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FM 6-20-1

FM 6-20-1
July 1961

DEPARTMENT OF THE ARMY FIELD MANUAL

FIELD ARTILLERY TACTICS

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HEADQUARTERS, DEPARTMENT OF THE ARMY
OCTOBER 1961

FIELD MANUAL
FIELD ARTILLERY TACTICS

FM 6-20-1

CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 7 March 1962

FM 6-20-1, 27 October 1961, is changed as follows.

*Figure 1. (Superseded) Field artillery tactical mission.
(Located in back of manual)*

42. General Areas

a. General. (Superseded) The location of artillery position areas is governed mainly by the mission, the terrain, the nature of the tactical operation, and the need for dispersion as a defensive measure. Artillery commanders may have to define areas for the location of the major elements of their commands in order to coordinate the position areas with the operation. Direct support artillery has priority for positions within the division area and division artillery units have priority over corps artillery units for positions within the corps area. Corps artillery units have priority over army artillery for positions within the army area. On the other hand special requirements may necessitate special priorities.

79. Nuclear Class V Procedures

* * * *

b. (Superseded) A special ammunition load (SAL) is the number of nuclear rounds authorized to be carried by a fire unit. The force commander at each echelon will announce the prescribed nuclear load. The SA may be changed to conform with the tactical and logistical situation. However, replacement of the SA is not automatic as with nonnuclear ammunition. See FM 101-31 for a detailed discussion of the control of nuclear ammunition.

* * * *

BY ORDER OF THE SECRETARY OF THE ARMY:

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General, United States Army.
Chief of Staff.

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 Combat Arms Bde (5) TOF:
 Inf Regt (1) 17-22 (2)
 PA Gp (5)

NG: State AG (3): Units same as active Army except allow-
 ance is two copies 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.

An PA unit with a mission of--	Answers is for fire--	Establishes liaison with--	Establishes communication with--	Has as its zone of fire--	Furnishes forward observers--	Displaces when--	Has its fires planned by--
Direct support	Supportent. Own obsers. Higher & hq.	Supported unit (down to bat- talion level)	Supported unit.	Zone of sup- ported unit.	To each com- pany sized maneuver ele- ment of sup- ported unit	Unit comd deems necessary or ordered by higher arty hq.	Develops own fire plan.
Reinforcing	Reinforcunit. Own obsers. Higher & hq.	Reinforced unit.	Reinforced unit.	Zone of fire of reinforc- ed unit.	Upon request of reinforc- ed unit.	Requested by rein- forced unit, or ordered by higher arty hq.	Reinforced unit.
General support.	Higher & hq. Own obsers.	No inherent requirement.	No inherent requirement (internal comm only).	Zone of sup- ported unit.	No inherent requirement.	Ordered by higher hq.	Higher arty hq.
General support reinforcing.	Higher & hq. Reinforcunit. Own obsers.	Reinforced unit.	Reinforced unit.	Zone of sup- ported unit to include zone of fire of reinforced unit.	Upon request of reinforced unit subject to prior ap- proval of higher arty hq.	Ordered by higher arty hq, or upon request of reinforced unit sub- ject to prior ap- proval higher arty hq.	Higher arty hq.

*Notifies next higher headquarters time, position, and fire capabilities.

Figure 1. (Superseded) Field artillery mission.

Figure 1.

FIELD MANUAL } HEADQUARTERS,
No. 6-20-1 } DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 27 October 1961

FIELD ARTILLERY TACTICS

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***This manual supersedes so much of FM 6-20, 10 December 1958, as pertains to field artillery tactics.**

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CHAPTER 1

INTRODUCTION

1. Purpose and Scope

a. This manual is a guide for field artillery officers and for force commanders and staffs. By establishing the fundamentals of field artillery tactics, the manual provides guidance for the employment of artillery at all levels. The term artillery as used in this manual refers to field artillery. The maneuver elements referred to in this manual include group, combat command, regiment, brigade, or similar organizations.

b. The tactics of artillery in nuclear and non-nuclear warfare differ and this manual outlines the differences.

c. For employment of air defense artillery, see FM 44-1 and other manuals of the FM 44-series.

d. For field artillery techniques, see FM 6-20-2.

e. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to Commandant,

U.S. Army Artillery and Missile School, Fort Sill, Okla.

2. Mission of Artillery

The mission of the artillery is—

a. To support the ground-gaining arms by fire, give depth to combat by counterbattery fires, attack hostile reserves, restrict movement, and disrupt command systems and other installations.

b. In nonnuclear combat, to support maneuver elements by destroying or neutralizing those targets most dangerous to the supported arms.

c. In nuclear combat, to attain fire superiority over the enemy's nuclear artillery and to destroy other major targets which threaten the accomplishment of the force mission.

3. Artillery Weapons System

The artillery weapons system consists of weapons and those elements necessary to obtain the desired effect on the target. These elements are target acquisition; survey; meteorology; communications; air and ground transportation; and logistics. Fire support is the result of the effective application of the artillery weapons system.

4. General Considerations

The development of nuclear weapons and their delivery systems has changed the tactics of infantry, armor, and artillery. Even though nuclear weapons may not be employed, they pose a constant threat to ground operations. Two possible conditions are imposed, nuclear and nonnuclear

combat. Nonnuclear war will have many of the traits of nuclear war when the threat of nuclear war exists.

CHAPTER 2

FIELD ARTILLERY CHARACTERISTICS

Section I. CLASSIFICATIONS

5. By Weapon

Artillery weapons are classified as cannon or missiles.

a. Cannon are classified according to caliber as light, medium, heavy, and very heavy:

- (1) *Light*—120-mm and less.
- (2) *Medium*—Greater than 120-mm, but not to exceed 160-mm.
- (3) *Heavy*—Greater than 160-mm, but not to exceed 210-mm.
- (4) *Very heavy*—Greater than 210-mm.

b. Missiles are weapons which utilize a reaction motor to provide a propelling force to the payload. Artillery missiles are classified according to type as rockets and guided missiles.

- (1) A rocket is aimed by orienting the launcher; it cannot be further guided once it is fired.
- (2) A guided missile's course is subject to correction or alteration while in flight.

6. By Transport

a. Artillery weapons are further classified according to their method of transport:

- (1) *Towed*—Cannons and launchers which are mounted on a carriage designed to be moved as a trailed (transported) load by a prime mover. A towed carriage contains no power source.
- (2) *Self-propelled (SP)* — Cannons and launchers which are permanently installed on vehicles which provide automotive power for the vehicle and the weapon.

b. An artillery weapon is also classified according to the method of transportation which can be used to deliver it to a combat area. All artillery weapons can be transported by road, rail, or ship. Weapons that can be moved by aerial transportation are classified as follows:

- (1) *Helicopter transportable.* Weapons which can be carried by rotary wing aircraft and landed sufficiently assembled to permit immediate employment.
- (2) *Air transportable (par. 3, AR 705-35).*
 - (a) *Phase I (parachute and assault landing).* Weapons transportable in assault landing aircraft capable of landing on unprepared surfaces and minimum criteria airstrips within enemy territory. All phase I artillery must be capable of *immediate* effective employment.
 - (b) *Phase II (initial air landing).* Weapons transportable in aircraft capable of landing on minimum criteria air-

landing facilities held by friendly forces. Artillery normally moved during this phase are in the followup elements of the units participating in phase I. All phase II artillery should be capable of effective employment within *1 hour* after delivery.

- (c) *Phase III (heavy air landing)*. Weapons transportable in aircraft capable of landing on prepared air-landing facilities held by friendly forces. Artillery normally moved during this phase are in the followup elements of the units participating in phases I and II. It is desirable that all phase III artillery be capable of effective employment within *6 hours* after delivery.

Section II. CAPABILITIES AND LIMITATIONS

7. General

Artillery is the principal Army agency for delivering indirect fire on ground targets. Artillery operations are those combat operations of artillery units, trained, equipped, and organized to support other combat forces by providing neutralizing and destructive fires. The artillery is prepared to fire under either nuclear or nonnuclear conditions.

a. In the nonnuclear battle, the artillery provides close continuous support to ground elements. Artillery is ideally suited for the neutralization and destruction of enemy units.

b. In the nuclear battle, artillery's success is measured by its ability to establish nuclear fire superiority while continuing to provide support to maneuver elements as required. Primary targets are the enemy's nuclear delivery means. Priority of position is given to nuclear delivery units; artillery's nuclear delivery units must be prepared to deliver nuclear fire immediately when the transition to nuclear combat is made.

8. Capabilities

The artillery is capable of—

a. Shifting the fire of its weapons rapidly within a large area and on a wide front without displacing.

b. Massing the fires of many weapons on one target or series of targets.

c. Directing fire on targets without exposing the weapons to direct enemy observation or direct counterbattery fires.

d. Accurately firing ammunition appropriate for the target under all conditions of visibility, weather, and terrain from weapons emplaced laterally and in depth throughout the zone of action.

e. Placing fire on targets in defilade.

f. Delivering fires accurately with or without adjustment. The latter method improves the effect of fires by shock and surprise.

g. Displacing rapidly to new positions and employing artillery units to concentrate greater firepower in important sectors.

9. Limitations

The artillery is limited in that—

a. It cannot effectively execute its primary mission when required to engage in close combat with enemy ground forces.

b. Its effectiveness is reduced and its vulnerability is increased during displacements.

c. It is vulnerable to enemy air attack and nuclear fire.

CHAPTER 3

ARTILLERY ORGANIZATION AND ORGANIZATION FOR COMBAT

Section I. ARTILLERY ORGANIZATION

10. General

The general organizational objective of the artillery is to provide, at all times and under all conditions, an organization for combat which can most effectively and economically support the combat forces. The organization includes weapons, associated materiel, personnel, and logistical support. The organization of artillery units and headquarters is shown in detail in appropriate tables of organization and equipment.

11. Division Artillery

Division artillery consists of a division artillery headquarters and headquarters battery, other units organic to division artillery, and units attached to the division and placed under the command of the division artillery commander. The division artillery is organized for combat to support the division scheme of maneuver. Flexibility is achieved through the assignment of suitable tactical missions to the units of the division artillery. Additional artillery support is ordinarily provided by attaching artillery units to the divi-

sion or by reinforcing the fires of the division artillery with other artillery.

12. Corps Artillery

Corps artillery consists of a headquarters and headquarters battery, other units organic to corps artillery and such artillery headquarters and units as are assigned or attached to the corps artillery and not further attached to division. *Artillery with the corps* includes the corps artillery and the artillery with divisions of the corps.

13. Army Artillery

Army artillery consists of units assigned or attached to the army and retained under command of the army artillery commander. *Artillery with the army* includes the army artillery and the artillery with its subordinate corps.

14. Army Group and Theater Artillery

Artillery representation at these echelons consists only of the artillery staff sections necessary to fulfill the artillery requirements of these headquarters. There are usually no artillery units under the control of these headquarters.

15. Artillery Group

The artillery group consists of a headquarters and headquarters battery and attached units. It provides flexibility in organization for combat, since the number, type, and caliber of the attached units may be varied to meet the situation. Although units attached to a group may be of any caliber and type, mixed calibers and types permit

greater flexibility in employment. The group organization provides centralized training and tactical control as well as a limited degree of administrative and logistical supervision.

16. Artillery Battalion Group

In the absence of a group or other suitable tactical headquarters, one battalion may be attached to another battalion, forming a battalion group. The battalion group headquarters functions only as a tactical headquarters for limited periods. The numerical designation of the battalion group is that of the battalion providing the group commander.

Section II. ORGANIZATION FOR COMBAT

17. Purposes

Artillery is organized for combat primarily to enable it to—

- a.* Provide all committed maneuver elements adequate support.
- b.* Provide massed fires where they are needed.
- c.* Employ all available weapons and exploit their capabilities.
- d.* Facilitate future operations.

18. Methods

Artillery organization for combat is accomplished by—

- a.* Placing each artillery unit in a tactical organization.

b. Assigning each unit a tactical mission or attaching it to another artillery unit or other tactical element.

19. Considerations

a. *Centralized Versus Decentralized Control.* In organizing artillery for combat, each echelon retains centralized control of subordinate elements to the maximum. Tactical missions or attachment are used to regulate the extent of centralization or decentralization.

b. *Fundamentals.* Fundamentals governing artillery organization for combat are based on the requirements that it must provide—

- (1) Adequate fire support to the committed units.
- (2) In the offense, preponderance of fire support to the main attack.
- (3) In the defense, centralized control is retained to the maximum degree feasible. Vulnerable areas are given first consideration.
- (4) Fire support with which the force commander of that echelon can immediately influence the action.
- (5) Adequate fire support for the reserve, when it is committed.

c. *Basic Considerations.* Basic considerations in organizing for combat applicable to all echelons are—

- (1) Mission of the force.
- (2) Plan of maneuver.

- (3) Amount and type of artillery unit available.
- (4) Capabilities of the weapon system.
- (5) Availability of suitable position areas.
- (6) Availability of other fire support agencies.
- (7) Availability and expected expenditure of ammunition, particularly nuclear weapons.
- (8) Enemy intelligence, particularly target intelligence.
- (9) Weather.
- (10) Terrain.

d. Important considerations applicable to specific echelons are as follows:

- (1) Division artillery provides close and continuous support to maneuver elements, counterbattery fire, flak suppression, harassing and interdiction fires, and other programs of fire.
- (2) Corps artillery provides depth to combat, augments the fire support provided by the division artilleries, and provides the bulk of fires on hostile cannon, missiles, and rockets.
- (3) Army artillery provides depth to combat and augments the fire support provided by the artillery with the corps.
- (4) Army medium, heavy, and very heavy artillery cannon battalions are usually attached to corps and then further attached to artillery groups.

- (5) Army shorter range artillery missile battalions are usually attached to corps. Short range missile battalions may be further attached to artillery groups or to a division.
- (6) Some longer range artillery missile units are retained under Army artillery control.

Section III. TACTICAL MISSIONS

20. Assignment of Tactical Missions

Tactical missions for artillery are assigned by the force commander on the recommendation of the force artillery commander.

a. Authority may be delegated to each artillery commander to assign tactical missions to the artillery units under his control. Generally, individual missions are not assigned to battalions within a group or to batteries within a battalion. The artillery commander may, when assigning a tactical mission, direct the subordinate artillery commander to reinforce certain artillery unit(s) with a portion of the fires of his unit. In this case, close coordination between the reinforcing and the reinforced artillery commander is essential for accomplishing the mission. Coordination will include the processing of fire requests.

b. When a battalion of a group is assigned the mission of reinforcing, and that mission differs from the mission of the group, the battalion is detached from the group and placed under the con-

trol of the artillery commander assigning the mission.

c. Artillery attached to a force is assigned tactical missions and commanded by the force commander. Attachment is not a tactical mission; it is a status.

21. Tactical Missions

a. *General.* A tactical mission is the fire support responsibility that may be assigned to an artillery unit. Tactical missions are direct support, general support, reinforcing, and general support-reinforcing. They may be assigned to nonfiring units as well as to firing units. The responsibilities inherent to each tactical mission are given in figure 1.

b. *Direct Support.* An artillery unit with a mission of direct support provides the support to a designated maneuver element. The direct support unit furnishes close and continuous fire support to the maneuver element and must coordinate its fires with those of the supported force. The direct support artillery commander maneuvers his unit to conform with the plans of the commander of the supported element. When practicable, the supporting artillery unit is habitually placed in direct support of the same maneuver element in order to facilitate teamwork. An artillery unit with a mission of direct support remains under the command of the higher artillery commander.

c. *Reinforcing.* An artillery unit assigned the mission of reinforcing, augments the fires of another artillery unit. The reinforcing unit remains

under the command of the higher artillery commander, but its fires are planned by the reinforced unit. A *quick fire communications channel* is established between the reinforced and the reinforcing unit to facilitate calls for additional fires. The reinforced unit calls directly upon the reinforcing unit for additional fires.

d. General Support. An artillery unit assigned the mission of general support furnishes artillery fires in support of the force as a whole. Units with this mission remain under the control of the higher artillery commander and provide the force commander with a means of influencing the action.

e. General Support-Reinforcing. An artillery unit given the mission of general support-reinforcing fires in support of the force as a whole and, in addition, reinforces the fires of another artillery unit. A unit with this mission remains under control of the higher artillery commander. Calls for fire from higher artillery headquarters take precedence over those of the reinforced unit.

f. Attachment. When the mission of the supported force is such that it is impractical to assign the artillery a tactical mission, the artillery may be attached. An artillery unit attached to a maneuver element will be assigned a tactical mission by the maneuver element commander.

22. Modifications

To facilitate operations, it is frequently necessary to change certain designated responsibilities of a tactical mission. When any of the responsi-

bilities shown in figure 1 are changed, the mission is said to be modified tactical mission. Normally, direct support missions are not modified. Modifications will appear in both the operation orders and fire support plans.

23. Warning Orders

Warning orders serve to alert units of pending changes (see AR 320-5 and FM 101-5). Certain phrases can be included in operations orders and fire support plans which also alert units of pending changes. Any foreseeable change in the tactical mission should be included. Example: 1st How Bn, 3d Arty: GS-reinf, 1st How Bn, 5th Arty. On order DS, 1st Brigade.

A FA unit assigned a mission of:	Answers calls for fire from own observers and from—	Establishes communications and liaison with—	Has the following zone of fire:	Must provide forward observers—	Displaces on order of next higher headquarters or—
Direct support (DS).	Next higher headquarters. Supported unit. Develops own fire plans from requirements of division fire support plan and supported forces' requests for fire.	Supported unit.	Zone of action of supported unit.	For zone of action of each company size combat element of supported unit.	Unit commander.*
Reinforcing (Reinf).	Next higher headquarters. Fires are normally planned by the reinforced unit.	Reinforced unit.	Zone of fire of reinforced unit or as directed.	As requested by reinforced unit.	Reinforced unit.

General support reinforcing (GS-Reinf).	Reinforced unit.	Fires may be planned by higher artillery headquarters or allotted in whole or in part to the reinforced artillery unit.	Zone of action of supported unit or as directed.	As requested by reinforced unit, subject to approval of next higher headquarters.
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General support (GS).	Next higher headquarters.	Fires are normally planned by higher artillery headquarters.	Not required unless directed by next higher headquarters.	At direction of next higher headquarters.
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*Notifies next higher headquarters of time, position, and fire capabilities.

Figure 1. Field artillery tactical missions.

CHAPTER 4

COMMAND, CONTROL, AND COORDINATION

Section II. COMMAND RESPONSIBILITIES

24. Artillery Officer

In theater and army group, the senior artillery officer in the artillery staff section is designated the *artillery officer*. He is the special staff officer who advises the commander on artillery matters.

25. Artillery Commander

a. In army, corps, division, or task force, the senior officer of the artillery headquarters is designated as the *artillery commander*. He commands artillery units retained under control of the force. He is also the *artillery officer* of the special staff. He advises the commander and staff on all artillery matters and is the fire support coordinator for the force.

b. There is no direct chain of artillery command between force artillery echelons (par. 32).

26. Army, Corps, Division, and Task Force Artillery Commanders

The responsibilities of the artillery commander of an army, corps, division, or task force are to—

a. Determine the requirements and recommend the employment of units and the allocation of materiel and ammunition.

b. Command the assigned and attached artillery not reassigned or further attached to subordinate units.

c. Advise the force commander and staff on the employment of artillery fires.

d. Plan fires in support of the operation to include target analysis.

e. Coordinate all fires on terrestrial targets.

f. Coordinating all artillery target acquisition within the commander's zone of responsibility (normally limited to echelons below field army).

g. Collect, process, and distribute artillery information and intelligence, including target intelligence.

h. Coordinate artillery survey control.

i. Direct the fire of artillery with the force.

j. Recommend assignment of artillery personnel and estimate replacement requirements for units.

k. Direct the training of artillery units of the force.

27. Artillery Officers—Theater Army and Army Group

The duties and responsibilities of the artillery officer of a theater army or army group are assigned by the commander. The theater army or army group artillery officer is usually assigned the responsibility for—

a. Determining the number and types of non-organic artillery units required by the forces in the command, including special equipment for these units.

b. Recommending the allocation of the various types of artillery units to subordinate commands.

c. Recommending assignment of personnel and estimating replacement requirements for these units.

d. Supervising the training of units and replacement personnel within the command and the operation of artillery schools under the control of the commander.

e. Publishing information and intelligence of interest to the artillery.

f. Planning the reception and processing of units within the command.

g. Determining ammunition requirements and recommending the allocation of available ammunition.

h. Exercising, in the commander's name, operational control of those units which have not been assigned or attached to subordinate units.

28. Commander, Artillery Group

The group commander's responsibilities include the following command functions:

a. Coordinating target acquisition and survey control.

b. Planning fires to carry out the mission of the group.

c. Controlling the group fires.

d. Directing group training.

29. Commander, Field Artillery Battalion Group

a. The commander of a battalion group is des-

ignated by the authority establishing the group. He has similar tactical functions and responsibilities as a group commander plus command of his own battalion.

b. If a battalion group is formed with one battalion in direct support of a major combat element, the commander of the direct support battalion will normally command the group (par. 45c).

30. Direct Support Artillery Commander

In this manual, the term "direct support artillery commander" refers to the commander of an artillery unit who is assigned the mission of direct support and who is immediately and directly responsible to the commander of the supported force.

Section II. RELATIONSHIPS

31. Combined Arms Team

Field artillery is a member of the combined arms team used by the commander to complete his mission. When artillery is assigned or attached to the supported unit, the artillery officer is both a subordinate commander and a special staff officer of the supported unit commander. When artillery is neither assigned nor attached to the supported unit, the artillery commander's relationship to the supported unit commander is that of an adviser and an independent commander who must provide effective fire support in accordance with his assigned tactical mission.

32. Command Channels

Instructions for the corps artilleries of a field army are issued to the corps commander in the name of the army commander; in like manner, instructions for the division artilleries are issued to the division commander in the name of the corps commander. This procedure is necessary because there is no chain of command between the artilleries of the various echelons. Each artillery commander commands only the artillery at his echelon.

33. Liaison

a. General. Liaison is established between units to insure mutual understanding and unity of purpose and action. Liaison is usually carried out by a unit representative visiting or staying with another unit to exchange information.

b. Command Liaison. Through personal contact, artillery commanders establish command liaison with supported and reinforced commanders. This is the most effective type of liaison. The liaison established by commanders is maintained by liaison officers furnished by the unit responsible for its establishment.

c. Liaison Officers. The liaison officer is the commander's personal representative to the unit with which liaison is maintained. The principal duties of an artillery liaison officer are listed in FM 6-20-2. Frequent changes of liaison officers are undesirable; however, in situations requiring prolonged absences from his parent unit, it may be desirable to rotate liaison officers to keep them

informed of the current situation, plans, and command policies.

d. Staff Liaison. Liaison is not restricted to liaison officers but may be performed by any staff officer or other designated officer. Liaison between staff sections of one unit and similar staff sections of an associated unit is desirable for further cooperation and coordination, e.g., liaison may be established with the engineers in regard to survey control and with the Air Weather Service in regard to meteorological data.

Section III. CONTROL AND COORDINATION

34. Responsibility for Artillery Estimates

a. The artillery officer of an echelon ordering or conducting an operation is responsible for making the estimate of artillery requirements. In doing so, he considers the eventual organization for combat and the practicability of assembling the necessary artillery and ammunition at the time and place desired. Subordinate artillery commanders may assist in the preparation of the estimate.

b. Artillery estimates are made to determine the number and types of artillery units required, the amount of ammunition required to support the contemplated operation, and the allocations of units and ammunition to lower echelons.

35. Basis of Artillery Estimates

a. The minimum requirements are that sufficient artillery be available to—

- (1) Place the required mass of fire on all confirmed and suspect targets.
- (2) Attack effectively all enemy installations that will influence planned operations during any anticipated phase.

b. The amount and types of artillery required for an offensive operation depend primarily on the commander's plan and the type of enemy resistance expected. Generally, units making secondary efforts will be allowed only limited amounts of artillery in order to permit the massing of artillery in areas where decisive offensive action is contemplated.

c. The amount and types of artillery required for a defense depend primarily on the enemy capabilities, the terrain, and the commander's plans.

36. Estimate of Artillery Requirements

Artillery requirements vary so widely that no fixed listing can be furnished. FM 101-10 contains tables showing basic loads and expenditure of ammunition experience tables which are of assistance in making artillery estimates for various types of operations. As a campaign progresses, accurate experience data applicable to local conditions should be developed by commanders as a guide for the conduct of future operations. Factors which must be considered in estimating the number and types of artillery units and the amount of ammunition required are the—

a. Availability and known or expected use of artillery units and ammunition.

b. Type of operation (attack, defense, delaying, special operation, etc.) and supporting fires.

c. Availability of reinforcing fires from higher artillery headquarters.

d. Availability and known or expected use of weapons by air bombardment, naval gunfire, reinforcing fires by tanks and air defense artillery, or other means of support.

e. Composition, tactics, disposition, and organization of enemy force.

f. Types of enemy fortifications and defenses expected.

g. Capability of opposing artillery.

h. Terrain and weather.

i. Available time and capacity of road net.

j. Front and depth of main and secondary attacks.

k. Allowance for losses during combat:

l. Whether the combat is nuclear or nonnuclear.

37. Coordinating and Limiting Measures

a. *Zones of Fire.* Zones of fire are assigned to artillery units for control of fire laterally and in depth to support the action. Lateral limits within which a unit must be able to fire are designated by points or lines. Zones in depth may be designated by prescribing minimum range lines and lines to be reached by the fires of the unit. Zones of fire are designed with the tactical mission (fig. 1).

b. Boundaries. In addition to their use in defining areas of responsibility, boundaries also serve as a measure for coordinating fire support. When nuclear fires employed by one force will have casualty- or damage-producing effects in the zone of an adjacent force, these fires must be coordinated with, and approved by, the adjacent force.

c. No-Fire Lines. The no-fire line is a line short of which no artillery unit may fire without prior clearance from the headquarters which established it. The location of the no-fire line is established by the artillery commander in coordination with the supported unit commander. Each artillery echelon is kept informed of the location of and changes to the no-fire line. Division artillery consolidates and distributes this information to subordinate units, to artillery reinforcing the division artillery, to adjacent division artilleries, and to corps artillery headquarters. Corps artillery headquarters consolidates division no-fire lines and sends the location of the corps no-fire line to corps artillery units, to the artillery of the divisions of the corps, and to the adjacent corps. The artillery establishing the no-fire line may fire short of the no-fire line in its own sector. Other artillery units must obtain clearance from the artillery which established the no-fire line prior to firing short of it.

d. Fire Support Coordination Line (FSCL). The FSCL serves as a no-fire line between corps and higher echelons and as a bomb line for ground and air forces. A FSCL may be estab-

lished by the corps commander to insure coordination of those fires delivered by forces not under control of the corps which may affect current tactical operations. Whenever possible, the FSCL should be easy to define on the map and easy to recognize from the air.

e. 0-0 Line. The 0-0 line is a line established by corps artillery as a means of coordinating target search in depth. Usually, the frontline divisions conduct target search short of the 0-0 line; and corps artillery searches beyond it. This arbitrary division does not restrict the zones of observation or attack of targets. The 0-0 line should be designated by terrain features. Its location is changed to meet the situation.

f. Nuclear Safety Line (NSL). Nuclear safety lines are selected to follow well-defined terrain features and are used as troop safety measures when firing nuclear weapons. The artillery commander, as force fire support coordinator, establishes the NSL based on guidance issued by the force commander. During independent operations, the commander may be required to establish nuclear safety lines for weapons supporting his unit. A nuclear safety line may be used to—

- (1) Designate an area in which our troops must observe certain protective measures.
- (2) Designate limits to which our troops may advance before encountering unacceptable effects from our nuclear weapons.

- (3) Prescribe limits to which certain effects of our weapons may be permitted to extend in the direction of our troops.

g. Fire Coordination Line (FCL). The fire coordination line is a line between two converging forces beyond which fire may not be delivered without coordination with the affected force.

38. Communication

a. Communication facilities of the artillery provide the commander the means for controlling and coordinating the fires of his subordinate units. The commander of each echelon is responsible for the installation, operation, and maintenance of his communication facilities.

b. Artillery communication includes the employment of all means to transmit orders, information, intelligence, and commands between units and to establish liaison with supported, reinforced, and adjacent units. For details on artillery communication, see FM 6-10.

CHAPTER 5

FUNDAMENTALS OF EMPLOYMENT

39. Maneuver of Units

The artillery commander is responsible that his units are so maneuvered that they are able to render effective support in any situation. This requires—

- a.* That the mobility of artillery be maintained.
- b.* That all artillery commanders are informed of the plans of the supported unit and anticipate the requirements for artillery.
- c.* The proper organization for combat, necessary changes thereto during the operation, and decentralization of control when appropriate.
- d.* Coordinated movement of artillery units and proper disposition within march columns.
- e.* Selection of position areas from which effective fire can be delivered.
- f.* Continued reconnaissance for position areas, observation posts, and locations for other installations and routes.
- g.* Timely displacement of artillery units to provide continuity of fire support.
- h.* Sound procedures for effecting relief of artillery units in combat and for receiving attached artillery.
- i.* Effective security measures.

40. Marches

a. References. For basic doctrine governing troop movements, see FM 100-5; for technical and logistical data and march tables, FM 101-10; for march orders, FM 101-5; for motor movements, FM 25-10; for marches of field artillery battalions, FM 6-20-2; and for protection by air defense artillery, FM 44-1.

b. Tactical Marches. When a force is marching in several march columns, artillery is placed in each column to insure its availability for early and adequate support of the security forces and the initial action of the main body. Artillery may be attached to the column during the march. When the rate of march of the column is that of dismounted troops, the artillery marches by bounds.

c. Air Defense Protection. Continuous air defense will be provided, as much as practicable, for a force on the move. Organic firing teams will be dispersed throughout the march columns. Air defense artillery units will be deployed so as to provide air defense for march columns.

41. Artillery with Security Forces

A military force in movement protects itself with reconnaissance and security elements (covering forces) operating in front of the command and by advance, rear, and flank guards when necessary. Self-propelled artillery is desirable for the support of all security forces.

a. Covering Forces. A covering force should be strong in artillery. When the covering force has

no organic artillery, artillery units may be attached. Planning and reconnaissance must be continuous if the artillery is to occupy positions promptly in support of an action. Artillery with a covering force may be required to displace rapidly and frequently; it is positioned well forward to allow it to open fire at long ranges and so that other elements of the covering force can protect it from surprise attack. To speed the opening of fire, radio communications and minimum survey are used.

b. Advance Guard. Artillery may support the advance guard by the attachment of, or by assigning a direct support mission to, an artillery unit(s). If the advance guard is small and within range, direct support may be furnished by the artillery with the main body. The amount of artillery support depends on the mission and size of the advance guard and the expected enemy action. The position of the artillery and the requirement for rapid entry into action is similar to that for support of the covering force. When contact is imminent, the artillery supporting the advance guard moves by echelon from one firing position to another.

c. Rear Guard. Artillery may support the rear guard by the attachment of, or by assigning a direct support mission to, an artillery unit(s). The artillery occupies positions close behind each of the successive rear guard delaying positions. Fire is opened early to force the enemy to deploy and thus to delay his advance. Roads, road junctions, and key terrain features are placed under

interdiction fire. When the rear guard is engaged, the supporting artillery moves by echelon from one position to another.

d. Flank Guard. Artillery may support the flank guard by attachment of an artillery unit(s) or by direct support artillery with the main body. The employment of artillery attached to the flank guard is similar to that with the advance guard.

42. Position Areas

a. General. The location of artillery position areas is governed mainly by the mission, the terrain, the nature of the tactical operation, and the need for dispersion as a defensive measure. Artillery commanders may have to define areas for the location of the major elements of their commands in order to coordinate the position areas with the operation. In nuclear combat direct support artillery has priority for positions within the division area and division artillery units have priority over corps artillery units for positions within the corps area. Corps artillery units have priority over army artillery for positions within the army area. On the other hand special requirements may necessitate special priorities.

b. Responsibility. Direct support artillery commanders normally select their own position areas subject to the approval of the next higher headquarters. Position areas for general support units are selected by the force artillery commander and may be selected for reinforcing artillery units by either the force artillery commander or by the commander of the reinforced unit. Corps and

army artillery position areas within the division area are coordinated with the division artillery commander concerned; army artillery position areas within the corps area are coordinated with the corps artillery commander concerned. All artillery commanders should be aggressive in searching for position areas and should be prepared to make recommendations to the commander responsible for the selection.

43. Displacements

Timely and rapid displacements of artillery units are necessary to deliver continuous fire support. Fire support is maintained during displacements by displacing units by echelon or by using other artillery units to answer calls for fire. Displacements are completed as rapidly as possible so that fire can be resumed with minimum delay and to lessen the probability of enemy detection and attack during displacement. If possible, command posts are displaced by echelon to insure continuity of control. Communications are installed and operations are begun at the new command post location before the old command post displaces. If possible, survey should be completed before displacement is begun. Units may displace to position during darkness or reduced visibility to avoid enemy detection. Many considerations such as the immediate situation, overall plan of operations, effective range of weapons, terrain, difficulty in maintaining communication, and availability of position areas and routes, will influence each displacement. Authority for displacement of artil-

lery units varies with the assigned tactical mission (fig 1).

44. Relief in Combat

a. General. Relief in combat is of two general types: relief in place and passage of lines. During the relief, the artillery maintains its normal fires. When possible, relief is made at night or by echelon to maintain secrecy.

b. Warning Orders. When a relief in place is to be accomplished, warning orders are issued by the commanders of the next higher headquarters, the relieving unit, and the unit to be relieved. Warning orders should include the time of the movement, road priority, the zone of operation of the relieving unit, the time the fire support responsibilities pass to the relieving unit, and any control measures required to maintain secrecy (par. 23).

c. Responsibilities. The unit being relieved is responsible for furnishing the relieving unit any of the following information that is needed:

- (1) Friendly situation, to include unit and installation, locations, no-fire line, 0-0 line, and observation posts.
- (2) All available information of the enemy.
- (3) Route information and, if needed, road guides.
- (4) Survey information.
- (5) Location of supply installations.
- (6) Location of other artillery within sup-

porting range and means of communicating with them.

- (7) Fire or movement restrictions.
- (8) Existing wire circuits and wire line route maps.
- (9) Information necessary for fire control including fire plans, situation maps, and other information pertinent to the operation.
- (10) Location of minefields.
- (11) Other pertinent information.

d. Command. The principle of one responsible commander must be adhered to during the execution of a relief in place.

- (1) When a relief in place occurs and both the artillery and the supported unit are relieved at the same time, the artillery command passes from the relieved artillery commander to the relieving artillery commander at the same time as the passage of command from the relieved supported unit commander to the relieving supported unit commander. When the artillery and the supported unit are relieved at separate times, the artillery command passes from the relieved artillery commander to the relieving artillery commander as determined by agreement between the two commanders, unless directed by higher headquarters.
- (2) When a relief by passage of lines occurs, the artillery command passes to the re-

lieving artillery commander before the passage of lines begins. The relieved artillery may be attached to the relieving artillery or may be ordered to reinforce from its original positions until the force supported by the relieving artillery passes beyond range.

45. Receiving Attached Artillery

a. General. The presence of additional artillery in a combat area could be an indication of more active operations. Artillery supporting a combat area should move in with utmost secrecy and during periods of reduced visibility.

b. Attachment to Other Artillery Headquarters. Artillery units (e.g., battery, battalion, group, or division artillery) may be attached to other artillery headquarters. The attached units are given orders similar to those given to assigned units, stating their mission, position areas, and routes.

c. Attachment to Division Artillery Battalion. When a nondivisional battalion is attached to a division artillery battalion, the commander of the divisional artillery unit is designated as the battalion group commander. He is responsible that complete preparations are made for the reception of the attached battalion. The battalion group commander is responsible that command guidance and control is furnished the attached battalion to the same degree that he would for his own units (par. 29b).

46. Security

a. General. Imagination and initiative in the employment of security measures are necessary to maintain effective fire against an enemy strong in artillery and tactical air or skilled in infiltration and guerrilla tactics. Deception contributes to effective security. Deceiving the enemy as to the amount of artillery, gives the commander the advantage of surprise in launching an attack. For active and passive defense measures of artillery battalions and batteries in position and during the march, see FM 6-20-2 and FM 6-140.

b. Movements. Secrecy in moving artillery into position is gained by night marches and infiltration. To avoid confusion and delay, detailed staff planning and coordination are necessary.

c. Deceptive Measures. Deceptive measures must conform to the mission and counterintelligence plan of the force commander.

- (1) Dummy positions are used to deceive the enemy as to the location of artillery units. These positions are constructed to appear as realistic as possible. Logs, captured weapons, and pneumatic devices may be used to simulate artillery weapons. Marks of digging, vehicle tracks in and around the position, and actual or simulated firing add to realism.
- (2) Many other deceptive measures may be taken. Artillery may occupy supplementary positions, fire from them for a short period, and return to their pri-

mary positions. Registration, interdiction, or harassing fires by roving guns from surveyed positions are effective. Simultaneous firing by several units increases the enemy's difficulty in locating individual positions. Reduction of fires, elimination of artillery preparations, restrictions on registrations, and radio silence or other restrictions on radio operation all help to conceal the presence of artillery.

47. Auxiliary Weapons

a. When directed, the fires of auxiliary weapons are used to supplement artillery fires. Weapons which may be used as artillery are tanks, air defense artillery, and armored amphibians.

b. The employment of auxiliary weapons as artillery is facilitated by assigning the unit a mission of reinforcing an artillery battalion.

c. Units furnishing auxiliary fires usually remain under the command of the unit of assignment or attachment.

d. The reinforcing unit will usually be responsible for the following:

- (1) Establishing communication and liaison with the reinforced artillery.
- (2) Providing its own logistical support.

48. Army Aviation

a. Army aircraft are utilized to expedite and improve the Army's ground combat capabilities

and logistics. For a detailed discussion of Army aviation, see FM 1-100.

b. When available to artillery, Army aircraft are used in performing the following tasks:

- (1) Target acquisition.
- (2) Conduct of artillery fire.
- (3) Observation.
- (4) Photography.
- (5) Route reconnaissance.
- (6) Wire laying and radio relay and message delivery.
- (7) Inspection of camouflage.
- (8) Survey assistance.
- (9) March column control.
- (10) Movement of artillery weapons, crews, and supplies.
- (11) Radiological survey.
- (12) Damage assessment.

CHAPTER 6

ARTILLERY IN NONNUCLEAR COMBAT

Section I. SUPPORT OF THE OFFENSE

49. General

The purpose of offensive action is the destruction of the enemy's armed forces, the imposition of the commander's will on the enemy, or the seizure of territory to further operations. For a complete discussion of offensive action, see FM 100-5.

50. Missions and Requirements

Artillery must be deployed and organized to provide supporting fires to the attack, furnish continuous support during the action, and protect the attacking force during reorganization. The weight of artillery firepower and priority of fires is normally given to the main attack. Prior to the attack, control is centralized. As the attack develops or the exploitation begins, however, control may be decentralized.

51. Artillery Positions in the Offense

Artillery position areas in the offense are located—

a. As far forward as practicable to exploit the range of the weapons and to facilitate liaison, and communications.

b. To avoid interference with other units.

c. To maintain adequate separation between units consistent with their mission.

d. To give priority of position to units in direct support of elements in contact.

52. Preparing to Support the Attack

a. Registration increases the accuracy of fires, permits placing unobserved fires close to friendly troops, and saves ammunition. Unrestricted registration discloses artillery positions and thereby indicates strength and deployment, signifies the commander's intentions, and invites neutralization. These disadvantages can be minimized by—

- (1) Using special registration positions.
- (2) Keeping the number of registering batteries to a minimum.
- (3) Registering as late as possible before the attack.
- (4) Registering several units simultaneously.
- (5) Employing meteorology plus velocity error (VE) techniques to reduce the need for registration.
- (6) Using accurate survey and current meteorological data.

b. The force commander decides whether registration will be restricted or prohibited. When conditions indicate a need to restrict registration, the force commander coordinates registration.

c. Actions of artillery before the attack include—

- (1) Development of an organization for combat and preparation of fire plans.
- (2) Reconnaissance, selection, and occupation of firing positions.
- (3) Completion of the communication system.
- (4) Provision of a common grid for firing units and target acquisition installations.
- (5) Organization and coordination of observation.
- (6) Assembly of supplies and equipment in forward areas.
- (7) Establishment of liaison.
- (8) Registration in accordance with the instructions or policy of the commander.

53. Meeting Engagements

a. A meeting engagement is the combat action which occurs when a moving force, incompletely deployed for battle, engages an enemy force. The action ceases to be a meeting engagement when the enemy's situation has been developed and operations, planned and coordinated for the specific situation, are undertaken.

b. The artillery must be sufficiently far forward in the formation to support the action from the start. When the advance guard deploys, supporting artillery occupies positions at once to support it.

c. Artillery support is not limited to planned fires. The timely delivery of fire is given first consideration. The artillery moving to positions should be given road priority.

d. The advance guard and main body contain medium and heavy artillery, interspersed throughout columns, capable of giving reinforcing and general support fires at the earliest stages.

54. Exploitation and Encirclements

Artillery with an exploiting or encircling force is normally attached. Mobility and the capability of quick delivery of fire is essential to the artillery attached to these forces. It may be necessary to provide additional logistical support.

55. Fires in Support of the Offense

a. *Before the Preparation.* Fires before the preparation usually consist of registrations, fires on targets of opportunity, and fires covering the deployment and movement of the attacking troops into position. Interdiction fires may be employed to restrict enemy operations, disrupt communications, and prevent the movement of enemy reserves.

b. *Preparation.* The force commander decides whether a preparation is to be fired and its duration. The time length of the preparation may vary from a few minutes to several hours, depending on the degree of surprise required, the amount of ammunition available, and the extent to which the enemy position is organized. The

preparation may or may not be divided into phases. In general, any division of a preparation into phases should provide for gaining fire superiority over hostile artillery in the early phases, neutralization of hostile artillery throughout the preparation and delivery of massed fires on enemy forward elements in the final phase. These phases allow the artillery to attack, in succession, various types of targets according to priority.

c. During the Attack. Fires during the attack are delivered to assist the advance of the supported unit. All types of firepower are employed. Successive concentrations on known (*real*) or suspect (*possible*) enemy locations may be prearranged. Fires must be planned on phase lines or objectives to protect the attacking unit during its reorganization.

Section II. SUPPORT OF THE DEFENSE

56. General

The defense is the employment of all means and methods available to prevent, resist, or destroy an enemy attack. The defensive is that attitude or condition of a force when it stands ready to protect itself against enemy attack. For a complete discussion of defensive action, see FM 100-5.

57. Missions and Requirements

Artillery must be prepared to support all phases of defensive action. It must be capable of massing fires on critical localities and on

ground that is lightly held or beyond the range of other supporting weapons. The artillery must be prepared to fire in any area by rapidly shifting its direction of fire or by occupying alternate or supplementary positions. It augments the defensive fires of the supported force with barrages and other prearranged fires.

58. Artillery Positions in the Defense

a. General. Since the rapid concentration of artillery fire is essential to a successful defense, centralized control is desired. Every effort is made to meet the main attack with a mass of artillery fire. Deception is employed to mislead the enemy as to artillery numbers and locations. Position areas are selected to provide continuous and effective fire support throughout the action. Organization of position, target acquisition, survey, communication, and fire planning are as complete as time and the situation will permit. Artillery movements are coordinated with each other and with other forces to insure the most effective support.

b. Position Areas. In the defense, artillery is positioned so that—

- (1) It is echeloned in depth to insure continuous fire support can be delivered within the battle area.
- (2) All division artillery can fire immediately in front of the forward edge of the battle area.
- (3) Some artillery units are placed in forward positions to perform counterbat-

tery and longer range harassing and interdiction fire.

- (4) Advantage of terrain defensive features, of incidental protection afforded by the reserve, and access to route of withdrawal, are all considered.
- (5) Priority of positions if given to units providing close support for elements in contact.
- (6) Every effort is made to position artillery in the zone or area of responsibility of the supported unit and to avoid interference with other units.
- (7) Positions are selected to facilitate organization, camouflage, and defense. Camouflage is stressed. All units prepare their positions for defense against ground and airborne attack.

c. Alternate and Supplementary Positions. All artillery commanders are responsible that the necessary alternate and supplementary positions are selected and prepared to the extent possible.

- (1) Alternate positions are those from which the mission can be continued. These are usually occupied only when the primary position becomes untenable.
- (2) Supplementary positions are those used to attack targets which cannot be fired upon from the primary or alternate positions. A supplementary position is usually occupied only after approval by the commander of the supported force.

59. Defensive Fires

a. Fire Planning. Detailed fire planning is essential to effective artillery support of defensive operations. Defensive fires are planned to—

- (1) Delay and disorganize the enemy's approach.
- (2) Disrupt the enemy's attack preparation by counter preparation fire.
- (3) Impede the enemy's attack with close defensive fires in width and depth throughout the sector.
- (4) Break up the enemy's assault by final protective concentrations and barrages.
- (5) Limit penetration with on-call fires within friendly lines.
- (6) Support the counterattack and associated limited offensive actions.

b. Fires Delivered Before the Enemy Forms for the Attack. These include interdiction and harassing fires which will force the enemy into early deployment and fires in support of security forces.

- (1) Harassing and interdiction fires are usually planned by division, corps, and army artilleries.
- (2) Fires in support of a covering force are usually planned by the highest artillery echelon with that force. Additional fire support by the artillery with the general outpost force and with the main defensive force is planned to cover the withdrawal of the covering force.

- (3) Fires in support of the general outpost force are usually planned by the artillery with that force. Additional fires by the artillery with the main defensive force may be planned in support of the general outpost force and will be planned to cover its withdrawal.
- (4) Artillery supporting a covering force or general outpost force will usually fire from supplementary positions to avoid disclosing the artillery positions prepared for use in support of the battle area.
- (5) Time of opening fire, is decided by the force commander. Premature firing may expose the artillery to neutralization and reveal the plans of the defending force. Firing is usually confined to the attack of dangerous or highly profitable targets.
- (6) Harassing and interdiction fires are planned fires. Planning is based on studies of maps, terrain, road nets available to the enemy, and all target intelligence. Targets suitable for harassing fires are enemy batteries, industrial sites, assembly areas, observation posts, communication centers, command posts, and leading enemy elements. Interdiction fires on communication centers, harbors, command posts, road junctions, bridges, and crossroads are profitable. Harassing and interdiction fires are irregularly

timed to prevent the enemy from determining their pattern.

60. The Counterpreparation

a. A counterpreparation consists of planned fires designed to disrupt the enemy's attack preparations; it is delivered only on order of the force commander. A counterpreparation includes fire on command posts, observation posts, assembly areas, lines of communication, weapons, and all other known targets.

b. Premature firing provides the enemy with counterfire data for his artillery preparation, indicates to him the areas to be avoided in forming for the attack, and expends ammunition that may be irreplaceable.

Section III. RETROGRADE OPERATIONS

61. General

a. A *retrograde movement* is any movement of a command to the rear or away from the enemy. Retrograde movements are further classified into withdrawal from action, delaying action and retirement.

b. In retrograde movements the mission of the artillery is to neutralize the enemy artillery, to delay the enemy advance, and to assist the infantry or armor in disengaging from action. In the event the force commander launches a limited counterattack to assist the disengagement of units, the artillery must be prepared to support the counterattack with the preponderance of avail-

able fire power. The air defense of elements moving to the rear and of critical points along the route is of primary consideration. It is essential that the leading elements are not stopped and withdrawal routes are not blocked.

62. Withdrawal from Action

a. A withdrawal from action is an operation in which all or a part of a deployed force disengages from the enemy. Its purpose is to regain or preserve freedom of action. It may be followed by a retirement, a delaying action, or the defense of another position. Enemy contact is maintained by frontline units and reconnaissance or security forces. Whenever possible, withdrawals from action are accomplished at night or during periods of reduced visibility to avoid enemy detection.

b. The appearance of normal artillery fire is maintained with the security force by retaining a minimum number of units, calibers, and types of artillery representative of all artillery with the force. Deceptive measures are employed during the withdrawal.

63. Delaying Actions

The use of self-propelled artillery in the delaying action is particularly effective. Employment of artillery during a delaying action is similar to that with a rear guard. Artillery is usually attached to the delaying force.

64. Retirements

Strong artillery support is provided the security forces. Artillery is used to force the enemy's early

deployment and permit the security force to retain flexibility. Artillery is positioned throughout the columns to support the main body or furnish additional support to the security force.

CHAPTER 7

ARTILLERY IN NUCLEAR COMBAT

Section I. GENERAL

65. Scope

a. This chapter establishes the fundamentals for employment of artillery in nuclear combat. It includes a description of the nuclear battle and explains the role of artillery in nuclear warfare and the exploitation of nuclear fire superiority.

b. Emphasis is placed on the differences between nuclear and nonnuclear combat.

66. Character of the Nuclear Battle

a. Dominance of Nuclear Firepower. The development of nuclear weapons and nuclear artillery has reached the stage where their domination of the battlefield is unquestioned. Hence, the first task in nuclear combat is to gain fire superiority over the enemy's nuclear artillery. Simultaneously, the combat arms position their major elements to acquire nuclear targets, to maintain the integrity of the battle position and to protect themselves against nuclear attack through dispersion, concealment, and deception.

b. Nuclear Superiority. When the bulk of the enemy's nuclear capability has been destroyed or neutralized, we have attained nuclear superiority.

Depending on the degree of success attained in the nuclear battle, the succeeding phase(s) may take the form of a battle of maneuver or infantry and armor may immediately exploit nuclear superiority. In either case, artillery will support maneuver elements, delivering either nuclear or nonnuclear fires as required.

c. Acquiring Nuclear Targets.

- (1) The primary task of counterbattery artillery weapons in the nuclear battle is the destruction of enemy nuclear artillery. Accordingly, the location of hostile nuclear artillery is of primary concern.
- (2) The target acquisition effort will exploit fully all means available to locate nuclear targets. At division and corps level these means will include ground and air observers, electronic and mechanical means, and reconnaissance and intelligence agencies such as patrols and stay-behind elements.

Section II. ARTILLERY IN THE NUCLEAR BATTLE

67. Artillery in Transition from Nonnuclear Combat

a. General. A major problem confronting artillery in nuclear warfare is the transition of the force from a nonnuclear to a nuclear posture. When the necessity for this action occurs, the movement and positioning of artillery will be governed by—

- (1) The mission of the force.

- (2) The mission of the force artillery—the requirement to provide continuous support throughout the operation.
- (3) Movement of major maneuver elements.
- (4) Position areas.
- (5) Enemy capabilities.

b. Operations During Transition.

- (1) In general, the initial disposition of our forces, upon completion of the transition, will be in considerable depth. When the mission and the tactical situation permit, boundaries may be adjusted and units displaced to provide greater separation, laterally and in depth. Logistical elements must be kept to the rear and displaced as required on a schedule which will avoid conflict with the movement of tactical units.
- (2) The movements of artillery are governed by its mission. In general, longer range artillery will displace first. Artillery supporting maneuver elements (direct support and reinforcing artillery) displaces by echelon to insure continuous support.
- (3) When limited objective attacks are made to cover the movement of the force, artillery will provide the necessary support.

68. Employment of Artillery During the Nuclear Battle

a. General.

- (1) This phase of combat is the battle for nu-

clear superiority. The principal weapon is the missile.

- (2) Since a static position cannot survive a nuclear attack, nuclear artillery units will prepare and use numerous alternate and supplementary positions. Consequently, the maneuver of artillery units will be required throughout the battle consistent with their missions.
- (3) Although centralized control may be desirable, distances and deployments may dictate decentralization. In that case, artillery will usually be attached to lower echelons.
- (4) The bulk of artillery units not involved in the nuclear battle will be disposed in depth to—
 - (a) Support infantry and armor in action against enemy penetration or infiltration.
 - (b) Provide dispersion as a passive measure against nuclear attack.
 - (c) Provide for artillery unit replacement.
 - (d) Support infantry and armor in subsequent phases.

b. Army and Corps Artillery.

- (1) The bulk of the missile units required to fight the nuclear battle are found at army and corps artillery levels. In view of the formidable nuclear delivery capability of potential enemies, every

- nuclear delivery means in the field army will be needed to win the nuclear battle.
- (2) The limited ranges of certain nuclear artillery and employment over extended distances may dictate attachment of army artillery units to corps. Also, corps may attach cannon and missile units to division.
 - (3) Cannon artillery, with the exception of some dual-capable units, will be positioned in considerable depth for the purposes stated in a(4) above. Some cannon artillery units may be out of range of the line of contact or forward edge of the battle area and are positioned to support units deployed at relatively great depths.
 - (4) Shorter range nuclear artillery will require firing positions relatively near the line of contact. Each of these units will maintain supplementary firing positions in the forward area. In addition, these units will require assembly areas and firing positions deeper in the zone. The density of nuclear artillery units in the forward area *at any one time* should not present lucrative target complexes to the enemy. Artillery not employed in the nuclear battle will be positioned to support the force throughout the sector.
 - (5) Missile units will be positioned anywhere in the field army sector required to accomplish their mission(s). There-

fore first priority for positions must be given to missile artillery. Centralized control of nuclear artillery will be maintained consistent with the force fire support requirements and ability of the higher artillery commander to control the unit. When control must be decentralized, these units may be attached either to corps artillery groups or to divisions.

- (6) In addition to its tasks during the nuclear battle, nuclear artillery will attack targets which can prevent or definitely hinder the accomplishment of the force mission. Examples of such targets are major penetrations and preemptive or spoiling attacks.

c. Division Artillery. Since division artillery weapons consist of cannon and missiles, the general considerations outlined for corps artillery weapons of similar type will apply equally to division artillery. Considerations concerning employment of the division artillery in nuclear combat are—

- (1) *Direct support battalions* will normally be attached to major combat elements. Therefore, their position areas will be determined by the deployment of these elements and may be out of range of the line of contact.
- (2) *The nuclear artillery of the divisions with the corps* is employed by the division commander in a manner to assure

maximum participation in the nuclear battle consistent with the capabilities of his weapons. Missile units will prepare numerous supplementary positions in the forward area and to a lesser degree in depth. In general, nuclear cannon artillery will be employed throughout the depth of the zone. In the event of conflict with corps nuclear artillery positions, corps artillery will coordinate position areas.

Section III. EMPLOYMENT OF ARTILLERY FOLLOWING THE NUCLEAR BATTLE

69. General

a. In the phases succeeding the battle for nuclear superiority, artillery supports the maneuver of infantry and armor with nuclear and non-nuclear fires.

b. Artillery continues to maintain nuclear superiority over enemy nuclear artillery.

70. Major Considerations

a. The fluid nature of nuclear operations will require continuous artillery support at all levels. The outcome of the battle will frequently depend on the speed and responsiveness of artillery support.

b. Since many artillery headquarters and units will have been subjected to nuclear attack, increasing demands will be placed upon artillery commanders and staffs as they seek to accomplish

their missions. In general, they must continue to provide fire support under a variety of adverse conditions. In so doing, they will be required to—

- (1) Decentralize control to the degree which the situation dictates.
- (2) Operate with limited logistical support.
- (3) Improvise command and administrative structures.
- (4) Replace or reconstitute ineffective units.

c. Artillery must be prepared to support mobile forces, both airmobile and ground. When employed in such a role, artillery will be attached, if control cannot be maintained by the artillery commander while satisfying the supported element's requirements for fires. As operations assume an increasingly fluid character, the artillery must be capable of operation with any type of march column, rapid occupation of position, and immediate response to fire requests.

CHAPTER 8

OPERATIONS UNDER SPECIAL CONDITIONS

71. General

Operations under special conditions are those where the terrain, weather, or nature of the operation itself create the necessity for special measures to meet the situation. Operations under special conditions include night attacks, raids, river crossings, defense of a river line and mountain, jungle, desert, guerrilla, antiguerrilla, and arctic operations. The discussion in this section is limited to general considerations in planning for operations under special conditions. Techniques modified to specific types of operations are discussed in FM 6-20-2.

72. Plans and Estimates

The artillery commander at each echelon is responsible for providing adequate fire support to the maneuvering force. Commanders must assure themselves that personnel of their staffs are trained in detailed planning for operations under special conditions when such operations are contemplated.

a. Information and intelligence on which estimates are based will often come from other agencies. In some operations, it is impossible to verify the information received because of the distance

or the inaccessibility of the area of operation. Plans developed from estimates based on such information must be extremely flexible, so they can be adjusted to unforeseen situations in the combat area.

b. Artillery plans for operations under special conditions include considerations of—

- (1) Liaison and coordination with appropriate arms and services of the forces concerned.
- (2) Acquisition, evaluation, and analysis of targets.
- (3) Coordination of fire support.
- (4) Amounts and types of artillery and ammunition required during various stages of the operation.
- (5) Organization for combat.
- (6) Special equipment, clothing, and training required by units.
- (7) Details of employment of artillery units to include movement into selected position areas, registration, fire plans, and survey.
- (8) Special communication equipment and procedures.
- (9) Artillery training for operations under special conditions including—
 - (a) Use of special equipment.
 - (b) Operation, care, and maintenance of equipment under expected terrain and weather conditions.
 - (c) Special techniques required to apply the basic artillery combat principles.

CHAPTER 9

TARGET INTELLIGENCE AND ANALYSIS

73. Scope

In this chapter, target intelligence, target acquisition, counterbattery fires, and target analysis are explained in general terms. For more detailed guidance, see FM 6-121.

74. Collection of Target Information

Target information is collected through the continuous planning and systematic direction of the target acquisition effort. To make the most effective use of the target acquisition sources and agencies available to the artillery, the artillery S2 must have a complete knowledge of their capabilities and limitations.

75. Coordination of Target Acquisition

a. Target acquisition is that part of the combat intelligence function which involves the detection, identification, and accurate three-dimensional location of a target in sufficient detail to permit target analysis and effective employment of weapons.

b. Artillery intelligence agencies are part of the intelligence gathering agencies of the whole force. The force G2 or S2, in developing his collection plan, makes full use of artillery agencies in

producing combat intelligence. The discharge of this additional responsibility is furthered by the artillery's efficient communication system, special target acquisition equipment, and ability to coordinate numbers of observers.

c. Coordination of target acquisition activities must be continuous at all levels of command to insure complete coverage of the zone of operations. The artillery S2 (S3 in the target acquisition battalion) coordinates all information from the target acquisition sources available to his commander. The target acquisition plan is prepared concurrently at all levels.

76. Target Analysis

Target analysis, a responsibility of the artillery commander, is the examination of the characteristics of a target to determine its vulnerability and the relative suitability of available weapons systems for its attack. An analysis may be either a rapid mental calculation for tactical planning or a detailed and written calculation for execution.

77. Counterbattery Activities

a. The term counterbattery includes fires on mortars, cannon, rockets, and missile positions and units.

b. Division artillery is responsible for supervision of counterbattery functions within the division zone of action.

c. Corps artillery is responsible for counterbattery functions within the corps zone of action.

d. Army artillery is responsible for counterbattery activities within its zone of action.

e. The zone of action—

- (1) Is determined by the commanders plan of maneuver commensurate with the capabilities of his command.
- (2) Will include the objective and, where possible, important terrain features and approaches thereto.
- (3) Is defined by its lateral boundaries which are easily identifiable on the ground.

CHAPTER 10

PRINCIPLES OF FIRE SUPPORT COORDINATION

78. General

a. Fire support is the most flexible and one of the principal means available to the commander for influencing an action. The effectiveness with which he uses it in support of his plan of action can be a decisive factor in battle.

b. The force commander through his artillery officer makes detailed plans for the use of the artillery under his direct control; in addition, he makes general plans for the coordinated employment of all artillery with the force. In subordinate echelons the same methods apply. Plans may be implemented in combat orders, policies, priorities or individual decisions.

c. Coordination of fire support is usually accomplished at the force headquarters. The artillery officer at each echelon is the fire support coordinator.

d. Techniques of fire support coordination are discussed in FM 6-20-2.

CHAPTER 11

AMMUNITION SUPPLY

79. Nuclear Class V Procedures

a. A nuclear allocation is the number of nuclear weapons, by yield, type, and delivery means which a commander is permitted to use during a specified period of time or for a given operation. Nuclear weapons allocated to a commander are usually divided into three categories—those weapons or fires held in reserve, those planned for employment as directed by the commander having the allocation, and those allocated to subordinate units. Nuclear allocations are made after considering missions, nuclear weapons available, delivery units available, characteristics of delivery means, and capability of subordinate units to acquire targets, exploit effects of nuclear weapons, and to coordinate the planned effects.

b. A prescribed nuclear load (PNL) is the number of nuclear rounds authorized to be carried by a fire unit. The force commander at each echelon will announce the prescribed nuclear load. The PNL may be changed to conform with the tactical and logistical situation. However, replacement of the PNL is not automatic as with non-nuclear ammunition. See FM 101-31 for a detailed discussion of the control of nuclear ammunition.

c. Administrative orders will designate special ammunition supply points (SASP) or depots from which nuclear ammunition will be drawn.

80. The Ammunition Supply System

Class V supplies (ammunition) directly influence tactical operations and are controlled by each commander in the tactical chain of command. The ammunition supply system is designed for fast and informal resupply. This system, which is known as the continuous refill system, is based on possession by the using units of a fixed basic load of ammunition which will be replenished as used.

a. Units replenish their basic loads from designated ammunition supply points on presentation of an authenticated ammunition requisition bearing the statement, "Required to replenish basic load. Expenditures are within authorized available supply rate." Replenishing the basic load in an active situation may be done at the time of, in expectation of, or after its expenditure.

b. A division preparing to defend against an attack may stock-pile ammunition at weapon positions and draw ammunition from the ammunition supply point on the basis that it is needed for immediate use. A unit may draw in excess of its basic loads, ammunition that is "required for immediate consumption." Immediate consumption is interpreted to mean that the ammunition will be expended within 24 hours.

c. The amount of ammunition in a unit's possession may exceed the basic load for a short time.

A unit drawing ammunition on the basis that it is needed for immediate use is in effect, drawing ammunition in expectation of a future requirement. This temporary overage may be frequent and normal during continued fighting. When it occurs, it will not be reported as an overage unless it is excessive and is held for a period longer than 24 hours. Commanders must prevent ammunition overages from becoming excessive or prolonged.

81. Maintenance of the Basic Load

A basic load of ammunition is the quantity of ammunition which a unit is authorized to have in its possession. It is carried by organic equipment and personnel. Each commander must insure that his basic load is maintained at the prescribed level.

82. Class V Nonnuclear Procedures

a. Required Supply Rate. A required supply rate is the amount of ammunition for each type of weapon, expressed in rounds per weapon per day, required to sustain unrestricted operations of a force. Artillery commanders at division, corps, and army, working with the force G3 and G4, recommend to the force commander the quantity of artillery ammunition needed to support future tactical operations. These estimates are based on the mission, experience data, the theater, knowledge of the enemy, and the plan of operation. The quantity of ammunition requested by each echelon is reviewed, evaluated, and con-

solidated at the next higher echelon. Final determination of nonnuclear ammunition distribution is made at theater level. Consideration is given to the mission, plan of operation, available weapons and units, and other fire support means to determine a required supply rate.

b. Available Supply Rate (ASR). The available supply rate, for artillery weapons, is the rate of consumption of ammunition expressed in rounds per weapon per day, that can be sustained with available supplies, announced by each commander and applicable within his command. The ASR is announced by the army commander for a specific period. This rate is based on credit allocations from higher headquarters and the tactical requirement of corps and other elements of the Army. The corps commander announces a detailed allocation of artillery ammunition to the corps artillery units and the divisions of the corps, based on recommendations of the corps artillery commander. Ammunition at division level is similarly allocated. The ASR among units of the same type often varies with the mission, available targets, and plan of the supported unit. Authority from the next higher commander is required before a unit may exceed its available supply rate. The ASR is published in the administrative order and paragraph 4 of the fire support plan annex to the operation order or as a fragmentary order.

c. Tactical Savings. Within the available supply rate set by a higher headquarters, subordinate headquarters may establish ammunition rates for

their units to meet particular tactical situations. In this manner they may acquire tactical savings of ammunition by reducing the allocations to their units. Division is the lowest echelon which may develop a tactical saving of ammunition.

APPENDIX I REFERENCES

- AR 320-5 Dictionary of United States Army Terms.
- AR 705-35 Criteria for Air Transportability and Air Delivery of Materiel.
- FM 1-100 Army Aviation.
- FM 6-10 Field Artillery Communications.
- FM 6-20-2 Field Artillery Techniques.
- FM 6-121 Field Artillery Target Acquisition.
- FM 25-10 Motor Transportation, Operations.
- FM 30-5 Combat Intelligence.
- FM 44-1 Air Defense Artillery Employment.
- FM 44-1A Air Defense Artillery Employment (U).
- FM 100-5 Field Service Regulations; Operations.
- FM 101-5 Staff Officers' Field Manual; Staff Organization and Procedure.

- FM 101-10,
Part I. Staff Officers' Field Manual:
Organization, Technical and
Logistical Data. Part I. Un-
classified Data.
- FM 101-10,
Part III. Staff Officers' Field Manual:
Organization, Technical, and
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- FM 101-31 Staff Officer's Field Manual:
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NG: State AG (3); units—same as Active Army except allowance is two copies to each unit.

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For explanation of abbreviations used, see AR 320-50.