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# FM 6-102

DEPARTMENT OF THE ARMY FIELD MANUAL

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## FIELD ARTILLERY BATTALION AERIAL FIELD ARTILLERY

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HEADQUARTERS, DEPARTMENT OF THE ARMY  
JANUARY 1970



FIELD MANUAL

No. 6-102

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 5 January 1970

## FIELD ARTILLERY BATTALION

## AERIAL FIELD ARTILLERY

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This manual supersedes FM 6-102, 17 April 1968.



## CHAPTER 1

### INTRODUCTION

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#### Section I. GENERAL

##### 1-1. Purpose

This manual is a guide for the aerial field artillery (AFA) battalion commander, battery commanders, staff officers and other key personnel within the battalion, and commanders of supported units. The manual sets forth doctrine on the employment of the aerial field artillery battalion and battery to include organization; principles of employment; command, control, communication, and coordination; and combat service support.

##### 1-2. Scope

a. This manual supplements FM 6-20-1, FM 6-20-2, and FM 6-140 by presenting doctrinal guidance peculiar to the aerial field artillery battalion (battery), and by emphasizing established field artillery principles in their application to the aerial field artillery fire support system.

b. The material presented herein is applicable to nuclear and nonnuclear warfare; to stability operations in an internal defense and internal development environment; and to employment of and defense against chemical, biological, and radiological agents.

c. Users of this manual are encouraged to submit recommended changes and 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 will be provided for each comment to insure under-

standing and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded direct to the Commanding Officer, U.S. Army Combat Developments Command Field Artillery Agency, ATTN: CAGFA-DC, Fort Sill, Oklahoma 73503. Originators of proposed changes which would constitute a significant modification of approved Army doctrine may send an information copy, through command channels, to Commanding General, U.S. Army Combat Developments Command, Fort Belvoir, Virginia 22060, to facilitate review and followup.

##### 1-3. Classification

Field artillery weapons are classified as towed, self-propelled, or aerial. Aerial field artillery weapons are mounted on aircraft which serve as the primary means of mobility and from which the weapons can be fired.

##### 1-4. Definition

The following definitions apply:

a. *Aerial Field Artillery.* A unit organized and employed using its organic aerial carriage and affixed weapons systems to accomplish the field artillery mission.

b. *Airmobile Field Artillery.* A field artillery unit that is transported by helicopter in a tactical configuration to accomplish the field artillery mission *without* utilizing the serial prime mover as a firing platform.

#### Section II. CONCEPT OF EMPLOYMENT

##### 1-5. General

Aerial field artillery is employed to provide aerial fire support to all maneuver forces throughout all areas of operations and may be assigned any of the standard tactical missions for field artillery. It

is especially useful in meeting requirements for field artillery support in jungle, delta, and mountainous terrain, and in any tactical situation which limits effective and economical use of cannon artillery.

## 1-6. Operational Concepts

a. Aerial field artillery units deliver fires from the aircraft in flight, employing speed, agility, and responsiveness to achieve surprise and destroy targets. Aerial field artillery provides a means of extending the fire support capabilities available to the force commander. Aerial field artillery possesses mobility characteristics which provide for artillery support in many situations in which the mobility characteristics of other types of field artillery are less suited. It is capable of rapidly maneuvering and massing fires in any type of terrain despite the wide dispersion required for survival on the modern battlefield.

b. Delivery of fires in close support of maneuver forces requires precise timing in relation to the movement of the maneuver forces. One of the most important elements is the coordination and control required for fires in support of operations. Aerial field artillery; tactical air strikes; cannon, missile, and rocket artillery; naval gunfire, and CBR weapons are fire support means considered for operations. The fire support coordinator, when preparing the fire support plan for support of the operation, must consider all fire support means available in order to provide optimum fire support for the force.

## 1-7. Fires of Non-Organic Armed Helicopters

The ground commander has the ultimate responsi-

bility for and control of all supporting fires. When armed helicopters organic to organizations other than aerial field artillery provide fire support to ground forces, their fires are controlled and coordinated by the ground force commander or his designated representative. The ground force commander normally designates the senior field artillery officer as his fire support coordinator (FSCOORD). Under this arrangement, the FSCOORD coordinates the fires of all armed helicopters through field artillery fire support channels in the manner prescribed for aerial field artillery. This does not preempt the prerogative of air cavalry or aviation element commanders to control and coordinate the fires of their organic armed helicopters when the air cavalry element or the aviation element is operating outside the area of responsibility of a ground force commander. However, when the air cavalry element or the aviation element enters an area for which ground commander has responsibility, or when a ground commander assumes responsibility for an area in which they are operating, then the aerial fires from these elements come under the control and coordination of that ground commander or his designated representative. When the air cavalry or aviation element departs the area for operational reasons, it once again assumes the control and coordination of its own aerial fires.

## CHAPTER 2

### ORGANIZATION

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#### Section I. COMMAND AND STAFF

##### 2-1. General

This chapter outlines the functions and responsibilities of the major elements that are necessary to perform the aerial field artillery mission.

##### 2-2. Battalion Commander

The battalion commander, assisted by his staff, controls and supervises all tactical and administrative activities of the battalion. His responsibilities correspond to those outlined in FM 6-140, with the additional responsibility for supervision of aircraft control, user maintenance on aircraft, aircraft armament, and avionics equipment. He must be familiar with the capabilities and limitations of aerial field artillery in order to advise the higher echelon field artillery commander and/or supported unit commander on the proper employment of the battalion.

##### 2-3. Battalion Staff

The discussion of field artillery staffs in chapter 2, FM 6-140 is applicable to the aerial field artillery battalion with the following additions:

a. The aviation maintenance officer advises the battalion commander on aviation maintenance matters within the battalion. In addition, by providing technical guidance and conducting inspections, he insures that the maximum number of operable aircraft are available for the battalion to accomplish its mission. He supervises the performance of all maintenance activities and functions throughout the battalion.

b. The battalion surgeon, qualified as the aviation medical officer, supervises the aviation medical program and insures that all aviation personnel are physically qualified for flight missions. In addition, he advises the battalion commander on the health and welfare of the command. He supervises the activities of the battalion medical section and insures maximum unit and individual efficiency through a preventive medicine program.

c. The aviation safety officer advises the battalion commander on matters of aviation safety and also is responsible for supervising the battalion safety program.

#### Section II. ORGANIZATION

##### 2-4. Field Artillery Battalion, Aerial Field Artillery (TOE 6-725T)

a. *General.* The organization of the aerial field artillery battalion is shown in figure 2-1. The subordinate batteries are organized on separate tables of organization and equipment. The smallest fire unit normally employed for semi-independent operations is the battery.

b. *Mission.* The mission of the battalion is to provide fire support to maneuver units.

c. *Capabilities.* Capabilities of the battalion are as follows:

(1) Providing highly mobile fire support with aerially mounted weapons systems.

(2) Elements of the battalion may be de-

tached and placed in support of specific ground units.

(3) Employment as a battalion or as individual batteries.

##### 2-5. Headquarters, Headquarters and Service Battery (TOE 6-726T)

a. *General.* The organization of the headquarters, headquarters and service battery is shown in figure 2-2.

b. *Mission.* The battery mission is to direct and coordinate operations of the battalion; to provide facilities with which the battalion commander controls the battalion; to procure, breakdown, and distribute all classes of supply to units of the battalion.

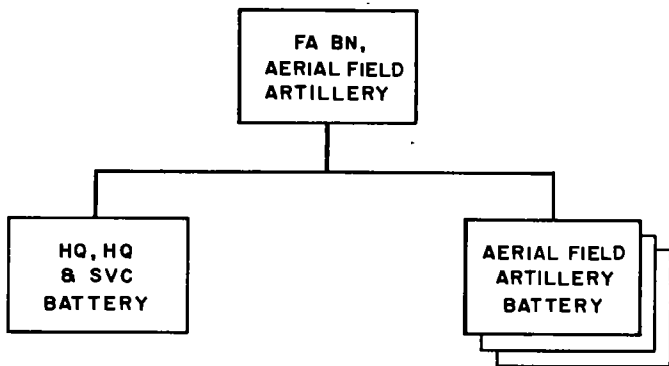


Figure 2-1. Field artillery battalion, aerial field artillery, TOE 6-725T.

c. *Capabilities.* Capabilities of the battery are as follows:

(1) Staff planning, supervision, coordination, and control of operations of organic and attached units of the battalion.

(2) Providing unit level medical service, establishing an aid station, and furnishing aidmen to other batteries.

(3) Providing personnel to supervise supply and maintenance for the batteries.

(4) Operating a central aircraft communication and control facility for the battalion.

(5) Drawing and issuing all classes of supplies and providing battalion level organizational maintenance for organic elements.

(6) Providing limited lift capability to the aerial field artillery batteries utilizing assigned utility aircraft.

d. *Functions.* Functions performed by the sections of this unit correspond to those described in FM 6-140 for artillery headquarters batteries. Additionally, elements of this battery perform the following functions peculiar to this organization:

(1) The aviation section provides aircraft for reconnaissance, command and control, and limited airlifting of personnel and equipment.

(2) The maintenance and supply section provides personnel for staff supervision of organizational supply and maintenance activities of the battalion.

(3) The operations and intelligence section provides a central aircraft control and communication facility, and performs tactical fire direction for the battalion.

(4) The communications section provides organizational maintenance on unit radio equipment.

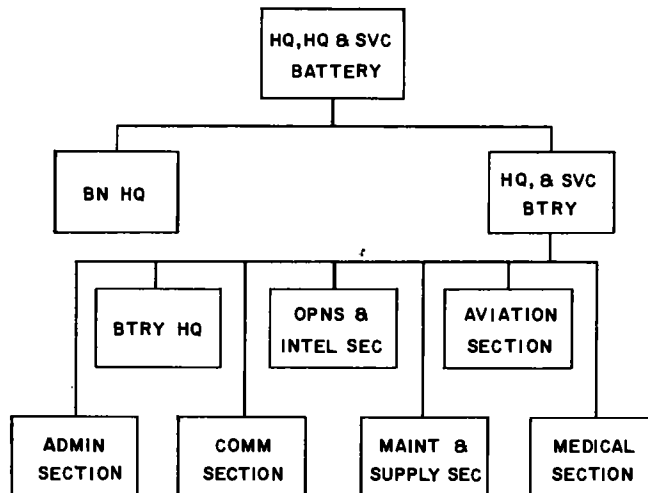


Figure 2-2. Headquarters, headquarters and service battery, aerial field artillery battalion, TOE 6-726T.

## 2-6. Aerial Field Artillery Battery, Aerial Field Artillery Battalion (TOE 6-727T)

a. *General.* The organization of the aerial field artillery battery is as shown in figure 2-3. Three aerial field artillery batteries are organic to the field artillery battalion, aerial field artillery.

b. *Mission.* This mission of the battery is to provide fire support and to furnish its portion of the battalion communications system.

c. *Capabilities.* Capabilities of the battery are as follows:

(1) Providing aurally-mounted weapons systems fire support.

(2) Conducting semi-independent operations.

d. *Functions.* The functions performed by platoons and sections of the aerial field artillery battery are similar to those outlined in FN 6-140, for the cannon battery, with the following additions:

(1) The aerial field artillery platoons serve as the fire delivery element of the battery.

(2) The flight operations and communications section provides a battery facility for command, control, communications, and tactical fire direction.

(3) The service platoon provides ammunition and POL supply and organizational maintenance on organic aircraft, armament, and aircraft electronic equipment.

e. *Duties.* The duties of the aerial field artillery battery commander, battery officers, and enlisted men are comparable to those outlined in FM 6-140 for the cannon battery, with the following exceptions.



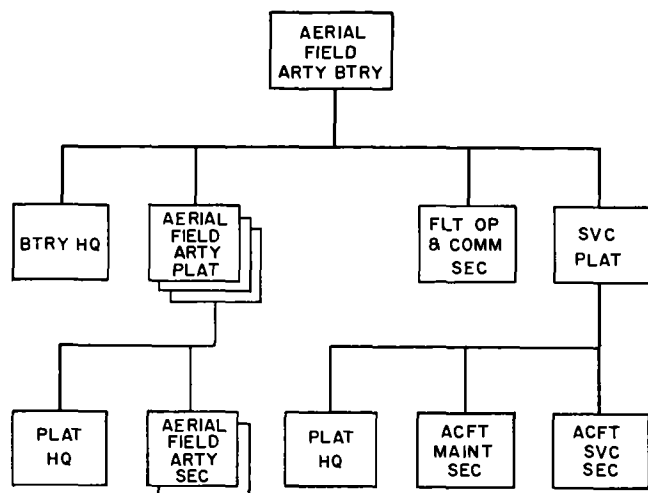


Figure 2-3. Aerial field artillery battery, aerial field artillery battalion, TOE 6-727T.

(1) A qualified officer or warrant officer should perform as the flight safety officer.

(2) The operations officer generally will establish, under the supervision of the battery commander, the allotment of aircraft and of fires delivered by the platoons. He also maintains a record of the status of aircraft availability through coordination with the service platoon commander, and coordinates the flight safety program with the battery flight safety officer. He is also responsible for maintaining individual flight records on all members of the unit on flight status.

(3) The platoon commanders position themselves where they can best control and influence the execution of the platoon's mission. They perform command and control in the execution of

separate platoon-size missions. They perform tactical fire direction for their platoons by directing the amount and method of fire, and the formation and direction of attack. They also render post-strike surveillance on targets engaged.

(4) The section leaders command their respective sections of two aircraft each and supervise section fire missions. While operating separately from their platoons, the section leaders perform tactical fire direction for their sections and render poststrike surveillance on targets engaged.

(5) The helicopter pilots in the aerial field artillery sections fly their helicopters and deliver the required fires.

(6) The service platoon commander supervises aircraft and vehicle maintenance, and ammunition and POL resupply. Additionally, he is responsible for the crash and rescue functions that may be performed by the battery.

(7) Aerial field artillery section crew chiefs perform organizational maintenance on helicopters to which they are assigned.

(8) Aviation mechanics in the service platoon perform organizational maintenance on organic helicopters.

(9) The aircraft senior armament repairman and aircraft armament repairmen in the firing platoon headquarters perform organizational maintenance on rocket launchers and associated armament equipment.

(10) The chief of the service section supervises the procurement, storage, and distribution of ammunition and POL.



## CHAPTER 3

### MISSION, ASSIGNMENT, CAPABILITIES, AND LIMITATIONS

#### 3-1. Mission

The mission of aerial field artillery is to provide close and continuous fire support to maneuver forces. In the performance of this mission, aerial field artillery reinforces or replaces other field artillery fire support available to the maneuver force. The aerial field artillery battalion may be assigned any of the standard field artillery tactical missions of general support (GS), general support reinforcing (GS reinf), reinforcing (reinf), direct support (DS), or modifications of these missions (see FM 6-20-1 for discussion of artillery missions). Aerial field artillery units may be attached, however, attachment is not a tactical mission; it is a status, and a mission must be assigned to the unit by the gaining organization. The TOE for the aerial field artillery battalion does not authorize forward observers and liaison officers. When required, forward observers and liaison officers are provided by other field artillery units.

#### 3-2. Assignment

An aerial field artillery battalion is organic to each airmobile division, and other nondivisional aerial field artillery battalions are attached to the corps artillery as required. These battalions provided general support aerial field artillery fires to the division and corps.

#### 3-3. Capabilities

The aerial field artillery battalion is capable of—

- a. Providing immediately responsive artillery fires for close and continuous support of the maneuver elements. These fires can be delivered significantly closer to friendly positions than the minimum safe distance permitted by tube artillery.
- b. Rapid displacement of firing elements over terrain impassable by surface transport.
- c. Providing command, control, staff planning

and supervision, and administrative and logistical support for subordinate and attached units.

- d. Being employed as a battalion or as semi-independent batteries.
- e. One-hundred percent air transportable in Army and/or U.S. Air Force aircraft.
- f. Phase III air transportability of operationally essential battalion equipment.
- g. Delivering aerial field artillery fires on targets located beyond cannon artillery range.
- h. Massing battalion or battery fires as the tactical situation dictates.
- i. Providing timely aerial radiological survey of large or inaccessible areas in a minimum of time and with a maximum of protection from dose rates acceptable to ground parties.

#### 3-4. Limitations

The following limitations apply to the aerial field artillery battalion—

- a. Its operations are affected by adverse weather.
- b. It is vulnerable to all types of air defense fires.
- c. It has a limited capability for defense against hostile ground attack.
- d. When on the ground, its fire delivery elements are highly vulnerable to counterbattery fire and air attack and are difficult to conceal or cover.
- e. Difficult to conceal movement.
- f. The aircraft are more vulnerable to blast and overpressures of nuclear fires than weapons of cannon artillery units.
- g. May require additional vehicular support to attain 100 percent mobility.
- h. Batteries must be augmented with one utility helicopter each when conducting semi-independent battery operations.



## CHAPTER 4

### EMPLOYMENT, CONTROL, AND COORDINATION

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#### Section I. EMPLOYMENT CONSIDERATIONS

#### 4-1. Considerations in Organization for Combat

a. Aerial field artillery is organized for combat as described in FM 6-20-1 to provide the required aerial artillery support to the maneuver forces. This is done by placing each aerial field artillery unit in a tactical organization and assigning each unit a standard artillery tactical mission. General support is usually the most desirable tactical mission for the aerial field artillery battalion. The use of this mission centralizes control of the aerial field artillery battalion at the division artillery or corps artillery level. General support (GD), reinforcing and general support-reinforcing (GDR) are the tactical missions normally assigned to aerial field artillery.

b. In developing an effective organization for combat, the following fundamentals must be placed in proper balance:

(1) *Maximum feasible centralized control.* Aerial field artillery is most effective when control is centralized at the highest level consistent with the requirements of the overall mission. Centralized control insures that effective aerial field artillery fire support is provided to each subordinate element of the command and to the force as a whole. Each standard tactical mission is representative of a selected degree of centralized control. The following general rules apply to the extent of control desired:

(a) In a defensive situation, a high degree of centralized control is desired since the enemy has the initiative.

(b) A lesser degree of centralized control is acceptable in the offense because the supported force possesses the initiative.

(2) Adequate aerial field artillery support for the committed maneuver units.

(3) Immediately available aerial field artillery support with which the force commander can influence the action.

(4) Anticipation of future aerial field artillery support requirements must be derived from the operation plan, and contingency or "on-order" missions should be employed.

#### 4-2. Types of Operations

a. *Support of Ground Mobile Forces.* Aerial field artillery units are employed in the same general manner as described in FM 6-140 for cannon artillery. Aerial field artillery should be considered for support of ground mobile forces whenever high mobility, rapid reaction, and extended ranges are required of the supporting artillery. Some operations which exploit the particular characteristics of aerial field artillery are: those beyond the range of cannon artillery; airborne/airmobile assaults, or deep enemy penetrations; and as cover for column movements when this mission is assigned and when displacement of cannon artillery by echelon is undesirable. In extremely difficult terrain where movement on foot is the fastest or only means of surface mobility, air lines of communication are established, and aerial field artillery and airmobile field artillery provide more of the fire support of the force.

b. *Support of Airmobile Forces.* The aerial field artillery battalion normally operates from battery position areas dispersed within the division area, or from brigade and maneuver battalion or task force bases in which ammunition and POL supplies are positioned by combat service support elements of the force. Aerial field artillery may be required in preparation and initial support of airmobile assault objectives since such objectives often are beyond range of cannon artillery positions. In such cases, aerial field artillery elements normally precede the airmobile assault force to the objective area and may maintain firing sections on aerial standby pending the arrival of cannon artillery within range of the supported force. In instances where the aerial field artillery is furnishing direct support to the airmobile force

pending arrival of cannon artillery in the objective area, FO's and LNO's from the cannon artillery units may accompany the assault echelon of the airmobile force into the objective area to provide FO and LNO support for the aerial field artillery. If cannon artillery is available for the preparation, aerial field artillery fires can provide a continuous link between the lifting or shifting of cannon artillery fires and the armed escort aircraft's suppressive fires.

*c. Offensive Operations.* Aerial field artillery is capable of providing responsive fire support to all types of ground offensive operations. Aerial field artillery in support of offensive operations must be organized and deployed to provide supporting fires to the attack or counterattack, furnish continuous support during the action, and protect the attacking force during reorganization.

*d. Defensive Operations.* Aerial field artillery will provide support to maneuver forces engaged in defensive operations. Aerial field artillery is ideally suited for both area and mobile defense.

*e. Retrograde.* Aerial field artillery can support retrograde operations by furnishing fire support to the delay force or the detachment left in contact and as a secondary mission, protection for the airmobile withdrawal of covering forces.

*f. Special Operations.* Aerial field artillery can provide fire support for special operations. Field artillery fire support for special operations discussed in FM 6-20-1.

#### 4-3. Effects of Night, Atmosphere, Terrain, and Weather on Operations

##### *a. Night.*

(1) *Operations at night.* Aerial field artillery may provide fire support for maneuver forces engaged in night operations. Mission success is dependent upon prior reconnaissance, simple plans as a result of detailed planning, accurate navigation, the night proficiency of crews, and thorough coordination between all elements involved. Target acquisition, identification of friendly and enemy forces, navigation to and from position and target areas, and delivery of fires are more difficult at night and require detailed planning, coordination, and training. Artificial lighting or marking lights will be needed during most night fire missions. Aerial field artillery is particularly effective in the acquisition and attack of enemy firing positions, when assigned a countermortar/counterrocket/counterbattery role.

(2) *Operations during periods of limited visi-*

*bility.* Limited visibility caused by fog, haze, dust, smoke, rain, and snow may restrict or occasionally prohibit the operation of helicopters. Although helicopters may be flown under instrument flight conditions, tactical operations may not be feasible due to the lack of required ground electronic navigational aids. Nap-of-the-earth flying techniques become more difficult and may require reduced speeds, or the lack of visibility may postpone the entire operation. The pilot must be able to identify both the target and friendly elements prior to engaging the target. Pilot experience and state of training will influence the decision to attempt the operation. Marginal ceilings and visibility which still permit safe flight may be favorable conditions for an airmobile operation because the limited visibility reduces the possibility of detection and resultant fire from enemy ground fire weapons, and the low ceilings reduce the possibility of attack by enemy high performance aircraft.

*b. Atmosphere.* In addition to those conditions which cause low visibility, other atmospheric conditions which affect operations are icing, wind velocity, turbulence, and density altitude. There may be times when aerial vehicles will be grounded by atmospheric conditions. However, such restrictions are considerably less for rotary-wing aircraft than for fixed-wing aircraft.

(1) When light or moderate icing conditions exist, aerial field artillery operations will be prohibited unless the helicopters are equipped with adequate deicing or anti-icing devices. Flights will not be made under known or forecasted heavy icing conditions.

(2) High winds and air turbulence render flight at low level (nap-of-the-earth) hazardous. Reduction in airspeed will become necessary in moderate to severe turbulence. In addition, turbulence adversely affects the accuracy of aerial rocket fire.

(3) Density altitude. Although weather (atmospheric pressure, temperature, and humidity) affects density altitude, problems caused by high-density altitude are most frequently encountered in high terrain.

(a) Density altitude is the one atmospheric factor which will probably most frequently affect operations. Density altitude is a term used to equate a given air density to an altitude above sea level. It reflects the ability of the air, at a particular time and place, to support the weight of an aircraft with a given amount of power. Density altitude is a function of temperature, barometric pressure, humidity, and elevation above sea level. Temperature and elevation have the most effect on

density altitude. An increase in either or both of these factors results in a higher density altitude condition. As the density altitude increases, the lifting capability of the aircraft decreases. As the temperature increases, each aircraft has a lesser lift capability.

(b) Aerial field artillery crews accustomed to operating in areas of low density altitude must be trained to perform missions in areas where landings and takeoffs at high density altitudes will occur. They must be cautioned on the flight characteristics of their particular aircraft and must be thoroughly indoctrinated on flight safety at high density altitudes.

c. *Weather.* Commanders staff officers of the aerial field artillery battalion must be able to visu-

alize the effects of weather on operations. For example, adverse weather may—

(1) Prevent or delay takeoff of aircraft or prevent aircraft in flight from reaching the objective area.

(2) Prevent the Air Force (Navy) (Marine Corps) from providing required air support.

(3) Prevent accurate or mass aerial delivery of units into the objective area.

(4) Prevent or delay aerial supply and reinforcement of units in the objective area.

(5) Affect the employment of smoke and nuclear, chemical, and biological weapons.

(6) Prevent or delay the rehabilitation, preparation, or construction of heliport and airfield facilities.

## Section II. CONTROL AND COORDINATION

### 4-4. Principles and Relationships

#### a. *General.*

(1) The aerial field artillery battalion is characterized by its organizational flexibility in providing fire support. Fire support may be provided by the smallest element, a section of two aircraft, up to complete battalion employment. This chapter outlines the functions and responsibilities of the major elements that are necessary for the performance of the aerial field artillery mission.

(2) Fire support is the most flexible and one of the principal resources available to the commander for influencing the outcome of battle. The control and coordination employed is the determining factor in the effectiveness of this support. Although established principles for coordination of fire support do not change with the addition of aerial field artillery weapons, the importance is enhanced by the flexibility of these weapons systems.

(3) Fire and maneuver are interdependent and their use must be coordinated and planned concurrently. The commander at each echelon is responsible for the coordination of fire and maneuver. To assist the commander in this responsibility, the force G3 or S3 has the staff function of coordinating fires with maneuver. The senior field artillery officer of the force is normally the fire support coordinator (FSCOORD); as such he is responsible to the commander for the details of fire support coordination, preparation of the fire support plan, and supervision of its execution.

(4) The established fire support coordination procedures and agencies must be flexible. The ap-

plication of procedures to accomplish the task involved in the coordination of fire support will vary with the headquarters, the amount and type of fire support available, and the type of operation.

#### b. *Principles.*

(1) The supported or force commander—through combat orders, policies, or priorities—employs all fire support available to his command.

(2) The organization and procedure for the coordination of fire support provides for the following:

(a) Adequate control and supervision by the force or supported commander.

(b) Concentration of fire on any target or targets.

(c) Distribution of effective fire on several targets simultaneously.

(d) Prompt attack on targets of opportunity.

(e) Modification of the fire support plan when necessary to meet unforeseen or changing situations.

(3) Primary consideration is given to furnishing the type of fire support requested.

(4) Fire missions are assigned to, or requested of, the agency that can deliver the most effective fire within the required time. When ammunition, tactical security, and coordination permit, the most economical means for delivery of fire is used.

(5) Coordination must be accomplished rapidly and decisively in the attack of targets of opportunity. Fires on such targets usually are delivered by the most readily available effective means.

(6) Fire support is accomplished by the lowest echelon which has the necessary means available. When appropriate means are not available, assistance is requested from higher echelons.

(7) Fire support is coordinated at each echelon to the degree required by the mission. Final action is accomplished at the lowest echelon which can accomplish complete coordination of the fire support mission.

(8) The necessary precautions to safeguard friendly troops, civilians, aircraft, vessels, and installations from friendly fires are implemented at each echelon where fire support is coordinated.

(9) A common system of target designation must be employed by all participating fire support agencies.

#### *c. Relationships.*

(1) The fire support coordinator coordinates closely with the G3 (S3) on fire support matters and in the preparation of the fire support plan.

(2) When artillery is assigned a tactical mission to support a force or is attached to a force having no organic artillery, the senior field artillery officer is the fire support coordinator for the force.

(3) When artillery is in direct support, the commander of the direct support artillery functions as fire support coordinator for the supported force. The artillery liaison officer represents the direct support artillery commander at supported headquarters. It should be noted that the aerial field artillery battalion has no liaison officers on its TOE. Liaison officers will have to come from augmentation or from within battalion resources.

### **4-5. Fire Support Coordination**

*a. General.* The objective of fire support coordination is to provide the most effective fire support possible with the means available, to avoid duplication of effort, and to achieve integration of all supporting fires in the scheme of maneuver or plan of defense. Fire support coordination is the coordinated planning and initiation of fire support so that targets are adequately attacked by appropriate means. To accomplish fire support coordination, the following principles of employment are used:

(1) The senior field artillery commander is the fire support coordinator (FSCOORD) and is responsible for coordination of all supporting fires.

(2) Fire support coordination is accomplished in the fire support element (FSE) of the tactical operations center (TOC) at division and

crosses and in fire support coordination centers (FSCC) at lower echelons.

(3) The commander of aerial field artillery units assigned the mission of direct support of a brigade or task force may be the fire support coordinator (FSCOORD) for the brigade or task force. However, the DS mission for aerial field artillery should be considered only when there is no other field artillery support available. The DS mission reduces the battalion's flexibility of fires and requires that forward observers and liaison officers be furnished by other field artillery units.

(4) Control measures usually include target designators, phase lines, checkpoints, fire coordination lines, coordinating points, no-fire lines, zones, and boundaries.

#### *b. Fire Support Request.*

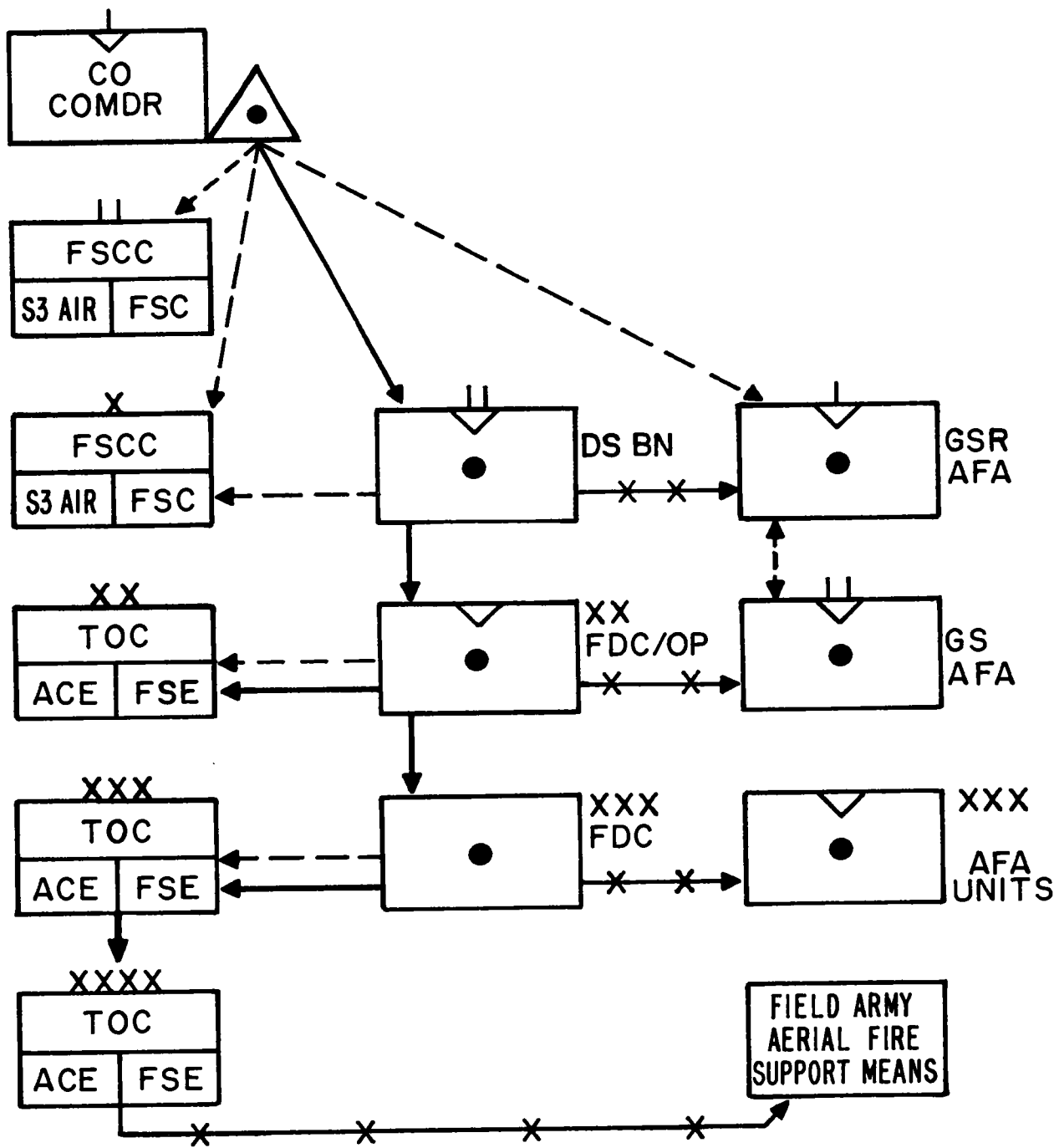
(1) Requests for aerial field artillery fires will be originated through the usual fire support agencies; i.e., forward observer (FO), liaison officer (LNO), FSCOORD, and will follow normal field artillery fire support request channels. Fire requests for aerial field artillery fires are processed as follows for the various tactical missions which can be assigned to aerial field artillery units (fig 4-1):

*(a) General support (GS).* The initial fire request is transmitted to the direct support field artillery battalion supporting the brigade. The request is forwarded to the division artillery fire direction center. The fire mission is assigned to the general support aerial field artillery battalion. The battalion assigns the fire mission to one of the batteries, which in turn assigns the mission to the most available aerial field artillery aircraft.

*(b) General support/reinforcing (CSR).* When assigned this tactical mission, the aerial field artillery battalion provides general support to the division, and normally reinforces each committed direct support field artillery battalion with one battery. The initial fire request is transmitted to the direct support field artillery battalion supporting the brigade. The DS battalion assigns the fire mission to the AFB battery reinforcing the battalion. Should the target warrant additional aerial field artillery, the DS battalion forwards a request to division artillery which assigns the mission to the aerial field artillery battalion.

*(c) Reinforcing.* The procedures described in (b) above apply when the AFA battalion is assigned the tactical mission of reinforcing, except that division artillery does not assign fire missions to the aerial field artillery battalion upon





**LEGEND**

- >** IMMEDIATE AERIAL FIELD ARTILLERY REQUESTS
- - - - ->** MONITORING/ COORDINATION
- X - - ->** TASKING

Figure 4-1. Immediate armed helicopter fire request channels—divisions supported by aerial field artillery.

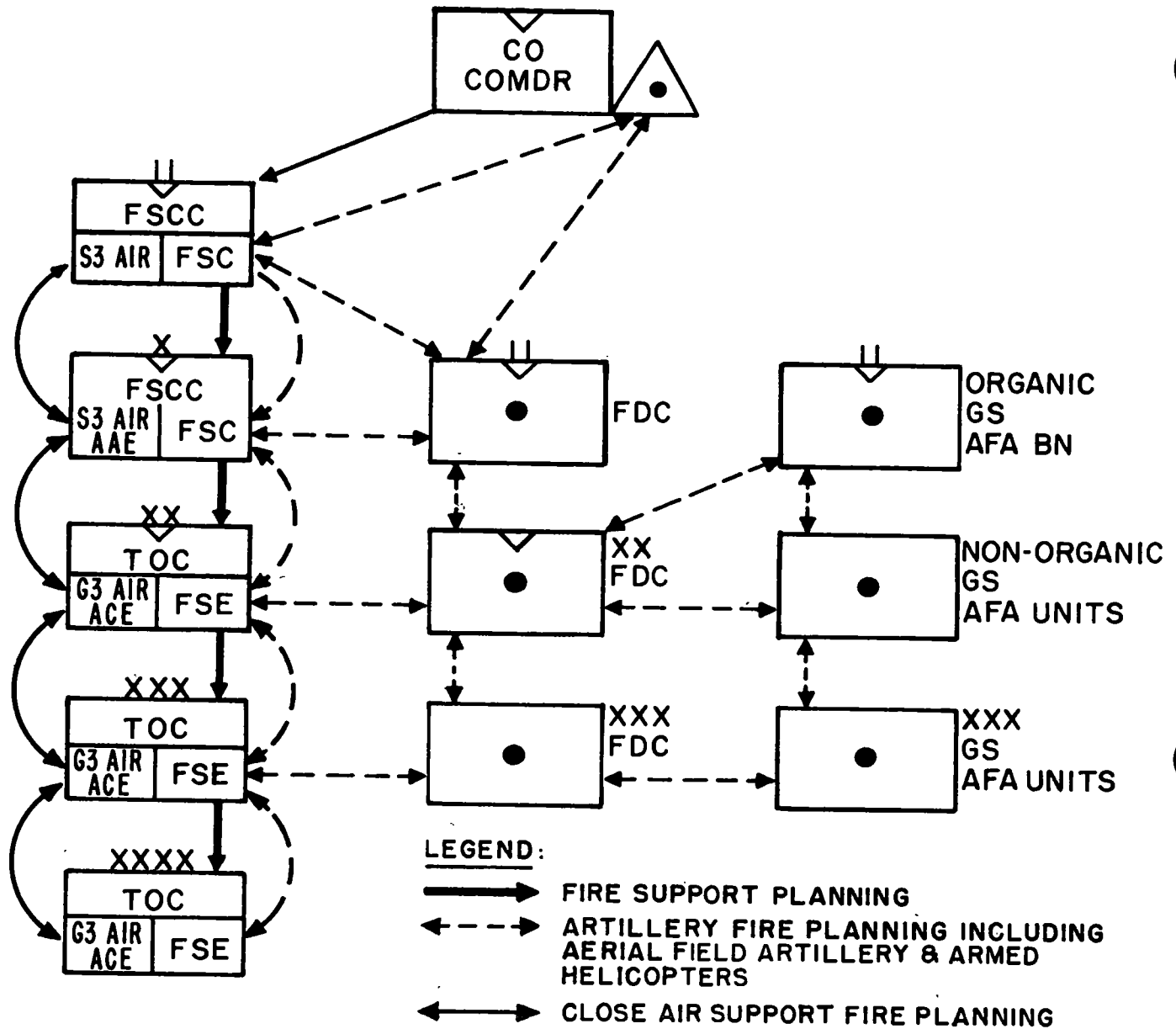


Figure 4-2. Fire planning channels—divisions supported by aerial field artillery.

receipt of requests for additional aerial field artillery.

(d) *Direct support (DS)*. Fire requests are processed as in DS cannon battalions. (NOTE: This tactical mission is less commonly assigned to AFA. However, when the AFA unit is augmented with FO's and LNO's it can readily accomplish the DS mission.)

(2) The flight leader accomplishes direct coordination with the forward observer or liaison officer of the direct support field artillery battalion. The FO or LNO of the DS battalion will provide mission control for aerial field artillery units delivering on-call fires and when firing upon

targets of opportunity. The FO or LNO will provide the flight leader with target location, friendly location (always marked), and nature of target, and may suggest a direction of attack. Techniques of target designation and control may include observers (aerial or ground) orally describing targets; marking of targets by firing tracers, smoke grenades, or rockets; vectoring of aerial field artillery helicopters by radio communications using checkpoints, grid coordinates, or prominent terrain features; and radar control of the aircraft by ground based radar. The position of friendly elements must be accurately identifiable to the armed helicopter pilot. Upon completion of the mission,

target surveillance is passed on to appropriate agencies.

(3) **Airmobile operations.** During assault operations, the FSCOORD (LO at battalion or brigade CP) must apply precise timing in support of airmobile landings at the LZ. When other fire support means and aerial field artillery are to be used in the same preparation, the aerial field artillery preparation is normally fired last, just prior to the arrival of the airmobile force. However, it may be desirable for aerial field artillery to fire a flechette preparation prior to other preparatory fires in order to maximize surprise and casualties among unprotected troops. During the subsequent assault to seize the objective, it is imperative that firm control of all fire support means available to the supported force be established and maintained. The biggest problem facing the FSCOORD will be to coordinate the fires of aerial field artillery, cannon artillery, naval gunfire, and close air support on a small target area. To insure safety and prevent unnecessary expenditure of ammunition, the commander must consider proper use of orbit areas, appropriate assignments of targets, ammunition expenditure control, and proper timing of all fires.

*c. Fire Planning.* Fire planning for aerial field artillery units is similar to the fire planning for other field artillery units as described in FM 6-20-2 (fig 4-2).

#### 4-6. Control

*a. General.* The aerial field artillery battalion is normally employed in the mission of general support of divisional and nondivisional units and reinforcing divisional and nondivisional artillery units.

*b. Fire Direction.* Fire direction at battalion and battery level is tactical. No technical firing data is developed at battery or battalion because no indirect fire capability exists with present weapon systems. The assignment of fire missions to batteries in general support is normally the extent of fire direction performed by the battalion. The S3 maintains maps and charts depicting location and operational status of weapons aircraft and recommends reallocation of aircraft when appropriate. Appendix B contains information on aerial field artillery gunnery and fire mission procedures. Fire direction consists of the following:

(1) Battery fire direction functions consist of mission assignment to one or more platoons and designation of the number of weapons aircraft to attack the target. Maximum reliance is placed on the judgment of the platoon or section leader executing fire missions to determine the amount and type of ammunition to expend on the mission.

(2) Platoon leaders perform tactical fire direction by making decisions regarding the amount and type of ammunition to expend, the method of fire (e.g., the number of pairs in each ripple and the number of ripples, when firing the 2.75 rocket), the direction or directions of attack, the number of firing runs at the target, the direction of departure when disengaging the target, and a rendezvous point of reassembly after the attack. Platoon leaders also render poststrike surveillance on targets.

(3) Section leaders, when operating separately from their platoons, perform the functions described in (2) above for missions executed by their sections.

### Section III. TACTICAL EMPLOYMENT

#### 4-7. Positioning

The aerial field artillery unit commander is responsible for insuring that his unit is positioned so that it provides effective aerial field artillery fire support inherent to his mission. Selection of position areas is governed mainly by the mission, nature of the tactical operation, and the need for dispersion as a protective measure. The aerial field artillery headquarters is located as close to the headquarters of the supported force as the mission and tactical situation permit. Firing elements and some logistics elements of the battalion are deployed in the zone of operations of the supported

unit as required, and are displaced as necessary for accomplishment of the mission and for security. Responsiveness and flexibility are enhanced by locating aerial field artillery units well forward in areas that are secured by divisions or brigades. Rear elements normally remain in the division or brigade trains area to facilitate resupply and maintenance functions.

#### 4-8. Reconnaissance, Selection, and Occupation of Position

The discussion concerning reconnaissance, selection, and occupation of position (RSOP) in FM

6-140 generally applies to aerial field artillery units. In addition, aerial field artillery position areas must include adequate heliport facilities. The following conditions for a position area are desirable:

- a. A slope of less than 10° (17 percent gradient).
- b. A hardstand firm enough to prevent miring.
- c. Landing sites clear of large obstructions.
- d. Landing sites clear of debris that can be drawn into rotor blades.
- e. Approach and departure paths clear of major obstructions, yet affording approaching and exiting helicopters concealment from ground observation.
- f. An area large enough to accommodate simultaneous landings and takeoffs by formations of at least platoon size from a firing battery.
- g. Areas sufficiently large for storage of supplies and for maintenance and operations facilities in consonance with the combat status of the unit. Units operating in forward areas may require only POL and ammunition storage and minimum maintenance facilities.
- h. Located, when practicable, within or near perimeters of other combat arms units for mutual security.

#### 4-9. Organization of Position Areas

The discussion in FM 6-140 on position areas applies to the aerial field artillery battalion. FM 1-110 discusses defensive positions when aircraft must be used to defend the perimeter.

#### 4-10. Planning

The following steps are required for aerial field artillery support of an operation:

- a. *Reverse Planning Sequence.*
  - (1) Planning for aerial field artillery prearranged (scheduled) fire missions in support of ground maneuvers should be developed in reverse sequence (FM 57-35). Such plans are based on the specific times the fire support is required in the tactical plan and the time of flight along the route specified in the plan. All maintenance, fueling, armament loading, and takeoff times must be planned.
  - (2) Normal troop-leading procedures are followed except that reconnaissance may be limited to use of maps and aerial photographs.
  - (3) Aerial field artillery fire requests follow

normal fire request channels. Call for fire procedures are presented in appendix B.

b. *The Ground Tactical Plan.* Aerial field artillery units must know exact target locations enroute to and on the objective, the direction from which fires are to be delivered, and the actions to be taken after delivery of fires. Detailed coordination is required with supported/reinforced units. In planning for aerial delivery of fires, the unit's capabilities and limitations must be considered. Tactical plans may require that the aerial field artillery unit remain in the area after delivery of planned fires.

c. *The Landing Plan.* If the entire aerial field artillery unit is required to land, a detailed air and ground reconnaissance must be performed. The reconnaissance should include a check for trip wires, boobytraps, obstacles, and concealed enemy personnel. Except in case of emergency, aerial field artillery units should not land in an insecure area.

d. *The Air Movement Plan.*

(1) Planning for aerial movement to the target area includes requirements for flight route diagrams and, when rear elements of aerial field artillery units are to displace, the air movement table.

(2) The tactical approach of aerial field artillery units must adhere to planned routes, initial points, release points, and other control measures established in operational plans.

(3) Techniques of air movement are greatly influenced by enemy air defense capabilities. Nap-of-the-earth techniques are employed as appropriate during the approach to target areas in order to achieve maximum surprise and to reduce vulnerability to hostile ground fires.

#### 4-11. Execution

In addition to the discussion in FM 6-140, the following principles apply to aerial field artillery:

a. *Coordination and Control.*

(1) To exploit the flexibility of aerial field artillery units, frequent changes of mission and rapid commitment of portions or all of the battalion will occur. To control the unit, the artillery commander must locate himself where he can best control and influence the most critical phases of the action.

(2) The means of control employed by the commander are personal supervision and all means of communications including radio, smoke signals, liaison, and messenger using both ground

and air transportation. Most of his orders are transmitted by radio which has been secured by proper cryptosecurity devices if available. The use of aerial command posts provides the commander with first hand observation and allows a more rapid response in coordination and control.

(3) Minimum control measures are imposed on subordinate commanders to allow maximum freedom of action and exercise of initiative. The commander employs only those measures necessary to insure positive control during all phases of the delivery of fires. Control measures usually include marking of friendly positions, target designation, phase line, direction of approach, checkpoints, non-fire lines, fire coordination and control lines, coordinating points, lines of departure, and boundaries. Control measures may be imposed by the operation orders of any echelon; the principle to follow, however, is to use only those that are necessary.

*b. Timing.* Because of the speed of the aircraft, the short duration of time over the target, and the problem inherent in coordinating the flight of a number of vehicles over a small target area, the timing of the delivery of fires is very critical. In order for aerial field artillery to achieve maximum surprise, the appropriate flight formation must be selected and the elapsed time between attacking echelons of aerial field artillery elements must be minimized. The enemy must not be allowed sufficient time between attacking waves to reorganize his air defense means and direct fire on the aircraft. When a target is in close proximity to friendly troops, their covering fire base should be used to minimize hostile fires.

#### 4-12. Types of Columns

Aerial field artillery units normally use one of three types of column formation—open, close, or infiltration.

*a. Open Column.* The open column is a formation in which normal distances between helicopters are increased to achieve greater dispersion. An open column is appropriate for tactical moves that must be made during daylight without air cover or when time is so important that infiltration is not feasible and when possible loss of some aircraft must be accepted. The distance between aircraft will be prescribed by the commander. The open column formation provides the aircraft with the ability to provide mutual support between aircraft, with each aircraft being able to provide covering fire to the aircraft ahead if antiaircraft fire is received.

*b. Close Column.* The close column formation is one in which helicopters are closed up to minimum safe flying distance. This formation is used when a large volume of traffic must be moved in minimum time. It is appropriate for moves where there is little or no danger from air or ground attack. This formation does not provide dispersion against enemy attack, and traffic problems can occur at critical or terminal points.

*c. Infiltrating Column.* The infiltrating column is one in which helicopters are dispatched at irregular intervals over multiple routes. Infiltration may be used when sufficient time is available and maximum secrecy, deception, and dispersion are desired as a means of passive protection from air and ground observation and attack. Control of helicopters is extremely difficult and routes must be planned carefully in advance.

#### 4-13. Helicopter Employment in a CBR Environment

*a. Friendly Employment of Nuclear, Biological, and Chemical Weapons.*

(1) Directives relating to the employment of nuclear, biological, and chemical munitions will be received through command channels. Warning messages and troop safety are discussed in detail in FM 101-31-1 and FM 3-10.

(2) Helicopter-delivered chemical weapons may be used to produce casualties or "flush-out" unmasked enemy troops in concealed or protected positions and to facilitate their capture or neutralization by other weapons. Consideration should be given to the integration of the munitions in the fire plan. Details for employment are contained in FM 3-10 and TC 3-16.

(3) The crew may require protective masks and clothing for certain tactical chemical missions; as a minimum, at least one pilot should be masked at all times.

(4) Aircraft suspected of being contaminated should land at preselected areas for inspection and decontamination, as required. These sites should be selected downwind from the aircraft servicing area. Detailed information on decontamination is contained in TM 3-220.

*b. Methods of Reducing Nuclear Effects.* Crews should always be on the alert for a nuclear explosion and should take the following actions if one occurs:

(1) Quickly turn the helicopter away from ground zero.

(2) If possible, fly upwind of the explosion to avoid contaminating the helicopter and personnel.

*c. Chemical, Biological, and Radiological (CBR) Attack.* Defensive measures against a CBR attack generally follow those applicable to field artillery cannon units as set forth in FM 6-140. Unit CBR defensive measures are designed to allow friendly forces to operate successfully in a CBS environment. The objective of these measures is to enable the unit to continue its mission. Some of these measures are: Use of alarm systems, wearing of protective masks, use of protective clothing and other protective equipment, use of protective shelters, dispersion of personnel and equipment, first aid, and decontamination. Standards of proficiency for operations while under a CBR attack are described in FM 21-40.

#### 4-14. Joint Aspects of Operations

*a. Use of Airspace.* There are many demands for the use of airspace within the field army area, e.g., field artillery surface-to-surface missions, air defense artillery missions, airmobile units for air movements, naval gunfire, and tactical Air Force aircraft. These demands cause many problems that require coordination.

(1) Each service is responsible for the internal control and/or coordination of its forces, air vehicles, and weapons.

(2) The theater (unified) commander is responsible for coordinating the use of the airspace over his area of responsibility. Much of this coordination is provided on a rules and procedures basis, to include priorities for operations at lower altitudes.

(3) The Army component commander normally will be given responsibility for coordination of a block of airspace below a designated altitude, and from a designated boundary forward of the FEBA (if one exists) to a designated rear boundary (normally corps or Army rear). The airspace control element (ACE) is the responsible

agency in the TOC for the coordination of airspace use with other elements, particularly the TASE and FSE.

(4) The aerial field artillery battalion commander exercises only that minimum control and coordination over subordinate operations necessary for effective combat operations. Maximum use is made of command policies, SOP, and coordination with appropriate staff sections having responsibility for coordination of the airspace within which the battalion and attached units will operate.

#### *b. Weather Support.*

(1) Air Force air weather service personnel are attached to Army echelons through division level.

(2) The aerial field artillery battalion uses the weather detachment attached to the corps or division to which the artillery battalion is assigned. When necessary, weather detachments may be attached to brigade headquarters.

(3) Weather information is also obtained from other sources such as field artillery meteorological sections, aviation and weather observers, direct reports from Army aviators, and visual observations made by combat units.

#### *c. Weather Minimums.*

(1) The ground component commander, based upon the recommendations of his aviation advisor, specifies the minimum acceptable weather conditions in the assembly area and enroute to, and in, the objective area.

(2) The support Air Force (Navy) (USMC) commander specifies the weather conditions that must exist in his departure area en route to, and in, the objective area in order for him to support the operation.

(3) When weather conditions are less favorable than specified minimums, the operation is either cancelled or postponed, or a decision is made to execute the operation despite the possible effects of the weather.

## CHAPTER 5

### COMMUNICATIONS

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#### 5-1. General

The signal communication system of the aerial field artillery battalion enables the battalion to react with speed and decisiveness. It is essential that the system be capable of continuous communication with higher, adjacent, and supported and/or reinforced headquarters. All means of signal communication are used, and maximum use should be made of communication security devices and techniques.

#### 5-2. Communications Requirements, Aerial Field Artillery Battalion and Battery

The communication requirements of the aerial field artillery battalion and battery are generally the same as those of other field artillery battalions; however, the organization and the assigned missions will vary. The requirements of the aerial field artillery battalion are described in *a* and *b* below.

*a. Internal Requirements.* The internal communication requirements of the aerial field artillery battalion are those necessary for internal command and administration of the battalion, to include facilities for—

- (1) Tactical and administrative control.
- (2) Fire direction.
- (3) Collection of information.
- (4) Dissemination of intelligence and warnings.
- (5) Aircraft control.
- (6) Flight operations.

*b. External Requirements.* The external communication requirements of the aerial field artillery battalion are those necessary for communication with higher, adjacent, and supported or reinforced units, to include facilities for—

- (1) Receipt of tactical orders and administrative supervision.
- (2) Receipt of fire missions from higher headquarters.

(3) Receipt of fire missions from supported or reinforced units.

(4) Exchange information and intelligence.

(5) Use of airspace and weather information.

*c.* The battalion and battery communications sections are divided into radio and wire sections. Wire plays a lesser role; normally, wire communication will be established for internal communication only (fig 5-1). Amplitude modulated (AM), single sideband (SSB), and frequency modulated (FM) radios are found throughout the battalion and are used to maintain the required radio nets. UHF/VHF radios are used for aircraft control and direction. The battalion's internal and external radio nets are listed in (1) and (2) below:

(1) *Internal* (fig 5-2):

- (a) Battalion command/fire direction net (FM).
- (b) Battalion command/fire direction net (AM).
- (c) Battalion aircraft control net (UHF/VHF).

(2) *External* (fig 5-3):

- (a) Division artillery command/fire direction net (FM).
- (b) Division artillery command/fire direction net (AM) (RATT).
- (c) Supported brigade command net.
- (d) Division log.
- (e) Host LO.

*d.* The battery's internal and external radio nets are listed in (1) and (2) below:

(1) *Internal*:

- (a) Battery command/fire direction net (FM).

(b) Battery aircraft control (UHF/VHF)

(2) *External*:

- (a) AFA battalion command/fire direction net (FM).

(b) AFA battalion command/fire direction net (AM).

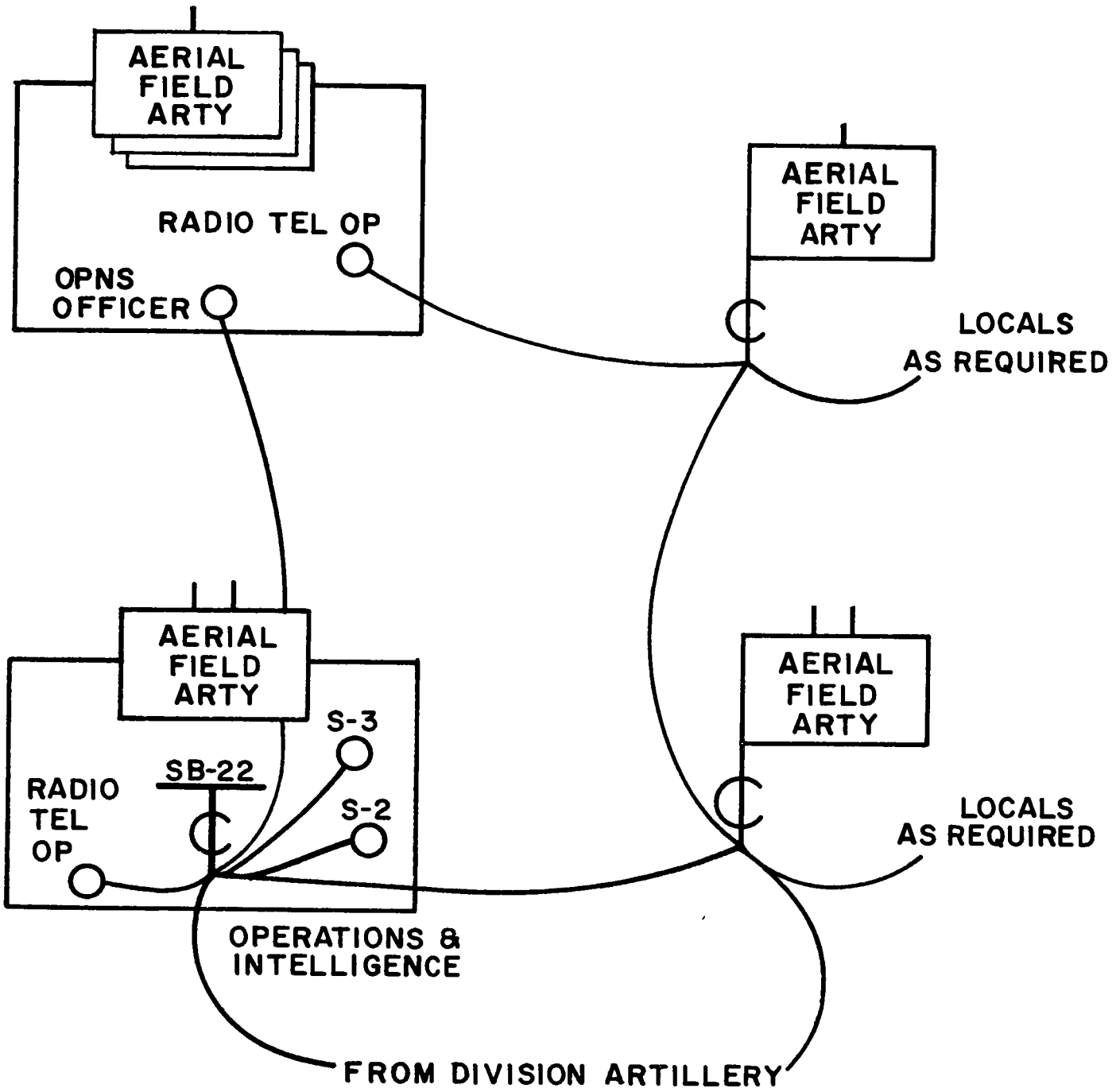


Figure 5-1. Type wire system, aerial field artillery battalion.

(c) Supported unit command net (FM).

e. The Signal Operation Instructions (SOI) and the Standing Signal Instructions (SSI) provide information regarding frequencies, nets, unit call sign, and codes.

**5-3. Communication Security and Electronic Warfare**

a. *General.* The mission of the battalion makes

it an especially lucrative target for enemy signal intelligence and electronic warfare exploitation. The battalion must utilize all available communications security and countermeasures to reduce the effect of such exploitation and its impact on unit operations.

b. *Electronic Warfare.* FM 32-20 provides general guidance for employment of electronic counter countermeasures in unit radio operations.



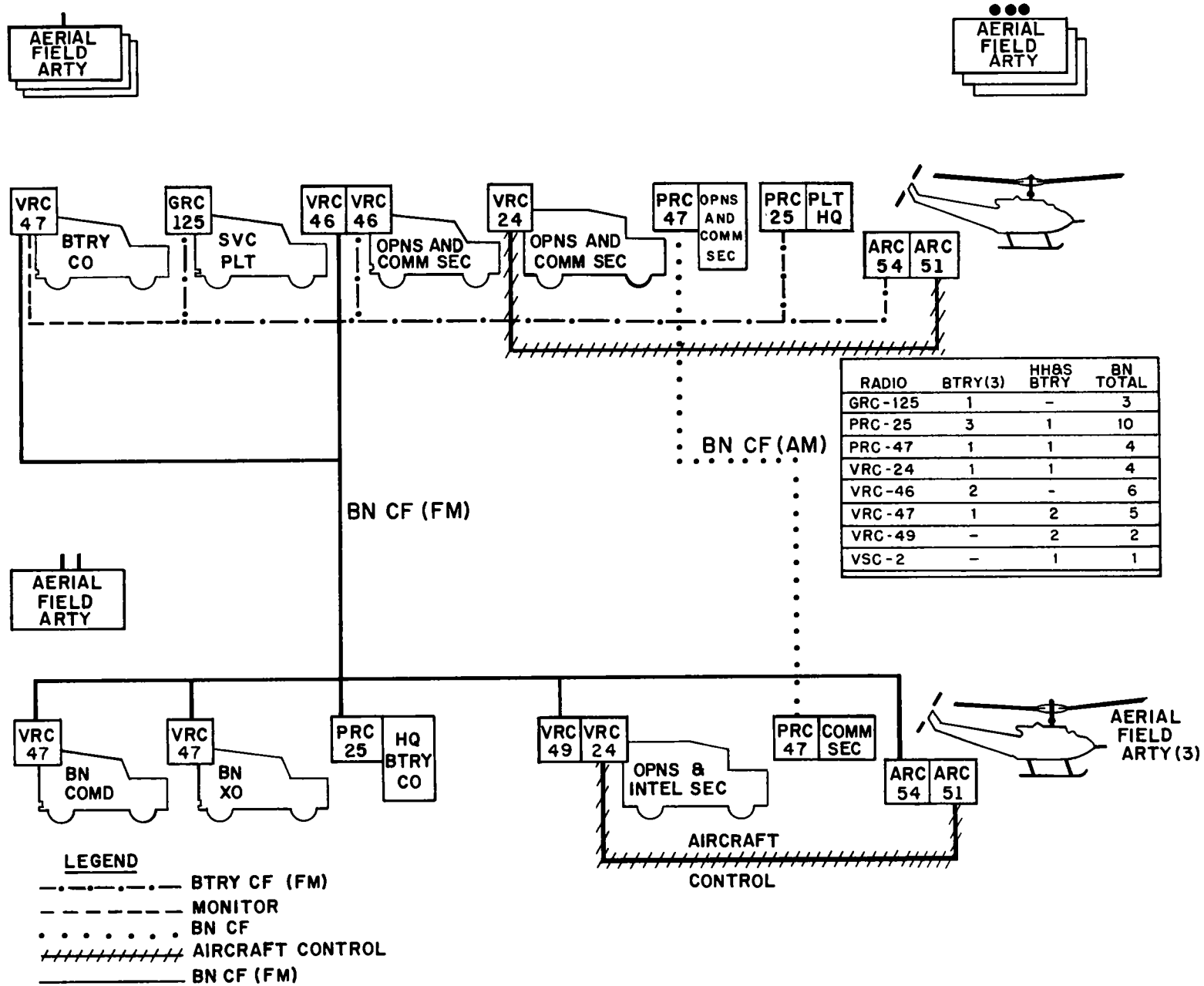


Figure 5-2. Type internal radio nets, aerial field artillery battalion.

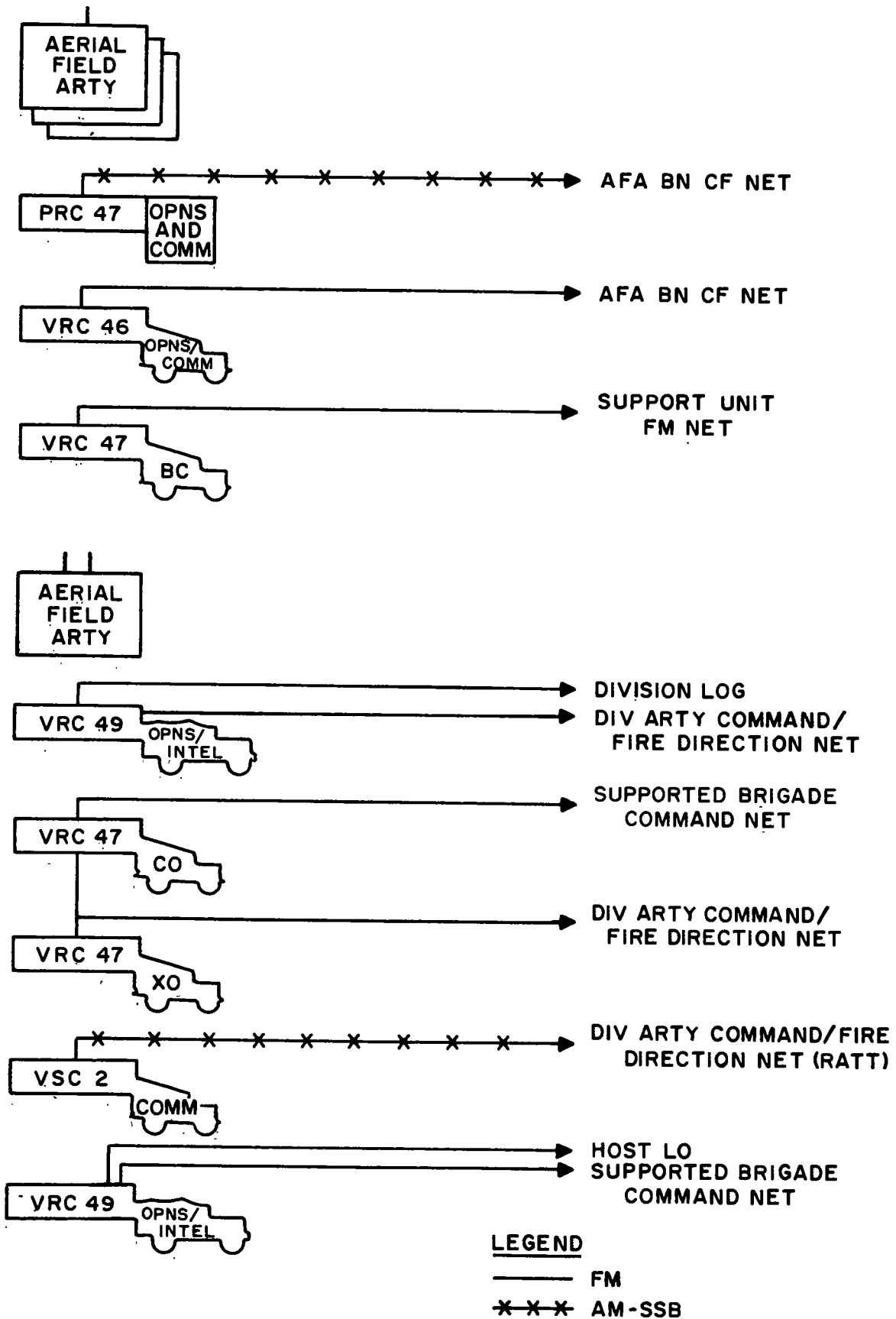


Figure 5-3. Type external radio nets, aerial field artillery battalion.

Special attention is required to provisions for alternative means of communication to reduce the effect of jamming. All actual or suspected jamming and imitative communications activities by the enemy will be reported to the net control station (NCS).

*c. Communications Security (COMSEC).* COMSEC is the protection resulting from all measures designed to deny unauthorized persons information of value which might be derived from the possession and study of communications or to mislead unauthorized persons in their interpretation of the results of such a study. All commanders, training personnel, and communicators should be thoroughly familiar with the provisions of FM 32-5.

#### **5-4. Wire System**

The extent of the aerial field artillery battalion

wire system depends on the tactical situation, the length of time the unit remains in deliberate position areas, and the mission assigned to the unit. Normally, wire communication will be established for internal communication only (fig 5-1). Switchboards are used where necessary to facilitate control. For detailed information on type wire systems, see FM 6-10. For detailed information on communications security using wire systems, see FM 32-5.

#### **5-5. Radio System**

The primary means of tactical communications of the aerial field artillery battalion is radio. Figures 5-2 and 5-5 show type internal and external radio nets. For detailed information on field artillery communications, see FM 6-10.



## CHAPTER 6

### COMBAT SERVICE SUPPORT

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#### 6-1. General

Combat service support requirements for aerial field artillery units are extensive and require close and careful planning and coordination of the resupply effort. Major requirements are coordinated with the division support command and the FASCOM corps support brigade. Units operating in forward areas or advanced bases normally coordinate combat service support requirements with elements established in such areas by the division support command and the corps support brigade. The source and type of transportation and the point of delivery of supplies depend upon the type of operation and the size and organization of the force. To the extent possible, supplies are delivered to the using echelon without use of aerial field artillery organic transport. To the extent practicable, direct support maintenance is provided in positions by teams from the appropriate direct support aircraft maintenance unit, which arranges for evaluation of nonflyable equipment when required.

#### 6-2. Supply

*a. Class IIIA.* Petroleum fuels constitute a major tonnage requirement in most aerial field artillery operations. Aviation fuel is frequently stored in forward unit areas to insure timely delivery of fires by airmobile units. The 500-gallon bladders are used for this purpose. Normally, POL is prepositioned in preselected refueling points by support elements, and the refueling function is performed by forward support elements. The use of common refueling points simplifies the unit logistical problem but is less preferable than refueling in unit position areas. Time/distance factors, congestion, etc., often detract from the mission and response time of the firing platoons. When support capability permits, units will request air delivery of Class IIIA supplies and use their own refueling capability. Unless the tactical mission or the unit location dictate otherwise, the logistical request for Class IIIA is from the using unit direct to a forward support element.

*b. Class VA.* Palletizing packaged ammunition is an aid in resupply operations. Palletized ammunition should be stocked in position areas forward of ground transport capability. Aerial field artillery batteries should have a basic load of ammunition either prepositioned in or programmed for early arrival into the operational area for immediate use in operations. Consideration must be given to the handling and storage of different types of ammunition. During periods of high expenditures, firing batteries may require additional manpower to breakout and assemble aerial rockets. As soon as possible after the initial phase of an operation, the ammunition supply will be replenished or built up to a higher level commensurate with tactical requirements.

#### 6-3. Maintenance

##### *a. Aircraft Maintenance.*

(1) Organizational maintenance of organic aircraft and aircraft armament is performed at battery and battalion by crew chiefs and maintenance personnel. Maintenance responsibilities are prescribed in current maintenance allocation charts which have been developed in consonance with the four-category concept of aircraft maintenance support. Maintenance should be continuous, and consideration must be given to scheduled downtime for maintenance purposes. All maintenance planning must allow for the contingencies of quick-evacuation of aircraft from the position area and calls for all available fires.

(2) Direct support (DS) maintenance is performed by the appropriate direct support aircraft maintenance unit on aircraft and aircraft avionics equipment and armament. Responsibilities of direct support maintenance are prescribed in current maintenance allocation charts referred to in (1) above. Direct support teams are available to perform sufficient maintenance in unit position areas to enable aircraft evacuation for further repair. A limited operational readiness float of operational helicopters may be available for exchange purposes in the supporting aircraft direct

support maintenance unit. For details on aircraft maintenance support, see FM 29-22 and FM 29-30.

*b. On-site Direct Support Maintenance.* On-site direct support maintenance (nonaviation) in aerial field artillery units is similar to that performed in other field artillery units. Tailored detachments from the maintenance battalion are available for emergency on-site direct support maintenance in position areas.

#### **6-4. Personnel and Administration**

All personnel and administration services, to include processing of replacements and personnel records; special services; and postal, legal, and

finance support normally are provided by the division administration company. Chaplain support for division battalions is provided by the division artillery headquarters. Chaplain support for non-divisional battalions is provided by an organic chaplain.

#### **6-5. Transportation**

*a.* Additional ground transport required for special operations is normally furnished by nondivisional transportation truck units.

*b.* Some additional ground transport is pooled in the support command.

*c.* Requirements for additional aircraft are coordinated with the division.

**CHAPTER 7**  
**ANTITANK CAPABILITY**  
**(TO BE PUBLISHED)**

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## APPENDIX A

### REFERENCES

#### A-1. Army Regulations (AR)

95-100	Clarification of Roles and Missions of the Departments of the Army and the Air Force Regarding Use of Aircraft.
310-25	Dictionary of United States Army Terms.
310-50	Authorized Abbreviations and Brevity Codes.
385-63	Regulations for Firing Ammunition for Training, Target Practice, and Combat.
750-8	Command Maintenance Management Inspections (CMMI).

#### A-2. Field Manuals (FM)

1-40	Attack Helicopter Gunnery.
1-60	Army Air Traffic Operations.
1-100	Army Aviation Utilization.
1-105	Army Aviation Techniques and Procedures.
1-110	Armed Helicopter Employment.
6-10	Field Artillery Communications.
6-20-1	Field Artillery Tactics.
6-20-2	Field Artillery Techniques.
6-40	Field Artillery Cannon Gunnery.
6-140	Field Artillery Cannon Battalions and Batteries.
21-40	Chemical, Biological, Radiological and Nuclear Defense.
24-1	Tactical Communications Doctrine.
29-22	Maintenance Battalion and Company Operations (Nondivisional).
29-30	Maintenance Battalion and Company Operations in Divisions and Separate Brigades.
30-5	Combat Intelligence.
(C) 32-5	Signal Security (SIGSEC) (U).
(C) 32-20	Electronic Warfare (Ground Based) (U).
57-35	Airmobile Operations.
61-100	The Division.

#### A-3. Technical Manuals (TM)

9-1005-297-12	Operator and Organizational Maintenance Manual for Armament Subsystem, Helicopter, 7.62 Millimeter Machine Gun: High Rate TAT-102A (1005-933-4710) (Used on AH-1G Helicopters), 23L0.10230.H011.
9-1090-203-12	Operator and Organizational Maintenance Manual for Armament Subsystem, Helicopter, 7.62 Millimeter Machine Gun—40 Millimeter Grenade Launcher: XM28 (1090-933-6701) (Used on AH-1G Helicopters).
9-1950	Rockets.

**FM 6-102**

38-750 Army Equipment Record Procedures (CS<sub>3</sub> Test).  
38-750-1 The Army Maintenance Management System (TAMMS) Field Command Procedures.  
55-1520-221-10 Operator's Manual: Army Model AH-1G Helicopter.

**A-4. Army Training Tests (ATT)**

6-725T Field Artillery Battalion, Aerial Field Artillery (when published).  
6-727T Aerial Field Artillery Battery, Field Artillery Battalion, Aerial Field Artillery (when published).

**A-5. Army Training Programs (ATP)**

6-700 Aerial Field Artillery Units (when published).

**A-6. Table of Organization and Equipment (TOE)**

6-725T Field Artillery Battalion, Aerial Artillery.  
6-726T Headquarters, Headquarters and Service Battery, Field Artillery Battalion, Aerial Artillery.  
6-727T Aerial Artillery Battery, Field Artillery Battalion, Aerial Artillery.

## APPENDIX B

## GUNNERY

**B-1. General**

Detailed gunnery information essential for the timely and accurate delivery of fires by armed helicopters, to include the AH-1G (Hueycobra) and its armament subsystems, is contained in FM 1-40, Attack Helicopter Gunnery. Tactical employment doctrine for aerial field artillery is contained in chapter 4.

**B-2. Call for Fire**

*a. General.* The call for fire stated herein is applicable to aerial field artillery (AFA). This system conforms as nearly as possible to the existing field artillery call for fire as stated in FM 6-40.

*b. Call for Fire.* The call for aerial field artillery fire is normally processed through field artillery or fire support channels. The ultimate decision as to the type of fire support to be provided rests with the fire support coordinator acting under the guidance of the force commander.

(1) *Observer identification.* No change from FM 6-40.

(2) *Warning order.* The standard term FIRE MISSION is used but may be modified to include a specific request for aerial field artillery; e.g., FIRE MISSION, ARMED HELICOPTERS. The final decision on the type fire support to be provided rests with the fire support coordinator.

(3) *Location of target.* There is no change from FM 6-40; however, regardless of the method used by the observer to initially locate the target, the armed helicopter commander requires a positive reference such as coordinates, polar plot, or prominent terrain features to locate the target area. It may be necessary for an intermediate agency to provide grid coordinates.

(4) *Description of the target.* The target description is as shown in FM 6-40. Adverse weather conditions and other flight hazards which affect the mission should be noted, to include pertinent enemy information.

(5) *Method of engagement.* The method of

engagement is as shown in FM 6-40 except when friendly troops are within 200 meters of the target, in which case the observer will include the warning DANGER CLOSE and the inner cardinal bearing and the distance in meters from the target to the friendly troops; e.g., DANGER CLOSE, SOUTHEAST 180 METERS.

(6) *Method of fire and control.*

(a) *Method of fire.* The safety of the friendly troops is the responsibility of the ground commander. Therefore, the direction of attack by the aircraft must be acceptable to him.

(b) *Method of control.* No change from FM 6-40.

*c. Additional Information.*

(1) When the aircraft arrive in the target area, contact must be established between the aircraft and the observer. Additional information is given directly to the aircraft, as necessary, by the observer.

(a) *Location of friendly ground forces.* The location of friendly ground forces can be accomplished by many means; e.g., smoke, panels, tape, radio transmission (by secure means when possible), etc. The system used should define the periphery of the ground forces.

(b) *Target location identification.* Specific target location information is usually necessary and may be given with reference to the location of friendly ground forces. It should be noted that when directions are given to the aircraft, or when recommendations are made for an aircraft attack heading, degrees or inner cardinal bearings rather than mils must be used.

(c) *Subsequent corrections.*

1. During subsequent corrections, either the observer-target line or the aircraft-target line may be used as a reference point for adjustment. However, the method used must be announced to the aircraft.

2. Because of the speed at which aerial fire missions are executed, particularly with a flight of two or more aircraft, the term SHOT

normally can be eliminated. (The fact that the aircraft is firing is obvious to the observer and pilot.)

3. Readback, as specified in FM 6-40, is an acceptable procedure. However, because of the normal clearness of transmissions and the speed of actions in aerial fire missions, readback should be reduced to the minimum amount required.

4. If troop safety is not a factor and the helicopter commander has identified the target, subsequent corrections may be minimized.

(2) The commander of the aerial field artillery element conducting the fire mission performs tactical fire direction by making decisions regarding the amount of ammunition to expend, the method of fire (the number of pairs in each ripple and number of ripples or the percentage of the ordnance load to be expended), the direction or directions of attack, the number of firing passes at the target, the direction of departure or break when disengaging the target, and a rendezvous point of reassembly for the aircraft after the attack. He should identify to the ground unit the markers used to designate the friendly position location, announce the attack heading to be used by the armed helicopter, and state whether or not he observes the target. This corresponds to the message to observer. In cases where troop safety is involved or the ground commander requires multiple passes, the ground force commander makes the decision regarding direction of attack and the number of firing runs to be made at a target.

*d. Sample Mission.* A friendly ground unit has discovered an enemy machinegun 180 meters from their position, on a magnetic azimuth of 5,334 mils (300°). An aerial field artillery battery, call sign DRAGON FLY, is currently reinforcing the fires of the direct support field artillery battalion, call sign BAR BELL.

(1) A call for fire is being transmitted through fire support channels by BAR BELL 30, an observer with the ground unit.

Observer: BAR BELL 8, THIS IS BAR BELL 30, FIRE MISSION, DRAGON FLY, OVER.

FDC: BAR BELL 30, THIS IS BAR BELL 8, FIRE MISSION, DRAGON FLY, OUT.

Observer: GRID 692312, MACHINEGUN FIRING FROM TREE LINE, DANGER CLOSE, SOUTHEAST 180 METERS, OVER.

FDC: Reads back the message, terminates with OUT; following the issuance of the fire order to the aerial field artillery unit, transmits to the observer; DRAGON FLY, ONE PLATOON, TARGET AF7405, OVER.

Observer: Reads back the message and terminates with OUT.

*Note:* The FDC has indicated that a platoon of aerial field artillery was assigned to BAR BELL 30's mission. As indicated in c(2) above, the commander of the aerial field artillery platoon will decide how many of these aircraft will attack the target. The target number, AF7405, is the fifth target number from a block of numbers that the direct support battalion has reserved for identifying targets of opportunity assigned to the aerial field artillery. Fire support coordinators provide information concerning adjacent friendly forces who may be endangered. By his silence, the battalion liaison officer concurs in this mission.

(2) When the reinforcing aerial field artillery unit is operating on a net other than that of the requesting observer, the information may be relayed as follows:

FDC: DRAGON FLY 23, THIS IS BAR BELL 8, FIRE MISSION, OVER.

AFA Platoon  
Commander: BAR BELL 8, THIS IS DRAGON FLY 23, FIRE MISSION, OUT.

FDC: GRID 692312, MACHINEGUN FIRING FROM TREE LINE, DANGER CLOSE, SOUTHEAST 180 METERS OVER.

AFA Platoon  
Commander: Reads back message, adds DRAGON FLY 21, ONE PLATOON, OUT.

FDC: ROGER, TARGET AF7405, CONTACT BAR BELL 30, CHANNEL 43, OVER.

AFA Platoon  
Commander: ROGER, OUT.

(3) When the aerial field artillery platoon arrives at the target area, contact is made with the observer over the designated radio frequency.

AFA Platoon  
Commander: BAR BELL 30, THIS IS DRAGON FLY 21, AF7405, MARK YOUR POSITION, OVER.

Observer: DRAGON FLY 21, THIS IS BAR BELL 30, WILCO, OUT.

AFA Platoon  
Commander: RED SMOKE, OVER.  
Observer: FROM RED SMOKE, DIRECTION 295 DEGREES, DISTANCE 200 METERS, MACHINEGUN IN TREE LINE, OVER.

AFA Platoon  
Commander: TARGET IDENTIFIED, OUT.  
Observer: PANELS MARK MY FLANKS, ADJUST FIRE, OT LINE, OVER.

AFA Platoon  
Commander: ROGER, FRIENDLY POSITION IDENTIFIED, ATTACK HEADING 045 DEGREES, OBSERVE MARKING ROUND (one pair), OVER.  
Observer: RIGHT 50, ADD 100, OVER.

AFA Platoon  
Commander: ROGER, OUT. (The number two aircraft fires the adjustment.)  
Observer: TARGET, FIRE FOR EFFECT, OVER.

AFA Platoon  
Commander: ROGER, OUT. (AFA platoon commander commits a section against the target.)  
Observer: END OF MISSION, MACHINEGUN DESTROYED, OVER.

AFA Platoon  
Commander: Reads back message, terminates with OUT.

## APPENDIX C

### CONDUCT OF SERVICE PRACTICE

---

#### Section I. GENERAL

##### C-1. Purpose and Scope

*a.* This appendix is a guide for all personnel concerned with the conduct of service practice for the aerial field artillery battalion.

*b.* It covers basic provisions for service practice, responsibilities of individuals, safety precautions, and phases of service practice.

##### C-2. Basic Provisions for Service Practice

*a. Purpose.* Service practice is a part of the tactical field training of the aerial field artillery battalion (battery). The preparation, execution, and conduct of fire with service ammunition is the final phase of training for battle. The techniques of preparation, execution, and conduct of fire must be developed and taught by units before they can be considered qualified to undertake service practice. These techniques must be developed and taught by many simulated firings.

*b. Scope.* Service practice combines all elements of aerial field artillery training, i.e., tactical employment; mobility; signal communications; preparation, execution, and conduct of fire; flight scheduling; navigation; and flying. Service practice is conducted as an extension of tactical field exercises wherein the most realistic tactical situation permitted by local conditions is created. These exercises should conform to the provisions of Army training tests for aerial field artillery units (when published).

*c. Responsibilities.* The unit commander is responsible for the conduct, scoring, and evaluation of the service practice. Based on recommendations of the commander, the next higher headquarters authorizes and arranges for service practice.

##### *d. Frequency.*

(1) Each aerial field artillery unit will conduct service practice as part of its training under the Army training program.

(2) During post-cycle training, each aerial

field artillery unit will conduct service practice at least twice annually.

(3) In addition, each aerial field artillery unit will conduct service practice during the three-month period prior to overseas deployment.

(4) The requirement in (3) above will be considered fulfilled by the service practice in (1) or (2) above, if either has been conducted within the 3-month period prior to overseas deployment.

*e. Ammunition Allowances.* Ammunition allowances for service practices will be as specified in directives from higher authority.

##### *f. Personnel.*

(1) In view of the infrequency of service practice, personnel should be assured of maximum training benefits from the ammunition fired. The maximum number of personnel assigned to units designated to conduct service practice should participate in these exercises. Unit commanders must be resourceful in initiating and adopting measures designed to provide maximum benefit from firing exercises to personnel of their command.

(2) All personnel required to monitor, record, and evaluate the service practice, including personnel efficiency and equipment performance, are furnished from units other than the participating unit by commanders ordering the service practice.

*g. Materiel and Equipment.* The battalion (battery) is limited to that equipment authorized by TOE. The tables of organization and equipment do not provide equipment for monitoring, recording, and evaluating the service practice.

##### *h. Command to Check Firing.*

(1) A command to "check firing" which will cause the operations in progress to temporarily halt may be given by any person when unsafe conditions such as the following are observed:

(*a.*) Individuals, vehicles, or aircraft are in field of fire.

(b) Malfunctioning of any fire control materiel, or safety features thereof, to include the aircraft.

(c) Improper safety procedures are being employed.

(2) All operations concerning ammunition and fire control materiel will temporarily halt upon receipt of this command and will not resume until the unsafe condition is corrected.

*i. Adaptation to Local Conditions.* Commanders may modify the provisions of this appendix to meet local conditions. However, modifications of Department of the Army regulations on safety should not be allowed except as provided herein.

*j. Scoring.* The performance of the unit is graded as indicated in the appropriate Army training tests.

## Section II. RESPONSIBILITIES OF INDIVIDUALS

### C-3. GENERAL

The discussion contained in FM 6-40, relative to responsibilities and duties of individuals in the conduct of service practice, is applicable except as modified herein.

### C-4. Commander Ordering Practice

The commander ordering practice—

*a.* Arranges for range facilities, coordinates range and airspace clearances, and provides for ammunition and aviation maintenance support.

*b.* Specifies the date, time, and place of practice.

*c.* Appoints safety officers, umpires, and other officials as required.

*d.* Implements Department of the Army regulations where required.

*e.* Provides target information to the chief umpire sufficiently far in advance to allow for planning of sequence of events.

*f.* Provides the unit with weather service as required.

*g.* Prescribes required reports.

### C-5. Officer in Charge

The battalion (battery) commander acts as the officer in charge of firing (para C-7).

### C-6. Umpire Team

*a.* The chief umpire supervises the performance of duties prescribed for the umpire team and also may be assigned the duty of chief safety officer (para C-10).

*b.* The umpire team—

(1) Performs duties and renders prescribed reports.

(2) Scores performance of unit personnel and equipment (para C-2j).

(3) Reports to chief umpire when unit is prepared to attack targets with aerial rockets.

(4) Provides necessary equipment and instructions to safety officers to enable them to fulfill their mission.

### C-7. Battalion (Battery) Commander

The battalion (battery) commander normally is designated as the officer in charge of firing. He—

*a.* Insures that organizational training has advanced to prescribed standards prior to service practice.

*b.* Disseminates to his command the necessary advance information concerning service practice.

*c.* Furnishes appropriate service practice plans to umpires and officials.

*d.* Establishes unit standing operating procedures (SOP) on safety peculiar to the local situation, to include provisions for appointment of safety officers (para C-4c).

*e.* Establishes and enforces restrictions on personnel relative to movement in the service practice area.

*f.* Provides for keeping necessary records to aid in determining firing proficiency, training progress, and equipment performance.

*g.* Assumes responsibility of "commander ordering practice" (para C-4) when his organization is operating independently.

*h.* Prepares reports for higher headquarters when prescribed. These reports should include recommendations for further training, modification of procedures, and doctrinal changes made apparent from service practice. Deficiencies noted during the exercise should be included also.

*i.* Conducts prompt critiques of the service practice to include personnel, equipment, results of at-

tacks on targets, and discrepancies noted in the conduct of firing runs.

### C-8. Subordinate Commanders

The subordinate commanders—

- a. Follow training directives, provisions of this

appendix, and pertinent instructions relative to the exercise.

- b. Maintain prescribed records relative to firing and submit required reports to battalion (battery).

- c. Supervise all activities pertaining to their respective commands.

## Section III. SAFETY

### C-9. General

A unit safety standing operating procedure (SOP) based on information contained in AR 385-63, USCONARC Training Directive, local directives, and this appendix must outline necessary precautions to be exercised in the handling, transporting, and storing of all ammunition. Information on precautions to be observed in loading and firing, aviation safety, and detailed duties of safety personnel must be included also.

### C-10. Safety Officers

The commander ordering service practice is responsible for the appointment of safety officers (para C-4c). For each aircraft armament system that is to fire, one safety officer is appointed, in addition to a chief safety officer, who also may be the chief umpire.

- a. *Chief Safety Officer.* The chief safety officer—

- (1) Is responsible for supervising all phases of safety throughout the practice exercises to include safety in the ammunition storage area.

- (2) Instructs all safety officers in the performance of their duties.

- (3) Coordinates with the installation range officer, to include limits of danger area and safety limits.

- (4) Coordinates preparation of safety diagram.

- (5) Determines when it is safe to fire.

- (6) Furnishes safety officers with the safety limits of the assigned firing area in written form. This may include a safety diagram or the coordinates outlining the approved impact area.

- (7) Receives report from chief umpire (when not acting in that capacity himself) when rockets or missiles are ready to be fired and obtains authority from him to fire.

- (8) Authorizes issuance of the command to fire after assuring himself that all safety precautions have been taken.

- b. *Safety Officers.* The safety officers—

- (1) Represent the chief safety officer (chief umpire) at each aircraft/weapon system.

- (2) Check for the proper employment of safety procedures to avoid fire hazards, particularly during arming and rearming of rockets and missiles.

- (3) Brief the player personnel on the safety limits of the assigned firing area.

- (4) Insure receipt of range clearance before firing commences.

- (5) Report to chief safety officer (chief umpire) when aircraft/armament system is ready to use.

## Section IV. RANGE REQUIREMENTS

### C-11. General

This section is designed to acquaint commanders and staff officers with the range requirements when firing air-to-ground missions. The following data will be used to determine the danger zones required for firing the listed weapons from helicopters. (Range data are also available in FM 1-40.)

- a. *Diagram.*

- (1) The danger zone diagram (fig. C-1) is

applicable to all the weapon systems mentioned below.

- (2) Area F of figure C-1 is not required when firing is conducted from a static position, i.e., aircraft on ground.

- (3) The requirement of Area F for firing from a moving helicopter is dependent on the level of competence of the gunner. Area F may be eliminated when, in the opinion of the range control officer, the gunner has achieved the ability to con-

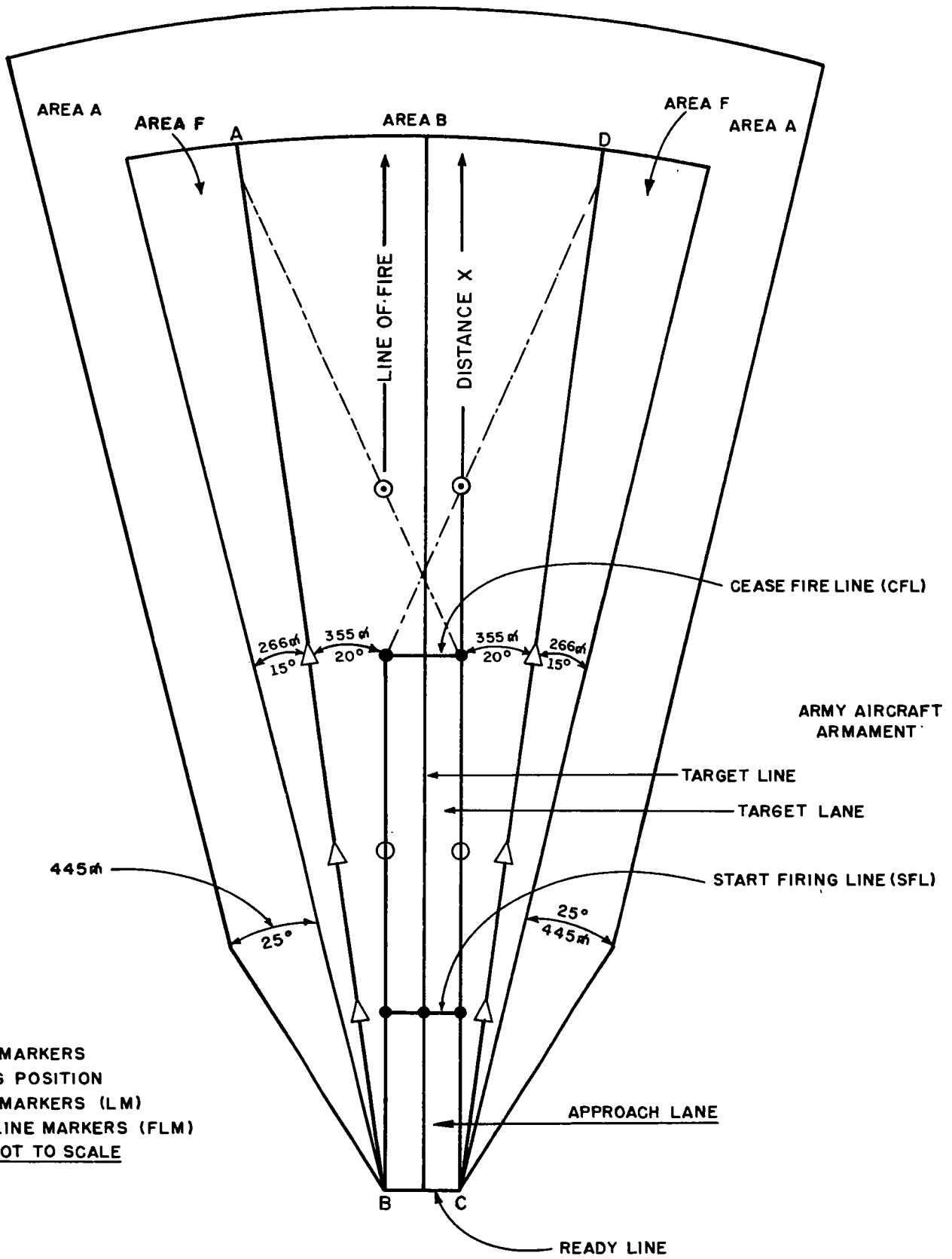


Figure C-1. Danger zone diagram.



fine rocket impact within the prescribed impact area.

*b. Firing Lane.*

(1) The firing lane consists of the target and approach lanes. Firing will be conducted only in the target lane starting at the SFL and stopping at the CFL.

(2) All firing will be conducted under direct supervision of the range control officer (RCO).

*c.* Limit markers may be established on lines AB and CD. Cross-firing in firing lane will be permitted, providing all firing is conducted within limit markers. In the event of several adjacent

firing lanes, lines AB and CD will be established for rightmost and leftmost lane, respectively, and all firing on all lanes will be conducted within limit markers. All limit markers must be visible from any helicopter position in the target lane.

*d.* The following table provides the dimensions necessary to complete figure C-1 for the various types of ammunition.

<i>Weapon</i>	<i>Width A, Meters</i>	<i>Width B, Meters</i>	<i>Distance X, Meters</i>
7.62-mm	500	500	4000
2.75-in	500	500	9200*

\*May be decreased to 7360 meters in event 2.75-inch rocket motors are 4 or more years old.

## Section V. PHASES OF SERVICE PRACTICE

### C-12. General

The conduct of service practice includes four phases—preparation; reconnaissance, selection, and occupation of position (RSOP); firing; and post practice. The planning and operations to be considered during each phase are outlined in paragraphs C-13 through C-16.

### C-13. Preparation Phase

The preparation phase includes—

*a.* Issuance of appropriate warning orders by commanders at all echelons concerned.

*b.* Determination of range facilities, availability, and SOP.

*c.* Formulation of assumed tactical situation on which to base subsequent orders.

*d.* Determination of the data needed to evaluate the service practice and the selection of means to provide these data in a suitable form.

*e.* Coordination with the installation range officer, to include matters concerning local range safety requirements.

*f.* Check of ground handling, fire control, and firing equipment for condition and adjustment.

*g.* Drawing ammunition.

*h.* Check of sighting equipment for condition and adjustment.

*i.* Determination of the time service practice is to start and its duration.

*j.* Completing details incident to reconnaissance selection and occupation of position.

*k.* Making provisions for communication systems.

*l.* Providing route markers for motor vehicles.

*m.* Obtaining necessary airspace.

*n.* Establishing local security.

### C-14. RSOP Phase

The RSOP phase includes—

*a.* Reconnaissance and selection of position.

*b.* March discipline (aerial and ground).

*c.* Occupation of position.

*d.* Organization of position. Organization includes—

(1) Construction of necessary field fortifications, revetments, and shelters.

(2) Organization and maintenance of rigid security measures.

(3) Exercise of strict camouflage discipline.

(4) Preparation of ammunition.

*e.* Simulated attacks on battery positions and motor dispersal areas.

*f.* Simulated casualties requiring care and evacuation.

### C-15. Firing Phase

The firing phase includes—

*a.* Aircraft takeoff and landing.

*b.* Arming the system.

*c.* Proper execution of firing sequence.

*d.* Immediate report to the FDC of any cause for delay in firing.

*e.* Maintenance of records.

**C-16. Post-Practice Phase**

The post-practice phase includes—

- a.* Police of area.
- b.* Check of equipment.
- c.* Cleaning and maintenance of equipment.

- d.* Displacement.
- e.* Aerial reconnaissance of impact area.
- f.* Post-strike analysis of fire.
- g.* Scoring by umpire teams.
- h.* Completing records and reports.
- i.* Critique.

## APPENDIX D

## AH-1G (HUEYCOBRA) AERIAL FIELD ARTILLERY WEAPON SYSTEM

**D-1. Purpose and Scope**

This appendix discusses the AH-1G (Hueycobra) and the armament configurations available to aerial field artillery units.

**D-2. AH-1G (HUEYCOBRA)**

All aerial field artillery battalions are equipped with the AH-1G helicopter. Detailed information pertaining to the AH-1G is contained in TM 55-1520-221-10, Operator's Manual: Army Model AH-1G Helicopter.

**D-3. ARMAMENT**

*a. Major Armament Configurations.* The major armament configurations for the AH-1G in the aerial field artillery battalion are shown at figure D-1. These consist of the XM-28 Armament Subsystem, the XM159 rocket launcher, and the XM157 rocket launcher. These systems are discussed in detail in FM 1-40.

(1) *XM-28.* The standard configuration for

the XM-28 is one 7.62mm machinegun and one 40mm grenade launcher. Alternate configurations are two 7.62mm machineguns or two 40mm grenade launchers.

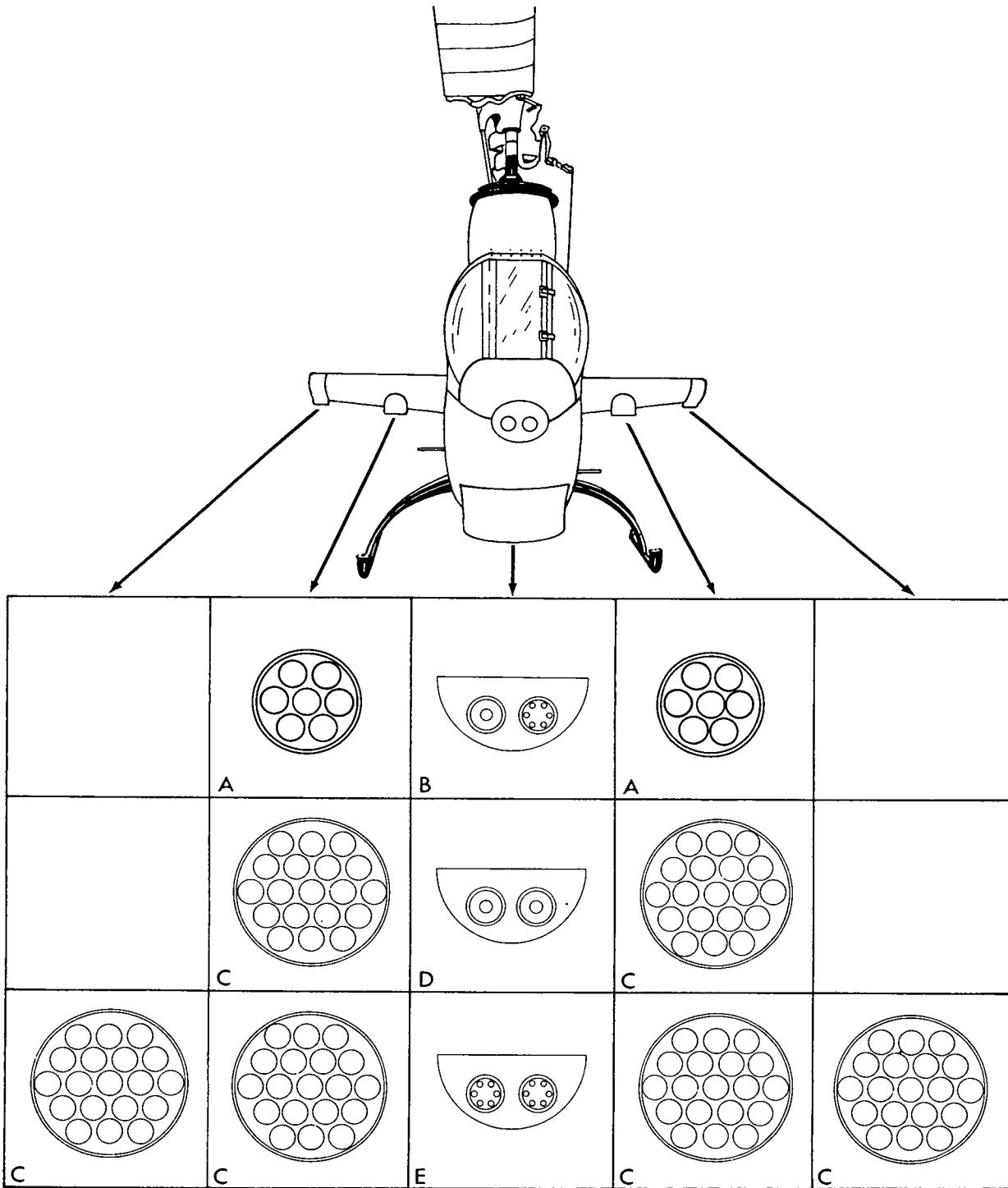
*Note.* Some AH-1G helicopters may be armed with the Tactical Armament Turret—TAT-102A in lieu of the XM-28.

(2) *XM159.* The XM-159 is a 19-tube, 2.75-inch folding fin aerial rocket launcher. The standard configuration is four XM-159 launchers (one at each of the AH-1G's external stations).

*Note.* When 17 lb warhead rockets are loaded outboard, only 12 rounds can be loaded due to the 550 lb weight limitation on the outboard stores.

(3) *XM157.* The XM157 is a 7-tube 2.75-inch folding fin aerial rocket launcher. The XM157 can be configured as described for the XM159.

*b. Other Armament Configurations.* The AH-1G can accommodate other armament subsystems and configurations. All of the alternate subsystems and configurations available for the AH-1G are discussed in detail in FM 1-40.



- A XM157: SEVEN-TUBE, 2.75-INCH ROCKET LAUNCHER.
- B XM28 SUBSYSTEM: 7.62MM HIGH RATE AUTOMATIC GUN AND 40MM GRENADE LAUNCHER.
- C XM159: 19-TUBE, 2.75-INCH ROCKET LAUNCHER.
- D XM28 SUBSYSTEM: TWO 40MM GRENADE LAUNCHERS.
- E XM28 SUBSYSTEM: TWO 7.62MM HIGH RATE AUTOMATIC GUNS.

Figure D-1. AH-1G major armament configurations.

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