FM 7-19

DEPARTMENT OF THE ARMY FIELD MANUAL

COMBAT SUPPORT COMPANY INFANTRY DIVISION BATTLE GROUP

HEADQUARTERS, DEPARTMENT OF THE ARMY
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HEADQUARTERS
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COMBAT SUPPORT COMPANY, INFANTRY DIVISION BATTLE GROUP

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CHAPTER 1
MISSION AND ORGANIZATION

1. Purpose and Scope

a. This text is a guide to the training and tactical employment of the combat support company of the battle group. It covers the organization and functioning of the company and its elements.

b. The material presented herein is applicable to nuclear and nonnuclear warfare. Where applicable, appropriate modifying guidance for nonnuclear warfare is integrated throughout the manual.

2. Mission

The combat support company provides heavy mortar, assault weapon, reconnaissance, and ground surveillance support for the infantry division battle group.

3. Organization

The combat support company consists of a company headquarters, a heavy mortar platoon, an assault weapon platoon, a reconnaissance platoon, and a radar section (fig. 1). For detailed organization of the company, see TOE 7–19D.

4. Company Headquarters

The company headquarters provides necessary control and services for all men and units assigned or attached to the company. It consists of a company commander, an executive officer, a first sergeant, mess personnel, a supply sergeant, an armorer, a company clerk, maintenance personnel, and two light truck drivers.

5. Duties of Personnel

a. The *company commander* gives positive leadership to his command and maintains its discipline, welfare, and combat proficiency. To accomplish these tasks, he uses all means at his command and requests additional means whenever necessary.

(1) He is responsible for administration, discipline, supply, first echelon maintenance, and tactical and technical training of all personnel assigned or attached to his unit. (Supervision of tactical and technical training, and recommendations to the battle group commander for employment of subordinate elements of the company, are responsibilities of the unit staff officer having primary interest in their operation.)

(2) In the battle area, he uses observation posts, aerial observation, patrols, outposts, roadblocks, interior guards, liaison, and personal reconnaissance to maintain the security of his unit when assembled.

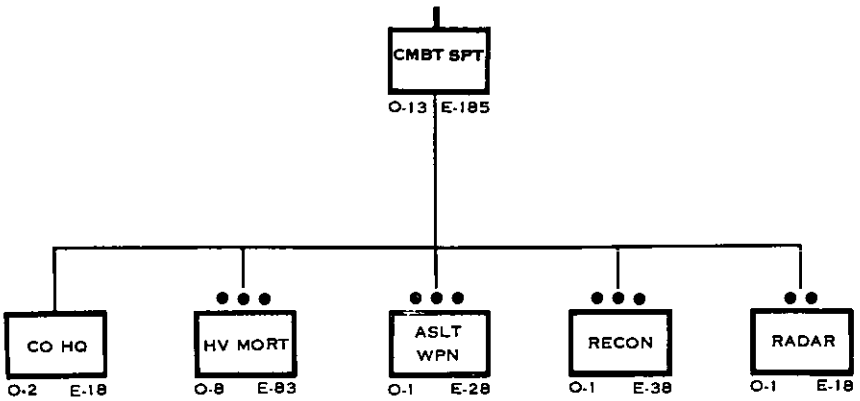


Figure 1. Combat support company, infantry division battle group.

(3) His other duties may include—

(*a*) Supervision and control of area security.

(*b*) Manning an alternate battle group command post.

(*c*) Operating a task force headquarters.

b. The *executive officer* is second in command of the company. His duties include—

(1) Assuming command during the company commander's absence.

(2) Assisting the company commander in the supervision of training, administration, mess, supply, and maintenance within the company.

c. The *first sergeant* assists the company commander and advises him on such matters as appointments, assignments, and disciplinary matters as they pertain to the enlisted members of the company.

d. The *company mess personnel* consists of the mess steward and cooks. These personnel operate the combat support company kitchen. The kitchen is operated as prescribed in TM 10–405.

e. The *supply sergeant* assists in receiving, maintaining, and turning in supplies and equipment of the company. He posts organizational clothing and equipment and personal clothing records. He supervises the company armorer.

f. The *armorer,* operating under the supervision of the supply sergeant, services and makes second echelon repairs on company weapons. He insures that arms are in serviceable condition. He drives and maintains the 2½-ton ammunition truck assigned to

the company headquarters. This ammunition truck functions under the operational control of the battle group S4.

g. The *company clerk,* supervised by the first sergeant, performs necessary administrative actions required within the company.

h. The two *light truck drivers* drive and maintain the two ¼-ton trucks assigned to the company headquarters and operate and maintain the radios mounted in them.

i. The *motor sergeant, wheeled and tracked vehicle mechanics, mechanics' helpers,* and *wrecker-operator/driver* work under the operational control of the S4. They assist in the evacuation and maintenance of battle group vehicles. One vehicle mechanic's helper drives and maintains the ¾-ton truck authorized for the company headquarters. The wrecker operator drives and maintains the light wrecker.

6. Means of Signal Communication

a. Radios. There are two AN/VRQ–3 radios in the company headquarters section. One of these radios is mounted in the company commander's ¼-ton truck. It normally operates in the battle group command net, and may operate in any net of the subordinate elements of the command. The other radio is mounted in the executive officer's ¼-ton truck. This radio normally operates in the battle group administrative net, and may operate in any net of the subordinate elements of the command.

b. Wire Nets. A wire net is not normally established for the combat support company. For details on communication, see FM 7–21 and FM 7–24.

CHAPTER 2

HEAVY MORTAR PLATOON

Section I. MISSION, CAPABILITIES, AND ORGANIZATION

7. Mission and Organization

a. The mission of the platoon is to provide close and continuous indirect fire support for the maneuver elements of the battle group.

b. The platoon consists of a headquarters, communications section, fire direction center and survey section, 3 forward observer teams, 2 firing sections, and 1 counterfire squad (fig. 2). Each firing section contains a section headquarters and three firing squads. For detailed organization, see TOE 7–19D.

8. Capabilities and Limitations

a. The heavy mortar platoon is capable of massing a heavy volume of accurate and sustained fire, limited only by ammunition supply. It may be employed to neutralize or destroy area targets and locate point targets, to screen large areas with smoke for sustained periods, and to provide illumination. It may also be employed to contaminate areas with persistent effect toxic agents. It can fire from covered and concealed positions and can engage targets in defilade. The platoon is capable of firing as a unit, or each of the sections can fire independently. However, wide deployment of the sections lessens the ability of the platoon to deliver massed fires.

b. The platoon depends on the company for administration, supply, evacuation, and maintenance.

9. Platoon Headquarters

a. The *platoon commander* commands the platoon and actively supervises the training of all elements of it. He makes full use of the chain of command to assist him in carrying out these responsibilities. Specifically, he—

(1) To insure the success of his plan, assigns definite missions to his leaders and keeps informed of their actions, in order to give assistance when needed. He goes where he can best control the action of the platoon.

(2) Is responsible for the tactical employment of the platoon in conformity with orders received from the battle group commander.

(3) Advises the battle group commander on the capabilities and best employment of his platoon.

(4) Selects position areas and controls the movement of the platoon.
(5) Keeps informed of the enemy and friendly situations.

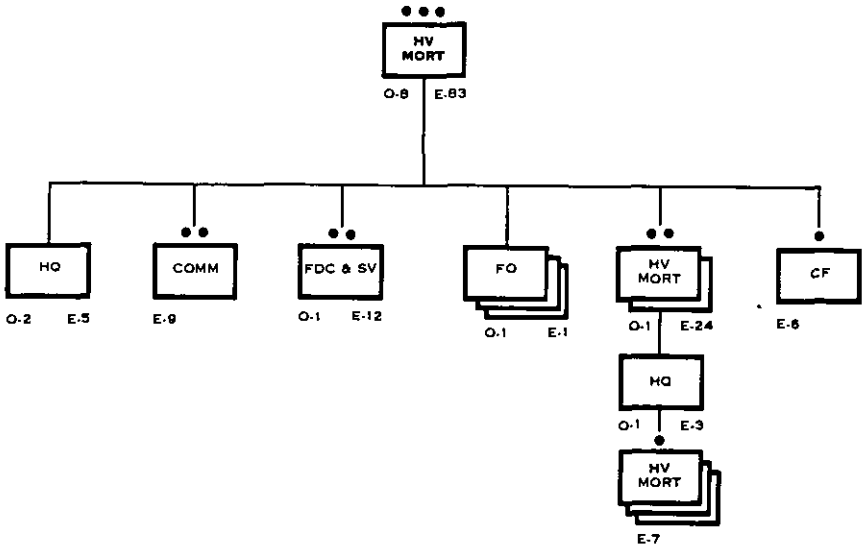


Figure 2. Heavy mortar platoon.

(6) Establishes and maintains communication with the supported units through the forward observer teams.
(7) Establishes a fire control system within the platoon.
(8) Prepares a plan for heavy mortar fire support of the forward elements.
(9) Plans for and supervises the timely displacement of the platoon or sections as required by the mission.
(10) Maintains adequate security.
(11) Supervises the supply of ammunition to each of the firing sections.
(12) Supervises the platoon communication system.
(13) Supervises the execution of his orders.
(14) Insures that liaison is maintained with the fire support coordinator at battle group headquarters and at the direct support artillery battalion FDC.
(15) Insures that communication is established and maintained with the direct support artillery fire direction center.

b. The *liaison officer* is second in command of the platoon. He keeps himself informed of the situation in order to take over the duties of the platoon commander.

(1) His normal station is battle group headquarters. In this role he passes on all intelligence information received from the heavy mortar FDC to the battle group S2. He

coordinates with the battle group S3 or the FSC the details of fire support. In the absence of the platoon commander, he advises the battle group commander on the capabilities and employment of the platoon.

(2) He informs the heavy mortar FDC of all pertinent and timely information relative to location of friendly troops, fire direction, intelligence, and fire support information as received from the battle group headquarters.

c. The *platoon sergeant* is the principal enlisted assistant to the platoon commander and assists him in matters pertaining to discipline, training, and efficiency of enlisted personnel. In addition, he—

(1) Is in charge of ammunition resupply for the platoon.

(2) Performs reconnaissance as directed by the platoon commander.

(3) May be designated to serve as liaison to the FDC of the direct support artillery battalion.

d. The *liaison agent* performs liaison in the absence of the liaison officer as outlined in *b* above. In addition, he operates and maintains the liaison section's vehicle and radio.

10. Communication Section

a. The *communication chief*—

(1) Commands the communication section.

(2) Advises the platoon commander on all matters pertaining to signal communication, including the state of training, functioning of channels of communication, and condition of signal equipment.

(3) Supervises the installation and operation of all means of communication within the platoon.

(4) Supervises the communication training of all platoon personnel.

(5) Supervises the performance of first echelon maintenance on signal equipment and arranges for higher echelon maintenance with the battle group communication platoon.

(6) Insures that all authorized signal equipment is on hand and assists the company supply sergeant in the procurement of signal supplies.

(7) Obtains and implements signal instructions.

(8) Supervises the establishment of communication with supported units.

(9) Supervises communication security.

b. The *switchboard operators* install, operate, and maintain the platoon switchboards. They help to install and maintain the platoon wire system as directed by the communication chief.

c. The *wiremen*, under the supervision of the communication chief, install and maintain the platoon wire system. They assist the switchboard operators in the performance of their duties.

Note. Duties and responsibilities of personnel are applicable for platoon or section operations. When the platoon operates by sections, each section must be allocated one or more forward observer teams and communication and fire direction personnel.

11. Fire Direction Center and Survey Section

a. The *fire direction officer* (FDO)—

(1) Takes charge of the fire direction center and plans, coordinates, and supervises its activities and training. He keeps himself informed of the tactical situation and the maneuver plans of the supported units. He is responsible for the preparation of firing data for all fires.

(2) Makes the decision to fire. When a target is reported, he examines its location relative to the front line, no-fire line, zones of fire, and reference points. Then, based on the nature of the target, ammunition available, and the policy of the battle group commander, he decides whether to fire the mission; the number of mortars to be fired; and the amount and type of ammunition to be used in engaging the target.

(3) Is responsible for maintaining ammunition records and initiating ammunition resupply to the mortar sections.

(4) Establishes and maintains close coordination of fires with the direct support artillery fire direction center.

(5) Supervises the survey party in the performance of its mission.

b. The *chief FDC computer*—

(1) Operates the FDC in the absence of the FDO. His duties are the same as the FDO's.

(2) Is responsible for informing the liaison team located at battle group headquarters of all intelligence information received in the FDC.

(3) Maintains a map firing chart from which he checks the accuracy of the chart operators, records and posts intelligence and tactical information.

c. The *chart operator*, under the supervision of the FDO, operates and maintains a current firing chart for the platoon. He supplies the computer with the mounting azimuth, initial firing data, deflections, and range to specific targets.

d. The *computer,* under the supervision of the FDO, determines the charge and elevation for the range given by the chart operator. He formulates and issues fire commands to the platoon and maintains a firing record of each mission fired. He also maintains current ammunition records and advises the chief computer of ammunition availability in the firing platoon.

e. The *chief of survey party*—

(1) Actively supervises and trains survey personnel in performing the mission of obtaining for the FDC the coordinates of each firing section, the selected observation posts, registration points, reference points, enemy targets, and the location of the counterfire squad.

(2) Coordinates with the direct support artillery battalion to obtain common survey control. This common control facilitates fire direction and exchange of survey information, enabling the mortar platoon and all supporting artillery to fill any fire request within their range.

(3) Performs reconnaissance under the direction of the platoon commander and coordinates closely with the firing section commanders when they select their mortar positions.

(4) Selects the locations of the survey stations and the traverse routes, and supervises the work of the survey section.

f. The *survey computer* records the angles, azimuths, and distances obtained from the survey and transforms this data into coordinate locations as directed by the chief of survey party.

g. The *instrument operator,* utilizing the aiming circle, measures horizontal and vertical angles between traverse stations. He assists the survey computer in computing the survey.

h. The *counterfire operations sergeant* receives, records, and evaluates all information that contributes to the accurate location of enemy close support weapons. His place of duty is the FDC of the heavy mortar platoon. Counterfire targets that are located are passed to the FDO for action. Targets that are beyond the capability of the unit are passed to the FDC of the direct support artillery battalion for action. The counterfire operations sergeant maintains close liaison with the battle group S2, S3, FSC (fire support coordinator), and the heavy mortar platoon commander to insure prompt, accurate evaluation and use of counterfire information.

12. Forward Observer Teams

These teams accompany forward units and advise the commander of the supported units of the capabilities of the mortar.

They request fires for supported units, observe and adjust fire for the mortar platoon, and may request and adjust artillery fires. For a detailed discussion of the duties of the forward observers, see paragraph 19.

13. Firing Section Headquarters

a. The *section commander*—

(1) Assumes responsibility for the training, discipline, control, and tactical employment of his section. He receives his orders from the platoon commander, except when the section is attached to another unit. He places himself where he can best control the fires of his section, and is responsible for the delivery of fires required by his mission.

(2) Selects the exact location of primary, alternate, and supplementary firing positions within the position area assigned by the platoon commander. He supervises the movement into position, the occupation and organization of the position, and the displacement to a new position.

(3) Is responsible for the delivery of sufficient ammunition to the mortars from the point where ammunition is made available by the platoon commander. He reorganizes his section as necessary to maintain maximum combat efficiency. When the section is operating alone, or in the absence of orders from the platoon commander, his duties and responsibilities are similar to those prescribed for the platoon commander.

(4) May be designated as liaison to the direct support artillery battalion FDC.

b. The *section sergeant* is second in command of the section. On the march, he moves at the rear of the section to maintain control and to keep in touch with the situation to the flanks and rear. He assumes command of the section when the section commander is absent. He is responsible to the section commander for the control and supervision of the actions of personnel at the firing positions. He supervises ammunition supply to the mortars and insures that sufficient ammunition is removed from containers, assembled, and made ready for firing.

14. Heavy Mortar Squad

The heavy mortar squad contains the men and equipment needed to serve one heavy mortar. The squad leader is responsible for the training, discipline, control, and employment of the squad. He supervises the movement of the squad to designated locations, the

preparation of the firing positions, and the delivery of fires by the mortar crew.

15. Counterfire Squad

For duties of the counterfire squad, see paragraphs 38 through 65.

16. Signal Communication

a. General. The ability of the platoon to render effective fire support depends on efficient communication. The means of signal communication used are wire, radio, messenger, visual, and sound. The communication plan should include the use of all available means of communication. To be effective, the system must utilize all available means.

b. Radio.

(1) The platoon normally employs 3 internal FM radio nets, 1 fire direction net, 1 fire control net, and a counterfire net. The fire control net is also the platoon command net. The platoon also monitors the division warning/broadcast net, which is an AM net.

(2) The platoon commander and liaison officer are on the battle group command net. The section commanders enter rifle company command nets as required.

(3) Radios located in the fire direction net are on the division warning net, the corps artillery metro net, and the supporting artillery fire direction net. Type platoon nets are shown in figures 3(1) and (2).

c. Wire. Wire for the platoon is installed by the wire teams organic to the communication section. The complexity of the system varies with the employment of the platoon and the time available. When time allows, wire is installed prior to or during occupation of positions. The system is expanded as time permits. Wire systems cannot be installed in all situations, but should be employed whenever possible. The system should be extended, duplicated, and improved to meet the maximum requirements as time, personnel, and equipment become available. Type platoon wire systems are shown in figures 4(1) and (2).

d. Communication for Counterfire Squad. See paragraphs 38 through 65.

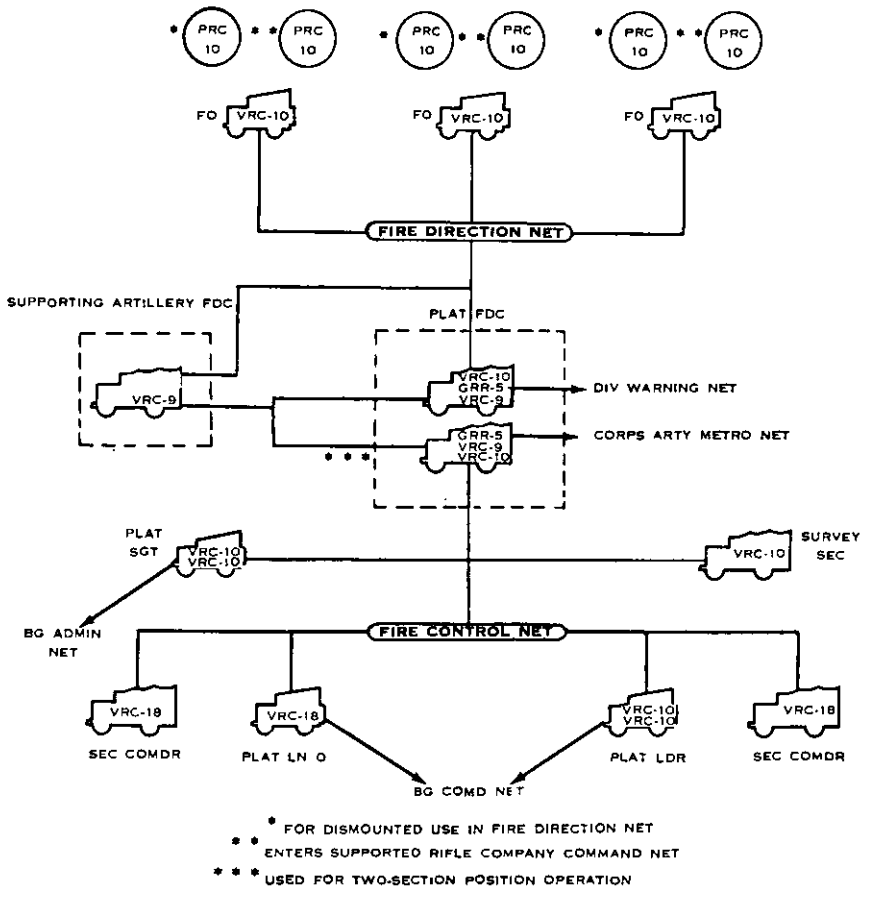
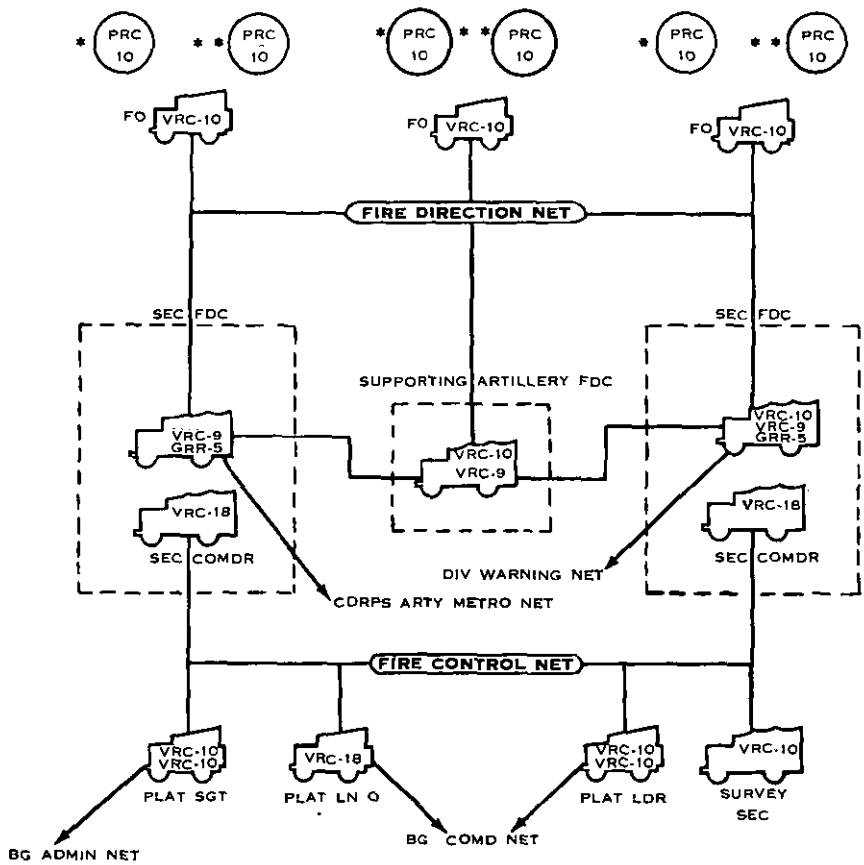


Figure 3. Type radio nets, heavy mortar platoon.



* FOR DISMOUNTED USE IN FIRE DIRECTION NET

* * ENTERS SUPPORTED RIFLE COMPANY COMMAND NET

2-section position

Figure 3.—Continued.

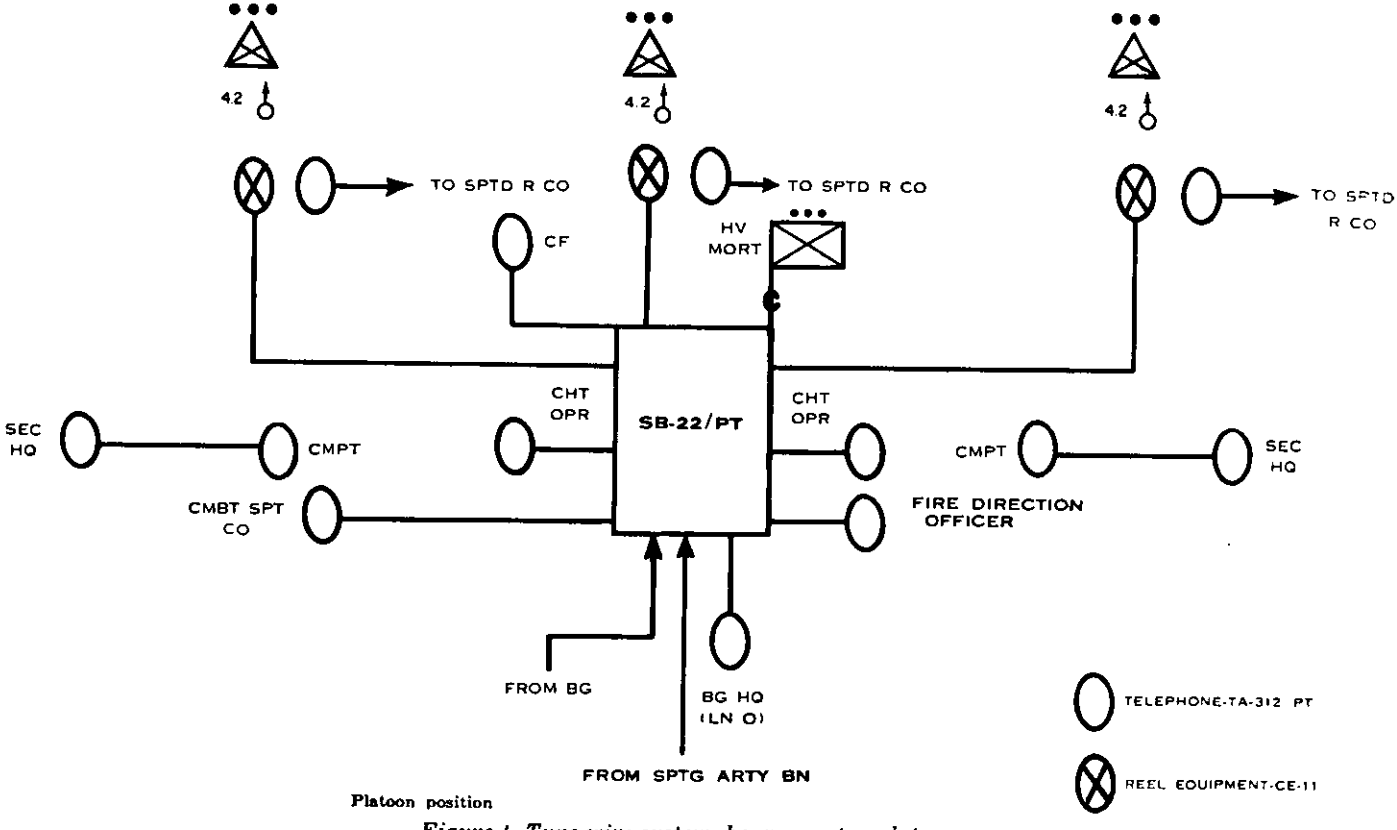


Figure 4. Type wire system, heavy mortar platoon.

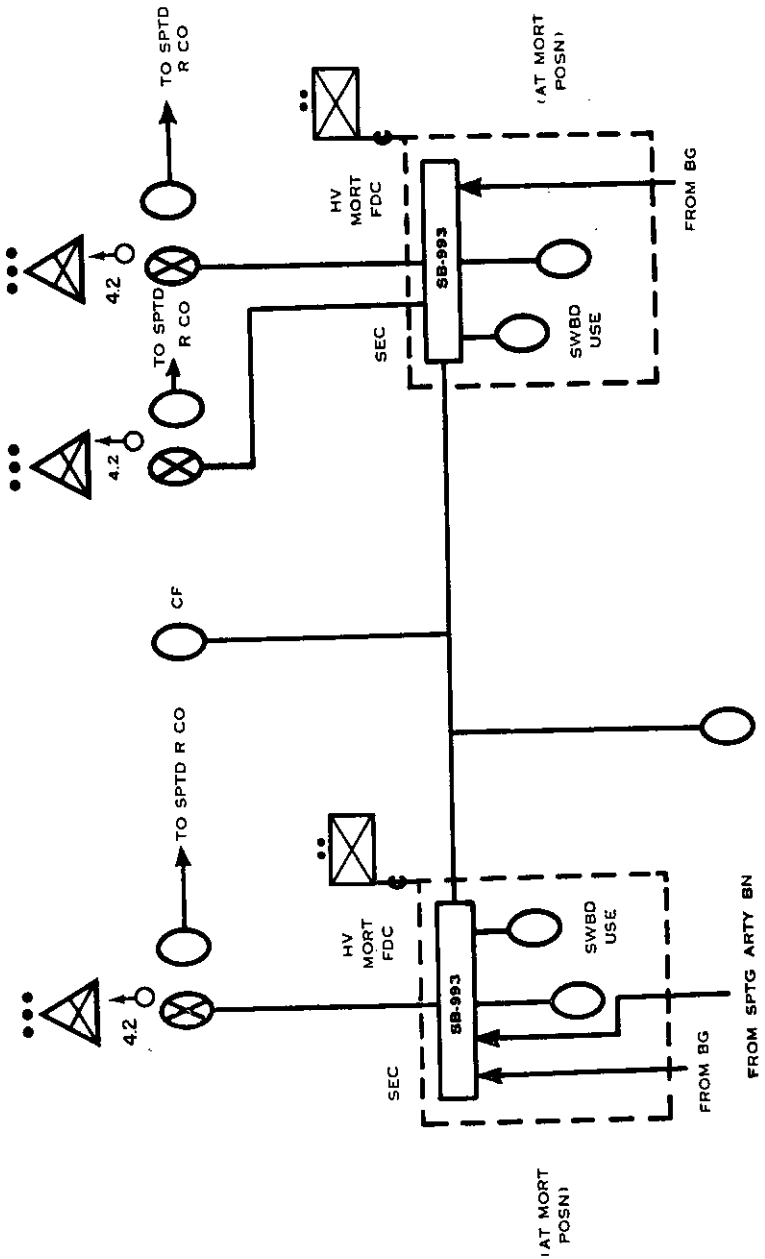


Figure 4.—Continued.

Section II. OPERATIONS

17. Liaison

The platoon establishes and maintains continuous liaison with the battle group headquarters and the direct support artillery bat-

talion FDC. During the planning phase and during critical phases of operations, the mortar platoon commander remains with or near the battle group commander. When he must be absent on other duties, he normally designates the platoon liaison officer to represent him at the battle group command post. The forward observer teams coordinate with artillery forward observers and the rifle company commanders in whose area they are working. The platoon commander coordinates with the supporting artillery through a designated liaison representative at the battle group CP and at the direct support artillery battalion FDC. When the sections operate separately in a direct support or attached role, the section commander establishes and maintains continuous liaison with the commander of the supported unit. When he is required to be absent, he designates a representative to maintain continuous liaison with the unit supported.

18. Employment

a. General.

(1) The platoon provides close and continuous fire support to the battle group. It provides general support for the battle group or direct support for designated elements. It must be capable of rapidly shifting and massing its fires to meet any changing situation. Primary, alternate, and supplementary positions are selected with this requirement in mind. Delivery of effective fire must not be sacrificed for other considerations.

(2) The platoon is employed as directed by the battle group commander, normally in general support of the battle group. The direct support artillery commander, who is the fire support coordinator for the battle group, insures maximum integration and utilization of available fire support. The mortar platoon and the direct support artillery battalion are organized and equipped to monitor each other's fire requests and to receive calls for fire from the other FDC. Normally, mortar and artillery forward observers process their requests for fire to their respective FDC.

(3) Organic fire support must be immediately responsive to, and consistent with, the changing tactical situation. The battle group commander, therefore, positions his mortars to support the main attack or (in defense) to cover the most dangerous avenues of approach. He may assign a priority of fires to designated units. The platoon commander controls the delivery of fire and displacement according to plans and instructions of the battle group com-

mander. Employment of the platoon is dependent on the mission, enemy, disposition of the battle group, terrain, and weather. (See FM 7–40.)

b. Section. When the situation does not permit the use of the mortar platoon under centralized control, a section may be placed in direct support of or attached to an element of the battle group to provide continuous close fire support to that element.

c. Detachment. Only under exceptional circumstances, is the platoon detached from its parent unit and attached to another battle group. Under such circumstances, the platoon commander insures prompt liaison and reconnaissance to the supported unit.

19. Observation

a. General.

(1) Continuous observation affords flexibility of fires and serves as a principal means of gaining information about the enemy. It also serves as a means of gaining information about our own units.

(2) The heavy mortar observer's area of responsibility for observation is the zone or sector of the supported unit. He observes the most critical areas within the battle group's sector. He must maintain a close working relationship with artillery forward observers. For forward observer procedures and duties, see FM 6–40 and FM 23–92.

b. Missions of the Forward Observer. The forward observer must—

(1) Establish observation.

(2) Maintain continuous surveillance over the supported unit's area of operation.

(3) Request, observe, and adjust fire.

(4) Report combat information.

(5) Arrange for maintenance of communication, to include duplication of facilities when possible.

(6) Determine the status of ammunition and type support that can be expected.

c. Procedures of the Forward Observer.

(1) Upon arrival at the command post of the supported unit, the forward observer—

(*a*) Determines the situation and scheme of maneuver of the supported unit.

(*b*) Locates the unit's tactical command post and other forward observers.

(*c*) Arranges to tie in with the supported unit's communication net.

(*d*) Gives supported unit locations of registration points and concentrations, to that it can call for prearranged fires.

(2) Upon arrival at the observation post, he—

(*a*) Determines his location and orients his map.

(*b*) Marks areas on his map which he cannot observe.

(*c*) Makes a study of the terrain to identify registration points, reference points, and other prominent terrain features.

(*d*) When time and situation permits, registers on the registration points.

(*e*) Makes a sketch of zone showing registration points, reference points, prominent terrain features, and likely target areas.

(*f*) Reports his location and fields of observation to the heavy mortar platoon FDC.

d. Observation Posts.

(1) Observation posts are established in the area of action of the supported unit to locate targets and direct fire for that unit and other units as may be required.

(2) An observation post should have the following desirable characteristics:

(*a*) Afford the most favorable view of the target area and zone of action.

(*b*) Afford ease of communication with the supported unit and the FDC.

(*c*) Be away from outstanding landmarks.

(*d*) Afford cover and concealment.

(*e*) Afford covered routes of approach from the rear.

(3) The observer selects alternate observation posts, if hostile fires force him to move, or if the primary post is blinded by smoke or haze. When practical, the alternate posts should have a covered route of approach from the primary post.

(4) The location of the observation posts must be coordinated with those of the 81-mm mortars and artillery observers to insure overlapping coverage of the area forward of and within the battle area.

(5) The observer occupies positions and displaces to locations where he can best observe the zone of action of the supported unit.

e. Coordination of Observation. The battle group commander through his S2 coordinates all organic observation to provide maximum coverage. Additional observation is provided by the direct support artillery battalion. Heavy mortar and artillery units coop-

erate in fire control by using each other's forward observers to observe and adjust fire. This insures support by the weapon that will best accomplish the mission.

f. Reports. The mortar platoon observers report significant enemy and friendly activities directly to the FDC of the heavy mortar platoon.

g. Aerial Observation. Army aircraft may be used to observe and adjust mortar fires. Direct radio communication is established between the FDC and the observing aircraft (FM 1–100).

20. Fire Direction

a. The definitions, objectives, techniques, and doctrine of fire direction for indirect firing and mortar gunnery are covered in FM 6–40 and FM 23–92. The purpose of fire direction is to achieve—

(1) Continuous and accurate fire support under all conditions of weather, visibility, and terrain.
(2) Prompt massing of fires.
(3) Flexibility of fires.
(4) Simultaneous placing of fires on numerous targets.

b. The FDC is that element of the platoon consisting of fire direction and communication personnel and equipment that the commander uses for fire direction and fire control. The FDC is located where the fires of the platoon can best be controlled. FDC personnel help the commander to control the fire missions, translate target intelligence, fire missions of higher commanders, and convert observers' requests for fire into commands to the firing sections. The efficiency and speed of execution of fire missions depend on the skill of personnel in the use of fire direction techniques and equipment. The fire direction officer supervises the activity of the FDC. Fire direction personnel, their duties and functions are outlined in paragraph 11.

c. When one section is operating independently, approximately one-half of the platoon fire direction personnel will establish a section FDC.

d. Heavy mortar fire direction procedures and techniques are based on, but differ slightly, from those of the artillery FDC in that the mortar is normally fired with a constant elevation and variable charge. Vertical interval between the mortar position and the target is converted to a range effect, and corrections for this effect are applied as charge corrections. These differences necessitate minor changes in basic procedures and techniques and are explained in detail in appendix II, FM 6–40.

e. The heavy mortar platoon FDC and the direct supporting artillery battalion FDC monitor each other's net. To insure adequate coverage of targets and to avoid duplication of effort, the battle

group fire support coordinator integrates the fires of the heavy mortar platoon and the direct support artillery battalion at both the battle group CP and the direct support artillery battalion FDC.

21. Fire Support Planning

a. General. The general principles governing coordination of fire support described for higher command levels are applicable within the battle group. However, to make sure that coordination is effected without adversely affecting the rapid delivery of fires, the procedures employed at battle group level must be as informal as possible. The fire support plan sets forth the commander's desired employment of fires in support of a given operation. The battle group fire support plan, when approved, is published as an annex to the battle group operation order (FM 7–40).

b. Mortar Fires.

(1) *Responsibility and control.* The platoon commander is responsible for planning, coordinating, preparing, and delivering all fires by his platoon. He gives priority to calls from his parent battle group; however, his platoon may, upon approval of the battle group commander, fire on call of division artillery or adjacent units when such firing will not interfere with firing in support of the battle group.

(2) *Characteristics of mortar.* The mortar has certain characteristics that must be considered in fire planning; for example, its—

(*a*) High rate of fire for short periods.
(*b*) Ability to fire in deep defilade.
(*c*) Steep angle of fall resulting in a greater lethal area.
(*d*) Capability of employment close to a mask for protection against enemy fire and observation.
(*e*) Relatively large dispersion pattern.
(*f*) Limited maximum and minimum range capability.
(*g*) Rapid displacement capability.

c. Fire Planning.

(1) Fire planning involves the following principles:

(*a*) Close and continuous support of the attacking or defending troops.
(*b*) Maximum prearrangement of fires.
(*c*) Cooperation with adjacent units.
(*d*) Continuous planning.

(2) The detail in which fire plans are made depends on the time available for planning, the extent and accuracy of target locations, the type of operation in which the supported unit or force is engaged, and the requirements of

the fire support plan of the higher echelon. Fire planning for a specific operation begins at each level with the commander announcing his concept of fire support. At battle group level, the fire plan is based primarily on requests from rifle companies, battle group headquarters, and those generated from target intelligence. Coordination of heavy mortar and artillery fires is effected simultaneously at the battle group CP and at the direct support battalion FDC. Mortar platoon liaison representatives at each location assist artillery personnel in integrating the fires of the heavy mortar platoon with those of the direct support artillery battalion. The result is one fire plan containing all requisite information such as graphic layout, target lists, and schedules of fire.

(3) To facilitate the tactical handling of prearranged fires, it may be desirable to arrange concentrations into groups, series, or schedules of fires. A system of numbers and letter prefixes should be used, based on a division SOP such as outlined in appendix II, FM 6–20.

(4) The fire capability of the platoon is the aggregate of the fire capabilities of its sections. The fire capabilities chart should show the area that can be covered by each section.

(5) The FSC, based on recommendations from forward observers and coordination with the battle group commander and staff, establishes the location of the battle group no-fire line. The FSC reports the selected line to division artillery. Division artillery disseminates the location of the no-fire line to its firing units and to the corps artillery FDC, which, in turn, disseminates it to all corps artillery units.

d. Company Fire Planning. The rifle company commander, through the mortar and artillery forward observers, requests the organic and nonorganic fire support desired. As a preliminary to fomulating this request, the forward observer informs the rifle company commander of the capabilities of the fire support available and obtains from him the following information:

(1) Present location of forward elements.

(2) Plan of attack or defense.

(3) Known enemy locations, including probable avenues of approach, assembly areas, and weapons positions.

(4) Protective fires desired.

(5) Location of the company command post.

e. Processing Fire Plans.

(1) Both the mortar and artillery forward observers send the company commander's fire requests to their respective

FDC for consolidation and coordination. Heavy mortar fires are integrated into the artillery fire plan at the direct support battalion FDC.

(2) The company fire support plans and the requirements from the battle group commander are integrated into the battle group fire support plan. This plan is prepared under the supervision of the FSC or his designated representative (normally the liaison officer from the direct support artillery battalion) and submitted to the battle group commander for approval.

22. Classification of Fires

a. General. Heavy mortar fires are classified according to methods of attack, targets, form, whether observed or unobserved, and whether or not they are prearranged. The method of attacking a target is influenced by the results desired from the fire. In general, these results are of four types which, by their description, furnish a guide for the method of attack.

(1) *Destruction*—fires delivered for the sole purpose of destroying material objects. Destruction fires may be accompanied by penetration, blast effect, or incendiary action, or by a combination of these actions.

(2) *Neutralization*—fires delivered to cause casualties, to hamper and interrupt the firing of weapons, movement, or action and to reduce the combat efficiency of enemy personnel.

(3) *Harassing*—fires of less intensity than neutralization, designed to inflict losses or, by the threat of losses, to disturb the rest of enemy troops, to curtail movement, and in general, to lower morale.

(4) *Interdiction*—fires placed on an area or point to prevent its use. Interdiction fire is usually of less intensity than neutralization fire.

b. Forms of Fire.

(1) A *concentration* is a volume of fire placed on an area within a limited time, or an area designated and numbered for future reference as a possible target. All mortar fires except registration fire and barrages are termed concentrations. The actual area covered by any concentration depends on the nature of the target to be engaged.

(2) A *barrage* is a prearranged barrier of fire designed to protect troops and installations by impeding enemy movement across defensive lines or areas. Each heavy mortar section can fire one barrage 150 meters wide. Each section supporting a forward unit in the defense is assigned

one barrage. These barrages are an integral part of the final protective fires. They are usually planned to cover dangerous avenues of approach, as in blocking narrow foot approaches to the position, or in covering wooded areas. To give maximum protection against an assault, barrages are located not more than 200 meters forward of the forward edge of the battle area (FEBA). Some factors that influence the distance of barrages from forward troops are—

(*a*) Range from mortar to barrage location.
(*b*) Inability to survey in mortars or to register.
(*c*) Conditions that result in decreased accuracy of fires (e.g., worn weapons, shifting base plates, and the state of training of the crew).
(*d*) The degree to which friendly troops are dug-in and protected by overhead cover.
(*e*) The presence of terrain features that might increase fragmentation effect or decrease accuracy (woods or steep slopes).

c. Observed and Unobserved Fires. Mortar fire is adjusted by observation whenever possible. Unobserved fires may be delivered on accurately located targets, but the effectiveness of unobserved fire depends on accurate survey data and firing corrections.

d. Prearranged Fires and Fires on Targets of Opportunity.

(1) *Prearranged fires* are those for which data has been prepared in advance. These may include both concentrations and barrages.
(2) *Targets of opportunity* are those targets located during the course of an action. They may be engaged at any time on request from anyone who can identify the target and adjust fire on it. If a target appears at a point for which no data has been prepared, it is engaged by adjustment following an estimation of the correction in range and deviation from the nearest reference point or by determining its geographic location on a map.

23. Survey

a. Survey permits the firing of unobserved fires and the accurate massing of fires on targets. Survey consists mainly of the topographical operations necessary to determine the relative locations, both horizontally and vertically, of the mortars and targets. Survey and fire direction are most efficient and effective when they are used together.

b. The survey party is used on missions assigned by the platoon commander. Its activities are supervised by the chief of the survey

party. During survey operations and prior to initial occupation of positions, section ammunition handlers may augment the platoon survey party. The survey party furnishes the FDC with the coordinates of each base mortar, observation post, registration point, and reference point, and the location of the counterfire squad, in that order. Survey is a continuous process requiring effective prior planning and thorough application. Accurate survey increases the effectiveness of indirect fires. Survey is accomplished in three phases:

(1) The reconnaissance phase, to determine the most efficient manner to accomplish the survey.

(2) The field work phase, during which the survey data is compiled.

(3) The computation phase, to determine coordinates using the data compiled during the field work phase by either mathematical computation or geographical plotting (TM 5–235).

c. To insure common survey control, the direct support artillery battalion establishes a survey control point within 1,000 meters of the heavy mortar platoon position area. This procedure facilitates coordination and integration of fires of the mortar platoon and artillery. The platoon must, however, initiate survey operations without delay, using the best starting data available. Upon establishment of common survey control, the platoon converts to this common control.

24. Reconnaissance, Selection, and Occupation of Position

a. Responsibility.

(1) The mortar platoon commander must keep himself informed of the battle group's tactical situation and plan of maneuver, so as to effect timely reconnaissance for platoon position areas and routes. He reports position areas and routes selected to the FSC. Coordination of the mortar platoon and the direct support artillery battalion position areas is a responsibility of the FSC. (The procedures to be followed by the platoon in the selection and occupation of positions parallel those outlined in FM 6–140.)

(2) When selecting a position, the platoon commander must formulate a plan for occupying the area selected, to include location of the weapons, vehicle park, wire routes, and routes into the position. Once he formulates his plan, he must issue necessary orders to execute it, including a general plan for survey and communications.

(3) Mortar range limitations make it imperative that reconnaissance for new firing positions be continuous. The commander must anticipate and plan for displacement of his platoon. Continuous fire support is provided by echeloned displacement.

b. Space Requirements. Whenever possible, the platoon is employed as a single unit. The sections are normally placed 200 to 500 meters apart. But if the battle group occupies a wide frontage, it may be necessary to employ the sections several thousand meters apart. The interval between individual mortars is normally 35 to 45 meters.

c. Reconnaissance. Position reconnaissance involves a search for locations for the various elements of the mortar platoon, to include firing positions, command posts, and observation posts. The high-angle firing characteristic of the mortar permits wider selections of positions than is normally considered for artillery weapons. Mortars can be positioned in small openings in woods and close to the base of hills or bluffs; ravines may also be utilized. These ground formations offer some protection from enemy observation or detection from weapons other than high-angle types. If necessary, the mortars may be hand-carried short distances to positions not accessible to prime movers.

25. Security

a. Firing Positions. The platoon or firing sections must be so positioned as to best accomplish their mission. Within the requirement of the mission, mortar units normally are located adjacent to reserve elements, thus increasing their own security. In some instances, position areas cannot be located near infantry elements; therefore, mortar personnel must be trained to occupy, organize, and defend their positions when necessary.

b. Responsibility. Security is a responsibility of command, and measures to be taken are stated in orders. These orders outline adequate security for all elements of the platoon from ground, air, nuclear, nonnuclear, and CBR attack. When planning security measures, the platoon commander considers the orders of the battle group commander, the effectiveness of available weapons, the proximity of friendly troops, and the enemy's capabilities.

c. Organizing for Security.

(1) The platoon habitually provides within its means a defensive perimeter which incorporates its organic weapons. Normally, the platoon organizes its defense in conjunction with infantry units near its positions.

(2) Air defense measures consist of passive means such as camouflage, concealment, and dispersion. During a motor march, an air guard is designated for each vehicle.

26. Displacement

a. General. To carry out its mission of close and continuous fire support, the platoon must displace promptly from one position area to another. Planning for displacement and reconnaissance for new positions is continuous. Effective planning and reconnaissance reduce the time that mortar units are out of action during a displacement. Reports on plans for displacement are made to the direct support battalion survey officer in order to insure timely survey. The scheme of maneuver of the supported unit influences the time and method of displacement and the location of new positions. Continuous fire support is made possible by displacing in echelon, so that at least one section is in position and able to fire at all times. Units normally displace by vehicle. Under special conditions, it may be feasible to displace by Army transport aircraft (FM 57–35).

b. Control. Except for elements attached to other units, the platoon commander controls the displacement of his platoon. He regulates movement to new positions according to plans and instructions of the battle group commander and the situation confronting the supported units. He informs the section commanders and communication chief of his plans for displacement. He gives instructions concerning reconnaissance, observation, communication, survey, and any other arrangements to be started prior to occupation of new positions. A section representative moves forward with the platoon party or joins it later. Displacement is usually made according to plan and is controlled by radio or messenger. Sections usually displace to assigned positions individually as directed by the platoon commander. If displacement is begun while fire missions are numerous, only one section may be displaced initially. This allows one section to fire at all times. The platoon commander reassigns to the section left in position the essential fire missions of the displacing section. Approximately one-half of the FDC is sent forward to prepare for operation at the new position area. In exceptional situations, when the leading assault elements are rapidly approaching the limits of mortar range, the entire platoon may displace at once. When such is necessary, coordination must be effected with other supporting units, such as the supporting artillery, to take over the fire missions of the platoon until displacement is completed.

c. Section Displacement Procedure. When a section is attached, the section commander initiates and controls displacement according to the plans of the supported unit commander. The procedure for displacement closely parallels that of the platoon, except that the entire section displaces at once. Coordination is necessary to insure that the fire missions of the section are taken over by

another unit until the section has displaced and is ready to fire. The 81-mm mortar section of the rifle company may take over these missions.

27. Ammunition

Class V supplies as related to the mortar platoon include all classes of ammunition, pyrotechnics, antitank mines, and chemicals. The commander is responsible for the supply of ammunition to his platoon, except for elements attached to other units. In such cases, the commander of the unit to which they are attached is responsible for their ammunition supply.

a. Types of Ammunition. Heavy mortar ammunition is available with high explosives, smoke, illuminating, or gas fillings.

(1) *HE shell.* HE shells are effective against personnel in the open or in light shelters. They usually are equipped with point detonation fuses. The HE shell with delay fuse is effective in the destruction of buildings and field fortifications of medium strength. The VT fuse is used to obtain air bursts and produces maximum blast and fragmentation effect on personnel.

(2) *Smoke shell.* Smoke ammunition is filled with white phosphorous (WP) or sulphur trioxide (FS). It is used to blind the enemy's observation, reduce the effectiveness of his fire, hamper his movements, deceive him regarding operations of friendly troops; as signals; and for fire adjustment. In addition, smoke ammunition is used for its incendiary, psychological, and casualty producing effect. The 4.2-inch smoke shell is the primary screening ammunition under direct control of the battle group commander.

(3) *Illuminating shell.* The illuminating shell produces 500,000 candle power and burns for 70 seconds; its rate of descent is relatively high, 30 feet per second. The diameter of the area illuminated by each round is 750 meters. This ammunition can be fired continuously at the rate of 2 rounds per minute. (See FM 20–60.)

(4) *Gas shell.* The gas shell may be filled with either persistent or nonpersistent type agents. It is effective as a casualty producer and may be used to deny ground for a limited period of time. The 4.2-inch mortar is ideally suited for chemical warfare because of its initial high rate of fire.

b. Ammunition Loads. The basic load is that quantity of ammunition authorized to be carried on individuals and vehicles of a unit. The platoon enters combat with its basic load intact. Replenish-

ment of basic loads to keep pace with expenditure of ammunition is a command responsibility. Only that ammunition necessary to meet anticipated needs is unloaded at mortar positions; remaining ammunition is kept mobile.

c. Resupply.

(1) Resupply is effected as ammunition is expended. Basic loads are replenished from the battle group combat trains by the platoon ammunition vehicle.

(2) The platoon distributing point is selected by the platoon commander and is supervised by the platoon sergeant.

(3) Normally, the platoon ammunition vehicle resupplies the mortars at the section positions. However, the squad vehicle may resupply from the platoon distributing point.

d. Ammunition Supply During Offensive Combat. When heavy expenditures are expected because of preliminary firing or other special firing missions directed by a higher commander, ammunition in excess of basic loads may be required. Only that ammunition required by the mission is obtained.

e. Replenishment During Defensive Operations. Ammunition requirements for defensive operations are estimated before the action. When heavy expenditures are anticipated, additional ammunition is prepositioned at the mortar positions. Ammunition placed at mortar positions must not exceed the anticipated expenditures. Continuous replenishment of the basic load is accomplished throughout defensive operations.

f. Replenishment During Retrograde Movements. Resupply is seldom made to forward areas. Sufficient ammunition for contemplated action is left with each unit. The battle group S4 prepositions ammunition along routes of withdrawal. When vehicles are not available to establish mobile distributing points, limited amounts of ammunition may be placed on the ground. If for any reason ammunition placed on the ground is not expended or evacuated, and capture by the enemy is imminent, it is destroyed or rendered unserviceable before the position is evacuated.

Section III. OFFENSE

28. Employment

The mission of the heavy mortar platoon in offensive combat is to provide close and continuous fire support to the assault elements of the battle group. Heavy mortar fires may be used to augment nuclear fires and to cover areas where nuclear fires are not used. Missions which may be assigned to the platoon or section are general and direct support. The platoon or a section of it may be attached to an element of the battle group. (See FM 7–40.)

a. General support is the normal and preferred method of employment and is used whenever the situation permits. It allows maximum flexibility of fires and insures ease of command control and continuity of support; it simplifies communication, liaison, and supply. When placed in general support, the mortar platoon is under the control of the battle group commander. There it—

(1) Answers fire requests from the rifle companies, mortar observers, and artillery forward observers.
(2) Establishes and maintains liaison with the battle group headquarters and the direct support artillery battalion FDC.
(3) Insures that wire communication is established from the direct support artillery battalion to the mortar platoon FDC.
(4) Establishes a zone of fire as directed by the battle group commander. The platoon is disposed to support the main attack or the most critical area of the battle group zone.
(5) Allocates forward observer teams based on tactical requirements.
(6) Displaces at the discretion of the platoon commander or on order. Firing positions, fire capabilities, and readiness to fire are reported to the direct support artillery battalion FDC.
(7) Designates priorities of fire as directed by the battle group commander.

b. A platoon is placed in *direct support* of a specified unit when it is desired that the platoon answer directly the supported unit's request for fire. The entire platoon may be employed temporarily in direct support of a single unit of the battle group when the battle group commander considers the mission of that unit sufficiently important.

c. Attachment is used when required by the mission. Sections are attached to the units they are to support when it is not practicable for the platoon commander to retain tactical control, control the fires, or handle supply. This may occur when the supported unit is operating on an independent mission, is beyond the supporting fires of the battle group, or when communication is inadequate. Exceptionally, the entire heavy mortar platoon may be attached to a single unit operating on an independent mission.

29. Movement to Contact

a. Movement to contact is that ground movement conducted in a theater of operations preliminary to combat to place troops in a position to close with the enemy. Movements to contact are classified by the degree of probability of contact. The purpose, character-

istics, and doctrine for movement to contact are discussed in FM 7–40, FM 100–5, and FM 101–10. The remainder of this paragraph applies to the advance when contact is imminent.

b. When the battle group is in column formation, with the leading company acting as the advance guard, one heavy mortar section is normally attached to or placed in direct support of the advance guard; the remainder of the mortar platoon moves well forward in the main body. When the battle group is widely deployed, heavy mortar sections may be attached to leading or flank companies.

c. The heavy mortar reconnaissance party, forward observers, and liaison personnel move with the leading company. The platoon commander marches with the battle group commander or with the leading company. The platoon is prepared to occupy firing positions promptly whenever the supported companies gain ground contact with the enemy. The platoon may be ordered to place sections in successive firing positions during the approach march in order to give immediate support upon making contact. The approach march ends when ground contact is made or when the battle group occupies attack positions.

30. Conduct of the Attack

a. Preparatory Fires. Mortars may deliver preparatory fires to neutralize, destroy, or screen hostile positions. These fires are delivered before the attack. They are prearranged and closely coordinated with supporting artillery and other mortar fires. They are directed upon targets of primary interest to the supported forward units. Suitable targets include defensive areas, machineguns, antitank guns, mortars, command posts, and observation posts. Before shifting a preparation, heavy mortars may also be used to fire screening missions. The battle group commander designates the targets and time for opening fire. The duration or intensity of the preparation is governed by the availability of ammunition and targets. The time or condition for shifting preparatory fires is coordinated with the unit or units being supported. Normally, fires are shifted at the same time that the company commander orders his lead elements to begin the assault.

b. Fires During the Attack. When preparatory fires shift, heavy mortars continue neutralization of enemy supporting weapons and observation. When a surprise attack is launched without preparatory fires, heavy mortars are prepared to deliver supporting fires on call during the attack. Mortars engage defensive areas and emplaced weapons. These include targets of opportunity discovered by the advancing assault echelon. To insure continuous support and to simplify communication and fire control, mortars are plac-

ed well forward during the attack. The platoon helps to maintain fire superiority on each successive objective. These fires assist in a continuation of the attack. After any halt of the attack, mortars are fired on enemy defensive areas, observation posts, weapons, and targets of opportunity. This is similar to support of the initial advance, and it permits the rifle units to resume the advance with fire superiority.

c. Fires to Assist Supported Units in Reorganization. Mortar fires are used to support the battle group reorganization. During an attack there may be temporary halts for reorganization or the attack may be stopped by hostile resistance. During these halts, the mortar platoon assists supported units by firing to assist in breaking up enemy counterattacks. Displacement during the advance is anticipated, so that heavy mortars will be in position in time to give support to the reorganization. During reorganization, the platoon occupies positions to support a continuation of the attack. Reorganization of the mortar platoon is accomplished during action. Key personnel who have become casualties are replaced, communication difficulties are corrected, ammunition is replenished, and casualties are evacuated.

31. Pursuit

The battle group may be ordered to execute a pursuit to maintain pressure and prevent disengagement. Mortars are employed to fire on targets of opportunity and to interdict routes of enemy withdrawal. The platoon remains within supporting distance by frequent displacement or by moving by bounds. The company or companies exerting the direct pressure may have one or both sections of heavy mortars attached or in direct support. Additional vehicles may be provided to carry ammunition in anticipation of greater difficulty in effecting replenishment. Resupply by Army aircraft may also be possible (FM 1–100).

32. Attack on Multiple Axes

When the battle group attacks on two axes, the mortar platoon normally supports the main axis. To insure adequate fire support, the other fire support elements are split but are retained in direct support under centralized control. Because of the need to provide the secondary attack with a responsive means of fire support comparable to that furnished the main attack with the heavy mortars, a portion of the direct support artillery battalion normally marches on the secondary axis.

33. Support of a Night Attack

a. Night combat is characterized by a decrease in the battle group's ability to place aimed fire on the enemy, difficulty in move-

ment, and difficulty in maintaining control, direction and contact. However, night operations are advantageous in that darkness hides friendly units from the enemy and reduces the accuracy of the enemy's target acquisition means. Especially is this true in nuclear warfare.

b. The employment of the mortar platoon in a night attack is similar to its employment during daylight; however, due to poor visibility, the platoon must acquire targets by relying on map data, daylight registration, or radars and sound ranging set of the radar section and counterfire squad. The adjustment of fires at night is difficult. If illumination is permitted, however, the forward observer can satisfactorily adjust fires using concurrent illumination. For details on the use of battlefield illumination, see FM 20–60.

c. The mortar platoon may be used in night attack to silhouette enemy forces on the objective. It does this by firing white phosphorous on flammable targets (e.g., built-up areas or woods) located beyond the objective. White phosphorous and illuminating rounds may be utilized to help the attacking echelon maintain direction.

d. Effective and reliable communication is essential in a night attack; wire is the preferred means. When possible, wire communication is maintained by the forward observer throughout the attack and the reorganization phase. Hand reels or wire dispensers may be used to install wire circuits as the unit moves forward. The forward observer maintains radio listening silence until the attack is discovered, at which time he may resume normal radio transmission.

Section IV. DEFENSE AND RETROGRADE

34. Fire Plan

a. The fire plan for defensive and retrograde operations is designed to bring the enemy under fire as soon as he comes within observation and range, to hold him under an increasingly heavy volume of fire as he approaches the forward edge of the battle area, and to break up his assault on the position. If he penetrates the battle area, the heavy mortars assist in limiting his penetration; they may be used to support a counterattack.

b. Nuclear fires are a vital part of the defensive fire plan. Nonnuclear fires of the mortar platoon are planned to assist in the defense of unit positions, to force the enemy to mass, to augment nuclear fires, and to cover areas where these fires are not used.

35. Defensive Fires

Mortar fires during a defensive operation include long range fires, close defensive fires, final protective fires, and fires within battle area.

a. Long Range Fires. Long range fires are planned to engage the enemy as early as possible. They inflict casualties, delay his advance, disrupt his organization, and deceive him as to the exact location of the battle area. During this phase, observed targets are engaged without delay wherever they appear, and take priority over unobserved targets. The fires of heavy mortars supporting the combat outpost and other ground security elements are included in this phase.

b. Close Defensive Fires. Close defensive fires are used to destroy the integrity of the attack by directing fire on the attacker before the assault, to disrupt command, cover attack positions, neutralize observation, and weaken supporting fires.

c. Final Protective Fires. Final protective fires are the fires planned to break up the enemy's assault on the battle area. For the heavy mortar platoon these are barrages. (See paragraph 22.) The battle group commander designates the general area for the barrage. The forward rifle company commander in whose area the barrage is located selects the exact location. Data is then computed for the barrages and, if time and the tactical situation permit, the mortars are adjusted in. The barrage is top priority fire and whenever the mortars are not firing other missions, they will be laid in to fire the barrage. Ammunition should be prepared and kept ready at the mortar positions for this purpose.

d. Fires Within the Battle Area. If the enemy succeeds in penetrating the battle area, heavy mortars assist in limiting the penetration. They are fired to prevent enemy reinforcements from entering the penetrated area and to destroy them after they enter. When the penetration has been slowed or stopped, a counterattack is made. The employment of heavy mortars during a counterattack is the same as in normal attack. Mortar fires in support of counterattacks are planned during the organization of the defense and are coordinated by the counterattacking force commander. When the enemy is ejected, he is pursued by fire.

36. Employment—Defense

a. The mortar platoon is normally employed in general support when the battle group is engaged in a defense and is so located that its fires can cover the most dangerous avenue(s) of approach. The fire support coordinator plans and integrates the fires of the platoon with those of the direct support artillery battalion. The FDC of both units are tied in by wire and radio, thereby insuring

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maximum utilization of fires. The mortars are usually emplaced within or near an occupied position of the battle group. The platoon may be employed by sections when the mortars cannot cover the entire front from a platoon position. The battle group commander assigns the general position area for the platoon; the platoon commander selects the exact position within the designated general area.

b. It may be necessary to place a heavy mortar section in direct support of or attach it to an element of the battle group (e.g., the combat outpost). This section will revert to general support at the earliest practicable time. The platoon supports a counterattack as it supports a normal attack. For a complete discussion of the defense and its variations, see FM 7–40.

37. Employment—Retrograde

a. General. A retrograde movement is any tactical movement of a command to the rear or away from the enemy. Heavy mortars are used extensively in such a movement. In general, positions are occupied hastily, and a wide latitude is allowed the heavy mortar platoon commander in his choice of position. Positions are selected and displacements made, so that continuous support may be rendered the troops engaged in the operation. Plans are made to allow mortars time to displace without abandoning materiel to the enemy. Materiel that cannot be evacuated is destroyed.

b. Night Withdrawal. The mortar platoon is left in position until the withdrawing force breaks contact and begins its withdrawal. One section of mortars may be left with the battle group detachments left in contact; the other section withdraws to the next position as ordered by the battle group commander. Elements left with detachments left in contact operate with skeleton crews; they fire to simulate normal activity and to assist the detachments in accomplishing their mission. These elements are ordered to move to the rear position in time to permit emplacement of all mortars by daylight if possible. Crew members not left with the detachments left in contact move to the rear position where they prepare emplacements for later occupancy. All mortar elements not left with the detachments move to the rear where they prepare and occupy previously selected positions. Movement should be completed before daylight. Registration fires are completed and the platoon is prepared to give normal fire support shortly after daylight.

c. Daylight Withdrawal. The mortar platoon usually supports a daylight withdrawal under platoon control. Mortar elements are withdrawn in time to prevent capture or destruction. Heavy fire is placed on the enemy both before and during the withdrawal. This prevents interference with the withdrawal until it is successfully

underway. Heavy mortars are used to establish and maintain smoke screens in order to limit hostile observation.

d. Delaying Action. A delaying action is an operation by which the advance of the enemy is retarded. The purpose of a delaying action is to gain time while avoiding a decisive engagement. The mortar platoon supporting a delaying action normally remains under platoon control. When platoon control is impracticable, sections of the platoon may be attached to the delaying force. The mortars are usually placed behind the initial delaying position. When the time of withdrawal cannot be anticipated, mortar sections are disposed in depth to insure continuity of support. They fire to delay the enemy at long ranges and to provide close support to the troops during the withdrawal from each position. Weapons carriers remain near the mortars to facilitate withdrawal. Only the ammunition required for immediate missions is placed at gun positions.

Section V. COUNTERFIRE SQUAD

38. Mission

The mission of the counterfire squad is to locate enemy close support weapons.

39. Organization and Training

a. Organization. The counterfire squad consists of a squad leader (chief operator), a counterfire specialist (operator), two computers, and two plotters. The squad is divided for sound locating operations into two teams. The chief operator, one computer, and one plotter are in one team. The operator, one computer, and one plotter are in the other team.

b. Training. The heavy mortar platoon commander supervises the training of the counterfire squad. He is assisted by the counterfire operations sergeant. This training includes recognizing, evaluating, recording, and reporting counterfire information. During advanced unit training, arrangements are made for the counterfire squad as part of the heavy mortar platoon to train with the rifle companies, so that they become proficient in operating together; then the squad takes part in battle group exercises. In tactical exercises; enemy weapons are simulated so that the counterfire squad and other agencies get realistic practice in collecting counterfire information.

40. Duties of Personnel

a. The squad leader's duties include—

(1) Acting as operator in the control team and as chief operator for the squad.

(2) Seeing that accurate data is promptly reported to the appropriate agency as sound locating reports.

b. The counterfire specialist's duties include—

(1) Acting as second in command of the squad.

(2) Acting as operator of the second team.

(3) Seeing that accurate data is properly reported to the computer of the control team.

c. Each computer's duties include—

(1) Assisting the squad leader or the counterfire specialist in transporting, installing, and surveying the equipment.

(2) Computing the azimuth to the targets by using data obtained from the recorder.

(3) Recording data on the data sheet.

(4) Acting as a radio operator.

(5) Seeing that accurate data is passed on. (The computer at the remote team gives data to the computer at the control team. The computer at the control team gives the data from both teams to the control team plotter.)

d. Each plotter's duties include—

(1) Assisting the squad leader or the counterfire specialist in transporting, installing, and surveying the equipment.

(2) Plotting the data from both teams and reporting it to the counterfire operations sergeant located in the FDC of the heavy mortar platoon when his team is the control team.

(3) Acting as a radio operator or as a driver.

41. Equipment, Maintenance, and Supply

a. Organic transportation of the counterfire squad consists of a ¼-ton truck and trailer. Other organic equipment includes the AN/TNS–3 sound ranging set consisting of microphone arrays, interconnecting cables, recorders, soundpowered telephones, computers M–414; aiming circles; and M–16 plotting boards. Additional equipment authorized the squad is a PE–210 power unit and AN/PRC–10 radio sets (TM 11–2552A).

b. First echelon maintenance on the sound ranging set is performed by members of the counterfire squad. Equipment requiring a higher echelon of maintenance is turned over the the communication platoon of headquarters and headquarters company.

c. The combat support company headquarters assists in the maintenance of all organizational equipment and individual weapons, and resupply.

42. Counterfire Operations

a. Counterfire operations include all measures initiated by the infantry to attack enemy close support weapons by fire. These in-

clude countermortar activities (FM 6–20), as well as, activities against other enemy close support weapons, including direct fire weapons. Infantry counterfire operations and artillery countermortar activities are coordinated by the battle group S3 and FSC.

b. The effectiveness of counterfire operations depends on the speed and flexibility with which the most appropriate counterfire weapon is selected to engage each counterfire target. Speed and flexibility depend on obtaining information rapidly in the FDC. Information of the number, type, and disposition of enemy weapons must be timely, accurate, and complete to be of value in counterfire operations.

43. Battle Group Counterfire Information

a. Counterfire information includes all information that contributes to the location of enemy close support weapons. It is the basis for effective counterfire operations.

b. The counterfire center is located in the mortar platoon FDC. It is established and operated by the counterfire operations sergeant, who has responsibility for collecting, evaluating, and disseminating counterfire information. He informs mortar FDC personnel whenever counterfire information indicates the location of a counterfire target. He submits reports of counterfire information to the battle group S2. This report lists the disposition and number or types of enemy close support weapons.

44. Control

a. The counterfire squad normally remains under the control of the mortar platoon. The squad reports information directly to the counterfire operations sergeant in the FDC. This assures the greatest flexibility and effectiveness of battle group counterfire operations. If the squad cannot establish direct communication with the counterfire operations sergeant, it submits data to the nearest mortar forward observer, who forwards it directly to the FDC. For normal counterfire information radio net, see figure 5. When time permits, a wire system is established which parallels the radio net.

b. If the counterfire squad is attached to a subordinate unit of the battle group, it reports counterfire information directly to that unit for action.

45. Counterfire Agencies

Agencies organic to the battle group include the counterfire squad, the radar section, the reconnaissance platoon, the assault weapon platoon, the rifle companies, and other battle group units in a position to obtain shelling reports. Other agencies include air

observers, photointerpretation specialists, POW interrogation specialists, attached and supporting units, and higher headquarters. All men in the battle group, however, are trained to report counterfire information.

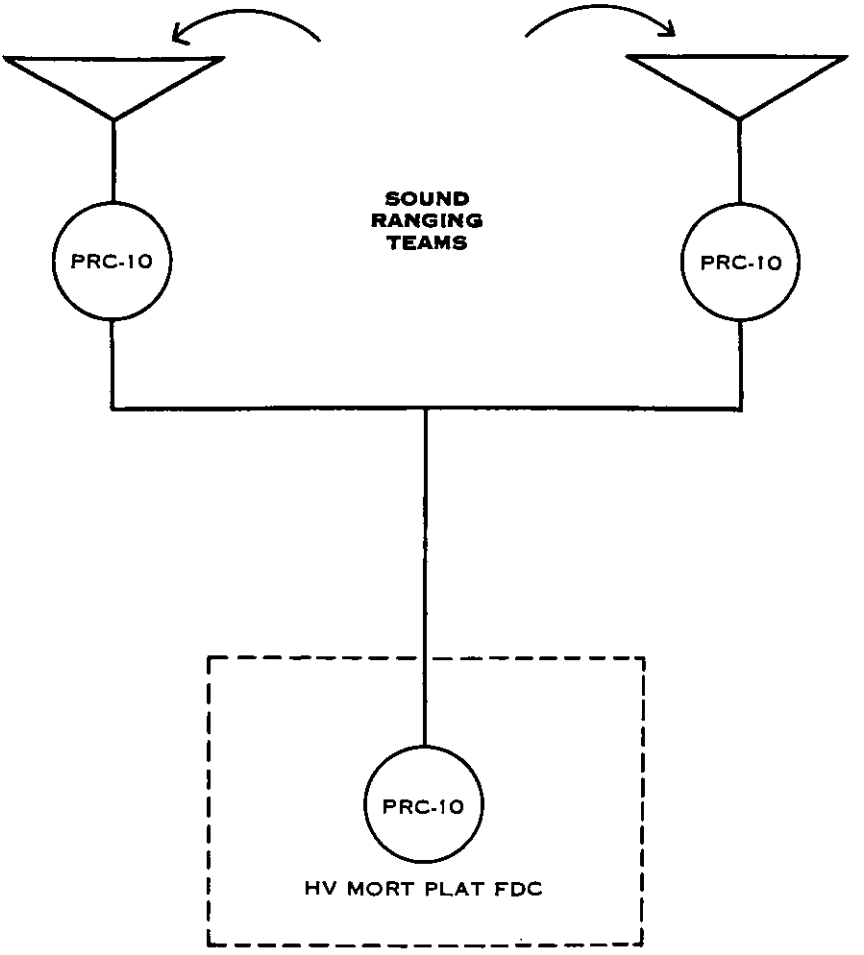

Figure 5. Counterfire information radio net.

46. Infantry Counterfire Weapons

a. Any infantry weapon that can destroy or neutralize enemy close support weapons is a counterfire weapon. The heavy mortar is the principal counterfire weapon in the battle group.

b. Counterfire missions include precision fire and area fire. To execute these missions without adjustment requires accurate target data. Lacking accurate target data when helping an infantry counterfire weapon to adjust fire, the counterfire squad furnishes

approximate target data initially, then computes the difference between the target and the shall burst locations and reports range and deviation corrections to the counterfire weapon.

c. The infantry counterfire weapons can use, and the counterfire teams can furnish, accurate target data only when their own positions are surveyed. When these surveys are not practicable, the counterfire squad may assist the weapons to engage unobserved targets by the *rapid method of fire adjustment* (par. 55).

47. Records and Reports

a. The counterfire operations sergeant keeps a counterfire information form (fig. 6) and a counterfire chart with a shelling report overlay and a suspect overlay (fig. 7). The counterfire chart is an acetate-covered map mounted on a board. Two sheets of acetate are fastened to opposite sides of the board so that they can be placed individually or together over the map. One of these acetate sheets is the shelling report overlay; the other is the suspect overlay.

b. All shelling reports (FM 6–20) and sound locating reports are recorded first on the counterfire information form. Then the shelling report overlay is placed next to the counterfire chart and a ray is plotted from the point of origin of the shellrep along the reported azimuth. Along the ray itself is written the time a particular weapon was reported active, the number of weapons firing, estimated caliber, and the number of the shelling reports from which the information was plotted. Depending on the accuracy of the shelling reports, the ray now plotted is a line of indefinite length, with the enemy weapon located somewhere along the line. If the distance to the weapon was reported, it is also entered. Intersection of two or more rays of the same estimated caliber that were active at approximately the same time indicates the general location of the firing weapon. Locations determined by this method or by a single ray with an estimated distance to the weapons are evaluated to determine if the enemy weapons could logically be there. If the location is logical, it is then plotted on the suspect overlay.

c. When each suspect location is confirmed by additional reports or other means, it becomes a counterfire target and is transferred to the counterfire chart. When shelling reports and sound or radar locations are received, the counterfire chart should be consulted immediately to ascertain if the active weapons have been previously located. Data of accurately located enemy weapons is reported immediately to the fire direction officer for use in counterfire missions.

SHELLREP NUMBER	A REPORTED BY AND TIME	B POSITION OF OBSERVER (MAP COORDINATES)	C AZIMUTH OF SOUND FLASH, OR FURROW	D TIME FROM	E TIME TO	F AREA SHELLED	G NUMBER AND TYPE OF GUNS	H NATURE OF FIRE	I NUMBER & TYPE OF SHELLS	J FLASH-BANG SECONDS	K DAMAGE (REMARKS)
1	WHITE OP 0710	970859	5690 M FL	0650	0700	967853	1SP	HARASS	6 HE	4 SEC	
2	CO, CO B 0715	949835	6200 M CRAT ANAL	0700	0710	949835	M/MORT	HARASS	12 HE		3 KIA 1 TRK DESTR AT 949834
3	BG OP #1 0718	960847	380 M SND	0710	0715		2 M/MORT		10 HE		

Figure 6. Counterfire information form.

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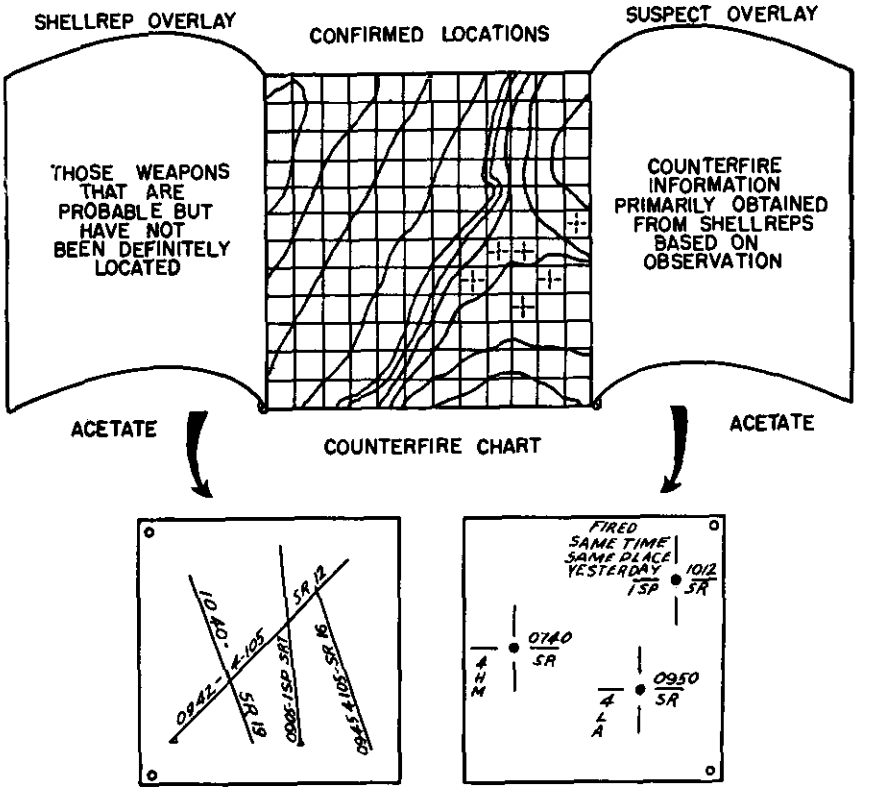

Figure 7. Counterfire chart.

48. Technique and Theory of Sound Locating

a. The technique of surveying and sound locating requires a knowledge of measuring and plotting magnetic azimuths on a map substitute. For this reason, the men of the counterfire squad are trained in map reading and surveying before they learn sound locating technique. For a diagram of the sound locating equipment of one team, see figure 8.

b. Sound locating is finding the location of a sound source. Two methods are used. One method uses two sound locating teams while the other uses only one. When only one team is used, it computes one azimuth by sound direction finding, and it computes distance by sound ranging. When two teams are used, each team computes an azimuth to the sound source by sound direction finding. Both azimuths are then plotted, and their intersection is the location of the sound source. Sound direction finding and sound ranging are described in *c* and *d*, below.

c. Sound direction finding is computing the magnetic azimuth from a point to the source of a sound. Sound waves travel in all

directions away from their source, like the waves caused by a stone dropped into a pond. This sound is received by all three microphones of the team and transmitted to the recorder. It does not reach all three microphones at the same time, so it is recorded as three sounds on a moving magnetic steel tape. The time differences between the sounds recorded on the tape are used by the computer to determine the magnetic azimuth from the No. 3 microphone to the sound source. Since sound direction finding from one team gives only the magnetic azimuth and not the distance to the sound source, to locate the sound it is also necessary to find either the magnetic azimuth from another location or the distance to the sound source by some other means (fig. 9).

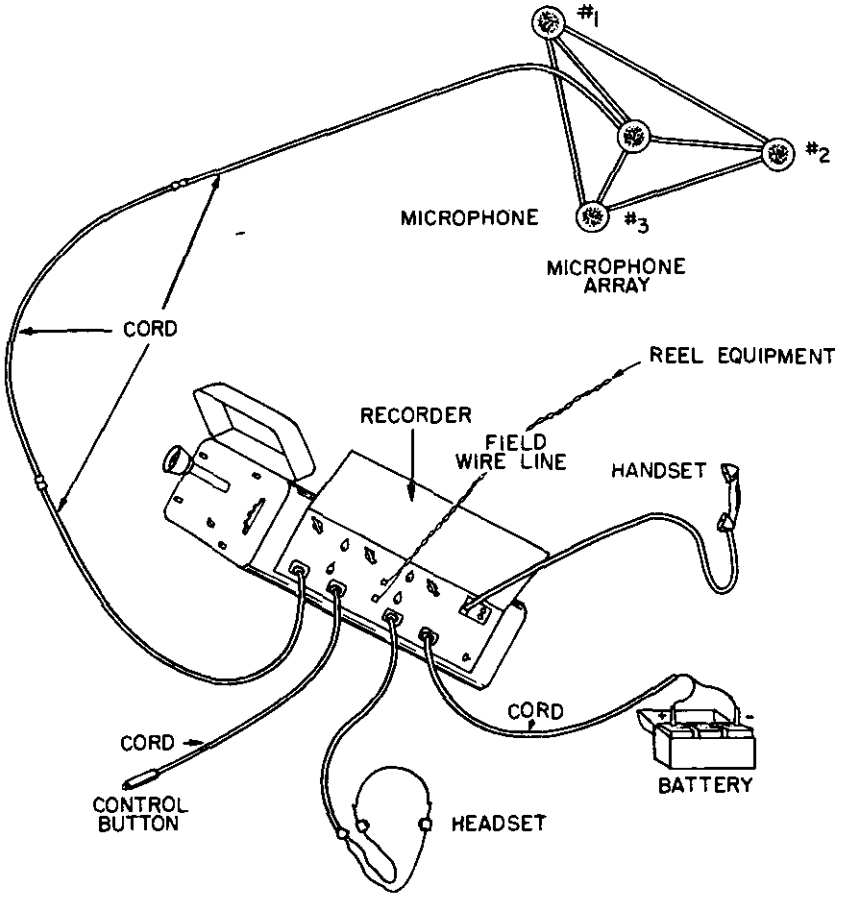

Figure 8. Counterfire team sound ranging equipment.

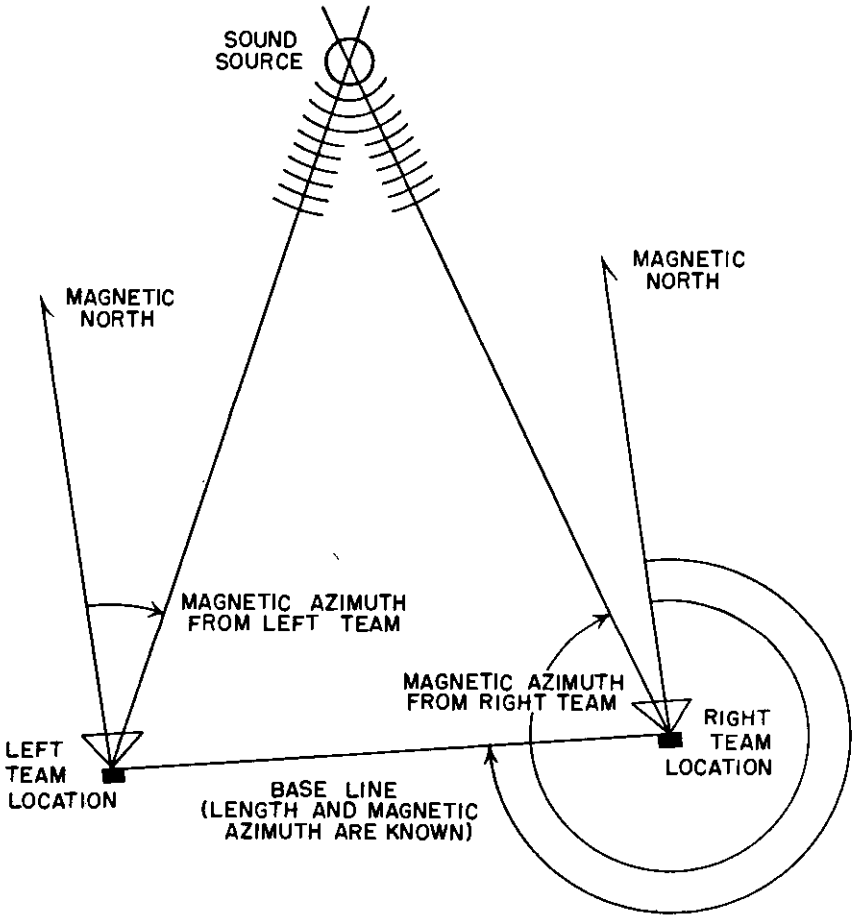

Figure 9. Sound direction finding from two or more teams.

d. Sound ranging is finding the distance from a point to the source of a sound. A sound is received by a telephone located at the sound source, transmitted by electricity to the recorder, and recorded on the recorder's moving tape. The same sound, which takes longer to travel by air to the team location, is received by the No. 3 microphone and recorded on the moving tape. The time difference between the sound recorded by the telephone and the sound recorded by the No. 3 microphone is used to compute the distance from the No. 3 microphone to the sound source. This method is not used to measure the distance to an enemy weapon, an area under enemy control, or to any other location where a field telephone wire line cannot be laid. This method may be used to measure the length of the baseline, the distance to a counterfire weapon position, or the distance to a reference point that is not under enemy control and can be reached by telephone wire line (fig. 10).

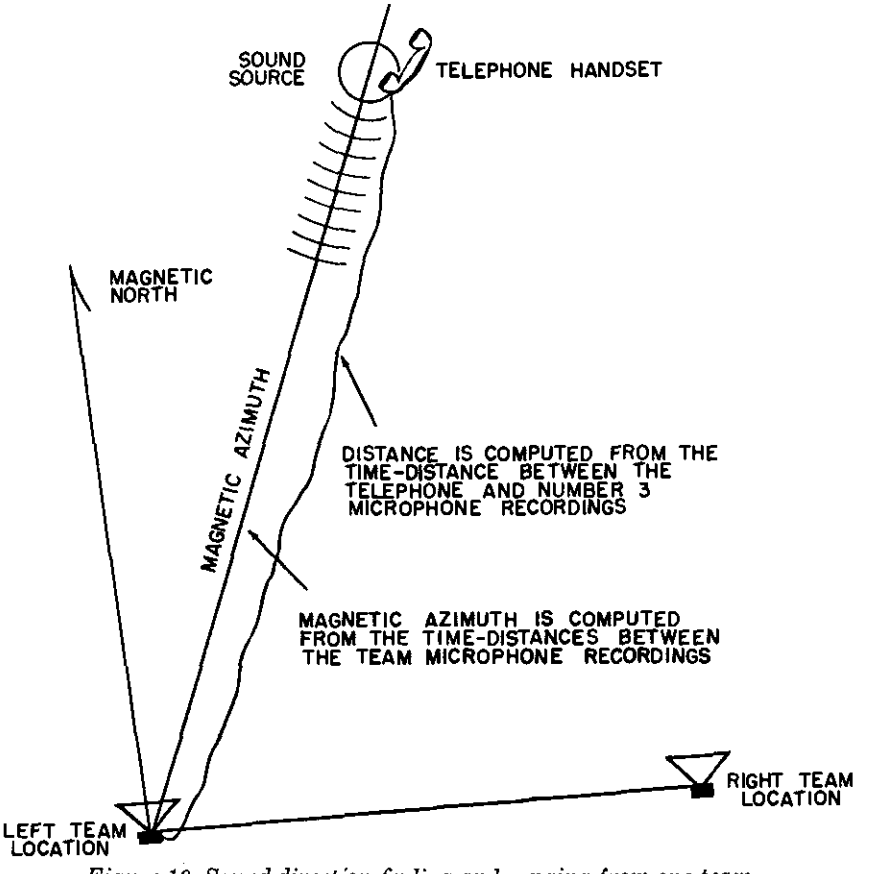

Figure 10. Sound direction finding and ranging from one team.

49. Selecting Sound Locating Positions

a. The mortar platoon commander normally selects the approximate team locations for the counterfire squad. After his squad surveys or estimates its position, he then reports the location of each team to the counterfire operations sergeant.

b. The team is as near the enemy as tactically possible. High, open, even ground is the best location for the microphones. Locations within dense woods or near high hills are avoided, because vegetation and irregularities in the ground absorb or reflect sound waves and cause echoes. Concealment and defilade protect the team from enemy observation and fire.

c. The baseline is a surveyed or estimated line from the No. 3 microphone of the other team. The magnetic azimuth of the baseline is measured from the control team, or computed from the back azimuth from the other team.

d. Normal sound locating range to enemy close support weapons usually is 2,000 to 4,000 meters. The best length for the base-

line is approximately one-third the distance to targets at normal sound locating range, or about 640 meters. A shorter baseline causes significant errors in plotting the location of counterfire targets.

e. When both recorders are controlled by the operator at the control team, a baseline longer than 680 meters will have dead spaces near and beyond each end. These dead spaces are areas where enemy weapons cannot be sound located. They are caused by sound waves from the flanks being recorded and erased at the recorder nearer the sound source before they arrive at the more distant recorder. Sound recordings remain on the moving tape only 2 seconds before they are erased to clear the tape for new sounds, unless the erasing head is made inoperative. Sound travels by air at a speed of about 340 meters per second under average temperature and humidity conditions at sea level. The counters on the recorder are calibrated to this speed.

50. Installing Sound Locating Equipment

a. Each team installs a microphone array of three microphones connected by electrical cable to a recorder. The team on the right (facing the enemy) is usually the control team. It has a field telephone wire line either to the mortar platoon FDC or to the nearest switchboard in the battle group wire system. When a counterfire squad is attached to a firing section, the control team has a field telephone wire line to the section position or FDC. The other team installs a field wire line from its recorder to the recorder at the control team. This line permits both recorders to be stopped by remote control at the control team, and it permits the two teams to communicate with each other by telephone. The teams also have radio communication with each other and with the mortar platoon FDC or counterfire weapon.

b. Each team member has assigned tasks in installing the sound locating equipment. Most of the same activities are performed by corresponding men of both teams. The following list is a summary of the detailed functions of each member of the squad when installing sound locating equipment:

(1) The squad leader's duties include—

(*a*) Leading the squad to its position.

(*b*) Selecting the locations for both teams.

(*c*) Supervising the installation of equipment by both teams.

(*d*) As chief operator, selecting the exact location for the right (control) team.

(*e*) Carrying the recorder and two Ch–291 battery boxes.

(*f*) Indicating the exact location of the No. 3 microphone of his team to the computer.

(*g*) Locating the No. 1 microphone to the left front and the No. 2 microphone to the right front of the No. 3 microphone.

(*h*) Tightening the chains spacing the microphones and staking the microphones into the ground.

(*i*) Connecting the battery to the recorder and turning on the power.

(*j*) Measuring the magnetic azimuth of the line from microphone No. 3 to microphone No. 1 by compass or aiming circle and telling the computer (fig. 11).

(*k*) Connecting the cable from the microphones to the recorder.

(*l*) Checking the microphones, the remote control operation, the soundpowered telephone, and the portable radio.

(*m*) Contacting the operator at the left team when the equipment is installed.

(2) The counterfire specialist's duties of the left team are similar to the squad leader's functions of the right team.

(3) Each computer's duties include—

(*a*) Carrying the team's accessory chest and one bag containing the microphones and cable.

(*b*) Arranging the microphones to zero the counters on the recorder.

(*c*) Laying out the cable from microphone No. 3.

(*d*) Laying out the microphone array on the ground in its approximate position.

(*e*) Staking the No. 3 microphone in the ground at the spot indicated by the operator.

(*f*) Assisting the operator install microphones Nos. 1 and 2, and to tighten the chains.

(*g*) Recording the magnetic azimuth of the 3–1 line and the location of microphone No. 3.

(*h*) Placing covers on the microphones.

(*i*) Setting the magnetic azimuth of the 3–1 line on the computer.

(*j*) Helping the plotter dig a shelter for and emplace the recorder.

(4) Each plotter's duties include—

(*a*) Carrying the AN/PRC–10 radio, a spare battery, and CE–11 reel equipment.

(*b*) Installing a wire line to the mortar platoon FDC or counterfire weapon. (The control team plotter lays a

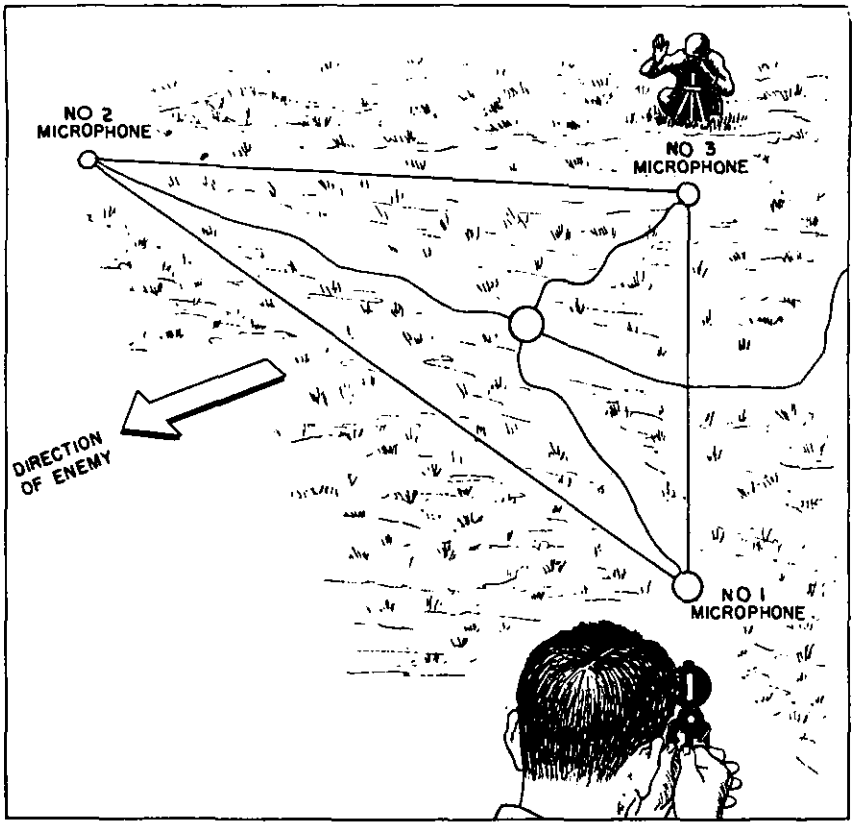

Figure 11. The operator measures the azimuth of the 3–1 line by compass or aiming circle.

field telephone wire line either to the battle group switchboard, the nearest switchboard, or to a counterfire weapon. When a counterfire squad is furnishing data directly to a counterfire weapon, the plotter paces and records the distance to the weapon position. The other team plotter installs a field wire line from his team to the recorder at the control team. He leaves enough slack to reach the No. 3 microphone at his team. He places the distance between teams so the length of the baseline can be estimated.)

(*c*) Digging a shelter for and emplacing the recorder.

51. Orienting the Squad Position

a. The squad orients its position as soon as it installs its sound locating equipment. This includes finding the location, length, and direction of the baseline. There are two methods of orienting the counterfire squad position. The most rapid method is by inspecting

a map or map substitute and estimating the team locations on the ground. The most accurate method is by surveying the No. 3 microphone locations on the ground.

b. Inspection and estimation is used only when it is impossible for the squad to make a survey. In this method, the squad plots the approximate location of each team and the baseline on a map or map substitute. It measures the length of the plotted baseline by using the scale of the map or map substitute. It measures the magnetic azimuth of the plotted baseline with a protractor. A counterfire squad that is oriented by inspection and estimation only cannot furnish accurate target data for counterfire weapons. It can, however, assist counterfire weapons in the rapid method of fire adjustment.

c. The squad surveys as soon as the situation permits. A squad that is oriented by survey can furnish accurate target data for any counterfire weapons whose locations also are surveyed. The counterfire squad is equipped to survey by visual and by sound locating methods. To survey by visual methods, each team locates its position by resection (fig. 12). When making a sound survey, it uses either sound direction finding and resection or sound direction finding and sound ranging. Survey also is possible by a combination of visual direction finding and sound locating methods. The squad is not equipped to make a survey by running a traverse, because it does not have conventional equipment for measuring distance on the ground.

d. The squad surveys its own position and reports the exact location of the control team to the counterfire operations sergeant. It normally is not responsible for surveying counterfire weapons positions. However, when the squad is in close association with counterfire weapons, it may survey one or more counterfire weapon positions. The squad may survey a counterfire weapon position either by sound direction finding from two teams, or by sound direction finding and sound ranging from one team. When it furnishes data directly to a counterfire weapon, it is not necessary to survey.

52. Surveying the Baseline by Sound Locating

a. General. When the squad cannot survey the baseline by visual resection, it surveys by sound locating or by a combination of visual direction finding and sound ranging. First, the squad finds the length and magnetic azimuth of the baseline. Then it determines the distance and magnetic azimuth to a reference point.

(1) *Length and magnetic azimuth of the baseline.* The survey switch on both recorders is placed in the survey position, the power switch on the distant recorder is turned off,

and the telephone handset is removed from *both* recorders. A weapon is fired close to the No. 3 microphone of the remote team, and the sound of the shot is transmitted by wire to the recorder at the surveying team. The same sound, after traveling through the air, is received again a moment later by the microphones at the surveying team. The time differences between the recorded sounds are measured on the recorder and used to compute the length and azimuth of the baseline (par. 48). The telephone handsets are reconnected. When one team has measured the length and magnetic azimuth of the baseline, the other team may check the results in a similar manner.

(2) *Location of the baseline.* After the length and magnetic azimuth of the baseline are measured, the squad finds the location of one team with respect to a reference point on the ground. If the reference point is not visible from either team, the distance and magnetic azimuth to the

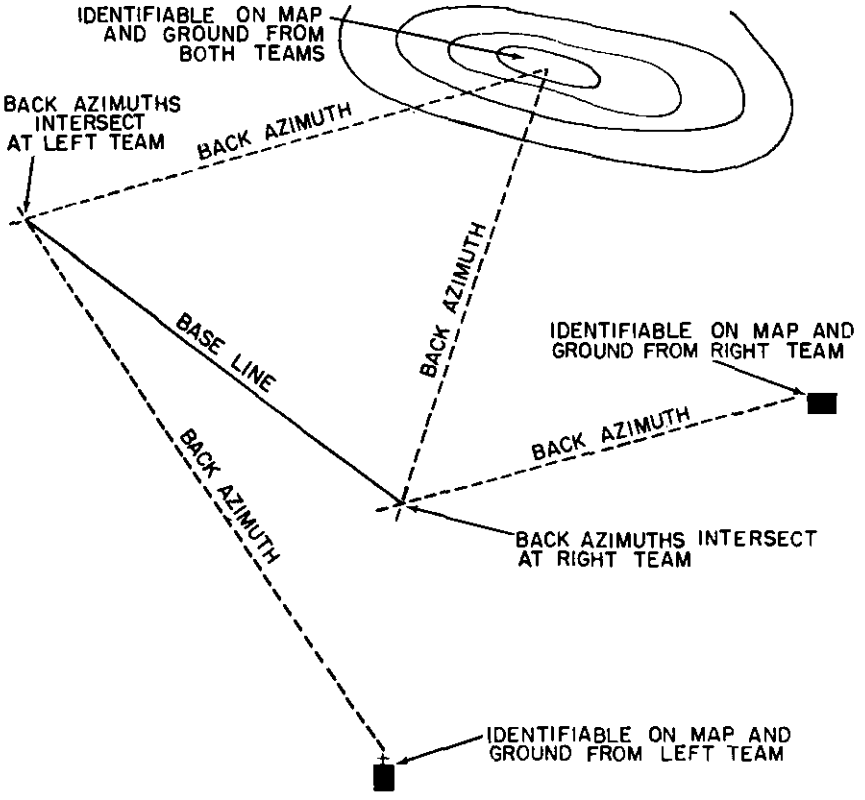

Figure 12. Resection method of surveying the baseline.

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reference point are measured by sound locating. If both teams participate in this part of the survey, each team finds the magnetic azimuth to the sound of a shot originating at the reference point. If only one team participates in this part of the survey, it uses sound direction finding and sound ranging to find the magnetic azimuth and the distance to the sound of a shot originating at the reference point. Both teams may have to be used to measure the magnetic azimuth to a distant reference point (sound direction finding) when a telephone wire line cannot be laid to it. When a reference point is near one team, only the nearest team measures the magnetic azimuth and the distance to the reference point (sound direction finding and sound ranging) (fig. 13).

b. Duties of Squad Members.

(1) The squad leader supervises sound locating by both teams in his squad and conducts the sound locating at the control team. During the survey of the baseline, he sets the control on the recorder at the control team; gives the command for the other team to fire a weapon; stops the recorder and checks the recording; sets the recorder controls for manual operation; makes measurements on the recorder; and decides when the survey is completed at the control team. He tells the counterfire specialist when to commence the survey at the other team. The squad leader reports the exact location of the control team to the counterfire operations sergeant.

(2) The counterfire specialist conducts the survey at the other team location. His functions are similar to those of the squad leader at the control team.

(3) Each computer uses either the sound-powered telephone or the radio to tell the plotter at the other team when to fire. He records the survey measurements on the survey data sheet (fig. 14). He computes and records the distance and magnetic azimuth to the other team. The computer at the control team receives data from the other team and tells the squad leader (chief operator) the results of the survey. He averages the results of the survey, records the baseline data on the data sheet, and gives it to the plotter.

(4) Each plotter furnishes security for his own team's position. He observes the microphones and cables and prevents any interference with the survey. He fires shots for the other team. He goes to the No. 3 microphone with his individual weapon. He reports to the computer when he is ready, and he fires a weapon on the order of the com-

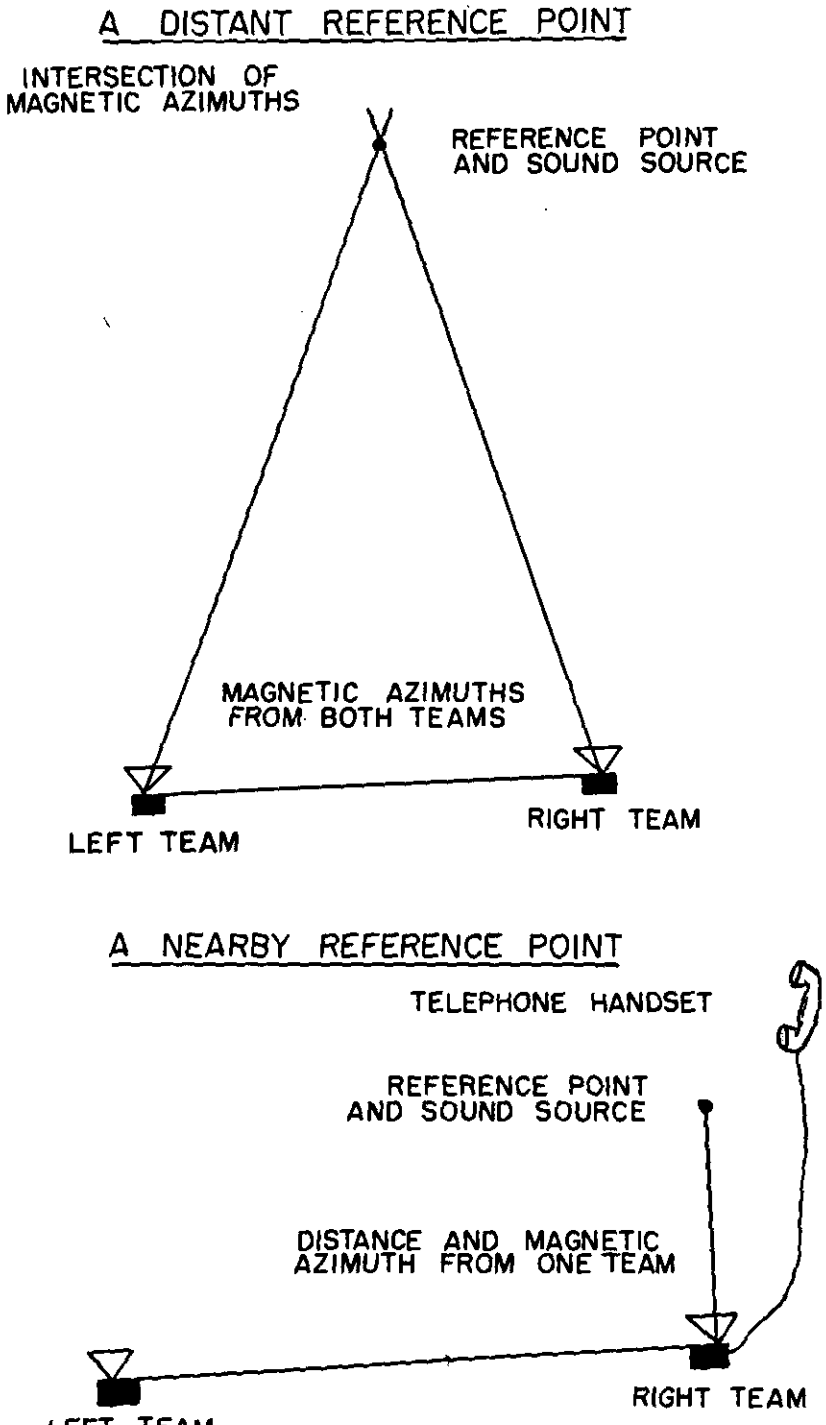

Figure 13. Surveying by sound locating on unobserved reference point.

SURVEY DATA			
		SHEET NO.	LOCATION FT. BENNING, GEORGIA
DATE 1 NOV —	WEATHER OVERCAST	WIND SPEED 5 MPH	DIRECTION 25ØØ MILS

SELF SURVEY OF BASE LINE

SHOT NUMBER	TEAM (L OR R)	HANDWHEEL READINGS TP	AIR	DIFF	COUNTER READINGS NO. 1	NO. 2	AZIMUTH Computed	Corrected	SPEED NUMBER	DISTANCE (METERS)	REMARKS
1	R	1	7	16	Ø94	912	1535		4Ø	64Ø	NO AZIMUTH CORRECTION NECESSARY
2	R	2	8	16	Ø96	914	155Ø		4Ø	64Ø	"
3	R	3	9	16	Ø94	91Ø	152Ø		4Ø	64Ø	"
4											
							AVERAGE AZIMUTH	1535	AVERAGE DISTANCE	64Ø	

SURVEY OF COUNTERFIRE WEAPONS POSITIONS

SHOT NUMBER	TEAM (L OR R)	HANDWHEEL READINGS TP	AIR	DIFF	COUNTER READINGS NO. 1	NO. 2	AZIMUTH Computed	Corrected	SPEED NUMBER	DISTANCE (METERS)	REMARKS
1	R	1	1	1Ø	Ø23	888	9ØØ		45	45Ø	
2	R	2	3	11	Ø28	874	92Ø		4Ø	44Ø	
3	R	1	2	11	Ø22	87Ø	88Ø		41	451	
4											
							AVERAGE AZIMUTH	9ØØ	AVERAGE DISTANCE	447	

LEFT TEAM	RIGHT TEAM	SQUAD LEADER
AZIMUTH OF 3-1 LINE 22ØØ	AZIMUTH OF 3-1 LINE 23ØØ	SGT ARTHUR J. KEITH
OPERATOR SP/3 WOODROW WILSON	CHIEF OPERATOR SGT ARTHUR KEITH	
COMPUTER PFC FRANK T. MATZ	COMPUTER PFC ELLWOOD HART	
PLOTTER PFC EDWARD PURCELL	PLOTTER PFC HUGH C. BERTRAND	

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Figure 14. Survey data sheet.

puter at the other team. When his team completes its survey, he plots the length and orientation of the baseline on grid paper.

53. Surveying a Counterfire Weapon by Sound Locating

When it is necessary for the counterfire squad to survey a counterfire weapon position, such as an 81-mm mortar section or its base survey point location, the survey may be made by sound locating. Sound locating is used only when the survey cannot be

made by visual resection. The counterfire squad locates a counterfire weapon position or base survey point by either sound direction finding from both teams, or sound direction finding and sound ranging from one team. When a survey is made from only one team, it usually is made by the team nearer the counterfire weapon.

54. Sound Locating a Target

After the squad installs its equipment and surveys or estimates its location, each team keeps the power turned on and its equipment in constant operation. Every sound that reaches either team location is received by all three microphones and recorded on the moving magnetic steel tape in the recorder. If the recorder is not stopped within two seconds after a sound is recorded, that sound is erased automatically to clear the tape for new sounds. When the squad leader (chief operator) at the control team hears what he believes to be an enemy weapon, he uses the remote control switch to stop the recorders of both teams. He reads the time differences between the sounds recorded at his team and tells the computer. The counterfire specialist (operator) reads the time differences between the sounds recorded at his team, and tells the computer. Each computer determines the magnetic azimuth from his team location to the sound source. The computer at the control team gets the magnetic azimuth at the other team by telephone or radio from the other computer and records this data on the Sound Locating Set data sheet (fig. 15). He gives the data sheet to the plotter at the control team. The plotter plots the location of the enemy weapon and tells the squad leader the result of the plot. The squad leader or the computer reports the location of the enemy weapon to the counterfire operations sergeant. This report includes the estimated number and type of weapons and the plotted location of the enemy weapon position. When the counterfire squad is operating with a forward rifle company, the counterfire squad leader or the computer reports the location of each enemy weapon to the 81-mm mortar section FDC or the counterfire weapon crew.

55. The Rapid Method of Fire Adjustment

a. The squad uses the rapid method of fire adjustment when the situation prevents counterfire weapons from having or using accurate target data on unobserved counterfire targets. This technique also may be used in engaging unobserved counterfire targets before surveys can be made. In this method, the counterfire squad is oriented by inspection and estimation. It sound locates an enemy weapon firing and a counterfire weapon shell burst, computes the difference between these two sound source locations, and reports necessary range and deviation corrections.

SOUND LOCATING SET DATA			SHEET NO.	LOCATION	DATE
				FT BENNING, GEORGIA	1 NOV —
WEATHER	WIND SPEED	DIRECTION		LENGTH OF BASE LINES	AZIMUTH OF BASE LINE
OVERCAST	5 MPH	2500 MILS		640 METERS	1535

DATA ON ENEMY TARGETS

TARGET NUMBER	TIME OF DAY	TYPE OF GUN	LEFT TEAM DATA 3-1 AZIMUTH MILS			RIGHT TEAM DATA 3-1 AZIMUTH MILS			COMPUTER'S DATA OPT ( ) CFW-T ( )		REMARKS
			No. 1	No. 2	Azimuth	No. 1	No. 2	Azimuth	Range (Meters)	Azimuth (Mils)	
1	0800	L MORT	000	100	3800	110	060	2800	850	3340	
2	0900	HV MORT	046	140	3440	110	040	2660	1635	3100	
3	1000	HOW	040	150	3535	080	050	2880	1190	3240	

LEFT TEAM		RIGHT TEAM		SQUAD LEADER
OPERATOR	SP5 WOODROW WILSON	CHIEF OPERATOR	SGT ARTHUR KEITH	SGT ARTHUR KEITH
COMPUTER	PFC FRANK T. MATZ	COMPUTER	PFC ELWOOD HART	
PLOTTER	PFC EDWARD PURCELL	PLOTTER	PFC HUGH C. BERTRAND	

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Figure 15. Sound locating set data sheet.

b. As soon as the sound locating equipment is installed, the squad estimates the location of each team by inspecting a map or map substitute, and then plots the baseline. It estimates the counterfire weapon position by sound locating on a shot fired from the weapon position or base survey point or by inspecting the map or map substitute. The squad tells the counterfire weapon crew or FDC the control team location with respect to the counterfire weapon or base survey point. It is then ready to adjust the fire of the counterfire weapon on unobserved counterfire targets.

c. When the squad leader hears an enemy weapon firing, his squad sound locates the apparent weapon position. It reports to the counterfire weapon crew or FDC the range and magnetic azimuth from the control team to the apparent target location. The counterfire weapon crew or FDC uses normal observed fire procedure to compute the firing data to the apparent enemy weapon location. When the counterfire weapon crew is not equipped to compute this data, the counterfire squad plots the counterfire weapon firing data and tells the counterfire weapon crew. Figure 16 illustrates this technique when the counterfire squad plots the firing data from the counterfire weapon position to the apparent target location. For normal observed fire procedure, see FM 6–135.

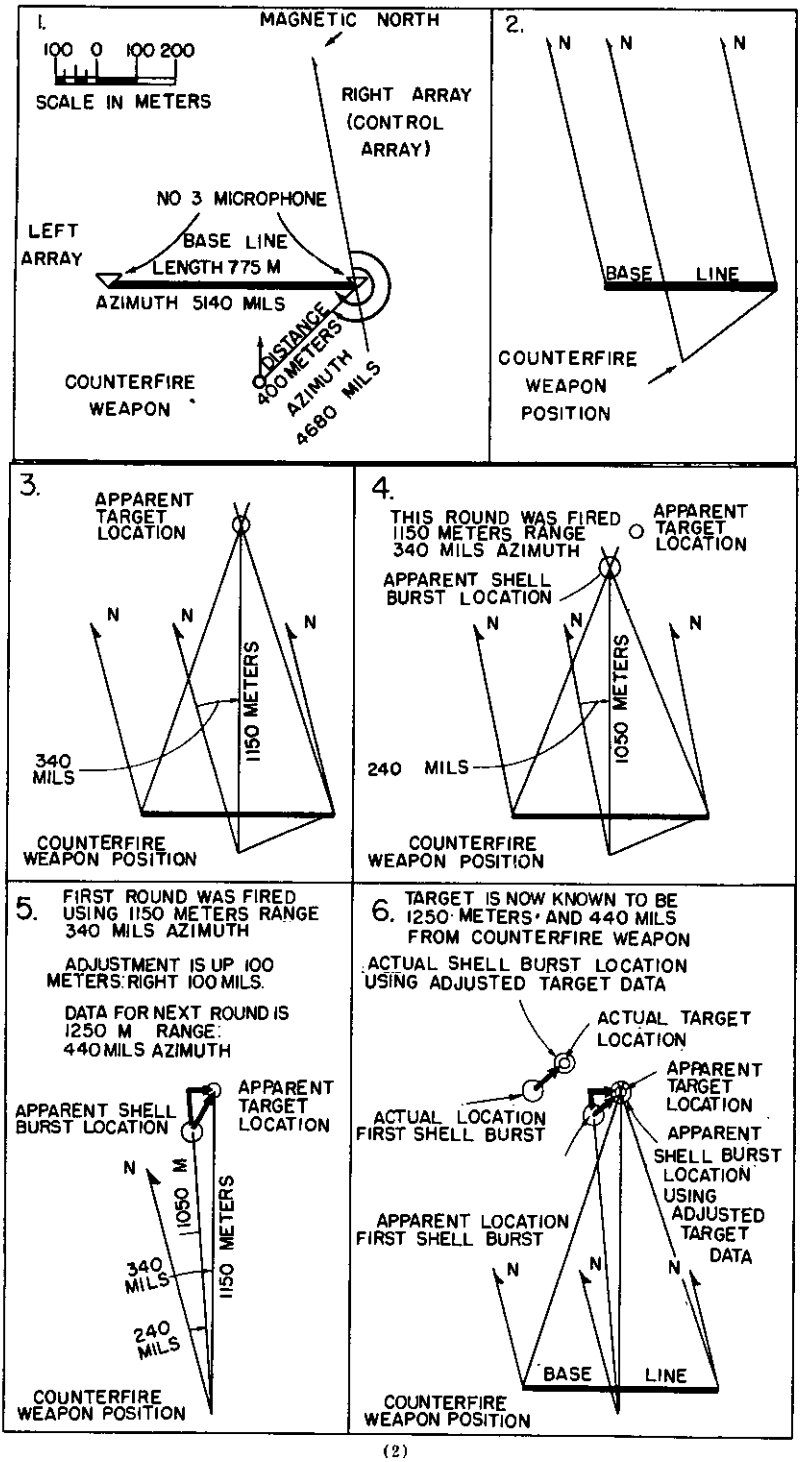
d. Surprise fire for effect also can be delivered when using the rapid method of fire adjustment. This is done by first adjusting the counterfire weapon on an auxiliary target and then shifting to the apparent target location (fig. 17).

56. Control

a. When the communication necessary for normal counterfire operations cannot be established, or when it is impossible to survey the counterfire squad's location, the squad may be attached to a rifle company or a counterfire weapon. In either case, the squad reports data directly to the counterfire weapon(s) or the 81-mm mortar section FDC without communicating with the counterfire operations sergeant. The squad reverts to centralized control as soon as possible.

b. When the counterfire squad is attached to a counterfire weapon or a rifle company, its positions are selected and occupied in the same manner as in normal operations. The squad lays a field telephone wire line to the 81-mm mortar section FDC or the counterfire weapon position. To save time, it may be able to use an existing wire system by tying in with a nearby switchboard or establishing radio contact, or by giving data to a nearby forward observer of the unit to which it is attached. As soon as possible after installing the equipment, the squad surveys the baseline and reports the exact location of the control team to the counterfire weapon crew or 81-mm mortar section FDC. When the counterfire squad and counterfire weapon are using an accurate map or map substitute, the squad reports counterfire information by coordinates. If the squad and the counterfire weapons are not surveyed, they use the rapid method of fire adjustment.

c. The squad and one or more counterfire weapons may work as a team to engage counterfire targets with the least possible delay. In this method, the counterfire weapon position is in the immediate vicinity of the control team location. For precision fire, the coun-



(2)

Figure 16. Rapid method of fire adjustment.

STEP 1. THE COUNTERFIRE SQUAD ORIENTS ITS POSITION ON THE GROUND BY INSPECTING A MAP AND ESTIMATNG THE LENGTH AND MAGNETIC AZIMUTH OF THE BASE LINE, AND THE DISTANCE AND MAGNETIC AZIMUTH FROM THE NEAREST END OF THE BASE LINE TO EACH COUNTERFIRE WEAPON.

STEP 2. THE PLOTTER AT THE CONTROL TEAM PLOTS THE BASE LINE AND COUNTERFIRE WEAPON POSITION ON A CLEAN SHEET OF PAPER, USING A CONVENIENT SCALE SUCH AS 1 INCH (200 M) AND DRAWS A ZERO AZIMUTH LINE N (MAGNETIC NORTH) FROM EACH END OF THE BASE LINE AND EACH COUNTERFIRE WEAPON POSITION.

STEP 3. THE COUNTERFIRE SQUAD LOCATES AN ENEMY WEAPON. THE PLOTTER AT THE CONTROL TEAM PLOTS THE APPARENT TARGET LOCATION. THE CHIEF OPERATOR GIVES THE APPARENT TARGET DATA (1150 M RANGE, 340 MILS AZIMUTH) TO THE COUNTERFIRE WEAPON CREW OR FIRE DIRECTION CENTER.

STEP 4. THE COUNTERFIRE WEAPON FIRES A ROUND. THE COUNTERFIRE SQUAD LOCATES AND PLOTS THE APPARENT SHELL BURST LOCATION. THE CHIEF OPERATOR GIVES THE APPARENT RANGE (1050 M) AND MAGNETIC AZIMUTH (240 MILS) OF THE SHELL BURST TO THE COUNTERFIRE WEAPON CREW OR FIRE DIRECTION CENTER.

STEP 5. THE COUNTERFIRE WEAPON CREW OR FIRE DIRECTION CENTER MAKES THE NECESSARY ADJUSTMENT BASED UPON THE DIFFERENCE BETWEEN THE APPARENT TARGET LOCATION AND THE APPARENT SHELL BURST LOCATION. USING THE ADJUSTED TARGET DATA THE COUNTERFIRE WEAPON FIRES FOR EFFECT.

STEP 6. THE COUNTERFIRE SQUAD LOCATES AND COMPARES THE APPARENT LOCATION OF THE NEXT SHELL BURST WITH THE APPARENT TARGET LOCATION. WHEN THE APPARENT SHELL BURST AND TARGET LOCATIONS COINCIDE ON THE COUNTERFIRE SQUAD PLOT, THE COUNTERFIRE WEAPON IS ON THE TARGET.

DURING THIS ADJUSTMENT THE ACTUAL TARGET AND SHELL BURST LOCATION ARE NOT KNOWN. THIS IS BECAUSE THE BASE LINE IS NOT SURVEYED. THE APPARENT TARGET AND FIRST SHELL BURST LOCATIONS MAY NOT COINCIDE BECAUSE THE COUNTERFIRE WEAPON POSITION IS NOT SURVEYED. WHEN THE APPARENT SHELL BURST IS AOJUSTED TO COINCIDE WITH THE APPARENT TARGET LOCATION, ALL ERRORS DUE TO NOT SURVEYING ARE CANCELLED, AND THE ACTUAL SHELL BURST LOCATION IS ON THE TARGET. THE RAPID METHOD OF FIRE ADJUSTMENT WILL COMPENSATE FOR SMALL ERRORS ONLY.

(1)

Figure 16.—Continued.

terfire weapon or base weapon is not more than 15 meters from the No. 3 microphone of the control team. For area fire, this distance may be slightly greater. In this method, the only means of communication between the counterfire squad and the counterfire weapon are by voice and arm and hand signals. This method has the disadvantage of limiting counterfire weapon positions to areas where the terrain is suitable for sound locating. Such terrain seldom is favorable for indirect fire weapons such as the heavy mortar. This usually requires that both the mortars and the sound locating squad move frequently to protect the mortars. When a rapidly moving situation slows down enough for the counterfire squad to establish communication and make surveys, this method should not be used. When speed of operation is essential, the squad surveys the baseline, but does not survey the counterfire weapon position. The counterfire weapon or base weapon position and its base aiming stake are on a line with the 3–1 line of the control team (fig. 18). The counterfire squad computes the distance to the target from the No. 3 microphone of the control team. It computes the angle to the target with respect to the 3–1 line of the control

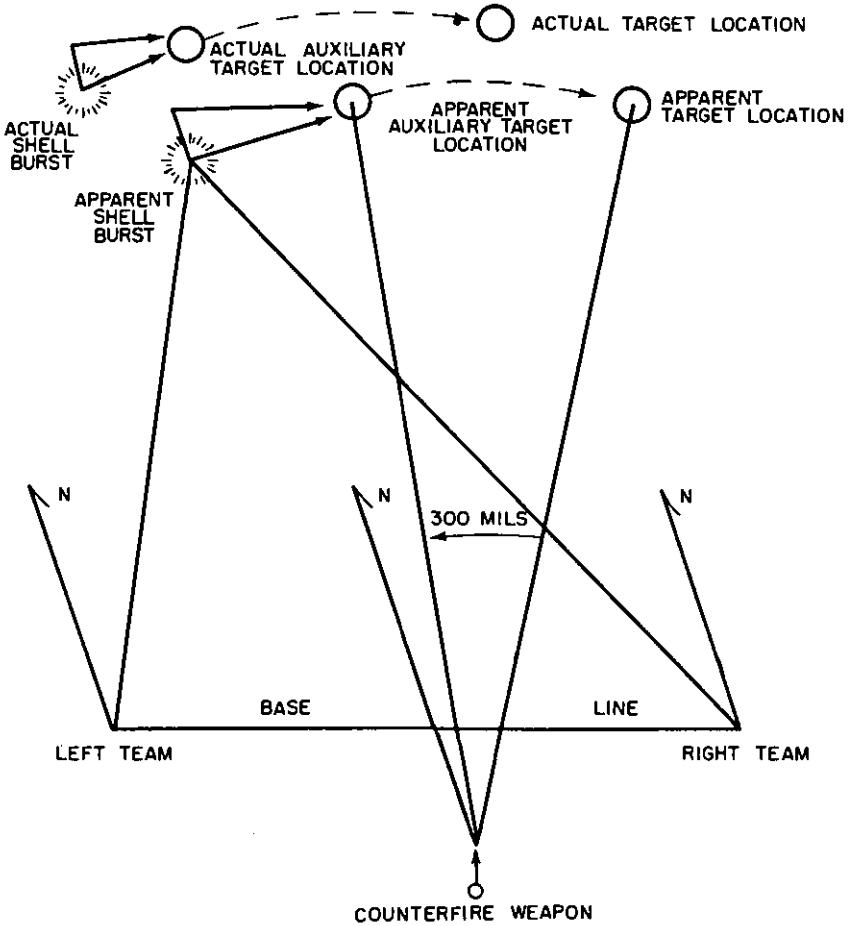


Figure 17. Surprise fire by the rapid method of fire adjustment.

team rather than the magnetic azimuth to the target. The squad leader gives the target distance and the target angle to the counterfire weapon crew as range and deflection from the base aiming stake. When the counterfire weapon or base weapon is 25 meters or more from the No. 3 microphone of the control team, an experienced weapon crew may modify this data slightly to obtain firing data that will cover the target. When time is not available to survey the baseline, the rapid method of fire adjustment is used.

57. Tactical Employment

a. The type of operation determines the way the squad is employed. The counterfire operations sergeant keeps the squad informed of the tactical situation to help it distinguish between enemy and friendly weapons.

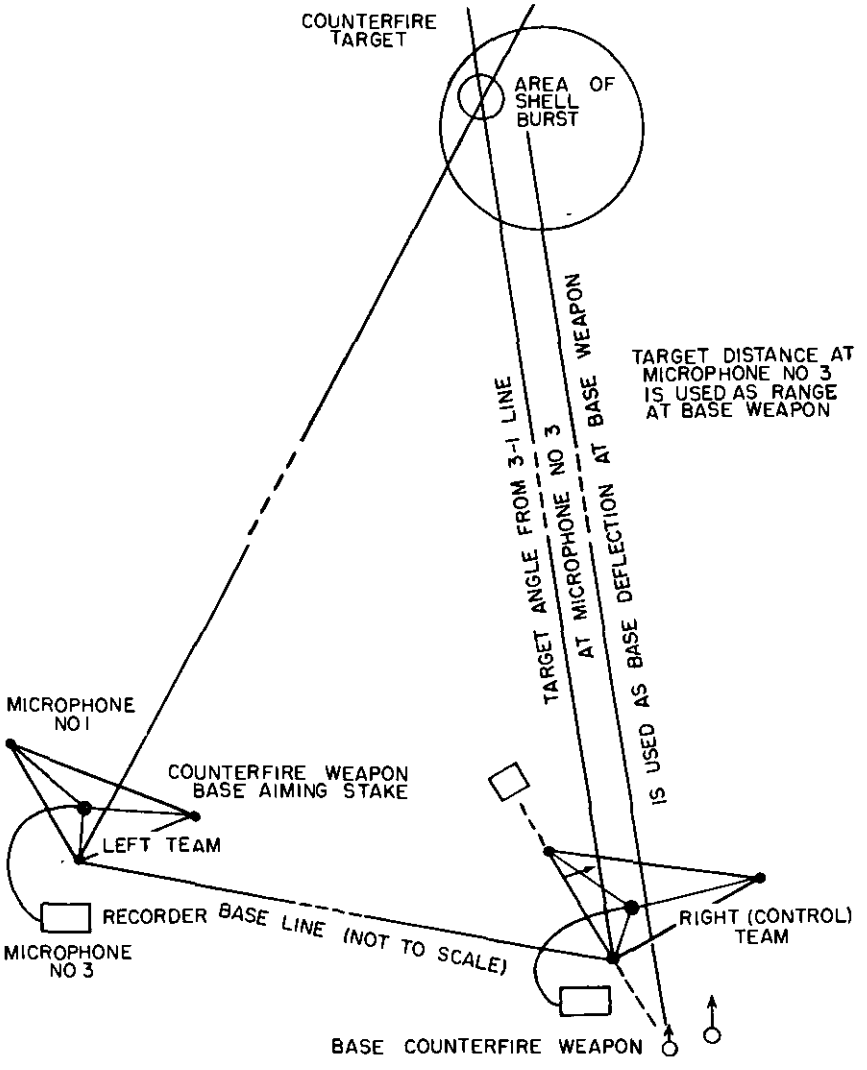


Figure 18. Counterfire squad and weapon as a team.

b. In operations such as an approach march, a pursuit, early phases of a withdrawal or a delaying action, the counterfire squad may not be able to maintain communication with the counterfire operations sergeant or to survey its positions. When platoon control is not practicable, the squad may be attached to a forward company or to a counterfire weapon.

c. While battle group plans and orders are being prepared for each operation, the counterfire operations sergeant prepares to collect and evaluate counterfire information. He makes a counterfire

chart of the area of operations and plots the location of each source of counterfire information and each counterfire weapon.

58. Movement to Contact

During route and tactical column, the squad moves with the heavy mortar platoon. During the approach march, it may move with the mortar platoon or with the leading rifle company or a selected counterfire weapon in order to begin counterfire operations promptly.

59. Attack

a. During the preparation for an attack and the attack itself, sound locating operations are directed at all enemy weapons that can interfere with the battle group mission. Enemy weapons observed or sound located are reported and recorded by the counterfire operations sergeant, confirmed in some instances by other intelligence sources, and destroyed or neutralized by counterfire weapons. To obtain surprise, counterfire information that is evaluated and confirms the location of enemy weapons is not used to fire counterfire missions until just before the attack.

b. Before the attack, the counterfire squad operates under centralized control. After the attack is launched, the squad may be used to report data directly to selected counterfire weapons. Counterfire squad positions are surveyed before the attack. After the first displacement, its positions are estimated initially, and surveyed as soon as the tactical situation permits. The rapid method of fire adjustment is used until the counterfire squad is able to survey its positions. During the conduct of the attack there is often insufficient time for the squad to install its equipment, and the volume of friendly fires may be so great as to prevent effective discrimination. The squad then continues to collect counterfire information using other techniques such as visual observation.

60. Reorganization

The squad displaces to the battle group objective during reorganization. It prepares to continue the attack or defend. It reestablishes communication with the mortar platoon FDC, if it has been interrupted, and completes its surveys. It continues to collect counterfire information and report it to the counterfire operations sergeant.

61. Pursuit

During a pursuit, the counterfire squad is normally under decentralized control. There is no time to install the equipment, so the squad is used to collect counterfire information or to direct

fires by visual observation. If it does occupy a position for sound locating operations, it uses the rapid method of fire adjustment. If the pursuit is slowed by enemy delaying action, the squad returns to centralized control.

62. Defense

In defense, counterfire information collecting operations are deliberate. The squad is normally employed under centralized control and well forward in one of the forward company's defense areas. The squad surveys its position, establishes communication with the heavy mortar platoon FDC, and reports data directly to the counterfire operations sergeant at the FDC.

63. Withdrawals

a. In a daylight withdrawal, the counterfire squad normally accompanies the main body. In the night withdrawal, the squad may remain with detachments left in contact as long as counterfire weapons are in position.

b. When the squad arrives at the new position, it surveys its location. New positions to be occupied by the squad during a night withdrawal must be surveyed during daylight.

64. Delaying Action

The squad operates in a delaying action the same way it does in defense.

65. Relief in Place

a. Plans for the relief are as detailed and complete as time permits. The incoming mortar platoon commander, with his advance party, conducts a reconnaissance of the position to be occupied. The counterfire operations sergeant is a member of this party. The following arrangements are made concerning counterfire:

(1) The incoming counterfire operations sergeant takes over the counterfire chart, overlays, and wire communication of the outgoing counterfire operations sergeant.

(2) The incoming counterfire squad takes over the positions and wire communication of the outgoing counterfire squad. Sound locating equipment normally is not exchanged.

(3) A guide leads the counterfire squad to its new positions. The incoming squad may accompany a rifle company in whose area it is to be located, in which case a guide for the counterfire squad is desirable.

b. Throughout the relief strict noise and light discipline is maintained to prevent the enemy from becoming aware of any movement or activity. When communication is established, no mention of the relief is made in the clear.

CHAPTER 3

ASSAULT WEAPON PLATOON

Section I. ORGANIZATION

66. Mission

The primary mission of the platoon is to provide antitank defense for the battle group. Its secondary mission is to provide direct fire support for the rifle companies of the battle group.

67. Capabilities

a. The platoon is capable of providing antitank defense and direct fire support for the battle group. Depending on the tactical plan, the platoon may also be used in general support or in an attached role. The platoon's mobility and communication enable it to move throughout the battle group area and to mass its fires.

b. The platoon's primary target is enemy armor. Lacking such targets, it may engage bunkers, observation posts, vehicles, crew-served weapons, grouped enemy personnel, and other similar point targets, provided this does not impair its capability to engage armor.

68. Organization

a. The platoon consists of a platoon headquarters and five squads (fig. 19). A platoon leader, platoon sergeant, and two radiotelephone operators with additional duties as light truck drivers comprise the platoon headquarters. Each squad has a squad leader, one gunner, one assistant gunner, and two ammunition bearers. The assistant gunner and ammunition bearers are also light truck drivers.

b. Transportation within the platoon is assigned as follows:

(1) Platoon headquarters — Two ¼-ton trucks with trailers.

(2) Assault weapon squads — One assault weapon launcher mounted on a ¼-ton truck. One ¾-ton truck with trailer.

c. The main armament of the platoon consists of five missile launchers assigned one per squad. For detailed organization of the platoon, see TOE 7–19D.

69. Duties of Personnel

a. Platoon Headquarters.

(1) The *platoon leader* is responsible for the platoon's training, control, tactical employment, and supply. He receives

his orders from the battle group commander or from the commander of the unit to which attached. He makes recommendations for the employment of his platoon and selects and directs the preparation of primary, alternate, and supplementary firing position areas for his squads. He either remains with the battle group commander or is in communication with him at all times. He coordinates

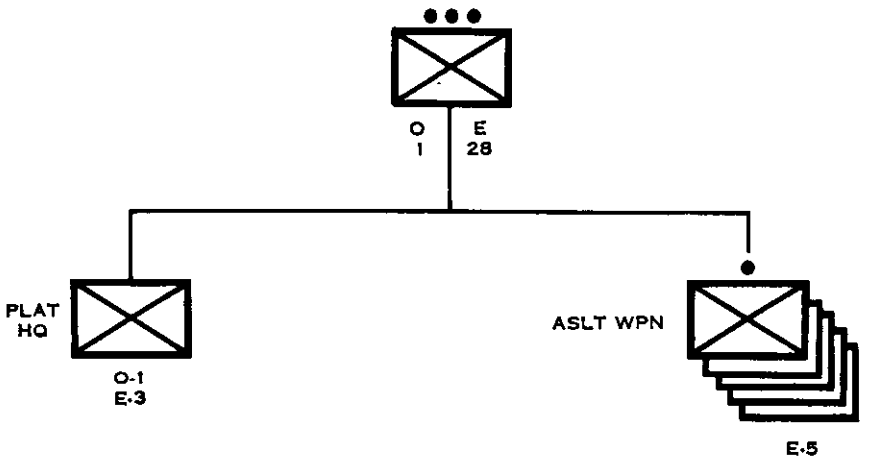


Figure 19. Assault weapon platoon.

with rifle company commanders in whose area his unit operates and locates himself where he can best influence the action of his unit.

(2) The *platoon sergeant* is second in command and assumes command of the platoon in the absence of the platoon leader. He supervises the activities of the platoon's transportation and the resupply of ammunition and replacement parts. He may be designated to accompany a portion of the platoon on a mission to assist the squad leaders in matters of fire control and coordination with supported units.

(3) The *radiotelephone operators* operate and maintain the radios in the platoon headquarters. They also drive and maintain the two ¼-ton trucks and trailers assigned to platoon headquarters.

b. Squad Personnel.

(1) The *squad leader* is responsible for all actions of his squad in tactical and technical operations. He supervises the organizational maintenance of squad equipment. He selects the exact position for the gunner, missiles, and launching vehicle. He is responsible for correctly posi-

tioning control and launching personnel and for emplacing and displacing the missiles and related equipment. He controls his squad's fire through issuance of timely orders. He operates in the command radio net with his AN/PRC–10 radio or in the wire net with his sound-powered telephone, when it is established.

(2) The *gunner* fires on targets as directed by the squad leader and on targets of opportunity that appear during his absence. The gunner issues the fire command to the assistant gunner, who fires the missile. The gunner then guides the missile to the target. He performs first echelon maintenance of the missile system and related equipment. He must be capable of assuming the duties of the squad leader.

(3) The *assistant gunner*, on command of the gunner, fires the missile. He also drives and maintains the squad's ¼-ton truck and assists in the first echelon maintenance of the missile system and equipment. He must be capable of assuming duties of the gunner.

(4) The *ammunition bearers* are responsible for preparing the missiles for firing and for the timely resupply of missiles. They assist in the first echelon maintenance of the missile and related equipment. One ammunition bearer operates and maintains the squad's ¾-ton truck and trailer. He also assists in laying and maintaining such communication lines as may be required.

70. Communication

a. Radio.

(1) The two AN/VRC–18 radios in platoon headquarters are mounted in the platoon leader's and the platoon sergeant's ¼-ton trucks. The platoon leader operates in the battle group command net and the platoon command net. The platoon sergeant operates in the battle group administrative net and the platoon command net.

(2) The two AN/PRC–10 radios in platoon headquarters are utilized by the platoon leader and the platoon sergeant for dismounted operations. They operate in either the battle group command net, the platoon command net, or any other net as required. These radios may also be used by the squad leaders in emergency operations until replacement can be effected.

(3) The AN/PRC–10 radio in each of the squads operates in the platoon command net when the squad is under control of the platoon leader. When a squad is attached to a rifle

company or specific portions of the battle group, it establishes communication with the supported units (fig. 20).

b. Wire.

(1) The TA–312/PT telephone in platoon headquarters operates in the battle group wire system.

(2) The platoon headquarters operates in the wire system with the SB–993/GT switchboard and the TA–312 telephone.

(3) The TA–1/PT telephone in each squad is used in the platoon wire system when established. When a squad is attached to a unit, it enters the wire system of the supported unit.

(4) To recover wire, the platoon headquarters has 1 RL–27 axle and 2 RL–159 reels. Platoon headquarters also has 10 DR–8 spools. The rule of superior to subordinate for installation of wire is followed as closely as possible (AR 105–15).

(5) When the tactical situation permits, wire systems parallel radio nets.

(6) Wire communication between the gunner and the assistant gunner is made possible by a telephone circuit built into the control cable. Special telephones also come as a component part of the control equipment.

71. Training

a. Gunners and assistant gunners acquire proficiency with the assault weapon training devices up to and including, as a minimum, inert missiles. The leaders, gunners, and assistant gunners receive training in—

(1) The recognition of friendly and enemy armor, armor characteristics, and the techniques of armor employment.

(2) The use of natural and artificial tank obstacles and antitank minefields.

(3) Range determination.

(4) The employment of other antitank weapons.

(5) Terrain evaluation.

(6) The proper utilization of all means of communication available.

(7) Leadership.

(8) Priority of work for emplacement of missiles and preparation of positions.

(9) Crew drill and handling of ammunition.

b. Other assault weapon squad personnel are trained in—

(1) Use of communication equipment.

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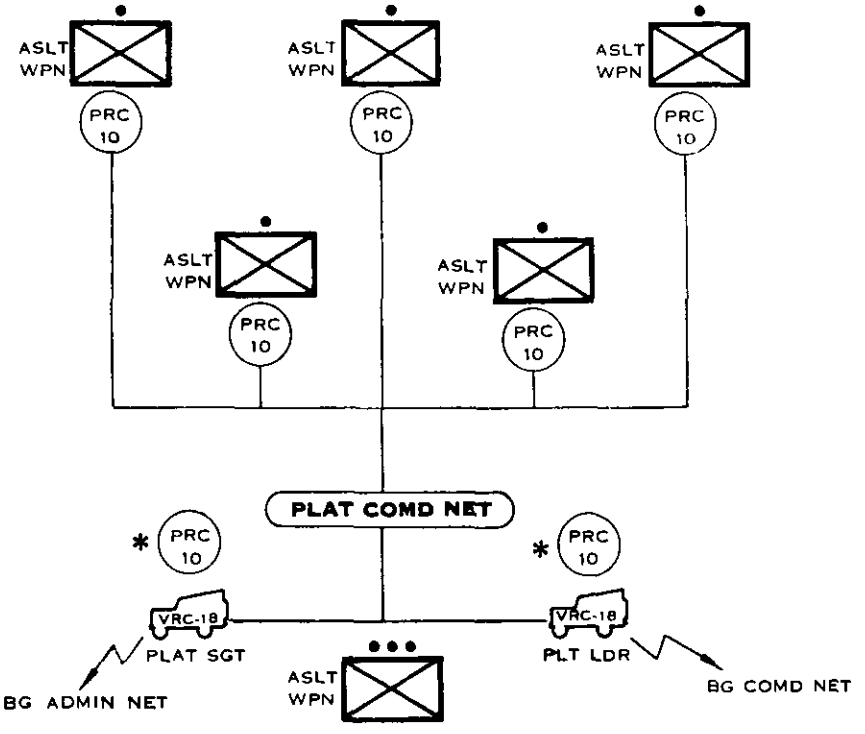


NOTE: EACH SQUAD HAS ONE TA-1/PT USED IN THE PLATOON WIRE SYSTEM WITH THE PLATOON HEADQUARTERS WHICH HAS A TA-312. THIS WIRE SYSTEM PARALLELS THE RADIO NET. WHEN ATTACHED TO RIFLE COMPANIES THE SQUADS WILL BE INTEGRATED INTO THE COMPANY COMMUNICATION SYSTEM.
* DISMOUNTED USE.

Figure 20. Type radio net (assault weapon platoon).

(2) Crew drill for assembly and preparation for firing missiles and for handling of ammunition.

Section II. OFFENSE

72. General

a. Careful consideration must be given to the capabilities and limitations of the missile when considering the weapon for tactical employment. The factors of METT (mission, enemy, terrain and troops available) are considered when determining the method of employment of the unit. To help maintain an effective sustained

rate of fire against enemy armor, consideration must also be given to resupply, control, and mutual support between squads.

b. The squad is the basic unit of the platoon. If the situation permits, it is desirable to employ two squads in a mutual support role. The following factors must be considered relative to employment of two or more squads in a specific zone:

(1) Minimum and maximum range.
(2) Vegetation or terrain that may screen the target from one firing position.
(3) Requirement for direct observation of the missile by the gunner in order to hit the target.
(4) The rate of fire of one missile launching unit.

c. It is necessary to realize that enemy armor will often present multiple targets. Here rapid target engagement is required to successfully employ the missile. Also, the enemy's use of cover and concealment, and smoke and artillery on the gunner's firing position—all may render the gunner (hence the weapon) ineffective. Successful tactical employment thus must be based on sound plans for utilization, selection of positions, displacement, ammunition resupply, communication, and coordination.

73. Movement to Contact

a. When enemy contact is remote, the platoon moves in the formation as a unit under battle group control. It operates within the battle group formation to facilitate prompt employment to the front, flanks, or rear of the formation as necessary.

b. As the probability of contact changes from remote to imminent, tactical organization for combat assumes increased importance. At this time, assault weapon units are moved to locations where the greatest enemy armor threats are believed to exist. Attachments may be made if appropriate.

c. When the advance and flank guards of the battle group do not have tanks attached and a tank threat exists, one or more squads are attached to the flank guard. The remainder of the platoon is held in general support, moving by bounds at or near the head of the main body or dispersed throughout the column to provide flank protection. One or more squads move by bounds between the advance guard and the main body. The other squads move by bounds to positions providing coverage of dangerous tank approaches to the flank. When tanks are attached to the advance and flank guards, the assault weapon platoon is employed in general support.

d. Throughout the movement to contact, the platoon leader and squad leaders plan for the squads to occupy positions from which they could cover the most dangerous avenues of enemy armor approach and best directly support the rifle companies.

74. Troop Leading

a. The platoon leader accomplishes as many of these troop leading steps as possible consistent with the time available and the situation:

(1) Receives the warning order.
(2) Plans and executes a reconnaissance. (This may be a map or ground reconnaissance.)
(3) Formulates and submits recommendations covering method of employment, firing position areas, and a tentative plan of displacement.
(4) Receives the battle group order.
(5) Makes necessary arrangements for the movement of the unit, reconnaissance, issuance of the platoon order, and coordination with organic, attached, or supporting unit commanders concerning the antitank defense and barrier plans.
(6) Completes the reconnaissance.
(7) Completes and issues the platoon order.
(8) Supervises the execution of the order.

b. The platoon leader reports to the battle group commander to receive the order. He is accompanied by his driver and the platoon sergeant and his driver. The senior squad leader controls the platoon during this time. When the battle group operation order attaches a squad to a rifle company, the squad leader reports to the rifle company commander to receive his order. Coordination for meeting the rifle company commander should be made by the platoon leader after receipt of the battle group order.

75. Method of Employment

a. To capitalize fully on the capabilities of the platoon, the battle group commander selects a method or combination of methods of utilization which best produces effective antitank protection and, when feasible, close support for the battle group. Important factors he considers include control, flexibility, mobility, and the nature of the armor threat to the battle group. Due consideration is given to the use of Army aircraft to enhance the flexibility and mobility of the platoon.

b. The general support method is appropriate when employment of squads permits centralized control. It provides placing all or a major portion of the platoon's fires promptly wherever they are needed within the battle group zone, as with other supporting weapons, but must rely not only on the range of capability of the weapon but on its mobility as well. Future possible employment must be anticipated and planned, and terrain must allow rapid movement by elements of the platoon.

c. When it is foreseen that a rifle company will require reinforcement of its organic antitank capability for a limited period, as during the initial phase of an attack, assault weapon squads may be employed in direct support of that company. Squad leaders maintain control over their squads, but establish close liaison between supported and supporting units to insure prompt delivery of requested fires.

d. All or part of the platoon may be attached to rifle companies when a continuous armor threat is expected within their assigned sectors.

76. Selection of Firing Positions

a. The platoon leader or supported unit commander designates general firing position areas, and the squad leader selects the exact location for the missile launcher. Ideally, they select positions from which the squads can perform both their primary and secondary missions. If this is impossible, positions covering the most dangerous avenue(s) of armor approach take priority. Alternate and supplementary positions are selected and prepared as time permits. The positions should provide mutual support between squads of the assault weapon platoon whenever possible.

b. The gunner is usually located at a vantage point from which he has good observation of the squads' assigned sector. The missile(s) may be offset from the gunner by 100 meters. The missile launching position should be in defilade to provide cover, concealment, and protection for the crew, launcher equipment, and missiles.

c. A good firing position provides—

(1) Good gunner observation of assigned sector to cover armor approach.
(2) Long-range fields of fire and observation.
(3) Defilade for launching position.
(4) Mask clearance.
(5) Security (by being near friendly troops).
(6) Good vehicle routes into and out of launching area.
(7) Concealment from aerial observation.
(8) Capability to employ flanking or oblique fire.

77. Occupation of Firing Positions

The platoon leader or supported unit commander designates when and how the squads move into position. The squad leaders familiarize themselves with the exact position, so that on order they can place the missiles into operation without loss of time. If the squads cannot move undetected into positions prior to prepara-

tory fires, they begin their movement when enemy observation is limited by these fires.

78. Supporting Fires

a. When supporting an attack, assault weapon squads are located to cover avenues of armor approach throughout the battle group area. They continue to occupy initial firing positions until they can no longer perform their primary mission or until their fires become masked by the attacking rifle units.

b. Squads may support the initial attack from positions on or near the line of departure. They may engage point targets before or during preparatory fires.

c. Squads engage enemy armor as soon as it comes within range and observation. They engage targets of opportunity as planned or on call from attacking unit commanders. The remain alert to locate and report targets that may be engaged from initial positions.

79. Alternate and Supplementary Positions

a. Squads occupy alternate positions when hostile fire threatens to neutralize the firing position. The authority to occupy alternate positions is delegated to the squad. When alternate positions are occupied, the platoon leader or supported unit commander is immediately notified.

b. Movement to supplementary positions is made on order of the platoon leader or the supported unit commander.

80. Security

Squad leaders are responsible for providing their own local security utilizing crewmen not engaged in firing and handling ammunition. They may use nearby riflemen to supplement the squads' capability for close-in protection. They make maximum use of deceptive measures to minimize the possibility of the enemy locating the position. They must take all possible passive protection measures to protect personnel and equipment from the effects of nuclear weapons.

81. Ammunition Resupply

a. Squads move into firing positions with a full load of ammunition in their vehicles. The basic load for the squad is 25 rounds—3 in the missile vehicle, 6 in the ¾-ton truck, 8 in the ¾-ton trailer, and 8 in the vehicles of the battle group ammunition squad.

b. In a general or direct support role, ammunition resupply is a function of the platoon sergeant. Squad leaders supervise and coordinate with the platoon sergeant the ammunition resupply for

their squads. The ¾-ton truck and trailer in each squad are utilized for resupply of Classes III and V. The platoon sergeant may elect to use one of the squad's ¾-ton trucks (w/trailer) to resupply 1, 2, or 3 squads. The squad leaders of two squads may coordinate through the platoon sergeant to use one vehicle to resupply their two squads.

c. In an attached role, ammunition resupply is the responsibility of the commander of the unit to which attached. The squad ammunition vehicle or any vehicle designated by the supported unit commander is used.

d. Resupply procedures are implemented whenever ammunition is expended. Normally the ¾-ton trailer is left near the missile launching site. Any remaining missiles on the ¾-ton truck are offloaded and the vehicle is returned to the battle group combat trains where missiles are readily available.

e. Squads normally will not draw missiles in anticipation of expenditure except when—

(1) Missiles are for use during preparatory fires.

(2) Missiles are for use in a defensive situation wherein armor approaches and known enemy situation dictates.

82. Displacement

a. The assault weapon squad may have to displace to support a continuation of the attack; to enable the gunner to maintain observation of a unit making a long movement during the attack; or to support the consolidation and reorganization on the objective. Displacement is not necessarily delayed until the squads can no longer provide effective antitank protection. Elements of the platoon may displace early to assist rifle units in repelling enemy counterattacks. Assault weapon squads must retain the capability of providing antitank fires at all times.

b. Squads displace by squad echelon. The availability of new positions, routes forward, and the enemy armor threat influence the method of displacement. When displacement is by two or more squads, continuity of fire is maintained by one squad remaining in supporting position while the other squad(s) displaces.

c. Squads displace to positions previously selected by a visual or map reconnaissance. Upon arrival at the new position areas, the squad leader selects exact missile locations.

d. When squads are employed in a general support role, displacement is on order of the platoon leader. In a direct support role, displacement is by order of the squad leader, who in turn notifies the platoon leader of the move. Squads displace as required to support the supported unit commander's concept of operations. When attached, squads displace on order of the supported unit commander.

83. Conduct of the Attack

a. Squads occupy previously selected positions from which to provide antitank protection to the battle group. They participate in preparatory fires, if so ordered, firing on enemy tanks and other targets in support of the attacking rifle companies.

b. When they can no longer accomplish their mission from initial positions, they displace. Early displacement by some squads is necessary to insure that antitank protection is continuous. Positions will cover armor approaches into the battle group flanks as well as the objective itself.

c. Squads displace to the objective as soon as it is secured and deploy in depth to provide antitank protection on the battle group flanks and rear during reorganization.

84. Consolidation

Plans are made for supporting the consolidation on intermediate and final objectives prior to the attack. In the objective area, assault weapon squads are positioned to cover the likely armor threat(s) into the area. They occupy positions that will support a continuation of the attack.

85. Reorganization

Key personnel of the platoon are replaced as necessary, adjustments in the organization are made based on personnel and equipment losses sustained during the attack.

86. Pursuit of Exploitation

When the battle group is engaged in a pursuit or exploitation, the assault weapon squads are normally employed as in the movement to contact. They are attached to an advance, flank, or rear guard. The pursuit or exploitation usually dictates decentralization of control and requires initiative and aggressiveness on the part of the platoon leader and the squad leaders. When tanks are not attached to the battle group and the enemy armor situation is vague, two or more squads may be attached to the lead company. They fire missiles from the vehicle launcher; radio is their primary means of communication.

87. Task Force Operations

a. All or a portion of the platoon may be attached to a task force. When so attached, the platoon or that portion of it operating as part of the task force is employed within the task force in the same manner as prescribed for the platoon in support of the battle group.

b. If the platoon or a portion of the platoon is involved in an air-landed operation, consideration must be given to type loads, tactical integrity, ammunition and resupply. Attachment of the platoon or squads is made to units that will initially be covering the armor approaches in defense of the airhead. After the landing zone has been cleared and units are deployed defending the airhead, assault weapon squads are so located as to obtain the best observation and fields of fire on enemy armor approaches. If centralized control becomes desirable or feasible, the squads may be detached and placed in general support of the battle group. If enemy armor approaches are limited, the squads will provide direct fire support for the battle group units in defense of the airhead.

88. Night Operations

a. The platoon is employed as any other crew-served supporting weapon in a night operation. It is considered as a direct fire weapon and may be utilized provided suitable battlefield illumination can be obtained. Mortars (81-mm or 4.2-inch), artillery, and searchlights are suitable for this illumination. Control and coordination will be difficult and movement will be slow.

b. The squads initially occupy well-covered and concealed positions to cover enemy armor threats prior to the night attack. During the consolidation, the squads displace to the objective area to provide antitank protection. Here the platoon, or a portion of it, may be employed in general support of the battle group or in direct support of the attacking companies. Control and priority of fire will be the determining factors.

Section III. DEFENSE

89. General

a. Antitank defenses are disposed both laterally and in depth. They are planned to separate enemy armor from accompanying infantry and to destroy it forward of the battle area. If enemy armor reaches or enters the battle area, then it is destroyed by offensive action of armor reserves and antitank weapons positioned in depth. Antitank defense in depth is obtained by employing assault weapons in the area of the battle group reserve, by assault weapons available to reserve battle groups, and by division and corps armored reserves.

b. As enemy armor approaches the battle area, it is taken under fire initially by the heavy antitank weapons. Tanks that continue to advance are subjected to an increasing volume of fire from the medium and light assault weapons. See FM 7–40.

90. Method of Employment

a. Because of the wide frontages and numerous tank approaches, units of the assault weapon platoon are usually attached to rifle companies. This facilitates control and provides rifle company commanders with additional antitank defense for their assigned sectors.

b. When enemy tank approaches are limited and frontages permit centralized control, the platoon, or portions of it, may be employed in general support in rifle company sectors. When armor approaches and fields of fire are limited, assault weapon squads may be echeloned in depth in a general support role.

c. To give a rifle company priority of antitank fire on a dangerous armor approach, squads may be employed in a direct support role. This provides closer coordination with the supported rifle unit and at the same time retains the advantage of having the squads under battle group control.

91. Selection of Positions

The consideration governing the selection of firing positions are essentially the same as those discussed for the attack (par. 76). The gunner offset method of fire is desired to allow maximum cover and concealment for the missile system. Missiles may be ground mounted to provide maximum missile launching capability in as many directions as possible from a single location. The missile launching vehicle may be used to supplement the ground mounted missiles.

92. Position of Leaders

a. When all units of the platoon are attached to rifle companies, the platoon leader and the platoon sergeant locate themselves where they can assist the rifle company commanders in the employment of the assault weapons. When not actively engaged in these functions, the platoon leader remains in close contact with the battle group commander. When enemy armor is active, the platoon sergeant may position himself on the MSR slightly to the rear of the FEBA with a resupply of missiles, or he may assist the platoon leader in directing the use of missiles of squads not engaged.

b. When the entire platoon is attached to one rifle company, the platoon leader receives his orders from that company commander. He usually follows the procedure described in *c* below.

c. When the platoon is placed in general support of the battle group, the platoon leader selects an observation post from which he can observe the avenues of enemy armor approach. If the terrain does not permit this, he places himself where he can best control the squads covering the most dangerous armor approaches.

He does not restrict himself to one location but moves wherever he is needed to control the platoon. He follows this same procedure when his platoon is in a direct support role.

d. Based on directions from the platoon leader or the supported unit commander, squad leaders position themselves where they can best control their squad.

93. Antitank Defense Plan

Fires of the assault weapon squads are integrated into the rifle companies' fire plan. The companies must have a thorough understanding of the battle group barrier plan and the antitank defense plan. Fire control is mandatory to achieve surprise and obtain sustained fire against enemy armor.

94. Mobile Defense

a. Forward Battle Group. The preferred employment for assault weapon squads is well forward covering the most dangerous avenues of enemy armor approaches into the battle area. When tanks are attached to the battle group, the major portion of them may be retained in reserves so as to capitalize on their offensive capabilities while at the same time providing battle group antitank defense in depth. When tank platoons are attached to forward rifle companies, they are employed to thicken the antitank defense and to cover armor approaches less important than those covered by the assault weapon platoon. Squads should be located to provide mutual support whenever possible. When the number of enemy armor approaches is limited and centralized control is feasible, the platoon may be utilized in general support. If a priority of fire is desired on one particular approach, one or more squads may be used in direct support of the company defending that approach. Antitank weapons other than the assault weapon should cover approaches with short or restricted fields of fire.

(1) *Position in depth.* The assault weapon units plan to utilize reserve or supplementary positions (within the forward rifle companies' sectors) in depth throughout the battle area. The positions are prepared consistent with blocking and switch positions. Consideration should be given to positions that will be occupied by tanks in their antitank role.

(2) *Combat outpost.* Depending on the number of antitank weapons available and the number of enemy armor approaches, assault weapon units may be employed on the COPL (combat outpost line), firing from the vehicle launcher or from ground mounted positions. Positions that permit long range observation and fields of fire on

enemy armor approaches are selected. These positions should afford a covered and concealed route into and out of them, so that the assault weapon units can move to the FEBA on short notice. Squads are normally attached to rifle companies for use on the COPL.

b. Reserve Battle Group. When the reserve battle group is used primarily in a blocking role, the platoon is normally employed in the antitank role to add depth to the antitank defense of the division area. When the reserve battle group is used as a counterattack force, the platoon is employed as prescribed for the attack.

95. Position—Defense

a. When conducting a deliberate defense, the battle group will have more time to prepare defensive positions. This affords the assault weapon units the necessary time to employ ground mounts. More time may be given to prepare alternate and supplementary positions, to include antitank defense in depth. All this is done in coordination with other battle group antitank weapons and attached tanks included in the antitank defense and barrier plans.

b. Assault weapon squads on the COPL are attached.

c. Positions in depth, which may include supplementary positions, are utilized by the assault weapon units to support the battle group counterattack force. Assault weapon units provide antitank defense and direct fire support from these positions.

96. Retrograde

a. Night Withdrawal. In a night withdrawal, all or a portion of the platoon may remain with detachments left in contact to cover a dangerous armor approach into the battle group sector, provided illumination is available. Units of the platoon not so employed withdraw with the main body to the new defensive position. Plans for movement of the platoon must include measures to provide security and maintain secrecy.

b. Daylight Withdrawal. In a daylight withdrawal, assault weapon units are attached to each company size unit left in contact, if a tank threat and fields of fire exist in the company's sector. When the forward rifle companies withdraw through the battle group covering force, then the assault weapon platoon normally is attached to the battle group covering force. The entire platoon may be attached to the battle group covering force commander to facilitate control.

c. Delaying Action. Assault weapon squads are employed on each successive delaying position in essentially the same manner as prescribed for the defense. The extended frontages frequently covered in delaying actions dictate attachment of elements of the pla-

toon for control purposes. During retrograde operations, routes to the rear should be reconnoitered whenever possible. Missiles should be fired from the vehicle launcher.

97. Employment During Limited Visibility

To employ the assault weapon effectively in limited visibility or darkness, the battle group must have battle field illumination. Illumination may be provided by mortars, artillery, aircraft flares, or searchlights. Basically, night operations are conducted in the same manner as daylight operations, but the problem of control and coordination is greater, dispersion is less, and movement is slower.

CHAPTER 4
RECONNAISSANCE PLATOON

Section I. ORGANIZATION

98. General

a. This chapter deals with the tactical employment of the reconnaissance platoon when the battle group is conducting offensive, defensive, or retrograde operations.

b. The platoon normally operates under battle group control. Under certain conditions, however, it is attached to task forces organized within the battle group for specific operations. The platoon can be air-transported in very large Air Force aircraft, but its tanks and armored personnel carriers are not airtransportable for tactical airborne operations employing existing medium transport aircraft. In certain circumstances, the reconnaissance section may well be reduced to foot mobility (FM's 72–20, 31–60, 31–71, and 31–72).

99. Mission and Characteristics

a. Mission. The platoon's primary mission is to reconnoiter and provide security for the unit to which it is assigned or attached.

b. Characteristics.

(1) *Movement.* The platoon is completely mobile and is capable of rapid movement on roads and trails. Its tracked vehicles provide excellent cross-country mobility.

(2) *Firepower.* The 76-mm gun mounted on the light tank provides limited antitank protection for the platoon and provides a large caliber direct fire weapon capable of being used against personnel, vehicles, and light fortifications. A high proportion of automatic weapons fire is provided by the machineguns of the tank and scout sections, and by the machinegun and automatic rifles of the rifle squad. The support squad provides limited indirect fire support.

(3) *Armor protection.* The protective armor of the light tanks and the armored personnel vehicles permit freedom of movement to the tank section, the rifle squad, and the support squad in the face of smallarms and light artillery fire.

(4) *Excellent communication.* The platoon leader has radio communication with all sections and squads of his platoon. A limited wire capability exists.

100. Organization

The platoon consists of a headquarters, a scout section, a tank section, a rifle squad, and a support squad (fig. 21). All platoon personnel should be trained to function as a member of any of these elements. Personnel in the scout section and the rifle squad should also be trained in demolition and pioneer work.

101. Duties of Key Personnel

a. Platoon Headquarters. The *platoon leader* is responsible for the training, control, supply, and tactical employment of his platoon. He operates under the control of the battle group commander.

b. Scout Section.

(1) The *section leader* is responsible for the training, control, and tactical employment of the section as directed by the platoon leader. He commands one of his scout squads.

(2) The *squad leader* commands the remaining squad of the section. He employs the squad as directed by the section leader. He commands the section in the absence of the section leader.

(3) The *assistant squad leader* commands the squad in the absence of the squad leader.

c. Tank Section.

(1) The *platoon sergeant* is second in command and normally rides with and commands the tank section. He commands the platoon in the absence of the platoon leader. He is charged with the administrative and logistical requirements of the platoon, and performs other duties as directed by the platoon leader.

(2) The *tank commander* commands the tank not occupied by the platoon sergeant or the platoon leader.

d. Rifle Squad. The *squad leader* is responsible for the training, control, and tactical employment of the squad as directed by the platoon leader.

e. Support Squad. Same as *d* above.

102. Signal Communication

a. General.

(1) *Platoon headquarters.* There is 1 radio, 1 telephone, and 2 CE–11 reel equipment in the headquarters. One AN/VRQ –3 radio is mounted on the platoon leader's ¼-ton truck.

(2) *Scout section.* Two AN/VRC–10 radios are in the section; they are mounted on the section leader's and squad leader's ¼-ton trucks.

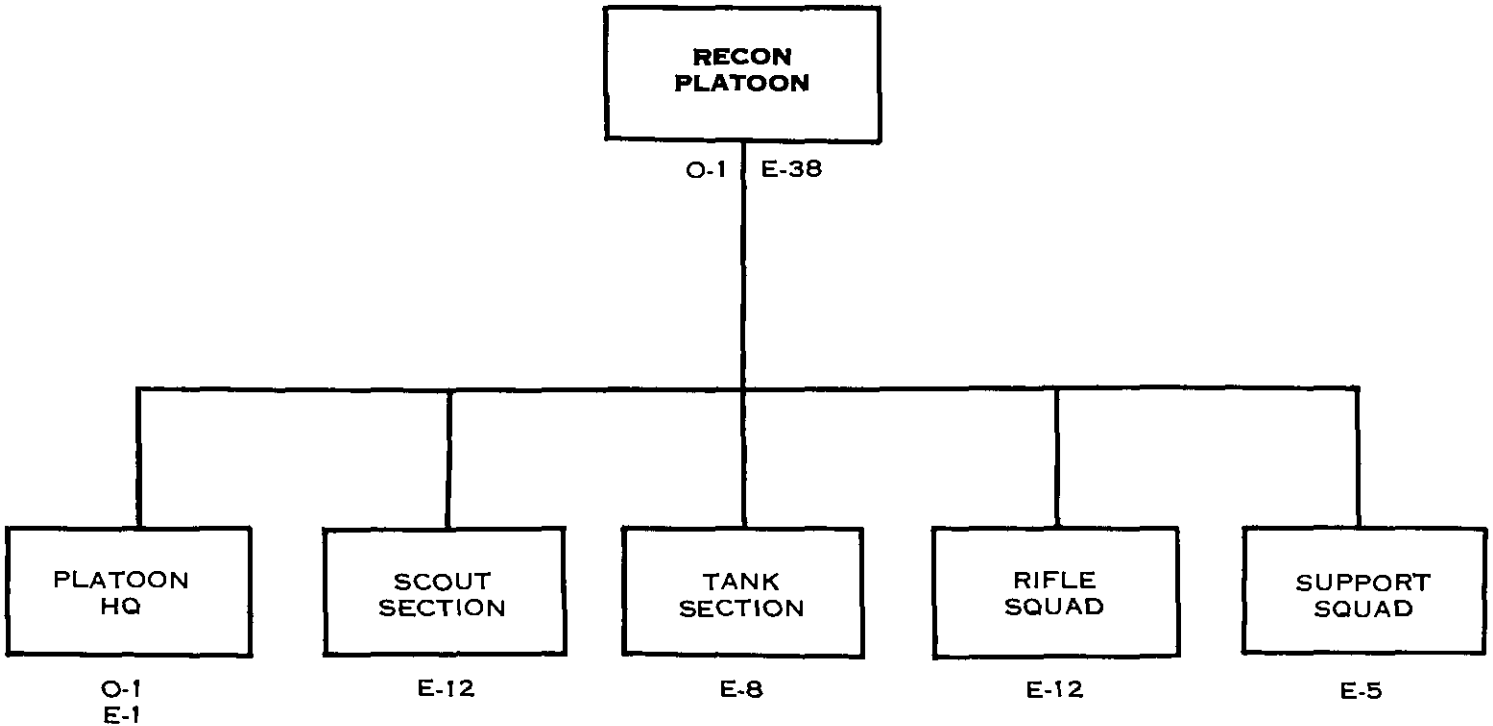


Figure 21. Reconnaissance platoon.

(3) *Tank section.* One AN–GRC/7 radio is mounted in the platoon sergeant's tank and one AN/GRC–8 radio is mounted in the other tank.

(4) *Rifle squad.* Mounted in the squad's armored personnel carrier is 1 AN/VRC–15 radio, and 1 AN/PRC–10 radio to be used by the squad when dismounted.

(5) *Support squad.* One AN/VRC–15 radio is in this squad, mounted in the squad's mortar carrier. Two TA–1/PT telephones provide wire communications between the observer and the gun position.

b. Radio Nets. The VRQ–3 in the platoon headquarters operates in both the battle group and platoon net. Other radios in the platoon normally operate only in the platoon net (fig. 22).

c. Wire Nets. The telephone in the platoon headquarters operates in the battle group wire system.

103. Capabilities

The platoon is capable of executing the following type missions:

a. Surveillance.

b. Collecting and reporting information of an intelligence nature.

c. Providing flank protection for a moving or stationary unit.

d. Providing security or maintaining contact between elements of the battle group or between the battle group and adjacent units.

e. Screening the main body of the battle group or subordinate elements.

f. Securing rear areas, lines of communication, and installations by establishing a warning system against enemy airborne or guerilla forces.

g. Maintaining combat liaison with units on the flanks or to the front of the battle group.

h. Providing alternate communication for other units in emergencies.

i. Conducting limited offensive, defensive, and delaying actions as an economy-of-force unit.

Section II. FUNDAMENTALS AND TECHNIQUES OF RECONNAISSANCE AND SECURITY

104. Basic Concepts

a. Reconnaissance missions may be performed by stealth or offensive action.

b. Security missions may be performed by patrolling, manning ground or aerial observation posts, or by actively engaging the enemy when necessary.

c. When a mission requires contact, the platoon employs the techniques of attack, defense, and delaying action as prescribed in paragraphs 108 through 112.

d. In performing its mission, the platoon may require support from other units; i.e., engineers and Army aviation.

105. Characteristics of Employment

a. Centralized Control. Actions of the platoon must be coordinated at battle group with the actions of other units, including those of adjacent and higher headquarters.

b. Independent Actions. Missions assigned the platoon may require it to operate at extended distances or beyond the supporting range of the battle group. The platoon is capable of conducting limited independent action.

106. Reconnaissance

a. Definition. Reconnaissance is the directed effort in the field to collect information of the enemy and the area of operation.

b. Fundamentals.

(1) *Report all information.* The primary purpose of reconnaissance is to secure information that may be used as a basis for tactical planning. All information must be reported, regardless of its apparent value. When considered in conjunction with information obtained from other sources, it might be extremely valuable to higher headquarters.

(2) *Submit accurate and timely reports.* Reports must be accurate and answer the questions *what, when, where,* and *how many.* The reports must be transmitted rapidly, if the information is to be of value to the battle group. Communication with the battle group must be maintained to expedite the transmission of reports. Rapid transmission of information concerning potential nuclear targets is imperative, in order that these targets will not dissipate before nuclear weapons may be employed.

(3) *Avoid decisive engagement.* The platoon secures information without engaging the enemy when possible, but fights when necessary to accomplish its mission. The leader's decision to fight is based on his assigned mission and the immediate situation. The platoon must not become engaged to the point where losses would jeopardize the mission.

(4) *Maintain contact with the enemy.* When the platoon makes either physical or visual contact with the enemy, it exerts every effort to maintain it. It does not voluntarily

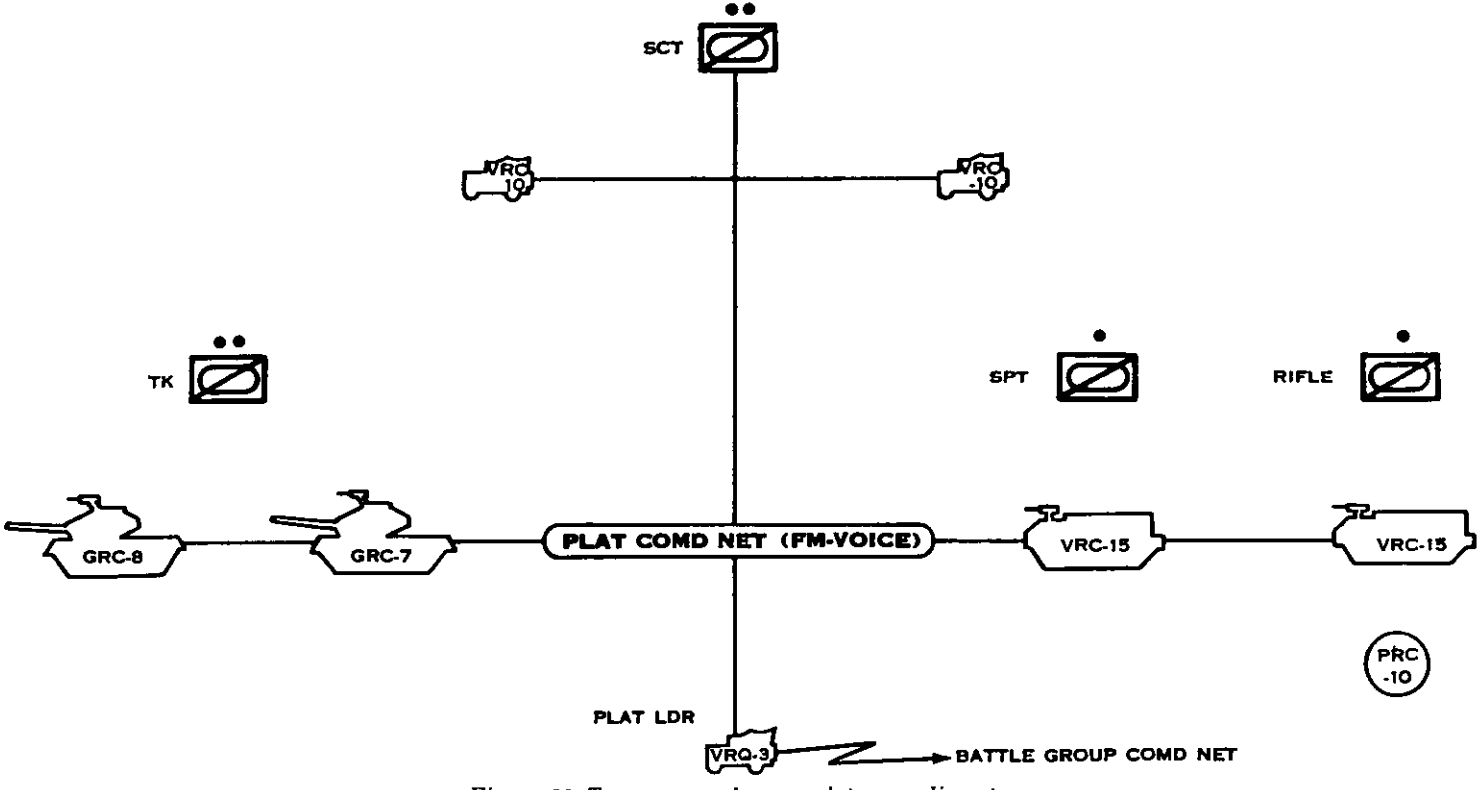


Figure 22. Type reconnaissance platoon radio net.

break contact unless maintenance of contact seriously interferes with the accomplishment of an assigned mission, or unless ordered to do so.

c. Frontages. The platoon is limited in the frontages over which it can successfully operate by such factors as road net, mission, terrain, and effective range of radio communication. The platoon operates more effectively when employed as a unit.

d. Specific Reconnaissance Missions.

(1) *General.* The platoon may be given the mission of reconnoitering a route, zone, or area. Factors to be considered in determining the mission to be assigned are the information desired, where the information is to be sought, the known enemy situation, the terrain, the weather, and the time available for completing the mission. In performing its mission, the platoon continually monitors for the presence of chemical, biological, or radiological contamination or activity in the battle group area. For a discussion of air mobility for land reconnaissance, see FM 1–100.

(2) *Route reconnaissance.* Route reconnaissance is the directed effort to obtain information of the enemy or the terrain along a specific route and on the terrain features that dominate the route. The platoon conducts a route reconnaissance by moving on the route in column formation with the scout section reconnoitering the terrain features that dominate the route. It gathers such specific information as the nature of the terrain, the conditions of existing roads and their lengths, load classification and condition of bridges and other steam crossing means, obstructions, and bottlenecks (fig. 23).

(3) *Zone reconnaissance.* Zone reconnaissance is the directed effort to obtain information of the enemy or terrain between two assigned boundaries. All roads and terrain features within the zone must be reconnoitered. The same type information as listed for the route reconnaissance is obtained. The platoon conducts a zone reconnaissance by advancing in column formation on the best road within the zone. The scout section reconnoiters other roads and terrain features between the assigned boundaries, overwatched by the rest of the platoon (fig. 24).

(4) *Area reconnaissance.* Area reconnaissance is the directed effort to obtain information of the enemy or the terrain within a definitely defined locality. The area to be reconnoitered need have no connection with the terrain over which current operations are being conducted (fig. 25).

The platoon conducts an area reconnaissance by moving over the most direct route to the area to be reconnoitered. It then reconnoiters the area using the same technique as that used for the zone reconnaissance. An area reconnaissance mission is assigned when detailed information of the enemy or the terrain in a specific locality is desired. An example of such a mission is the reconnaissance of a bridge, town, possible enemy location, tentative assembly area, or possible contaminated area.

e. Formations.

(1) The platoon uses two basic formations when performing reconnaissance missions (figs. 26 and 27). The formation selected by the platoon leader is based on the terrain and the location of suspected enemy positions, to include the the probable location of antitank weapons, minefields, and obstacles.

(2) In performing a reconnaissance mission, the platoon employs the advance to contact formation with the scout section leading (fig. 26). This affords greater flexibility and freedom of movement and permits the development of the situation prior to committing the combat elements of the platoon.

(3) The tank section may lead the formation with the scout section employed on the flanks by squad (fig. 27) when—

(*a*) The platoon is approaching a suspected enemy position.

(*b*) Necessary to insure the uninterrupted advance of the platoon against delaying forces employing harassing small-arms and artillery fire.

f. Conduct of the Reconnaissance.

(1) In general, reconnaissance missions are executed boldly and aggresively. The platoon makes full use of its mobility and firepower. However, it must make maximum use of the scout section's capability for rapid and relatively quiet movement in order to accomplish the mission with as much secrecy as possible. The scout section, closely supported by the remainder of the platoon, executes the reconnaissance mission.

(2) When necessary, the platoon attacks in the performance of its reconnaissance mission. Before committing his unit to an attack, however, the platoon leader must be relatively certain of success. He must exercise care not to commit his platoon in an attack in which the losses might be so great as to prevent further accomplishment of the reconnaissance mission.

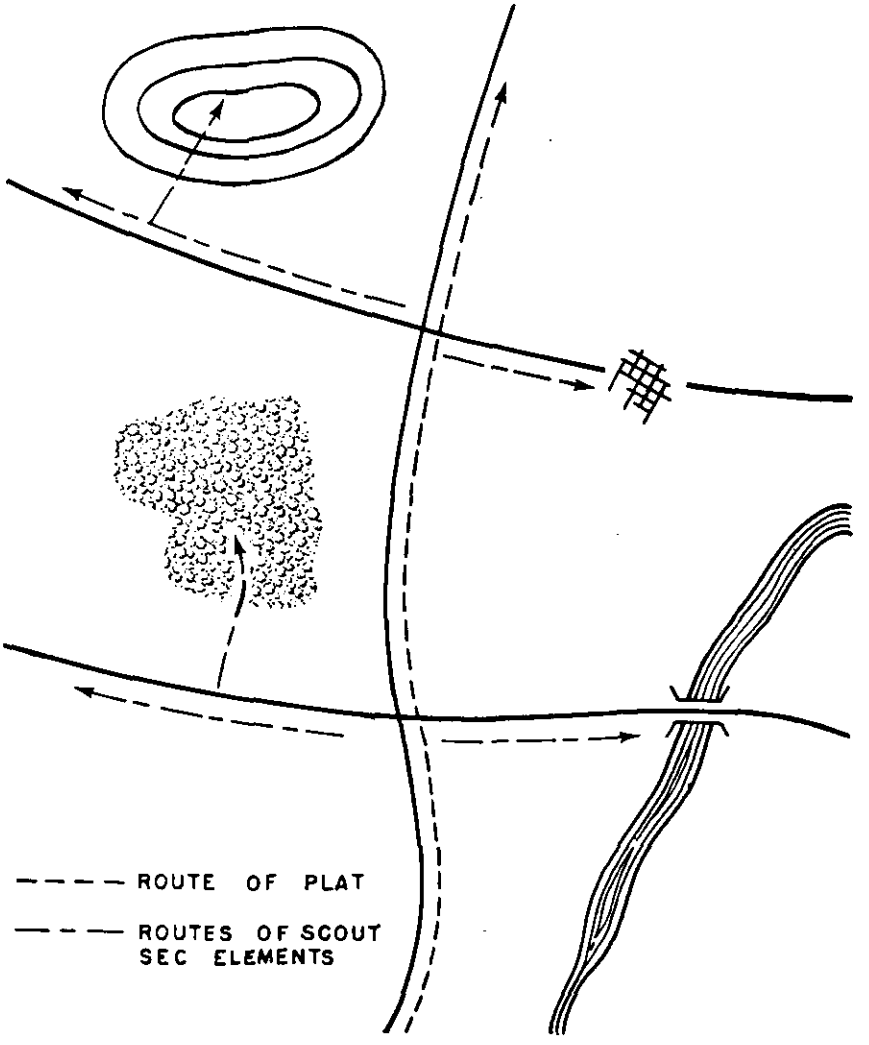


Figure 23. Route reconnaissance.

g. Reconnaissance by Fire.

(1) Reconnaissance by fire is accomplished by firing into likely or suspected enemy positions in an attempt to cause the enemy to disclose his presence by movement or return fire. During reconnaissance by fire, personnel with binoculars must continually observe the positions being reconnoitered, so that any enemy movement or return fire is definitely located.

(2) Reconnaissance by fire is a technique used when time is critical or the terrain does not favor the employment of patrols. It is employed at the loss of secrecy, because it

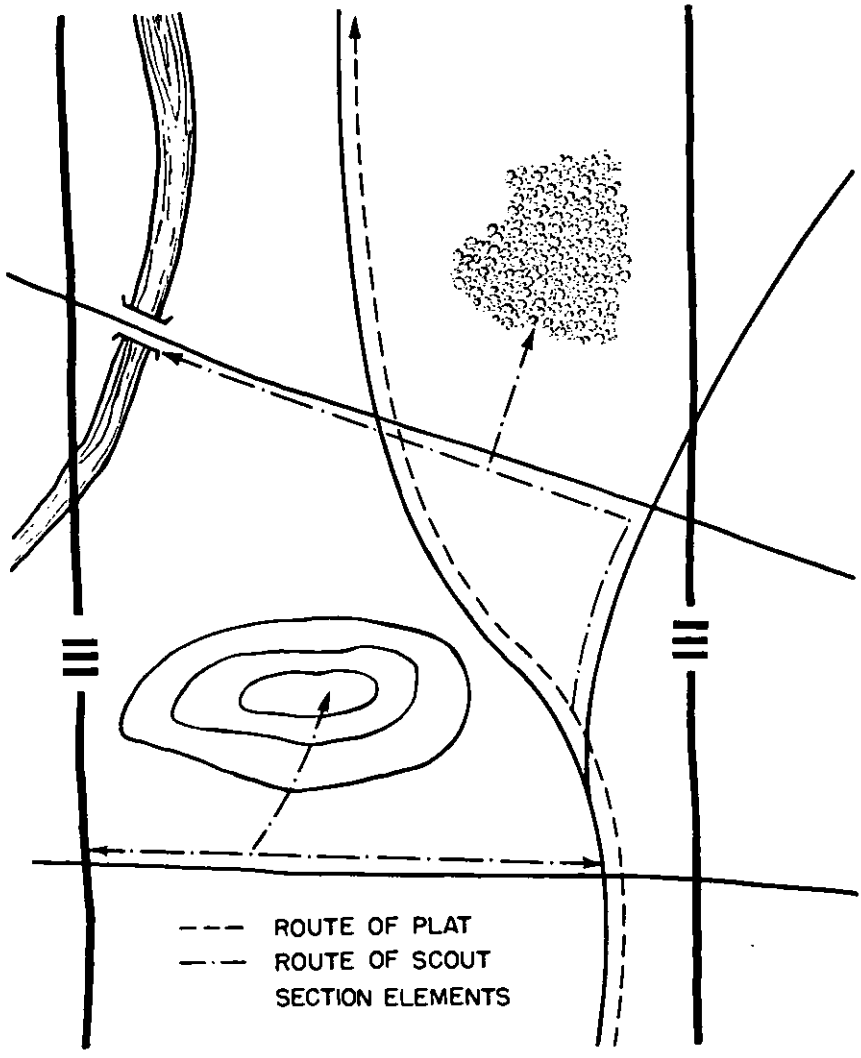


Figure 24. Zone reconnaissance.

discloses the platoon's location and alerts the enemy to its presence in the area.

(3) If the enemy returns the fire, the platoon proceeds to develop the situation. If the fire is not returned, the platoon reconnoiters the position and continues on its mission. However, while reconnoitering the position, the platoon must exercise caution since reconnaissance by fire may fail to draw the fire of seasoned troops.

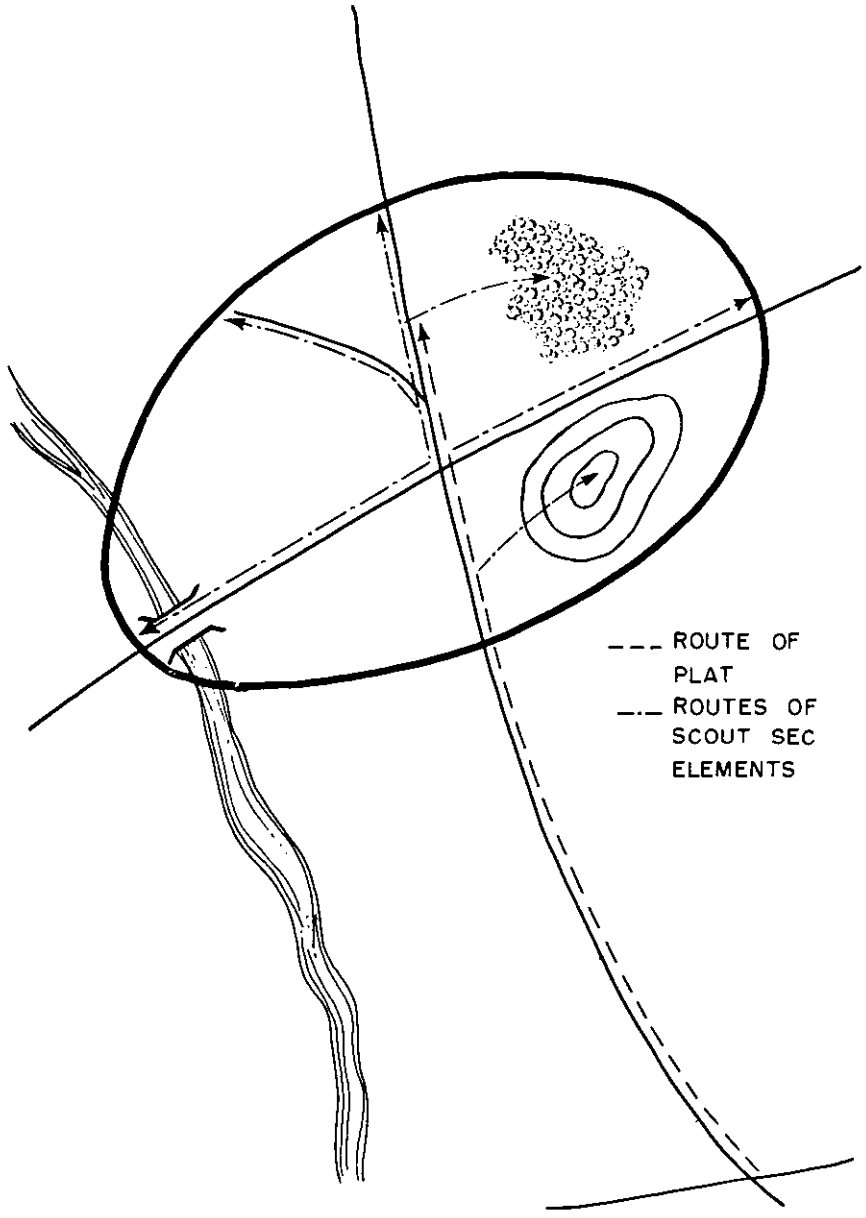


Figure 25. Area reconnaissance.

h. Development of the Situation.

(1) When the platoon makes contact or meets an obstacle, it rapidly develops the situation. It determines the enemy's strength, location, composition, and dispositions; it makes a special effort to determine the flanks of his position. In keeping with the mission, the platoon leader decides to

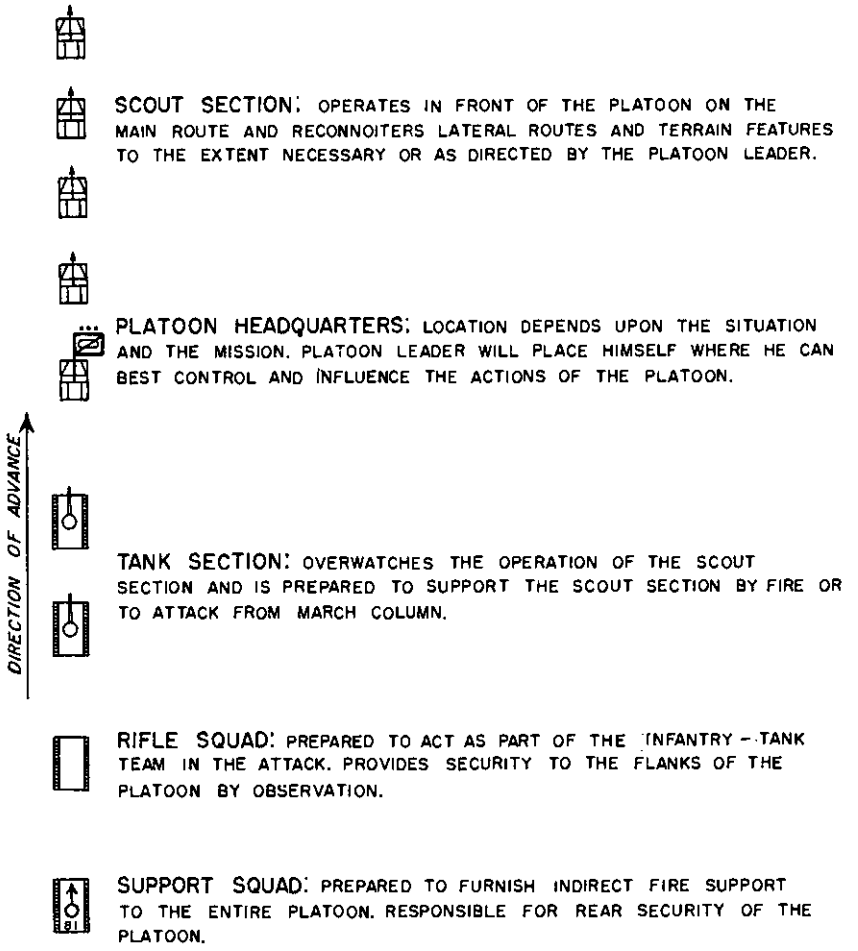


Figure 26. Reconnaissance platoon advancing to contact—scout section leading.

attack, bypass the position, or maintain pressure on and contact with the enemy. However, he bypasses an enemy location only on order.

(2) When possible, the scouts deploy and reconnoiter the position with mounted reconnaissance and reconnaissance by fire. If the terrain or enemy action restricts vehicular movement, the situation is developed with dismounted patrols from the scout section or the rifle squad.

i. Reconnaissance of a Bridge or Defile. Visual reconnaissance is made for enemy positions before the leading elements cross a bridge or pass through a defile. When mines, boobytraps, or ambushes are suspected, patrols from the scout section, overwatched by tanks, reconnoiter the approaches, banks, and the bridge or

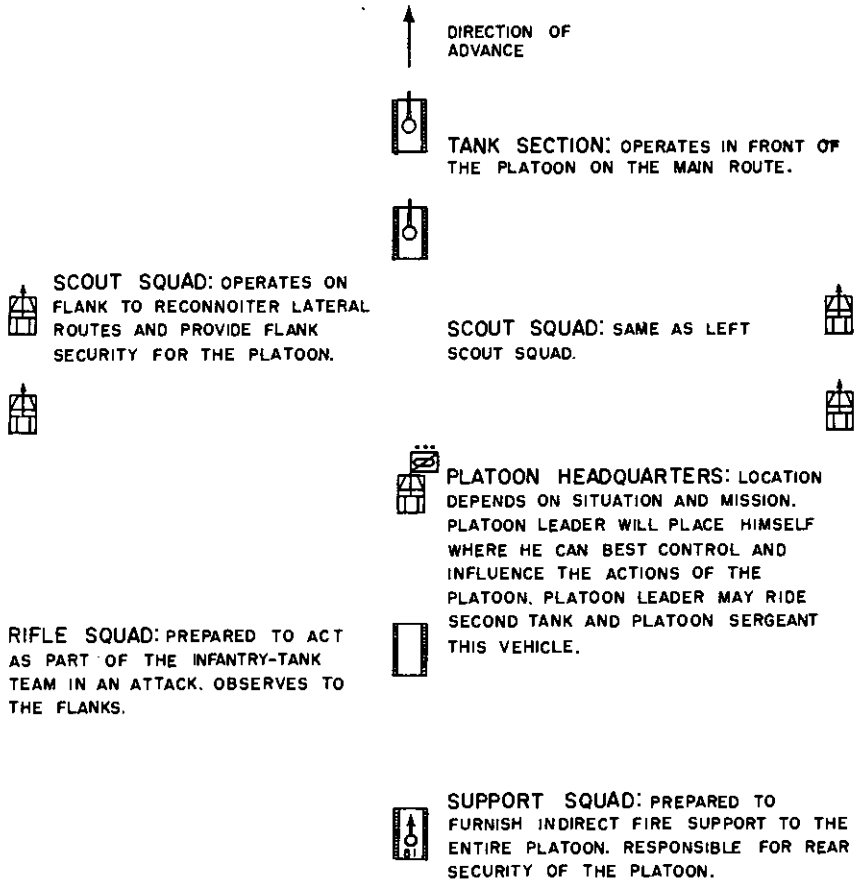


Figure 27. Reconnaissance platoon advancing to contact—tank section leading.

defile. Reconnaissance of a bridge includes searching for demolition charges or purposely weakened construction. Any mines, booby-traps, or demolition charges must be removed or neutralized. Required technical assistance is obtained from organic or direct support engineer units, which, when time permits, classify bridges.

j. Reconnaissance of a Town, Obstacle, or Enemy Position.

(1) When the platoon has been assigned the mission of reconnoitering a town, obstacle, or enemy position, it makes an attempt to approach it from the flanks or rear (fig. 28). Detailed observation with binoculars precedes the actual reconnaissance.

(2) When time is available, dismounted patrols from the scout section or rifle squad move forward, covered by the remaining elements of the platoon. The number of patrols depends on the size of the objective, the available ap-

proaches, and cover and concealment. When patrols find the near edge of a town clear, the remainder of the unit moves forward. The dismounted patrols then continue the reconnaissance, overwatched and closely followed by the rest of the platoon.

(3) When speed of advance is essential and time cannot be taken to approach towns from the flanks or to perform dismounted reconnaissance, the scouts accomplish the reconnaissance mounted. In this case, the scout elements, after a visual reconnaissance with binoculars and reconnaissance by fire, move forward rapidly, overwatched by the remainder of the platoon. If the near edge of the town is clear, the overwatched elements move forward and the advance continues. Vehicles move through the town by bounds in a staggered formation, close to the buildings, covering the buildings on the opposite side of the street by observation and fire (fig. 29).

k. Control.

(1) The platoon leader controls and coordinates the movement of his platoon primarily by radio. The platoon leader places himself in a location where he can maintain contact with and control all elements of the platoon. He is prepared to move rapidly to any portion of his area to supervise a critical action.

(2) To assist in the control and coordination with other reconnaissance units, the platoon may be assigned phase lines, check points, or contact points. Normally, the platoon reports but does not stop on reaching or crossing phase lines unless otherwise directed by the battle group commander.

l. Reconnaissance Orders and Instructions.

(1) A reconnaissance mission is assigned to the platoon as a unit. Instructions normally are issued orally to the platoon leader. When he is assigned more than one mission, he is given a definite priority.

(2) Missions must be specific. Instructions to the platoon, squads, and sections must be complete. They must include—

(*a*) Available information on the enemy and friendly troops in the area of operation.

(*b*) Plans of the higher commander.

(*c*) Specific information desired.

(*d*) Zone, area, or route to be reconnoitered.

(*e*) When, where, and how information is to be reported.

(*f*) Time of departure.

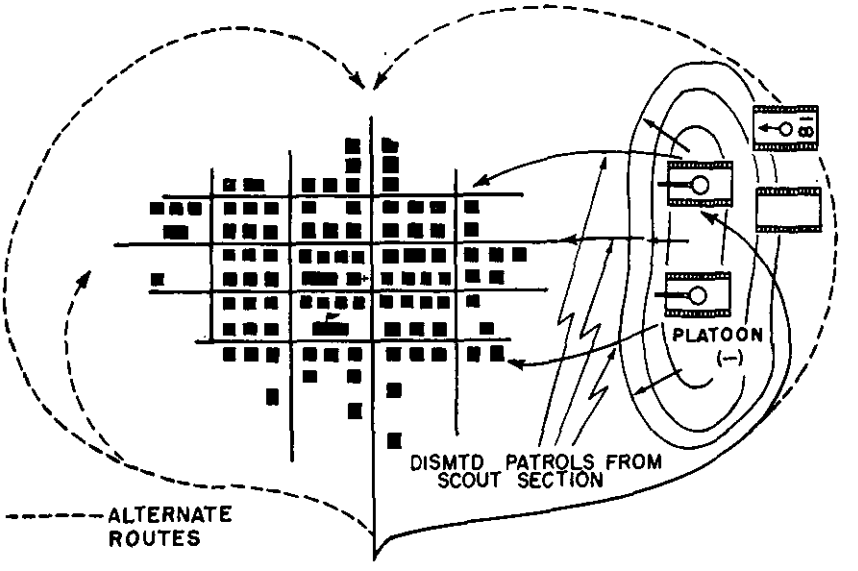


Figure 28. Reconnaissance of a town.

(*g*) Formations and control measures, such as phase lines, check points, and contact points.

(*h*) Time mission is to be completed.

(*i*) Action after the mission is completed.

(3) The platoon leader issues oral instructions to his platoon. Unless the immediate situation makes it impractical to do so, he assembles his squad and section leaders to receive the order. After the reconnaissance begins, he disseminates necessary additional instructions by radio, messenger, or in person.

m. Reconnaissance at Night. Reconnaissance operations are slower and less effective at night. They are usually limited to dismounted patrolling, observation of routes, and the use of listening posts. Only against very light resistance and with favorable terrain and routes of advance can vehicular reconnaissance be used without being preceded by dismounted patrols. Except for short cross-country movements, night vehicular reconnaissance should be confined to the road net.

107. Security

a. Definition and Purpose. Security includes all measures taken by a command to protect itself from enemy observation, sabotage, annoyance, or surprise. Its purpose is to preserve secrecy and to gain and maintain freedom of action.

b. Fundamentals.

Figure 29. Passage through a town.

(1) *Orient on the main body.* The reconnaissance platoon performing a security mission positions itself between the main body of the unit it is protecting and a known or suspected enemy. The platoon regulates its rate of movement to that of the main body.

(2) *Report information promptly.* The speed with which the platoon reports information is of primary importance. The battle group commander must have early warning of the location and movement of enemy forces that constitute a threat to his mission.

(3) *Provide reaction time.* There is no set distance that the platoon operates from the main body. However, it must operate far enough away to provide the battle group time and space to react to an enemy threat.

(4) *Maintain contact.* When the platoon makes contact, it maintains it as long as the enemy presents an immediate threat to the main body. It is essential that the platoon not permit enemy forces to penetrate the security force unobserved and surprise the main body. If the enemy moves out of the area of responsibility of the reconnaissance platoon, adjacent units must be informed, either directly by the reconnaissance platoon or through the battle group.

(5) *Avoid decisive engagement.* The reconnaissance platoon avoids decisive engagements. Destroying the enemy is not a part of its security mission.

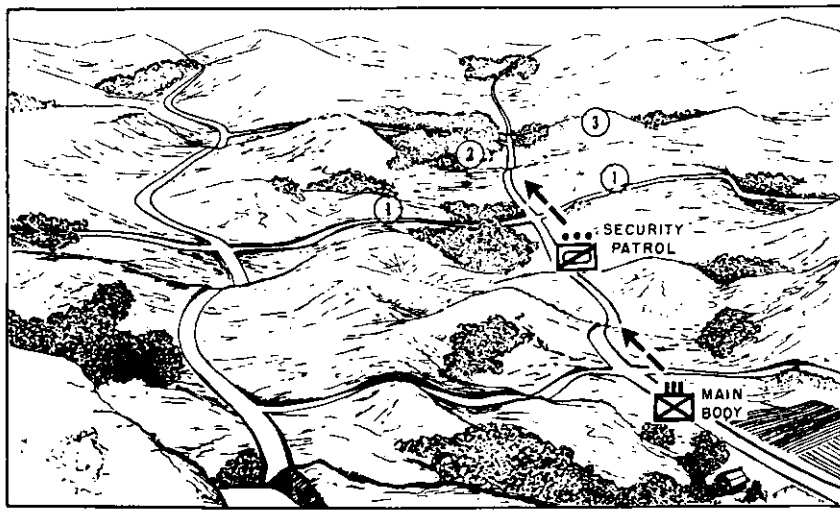
c. Specific Security Missions.

(1) *Security patrolling.* The reconnaissance platoon may receive the mission of providing security to the front, flanks, or rear of the battle group. For considerations, see FM 7–40.

(*a*) *Security patrolling to the front* (fig. 30).

1. When the battle group is moving on one route or axis, the platoon positions itself in front of and along the route or axis of advance of the battle group. It uses one of the two basic formations prescribed in paragraph 106. It operates as prescribed for the route reconnaissance. When the battle group is moving on multiple routes or axes, the platoon normally moves on the most dangerous route or axis. It then operates as prescribed for the zone reconnaissance (par. 106).

2. The distance the platoon operates forward of the battle group is prescribed by the battle group commander. It is based on the known enemy situation, the terrain, the location of other friendly reconnaissance units, the



1 Reconnoiter lateral roads.
2 Reconnoiter woods for suspected enemy.
3 Reconnoiter hill for suspected enemy position.

Figure 30. Security patrolling to the front.

rate of movement of the main body, and the mission of the battle group.

3. When the platoon makes contact, the platoon leader reports the information promptly and develops the situation. The platoon acts aggressively to push aside enemy resistance. When the platoon encounters strong resistance, it continues to reconnoiter the position, keeping it under observation, and awaits further instructions.

4. The platoon may bypass enemy resistance, depending on orders of the battle group commander. It may receive the mission of finding a bypass to be used by the remainder of the battle group.

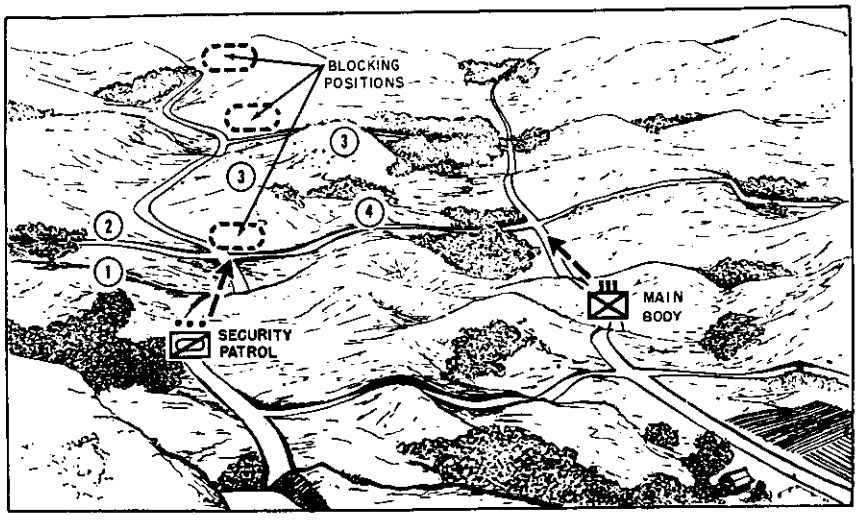
5. The attack is the most common type of combat action employed by the reconnaissance platoon when conducting security patrolling to the front.

(*b*) *Security patrolling to the flank* (fig. 31).

1. The platoon protects the main body from ground observation, direct fire, and surprise attack; and provides time and space for the main body to react to an enemy threat. It may be the flank guard of the battle group or it may be a part of a stronger flank guard.

2. The platoon positions itself on the flank of the main body. Whenever possible, it moves on a route parallel to that of the main body and regulates its speed of movement to that of the main body.

3. The distance the platoon operates from the main body is prescribed by the battle group commander. It is based on the same considerations listed for the platoon conducting security patrols to the front as prescribed in (*a*) above.
4. The platoon maintains radio or visual contact with the main body or the remainder of the flank guard. Blocking positions are selected on critical terrain features that dominate likely avenues of enemy approach into the flank of the main body. These positions may be assigned by higher commanders or they may be selected by the platoon leader.



1 Reconnoiter woods for suspected enemy.
2 Reconnoiter road to the flank.
3 Reconnoiter hills for suspected enemy position.
4 Send patrol to make contact with main body.

Figure 31. Security patrolling to the flank.

(*c*) *Security patrolling to the rear* (fig. 32).
1. The platoon protects the rear of the main body from attack, observation, or interference.
2. The platoon positions itself in rear of and follows the main body. It moves on the same route or axis as the main body, or on the most dangerous route or axis, when the battle group is moving on multiple routes or axes. It may be the battle group rear guard, or it may be part of a stronger rear guard.
3. The platoon performs reconnaissance to its flanks to insure that an enemy force does not envelop its flanks

and attack the rear of the main body. The distance it operates from the main body is prescribed by the battle group commander. The platoon regulates its movement on that of the main body.

4. When the main body is halted or is moving slowly, the platoon moves by bounds. When the main body is moving rapidly, it follows the main body at a prescribed distance.

(2) *Screening* (fig. 33).

(*a*) The reconnaissance platoon performing a screening mission provides early warning of enemy activity. It observes, reports, and maintains visual contact with the enemy. It does not actively engage the enemy but keeps him under observation.

(*b*) The platoon positions itself between the main body and the area to be screened. It establishes a series of observation posts on terrain that permits overlapping fields of observation. It covers by patrols, areas that it can't observe from the observation posts.

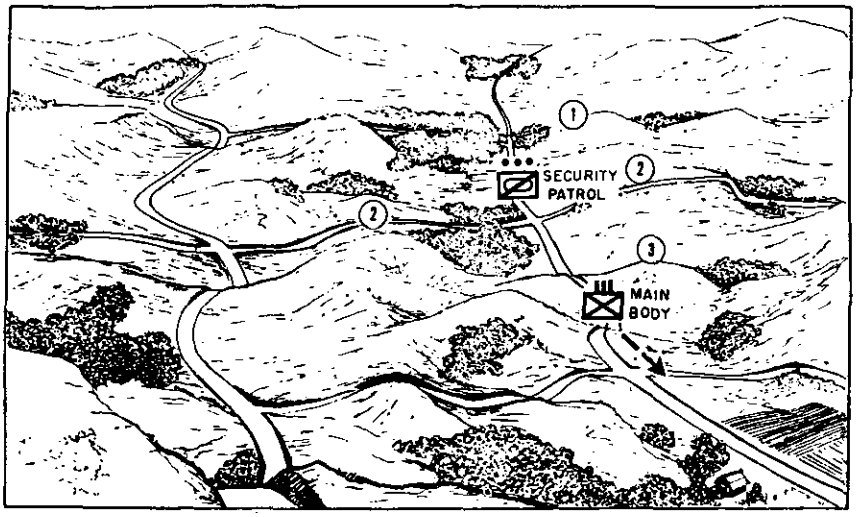
(*c*) The scout section, rifle squad, and the support squad normally man the observation posts. Tanks may be used but are not ideally suited for this role. All observation posts must be in communication with the platoon leader.

(*d*) Without additional communication equipment, the platoon is capable of manning seven observation posts by using the platoon headquarters and the tanks. Four observation posts are the ideal number, with the two scout squads, the rifle squad, and the support squad operating one each.

(*e*) When the enemy comes under observation, the observation posts maintain visual contact and withdraw by bounds as he approaches. Depending on the situation, the battle group commander may specify that small enemy patrols be permitted to infiltrate the security screen. Under these conditions, the observation posts remain concealed and continue to observe for larger enemy troop movements. They continue to report all information as it becomes available.

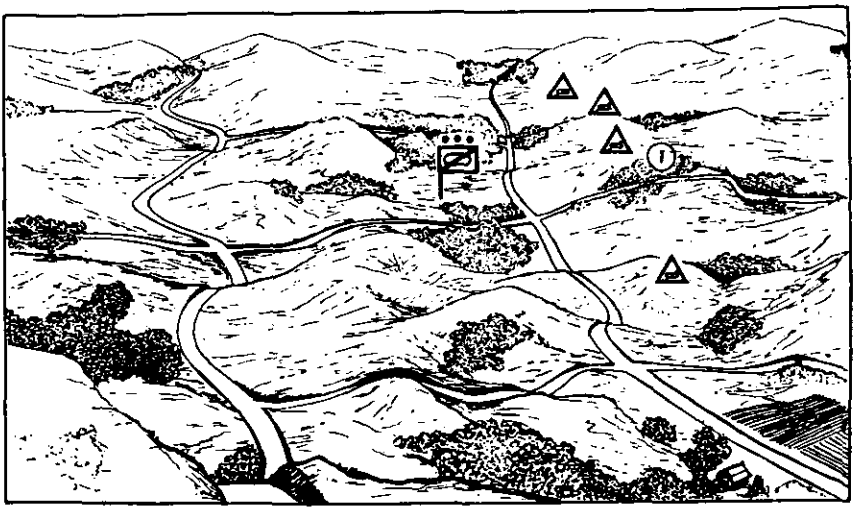
(3) *Maintaining contact.*

(*a*) The platoon may be assigned the mission of maintaining contact with friendly or enemy units. Physical, radio, or visual contact may be prescribed for friendly forces.



1 Occupy delaying position.
2 Reconnoiter lateral roads on movement to next position.
3 Next delaying position to be occupied.

Figure 32. Security patrolling to the rear.



1 The area between the two OPs should be patrolled because of poor observation.

Figure 33. Screening.

(*b*) In a contact mission, the platoon uses the same techniques as prescribed for a reconnaissance or other security mission. The enemy situation, terrain, distances involved, and the actions of the main body are the factors determining which technique(s) it employs.

Contact missions may be assigned in conjunction with reconnaissance or other security missions.

Section III. TACTICS OF RECONNAISSANCE PLATOON

108. General

The reconnaissance platoon may conduct an attack, a defense, or a delaying action in the accomplishment of its assigned reconnaissance or security mission. The platoon leader determines the best type of action to take consistent with his mission.

109. Actions Upon Contact

When the platoon makes contact, it follows four distinct steps:

a. Deploys. The vehicles move off the road and take up positions from which they can engage the enemy by fire. The platoon leader immediately reports the contact to the battle group commander.

b. Develops the Situation. The platoon leader proceeds to develop the situation as prescribed in paragraph 106.

c. Chooses a Course of Action. After developing the situation, the platoon leader decides on a course of action. It may be to attack, delay, maintain contact, or bypass. The decision is based on the following:

(1) Assigned *mission* of the platoon.
(2) Immediate *enemy* situation.
(3) *Terrain.*
(4) *Troops* available.

d. Reports. The platoon leader makes a complete report to the battle group commanders. In it he includes the enemy situation as it has been developed and the course of action decided upon.

110. Plan of Attack

a. Essential Details. The plan of attack is designed to insure maximum coordination between the elements of the platoon throughout the operation. The plan must be simple, but it must include certain essential details; for example—

(1) The composition and location of the fire support element, targets to be fired on, and control measures for lifting or shifting the fires.
(2) The composition of the maneuvering force, the route it will follow to the objective, and its method of advance (fig. 34).
(3) Provisions for security during the attack, consolidation of the objective, reorganization, and for resumption of the advance.

b. Maneuvering Force.

(1) The maneuvering force advances rapidly and fires all its weapons when they come within effective range of the objective. These fires are reinforced by all available supporting fires.

(2) When tanks are used in the assault, they are normally in a deployed formation.

(3) The rifle squad advances in the armored personnel carrier as far as possible, dismounting when forced to by enemy fire or when dismounted action is required. Riflemen mop up enemy personnel not destroyed by the tanks. The rifle squad may advance ahead of the tanks to clear buildings or to locate well-hidden antitank weapons. Riflemen designate targets to the tank commanders by the use of prearranged signals, radio, the external interphone located on the rear of the tank, flares, smoke grenades, or tracers. Whenever possible, a rifleman mounts the tank and points out targets to the tank commander.

c. Fire Support Element.

(1) The fire support element opens fire on order on known and suspected enemy within the objective area. When the fire is masked by the maneuvering force, it is lifted or shifted to the enemy flanks or rear. The fire is controlled by radio, wire, observation, or prearranged signals. Tanks and automatic weapons in the fire support element may be moved when necessary to attain better fields of fire or to avoid fire.

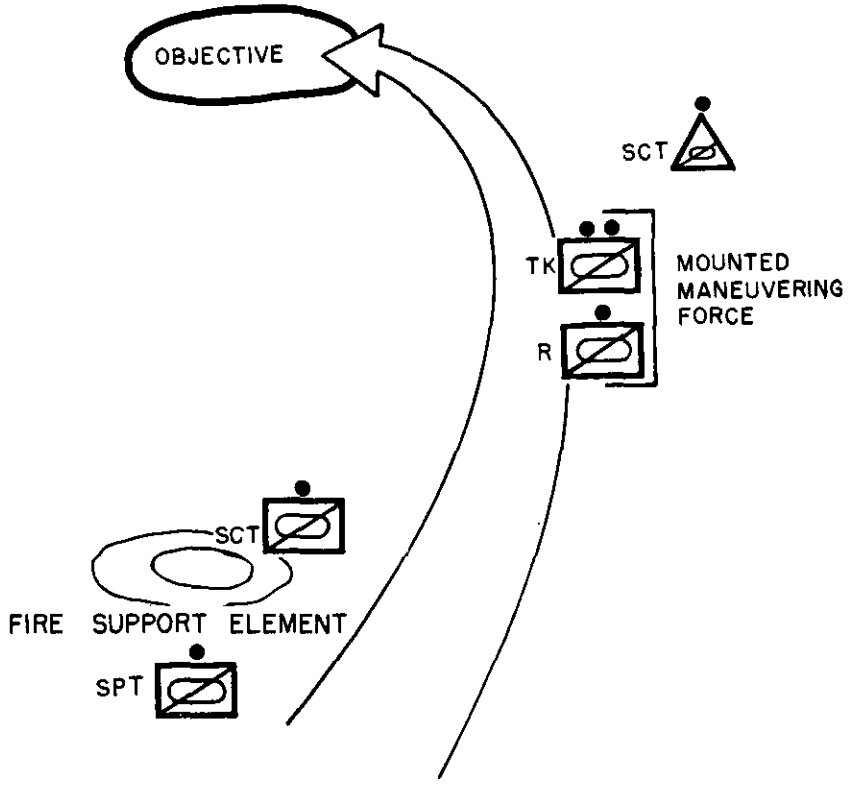
(2) The maneuvering force must be in position to fire on the objective before the supporting fires are lifted. When the fires of the fire support elements are lifted or shifted, the maneuvering force moves directly onto the objective.

(3) Direct fire weapons must be prepared to displace forward when their fires are masked. The support squad normally does not displace until the consolidation of the objective is completed.

d. Attack Formations. Several methods of deploying the platoon for the attack are illustrated in figure 34.

e. Action on the Objective. When the platoon takes the objective, it consolidates it and reorganizes in preparation for future operations. The extent of consolidation and reorganization depends on the mission, time available, and losses suffered by the platoon. The objective is consolidated using the techniques prescribed for the defense (par. 111).

f. Command and Control. During the attack, the platoon leader may remain with the fire support element or accompany the



1

Figure 34. Attack formation—reconnaissance platoon.

maneuver force. The platoon sergeant controls those elements not directly under the control of the platoon leader.

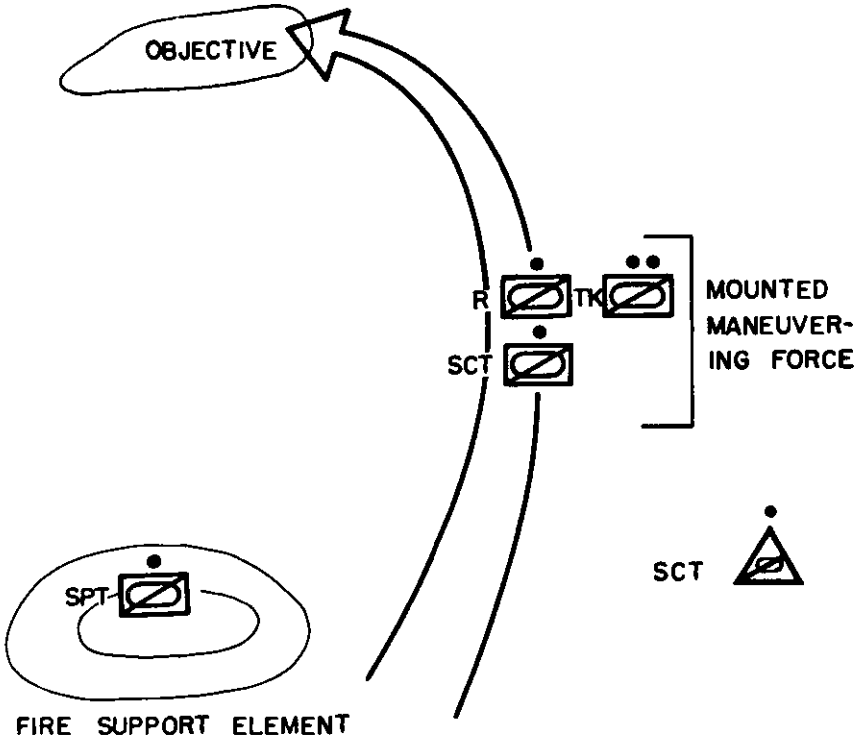
111. Defense

a. General. The platoon operating alone is limited in its ability to conduct a prolonged defense. However, in the conduct of reconnaissance and security missions, it may be required to defend an area for a limited time.

b. Reconnaissance and Selection of Positions. The platoon leader, accompanied by his section and squad leaders, reconnoiters the area to be defended. The availability of time determines how extensive the reconnaissance will be. Based on this reconnaissance, the platoon leader formulates his plan.

c. Occupation and Preparation of Positions.

(1) The platoon provides security to the front and flanks of the position by establishing observation posts to give early warning of enemy approach. It may use patrols to cover areas not under observation from the observation posts. Flanks are tied into obstacles whenever possible.



2

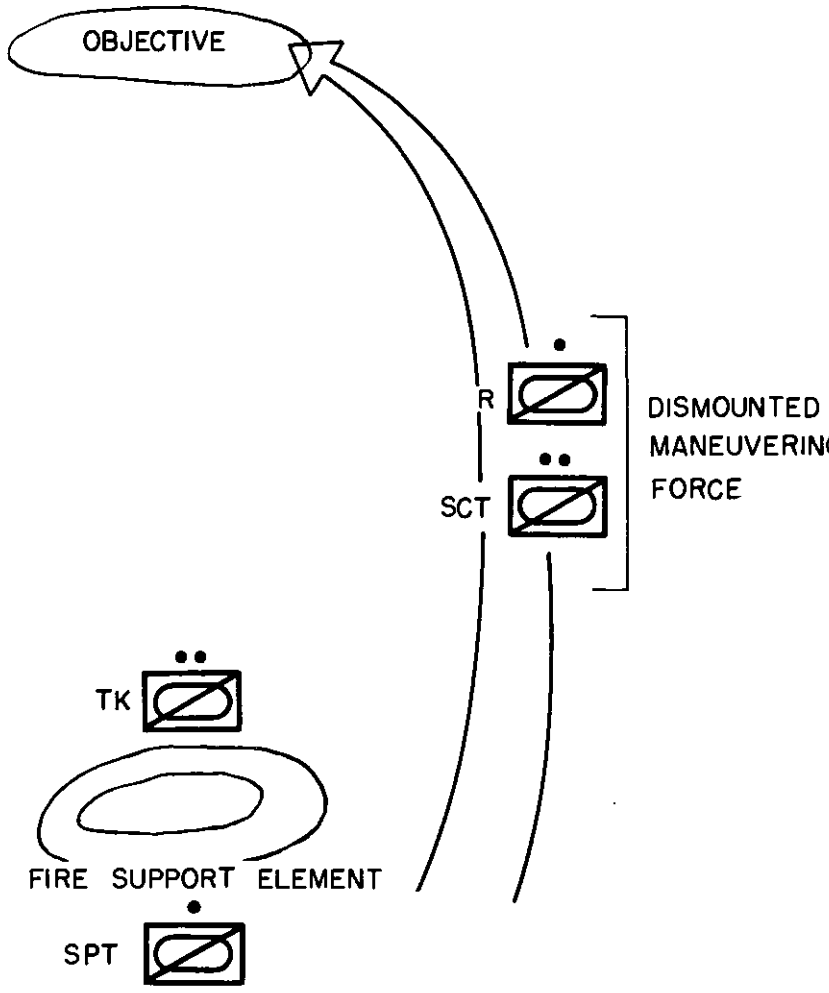
Figure 34.—Continued.

(2) The platoon leader assigns specific areas of responsibility to the elements of the platoon. He assigns sectors of fire and final protective lines to the machineguns employed on the position (fig. 35).

(3) The platoon defensive position is organized around the tank section. The tanks are positioned to cover the most dangerous enemy armor approach into the position. Each tank is placed in hull defilade and should mutually support each other.

(4) The mission of the rifle squad is to provide maximum fire to the front and flanks. The rifle squad has the additional responsibility of protecting the tanks from tank-hunter teams. It normally does this by covering the most dangerous avenue of enemy foot approach. The rifle squad may be organized into two automatic weapons teams, one equipped with the machinegun and the other with the two automatic rifles. These teams should be mutually supporting.

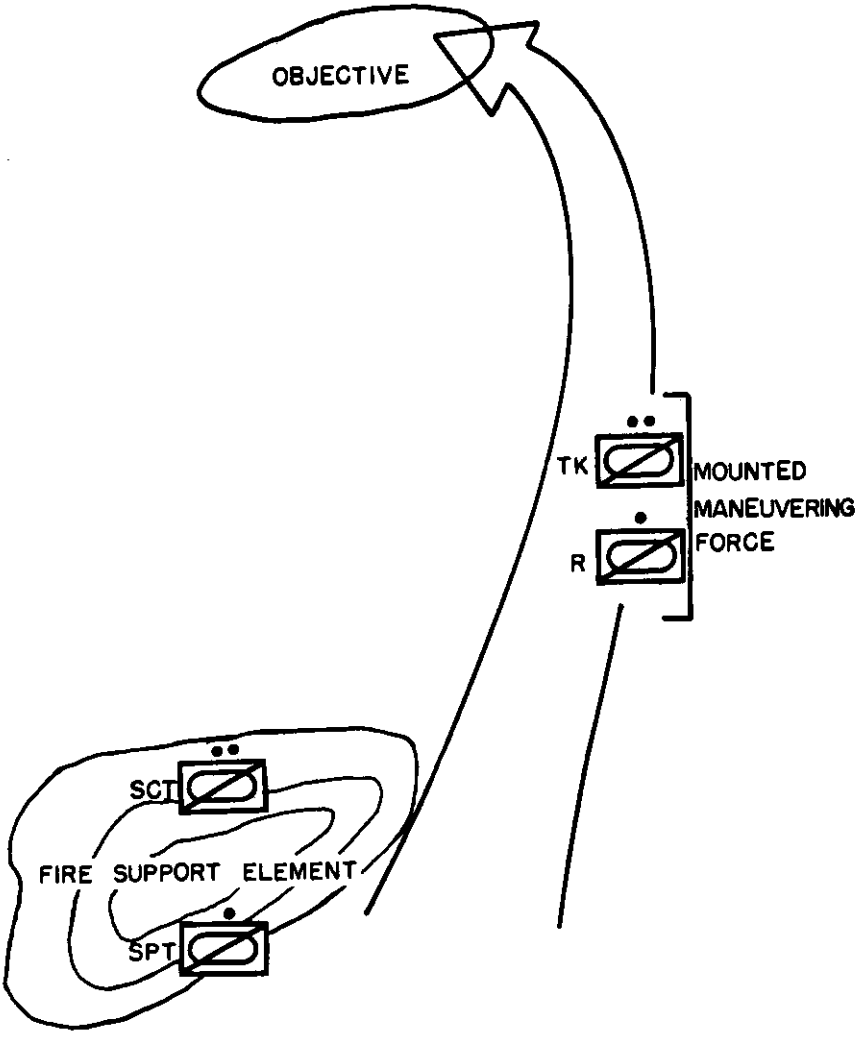
(5) The primary mission of the scout section is to provide security for the platoon. Personnel of the section man ob-



3
Figure 34.—Continued.

servation posts and patrol to accomplish this mission. A portion of the scout section may remain in the defensive position and be employed as riflemen. The platoon leader normally prescribes the location of the observation posts. The observation posts report the location, strength, disposition, and movement of the enemy, and adjust long range fire. When enemy action forces the observation posts and patrols to be withdrawn into the defensive position, the personnel of the scout section occupy previously prepared positions.

(6) The support squad provides indirect fire support. It is normally located to the rear of the position and is re-



4
Figure 34.—Continued.

sponsible for rear security. Whenever possible, the mortar is fired from the carrier.

(7) The platoon's ¼-ton trucks, when not employed on security missions, are located to the rear where they are protected from direct fires delivered on the defensive position.

d. Fire Planning. Firepower is the platoon leader's means of stopping the enemy forward of the defensive position. Fire planning includes the coordination of all available fires that can be brought to bear. The fire plan is designed to bring the enemy under

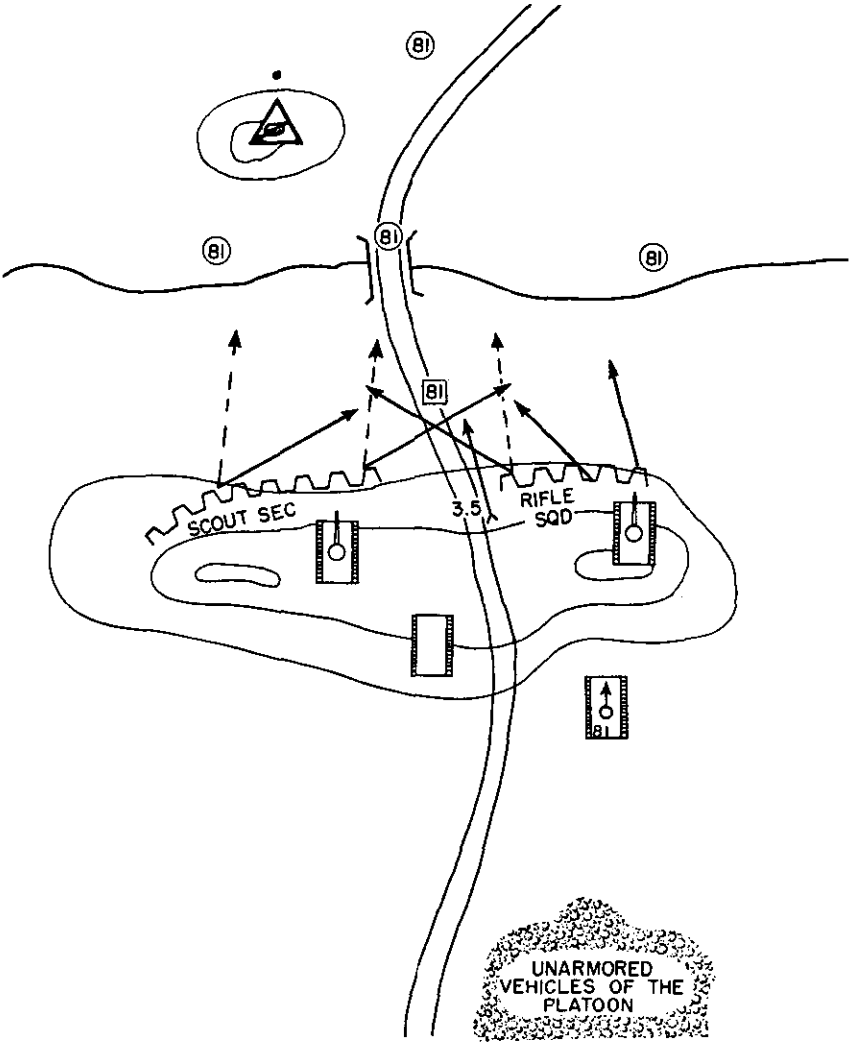


Figure 35. Reconnaissance platoon in defense.

fire at maximum range and subject him to an ever-increasing volume of fire as he approaches the defensive positions.

e. Conduct of the Defense. The enemy approach is detected as far forward of the defensive position as possible. Personnel on the observation posts adjust long range fires as he comes within range. As the enemy approaches the defensive position, he is brought under fire. Each weapon takes the enemy under fire as he comes within range. If the enemy envelopes the flanks of the position or succeeds in penetrating it, supplementary positions are occupied.

112. Delaying Action

a. General. The platoon frequently conducts delaying actions in accomplishing a reconnaissance or security mission. The action is conducted on a series of delaying positions organized in depth (fig. 36).

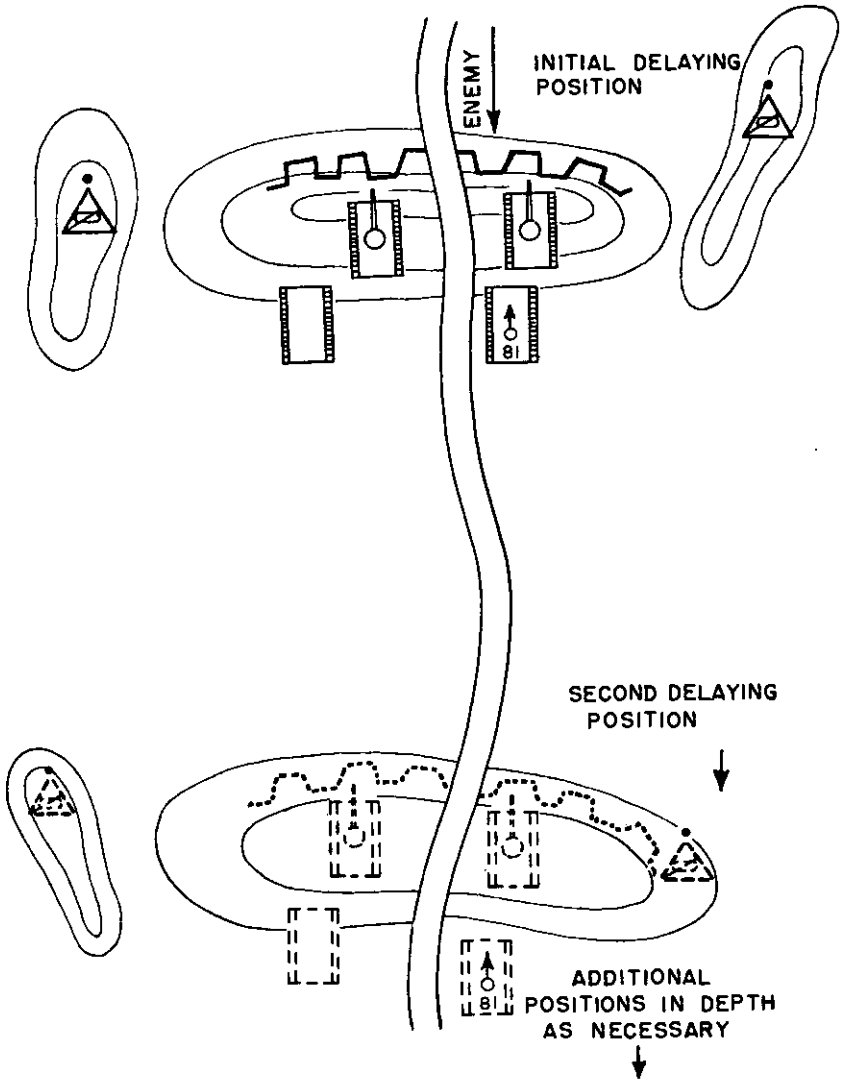


Figure 36. Delaying positions prepared in depth.

b. Selecting Delaying Positions. Whenever possible, the delaying positions should be on commanding terrain, using the topographical crest. They should have good observation and fields of fire,

cover and concealment, obstacles to both front and flanks, and routes of withdrawal. The platoon leader reconnoiters the initial delaying position and sends the platoon sergeant to reconnoiter each succeeding position. The platoon sergeant uses the platoon leader's ¼-ton truck, driver, and one or more men from the rifle squad.

c. Organizing the Position. A delaying position is organized in generally the same manner as prescribed for the defense except that the scout section mans observation posts to the front and the flanks (par. 111). The platoon is positioned on commanding terrain that covers one likely avenue of enemy approach, preferably with only one road leading into the position. The platoon leader normally operates from the platoon sergeant's tank of the rifle squad's armored personnel carrier, but he may be anywhere on the position from which he can best control the action. Preparation of the position begins as soon as the platoon arrives in the area and continues as long as time permits. Upon occupation of each delaying position, the platoon takes immediate steps to provide security to the front and flanks.

d. Conduct. The action on the delaying position is similar to that prescribed for the defense (par. 111), except that the platoon does not engage in close combat. When the position is in danger of being overrun, or at a specified time, the platoon withdraws to the next delaying position.

e. Withdrawing to Subsequent Positions. The platoon holds each delaying position until forced to withdraw or to conform with orders from the battle group commander. In either case, the platoon must have prior permission to withdraw. If the platoon is forced to withdraw by enemy action, the platoon leader must inform the battle group commander in sufficient time to obtain authority to withdraw before becoming decisively engaged. He must keep the battle group commander informed as the situation progresses, so that the battle group commander has detailed knowledge of the situation and can make a quick decision. The platoon may withdraw from the delaying position as a unit or by squads and sections. In either case, the withdrawal is normally accomplished as follows:

(1) *Platoon leader*—withdraws with the last element to leave the position.
(2) *Tank section*—withdraws as the last element of the platoon. If the terrain is heavily wooded, or observation is otherwise restricted, the rifle squad covers the withdrawal of the tank section.
(3) *Rifle squad*—withdraws before the tank section when the terrain provides good observation.

(4) *Support squad*—withdraws after maximum assistance has been given the withdrawal of other elements of the platoon. It normally withdraws at the same time as the rifle squad.

(5) *Scout section—is not* considered in the order of withdrawal of the platoon. The section leader, under the direction of the platoon leader, controls the withdrawal of the scout squads. He withdraws the scout squads on the flanks so that at least on squad has visual contact with the enemy at all times.

Section IV. BATTLE GROUP TACTICS AS APPLIED TO RECONNAISSANCE PLATOON

113. Movement to Contact

a. During movement to contact, the reconnaissance platoon may reconnoiter routes over which the battle group will advance; it can assist in traffic control. It may reconnoiter assembly areas and attack positions as well as provide security while the battle group occupies these positions.

b. When there are no friendly forces to the front and the enemy situation is vague, the platoon conducts security patrolling to the front. However, if the battle group commander has reason to be more concerned about a flank, the platoon may patrol on that flank.

c. When friendly forces are to the front, the platoon may conduct security patrolling on the most dangerous flank. If friendly forces are operating far to the front, the platoon may be assigned the mission of maintaining contact with these forces. The platoon may also be given the mission of maintaining contact between elements of the battle group, if it is moving on multiple routes or axes, or with other friendly units operating on the flanks.

d. When in the performance of any of the above missions, the platoon makes contact with the enemy, the platoon leader selects a course of action. He may elect to attack the enemy; to conduct a defense or delaying action, if the enemy force is moving toward the main body; or to keep the enemy force under observation, if it represents no immediate threat to the main body. The battle group commander must be kept thoroughly informed of all enemy encountered and the actions taken by the reconnaissance platoon.

114. Attack of Initial Objectives

The reconnaissance platoon does not normally operate forward of the battle group in the attack, but is assigned a security patrol mission on the most dangerous flank. The platoon may also be given the mission of maintaining contact with adjacent units.

115. Action Within the Enemy Position

a. When, after seizure of the objectives, the battle group immediately resumes the attack toward a deep objective, the reconnaissance platoon normally functions as in the movement to contact (par. 113).

b. When the battle group consolidates the objective prior to the continuation of the attack, the platoon may reconnoiter beyond the objective and maintain contact with the enemy, conduct security patrolling to the front or flanks, or maintain contact with adjacent units.

c. When nuclear weapons are used by either friendly or enemy forces, the platoon may receive the mission of reconnoitering the area of detonation to determine the amount of damage and/or contamination in the area. Engineer personnel may be attached to the platoon for such a mission.

116. Pursuit

If the enemy resistance collapses, a pursuit may be ordered. When the battle group is engaged in the pursuit, the reconnaissance platoon functions generally as prescribed for the movement to contact (par. 113). Every effort is made to gain and maintain contact with the withdrawing enemy.

117. Task Force Operations

Because of the areas over which the battle group operates and the fluid warfare contemplated under nuclear conditions, the battle group commander will have frequent occasions to send out task forces. The reconnaissance platoon may be attached to a task force or may provide a nucleus around which a task force can be built.

118. The Defense

a. The battle group normally defends as part of a larger force. It employs the defense to deny a vital area to the enemy, protect a flank, contain an enemy force, gain time, economize forces, or to destroy or disorganize the enemy.

b. The reconnaissance platoon normally operates initially with the security echelon. When a general outpost is established, it usually operates between the GOPL (general outpost line) and the COPL. It maintains contact with the GOPL and adjacent units. While accomplishing this, the platoon reconnoiters the roads and trails in the area and establishes temporary observation posts to observe particular areas. It also reconnoiters for enemy approaches and possible locations of future enemy assembly areas and weapon positions. It recommends locations for concentrations as part of the long range defensive fires. It is capable of performing a com-

bination of these missions simultaneously. Upon the withdrawal of the GOPL, the platoon may be attached for use on the COPL, or it may operate in the area between the COPL and the FEBA, maintaining contact with units on the flanks.

c. Upon withdrawal of the security elements into the battle position, the platoon may operate battle group observation posts within the position, maintain contact with adjacent units, conduct security patrolling on an exposed flank, perform reconnaissance throughout the battle group rear, or become part of the battle group reserve. Its ability to perform more than one of these missions simultaneously is limited.

d. When there are no friendly forces operating forward of the battle group, the platoon may conduct a screening mission to the front, maintaining visual contact with the enemy as he approaches.

e. The reconnaissance platoon of a reserve battle group normally performs reconnaissance and security missions throughout the battle group area of responsibility. When the reserve battle group is committed to the counterattack, the platoon functions as prescribed for the attack.

119. Retrograde

When the battle group is conducting a withdrawal or a delaying action, the platoon functions as prescribed for the defense. Under some conditions, it may be attached to the covering force; however, it normally operates under battle group control.

CHAPTER 5
RADAR SECTION

Section I. MISSION AND ORGANIZATION

120. Mission

The primary mission of the radar section is to provide ground radar surveillance for the battle group.

121. Organization

a. General.

(1) The radar section consists of a section headquarters, two medium range radar teams, and five short range radar teams (fig. 37). A lieutenant section leader, a section sergeant, and one radar mechanic comprise the section headquarters. The medium range radar team consists of a senior radar operator and two radar operators. Each short range radar team has a senior radar operator and one radar operator.

(2) Vehicular transportation within the section is as follows:

Section headquarters —One ¾-ton truck with trailer.
One ¼-ton truck with trailer.
Medium range radar team—One ¼-ton truck with trailer.

(3) Communication equipment in the section consists of one AN/VRQ–3 radio mounted on the section leader's ¼-ton truck, one AN/VRC–10 radio mounted on the ¼-ton truck of each medium range radar team, and one AN/PRC–10 radio for each short range radar team. See figure 38 for a type radio net for the radar section. The medium range radar teams are equipped with the medium range AN/TPS–21 portable radar set and associated equipment. The short range radar teams are equipped with the portable short range AN/PPS–4 radar set and associated equipment. Second echelon maintenance for this equipment is provided in the radar section headquarters of the battle group.

b. Capabilities and Limitations.

(1) *Capabilities.* The radar section is capable of providing ground radar surveillance over selected sectors of the battle group area of responsibility that fall within the

range and line of sight capability of the equipment. Through an analysis of the radar audio tone return, the operator can determine range, azimuth, and speed of the detected target. Reliable ranges for planning purposes are—

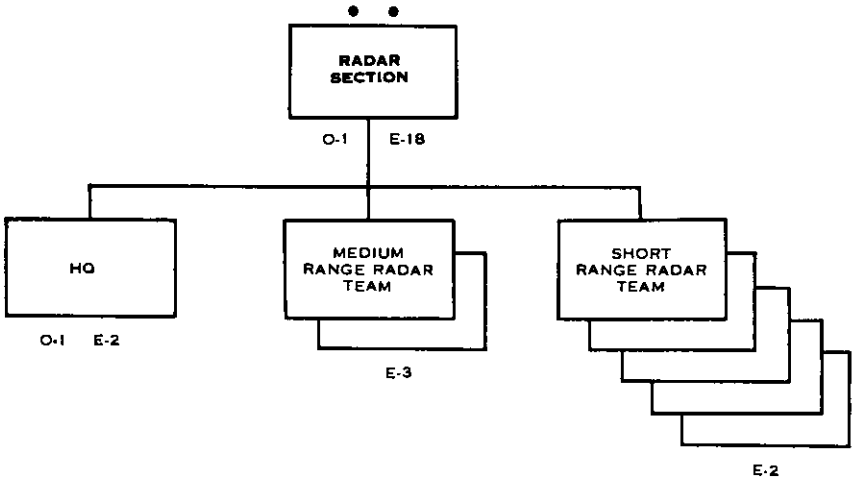


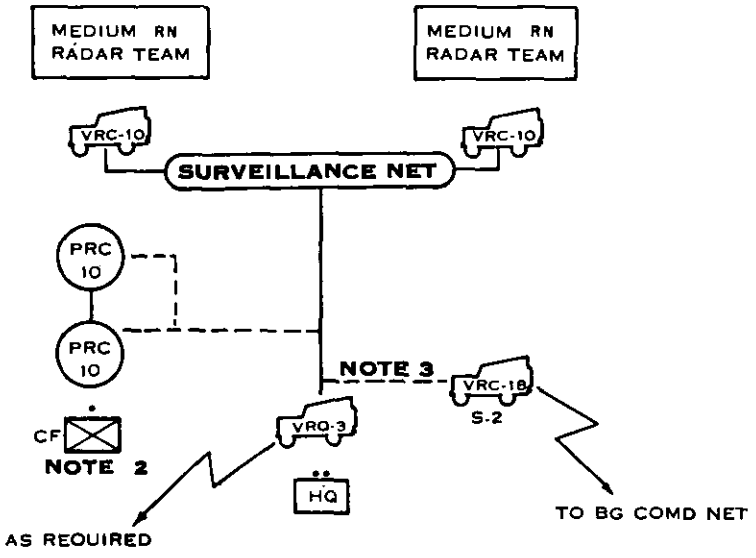
Figure 37. Radar section organization.

AN/PPS-4: Detection of individuals—3,500 meters
Detection of vehicles—6,000 meters
AN/TPS-21: Detection of individuals—5,000 meters
Detection of vehicles—20,000 meters

(2) *Limitations.* Limited personnel, transportation, and communication—as well as the line of sight characteristics and inability of the radars to penetrate dense undergrowth, trees and foliage—all influence the employment and capabilities of the radar section.

(3) *General description.*

(*a*) *Radar set AN/PPS-4 (short range)* (fig. 39). This is a lightweight, portable radar set designed to detect moving targets, such as vehicles and personnel, which are indicated by distinctive audio tones in the operator's headset. The operator is aided in the recognition of types of moving targets by superimposed audio tones resulting from the independent radial velocity of the target's moving parts; for example, tracks on tanks. Maximum tone signal indicates "on target." Manual operation allows a specific target to be tracked or "pin pointed" in range and azimuth. There are no provisions for remote control. An optical sight is mounted on the radar to provide an optical axis for orientation and for



NOTE: 1. SHORT RANGE TEAMS MAY ENTER THIS NET AS REQUIRED. WHEN ATTACHED TO RIFLE COMPANIES THE SHORT RANGE RADAR TEAMS WILL ENTER THE COMPANY COMMAND NET.

2. ENTERS SURVEILLANCE NET WHEN TRANSMITTING INFORMATION TO S-2.

3. MONITORS NET.

Figure 38. Type radio net (radar section).

target identification when the radar is operated. One man can place the radar in operation within 10 minutes. To attain desired efficiency of operation, operators should alternate every 30 minutes. This radar can be carried on two standard pack boards.

(*b*) *Radar set AN/TPS–21 (medium range)* (fig. 40). Method of operation and recognition of targets are identical to those of the AN/PPS–4. However, automatic operation permits a predetermined area to be scanned. Remote control operation is accomplished by using cables up to 50 meters from the transmitter. Later models of this radar are equipped with an oscilloscope (A scope), which presents a visual display of pulse returns from a target area. By observing the visual presentation, an operator is able to maximize the intensity of the pulse return on the A Scope, thereby insuring that the antenna tilt is correct and properly oriented with respect to the target area. The distinc-

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tive pulse return of a moving target and a well-defined gap, representing an 80 yard "range gate," are plainly visible on the A Scope. Being able to observe movement of the "range gate" on the A Scope enables the operator to quickly engage a target in range even though initially the characteristic audio tone of a moving target may not be present in his headset. The A Scope reduces operator fatigue by providing relief from the necessity of concentrating on the audio signal. A target which may not be detected by its audio signal in the headset due to operator fatigue may very well be detected by its visual presentation on the A Scope. This radar can be carried on five standard pack boards.

122. Duties of Personnel

a. Section Headquarters.

(1) The *section leader* is responsible for the section's training, control, tactical employment and supply. He recommends to the battle group commander and staff methods of employment of his section. Within the guidance of the surveillance plan (fig. 41) prepared by S2, he selects the primary positions and surveillance areas for the medium range radar teams. He insures that adequate orientation of the medium range radars is accomplished to provide accurate electronic surveillance data. He coordinates with the battle group signal officer on signal matters and with the fire support coordinator to insure a correlation of surveillance areas and the capability of firing in those surveillance areas. He insures that radar surveillance cards for all devices retained under battle group control are prepared, utilized, and distributed to the battle group S2 and fire support agency (fig. 41). He coordinates with unit commanders in whose area his radar teams are operating on matters of communication, security, administration, and logistical support. He performs such other duties as the battle group commander may direct.

(2) The *section sergeant* is second in command of the section; he assumes command in the absence of the section leader. He is normally charged with the administrative and logistical functions of the section.

(3) The *radar mechanic* performs second echelon maintenance on radar equipment. Third echelon maintenance is provided by the division signal battalion.

b. Medium Range Radar Team.

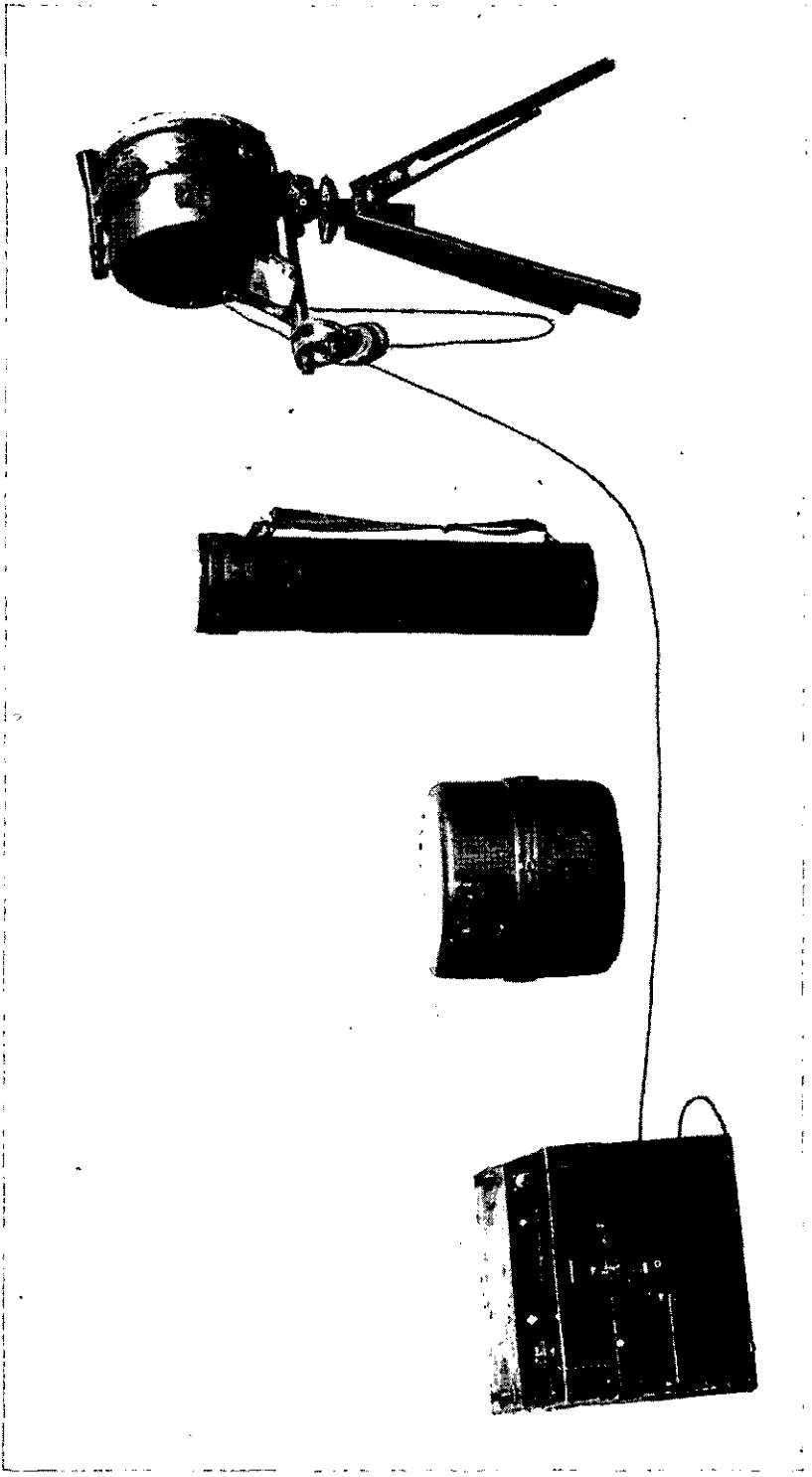


Figure 39. AN/PPS–4 short range radar set.

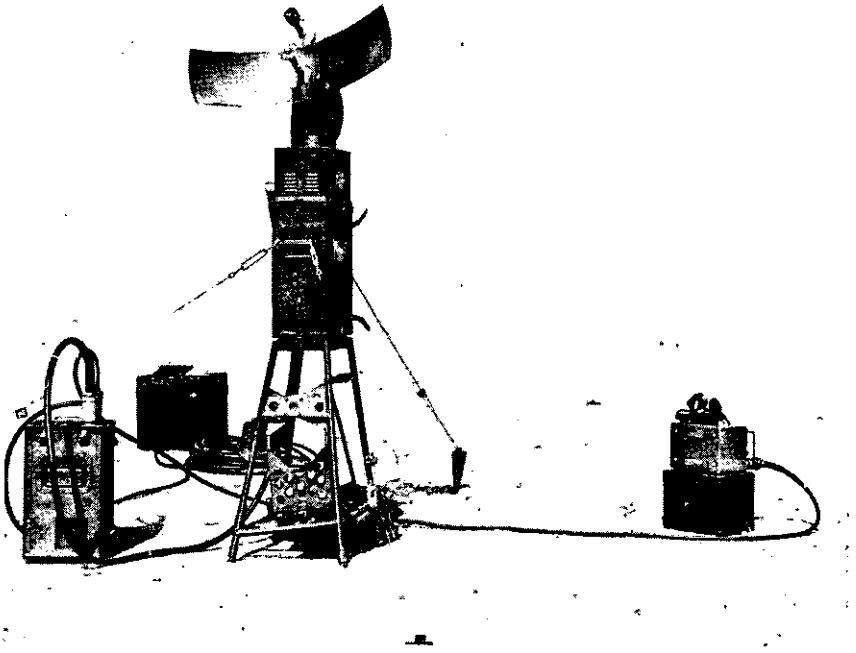


Figure 40. AN/TPS–21 medium range radar set.

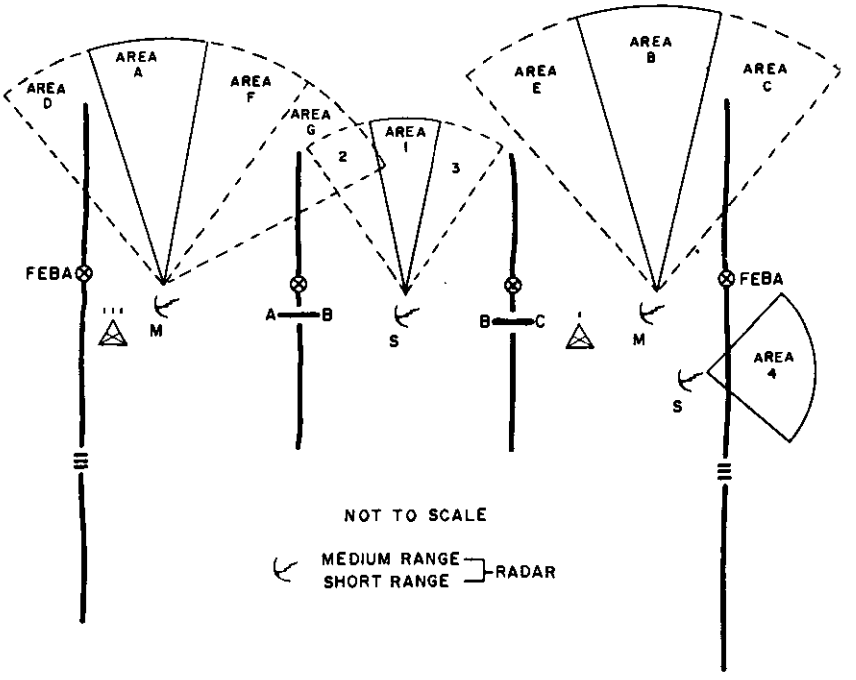


Figure 41. Radar surveillance plan.

(1) The *senior radar operator's* duties generally parallel those of a crew-served weapons squad leader. He is responsible for establishing and operating the radar site and for preparing an appropriate radar surveillance card (fig. 42). He insures that specific areas are kept under surveillance as prescribed in the surveillance plan.

(2) The *radar operators,* assisted by the senior radar operator, operate the radar equipment on site. They also operate the communication equipment and vehicle.

c. Short Range Radar Team.

(1) The *senior radar operator's* duties are similar to those of the senior operator of the medium range radar team. He is responsible for establishing and operating the radar site in accordance with instructions from his section leader or the commander of the unit to which his team is attached. He insures that all information obtained by his team is reported to the commander of the unit to which he is attached. This is accomplished by establishing wire or radio communication with the attached unit.

(2) The *radar operator,* assisted by the senior radar operator, operates the radar and communication equipment on site.

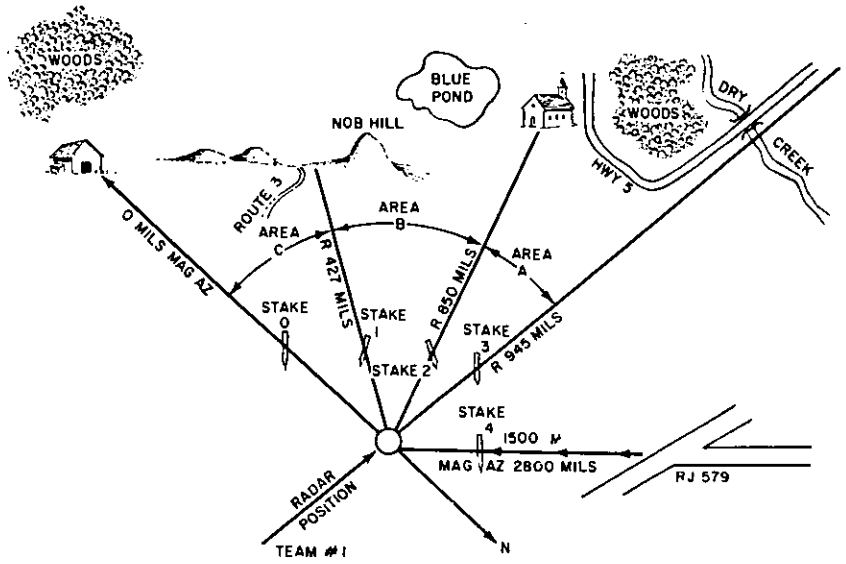
Section II. TECHNIQUES OF EMPLOYMENT

123. General

a. The battle group S2 has primary staff supervision over the employment of the radar section. He recommends the method of employment (general support, direct support, or attachment) to the commander. He prepares the surveillance plan and designates general site locations and specific areas of surveillance, to include the frequency of coverage desired for the medium range radar teams. The medium range radar teams normally are employed in general support to add depth to the battle group's surveillance coverage.

b. The short range radar teams are normally attached to a rifle company or other subordinate units of the battle group. The commander of the unit to which the team is attached selects the exact site for the radar, prescribes the area and method of surveillance, and arranges for security and logistical support of the team.

c. The medium range radars must be oriented when occupying a site. By proper orientation of the set and coordination with fire support elements, moving targets detected by the radars can be taken under fire by fire support elements using preplanned concentrations. Orientation and coordination of surveillance areas for



PRIORITY AREAS OF SEARCH

TIME	AREA	PRIORITY	RANGE	FREQUENCY OF SEARCH
0 TO +15	A	1	6000 M	AS ANNOUNCED
+15 TO +25	C	2	4000 M	" "
+25 TO +45	B	3	5000 M	" "
+45 TO +60	A	1	6000 M	" "

NOTE: STAKE NUMBERS AID IN NIGHT ORIENTATION OF SET.
NOT TO SCALE

Figure 42. Radar surveillance card.

the short and medium range radars will be accomplished during daylight hours when feasible. Radar surveillance cards must be prepared and distributed to the fire support agency. Since these radars operate on line of sight and require background to detect movement, they are normally employed on dominating terrain similar to that required for a battle group or company observation post. A radar site and an observation post may be located together; however, radar personnel should not be detailed as ground observers except in emergencies. Additional items of surveillance equipment having range capabilities greater than that normally required by the battle group will be available at higher headquarters. When longer range ground surveillance equipment is required to support the battle group, such support is made available on a mission basis. When division ground surveillance devices are located in the battle group area, close coordination must be effected to insure maximum effectiveness of the overall surveillance effort. Employment of this additional supporting equipment is similar to that of organic medium range radars.

d. Each radar team is assigned a specific area of surveillance. In assigning sectors, consideration is given to terrain, enemy capa-

bilities, equipment capabilities, and desired degree of sector overlap. Sector surveillance assignments and frequency of coverage must be included in the instructions to the radar team. The technique of scanning an area by radar is comparable to the scanning technique of a ground observer.

e. The range of these radars increases the commander's surveillance capability in his area of interest during hours of poor visibility or darkness, thus permitting him greater reaction time within his area of influence. Terrain, visibility, or the enemy situation may dictate the employment of the radars during daylight hours.

124. Offense

The tactical employment of the radar section is affected by the dispersion and rapidity of movement that characterizes the operations of the battle group. Radar teams may be used to provide surveillance forward of the line of contact as well as surveillance of an open or exposed flank. They may be used as a means of vectoring friendly attacking elements or patrols in darkness or poor visibility. They may be used to provide surveillance of critical areas or avenues of approach into the zone of attack of the battle group. Radars should be kept as far forward as the tactical situation and terrain will permit. These various tasks may be accomplished by employing the section or teams in general support, direct support, or by attachment.

125. Defense

a. General. In defense, the surveillance radars are employed to maintain surveillance over avenues of approach, gaps between units, and critical areas during periods of poor visibility or darkness. The short range radar teams are usually attached to the forward units or security elements to provide the subordinate unit commander with an electronic surveillance capability. Subordinate unit commanders usually employ the short range radars to cover gaps between platoons and companies, and for surveillance of specific areas to the front or flank. The medium range radars are normally employed in general support to add depth to the battle group surveillance coverage. In defense as well as offense, a battle group surveillance plan must be prepared to insure adequate surveillance coverage and coordination with fire support units. The plan is prepared by the S2 in coordination with the radar section leader. Radar surveillance cards must be prepared for each radar site. It is desirable that the radar be oriented at the selected site and that radar surveillance cards be prepared during daylight. During periods of poor visibility or darkness, radars are moved

into the previously prepared positions to cover prescribed surveillance areas. When the medium range radars must be located in an exposed position, remote control operation is desirable. If enemy activity is detected in an area not included in the surveillance plan, a new mission may be prescribed redirecting the efforts of the radars. When such a mission is completed, the operator returns to the prescribed area of surveillance. A similar procedure can be employed by a commander to whom the short range radar is attached.

b. Retrograde.

(1) *Medium range radar team.* Radar sites or positions are selected to which the medium range radar teams will displace. These positions are prepared and tentative radar surveillance cards made out. The section leader or the section sergeant and senior radar operator conduct reconnaissance and insure that radar positions are prepared, preferably during daylight hours. Medium range radar teams may remain with detachments left in contact in a night withdrawal, in which case they are attached to a unit for the withdrawal.

(2) *Short range radar team.* Short range radar teams operate under the control of the company or subordinate unit to which they are attached. The team may operate with detachments left in contact or displace to new surveillance sites in a manner similar to the displacement of the medium range radar teams.

126. Air Mobile Operations

a. The radar section can be delivered into combat by parachute, assault aircraft, or transport helicopter. The section is delivered into the objective area as early as practicable to provide maximum time for reconnaissance and preparation of radar sites. Usually the section lands with the main body, but teams may land early with security elements.

b. The radar section is employed in air mobile assault and subsequent operations in generally the same manner as discussed elsewhere in this chapter.

APPENDIX

REFERENCES

AR 105–15	Army Field Commands
AR 320–5	Dictionary of United States Army Terms
AR 320–50	Authorized Abbreviations
FM 1–100	Army Aviation
FM 3–5	Tactics and Techniques of Chemical, Biological and Radiological (CBR) warfare.
FM 5–36	Route Reconnaissance and Classification
FM 6–20	Field Artillery Tactics and Techniques
FM 6–40	Field Artillery Gunnery
FM 6–135	Adjustment of Artillery Fire by the Combat Soldier.
FM 6–140	The Field Artillery Battery
FM 7–10	Rifle Company, Infantry and Airborne Division Battle Groups.
FM 7–21	Headquarters and Headquarters Company, Infantry Division Battle Groups.
FM 7–24	Communication in Infantry and Airborne Divisions.
FM 7–40	Infantry and Airborne Division Battle Groups.
FM 20–60	Battlefield Illumination
FM 21–5	Military Training
FM 21–6	Technique of Military Instruction
FM 21–30	Military Symbols
FM 23–90	81-mm Mortar, M29
FM 23–92	4.2-Inch Mortar, M2
FM 31–60	River-Crossing Operations
FM 31–71	Northern Operations
FM 31–72	Mountain Operations
FM 57–35	Army Transport Aviation, Combat Operations.
FM 72–20	Jungle Operations
FM 100–5	Field Service Regulations; Operations
FM 101–10 (Part I)	Staff Officers' Field Manual; Organization, Technical, and Logistical Data.
TM 3–200	Capabilities and Employment of Toxic Chemicals.
TM 5–235	Special Surveys
TM 10–405	Army Mess Operations
TM 11–2552A	Sound Locating Set GR–6–A and Sound Ranging Set AN/TNS–3.

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  USASCS (15)
  USATSCH (10)
  USAIS (2596)
Combat Surveillance & Tgt
  Acquisition Tng Comd (10)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: Same as Active Army.

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

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