

CHAPTER 6

ORGANIZATION OF POSITION

42. (U) General

a. This chapter covers the composition and arrangement of elements of a battalion in position. For a discussion of other aspects of organization of position, such as security, communication, and survey, see chapters 7, 8, and 9.

b. The organization of a position includes those operations necessary for delivery of fire. Operations required to deliver fire as soon as possible after occupying position have first priority. These operations include assembly and checkout of missiles, preparation of ground handling equipment for action, and production of liquid oxygen and liquid nitrogen.

c. A new position should be prepared prior to occupation, as completely as time allows. All practicable measures are taken to avoid disclosing the position to the enemy. All personnel must be indoctrinated in the necessity for concealing the position from air observation. All units continue to organize and improve positions as long as the positions are occupied. Alternate firing positions should be prepared as soon as possible after completion of the primary positions.

43. (U) Headquarters and Headquarters Battery Area

a. The discussion in FM 6-101 and 6-140 on organization of command posts, and headquarters battery areas, generally are applicable to the headquarters and headquarters battery area of the Redstone battalion.

b. The headquarters battery position is organized to facilitate support of the command post.

c. The battalion fire direction center (FDC) should be located and organized where possible to permit operation with both missile batteries from a single location. The FDC has a capability of being split to operate simultaneously with the two missile batteries at widely separated locations. However, the battalion is authorized only one missile programming data computer Redstone.

44. (U) Missile Battery Position Areas

a. Each missile battery will normally occupy a position area and prepare firing positions in advance for occupation on receipt of a

fire mission. The position area will be organized to take maximum advantage of natural camouflage and cover. The vehicles and equipment will be arranged to permit rapid movement out of the position area.

b. Firing positions may be prepared in the missile battery position area, adjacent to it, or sufficiently distant from it to minimize the danger of exposing the area to counterfire aimed at a firing position.

c. The firing position will be organized solely to facilitate the execution of the fire mission. A cleared area 65 by 12 meters must be available to permit maneuvering the necessary vehicles around the launcher. Within this area, the supporting media must be solid enough to support the launcher and the missile prepared for firing. The launcher with a loaded missile has approximately the same bearing pressure as an average person standing on his feet. The moisture content of the soil is important and its effects vary with different types of soils. It is extremely important that the soils supporting the launcher be homogeneous to prevent the launcher from settling unevenly under the weight of a fully loaded missile. In wet climates, due consideration must be given to an adequate drainage system around the launcher.

d. The location of the launcher, and the blast danger area determines the general arrangement of a firing position. The exact positioning of equipment depends on the mission, terrain, road nets, and unit standing operating procedure. A typical layout of equipment around a firing position is shown in figure 9. The danger area around the area is 45 meters for required ground support equipment, and a minimum of 180 meters for personnel protected by a revetment. The following are the recommended placement practice distances for personnel and equipment during a firing.

Personnel and equipment	Distance from launcher	Additional protection required
Personnel.....	740 meters.....	None.
	180 meters.....	Revetments.
Firing support equipment.	45 meters.....	None.
	As near as 40 meters in blast area.	Revetments the height of the equipment.
Other support equipment.	210 meters.....	None.
Second missile.....	210 meters.....	Revetments.

45. (U) Engineer Company Area

a. The engineer company organizes its area in accordance with the criteria for dispersion and protection prescribed by the battalion commander. Liquid oxygen-nitrogen generating plants and accessory

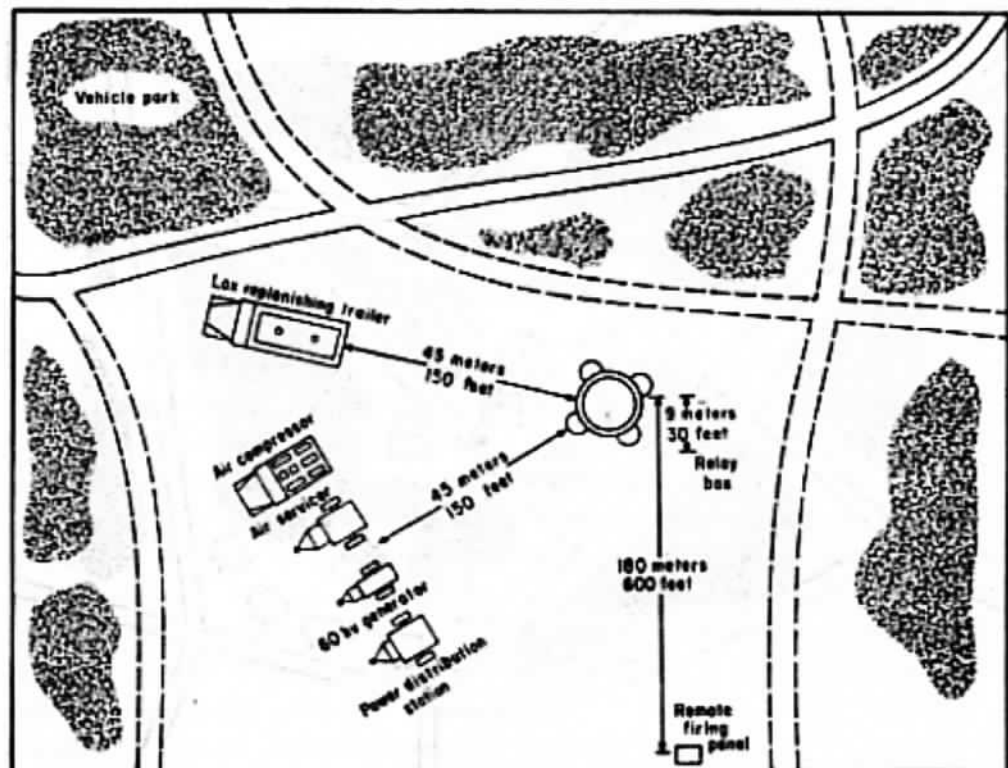


Figure 9. (U) Typical final layout of equipment, firing position field artillery missile battery, Redstone.

equipment should be dispersed in such a manner that minimum loss or damage will result in event of a single attack. Figure 10 represents one possible layout of the engineer company.

b. Subordinate elements of the engineer company are organized under the following requirements:

- (1) Company headquarters should be located centrally in order to provide administrative support to company elements.
- (2) The location of the maintenance platoon must be selected with particular care. This location must serve as a working area for the platoon and provide access to the various sections of the engineer company and to other elements of the battalion. Consideration should also be given to supply routes to the supporting engineer repair parts company and field maintenance company.
- (3) The generating sections and platoon headquarters can occupy a position in many patterns. Some factors which affect the layout are road nets, soil stability, existence of natural concealment, and space for LOX storage trailer exchange. However, one method of achieving maximum control without increasing the distance to supported units is to employ the pattern shown in figure 10.

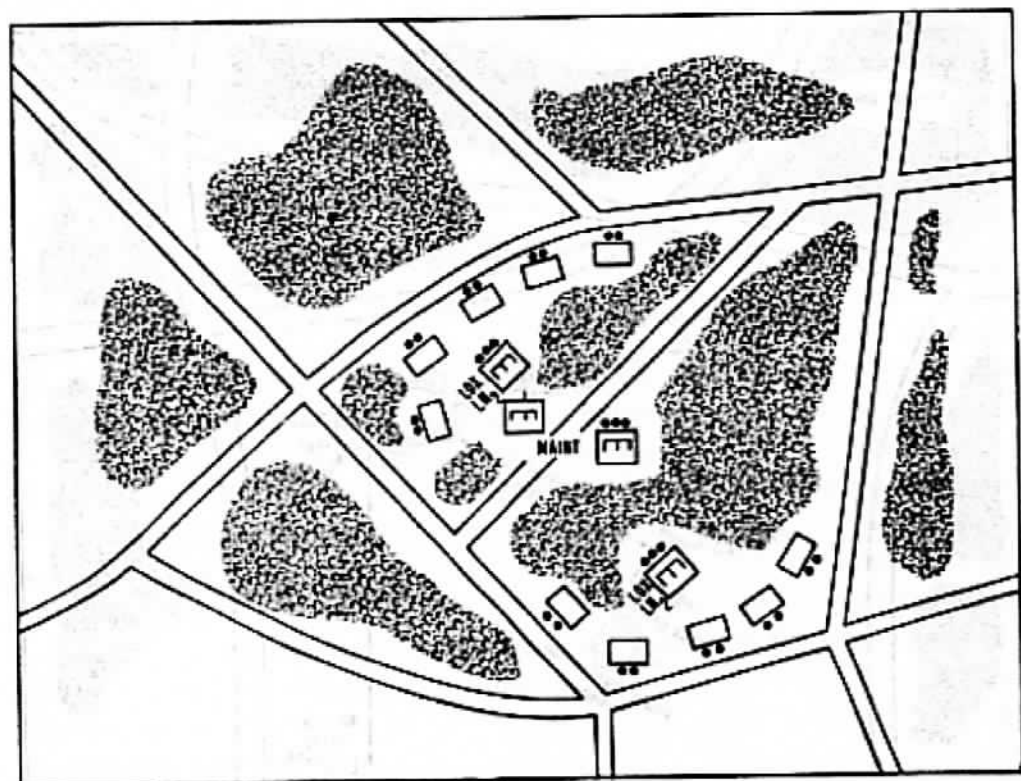


Figure 10. (U) Typical engineer company position.

46. (U) Ordnance Company Area

The ordnance company area should be organized with the following considerations:

a. The company headquarters and maintenance shop area should be located centrally to provide administrative support to all elements of the company. The shop office should be located near the entrance to the area, but also located so as to provide control and administrative support to the maintenance shops.

b. The ordnance company should be located as close to the missile batteries as the situation permits to facilitate support of firing operations.

c. An internal road net should be available where possible.

d. Supply elements of the company should be available to the company maintenance shops and also other elements of the battalion.

e. The exclusion area should not be located for ease of access.

f. Maintenance elements of the company should be located for ease of access.

g. Advantage should be taken of terrain for communications and local defense.

CHAPTER 7

SECURITY

47. (U) General

a. Personnel and equipment organic to the battalion are not adequate for ground and air defense. Higher commanders are responsible for providing ground and air defense.

b. Each unit of the battalion should organize its position for local security to include an adequate warning system, provisions for active and passive security measures, and marking areas swept for mines.

c. The nuclear capability of the Redstone missile makes each unit position of the battalion a high-priority target for attack by the enemy. The most effective way for an enemy to counteract the effectiveness of missile fire is to prevent the unit from firing its missiles. It can be expected that an enemy will focus his counterbattery intelligence efforts on locating unit positions of a field artillery missile battalion, Redstone. It can also be expected that the enemy will attack these unit positions with every means possible. Therefore, all active and passive security measures must be fully implemented. Particular attention must be given to passive air defense measures, especially camouflage of unit positions.

d. While establishing security for their units, commanders must consider the following principles:

- (1) Security measures must *not* prevent this battalion from the timely accomplishment of its mission.
- (2) Security measures must prevent enemy action from interfering with the timely accomplishment of the battalion mission.
- (3) Security measures must not give a unit distinctive features which identify it as one having a nuclear capability.
- (4) Security measures must prevent access to classified material by unauthorized personnel during training as well as in combat. Access to classified information and material will be based primarily on *visual recognition* of the person requiring access.

48. (U) Active Security Measures

a. Both the missile batteries and the ordnance company must take every precaution to protect ammunition from enemy action and pre-

vent access to classified material by unauthorized personnel at all times. Nuclear munitions storage areas, warhead checkout areas, and the portions of the firing positions required for warhead operation are designated as limited areas as defined in AR 190-60.

b. Commanders concerned will take the following precautions to protect nuclear ammunition:

- (1) Place an armed guard on each vehicle transporting ammunition during marches, and arrange the march column so that vehicles with mounted machineguns can cover by fire the vehicles transporting ammunition.
- (2) Designate only a minimum number of authorized entrances and exits in the perimeter defense.
- (3) Instruct guards to prohibit anyone who cannot properly identify himself from entering or leaving the perimeter defense of the unit.
- (4) Organize a special reserve under the command of an officer with the specific mission of providing additional protection for ammunition. Members of this special reserve will be trained and equipped for hasty evacuation and destruction of ammunition. Reserve members will be designated by name and will have complete instructions as to the signal for and plan of assembly. Each member of this reserve should know those items of equipment he must have with him and be thoroughly rehearsed in his duties to insure rapid assembly and employment.
- (5) Make plans for the disposition of ammunition to prevent capture. Preventing nuclear components from falling into enemy hands is of first importance. Instructions for disposition of ammunition to prevent its capture will normally be issued to the battalion by or through the army artillery headquarters. If capture is imminent and there is no communication with higher headquarters, the senior person eligible to exercise command in the unit will order evacuation, firing, or destruction of the ammunition in the following priority:
 - (a) Evacuation of all components of nuclear weapons and related sensitive items is preferred in all cases and will be given first consideration.
 - (b) If evacuation does not appear possible, he will next give consideration to the possibility of firing the ammunition ((6) below).
 - (c) If evacuation in the case of the ordnance company does not appear possible, he will order the destruction of the ammunition.

- (6) Maintain current firing data in the missile battalion, for locations furnished by higher artillery headquarters for *safely* disposing of ammunition by firing. The senior officer present must be sufficiently familiar with the situation to insure that these fires will not endanger friendly troops.
- (7) Maintain a standing operating procedure for the destruction of ammunition. Items will be destroyed only as a last resort or when directed by higher authority. Destruction will be carried out only on order of the senior person eligible to exercise command, who is present in the unit. For instructions on procedures for destruction of ammunition, see TM 39-W39.16-9, Warhead Section, XM18 and XM30 (Redstone) (S).

c. The security platoon of the headquarters and headquarters battery is designed to perform many of the functions required in *b* above.

d. The security procedures required in *b* above will be the principal means of preventing personnel not organic to the unit from having access to classified materiel. In addition, the unit commander will take the following precautions to prevent access to classified materiel, including ammunition, by unauthorized personnel:

- (1) Protect classified materiel at all times with a guard.
- (2) Furnish unit officers, chiefs of section, and guards a list of the names of *organic* personnel who are authorized access to the materiel.
- (3) Prohibit access to classified materiel by *nonorganic* personnel, unless the next higher headquarters clears them by name and specifies the type of information they are authorized to receive; these personnel will not be granted access to classified materiel, until they are *visually* recognized by the officer or noncommissioned officer from the unit visited who will accompany them while they are with the classified materiel.
- (4) Instruct guards protecting classified materiel to allow those persons whom he visually recognizes as being on the list in (2) above to have access to the classified materiel. Instruct guards to allow other persons to have access to the classified materiel only when they are accompanied by an officer or noncommissioned officer whom the guard *visually recognizes* as on the list in (2) above.
- (5) Arm guards with live ammunition at all times.
- (6) Instruct guards as to what materiel or components of materiel are classified and what the classifications are.

49. (U) **Passive Security Measures**

Existing doctrine for the passive defense of unit positions will be fully implemented. Passive security measures include:

- a. Camouflage, cover, and concealment.
- b. Dispersion of vehicles and equipment.
- c. Field fortification (FM 5-15).
- d. Communication security.
- e. Adequate warning system to include communication listening posts and trip flares.
- f. Obstacles (FM 5-31).

CHAPTER 8

COMMUNICATION

50. (U) General

a. All available means of communication must be utilized. No one means is considered primary or relied on exclusively. The field artillery missile battalion, Redstone, employs wire, radio (AM and FM), and messenger communication. Sound and visual means may also be employed when appropriate. In all communications systems, adequacy, reliability, and flexibility are prime considerations in their establishment and maintenance. These same considerations apply within this battalion. For a general discussion of communications, see FM 6-20-1 and FM 6-20-2. A detailed discussion of communication procedures and techniques is contained in section V, FM 6-10.

b. Headquarters and headquarters battery is responsible for establishing and maintaining communications to its subordinate elements (missile batteries, ordnance company, and engineer company). The subordinate elements are responsible for their internal communications. The wire laying capability of the ordnance and engineer companies is limited. When it will not interfere with the primary requirements, the battalion should assist these companies in installing wire circuits.

51. (U) Wire Systems

a. Wire communication requirements are essentially the same for any employment of the battalion. A type wire system is shown in figure 11. When the missile batteries are widely dispersed, the command and operations circuits from the battalion to the batteries may be routed through the area communications system. The circuits from the battalion to the batteries must be sole-user circuits.

b. Since the battalion may be employed throughout the army area, communication with controlling headquarters (army artillery) may be difficult. When equipment and personnel are available from army signal units, the most satisfactory solution is a direct radio link between the army artillery command post and the missile battalion command post. A secondary solution is sole-user circuits through the army area communication system.

c. It is to be stressed that the criticality of the battalion fire support and the possible necessity to suspend a fire mission require direct

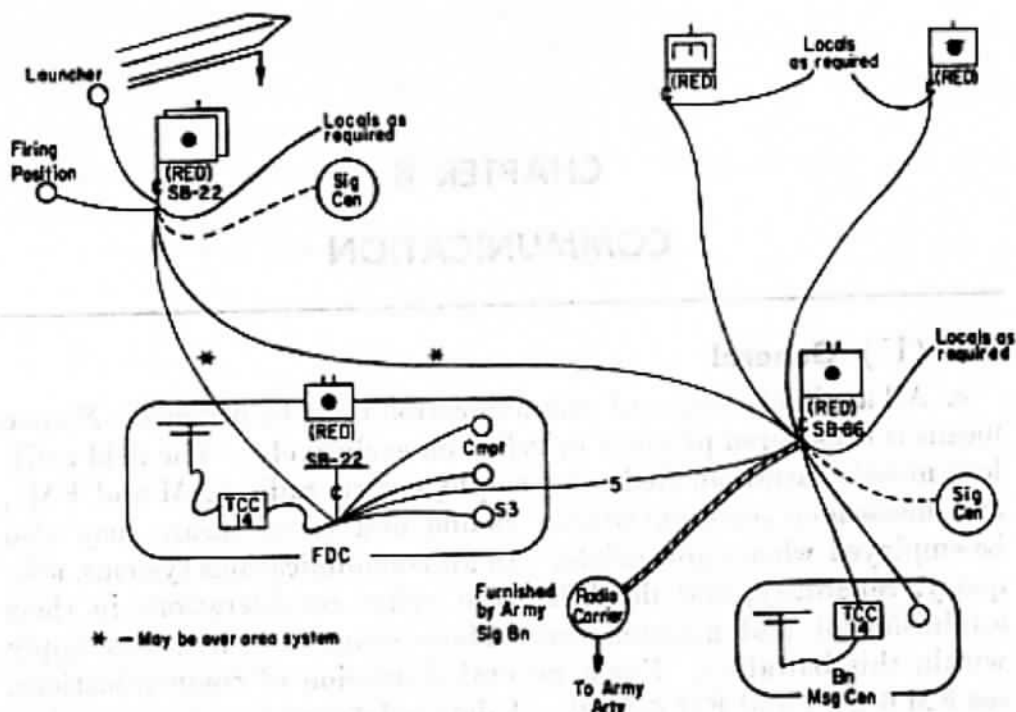


Figure 11. (U) Type wire system for a field artillery missile battalion, Redstone.

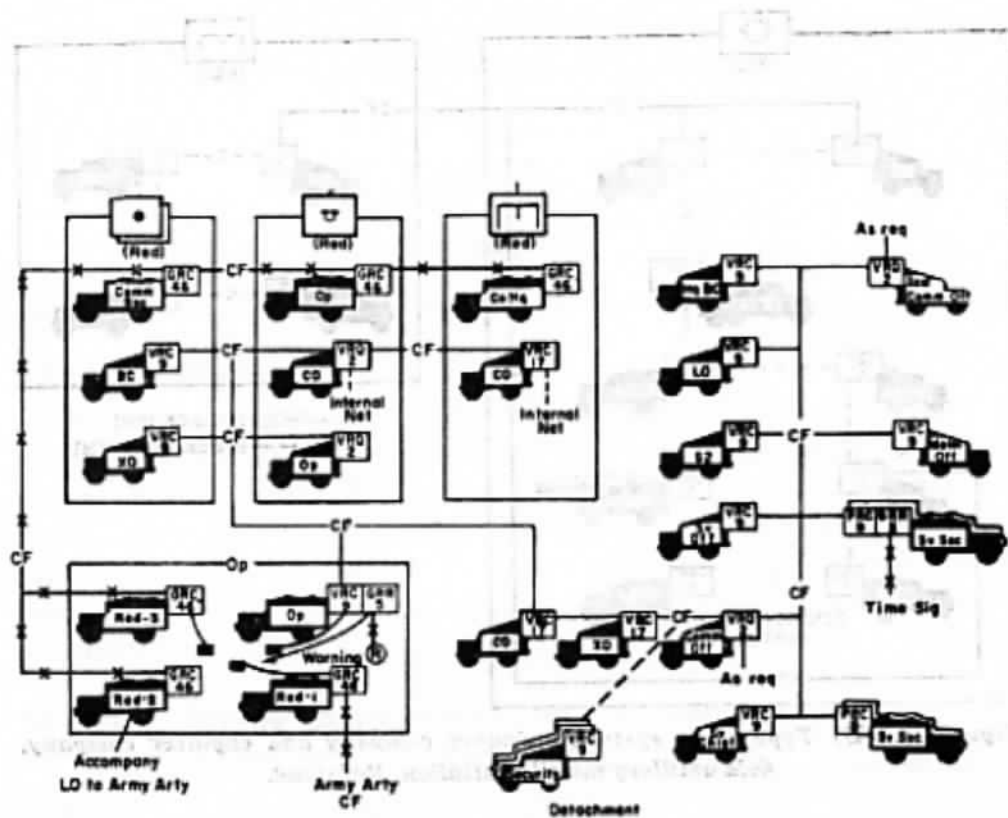
communication from the army artillery FSCS to the fire unit. Signal officers responsible for area communication systems over which sole-user circuits are routed must be cognizant of this requirement.

52. (U) Radio Systems

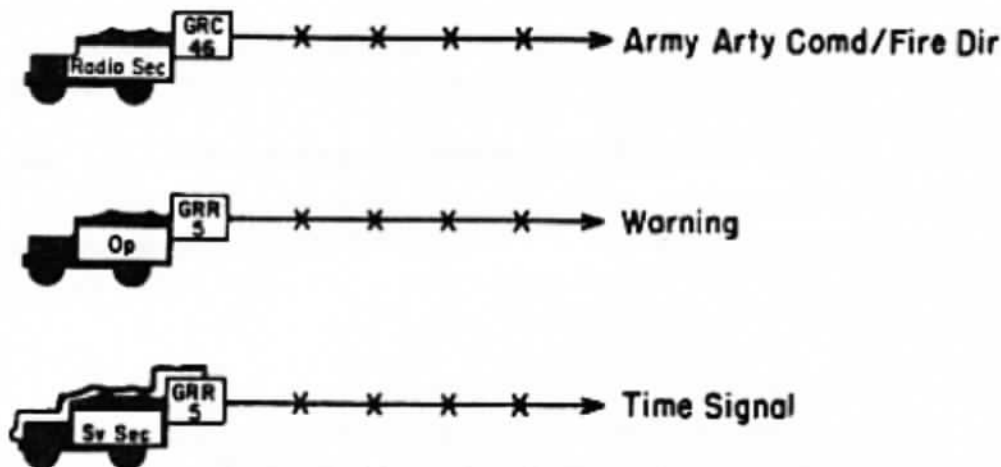
a. The missile battalion normally operates two command and fire direction nets, an AM and an FM. The AM net is used primarily for communication with subordinate units utilizing radioteletype. The FM net is used primarily for staff communication and communication with Army aircraft supporting the battalion. When distance permits, the FM net may be used for communication with subordinate units. The battalion operates in the army artillery command and fire direction net, AM, and monitors the appropriate warning net. A type internal radio system is shown in 1, figure 12. A type external radio system is shown in 2, figure 12.

b. The missile battery FM radio equipment operates on the battalion command and fire direction net. The battery AM radio normally operates on the battalion command and fire direction net, AM, but may operate on the army artillery command and fire direction net, AM, while a fire mission is in progress.

c. In addition, the ordnance company and engineer company each operate an internal FM net. A type radio system is shown in figure 13.



1 Type internal radio nets



2 Type external radio nets

Figure 12. (U) Type radio nets.

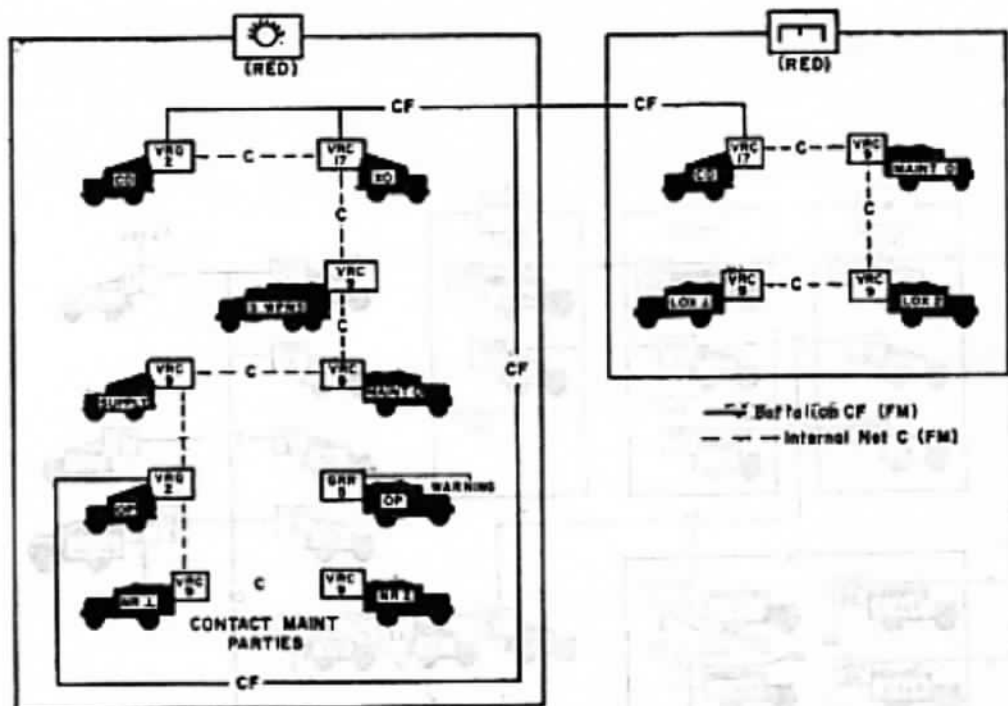
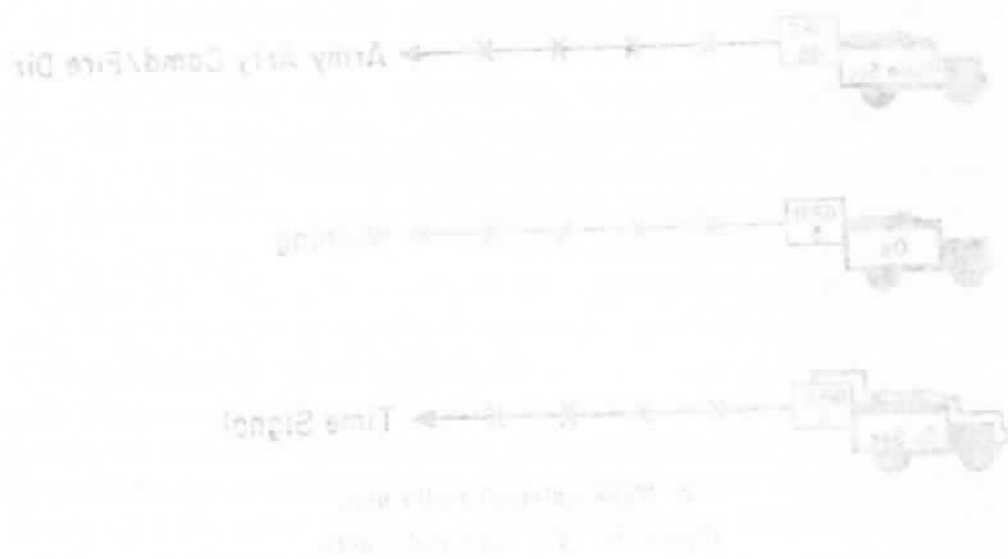


Figure 13. (U) Type radio system, ordnance company and engineer company, field artillery missile battalion, Redstone.



CHAPTER 9

SURVEY

53. (U) General

The survey requirements of the field artillery missile battalion, Redstone, are essentially the same as the survey requirements of any very heavy artillery unit. The principal differences are the greater accuracy with which an orienting azimuth is established at the missile battery firing position and the added requirement of accurate survey from the external source for the planetary test stand of the ordnance company (par. 55).

54. (U) Survey Organization and Responsibilities

a. The reconnaissance and survey officer is a member of the battalion staff and is responsible for planning, coordination, and overall supervision of survey operations within the battalion.

b. Survey personnel are assigned to the headquarters battery of the battalion to perform the survey required by the Redstone batteries.

c. Survey personnel are also assigned to the servicing section of the Redstone batteries to assist in laying the missile. They are under the operational control of the chief of the servicing section, but may be trained in the operation of the theodolite under the supervision of the battalion reconnaissance and survey officer.

55. (U) Survey Requirements and Accuracies

a. Survey requirements of the battalion performed by battalion survey personnel are as follows:

- (1) Grid coordinates and height of each launcher and alternate launcher position. The grid coordinates and height of the launcher must be determined to an accuracy of 1:1000. These data are obtained by using 5th order (1:1000) survey procedures to extend control from a survey control point. The survey control point should be established to an accuracy of 4th order (1:3000).
- (2) Grid azimuth of an orienting line for each launcher and alternate launcher position. Survey procedures will be employed that will insure an accuracy of ± 20 seconds for the orienting line.

b. Survey requirements of the battalion performed on request by engineer topographic units at Army are as follows:

- (1) Positioning the planetary test stand of the ordnance company. The astronomic position accuracy requirement for the planetary test stand is a probable error of ± 1 second in geographic coordinates (this approximates 1 second of arc or 30 meters at midnorthing latitudes), and is ± 5 meters in height.
- (2) Astronomic azimuth for orienting the planetary test stand of the ordnance company. The planetary test stand must be oriented to an accuracy of ± 20 seconds. Since the test stand has a system error of ± 2.5 seconds and two angle measurements are required (± 5 seconds probable error each) to orient the planetary test stand, the orienting line must be established to an accuracy of ± 7.5 seconds.

56. (U) Survey Procedures, Methods and Techniques

a. *Horizontal and Vertical Control.*

- (1) A survey control point for the Redstone battalion is established within 1,000 meters of the firing position by an engineer topographic unit or a field artillery target acquisition battalion. Battalion survey personnel normally employ a closed traverse to extend horizontal and vertical control from the survey control point to the firing position. When survey control of the required accuracy is not available in the vicinity of the firing position, plans for employment of the Redstone battalion should provide for the extension of survey control of the desired accuracy to the firing positions. Procedures are employed that will insure a 5th order accuracy (1:1000) for the location of the launchers, and the orienting station (if an astronomic observation is to be made).
- (2) As a last resort, a map inspection from a large scale map of known reliability (1:50,000 or larger) is acceptable when time is not available in which to perform a complete survey and the situation is such that the commander considers immediate firing necessary for the successful accomplishment of the mission.

b. *Directional Control.*

- (1) Whenever possible, direction for orientation of the missile will be established by astronomic observations. These observations will be made at the orienting station. The final azimuth determined by astronomic observations will be the result of four usable sets that agree within ± 20 seconds of the mean. If any one of the four sets fails to meet this criteria, it should be rejected and another observation made.

- (2) If a starting azimuth of 3d order astronomic accuracy (probable error ± 5 seconds) or higher is available at the survey control point, the azimuth of the orienting line may be established as part of the position area survey, provided no more than two traverse legs are required to reach the orienting station. If more than two traverse legs are required, then a normal position area survey is used to extend horizontal and vertical control to the firing position, and a directional traverse of not more than two legs will be used to establish the azimuth of the orienting line. Using either procedure, all angles used to determine the azimuth of the orienting line are measured two positions with a theodolite. The angles must be remeasured if the value determined for each position varies by more than 5 seconds from the mean; i.e., if the spread exceeds 10 seconds. By using this procedure and by limiting the number of directional traverse legs to two, a high assurance is provided that the azimuth placed on the orienting line will be accurate within ± 20 seconds.
- (3) When it is not possible to make an astronomic observation for azimuth determination, the direction of the orienting line should be determined with the artillery azimuth gyro surveying instrument.
- (4) An azimuth determined by astronomic observations should be checked as soon as possible with the artillery azimuth gyro surveying instrument, or by a directional traverse based on existing survey control of equal or higher accuracy. An azimuth determined by the artillery azimuth gyro surveying instrument should also be checked. All directional traverses must be closed.

c. Methods and Techniques. The survey methods and techniques discussed in TM 5-234 and FM 6-2 are used in survey operations performed by the missile battalion.

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