discussed in paragraph 13.

(2) Drivers should learn the duties of the squad leaders and, when possible, those of the mechanics. Wherever practicable, suitably qualified mechanics and drivers should exchange jobs as a part of their training. By this method the drivers learn the duties of the mechanics and the mechanics improve their skill as drivers. In the event that men of either group become casualties, the company is able to continue to operate efficiently.

m. Armorer-artificer. The armorer (T/O & E 10-57) or artificer (T/O & E 10-37) is the "handy man" of the company. In addition to maintaining, servicing, and making minor repairs on the small arms of the company, he does carpentry, painting, and similar repair work. In the field the artificer constructs tables, showers, work racks, and other field expedients to improve the bivouac or billet area. When the truck company expects to be in one location for several weeks, field installations constructed by the artificer contribute greatly to the health and comfort of the men.

12. TRAINING. a. Responsibility. The Commanding General, Army Ground Forces, is charged with the responsibility of organizing, activating, equipping, and training the quartermaster truck company (troop) or quartermaster troop transport company, T/O & E 10-57. The unit training is prescribed by MTP 10-4, Headquarters, Army Ground

Forces, which is supplied to the unit upon activation. The actual training is the responsibility of the company commander. He prepares the training schedules based on MTP 10-4 and sees that the training is conducted as prescribed. The quartermaster truck company, heavy, T/O & E 10-37, is trained under a similar program.

b. Function of enlisted cadre during training. Two basic qualifications for cadremen are a knowledge of their specialty and the ability to teach it. While all phases of the training of a quartermaster truck company will be personally directed and supervised by an officer, the cadre will usually have direct contact with the trainees except during lectures or conferences conducted by the commissioned officers. Therefore, it is necessary that the company officers and the enlisted cadre work together closely as supervisors and teachers. To accomplish this, a cadre school is organized as soon as the unit is activated, preferably before the trainees arrive. Here the cadremen are reviewed in their specialty and are trained in the methods of military instruction outlined in FM 21-5 and TM 21-250. As soon as the platoon sergeants and squad leaders are selected, they also attend the school. Here the company commander is able to set up definite chains of responsibility for job supervision. The school continues throughout the training period, although classes may not meet as often after formal basic and technical training are completed.

c. Teaching methods. All officers and noncommissioned officers who teach or train personnel should be thoroughly familiar with the Army method of teaching, and with the manuals, charts, graphs, training films, and other instructional aids which are available through supply channels. All text references given in the mobilization training program should be gathered into a company reference library so that they are available to all personnel. The following publica-

tions are particularly useful in planning training schedules and in preparing for each day's training:

(1) FM 21-5, Military Training.

(2) FM 21-6, List and Index of War Department Publications.

(3) FM 21-7, List of War Department Films, Film Strips, and Recognition Film Guides.

(4) FM 21-8, Military Training Aids.

(5) TM 21-250, Army Instruction.

(6) TM 21-300, Driver Selection, Training and Supervision, Wheeled Vehicles.

(7) AR 1-5, Index to Army Regulations.

d. Developing the skill of personnel. Because of the wide variety of possible assignments, training of a quartermaster truck company must be comprehensive and continuous. A theater of operations is no place to teach a man to drive. There is little time for it and the work loads are often too heavy. The training period in the United States must be utilized to the fullest so that every member is trained to his highest capabilities before the unit moves to a port of embarkation. Squad leaders and section leaders, as well as men of the first three grades, must be thoroughly trained in their duties. Their responsibility as job supervisors who see that the work gets done must be made real and developed. In operations where personnel and vehicles are separated from the company in carrying out their mission, dependable noncommissioned officers are necessary.

e. Hints for particular emphasis. Experience in theaters of operations has proved that the following subjects must be stressed incessantly if the company is to operate efficiently overseas:

(1) *First echelon maintenance.* Every driver must *know* his vehicle and must perform the maintenance prescribed by the Technical Manual for the vehicle.

(2) *Trouble shooting.* Vehicles do break down and drivers who are dispatched individually must know what to do to bring the vehicle in.

(3) *Driver discipline.* The responsibility of the driver for his load must be emphasized and made real. Proper handling, loading, protection against theft, and protection against weather are the responsibility of the driver. Drivers operating individually must also be impressed with their responsibility to deliver their loads without delay and to return promptly to the place specified.

(4) *Bivouac development.* Truck companies assigned to communications zones or army service areas may bivouac in the same location for several weeks or months. In such a situation the value of improving the semipermanent camp site by good camp engineering cannot be overstressed. It is one of the most important factors contributing to the comfort, morale, health, and efficiency of a truck organization in the field. Proper selection of sites, tent pitching, and operation and maintenance of field installations (showers, wash racks, box latrines, etc.), should be included in the training. The artificer-armorer particularly should know how to improvise field installations to develop the camp site.

(5) *Field sanitation and personal hygiene.* During the training period, field sanitation and personal hygiene must be stressed until it becomes second nature with the men. In tropical and semitropical areas and in semipermanent bivouacs in any climate, the health and comfort of the men depend to a large degree upon how well the company is trained in these subjects.

(6) *Security.* In areas subject to enemy observation and attack, proper security measures must be taken both in bivouac and on the road. The principles and techniques outlined in paragraphs 13 and 21 must be thoroughly taught.

(7) *Separate platoon operations.* Platoons should be trained to operate as self-sustaining units. In some situations a platoon may be detached from the company and operate independently for long periods of time.

(8) *Convoy operations.* Many truck companies operate generally as convoys or parts of convoys. Officers, truck-masters, and motor sergeants must be capable of convoy control. Drivers and other company personnel must be thoroughly trained in convoy operations.

(9) *Interchangeability of personnel.* Every man in the company should know his own job and at least one other man's. By this method the company or separate platoon can continue to operate effectively in spite of losses in personnel.

(10) *Motor discipline drills* during lulls in active operations, as well as in the training period, are important aids in maintaining discipline and control in the unit. Drill periods should be short but well organized. Preciseness in carrying out such drills must be insisted upon or the drill loses its value.

CHAPTER 3

OPERATIONS

13. CONVOY. a. General. A convoy consists of two or more vehicles temporarily operating as a unified and controlled element. The motor convoy is commonly employed by quartermaster truck companies to transport troops and cargo and to move the company to a new bivouac.

b. Reconnaissance. Advance planning is essential to insure the success of any convoy mission. Prior to movement, the truck company commander must know the condition of roads, traffic, terrain, road obstacles, capacity of bridges to support the weight of traffic, the possibility of contact with the enemy, and other factors affecting the march. Information not already obtained through prior operations nor furnished by higher headquarters must be secured from maps and through personal reconnaissance.

(1) *Map reconnaissance.* The location of roads and towns and the determination of distances and the nature of terrain can readily be obtained from the study of maps and, when available, recent aerial photographs. Every truck company officer and noncommissioned officer should have a thorough knowledge of map reading.

(2) *Field reconnaissance.* Such factors as the condition of roads, washed-out bridges, low underpasses, hazardous curves, road blocks, and effects of recent enemy action cannot be determined by maps. Personal reconnaissance by the

commanding officer or a reconnaissance party designated by him is usually necessary. This is especially true when operating over unknown routes or in the combat zone. The reconnaissance party must note anything that might interfere with the progress and safety of the convoy. If repair work is necessary to make the route passable, the company commander should call on engineer troops. Lacking these, the work must be done by convoy personnel.

(3) *Selection of bivouac.* When the truck convoy requires a new bivouac area, the reconnaissance party, or a separate quartering party in the case of a large convoy, will select a site, subject to the approval of the company commander. A sketch or overlay of the area, showing terrain features and the location of units should be prepared to assist the company commander in planning the defense of the area. (See par. 21.) Upon arrival of the column, the advance party, assisted by section and squad leaders, will assign trucks and personnel to specific locations.

c. *The organization* and selection of personnel of a convoy depends on such factors as number of vehicles, traffic conditions, and the tactical situation under which they will operate. Whether the convoy is composed of 4 vehicles or 40, the following elements are essential: control (head), main body, and maintenance (trail). (See fig. 3.)

(1) *Control* of the convoy is vested in the convoy commander who is responsible for the planning and operations of the convoy. When the entire company operates as a convoy, the company commander will usually be convoy commander. When a platoon, section, or smaller group of vehicles of the company makes up the convoy, the company commander will designate an officer or noncommissioned officer to take charge. In large convoy movements, an escort officer may be designated to keep the column on the correct road, to follow the timetables, and to post necessary traffic

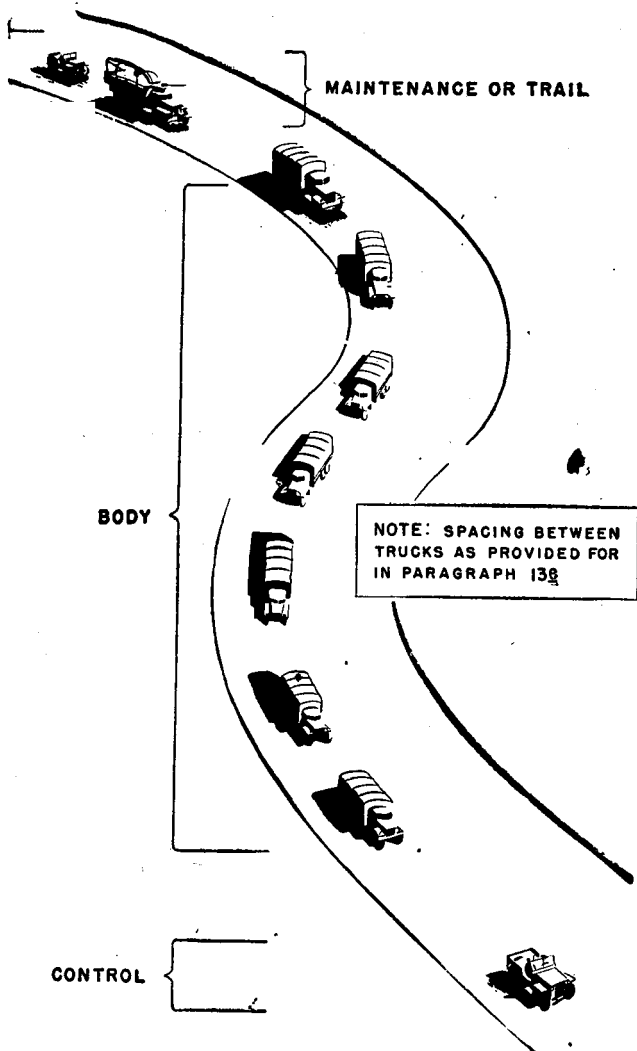


Figure 3. A typical convoy has three elements: control, body, and maintenance.

guards, thus enabling the convoy commander to supervise convoy personnel and to conduct route reconnaissance. A ranking noncommissioned officer is usually designated to form the convoy and to ride in the first truck in order to set the pace.

(2) *Main body.* To facilitate control of a large convoy, the main element may be divided into smaller groups or serials, each serial under the supervision of an officer or noncommissioned officer. Serials may be further divided into smaller march units, with section and squad leaders over each unit to supervise the operation and maintenance of each vehicle. Section and squad leaders will be responsible for checking on the observance of safety regulations, supervising proper loading of vehicles, regulating the distance between vehicles in accordance with instructions, supervising preventive maintenance, and reporting vehicle failure to the maintenance officer. Drivers and assistant drivers, working under the supervision of their section and squad leaders, are responsible for safe driving and for the proper maintenance of their vehicles according to instructions set forth in TM 21-305.

(3) *Maintenance* personnel, under the supervision of the motor officer or noncommissioned officer, will ride at the rear of the column where they will be able to check on any disabled truck. The trail officer or noncommissioned officer must decide whether the disabled vehicle is to be repaired, abandoned, or taken in tow. He will also check on infractions of march discipline, and will post rear guards. The number of mechanics and the amount of maintenance equipment taken on the convoy will be determined by the number and condition of vehicles in the column and by the condition of roads. Mechanics will make necessary repairs en route, perform scheduled preventive maintenance, and assist section chiefs and squad leaders, on request, in making inspections and adjustments and in servicing vehicles.

d. Security. (1) *Plan.* Where security is not provided by higher headquarters, it is the responsibility of the convoy commander to prepare in advance of the movement a plan for the protection and defense of his convoy. Whenever possible, the plan should be based on information gained through personal reconnaissance. This information should include indications of enemy troops, demolitions, mined and gassed areas, possible points of ambush, and areas favorable to mechanized attack. The security plan will vary with the tactical situation and with the standing operating procedure established by higher headquarters. It is essential that the security plan embrace such factors as the type of march column necessary for maximum protection (*e.* below), warning sentinels, night discipline, placement of weapons, and procedure in case of air, mechanized, or ground attack. The action to be taken in case of an attack should be thoroughly understood before the actual movement begins.

(2) *Route reconnaissance.* In addition to the advance reconnaissance, a continuous route reconnaissance must be provided by advance, rear, and flank guards. The size and the nature of the guard to be posted by the convoy commander depend primarily upon the probability of hostile attack. The chief duties of these guards are to clear traffic and to check on road conditions. It may become necessary for guards to close with the enemy in order to enable the convoy to get through; however, combat will be avoided, for the mission of the convoy is to deliver the goods, not to engage the enemy. Guards must keep the convoy commander constantly informed of the situation in their sectors. It is important that all elements detached from the column for temporary guard duty rejoin the rear of the column without delay. The following elements provide continuous route reconnaissance:

(a) *The advance guard* will protect the convoy from the front. The advance guard will precede the first element of the convoy and will make contact with friendly troops to provide free passage through the lines. It will observe the condition of the road over which the convoy will travel and will be on the alert for mined areas and any indication of the enemy. In combat areas the advance guard must be prepared to deal with snipers, to drive off small enemy forces, and to delay stronger forces until reinforcements arrive or until the convoy can be rerouted.

(b) *The rear guard* will protect the column from hostile forces that may overtake it from the rear. On contact with the enemy, its chief duty is to warn the convoy commander and to execute demolitions which will delay the enemy and enable the column to get away.

(c) *The flank guard* must occupy key points along the flanks of the column (road junctions, lookout points, possible ambush areas, tank approaches, etc.) in order to ward off the enemy. To regulate their movement, flank guards must be thoroughly familiar with the route and time schedule of the convoy. It will sometimes be necessary for flank guards to move out far in advance so as to operate cross country and take up a position in time to cover the main element.

(3) *Type of march.* Open column is generally used in the combat zone because it provides the best passive defense against air attack and artillery fire. When air attack is likely, distance between vehicles is lengthened to at least 200 to 300 yards. Such dispersion prevents destruction of more than one vehicle by a single bomb and offers a poor target for strafing planes. Tactical conditions, however, may require bumper-to-bumper driving.

(4) *Warning sentinels.* When there is a probability of air or mechanized attack, each vehicle in the convoy keeps a

man on constant lookout. Without radio communication, very little advance warning is possible concerning strafing planes which are perhaps the greatest menace to a column of trucks. Prearranged signals, such as three blasts of the horn or three rifle shots, will be established to indicate the danger of attack. Every convoy should also have a gas sentinel, trained in the detection of enemy gases. Convoy personnel will be acquainted with the standing operating procedure in event of gas attack.

(5) *Night discipline.* (See *h* below.)

(6) *Defense against air attack.* In event of a bombing or strafing attack, all drivers at first warning seek cover for their vehicles under any available trees. One method is to have odd-numbered trucks taken to one side of the road and even-numbered to the other. All personnel, except machine gunners, take cover at least 50 yards from the convoy. Each man carries his individual weapon with him. If time permits, the driver will remove the fire extinguisher from his truck and take it with him to fight possible fires resulting from the raid. Small arms, as well as machine guns, may be used against planes if higher headquarters so directs. Machine guns, usually available in the ratio of one to every four vehicles, are spaced throughout the convoy so that attacking planes are subject to a field of fire the entire length of the column. A successful defense plan is to have the first gun in the convoy pointed to the front, the second to the rear, and all of the others in alternate directions. Such a screen of fire will keep away all but the most determined strafing planes. During an air raid, when it appears that enemy planes are more intent on destroying nearby installations than in attacking the convoy, it may be better for the convoy to keep going at increased speed, with the assistant drivers manning the machine guns. This decision rests with the convoy commander.

(7) *Defense against mechanized attack.* If the main body of the convoy is attacked by armored vehicles, the attack is dealt with in one of two ways. If the tanks attack from such a position that a route is left open, the convoy proceeds on its course at the fastest possible speed in hope of outdistancing the tanks. All but the driver employ organic weapons against the tanks. If the tank attack takes the form of an ambush which cuts off the route of the convoy, defensive action is somewhat similar to that employed against aircraft. All vehicles are brought to a halt and all men with weapons seek cover which will afford them protection from tanks—steep, rocky hillsides, clumps of heavy trees, rocky creek beds, or ditches with steep sides. Small arms are relatively ineffective against tanks except to cause them to “button up.” At close range, grenade launchers, rocket launchers, and Molotov cocktails are most effective against tanks. When the convoy is attacked, a predesignated “get-away” vehicle will head for the nearest command post to summon reinforcements which will relieve the convoy and enable it to resume its march.

(8) *Defense against ground attack.* Enemy riflemen or machine gunners may elude the advance or flank guards and attack the main body of the convoy, particularly when the convoy is halted by a road block. Previously designated personnel, trained for the task, must set to work removing the obstacles while others give these personnel protection and return the fire of the attackers. When troops are being transported by the convoy, the commander of troops takes charge of the fire fight. If time does not permit the removal of obstacles, cross country operations may become necessary. Care must be taken, however, not to run into a mine field when bypassing a road obstacle.

(9) *Defense against artillery fire.* When artillery shells are falling in the area of the truck convoy, the best passive defense is increased speed and irregular spacing of trucks.



NOTE: NORMAL 100 TO 200 YARDS
DISTANCE BETWEEN VEHICLES
HAS BEEN REDUCED BECAUSE
OF SPACE LIMITATIONS OF
ILLUSTRATION.

Figure 4. When attacked by hostile aircraft each driver will act according to a prearranged plan. The above plan provides dispersion, concealment, and effective cross-fire.

e. Types of marches. The time factor and the varying conditions under which a convoy must operate, such as secrecy and threat of attack, will determine which of the following types of convoy marches is to be used:

(1) *Infiltration* is a type of movement in which vehicles are dispatched individually or in small groups at irregular intervals with a fixed density, such as three, four, five, and six vehicles a mile, so as to enter the normal flow of traffic. By using more than one route and by mingling with other traffic, this type of march provides a maximum of secrecy, deception, and dispersion as passive protection against enemy observation and attack. It is well suited for daylight marches in the combat zone. Because of the maneuverability of individual trucks, the rate of march is high. However, the column is so extended that the total convoy time may be greater than for any other type of march. Control of the column is extremely difficult and careful marking of the route is essential. In island operations the distances are normally so short and the route so congested that infiltration is the only form of convoy practicable. Where infiltration is used extensively it is common practice to have road patrols operate to aid vehicles broken down on the road and to prevent unauthorized stops and trips. Infiltration requires skilled and reliable drivers who are able to operate efficiently with a minimum of supervision.

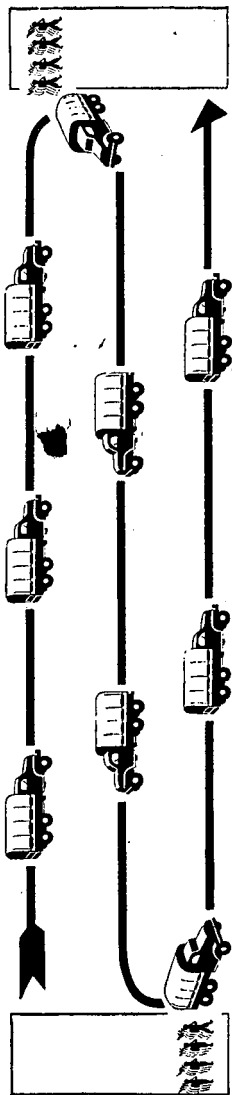
(2) *Close column* moves the largest amount of traffic in the shortest time. The vehicles are closed up to safe driving distances from each other, usually between 10 and 70 yards. (This spacing is usually figured as twice the speedometer reading in yards.) Since close column does not provide adequate dispersion, its use is limited to the communications zone or to black-out driving where vehicles must maintain close contact. Unless there is tight control of the column, vehicles are likely to jam or to arrive at the destination faster

than they can be unloaded or assigned space. Close column should never be used when open column will provide the desired traffic flow.

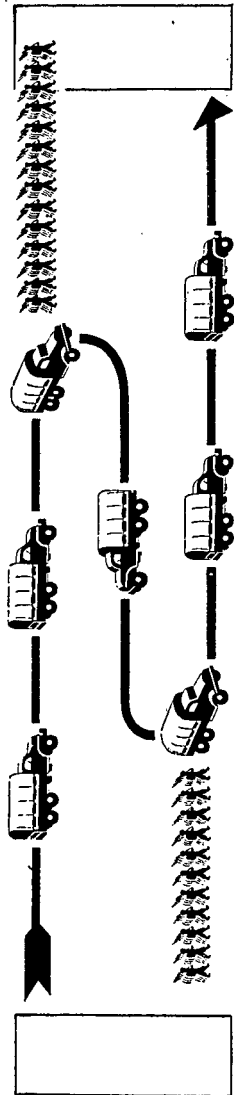
(3) *Open column* provides the best possible compromise between infiltration and close column—a shorter time length than infiltration and a wider dispersion than close column. Vehicles march in formation with a flexible spacing of from 100 to 225 yards or more apart, depending on speed of vehicle and visibility. This dispersion maintains the integrity of the marching unit yet reduces the vulnerability to air attack. Because of the greater lead, driver fatigue is less than with close column. Each driver, however, must be trained to estimate distances and maintain proper leads. Open column is used extensively in the combat zone and at night when lights are permitted.

Note. To compute data for road space and time length of column for large convoys, see FM 101-10 and FM 25-10.

f. *Shuttling* is a system of transportation employing several trips of the same vehicles to complete the movement of troops or supplies. (See fig. 5.) It is customarily used where transportation facilities are limited. There are two methods of shuttling. In the first, the vehicles transport part of the troops all the way to their destination and then return to the starting point for the remainder of the troops. This is the usual method employed to shuttle troops, and is the only shuttling method applicable to supplies. In the second method the vehicles transport part of the troops to a previously designated turn-around point, from which they proceed by foot to their destination. In the meantime, the troops left at the starting point have proceeded on foot until they are picked up by the returning vehicles. They are then transported to their final destination. This second method, although reducing the total time required for the movement,



POINT TO POINT SHUTTLING



PART RIDE PART WALK SHUTTLING

Figure 5. Shuttling is necessary when insufficient vehicles are available to transport all troops or supplies in one trip.

produces greater troop fatigue. (For a more detailed discussion of motor marches, see FM 25-10.)

g. *Proper convoy control* is essential to insure the unimpeded progress of the column, to maintain proper dispersion and security, and to enforce maintenance and safety regulations. Lack of proper control will result in delayed movement of supplies, in accidents, and in excessive casualties from enemy action.

(1) *Traffic systems.* Two systems of road control are used, the choice depending on the size of the convoy, on the traffic, and on tactical considerations.

(a) *Area control.* Under area control the headquarters responsible for traffic control in the area assigns military police to guard intersections, to escort the column, and to do patrol duty en route, in accordance with the circulation plan in effect. Area control is used chiefly in large-scale operations and where unified control over all traffic in the area is necessary. In such cases, higher headquarters will usually furnish march orders together with tables and graphs specifying route of march, control points, and time for arrival of all elements of the convoy. If the convoy is to pass through cities or towns, higher headquarters will make the necessary arrangements with civil authorities. The motor express route is one adaptation of area control sometimes used for long-distance hauling in the communications zone over an established route. This route is reserved for supply and troop convoys and may be blocked off by signs and by military police. Each truck platoon or company is assigned a sector of the highway and operates a service and maintenance station for all vehicles passing through the sector. While a vehicle is being serviced, the driver rests and is fed by the organization mess. Unless tactical considerations require such a system, it is not normally employed because it requires the driver to operate independently, and because the relaxing

of driver responsibility for preventive maintenance may result in increased mechanical failures on the vehicle.

(b) *Unit or organizational control.* Under the unit system, traffic control is handled by the traffic personnel of the convoy, supervised by the convoy commander. A control vehicle usually precedes the convoy and blocks all traffic at busy intersections. The guards remain at the intersection until the convoy passes and then proceed to the head of the column in preparation for the next intersection. Where dismounted guards or guides are posted by the control vehicle, they are picked up by the trail vehicle and returned to the head of the column, usually at the halt.

(2) *Briefing.* Prior to starting the march, the convoy commander should outline to the convoy personnel, including drivers, the mission of the convoy, route, and such details of road conditions as are available. Personnel should be supplied with strip maps (see fig. 6) when possible. This briefing will prove especially valuable should any vehicle become separated from the column.

(3) *Communications.* (a) *Signals.* Standard hand signals are used to control columns that are short enough for signals to be seen the length of the column. (For conventional hand signals, see TM 21-305.) Bugle, whistle, and horn are seldom used as signals because they may be confused with the standard emergency warning of attack which is three blasts of a bugle or horn, or three shots from a weapon. At night, prearranged headlight signals may be used to control the convoy, provided there are no black-out restrictions.

(b) *Written or verbal messages.* A $\frac{1}{4}$ -ton truck may be employed to send written or verbal message from front to rear, where road width permits. Whatever method of communication is used, only brief, simple messages should be transmitted while the column is in motion. Longer instructions may be conveyed while the column is halted.

(4) *Traffic aids.* (a) *Road maps* showing the route of travel are useful for orientation and guidance and provide a convenient form on which to record road data. Recent aerial photographs are a valuable supplement.

(b) *Strip maps.* The most common form of map used by small truck convoys is the strip map which may be produced in quantity and furnished to convoy personnel. It is a schematic picture of the route of march, giving route numbers, the location of side roads, towns, and rest points. (See fig. 6.) Strip maps are especially helpful to drivers who operate independently or when distances between vehicles are so great that individual vehicles are liable to become separated from their column.

(c) *Timetables and march graphs* are prepared for large convoy operations and accompany the march order from higher headquarters. They provide the simplest means of determining the detailed time schedule of a march. They show such data as entrucking time and hour of arrival and departure of each serial, thus enabling the command to keep the convoy moving on time and to synchronize with other traffic in the area. (See FM 25-10 and FM 101-10 for data on compiling march tables and graphs.)

(d) *Road markers.* Signs can be used effectively to guide the convoy over proper roads and to protect it from traffic conflict and road hazards. Personnel should not be posted where signs can be used with equal effectiveness. Signs placed by advance vehicles are usually picked up under the supervision of the trail officer.

(e) *Road guides and guards* are useful after dark and at confusing intersections and railroad crossings. They may serve as guards to halt cross traffic, thus enabling the convoy to pass through. For a large convoy they may be furnished by the provost marshal, or in case of a troop convoy, by the

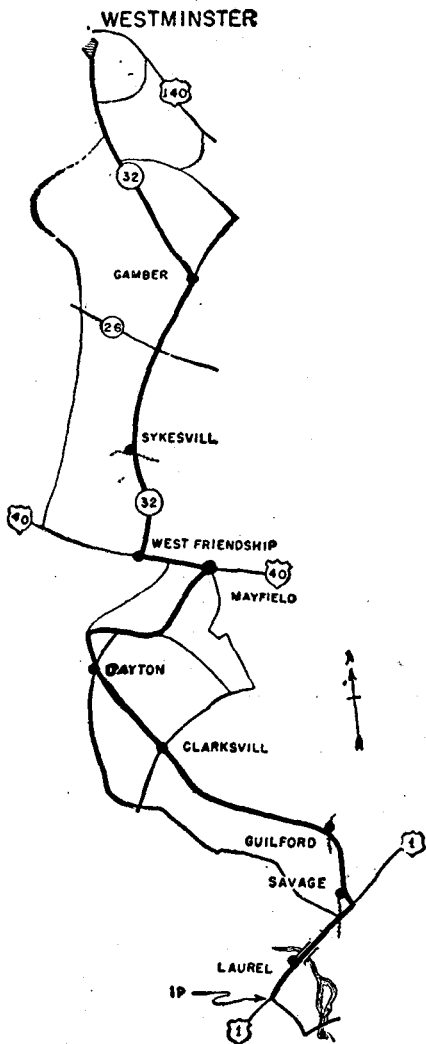


Figure 6. Strip maps are often needed by drivers operating independently and by small convoys.

commander of troops. Guards should be posted at the front and rear of a halted convoy.


(5) *Halts* should be made for scheduled preventive maintenance and for the relief of troops. It is advisable to schedule the location of halts prior to departure. Selection of halts in combat areas must take into consideration camouflage and dispersion. Instruction for making halts and posting of security is contained in FM 25-10.

h. Night operations. (1) *General.* Truck convoys must frequently move under cover of darkness to escape enemy observation and attack, to make use of a round-the-clock schedule, or in desert operations to avoid the heat of day. Daylight reconnaissance should precede night operations in the combat zone or over unknown routes.

(2) *Drivers.* Night driving requires skilled and experienced drivers and strict march discipline. Drivers must be thoroughly familiar with the instructions on night driving contained in TM 21-305. The company commander, through testing, should select only the most capable men for night driving, being careful to reject men who are affected with night blindness. He must make certain that drivers are changed as often as possible during night operation to prevent fatigue and drowsiness. A halt should be given at least every 2 hours so that drivers can get some exercise. The serving of hot coffee is helpful. When changing from regular lights to black-out lights during a march, a halt of from 15 to 20 minutes should be allowed to accustom drivers' eyes to the darkness.

14. LOADS AND LOADING. a. *Personnel.* (1) *Capacity.* Maximum troop-carrying capacity of vehicles transporting no materials other than arms and equipment of troops is as follows: truck, $\frac{1}{4}$ -ton, 3 men; truck, $\frac{3}{4}$ -ton, 8 men; truck, $2\frac{1}{2}$ -ton, 25 men. This is in addition to the

driver and assistant driver. For distances greater than 75 miles, these loads should be reduced. As a general rule, unless conditions require maximum loading, no more than 18 men are loaded in a 2½-ton truck. It is important that the soldiers arrive at their destination ready for action, not exhausted and cramped.

(2) *Loading.* Entrucking and detrucking tables are prepared for important movements. Even with small convoys, however, careful plans for loading should be made to eliminate traffic conflict, to conserve the energy of troops, and to facilitate prompt movement of the convoy. An officer or noncommissioned officer is usually stationed at the initial point to see that the convoy is properly formed and that it  out in the prescribed manner. Troops should be loaded just prior to departure. (See FM 25-10 for instructions in entrucking and detrucking.) Although the actual loading and unloading procedure is the responsibility of troop commanders and is governed by their standing operating procedure, each truck driver is responsible for the enforcement of safety regulations as prescribed in TM 21-305 in loading and unloading his truck.

(3) *Loading time.* The average time (for purpose of computation) required for loading personnel into trucks is 15 minutes; for unloading personnel, 10 minutes. Well-trained and properly organized troops can do it in much less time.

b. Cargo. (1) *Capacity.* (a) *General.* Maximum pay loads and maximum tow loads for road operations as well as for cross country operations are shown on plates on the vehicle instrument panel. These loads should not be exceeded except in emergencies and then only by special authorization, as covered by current War Department directives.

(b) *Fuel.* A 2½-ton truck will carry a maximum of 125 five-gallon drums of gasoline, except for on-highway use when 200 five-gallon drums may be authorized; a 1-ton trailer will carry a maximum of 50 five-gallon drums.

(c) *Bulk materials.* In the absence of dump trucks, truck company cargo vehicles will occasionally be called upon to haul such bulk materials as sand, gravel, earth, or garbage.

(2) *The loading of vehicles must be carefully supervised to insure that cargo space is used efficiently, that supplies are evenly distributed throughout the body of the truck, and that the load is correctly lashed down to prevent shifting. Unusually heavy items such as machinery should be placed over the rear axle to reduce strain on the chassis. Cargo should be so stowed that the load will not damage the vehicle and that the height of the load will not make d*

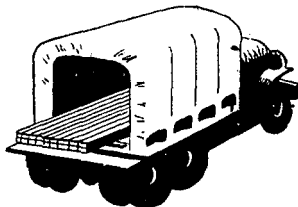
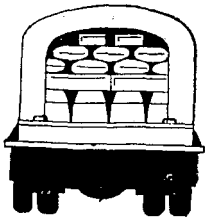
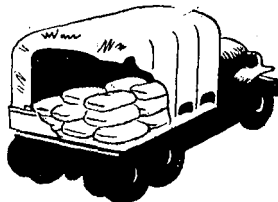
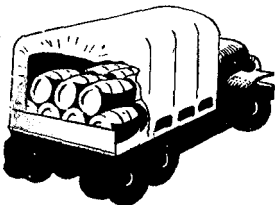


Figure 7. Properly loaded cargo is secure, evenly distributed, and not stacked too high.

difficult. (See fig. 7.) Drivers will see that their vehicles are loaded according to instructions in TM 21-305 and TF 10-1241, that all safety regulations are complied with, that cargo is protected against the weather, and that the weight does not exceed the authorized maximum.

c. Handling of explosives and inflammables. (1)

General. The movement of ammunition or gasoline in trucks is a highly dangerous task. It is, therefore, essential that personnel know and observe all safety regulations. Ammunition and gasoline should not be hauled in the same vehicle with supplies or troops. Vehicles carrying these materials should travel in the rear of the convoy. In the zone of the interior, Army vehicles carrying ammunition or toxic gases across state borders must also comply with Interstate Commerce Commission regulations governing these materials. (See AR 55-155.)

(2) *Ammunition.* These general rules for the transportation of explosives must be followed. (For detailed instructions, see TM 9-1900.)

(a) Handle with care and avoid overloading.

(b) Explosives must be securely placed in the vehicle to prevent shifting and falling. They must never be carried on the tail gate. Drivers should stop at least once each hour to check the load.

(c) Vehicles bearing explosives should be clearly labeled to warn approaching traffic, unless labeling is prohibited for security reasons.

(d) Vehicles should be driven at safe distances from other traffic and drivers should be cautioned about making sudden stops or turns.

(e) Detonating caps must not be transported in the same vehicle with other explosives. This does not apply to carrying complete rounds of artillery ammunition, including fuze

and primer, in one vehicle by combat units. Mines and grenades must not have fuzes connected while in transit.

(f) Artillery projectiles should be laid on the side instead of on the base, with sides of projectile parallel with the truck body.

(g) The engine must be turned off and smoking in or near the vehicle must be prohibited during the loading of these materials.

(3) *Gasoline and other inflammable liquids.* Because gasoline is such a common commodity, the fact that it is a powerful, dangerous explosive is sometimes overlooked. The vapor from 1 pint of gasoline will make from 62.5 to 250 cubic feet of explosive mixture. Therefore, the safety rules prescribed in AR 850-20 must be rigidly observed. The following points continuously stressed:

(a) During the loading and unloading of these materials, vehicle engines must be turned off and smoking in the area must be prohibited.

(b) Proper fire-extinguishing equipment will be carried on the trucks and will be checked regularly.

(c) Drivers must inspect gasoline cans for leaks and permit no defective cans to be loaded.

(d) Gasoline cans will be kept tightly closed, whether full or empty.

(e) Normally, tarpaulins should be removed from trucks hauling gasoline. If that is not possible, tarpaulins which have become saturated with gasoline or fumes should be carefully aired and dried before being stowed.

(4) *Chemical agents.* When transporting chemical shells, the driver should be provided with a gas mask and with a supply of protective ointment for burns.

15. SHIPMENT OF VEHICLES. a. Rail. (1) *General.*

The local rail transportation officer and railroad officials

should be consulted far enough in advance of date of shipment to insure adequate planning. The shipment of Army vehicles in the zone of the interior must conform to carriers' rules established and published by the Association of American Railroads. Useful tables for estimating space requirements for vehicles are contained in FM 101-10.

(2) *Preparation of vehicles.* Instructions for the preparation of vehicles for shipment are contained in current War Department publications.

(3) *Loading.* Vehicles may be shipped on flatcars, end-door boxcars, side-door boxcars, or drop-end gondola cars. If possible, load vehicles under their own power, using end ramps and spanning platforms. Vehicles on the car must be secured against movement lengthways and sideways and must not bounce. Detailed instructions for blocking and securing vehicles on the car are found in AR 55-155 and in the vehicle Technical Manuals. This procedure is also demonstrated in TF 10-1240.

b. Water. (1) *Preparation of vehicles.* All unboxed vehicles will be prepared for oversea shipment under the direction of the port commander, taking into consideration the safety of the ship and the mission assigned. In preparing the vehicle for loading, the factors of extended storage time, temperature changes, and the effects of sea water must be considered.

(2) *Loading* and securing the vehicle on board ship is accomplished by ship personnel, with the assistance of truck company personnel.

16. DISPATCHING. Efficient dispatching makes maximum use of carrying power of company vehicles and prevents unnecessary tying up of vehicles and drivers.

a. Dispatching point. Vehicles of a truck company are usually dispatched from a motor pool which is operated

either by the company, or by the battalion when several truck companies are operating as a unit. In the communications zone, when there is little danger of air attack, the motor pool may consist of a formal arrangement of vehicles in a motor park; in the combat zone the motor pool will consist of a centrally located dispatching point surrounded by truck units which are widely dispersed.

b. Procedure. When validated requests for transportation are received at the dispatching point, vehicles are sent out either in groups (convoy) or individually as the occasion requires. Convoys are made up according to instructions outlined in paragraph 13. The assignment of trucks and drivers and the scheduling of individual and nontactical trips are normally the responsibility of the truckmaster who is assisted by the dispatcher.

c. Record keeping. The dispatcher must keep a record concerning each trip and the availability of vehicles and drivers.

(1) On receipt of a request for transportation, the dispatcher will fill out the Daily Dispatching Record of Motor Vehicles (WD AGO Form 9-75). Considerable time and confusion can be avoided if all of the following information is secured at the time the request for transportation is received: Who is making the request? How many vehicles are needed and for what length of time? When, where, and to whom will the driver report? What kind of work is to be done? The driver should know in advance what type of hauling he is to do in order to prepare his vehicle for the particular duty.

(2) The dispatcher will prepare the Driver's Trip Ticket and PM Service Record (WD Form 48) and present it to the driver who is to make the trip. This is the driver's official authorization, a record of events, and a reminder of maintenance responsibility. The dispatcher will make certain

that the form, when turned in to him after the trip, is completely filled out by both driver and official user.

(3) In case of an accident resulting in injury or property damage, the driver will fill out Driver's Report—Accident—Motor Transportation (Standard Form 26) as prescribed in TM 21-305 and submit it immediately after the accident to the officer or noncommissioned officer in charge. One copy of this form will be kept in the vehicle at all times. The action required by the company commander, in case of an accident, and the disposition of this form are specified in AR 850-15.

d. Dispatching board. The dispatching board is a simple device which facilitates the keeping of records and affords a quick method of locating and determining the availability of vehicles and drivers. The board, which is not organizational equipment but may be improvised, usually contains removable labels for each vehicle and each driver. Pegs are used opposite each label to designate the status of company vehicles—"in," "out," or "deadlined." (See fig. 8.) More elaborate boards also show location of trucks.

17. REFUELING. a. General. Truck company vehicles should be refueled and serviced immediately after they return from a mission. Both the tanks and the spare fuel containers should be kept full. Vehicles are usually supplied with gasoline from 5-gallon drums, and with lubricating oil either from 55-gallon drums or from smaller containers.

b. Methods of refueling. (1) *Company storage.* Vehicles are filled from 5-gallon drums stored at a company refueling point located in or near the motor park. The company supply of gasoline is replenished by an exchange of empty drums for full ones at a class III supply point.

(2) *Supply trucks.* Vehicles operating in a convoy secure gasoline en route by exchange of empty drums for full drums

| 1ST PLATOON | | | 2ND PLATOON | | | 3RD PLATOON | | |
|-------------|-----------|----------|-------------|----------|-----------|-------------|-----------|----------|
| REG. NO. | DRIVER | DEST. | REG. NO. | DRIVER | DEST. | REG. NO. | DRIVER | DEST. |
| 4047747 | CERRA | BMT AREA | 2057745 | RUSSELL | | 2030300 | JEFFREYS | 118 INF. |
| 4190744 | REYNOLDS | | 4190789 | ADAMS | | 4190768 | CRAIG | 118 INF. |
| 4328671 | CRAMER | | 4135767 | FELDMAN | R.H.D. | 4206789 | HOY | 118 INF. |
| 4355874 | WAGHART | BMT AREA | 4128001 | SCORVIN | | 4386164 | SEARING | |
| 4300468 | DUSTIN | | 4135140 | SHERIDAN | | 4386387 | SUPREMAN | |
| 4191879 | FAZOLT | | 4190782 | COFFEY | | 4170748 | AFLEHER | 118 INF. |
| 4300510 | DILL | | 4135061 | BRACKET | | 4305505 | NEANNY | 118 INF. |
| 4306007 | PATKOWITZ | | 4179787 | SANDELL | R.H.D. | 4306795 | LETTA | 118 INF. |
| 4182007 | STOM | | 4102653 | LOVOCANO | R.H.D. | 4346724 | MAAN | |
| 4365473 | KACOVITZ | | 4190787 | PIKE | | 4400765 | STARBUCK | 118 INF. |
| 4300917 | KNIGHT | BMT AREA | 4228824 | HOUSER | | 4306286 | CONNELL | |
| 4315040 | COOPER | | 4421321 | GREGGART | | 4306476 | CONSTANCE | |
| 4190780 | LYMAN | | 4231716 | VICKERY | | 4306654 | LEIBERT | |
| 4317216 | SCHWIKER | | 4171907 | SUMMERS | | 4170747 | COATES | 118 INF. |
| 4318410 | KRIEGL | BMT AREA | 4107745 | SHIMODA | | 4306481 | REVINSON | 118 INF. |
| 4317449 | WRIGHT | BMT AREA | 4102872 | LENDAS | ANNI BFR. | 4306019 | WISENAP | |
| 4314278 | BORZALIA | BMT AREA | 4102870 | JEHRAH | | 4306127 | POTLER | |

| HEADQUARTERS | | |
|--------------|---------|----------|
| 2067722 | SESEL | BW Hq |
| 237328 | STEWART | |
| 4172265 | KOBB | 118 INF. |
| 4317452 | COLEMAN | |

Figure 8. Dispatching board shows whether the vehicles of the company are available, out on assignment, or laid up for maintenance.

during a halt. Either the gasoline supply truck drives down the length of the column to make this exchange, or individual trucks drive past the gasoline truck, make the exchange, and then move to a covered area for refueling. Refueling should be planned to provide security and to avoid traffic congestion.

(3) *Deposit points.* Trucks operating independently may be supplied from a supply truck or from dumps of 5-gallon containers placed at designated points along the route.

(4) *Filling stations.* On established truck routes, trucks may be refueled directly from filling stations set up along the route by either the truck company or a gasoline supply company.

(5) *Gasoline supply point.* In some instances truck company vehicles secure gasoline directly from a gasoline supply point by exchanging empty containers for full ones.

c. Safety precautions. (1) When refueling from 5-gallon drums, the flexible spout should first be inserted in the drum and contact made between the end of the spout and the opening of the gasoline tank. Such contact should be maintained at all times during the process of refueling to avoid danger of sparks generated by static electricity.

(2) Engines and lights should be turned off and no smoking should be allowed in or near the vehicle during refueling.

(3) In event of an oil or gasoline fire, the fire extinguisher provided in the vehicle, or sand, dirt, or ashes should be used. Water should never be used because it will cause the fire to spread. (See 14c above.)

d. Storage of gasoline and oil. It will usually be necessary to maintain limited supplies of gasoline and oil in the company area. These materials should be stored outdoors, at least 150 feet from any installation. There should be ade-

quate drainage ditches around the gasoline supply and the ground should be cleared of vegetation for 30 feet on all sides. Since gasoline tends to form a gum when allowed to stand in containers for long periods of time, the principle of "first in, first out" should be followed in issuing the supply. Five-gallon drums of gasoline should be stored on their bases in blocks not over 50 feet square and not over 5 drums in height. Shoring should be provided at the end of each block to prevent toppling and to permit adequate expansion of drums. Protection against the direct rays of sun should be provided by tarpaulin or other means. Drums of lubricating oil should be stored on their sides, back to back on dunnage, not more than 5 drums high and in not more than 11 double rows.

18. SPECIAL OPERATIONS. a. General. Before a quartermaster truck company begins a special operation, personnel must be trained in that particular type of operation. Unusual driving conditions, wide variation in temperature, extremes in temperature, and other factors require special preparations and special operating techniques. Before the trucks are dispatched, the drivers must be checked to see if they have the proper clothing and equipment. Extra clothing, sleeping bags, insect repellent, or other items that might be needed should be carried. The vehicles must also be checked. Heaters, chains, traction devices, and other special items necessary for the operation must be present and in good condition. Vehicles must be lubricated and serviced according to the requirements of the operation. When the trips are long or there is a possibility that the driver will be out for more than several hours, rations (C or K) should be carried. The success of special operations is largely dependent upon the training, planning, and preparation which precede them.

b. Operations in sand, dust, and dirt. The vehicle Technical Manual and TM 21-305 give directions for driving in sand, dust, and dirt. In general, the following points must be stressed when vehicles are operating in such terrain:

(1) Soft sand provides little traction for wheeled vehicles. Tires may be partially deflated to provide more traction but must be reinflated immediately upon reaching hard ground.

(2) Front-wheel drive and low range are used to keep shifting of gears to a minimum. The gear ratio needed for a particular movement should be employed before the movement begins.

(3) The vehicle must be started slowly to prevent digging in. If the vehicle is parked on a downhill slope, starting is easier.

(4) In areas of soft sand, the tracks of the preceding vehicle should be followed when possible.

(5) Maintenance inspections must be frequent and thorough. See the vehicle Technical Manual and TM 37-2810 for detailed instructions.

c. Operations in water and mud. (1) The vehicle Technical Manual and TM 21-305 give directions for operation in water and mud. If deep-water fording operations are anticipated, vehicles should be prepared as directed in TM 9-2853. In addition, drivers must become skilled in the use of the winch, snatch blocks, and A frames. Tire chains are necessary and must be kept in the vehicles at all times when they are not in use. When traction devices are issued, they also should be kept in the vehicles.

(2) Maintenance problems (particularly lubrication) are increased by operations in water and mud. The maintenance directions given in the vehicle Technical Manual should be followed closely.

d. Operations in extreme cold. Before engaging in operations in extreme cold, quartermaster truck company

personnel must be familiar with cold-weather operations in general and with the care and operation of vehicles in particular. The following publications will be helpful:

(1) FM 25-10, Motor Transport.

(2) FM 70-15, Operations in Snow and Extreme Cold.

(3) TM 10-275, Principles of Cold Weather Clothing and Equipment.

(4) TM 21-305, Driver's Manual.

(5) Appropriate vehicle Technical Manuals.

e. Operations in the jungle. Truck operations in the jungle are limited to the few roads which exist or which may be constructed. Truck companies going into the jungle must be familiar with the approved doctrine as explained in FM 72-20, Jungle Warfare, and other current War Department publications.

f. Operations in the desert. In preparing for desert operations, truck company personnel must be trained in desert procedure as given in FM 31-25, Desert Operations. The driving precautions for operations in sand, dust, and dirt (*b* above) apply generally to desert operations. The appropriate vehicle manual and TM 21-305 also give information regarding desert operations.

19. TRACTOR-TRAILER OPERATION. a. General.

Tractor-trailer units of the quartermaster truck company (heavy) and the quartermaster truck company (petroleum) generally operate in the communications zone where the road network will permit the additional cargo weight and where vehicles will not be subjected to the constant threat of enemy action. Before sending a tractor-trailer over new roads, the company commander or other officer must make certain in his reconnaissance that roadbeds will permit the weight, that trees or other obstacles will not interfere with the movement of the tractor-trailer, that terrain will not cause any

serious operational difficulties and that bridges and underpasses are adequate.

b. Drivers. Although tractor-trailer units of a heavy truck company are built to a high degree of perfection in safety and maneuverability, they require skilled and experienced drivers. Personnel selected as tractor-trailer drivers should have completed driver training on trucks before being placed on tractors. Drivers must become proficient in making turns with the tractor-trailer, in backing into limited spaces, in applying brakes, in double-clutching, and in connecting and disconnecting the semitrailer. Instructional information is contained in TM 21-305, and in the appropriate vehicle Technical Manuals. Drivers in the quartermaster truck company (petroleum) must be thoroughly familiar with safety regulations prior to operating the gastank trailers. (See 14c above.)

c. Safety measures. The company commander must give special attention to the following safety measures:

(1) Air brakes on the semitrailer must be kept in good repair and drivers must be skilled in their operation. Heavily loaded cargo semitrailers or gasoline tanks are dangerous if not under perfect control.

(2) The process of connecting and disconnecting the tractor-trailer must be strictly supervised to prevent such mishaps as broken brake hose and light connection, damaged supports, or a tilted or upset trailer.

(3) In addition to safety precautions which must be observed in the transportation of gasoline (14c above), attention must be given to the proper draining and cleaning of the interior of the gasoline tanks and the maintenance of the valves. For instructions, consult the Technical Manuals which accompany the tractor-trailer unit.

(4) When cross country type tractors having universal action fifth-wheels are employed for highway operation, the

side oscillation should be locked out to prevent swaying of semitrailer equipment.

20. SELECTION OF BIVOUAC AREA. a. General.

The general location of the truck company bivouac will be determined by the command to which the company is attached. After the general area is assigned, the company commander will base his selection of a specific location on its proximity to railheads, supply points, or other installations with which the company will work, and on such considerations as terrain, road network, security, sanitation, and the general comfort of troops.

b. Road network. There must be an adequate road network, with a sufficient turn-around area and parking space to accommodate company vehicles. The roadbed must be firm enough to support the truck traffic. This is a problem existing particularly in jungle operations. It may be necessary to reinforce roadbeds or to clear areas of approach. Existing roads should be utilized whenever possible, for newly constructed roads, unless carefully camouflaged, will mark the bivouac location on the enemy's aerial photographs.

c. Concealment. Wooded areas should be selected when possible to provide natural concealment for vehicles and personnel.

d. Security. The area should be selected from the standpoint of providing adequate security for the company. Guard posts, lookout stations, gun emplacements, space for dispersion of vehicles and personnel, natural obstacles to tanks, and ground suitable for the digging of foxholes are factors to be considered in making the selection. (See par. 21.)

e. Sanitation. The area must be considered from the standpoint of sanitation. High, dry ground and accessible

water supply are essential. When an area has formerly been occupied by the enemy, the advance party must see that there are no booby-traps, no gas-contaminated areas, and that the water and ground are not polluted by the disposal of waste. In tropical regions antimalarial measures may have to be taken. Company officers and noncommissioned officers must be thoroughly familiar with information in FM 8-40.

21. SECURITY OF BIVOUAC AREA. a. General.

Truck companies in bivouac will occasionally be given some measure of protection by special security detachments, but more often tactical conditions will preclude such arrangements, and the unit will have to provide its own complete security organization. There will be times when the company in bivouac can coordinate its security plan with those of adjacent troops and thus conserve manpower for active operations.

b. Camouflage and dispersion. Camouflage and dispersion will constitute the major portion of any plan for defense of bivouac against air attack. If the enemy cannot locate the position on aerial photographs, the area will probably escape air attack. Vehicles should be placed as far apart as possible, preferably from 100 to 200 yards, and not closer than 100 yards to the perimeter of the area. Vehicles and installations should be placed in such a position as to take full advantage of woods, shrubs, or other natural concealment from air observation. When trees do not provide adequate overhead and oblique concealment, garnished nets and other artificial material should be used. Prior instruction and strict supervision are necessary to construct proper camouflage. Faulty camouflage can spoil otherwise good concealment. Detailed instructions for camouflaging given in FM 5-20, 5-20A, 5-20B, 5-20C and 5-20G should be studied by company officers and noncommissioned officers.

c. Perimeter defense plan. When a truck company is not supported by neighboring units, the security plan must provide all-around defense. It must utilize such terrain features as drains, steep slopes, wooded areas, and vantage points. (For the preparation of a security plan in jungle operations, see FM 72-20.) Although modifications will be required in given tactical conditions, figure 9 represents one workable perimeter defense plan for a truck company. In this plan trucks and personnel of the three platoons are grouped around the command post which is located in the center of the bivouac area. The outer ring of sentries should generally be 1,000 yards or more from the command post. These sentries will serve as guards against attack by air or by land. They guard against attack by means of chemical agents. The outer ring of guards, remaining under cover, should be checked at irregular intervals during the night by a roving patrol. Signs and countersigns are necessary, because the infiltration of enemy snipers during the night is a serious threat to service installations especially in jungle bivouac. The remainder of the defense is hinged on the .50-caliber machine guns located to provide a maximum of traverse, and on grenade launchers used to guard tank approaches. It may become necessary to clear fields of fire for the automatic weapons. In case of attack not more than two-thirds of the available troops should be employed against the enemy in the beginning. The remaining one-third will be held in reserve near the command post to be committed only after the direction of the attack is determined. Mines, tank traps, and road blocks can be used to strengthen the position. Machine guns mounted on tripods should be dug in and carefully camouflaged; in a fire fight they should be covered by rifle fire. If machine guns are kept mounted on trucks, the trucks should be dug in; otherwise they become the target of enemy fire. (See fig. 10.) A security plan is of

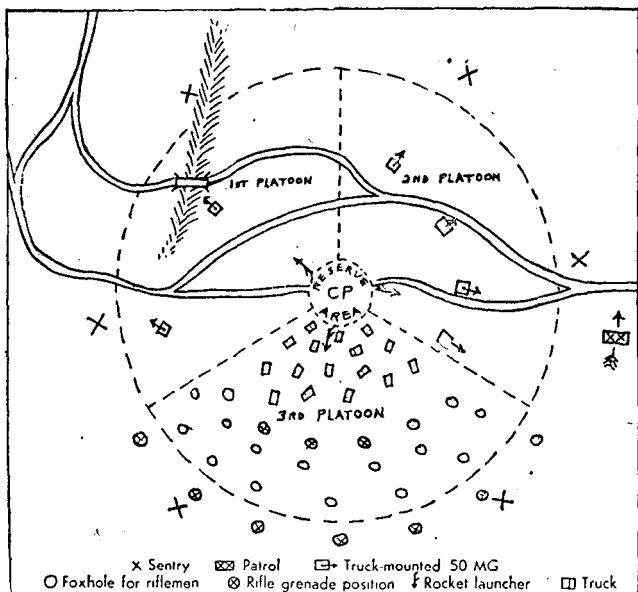


Figure 9. Defense plan for bivouac area should give all-around protection. In this diagram of a typical defense plan, first and second platoon areas show the siting of machine guns, and the third platoon area shows the disposition of vehicles and personnel.

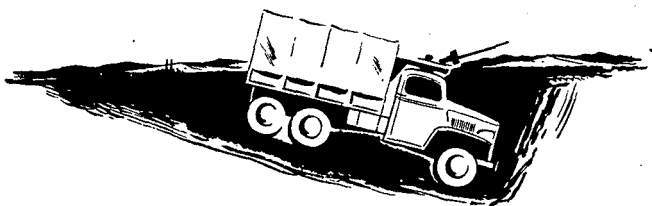


Figure 10. Machine guns on dug-in truck can be fired against either ground or air targets without exposing vehicle or gunner.

little value unless it is thoroughly understood by all personnel. Every man in the company must be assigned a specific duty and responsibility in case of attack

d. Individual security. Every man in the truck company must be prepared to meet sudden and unexpected assaults which might include air attack, mechanized attack, or attack from foot troops dropped by parachute and glider. He must be especially alert for enemy snipers that are intent on firing on the command post. In each new area the troops should be instructed how and where they are to construct individual fortifications. These fortifications must fit in with the general defense plan of the area.

e. Defense against mechanized attack. Lookouts should be placed on high points to watch for mechanized attack. Tank approaches should be guarded by rocket launchers and machine guns. In case of attack, care should be taken not to disclose the position of these weapons by firing prematurely and thus making them a target for long-range guns on the armored vehicles. Personnel should take full advantage of natural tank obstacles, for truck company weapons have limited effect on armor. When tanks are first sighted, carbine and rifle fire should be opened at maximum range to force tank personnel into the tanks where their vision is limited. Every attempt should be made to penetrate the vision slots and periscopes with small-arms fire. If the attack is made by armored personnel carriers such as scout and reconnaissance cars, rifle and machine gun fire may be started at any time when the occupants of the carriers are within range of the weapons.

f. Defense against air attack. Camouflage and dispersion provide the best passive protection against air attack. The bivouac area should always be considered in accordance with the impression it will present in an aerial photograph. To keep planes away from the area, .50-caliber machine guns

are effective in a 1,000-yard radius. Guns should be placed so as to provide interlocking fire. All personnel not required to man the guns during a raid will take shelter. Personnel should hold their fire unless it is certain that the planes have recognized the area and intend to attack. It is also essential that positive identification of the planes as enemy aircraft has been made before orders are given to commence fire.

g. Defense against chemical attack. Quartermaster installations are vulnerable to contamination by toxic chemical agents. Low-flying planes can appear with very little warning and release chemical agents. Defense against chemical attack varies with the standing operating procedure of different theaters, but in general the following procedure should be followed. Gas sentries should be instructed to be on the alert for gas attack, especially during the night. They are responsible for waking the occupants of the area when gas is detected. Each member of the truck company must be thoroughly familiar with his gas mask and other protective equipment and must be able to identify toxic gases. Every vehicle should carry a 1½-quart hand-operated spray apparatus containing a noncorrosive decontamination agent. Drivers should be familiar with the method of decontaminating their vehicles. In addition each truck company should have a trained, fully equipped decontamination squad. Since practically all surfaces except glass and unpainted metal absorb persistent agents quite rapidly, decontamination should be started as soon as practicable.

22. MINES AND BOOBY TRAPS. Vehicles driving in areas suspected of being mined should be heavily sandbagged as protection to the personnel. Advance guards of a convoy should be wary of any spots of fresh-turned earth in roads, and of detours around bridges or road blocks. Booby traps are likely to be found in areas apparently fitted for bivouac

or in the vicinity of wrecked equipment or road blocks. Buildings and field fortifications abandoned by the enemy may be booby trapped. Bivouac areas to be occupied by the truck company should be checked by the advance party for possible traps, and troops upon entering a new area should be cautioned about mines and booby traps. (Detailed information on mines and booby traps is contained in FM 5-31.)

23. WEAPONS. For lists of weapons authorized the company, see applicable T/O & E.

24. DEMOLITION. Every truck company commander should instruct members of his command in the fundamentals of demolition technique. (See FM 5-25.) Such action may be necessary to prevent vehicles or equipment from falling into enemy hands. Orders for the destruction will usually come from higher authority. Such orders may indicate whether incendiary, explosive, or mechanical devices are to be employed. The company must have a plan of demolition for every type of vehicle and weapon, taking into consideration the general method to be employed and the time available. The same parts of each vehicle should be destroyed to prevent cannibalization. Pioneer tools are useful in mechanical destruction. When the situation is reversed, the discovery of abandoned enemy equipment should be reported to G-2 immediately.

CHAPTER 4

MAINTENANCE

25. IMPORTANCE OF MAINTENANCE. Proper and continuous maintenance is necessary to keep vehicles of truck companies "ready to roll" on short notice. No other organization in the Army is more dependent upon the proper operation of its vehicles to fulfill its mission; and vehicles will not operate properly unless they are regularly serviced, lubricated, tightened, cleaned, and repaired. Complete maintenance service is performed under what is termed the "Five Echelon System" which consists of the two following basic divisions:

a. *Organizational maintenance* consists of the first and second echelons and is performed by company personnel. Proper organizational maintenance is the responsibility of the company commander. He is responsible that instructions and procedures for preventive maintenance are complied with, that lubricants, tools, parts and supplies are available at all times, that personnel are trained in preventive maintenance, and that drivers and mechanics are given time to do maintenance work.

b. *Supporting maintenance* consists of third, fourth, and fifth echelon maintenance. It is performed by service units in support of organizational maintenance.

26. FIRST ECHELON MAINTENANCE. a. **General.** First echelon maintenance is the responsibility of the vehicle

driver. Section and squad leaders, as job supervisors, check his work; but the driver is the key person in successful first echelon maintenance. Each driver is assigned a particular vehicle which he drives and maintains, and for which he is responsible. He must conscientiously perform the daily and weekly preventive maintenance services and report to the company mechanics any faults he cannot repair.

b. Scope. Detailed discussion of first echelon maintenance is given in TM 37-2810 and in the vehicle Technical Manual. In general, first echelon maintenance includes:

(1) Inspecting and servicing the vehicle in accordance with the preventive maintenance operations listed on WD Form 48, Driver's Trip Ticket and P.M. Service Record. The directions given in TM 37-2810 or the appropriate vehicle Technical Manual must be followed.

(2) Lubricating the vehicle in accordance with the proper War Department lubrication order.

(3) Repairing defects which the driver is capable of repairing, equipped to repair, and authorized to repair.

(4) Reporting defects whose repair is not a function of the driver.

(5) Preventing abuse of the vehicle (including care of equipment, tools, tires, and batteries).

(6) Making emergency roadside repairs. (See FM 25-10, TM 21-305, and vehicle Technical Manual.)

c. Necessity for scheduled preventive maintenance.

Each driver is required to perform preventive maintenance as a matter of regular routine. However, he must never forget the necessity for performing the daily and weekly services as listed on WD Form 48. He must be thoroughly familiar with the items listed and with the manner in which they are to be inspected and serviced. During the training period, WD Form 48 may be used as check list but the items must be memorized so that the services will be per-

formed automatically. Driver maintenance services, with their purposes, are as follows:

(1) *Before-operation service.* Many things can happen to a vehicle between the last check and the time it rolls again. A quick check is necessary before the vehicle is again put into operation. The before-operation service should never be omitted, even in extreme tactical situations.

(2) *The during-operation service* consists of detecting improper performance. On the march it is necessary to notice unsatisfactory or unusual performance and to take corrective steps before the deficiencies cause an actual break-down.

(3) *At-halt service.* The object of the at-halt service is to correct deficiencies developed during operation. The at-halt service represents the minimum of preventive maintenance that must be performed to continue operation of the vehicle.

(4) *After-operation service.* The purpose of the after-operation service is to prepare the vehicle to operate again at a moment's notice. When it is completed, the vehicle is ready to roll and should be so reported to the section leader or other designated authority. The after-operation service is never entirely omitted but in urgent tactical situations may be reduced to the bare fundamentals of the at-halt service.

(5) *The weekly service* is designed to reinforce daily maintenance. It consists of the after-operation service plus additional attention to certain designated items, including a general tightening, cleaning, and lubrication if required. This weekly service should include a detailed check by the section leader and the platoon leader or motor officer on the quality of maintenance performed by the drivers. The driver should report the completion of the weekly service so that the proper entry can be made on the WD AGO Form 460.

d. First echelon during 24-hour operation. When the company is operating 24 hours a day and it is necessary to assign more than one driver to each vehicle, the company

commander may organize first echelon maintenance teams to help the drivers. These teams may consist of a mechanic or noncommissioned officer and several men—replacements, grounded drivers, or men detailed by roster. Often drivers serve in turn on the maintenance team. This gives the driver a break in the monotony of almost continuous driving and an opportunity to learn first echelon maintenance under the supervision of an expert.

27. SECOND ECHELON MAINTENANCE. a. General. Second echelon maintenance is performed by the company mechanics under the supervision of the motor officer and the motor sergeant. In general this includes additional preventive maintenance, lubrication, minor repairs or unit replacements, run-in tests, supply, recovery, and inspections. Drivers should accompany their vehicles to the second echelon shop and report defects to the company mechanics. When possible, buildings or improvised shelters should be used to house the second echelon shop.

b. Monthly services. (1) Each month, vehicles of a truck company are brought by their drivers to the company maintenance personnel for the monthly maintenance services. However, the interval between these services may be shortened if the vehicles are operating under adverse conditions. They should be coordinated with necessary repairs whenever possible to reduce the number of trips to the repair shop.

(2) Services must be carefully scheduled to regulate the number of vehicles in the company shop at one time. To control the flow of vehicles to be serviced and to determine when vehicles are due for monthly services, WD AGO Form 460 is kept by the motor officer.

(3) To establish uniform procedure for the monthly services, WD AGO Form 461 is provided. The form lists items which are to be checked and (when indicated on the form)

cleaned, tightened, adjusted, serviced, or lubricated (according to the applicable lubrication order). Detailed instructions, procedures, and technical information for the road test, maintenance operations, and final road test which constitute the monthly services are given in TM 37-2810 and the vehicle Technical Manual. When the operations of the truck company make it impossible to complete the monthly services at one time, it can sometimes be handled in sections, provided the services are completed within a week.

c. Semiannual services. Vehicles of the truck company are given a semiannual servicing by second echelon personnel. WD AGO Form 461 is used as the work sheet for this servicing also. Detailed instructions, procedures, and technical information are given in TM 37-2810 and the vehicle Technical Manual.

d. Unit replacement and minor repairs. (1) Repairs to vehicles are performed in the lowest echelon of maintenance consistent with: the nature of the repairs; the availability of authorized spare parts, tools, and equipment; the capabilities of personnel; and the tactical situation.

(2) Quartermaster truck companies have tools, spare parts, supplies, and mechanics to make the unit replacements and repairs which are the responsibility of second echelon maintenance. The appropriate vehicle Technical Manuals contain the technical information needed. When vehicles need unit replacements or repairs beyond the facilities of second echelon maintenance, they are evacuated to higher echelons as described in paragraph 28.

e. Supply of spare parts and maintenance supplies. (1) Estimated quantities of spare parts and maintenance supplies to be stocked by the company are set up in the appropriate Standard Nomenclature List (SNL) and the

Army Service Forces Ordnance Supply Catalog. Stocks of spare parts and supplies should not exceed the allowances authorized unless specific authority has been granted.

(2) The second echelon maintenance shop normally obtains replacement spare parts and unit assemblies by requisition or by direct exchange at the third echelon maintenance organization supporting the truck company. If the unserviceable item cannot be presented for exchange or has no reclaimable value, the replacement item is issued on a WD AGO Form 446, signed by the company commander. The signed property issue slip serves as a certificate that the supplies are necessary and that their replacement will not result in assemblies, parts, or tools in excess of authorized allowances.

(3) Unserviceable but repairable parts and assemblies presented to the third echelon maintenance organization for exchange are tagged by the motor officer to indicate the part number, the make and model of the vehicle from which removed, and the nature of the unserviceability. For this purpose the form used is WD AGO Form 9-81.

(4) Expendable supplies are requisitioned from appropriate supporting organizations using WD AGO Form 446.

(5) Excess parts and supplies are turned in to the third echelon maintenance shop using WD AGO Form 447.

(6) When the tactical situation prevents the normal exchange of spare parts and unit assemblies, replacements may be secured from disabled vehicles. However, cannibalization is forbidden except in emergencies when contact with a third echelon maintenance organization cannot be established.

f. Special maintenance problems imposed by unusual operations. The vehicle Technical Manuals give detailed instructions for maintenance procedures after unusual operations. The following points are stressed:

(1) *Sand, dust, and dirt.* After operations in sand, dust, or dirt the following points should be carefully checked:

(a) *Brakes* should be carefully tested. All fluid lines and the hydraulic master system should be checked for leaks and damage. Sand, dust, and dirt may cause abnormal wear and require adjustment of the brake shoes.

(b) *Air cleaners and filters.* When operating in sandy or dusty conditions, clean and service all air cleaners according to the lubrication order as often as necessary.

(c) *Chassis units and gear cases.* Excessive dirt and dust may make more frequent lubrication necessary. Consult the vehicle Technical Manual or the appropriate lubrication order for detailed instructions.

(2) *Water and mud.* Before operations in water, vehicles should be prepared as prescribed in TM 9-2853. After operations over muddy terrain, or after shore operations, the vehicles should be carefully checked. Water and mud destroy the protective film of the lubricant, and the grit may destroy wheel bearings, universal joints, and other exposed assemblies. Vehicles should be lubricated as often as necessary. Drivers and company mechanics must be very careful with their maintenance procedures. Particular attention should be paid to:

(a) *Brakes and wheel bearings.* Wheels should be pulled frequently and the brakes and wheel bearings checked for necessary cleaning and repacking.

(b) *Chassis units and gear cases.* Chassis units should be carefully inspected for damage. Gear cases must be drained and refilled.

(3) *Cold, jungle, and desert.* The vehicle Technical Manual gives detailed instructions for maintenance problems caused by operations in cold, jungle, and desert.

g. Care and maintenance of unit tools and equipment. Second echelon tools and equipment for the truck

company are prescribed by the Table of Organization and Equipment and Standard Nomenclature List G-27, Tools, Maintenance, for Repair of Automotive and Semiautomotive Vehicles. In general, they consist of the following:

(1) *Mechanic's tool set.* Each mechanic is provided with a general mechanic's tool set. Proper care and maintenance of these tools are the responsibility of the mechanic. A record of the component items of the sets is kept by both the motor sergeant and the supply sergeant and frequent inspections should be made by company officers to assure the good condition of all tools. Replacement of lost or unserviceable items is made through the channels discussed in *e* above.

(2) *Echelon sets.* The care and maintenance of second echelon unit equipment are the direct responsibility of the motor officer and the motor sergeant. In general this responsibility includes:

(a) *Proper record keeping.* Second echelon tools are entered on the records of both the motor sergeant and the supply sergeant.

(b) *Proper storage.* All tools and equipment must be properly stored in the repair trucks or buildings used by second echelon personnel.

(c) *Clearly defined system.* A system of signing for company tools used by the mechanics should be enforced. This system assures the return of a tool and fixes responsibility for its condition.

(d) *Replacement of lost and unserviceable items.* All tools and equipment authorized should be on hand and in a serviceable condition. When items are lost or become unserviceable, replacement items should be secured by exchange or requisition from the supporting third echelon organization.

(e) *Proper use of tools.* The motor officer and motor sergeant must be sure that mechanics use tools only for the

purpose intended. Use of screw drivers for chisels, wrenches for hammers, and other malpractice must be avoided. (See TM 10-590.) The Training Films listed in FM 21-7 on the care and use of tools should be shown.

(f) *Proper maintenance of tools and equipment.* Tools and equipment must be properly cleaned, oiled, and repaired. Of particular importance are the following:

1. Gasoline-driven items (compressor, battery charger) must have the preventive maintenance services that are given all gasoline-driven equipment.
2. Grease-gun fittings and similar items must be regularly checked.
3. To prevent loss, gases (oxygen and acetylene) must be turned off at the cylinder when not being used. Directions for the safe handling of compressed gases are found in TM 9-2852.
4. Welding-torch points must be regularly checked.

(g) *Prevention of accidents and fires.* All personnel must be instructed in accident and fire prevention. Inflammables must be properly handled. Wiping rags, oily waste, and similar material must be burned, buried, or submerged in water to prevent spontaneous combustion.

h. *Command inspections* are made by the company commander to determine the condition of the equipment of the company and the efficiency of the personnel. This type of inspection may or may not be scheduled. Procedure for conducting command inspections is given in TM 37-2810. These inspections may be any of the following types:

(1) Formal inspections with the vehicles drawn up in formation, tools displayed, compartments opened, and the drivers stationed adjacent to the vehicles.

(2) Informal inspections when the vehicles are parked in their usual position in the motor park, halted on the road, or passing by on the road.

(3) Spot-check inspections using WD AGO Form 9-68.

i. New vehicle run-in test. When a new or reconditioned vehicle is received by the company, second echelon personnel give it the new vehicle run-in test outlined in TM 37-2810 to determine whether or not it will operate satisfactorily when placed in service. All assemblies, sub-assemblies, tools, and equipment are inspected to see that they are in place and correctly adjusted. A 50-mile road test is given the vehicle in accordance with the vehicle Technical Manual. Deficiencies which are within the scope of second echelon maintenance are corrected. Deficiencies beyond the scope of second echelon maintenance are referred to third or fourth echelon for correction.

28. THIRD ECHELON. **a.** Repairs requiring spare parts, tools, equipment and mechanical skill beyond that of the second echelon organization are usually performed by the supporting third echelon organization. Close liaison between the company and the third echelon maintenance shop will save time in getting repairs done since the tactical situation, quantities of work on hand, and the nature of repairs will sometimes determine the echelon which will do the work.

b. Direct communication between the truck company and the third echelon organization is necessary.

c. Technical inspections of vehicles are performed by third echelon personnel upon the following occasions:

(1) When a vehicle goes to the third echelon shop for repair. (It is inspected to determine the repairs necessary, whether or not it should be continued in service, and (after repair) whether or not all defects have been corrected.)

(2) When a vehicle is transferred between organizations, except in theaters of operations.

(3) When required by AR 850-15. (This regulation requires that at least 10 percent of all automotive vehicles and

equipment shall be given a technical inspection each 6 months.)

Note. Limited technical inspections, using WD AGO Form 461-5, are given all vehicles (other than new ones or those made serviceable by repair shop processing) received at motor storage pools. If a vehicle is classified as serviceable as a result of the limited technical inspection, a complete technical inspection is performed to insure that all mechanical defects have been corrected.

29. MAINTENANCE FORMS AND RECORDS.

These forms and records as required for the quartermaster truck company are described in detail in TM 37-2810. These forms are classified into the following groups:

a. **First echelon.** The forms and records listed below should accompany each vehicle while operating on the road:

(1) *Driver's Trip Ticket and PM Service Record (WD Form 48)*. Each driver of an individual vehicle on a non-tactical mission or not in convoy is required to carry a WD Form 48. This is his official authorization for driving the vehicle and (when completed) contains a record of the trip. The reverse side lists the preventive maintenance services a driver must perform.

(2) *Driver's Report—Accident—Motor Transportation (Standard Form 26)*. In case of an accident resulting in injury or property damage, this form is filled out by the driver on the spot or as promptly as possible thereafter. (See TM 21-305.)

(3) *Motor Vehicle Operator's Permit (WD AGO Form 9-74)*. This form is issued to all drivers who are qualified to operate the particular vehicles noted on the permit.

(4) *War Department lubrication order*. The appropriate lubrication order will accompany each vehicle at all times.

(5) *Vehicle Technical Manual*. Each vehicle will have the appropriate vehicle Technical Manual at all times.

b. Second echelon. This group consists of operation, inspection and maintenance forms.

(1) *Daily Dispatching Record of Motor Vehicles (WD AGO Form 9-75)*. This form records the status of all vehicles dispatched for any particular day.

(2) *Automotive Disability Report of Vehicles Disabled More Than 3 Days (WD AGO Form 13-1)*. This form is prepared as directed in current War Department directives (references printed on face of form).

(3) *Spot-check Inspection Report for Wheeled and Half-track Vehicles (WD AGO Form 9-68)*. This form is used by officers making spot-check inspections.

(4) *Preventive Maintenance Roster (WD AGO Form 460)*. This form is used for recording the preventive maintenance services performed on each vehicle. It also serves as a control to schedule the services on a regular cycle.

(5) *Preventive Maintenance Service and Technical Inspection Work Sheet for Wheeled and Half-track Vehicles (WD AGO Form 461)*. This provides a convenient check list to be used in performing the second echelon monthly and semi-annual services. It is also used by third and higher echelons when performing technical inspections.

(6) *MWO and Major Unit Assembly Replacement Record and Organizational Equipment File, (WD AGO Form 478)*. This form is printed on a jacket which serves as a file for other vehicle records.

c. Supply forms. Supply forms are used to obtain, control, replenish, and to dispose of property. Use of these forms is discussed in detail in TM 38-403.

(1) *Property Issue Slip (WD AGO Form 446)*. This form is used to obtain authorized supplies and equipment.

(2) *Property Turn-in Slip (WD AGO Form 447)*. This form is used to dispose of unserviceable or excess property.

(3) *Exchange Part or Unit Identification Tag (WD AGO*

Form 9-81). This tag is used to identify and exchange un-serviceable automotive equipment.

(4) *Locator and Inventory Control Card (WD AGO Form 9-71)*. All spare parts on hand, regardless of the manner of acquisition, are recorded on this form.

INDEX

| | <i>Paragraph</i> | <i>Page</i> |
|---------------------------------|------------------------|------------------------|
| Armorer (artificer) | 11 | 12 |
| Battalions, quartermaster | 4 | 4 |
| Bivouac | 12, 13, 20, 21 | 18, 23, 53, 54 |
| Booby traps | 22 | 58 |
| Cadre | 12 | 18 |
| Cold weather operations | 18 | 49 |
| Company | | |
| Clerk | 11 | 12 |
| Commander | 10, 12, 13, 20, 24, 25 | 10, 18, 23, 53, 59, 60 |
| Convoy | 12, 13 | 18, 23 |
| Cooks | 11 | 12 |
| Demolition | 24 | 59 |
| Desert operations | 18 | 49 |
| Dispatcher | 11, 16 | 12, 44 |
| Dispatching | 16 | 44 |
| Drivers | 11, 12, 19, 26 | 12, 18, 51, 60 |
| First sergeant | 11 | 12 |
| Forms and records | 16 | 44 |
| Group, quartermaster | 4 | 4 |
| Jungle operations | 18 | 49 |
| Loading | 14 | 39 |
| Maintenance | | |
| First echelon | 12, 26 | 18, 60 |
| Forms and records | 29 | 70 |
| Importance | 25 | 60 |

| <i>Maintenance (cont'd)</i> | <i>Paragraph</i> | <i>Page</i> |
|--------------------------------------|------------------|----------------|
| In convoy | 13 | 23 |
| Second echelon | 27 | 63 |
| Third echelon | 28 | 69 |
| Trouble shooting | 12 | 18 |
| Marches, types of | 13 | 23 |
| Mechanics | 11, 26, 27 | 12, 60, 63 |
| Mess sergeant | 11 | 12 |
| Mines | 22 | 58 |
| Motor officer | 10 | 10 |
| Motor sergeant | 11 | 12 |
| Night operations | 13 | 23 |
| Platoon leaders | 10 | 10 |
| Platoon sergeants | 11 | 12 |
| Quartermaster battalions | 4 | 4 |
| Quartermaster group | 4 | 4 |
| Reconnaissance | 13 | 23 |
| Records and forms | 16, 29 | 44, 70 |
| Refueling | 17 | 46 |
| Safety | 17, 19 | 46, 51 |
| Sand, dust, dirt—operations in | 18 | 49 |
| Sections leaders | 11 | 12 |
| Security | 12, 13, 20, 21 | 18, 23, 53, 54 |
| Shipment of vehicles | 15 | 43 |
| Shuttling | 13 | 23 |
| Special operations | 18 | 49 |
| Squad leaders | 11 | 12 |
| Supply sergeant | 11 | 12 |
| T/O & E-500 | 3, 7 | 2, 8 |
| Tractor-trailer operation | 19 | 51 |
| Training | 12 | 18 |
| Truck company, quartermaster | | |
| Assignment | 4 | 4 |
| Functions | 3 | 2 |
| Mission | 2 | 2 |
| Organization and equipment | 5 | 6 |

| | <i>Paragraph</i> | <i>Page</i> |
|-------------------------------------|------------------|-------------|
| Truck company, heavy, quartermaster | | |
| Assignment | 8 | 8 |
| Functions | 7 | 8 |
| Mission | 6 | 7 |
| Organization and equipment | 9 | 8 |
| Truckmaster | 11 | 12 |
| Water and mud, operations in | 18 | 49 |
| Weapons | 21, 23 | 54, 59 |

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