FM 6-140

DEPARTMENT OF THE ARMY FIELD MANUAL

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THE FIELD ARTILLERY BATTERY

HEADQUARTERS, DEPARTMENT OF THE ARMY
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HEADQUARTERS,
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PART ONE
GENERAL
CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Purpose and Scope

a. This manual is a guide for commanders and personnel of field artillery batteries. The portions covering administration and training apply to all field artillery batteries; the portions covering organization, duties of personnel, and tactical employment do not apply to missile, mortar, searchlight, or observation batteries. For consistency and clarity, the types of batteries used as specific examples throughout this manual are those of an infantry division field artillery howitzer battalion, 105-mm, towed. Any significant differences between these and other field artillery batteries will be pointed out and explained. For techniques peculiar to missile batteries, see the appropriate 6-series field manuals. For techniques peculiar to the mortar battery, see FM 6–18; for the searchlight battery, FM 6–115; and, for the observation battery, FM 6–120 and FM 6–122.

b. The principles of employment are generally the same for all classes of cannon artillery; techniques of employment will necessarily vary. Tech-

niques covering every situation cannot be prescribed; therefore, this manual should be used as a guide in determining the most suitable application of the principles and techniques discussed. The material presented herein is applicable without modification to both atomic and nonatomic warfare.

2. Types of Batteries

a. The types of batteries discussed in this manual are—

(1) The howitzer (gun) battery.
(2) The headquarters battery.
(3) The service battery.

b. For classification of artillery weapons, see FM 6–20.

Section II. COMMAND

3. The Battery Commander

a. The degree of efficiency of a battery's performance is a reflection of the leadership and professional knowledge of the battery commander.

b. When a battery is not under the operational control of a field artillery battalion, the responsibilities of the battery commander are comparable to those of a battalion commander as discussed in FM 6–20 and FM 6–101. When a battery is under the operational control of a field artillery battalion, the battery commander is responsible for—

(1) Training the battery in conformance with the battalion training program, and attaining the prescribed training objectives.

(2) Maintaining materiel and equipment.
(3) Maintaining high standards of discipline and morale.
(4) Preserving health and physical fitness of battery personnel.
(5) Keeping the battery ready to accomplish its mission.
(6) Insuring adherence to proper safety pretions.
(7) Insuring that the battery functions in accordance with regulations and the policies of higher commanders.
(8) Keeping personnel of the battery informed of the general and special situations.

4. Methods

The battery commander carries out his command responsibilities by—

a. Personally participating in training to the maximum extent consistent with his other duties. His presence with the majority of his men during athletics, training, and combat develops the leadership qualities of the battery commander.

b. Making frequent inspections to see that his orders are being carried out; that living quarters are adequate and well policed; that the mess is punctual, attractive, and satisfactory; and that the routine work is equitably distributed.

c. Making himself available, under appropriate conditions, for conferences with battery personnel on matters of a personal nature.

d. Administering firm, fair, and impartial military justice.

e. Giving careful attention to the assignment of personnel to insure placing the right man in the right job.

f. Instructing key subordinates in their duties.

g. Maintaining an effective troop information program.

h. Emphasizing the maintenance and proper use of all equipment.

i. Insuring the application of the principles of supply economy and cost consciousness.

j. Delegating such authority to his officers and noncommissioned officers as is consistent with their position and the efficient operation of the battery. For a detailed checklist of the actions of a battery commander in specific situations, see DA Pam 6–1.

5. Plans and Orders

The plans and orders of the battery commander are based on those received from the next higher commander. The plans consist of precise steps, arranged in a logical sequence, that must be taken by each subdivision of the battery at a predetermined time to enable the battery to properly perform its mission. Brief and informal oral orders are employed by the battery commander. They should be given to fit each specific situation and should not be merely a reference to a checklist or a repeat of standing operating procedure (SOP).

CHAPTER 2

ADMINISTRATION

Section I. GENERAL

6. General

a. Efficient administration is essential to the effective operation of the battery. Administration at the battery level involves management, record keeping, and reporting. Administrative actions must be sound, speedy, and accurate. The battery commander should delegate specific administrative duties to his subordinates, but he cannot delegate his responsibility for administration.

b. The battery commander should personally perform those administrative duties closely allied to leadership, such as personnel management and morale.

7. Management

Management is the efficient, economical, and judicious use of means to accomplish an end. As discussed here, it includes both organization management and personnel management. Organization management is the operation and direction of details pertaining to the housing, messing, clothing, and physical matters of the battery. Personnel management is the direction of the activities of the individuals so as to secure the maximum output from each individual and from the group as a whole.

8. Principles of Personnel Management

The battery commander exercises personnel management by conducting personal interviews and by maintaining close personal supervision and observation. He gains useful guidance by studying the results of standard army tests and by examining individual records. The main principles of personnel management are to—

a. Place the right man in the right job.

b. Increase his availability for work.

c. Stimulate his will to work.

d. Increase his capacity to produce.

e. Use him fully on essential tasks.

9. Morale

a. Morale is a mental and emotional state identified through outward behavior. Morale is characterized by the spirit, confidence, satisfaction, enthusiasm, cooperation, and initiative which is present or lacking in personnel as they perform their military tasks. Good morale results from a number of intangibles. Generally, the same things which build a good unit also build good morale. Poor morale is evidenced by dissatisfaction, indifference, lack of discipline, and lethargy. Maximum military performance is attained only when the individual has the desire to accomplish all tasks to the best of his ability.

b. The battery commander is responsible for creating a state of high morale within the battery. In building and maintaining high morale, the battery commander must—

(1) Gain the confidence and respect of the men.
(2) Look after the welfare of the men.
(3) Keep the men informed.
(4) Be impartial and consistent in assigning duties and in giving awards and punishments.

10. Military Justice

The battery commander personally administers military justice within his authority. He is governed by The Uniform Code of Military Justice and the provisions of the Manual for Courts-Martial. The administration of punishment must be fair, consistent, and impartial. The Manual for Courts-Martial prescribes details of the administration of military justice and the keeping of the Unit Punishment Book. In using the Manual for Courts-Martial, it is imperative to have and to refer to the latest Cumulative Pocket Part.

Section II. BATTERY HEADQUARTERS ADMINISTRATION

11. General

The battery headquarters section assists the battery commander in the performance of most routine administrative duties. The most important records, reports, and files kept by the battery include the morning report, duty roster, individual sick slips, publications files, correspondence file, Army Regulations (AR) and Special Regulations (SR) file, and unit fund records. Administrative personnel must have a thorough knowledge of the

use of Department of the Army (DA) publications in order to properly perform their duties. To facilitate reference to any publication issued by Department of the Army, indexes in the form of DA Pamphlets (app. I) have been published.

12. Morning Report

a. General. The morning report is one of the most important reports prepared in the battery since it is the basic source of data required for official strength reports and is the record of the official status each day of each person in the unit. It has significant historical value because it records all changes affecting the status of the battery. It may be used as legal evidence in courts-martial and in other legal matters. Prepared by the battery, it is ultimately forwarded to The Adjutant General's Office where it becomes a permanent record.

b. Preparation. The morning report covers the period from midnight to midnight of each day. It is prepared as soon as possible after midnight and no later than 0900 hours of the day following the period which it covers. The battery commander is responsible for the morning report, but the actual preparation is usually accomplished by the battery clerk under the supervision of the first sergeant. The morning report is usually authenticated by the battery commander; although it may be authenticated by any officer or warrant officer designated by the battery commander or higher authority. For a detailed discussion of the preparation of the morning report, see AR 335–60.

13. Duty Roster

a. General. The duty roster is an aid in providing an equitable distribution of routine duties among the battery personnel and furnishes a record of the availability of personnel for those duties. A separate roster is maintained for each duty; such as guard, charge of quarters, kitchen police, and other duties as directed by the battery commander.

b. Preparation. Duty rosters should be maintained by the first sergeant under the supervision of the battery commander. Rosters should be posted well in advance of the time the duty is to be performed. Last minute changes should be avoided. For a detailed discussion of duty rosters, see AR 220–45.

14. Individual Sick Slips

a. The individual sick slip is an informal memorandum pertaining to the request for or receipt of medical attention by an individual. It is used to exchange information between the medical officer and the unit commander. It may be the basis for entries in the morning report and may include any information agreed upon by the commanding officer and the medical officer. The individual sick slip is not a permanent record and will normally be destroyed except when the line of duty status of the individual is in doubt.

b. Preparation. Individual sick slips should be prepared by the battery clerk under the supervision of the first sergeant. The sick slip is sent

with the patient to the medical facility and is returned to the battery after the patient has received treatment or an examination. For a detailed discussion of the individual sick slip, see AR 40–207.

15. Publications Files

a. Record Set. The battery will maintain a set of all publications which is originates, such as battery orders and memorandums. This set will include both current and superseded publications. It is not to be taken from the battery headquarters for any reason until it is retired to a records holding area as directed by AR 345–292.

b. Reference Sets.

(1) One complete file of all publications issued by the battery will be maintained at the battery headquarters in addition to the record set discussed in *a* above. This reference set will not be retired periodically with other records, but will be retained at the battery headquarters until its reference value has elapsed, at which time it will be disposed of under provisions of AR 345–292.

(2) Reference sets of publications received from higher headquarters will be grouped first by source, arranged in order of headquarters level, and then by type in alphabetical order. Each type of publication will be filed chronologically (or numerically, if numbered). The file must be kept current by posting all changes as they are published.

16. Army Regulations and Special Regulations File

Each battery is required to keep a file of all AR's and SR's authorized for distribution to the battery. AR's and SR's may be filed together in the same binder since each SR is numbered in accordance with the corresponding AR. No special regulations have been issued since 1 January 1955.

17. Correspondence File

The correspondence file consists of copies of correspondence originating in the battery and the original, copy, or summary of incoming correspondence. Correspondence is filed in ordinary 8½ by 11½-inch envelopes. The correspondence file is screened annually by the battery commander; he removes and destroys all nonrecord materials which have become obsolete or unnecessary for reference. For disposition of the correspondence file, see AR 345–292.

18. Unit Fund

a. The purpose of the unit fund is to provide a means of increasing the comfort and welfare of the men of the battery. Proper use of this fund aids in establishing high morale and esprit de corps. The battery commander is custodian of the unit fund. He is assisted in the administration of the fund by a unit fund council.

b. The primary source of income for the unit fund comes from the Post Trust Fund as a monthly grant based on the battery personnel strength. Also, the battery day room may have a pool table,

cold drink machine, juke box, or some other equipment, the operation of which may produce income for the unit fund.

c. Expenditures from the unit fund may be made for any purpose for which the fund was established. Examples of authorized expenditures include—

(1) Athletic and recreational equipment.
(2) Laborsaving devices.
(3) Protection, care, and preservation of fund-owned property.
(4) Distinctive insignia.
(5) Prizes for excellence in military activities.
(6) Supplies, materials, or services for mess hall and day rooms.

d. Unit funds may not be expended for articles which may be requisitioned unless such articles are immediately necessary and cannot be issued in a reasonable length of time. Purchases of such articles must be supported by certificates of nonavailability from the appropriate supply officer.

e. For a detailed discussion of general policies, administration, and accounting procedures of the unit fund, see AR 230–5, AR 230–10, AR 230–21, AR 230–63, and AR 230–80.

Section III. SUPPLY

19. General

a. The battery commander is responsible for all public or Government property pertaining to the

battery. This responsibility extends to property on hand in the unit whether or not the battery commander has actually receipted for it.

b. The responsibilities of the battery commander pertaining to property include—

(1) Having on hand or on requisition all articles that are currently authorized for the unit.

(2) Determining by frequent inspections that supplies and equipment on hand are complete, that they meet proper serviceability requirements, and that they are being properly used and adequately safeguarded.

(3) Insuring that all battery personnel are properly instructed in the care and maintenance of Government property and in all the principles of supply economy.

(4) Maintaining prescribed property records which will, at all times, reflect the status of all property currently authorized for the unit.

(5) Insuring that no unauthorized property is on hand.

(6) Reporting as excess all items not required for the fulfillment of the unit mission.

(7) Assuming responsibility for all Government property on hand in the battery, whether it has been receipted for or not.

(8) Taking physical inventory of all property on hand *at least every six months,* initiating any required adjustments, and

making the necessary entries to unit property records.

(9) Insuring that the operation of the battery is in accordance with the principles of supply economy and cost consciousness.

(10) Taking a joint inventory with the new battery commander when property is being transferred and making proper adjustments of any discrepancies which may be discovered in accordance with AR 735–35.

c. The battery commander may delegate the duty of maintaining records and the actual operations of drawing and issuing supplies and equipment. Delegation of these duties does not relieve the battery commander of responsibility for their proper performance.

20. Supply Economy

Supply economy is the practice of conservation of supplies and equipment by every individual in the unit. It is developed through training and practice until it becomes habit. Supplies and equipment may be used most efficiently by insisting that each item be properly used, by using only the amount needed to do the job, by demanding that supplies and equipment be given proper care and maintenance, and by guarding them against loss. An individual should be required to pay for items which he has lost or damaged through fault or neglect.

21. Supply Terms

The following are definitions of some of the basic terms applying to supply administration:

a. Organizational Property—Any property issued under authority of tables of organization and equipment (TOE) and those items of organizational clothing and equipment authorized by table of allowances (TA) 21.

b. Installation Property—Property that is authorized for use at a particular installation. Items of installation property will not be taken by unit upon change of station unless approval has been granted by the theater commander or Department of the Army.

c. Individual Property—Items of clothing and equipment authorized by TA 21 for issue to individuals.

d. Expendable Property — Articles which are consumed in use, such as cleaning materials and office supplies, and spare or repair parts that are used to repair or to complete other articles and which thereby lose their identity.

e. Nonexpendable Property — Items which are not consumed in use and which ordinarily retain their original identity during the period of use.

f. Informal Accountability—The obligation to maintain records, other than a stock record account, of certain classes of property under conditions prescribed in regulations or specific instructions of the Department of the Army. The battery commander maintains informal accountability of

battery property through the use of the property records.

g. Property Responsibility—The obligation of an individual for the proper custody and care of Government property entrusted to his possession or under his supervision.

22. Supply Publications

The term "supply publications" applies to all of the various instructions and references prepared by the technical services and the Department of the Army for use by supply personnel at all levels. Supply personnel must know how to use these publications in order to perform their duties. Care must be taken to insure that the prescribed supply publications are on hand and current, all changes posted.

23. Types of DA Supply Publications

a. Army Regulations (AR). Army regulations set forth the authority, basic policies, administrative procedures, and other instructions implementing basic policies. Since AR's are the basis for supply operations, it is important that battery personnel be familiar with and that all applicable AR's are in the battery file.

b. Special Regulations (SR). Special regulations originally amplified the more general wording of AR's. SR's are no longer published. The material they contained is being incorporated in the AR's.

c. Circulars (Cir). Circulars contain matter which is informative or directive in nature, general in application, but temporary in duration.

d. Technical Manuals (TM). Technical manuals contain descriptions of arms, materiel, and equipment. They also provide instructions for the operation, care, and handling of equipment, along with technical procedures, reference data, and similar specialized subject matter.

e. Technical Bulletins (TB). Technical bulletins contain technical information pertaining to weapons and equipment procured and issued by the preparing service. Technical bulletins supplement technical manuals.

f. Supply Bulletins (SB). Supply bulletins disseminate instructions and information of the more technical aspects of supply matters.

g. Lubrication Orders (LO). Lubrication orders prescribe authorized lubricants, lubrication intervals, and lubrication instructions for all equipment which require lubrication by battery maintenance personnel.

h. Modification Work Orders (MWO). Modification work orders provide uniform instructions for authorized alteration and modification of materiel.

i. Table of Allowances (TA). Tables of allowances prescribe the items of clothing and equipment normally required and issued for the use of troops. Also included in the tables of allowances are items of training equipment for use at installations and items of expendable supplies.

j. Tables of Organization and Equipment (TOE). Tables of organization and equipment prescribe the

normal mission, organizational structure, personnel, and equipment authorized a unit.

k. Supply Manuals (SM). Supply manuals supplement equipment authorization tables in that they cover identification and stock classification data, prices, expendability and basic allowances, and maintenance parts and accessories.

24. Supply Manual System

Each technical service publishes a group of supply manuals that cover all items of equipment supplied by that technical service. A 310-series DA pamphlet index of supply manuals is published for each technical service. A complete explanation of the numbering system for supply manuals and all other DA publications is contained in AR 310–2. A list of the 310-series DA pamphlet indexes is in DA Pam 310–1.

25. Ordnance Supply Manuals

a. The ordnance supply manual system is especially important to artillery units because of the large number of complex ordnance items in a battery. Battery supply personnel should be thoroughly familiar with the use of all appropriate ordnance supply manuals. Current supply manuals for each item of equipment should be on hand in the supply room.

b. A standard nomenclature list (SNL) is a part of the ordnance supply manual system. SNL's tabulate and illustrate photographically the major items, parts of major items, and tools and equipment for the major items. A complete listing of

SNL's and other ordnance supply manuals is given in DA Pam 310–29.

26. Supply Records

a. In time of war or declared emergency, accounting for property will be in accordance with the provisions of FM 100–10. In peacetime, the records shown below are maintained by separate batteries and by battalions. Batteries organic to battalions do not maintain these records. See AR 735–35 for a detailed discussion of property records and property accounting procedures.

(1) *Organization property book.* The property book is a record of all property authorized the unit by TOE and those items of TA 21 which have been designated as organizational clothing and equipment.

(2) *Installation property book.* The installation property book is a record of all installation property authorized for the unit.

(3) *Organizational clothing and equipment record.* The organizational clothing and equipment record is a consolidated record of all organizational clothing and equipment issued to individuals for personal use.

(4) *Individual clothing record.* The individual clothing record is a record of individual clothing issued to an individual for personal use.

(5) *Transaction file.* The transaction file con-

tains all documents supporting entries in the property books.

(6) *Suspense file.* The suspense file contains copies of all incomplete supply transactions entered in the transaction register.

(7) *Transaction register.* The transaction register is used to record supply transactions.

(8) *Unit equipment status report.* The unit equipment status report is machine prepared by higher headquarters. The original copy is sent to the battery where it is adjusted to reflect the status of equipment as shown in the property books as of the last day of the reporting period. For a detailed discussion of the unit equipment status report, see AR 711–41.

b. Units may be required by higher headquarters to maintain supply records in addition to those prescribed by Department of the Army. Examples of additional records which may be required are component parts books and hand receipt files (par. 28*a*).

27. Requisitioning and Turn-In of Supplies

The battery supply section submits requisitions and turn-ins to the battalion supply section in accordance with schedules established by the battalion supply officer.

28. Supply Safeguards

Supply safeguards are those means taken to insure protection of supplies and equipment from

damage or loss. They include maintenance of records, property inventories, maintenance of registers for serially numbered items, security of the supply room, and similar means. In addition to the records required by regulations, the battery commander may keep other records to further account for supplies. Some of these are—

a. Records.

(1) *Component parts book.* Many major items of equipment have a great number of nonexpendable component parts. A component parts book may be prepared on DA Form 14–110, (Organization (Installation) Property Record) with a page for each component of a major item. Receipts and turn-ins of parts may then be posted in the same manner as postings are made to the unit property books. This record, properly kept, provides the battery commander with a ready check of the status of all component parts.

(2) *Hand receipt.* Property used by a section may be signed out to the chief of section. This helps to insure supply economy and proper maintenance of equipment.

(3) *Memorandum receipt.* Battery supply personnel should require that individuals sign a memorandum receipt for any item which the individual takes from the supply room to use for a short time. Examples of items which might be signed out on memorandum receipt for a short

time are flashlights and athletic equipment.

b. Inventories.

(1) *Semiannual inventory.* Department of the Army regulations require that the battery commander perform an inventory of all property every six months, that the results of the inventory be posted to the property books, and that necessary adjustments be made.

(2) *Joint inventory.* Department of the Army regulations require that an inventory of all property be made whenever there is a change of battery commanders. This inventory is to be performed jointly by the former battery commander and the new battery commander. The adjustment of any discrepancies discovered by the inventory is the responsibility of the former battery commander. The new battery commander assumes responsibility for all property on hand in the battery at the time he assumes command of the battery.

(3) *Partial inventories.* The battery commander should make frequent partial inventories of property in addition to the periodic inventories required by Department of the Army. By inventorying some particular item or items each week, as time permits, a systematic coverage of all property is accomplished every few weeks. These partial inventories promote supply consciousness and give the bat-

tery commander a check on the condition, care, and location of equipment. Any discrepancies discovered by these partial inventories should be adjusted immediately.

c. Serially Numbered Items. All serially numbered items of equipment must be accounted for by serial number. The serial number of the item is entered on the back of the property book page listing the item. Serially numbered items should be inventoried monthly.

d. Property Kept in the Battery Supply Room.

(1) The battery commander should minimize the amount of supplies and equipment that is habitually kept in the battery supply room. Property receives better care and more efficient use when it is signed out to the chief of section who is responsible for its normal use; however, the chief of section should not be forced to accept items which will not be used. Seasonal items or items used only in special situations should be retained in the supply room. Items which are of no use to the unit or are surplus should be reported and a request should be made for permission to turn them in.

(2) Supply rooms should be well constructed. Windows should be protected by bars or heavy screen and doors should have substantial locks.

(3) Weapons must be kept under triple lock.

(4) Paint, oil, lubricants, and other highly inflammable materials should be kept in a separate inclosure which is at least 50 feet from any building.

29. Relief From Property Responsibility

The battery commander has several courses of action for relief from responsibility when battery property has been damaged, destroyed, or lost. The action taken depends upon the circumstances of the loss. The methods of relief are the report or survey, the statement of charges, declaration of fair wear and tear, and quarterly operational breakage and loss report (quarterly droppage). For a detailed discussion of relief from property responsibility, see AR 735–10 and AR 735–11.

Section IV. MESS ADMINISTRATION

30. Mess Management

Mess management is the supervision and control of the mess to the end that soldiers are provided with nourishing, satisfying food. *Good mess management helps build good morale.* The battery commander is responsible for the management of the battery mess. He should delegate to a battery officer the duty of mess officer, who must give close and constant supervision to the mess to insure that food is properly prepared, waste is avoided, equipment is properly cared for, and high standards of sanitation are maintained. See TM 10–402 for a detailed discussion of mess management.

31. Duties of the Mess Officer

The mess officer exercises direct supervision over the functions of the battery mess. The mess officer does not manage the cooks and other mess personnel directly, but works through the mess steward. As a guide, the duties and responsibilities of the mess officer are to—

a. Obtain subsistence, equipment, and supplies necessary for the operation of the mess and feeding of the troops.

b. Make frequent inspections of the mess to insure that all subsistence is properly stored; that the menu is being followed or that only authorized substitutions are made; that the cook's worksheet is being followed for details of preparing, cooking, and serving; that leftovers are kept to a minimum and utilized to the fullest extent; that all mess equipment is properly maintained and utilized; that all phases of sanitation are enforced; and that mess records are properly kept.

c. Encourage all mess personnel to further their training and improve themselves in the performance of their duties.

d. Sample foods and inspect them frequently to determine their palatability and attractiveness.

e. Insure that continuing effort is made to make the serving methods, the food itself, the equipment, and the area as attractive as possible.

f. Discourage hoarding.

32. Field Messing Operations

a. General. Messing in the field is the most diffi-

cult of all military feeding operations. It is a challenge to the skill and ingenuity of mess personnel whose goal is to make the field mess as much like the garrison mess as the situation permits. The general rules of mess management apply to field messing operations. Rules of sanitation must be rigidly enforced since the possibility of dysentery or food poisoning is always present. The mess steward must be able to utilize available facilities and to improvise expedients to accomplish tasks for which no facilities are provided.

b. Location of the Mess. The tactical situation will dictate whether the battery mess is located within the battery position area or to the rear with the service battery or battalion train. Location of the mess within the battery position area allows more efficient preparation and serving of food and permits the majority of battery personnel to be served three hot meals a day. Location of the mess to the rear with service battery is advisable when the forward batteries are in exposed positions or are displacing very frequently. The menu must be checked with foresight to insure that it will fit the situation and modifications should be made when necessary. For instance, substitute biscuits for rolls when the battery is in a fast moving situation. Schedule scrambled eggs instead of "eggs to order" on mornings when time will be short.

33. Types of Field Messing Operations

a. In Rear Areas. When the battery is located

far enough to the rear to be temporarily safe from attack and when it is expected that the position will be occupied for a period of weeks or months, the battery mess may be established on a semipermanent basis. Expedients may be devised to take the place of equipment and facilities not available and facilities may be so improved that messing operations may be conducted in almost the same manner as in a fixed installation. For a discussion of the layout of a semipermanent mess area, see TM 10–402.

b. In Forward Areas. When the battery is located well forward, in exposed areas, or subject to frequent movements, the battery mess is established on a temporary basis. Equipment must be set up quickly, and only temporary expedients can be devised. There is little time for improvement of facilities. Small details of men outside the battery area may be fed by having their meals delivered in insulated containers. In order for the mess to stay with the battery, it is necessary for it to be completely mobile. This may be accomplished, when authorized, by converting a 2½-ton truck for exclusive use as a mess truck. When such a mess truck is properly used, it is possible to cook the bulk of the meal while on the road and to serve from the truck when the battery is in position (fig. 1). This will enable the mess section to march order as fast as other sections of the battery. See TM 10–402 for details in setting up a kitchen truck.

c. Water. Attention must be given to the resupply of water. The need for refilling the water

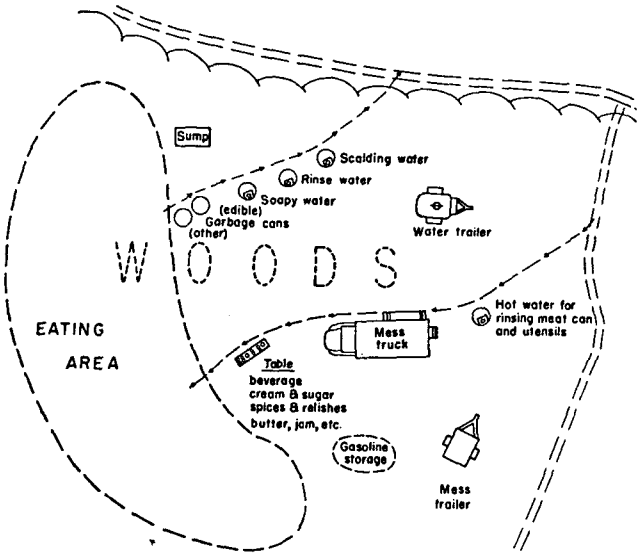


Figure 1. Layout of field mess area.

trailer must be anticipated and the location of the water supply point predetermined so that the preparation of a meal will not be delayed because of a lack of water. Supplementary water containers should be kept filled. Periodically, the mess steward should request the chiefs of section to bring in their section water cans so that the water may be used and the cans refilled with fresh water.

Section V. MAINTENANCE, GENERAL

34. Command Responsibility

The battery commander is responsible for the

maintenance and proper use of all equipment issued or assigned to the battery.

35. Direct Responsibility

Direct responsibility for maintenance is placed on individuals to whom equipment is entrusted for their personal use or for the use of their subordinates. Direct responsibility may be either personal or supervisory. Each individual has personal responsibility for the proper use and care of his individual clothing and equipment and any other equipment issued to him for his own use or under his care. Each section chief and battery officer has supervisory responsibility for all equipment used by his command.

36. Preventive Maintenance

Preventive maintenance is the care and servicing of equipment, including systematic inspection, detection, and correction of incipient failures, either before they occur or before they develop into major defects. Each user, wearer, or operator of equipment must be trained in the proper preventive maintenance of such equipment. Sufficient time must be allotted to insure the proper application of preventive maintenance services.

37. Equipment Abuse

Some common abuses of equipment are—

a. Improper or negligent use or operation of equipment.

b. Lack of lubrication, overlubrication, or use of unauthorized lubricants.

c. Lack of adequate maintenance inspections.

d. Deferred maintenance, including lack of proper servicing and adjustments.

e. Attempted repairs by unqualified personnel.

f. Improper use of tools and failure to use the proper tool for the job.

g. Improper transporting and storage of equipment.

38. Specific Maintenance Instructions

The field manual, technical manual, lubrication order, and other appropriate technical publications for each item of equipment prescribe specific maintenance procedures for the equipment.

39. General Care and Cleaning Instructions

a. Weapons. Rust, dirt, grit, gummed oil, and water cause rapid deterioration of all parts of the weapon. Particular care should be taken to keep all bearing surfaces and exposed unpainted parts clean and properly lubricated. Cleaning solvents, soap and water, or volatile mineral spirits may be used to clean all metal parts of weapons except those that have been exposed to powder fouling during firing. Gasoline will not be used for cleaning purposes. Rifle bore cleaner is used to clean tubes, barrels, breechblocks, and other parts that have been exposed to powder fouling during firing. After parts are cleaned and dried, a light coat of oil is applied to all unpainted metal surfaces to prevent rusting. Particular care must be given to cleaning after firing. Immediately after firing, and for three consecutive days thereafter, tubes or

barrels and other parts exposed to powder fouling are thoroughly cleaned with rifle bore cleaner leaving the bore cleaner on the parts. On the third day after firing, the parts are thoroughly cleaned with bore cleaner, dried, and given a light coat of oil.

b. Optical Equipment. The exterior working parts are the only mechanical parts of optical equipment that battery personnel are permitted to clean. Instruments in constant use should be given a general cleaning at least once each day. Exposed bearing surfaces and unpainted surfaces are wiped clean and a light film of the proper oil is applied. Excess oil which may seep from interior working parts is wiped off to prevent the accumulation of dust and grit. Rubber eyeshields should be removed and cleaned with mild soapy water and rinsed, dried, and lightly dusted with talcum. The exposed surfaces of lens and other glass parts should be kept clean and dry to prevent corrosion and etching of the surface of the glass. Liquid soap, lens cleaning tissue, and camel's hair brushes are issued for cleaning optical glass. Under no circumstances should polishing liquids, pastes or abrasives be used for polishing lenses and glass parts. Do not wipe lenses with the fingers or cleaning cloths. Some optical instruments are provided with grease fittings; however, these instruments are to be lubricated only by technical service personnel. If doubt exists as to the proper maintenance procedures, refer to the appropriate technical manual or consult technical service personnel.

c. Communication Equipment. Communication equipment should be kept clean, free of dust, rust, or corrosion. Operator maintenance should be performed regularly, using the appropriate technical manual as a guide. All batteries should be removed from equipment not in use.

Section VI. MOTOR MAINTENANCE

40. Responsibility

a. The battery commander is responsible for the maintenance of motor vehicles and their equipment and tools. He coordinates and controls all maintenance operations. He must designate functions of maintenance personnel, set definite and attainable maintenance standards, provide for the training of maintenance personnel and drivers, allot sufficient time for maintenance, and frequently inspect vehicles and maintenance operations. He may delegate maintenance functions to the battery motor officer, motor sergeant, and other personnel, but must assure himself of their proper performance and the effective supervision of maintenance by his battery officers and section chiefs.

b. The chief of section is responsible for the proper use and maintenance of all vehicles assigned to his section. He should personally supervise the performance of preventive maintenance services. Crew maintenance should be emphasized by assigning section members to assist the driver in performance of preventive maintenance services.

41. Preventive Maintenance

a. Preventive maintenance is the keystone of efficient battery motor maintenance. The TOE for each unit authorizes sufficient personnel and equipment to perform the maintenance for which the unit is responsible. Preventive maintenance services, procedures, and records for motor vehicles are discussed in TM 9–2810 and the technical manuals for each vehicle. Organizational preventive maintenance consists of first and second echelon maintenance operations.

b. First echelon maintenance is performed by the driver or by the driver and crew. The driver and crew may be assisted by battery motor maintenance personnel in the performance of certain first echelon operations. First echelon maintenance consists generally of—

(1) Daily and other scheduled services.
(2) Inspection.
(3) Servicing and tightening.
(4) Lubrication.
(5) Care of tools, equipment, and accessories.
(6) Cleaning.
(7) Emergency roadside repairs and minor adjustments.

Note. For further details of first echelon maintenance, see TM 21–305 and TM 21–306.

c. Second echelon maintenance is performed by battery and battalion motor maintenance personnel. Maintenance personnel should be assisted by the driver, who should be present whenever his vehicle is being worked on. Second echelon main-

tenance operations performed at battery level consist generally of—

(1) Run-in tests prior to operation of new vehicles.

(2) Lubrication and adjustments.

(3) Scheduled maintenance operations as prescribed in TM 9–2810 and the vehicle technical manual.

(4) Minor repairs and assembly replacements as authorized in appropriate technical manuals. (Normally, spare parts are carried in battalion maintenance section.)

(5) Battlefield recovery.

Note. In a separate battery, second echelon operations normally performed by a battalion maintenance section are performed by the battery maintenance section.

42. Vehicle Drivers

a. Inadequate mobility is most often the fault of poorly trained drivers and improper first echelon maintenance. The *driver* is the *key individual* in the preventive maintenance program. Incompetent or careless drivers can nullify all efforts to properly maintain vehicles.

b. Drivers must be carefully selected. Prospective drivers must be able to pass a *Drivers Physical Aptitude Test* and should be interviewed by the battery commander before receiving driver training. Good driver training results from careful planning, thorough instruction, and supervised

practice. For details of driver selection and training, see TM 21–300.

c. Every effort should be made to lend a measure of prestige to the duty of driving. This may be done, in part, by such actions as—

(1) Suspending or revoking the license of a driver who receives punishment or who violates driving rules.

(2) Assigning each vehicle a driver and assistant driver. Only the assigned driver or assistant driver should be allowed to operate the vehicle except in emergency.

(3) Paying particular attention to drivers in training and critiques.

(4) Awarding Motor Vehicle Driver's or Mechanic's Badges when merited (AR 600–70).

43. Maintenance in the Field

a. Motor maintenance operations in the field are made more difficult by adverse conditions of climate and terrain, the lack of shop conveniences, and the strain of combat on both the men and equipment. Maintenance must be scheduled and performed so as to permit rapid movement of the battery on short notice without the loss of vehicles. Close supervision of maintenance is necessary, especially the driver's preventive maintenance services. Extended field operations demand continuous maintenance of vehicles. The intervals between scheduled preventive maintenance services may be decreased to meet the increased maintenance requirements.

b. The battery motor park should be located in an area which is well-drained and provides concealment for personnel and equipment. There should be a minimum of traffic in and through the area. The area selected for the battery maintenance section is located in the motor park and should be flat and as dry as possible. A water source is desirable, but care must be exercised to insure that it is not used as a dump. Pits should be dug for waste disposal. Time permitting, pits should be dug for protection of gasoline and lubricants. Vehicles must be parked so they can move out of the area without backing.

44. Field Expedients

a. General. Field expedients are often necessary when the battery is operating over difficult terrain and during conditions of inclement weather. Field expedients are devices or techniques that will assist in accomplishing the mission without damage to equipment. The successful use of field expedients requires imagination and the ability to improvise. Detailed discussions of field expedients are contained in TM 21–305 and TM 21–306. Some basic field expedients are discussed below.

b. Water Crossing. In the absence of bridges or fords, rafts may be used for crossing large streams or rivers. Rafts may be constructed of logs, oil drums, gasoline cans, or various combinations of whatever material is available. Lighter vehicles may be floated across tranquil water by wrapping the bottom and sides in a tarpaulin. Overhead cable may be used to move vehicles

across ravines or streams in mountainous or wooded country. As a rule of thumb, the cable used should have a rated capacity of twice the weight of the load to be supported and sufficient cable sag should be allowed to prevent undue strain on the cable (TM 21–305).

c. Mud Crossing. Crossing most muddy areas with a vehicle requires increased flotation and traction. Flotation may be increased by using mats constructed of small logs, bundles of brush, or chicken wire, for example. Partial deflation of tires also increases flotation. Tire chains, grousers, and similar devices may be used to increase traction. The use of such expedients must be anticipated and the equipment should be installed or put in position before the crossing is attempted.

d. Winching. Vehicle winches provide valuable assistance for difficult crossings, for ascending and descending steep slopes, and for freeing mired vehicles or guns. They are also of assistance in emplacing guns in difficult terrain. The vehicle technical manual should be consulted for proper procedures. The rated capacity of winch must not be exceeded. The mechanical advantage may be increased through the proper use of snatch blocks or pulleys. Improvised capstans may be attached to the rear wheel as a substitute winch for those vehicles not so equipped.

e. Ice and Snow. Ice and snow conditions present individual problems. Traction devices may be successfully used in snow or soft ice. They should not be used on glare ice. Decreasing ground pres-

sure by partially deflating the tires assists in traversing ice.

f. Sand. Crossing sand presents the same type of problem as crossing mud. Wetting loose sand will assist by packing it.

g. Steep Slopes. Steep slopes may be ascended by adding weight to the vehicle to increase the traction, by using the winch, or by using vehicles in tandem.

Section VII. SANITATION

45. General

The purpose of military sanitation is to keep soldiers healthy and to prevent the spread of disease. The battery commander is responsible for enforcing sanitation regulations within the unit and within the boundaries of the battery area. He must insure that all personnel are instructed in the basic principles of hygiene and sanitation. Instructions covering all aspects of military sanitation are given in FM 21–10. The principles of hygiene and sanitation must be rigidly enforced in the field. The lack of permanent facilities makes sanitation in the field more difficult than it is in garrison. The major sanitation problems confronting the battery commander during field operations are mess sanitation, water supply, personal cleanliness, insect and rodent control, and disposal of human waste.

46. Mess Sanitation

a. General. Proper mess sanitation procedures must be followed at all times. Whenever sanitary discipline is relaxed in mess operations, an epidemic of diarrhea or other intestinal diseases is almost sure to occur. FM 21–10 gives a detailed discussion of mess sanitation requirements and procedures.

b. Garbage Pits. Garbage may be buried in pits or a trench when the position is to be occupied for less than one week. A garbage pit to serve for 1 day should be about 1.2 meters square and 1.2 meters deep. A continuous trench may be used instead of a pit, but each deposit should be covered. The trench should be 0.6 meters wide, 1.2 meters deep, and as long as necessary. When a pit is filled with garbage to within 0.6 meters of the top, it should be filled in with dirt, domed, and marked. When a position is to be occupied for an extended period, a sanitary fill should be established outside the battery area. This is normally accomplished by the battalion.

c. Burning Garbage. Burning is an acceptable method of disposing of combustible garbage. This method is not employed when the smoke might give information to the enemy. FM 21–10 gives details of construction for several types of incinerators.

d. Liquid Waste. Liquid kitchen wastes should be disposed of in a soakage pit. The soakage pit should be about 1.2 meters square, 1.2 meters deep, and filled with rocks, broken bottles, or flattened

tin cans., The liquid must pass through a grease trap (FM 21–10), before entering the soakage pit. If the position is to be occupied for more than 2 weeks, 2 soakage pits should be constructed and used alternately. Getting rid of liquid wastes by merely digging a hole and pouring them into it is not satisfactory, unless it is covered after each deposit. This method may be used when the position is to be occupied for a short time.

47. Field Water Supply

a. General. Impure water serves as the means of transmission for many diseases. Water from streams, shallow wells, ponds, swamps, and lakes is especially likely to carry disease organisms. *All water* from any source other than the approved water supply point must be considered unsafe for drinking until tested and approved by medical personnel or properly treated.

b. Purifying Water. The battery will normally obtain its water from a designated water supply point. Water for the battery is transported in the 250-gallon water trailer and 5-gallon water cans. The water carried in the water cans must be changed regularly. When no source of purified water is available, the battery must test and treat its own drinking water with equipment issued for these purposes. This is an emergency measure and should not be allowed when an approved water supply is available. Small amounts of water may be purified by boiling it for at least one minute.

c. Water Requirements. Climate, types of work being done, and the general conditions of the posi-

tion area dictate the amount of water needed by the unit. Men in the field cannot be kept in good health, over extended periods of time, with less than 1 gallon of water per man per day for drinking, cooking, and washing; however, 5 gallons of water per man per day is the average requirement. If one position is occupied long enough to permit the mess to be established on a semipermanent basis, the daily requirement for water will be further increased.

48. Personal Cleanliness

a. General. High standards of personal cleanliness, appearance, and hygiene must be maintained in the field as well as in garrison. Besides helping to keep soldiers healthy and to prevent the spread of disease, facilities for showers, laundry, and haircuts help to build high morale. Rules of personal hygiene that should be followed are discussed in FM 21–10.

b. Laundry and Bathing Facilities. Facilities for laundry and bathing should be improvised whenever they are not otherwise available. A running stream or other body of water may be used for these purposes when approved by medical personnel. Improvised showers with at least 2 showerheads for every 100 men are especially desirable. Improvised showers may be used during cold weather by adapting a heated tent for use as a shower tent. Hot water for washing and shaving should be provided each morning. This may be accomplished by centrally locating a large can or drum of water, heated by a standard immer-

sion heater. The battery commander should insist on personnel shaving every day.

c. Haircuts. A soldier volunteer should be appointed to give haircuts to battery personnel in the field.

49. Insect and Rodent Control

Proper attention to sanitary measures will reduce the incidence of insects and rodents in the battery area. Specific measures such as screens, spray, powder, and traps are to be used as necessary. In certain geographical areas, special equipment, such as protective clothing, will be issued.

50. Disposal of Human Waste

a. Latrines.

(1) Latrines should be located on the side of the position area opposite to prevailing winds, at least 100 meters from the battery mess, at least 30 meters from the nearest tent, and so located that drainage is not toward a water supply. Latrines should not extend below ground water level. Hand washing facilities should be placed near the latrine. A shovel must be provided so that each deposit may be covered. Latrines must be properly closed and marked when they become filled or when the position area is vacated. See FM 21–10 for details of construction and use of various types of latrines and urinals.

(2) Straddle trench latrines are used when the battery occupies a position for a short time. Straddle trenches are dug 0.3 meters wide, 0.75 meters deep, and 1.2 meters long. A length of 0.6 meters is allowed per man for a minimum of 8 percent of the battery. For example, there should be 4 such 1.2 meter trenches for 100 men.

(3) Deep pit latrines should be constructed when the battery occupies a position for an extended period of time. The standard latrine box (FM 21–10), which is 2.4 meters long and seats 4 men, may be built by the battery. Seating should be provided for 8 percent of the battery. For example, 2 standard latrine boxes are needed for 100 men. The depth of the pit varies with the length of time the latrine will be used. As a guide, allow 0.6 meters for cover and 0.3 meters of depth for each week of use. The pit must be flyproofed and the latrine box must be scrubbed daily with soap and water.

b. Urinals.

(1) If a deep pit latrine is constructed, a urine trough may be installed in the latrine to drain into the pit. The trough should slope toward the draining end and should be 3 meters in length for every 100 men.

(2) Separate urine soakage pits with improvised urine tubes inserted into them may be used, especially if the deep pit latrine absorbs liquids poorly. For convenience, several soakage pits may be established, scattered throughout the position when elements of the battery are dispersed. A soakage pit 1.2 meters square and 1.2 meters deep, filled with rock, broken bottles, or flattened tin cans, will accommodate 200 men for an indefinite period. Metal ammunition or powder containers or fiber tubes may be adapted for use as urine tubes by removing or perforating the closed end, inserting that end at least 0.2 meters into the pit, and placing a funnel-shaped piece of screen in the open end.

Section VIII. INSPECTIONS

51. General

Inspections are conducted to observe the appearance and state of training of personnel; to determine the adequacy of living quarters, the efficiency of battery administration, and the condition of equipment; to detect faults; and to disclose the degree of compliance with prescribed standards. The purpose of inspection of equipment is to insure that operation, use, maintenance, and supply will meet the demands of combat. Inspections are a function of command and are made by the battery commander or for him by person-

nel charged with that duty. An inspection must have a definite objective and must be conducted by qualified personnel. Defects, deficiencies, abuses, or other unsatisfactory conditions or procedures disclosed by inspections should be corrected immediately by responsible personnel. Inspections, followed by appropriate corrective action, will help to—

a. Insure efficient use of equipment.

b. Correct deficiencies in progress and quality of training.

c. Insure high standards of appearance and conduct of personnel.

d. Disclose and correct misuse of vehicles, tools, weapons, and other equipment.

e. Insure adherence to prescribed maintenance procedures and standards.

f. Insure completeness and accuracy of administrative records, reports, and procedures.

g. Insure adequacy of supply and mess.

52. Types of Inspections

a. Formal. There are two types of formal inspections, command and technical.

(1) Command inspections are conducted by all commanders to determine the appearance and state of training of personnel, the condition and use of equipment and supplies, and to insure that personnel are complying with established procedures and regulations. Formal command inspections are scheduled and announced

in advance. In garrison, the battery commander will usually conduct a formal command inspection once each week.

(2) Technical inspections are performed by the technical services at the request of higher headquarters. These inspections determine the degree of compliance with prescribed standards of use and maintenance of equipment.

b. Informal. The battery commander conducts frequent informal inspections of facilities, equipment, administrative records, and maintenance. Informal inspections are most effective when they are unannounced. This type of inspection is one of the most useful means the battery commander has of determining the true condition and functioning of the battery.

CHAPTER 3
MARCHES AND BIVOUACS

Section I. GENERAL

53. General

a. The tactical employment of artillery requires frequent and timely movements by artillery units. The ability to move rapidly and efficiently is essential to the performance of the artillery mission. A successful march places the troops and equipment at their destination at the proper time and in condition to accomplish the assigned mission.

b. Every battery should have a standing operating procedure (SOP) covering marches and bivouacs. Proficiency in marching is attained only through extensive training and experience.

c. A detailed discussion of various types of marches and bivouacs is given in FM 6–101. Detailed techniques of motor movements is covered in FM 25–10.

54. March Discipline

a. March discipline is attained through training and through internal control within the marching unit. It is indispensable to the effectiveness of the march column. The specific objective of march discipline is to insure intelligent cooperation and effective teamwork on the part of all march per-

sonnel. Such cooperation and teamwork can be attained only by thorough training, constant supervision by every officer and noncommissioned officer, practical experience in marching, and meticulous attention to the details of technique listed below.

(1) Correct driving.

(2) Immediate and effective response to all signals and orders.

(3) Prompt relaying of all visual signals.

(4) Strict obedience to traffic regulations, rules of the road, and the instructions of traffic control and command personnel.

(5) Effective use, as prescribed, of cover, concealment, camouflage, dispersion, radio silence, blackout precautions, and other protective measures against air, ground, armor, or chemical, biological, radiological (CBR) attack.

(6) Correct speeds, distances, and positions within the column.

(7) Observance of the rules of hygiene; some of the more important of which are—

(*a*) No food or drink should be obtained from local sources unless authorized by proper authority.

(*b*) Paper, garbage, and other debris must not be thrown from the vehicles during a march, but should be retained until proper disposal can be made.

(*c*) Proper latrine and sump facilities must be made available at halts and must be

properly closed and marked before departure.

(8) Proper care of equipment.

b. The responsibility for good march discipline begins with the driver of each vehicle and increases with each commander charged with internal control. Their duties are briefly, as follows:

(1) The driver of each vehicle is responsible for observing the proper distance and speed, for exercising safety precautions, for good driving, for the performance of prescribed first echelon maintenance, and for the strict observance of all requirements of SOP or specific orders for the march.

(2) The assistant driver should be constantly on the alert for signals and warnings and for signs placed along the road. He warns the driver and transmits the information to the next vehicle in the column when appropriate. This is particularly important at night or during periods of poor visibility. He should assist the driver in every way possible; such as, following the strip map, helping the driver stay awake, assisting in at-halt maintenance, and helping with emergency repairs.

(3) Section chiefs supervise the actions of their drivers, giving particular attention to the spacing of vehicles and the performance of first echelon maintenance.

(4) The first sergeant, the chief of firing battery, and the chief of detail supervise the actions of the section chiefs, giving them such instructions as may be required for the proper functioning of their sections.

(5) The march unit leader or commander gives the orders to move or halt and exercises general supervision over the conduct of his unit. He is responsible for maintaining the proper position of his column within the larger column and for executing the orders of the column commander.

(6) Higher commanders in a convoy, column, or serial are successively responsible for their units, the responsibility becoming broader and more general in nature at each higher level of command.

55. Loading Plans

Loading plans for motor movements should be available for all batteries. If a loading plan is not prepared or specified by battalion headquarters, each battery should prepare its own. There is no standard loading plan that will meet the requirements of every battery. A loading plan may be devised by considering the mission, personnel, SOP, and equipment of the battery. The purpose of a loading plan is to efficiently load personnel and equipment for movement. Steps in preparing a loading plan include—

a. Examining the battery TOE to determine the

breakdown of personnel, equipment, and vehicles authorized for each section.

b. Including all non-TOE property that must be transported by the battery. When possible, this equipment should be carried with the sections responsible for its use.

c. Considering the mission of the unit, and preparing a loading plan that lists the personnel and equipment to be carried in each vehicle. Section integrity should be maintained. Devise procedures for the most efficient loading of the equipment in each vehicle.

d. Practicing loadings to test the validity of the prepared loading plan, and adjusting the procedures where necessary.

e. Providing a copy of the loading plan for each chief of section. Extract from the loading plan a loading list for each vehicle, and keep this list in the vehicle at all times.

f. Loading defensive weapons so that they are dispersed throughout the column and available for immediate use.

Section II. MOTOR MARCHES

56. Battalion Control

Normally, the battery marches and bivouacs as an element of the battalion. When marching with the battalion, the battery conforms to the orders and instructions issued by the battalion commander. A battalion warning order is issued to the battery prior to the march. The battery commander

coordinates preparation for the movement and outlines to his subordinates the necessary preparatory measures to include preparation to break camp and load vehicles, vehicle maintenance, feeding and fueling arrangements for the march, preparation of advance parties required by the battalion, and any other special instructions not covered by the unit SOP. The battery commander issues his march order based on the battalion order. Section chiefs and drivers should be briefed on the routes and destination, and each driver should be issued a route map. The battery commander insures that all preparations are complete before the march is begun, and that the area he is evacuating is left in a clean and sanitary condition. The battery column then moves to cross the initial point (IP) at the prescribed time.

57. Battery Control

a. When the battery is detached from the battalion and is operating independently, the battery commander assumes the responsibility for planning, reconnaissance, marking of routes, and execution of marches as indicated for the battalion commander in FM 6–101.

b. When attached to an infantry battle group or other maneuver element, the battery executes the march as directed by the commander of the unit to which attached. In general, the techniques used when marching as part of the battalion apply.

58. Communication

Communication during the march is ordinarily

regulated by the SOP of the battalion and of the battery. During administrative marches, messengers, battalion control points, and radio may be used. During tactical marches, radio silence may be imposed. If the column is allowed to use radio communication during a tactical march, clear text messages that might reveal the location of the column should be avoided. The use of prearranged codes and indexed maps should be emphasized. The location of the battery commander should be known at all times by the person leading the battery column in order that messengers may be directed to him.

59. Control Identification of Vehicles

It is often desirable to mark or otherwise designate vehicles of the column for internal, as well as external, control purposes. Such identification is subject to local conditions and is usually specified in SOP. Marking should be kept to the minimum consistent with its necessity for column control. Markings of a temporary nature should be easily removable.

a. Unit Flags and Symbols. Security permitting, headquarters vehicles may display guidons. Message center vehicles may be indicated by distinctive symbols or panels displayed on the front, rear, top, and sides. When necessary for security reasons, guidons may be cased and symbols or panels may be covered or removed.

b. Cloth Control Indicators. Control vehicles of columns may be indicated by cloth panels or flags

attached to their front or rear. The following colors are standard:

(1) Blue—head of a serial or unit.
(2) Yellow—head of sub-unit (if any are present).
(3) Brown — tail of sub-unit (if any are present).
(4) Green—tail of a serial or unit.
(5) Red—danger or explosives.
(6) Black and white checkered — priority movement.

c. Serialization of Vehicles. Individual vehicles within the main body of the column may be numbered serially to facilitate formation of the column and identification of individual vehicles. Numbers may be drawn on the sides and bumpers of vehicles with chalk or indicated by prepared signs.

60. Administrative March

a. An administrative march is a nontactical movement, conducted in an area of relative security, such as the communication zone or, under favorable conditions, in the rear area of the combat zone. The battery commander usually marches at the head, and the motor officer at the rear, of the column. The battery commander may supervise the march by taking a position to one side of the road where he can observe the vehicles as they pass, or he may patrol the column. The battery executive is usually the leader of the column. If signs, such as Convoy Follows and Convoy Ahead, are used, they should be placed on the battery executive's vehicle (or the permanent lead vehicle)

and the rear vehicle (not the maintenance truck). The maintenance truck should not be considered as part of the column. It follows the column and will often be some distance behind since it will stop with any vehicle which has to fall out of the column.

b. The battery commander inspects his column continuously to see that—

(1) Prescribed speeds and distances between vehicles are maintained.

(2) The vehicles in the column are operating effectively.

(3) All vehicles are present, or that the motor maintenance section is attending to disabled vehicles.

(4) Personnel in the vehicles are maintaining the required standards of march discipline.

c. During halts in an administrative march, the vehicles usually close up in column to an interval of about 3 meters between vehicles and, if possible, pull off the road on the right shoulder. The battery commander inspects his column at the halt to see that—

(1) Guards, warning flags, caution lights, or flares are posted at the front and rear of the column distant enough to give timely warning to traffic.

(2) All personnel dismount and exercise briefly. (This is very important in cold weather.)

(3) Drivers are performing the required maintenance.
(4) The motor maintenance section is carrying out its duties.
(5) Vehicles rejoining the column regain their proper position.
(6) Personnel stay away from the traffic side of the column.
(7) The area of the halt is thoroughly policed prior to resuming the march.

d. In areas where enemy air attack may be expected, the following precautions must be taken:
(1) Each vehicle should have one or more air guards posted to give warning in case of attack.
(2) Vehicular mounted air defense machineguns must be ready for use.
(3) Vehicles must not close up at halts.
(4) Halts should be made in areas providing concealment or room for dispersion of vehicles.
(5) During halts, personnel should dismount and remain off the road, except those manning air defense weapons.

61. Tactical March

A tactical march is a movement made under combat conditions. The principles for administrative marches apply to tactical marches with the following additions:

a. The battery must be combat loaded and prepared to go into action from the march column at any time.

b. When contact with the enemy is imminent, reconnaissance for firing positions is continuous.

c. Security against possible enemy action is emphasized. During halts, flank guards should be posted to protect the column from surprise attack.

d. The battery commander and a reconnaissance party usually march with the battalion commander during a tactical march.

e. The battery executive officer normally commands the battery column during a tactical march. The motor officer rides at the rear of the column.

f. The howitzers (guns) should follow immediately behind the lead vehicle. The rest of the column should follow in order of vehicle size, with the largest following the prime movers. This is advisable for two reasons. First, vehicles which could serve as alternate prime movers for the howitzers will be more readily available. Second, the slowest moving vehicles will be in front, thus making it easier to maintain the prescribed interval and rate of march. If a prime mover should break down, the first available alternate prime mover should pick up the weapon, crew, and ammunition and continue the march.

g. The entire column must not be halted because of the breakdown of a single vehicle. It is especially important that all the howitzers be kept with the column at all times. When any vehicle breaks down, the equipment and personnel essential to the accomplishment of the mission must be transferred to some other vehicle with minimum delay. The driver of a disabled vehicle stays with the ve-

hicle until it can be repaired or replaced. The crew of the maintenance vehicle must not confine their attentions to any vehicle which cannot be repaired in a short time. Such a vehicle should be reported to battalion, or, if operating as a separate battery, to whatever unit is furnishing logistical support, and the maintenance truck should proceed along the march route so as to be available to the whole battery.

h. A battery may march as an element of the advance guard during the movement of a task force. When the battery has this mission, the battery commander and reconnaissance party usually march with the advance guard commander. It is vital that at least a map reconnaissance be performed prior to the march in order to detect critical areas, such as dangerous crossroads, inadequate bridges, and areas where vehicles would not be able to disperse off the road. A route reconnaissance by vehicle or aircraft should be made prior to the march if possible.

Section III. SECURITY DURING MARCH

62. General

Artillery is particularly vulnerable to attack when on the march. Its vulnerability increases when moving into or out of a position or bivouac, and when it is confined to a road by steep banks, bridges, or mud. Artillery units should expect and be prepared for any attack during the march. Each battery should have plans for defense and counterattack from the march column as part of

its SOP. These plans should include mutual support with any other march unit which might be present.

63. Hostile Artillery Fire

The battery can take little action against hostile artillery fire during the march except for reporting it to higher headquarters. Selection of routes to avoid dangerous areas, camouflage, and movement by open column or infiltration are passive means of defense.

64. Air

Defense against air attack during the march will be primarily a matter of unit SOP and training. Marching at extended intervals or by infiltration can be employed where the situation permits. Air defense weapons, if available, marching with the battery and dispersed throughout the column, and vehicular mounted machineguns provide the best active means of defense from air attack. If the terrain permits, the battery should pull off the road, disperse, and bring the fire of all appropriate weapons to bear on the attacking planes. If the terrain does not permit dispersion, as in a defile, the column may continue the march until it can disperse, halt, and take up more active defense.

65. Roadblocks

Roadblocks should be avoided if possible. When reconnaissance or security elements report a roadblock, the report should be relayed to battalion

and the column should be rerouted. If the battery finds itself engaged with a roadblock, the obstruction should be reduced by force. In doing this, the battery should use such force as is necessary, to include direct or indirect fire by the artillery pieces, concentrated fire by available automatic weapons, and direct or flanking attack by a security force from the battery. No attempt should be made to move through the roadblock until it has been reduced by fire and checked for mines. Roadblocks are usually mined, and an attempt to crash through them with vehicles before checking for mines may result in unnecessary loss of equipment and a complete blocking of the road by disabled vehicles.

66. Ambush

If the battery is attacked by surprise while moving, the battery commander must make a rapid estimate of the situation and decide his course of action. Ambushes are often used in conjunction with roadblocks. If there is no roadblock, the battery commander may attempt to move his unit clear of the affected area by keeping the unit in column and increasing the speed. When this course of action is followed, the moving column should place the maximum amount of small arms and automatic weapons fire on the attackers. Some self-propelled units will be able to place direct artillery fire against the attacker without delaying the column. If the ambush is accompanied by a roadblock, the column should be halted, pulled off the road, dispersed under available cover, and positive, offensive action taken. Direct fire should

immediately be placed on the attacking forces. The piece nearest the roadblock should begin reducing the obstruction by direct fire. All available automatic weapons and small arms fire must be employed, and the battery security force (par. 72*c*) may attack as infantry to hold or drive off the attacking force. As soon as the roadblock is cleared, the battery should fight its way clear of the ambush. The battery should not allow itself to become engaged with a stronger force or to pursue the enemy if they withdraw. An immediate report of the enemy contact should be made to the next higher command.

67. Tank-Infantry Attack

If the battery is attacked by tanks supported by infantry, the battery commander must take immediate steps to bring all of his firepower against the attacking force to prevent his battery from being overrun. Direct fire from artillery pieces is effective against both tanks and infantry. Rocket launchers are particularly effective against tanks at short range. These fires, supplemented by the fires of all available small arms and automatic weapons, constitute the best protection against a tank-infantry attack.

Section IV. BIVOUACS

68. General

When the battery is to go into bivouac, quartering parties under battalion control are sent ahead of the column. The quartering parties ar-

range details of supply, select specific areas for elements of the battery, and receive their units at the bivouac area. On arrival at the bivouac area, the battery commander supervises the prompt and orderly clearance of his vehicles from the road and their arrangement within the assigned area. He inspects the battery arrangement, security measures, and sanitary provisions laid out by the quartering party and makes any necessary changes. He checks to see that all vehicles have arrived, or that the maintenance section is aiding those that have not yet arrived. He verifies that after-operation maintenance is being performed on the vehicles and checks the condition and comfort of his men.

69. Security

The battery bivouac area is organized for defense as discussed in chapter 4. Batteries whose weapons have a direct fire capability dispose their pieces to provide all-around direct fire coverage of the bivouac area. All batteries prepare all-around protection using all available automatic weapons and small arms. Priorities for the organization of a bivouac area are the same as for a normal organization of position. Cover, camouflage, and dispersion are especially important in bivouac areas to prevent detection by the enemy.

Section V. MOVEMENT BY RAIL, WATER, OR AIR

70. Preparation

a. Normally, the battery moves by rail, water,

or air as an element of the artillery battalion or with a supported unit. In any case, the battery receives detailed instructions in the form of movement orders, or pertinent extracts therefrom. Warning orders, or alert instructions, give the battery sufficient information of the impending movements on which to base plans and take the necessary preliminary action.

b. The battery commander is responsible that the battery is in the prescribed state of readiness at the time indicated in the movement orders. The state of readiness may include personnel and administrative arrangements and adjustments; attainment of a prescribed standard of training; and possession of combat serviceable clothing, materiel, and equipment. Movement orders will specify the equipment that is to be left at the home station; that to be preshipped; that to accompany troops; and exact details for packing, crating, marking, and loading of equipment and for processing paper work.

c. Loading plans for air movement should be prepared and included in the battery SOP.

d. The battery commander may obtain assistance from the representatives of the technical services located at his home station. He must make frequent, detailed inspections of the clothing and equipment of his battery to insure that the clothing, equipment, and materiel of his unit meet the serviceability standards set forth in the movement order. Any item not meeting those standards must be replaced prior to departure.

71. Loading

a. Loading is accomplished at the time and place scheduled in the plan for movement and in accordance with the movement order. Details should be coordinated with the local transportation officer.

b. When materiel is preshipped by rail, the battery commander supervises and inspects the loading to insure that it conforms with the accepted practice of securing and blocking laid down in appropriate technical manuals for that particular item. If guards are required but not provided for in the movement order, he obtains authority for them to accompany the shipment; he arranges the details for their transportation, messing en route, and time and place for rejoining the battery.

c. The port commander is responsible for loading personnel and equipment on ships. The battery commander checks to see that equipment to accompany the troops for use during the voyage and immediate use on debarkation is carried aboard and properly stowed in accordance with the instructions issued by the port. The battery commander is responsible that the battery arrives at the embarkation point at the proper time and that the personnel are arranged in passenger list order.

d. Some artillery batteries may be transported by helicopter. Movement by helicopter is especially suitable for short, rapid movements and for crossing terrain obstacles. Detailed instructions for loading and movement will be issued by battalion headquarters when a movement by helicopter is to be made.

e. For information concerning loading of personnel and equipment for movement by air, see TM 57–210.

CHAPTER 4

DEFENSE OF THE BATTERY POSITION AREA

Section I. DEFENSIVE PRINCIPLES

72. General

Artillery units must be able to engage in close combat with the enemy when necessary to accomplish their mission. Attacks against artillery in position can be expected and must be resisted. The role of field artillery is to give fire support to infantry and armor. Artillery will not withdraw from a position or fail to render fire support because of a threat or an attack by hostile forces except as a part of a planned withdrawal and upon receipt of orders from the next higher commander. The prime tradition of artillery is to always *defend its guns.*

a. Flexible, All-Around Defense. An all-around, completely integrated defense system is essential for the defense of the battery. This may be gained by—

(1) Assigning primary and secondary sectors of responsibility to each crew-served weapon.

(2) Preparing the howitzer (gun) positions to permit direct fire coverage of the entire perimeter.

(3) Developing fire plans to cover all avenues of approach.
(4) Forming a battery security force.
(5) Effectively locating automatic weapons and rocket launchers.
(6) Assigning definite defensive positions for all personnel.
(7) Establishing an effective warning system.
(8) Coordinating defense with adjacent units.

b. Field Fortifications. Field fortifications should be initiated as soon as possible without delaying the delivery of fire. Bulldozers, if available, expedite the preparation of fortifications and conserve manpower. As a rough guide, a man using a pick and shovel can excavate between ½ and 1 cubic meter of earth per hour. Sandbags and salvage material, such as powder containers and ammunition boxes filled with sand, provide material for revetments. See FM 5–15 for various types of field fortifications.

c. Security Force. Each battery must form a security force as an integral part of the battery defense system. The primary purpose of the security force is to counterattack any enemy who penetrates the perimeter, to eject them, and to restore the defensive line. This force should resemble an infantry rifle squad both in size and composition. The security officer, an officer designated by the battery commander, commands the battery security force and insures that they have received complete instructions, including the signal for and place of assembly.

d. General Plan. The defended area is encircled by a dug-in main defensive line. A system of outposts is established beyond this line to provide warning. The line is established just beyond hand grenade range of the howitzer (gun) emplacements (about 40 meters) and other vital installations. The main defensive line consists of emplacements for the machineguns and rocket launchers and two-man foxholes for the riflemen. The locations of the machineguns and rocket launchers should be periodically changed. The howitzers (guns) provide direct artillery fire to support the main defensive line. Barbed wire and other obstacles covered by fire, are placed in front of the line to impede the enemy. A centrally located assembly point must be designated for the battery security force so that they may be immediately dispatched to any point of the main defensive line.

73. Maintenance of Artillery Fires

The battalion or separate battery should make arrangements with adjacent artillery units and higher echelons to insure mutual support in the continuance or assumption of artillery fire missions during an attack on the position. However, a field artillery battery must be able to continue to provide fire support even during an attack against its position. If necessary, this may be accomplished by directing some sections to continue the fire mission while the other sections place direct fire on the attacking enemy.

Section II. SECURITY

74. General

The battery commander is responsible for the security of his unit. He should designate a battery officer as the battery security officer. The battery security officer assists the battery commander in all matters relating to the security of the battery by—

a. Implementing the battery commander's security plan. Whenever possible, the security officer accompanies the battery commander on reconnaissance. Based on the battery commander's selection of locations for the battery installations and his plan for defense, the security officer prepares the detailed plan for the battery defense system. He specifies responsibilities of each machinegun and rocket launcher position and supervises the posting of the outposts, machineguns, and rocket launchers.

b. Installing, marking, charting, reporting, and removing warning devices, barbed wire, and, when authorized by higher authority, mines and booby traps. All such obstacles should be covered by the fire of howitzers (guns) or automatic weapons.

c. Coordinating battery defense plans with any available light air defense artillery elements as well as with adjacent units.

d. Assigning specific defense missions to elements of the battery.

e. Planning, organizing, and conducting patrols as directed by the battery commander.

f. Organizing and commanding the battery security force.

g. Supervising the continuous improvement of the battery defenses.

h. Submitting a plan of the battery defense system to the battery commander for approval and for subsequent submission to the battalion security officer.

i. Conducting rehearsals of the battery defense plan to insure rapid and efficient assumption of duties and positions.

75. Security Outposts

Security outposts may include machinegun positions, rocket launcher positions, and listening posts. The distance from the defensive line to the outposts depends on the terrain in and around the position area. Outposts should be far enough from the defensive line to provide warning of attack and time for preparation of defense. The distance will usually be from 200 to 800 meters. The more distant outposts may be withdrawn into or near the defensive line at night, if necessary. Outposts are situated on commanding terrain to provide observation and coverage by fire over all routes of approach to the battery. When time permits, the intervals between outposts are covered by barbed wire, obstacles, trip flares, and, when directed by higher authority, with mines. Outpost personnel must be thoroughly briefed on the location of friendly positions and advised of the movements of personnel such as messengers, patrols, and wire

crews. Communication between the outposts and the battery is imperative.

76. Listening Posts

When outposts are withdrawn at night, listening posts should be established on or near the perimeter of the defended area. They are usually located on low ground along avenues of approach to facilitate night observation of silhouettes and to detect sounds made by enemy personnel and equipment. They must be dug-in, provided with communications covered by fire from within the position, and should be protected by barbed wire or other obstacles.

77. Patrols

Avenues of approach to the battery and areas which might provide concealment or cover for enemy forces should be actively patrolled. Patrols should cover specific areas, but must not follow identical routes or schedules. Patrols should make physical contact with as many outposts along their route as possible without exposing either themselves or the outposts. Visual contact must be made with those outposts in exposed locations. Patrols also maintain contact with adjacent units. When enemy forces are located by patrols, they are kept under surveillance and the battery is notified. Prior to darkness and immediately after dawn, patrolling should be intensified. Patrolling is not normally conducted by artillery units during the hours of darkness. Before outposts are reoccupied after dawn, the routes and positions

should be checked by patrols for possible ambushes. All patrol activities must be coordinated with adjacent units to prevent duplication of effort and the possibility of having patrols fire at one another.

78. Warning System

An efficient warning system is required for alerting the battery immediately upon the detection of enemy forces. The warning system is provided primarily by outposts, listening posts, or patrols. A system of signals is established and should include multiple means such as pyrotechnics, horns, whistles, gongs, shots, and voice. Provisions should be made for mutual warning between adjacent, supported, and higher units.

79. Communications

Communications between the outposts, patrols, and the battery must be carefully planned. Wire circuits should connect all outposts, the battery security officer, and the switchboard. One effective solution is to place them all on one continuous circuit (hot loop) so that the circuit will still function if cut at any one place. This system permits any outpost to simultaneously alert all the other outposts and the battery. Alternate methods, such as sound devices, pyrotechnics, and runners, should be ready for use. Time permitting, all wire lines must be placed well overhead or dug in to avoid detection by the enemy. Radio communication will normally be used by patrols and

may also supplement the wire communication to the outposts.

80. Illumination

Illuminating shells and grenades may be effectively used when the battery is attacked at night. Provisions for illumination usually must be preplanned and coordinated with higher headquarters. When illuminating shell is used, it should be detonated well behind the enemy force to silhouette them and at the same time to place a minimum of light on the defending battery. Care should be taken to avoid disclosing friendly locations not under attack.

81. Obstacles

Obstacles may be used to reinforce the outpost system and the main defensive line. Artificial obstacles supplement natural obstacles. Both *must be covered by fire* to be effective. Devices, such as mines, trip flares, and barbed wire, serve both as obstacles and as part of the warning system. Mines and booby traps may be used only when specifically authorized by higher headquarters. Unit mine fields must be properly marked. Friendly personnel must be warned of their location. If necessary, guards may be posted to warn friendly personnel. A report must be submitted to higher headquarters and to friendly units in the vicinity showing the locations of mines and safety lanes (FM 5–15). Concertina or double-apron barbed wire is used to cover avenues of approach and to protect the main defensive line. Barbed wire

should be located beyond the normal grenade throwing distance from the protected installations, yet close enough to insure both day and night observation and fire coverage. Trip flares and perforated tin cans containing pebbles may be attached to the barbed wire as alarm devices.

82. Deception

The deceptive measures discussed below *will not be employed without authorization* by the appropriate commander. Dummy positions may be employed to deceive the enemy concerning the true location of units. One or more pieces may temporarily occupy positions and fire for short periods of time before moving back to the primary position. Roving guns may be used for harassing and interdiction missions. For a detailed discussion of deceptive measures, see FM 6–20.

Section III. DEFENSE PREPARATIONS

83. Normal Battery Procedures

a. Each battery should devise an SOP for the conduct of defense. Procedures which apply generally to the defense of all types of batteries include the following:

(1) Each machinegun or light air defense weapon must be protected by rifle fire.
(2) Sectors of fire are assigned and stakes are set to indicate the final protective fire for each machinegun.
(3) Indiscriminate firing of any weapon is prohibited.

(4) Whenever possible, friendly troops who may be affected are warned of impending direct artillery fire or long range automatic weapons fire.

(5) Periodic reports are required from all outposts.

(6) Unmistakable warning signals are required.

(7) Personnel and weapons must not be silhouetted against the sky.

(8) Patrols should search the terrain surrounding the battery each day.

b. Night operations and conditions of limited visibility necessitate the following precautions in addition to those listed above:

(1) Distribution of reserve small arms ammunition and grenades for night use is made prior to darkness. Grenade boxes must be opened, and ammunition must be placed in clips and magazines. (In training exercises, avoid mixing the lot numbers of the ammunition.)

(2) Trip flares, booby traps, and mines (when authorized) must be armed prior to darkness.

(3) Strict adherence to the correct use of the sign and countersign is required.

(4) Outposts should be pulled in close to the perimeter, and listening posts must be established along avenues of approach.

(5) Movement within the defended area must be minimized.

(6) A definable point on the perimeter should be designated as an exit and entrance point for personnel who must leave the position.
(7) Firing of automatic weapons must be carefully controlled to prevent unnecessary disclosure of their locations.
(8) Light and sound discipline must be maintained.
(9) Vehicles should be brought into the perimeter before dark, except those mounting weapons.

84. Perimeter Sketch

When the battery is functioning as part of a battalion, the battery security officer forwards an accurate sketch of the battery defenses to the battalion executive officer. This sketch is consolidated with those of the other batteries into one overall plan of the battalion defenses. The information to be included on the sketch will be a matter of battalion SOP. It is valuable to have, in addition to weapons locations, the site of the fire direction center (FDC), the command post (CP), the switchboard, and other locations which might be subject to an inspection or sought by messengers or communications personnel. A simple method of making a sketch which will be accurate as to scale and the locations of installations is as follows (fig. 2):

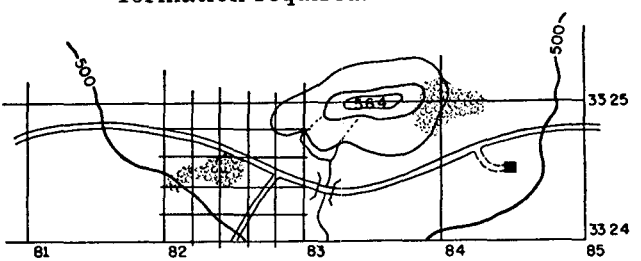
(1) On a 1:25,000 map, tick off 200-meter intervals along the sides of the grid square(s) containing the battery posi-

tion. Connect the tick marks to form a grid.

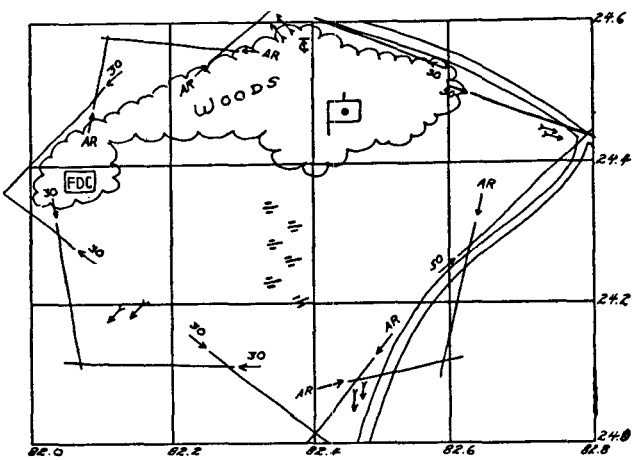
(2) Attach overlay paper to a grid sheet and write coordinates in the margin.

(3) Reproduce the detail from each 200-meter square in the large squares of the grid sheet.

(4) The scale of the sketch on the overlay paper is now 1:5,000. Draw in the information required.



① Section of 1:25,000 map showing grid drawn in.



② Grid sheet showing reproduction of portion of map.

Figure 2. Technique of drawing perimeter sketch.

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Section IV. TYPES OF ATTACK

85. General

Field artillery batteries may be subjected to air attacks, ground attacks by small infiltrating parties or guerrillas, or ground attacks in strength by exploiting or by-passed forces. The defense against any of these attacks is conducted aggressively, using predetermined defense plans and preparations modified to fit the situation. The paramount consideration is protection of the howitzers (guns).

86. Air Attack

The field artillery battery has only a limited capacity for defense against air attack. Emphasis must be placed on camouflage, dispersion, and other passive means of defense. Heavy machineguns and light air defense weapons (par. 91) provide the means for active defense. Fire should not be opened unless the aircraft actually attack the position. Opening fire when the aircraft are not attacking or are at extreme range unnecessarily exposes the position. Opening fire with only a portion of the available weapons is ineffective. If defensive fire is employed, all available weapons should be used simultaneously.

87. Infiltration

Small bands of infiltrators, with a hit-and-run mission, may attempt to destroy a small portion of the battery and to force disclosure of the locations of weapons and installations. Such attacks usual-

ly occur at night or during periods of poor visibility and may precede an attack in strength. Personnel should use small arms and grenades to disorganize and repel the attack without employing the automatic weapons or howitzers (guns, if possible. The battery security force should not be committed against such attacks.

88. Attacks in Strength

Attacks by strong forces may occur at any time. When an attack occurs in the sector to the front of the battery, the entire battery is alerted and the defenses are fully manned. Outposts remain hidden as long as possible to observe and report enemy movements and to conduct indirect artillery fire. When the enemy approaches the position, the outposts open fire to delay and disorganize the attack. Machineguns and other automatic weapons open fire when the enemy is within effective range. Rocket launcher teams attack enemy tanks, personnel, and crew-served weapons at close range. Personnel not engaged in serving a crew-served weapon deliver rifle fire from the main defensive line. The howitzers (guns) deliver direct fire until the enemy is destroyed or until the fire is no longer effective. If the enemy closes on the howitzer (gun) positions, the cannoneers commence small arms and grenade fire from the emplacements and from special trenches (FM 5–15). The security force is employed to reinforce the most threatened area and to eject any force which penetrates the perimeter. Aggressive and determined resistance must continue until the attack has been

repelled. Once the close defensive action has begun, withdrawal by the defenders is difficult and costly, if not impossible. Artillery units properly prepared for defense will not be overcome unless overwhelmed by a great superiority in numbers or weapons. Once the attack has been repelled, the artillery unit does not attempt to pursue.

Section V. EMPLOYMENT OF WEAPONS

89. Rocket Launchers

Some of the rocket launcher teams are placed to defend against hostile tanks while the remainder are assigned to the security force. Each team, consisting of two men with a rocket launcher, should prepare several positions echeloned in depth. The rocket launcher positions should not be more than 200 meters beyond the main defensive line. The most distant position is occupied first. All areas which might be used as a tank approach should be covered by rocket launchers; however, launchers should not be emplaced within the field of fire of the howitzers (guns) except that they may be properly used to cover a portion of the howitzer (gun) sector which is in defilade. Rocket launcher positions should be covered by fire of other weapons, concealed, and well dug in, preferably with overhead cover so that they may remain in position under artillery fire. When rocket launcher positions cannot be covered by fire from the main defensive line, the rocket launcher team should have riflemen attached to it. Positions should be selected to permit firing at close

range at the sides of tanks as they are *passing* the rocket launcher position. Such siting will offset the inclination to open fire at extreme range, which discloses the position and reduces the effectiveness of the fire. Rocket launcher teams must vary the locations of their positions as well as their route to and from the position.

90. Machine Guns

Machine guns are used both on outposts and on the perimeter. Light machine guns are preferred for outposts since they are more easily moved. Heavy machine guns mounted on vehicles are sited to provide air and ground defense. Machine guns on the perimeter must be sited to provide covering fire for the outposts. Locating the machine guns should be coordinated closely with any available air defense artillery. Several positions may be used for each machine gun; outpost positions for normal daylight use, air defense positions, and positions on the perimeter for use at night and when the outposts have withdrawn.

91. Light Air Defense Artillery Weapons

Light air defense artillery (ADA) weapons, if available, may be assigned the mission of providing support to field artillery batteries; or they might be located near the battery while on another mission. In either case, the battery commander and the ADA unit commander should closely coordinate their defense plans to provide mutual security. Integrating the ADA weapons into the battery defenses increases the efficiency

of the warning system and enhances the security of the unit by providing increased firepower. These weapons can provide extremely effective ground fire in addition to air defense fires. At night the ADA weapons should be withdrawn to prepared positions within the battery perimeter. The ADA communications system must be tied into that of the battery.

92. Small Arms

Personnel must always have their individual weapons with them and ready for use. Indiscriminate firing, especially at night, must be prohibited. No ammunition should be allowed to remain in the chambers of weapons except when individuals are on patrol or are alerted against an attack. Automatic rifles should have a specific location on the perimeter. These locations should be periodically changed. Some automatic rifles should be assigned to the security force. Small arms ammunition distributing points should be set up at frequent intervals along the main defensive line to provide immediate resupply. The ammunition *must* be ready for use, in clips or magazines.

93. Grenades

Hand grenades are effective for close-in defense and are especially effective in repelling a night attack. All defensive positions should have a number of grenades readily available. The use of fragmentation grenades must be closely controlled to prevent injury to friendly personnel. Offensive grenades have no dangerous fragmentation effect and are more suitable for extremly close defense.

Section VI. DEFENSE OF HOWITZER (GUN) BATTERY

94. Organizing for Defense

a. General. The emplaced howitzers (guns) are the nucleus of the defense of the battery. The position should be as compact as possible to provide greater control and security (fig. 3).

b. Howitzer (Gun) Emplacements. The positions for howitzer (gun) emplacements are selected as indicated in chapter 8. The function of an emplacement is to provide protection for the piece and the cannoneers. FM 5–15 illustrates the details of construction of various types of emplacements. Any howitzer (gun) emplacement usually consists of—

(1) A shallow pit, prepared to permit all-

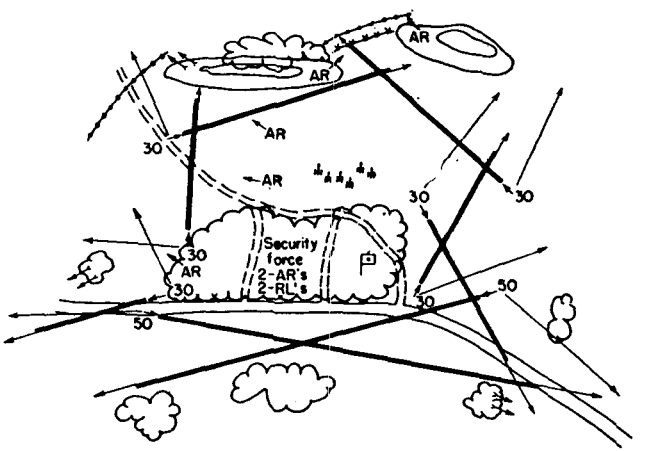

Figure 3. Type battery defense of a firing position.

around fire capability for the howitzer (gun).

(2) A parapet, at least 3 feet thick at the top, encircling the pit. The parapet should be as high as will permit depressing the tube for direct fire.

(3) A ramp leading from the pit to facilitate displacement.

(4) An ammunition shelter.

(5) Special trenches or foxholes for section personnel.

c. Cover for Personnel. Preparation of cover for personnel is begun as soon as possible after the battery is ready to deliver artillery fire and the defenses have been organized. Foxholes or trenches should be available for all personnel at their normal duty positions as well as on the main defensive line. A prolonged stay in a position may permit the construction of bunkers with overhead cover. Cover for cannoneers is furnished initially by the howitzer (gun) emplacement. Foxholes and special trenches are dug adjacent to the emplacement as soon as possible. See FM 5–15 for details of construction of foxholes, special trenches, and bunkers.

d. Cover for Ammunition. Initially, ammunition may be placed in small stacks, covered with a tarpaulin, and revetted with sandbags to provide temporary protection against enemy action and weather. As time permits, storage pits or trenches equipped with platforms to hold the ammunition and provided with a means of drainage

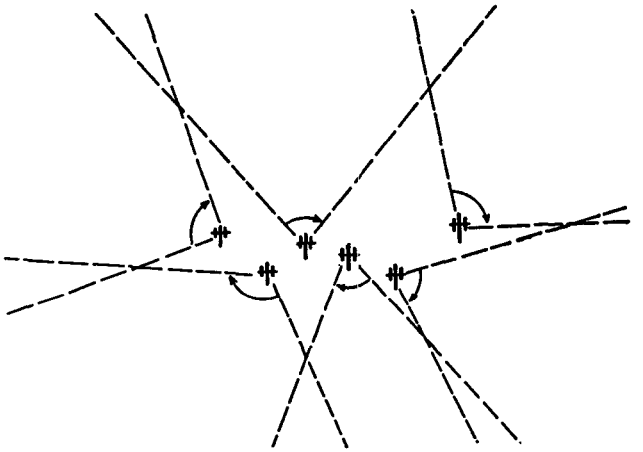

Figure 4. Sectors of responsibility of howitzers (guns).

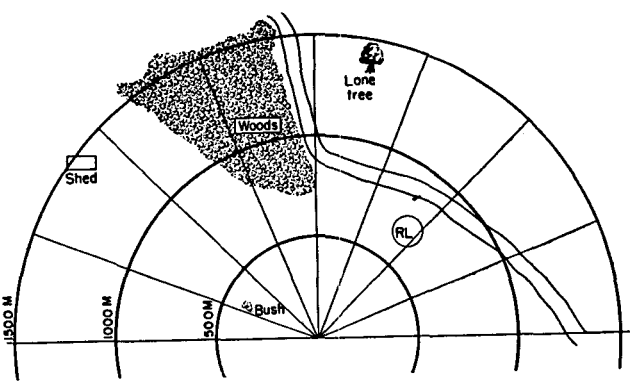

Figure 5. Range card for direct fire.

should be constructed. These may be improved by the addition of overhead cover. Ammunition storage niches may be cut into the parapet.

95. Employment of Howitzers (Guns)

a. General. The emplaced howitzers (guns) deliver direct artillery fire against an attacking force to delay, disorganize and destroy them. These fires are integrated into the battery defense plan and sectors of responsibility are assigned to each section (fig. 4). These sectors must overlap slightly and provide all-around coverage. Secondary sectors of fire are assigned to insure coverage if a howitzer (gun) fails to operate.

b. Range Cards. After sectors are assigned, the chief of section prepares a range card for his sector. These cards indicate the ranges and corresponding elevations to critical points on all likely avenues of approach whether within or outside of the assigned sector (fig. 5). If there are no prominent terrain features, stakes may be driven into the ground for reference. As time permits, range cards are improved by replacing estimated data with more accurate data obtained by firing, pacing, taping, or map measurement. The range card must be readily available and all men in the section should be familiar with its use. Range cards are also an aid to gunners of automatic weapons and rocket launchers. These cards should not contain information that would be of value to the enemy.

c. Direct Fire Positions. Direct fire positions should be prepared for those pieces unable to con-

duct effective direct fire from their primary position. Both positions should be stocked with ammunition prepared for direct fire missions. Direct fire positions should be selected as near the primary position as possible to minimize the distance the piece must be moved.

d. Direct Fire. Direct fire is most effective against armor at the range of 400 meters or less. Foot troops accompanying armor are particularly vulnerable to direct artillery fire. Planned defensive fires are adjusted on the nearest threat in the sector of responsibility. The sight systems, fire commands, methods of observation, and adjustment on targets with a vertical profile are discussed in detail in FM 6–40 and in the appropriate manuals for each piece.

96. Heavy and Very-Heavy Artillery

Principles for the defense of heavy and very-heavy artillery batteries are the same as for light and medium artillery except that the direct fire capabilities are greatly reduced by the weight of the piece. More extensive use of rocket launchers and automatic weapons must be made in defending heavy and very-heavy artillery units.

Section VII. DEFENSE OF HEADQUARTERS AND SERVICE BATTERIES

97. General

Field artillery headquarters or service batteries employ the same general type of defense as the howitzer (gun) batteries. The location of these

units frequently permits integration of their defenses with adjacent units. Echelonment of these units complicates the planning and implementation of their defenses.

98. Headquarters Battery

The headquarters battery is subdivided into several installations including the battalion command post, aid station, and the headquarters battery area. Security is achieved with organic weapons and personnel by utilizing the terrain, arranging for mutual support with adjacent units, and organizing a security force. Machineguns and rocket launchers are sited to cover any avenues of approach and are in turn covered by riflemen. The components of the battery, such as the fire direction center, message center, and communications section prepare their positions as strong points by digging foxholes and automatic weapons positions. An efficient warning system, patrols, and a security force round out the active defense measures. Passive measures include camouflage, field fortifications, and obstacles. Depending on the type of unit, its mission, and the situation, the battery may be placed adjacent to and its defense integrated with other units such as howitzer (gun) batteries and supported unit command posts, or within the perimeter of reserve elements of the supported unit.

99. Service Battery

a. General. The service battery is the rear echelon of the battalion. It is located on or near

the axis of supply and to the rear of the bulk of the combat units. The location will depend on the instructions of the battalion commander, the existing road net and road conditions, availability of concealment and areas for dispersal of heavy vehicles, and proximity of other units. If several service batteries are located in the same area, local defense is facilitated. At times, the situation may require that the service battery be located within the battalion perimeter. Wherever the location, provisions must be made with adjacent units for mutual support. The small size of this battery, plus the frequent absence of the ammunition train and other personnel, will make it difficult for the battery to organize an effective defense by itself.

b. Ammunition Train. The ammunition train normally is located with service battery and should be on or near the route from the firing batteries to the ammunition supply point. Occasionally sections of the train will be attached to the firing batteries; and frequently the firing battery ammunition sections will be attached to the train. The greatest threat to the ammunition train is that of being attacked while on the road. Maintaining alert guards, avoiding defiles whenever possible, making reconnaissance of points of possible ambush, and attaching air defense artillery weapons to the column when available are normal security measures.

PART TWO
THE HOWITZER (GUN) BATTERY
CHAPTER 5
ORGANIZATION

Section I. GENERAL

100. General

The howitzer (gun) battery has the personnel and equipment necessary for the conduct and delivery of fire and for communication, movement, and minor administration. It may operate as a separate tactical unit for a limited period of time. When the battery is operating independently, additional personnel and equipment may be attached to it to meet the requirements of the mission.

101. Organization

a. The organization of all howitzer and gun batteries is fundamentally the same. For the organization of field artillery howitzer battery, 105-mm, towed (infantry division), see figure 6. The battery consists of the —

(1) Battery headquarters.
(2) Battery detail.
(3) Firing battery.
(4) Forward observer sections.
(5) Liaison section.
(6) Ammunition section.

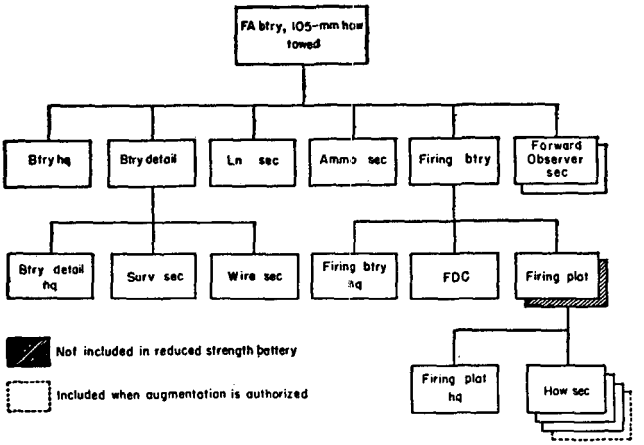

Figure 6. Organization of field artillery howitzer battery, 105-mm, towed (infantry division).

b. The battery headquarters provides the administration, mess, supply, and motor maintenance for the battery.

c. The battery detail performs the reconnaissance, survey, and communications for the battery.

d. The firing battery determines firing data and fires the howitzers or guns. It consists of the firing battery headquarters, the fire direction center, and the firing platoons or sections.

e. The forward observer section locates targets and adjusts fire.

f. The liaison section performs liaison for the battery.

g. The ammunition section provides ammunition resupply.

102. Differences

Certain differences in organization exist because of the various types of weapons or employment. They are as follows:

a. Howitzer or Gun Sections. Light and medium artillery batteries are normally authorized 6 howitzers. The 8-inch howitzer and 155-mm gun batteries are authorized 4 sections. The 280-mm gun battery is authorized 2 guns.

b. Forward Observer Sections. Infantry division 105-mm howitzer batteries have 2 forward observer sections. The armored division 105-mm howitzer batteries have 4 forward observer sections. Airborne division 105-mm howitzer batteries, 155-mm gun, and infantry and armored division 8-inch howitzer batteries have 1 forward observer section each.

c. Liaison Sections. The location and number of liaison sections vary considerably with the type of field artillery unit. However, the only howitzer (gun) batteries that have a liaison section are the 105-mm howitzer batteries of infantry and airborne divisions.

Section II. DUTIES OF PERSONNEL

103. List of Duties

The principal duties of key personnel of howitzer (gun) batteries are listed below. These duties

are generally the same in all types of batteries in which the listed duty is authorized by TOE. For a detailed listing of duties of selected personnel, see DA Pam 6–1.

Individual	*Duties*
BATTERY HEADQUARTERS	
Battery commander	Commands the battery (pars. 3–5).
First sergeant	Personal assistant to the battery commander; acts as contact between the commander and enlisted personnel. Assists the commander in administration. Prepares or supervises the duty roster, morning report, and sick slips. He should have a knowledge of the duties performed by battery personnel and of each individual's qualifications. In the field, he assists the battery commander in organizing the battery position area.
Battery clerk	Works under the supervision of the first sergeant in preparing battery correspondence and reports and maintaining the files. He notifies men of medical and dental appointments. Assists the men with personal administrative problems.
Mess steward	Requisitions and draws rations, plans meals, and keeps mess records and accounts. Insures the proper storage of food, its economical use, and the best possible serving and dining conditions. Supervises preparation and serv-

Individual	*Duties*
	ing of meals, maintenance of mess equipment and vehicles, the work of men detailed on kitchen police, and the police and sanitation of the dining area, kitchen, and surrounding area.
Supply sergeant	Requisitions, receives, issues, and turns in supplies used by the battery. Keeps supply records and accounts. Maintains supplies on hand in the supply room. Receives and inventories, in the presence of an officer, all property, government and private, of men not present for duty in the battery. Handles laundry. Encourages and exercises supply economy, especially in turning in excess property.
Motor sergeant	Principal assistant to the motor officer. Supervises mechanics, motor park, and administration, to include scheduling of maintenance in battery and coordinating with battalion maintenance schedules, vehicle operations, repair or towing of disabled vehicles on motor marches, and requisitioning of parts and tools. Assists, when required, in making inspections. Reports evidence of carelessness, neglect, or abuse of vehicles and equipment to his superior officer. Diagnoses mechanical failures and, when necessary, gives mechanics instructions for corrective action.

Individual	*Duties*
	Assists in supervision of driver training and maintenance.

BATTERY DETAIL

Reconnaissance and survey officer.	Commands the battery detail. Performs reconnaissance, prepares survey plan, supervises survey operations and installation of communications. Supervises training and performances of all members of the detail. Mans battalion observation post when directed. Responsible for the proper use and maintenance of detail vehicles and equipment.
Chief of detail	Platoon sergeant of battery detail. Assists the reconnaissance and survey officer.

Survey Section

Chief of survey party	Directs and supervises the work of the survey section. Conducts survey training. Insures proper use and maintenance of instruments, equipment, and vehicles. Supervises and checks accuracy in field work and computations.
Survey computer	Computes survey. The two computers work independently, comparing data only when completed.
Instrument operator	Operates and maintains the aiming circle or other optical instruments.
Survey recorder	Keeps survey field notes.

Communications Section

Communications chief—Chief of communications section. Directs installation, operation, and maintenance of battery communications. Supervises training of all communications personnel, including all radio/telephone operators. Supervises maintenance of section equipment and vehicles and all battery signal equipment. Requests issue and turn-in of equipment.

Wire team chief ——In charge of the wire team. Installs and maintains the battery wire net. Supervises maintenance of wire equipment and vehicles.

Liaison Section

Liaison officer ——Represents the battery commander at the supported unit, or as directed. Plans fires. Keeps battery commander informed of situation and plans.

Liaison sergeant ——Assists liaison officer. Supervises operation of section and maintenance of vehicles and equipment.

Liaison specialist ——Operates radio, assists driver, draws fire plans and overlays. Maintains vehicle and equipment.

Ammunition Section

Chief of ammunition section. Supervises procurement, loading, transport, and distribution of ammunition. Insures adherence to safety precautions. Directs maintenance of ammunition, vehicles, and equipment and the proper

Individual	*Duties*
	storage of ammunition. Requests issue and turn-in of ammunition.

FIRING BATTERY

Battery executive	Commands firing battery, is second-in-command of battery. Must be prepared to take command of battery. In garrison: assists the battery commander in administrative work, drafts training schedules, and supervises all training. In field: directs all actions of the firing battery, responsible for the delivery of fire, commands the battery when the battery commander is not in the battery area. For a detailed list of duties, see DA Pam 6–1 and the U. S. Army Artillery and Missile School Pamphlet, "Notes for the Battery Executive and Fire Direction Officer."
Recorder	Assists the battery executive. Records firing data for each piece, announces correct data for any piece when required, records minimum elevation, and keeps a running account of ammunition supply and expenditures.
Chief of firing battery	Platoon sergeant of firing battery. Assists the battery executive and directs the chiefs of section. Should be capable of performing the duties of platoon executive, platoon commander, and battery executive.

Individual	*Duties*

Fire Direction Center

Fire direction officer	Battery gunnery officer. Directs operations of the fire direction center. Conducts training of fire direction specialists and supervises maintenance of vehicles and equipment. For a detailed list of duties, see FM 6–40, DA Pam 6–1 and the U. S. Army Artillery and Missile School Pamphlet, "Notes for the Battery Executive and Fire Direction Officer."
Operations sergeant	Supervises enlisted members of fire direction center. Computes met and VE corrections. Maintains ammunition records and records of firing.
Intelligence sergeant	Maintains situation map and records of targets. Coordinates reporting of intelligence data, information, particularly counter-mortar and counterbattery information, and reports from observers. Insures rapid transmission of intelligence and information to higher headquarters. Notifies supported unit of intelligence or information as appropriate.
Fire direction computer.	Computes firing data and records fire missions.
Chart operator	Prepares, maintains, and announces data from firing chart.

Platoon Headquarters

Platoon commander	Directs operations of howitzer or gun platoon, including training, firing, and maintenance of ve-

Individual	*Duties*
	hicles and equipment. Must be prepared to act independently with a detached platoon. Assists executive and fire direction officer.
Platoon executive	Assists platoon commander. Acts as platoon fire direction officer when platoon is detached.
Platoon sergeant	Assists platoon commander. Must be capable of performing the duties of the platoon executive, platoon commander, or battery executive.

Howitzer (Gun) Sections

Chief of section	Supervises the execution of fire commands by his section. Directs emplacement of howitzer, prepares range card, and maintains observation in his sector of responsibility. Conducts maintenance of the howitzer, prime mover, and equipment. Insures that sighting and laying equipment is properly adjusted. Keeps the gun book current.

Forward Observer Section

Forward observer	Operates battery or battalion observation post as directed. Functions as forward observer when required by the tactical mission, or as required by reinforced unit. See Paragraphs 143 and 182. Supervises the operation of the section and the maintenance of vehicles and equipment. See chapter 10.

Individual	*Duties*
Reconnaissance sergeant.	Assists the forward observer. Must be capable of replacing the forward observer.

104. Additional Duties

In addition to the duties outlined above, battery officers and noncommissioned officers will perform other duties as the battery commander may direct. For example, certain officers may be designated as motor officer, mess officer, supply officer, CBR officer, troop information officer, A&R officer, safety officer, mail officer, etc. Noncommissioned officers may be designated as CBR, NCO, A&R NCO, troop information NCO, etc.

CHAPTER 6

PRINCIPLES OF EMPLOYMENT

Section I. GENERAL

105. General

The principles of employment discussed in this chapter are those which apply particularly to the howitzer (gun) battery operating as part of the battalion. When the battery is detached from the battalion to operate independently, the principles of employment are essentially those for the battalion, as discussed in FM 6–20 and FM 6–101.

106. Considerations

Some considerations in the employment of the howitzer (gun) battery are as follows:

a. The mortar battery is the normal agency for general support of the battle group, or for direct support of designated elements thereof. A howitzer battery may be assigned a direct support mission to support a battle group when the organic mortar battery has been detached, or to support a task force not organized around a battle group.

b. If a howitzer battery is attached to a battle group, it may be assigned the mission of reinforcing the fires of the organic mortar battery. However, the howitzer battery is normally further attached to the mortar battery, thus forming

a battery group, the command of which will be exercised by the mortar battery commander.

c. When a relationship has been established between a howitzer battery and a mortar battery (reinforcing or general support-reinforcing), the howitzer battery should work with that same mortar battery whenever possible.

d. The 105-mm howitzer battery may be employed under battalion control, but is also subject to the assignments discussed in *a* and *b* above.

e. The 155-mm howitzer battery will normally operate under battalion control, but might be assigned as discussed in *a* and *b* above.

f. The 8-inch howitzer battery may be employed under division artillery control or it may be employed as a whole or in part under the control of the battalions.

g. Corps artillery units are organized as battalions and will be employed as such unless they are attached to units subordinate to corps, when they may be employed similarly to the divisional units.

Section II. MOBILITY

107. General

An artillery battery must be capable of moving on short notice without extensive, time-consuming preparations. A battery must be able to move readily, rapidly, and efficiently in order to perform its portion of the artillery mission of providing continuous fire support. Mobile warfare

requires frequent and timely displacements forward, rearward, and laterally.

108. Training

The ability of a battery to move is developed by continuous training and practice in motor maintenance and road marches. Intensive training in night movements should be conducted since movements are frequently made at night. The battery commander must always know the capability of his unit to move. He should know the operational status of all vehicles and the availability of supplies and equipment necessary for displacements or motor marches.

109. Plans

Loading plans and general movement instructions should be a part of the battery SOP. Frequent practice loadings and equipment checks should be conducted. Supplies and equipment in excess of those authorized and not necessary for the accomplishment of the mission restrict the mobility of the battery and should not be accumulated.

Section III. COMMUNICATIONS

110. General

Batteries cannot deliver effective fires without a flexible, adequate, and reliable communications system. Communications are essential for administrative and tactical control, as well as for the conduct of fire.

111. Means

Wire, radio, and messenger are the principal means of communication employed by the battery. Visual and sound signals are particularly adaptable for emergency and warning signals. Training should include all secondary means, particularly the use of pyrotechnics. Continuity of communication is insured by proper use and maintenance of equipment, by proper training of personnel, and by establishing alternate means. Neither radio nor wire should be considered as the primary means of communication; each is to be considered of equal importance. Radio is particularly useful during displacement and in the initial stages of an occupation of position. Wire presents more ease of operation and slightly more security.

Section IV. CONTINUOUS FIRE SUPPORT

112. General

Artillery units must be able to provide continuous fire support to infantry and armor. Every type of battery has essential functions and responsibilities in rendering around-the-clock fire support. Howitzer (gun) batteries must be able to deliver immediate fire when requested. Headquarters batteries must provide the personnel and facilities for battalion command and fire direction activities. Service batteries must provide ammunition and other logistical and technical support.

113. Organization

Each battery must be organized to provide for continuous operation. Twenty-four hour operation requires training of personnel and the integrated efforts of all sections of the battery. Training in depth for key positions is essential since fire direction centers, communication facilities, howitzers (guns), and battery defenses must be manned continuously. Skeleton crews are used during periods of little activity to allow personnel to rest.

114. Mess

Battery messes often must feed on staggered schedules during periods of increased activity. Hot beverages or soups should be available between meals during cold weather and at night to increase the operating efficiency of personnel.

115. Maintenance

Increased emphasis must be placed on maintenance during periods of frequent movements and sustained operations. Maintenance should be performed continuously as the tactical situation permits. The battery commander must actively support the maintenance program. Officers and noncommissioned officers must intensify their efforts toward supervision and encouragement of the program at times when great stress is put upon the equipment.

Section V. SECURITY

116. General

A field artillery battery must not allow an enemy attack, or threat of attack, to interfere with the accomplishment of its mission. Each battery is authorized sufficient personnel and equipment to conduct an active defense against such attack. Security of the battery requires flexible, well-planned procedures and organization. The battery commander must consider all possible types of attack in planning the battery defense. Because of the necessity for personnel economy, it is essential to have carefully planned and rehearsed procedures for defense. Personnel must know their posts and duties *before* any emergency arises.

117. Integrated Defense

Each battery must provide an all-around defense of its position. The battery defenses are integrated into a battalion defense whenever possible. Howitzer (gun) batteries have a greater defensive capability than headquarters or service batteries. The headquarters should be located for mutual support with at least one of the howitzer (gun) batteries. Service battery, since it is usually well to the rear of the battalion, should be located adjacent to other units for mutual support.

CHAPTER 7

RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

Section I. GENERAL

118. Purpose

The purpose of reconnaissance, selection, and occupation of position (RSOP) is to move a unit from a firing position, rendezvous, bivouac, or march column into a position from which it can deliver the fires required to accomplish its mission. A battery is *in position* when the pieces are ready to fire.

119. Procedure

A systematic procedure for the RSOP is necessary in order to move and emplace artillery rapidly and efficiently. A rigid set of rules to be followed in every situation cannot be established. Commanders are expected to modify procedures as the circumstances may require. Situations may require that positions be occupied with little or no prior reconnaissance. Each unit should establish a sound, flexible SOP. RSOP may be rapid or deliberate, depending upon the time available. The commander must delegate responsibility for the performance of duties during rapid RSOP to gain speed by the simultaneous accomplishment of tasks.

120. Reconnaissance

The purpose of reconnaissance is to obtain information of the terrain, routes of communication, the enemy situation, and the location of friendly troops. This information aids the commander in his selection of the battery position area. Reconnaissance should be timely, well planned, and limited to the personnel and vehicles actually required. The reconnaissance and selection of the general location of battery position areas is normally accomplished by the battalion commander. This is done by the battery commander when the battery is operating alone.

121. Selection

The restrictions placed on the battalion commander (battery commander when the battery is operating alone) in selecting position areas are usually determined by the tactical mission assigned the battalion and the size, type, and location of other troop units in the vicinity. Other factors affecting the selection of areas are terrain and weather conditions, type of howitzer (gun) with which the unit is armed, and the tactical situation. It is desirable to select position areas which provide concealment and defilade, sufficient space for dispersion of battery installations, terrain adaptable for defense of the unit, and facilities for shelter and comfort of personnel. When time is short, entry into action must not be delayed by a search for the perfect position. The only essential characteristic of a position area is that it permits the unit to fire effectively.

122. Occupation

The actual occupation of the battery position area is always as rapid as practicable. The occupation should be orderly, efficient, quiet, and in conformance with a sound SOP. Speed is obtained by proper prior planning and a high degree of training.

Section II. POSITION AREAS

123. Battery Position Areas

The *firing position* is the location occupied, or to be occupied, by those elements of the battery which are essential for firing. The *battery position area* includes the firing position, battery command post, and all other battery installations.

124. Classification of Position Areas

Artillery position areas are classified tactically as primary, alternate, and supplementary.

a. A *primary* position area is one from which the battery intends to accomplish its tactical mission. Plans should be made to organize and improve this area as though for permanent occupancy although the tactical situation may necessitate displacement at any time.

b. An *alternate* position area is one to which the battery moves when the primary position becomes untenable. It must permit accomplishment of the same mission as the primary position. It must be close enough to the primary position to permit rapid displacement, but distant enough to

prevent its being rendered untenable by the same action that affected the primary position. At least one alternate position area should be selected for each primary position.

c. A *supplementary* position area is one for the attack of targets which cannot be fired on from the primary position.

125. Essential Requirements

a. General. The primary and only essential requirement of a battery position area is that the battery be able to accomplish the assigned mission from it. To accomplish the assigned mission, the battery must be able to shoot, move, and communicate from that area.

b. Shoot. To shoot effectively from a position, the battery must be able to reach the minimum range, fire throughout the assigned zone, and exploit the range of its pieces.

(1) *Minimum range.* The minimum range at which the battery must be able to shoot is usually determined by the tactical mission assigned to the battery or battalion.

(2) *Fire throughout the zone.* The battery must be able to fire throughout the width of the assigned zone. The selection of positions to meet this requirement varies with the type of howitzer (gun). For example, if light artillery is so close to the frontlines that the width of the zone cannot be covered by the on-carriage traverse, the trails may be quickly

shifted to take in the rest of the zone. Towed heavy artillery cannot shift trails without appreciable loss of time.

(3) *Exploit the range.* In order to fire on the minimum range and to fire throughout the zone without shifting trails, the pieces would be emplaced a considerable distance to the rear. Conversely, the pieces would be emplaced close to the frontlines in order to exploit the range of the pieces by firing deep into the rear of the enemy positions. The commander must make a reasonable compromise between these requirements in his selection of positions.

c. Move. A battery position area must have adequate routes to permit movement into and out of the area. Otherwise excellent areas would not be satisfactory if rapid entry and exit were not possible. Ground reconnaissance is the best way of determining the availability of routes into and out of the area.

d. Communicate. The location and characteristics of the battery position area must permit satisfactory communications with the battalion and with the supported unit.

126. Desirable Characteristics

Desirable characteristics of battery position areas include—

a. Dry, well-drained ground, free from large stones, tree stumps, and other obstructions.

b. Terrain suitable for strong perimeter defense and for dispersion.

c. Availability of alternate positions.

d. Location within or adjacent to infantry or armor perimeters when such location would not interfere with the mission of either unit.

e. All-around (6400 mils) fire capability, for direct fire.

f. Separate entry and exit routes, concealed from enemy observation.

g. Maximum defilade consistent with the accomplishment of the assigned mission. Flash defilade of at least 5 meters is sought for light artillery, and at least 10 meters for medium, heavy and very-heavy artillery.

h. Facilities for shelter and comfort of personnel.

127. Suitable Locations

Good position areas may often be found—

a. Near roads and trails not normally subject to artillery fires. Such positions are particularly appropriate for heavy and very-heavy artillery.

b. In woods consisting of small trees where the cutting of trees would not be necessary, or in the forward edge of larger woods. These locations are most appropriate when enemy air is active. However, enemy artillery fire falling in trees may result in very damaging air bursts.

c. In large quarries.

d. In ruins or under roofs in a village.

e. On open terrain, away from prominent features. In such positions, installations should be well dispersed, camouflaged, and irregularly spaced.

f. In isolated open spaces in a large wooded area.

Section III. PROCEDURES

128. Reconnaissance Party

The battery commander usually takes a small party to assist him in reconnaissance and initiating the occupation. The composition and loading of this small party is based on the initial tasks to be performed and the number of vehicles the battery commander is permitted to take with him. The battery commander's party will consist of 1 to 4 vehicles. Each battery should devise an SOP for the composition of a 1, 2, 3, or 4-vehicle reconnaissance party. Table I illustrates a 4-vehicle party, which can be easily modified to meet the requirements of any type of battery.

129. Receipt of Orders From the Battalion Commander

a. Instruction to the Battery. When reporting to the battalion commander for movement orders, the battery commander is accompanied by his reconnaissance party. Before leaving the battery, the battery commander issues instructions for actions during his absence and tells his executive where he is going, when he expects to return, and as much as he knows of the situation.

b. Arrival for Receipt of Orders. When the battery commander and his party arrives near the place where he is to receive the battalion commander's orders, he halts the party, directs dispersion and concealment of the vehicles, and, accompanied by his reconnaissance and survey officer or other individual, reports to the battalion commander for orders.

130. Action Upon Receipt of Orders

After receiving the battalion order, the battery commander assembles his party, explains the situation, and issues instructions to expedite the reconnaissance. He points out on the ground or on a map the general area of the battery position, location of the battalion command post, and the location of registration points. He prescribes in general the system of communication to be used and gives the azimuth of the direction of fire, if known. He proceeds to the position area with his party to conduct a detailed reconnaissance.

131. Reconnaissance of the Battery Position Area

a. The tasks of the battery commander involved in getting his battery into position include reconnaissance for and selection of locations for battery installations, formulation of an occupation plan, issuance of orders to carry out the plan, and supervision of the execution of the plan. The methods of accomplishing these tasks vary according to the time restriction and composition of the reconnaissance party.

b. As soon as the battery commander arrives

at the proposed battery position area with his party, he first determines the direction of fire on the ground, then he begins his reconnaissance for and selection of positions for battery installations. Security is organized immediately. The procedure will vary according to the composition of the reconnaissance party. When there is sufficient time, the area should be reconnoitered in detail by the battery commander. When there is little time, the battery commander must appoint members of his party to perform portions of the reconnaissance. The initial selection of a location may be made by any member of the party, but the selection must be approved by the battery commander. The battery commander should personally select the areas for the howitzers (guns). This is normally done prior to any other part of the reconnaissance.

132. Orders for Occupation

The battery commander formulates his plan for the occupation as he performs his reconnaissance of the battery position. After the reconnaissance and selection of locations is complete, he issues his orders for the occupation to the members of his party. These orders include—

a. General Instructions. The battery commander points out the location of the base piece or battery center, the direction of fire, and the location of the truck park. He gives instructions concerning the method of laying, ammunition storage, camouflage, routes into and out of the position, and the location of perimeter defense weapons.

b. Communication Instructions. The battery commander points out the locations of the FDC, the CP, and the switchboard and gives the necessary orders for the installation of the battery communication system. He gives the communications chief detailed instructions on any wire lines that must be laid outside of the battery area, or any radio relay which must be established.

c. Local Security Plan. The battery commander outlines the plan for perimeter defense and directs the first sergeant to make the detailed plans, to include the locations of machine guns, rocket launchers, outposts and adjacent units. The battery commander then checks the plans and makes any changes he deems necessary. He also gives instructions on any other security measures which are to be employed.

133. Actions Prior to Arrival of Battery

After receiving the battery commander's instructions, the reconnaissance party rapidly makes preparations for the arrival of the battery. Howitzer (gun) marking stakes are put in, trail pits are dug if directed, the aiming circle is set up and oriented, aiming posts are set out if directed, and initial readings to the marking stakes are read and recorded. The wire net is installed, and guides are designated to direct each vehicle to its proper location upon arrival of the battery.

134. Moving the Battery

a. Battery Moving in a Battalion Column. As

soon as practicable after the location of the firing battery position and route thereto are known, the battery commander directs his driver or other individual to return to the battalion release point, report to the battalion executive, and guide the battery into position. The battery commander gives the individual any orders he may have for the battery executive concerning the occupation of position. In many situations, it will be desirable for the battery commander to go to the release point, lead his battery to the position area, and supervise the occupation. This technique is often used for night occupation.

b. Battery Operating Alone. As soon as practicable after he has completed his reconnaissance of the battery position area, the battery commander orders his battery forward. He may send his driver or other individual back for the battery or he may order it forward by radio. When he orders the battery forward by radio, a guide must be dispatched to meet the battery and lead it into the position area.

135. Occupation of Position

a. The actual occupation of the position area must be efficiently planned to prevent confusion and to save time. The battery is extremely vulnerable during the occupation; therefore, this critical phase must be completed as quickly and efficiently as possible.

b. Upon arriving at the battery position, all vehicles should be moved off the road into the posi-

tion area without halting or closing interval. Guides should lead each vehicle to its proper location. As soon as vehicles are unloaded, they are guided to the truck park or other designated spot. Ammunition trucks are brought into the battery position only when ammunition is to be unloaded. Equipment should be unloaded quietly, quickly, and in an orderly manner. Noise should be held to a minimum so that commands for laying the battery and other necessary instructions may be heard. A minimum of orders and instructions will be necessary if the occupation has been well planned and if the battery is operating under a sound SOP.

c. Night Occupation.

(1) Continued practice in night occupation of position is necessary to obtain smoothness of operation. If time and the situation permit, daylight reconnaissance should be made by the executive, first sergeant, chiefs of section, and drivers. This reconnaissance should include the position area, alternate positions, and routes into and out of the area. The number and location of route markers required should be determined, and the plans for security on the march and in position should be established. Night occupation of position is facilitated by leaving one or more men in the position area following the reconnaissance. They should know the location of each installation in the area. At the conclusion of the

reconnaissance, all key personnel, including drivers, should be briefed.

(2) In deliberate occupation of position, stakes are used to mark the position of the panoramic sight of each piece, each instrument used in laying for direction, each aiming post, and the direction used to orient the instrument that establishes direction. An identifying tag, with lettering large enough to be read under blackout conditions, is attached to each stake.

(3) Night occupation may be facilitated by accomplishing certain tasks during daylight. Some of these are—

(*a*) Emplacing aiming posts.

(*b*) Completing survey.

(*c*) Laying wire.

(*d*) Digging parapets, ammunition pits, trail pits, and foxholes.

(*e*) Preparing the CP, FDC, and executive post.

(4) When fire control instruments are used at night, it is often difficult to determine which is the correct light on which to sight. Identification may be made by blinking the light in accordance with prearranged signals or by using colored lights. In laying the battery at night, it is advisable to remain sighted on one piece until it is completely laid. Only those lights actually in use should be allowed to remain illuminated.

(5) A marker for the orienting line should always be emplaced and marked with a light. This marker should be from 50 to 300 meters from the aiming circle.

(6) A night occupation will usually be slower than a daylight occupation, but there is a greater need for it to be orderly and efficiently conducted. No attempts to develop speed should be made until all personnel are capable of the performance of their duties in darkness. Particular care is necessary in guiding vehicles during blackout. The tendency to use undimmed lights, to make noise, and to misplace equipment must be overcome by immediate corrective action.

d. Placing of Equipment. Rapid displacements and night movements make it imperative that each unit work out an efficient system of loading and unloading equipment. The following general principles apply to all systems:

(1) Hold each man responsible for his own equipment and for specified items of section equipment (normally those which he uses).

(2) Require the chief of section to supervise the loading of equipment and see that all equipment is in its proper place before he reports his section in order.

(3) Unload only those items required.

(4) Keep small, loose items together when not in use; for example, the tools in the section chest.

136. Rapid Occupation of Position

The foregoing paragraphs deal primarily with occupation of position when ample time is available: however, there are situations in which time will be limited. Certain procedures which will facilitate rapid occupation of position are discussed below.

a. General. In a rapid occupation of position, decentralization of duties is essential. All key personnel must be capable of performing predetermined duties with little or no supervision. Continuous practice under a sound SOP will greatly simplify and speed up the task of occupying a position.

b. Organization of the March Column. As discussed in paragraph 61, the howitzers (guns) should follow the lead vehicle in the column. If the FDC vehicle is not in the lead, it should be located immediately behind the prime movers and their alternates and so loaded that it can be operational by the time the pieces are ready to fire.

c. Continuous Reconnaissance. The battery commander and/or the reconnaissance officer precede the battery by several miles, constantly looking for and reporting possible position areas back to the executive. The executive notes the positions and should be prepared at all times to occupy the nearest suitable position in the event a fire mission is received.

d. Codes and Signals. The unit SOP should specify certain codes and signals to order the battery

into position and to direct the occupation, thus eliminating lengthly orders and instructions.

e. Occupation of Position. When so directed, the executive leads the battery into the nearest position. The unit SOP should provide for the selection of howitzer (gun) positions by the executive designating the position for the base piece, the battery center, or in some manner indicating the general area for the sections and allowing the chiefs of section to select the specific location for their own pieces. The executive points out the direction of fire. Section tools which are not essential for the immediate delivery of fire should be left in the prime mover and ammunition can be taken directly from the prime mover or ammunition vehicle until time is available for a more thorough unloading of all vehicles. Boresighting may be performed or not, depending on unit SOP.

f. Laying the Battery. The battery may be laid by the chief of firing battery or some other individual using the aiming circle, or it may be laid by any other method (FM 6–40) to save time. It is not necessary to sacrifice speed to obtain a high degree of accuracy in the initial lay; the battery may be laid more accurately after the fire request has been fulfilled. The laying should begin with the first piece reporting ready. The firing should commence with the first piece laid. If setting out aiming posts will delay firing, a distant aiming point may be used in conjunction with the slipping scale of the panoramic sight. This might necessitate the use of individual piece corrections to cor-

rect for a converged sheaf, depending on the distance from the battery of the aiming point.

g. FDC Procedures. During the march, the FDO should follow the route on his map so that, after occupation, the battery position can be quickly determined by map inspection. The determination of initial firing data is begun as soon as the fire mission is received and firing data is sent to the executive as soon as it is available. Initially, the FDC should be set up close to the executive so that fire commands can be relayed by voice. FDC personnel must be trained in emergency procedures so that a shortage of equipment or personnel will not delay operations.

h. Organization and Improvement of Position. After the fire request has been fulfilled, the organization and improvement of position proceeds normally. Any inaccuracies in laying or boresighting are eliminated, communications are installed, and the various installations are set up in the usual manner.

Section IV. DISPLACEMENTS

137. General

The principles discussed in paragraphs 118 through 136 apply to displacements as well as to an initial occupation. A displacement differs only in the fact that the unit is already engaged in firing. A preliminary reconnaissance often is made by the battery commander to determine the suitability of routes and areas. A detailed reconnais-

sance is made prior to the displacement, if possible.

138. Displacement as a Unit

When the artillery battalion is organized with 3 firing batteries, movement by more than 1 echelon may be accomplished as described below. This procedure may be modified when the battalion has more or less than 3 firing batteries. The battery displaces as a unit when the battalion of which it is a part—

a. Moves as one echelon. This method is employed when continuous fire support is not needed or when another artillery unit temporarily takes over the fires of the battalion.

b. Moves with 2 firing batteries in the first echelon and 1 firing battery in the second echelon. This method is used when no critical time for the supported troops is foreseen, but some fire support is needed during displacement.

c. Moves with 1 firing battery in the first echelon and 2 firing batteries in the second echelon. This method is used when the critical phase for the supported troops has not passed, but some artillery is needed in the new area.

d. Moves in 3 separate echelons. This method is used when supported troops require continuous maximum fire support, but displacement is necessary in order that the artillery may remain within range.

139. Displacement by Platoon or Single Piece

The battery may displace by single piece or

platoon (whether operating alone, marching with an advance guard, or as part of the battalion) when—

a. The supported troops require maximum continuous fire support.

b. The road net is crowded and movement is difficult.

c. The roads are under heavy air or artillery attack.

140. Fire Direction Center

When the battery displaces by platoon or single piece, sufficient fire direction personnel and equipment must accompany or precede the pieces to provide for uninterrupted fire in both the old and new position.

Section V. BATTERY OPERATING ALONE

141. General

When the battery is given a mission that will separate it from the remainder of the battalion, the battery commander of the detached battery will take over the appropriate functions of the battalion commander, in addition to his normal duties. See FM 6–101 for duties of battalion commander.

142. Reconnaissance and Selection

The battery commander must perform initial reconnaissance for position areas. After the area has been selected, the occupation will be similar

to that of a battery operating as part of a battalion.

143. Observation

Observation functions will be similar to those when the battery is operating as part of a battalion. The forward observers will man observation posts for the battery as required or will act as replacements for the forward observers of the mortar battery. The reconnaissance and survey officer, in addition to his normal duties, will be responsible for the coordination of observation and the collection, evaluation, reporting, and dissemination of intelligence and information. He is assisted in this by the intelligence sergeant.

144. Liaison

The liaison officer (when authorized) of each battery performs representative liaison (par. 195) for the battery when it is attached to a battle group is attached to a mortar battery or is in support of a task force.

145. Survey

Survey will normally be conducted under the supervision of the reconnaissance and survey officer. Additional survey personnel from the battalion survey section may be attached to the battery to assist in survey operations.

146. Communications

The communication chief will supervise the installation and operation of all wire and radio com-

munications. His duties will be similar to those of the battalion communication officer (FM 6–101). Communications with the supported unit is of primary importance and must be maintained.

147. Fire Direction Center

The battery fire direction officer will supervise the fire direction center. The FDC will be organized so that multiple missions can be fired by the battery. All of the radio telephone operators should be able to act as recorders. All FDC and firing battery headquarters personnel should be trained to act as computers and chart operators. All officers should be able to act as fire direction officer. In the event the battery displaces by echelon, it is necessary to set up an FDC in the new area while maintaining the FDC in the old area.

148. Supply and Ammunition

When the battery is operating alone, supply functions normally performed at battalion will be the responsibility of the battery supply officer. The battery ammunition section may be supplemented by part of the battalion ammunition train. An officer or the chief of the ammunition section will assume the duties of train commander.

CHAPTER 8

ORGANIZATION OF POSITION

Section I. GENERAL

149. General

The organization of a position consists of those operations necessary to develop a position to permit the battery to accomplish its mission and to provide for the safety and comfort of the personnel. Organization of a position may be divided into those operations necessary for immediate delivery of fire, and those measures taken to insure continuous fire support and to improve the position. The organization of a position area is a continuous process. It begins when the position area is selected and ends when the area is vacated. The first phase, preparation for immediate delivery of fire, is accomplished during the reconnaissance, selection, and occupation of position (ch. 7). When the situation permits, the battery commander should infiltrate personnel into the position area to accomplish as much of the organization as possible before the arrival of the battery. This may include erection of camouflage nets, installation of wire nets, improvement of routes, organization of local security posts, and partial digging-in. After the battery has occupied the position area, improvement of the area continues as firing permits. See figure 7 for a type position area layout.

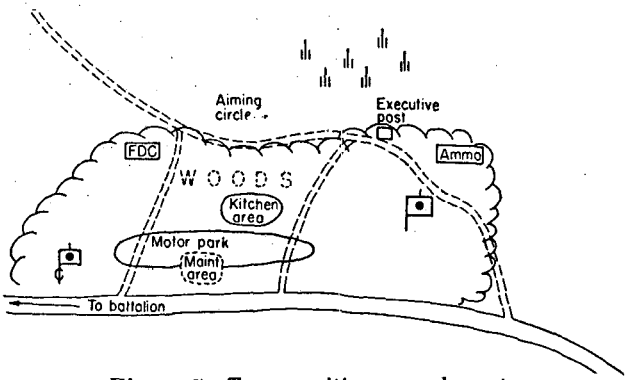

Figure 7. Type position area layout.

150. Planning

The battery commander should make a plan for the organization of the battery position area as soon as possible after the selection of the area. Priorities should be announced so that the most important tasks are performed first. Consideration should be given to the effect on the area of changing weather conditions. Heavy and very-heavy artillery require special consideration in concealment from air observation. Maximum preparation prior to occupation is of great assistance in organizing the position.

151. Priorities

The battery commander establishes priorities for the organization and improvement of the position area. The following priority will usually be appropriate.

a. Preparation to deliver fire at the earliest possible moment.

b. Establishment of a strong defense.

c. Protection of personnel by digging special trenches and foxholes.

d. Protection of ammunition.

e. Camouflage.

f. Preparation of emplacements for the howitzers (guns) and other weapons.

g. Preparation of alternate and supplementary positions.

h. Preparation of dummy positions (only when authorized by higher commander).

Section II. INSTALLATIONS

152. General

The arrangement of the different installations of the battery depends on the mission assigned, available fields of fire, possibilities of defilade and concealment, and the layout of the firing position. Wide variations will be necessary to fit the existing terrain. Organization of position in the desert requires emphasis on dispersion and camouflage. Organization of a position area in or near a village differs greatly from that in unpopulated areas. The installations within the battery position may be grouped generally under three headings; the firing position, the command and service area, and the perimeter defense.

153. Firing Position

a. General. The firing position contains the in-

stallations around which the entire battery position area is organized. The selection and preparation of installations within the firing position have priority over all others. The firing position includes the emplaced howitzers (guns), the aiming circle(s), the ammunition dump, the executive post, and the FDC.

b. Howitzer (Gun) Positions. In selecting the locations for the howitzers (guns), the primary consideration is the capability of firing effectively in support of the assigned mission. When organizing the firing position, the executive may move some of the pieces from their previously selected positions in order to more effectively organize the position for prolonged occupation. Some of the factors to consider in organizing the firing position are as follows:

(1) *Terrain.* When possible, a position should permit all-around (6,400 mils) fire capability. A position should provide defilade without creating an excessive minimum elevation. Although most artillery pieces are capable of firing high-angle fire, it may be undesirable from a time standpoint to fire high-angle at the close ranges required of some units. Positioning weapons too close to a high terrain may preclude the use of the weapons in a direct fire role against enemy ground forces attacking the battery position area. Terrain features to the flanks and rear of the battery position must also be considered. Hills, cliffs, and high trees

to the flanks or rear may adversely affect an otherwise excellent position. Rocky or swampy ground should be avoided when possible, and a relatively level spot should be selected for each piece.

(2) *Tactics and capability of the enemy.* The tactics and capability of the enemy are interrelated with the influence of terrain. When the enemy has air superiority, is active in counterbattery fire, or when the area is in barren dessert, the weapons and other battery installations are widely dispersed. When the battery is operating in mountains or heavily wooded areas, where friendly forces have air superiority, or when confronted with guerilla or infiltration tactics, the battery installations will usually be kept in a compact, easily defended area, away from woods which might offer the enemy concealed routes of approach.

(3) *Formation of howitzers (guns).* The formation of the howitzers (guns) in the firing position is dictated by a compromise between the influence of the terrain and the tactics and capability of the enemy. Individual locations are selected to obtain maximum cover, concealment, and dispersion consistent with control and the ability to deliver all-around fire. A compact firing position facilitates control by the executive and is easier to de-

fend during a ground attack: however, this type of position is vulnerable to air attack and accurate counterbattery fire. A straight line of howitzer (gun) emplacements is an easy target for strafing or low-level bombing attacks by enemy planes and should be avoided. Staggering the emplacements helps conceal the position and facilitates firing to the flanks and rear. The optimum battery front for light and medium artillery is generally from 150 to 250 meters in width, and for heavy artillery from 250 to 350 meters in width. This frontage should not be exceeded since the sheaf would be so wide as to be ineffective or would require the addition of special corrections to converge the sheaf on each fire mission. Pieces are numbered counterclockwise (seen from above) when in a circular formation, such as around a rendezvous area; and from right to left (seen from the rear) when in a linear formation, as in a firing position.

(4) *Preparation of emplacements.* Preparation of emplacements for the howitzers (guns) is a progressive program that continues throughout the occupancy of the position. The purpose of the emplacements is to provide cover for the howitzer (gun), its crew, and ammunition. Emplacements are either surface or pit type. For the surface type, a para-

pet is built up with sandbags or by pushing up earth with a bulldozer. For the pit type, a shallow pit is dug and the removed earth is used to build up the parapet. For a detailed discussion of emplacements, see FM 5–15.

c. Aiming Circle Location.

(1) The location chosen for the aiming circle should be one from which all the pieces may be seen and easily laid. A good line of sight is obtained by locating the aiming circle on higher ground than the howitzers. A stake should be driven into the ground to mark the location of the aiming circle. In consideration of the probable necessity for its use during firing, the aiming circle is most efficiently located to the left rear of the line of weapons. When terrain conditions make it impossible to see all pieces from one aiming circle, a second aiming circle may be used to lay the remaining pieces. The second aiming circle must be laid reciprocally from the first, if possible.

(2) When the magnetic nedle of the aiming circle is used, the aiming circle must be set up at least the following minimum distances from objects which will affect the magnetic needle:

	Meters
High tension power lines	150
Railroad tracks or very-heavy weapons	75
Medium and heavy weapons or armored vehicles.	60

	Meters
Light weapons, vehicles, or telephone wires.	40
Barbed wire	10

(3) Steel helmets, small arms, steel-rimmed eyeglasses, rings, pencils, and other metallic objects which affect the needle must be kept away from the instrument.

d. Ammunition Dump. The ammunition dump (when authorized) should be located to the flank of the firing position and at least 100 meters from other installations. Dispersion, concealment, and cover should be sought for passive protection. Defilade and good drainage are desirable. Ammunition should be in small stacks of not more than 3 layers, with a minimum interval of 10 meters between stacks. Different components, such as fuzes, primers, powder increments and projectiles, should be stacked separately.

e. Executive Post. The executive post is the firing battery headquarters and is connected to the communications network. The executive, chief of firing battery, and recorder work out of the executive post. It should be located about 30 meters to the rear of the howitzers (guns).

f. Fire Direction Center. The FDC is the installation in which firing data are prepared, firing charts and intelligence are maintained, and the primary battery communications are located. The FDC is an increment of the firing battery, supervised by the fire direction officer. It should be located so as to avoid traffic to other installations. For a detailed discussion of the construction of an FDC bunker, see FM 5–15.

154. Battery Command Post

The battery CP is usually located in the general vicinity of the FDC. It should be connected with the battery wire system. Defilade and concealment are desirable.

155. Switchboard

The battery switchboard should be located to the flank of the battery near the exit of the exterior wire lines. It should be a dug-in position, utilizing available cover and concealment. Its location should be relatively free from noise, and at least 300 meters from roads or other installations.

156. Service Area

The service area contains the truck park and the battery mess. These installations are not directly connected with the delivery of fire and are located away from the firing position.

a. Mess. It is desirable to have the battery mess in the battery position area when the situation permits. Hot, well-prepared meals add greatly to the morale and efficiency of the battery personnel. The mess should be placed in a defiladed and concealed location that is accessible by road. The area should have good drainage and soil conditions that will permit seepage from sumps and garbage pits.

b. Truck Park. The truck park should be located to the flank or rear about 300 meters from the howitzers (guns) in an area that is readily accessible and has firm ground, good drainage,

cover and concealment, and room for dispersion of vehicles. When cover is not available, vehicles should be dispersed to a minimum distance of 50 meters between vehicles. All vehicles that are not required at the various battery installations should be kept in the truck park.

157. Perimeter Defense

The perimeter includes the positions for machineguns and rocket launchers, sentinels, outposts, and obstacles. These are located to provide a flexible, all-around defense of the position area. Simultaneously with the occupation, the weapons are emplaced for defense, camouflage is begun, and the coordination of local security is commenced. The improvement of the perimeter continues throughout the occupancy of the position area. For a detailed discussion of the defense of the battery position area, see chapter 4.

Section III. SURVEY

158. Battery Survey Personnel

Each firing battery has a reconnaissance and survey officer and a survey section. The number of enlisted survey personnel varies in the different type batteries. Battery survey personnel often work with or under the direction of the battalion survey section.

159. Survey Operations

The purpose of artillery survey operations is to provide horizontal and vertical locations of points

to be used in determining firing data and to provide a means for orienting weapons, instruments, and radar. Survey control in the position area of each howitzer (gun) battery is used for the accurate determination of firing data. Medium and light artillery and mortar battery position area survey requirements are the same. For heavy, very-heavy, and missile units, the requirements vary slightly. When the battery is operating under battalion control, a starting point (battery survey control point) for the position area survey will normally be designated by the battalion reconnaissance and survey officer. The battery survey control point is chosen within 1,000 meters (when possible) of the battery position area and is so located as to facilitate the survey to be performed by both the battalion and battery survey parties. If starting control is not already available at this point, it will be assumed by the battery reconnaissance and survey officer when his survey begins. For light and medium artillery batteries, the approximate geometric center of the formation of howitzers (guns) must be surveyed. For all other artillery batteries, each individual weapon is surveyed. An orienting line of known direction is established in the position area of all batteries and, unless otherwise specified by unit SOP, the battery survey party computes an orienting angle and gives this information to the battery executive officer. Additional survey tasks may be prescribed for the battery survey party by the reconnaissance and survey officer or battery command-

er. For a detailed discussion of survey operations, see TM 6–200.

Section IV. CAMOUFLAGE

160. Principles of Camouflage

The purpose of camouflage is to conceal the location of the position or to mislead the enemy as to the strength, type and intentions of the battery. In organizing his battery position area, the battery commander must devise a camouflage plan to take advantage of natural concealment and to supplement the natural means by a skillful application of camouflage principles. Camouflage is a passive measure for defense of the position area and is especially important when the enemy has air observation. For a detailed discussion of camouflage, see FM 5–20.

161. Phases of Camouflage

The three major phases of camouflage are choice of position, camouflage discipline, and camouflage construction.

a. Choice of Position. The most important consideration in the selection of a position area is the mission of the unit: however, the availability of natural camouflage is another factor that affects the selection of an area. When possible, the area selected should afford natural concealment, defilade, and concealed routes of approach. Changing the appearance of the area should be avoided since aerial photos taken at intervals will reveal the changes to trained photointerpreter teams.

b. Camouflage Discipline. Camouflage discipline is the adherence to practices which are designed to avoid revealing military objects to the enemy or changing the appearance of the area. Continual emphasis must be placed on the observance of camouflage discipline by all personnel. One breach may disclose the position to the enemy. Elements of camouflage discipline include the following:

(1) Avoid making changes in the vegetation or previous construction in an area.

(2) Cover spoil from digging and debris or place it where it will blend with the surroundings.

(3) Follow existing tracks, paths, roads, or natural terrain lines in order to avoid making new tracks and trails.

(4) Do not terminate an exposed route at the battery position; extend the route to where it might logically terminate, at some location remote from the battery.

(5) Control and disperse smoke.

(6) Do not litter the area with trash or leave objects in the open.

(7) Prevent shine from any object, or conceal it.

(8) Maintain light discipline.

(9) Maintain sound discipline.

c. Camouflage Construction. Where existing natural concealment is not adequate, camouflage construction helps blend equipment and personnel with the surroundings. Maximum use should be

made of natural materials which are similar to those in the position. Artificial materials should be capable of withstanding adverse weather. Changes in season require gradual changes in the color and kind of materials used.

162. Natural Camouflage Materials

The greatest possible use should be made of natural materials since they best match local colors and textures. Freshly cut vegetation must be replaced as soon as it begins to wilt and change color or texture. Cut foliage should be placed as it appears in its natural, growing state, with the tops of leaves up, tips of branches pointing out, and otherwise matched to its surroundings. Changing the appearance of the area should be avoided by taking the lower branches from trees scattered throughout the area. Bushes or other vegetation should not be entirely removed.

163. Artificial Camouflage Materials

Artificial materials used for camouflage include camouflage nets, wire netting (similar to chicken wire), cloth garnishing, and camouflage paints. Camouflage nets with appropriate cloth garnishing and camouflage paints are the most commonly used artificial materials.

164. Camouflage of Materiel

a. Camouflage of materiel within the battery position area is best accomplished by proper location to take advantage of existing concealment and then supplementing it with natural and artificial

camouflage materials. Terrain with scattered trees and bushes presents a confusing pattern to enemy aerial observers. An irregularly dispersed battery can be hidden in such terrain by using cut brush to supplement natural concealment. In open terrain, locations in hedge lines, brush patches, overgrown gullies, dry washes, and folds in the ground furnish partial concealment. Positions in towns or near groups of farm buildings offer good possibilities for concealment. Debris such as timber and rags can be used as camouflage materials in such areas.

b. Camouflage paint assists in concealment of materiel and installations by breaking outlines and blending the object with the surroundings. Colors of camouflage paints are chosen to match the dominant colors of the area. When camouflage paint is used, the patterns should be large and bold, the under surfaces should be lighter than upper surfaces, the patterns should cut across the main straight lines of the object and continue across adjacent surfaces, and the colors used should contrast strongly. Natural materials such as mud or snow can be used effectively in place of camouflage paint.

c. The two types of camouflage nets commonly used are the flattop net and the drape net. The flat-top net is erected on a wire frame over an object to conceal the object from aerial and oblique observation. The drape net conceals the identity of an object by distorting its shape and is more heavily garnished than the flattop net. It is more versatile than the flattop net and can be used to

conceal almost any object. The drape net is easier to erect, blends better with the irregular patterns of nature, and protects against ground observation as well as against aerial observation. See FM 5–20D for details of the use of various types of camouflage nets.

165. Evacuation of Position

The battery position area should be left in its original state when the area is evacuated. Aerial photographs of a littered, uncamouflaged position area that has been evacuated may reveal to the enemy the type of weapons or equipment the unit carried, the approximate strength of the unit, and the direction of departure. Trail pits and weapon emplacements should be filled, sumps closed, trash and garbage disposed of, and individual foxholes and trenches filled. Nothing should be left in the evacuated area that would reveal the identity or nature of the unit.

CHAPTER 9

COMMUNICATIONS

Section I. GENERAL

166. General

The ability of the battery to render effective fire support requires efficient communications with the next higher headquarters, with the forward observers and/or liaison officers with the supported unit, with battery observation posts, with adjacent batteries, and within the battery itself. Communication is necessary for the effective control of all battery activities. The battery detail contains the personnel and equipment for the installation and maintenance of the battery communications system.

167. Means of Communication

The principal means of communication employed by the battery are wire, radio, and messengers. Visual and sound signals may also be employed. Visual communication includes the use of lights, flags, panels, pyrotechnics, and hand and arm signals. Sound communication includes whistles, horns, sirens, gongs, and other such devices. Visual and sound communications are generally limited to a short distance. Sound communication is usually reserved for alarm signals.

168. Communication Requirements

a. Internal Requirements. The internal communication requirements of the battery are those necessary for command, fire direction, and administration. These requirements include—

(1) Tactical and administrative control of the battery.

(2) Fire direction.

(3) Receipt and adjustment of fire missions.

(4) Exchange of information and intelligence.

b. External Requirements. The external communication requirements of the battery are those necessary for communication with higher headquarters and adjacent units and with the reinforced or supported unit. These requirements include—

(1) Receipt of tactical and administrative orders.

(2) Receipt and adjustment of fire missions.

(3) Exchange of information and intelligence.

(4) Liaison.

169. Signal Orders

Necessary signal orders and instructions are issued to the battery in the communication plan of the next higher headquarters, in the SOI (signal operating instructions), and in the SSI (standing signal instructions). The SOI contains general communication instructions subject to frequent

change, such as codes, ciphers, radio call signs and frequencies, telephone directory, and visual and sound signals. The SSI contains instructions on the use of the SOI as well as operational data which are not normally subject to frequent change. For further discussion of signal orders, see FM 24–5.

170. Alternate Means of Communication

Complete reliance must not be placed on any single means of communication. The wire communication system parallels the radio communication system so that an alternate method is always available. During displacements and initial occupations of position, radio is particularly useful. As time permits, the wire system is installed, and wire and radio become equally important.

Section II. WIRE SYSTEM

171. General

The battery wire system is a vital means of signal communication for the battery. Wire communication is generally more stable than other means, does not require a high degree of technical skill to install and operate, and is less subject to electrostatic disturbances or enemy jamming than radio communication. Disadvantages of wire communication are that the lines are vulnerable to tapping by enemy patrols and to being broken by shelling, bombing, and vehicles. For a type battery wire system, see figure 8. The installation of

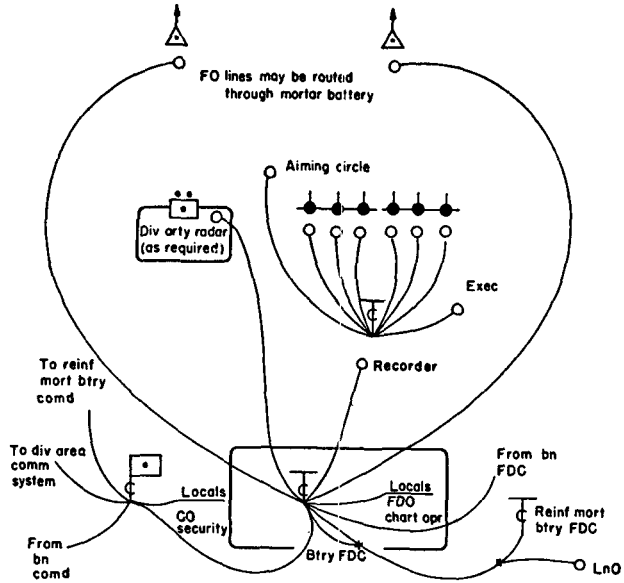

Figure 8. Type battery wire system.

the wire system is started as soon as the situation permits.

172. Use of the Area Communication System

The area communication system, installed by the Signal Corps, is used to supplement and augment artillery communication systems. The area system offers a means for expeditiously establishing a wire network between artillery elements when the length of the line is beyond the capability of the units to establish or maintain. When the area system is used for fire control purposes, sole user circuits are provided. Administrative

and logistic traffic is handled on a common user basis.

173. Equipment

Some of the major items of wire communication equipment authorized for howitzer (gun) batteries are—

a. Switchboard SB–22/PT. This switchboard is small, lightweight, immersion-proof, and requires no special mounting for operation. It has a capacity of 12 line circuits, and weighs approximately 30 pounds. For further details, see TM 11–2202.

b. Connecting and Switching Kit, MX–155/GT. The switching kit is a small, lightweight item that is used to provide a rapid means of connecting telephone circuits between the battery executive officer and the individual pieces. For further details, see TM 11–2546.

c. Telephone, TA–312/PT. This telephone is a rugged, lightweight, waterproof, field telephone that can be used under all conditions. It weighs about 9½ pounds. For further details, see TM 11–2125.

d. Wire, WD–1/TT. This is the standard wire issued for field use. It weighs about 48 pounds per mile and has a voice transmission range (non-loaded) of about 20 miles when dry and 12 miles when wet.

174. Phases of Wire Installation

Since considerable time is required to install a

complete battery wire system, priorities for installation are established by installing the wire in three phases: the initial phase, the expansion phase, and the improvement phase.

a. The Initial Phase. The circuits necessary to the delivery of fire are established during this phase. Lines are installed before occupation of position, when possible, or immediately thereafter. The lines which may be included in this phase are—

(1) Lines from each howitzer (gun) to the connecting and switching kit.

(2) Line from the executive post to the battery FDC.

(3) Local lines from the battery switchboard to the battery commander and executive officer.

(4) Lines to the forward observer or battery observation posts as directed.

(5) Lines to the liaison officer and to the supported or reinforced unit.

b. Expansion Phase. During this phase additional circuits are established by—

(1) Simplexing the trunk line from the battalion switchboard to the battery FDC.

(2) Laying a hot loop line to the outposts and security installations.

(3) Adding local lines as specified by the battery commander.

c. Improvement Phase. During this phase the wire system is continually improved to prevent

interruptions of communication. Duplicate trunk circuits and lateral lines are installed. Police and maintenance of the wire lines is continuous. Lines which may be laid during this phase include—

(1) Lateral lines as directed.

(2) Duplicate lines to the liaison officer and the supported or reinforced unit.

175. Procedure in Laying Field Wire

a. General. Each battery should establish an SOP for the laying of all wire lines for the battery (FM 24–20). Local lines can usualy be laid rapidly and without prior reconnaissance. Before beginning construction of long wire lines, the wire team chief should, if time permits, make a reconnaissance of the available routes to determine the best route to lay the line, the distance in miles, the number and types of crossings, obstacles to maintenance, and alternate routes. All wire should be serviced and tested before beginning to lay the line. Reels of wire that do not show a continuous circuit should not be used. After a splice has been completed during the laying operation, the circuit should be tested back to the starting point from the far side of the splice to insure continuity of the circuit. A procedure that may be used to insure the proper completion of the wire lines is observance of the rule of the four T's, as follows—

(1) Tie —The wire should always be tied to some sturdy object before connecting to any equipment.

(2) Tag —The wire line should be tagged near its terminal for identification.

(3) Test —The line should be tested back to its starting point.

(4) Turn over —The line should be turned over to an operator at the using installation, not just dropped on the ground.

b. Surface Lines.

(1) The lines initially laid by the battery are usually laid hastily on the ground. Surface lines require minimum time for installation and, when properly laid, are less vulnerable to artillery fire than other types of construction. The disadvantages of surface lines are that they may become unserviceable in wet weather as a result of leakage to the ground and they are subject to being broken by troops and vehicles.

(2) Surface lines should be laid loosely, leaving from 15 to 20 percent of well-distributed slack. This enables the wire to lie flat on the ground, provides incidental protection against artillery fire, facilitates repair of breaks, and allows for subsequent changes in the type of construction.

(3) At suitable intervals, and when attempting a crossing or changing direction, sur-

face lines should be tied to trees, posts, or stakes at ground level. This helps to maintain sufficient slack and prevents the wire from being pulled into traffic lanes. When surface lines are routed along roads, they should be kept well off the shoulder.

(4) Surface lines should be protected from traffic at the FDC, the CP, road and railroad crossings, and other congested areas. For details on construction, see FM 24–20.

(5) Lines from the executive post to the switching kit and other lines in heavily traveled areas of the position should be protected by digging in. Lines should be buried a minimum of 6 inches.

c. Tagging Lines. Wire lines should be tagged for identification. Tags should be attached approximately 1 foot from any terminal and at frequent intervals along the route, including each spot where the wire is tied. The SOI or SSI normally prescribes the wire tagging code to be used. Clear text designation of units should not be used.

176. Maintenance and Recovery of Wire

The maintenance of completed wire circuits is a joint responsibility of the units to which the line is connected. Recovery of wire is initiated as soon as possible and is continued as long as time permits.

Section III. RADIO SYSTEMS

177. General

The battery operates in the battalion and the reinforced or supported unit radio nets. The type radio system used varies with the type battery, its mission, and the channels and equipment available. For a type battery radio system, see figure 9. For a detailed discussion of radio systems, see appropriate 6-series field manuals. Radio communication is especially important in fast moving situations, during displacements, and in the initial stages of an occupation of position. As the wire system is installed and expanded the traffic load is shifted from radio to wire. If wire communications fail, or the load becomes too great, radio is again used. One radio at each element or installation should remain in use on a standby basis so as to be immediately available for use if the wire system fails.

178. Equipment

The number and types of radio equipment authorized for each battery are specified in the TOE for the battery. The normal operating range listed for each set is affected to varying degrees by the weather, terrain, time of day, season of year, magnetic disturbances, and the frequency on which operating. All FM (frequency moduated) radios are basically line-of-sight sets, and operate best where there are no intervening terrain features between the transmitting and receiving stations.

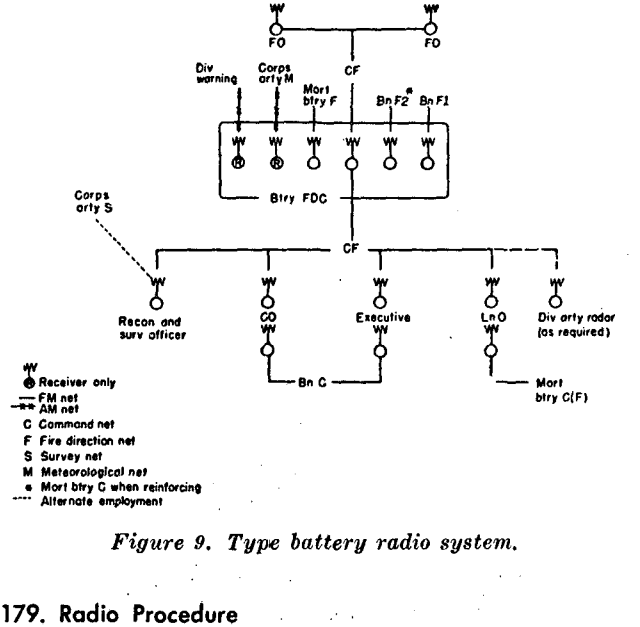

Figure 9. Type battery radio system.

179. Radio Procedure

a. Radio communication may bcome difficult because of battlefield or vehicular noises. To insure effective voice transmissions, operators should develop the skill of knowing what to say, how to say it, and when to say it. ACP 125(B) prescribes radio procedure to be used by all units. See FM 6–40 for the *short-phrase, repeat-back* procedure used for transmission of fire commands. Observance of proper radio procedure aids in the efficient transmission of messages by preventing confusion and misunderstanding.

b. Additional suggestions for the proper operation of radios are as follow:

(1) Do not transmit more than necessary. Long transmissions deny use of the net to other stations and aid the enemy in locating the station.

(2) Know what to say before pressing the microphone switch.

(3) Pause between pressing the switch and beginning to transmit.

(4) Hold microphone close to mouth.

(5) Speak clearly and directly into the mouthpiece.

(6) Speak in a normal tone and in a slower rate than normal conversation, but do not drag or slur.

(7) Release microphone switch as soon as transmission is complete. Reception is impossible when the switch is pressed.

180. Operating Hints

Maximum performance can be obtained from radio equipment only when the equipment is properly located, operated, and maintained. Some important hints on obtaining maximum performance from radio sets are as follow:

a. Preventive maintenance must be performed regularly in accordance with the instructions in the appropriate manual.

b. Power supplies and batteries must be in good condition. A spare set of batteries should be obtained for each piece of equipment and tested before leaving the supply location. Batteries become inefficient in very cold weather and are gen-

erally inoperable at temperatures of —20°F. or colder. Spare batteries should be kept warm and rotated with the cold batteries in the equipment.

c. The radio set must be accurately tuned to the proper frequency.

d. Whip type antennas should be placed in a vertical position for operation. Tying down an antenna greatly reduces the range of the set.

e. The set should be located for best operation and then remoted into the using installation. Radio sets located on hills will operate over greater distances than those located in depressions.

f. Radio sets should not be located in the vicinity of, or under, bridges or underpasses. Large metal structures absorb radio energy and reduce the range of the set.

g. When trees are used for concealment, the leaves or branches must not touch the antenna. Green or wet leaves and branches absorb radio energy and reduce the range of the set.

h. When the radio set is mounted in a vehicle, the vehicle should be positioned so that its mass is between the antenna and the distant station. This will increase the range of the set.

i. When the transmission range becomes too great for effective operation, a relay station or elevated type of antenna may be used.

j. Nonstandard antennas may also be used to increase the range of the set. However, an improperly designed or installed antenna may decrease the range. For detailed information on the construction and use of nonstandard antennas, see TM 11–666.

CHAPTER 10

OBSERVATION, FIRE SUPPORT, AND LIAISON

Section I. THE FORWARD OBSERVER

181. General

a. Functions. The functions of the forward observer are to locate targets, adjust artillery fire, advise the supported company commander on artillery employment, plan artillery fire, assist in fire support planning and coordination, report all information of an intelligence nature, and keep his battery or battalion informed of the situation, plans, and locations of friendly troops.

b. Assignment. Forward observers are assigned to either the howitzer (gun) battery or the headquarters battery, depending on the type of battalion (par. 102). An infantry division 105-mm howitzer battery has two forward observer sections. The forward observer is assisted by a reconnaissance sergeant, a liaison specialist, and a radio/telephone operator-driver. Appropriate TOE's list the personnel and equipment authorized for forward observer sections of specific units.

c. Status. The forward observers of artillery units other than the mortar battery or armored division direct support battalions are normally required to man artillery observation posts (OP's). They may, however, be required to act as forward

observers for mortar batteries or for direct support battalions, or for their own unit if it is assigned a mission of direct support (par. 106).

d. Coordination. Direct support forward observers are coordinated by their liaison officer with the supported unit. Forward observers with mortar batteries are coordinated by the mortar battery fire direction officer.

e. Zone of Observation. For the forward observer, the zone of observation is the zone of action of the supported unit.

f. Location of the Forward Observer. The forward observer normally remains close to the supported unit commander. Both the forward observer and the supported unit commander are responsible that the necessary contact is maintained.

182. Procedure of the Forward Observer

a. Before leaving his battery area, the forward observer—

(1) Checks equipment for completeness and condition.

(2) Obtains supply of rations, gasoline, and water.

(3) Obtains ammunition for the weapons carried by his section.

(4) Checks radio communications.

(5) Reports to the FDC to obtain—

(*a*) Supply of indexed maps and/or photographs.

(*b*) Enemy situation and locations of enemy installations.

(*c*) Observation plan and locations of battalion OP's.

(*d*) Essential elements of information (EEI).

(*e*) The password, or sign and countersign.

(*f*) The overall tactical situation.

(*g*) Amount and type of friendly artillery available.

(*h*) Ammunition situation, quantity, and type available.

(*i*) Locations of registration points and concentrations.

(*j*) Location of supported unit command post.

(*k*) Radio call signs and frequencies.

(*l*) Telephone names and numbers.

(*m*) Communication plan.

(*n*) Status of wire and radio communications.

(*o*) Extracts from signal orders and current codes.

b. Enroute to the supported or reinforced unit command post, the forward observer notes the terrain features, including the routes of communication. He has all members of his section become familiar with the route so that they may return without him, if necessary.

c. On arrival at the supported or reinforced unit command post, the forward observer reports to the liaison officer or the mortar battery fire direction officer and learns the following:

(1) The situation and scheme of maneuver of the supported unit, including the locations and plans for employment of the infantry weapons.

(2) The location of the company for which he will conduct artillery support.

(3) Other information listed in *a*, above, which was not available at the time of his departure.

d. On arrival at the supported company, the forward observer reports to the company commander and—

(1) Determines the disposition of the company on the ground.

(2) Obtains plans of attack, defense, and patrols.

(3) Determines the local security and medical evacuation SOP of the company.

e. In addition, the forward observer—

(1) Locates on the ground, with the assistance of the preceding forward observer, if possible, the locations of registration points, concentrations, and barrages.

(2) Checks communications.

(3) Notifies the artillery unit which will be firing for him that he is in position.

(4) Briefs the members of his section on the situation and the supported company SOP.

f. During his tour of duty, the forward observer takes the following actions:

(1) Keeps the supporting artillery unit informed of—
   (*a*) His location and field of observation.
   (*b*) The locations of friendly troops and any changes in their disposition.
   (*c*) All known enemy disposition and movement, including the actions of enemy aircraft. *He reports exactly what he observes, not what he infers or deduces from his observation.*
(2) Maintains contact with the supported company commander and communications with the supporting artillery.
(3) Plans artillery fires; advises and assists the supported unit commander in fire support planning (par. 192).
(4) Observes and adjusts fire and reports the results.
(5) Prepares a terrain sketch of his area (FM 6–40).
(6) Prepares, if required, a visibility diagram (FM 6–40).
(7) Within his capabilities, coordinates observation and fires with other observers in his vicinity.

183. Forward Observer in the Offense

a. General. In offensive operations, the forward observer should stay as close as possible to the supported company commander. The commander receives reports from all elements of his unit and will know where artillery support is most urgent-

ly needed. The forward observer is able to assist the supported company in the offense by—

(1) Planning fire on enemy locations, and on critical areas as necessary to protect the reorganization of the supported unit following the seizure of an objective.

(2) Adjusting fire on enemy positions, fortifications and targets of opportunity.

(3) Rendering close and continuous fire support of the maneuver of the company.

(4) Providing combat intelligence.

(5) Providing additional channels of communication.

b. The Approach March. During the approach march, the forward observer is concerned primarily with the maintenance of his communications and with fire planning. He should periodically check his communications with the FDC, the liaison officer (if appropriate), and other observers. When time permits, the forward observer should plan fire missions on critical points along the line of march.

c. The Attack. When contact with the enemy has been made, the forward observer must position himself where he can best observe the actions of the supported company, conduct fire missions, and advise the company commander on artillery matters. If circumstances require the forward observer to select an observation post at a point distant from the company commander, he should have the reconnaissance sergeant perform the actual observation, allowing the forward observer to re-

main with the company commander. The forward observer normally should check with the company commander before firing missions in an attack, since the friendly troops may have approached to within a dangerous distance of the location of the fire mission.

d. Consolidation. When the objective has been taken, the forward observer—

(1) Notifies the FDC or liaison officer that the objective has been taken.
(2) After consulting with the supported company commander, plans and, when appropriate, fires-in protective concentrations.
(3) Maintains continuous observation and fire support.
(4) Directs his section to dig in and camouflage their position.
(5) Arranges a schedule to allow each member of his section to eat and sleep.

184. Forward Observer in the Defense

a. Defensive Fires. In the defense, the necessity for speed and accuracy of fire is vital. The artillery forward observer should normally fire-in defensive concentrations. Check rounds should be fired periodically to confirm firing data. The adjustment of the fire of weapons which will fire a barrage normally should be accomplished as soon as the ground location of the barrage has been selected. Each weapon may be individually adjusted if time and the availability of ammunition permit.

b. Wire Communications. A static situation may present the opportunity to improve the wire communications of the forward observer. In this case, the wire system should include two lines between the FDC and the forward observer, lateral lines between the forward observer and adjacent forward observers and observations posts, and a line to the supported company switchboard.

c. Retrograde Movement. When the supported company is withdrawing and contact with the enemy is not imminent, the forward observer may keep his section together. If enemy contact is imminent, or if the company is withdrawing in contact with the enemy, the forward observer may organize his section in two teams and have them displace by bounds while he remains with the supported company commander. One team will engage the enemy with rapidly adjusted covering fire until the last elements of the supported troops withdraw abreast of their position. That team will then withdraw past the second team, who will be continuing the fire. This action can be repeated from vantage point to vantage point, keeping to a minimum the interruptions in observation and fire.

185. Forward Observer in Patrol Actions

a. Patrol Support. Providing fire support for friendly patrols is an important function of the forward observer. However, the forward observer should not accompany a patrol unless it consists of the major portion of the supported company, and then not without specific permission

from his parent unit commander or his designated representative. When the importance of a patrol requires the presence of the forward observer, he should leave a member of his section with the remainder of the supported company during his absence. Complete information on all patrols should be given to the supporting battery FDC by the forward observer.

b. Planning. Planning for artillery support of patrols must be carefully coordinated before the patrol begins. Steps in planning include the following:

(1) The supported company commander notifies the forward observer of the patrol and provides information of the size of the patrol, the times of departure and return, its mission, routes, and any special instructions.

(2) When the supported company commander requests fire support for the patrol, the forward observer contacts the patrol leader and personally plans the support. When possible, the forward observer and the patrol leader look at the patrol route on the ground and plan prearranged fires on critical areas.

(3) The forward observer gives the patrol leader the numbers of the planned concentrations.

(4) The forward observer fires-in concentrations if the situation requires.

(5) The patrol leader informs the forward

observer of the communication instructions of the patrol, including emergency signals.

(6) The forward observer makes arrangements to maintain communications with the patrol, when necessary.

c. Armored Patrols. When the forward observer accompanies an armored patrol, he is furnished a tank by the supported armored unit. If dismounted infantry accompany the armored patrol, the forward observer must be prepared to adjust fire either from the tank or on the ground. The forward observer must avoid engaging his tank in a fire-fight unless absolutely necessary.

Section II. OBSERVATION

186. General

a. Purpose. Observation is employed by the field artillery for target acquisition, adjustment and surveillance of fire, and to gain information. Observation may be visual or electronic; the discussion in this section concerns only visual observation. For a discussion of the techniques of all types of observation, see FM 6–20 and FM 6–40.

b. Observer Parties. The forward observer section of an artillery unit which is not in direct support will normally be available to act as the artillery observer party (par. 181*c*). If the forward observer section is not available, or if additional observer parties are needed, they can be organized from qualified personnel available in the ar-

tillery unit. Generally, an observer party of this type is made up of the reconnaissance and survey officer and men from the battery detail.

c. Functions of the Observer. The artillery observer maintains observation over an assigned sector to provide a portion of the complete coverage of the frontlines. He fires registrations and other special missions for his unit and may act as one end of a target area-base. He is required to submit a visibility diagram (FM 6–40) to his battery or battalion FDC.

187. Selection of Observation Posts

The observation post is located by the observer to obtain a wide, deep field of view. Observation posts should be located to supplement the observation by the forward observers and to add depth to the zone of observation. In selection the location for an observation post, consideration should be given to ease of concealment, the routes available, ease of installation of communications, and the avoidance of landmarks or prominent terrain features. Alternate positions for observation posts should be selected and developed as much as the situation permits, to include preparing the terrain sketch and the visibility diagram, laying wire to the position, and camouflaging. In a moving situation, plans should be made for the timely displacement of artillery observation posts to prevent interruption of the continuous observation over the battle zone. The responsible unit should provide a visitor's observation post so that the locations of the tactical artillery observation posts will

not be revealed by the excess traffic. For details of the construction of several types of observation posts, see FM 5–15.

188. Reverse Slope Positions

a. Advantages. The advantages of a reverse slope position (fig. 10) are that it—

(1) May be occupied during daylight.
(2) Allows greater freedom of movement.
(3) Facilitates installation, maintenance, and concealment of communication equipment.

b. Disadvantages. Disadvantages of a reverse slope position are that—

(1) It usually affords only a limited field of view to the front.
(2) Fire adjusted on the crest may neutralize the observation post.
(3) Instruments and personnel appearing above the crest are difficult to conceal.

189. Forward Slope Positions

a. Advantages. Advantages of a forward slope position (fig. 11) for an observation post are that it—

(1) Is removed from the crest so that fire on the crest will not neutralize the observation post.
(2) Affords a good view of the area to the front.
(3) Affords a background which facilitates concealment.

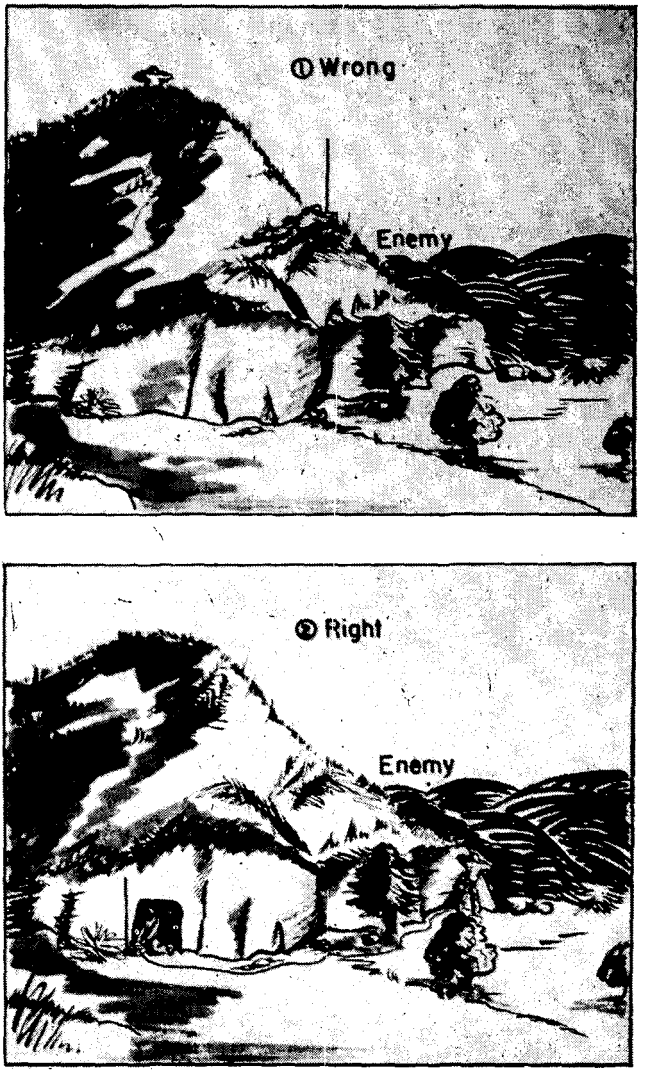

Figure 10. Reverse slope position for observation post.

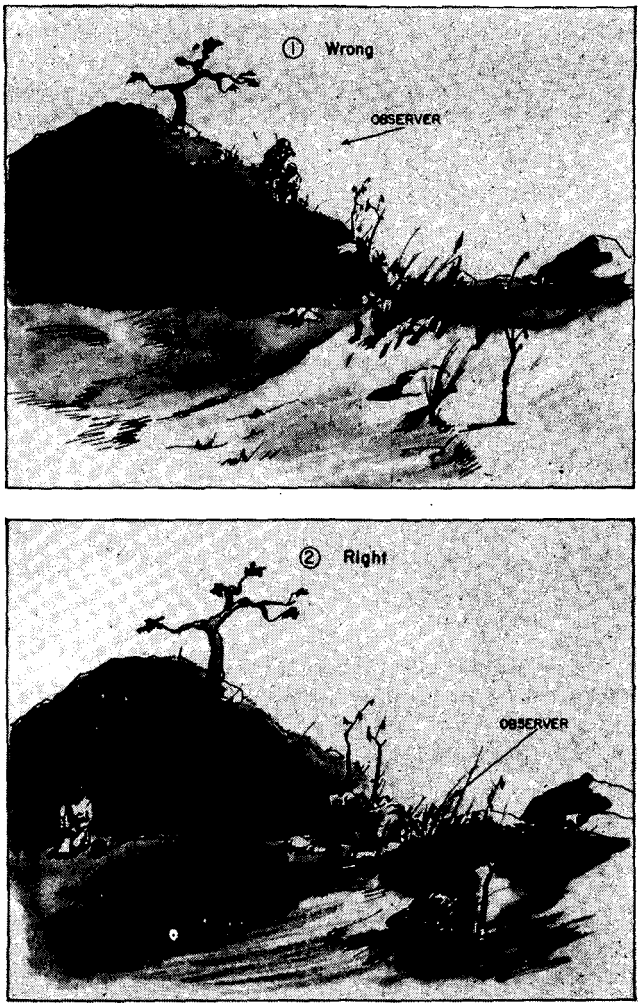

Figure 11. Forward slope position for observation post.

b. Disadvantages. Disadvantages of a forward slope position are that—

(1) It must usually be occupied under cover of darkness.

(2) Its location cannot be changed during daylight without risking disclosure of the position.

(3) Daylight maintenance of wire communication is difficult unless lines may be laid along a concealed route.

(4) Radio communication may be difficult, making it necessary to remote the radio from the reverse slope.

Section III. COORDINATION AND PLANNING OF FIRE SUPPORT

190. General

This section discusses fire support coordination, procedures for preparation of fire support plans, and techniques of preparing artillery fire plans. More detailed discussions of these procedures and techniques may be found in FM 6–18, FM 6–20, FM 6–21, and FM 6–40.

191. Fire Support Coordination

a. The supported or force commander, through combat orders, policies, priorities, or individual decisions, employs all fire support available to his command.

b. The senior field artillery officer at each eche-

lon is the fire support coordinator and principal advisor to the commander on fire support matters.

c. Fire support coordination functions at division level and above are normally assigned to a fire support coordination center or similar fire support coordination agency. At echelons below division, these functions are accomplished informally by personnel concurrently with their regularly assigned duties.

d. For details of fire support coordination, see FM 6–20.

192. Fire Support Planning

a. On receipt of warning orders, the force commander announces his mission and concept of operation to his staff and commanders. His guidance and general plan for the employment of available fire support, to include his guidance and general plan for the employment of atomic weapons when appropriate, are included in the concept of operations.

b. The force fire support plan is based on the fire support portion of the commander's concept of operation. It is the announcement of the commander's decision concerning the employment of fire support means available to or in support of the force. It may or may not be a formal, written document. At lower echelons the fire support plan is often issued orally or in written fragmentary form.

c. When written, the fire support plan, with the fire plans of the appropriate fire support agencies

as appendixes, becomes an annex to the operation order and is disseminated to subordinate units.

d. The senior artillery officer at each echelon, as fire support coordinator, is responsible for the preparation of the fire support plan. The procedures for developing the fire support plan are generally as follow:

(1) The fire support coordinator, or his representative, develops a tentative plan for fulfillment of the fire support requirements of the force as set forth in the commander's concept of operation. When necessary, he coordinates with the force S3 to obtain additional fire support means from higher headquarters.

(2) After approval by the force commander, this tentative plan becomes the fire support plan. Portions of the plan applying to specific fire support means, such as artillery, air, and naval gunfire, are used in developing the fire plan for that fire support agency.

e. The fire support plan indicates what is to be done by available fire support means. For detailed information concerning fire support planning and fire support plans, see FM 6–20.

193. Fire Planning

a. Fire plans are prepared to implement fire support plans Fire plans are relatively detailed plans which show how fire support will be provided. They are tactical plans for using available

fire support weapons. Fire plans prepared by the field artillery are known as artillery fire plans regardless of the echelon at which they are prepared. An artillery fire plan has five component parts; a graphical portion showing the planned concentrations, a target list, marginal information which includes requests for additional fires, a schedule of fires when appropriate, and a table of groups of fires when appropriate.

b. Those parts of an artillery fire plan which are not needed at a particular echelon may be omitted. For example, the artillery fire plan prepared by a forward observer is actually a target list which includes concentration designations, description, coordinates, and remarks columns.

c. Before beginning his fire planning, the artillery forward observer must know the company mission, the plan of maneuver or the scheme of defense, the company commander's scheme of fire support, and such requirements of the force fire support plan as are relayed to him by the FDC.

d. The artillery forward observer plans artillery fires on targets and potential targets to support the company in accomplishing its mission. Targets are selected by various means, such as the forward observer's own observation, map inspection, known enemy tactics, and the desires of the company commander. Concentrations are planned regardless of boundaries.

e. The detail with which fire plans are prepared by forward observers will depend on the time available, the extent and accuracy of target loca-

tions, the type of operation in which the force is engaged, and the requirements of the fire support plan. Fire plans prepared by forward observers must be kept simple and informal.

f. In armored divisions, artillery fire plans are sent from the forward observer to a liaison officer for coordination and consolidation prior to being forwarded to the FDC. In infantry and airborne divisions, the forward observer sends the fire plan directly to the appropriate FDC. The plans may be transmitted by wire, radio, or messenger.

g. The FDC effects consolidation and coordination of fire plans as necessary, adds fires desired by the force commander and his staff, and develops the artillery fire plan for the force. The force artillery fire plan becomes an appendix to the fire support plan, or is issued as a separate document if the fire support plan is not in written form. A copy of the fire plan is forwarded to the division artillery FDC through artillery channels.

h. Forward observers are informed of the action taken on their submitted fire plans by higher artillery echelons. For example, concentration designations near boundaries may have been changed to coincide with plans of adjacent units, or fires desired by the force commander may have been added to the plan. The forward observer informs the company commander of any changes.

i. All, or a designated part, of the fires of a reinforcing unit are planned by the reinforced unit. For example, when the reinforcing unit has a *reinforcing* tactical mission, the reinforced unit

plans all the fires of the reinforcing unit. When the reinforcing unit has a *general support-reinforcing* tactical mission, the reinforced unit plans only that portion of the fires of the reinforcing unit specified by the commander who assigned the tactical mission.

j. Detailed information concerning artillery fire plans and fire planning, to include fire planning by division, corps, and army artillery, is presented in FM 6–18, FM 6–20, FM 6–21, and FM 6–40.

Section IV. LIAISON

194. General

Liaison is maintained between units to facilitate mutual understanding and cooperation. Artillery liaison must be established—

a. By the supporting unit with the supported unit.

b. By the reinforcing unit with the reinforced unit.

c. When directed, with adjacent units and/or other headquarters.

195. Types of Liaison

a. Command Liaison. Command liaison is the personal contact between the artillery commander and the commander of the supported, reinforced, or adjacent unit.

b. Representative Liaison. The liaison officer is

the artillery commander's personal representative to the unit with which liaison is established. The principal duties of an artillery liaison officer are discussed in paragraph 196. Frequent changes of liaison officers are undesirable. However, in situations requiring prolonged absences, it may be desirable to rotate liaison officers back to the parent unit so that they may keep up with the current situation, plans, and policies of their own command.

c. Staff Liaison. Staff liaison is normally found at battalion or higher level. It consists of the working contacts between members of a staff and their counterparts on the staffs of other organizations. These contacts facilitate mutual exchange of information.

196. Liaison Officer

The principal duties of an artillery liaison officer are to—

a. Represent the artillery commander at the headquarters to which sent.

b. Keep the headquarters to which he is sent informed of the situation, plans, policies, and capabilities of the command he represents.

c. Keep his own headquarters informed of the situation, plans, policies, and capabilities of the command with which he establishes liaison.

d. Facilitate necessary coordination and cooperation between units.

e. Perform other functions as directed. In the case of artillery liaison officers with supported units, such functions may include fire support coordination, fire support planning, and artillery fire planning duties.

PART THREE
THE HEADQUARTERS BATTERY
CHAPTER 11
GENERAL

Section I. ORGANIZATION

197. Mission

The mission of a field artillery headquarters battery is to assist the commander and his staff in the performance of their duties by providing the personnel, equipment, and facilities to operate the headquarters.

198. Organization

a. For convenience, the unit headquarters and the headquarters battery are combined. The unit headquarters consists of the commander and his staff. Figure 12 shows the organization of the headquarters battery of an infantry division 105-mm howitzer battalion. The headquarters battery is organized with the following major elements:

(1) Battery headquarters.
(2) Administrative section.
(3) Operations and intelligence platoon.
(4) Communication platoon.
(5) Liaison section.
(6) Medical section.

b. The battery headquarters is the battery administrative section and is supervised by the first sergeant. This section performs the functions of battery administration, mess, supply, and maintenance.

c. The administrative section is supervised by the sergeant major. It performs administrative functions for the battalion headquarters.

d. The operations and intelligence platoon consists of platoon headquarters, the FDC, and the survey section. The platoon performs plans and trtaining functions, fire direction, survey operations, intelligence activities, and target location for the battalion.

e. The communication platoon consists of platoon headquarters, the radio section, and the wire section. The platoon headquarters operates the message center. The platoon installs, operates, and maintains the communication system for the commander under the supervision of the communications officer.

f. The medical section, commanded by the battalion surgeon, performs dispensary service, conducts sick call, and treats and evacuates casualties in the field.

g. The liaison section is supervised by the battalion liaison officer. This section performs functions in support of the activities of the liaison officer.

199. Organizational Differences

Most headquarters batteries are organized in a

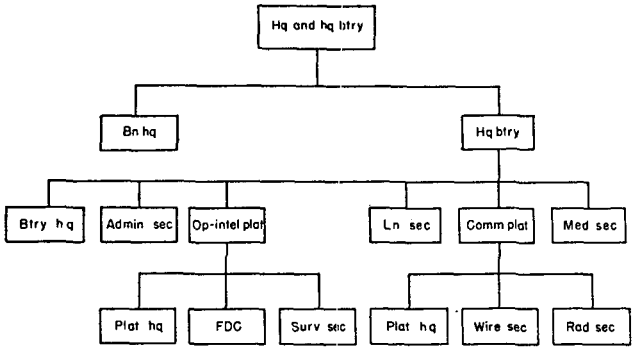

Figure 12. Organization of headquarters and headquarters battery, field artillery howitzer battalion, 105-mm towed, (infantry division).

similar manner. However, due to differences in assignments and missions, headquarters batteries differ in some organizational details. In the 280-mm gun battalion and certain missile units, the functions of headquarters battery and service battery are combined in a single unit. The TOE should be consulted for the details of organization of a specific type of headquarters battery.

Section II. DUTIES OF PERSONNEL

200. The Battery Commander

a. The battery commander of headquarters battery has a dual function; battery commander and headquarters commandant. As a battery commander, he exercises command as described in paragraphs 3 through 5. As headquarters commandant, he—

(1) Locates the elements of the command post (ch. 12).
(2) Organizes the command post.
(3) Supervises the displacement of the command post.
(4) Supervises and coordinates the administration of the battalion headquarters, including mess, transportation, and supply.
(5) Organizes local security for the command post.

b. While the personnel of a headquarters battery are under the command of the battery commander, the greater part of their work is performed under the supervision of the battalion staff officers. The battery commander must promote cooperation between headquarters battery personnel and the battalion staff. He must encourage staff officers to be interested in the welfare and performance of the men under their supervision and to recommend promotions, awards, and disciplinary actions. The battery commander must indoctrinate the men with the mission of the battery and must insure an equitable distribution of the routine battery duties among all sections.

201. Key Personnel

The principal duties of key personnel are listed below. Section chiefs are responsible for the efficient operation and prescribed maintenance of the motor vehicles assigned to their sections. For complete job descriptions and requirements for all battery personnel, see AR 611–201.

Individual	*Duties*
BATTERY HEADQUARTERS	
First sergeant, mess steward, motor sergeant, supply sergeant, battery clerk.	See paragraph 103.
ADMINISTRATIVE SECTION	
Sergeant major	Member of the battalion staff. Supervises the administrative section. Personal assistant to the artillery (battalion and higher) commander and works in the commander's headquarters. He must know the functions of the headquarters and be able to organize the command post; supervise the preparation of correspondence, records, reports, and orders, both tactical and administrative. Under direction of the executive officer, supervises the keeping of the unit journal, allocates details such as guard and fatigue to subordinate units and maintains roster and records of such details.
OPERATIONS AND INTELLIGENCE PLATOON	
Platoon Headquarters	
Assistant S3	Chief assistant, relief, and replacement for the S3. Must be able to perform all duties of the S3 (FM 6-101).
Fire direction officer	Performs fire direction for the battalion. Primarily responsible for the training and supervision of FDC (FM 6-40). Relief and re-

Individual	*Duties*
	placement for the assistant S3; must be able to perform all duties of the S3.
Intelligence sergeant	Principal enlisted assistant to the S2. Maintains the S2 situation map and coordinates the work of the intelligence section and attached teams. See FM 6–20 and FM 6–101.
Operations sergeant	Principal enlisted assistant to the S3. Maintains the situation map, prepares overlays and charts, and assists the S3 in the preparation of operation orders. Should be able to perform the duties of all personnel in the operations section.
Fire Direction Center	
Computers and chart operators.	See paragraph 103.
Survey Section	
Chief of survey party	Principal assistant to the reconnaissance and survey officer. Trains and supervises the survey section; establishes the survey information center (SIC). Should be able to perform any type of survey, use drafting instruments, construct firing charts, and perform restitution.
Computers, instrument operator, recorder.	See paragraph 103.
LIAISON SECTION	
Liaison sergeant and liaison specialist.	Enlisted assistants to the liaison officer. Assist in liaison activities to coordinate artillery support

Individual	*Duties*
	for infantry or armor operations. Prepare and post situation maps and charts, collect data from observers radar, and other units. Assist in preparation of fire plans. Adjust artillery fires when required.

COMMUNICATIONS PLATOON

Platoon Headquarters

Assistant communication officer.	Executive officer of the battery. Leader of the communication platoon; supervises operation of the platoon; supervises installation, operation, and maintenance of all communication installed by headquarters battery. Supervises the training of the platoon.
Communication chief	The senior noncommissioned officer of the communication platoon; supervises the installation, operation, and maintenance of all communication installed by headquarters battery; coordinates communication at the command post. Supervises message center operations.
Senior message clerk and message clerk.	Operates battalion message center (app. III).

Wire Section

Chief of section	In charge of wire section; directs and supervises the maintenance of equipment and installation, operation, and maintenance of all wire communication installed by headquarters battery.

Individual	*Duties*
Wire team chief	In charge of a wire team and truck. Installs and maintains wire circuits.

Radio Section

Chief of section	Radio chief, in charge of the radio section; directs and supervises the maintenance of radio equipment; directs radio operators in establishing and maintaining radio communication of headquarters battery.

MEDICAL SECTION

Section sergeant	Enlisted assistant to the battalion surgeon. Assists in conduct of medical reconnaissance, sanitation inspections, and sick call. Supervises administrative functions of the medical section. Assists medical officer at aid station in receiving, sorting, treating, and preparing patients for further evacuation.
Battery aidman	Assigned to battalion medical section. Works with a specific battery of the battalion. Makes a preliminary diagnosis and evacuates casualties to battalion aid station. Gives first aid, including control of hemorrhage and shock, application of dressing and splints, and administration of injections.

CHAPTER 12
RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

Section I. GENERAL

202. General

a. Reconnaissance and selection of the command post area is performed by the batalion commander and his staff. The CP must be located to facilitate the exercise of command of the subordinate elements of the battalion. For a discussion of battalion CP areas, see FM 6–101. The same principles apply to CP areas for higher echelons. This chapter discusses only that reconnaissance and selection of position performed by the headquarters battery personnel within the command post area and the occupation of the area.

b. The latitude allowed the headquarters battery commander in locating elements of the command post and organizing the position and the extent to which he can develop a standing operating procedure vary widely and depend on the following:

(1) *Echelon involved.* In the battalion, the staff sections have few subdivisions requiring separate locations, for example, all S2 functions are carried on in one place. In higher echelons, the CP organi-

zation is more complex and the installations more numerous.

(2) *Policy of his commander.* Normally, the commander will direct the headquarters battery commander to organize the CP area. The headquarters battery commander may be required to obtain approval of his plan prior to the organization, or he may have complete responsibility. The reconnaissance is usually made by the communications officer, who makes the tentative selection of locations for the various installations. Both the communications officer and the headquarters battery commander must know the desires of the commander.

(3) *Staff section requirements.* The headquarters battery commander and the communications officer should learn the type of location which each installation needs for efficient operation and the ideal relationship of the elements of the CP to one another. They should also acquaint themselves with the wishes of the staff officers in charge of the installations and try to select locations that are satisfactory to them so that, once the CP is organized, it need not be changed.

(4) *Tactical situation.* Facilities and installations of the headquarters will be of a more improvised and temporary nature in a rapidly moving situation than in a static situation.

c. Once an SOP has been developed, the same general layout of the CP should be set up in each position. Preserving the same relationship of positions of the installations will result in greater efficiency of operation.

203. Characteristics of Position Areas

a. General. The battalion commander selects the general location of the CP area. The communications officer should be able to recognize the desirable characteristics of an area for the CP and to make recommendations to the commander for the selection of a location. The desirable characteristics of CP areas for artillery are, in general, the same for all echelons. In planning the organization of the areas, the headquarters battery commander and the communications officer consider the space available; cover and concealment; security; communication with subordinate, supported, or reinforced units; routes; and requirements of headquarters battery.

b. Space Requirements. Except as varied by the policies and desires of commanders, the space requirements for battalion and group CP's are approximately the same. The division artillery CP will require a somewhat larger area, depending on the organization of the FDC and the additional personnel to be accommodated. Attached specialist teams and the requirement for separated locations for some installations of corps and army artillery CP's result in the requirement for a larger area. In evaluating the space available, the com-

munications officer considers locations for such of the following elements as may be appropriate:

(1) Operations section.
(2) War room.
(3) Elements of the intelligence section, such as the counterbattery section or countermortar section.
(4) Specialist teams, such as photointerpreters.
(5) S1 section.
(6) S4 section.
(7) Message center.
(8) Switchboard.
(9) Radio sets and panel stations.
(10) Survey information center.
(11) Sleeping areas for the commander, staff, and attached personnel.
(12) Vehicle park for visitor's vehicles near message center.
(13) Headquarters battery installations and bivouac area.

c. Cover and Concealment. Cover and concealment are sought for the CP area as a whole, if possible. The area should have sufficient defilade to prevent visual or radar observation by the enemy. In heavily wooded areas, concealment is available, but it is difficult to find good locations for the radio and panel stations. In areas of sparse or scattered vegetation, it is necessary to include plans for camouflage in the initial considerations of the area. In open terrain, such as desert, ele-

ments of the CP are dispersed and located so as to conceal the identity of the installation.

d. Security. The position should be such that the defense can be organized with the weapons and personnel available. The CP area should, if possible, be located to derive some protection from the howitzer (gun) batteries (FM 6–101). Commanders should arrange for mutual protection with adjacent units.

e. Routes. Separate entrance and exit routes are desirable. If available, established roads and trails should be used. The entrance to the bivouac area of headquarters battery should be located so that battery vehicles do not pass through the CP area.

f. Headquarters Battery Bivouac. The location of the CP, the tactical situation, security, supply, sanitation, accessibility, and comfort of personnel govern the location of the headquarters battery bivouac area. Drainage, concealment, and protection from the enemy are important considerations. The area should offer adequate space for the motor park, maintenance facilities, and sleeping area. The elements of the battery should be grouped together for ease of administration, but must be so located as to provide protection for the CP.

Section II. PROCEDURES

204. General

a. The procedures employed by the communications officer and the headquarters battery com-

mander in the reconnaissance, selection, and occupation of position are dependent on the echelon concerned, the situation, the policies of the commander, and the personnel available. The variable conditions that exist at each echelon preclude the establishment of a common procedure.

b. The communications officer and headquarters battery commander should develop an SOP for the RSOP. In establishing procedures or making changes thereto, they should seek th advice and approval of the battalion commander and the battalion executive officer.

c. In general, procedures employed by the communications officer and the headquarters battery commander can be broken down into the following steps:

(1) Receipt of orders.
(2) Planning the reconnaissance.
(3) Executing the reconnaissance.
(4) Planning the occupation.
(5) Coordination with executive.
(6) Issuance of orders.
(7) Supervision of the movement to and occupation of position.

205. Receipt of Orders

The headquarters battery commander and the communications officer receive their orders at the same time as the other battery commanders. The communications officer will frequently be a member of the battalion commander's reconnaissance

party and accompany the commander when the CP area is selected.

206. Planning the Reconnaissance

In planning his reconnaissance, the communications officer considers the following:

a. Distance and route to the new area.

b. Personnel available and additional personnel required.

c. Vehicles and equipment required for the reconnaissance and for early preparation of the position (wire, tentage, and fire direction equipment).

d. Time available.

e. Tactical situation.

207. Executing the Reconnaissance

a. After receiving the order, the communications officer assembles his party, explains the situation, and proceeds to the new area. On the way he notes the condition of the route and the number of route markers required.

b. On arrival at the CP area, the communications officer makes a general survey of the area and assigns reconnaissance missions to the members of his party. If the party consists of only the communications officer and the headquarters battery first sergeant, the first sergeant is usually shown the area to be occupied by headquarters battery and proceeds to select the locations of installations. The communications officer then selects the locations for CP installations. Before

leaving the area or issuing his orders, the communications officer receives recommendations from the first sergeant and considers them for use in his plan.

c. When the party consists of additional personnel, it may be divided into two groups; one for the CP area, and the other for the headquarters battery area.

d. In selecting locations for the elements of the CP, there are two methods of simplifying the selection. One is to designate the position for one major element and to locate the others according to their functional relationship to the base element. The other method is to base the layout of the area on a terrain feature, such as a hill, creek, or road.

e. For a discussion of the organization of the CP area, see paragraphs 215 and 216.

208. Planning the Occupation

a. General. After selecting locations for the various elements of the CP and verifying the plan for the headquarters battery area, the headquarters battery commander and the communications officer plan for the occupation.

b. Marking Locations. It is desirable to have a man lead each vehicle to its parking place, especially after dark. If personnel are not available or if the time of occupation is uncertain, locations may be marked by signs. If signs are used, consideration must be given to security.

c. Guides. A guide should be provided for each staff section or CP element. In small units, such

as the battalion and group, the individuals used as location markers may also act as guides. This expedites movement of vehicles from the column to their proper locations in the CP area without halting and delaying the prompt clearance of the road.

d. Equipment. It is desirable to move and install a certain amount of equipment prior to the occupation. Such equipment will consist primarily of shelter and local communication equipment. For example, the fire direction center should be able to move into the area, occupy its location, and commence operations without delay.

e. Transportation. The battery commander must plan for the efficient use of vehicles. He must consider the transportation required, vehicles available, distance, and the need for shuttling.

f. Route Markers. When the CP moves as part of a unit, as it frequently does in the battalion, route markers are usually provided for in the orders of the higher commander. When the CP moves alone, the headquarters battery commander is usually responsible for route markers.

g. Order of March. The battery commander plans the order of march to avoid confusion at the new area. In general, those elements located deep in the CP area are placed first in the column.

2C9. Coordination with Executive

Coordination with the battalion executive may be effected at any time prior to the issuance of the order. The degree of coordination required depends on the policy of the commander, but the general plan, when practicable, should be submit-

ted to the executive for approval before movement is started.

210. Issuance of Orders

a. The battery commander may issue his orders for the occupation to the members of his party, or he may return to the headquarters battery before issuing his orders. When it is necessary for him to return to the battery, he may leave the first sergeant in the new area. On returning from reconnaissance, he reports to the battalion executive, or other staff officer in charge, the results of his reconnaissance and gives his plan for the movement and occupation. The executive, or the staff officer in charge, issues instructions to the staff sections in conformance with the approved plan. The battery commander then assembles the key personnel of the headquarters battery and issues his orders.

b. The order follows the sequence of other operation orders as far as practicable. It includes the situation, time of movement, detailed instructions to elements of the battery, order of march, administrative arrangements, and communication during the movement.

211. Supervision of the Movement to and Occupation of Position

a. The battery commander may assemble certain personnel from the staff sections and headquarters battery and proceed to the new area in advance of the main column. This party should include route markers and sufficient personnel to

prepare the new area for occupation. A staff officer may be designated by the battalion commander to lead the main column, or the battery commander may assign this duty to the headquarters battery executive officer.

b. On arrival at the new area, a guide meets the column at the release point. A guide may join each element of the column and lead it to its location.

Section III. DISPLACEMENTS

212. General

a. When the CP is displaced as a whole, the procedure employed is similar to that described in section II of this chapter. After a command has once been committed to action, displacement of the artillery CP is generally by echelon, particularly in the higher headquarters. A battalion may displace as a unit, moving all of its elements at one time, but a group or higher echelon will seldom move all its battalions at one time.

b. The method of displacement is prescribed by the higher commander either in standing operating procedure or in orders for each movement. The headquarters battery commander is responsible for accomplishing the displacement in the prescribed manner.

c. The battery commander should, at all times, know the capabilities of the headquarters battery to move the CP. If, for any reason, he is unable to move the CP in one echelon, he should inform the battalion executive and recommend a method of displacement. When a move is imminent, he

should be able to make recommendations before the commander's plans are made. He must be kept informed of contemplated movements.

d. When the CP displaces by echelon, each staff officer is responsible for the subdivision of the sections under his control and the assignment of subdivisions to echelons. He informs the battery commander as to the number of personnel, the amount of equipment, and the persons in charge of his subdivisions in each echelon.

213. Procedures

a. General. Reconnaissance and selection of positions is accomplished as described in section II of this chapter. Close coordination between the headquarters battery commander and the communications officer is essential for the movement of communication personnel and equipment. The headquarters battery commander may be required to supervise the installation of local communication facilities of the new CP.

b. Headquarters Battery. As part of the standing operating procedure, the headquarters battery commander should provide for the organization of the battery into echelons. Specific personnel and equipment are assigned to each echelon. This procedure will minimize the detailed instructions required each time a displacement by echlon is made. When prescribing the organization of echelons, the headquarters battery commander must consider the following:

(1) *Transportation.* Certain vehicles should be designated to displace and remain

with each echelon. These are primarily the command and administrative vehicles needed at each location. Other vehicles may remain at the advance CP or may be returned to assist in the displacement of the rear echelon.

(2) *Mess.* Provisions must be made for messing the personnel of each echelon. When the time lag between the displacement of echelons is short, emergency rations may be issued to the echelon containing the fewest personnel. When the time lag is more than 24 hours, provision should be made to provide personnel in both echelons with hot food.

c. Command Post Elements. Division of the CP elements into echelons is the responsibility of the battalion executive and the staff officers concerned.

CHAPTER 13
ORGANIZATION OF POSITION

Section I. THE COMMAND POST AREA

214. General

Organization of the CP begins with the headquarters battery commander's plan and improvement continues as long as the unit remains in that position. Although no standard plan or organization can be prescribed to fit all situations, the suggestions given in this chapter may be used as guides.

215. Locations of Elements and Key Personnel

a. General. The locations of CP elements are dependent on the echelon concerned, the size of the area, the desires of the commander and his staff, and the working relationships of the elements to one another. The general arrangement should be such that visitors arriving at the CP pass first through the message center or, in large units, an information center.

b. Commander. Usually the commander will be located in the vicinity of the FDC. The executive and the sergeant major are located near the commander.

c. Fire Direction Center. Fire direction installations should be marked or roped off in some manner to indicate that only authorized personnel

should enter. The FDC should be located in an area which is out of the normal traffic of the other activities of the CP.

d. Intelligence Elements. The installations at which intelligence functions are performed should be convenient to the FDC.

e. S1 and S4. In the battalion, S1 and S4 sections are with service battery. In the CP's of higher units, these sections are often present in the forward echelon.

f. Message Center. The message center should be placed at the entrance to the CP area where it will be easily found by incoming messengers and visitors. A parking area should be provided adjacent to the message center.

g. Switchboard. The switchboard is located to facilitate the installation of wire circuits. Primary consideration is given to trunk circuits coming into the CP. It should be near the entrance to the CP but should not be conspicuous.

h. Radio and Panel Station. The radio and panel station consists of the radio sets operating in the higher headquarters command net, other high-powered radio sets, the panel display ground, and a pickup field. It is located some distance from other installations (300 to 500 meters), but must be within the defensive perimeter. The location should provide concealment for radio sets, vehicles, and personnel. There must be sufficient open ground to permit the display of panels and the operation of the pickup field. As the organization of the CP progresses, remote control from the

radio sets to the message center or operations center should be established.

i. Troop Bivouac. CP personnel should sleep near the installations in which they work and headquarters battery personnel should bivouac in the headquarters battery area.

j. Aid Station. The aid station should be located so as to be readily accessible and should have defilade, cover, and concealment. A location near a road or trail is desirable in order to facilitate evacuation of patients.

216. Security

Security of the CP is provided for by the headquarters battery commander and is integrated with the security measures of the headquarters battery. Machine guns and rocket launchers are the primary defensive weapons. Machine guns are sited to cover the rocket launcher positions and to support each other. Positions are selected from which the machine guns can be supported by rifle fire. Each individual in the CP is assigned a defensive position to which he reports in an emergency. In organizing the CP area for security, the battery commander arranges for mutual support with any other troops in the vicinity. All internal security measures should take into consideration the possibility of an enemy airborne attack.

217. Traffic Circulation

Traffic within the CP area is kept to a minimum and is controlled. Vehicles entering the area are stopped at a designated point, usually the message

center, and directed to a vehicle park. Vehicles which must enter the area are restricted to prescribed routes. Foot movement within the CP is restricted to prescribed trails or paths.

Section II. THE HEADQUARTERS BATTERY AREA

218. General

The headquarters battery area is organized to give maximum support to the CP. In organizing the area, the battery commander considers the following battery functions:

a. Operation of the CP. All personnel assigned to the same CP element should be quartered together. Assignment of personnel to shifts for 24-hour operation is usually made by the staff officer supervising the element in cooperation with the battery commander; the battery commander is responsible that assigned personnel are on duty at the required times.

b. Transportation.

(1) The battery commander is responsible that transportation is available for CP personnel. He should institute a schedule of maintenance with particular attention to those vehicles which are in constant use by the battalion commander and staff.

(2) As a security measure and to avoid confusion, a route from the motor park to the message center is prescribed. Vehicle drivers reporting to staff officers may be

required to drive to the message center without entering the CP area. It is desirable to install a local telephone circuit from the switchboard to the motor park.

219. Mess

a. The kitchen should be located in the headquarters battery area but as near the CP installations as practicable to facilitate messing. It should be located near a road to facilitate supply.

b. The kitchen should be organized to provide mess at odd hours for the personnel of the various shifts working in the CP. It is desirable to provide hot coffee for personnel working at night, particularly in cold or wet weather.

220. Security

The security of the headquarters battery bivouac area is integrated with that of the rest of the CP. Procedures for the defense of the headquarters battery and CP area are generally the same as for howitzer (gun) batteries. See chapter 4 for a detailed discussion of defense of the battery position area.

PART FOUR
THE SERVICE BATTERY
CHAPTER 14
GENERAL

Section I. ORGANIZATION

221. Mission

The mission of a field artillery service battery is to procure and distribute all classes of supplies to the units of the battalion, to maintain appropriate supply and personnel records, and to perform organizational motor maintenance not within the capabilities of the batteries.

222. Organization

a. The organization of all field artillery service batteries is fundamentally the same. The battery is divided into various sections to facilitate control and efficiency of operation. For the organization of a service battery, see figure 13.

b. The battery consists of the battery headquarters, battalion maintenance section, battalion personnel section, battalion supply section, and the battalion ammunition train.

c. The battery headquarters performs command, administrative, mess, supply, and maintenance functions for the battery.

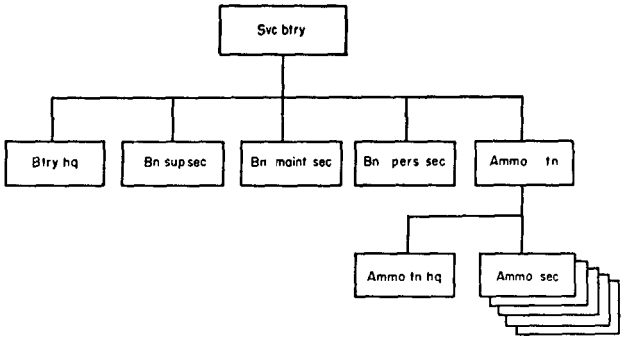

Figure 13. Organization of service battery, field artillery howitzer battalion, 105-mm, towed, (infantry division).

d. The battalion supply section performs supply functions for the battalion. This section keeps necessary property records, consolidates requisitions and turn-ins for the batteries, procures and issues supplies, and assists battery supply sections in all matters concerning supply.

e. The battalion personnel section maintains personnel records for all battalion personnel and prepares all battalion correspondence, reports, and orders dealing with personnel.

f. The battalion maintenance section performs all organizational motor maintenance functions not within the capabilities of the batteries, and supplies the batteries with spare parts.

g. The battalion ammunition train performs ammunition supply and resupply functions for the battalion. When necessary, ammunition sections from the firing batteries may be attached to the

ammunition train, or sections from the ammunition train may be attached to the firing batteries.

Section II. DUTIES OF PERSONNEL

223. Battery Commander

The battery commander of service battery is also the battalion S4 and the munitions officer. For duties of the S4 and munitions officer, see FM 6–101. For duties of the battery commander, see paragraphs 3 through 5.

224. Other Key Personnel

The principal duties of other key personnel are shown below:

Individual	*Duties*
	BATTERY HEADQUARTERS
Battery headquarters personnel.	See paragraph 103.
	BATTALION SUPPLY SECTION
General supply officer (warrant officer).	The supply warrant officer is the assistant S4. He directs the operations of the battalion supply section. He supervises procurement and distribution of all classes of supply except ammunition. He is responsible for the efficient operation and prescribed maintenance of his section's motor vehicles.
Battalion supply sergeant, assistant supply sergeant.	The battalion supply sergeant assists the general supply officer in all phases of battalion supply functions. He is assisted by the assistant supply sergeant.

Individual	*Duties*
Senior supply clerk and supply clerk.	The supply clerks keep battalion supply records, files, and forms.
BATTALION MAINTENANCE SECTION	
Motor maintenance officer (warrant officer).	Assistant to the battalion motor officer. Supervises motor maintenance performed by battalion maintenance section. Supervises battalion organizational maintenance records and prepares required reports.
Motor maintenance sergeant.	Supervises recovery, repair, and salvage of battalion vehicles. Assists the motor maintenance officer in supervising the work of maintenance personnel.
Ordnance parts specialist.	Requisitions, receives, issues, and keeps records of spare parts. Is stock clerk. Issues spare parts to battery motor maintenance sections.
Mechanics, wrecker operator.	Perform repair and recovery of battalion motor vehicles. Mechanics perform required organizational maintenance services, as outlined in appropriate manuals, for battalion vehicles.
BATTALION PERSONNEL SECTION	
Personnel officer (warrant officer).	In charge of the personnel section. Responsible for maintaining personnel records, orders, and reports for the battalion. Insures accomplishment of scheduled personnel actions.
Personnel sergeant	Assists the personnel officer. Supervises the work of personnel specialists and clerks.

Individual	*Duties*
Personnel administrative specialist.	Maintains service and finance records. Prepares, posts, and files orders and correspondence pertaining to personnel.
Personnel management specialist.	Maintains portions of personnel records pertaining to qualifications, military occupational specialty (MOS) awards and changes, promotion, reduction, and transfer of personnel.
Personnel administrative clerk.	Performs general clerical work for the personnel section.

AMMUNITION TRAIN

Ammunition train commander.	Commands battalion ammunition train; supervises procurement and distribution of ammunition. Responsible for the efficient operation and prescribed maintenance of the train.
Ammunition supply sergeant.	Assists ammunition train commander; keeps ammunition records.
Section chiefs	In charge of ammunition sections of the battalion ammunition train.
Agent	Messenger and guide (usually stationed at battalion command post).

CHAPTER 15
RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

Section I. GENERAL

225. General

No set procedure is established for the reconnaissance, selection, and occupation of a service battery position. The battalion commander will usually select the general area for the location of the service battery. The service battery commander may or may not accompany the battalion commander on reconnaissance. The battery commander will make his own detailed reconnaissance in the general area designated by the battalion commander. The essential characteristic of a service battery position is that it must permit the battery to perform its support mission for the battalion.

226. Reconnaissance Party

The service battery commander will usually have sufficient time to make a deliberate reconnaissance, selection, and occupation of the position area. The reconnaissance party should be composed of those personnel necessary to assist the battery commander in selecting locations for installations, in organizing the area prior to occupation, and in providing local security prior to and during the occupation of the position.

227. Procedures

The service battery will occupy the new position at the time directed by the battalion or battery commander. The battery may displace in two echelons or as a unit. Moving as a unit provides a greater capacity for local defense against ground attack. The general procedures for occupation of a position area discussed in chapter 7 are applicable to occupation of position by a service battery. The large number of heavy vehicles creates a requirement for detailed planning and the use of guides for each vehicle.

Section II. POSITIONS

228. Positions with Artillery Other Than Armored Division Artillery

a. The service battery bivouac is the battalion rear echelon. It should be on or near the axis of supply and in rear of the bulk of combat troops. The location depends on the condition of the existing road net, availability of concealment or dispersal areas, location of supply installations, and the proximity of other troops for mutual defense.

b. The ammunition train park should be located to facilitate ammunition supply; normally, it is near the route from the position areas to the ammunition supply point. Ample facilities for concealment and dispersion of vehicles are essential. These considerations generally will place the ammunition train park with the service battery or at some position between the service battery and the firing batteries.

229. Positions with Armored Division Artillery

a. General. The service battery of an armored division artillery battalion will normally be divided into two echelons, the field train (rear echelon) and the combat train (forward echelon).

b. Field Train. The field train consists of the mess (when not with the combat train), administrative, supply, and maintenance vehicles which are not part of the combat train. The battalion field train will normally become a part of the combat command or division field trains.

c. Combat Train. The combat train, consisting of the mess, fuel and lubricants vehicles, ammunition train, and portions of the maintenance section, remains with the battalion. In some instances, the fuel and lubricants vehicles and the ammunition train may be assigned to the batteries. Whether or not elements of the combat train are with the batteries, an area must be selected which will accommodate the whole combat train. This area should be on or near the axis of supply. Proximity to other battalion installations will depend on the situation. The combat train must be placed far enough to the rear to permit uninterrupted performance of its functions. Selection of the area for the maintenance section involves a careful study of the road net and the accessibility of the batteries to the area. Entrances and exits should be as inconspicuous as possible. Cover and concealment should be available to permit maintenance operations day and night.

d. Ammunition Dump. The battalion may es-

tablish ammunition dumps in the vicinity of each battery position. Resupply of ammunition is usually accomplished during darkness; therefore, the ammunition section may occupy a concealed position during daylight hours.

CHAPTER 16
ORGANIZATION OF POSITION

Section I. GENERAL

230. General

The service battery area is organized as prescribed by battalion SOP, unless changes are directed by the orders of the battalion commander. The organization of the area must permit efficient operation of all battalion and battery functions and must provide for a strong defense against all types of attack.

231. Terrain

The location selected for service battery installations should provide a maximum passive defense capability against attack by air and artillery. In organizing the position, the battery commander should take advantage of defiladed areas, cover, and concealment.

232. Routes

The organization of the position area should permit easy access to all installations. Routes to the battalion supply and maintenance installations and the battalion ammunition dump should not pass through the bivouac area. Separate entrance and exit routes should be well concealed and made as inconspicuous as possible.

233. Dispersion

The installations of the service battery must be sufficiently dispersed to provide a reasonable degree of passive defense against enemy air or counterbattery attack. Considerations affecting dispersion are the terrain and the capabilities of the enemy. The defense of a widely dispersed service battery against ground attack is difficult because of the small number of personnel organic to the service battery.

Section II. INSTALLATIONS

234. Battery Headquarters and Bivouac Area

The battery headquarters and bivouac area should be located so that traffic to the battalion installations will not be routed through it. The location of battery installations within the headquarters and bivouac area are generally the same as for other type batteries.

235. Battalion Supply Section

The battalion supply section should be conveniently located near an entrance to the position area. The area should be well drained and should permit concealment of bulk supplies. The elements of the section will be organized as directed by the S4 or general supply warrant officer. A separate tent, fly and rodent proofed, may be established as a ration breakdown and storage tent.

236. Battalion Maintenance Section

The location selected for the maintenance section should provide sufficient room for dispersion

of vehicles, firm ground, cover and concealment, and a water source. It should contain a relatively flat location for maintenance operations. Sumps for disposal of waste lubricants and trash should be prepared.

237. Battalion Personnel Section

The personnel section may be located adjacent to or near the battalion supply section. Improvised office space must be provided. The personnel warrant officer will direct the functioning of the personnel section.

238. Ammunition Train Park

The ammunition train park will usually be established within the service battery position area. It should be located so that the danger from enemy fire directed against the ammunition train park will be minimized for the remainder of the battery. The area should be well drained; should provide cover, concealment, and room for dispersion; and should be readily accessible to ammunition vehicles.

Section III. SECURITY AND COMMUNICATIONS

239. Security

The principles and procedures for defense of the battery area discussed in chapter 4 are applicable to the service battery. Defensive measures for the service battery must be carefully planned because of the small personnel strength of the battery and the lack of artillery pieces for direct fire. Every

individual must be assigned specific duties and responsibilities for defense of the battery position. When possible, the defensive system of the service battery should be integrated with the defenses of other units in the area.

240. Communications

The service battery should have a direct wire line to the battalion switchboard. However, the service battery may be so distant from the battalion in some situations that direct wire communication may be impracticable. The battery should always lay a line to the nearest unit having access to trunk lines connecting with the battalion wire system and request that the line be connected to the unit's switchboard. Local lines within the service battery position area are established as directed by the battery commander. In addition to wire communication, the battery commander has a radio set that operates in the battalion command radio net.

CHAPTER 17
OPERATIONS

Section I. BATTERY HEADQUARTERS

241. General

The battery headquarters of the service battery performs the same functions as the headquarters sections of other types of batteries. Details of battery administration are discussed in chapter 2.

242. Special Considerations

a. Routine Battery Duties. Provisions for the equitable distribution of routine battery duties, such as guard and fatigue, should receive special attention because of the small personnel strength of the battery. Most of the personnel in the service battery are assigned to sections performing critical battalion functions. The battery commander should avoid exempting an excessive number of personnel from routine battery duties, and battalion sections must cooperate by planning their work so that personnel are available for routine duties at the prescribed time.

b. Replacements. Personnel replacements for the battalion may be picked up at the railhead, division personnel services company, or other designated spot. Replacements may be billeted temporarily in the service battery until assigned to a battery. Facilities should be available for housing

and feeding small numbers of replacements for a period of at least 1 day.

c. Motor Maintenance. Service battery trucks are in almost continuous service for the hauling of supplies and ammunition for the battalion. Organizational maintenance operations for these vehicles must be carefully planned, coordinated, and executed. Drivers should be carefully selected and thoroughly trained in operation and maintenance of the vehicles.

Section II. BATTALION SUPPLY SECTION

243. General

The battalion supply section is normally responsible for procuring all supplies except ammunition for the battalion. However, under the unit distribution system, the division technical service units relieve the battalion of this responsibility for classes I, II, and IV supplies. These are normally delivered from army installations directly to division technical services and are distributed to the division by the technical services on a unit distribution basis.

244. Procurement

a. General. The battalion supply section prepares and submits requisitions for supplies for all batteries of the battalion. These requisitions are a consolidation of the requirements of each battery. If the battalion is not under the unit distribution system, the supply section draws supplies for the battalion at the places and times indicated in ad-

ministrative orders or messages issued by the headquarters responsible for supplying the battalion.

b. Class I Supplies. The supply section draws rations from the division class I distributing point (unless issued on a unit distribution basis) on the basis of the daily ration request for the battalion.

c. Class II Supplies. Clothing and items of organizational equipment are procured on the basis of maintaining the authorized level prescribed by the TOE for the unit. These supplies will be distributed on a unit distribution basis or procured by the battalion supply section.

d. Class III Supplies. POL products are procured on the basis of daily and anticipated requirements of the battalion. The supply section draws class III products from the division class III distributing point. All issues of gasoline are normally made on a can-for-can exchange basis. Packaged oils and lubricants are issued at the same time as gasoline.

e. Class IV Supplies. Special supplies, such as engineer materials and those supplies required in greater quantities than authorized by TOE are procured on a requisition basis when such procurement is authorized by higher headquarters. Distribution will be made to the battalion on a unit distribution basis or issued to the battalion supply section at division class IV distribution points.

f. Class V Supplies. The ammunition train performs class V supply functions for the battalion.

For further details, see paragraphs 250 through 256.

g. Class VI Supplies. Spare parts, repair parts, major and minor assemblies, and allied secondary items pertaining to equipment are procured by the battalion supply section from the division maintenance company.

245. Distribution

a. General. After the supplies are drawn, the battalion supply section segregates them for distribution. Class I supplies are prorated to units of the battalion based on the strengths of the batteries. Requisitioned supplies are distributed in accordance with the unit requisitions.

b. Methods. The battalion supply section supplies the batteries by 1 of 2 methods; supply point distribution or unit distribution. In supply point distribution, the battery sends transportation to a designated supply point to pick up the supplies. In unit distribution, service battery delivers the supplies to the battery position. Unit distribution is normally employed in battalion.

c. Records. The battalion supply section maintains accurate and current records of the status of supply of the battalion, except for ammunition.

Section III. BATTALION MAINTENANCE SECTION

246. General

The battalion maintenance section performs the periodic inspections of vehicles required in the organizational level of maintenance and keeps the

inspection records for each vehicle in the battalion. It performs scheduled maintenance services, as required in TM 9–2810, on all vehicles. It maintains a supply of the spare parts that are frequently required and is responsible for the requisitioning, storage, and record-keeping of all motor maintenance parts and supplies. Batteries usually submit their requisitions for motor maintenance parts and supplies to the battalion maintenance section. These requisitions are then consolidated and submitted to the supporting technical service. The battalion maintenance section also furnishes technical advice and assistance to the battery motor maintenance sections. The battalion motor officer arranges for higher echelon maintenance when the job requirements are beyond the capability of th battalion maintenance section and, when necessary, arranges for replacement vehicles.

247. Recovery and Evacuation

a. Instructions pertaining to battlefield recovery and evacuation of vehicles are usually covered by SOP. In the average situation, battlefield recovery is normally accomplished by the battalion maintenance section. The section marches at the rear of the column during movements. It makes roadside repairs beyond the capability of battery maintenance personnel, tows disabled vehicles to the march destination, and recovers all vehicles that have fallen out of the column.

b. Vehicles which cannot be repaired by the battalion maintenance section are evacuated to the unit providing the next higher echelon of mainte-

nance support where they are, if possible, repaired and returned to the battalion. The battalion usually is not responsible for evacuating vehicles beyond the next higher maintenance echelon.

c. Burned vehicles, or vehicles which obviously cannot be repaired, are not recovered by battalion personnel. The location and condition of these vehicles are reported to higher headquarters through maintenance channels.

Section IV. BATTALION PERSONNEL SECTION

248. Location

The battalion personnel section is usually located in the service battery area. The section operates under the direct supervision of the battalion personnel officer. The personnel officer is the assistant to the battalion adjutant.

249. Functions

The battalion personnel section is responsible for administrative procedures concerning personnel records and reports, replacements for the battalion, and miscellaneous personnel procedures. Specific duties performed by the section are—

a. Maintenance of service records, classification records, and other individual records.

b. Preparation of payrolls, allotment, and issuance forms.

c. Preparation of orders for promotions and demotions.

d. Preparation and forwarding of casualty reports.

e. Requisition and reception of replacements.

f. Submission of strength returns.

Section V. BATTALION AMMUNITION TRAIN

250. General

The ammunition train is the element of service battery that performs the ammunition (class V) supply functions for the batteries of the battalion. The train commander is in charge of the ammunition train. The ammunition sections of the firing elements of the battalion may be attached to the train, when necessary, for return to the ammunition supply point for resupply, or may obtain their resupply from the train by exchange of vehicles. When a firing battery is operating independently or under circumstances that preclude the normal handling of ammunition supply, a section of the battalion ammunition train may be attached.

251. Basic Load

The basic load is that quantity of ammunition (expressed in terms of rounds, for ammunition items fired by weapons, or in terms of units of measure, for bulk allotment items, such as grenades, mines, explosives, etc.) which is prescribed to be carried by the individuals and on the vehicles of a unit. It includes the ammunition carried by the individual soldier and the ammunition loaded in self-propelled weapons, in prime movers, and in unit trains. The total number of rounds of each caliber is fixed by the Department of the Army, but the percentages by type of each caliber

may vary. The basic load of ammunition represents the tactical reserve of ammunition for the unit. Replenishment of the basic load is concurrent with or in anticipation of expenditures. The basic load is the basis of the ammunition supply system which is known as the *continuous refill system.* The basic load is subject to variation by army commanders when the transportation provided in tables of organization and equipment is modified by reduction or augmentation tables or by operational projects.

252. Available Supply Rate

The available supply rate (ASR) is that quantity of ammunition that can be sustained with available supplies. The available supply rate for nonatomic ammunition is expressed in terms of rounds per weapon per day for a stated period. For bulk allotment items, it is expressed in terms of units of measure per organization or units per day. The authorized number of atomic weapons (identified by type of nuclear component and/or shell, warhead or bomb) will be the atomic ammunition available supply rate for the period. Any commander may vary the available supply rate in his command from that published by the next higher commander, provided his announced ASR does not exceed the total amount of ammunition authorized for his command; i.e., the number of weapons in the command multiplied by the ASR for the command. Units are not authorized to accumulate an ammunition reserve in addition to their basic load; any unused portion of the ASR

does not accrue an ammunition supply credit for that unit. Each tactical commander must realize that the purpose of having an ASR is to control the expenditure of ammunition so that higher commanders can build up necessary reserves to conduct future operations. Any attempt by individual units to increase their own reserve will defeat the purpose of the system.

253. Continuous Supply

The ammunition train provides a continuous supply of ammunition to the units of the battalion. It draws the ammunition necessary to replace expenditures from the basic load or to meet anticipated expenditures as indicated by the battalion commander's estimate. If possible, each battery is issued a large percentage of its ammunition in a single lot number. The train commander must consider road nets, distance to the ammunition supply point, turnaround time, and guerilla or partisan activity in determining the number of vehicles to be dispatched and the time necessary for the run to the ammunition supply point.

254. Procedure

a. Haulage Plan. The battalion S4 coordinates the preparation of the battalion ammunition haulage plan with the S3. After the plan is approved by the battalion commander, it is executed by the ammunition train commander.

b. Reserve. A portion of the basic load will usually be held in reserve at the battalion ammunition dump. The battalion commander will

direct the amount and types of ammunition to be held in reserve. When heavy ammunition expenditures are expected, a number of battalion ammunition trucks may be kept loaded and ready for immediate dispatch to the firing batteries.

c. Resupply. As the ammunition is fired, it is replenished from the battalion reserve. A suggested procedure is as follows: when the ammunition resupply to the batteries is necessary, the battalion S3 notifies the S4 or ammunition train commander of the amounts and types needed. The ammunition train commander dispatches ammunition trucks directly to the batteries, tactical con ditions permitting, to replace battery expenditures. The empty trucks, accompanied by the battery ammunition trucks if directed, then return to the battalion ammunition dump. From there, they are dispatched in convoy, with protection as required, to the ammunition supply point. The ammunition train commander will report to the division ammunition office to obtain authority to draw the required ammunition. The division ammunition officer will authenticate the ammunition requisition and direct the convoy to the ammunition supply point. After the ammunition trucks are filled, they will return to the battalion ammunition dump.

255. Exceptional Situations

Occasionally, it may be necessary for a unit to obtain and hold reserves of ammunition in excess of its basic load. Examples are units undertaking a passage across a terrain obstacle or preparing

to operate independently. Under such circumstances, a portion of the army tactical reserve may be transferred to the physical possession of the unit. Army authorization is granted for a specific reserve to be in the possession of the unit for a quantity of ammunition from the army tactical stated period of time. Expenditures from this excess authorization are reported daily in order that an accounting of the army tactical reserve can be made. On expiration of the period, expenditure reports are continued until the ammunition is exhausted and the unit has reduced its ammunition reserves to its basic load. During this period, the unit commander is responsible for safeguarding, conserving, and displacing this excess ammunition.

256. Reports

The S4 must render a *report of excess* in those circumstances where the unit finds itself in possession of ammunition in excess of the basic load. This situation may result from expending less than the amount of ammunition that was anticipated by the commander's estimate. The S3 will require certain reports from the firing batteries and the ammunition train, in order that he may properly allocate fire missions.

PART FIVE

TRAINING

CHAPTER 18

FUNDAMENTALS OF TRAINING

Section I. GENERAL

257. Objective of Training

The ultimate objective of all military training is success in combat. On an individual basis, the objective of artillery training is to provide the soldier with the necessary knowledge and skill to enable him to be an efficient member of an artillery team. On a unit basis, the objective of artillery training is to develop teamwork and coordination between teams so that the battery will function as an effective unit. Successful training develops in soldiers and, therefore, in units, the following qualities:

a. Discipline.
b. Technical proficiency.
c. Teamwork.
d. Leadership.
e. Initiative.
f. Adaptability.
g. Morale and esprit de corps.
h. Tactical proficiency.
i. Health, strength, and endurance.

258. Basic Concepts of Training

All military training is based on the following concepts:

a. The dignity of the individual is not to be violated.

b. The average man can be made into an efficient soldier when his training is properly planned, conducted, and supervised.

c. The applicatory system of instruction best suits the needs of military instruction.

d. Military training progresses from basic to advanced subjects and from individual to team training.

e. Skills are acquired through supervised practice.

f. Training doctrines and techniques are standard throughout the Army.

g. Responsibility for the conduct of training is vested in the unit commander.

259. Phases of Training

a. The general phases of training are basic military training, advanced individual training, basic unit training, advanced unit training, combined training, and joint training. Each phase of training may overlap other phases. The phases of training usually conducted in an artillery battery are advanced individual training and basic unit training.

b. Advanced individual training teaches the basically trained soldier his occupational skills as an artilleryman, preparing him for specific func-

tions as a member of an artillery team. Formal training in this phase does not occupy a large portion of the annual training time of the battery, but informal training of this type continues throughout the career of the soldier.

c. Basic unit training teaches teamwork and allows the soldier to practice the skills acquired in advanced individual training. Basic unit training integrates the various sections into an efficient, smoothly-working battery.

d. Advanced unit training, in which the battery trains as an element of a larger organization, such as the artillery battalion, is usually conducted by or under the supervision of the higher headquarters.

260. Training Schedules

a. The battery commander must take an active interest in the preparation of training schedules for his unit. If the battery weekly training schedule is not prepared at battery level, the battery commander should establish a working liaison with whoever prepares the schedule so that his ideas on the training needs of the battery may be incorporated into the schedule. This will reduce the necessity for changes to the schedule once it has been distributed.

b. The schedule should be followed exactly as published and changes or cancellations of periods should be avoided. Any deviation from the schedule must be reported in advance to the battalion S3 or to the training officer at next higher headquarters.

c. If the schedule is to be prepared at battery level, the battery commander may logically delegate this duty to the executive officer. The battery commander must check the draft schedule before it is approved to see that all requirements have been included and that training is scheduled in an efficient and logical manner.

d. As soon as possible after preparation of the schedule, all personnel scheduled to instruct or assist in instruction should be informed and given the details of the class, so that they will have the maximum time for preparation.

Section II. CONDUCT OF TRAINING

261. General

Training should be conducted according to the principles and techniques given in FM 21–5 and FM 21–6. The standards should be those set in FM 6–125, AR 611–201, and Army training tests. If time permits, each section of the battery should be given general instruction on the functions and techniques of the other sections of the battery. The results obtained, better understanding, closer coordination, and greater cooperation, will be well worth the extra time and effort required. The more a soldier knows about the duties of those with whom he works, the better he understands his own job.

262. Methods

a. The most efficient and direct way of teaching at the battery level is by the applicatory method.

To learn how to do a job, the soldier must be told what to do and shown how to do it. Proficiency is achieved through practice. As a rough guide, instruction should be about 10 percent explanation, 25 percent demonstration, and 65 percent practice.

b. Throughout training the trainee should be shown how instruction and current training corresponds to the actual duties of the sections and the mission of the unit must be emphasized. As individuals and sections master fundamental tactical and technical skills, exercises should be expanded in scope so that all phases of combat operations are included. Maximum use should be made of field exercises to develop the battery.

c. Personal supervision by the battery commander is of the greatest importance. By his presence at a class, he shows his support of that portion of his unit. His interest will arouse the interest of his officers and noncommissioned officers. By attending training, the battery commander is able to take every opportunity to mold the teams and to shape policies and SOP's according to his desires. It is in the classroom that the foundation is laid for the well-operating, efficient battery team.

263. Instructors

Instructors should be carefully selected and given sufficient time for preparation and rehearsal of their instruction. In general, noncommissioned officers conduct individual and section training. The use of noncommissioned officers as instructors enhances their position in the eyes of the soldier

and develops their leadership and initiative. Battery officers are responsible for making training plans, conducting unit training, and supervising and testing individual and section training.

264. Critique

a. During training the completion of an exercise should be followed immediately by a critique. Every exercise has points of instructional value. The critique should clearly emphasize each point of instructional value. Only by this means can the instructor be assured that maximum benefit has been obtained from the exercise.

b. Every critique should be—

(1) *On the spot.* Correction must be made while the error is still fresh in mind. To prevent the forming of bad habits, it is normally advisable to stop a problem at the time errors are committed. In certain types of problems, where continuity of action is a desirable element, the discussion of errors may be deferred until the problem is completed.

(2) *Specific.* A general statement is not enough. Personnel should be told who made the mistake, what the mistake was, when it was made and how to correct the mistake.

(3) *Applied to combat.* Men must be made to realize what their mistakes or errors in training would have meant in combat.

(4) *Concise.* The critique is not the place for

a summary of the exercise. No attempt should be made to cover again all of the points of the problem.

c. A critique should be conducted essentially as follows:

(1) Where applicable, a brief tactical presentation of the problem is given with a statement regarding the proper method of approach. Battlefield application is stressed at this time.

(2) The instructor then states whether or not the problem was satisfactorily conducted and his reasons therefor. Emphasis is placed on correct practice and mistakes are pointed out. The instructor should point out why the mistakes were made and how they can be corrected. The critique should not be a rehash of the problem but should merely cover the most important points. A good critique gives constructive criticism on a few major errors.

(3) On completion of the critique, the instructor should ask if there are any questions, answer them, and then summarize.

CHAPTER 19
TRAINING THE BATTERY

Section I. GENERAL

265. Training Programs

a. Mandatory training is conducted in accordance with the directives of higher headquarters. Department of the Army training programs (ATP) provide guidance in the preparation of the unit training schedules. The ATP specifies the subjects to be covered, the hours to be allocated to each subject, the scope of instruction, and a recommended sequence for presentation. ATP's covering artillery training are included in the ATP 6–300 series.

b. The schedule of training will not necessarily be as outlined in the ATP's. Once the ATP cycle has been completed, the unit has considerable discretion in scheduling. Higher commanders may modify the program as outlined in the ATP's to insure best use of existing facilities; to conform to limitations imposed by funds, facilities, or personnel; or to facilitate the attainment of objectives.

c. Army subject schedules are valuable aids in training battery personnel, both for general and specialist training. Each ASubjScd for a particular subject contains a statement of the training ob-

jective, scope of instruction, training notes, schedule charts, lesson outlines, and references to appropriate texts, training aids, facilities, and equipment for the conduct of training. For a complete listing of current ASubjScd's, see DA Pam. 310–3.

d. It must be emphasized that no soldier becomes a thoroughly-trained artilleryman, nor any battery a superior unit, merely by being exposed to a certain number of hours of instruction. ATP's and unit training programs are merely guides for the commander in planning and organizing training. The battery commander must be constantly alert to the state of training of his unit and cause emphasis to be placed on those areas where the performance of the battery is below his standards. The quality of instruction presented is much more important than the quantity. Training does not end with the completion of a training program, nor is it restricted to the subjects and hours suggested in the ATP. Valuable training in discipline and teamwork may be accomplished during routine battery activities.

266. Advanced Individual Training

Advanced individual training may be divided into the following categories:

a. General Training. The objective of general training is to provide a general knowledge of the organization, mission, and function of artillery and of the unit to which the individual is assigned.

b. Specialist Training. The objective of specialist training is to qualify the individual to perform the duties required by his assignment in the unit.

Specific training directives for each specialist are outlined in appropriate Army subject schedules (ASubjScd), AR's, and FM's.

267. Schools

Maximum use should be made of schoods conducted by higher headquarters for the training of cooks, mechanics, communications personnel, survey specialists, and other specialists. Occasionally, the unit may be called upon to furnish a student for a course of instruction. The battery commander should insure that the designated student meets the required criteria and is suitable for training.

Section II. BATTERY HEADQUARTERS PERSONNEL

268. General

Training of battery headquarters personnel is complicated by the fact that routine battery duties must be performed, even during scheduled training periods. Specialist training of headquarters personnel is usually accomplished by special schools or on-the-job training. The battery commander must insure that headquarters personnel attend mandatory training as directed by higher headquarters. Training methods and objectives for certain headquarters personnel are described below.

269. Battery Clerk

a. The battery clerk receives on-the-job training under the direct supervision of the first sergeant. When possible, the clerk should attend

an administrative school conducted by higher headquarters. A locally supervised school is especially valuable since it teaches the procedures and SOP's to be followed in that command.

b. The battery clerk must be a proficient typist and should be able to perform the following specific duties:

(1) Prepare military letters and indorsements.

(2) Prepare charge sheets for courts-martial.

(3) Prepare line of duty and claims investigations.

(4) Prepare morning reports, sick slips, and duty rosters.

(5) Prepare battery orders.

(6) Maintain a file of authorized references with all current changes.

(7) Maintain the unit files.

(8) Prepare necessary records for the unit fund.

(9) Practice proper procedures for safeguarding classified documents.

(10) Handle and distribute mail.

270. Supply Personnel

Supply personnel should be school-trained, and should be able to perform the following duties:

a. Maintain a file of current authorized supply directives, regulations and references.

b. Maintain supply records, such as vouchers, property books, and suspense files.

c. Prepare forms for requisition, receipt, issue, and turn-in of supplies.

d. Prepare statements of charges and reports of survey.

e. Assist in property inventory.

f. Properly safeguard supplies.

g. Administer unit laundry requirements.

271. Mess Personnel

a. General. The selection and training of mess personnel must be carefully conducted. The battery commander must have a personal interest in the operation of the unit mess.

b. Training. The mess steward and all first cooks should receive their training at an Army cooks' and bakers' school. It is desirable to have all mess personnel similarly trained. However, since school quotas are not always available, cooks may be trained in the unit. Soldiers who desire to learn to cook may be trained by working on shifts as student cooks under the supervision of the regular first and second cooks and the mess steward. ASubjScd 10–102 is a useful guide in training mess personnel within the battery.

c. Objectives. Mess personnel must be expert in the preparation and serving of food in a garrison mess and must also be thoroughly trained in—

(1) The care, maintenance, and operation of field ranges and immersion-type water heaters.

(2) Sanitation procedures.

(3) The layout of a field mess under various

conditions of terrain and tactical situation.

(4) Mess operation from a kitchen truck.

(5) Mess operation in rail troop-kitchen cars.

(6) Operation and maintenance of mess truck and trailer.

d. Training Suggestions. The battery commander should insure that the mess section receives practical field training at every opportunity. The training should be integrated with battery field training exercises. When the major portion of the battery is in the field, the mess should accompany it. The practice of preparing the food in garrison and sending it to the troops in the field should be discouraged.

272. Maintenance Personnel

a. Training. The motor sergeant and senior mechanics should be school-trained. Other mechanics and helpers may receive on-the-job training initially, but should receive school training at the earliest opportunity. Prospective mechanics must demonstrate mechanical aptitude and be expert drivers. Maintenance personnel should be able to—

(1) Perform first and second echelon repairs on battery, vehicles.

(2) Spot check driver preventive maintenance operations and provide technical assistance.

(3) Perform scheduled preventive maintenance services.

(4) Understand the use of preventive maintenance forms, records, and reports.
(5) Requisition spare parts.

b. Training Suggestions.

(1) A short preventive maintenance period should be conducted daily before the vehicles are dispatched. This period should be restricted to the performance by the drivers of the before-operation maintenance services. The vehicles should then be inspected to determine that the vehicle is in proper operating condition and has not been operated, damaged, nor pilfered subsequent to the after-operation inspection and service. Items needing adjustment, repair, or replacement should be reported. This period contributes to the training of drivers and mechanics, insures that before-operation services are performed, affords the battery commander a daily check on the appearance and condition of his vehicles, and assists in accident prevention.

(2) A formal preventive maintenance period (motor stables) should be performed daily by the maximum number of available personnel with the close supervision of the battery officers and chiefs of section. Advice and guidance should be provided by the school-trained maintenance personnel. This period should be conducted at the end of the day and should in-

clude the after-operation maintenance services on all vehicles, as well as preventive maintenance on all other equipment. Commanders should insure maximum support to the officers and noncommissioned officers with direct responsibility for preventive maintenance. This period contributes to the training of all personnel and to the care of equipment and insures that the unit is prepared to roll at any time thereafter.

(3) The motor sergeant should establish a spot-check inspection program for battery vehicles. This may be done by inspecting certain items on all vehicles each day, or by giving one or more vehicles a complete inspection each day. This procedure will provide further training for mechanics and will assist in detecting incipient failures before they result in a complete breakdown. The motor sergeant must be discouraged from performing duties of the mechanics. His duties are administrative and supervisory. He must be a skilled mechanic, but he should use this skill in training and supervising drivers and mechanics.

Section III. FIRE DIRECTION PERSONNEL

273. Fire Direction Training

a. General. Fire direction specialists should receive their training in a formal course conducted by higher headquarters. It will be neces-

sary to conduct fire direction training in the battery to maintain the proficiency of the personnel and to train in depth, so that multiple teams may be formed. Fire direction training should be conducted by the operations sergeant or chief computer and supervised by the fire direction officer.

b. References. For details of fire direction procedures and training, procedures for team drills, and training checklists, see FM 6–40.

274. Training Exercises

The majority of fire direction training on a battery level will be some sort of team drill. No opportunity should be missed to allow the FDC to work in conjunction with other portions of the battery. Numerous exercises suitable for training in garrison can be devised which involve the FDC, the firing battery, and the forward observers. These exercises may be detailed solutions to firing problems or may be simple communications exercises. The FDC should always accompany the firing battery in field training. If the training taking place in the firing battery does not lend itself to working with the FDC, such as in practicing RSOP's, the FDC may conduct some of its training separately, but should move and occupy position with the firing battery.

Section IV. COMMUNICATIONS PERSONNEL

275. Communications Training

a. General. Communications training may be divided into two categories, the detailed instruc-

tion in specific duties which applies to personnel in communications assignments and the more general instruction in procedures, use, and maintenance which applies to personnel who use communications equipment in the course of their other duties. The demands of the present communications systems, with their numerous stations, and the critical requirements of security make it mandatory that all personnel who use communications equipment receive sufficient training to achieve and maintain the ability to operate correctly.

b. References. For further details, see FM 6–40, FM 24–5, FM 24–18, FM 24–20, and the ATP 6–300-series.

276. Officer and Noncommissioned Officer Participation

Officers and noncommissioned officers must have a thorough knowledge of communications procedures and the means of maintaining security. They should attend classes periodically to maintain their proficiency.

Section V. SURVEY PERSONNEL

277. Survey Training

a. General. A well trained survey section is of primary importance to the effective operation of the battery. Its importance is magnified for the battery operating separately, since there is no battalion-level support, and for heavy artillery units, since registrations or adjustments may be prohibited or curtailed.

b. References. For further details, see FM 6–40, TM 6–200, and the ATP 6–300-series.

278. Training Exercises

Survey schools may be conducted on a battalion level or by higher headquarters. Training exercises conducted with large groups such as these are more valuable than those on a battery level. However, it will be necessary to conduct survey training in the battery in order to work out standard methods and to build teamwork and coordination between the survey section and the other sections of the battery.

Section VI. RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

279. General

Practice of the RSOP, especially if combined with service practice, puts the final polish on the performance of a battery. It is during this training that the individual efforts of each member of the battery fall into place as part of the team effort; and the performance of the various teams and sections is made to blend into the overall operation of the battery.

280. Procedure

Practice of the RSOP should be conducted similarly to service-of-the-piece drill; going through each phase in detail at first, then walking through the complete action, then going through the exercise at full speed. The number of repetitions per-

formed during one session should be increased as the skill of the personnel develops.

281. Critique

The critique assumes an added importance in this training. The technique of the critique is important. While teamwork is still being developed, someone should be designated to closely watch each section and to critique that section. During the first phase of practice the action may be interrupted for corrections. During this phase, each section should receive an initial critique separately; then the assembled battery should receive a short critique given by the battery commander. As the battery develops, the critiques should remain detailed, but should be given to the assembled battery to stimulate competition and generate an interest in the overall progress of the battery. During this phase, the action should be allowed to continue without interruption until it is completed. During the most advanced phase of practice, when the battery will occupy several positions during a training period, a brief critique by the battery commander at the end of the occupation of each position or at the end of the training period will be sufficient.

Section VII. WEAPONS TRAINING

282. Firing Battery

For a detailed discussion of the techniques of conducting service-of-the-piece drill and service practice, see FM 6–40, *Notes for the Battery*

Executive and Fire Direction Officer, and appropriate manuals for the piece.

283. Small Arms

For detailed discussions of training with small arms, see the appropriate manual for each weapon.

APPENDIX I

REFERENCES

1. Army and Special Regulations

Medical service

AR 40–207 Individual Sick Slip.

AR 40–230 Preventive and Control of Communicable Diseases of Man; Immunization.

Field organizations

AR 220–45 Duty Rosters.

AR 220–70 Companies; General Provisions.

Nonappropriated funds and related activities

AR 230–5 General Policies.

AR 230–10 Nonappropriated Military Welfare Funds.

AR 230–21 Accounting Procedures for Nonappropriated Unit Funds, Inmates, Welfare Funds, Stockade Welfare Funds and Commandants' Welfare Funds.

AR 230–63 Financial Planning and Management for Nonappropriated Funds.

AR 230–80 Report of Sales and Expenditures in Foreign Countries

	Pertaining to Nonappropriated Funds and Activities.
	Military publications
AR 310–1	General Policies.
AR 310–2	Department of the Army Publications Media and Numbering.
	Administration
AR 335–60	Morning Report.
AR 345–292	Records Administration; Units of the Active Army and the Army Reserve.
AR 380–5	Safeguarding Defense Information.
	Safety
AR 385–10	Army Safety Policy.
AR 385–40	Accident Reporting and Records.
AR 385–63	Regulations for Firing Ammunition for Training, Target Practice, and Combat.
	Personnel administration
AR 600–70	Badges.
AR 611–201	Manual of Enlisted Military Occupational Specialties.
	Supply
AR 711–41	Army Supply Status Reporting System, Unit and Organization Equipment Status Report.
AR 735–11	Accounting for Lost, Damaged, or Destroyed Property.

AR 735–35	Supply Procedures for TOE Units, Organization, and Non-TOE Activities.

2. Field Manuals

FM 5–15	Field Fortifications.
FM 5–20	Camouflage, Basic Principles.
FM 5–20A	Camouflage of Individual and Infantry Weapons.
FM 5–20B	Camouflage of Vehicles.
FM 5–20C	Camouflage of Bivouacs, Command Posts, Supply Points, and Medical Installations.
FM 5–20D	Camouflage of Field Artillery.
FM 5–22	Camouflage Materials.
FM 5–25	Explosives and Demolitions.
FM 5–31	Use and Installation of Booby-traps.
FM 6–18	Mortar Battery, Infantry and Airborne Division Battle Group.
FM 6–20	Artillery Tactics and Technique.
FM 6–21	Division Artillery, Infantry Division.
FM 6–40	Field Artillery Gunnery.
FM 6–101	The Field Artillery Battalion.
FM 6–125	Qualification Tests for Specialists, Field Artillery.
FM 7–10	Rifle Company, Infantry Regiment.
FM 7–20	Infantry Battalion.
FM 7–40	Infantry Regiment.

FM 20–32	Employment of Land Mines.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–10	Military Sanitation.
FM 21–13	The Soldier's Guide.
FM 21–40	Defense Against CBR Attack.
FM 21–41	Soldier's Manual for Defense Against CBR Attack.
FM 21–48	CBR Training Exercises.
FM 23–5	U. S. Rifle, Caliber .30, M1.
FM 23–7	Carbine, Caliber .30, M1, M2, and M3.
FM 23–15	Browning Automatic Rifle, Caliber .30, M1918A2.
FM 23–25	Bayonet.
FM 23–30	Hand and Rifle Grenades.
FM 23–32	3.5-inch Rocket Launcher.
FM 23–35	Pistols and Revolvers.
FM 23–41	Submachinegun, Caliber .45, M3 and M3A1.
FM 23–55	Browning Machinegun, Caliber. 30, M1917A1, M1919A4, M1919A4E1, M1919A6, and M37.
FM 23–65	Browning Machinegun, Caliber .50, MB, M2.
FM 24–5	Signal Communications.
FM 24–18	Field Radio Techniques.
FM 24–20	Field Wire Techniques.
FM 25–10	Motor Transportation, Operations.
FM 30–5	Combat Intelligence.

FM 30–7	Combat Intelligence, Regiment, Combat, Command, and Smaller Units.
FM 100–5	Field Service Regulations, Operations.
FM 101–10	Organization, Technical, and Logistical Data.

3. Technical Manuals

TM 6–200	Artillery Survey.
TM 6–230	Logarithmic and Mathematical Tables.
TM 6–240	Rule, Slide, Military, Field Artillery, With Case, 10-inch.
TM 9–575	Auxiliary Sighting and Fire Control Equipment.
TM 9–1275	Ordnance Maintenance, U. S. Rifle, cal. .30, M1, M1C (sniper) and M10 (sniper).
TM 9–1276	Ordnance Maintenance, Carbine, cal. .30, M1, M1A1, M2, and M3.
TM 9–1295	Ordnance Maintenance, Caliber .45 Automatic Pistol M1911 and M1911A1.
TM 9–1527	Ordnance Maintenance, Gunner's Quadrant and M1918 and Machinegun Clinometer M1917.
TM 9–1530	Ordnance Maintenance, Aiming Circle, M1, Compass M2 and Prismatic Compass M1918.

TM 9–1900	Ammunition, General.
TM 9–1901	Artillery Ammunition.
TM 9–1903	Care, Handling, Preservation, and Destruction of Ammunition.
TM 9–1910	Military Explosives.
TM 9–1990	Small Arms Ammunition.
TM 9–2002	3.5-inch Rocket Launchers M20 and M20B1.
TM 9–2005	Browning Machinegun, Cal. .30 and Tripod Mounts.
TM 9–2021	Browning Machinegun, Cal. .50, M2.
TM 9–2023–1	Field Maintenance, U. S. Rifle, Cal. .30, M1.
TM 9–2111–1	Field Maintenance, Browning Automatic Rifle.
TM 9–2171–1	Field Maintenance, Cal. .45 Submachinegun M3 & M3A1.
TM 9–2200	Small Arms Materiel and Associated Equipment.
TM 9–2300	Artillery Materiel and Associated Equipment.
TM 9–2810	Tactical Motor Vehicle Inspections and Preventive Maintenance Services.
TM 10–405	Army Mess Operations.
TM 11–666	Antennas and Radio Propagation.
TM 11–2125	Automatic Switching Equipment, All-Relay 200-Point,

	Dial Central Office: 600 Lines Expendable to 1,400 Lines.
TM 11–2202	Manual Telephone Switchboard SB-22/PT.
TM 11–2546	Connecting and Switching Kit MX–155/GT
TM 21–300	Driver Selection and Training.
TM 21–301	Driver Selection, Training, and Supervision, Full-Track Vehicles.
TM 21–305	Manual for the Wheeled Vehicle Driver.
TM 21–306	Manual for the Full-Track Vehicle Driver.
TM 57–210	Air Movement of Troops and Equipment.

4. Department of the Army Pamphlets

DA Pam 6–1	Field Artillery Checklists.
DA Pam 39–3	The Effects of Nuclear Weapons.
DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310–1	Military Publications: Index of Administrative Publications (AR, SR, DA Pam, CTB, GO, Bul, Cir).
DA Pam 310–2	Military Publications: Index of Blank Forms.
DA Pam 310–3	Military Publications: Index of Training Publications (FM, ROTCM, TC, ATP,

	MTP, ASubjScd, ATT, WD&DA Posters, and FT and TjC).
DA Pam 310–4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310–7	Military Publications: Index of Tables of Organization and Equipment, Tables of Organization, Type Tables of Distribution, and Tables of Allowances.
DA Pam 310–21	Military Publications: Index of Supply Manuals; Signal Corps.
DA Pam 310–22	Military Publications: Index of Supply Manuals; Transportation Corps.
DA Pam 310–23	Military Publications: Index of Supply Manuals; Chemical Corps.
DA Pam 310–25	Military Publications: Index of Supply Manuals; Corps of Engineers.
DA Pam 310–29	Military Publications: Index of Supply Manuals; Ordnance Corps.
DA Pam 310–30	Military Publications: Index of Supply Manuals; Quartermaster Corps.

5. Miscellaneous Publications

ACP 125(A)	Allied Communications Publication.
ATP 6–300	Army Training Program for Field Artillery Units.
ASubjScd 10–102	MOS Technical Training of Cooks.
6-series	Training for Artillery.
ATT 6-series	Unit Training Tests for Artillery.

APPENDIX II

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE

1. General

a. There exists no nation in the world which does not have the potential for including some phase of chemical, biological, or radiological warfare in its military weapons. The threat of such warfare will always be present in combat. The artillery battery must include training for CBR concurrently with its other training.

b. This appendix will briefly discuss training, general and specialist; special equipment; and defense measures.

c. This appendix is not intended to replace other publications on the subject of CBR, but to supplement them by putting emphasis on the specific application of this subject to the field artillery battery. For detailed information on CBR and allied subjects, see DA Pam 39–3, and FM's 7–40, 21–13, 21–40, 21–41, and TC 3–2 (25 April 57).

2. Personnel

a. Each unit should appoint an officer and a noncommissioned officer to the duty of CBR Officer and CBR NCO, respectively, in addition to their other duties.

b. The duties of the CBR Officer include—

(1) Outlining the CBR training program for the unit.

(2) Conducting CBR training for the battery as a whole.

(3) Supervising training conducted for less than the whole battery.

(4) Insuring that the unit has been issued the equipment, in the proper amounts, as authorized by competent authority.

(5) Training the CBR NCO in his duties.

(6) Advising the battery commander in all matters pertaining to CBR.

(7) Acting as the representative of the battery commander in all matters pertaining to CBR.

c. The duties of the CBR NCO include—

(1) Assisting the CBR Officer in the performance of his duties.

(2) Conducting training for sections of the battery as appropriate.

(3) Supervising training given by other personnel which includes CBR.

(4) Supervising the maintenance of the CBR equipment.

(5) Training assigned personnel in the care and use of CBR equipment.

3. Training

a. General. Training in CBR is never completed. It must be continuous. In this, as in all other phases of training, it is the direct responsibility

of the battery commander that the men of his unit are properly trained. It is of the utmost importance that all personnel are familiar with and are thoroughly trained in all aspects of CBR. The greatest threat posed by CBR is that of shock and the resulting panic. Untrained soldiers, or those who have not had continuous CBR training, may panic at the first use of any phase of CBR. This panic can result in a whole unit being put out of action without sustaining a single actual casualty.

b. Specific Training. Initially, CBR training should be in the form of classes which are devoted solely to the subject of CBR. These basic classes should be conducted until the personnel of the unit are familiar with the basic principles and have a good working knowledge of the subject. In these classes the soldier must learn to—

(1) Recognize the various forms of CBR.

(2) Report properly any information he gains.

(3) Defend himself and his section against CBR.

(4) Render first aid to himself and others.

(5) Operate and maintain the equipment used in detecting and defending against the use of CBR weapons.

c. Integrated Training. After the personnel have received the basic instruction in classes, this instruction should be amplified by integrating it into the other training of the battery. During practice in other duties, the conduct of drills, and in field exercises, CBR must be included in such

a way as to cause the soldier to use and develop the techniques he has learned in class. This practice will maintain and increase his proficiency and will instill in the soldier a continuing consciousness of the importance of CBR. He must learn to accept CBR as an integral part of modern warfare.

4. Defense Against CBR Attack

a. General. The defensive measures adopted by units as protection against conventional warfare also provide protection against CBR. Camouflage, defilade, cover, concealment, and fortifications are general-purpose defenses. If the enemy cannot discover the position, he cannot attack it. If he cannot hit the position, he cannot deliver most CBR agents or weapons into the area. If the men and equipment are protected against conventional shelling, they will be protected to some degree from the effects of most CBR weapons.

b. Dispersion. Dispersion, as a defense against CBR, is effective for the larger units, division-size or greater. However, the use of dispersion on the battery level is totally ineffective and actually detrimental to the functioning of the unit. The dispersion of a battery to the extent that would provide a defense against even the smallest CBR weapon would cause the battery to be unable to function, to defend itself from ground attack, or even to operate as a cohesive unit.

c. Protective Clothing and Equipment. The use of protective clothing, the protective mask, and the protective ointment kit must be commonplace

in the unit. Personnel must be thoroughly trained in maintenance and use of protective clothing and equipment. The time factor in CBR is such that, for the equipment to be of any benefit, its use must be instantaneous and automatic.

d. Discipline. CBR training should instill a rigid discipline in the soldier. No infraction of the rules can be allowed. Restrictions on entering contaminated areas, eating questionable food, using exposed equipment, and the maintenance of security with respect to an enemy CBR attack can never be relaxed.

5. Preparedness

An attack with some form of CBR does not necessarily mean disaster for our forces. The success or failure of such an attack will depend on the conduct of the soldiers who are subjected to the attack. If they have been thoroughly trained, if the officers and noncommissioned officers who conduct their training have instilled in them an understanding of CBR in its proper perspective, if their equipment and ability are ready for use; then the use of CBR by an enemy will not be decisive.

APPENDIX III

MESSAGE CENTER PROCEDURE

Section I. GENERAL

1. General

The procedure outlined herein is applicable to the message center operated by the headquarters battery of all field artillery units.

2. Organization

a. The TOE for artillery units above battery level normally provides for personnel to operate a message center. The personnel are—

(1) *Senior Message Clerk.* The senior message clerk supervises all activities of the message center, to include cryptography and receipt, transmission, and delivery of all messages received in the message center.

(2) *Message Clerk.* The duties of the message clerk are the same as those of the senior message clerk. He will normally act as code clerk when both he and the senior message clerk are present in the message center.

b. Although not specifically provided by TOE, certain other personnel are required by duty assignment to work in the message center and

should be trained in message center procedure. These personnel are—

(1) *Messengers.* Assigned personnel are used as messengers.

(2) *Means Operators.* Radio and teletype operators are trained in cryptography to assist in processing messages requiring encrypting or decrypting when message center personnel are not available.

3. Forms and Equipment

Message center operation is not dependent on elaborate forms and equipment. It may be operated with some simplified means of recording the communications facilities available and messages handled. Nothing more is needed than pencils, paper, a watch, and the necessary codes and ciphers. However, the following forms facilitate message handling and are used when available.

a. Message Book, DA Form 11–170. This message book provides sets of blank message forms for use in writing or recording messages.

b. Route Delivery List, DA Form 11–63. The route delivery list is used as a receipt when the messenger has more than one message to deliver on a single trip.

4. Records

a. General. Elaborate records and unnecessary work must be avoided. Any record which materially delays the transmission of messages should be eliminated. The message center maintains only such records which insure rapid and ac-

curate handling of messages. These records include live and dead files, message center log, message clerk's file, operator's file, and the communication status log.

b. Live File. The duplicate clear text copy or skeleton copy of each outgoing message processed by the message center is placed in the live file. This copy remains in the live file until a receipt is obtained from the receiving headquarters. It is then indorsed and placed in the dead file.

c. Dead File. The dead file consists of the duplicate copies of all receipted outgoing messages and completed receipt forms. This file is turned over to the S1 or similar authority by the communications officer at frequent intervals (usually daily) so that messages may be included in the unit journal or other official records of the headquarters.

d. Message Clerk's File. The message clerk retains on file the original clear text copy of each outgoing cryptogram and the original cryptographed copy of each incoming cryptogram. Care must be taken to insure that the clear text and the cryptographed copy of a single message are never filed together. The file is disposed of as directed by the communications officer.

e. Operator's File. The file kept by the radio and teletype operators will contain a copy of each message sent or received. The file will be disposed of as directed by the communications officer.

f. Communication Status Log. The communication status log is a record maintained by the message center which shows the current avail-

COMMUNICATION STATUS LOG (FM 6-140)											DATE
UNIT						TIME ZONE			PAGE NO.		NO. OF PAGES
UNITS TO WHICH CONNECTED	AM RAD		FM RAD		TT		TP		VHF		REMARKS
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	

DA Form 2150-R, 1 AUG 58

Figure 14. DA Form 2150-R, Communication Status Log.

ability of all means of communication used by the message center. It is used to determine the best available routing for messages. The operators of the various means keep the message center informed of the status of communication with other units. DA Form 2150-R (Communication Status Log), figure 14, will be reproduced locally on 8- by 10½-inch paper.

g. Message Center Log. The message center log is a daily chronological record of all messages handled by the message center. A separate log is maintained for incoming and outgoing messages. The logs are closed as of 2400 hours daily. Any messages not yet receipted for must be checked to insure that the message has been received by the addressee. When all messages have been cleared, the log is placed in the dead file. DA Form 2151-R

MESSAGE CENTER LOG
(FM 6-140)

UNIT							DATE		
							PAGE NUMBER	NO. OF PAGES	
MESSAGE CENTER NUMBER	TIME FILED	MEANS	PREC	MESSAGE DATE/TIME GROUP	CRYPT	GR COUNT	CLEARED TO/FROM	TIME OF RECEIPT	REMARKS

DA Form 2151-R, 1 AUG 58

Figure 15. DA Form 2151-R, Message Center Log.

(Message Center Log), figure 15, will be reproduced locally on 8- by 10½-inch paper.

Section II. HANDLING OUTGOING MESSAGES

5. Outgoing Messages by Special Messenger (Clear Text)

a. Origin. The outgoing message is prepared by the writer and submitted to the message center in 2 or more copies (always 1 copy more than the number of addressees).

b. Processing. The message center enters the *time filed, message center number,* and *how sent* in the spaces provided on both copies of the message form. The duplicate is placed in the live file. The original is now ready for delivery.

c. Dispatch of Messages. The designation of the addressee, message center number, and the time of dispatch are placed on the message. The message is given to the messenger for delivery. Prior to dispatch, the messenger should be instructed concerning—

(1) The route to follow.
(2) The importance of the message (if applicable).
(3) Whether or not to wait for an answer to the message.
(4) Other information concerning the delivery of the message.

d. Message Center Log Entry. After dispatching the messenger, the senior message clerk uses the duplicate copy to record the message in the outgoing message center log.

e. Delivery of the Message. When the special messenger arrives at the addressee's unit, he delivers the message to the message center and obtains the signature of the message center. Prior to departing, the messenger inquires if there are any messages for his unit.

f. Recording Receipt of Message. When the message is returned to the message center, the senior message clerk enters the time of return and the messenger's initials on the message. The duplicate copy is removed from the live file and the time of receipt and the message clerk's initials are placed on it in a circle. The receipt is attached to the duplicate copy and both are placed in the dead file. The outgoing log entry pertaining to the message is closed by completing the *time of receipt* column.

6. Outgoing Message by Electrical Means (Encrypted)

a. Origin. The message is prepared by the originator and submitted in duplicate to the message center.

b. Processing. The message clerk enters the *time filed, message center number,* and *how sent* in the spaces provided on both copies of the message. The original copy of the message is given to the message clerk for encrypting. The duplicate copy is used by the senior message clerk in entering the information in the outgoing message log and then is placed in the live file.

c. Cryptographing. The message text is encrypted by the message clerk, using the TSEC/KL7, the Converter M209, or, in emergency, the

operations code. The encrypted text is entered on a message form together with the *time filed, message center number, how sent,* and *date-time group.* Radio call signs or routing indicators are placed on the message in lieu of the clear designation of the originator and addressee. The proper authenticators and group count are also placed on the message, which is then sent to the means for transmission. The clear text original copy is placed in the message clerk's file. Worksheets, tapes, and other material related to the message are destroyed by burning. The senior message clerk is notified of the group count and this information is entered on the outgoing message log.

d. Transmission. The message is transmitted by the means operator to the addressee. When the addressee's station receipts for the message, the means operator places his initials and the time of receipt on the message. The message center is notified of the time of receipt and the message is placed in the operator's file.

e. Recording the Receipt. On receiving the time of receipt from the means operator, the message clerk removes the duplicate clear text copy from the live file, indorses it, completes the entry in the outgoing message log, and files the copy in the dead file.

Section III. HANDLING INCOMING MESSAGES

7. Incoming Message by Messenger

a. Receipt of Message. On receiving a message delivered by a special or scheduled messenger, the

senior message clerk signs the message route delivery list and indicates the time received.

b. Processing. The senior message clerk makes the proper entries in the incoming message log, prepares a delivery list, and dispatches the message or messages to the addressee or appropriate staff officer. When the receipt is returned to the message center, the time cleared is entered in the incoming message log.

8. Incoming Message by Electrical Means

a. Receipt. The means operator copies the incoming message in triplicate on the message form. After receipting for the message to the transmitting station, the means operator places his initials and time of receipt on the message. The triplicate copy is placed in the operator's file and the original and duplicate are forwarded to the message center.

b. Processing. The message clerk decrypts the message and copies the clear text version on a message form. The originator and addressee are determined from the radio call sign and entered on the clear text version. Authentication is checked and noted on the message form with the time of receipt by the means operator and the initials of the person who decrypted the message. The original encrypted copy is placed in the message clerk's file. The clear text copy is delivered and recorded in the incoming message log as indicated in paragraph 7*b* of this appendix. All worksheets, tapes, and extra copies of the message are destroyed by burning.

Table I. Composition of Field Artillery Battery Reconnaissance Party and Duties of Individuals in Reconnaissance, Selection, and Occupation of Position (RSOP)

VEHICLES

1. Battery commander ____¼ ton
2. Fire direction center ___¾ ton, w/trailer
3. Survey _____¾ ton, w/trailer
4. Wire team _____¾ ton

When the reconnaissance party is limited to 2 or 3 vehicles, they are eliminated from the bottom of the list. When a one car party is ordered, the FDC vehicle will be used.

When time is limited, BC may decentralize responsibility for the reconnaissance and selection of sites for installations.

If guides are needed for the occupation, most of the listed personnel are available after completing their assigned duties.

BATTERY COMMANDER'S VEHICLE

Personnel	*Duties*
BC _____	1. Makes a reconnaissance of the area. 2. Selects locations for installations. 3. Formulates occupation plan. 4. Issues orders. 5. Supervises execution of orders.
Driver (radtp opr).	Meets the battery at the battalion release point and leads it to the area. (An officer should be sent with this vehicle if a night occupation.)
*First Sergeant.	1. Plans local security. 2. Reconnoiters truck park.

FIRE DIRECTION CENTER VEHICLE

Personnel	*Duties*
Operations Sergeant	Supervises establishment of FDC.
FD Computer	Establish FDC as directed.
2 Chart Operators	Assist. One man sometimes used as sentry.
Radtp Opr	Operates radio.
2 Platoon Sergeants	1. Both assist in location of howitzers. 2. Each marks respective platoon positions. 3. Each sets up and orients respective aiming circles, if necessary.
*Comm Chief	Plans and reconnoiters wire routes and supervises installation of communications. (Rides in wire truck if it is with the party.)

SURVEY VEHICLE

Personnel	*Duties*
*Recon Officer	1. Establishes observation post, if directed. 2. Performs survey. 3. Assists in reconnaissance.
*Chief of Detail	1. Assists recon officer. 2. Supervises communication and survey personnel and operations.
Chief of Survey Party, 2 Survey Computers, Instrument Operator, Recorder, 3 Tapemen	1. Perform survey. 2. Furnish men and machinegun for security when required.

WIRE TEAM VEHICLE

Personnel	*Duties*
Wire Team Chief, Switchboard Opr, 2 Wiremen, Driver.	This team installs wire net and switchboard and operates the machine guns for security of the reconnaissance party.

* Indicates personnel who do not normally ride in the vehicle shown except while on reconnaissance.

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[AG 353 (11 Jul 58)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

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Chief of Staff.

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USAIS (50)
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PMST Jr Div Units (3)
PMST Mil Sch Div Units (3)
Mil Dist (1)
US Army Corps (Res) (1)
Sectors, US Army Corps (Res) (1)
MAAG (2)
Mil Mis (1)
Units org under fol TOE:
6–100 (10)
6–200 (10)
6–300 (10)

NG: State AG (6); units—same as Active Army except allowance is one copy to each unit.

USAR: Same as Active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320–50.

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